





**START**

U S  
OFFICIAL GAZETTE  
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PATENT OFFICE

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MICRO PHOTO DIVISION



BELL & HOWELL

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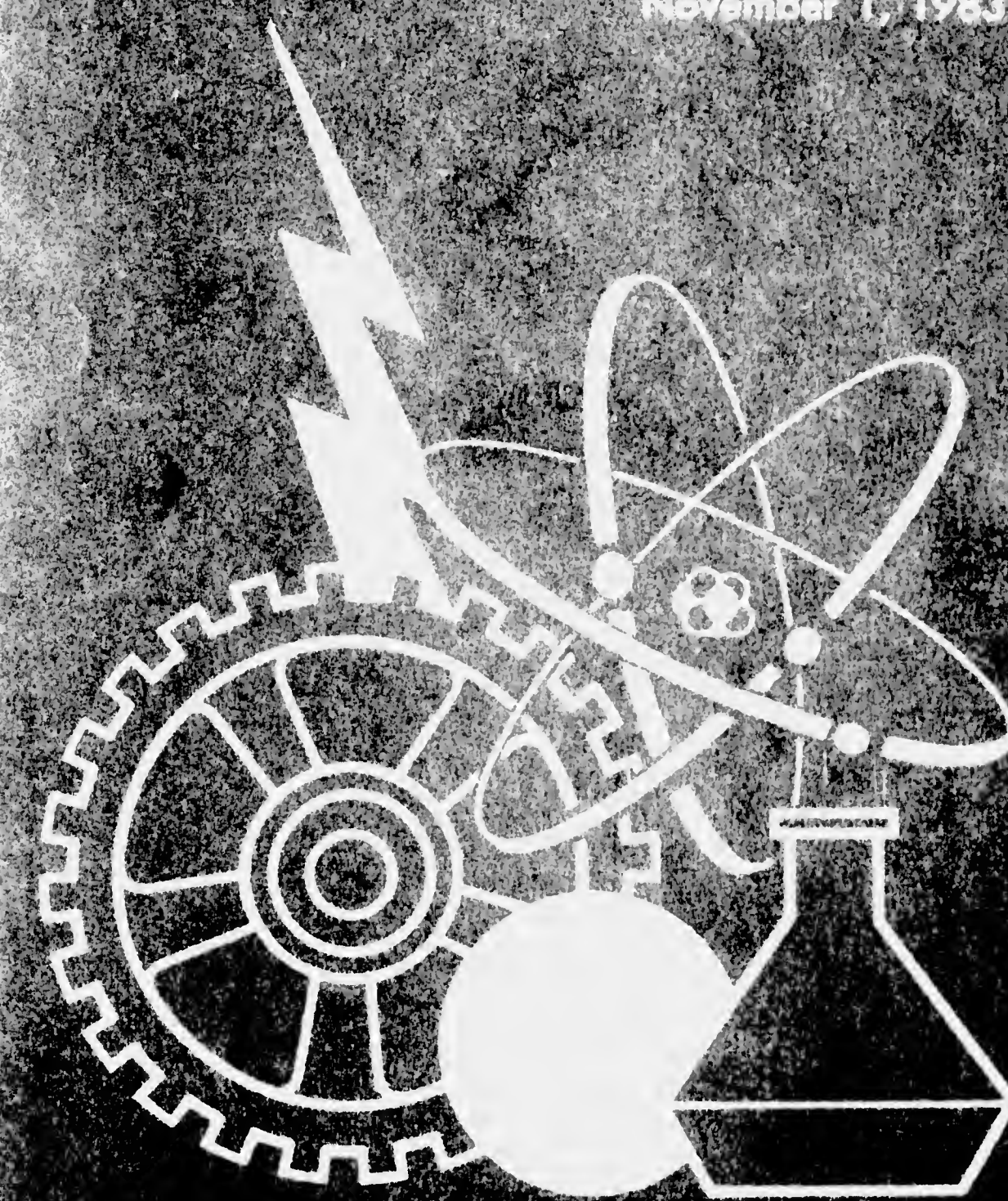
VOL. 1036 14th mo.

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 1, 1983



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DEPARTMENT  
OF COMMERCE

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Trademark  
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CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1036 OG 2
Board of Appeals Decisions	1036 OG 2
Reissue Applications Filed	1036 OG 2
Request for Reexamination Filed	1036 OG 2
Errata	1036 OG 2
Xerox License Offer	1036 OG 3
Patent Certificates of Correction	1036 OG 4
Disclaimers	1036 OG 4
Dedication	1036 OG 4
Disclaimers and Dedications	1036 OG 4
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1036 OG 5
Condition of Patent Applications	1036 OG 6
Defense Patent Publication: (103,601)	1
Reissue Patents Granted (31,432)	3
Plant Patents Granted (5,129)	5
Patents Granted	
General and Mechanical (4,412,357)	7
Chemical (4,412,837)	173
Electrical (4,413,157)	259
Design Patents Granted (271,154)	327
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 39
List of Defensive Publications	PI 42
Classification of	
Patents (Including Reissues)	PI 43
Designs, Plants and Defensive Publications	PI 45
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 46
Designs, Plants and Applicants of Defensive Publications	PI 47
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at \$1.00 each; PLANT PATENTS in color, \$8.00 each; copies of TRADEMARKS at \$1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

### Board of Appeals Decisions Rendered in the Month of Sept. 1983

Affirmed	195
Affirmed in Part	15
Reversed	64
Total	274

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**4,100,214**, Re. S.N. 516,830, Filed July 25, 1983, Cl. 585/481, ISOMERIZATION OF MONOCYCLIC ALKYL AROMATIC HYDROCARBONS, Francis G. Dwyer, Owner of Record: *Mobil Oil Corp.*, New York, N.Y., Attorney or Agent: Alexander J. McKillop, Ex. Gp.: 116

**4,182,486**, Re. S.N. 487,631, Filed Apr. 22, 1983, Cl. 236/49, FLUIDIC FLOW SENSING AND CONTROL APPARATUS, Richard C. Mott, Owner of Record: *Honeywell, Inc.*, Minneapolis, Minn., Attorney or Agent: Stephen W. Buckingham, Ex. Gp.: 344

**4,274,202**, Re. S.N. 510,397, Filed June 30, 1983, Cl. 30/365, PERFORATING DEVICE, Detlef Petrick, Owner of Record: *Bonumwerke Tigges & Winckel GmbH & Co. KG, Langenberg, Germany*, Attorney or Agent: Michael J. Striker, Ex. Gp.: 323

**4,320,224**, Re. S.N. 498,116, Filed May 25, 1983, Cl. 528/125, THERMOPLASTIC AROMATIC POLYETHERKETONES, John Brewster Rose, et al., Owner of Record: *Imperial Chemical Industries Ltd.*, London, England, Attorney or Agent: None, Ex. Gp.: 144

**4,386,999**, Re. S.N. 515,418, Filed July 20, 1983, Cl. 156/494, INERTIAL SPIN WELDING OF THERMOPLASTIC AND THERMOPLASTIC COATED CONTAINER PARTS, Vincent E. Fortuna, et al., Owner of Record: *Cosden Technology, Inc.*, Dallas, Tex., Attorney or Agent: Michael J. Caddell, Ex. Gp.: 161

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**3,523,464**, Reexam. No. 90/000,448, Requested: Sept. 22, 1983, Cl. 74/552, STEERING WHEEL WITH PLASTIC FOAM SHEATHING, Henri Paul Marcel Quillery, et al., Owner of Record: *Inventor*, Ex. Gp.: 352, Requester: Sheller-Globe Corp., Toledo, Ohio

**3,815,831**, Reexam. No. 90/000,443, Requested: Sept. 12, 1983, Cl. 239/498, IRRIGATION SPRINKLERS, Abraham S. Jooste, Owner of Record: *Abraham S. Jooste, Cape Town, South Africa*, Attorney or Agent: John W. Malley, Ex. Gp.: 330, Requester: Microjet International, Inc., Dundee, Fla.

**4,055,966**, Reexam. No. 90/000,447, Requested: Sept. 19, 1983, Cl. 464/99, TORQUE TRANSMISSION COUPLING, Walter A. Fredericks, Owner of Record: *Rexnord, Inc.*, Milwaukee, Wis., Attorney or Agent: Robert H. Kelly, Ex. Gp.: 240, Requester: Owner

**4,128,458**, Reexam. No. 90/000,449, Requested: Sept. 26, 1983, Cl. 204/1T, COMBUSTIBLE ELEMENT AND OXYGEN CONCENTRATION SENSOR, Joseph O. Obiaya, Owner of Record: *Inventor*, Attorney or Agent: James T. Hoffman, Ex. Gp.: 112, Requester: Babcock & Wilcox Co. & Bailey Controls Co., Willoughick, Ohio

**4,156,999**, Reexam. No. 90/000,452, Requested: Oct. 4, 1983, Cl. 52/376, BEAM FOR CONCRETE FORMING STRUCTURES, Peter J. Avery, Owner of Record: *Demiro Construction Ltd.*, Ontario, Canada, Attorney or Agent: Donald E. Hewson, Ex. Gp.: 354, Requester: Structural Contours, Inc., Greenwich, Conn.

**4,323,060**, Reexam. No. 90/000,445, Requested: Sept. 16, 1983, Cl. 128/84, SPLINT, Jean-Claude R. Pecheux, Owner of Record: *Societe Anonyme Compagnie Generale de Materiel Orthopedique, Charleville-Mezieres, France*, Attorney or Agent: Bacon & Thomas, Ex. Gp.: 330, Requester: Biodynamic Technologies of Florida, Inc., Boca Raton, Fla.

### Erratum

In the Official Gazette of Jan. 2, 1979 under TRADEMARK REGISTRATIONS CANCELED, Section 8, on page TM 56, "943,290. CRAZY SHIRTS AND DESIGN. U.S. Cl. 39." should be deleted.

### XEROX LICENSE OFFER

This notice is published pursuant to a CONSENT ORDER TO CEASE AND DESIST dated July 29, 1975, as modified Sept. 10, 1982, between Xerox Corp. and the Federal Trade Commission.

TERMS contained in this notice are defined in the Consent Order. All interested parties should refer to that document for the definitions and additional details of Xerox' patent and know-how licensing obligations thereunder. A copy of the Consent Order and a list of PATENTS licensed to Xerox which are subject to the provisions of paragraphs II and IV (C) (9) of the Order, if any, are available from Xerox upon written request. All such requests and any request relating to the licensing of PATENTS pursuant to the Consent Order should be made in writing and addressed to:

The Manager of Patent Licensing  
Xerox Corp.  
P.O. Box 1600  
Stamford, Conn. 06904

Xerox shall, in accordance with the terms of the Consent Order, grant licenses under

- (a) its ORDER PATENTS to make, have made, use and vend OFFICE COPIER PRODUCTS under the terms of the Consent Order; and
- (b) patents which are required to be licensed pursuant to the terms of paragraph X of the Consent Order, if any.

The following is a list of patents which is believed to include all of the PATENTS available for licensing in accordance with the terms of the Consent Order issued since the publication of the last notice by Xerox (1025 OG-6). Fuji Xerox, Ltd. patents which also make up part of the list are grouped separately. A copy of the classification index for the listed patents appears at 1012 OG-55. Since the classification system is not restricted solely to OFFICE COPIER PRODUCTS, there are several patents included in the list to which the Consent Order is not applicable.

### FUJI XEROX PATENTS

#### CLASS 01A04

**4,346,159**.—PHOTOSENSITIVE ELEMENT FOR ELECTROPHOTOGRAPHY. Aug. 24, 1983.

#### CLASS: 01E

**4,370,047**.—HIGH SPEED COLOR APPARATUS. Jan. 25, 1983. CAN. 1,120,092, EPC. 4,736, FRA. 4,736, GER. 4,736, GRB. 4,736, HOL. 4,736.

#### CLASS: 05N

**4,378,228**.—PROCESS FOR PREPARATION OF MONODISPERSED CRYSTALLINE PARTICLES FROM AMORPHOUS POLYMERS. Mar. 29, 1983.

#### CLASS: 10A

**4,350,332**.—SHEET HANDLING APPARATUS. Sept. 21, 1982. GRB. 1,549,285.

#### CLASS: 15

**4,346,156**.—ELECTROPHOTOGRAPHIC-MAGNETIC DUPLEX IMAGING STRUCTURE AND METHOD. Aug. 24, 1982. CAN. 1,106,675, GRB. 1,581,361.

#### CLASS: 32

**4,378,228**.—PROCESS FOR PREPARATION OF MONODISPERSED CRYSTALLINE PARTICLES FROM AMORPHOUS POLYMERS. Mar. 29, 1983.



## PATENT NOTICES

### Certificates of Correction for the Week of Nov. 1, 1983

D. 269,919	4,367,846	4,387,846	4,395,966
4,091,093	4,368,465	4,388,308	4,395,996
4,231,786	4,368,503	4,388,380	4,396,062
4,233,187	4,368,661	4,388,783	4,396,373
4,243,984	4,368,873	4,388,851	4,396,439
4,249,092	4,369,100	4,390,049	4,396,623
4,250,514	4,373,497	4,391,876	4,396,624
4,267,306	4,376,103	4,392,487	4,397,117
4,272,809	4,376,316	4,392,521	4,397,340
4,280,957	4,376,598	4,393,401	4,397,436
4,281,920	4,376,903	4,393,470	4,397,731
4,289,762	4,379,343	4,393,592	4,397,886
4,306,074	4,379,839	4,393,839	4,398,530
4,320,915	4,380,320	4,394,024	4,399,233
4,321,133	4,380,639	4,394,088	4,399,252
4,325,992	4,380,865	4,394,108	4,399,664
4,328,240	4,383,166	4,394,121	4,399,752
4,329,033	4,383,992	4,394,183	4,400,446
4,335,058	4,384,096	4,394,237	4,400,473
4,342,135	4,384,136	4,394,302	4,400,911
4,355,556	4,385,393	4,394,620	4,401,579
4,356,195	4,386,361	4,394,698	4,401,720
4,360,671	4,386,396	4,394,876	4,401,726
4,362,976	4,386,858	4,395,262	4,402,676
4,364,888	4,387,285	4,395,588	4,402,786
4,367,316	4,387,520	4,395,599	4,402,910
4,367,674	4,387,783	4,395,678	4,403,325

### Disclaimers

3,996,153.—*Dieter Heeb, and Volker Bollert*, Hamburg, Germany. AEROSOL PROPELLANT. Patent dated Dec. 7, 1976. Disclaimer filed Sept. 14, 1983, by the assignee, *Hans Schwarzkopf, GmbH*.

1036 OG 4

Hereby enters this disclaimer to all claims of said patent.

4,296,359.—*Dennis L. Dodds*, Indianapolis, Ind. TELEVISION DISPLAY ERROR CORRECTION. Patent dated Oct. 20, 1981. Disclaimer filed Sept. 14, 1983, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

### Dedication

3,765,537.—*David J. Rosenberg*, Glen Cove, N.Y. DUAL BLOOD FILTER. Patent dated Oct. 16, 1973. Dedication filed Dec. 31, 1981, by the assignee, *Pall Corp.*

Hereby dedicates to the Public claims 1 through 17 of said patent.

### Disclaimers and Dedications

3,560,704.—*John R. Albert*, Leawood, Kansas. ELECTRICALLY HEATED HAIR CURLER. Patent dated Feb. 2, 1971. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Dazey Products Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

4,285,858.—*Joseph H. Cort*, New York, N.Y. and *Alan Fischman*, New Haven, Conn. VASOPRESSIN ANALOGS. Patent dated Aug. 25, 1981. Disclaimer and Dedication filed July 18, 1983, by the assignee, *Mount Sinai School of Medicine of The City University of New York*.

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the

table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
	Denver Public Library	(303) 571-2122
Colorado	Newark: University of Delaware	(302) 738-2238
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Georgia	Chicago Public Library	(312) 269-2865
Illinois	Indianapolis—Marion County Public Library	(317) 269-1706
Indiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Louisiana	Boston Public Library	(617) 536-5400 Ext. 265
Massachusetts	Detroit Public Library	(313) 833-1450
Michigan	Minneapolis Public Library & Information Center	(612) 372-6570
Minnesota	Kansas City: Linda Hall Library	(816) 363-4600
Missouri	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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\*Collection organized by subject matter.

\*\*Call only between the hours of 10:00 a.m. and 5:00 p.m.

1036 OG 5



**PATENT EXAMINING CORPS**  
**RENE D. TEGTMEYER, Assistant Commissioner**  
**WILLIAM FELDMAN, Deputy Assistant Commissioner**  
**CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983**

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director . . . . .	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal- lurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director . . . . .	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director . . . . .	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthetics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Thereof; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director . . . . .	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170— R. F. WHITE, Director . . . . .	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufac- ture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director . . . . .	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Records; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director . . . . .	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics; Communications; Opti- tics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Composi- tions; Thermal and Photoelectric Batteries.	
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director . . . . .	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240— G. M. FORLENZA, Director . . . . .	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director . . . . .	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGN, GROUP 290—KENNETH L. CAGE, Director . . . . .	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director . . . . .	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprin- kling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director . . . . .	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders; Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330— R. E. AEGERTER, Director . . . . .	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Infor- mation Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director . . . . .	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Gener- ation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350— A. L. SMITH, Director . . . . .	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscel- laneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . .	Numbers 3,243,822 to 3,248,737, inclusive
Plant Patents . . . . .	Numbers 2,616 to 2,627 inclusive

## DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 1, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

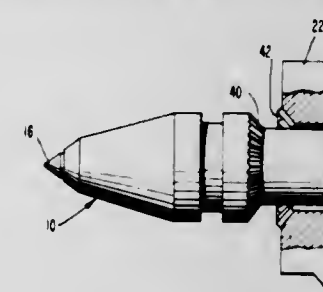
**T103,601**  
**PROCESS FOR PREPARATION OF MICROPOROUS**  
**MEMBRANES OF CONTROLLED FLOW**  
**CHARACTERISTICS**  
 Ronald V. Repetti, 9 Marshall St., Old Greenwich, Conn. 06870  
 Continuation of Ser. No. 334,771, Dec. 28, 1981, abandoned,  
 which is a continuation of Ser. No. 201,086, Nov. 27, 1980,  
 abandoned. This application Dec. 3, 1982, Ser. No. 446,832  
 Int. Cl.<sup>3</sup> B29D 27/04  
 U.S. Cl. 264—41

**No Drawing. 25 Pages Specification**

A dimensionally stabilized microporous polyamide membrane having enhanced flow characteristics comprised of a film forming organic polymeric material of low shrinkage prepared by drying the membrane, under conditions of restraint in the plane of the membrane to minimize the shrinkage until the membrane is essentially in a dried condition. A process is also described for preparing a microporous membrane designed to enhance incorporation and retention of a charge modifying resin for use as a charge modified filter media. The process comprises preparing a dope solution of a film forming polymer in a solvent system, directly casting the solution under the surface of a quenching medium comprising a non-solvent system for the polymer for a time sufficient to form micropores in the film, and drying the film while controlling the planar dimensions of the film during the drying.

The foregoing process is particularly useful in the preparation of a charge modified membrane of enhanced electrokinetic capture potential in the filtration of charged submicronic contaminants from aqueous liquids.

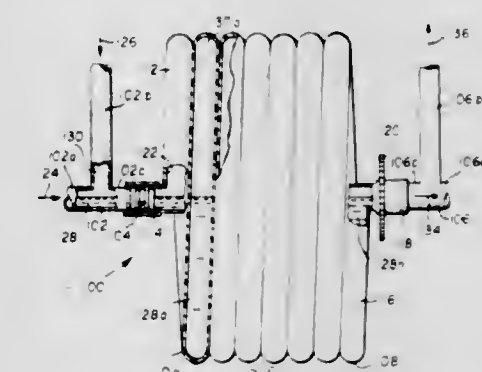
**T103,602**  
**ROTARY-TYPE CUTTER ELEMENT WITH MEANS FOR**  
**DISTRIBUTING WEAR**  
 Gary H. Rettkowski, 112 Yeager Rd., Mountaintop, Pa. 18707  
 Filed Dec. 28, 1981, Ser. No. 334,637  
 Int. Cl.<sup>3</sup> E21C 35/18  
 U.S. Cl. 299—10  
**3 Sheets Drawing. 223 Pages Specification**



A mining cutter comprises a plurality of holders mounted on a tool support, and a cutting element mounted in a socket of each holder. The tool support is driven such that the cutting elements are alternately moved into cutting and non-cutting modes relative to an earth formation. A retainer rotatably retains each cutting element in its associated socket for limited

longitudinal forward movement relative to the holder toward the non-cutting mode and limited longitudinal rearward movement toward the cutting mode. Each cutting element and holder includes mutually engageable surfaces for preventing rotation of the cutting element in the cutting mode while permitting rotation of the cutting element in the non-cutting mode. The arrangement may be such that rotary movement of the cutter element is induced as the cutter element travels toward its cutting mode and/or toward its non-cutting mode.

**T103,603**  
**PROCESS AND APPARATUS FOR PREPARING SILVER**  
**HALIDE EMULSIONS**  
 Jeffrey S. Baugher; Douglas L. Oehlbeck, and Barry M. Brown,  
 all of Kodak Park, Rochester, N.Y. 14650  
 Filed Dec. 6, 1982, Ser. No. 447,378  
 Int. Cl.<sup>3</sup> G03C 1/02; B01F 15/02; 9/00  
 U.S. Cl. 430—569  
**1 Sheets Drawing. 16 Pages Specification**



# REISSUES

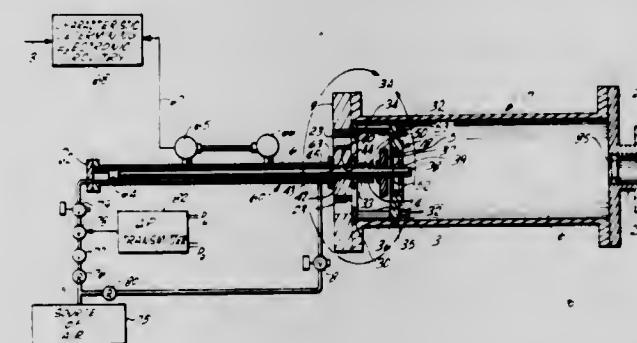
NOVEMBER 1, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 31,432 APPARATUS AND METHOD FOR DETERMINING THE CHARACTERISTIC OF A FLOWMETER

Edward E. Francisco, Jr., Paradise Valley, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.  
Original No. 4,152,922, dated May 8, 1979, Ser. No. 907,681, May 19, 1978. Continuation of Ser. No. 177,448, Aug. 11, 1980, abandoned. Application for reissue Nov. 2, 1981, Ser. No. 316,992

Int. Cl.<sup>3</sup> G01F 25/00  
U.S. Cl. 73—3 51 Claims



26. A method for proving a flowmeter connected in a fluid line, the method comprising the steps of:  
connecting a measuring cylinder in the fluid line, the measuring cylinder having a piston movable through the cylinder between an upstream position near one end of the cylinder and a downstream position near the other end of the cylinder;  
connecting a normally open valve in the line to prevent flow past the piston when the valve is closed, thereby driving the piston through the cylinder;  
setting the piston at the upstream position;  
closing the valve temporarily to drive the piston to the downstream position in synchronism with fluid flow through the line;  
opening the valve when the piston reaches the downstream position; and  
maintaining the pressure difference across the piston constant during its movement from the upstream position to the downstream position so as to suppress perturbations in the fluid line.

Re. 31,433  
VARIABLE TOOTH SAW BLADE  
Calvin M. Clark, Bernardston, Mass., assignor to Capewell Manufacturing Company, Hartford, Conn.  
Original No. 4,179,967, dated Dec. 25, 1979, Ser. No. 937,549, Aug. 28, 1978. Application for reissue Oct. 16, 1981, Ser. No. 312,360

Int. Cl.<sup>3</sup> B23D 61/12; B27B 33/02  
U.S. Cl. 83—846 13 Claims

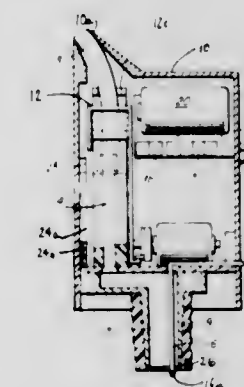


11. A saw blade having a toothed edge comprising a plurality of recurrent groups of teeth with each group including a series of teeth which are set angularly and alternately sidewise the same amount, which have their tips in substantial alignment and which have varying gullet depths and varying pitch and varying rake angles and with the teeth changing gradually in gullet depth, the

pitch distance between each pair of teeth increasing with gullet depth and each tooth of lesser gullet depth having a more positive rake angle than a tooth of greater gullet depth.

Re. 31,434  
PORTABLE LIQUID METERING DEVICE  
David H. Reilly, Fort Lauderdale, Fla., assignor to Electro Data Systems, Inc., Fort Lauderdale, Fla.  
Original No. 4,265,370, dated May 5, 1981, Ser. No. 22,984, Mar. 22, 1979. Application for reissue May 3, 1982, Ser. No. 374,021

Int. Cl.<sup>3</sup> B67D 5/30  
U.S. Cl. 222—25 5 Claims



1. A self-contained portable liquid metering and dispensing device comprising: a housing (10) having upper pouring means (10a) and lower inlet means (19) for detachably securing the housing to the opening of a liquid container; air means (16) extending through said housing into said lower means (19); conduit means connecting said pouring and lower means and including a flexible resilient portion (13), means (12a) for pinching off flow in said resilient portion (13), a reverse polarity motor means (11) connected to and actuating said pinching means (12a); power means (20) for actuating said motor means (11); [movable magnet means (24b) moved by tipping of the device; switch means (24) actuated by said magnet means (24g)]; switch means (24) actuable by tipping of the device; logic means (100) actuated by said switch means (24) to cause said motor means to rotate to release said pinching means (12a) from said resilient portion (13), stop rotation for a predetermined period of time and then rotate on reverse to pinch off said resilient portion (13); and means (17) for counting and displaying the number of actuations of said switch means (24); all of said means being carried completely by said housing.

Re. 31,435  
TELESCOPIC CARTON ASSEMBLY  
Raymond A. Gillie, Walnut Creek, Calif., assignor to Arvey Corporation, Chicago, Ill.  
Original No. 4,323,187, dated Apr. 6, 1982, Ser. No. 896,797, Apr. 17, 1978. Application for reissue Sep. 30, 1982, Ser. No. 431,825

Int. Cl.<sup>3</sup> B65D 5/22, 5/30, 5/68  
U.S. Cl. 229—34 R 17 Claims

11. A carton forming a separate, self-contained, coverage shipping container which is adapted to be converted into part of a telescopic carton assembly, comprising:  
an outer panel providing a bottom for said separate, self-contained, covered shipping container;  
upright walls extending generally upwardly around said outer panel, and a movable flap assembly integrally hinged to and



[illegible]

U.S. Cl. 338—308 8 Claims  
 1. A resistance material consisting essentially of a mixture of [at least one metal oxodic compound], a permanent binder and a temporary binder, [at least one metal oxide] and, as a resistance determining component, a barium-rhodate of the formula  $\text{BaRh}_6\text{O}_{12}$ .

GRANTED NOVEMBER 1, 1983

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct cultivar of *impatiens* known by the cultivar name Gemini, as disclosed and illustrated, and particularly characterized by its clear bright pink flower color and contrasting dark green variegated foliage; highly floriferous habit; firm petal texture, relatively large flowers, with distinct deep pink to red throat; continuous flowering and highly stable flower color, with little fading in summer, and by its semi-procumbent and weather resistant habits which make it ideal for baskets and bedding plants.

# PATENTS

GRANTED NOV. 1, 1983

## ERRATA

For CLASS	See PATENT NO.
101-347 .....	4,412,496
604-415 .....	4,412,573
383-048 .....	4,412,645
502-423 .....	4,412,937
502-115 .....	4,412,939
502-209 .....	4,412,940
377-025 .....	4,413,175

# PATENTS

GRANTED NOVEMBER 1, 1983

## GENERAL AND MECHANICAL

4,412,357  
SHIRT

Sally Mincher, 104 Live Oak Dr., Wrightsville Beach, N.C. 28480

Filed Dec. 29, 1980, Ser. No. 220,689  
Int. Cl.<sup>3</sup> A41B 1/18

U.S. Cl. 2—118

4,412,359  
POSTERIOR CHAMBER LENS IMPLANT

William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48011

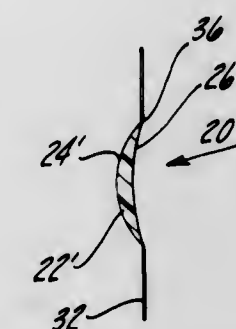
Filed Apr. 26, 1982, Ser. No. 371,541  
Int. Cl.<sup>3</sup> A61F 1/16, 1/24

7 Claims U.S. Cl. 3—13

1 Claim



1. An improved shirt for female athletes comprising: a shirt body for completely encircling and covering the torso of a female athlete from the waist up; said shirt body comprising permanently joined front and rear panels, said front panel comprising means for covering an athlete's breasts and abdomen and said rear panel comprising means for covering an athlete's back; and adjusting means attached to the exterior of said front panel for selectively and adjustably applying constraining forces to the breasts of an athlete wearing the shirt



1. A posterior chamber lens implant for a human eye for use after extracapsular surgery in which a posterior capsule is left substantially intact, said lens implant comprising:  
a substantially circular rigid optic having a front surface, a rear surface and a substantially circular and continuous outer rear edge, said front surface being a continuous convex surface and said rear surface being a continuous concavely curved surface extending between said outer rear edge,  
means for securing said optic to the eye within the posterior chamber so that said outer rear edge abuts against the posterior capsule and so that the rear concavely curved surface of said optic is spaced from the posterior capsule by a distance sufficient to safely allow a subsequent laser posterior capsulotomy.

4,412,358

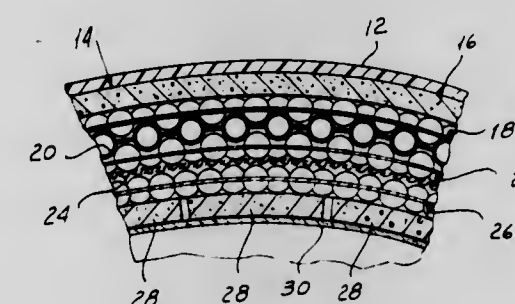
INDIVIDUALLY FITTED HELMET LINER AND METHOD OF MAKING SAME

Michael R. Lavender, Vandling, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Continuation of Ser. No. 132,817, Mar. 24, 1980, abandoned.  
This application May 27, 1982, Ser. No. 382,420  
Int. Cl.<sup>3</sup> A42B 3/00

U.S. Cl. 2—412

13 Claims



1. A helmet liner including in combination a plurality of layers conforming generally to the top of a wearer's head, said layers being assembled in superposed contacting relationship with one another and each comprising a sheet having spaced projections on at least one side thereof, said sheets being elastic at normal temperatures and plastically deformable at elevated temperatures to permit adjustment of the effective thickness of said liner.

4,412,360

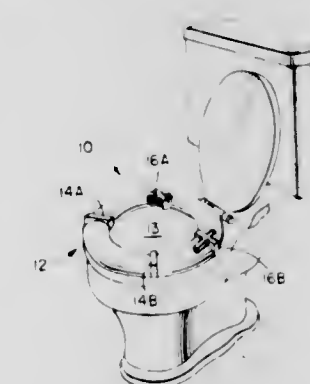
METHOD OF AND APPARATUS FOR PROVIDING A PERSONAL SANITARY TOILET SEAT COVER

Harold Levin, 725 Providence Rd., Charlotte, N.C. 28207

Filed Jun. 15, 1981, Ser. No. 273,863  
Int. Cl.<sup>3</sup> A47K 13/14

U.S. Cl. 4—242

10 Claims



1. A toilet seat comprising:  
(a) a base seat having an upper surface and an opening;  
(b) mounting means attached to, and extending upwardly from, said base seat upper surface, said mounting means comprising at least two mounts, each of said mounts having its uppermost surface, substantially horizontal, said horizontal surfaces being located above the upper surface of said base seat, said upper horizontal surfaces lying in substantially the same plane above the plane of said base seat; and



(c) a protective cover adapted to be detachably mounted on said mounting means, said protective cover having a smooth upper surface and an opening corresponding to said base seat opening and means to cooperate with said mounts, whereby when said protective cover is mounted on said mounting means, the mounting means are covered by said cove and are not exposed to a user of said toilet seat.

4,412,361

## BUTTON ACTUATED POP UP DRAIN FITTING

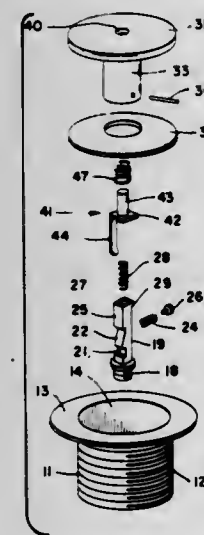
Casper Cuschera, 800 Durham Rd., Fremont, Calif. 94538

Filed Dec. 14, 1981, Ser. No. 330,718

Int. Cl.<sup>3</sup> A47K 1/14

U.S. Cl. 4—286

5 Claims



1. In a drain valve including a drain body having a flow channel therethrough and a post extending axially through said flow channel, and a drain sealing cover provided with a tubular portion having a central passage receiving said post for slidable translation thereabout and radial clearance therefrom, detent means in one axially extending surface of said post for selectively securing said post and said tubular portion with said drain sealing cover sealing said flow channel, and resilient means for biasing said cover upwardly to the open position, the improvement comprising button actuator means for releasing said detent means, said button actuator means including a button extending upwardly from said drain sealing cover and adapted to be manually depressed to release said detent means, said central passage comprising a rectangular bore extending axially in said tubular portion, and a rectangular groove formed in one wall of said rectangular bore, said button being disposed generally within said bore, said drain sealing cover including a hole extending therethrough to said rectangular bore, said button extending upwardly from said button actuator means and through said hole, said button actuator means further including an arm extending generally downwardly from and edge portion thereof, said arm being slidably received in said rectangular groove.

4,412,362

## PARTIAL FLUSH APPARATUS UTILIZING PNEUMATIC TIME DELAY MECHANISM

Kenneth G. Nylund, Rte. 1, Box 40C, Globe, Ariz. 85501

Filed Jan. 15, 1981, Ser. No. 225,390

Int. Cl.<sup>3</sup> E03D 1/34

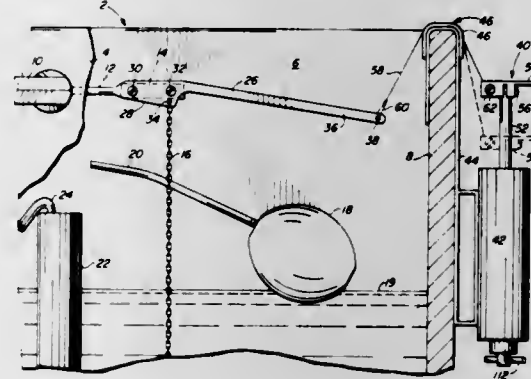
U.S. Cl. 4—388

14 Claims

1. A partial flush apparatus for use in conjunction with a conventional toilet of the type having a water tank, a flapper valve mounted at the bottom of the water tank, a flush handle, a lever arm disposed within the water tank and having a first end connected to the flush handle and having a second end opposite the first end, and a first flexible linkage coupling the flapper valve to the second end of the lever arm for raising the

flapper valve when the flush handle is operated, said partial flush apparatus comprising in combination:

- a. pneumatic time delay means secured to said water tank substantially external therefrom, said pneumatic time delay means including a plunger slidably extending therein and biased toward a released position, said plunger having an actuator operated by the user apart from said flush handle for depressing said plunger from the released position to a depressed position, said pneumatic time delay means retarding the return of said plunger from the depressed position to the released position for a predetermined time; and



- b. coupling means for coupling the second end of said lever arm to said plunger in order to raise the second end of the lever arm for partially opening the flapper valve for the predetermined time whenever the user actuates said plunger, said coupling means including a second flexible linkage which is made taut when said plunger is depressed and which is slackened when said flush handle is operated for preventing said pneumatic time delay means from interfering with the normal operation of said lever arm when said flush handle is operated.

4,412,363

## APPARATUS FOR COLLECTING AND DISTRIBUTING POLLEN

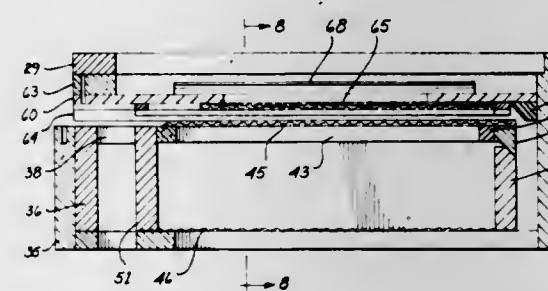
Charles H. Robson, 6241 S. 30th St., Phoenix, Ariz. 85040

Filed Aug. 7, 1981, Ser. No. 290,750

Int. Cl.<sup>3</sup> A01K 47/06

U.S. Cl. 6—4 R

14 Claims



12. Apparatus for collecting and distributing pollen, and for placement at different levels in a segmented bee colony, said apparatus comprising:

- (a) a housing for insertion in a segmented bee colony and having a front wall;
- (b) pollen collection means movably mounted in said housing for receiving pollen and bounding at least one vertical bee passageway adjacent thereto;
- (c) reversible scraper means movably mounted in the front wall of said housing, said means being spaced from adjacent portions of said front wall and being positioned in overlying relationship to said bee passageway for removing the pollen from bees passing there through;
- (d) a pollen tray mounted on one side of said scraper means and adjacently spaced thereto, the reversal of said scraper

means placing said pollen tray beneath said scraper means and above said collection means whereby pollen removed from the bees is retained on the pollen tray; and

(e) means for controlling access to said bee passageway.

4,412,364

## PROCESS FOR THE NORMALIZED MANUFACTURE OF SHOES

Fernando Orea Mateo, Edificio Torres Blancas, Avda. America, 37-945 Madrid, Spain

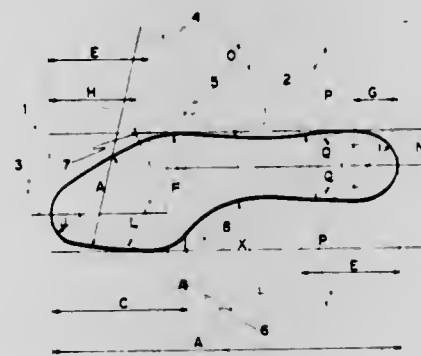
Filed Mar. 10, 1981, Ser. No. 242,254

Claims priority, application Spain, Mar. 18, 1980, 489,711

Int. Cl.<sup>3</sup> A43D 3/00

U.S. Cl. 12—146 L

6 Claims



1. A process for the normalized manufacture of shoes, such that as shoe lengths change, other shoe dimensions are changed proportionally, said process comprising contouring shoe lasts used for shoe manufacture such that for each shoe last the sole of the last is dimensioned by:

- defining an axis extending transverse to the length of said sole of said last at a position spaced from the front of said sole by one-third the length of said sole;
- defining four forward sole zones separated by three lines extending transverse to said length and spaced between said front and said axis by equal intervals of 1/12 said length;
- forming said sole at a first said transverse line closest to said front to have a straight contour along said first transverse line;
- forming said sole at a second said transverse line rearwardly adjacent said first transverse line to have a regularly arched contour having a height of 1/120 of said length;
- forming said sole at a third said transverse line closest to said axis to have a regularly arched contour having a height of 1/96 of said length;
- defining eight rearward sole zones separated by seven rear lines extending transverse to said length and spaced between said axis and the heel of said sole by equal intervals of 1/12 said length;
- forming said sole at a first said rear transverse line closest to said axis to have a regularly arched contour having a height of 1/96 of said length; and
- forming said sole at each of the remainder of said rear transverse lines to have a regularly arched contour having a height of 1/60 of said length.

4,412,365

## BRUSH

Wilhelm E. Schmitt, Le Grange Park, Ill., assignor to Jack S. Friedman, Highland Park, Ill.

Continuation-in-part of Ser. No. 782,176, Mar. 28, 1977, abandoned, and Ser. No. 802,793, Jun. 2, 1977, abandoned, and Ser. No. 90,101, Nov. 1, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 294,361

Int. Cl.<sup>3</sup> A46B 7/00, 9/02, 17/06

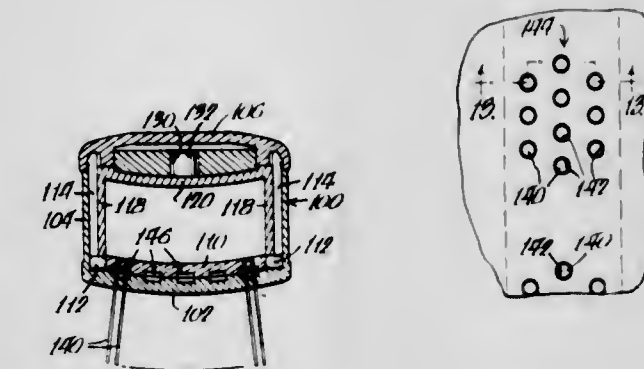
U.S. Cl. 15—184

26 Claims

5. A brush comprising: a body having wall means defining an internal chamber, said walls means including a bottom wall

having a plurality of openings therein establishing communication between said chamber and the exterior of said body, a bristle holder within the internal chamber of said body, a plurality of bristles carried by said bristle holder, each bristle being aligned with one of said openings, means for moving said bristle holder toward and away from said bottom wall to move said bristles between an operative position wherein the free ends of the bristles are disposed outwardly of the outer surface of said bottom wall to a retracted position wherein the free ends of the bristles are disposed at least at the level of the outer surface of said bottom wall, said bottom wall having an arcuate inner surface, said bristle holder having an arcuate outer surface adapted to be positioned in surface-to-surface contact with the arcuate inner surface of said bottom wall when said bristles are in the operative position, and recess means in both of said surfaces in alignment with said openings to prevent kinking of said bristles when said bristles are in the operative position.

25. A hair brush comprising: a generally rigid body having a bottom surface, a plurality of openings in said body extending upwardly of said bottom surface and generally perpendicularly thereto, said openings being arranged in plural rows of plural clusters of relatively closely spaced individual openings, a single slender elongate monofilament bristle of a given cross-



sectional configuration and flexibility extending through each of said openings, said bristles projecting outwardly of said bottom surface in an operative position and disposed substantially parallel with one another at least along the length of said brush, the ratio of the largest cross-sectional dimension of one of said bristles to the spacing between said one bristle and any closest other bristle being in an effective range that permits the coaction among

- (a) bristle flexibility,
- (b) bristle cross-sectional configuration and dimension,
- (c) bristle projecting length, and
- (d) spacing and pattern of said openings to collectively provide means for disposing the bristles in mutually supportive relationship with one another in said operative position when said bristles are flexed, a ratio of about 1:2 being in said effective range for a bristle having a circular cross-section with a diameter of 0.02 inch, said openings and said bristles having substantially the same cross-sectional configuration and dimensions and said openings being positioned in sufficiently closely spaced relationship to said bristles to define means for retaining the bristles of each cluster spaced from one another at least adjacent said bottom surface to prevent the formation of pressure points, and securement means for retaining each bristle within its opening.



4,412,366

## ADJUSTABLE HINGE

Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

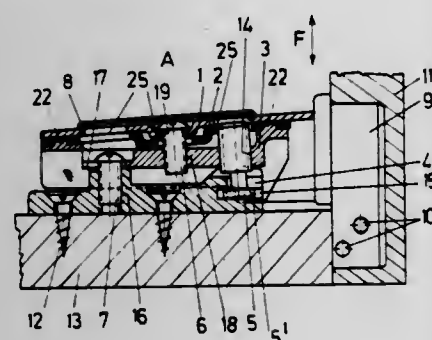
Filed Feb. 26, 1981, Ser. No. 238,557

Claims priority, application Austria, Feb. 26, 1980, 1047/80; Dec. 1, 1980, 5848/80

Int. Cl.<sup>3</sup> E05D 7/04

U.S. Cl. 16—236

11 Claims



1. A furniture hinge comprising:

- a supporting member adapted to be mounted on a wall portion of an article of furniture;
- a hinge arm adapted to be connected to a door of an article of furniture so that the door is pivotal with respect to the wall portion about a rotational axis, said hinge arm having a U-shaped cross-sectional configuration and a longitudinal center axis;
- clamping screw means for clamping said hinge arm to said supporting member in an orientation such that said longitudinal center axis is adapted to extend transverse to the rotational axis, said clamping screw means being capable of being loosened so that the position of said hinge arm with respect to said supporting member is adjustable; and
- guiding means, positioned between said hinge arm and said supporting member, for guiding adjusting movement of said hinge arm with respect to said supporting member in a direction parallel to the mounting plane of said supporting member and oblique to said longitudinal center axis without altering the orientation of said longitudinal center axis with respect to the rotational axis of said supporting member, said guiding means comprising a guiding member positioned within the U-shaped profile of said hinge arm, said guiding member and said supporting member having mutually abutting surfaces extending in directions inclined to said longitudinal center axis and parallel to said mounting plane.

4,412,367

## ELECTRIC STOP MOTION APPARATUS FOR A TEXTILE MACHINE

Heinz Clement, and Christina Furrer, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Apr. 6, 1981, Ser. No. 250,942

Claims priority, application Switzerland, Apr. 23, 1980, 3127/80

Int. Cl.<sup>3</sup> D01G 31/00; B65H 25/14; D01H 13/16

U.S. Cl. 19—0.25

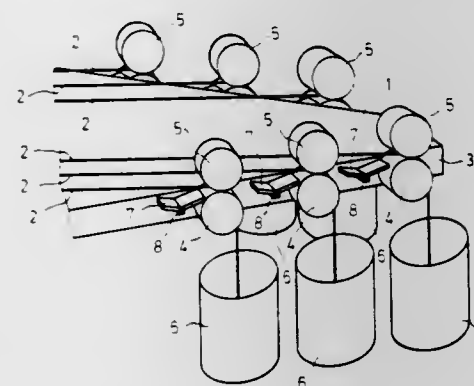
8 Claims

- 1. An electric stop motion apparatus for a textile machine which is fed with traveling fiber slivers, particularly a draw-frame, wherein a respective pair of feed rolls are provided for each fiber sliver for feeding the fiber sliver in a predetermined direction of travel, comprising:
  - a respective tiltable pan provided for each infed fiber sliver;
  - means mounting each said tiltable pan for tilting movement between a working position and a stop position;
  - tilting of said tiltable pan being accomplished by depletion of the fiber sliver either upstream or downstream of the related pair of feed rolls with respect to said predeter-

mined direction of travel of the sliver, in order to thus activate an electric stop motion contact upon depletion of the fiber sliver either upstream or downstream of said related pair of feed rolls;

said tiltable pan being arranged beneath the normally running fiber sliver without being in contact with said fiber sliver;

said mounting means for said tiltable pan defining a horizontal tilt axis arranged substantially perpendicular to the direction of travel of the fiber sliver;



- stop means positioned to cooperate with said tiltable pan;
- said tiltable pan possessing a mass distribution which is selected such that when the pan is in its working position it is maintained against said stop means through a self-holding action exerted by said tiltable pan; and
- tilting of the pan into its working position being accomplished by overcoming the self-holding action of said tiltable pan through the application of an external force while the tiltable pan passes through an unstable neutral position.

4,412,368

## SAFETY-PINS

Paul H. Springer, West Midlands, England, assignor to Newey Goodman Limited, Birmingham, England

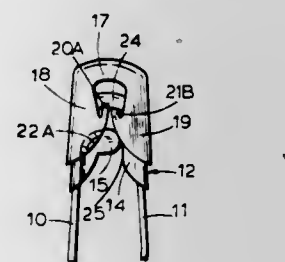
Filed Nov. 6, 1981, Ser. No. 318,698

Claims priority, application United Kingdom, Aug. 11, 1980, 8035950

Int. Cl.<sup>3</sup> A44B 9/14

U.S. Cl. 24—158

9 Claims



- 9. Blocking means for preventing unintentional opening of a safety pin of the type having a first limb to one end of which is affixed a cap having a recess opening in the direction of that limb and a second limb is received and resiliently retained within the recess within said cap said cap being so shaped as to permit said end portion of the second limb to enter the recess from either side of the cap at will, said cap including a tongue projecting into or close to the mouth of the recess from a part of the cap facing the recess, said sheath comprising a top portion of inverted channel shape, a first end portion depending from one end of the top portion, and a second end portion depending from the other end of the top portion, the two end portions each being of channel-like shape, with the channels opening towards each other, each said end portion having two lugs, one on each face of each said end portion, and two de-

formable parts, one on each face of each said end portion, the two lugs on that end portion adjacent to the recess of said cap being bent inwards to form restraining means, and the deformable parts on the end portion adjacent to the base of said tongue being pinched inwards to form restraining means, said lugs and said deformable parts being located on said sheath that two of said lugs and two of said deformable parts are always located for said bending and pinching respectively regardless of the initial orientation of said sheath relative to said cap.

4,412,369

## HOOK-LIKE END FOR DRAWSTRING

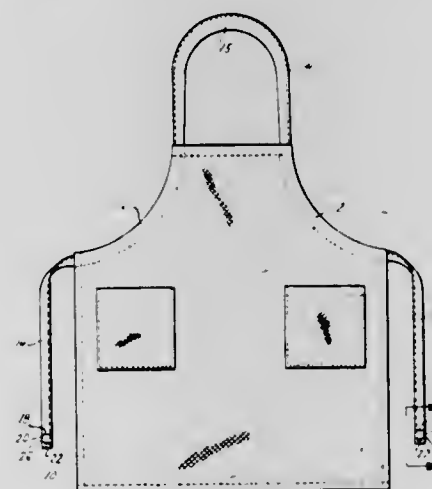
Arturo A. Carnaghi, St. Louis, Mo., assignor to Angelica Corporation, St. Louis, Mo.

Filed Jun. 11, 1982, Ser. No. 387,695

Int. Cl.<sup>3</sup> A41F 1/00; A41D 13/04

U.S. Cl. 24—266

4 Claims



- 4. A drawstring which comprises a first portion that is disposed within a first tubular passage, a second portion that is disposed within a second tubular passage which is spaced away from said first tubular passage, and a third portion that spans the space between said tubular passages, said third portion having a wide section therein which is substantially wider than the internal width of either of said tubular passages, said wide section resisting accidental movement of said third portion into either of said tubular passages and also resisting accidental telescoping of said tubular passages over said wide section, said wide section being bendable in transverse section to permit said third portion to be moved into either of said tubular passages, said third portion having a tapered section intermediate said wide section and one of said tubular passages, and said third portion being made of flexible and yieldable material and being bendable in transverse section to permit said tapered section of said third portion to enter said one of said tubular passages, but the resistance of said third portion to bending in transverse section enabling said third portion to resist but not prevent telescoping of said one tubular passage over said tapered section and thereafter to resist but not prevent movement of said third portion relative to said one tubular passage, said tapered section of said third portion being free of abrupt width-reducing steps which could prevent movement of said tapered section of said third portion into said one tubular passage.

4,412,370

## CLAMPS

Graeme K. Speirs, Redridge Cottage, Den of Cults, Aberdeen, Scotland

Filed Jun. 21, 1982, Ser. No. 390,368

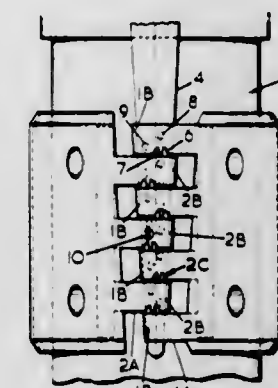
Claims priority, application United Kingdom, Jun. 19, 1981, 8118901

Int. Cl.<sup>3</sup> B65D 63/08

U.S. Cl. 24—268

3 Claims

- 1. A clamp which comprises two arcuate portions each



hinged to the other along one edge, the other edges of the clamp portions being formed with fingers which interlace when the clamp is closed, each finger having its tip portion bent back on itself to form a flat loop, the looped ends of the individual fingers being so dimensioned that when the fingers are interlaced the looped ends define between them a passage which tapers from one end of the clamp to the other, at least one finger being formed on the outer face of the looped portion with which a tab which is deformable to project into the passage and a tapered pin formed with at least one set of holes longitudinally disposed along the pin in a position such that when the pin is inserted into the passage the holes pass successively across the position of the tab formed on the finger.

4,412,371

## DEVICE FOR INTRODUCING A TRAVELING YARN INTO A YARN TREATMENT CHAMBER

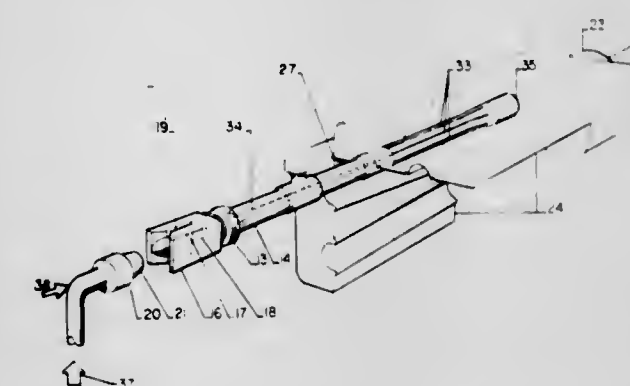
Gerry A. Hagen, and Edward N. Donnelly, both of Anderson, S.C., assignors to Badische Corporation, Williamsburg, Va.

Filed Jun. 11, 1981, Ser. No. 273,152

Int. Cl.<sup>3</sup> D02G 1/16

U.S. Cl. 28—272

3 Claims



- 1. A device for introducing a traveling yarn into a yarn treatment chamber and causing the yarn to pass through, out of, and away from the chamber; the device comprising:
  - (a) a head piece having an orifice communicating with a channel running therethrough and a means for capturing and positioning the traveling yarn in front of the yarn treatment chamber, the head piece providing alignment for the push jet recited in (b) below with respect to the traveling yarn and the yarn treatment chamber;
  - (b) a push jet having a mating surface for engaging the head piece, the push jet being provided with means for directing gas into the head piece;
  - (c) means for positioning the traveling yarn across the orifice of the head piece;
  - (d) means for aligning the push jet so that it is contiguous with the orifice of the head piece;
  - (e) a yarn cutting means located downstream from the head piece with respect to the direction of yarn travel;
  - (f) means for common activation of the push jet and the yarn cutting means; and



g) means for conveying the yarn away from the yarn treatment chamber after it has passed therethrough.

4,412,372

# METHOD OF MANUFACTURING BEARING RINGS RUPTURED ALONG AN ARROW-SHAPED PARTITION LINE

Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eusenheim; Lothar Walter, and Heinrich Kunkel, both of Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

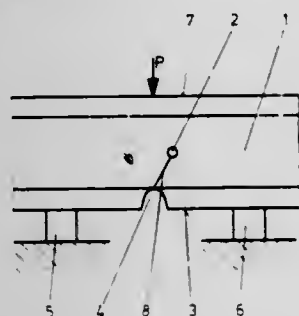
Filed Nov. 21, 1980, Ser. No. 209,054

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1979, 2947091

Int. Cl.<sup>3</sup> B21D 53/10; B23P 17/00

U.S. Cl. 29—149.5 R

10 Claims



1. In a method for manufacturing a bearing ring fractured along an arrow-shaped partition line, the method including the steps of forming a first radial bore in the wall of the ring intermediate opposite ends of said ring, and forming notches in opposite ends, the notches being displaced in relation to the radial bore in a circumferential direction, the ring having a first of its ends supported on support means, being initially fractured on said first end from the notch down to the radial bore by means of a force directed against the support means, after which the ring is turned over and is fractured again by a force directed against the support means, the improvement comprising the steps:

- forming said radial bore in the wall of the ring intermediate said opposite ends, and forming a first notch in only the first end of the bearing ring,
- positioning said bearing ring with the first notch on said first end downward upon two support means arranged at a distance from one another, whereby the radial bore and the first notch are situated between the support means,
- applying an axially directed force upon the bearing ring upon said second end opposite to the support means, in the plane of the first notch in the first end, until the ring fractures along a fracture line starting from the first notch and extending to the radial bore,
- forming a second notch in said second end of the bearing ring opposite the first notch in said first end,
- positioning the bearing ring with the second notch on the second end of the bearing ring downwards on said support means, similarly as said first end was positioned, and
- applying an axially directed force upon the bearing ring on said first end toward said second end, in the plane of the radial bore, until the ring fractures along a second fracture line starting at the second notch and extending to said radial bore.

## 4,412,373 METHOD OF MANUFACTURING A THIN COPPER PLATE WITH FLOW CONDUITS

Ahti Kosonen, and Mauri Palmu, both of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

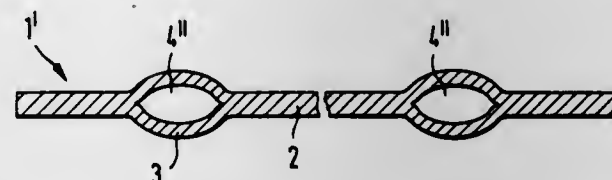
Filed Dec. 24, 1980, Ser. No. 219,979

Claims priority, application Finland, Dec. 28, 1979, 794087

Int. Cl.<sup>3</sup> B21D 53/04; B21P 15/26

U.S. Cl. 29—157.3 V

5 Claims



1. A method of manufacturing a generally planar thin plate or band of copper or copper alloy having at least one flow conduit parallel to the plane of the plate or band consisting of the following steps:

- continuously casting a thick, profiled billet having an open flow conduit extending therethrough parallel to the plane thereof, said conduit having walls which, measured in a direction perpendicular to the plane of the billet have a total wall thickness at least equal to the thickness of the billet on both sides of the flow conduit;
- then cold working the profiled, continuously cast billet to reduce the thickness thereof whereby said conduit is flattened and the conduit walls are pressed into mechanical contact with each other without welding the conduit walls together, and
- then opening the flow conduit by applying pressure to the inside of the conduit.

4,412,374

## DEVICE FOR CLAMPING AN INSULATED CABLE WIRE TO A TERMINAL ELEMENT

Horst Forberg; Klaus-Peter Achtnig, and Anneliese Stoeve, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

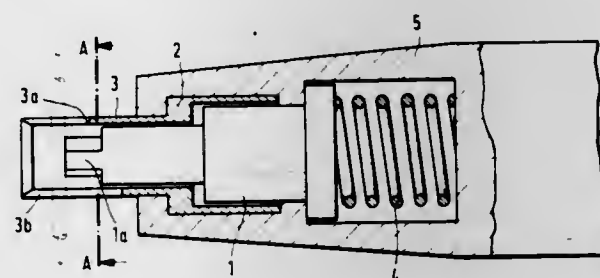
Filed May 21, 1981, Ser. No. 265,979

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040709

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—566.4

6 Claims



1. A device for electrically connecting an insulated thin cable wire to an upright terminal element, said terminal element being formed with spaced parallel legs interconnected by means of a slotted contact portion at an oblique angle with respect to said legs, said legs having support slots aligned with said contact portion slot, said device comprising:

- a hollow housing;
- a sleeve disposed in said housing and projecting from one end thereof, said sleeve having oppositely aligned slots opening into the distal end of said sleeve;
- a plunger mounted within said housing for limited longitudinal movement therein, said plunger having a pressure member extending outwardly from said housing and within said distal end of said sleeve, said distal end of said

sleeve projecting beyond said pressure member, said pressure member being adapted to engage the wire; said sleeve being adapted to circumscribe and support said legs of said terminal when said pressure member engages the wire at the top of said terminal and upon insertion of the wire into said contact slot, said sleeve slots encompassing and confining the wire on both sides of said terminal element at all times when said pressure member contacts the wire.

4,412,375

## METHOD FOR FABRICATING CMOS DEVICES WITH GUARDBAND

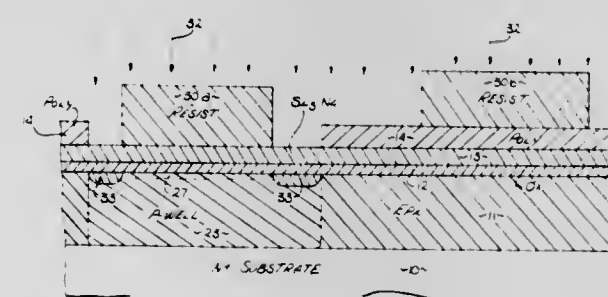
James A. Matthews, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 10, 1982, Ser. No. 387,050

Int. Cl.<sup>3</sup> H01L 21/265

U.S. Cl. 29—571

13 Claims



1. The fabrication of a complementary metal-oxide-semiconductor (CMOS) integrated circuit on a silicon substrate, an improvement comprising the steps of:

- forming a layer of polysilicon over said substrate,
- forming an opening in said layer of polysilicon,
- introducing a first dopant into said substrate through said opening so as to form a doped first region in said substrate,
- defining a masking member within said opening, said masking member being spaced apart from the edge of said opening formed in said polysilicon layer; and
- introducing a second dopant into said first region between said masking member and said edge of said polysilicon opening so as to form a guardband about said first region, whereby a self-aligned guardband is formed in said first region.

4,412,376

## FABRICATION METHOD FOR VERTICAL PNP STRUCTURE WITH SCHOTTKY BARRIER DIODE EMITTER UTILIZING ION IMPLANTATION

David E. De Bar, Manassas, Va.; Raymond W. Hamaker, Gilroy, Calif., and Geoffrey B. Stephens, Cary, N.C., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 142,323, Apr. 21, 1980, abandoned, which is a division of Ser. No. 25,693, Mar. 20, 1979, abandoned.

This application Mar. 5, 1982, Ser. No. 355,059

Int. Cl.<sup>3</sup> H01L 21/265, 21/283

U.S. Cl. 29—576 B

3 Claims

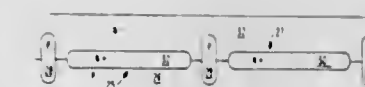
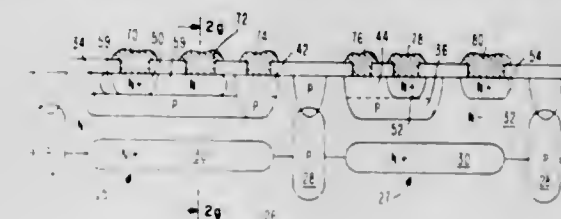
1. A method for fabricating an array of complementary bipolar transistors in an N-type silicon substrate, comprising the steps of:

- ion implanting a first plurality of P-type regions relatively deeply beneath the surface of said substrate, a first subplurality thereof forming the subcollectors of PNP transistors and a second subplurality thereof forming the intrinsic base region of NPN transistors;
- ion implanting a second plurality of P-type regions shallowly beneath the surface of said substrate, each of a first subplurality thereof juxtaposed above and intersecting respective ones of said first subplurality in said first plurality of P-type regions, forming the collector contacts for said PNP transistors and each of a second subplurality thereof juxtaposed above and intersecting respective ones

of said second subplurality of said first plurality of P-type regions, forming the extrinsic base region of said NPN transistors;

ion implanting a plurality of N-type conductivity base regions in said substrate, each juxtaposed above and intersecting a respective one of said first subplurality of PNP subcollectors, forming the base regions of PNP transistors, said N-type base regions having a dopant concentration at the surface of said substrate of less than  $10^{17}$  atoms per cubic centimeter;

depositing a plurality of metal contacts having a metal work function of approximately 4.8 electron volts or greater, on



the surface of said substrate, each spaced from a respective one of said first subplurality of PNP collector contacts and electrically contacting a respective, corresponding one of said plurality of N-type conductivity base regions, forming a Schottky Barrier emitter for each of said PNP transistors, having a barrier height with a magnitude greater than 0.8 electron volts;

ion implanting an N-type dopant as the base contact in said PNP transistors and as the emitter in said NPN transistors; whereby a plurality of PNP bipolar transistors with Schottky Barrier contact emitters is formed simultaneously with a plurality of NPN transistors on the same semiconductor chip.

4,412,377

## METHOD FOR MANUFACTURING A HYBRID INTEGRATED CIRCUIT DEVICE

Kenji Nagashima, Tokyo; Hiroshi Matsumoto, Yokohama; Masataka Tanaka, Kitakyushu; Hiroshi Oodaira, Chigasaki, and Nobuo Iwase, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,589

Claims priority, application Japan, Jan. 23, 1981, 56-8758

Int. Cl.<sup>3</sup> H05K 3/34; H01L 21/84

U.S. Cl. 29—577 C

6 Claims

1. A method for manufacturing a hybrid integrated circuit device comprising the following steps in the stated order:

- a step of forming a ceramic layer on a metal substrate by flame-spraying a ceramic material onto the metal substrate;
- a step of forming on said ceramic layer a resist layer having



a pattern opposite to that of a conductive layer which will be formed on said ceramic layer by a later step;  
a step of forming the conductive layer by flame-spraying a conductive material on said ceramic layer using said resist layer as a mask;



a step of impregnating thermosetting insulative material into both said ceramic layer and said conductive layer; and  
a step of providing at least one semiconductor element on said conductive layer.

4,412,378

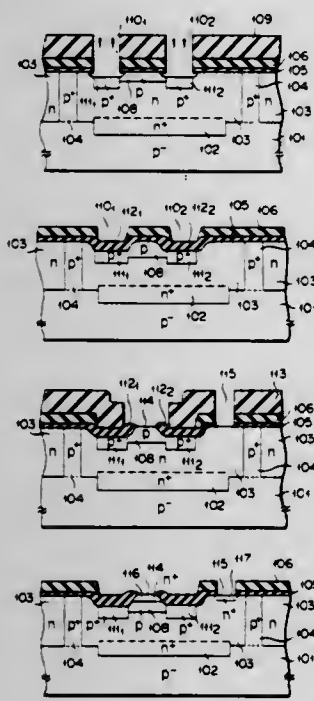
# METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE UTILIZING SELECTIVE MASKING, ETCHING AND OXIDATION

Kazuyoshi Shinada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
Filed Feb. 22, 1982, Ser. No. 351,251

Claims priority, application Japan, Feb. 24, 1981, 56-25666  
Int. Cl.<sup>3</sup> H01L 21/302, 21/265

U.S. Cl. 29—578

7 Claims



1. A method for manufacturing a semiconductor device comprising the steps of: forming an oxidation resistive insulating film on a semiconductor body of a first conductivity type; selectively forming a first impurity region of a second conductivity type in said semiconductor body before or after said insulating film is formed; etching part of said insulating film which corresponds to part of said first impurity region and isotropically etching exposed portions of said semiconductor body to a predetermined depth, using said insulating film as a mask; doping an impurity of the second conductivity type into said first impurity region, using said insulating film as a mask, so that a second impurity region of the second conductivity type whose concentration is higher than a concentration of said first impurity region is formed in said first impurity region and said semiconductor body; performing thermal oxidation using said insulating film as a mask, so that an oxide film is formed to cover exposed portions of said first impurity region, said second impurity region and said semiconductor body; and forming a third impurity region of the first conductivity type in

said first impurity region which is exposed, after part of said insulating film on said first impurity region is etched.

4,412,379

# METHOD OF MANUFACTURING A MULTITRACK MAGNETIC HEAD EMPLOYING DOUBLE HELIX STRUCTURE

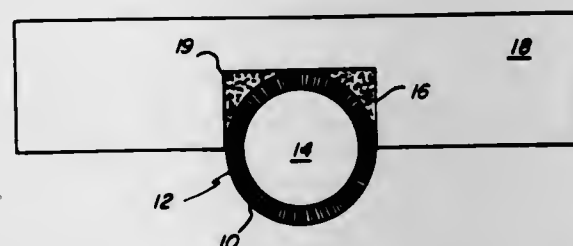
James U. Lemke, Del Mar, and William W. French, Cardiff-by-the-Sea, both of Calif., assignors to Eastman Technology Inc., Rochester, N.Y.

Division of Ser. No. 83,036, Oct. 9, 1979, Pat. No. 4,316,227.  
This application Sep. 17, 1981, Ser. No. 303,315

Int. Cl.<sup>3</sup> G11B 5/42

U.S. Cl. 29—603

3 Claims



1. The method of making a multitrack magnetic head comprising the steps of:

- severing a length of magnetic material which has been wound on a mandrel into a succession of gapped cores by lapping or cutting a longitudinal flat into said mandrel; and
- bonding a pole tip piece comprised of discrete pole tip pairs to said mandrel-supported cores in such a way that discrete pole tip pairs magnetically couple to respective cores on said mandrel.

4,412,380

# HOSE CUTOFF DEVICE OR TOOL

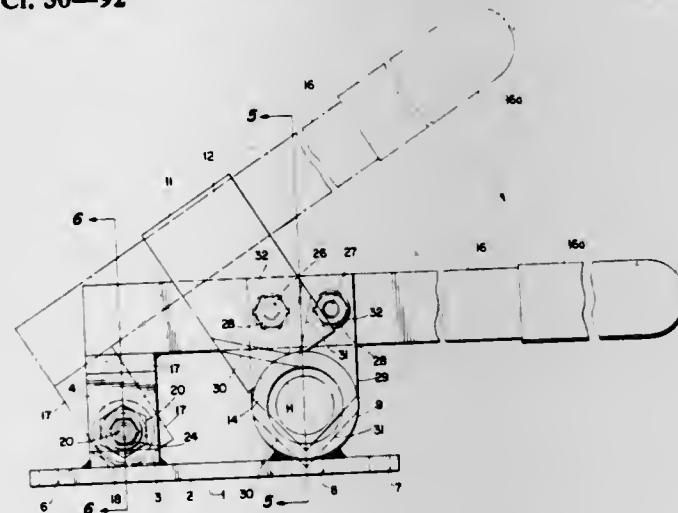
Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Filed Sep. 2, 1981, Ser. No. 298,647

Int. Cl.<sup>3</sup> B23D 21/06

U.S. Cl. 30—92

1 Claim



1. A hose cutter or device of the character described comprising a base, a pair of axially-spaced and axially-aligned cylindrical tubes mounted on said base and extending transversely thereof, said cylindrical tubes adapted to receive the hose to be cut, a bracket welded to said base and having an upright flange, an elongated handle pivotally secured to said flange, a cutter blade removably secured to said handle, said cutter blade being of generally rectangular configuration and having cutting edges extending at an angle to each other, said handle adapted to be moved toward said base and into the space between said cylindrical tubes, and a guard of inverted U-shaped configuration comprising a flat base portion and

parallel legs or sides extending downwardly from the marginal edges of said base portion and welded to said cylindrical tubes, said base portion adapted to prevent said handle from being moved beyond a predetermined point relatively to said base.

4,412,381

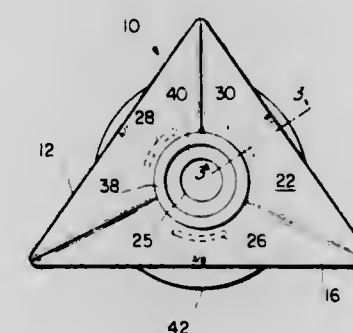
# BLADE HOUSING FOR CAST CUTTING TOOL

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611  
Continuation-in-part of Ser. No. 180,363, Aug. 22, 1980, Pat. No. 4,316,323. This application May 5, 1981, Ser. No. 260,832  
The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B27B 9/02

U.S. Cl. 30—124

14 Claims



1. A plaster cast saw device for cutting a cast comprising: a cast cutting tool having a body, a shaft extending from said body, and a movable circular saw blade mounted on said shaft;
- a housing engaging said body and enclosing portions of the edge of said saw blade, said housing having peripheral straight sides such that said housing has a substantially polygonal profile when viewed normal to a plane which is parallel to said saw blade, and said housing containing a slot through the face of a plurality of said peripheral straight sides through which a portion of said saw blade projects varying distances, whereby the depth of the cut of said saw blade is determined by the side face which is positioned in contact with the cast.

4,412,382

# LINE FEED MECHANISM FOR FILAMENT CUTTING

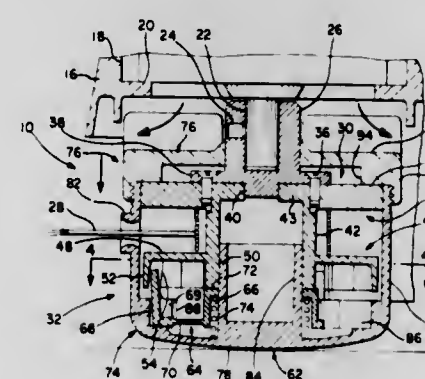
Donald M. White, III, Chanhassen, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed May 4, 1981, Ser. No. 260,450

Int. Cl.<sup>3</sup> B26D 1/12

U.S. Cl. 30—276

5 Claims



1. In a vegetation cutting device in which a free end of a flexible filament is rotatably swung as a cutting length about the axis of a drive shaft, apparatus for metering discrete lengths of filament comprising:

- (a) driving means for rotatably driving said filament about an axis, said driving means including at least one driving member;
- (b) driven means having at least one driven member selectively

engageable with said driving member for selectively coupling said driven means with said driving means for rotation therewith said driven member being capable of radial and rotational movement with respect to said driving member;

- (c) spool means for storing said flexible filament, said spool means being coupled to said driving means for rotation therewith; and
- (d) means for metering discrete lengths of filament from said spool means to extend said cutting length by bumping said driven means on the ground, wherein the metering means includes means for moving said driven member radially with respect to the drive shaft axis during the bumping operation until said driven member disengages said driving member to free the driven means for rotation relative to the driving means, whereby said spool means pays out a length of filament during said relative rotation, and wherein said driven member is carried on an arm which is radially bendable in response to bumping said driven means on the ground.

4,412,383

# CABLE DRIVEN PLOTTER

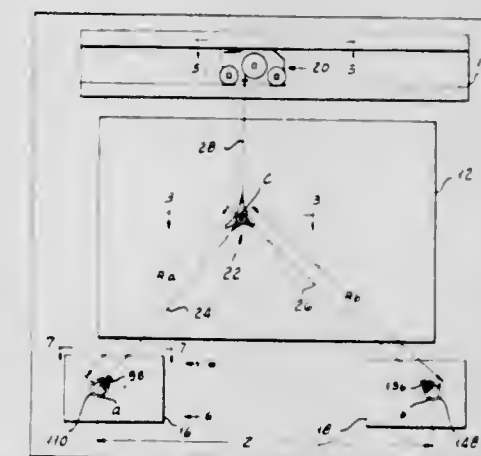
Benzion Landa, 10045-118 St., Apt. 206, Edmonton, Alberta, Canada T5K 1Y1

Filed Aug. 13, 1981, Ser. No. 292,723

Int. Cl.<sup>3</sup> G01B 5/03, 7/03

U.S. Cl. 33—1 M

5 Claims



3. A plotting device comprising a plotting surface, marking means adapted to move freely over said plotting surface, first and second cable means connected at respective ends to said marking means, means including a motor and cable supply means for varying the length of said first cable means, means including a motor and cable supply means for varying the length of said second cable means, third cable means connected at one end to said marking means, and means for maintaining the third cable means in tension.

4,412,384

# HEIGHT MEASURING DEVICE HAVING LEVEL INSTRUMENT AND PLATFORM

William Viets, 849 Barth La., Kettering, Ohio 45429

Filed Jun. 15, 1981, Ser. No. 273,467

Int. Cl.<sup>3</sup> G01B 3/10, 5/00

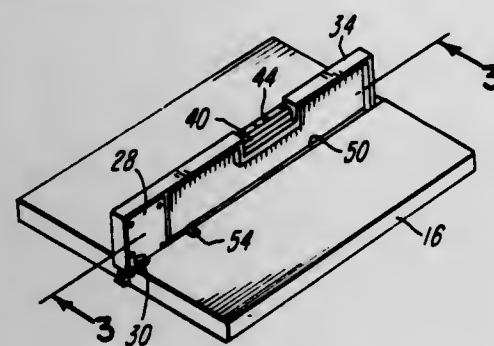
U.S. Cl. 33—169 R

4 Claims

1. In a device for measuring the height of a person and including a platform, an elongate support member having a lower portion, the platform and the support member being relatively movable, a coiled measuring tape having units of measurements thereupon, the coiled measuring tape being carried by the support member, the measuring tape having an end portion attached to the platform, successive portions of the tape being uncoiled and extendible from the lower portion of the support member as the support member is elevated from the platform when a person whose height is to be measured stands on the platform, a level indicator member carried by the support member, the support member being positionable upon



the head of the person whose height is to be measured as the support member is oriented to a level position by use of the level indicator member, and the height of the person being noted by observing the indicia upon the measuring tape adjacent the support member, the improvement wherein the platform has a slot for receiving the lower portion of the support member, resilient clip means mounted within the slot and



engageable with the lower portion of the support member for releasably attaching the support member to the platform, the clip means being completely recessed within the slot of the platform to provide for unobstructed standing on the platform by the person whose height is being measured, and to provide a compact unit for carrying and/or storage of the device when the device is not in use for measuring.

4,412,385

#### GAUGE FOR CHECKING FEATURES - LIKE LINEAR DIMENSIONS - OF A MECHANICAL PIECE

Narciso Selli, Montevoglio, Italy, assignor to Finike Italiana Marpos S.p.A., S. Marino di Bentivoglio, Italy

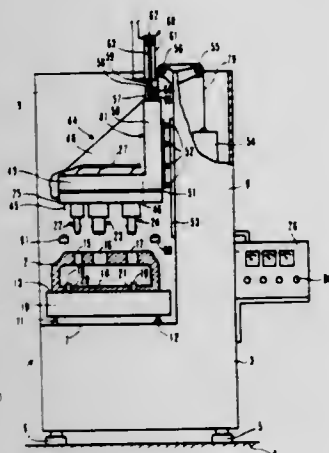
Filed Jan. 20, 1982, Ser. No. 341,013

Claims priority, application Italy, Jan. 27, 1981, 3318 A/81

Int. Cl.<sup>3</sup> G01B 5/12, 7/12

U.S. Cl. 33—178 E

10 Claims



1. A gauge for checking features of a mechanical piece, comprising: a first support for the piece; a second support, the first and the second support being movable one with respect to the other; actuation means to control the relative movement of the supports; gauging means with feeler elements adapted to cooperate with the piece and protection means for protecting the feeler elements, the gauging means being coupled to the second support in order to be selectively arranged in a gauging position—where the feeler elements cooperate with the piece—for providing a signal responsive to said features and in a rest position; and safety means for preventing the gauging means from getting damaged as a consequence of incorrect piece positioning on the first support, or whenever the piece to be checked has an irregular shape, said safety means including a first circuit with first circuit means associated with the first support and including the piece, a second circuit means associated with the second support and control means connected to the actuation means, the first and the second circuit means

being adapted to close the first circuit and to switch the control means for stopping said relative movement.

4,412,386

#### COMPASS

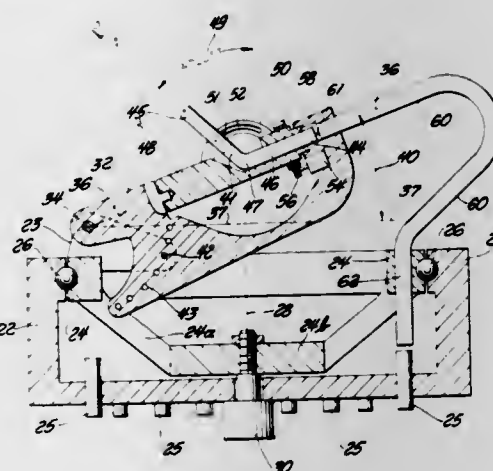
John G. Bennet, Macomb, Mich., assignor to The United States of America as represented by the Army, Washington, D.C.

Filed Aug. 4, 1981, Ser. No. 289,939

Int. Cl.<sup>3</sup> G01C 17/34

U.S. Cl. 33—268

6 Claims



1. A compass comprising a base; a platform mounted for rotation on the base; motor means for rotating the platform in a horizontal plane at a relatively high speed; a frame located in close proximity to the platform; a swingable connection between the platform and frame enabling the frame to have angular motion in the elevational direction; means holding the frame in selected positions of adjustment in the elevational direction, whereby the frame can establish a sight line with the north star at a particular point in the platform rotational cycle; a columnar element oriented on the frame so that its axis coincides with the north star sight line; means for slowly rotating the columnar element around its axis once per twenty four hour day; a telescope mounted on the columnar element; and means for adjusting the telescope so that its optical axis has a predetermined angle to the columnar element axis, the predetermined angle being such that when the columnar element is sighting the north star the telescope will be sighting the sun.

4,412,387

#### DIGITAL COMPASS HAVING A RATIOMETRIC BEARING PROCESSOR

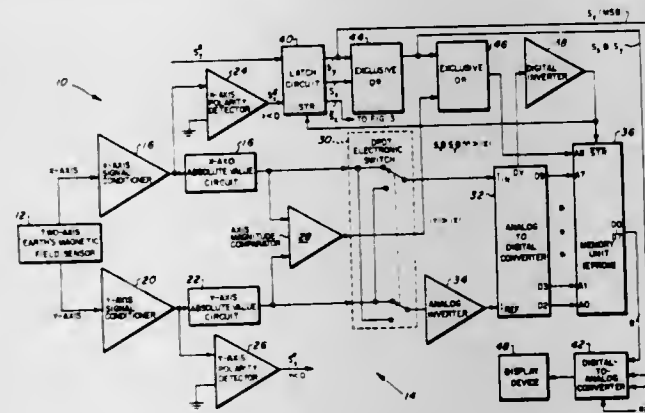
Daniel S. Lenko, Monrovia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,474

Int. Cl.<sup>3</sup> G01C 17/28

U.S. Cl. 33—361

16 Claims



1. An improved digital compass of the type in which a

two-axis earth's magnetic field sensor generates two bipolar analog signals, an x-axis signal and a y-axis signal indicative of bearing, which define sine and cosine functions when said two-axis earth's magnetic field sensor is rotated in the earth's magnetic field, and in which a bearing processor is operatively connected to said two-axis earth's magnetic field sensor for computing a digital bearing in binary form, wherein the improvement comprises:

means operatively connected to said two-axis earth's magnetic field sensor for generating the absolute values of the x-axis signal and the y-axis signal;

means operatively connected to said two-axis earth's magnetic field sensor for detecting the polarities of the x-axis signal and the y-axis signal as indicated by  $S_x^*$  and  $S_y^*$  signals, respectively, and wherein the  $S_x^*$  and  $S_y^*$  signals are logical "0" for a respective positive axis and a logical "1" for a respective negative axis information;

means connected to said means for determining the absolute values of the x-axis signal and the y-axis signal for comparing the magnitudes thereof to determine which axis has the larger absolute magnitude, wherein a logical "0" output from said means for comparing the magnitudes is indicative of the fact that  $|y| < |x|$ , and a logical "1" indicative of the fact that  $|y| > |x|$ ;

a double-pole-double-throw (DPDT) electronic switch having first and second poles operatively connected to the output of said magnitude comparing means, a first set of terminals being operatively connected to the x-axis absolute value output and a second set of terminals being operatively connected to the y-axis absolute value output of said absolute value generating means, the output of said magnitude comparing means controlling the position of said DPDT electronic switch such that the smaller of the absolute value of x or y is always fed to said first pole and the larger of the absolute values of  $|x|$  or  $|y|$  is always fed to said second pole;

an analog-to-digital converter connected at an  $I_N$  input to said first pole of said DPDT electronic switch and operatively connected at an  $I_{REF}$  input to said second pole of said DPDT electronic switch, said analog-to-digital converter being configured for ratiometric measurements, wherein the digital output is the ratio  $I_N/I_{REF}$  of the analog inputs, and wherein said analog-to-digital converter computes the ratio  $y/x$  for the angles  $335^\circ$  thru  $45^\circ$  and  $135^\circ$  thru  $225^\circ$  and the ratio  $x/y$  for the remaining angles  $45^\circ$  thru  $135^\circ$  and  $225^\circ$  thru  $335^\circ$ ;

means connected to said means for detecting the polarities of the x-axis signal and the y-axis signal ( $S_x^*$  and  $S_y^*$  respectively) and operatively connected to a data valid (DV) output of said analog-to-digital converter at its STR input for latching the polarity of the axis information at the end of each analog-to-digital conversion upon the application of a DV signal to eliminate the effects of changing polarities of the axes of said two-axis earth's magnetic field sensor during rotation thereof while a bearing indication is being presented, wherein  $S_x$  is representative of  $S_x^*$  after storage and  $S_y$  is representative of  $S_y^*$  after storage;

a first exclusive-OR circuit connected to said means for storing means polarity data for generating the logic signal  $S_x \oplus S_y$  at its output;

a second exclusive-OR circuit connected to the output of said first exclusive-OR circuit and connected to the output of said means for comparing the magnitudes of the x-axis signal and the y-axis signal for generating the logic control signal  $S_x \oplus S_y \oplus (|y| > |x|)$ ; and

a memory unit operatively connected to the output of said analog-to-digital converter and to the output of said second exclusive-OR circuit and being programmed in such a fashion as to compute the arc tangent of the ratio  $y/x$  or the ratio  $x/y$  according to the output of said analog-to-digital converter and the logic control signal  $S_x \oplus S_y \oplus (|y| > |x|)$ , and said memory unit also being programmed in such a fashion as to output a quadrant displacement angle in binary form from  $0^\circ$  thru  $90^\circ$  referenced to the cardinal point forming the lower boundary of the quadrant of

interest, the quadrant displacement angle in binary form, along with the logic signals  $S_x$  and  $S_x \oplus S_y$  being representative of the digital bearing.

4,412,388

#### METHOD FOR DRYING SEMICONDUCTOR SUBSTRATES

Mikio Takagi, Kawasaki, and Hajime Kamioka, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

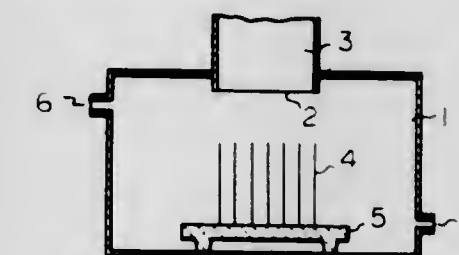
Filed Dec. 22, 1980, Ser. No. 218,802

Claims priority, application Japan, Dec. 25, 1979, 54-169041

Int. Cl.<sup>3</sup> F26B 3/34

U.S. Cl. 34—1

11 Claims



1. A method for drying semiconductor substrates, which comprises irradiating a plurality of semiconductor substrates with electromagnetic waves emitted from a waveguide in a non-reactive atmosphere of normal atmospheric pressure while holding the semiconductor substrates so that the predominant faces thereof substantially form right angles to the face of an opening of the waveguide, wherein the semiconductor substrates are positioned in a row on a substrate holder and a pair of dummy substrates are placed on the ends of said row, and wherein the substrates are placed at intervals of from about 5 mm to about 20 mm.

4,412,389

#### METHOD OF AUTOMATICALLY CONTROLLING THE DRYING PROCESS IN A LAUNDRY-DRYING SYSTEM, AND EQUIPMENT FOR PERFORMING THE METHOD

Manfred Krüger, Berlin, Fed. Rep. of Germany, assignor to Bosch-Stiemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

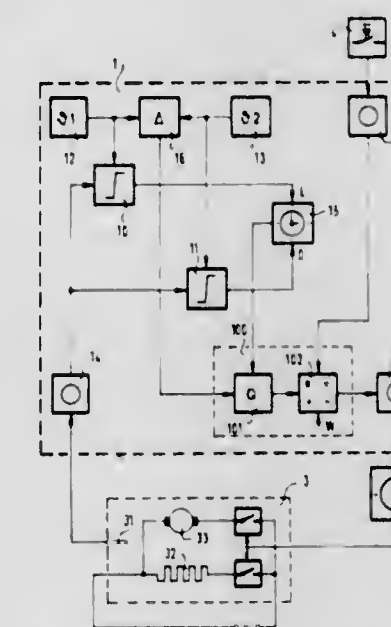
Filed Aug. 6, 1981, Ser. No. 290,513

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030864

Int. Cl.<sup>3</sup> F26B 21/10

U.S. Cl. 34—46

29 Claims



1. Method of automatically controlling the drying process of a laundry drying system until a given desired degree of dryness



is reached, including heating means, a drive for the drying system, a control device for controlling the drive and heating means, and means for supplying system-related fixed data concerning the drying of particular laundry, which comprises determining the gradient of rising air temperature leaving the drying system during a given early phase of the drying process, calculating a required operating time for the heating means and the drive from the determined gradient and the system-related fixed data, and feeding the calculated operating time as an input to the control device.

4,412,390

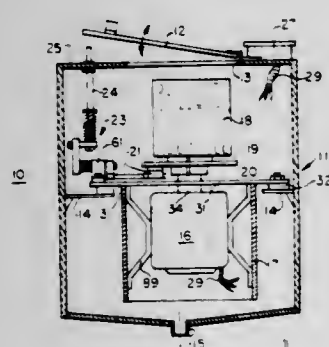
## CENTRIFUGAL SPIN AIR DRYER

William P. Grant, 620 Cleveland Ave., Elgin, Ill. 60120  
Continuation-in-part of Ser. No. 190,020, Sep. 23, 1980,  
abandoned. This application Nov. 10, 1981, Ser. No. 319,930

Int. Cl.<sup>3</sup> F26B 11/08

U.S. Cl. 34—58

3 Claims



1. A centrifugal extractor apparatus comprising in combination cabinet means defining an interior cavity and including a top wall defining a first opening therein, hinged cover means to be pivotally connected to the top wall and moveable between closed and open positions with respect to the first opening, rotatable shaft means to be mounted in the interior cavity, motor means to be connected to the rotatable shaft for rotating same, basket means for receiving wet articles to be spun dry and being connectible to the rotatable shaft means, braking means to be mounted in the interior cavity and being selectively engageable to arrest the rotational movement of the shaft, brake linkage mechanism connectible to the braking means and being engageable by a substantially closed cover means, motor activation means to be activated during movement of the cover means to the closed position thereof, the improvement comprising rotatable disc-type brake plate means for the braking means to be mounted to the shaft means for rotation therewith, pivotal disc-type brake pad means for the braking means biased to normally engage the brake plate means for preventing rotation, and being selectively moveable to release engagement therewith, pivotal lever arm means for the brake linkage mechanism carrying thereon the pivotal brake pad means and biased toward engagement with the brake plate means, and post means for the brake linkage mechanism to be connected to the lever arm means and extendible from the cabinet means in alignment for contact by the cover means during closing thereof, the post means being moveable by the closing cover means to move the lever arm means against the bias thereof for selectively releasing engagement between the brake plate means and the brake pad means, and said cabinet means including a bottom wall defining a first opening and a second opening therein, said bottom wall tapering outwardly to converge on the first opening for draining moisture therefrom; enveloping shroud means being mounted within said interior cavity of the cabinet means to envelope the motor means and extending to communicate with the second opening of the bottom wall whereby outside ambient air is excessible to the motor means and the shroud means prevents moisture contact with the motor means.

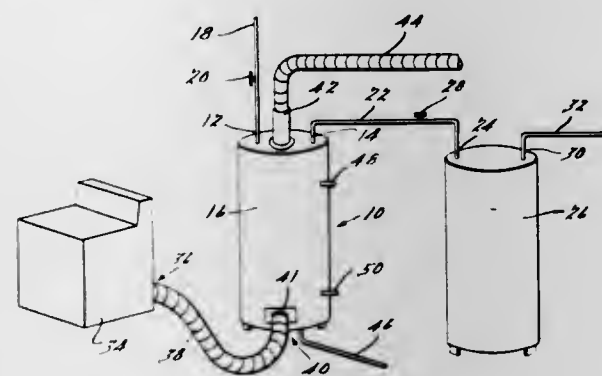
4,412,391  
WATER HEATER UTILIZING LAUNDRY DRYER  
EXHAUST

John V. Bolognino, 24836 Masch, Warren, Mich. 48091  
Filed Sep. 29, 1982, Ser. No. 427,458

Int. Cl.<sup>3</sup> F26B 19/00

U.S. Cl. 34—90

13 Claims



1. A water preheating system for use with a laundry dryer having a vent for exhausting heated air therefrom and a hot water heater having an inlet pipe for coupling to a source of water to be heated comprising:  
a tank having an underside;  
a base for supporting said tank;  
air intake port receptive of heated air from said dryer vent;  
air retainer means for directing said heated air from said air intake port generally towards the underside of said tank, wherein said air retainer means and the underside of said tank define a heating chamber;  
exhaust flue communicating with said heating chamber;  
condensation collection means disposed on said base generally beneath the underside of said tank having drain orifice therein for collecting and removing condensation from said heating chamber;  
water inlet means adapted to receive water from a supply main and communicating with said tank for filling said tank;  
water outlet means adapted to be coupled to the inlet pipe of said hot water heater so as to supply preheated water to said hot water heater.

4,412,392

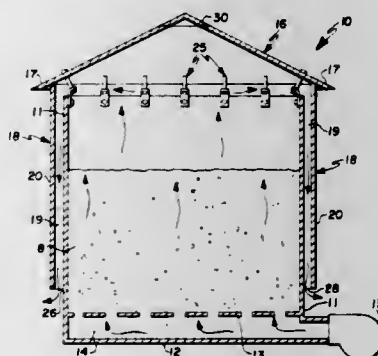
## GRAIN DRYING AND STORAGE STRUCTURE

Richard L. Keller, Tenney, Minn. 56582  
Filed Jun. 7, 1982, Ser. No. 385,667

Int. Cl.<sup>3</sup> F26B 11/00

U.S. Cl. 34—233

9 Claims



1. In a drying structure of the type having an exterior wall with an upper edge, an inclined roof structure with a lower portion extending outwardly beyond and overhanging the upper edge of the exterior wall, a perforated false floor on which a material to be dried is placed and means for driving heated air from under the perforated false floor up into and through the material to be dried, the improvement comprising:

- (a) means for supporting the roof structure so that its lower portion is spaced equidistant above the upper edge of the wall;  
(b) a shell structure for surrounding a portion of the wall, said shell structure having an upper edge and a lower edge and extending substantially continuously around the exterior of the wall; and  
(c) means for holding the shell structure exterior of the wall so that the shell is in a spaced relationship with the wall, the upper edge of the shell being in close proximity to the overhanging lower portion of the roof structure where it extends outwardly beyond the upper edge of the wall, and the lower edge of the shell extending at least fifty percent of the distance between the overhanging lower portion of the roof structure and the perforated floor of the drying structure, whereby the heated air, after passing upwardly through the material to be dried, is directed through the space defined between the upper edge of the wall and the lower portion of the roof structure and thereafter passes downwardly through the space defined between the shell structure and wall so as to protect the wall adjacent the shell from ambient temperature and to also prevent condensation from forming on the interior of the wall.

4,412,393

## BALLET TOE SHOE AND PROCESS OF MANUFACTURE THEREOF

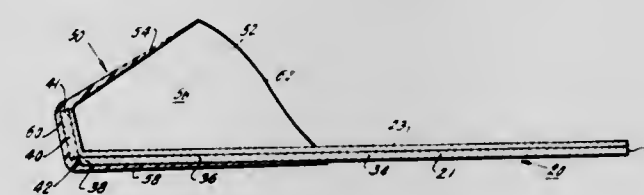
Nicholas Terlizzi, Jr., North Haledon, and Donald Terlizzi, Paquanock, both of N.J., assignors to Ballet Makers, Inc., Totowa, N.J.

Filed Jul. 10, 1981, Ser. No. 281,947

Int. Cl.<sup>3</sup> A43B 3/00, 23/00; A43C 13/14; A43D 9/00

U.S. Cl. 36—113

26 Claims



1. A shank and toe box support frame combination for a ballet toe shoe, or the like, comprising:  
a shank for being located in a ballet toe shoe beneath the sole of a wearer of the toe shoe; the shank having a front end;  
a tip flap located at the front end of the shank; the tip flap being folded up from the portion of the shank beneath the wearer's sole to define a front tip panel of the toe box support frame;  
the toe box support frame being shaped to define a toe box for a ballet toe shoe for covering over the front portion and toes of a wearer's foot; the toe box support frame having a front end and the tip flap at the front end of the shank being integrated with the support frame for at least in part defining the front end of the support frame; the support frame having an open rear end and having and defining an interior into which the toe and foot of the wearer are placed; the support frame having an exterior; the shank extending rearwardly from the front end of the support frame and extending out the rear end of the support frame.  
20. A method of making a combination of a toe box support frame and a shank for a ballet toe shoe, or the like, the method comprising:  
applying a ballet toe shoe shank having a front end, with a foldable tip flap being defined on the front end of the shank, to the toe shoe sole side of a male mold member that is generally in the shape of a toe box of a ballet toe shoe, and the shank being applied to the male mold member so that the tip flap of the shank extends forward of the forward end of the male mold member;  
inserting the male mold member, forward end first, into the mold cavity of a female mold member which cavity has a

profile that generally conforms to the external profile of the male mold member, and the respective profiles of the male and female mold members being shaped so that there is a narrow space defined between the male and the female mold members for receiving a moldable resin material, or the like; the male mold member being inserted far enough for the tip flap at the front of the shank to contact the interior of the female mold member for then folding up the tip flap over the front end of the male mold member, whereby the tip flap is then in position to be at the front tip of the toe box support frame;

applying resin in the space between the male and the female mold members and also applying the resin over the tip flap, and allowing the resin to set for thereby defining the toe box support frame and for integrating the shank and the support frame; and  
removing the toe box support frame with the shank integrated therewith from the mold members.

4,412,394

## DREDGING SUCTION-JET HEAD

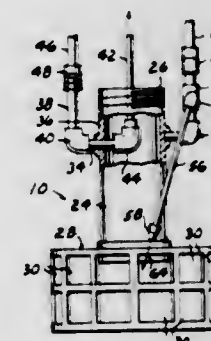
Ernest Z. Coker, 1525 SW. 23, Oklahoma City, Okla. 73108

Filed Sep. 9, 1982, Ser. No. 416,413

Int. Cl.<sup>3</sup> E02F 3/88

U.S. Cl. 37—57

3 Claims



1. In a boat supported placer-stream dredging apparatus having a generally vertical gangue tube extending from the placer above the surface of the stream and generating an upward flow of gangue therethrough and having first and second pressure hoses coextensive with the gangue tube and containing water under greater than atmospheric pressure, the improvement comprising:  
a dredging head secured to the depending end of said gangue tube, said dredging head comprising:  
an open end section of pipe coaxially secured at one end portion to the depending end of said gangue tube,  
nipple means communicating with the first said pressure hose and extending through the wall of said pipe section for reducing stream water pressure within the pipe section by generating an upwardly directed jet action water flow therethrough,  
cage means consisting of a cylindrical member having a top end wall of greater diameter than said pipe section coaxially secured to the depending end portion thereof and having a closed bottom wall spaced from said top wall a distance at least equal to one-half its diameter, the wall of said cylindrical member having openings therein dimensioned for limiting the diametric size of gangue particles passing through the openings in response to lateral movement of the cylindrical member across a stream bed by the trailing action of the gangue tube following boat movement,  
a cross communicating with said second pressure hose and rigidly secured to said pipe section opposite said nipple means, and,  
angularly downward directed nozzle means communicating with said cross for impinging a high velocity stream of water on the gangue at opposite sides of said cage.



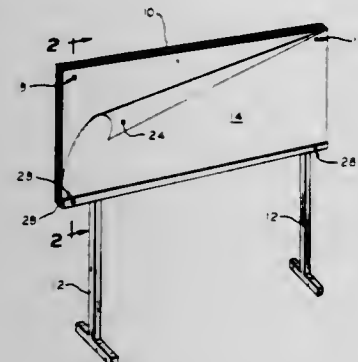
4,412,395

## DISPLAY DEVICE

William R. Markin, 5502 Chippewa Rd., Toledo, Ohio 43613  
Continuation of Ser. No. 938,017, Aug. 30, 1978, abandoned.  
This application Dec. 1, 1980, Ser. No. 211,836  
Int. Cl.<sup>3</sup> G09F 19/00

U.S. Cl. 40—530

3 Claims



1. A free-standing device for supporting a tablet of sheets of paper comprising:  
a backing plate including an upper marginal edge and lower marginal edge;  
at least one floor engaging leg attached to and supporting said backing plate in a substantially upright position;  
means for positioning the upper marginal edge of the tablet of sheets of paper and releasably securing the upper marginal edge of the sheets of paper along the upper marginal edge of said backing plate such that each sheet of paper in the tablet may be individually released;  
a channel member, generally U-shaped in cross section, secured to and coextensive with the lower marginal edge of said backing plate adapted to receive and contain the lower marginal edge of a tablet of sheets of paper; and  
clamping means affixed to one leg of said channel member for snugly securing the lower marginal edge of the tablet of sheets of paper within said channel member.

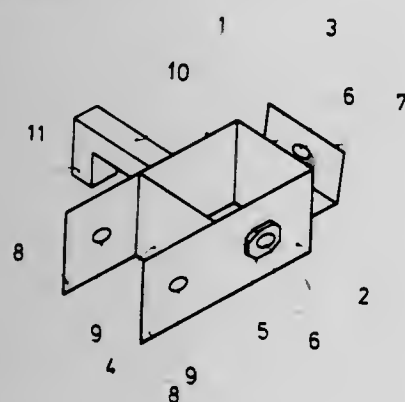
4,412,396

## SIGN HOLDER WITH REVERSIBLE SUPPORTING BRACKETS

Hermann Silbernagel, Friesenheimer Strasse 7a, 6800 Mannheim 1, Fed. Rep. of Germany  
Filed Jan. 17, 1980, Ser. No. 113,110  
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 7930368[U]  
Int. Cl.<sup>3</sup> G09F 15/00

U.S. Cl. 40—607

6 Claims U.S. Cl. 43—1



1. A sign holder comprising:  
at least one post of square shaped cross-section, over which several reversible supporting brackets each having a square shaped opening therethrough are placed which embrace said post;  
each said square shaped opening supporting bracket having

at the front thereof an angle iron for holding an edge of a sign from either above or below;  
each said supporting bracket further having on at least one side thereof a threaded hole, more particularly in the form of an external nut provided on the outside of the supporting frame in which a screw can be threaded, said screw being turned into engagement with the post so as to lock each supporting bracket thereto, and  
at least one bracket having said angle iron sloped slightly outwardly away from the front of said supporting bracket so that when said at least one bracket is used to hold an edge of a sign from below the weight of the sign effects a wedging action with said bracket.

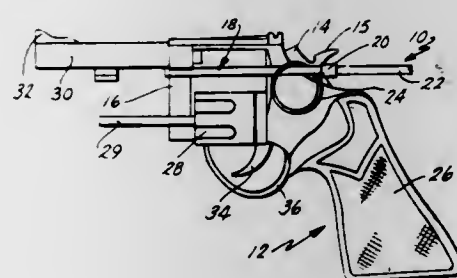
4,412,397

## FIREARM SAFETY APPARATUS AND METHOD OF USING SAME

William H. Bayn, 5095 Pettis, Belmont, Mich. 49306  
Filed Mar. 19, 1982, Ser. No. 359,683  
Int. Cl.<sup>3</sup> F41C 27/00

U.S. Cl. 42—1 LP

54 Claims



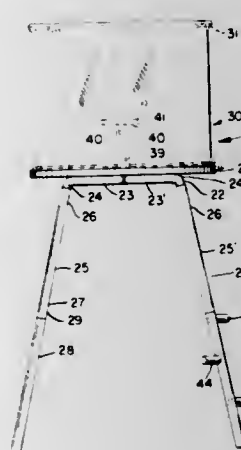
10. A firearm safety device for rendering a firearm positively but temporarily inoperative, the firearm having a first element normally movable to a ready-fire position, the device comprising:  
a fractureable strap; and  
means for securing said fractureable strap about the firearm to prevent the first element from moving to the ready-fire position, whereby the firearm is rendered operative by fracturing said strap and removing said strap from the firearm.

4,412,398

## HUNTING STAND

Alvin E. Harmon, R.R. 1, Bagley, Minn. 56621  
Filed Mar. 17, 1981, Ser. No. 244,660  
Int. Cl.<sup>3</sup> A01M 31/02

3 Claims



1. A hunting platform device comprising an upright sleeve, a platform, said upright sleeve being mounted on said platform and having a vertical axis perpendicular to said platform, said sleeve being made of flexible material, a seat mounted on said platform, said sleeve being movable upward from a position

adjacent the platform to a raised position, said sleeve when raised having a height extending from the platform to a height above the seat to surround said seat and form a wall enclosing said seat, to at least partially conceal an operator seated on said seat, said sleeve being open across its top, support means for supporting said sleeve in its raised position, said support means comprising a hoop fixed about the upper open end of said sleeve, removable rods having their upper ends engaging said hoop for supporting said hoop and thereby supporting said sleeve, with their lower ends mounted to said platform, a plurality of legs mounted beneath said platform to support said platform in a raised position above the ground.

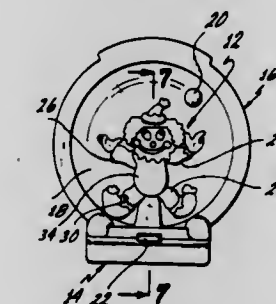
4,412,399

## JUGGLING TOY

Akira Abe, Tokyo, and Tomihisa Tanimura, Mibu, both of Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan  
Filed Dec. 14, 1981, Ser. No. 330,524  
Claims priority, application Japan, Dec. 18, 1980, 55-182334  
Int. Cl.<sup>3</sup> A63H 1/32

U.S. Cl. 46—47

7 Claims



1. A toy which comprises:  
a housing;  
movable means rotatably mounted on said housing such that it is capable of reciprocal movement in an arcuate pathway with respect to said housing;  
moving means located on said housing in association with said movable means and capable of interacting with said movable means at at least two points in said arcuate pathway, each of said interactions of said moving means with said movable means capable of at least inhibiting movement of said movable means in one direction and further capable of initiating movement in the opposite direction;  
at least a portion of said movable means comprises an object capable of moving in said arcuate pathway;  
said moving means interacting with said object, said interaction of said moving means with said object capable of at least inhibiting the movement of said object in said one direction and further capable of initiating movement of said object in said other direction;  
said moving means comprises a first and a second element and an element activation means, said first and said second element each having an end and each movably mounted on said housing such that said end of said first and said second elements is capable of moving and contacting said object, said first and said second elements each operatively associated with said element activation means and each movable in response to said element activation means.

4,412,400

## APPARATUS FOR BURNISHING

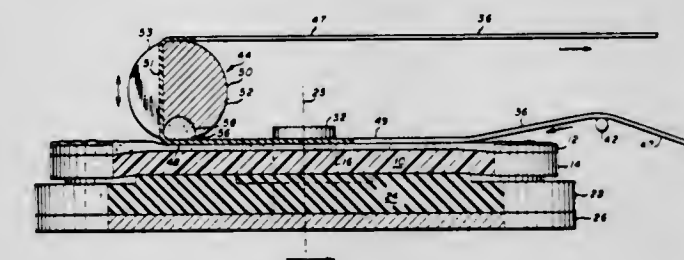
Craig B. Hammond, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.  
Division of Ser. No. 198,714, Oct. 20, 1980, Pat. No. 4,347,687.  
This application May 5, 1982, Ser. No. 374,934  
Int. Cl.<sup>3</sup> B24B 21/16

U.S. Cl. 51—58

18 Claims

1. Apparatus for burnishing an annular region of a circular surface of a disk which comprises:  
means for rotating a disk having a coated surface about an

axis substantially normal to said coated surface whereby a plane of rotation is established for said coated surface;  
a burnishing head having an outer surface secured so as to permit moving the burnishing head into close proximity to said plane of rotation and to permit oscillating the burnishing head laterally to said plane of rotation, said burnishing head having a length of tape having a working surface thereon wrapped partially around said outer surface of the burnishing head closest to said plane of rotation when the burnishing head is moved into close proximity to said plane of rotation, said burnishing head further adapted to constrain said length of tape so received so as to cause said received tape to move laterally with the burnishing head when the head is moved into close proximity to said plane of rotation and is oscillated laterally back and forth;



means for securing a length of said tape and having a guide surface means for guiding said tape around said outer surface of the burnishing head and establishing a tape path wherein said tape surface closest to said plane of rotation has a first segment located about the burnishing head and urged into intimate contact at a first force with the surface of a disk located in said plane of rotation and said tape surface has a second segment having a common terminal end with said first segment, which second segment is urged toward said circular surface at a lesser force than said first force;  
means for oscillating the burnishing head back and forth laterally relative to said plane of rotation when the head is moved into close proximity to said plane of rotation.

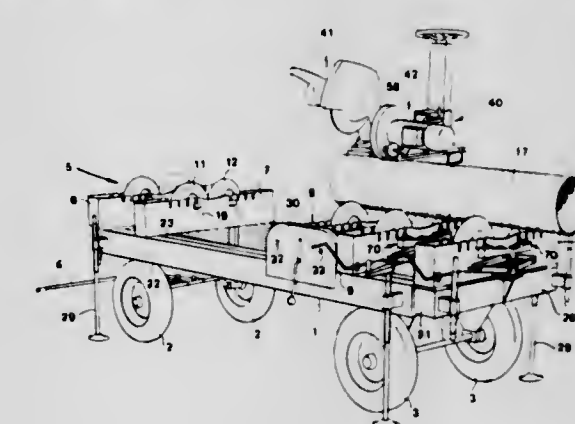
4,412,401

## APPARATUS FOR PROCESSING TUBES

Bo W. Fundell, Alvkärlaby, Sweden, assignor to Skutskars Rostfria AB, Skutskar, Sweden  
PCT No. PCT/SE80/00236, § 371 Date May 29, 1981, § 102(e) Date May 29, 1981, PCT Pub. No. WO81/00821, PCT Pub. Date Apr. 2, 1981  
PCT Filed Oct. 1, 1980, Ser. No. 269,026  
Claims priority, application Sweden, Oct. 1, 1979, 7908103  
Int. Cl.<sup>3</sup> B24B 5/34, 27/04

U.S. Cl. 51—103 R

10 Claims



1. An apparatus for processing tubes and the like, said apparatus comprising a frame, support means for supporting a tube above said frame and a processing tool for working upon the tube, said support means being a plurality of supports spaced



along a longitudinal axis of said frame, each of said supports having two roller elements for permitting rotation of the tube relative to said processing tool, at least one of said supports being movable along said frame, said processing tool being carried by said movable support whereby said processing tool may be moved to various positions along the length of said frame, means for locking said movable support to said frame in a stationary adjusted position, and said locking means including means for raising and lowering said two roller elements of said movable support vertically into and out of contact with a tube supported by others of said supports whereby said movable support and said processing tool may be readily adjusted relative to such a supported tube.

4,412,402

# EQUIPMENT AND METHOD FOR DELIVERING AN ABRASIVE-LADEN GAS STREAM

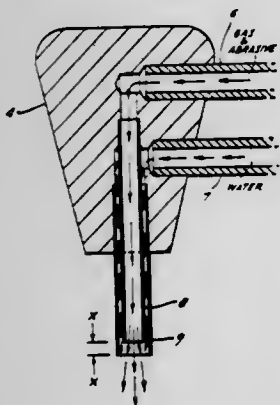
Ben J. Gallant, Portland, Tex., assignor to Cavitron Inc., Long Island City, N.Y.

Continuation of Ser. No. 65,288, Aug. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 14,435, Feb. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 928,907, Jul. 28, 1978, Pat. No. 4,174,571. This application Oct. 17, 1980, Ser. No. 197,886

Int. Cl.<sup>3</sup> B24C 5/04

U.S. Cl. 51—439

24 Claims



1. A method for effecting abrasion comprising delivering from a nozzle orifice a pressurized jet of particle-laden gas, with resultant development of an ambient induction zone, releasing a substantially unpressurized flow of the liquid into an annual space surrounding the ambient induction zone and thereby establish a combined stream of gas, particles and liquid, and directing the combined stream against the surface to be abraded.

4,412,403

# TELESCOPING GRANDSTAND ARRANGEMENT

Christiane LeFranc, 72, avenue du Midi, 63800 Cournon, and Francois Verdier, 46, Boulevard Cote Blakin, 63000 Clermont-Ferrand, both of France

Filed May 21, 1982, Ser. No. 380,566

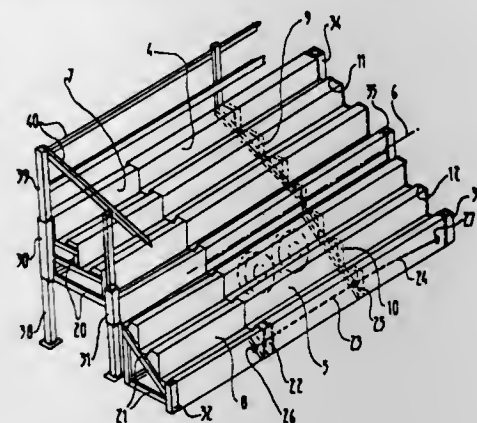
Int. Cl.<sup>3</sup> E04H 3/12

U.S. Cl. 52—9

10 Claims

1. In a tiered grandstand arrangement of the type adapted to support individuals for purposes including group photography of the individuals and seating thereof to watch a show, conference, or other event, and of the type formed of a frame mounted on wheels and equipped with means to permit towing to a desired location, comprising a first, top group of tiers being permanently mounted on said frame, and a second, bottom group of tiers hingedly joined to the first group about a horizontal axis parallel to the length the tiers of the first and second groups thereof, the second group being pivotally movable about said axis to be folded onto and placed atop the first group for travelling, and to be unfolded therefrom into an opened position for use; the improvement wherein each of said first and second groups of tiers has a generally tubular prismatic structure, and there are further provided for each of said

first and second groups of tiers at least one inside group of tiers of structure similar to the associated one of said first and second groups of tiers, the latter forming outside groups of tiers relative to said inside groups of tiers and serving as housings



4,412,404

# COMBINED VENT AND ESCAPE HATCH

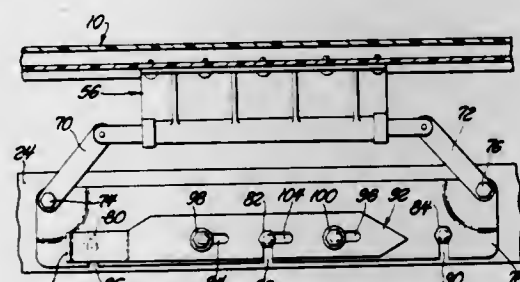
Donald L. Manning, Orchard Lake, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Apr. 19, 1982, Ser. No. 369,387

Int. Cl.<sup>3</sup> E05B 65/10; E05C 15/02; E05D 15/50

U.S. Cl. 52—19

7 Claims



1. A combined vent and escape hatch assembly of the type adapted to be mounted in an opening on a vehicle roof, said assembly comprising a lid, a lid supporting ring of generally the same shape and size as the roof opening and mounted on said roof so as to surround said opening, a pair of linkage mechanisms mounted on laterally opposite sides of and connected between said lid and said ring, each linkage mechanism comprising first and second bracket members respectively connected to said lid and said ring and lever means interconnecting said bracket members to permit said lid to be moved between a seated position upon said ring closing the roof opening and a plurality of partially opened venting positions in which the lid is supported by both of said linkage mechanisms, and a latching means for disconnecting one of said linkage mechanisms whereby the lid may be moved to a fully opened position relative to the roof opening, the improvement in said latching means comprising:

- A. a latch element slidably mounted on one of said second bracket members; and
- B. said ring including means for supporting one second bracket member, said latch element being adapted to coact with the bracket supporting means to releasably lock said one second bracket member against movement relative to said ring.

4,412,405

# INTERLOCKING BUILDING STRUCTURE

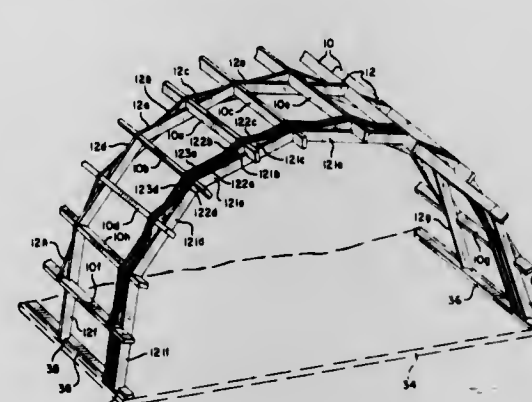
Jasper J. Tucker, 4674 Tragen Ct., SE., Salem, Oreg. 97302

Filed Aug. 28, 1981, Ser. No. 297,314

Int. Cl.<sup>3</sup> E04B 1/32

U.S. Cl. 52—86

8 Claims



1. An interlocking building structure comprising: a plurality of rigid elongated stringer members and a plurality of rigid elongated cross members for positioning cross-ways of said stringer members, said cross members each being provided with an upper slot intermediate ends thereof for receiving a stringer member, said stringer members having upper slots for receiving ends of cross members, ones of said cross members being offset from one another so that their upper slots receive different stringer members, wherein a given stringer member is received in an upper slot of a given cross member while ends of said given cross member are received in upper slots in second and third next adjacent stringer members on either side of said given stringer member, an end of a cross member offset from said given cross member being received in an upper slot in said given stringer member while said second and third stringer members are respectively received in upper slots in offset cross members.

4,412,406

# METHOD OF AND A DEVICE FOR FIXING A WINDOW MOLDING ONTO A WINDOWPANE

Ikuo Sengoku, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

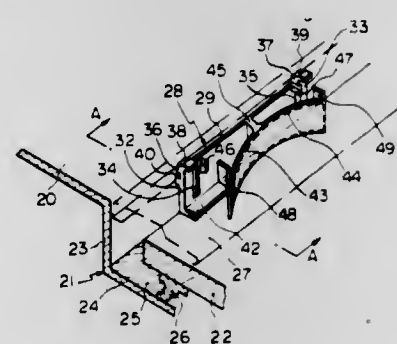
Filed Apr. 3, 1981, Ser. No. 250,678

Claims priority, application Japan, Nov. 5, 1980, 55-154572

Int. Cl.<sup>3</sup> E06B 3/00

U.S. Cl. 52—208

26 Claims



11. A windowpane assembly of a vehicle, which has a window molding and a windowpane arranged in an L-shaped cross-sectional fillister of a vehicle body, said fillister extending along an outer periphery of the windowpane and comprising a riser portion which extends inwardly from the vehicle body, and a bottom portion which extends substantially parallel to the vehicle body from an inner end of said riser portion, the windowpane being stuck onto the bottom portion by means of

an adhesive material, a gap formed between the riser portion and the outer periphery of the windowpane being covered by the window molding which has a substantially C-shaped cross-section and an outer periphery, said device having a molding clip fixed onto the riser portion of said fillister and inserted into the gap for fixing the window molding onto the windowpane, said molding clip comprising:

- a holding portion engageable with the outer periphery of said window molding to hold said window molding;
- an elastic wing member intended to resiliently abut against the outer periphery of the windowpane within the gap;
- latch means engageable with said elastic wing member for maintaining said elastic wing member in a compressed state to accumulate the elastic force of said elastic wing member; and;
- disengaging means for disengaging said elastic wing member from said latch means and causing said elastic wing member to resiliently abut against the outer periphery of said windowpane, said disengaging means comprising the outer periphery of said window molding, which is engageable with said elastic wing member.

4,412,407

# MOUNTING ARRANGEMENT FOR GUARD RAIL POST

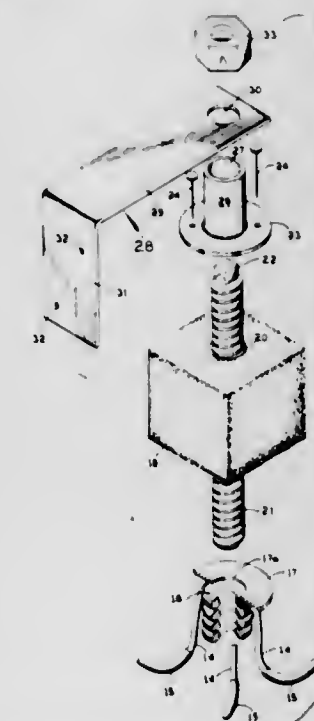
Samuel T. Melfi, 520 NE. Wavecrest Ct., Boca Raton, Fla. 33432, and Nicholas J. Melfi, 680 SW. 14th St., Deerfield Beach, Fla. 33441, assignors to Samuel T. Melfi, Anna J. Melfi, both of Boca Raton and Nicholas J. Melfi, Deerfield Beach, all of, Fla.

Continuation-in-part of Ser. No. 273,359, Jun. 15, 1981, abandoned. This application Oct. 2, 1981, Ser. No. 307,731

Int. Cl.<sup>3</sup> E04B 1/38

U.S. Cl. 52—699

1 Claim



1. For use in anchoring an upstanding guard rail support post to a concrete floor slab, the improvement which comprises: a helically wound wire nut having its successive helical turns engaging each other and defining a downwardly extending screw-threaded passageway for threadedly receiving a screw-threaded stem on the lower end of the support post; a rigid elongated bolt having an externally screw-threaded lower end threadedly received in said screw-threaded passageway in the nut, said bolt extending up from said nut above the level to which the concrete floor slab is to be poured and having a screw-threaded upper end; a bracket having a horizontal top leg with a vertical opening therein which passes said bolt and a vertical leg extending down from said top leg for attachment to a perimeter board of a form for the concrete floor slab;



spacer means engaged between said horizontal top leg of said bracket and the top of said nut, said spacer means having a vertical opening therein which passes said bolt; said spacer means comprising:  
a lower, rigid, flat, annular washer engaging the top of said wire nut;  
a block of expanded plastic extending up from said lower washer to form a complementary recess in said concrete floor slab above said wire nut, said block having a central vertical opening which registers with the screw-threaded passageway in said wire nut;  
an upper, rigid, flat, annular washer on top of said block; and a rigid sleeve extending up from said upper washer to said horizontal top leg of said bracket;  
clamping nut threadedly engaging the screw-threaded upper end of said bolt above said horizontal top leg of the bracket and clamping the latter down against said spacer means;  
and a plurality of feet extending down from said nut to engage a bottom wall of the form and hold the wire nut spaced above said bottom wall.

4,412,408

# HEAT-INSULATION BUILDING BLOCK OF ALL-METAL CONSTRUCTION

Manfred Scholz, Erlangen, and Wolfgang-Peter Fricker, Freinheim, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

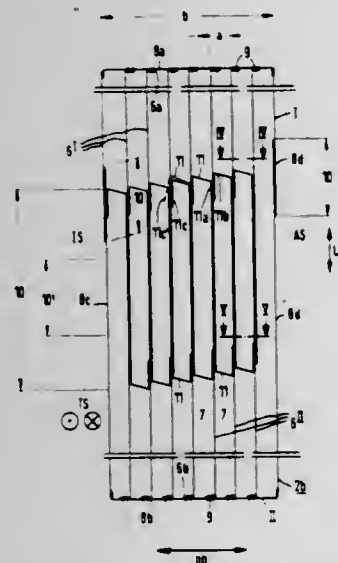
Filed Mar. 17, 1981, Ser. No. 244,653

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 3010256

Int. Cl.<sup>3</sup> E04C 2/34

U.S. Cl. 52—806

7 Claims



1. Heat-insulation building block formed of at least two parts slideable relative to one another over a given range and, respectively, including between two metal housing sheets maintained at a constant spacing from one another, a multiplicity of metallic insulation foils disposed consecutively in direction of said spacing between said housing sheets, and spacer elements holding the insulation foils in spaced relationship to one another, adjacent pairs of the consecutive insulation foils forming respective insulation cells, the housing sheets and the insulation foils of the respective parts being nested overlappingly within one another in consecutive alternating fashion within the given sliding range, the housing sheets and the insulation foils of the slideable parts nested within one another having respective overlap lengths greater than a maximum enlargement of the building block resulting from sliding the parts of the building block apart in direction of the given sliding range, comprising bent-away portions formed at a free end of the insulation foils of at least one of the relatively slideable building-block parts, said bent-away portions bridging the space between respective pairs of the consecutive insulation foils and tightly engaging

elastically respective adjacent insulation foils of at least the other of the relatively slideable building-block parts, and hair-pin shaped bent-away portions formed as pockets engaging in one another at free ends of the housing sheets of the two building-block parts forming the building block.

4,412,409

# METHOD OF CLOSING THE MOUTH OF A CONTAINER AND A SCREW CAP FOR USE THEREIN

Dietmar Aichinger, Reinach; Hans-Werner Breuer, Balsthal, and Albert Obrist, Kaiseraugst, all of Switzerland, assignors to Albert Obrist AG, Reinach, Switzerland

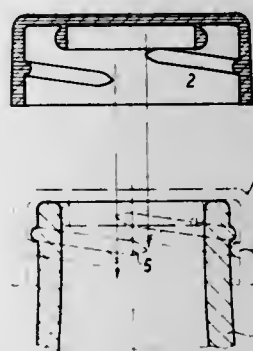
Filed Feb. 13, 1981, Ser. No. 234,558

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006481

Int. Cl.<sup>3</sup> B67B 3/22, 3/20, 1/08; B65B 7/28

U.S. Cl. 53—485

8 Claims



1. A method of closing a container mouth having an external screw-thread by a screw cap of resilient plastics material having an internal screw-thread of corresponding pitch, comprising locating the screw cap on the container mouth in a predetermined angular orientation corresponding to the angular orientation of the cap in its final position when the container is closed by screwing on the cap with a certain screw torque to fully engage the threads, and then applying pressure in the axial direction of the container to snap the cap over the threads of the container into its final position as would be occupied if screwed on with said certain torque.

4,412,410

# HORIZONTAL BALING APPARATUS AND METHOD

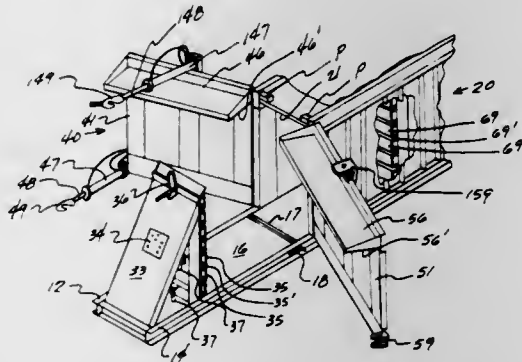
George F. Smith, Jr., Spartanburg, S.C., assignor to Hergeth, Incorporated, Spartanburg, S.C.

Continuation of Ser. No. 186,193, Sep. 11, 1980. This application Apr. 29, 1981, Ser. No. 258,766

Int. Cl.<sup>3</sup> B65B 63/02

U.S. Cl. 53—528

25 Claims



1. A horizontal baling apparatus comprising:  
(a) a frame, said frame having a bottom wall and a vertical, stationary platen secured at one end of same, said frame also including a housing located at an end of same oppo-

site said stationary platen, said housing defining a horizontal passageway therealong and being spacially separate from said stationary platen, said frame further having a pair of side wall sections pivotally secured thereon for movement between a closed position adjacent said housing and said platen and an open position;  
(b) a ram received in said horizontal passageway for movement therein between a first, feed position, and a second, material compression position, said ram having a platen secured at an end of same;  
(c) fluid operated closing and locking means associated with said side wall sections for locking said side wall sections adjacent said housing and stationary platen where a baling chamber is partially defined by said stationary platen, bottom wall and side wall sections, said closing and locking means comprising two pairs of interengageable locking elements, one of said elements of each pair being secured to one of said moveable side wall sections and the other of said elements of each pair being associated with a fluid operated cylinder and piston arrangement which is secured to the other of said side wall sections for movement of said interengageable element into and out of locking engagement with the other of said interengageable elements of said pair so that retraction of said pistons locks together said elements of each pair;  
(d) a source of fluid power for operating said cylinder and piston arrangements; and  
(e) means for controlling fluid power to said cylinders such that during closing of said side wall sections, a first of said cylinders only receives fluid whereby its interengageable elements only are brought into at least initial engagement, after which fluid power is automatically supplied to the other of said cylinders to initiate retraction of said piston therewithin, whereby said interengageable elements associated with said other of said cylinders may be easily, manually brought into initial engagement, and both of said cylinders may lock their respective interengageable elements.

4,412,411

# PAPER SHEET BUNDLING APPARATUS

Yoshiro Hashimoto, and Shigeo Horino, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 133,940, Mar. 25, 1980, abandoned.

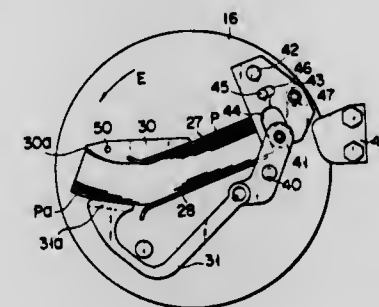
This application Sep. 2, 1982, Ser. No. 414,313

Claims priority, application Japan, Mar. 28, 1979, 54-36730; Mar. 28, 1979, 54-36731; Mar. 28, 1979, 54-36732; Mar. 29, 1979, 54-37508; Mar. 29, 1979, 54-37509; Mar. 29, 1979, 54-37510; Mar. 29, 1979, 54-41038[U]

Int. Cl.<sup>3</sup> B65B 11/04

U.S. Cl. 53—587

3 Claims



1. A paper sheet bundling apparatus for a paper sheet processing system in which stacked paper sheets are bundled in a bundling position with a thermally fusible bundling tape during a bundling operation, said bundling tape having a leading end portion and a trailing end portion, said apparatus comprising:  
a stationary frame;  
a rotary body supported within said frame and rotatable about an axis from a normal position;  
locating means provided within said rotary body and serving to locate the paper sheet stack in the bundling position,

said locating means being disposed such that the leading end portion of the bundling tape is pushed by a leading end of the paper sheet stack when the paper sheet stack is fed into the bundling position, and then rests on an upper surface of the paper sheet stack;  
paper sheet stack feed-in means for feeding the paper sheet stack into said locating means;  
bundled paper sheet stack feed-out means for receiving the bundled paper sheet stack from said locating means after the bundling operation;  
means for clamping the paper sheet stack in the bundling position;  
means for moving the clamping means in a direction having a perpendicular component with respect to the direction of transfer of the paper sheet stack between a clamp position, at which the paper sheet stack is held in the bundling position, and a clear position at which the paper sheet stack is released, said clamping means rotating together with said rotary body during the bundling operation while in said clamp position;  
heat receiving means, separate and independent from said clamping means, and having a back side surface and an upper surface, for holding the leading end portion of the bundling tape between the back side surface and the upper surface of the paper sheet stack, said heat receiving means being interposed between the paper sheet stack and the bundling tape wound around the paper sheet stack during the bundling operation;  
means, separate and independent from said clamping means moving means, for moving said heat receiving means in a crosswise direction with respect to the direction of movement of said clamping means moving means and with respect to the direction of transfer of the paper sheet stack; and  
heating means, facing the upper surface of said heat receiving member, for pressing the trailing end portion of the bundling tape to overlap and fuse with the tape wound around the paper sheet stack with said heat receiving means supporting the overlapped tape during the fusing operation.

4,412,412

# LOADING DEVICE FOR FALSE-TWIST APPARATUS

Günter Paul, Hammelburg; Kirit Patel, Elfershausen, and Günter Schmitt, Hammelburg, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

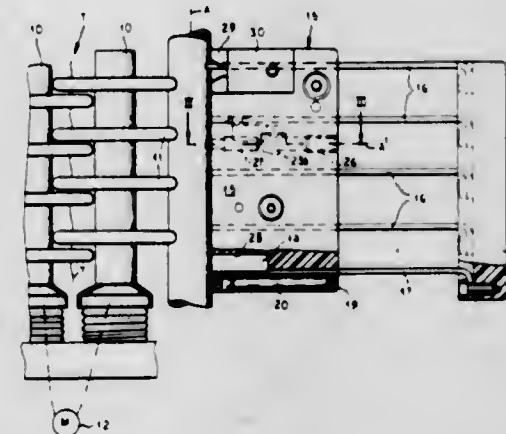
Continuation-in-part of Ser. No. 182,649, Aug. 29, 1980, abandoned. This application Apr. 20, 1982, Ser. No. 370,052

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935380

Int. Cl.<sup>3</sup> D01H 15/00; D02G 1/08

U.S. Cl. 57—280

9 Claims



1. In combination with a false-twist apparatus including:  
a frame defining at least three generally parallel and radially spaced axes surrounding a central axially extending twist-



ing region and having at least one frame element having an abutment surface turned away from said region; respective shafts lying on and journaled in said frame for rotation about the respective axes; respective sets of axially spaced disks fixed on said shaft and having rims radially overlapping at said twisting region, whereby a yarn to be false-twisted can pass axially along said region in contact with said rims; and drive means connected to said shafts for permanently connecting same together for joint rotation, whereby a yarn passing through said region is false-twisted by the rotating disks,

a thread-loading device comprising:

- a support;
- means including interengaging formations on said frame adjacent said abutment surface and on said support for releasably securing same together, said formations extending radially of said region, whereby said support can be fitted to said frame by being displaced radially toward said region to interfit said formations;
- a loading arm carried on and displaceable relative to said support and having a yarn-pushing tip turned toward and engageable between said disks, said tip being displaceable with said arm between an outer position spaced from said disks and an inner position with said tip and a yarn engaged thereover in said region and axially between said disks;
- means including a spring engaged between said support and said arm for urging same into one of said positions; and
- a detent carried in said support and displaceable between a blocking position engaged with said arm in said outer position thereof for preventing movement of said arm relative to said support and a freeing position permitting such movement; and
- release means linked to said detent and having a release element displaceable between a projecting position engageable with and depressable by said abutment surface when said formations are interfitted and a depressed position for displacing said detent into said freeing position only when said release element is in said depressed position, whereby said arm cannot move on said support unless said support is fitted snugly to said frame.

4,412,413

#### AIR CURRENT RECTIFIER PLATE ON AN AIR SPINNING DEVICE

Shoji Sakai, Kyoto; Michiaki Fujiwara, Shinomachi; Nobunori Kubota, and Koshi Noda, both of Kyoto, all of Japan, assignors to Murata Machinery, Ltd., Japan

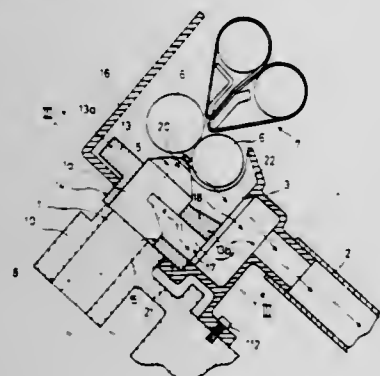
Filed Dec. 28, 1981, Ser. No. 335,220

Claims priority, application Japan, Oct. 13, 1981, 56-152716[U]

Int. Cl.<sup>3</sup> D01H 11/00

U.S. Cl. 57—304

13 Claims



1. An air current rectifier plate for use in an air spinning device characterized in that the rectifier plate is externally fitted on an air nozzle tip part which protrudes from a nozzle holder and includes a discharge port spaced from the tip of the

nozzle, wherein the rectifier plate includes a lower part which is positioned between said air nozzle tip and the discharge port wherein at least a space communicating with the interior of a dust box disposed below said air nozzle tip part is substantially partitioned into two air flow paths separated by said lower part, one on the side of the air nozzle tip and the other for discharged air from the discharge port.

4,412,414

#### HEAVY FUEL COMBUSTOR

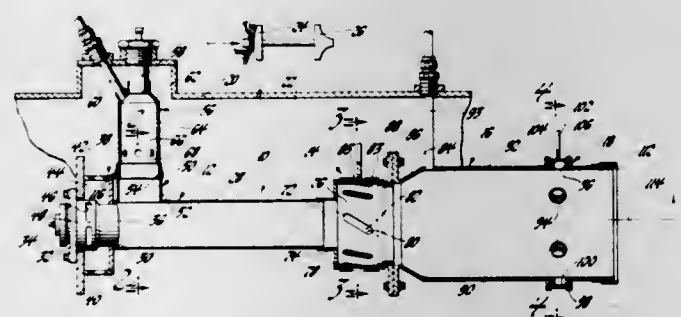
Allen S. Novick, Lafayette; Jerry G. Tomlinson, Indianapolis, and Dennis L. Troth, Speedway, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1980, Ser. No. 189,072

Int. Cl.<sup>3</sup> F02C 1/00

U.S. Cl. 60—39.23

2 Claims



1. In a high vapor temperature liquid fuel combustor, the combination comprising, a vaporizing tube of predetermined length and cross section having an inlet and an outlet, a fuel nozzle at said inlet connected to a source of said fuel and to a source of compressed air and operative to separate said fuel by air blast into a plurality of droplets and to direct a longitudinal stream of said droplets into said tube, a preheat combustor means operative to generate a preheat stream of heated products of combustion, means operative to direct said preheat stream into said tube generally at said inlet for interception of said droplet stream and mixture therewith whereby said mixture traverses said tube toward said outlet in a longitudinally moving swirl having a residence time in said tube proportional to said length and said cross section thereof and sufficient in duration for the heat from said preheat stream to vaporize said droplets without autoignition of said vapor, a primary air mixer connected to said tube outlet and to said compressed air source operative to combine said vaporized fuel and compressed air into a combustible mixture, first variable geometry means for regulating air flow into said primary air mixer thereby to control the equivalence ratio of said combustible mixture to reduce production of nitrous oxides, means defining a lean reaction zone for receiving said combustible mixture from said primary air mixer, means for igniting said mixture in said lean reaction zone to generate products of combustion, and second variable geometry means in a downstream portion of said lean reaction zone for regulating air flow from said compressed air source into said downstream portion to quench said products of combustion.

4,412,415

#### HYDROSTATIC STEERING GEAR

Svend E. Thomsen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 17, 1981, Ser. No. 234,778

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006509

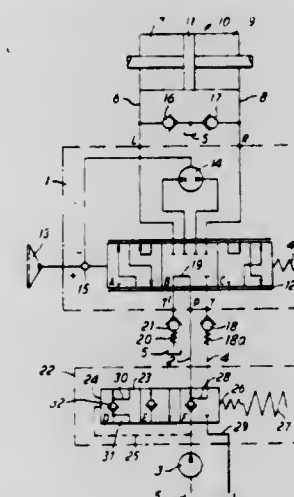
Int. Cl.<sup>3</sup> F15B 7/00; B62D 5/08

U.S. Cl. 60—384

7 Claims

1. A hydraulic steering control system comprising a bidirectional servomotor having two operating ports on opposite

sides thereof, pump and tank means, a valve assembly including a metering unit, said valve assembly having a steering wheel connection and being connected to said servomotor and said pump and tank means, said valve assembly being operable to form fluid supply and exhaust branches for selectively feeding and exhausting opposite sides of said servomotor, said metering unit being in at least one of said exhaust branches, auxiliary valve means between said pump and tank means on



one side thereof, said auxiliary valve means having a normal operating position assumable upon being subjected to pump pressure to connect said fluid supply and exhaust branches to said pump and tank means, said auxiliary valve means having an emergency operating position assumable in the absence of pump pressure to connect said fluid supply and exhaust branches to permit fluid flow in said branches responsive to the manual actuation of said valve assembly.

4,412,416

#### ALTITUDE COMPENSATED VACUUM SUPPLY SYSTEM AND CONTROL

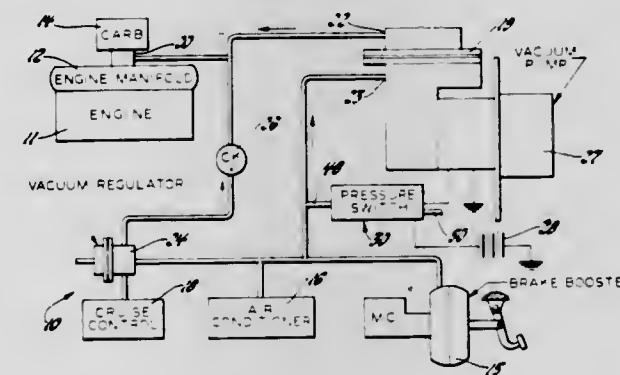
Robert M. Van House, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1980, Ser. No. 198,638

Int. Cl.<sup>3</sup> F15B 15/18

U.S. Cl. 60—397

4 Claims



1. An altitude compensated vacuum supply system for operating accessories of an automotive vehicle, said system comprising

- a vacuum pump connected to at least one vacuum powered accessory device and drivable to provide vacuum for operating said device,
- driving means connected with and selectively operable to drive the pump, and
- control means to operate the driving means only when the vacuum pressure falls below a predetermined control range of vacuum pressures adequate for operation of the accessory device but lying well below the pump vacuum pumping capability at sea level and declining at increasing altitudes at a rate less than that of the decline in pump vacuum capability, said control means being differentially

responsive to ambient pressure and to vacuum pressure between the pump and accessory device and operatively connected to selectively operate the driving means.

4,412,417

#### WAVE ENERGY CONVERTER

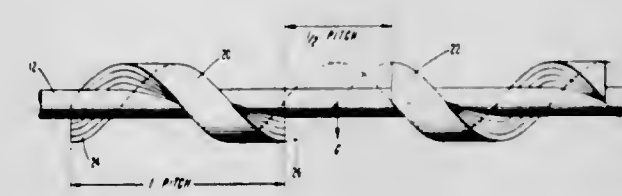
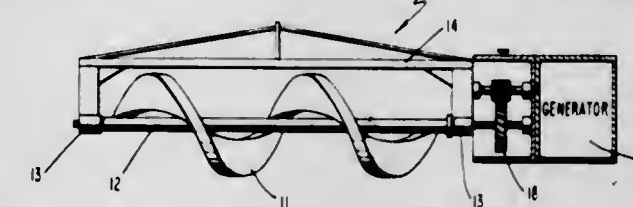
Daniel Dementhon, Annapolis, Md., assignor to Tracor Hydraulics, Incorporated, Laurel, Md.

Filed May 15, 1981, Ser. No. 263,886

Int. Cl.<sup>3</sup> F03B 13/12

U.S. Cl. 60—497

30 Claims



1. Apparatus for converting the energy of surface waves in a liquid comprising a buoyant mass rotatable around an axis of rotation, said buoyant mass comprising at least two similar helical volumes having a common axis coincident with said axis of rotation, said helical volumes being fixed for joint rotation about said axis, the position of one of said helical volumes being rotationally displaced about said axis with respect to the position of the other said helical volume.

4,412,418

#### HYDRODYNAMIC LUBRICATION SYSTEM FOR PISTON DEVICES PARTICULARLY STIRLING ENGINES

William T. Beale, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

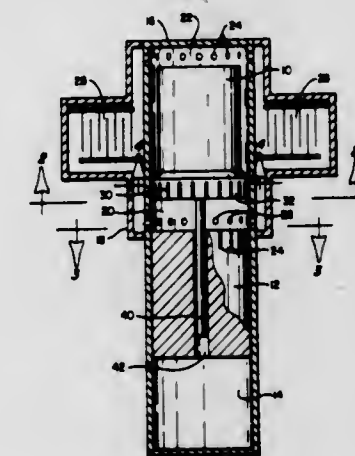
Continuation-in-part of Ser. No. 97,409, Nov. 26, 1979, Pat. No. 4,330,993. This application May 18, 1981, Ser. No. 265,030

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—520

21 Claims



1. An improved Stirling engine of the type having a dis-



placer piston and a power piston which reciprocate in cooperating cylinders confining a working fluid, said improvement being for hydrodynamically lubricating said pistons and comprising:

- (a) means for spinning a first one of said pistons about its axis; and
- (b) means for drivingly linking said first piston to said second piston to apply a torque to and spin said second piston.

4,412,419

## FLUID SUPPLY SYSTEMS

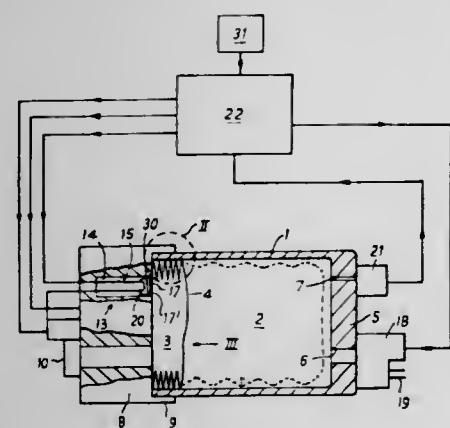
Alan V. Thomas, and Geoffrey E. Bone, both of Crowthorne, England, assignors to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 71,961, Sep. 4, 1979, Pat. No. 4,308,221. This application Sep. 25, 1981, Ser. No. 305,669. Claims priority, application United Kingdom, Sep. 18, 1978, 37221/78

Int. Cl.<sup>3</sup> F01B 29/00

U.S. Cl. 60—634

29 Claims



1. A fluid supply system comprising a chamber having a portion for containing a working fluid, a portion for containing a gas for pressurizing the working fluid, a movable partition separating the fluid portion from the gas portion of the chamber, an inlet for the gas and an outlet for the working fluid, a member operable to close the inlet and carrying solid propellant charge means, and ignition control means for the solid propellant charge means, characterized in that the solid propellant charge means comprise a plurality of individual charges, and in that the ignition control means is operable to ignite each charge as and when required to produce a pressurized gas which enters the gas portion of the chamber and moves the partition in the chamber to pressurize the working fluid and expel the same through the outlet, the ignition control means comprising pulse generating means, counter means responsive to the output of the pulse generating means, gate means responsive to the output of the counter means, and ignition circuits responsive to the respective outputs of the gate means, whereby the solid propellant charges are ignited serially.

4,412,420

## EXPLOSIVE ACTUATED PIN PULLER

Mihai D. Patrichi, Los Angeles, and Delbert L. Evanson, Mission Hills, both of Calif., assignors to Networks Electronics Corp., Chatsworth, Calif.

Filed Jul. 3, 1980, Ser. No. 165,732

Int. Cl.<sup>3</sup> F01B 29/08

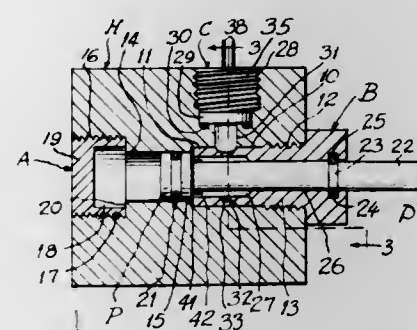
U.S. Cl. 60—635

7 Claims

1. An explosive actuated pin puller comprising:  
a piston including a head and a stem extending from the rear side thereof;  
a housing defining a cylinder in which said head is slidable in an actuator stroke;  
a slide bushing mounted in said housing, said bushing having a bore in which said stem is slidable in an actuating stroke, said

bushing defining a passage extending along said stem to the back side of said head;

said bushing having in its outer end an internal O-ring groove, said stem having an external O-ring groove aligned with said bushing groove prior to projection;  
a compressibly yieldable O-ring seated in said grooves and restraining said piston from projection prior to detonation of said cartridge; and



an ignition cartridge mounted in a side of said housing and communicating with said passage through a port extending radially of the axis of said piston;  
said cartridge including detonative means for providing a quantity of compressed gas transmittable through said radially extending port and said passage, and active against the rear side of said piston head to project the piston in an actuate stroke.

4,412,421

## ENGINE OPERATED BY A NON-POLLUTING RECYCLABLE FUEL

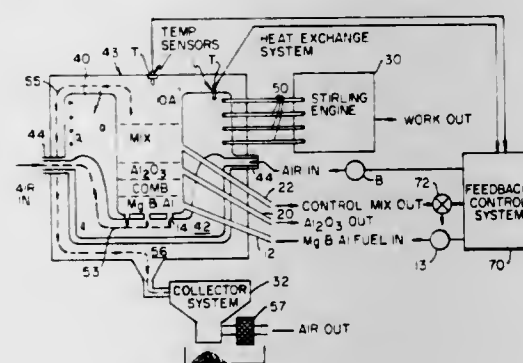
E. Quimby Smith, Jr., Graeagle, Calif., assignor to Q Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 937,553, Sep. 1, 1978, Pat. No. 4,248,048, which is a continuation-in-part of Ser. No. 671,280, Mar. 29, 1976, Pat. No. 4,129,003. This application Feb. 2, 1981, Ser. No. 230,798

Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—643

11 Claims



1. A system of operating an external combustion engine which is operated by a heated working fluid of the engine, comprising providing solid particles of fuel selected from the group consisting of magnesium, aluminum, magnesium plus aluminum, magnesium-aluminum alloy, magnesium hydride, aluminum hydride and magnesium aluminum hydride, providing a combustion chamber in association with the engine, feeding said solid particles of fuel into said combustion chamber, establishing a fluidized bed of solid particles in said combustion chamber by introducing a flow of air and burning said fuel particles in the presence of the air, and heating the working fluid of the engine by the heat of the burning fuel.

4,412,422

## APPARATUS AND METHOD FOR CONTROLLING A MULTI-TURBINE INSTALLATION

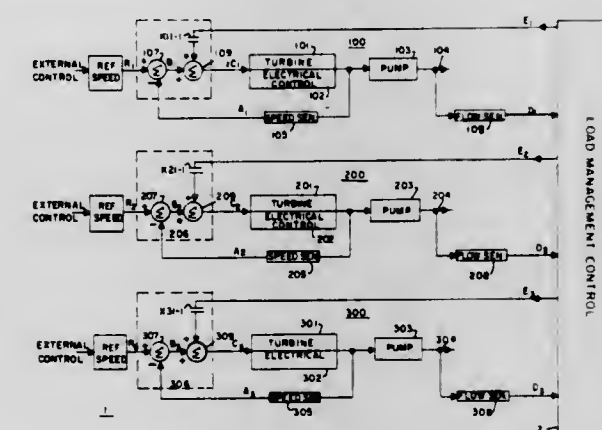
Anthony J. Rossi, Leominster, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Aug. 31, 1981, Ser. No. 298,272

Int. Cl.<sup>3</sup> F01B 21/00

U.S. Cl. 60—706

8 Claims



1. In a control apparatus for a multi-turbine installation, the combination comprising:

a plurality of turbine-driven systems, each producing an output proportional to a respective control signal;  
means for generating a respective first error signal for each of said turbine-driven systems and proportional to any deviation of a respective first system-output indicating parameter from a respective predetermined reference value therefor;  
means for generating a respective second error signal for each of said turbine-driven systems and proportional to any deviation of a respective second system-output indicating parameter from a respective complementary portion of the combined second system-output indicating parameters of said systems; and  
means for generating the respective control signal for each of said turbine-driven systems and proportional to the sum of respective ones of said first and second error signals, whereby a predetermined relationship of the individual outputs of said turbine-driven systems is maintained.

4,412,423

## SPLIT-CYCLE COOLER WITH IMPROVED PNEUMATICALLY-DRIVEN COOLING HEAD

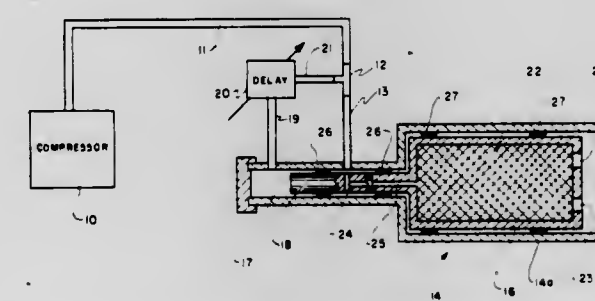
Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 16, 1982, Ser. No. 388,766

Int. Cl.<sup>3</sup> F25B 9/00

U.S. Cl. 62—6

2 Claims



1. A split-cycle cryogenic cooler system including a compressor which provides a pressure wave in said system, a displacer piston assembly, a cryogenic fluid conduit means between said compressor and said assembly, with a cryogenic fluid in said compressor, said assembly, and said conduit means, wherein the improvement comprise:  
said displacer piston assembly has an expansion space and

pneumatic space in communication with said fluid conduit means, wherein said fluid conduit means includes:

first and second fluid conduits respectively connected to said expansion space and to said pneumatic space to conduct respectively first and second portions of said pressure wave;  
a fluidic delay in said first fluid conduit whereby said first portion of said pressure wave leads in time or phase the second portion of said pressure wave.

4,412,424

## AIR CONDITIONING SYSTEM FOR PREVENTING FOGGING OF VEHICLE WINDOWS

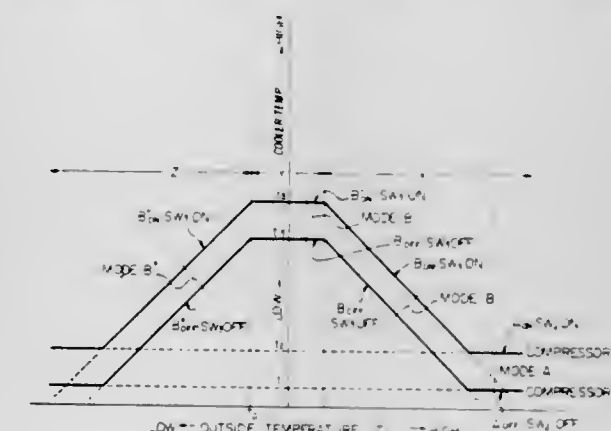
Katumi Iida; Shinji Sutoh, and Toshizo Hara, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 334,054

Claims priority, application Japan, Dec. 29, 1980, 55-188692 Int. Cl.<sup>3</sup> F25B 41/00; B60H 1/00

U.S. Cl. 62—209

5 Claims



1. An air conditioning system for controlling a temperature in an enclosure comprising:

a cooler for discharging cooled air into the enclosure;  
a cooler temperature sensor for sensing a temperature of the cooler;  
an outside temperature sensor for sensing a temperature outside the enclosure; and  
operation control means for turning the cooler on and off, said operation control means being constructed to compute a control on temperature and a control off temperature as predetermined functions of the cooler temperature and the outside temperature, turn the cooler on when the cooler temperature is higher than the control on temperature, and turn the cooler off when the cooler temperature is lower than the control off temperature;  
said operation control means being further constructed to change said control on and off temperatures to different levels such that the control on and off temperatures increase as the outside temperature decreases and when the outside temperature is above a first predetermined temperature, the control on and off temperatures are maintained constant at upper limits when the outside temperature is varied between the first predetermined temperature and a second predetermined temperature which is lower than the first predetermined temperature, and the control on and off temperatures decrease as the outside temperature further decreases and when the outside temperature is below the second predetermined temperature.



4,412,425

## AIR CONDITIONING AND VENTILATION SYSTEM

Akira Fukami, Okazaki; Hiroki Noguchi, Oobu, and Kunio Okamoto, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

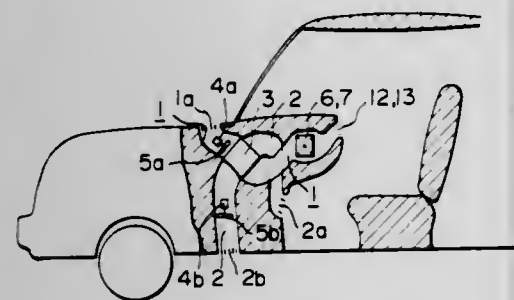
Filed Dec. 4, 1981, Ser. No. 327,615

Claims priority, application Japan, Dec. 9, 1980, 55-174055; Feb. 18, 1981, 56-22807

Int. Cl.<sup>3</sup> B60H 3/04

U.S. Cl. 62-244

7 Claims



1. An air conditioning and ventilation system for vehicles, comprising a first passage for introducing outdoor air into the passenger compartment of a vehicle, a second passage for guiding room air from said passenger compartment to the outside of said vehicle, said first and second passages intersecting at a point, a heat exchanger disposed at said intersection of said passages to exchange the actual heat and the latent heat of the air flowing through said first and second passages, first and second auxiliary passages respectively connecting sections of said first passage downstream of said heat exchanger to sections of said second passage upstream of said heat exchanger, first and second dampers for controlling the communications of said sections of said first passage through said first and second auxiliary passages with said sections of said second passage, respectively, the arrangement being such that, when said first and second dampers are moved to positions in which said first and second auxiliary passages are opened, the room air entering said second passage bypasses said heat exchanger and flows through said first auxiliary passage into said first passage downstream of said heat exchanger and thus into said passenger compartment and the outdoor air entering said first passage flows through said heat exchanger into said second auxiliary passage from which the outdoor air is again introduced into and flows through said heat exchanger into said second passage and is discharged therefrom into the atmosphere.

4,412,426

## WISER COOLING SYSTEM

Shao W. Yuan, 6701 Montour Dr., Falls Church, Va. 22043  
Continuation-in-part of Ser. No. 218,800, Dec. 22, 1980, Pat. No. 4,346,569, which is a continuation-in-part of Ser. No. 951,518, Oct. 13, 1978, Pat. No. 4,240,268. This application Jun. 23, 1981, Ser. No. 276,648

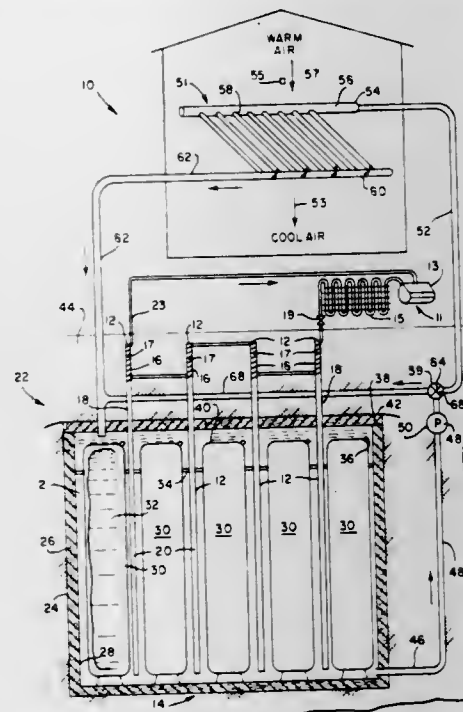
Int. Cl.<sup>3</sup> F25D 23/12

U.S. Cl. 62-260

5 Claims

1. A system for storing and utilizing cold, said system (10,25) including a chamber (22), insulating means surrounding said chamber, an anti-freeze liquid (2) contained within said chamber, water container means (30) immersed in said anti-freeze liquid and being at least partially filled with water (32), refrigeration means (11) for cooling said anti-freeze liquid below the freezing point of water so that water (32) within said container means (30) changes phase from liquid to solid; said refrigeration means (11) including a compressor (13), a condenser (15), cooling coils (17, 21), and a refrigerant contained therein for removing heat from said anti-freeze liquid; and heat exchange means (51) including first pipe means (46, 52) for passing said anti-freeze from said chamber (22) to said heat exchanger

means, second pipe means (62) for returning said anti-freeze liquid from said heat exchanger means to said chamber (22),



and pump means (50) for circulating said anti-freeze liquid in said pipe means and said heat exchanger means.

4,412,427

## NONCONTACT THERMAL INTERFACE

Stuart B. Horn, Fairfax; Lundy H. McMillion, Fredericksburg; Howard L. Dunmire, Stafford; Geoffrey S. Sawyer, Annandale, and William C. Gerkin, Vienna, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

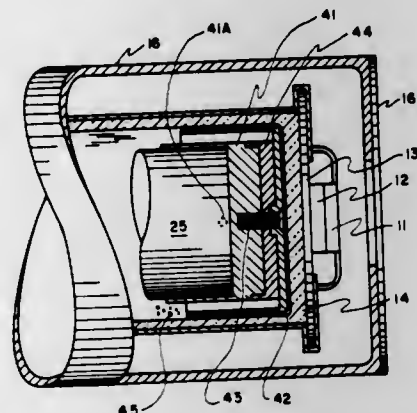
Division of Ser. No. 137,073, Apr. 3, 1980, Pat. No. 4,324,104.

This application Nov. 30, 1981, Ser. No. 326,094

Int. Cl.<sup>3</sup> F25D 19/00

U.S. Cl. 62-298

5 Claims



1. In a thermal viewer apparatus having a solid state detector mounted on the inside surface of the end wall of an exterior well in an evacuated dewar and a cooler with a cold finger extending into said well, the improvement comprising:

a heat exchange coupling member formed in the shape of a cup, with both the inner and outer configurations thereof similarly shaped, for coupling the cold finger of the cooler to the inside bottom and end-wall portion of the external well of the dewar, wherein the inner portion of the cup-shaped coupling member fits over the cold finger of the cooler and wherein the cold finger with the cup-shaped member attached fits into the exterior well of the dewar, wherein the outer surface of the cup-shaped member substantially conforms to the size and shape of the inner dimensions of the exterior well of the dewar.

4,412,428

## APPARATUS FOR PRODUCING AND DISPENSING AN AERATED FROZEN CONFECTION

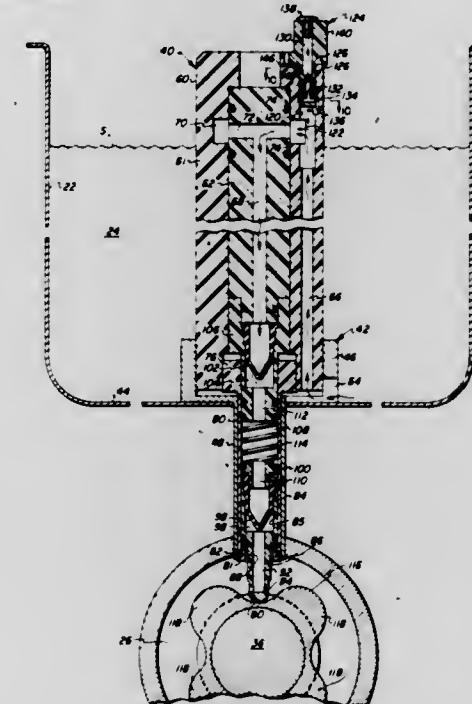
Frank Giannella, Hawthorne, and Enzo E. Pellicciari, Cliffside Park, both of N.J., assignors to Coldelite Corporation of America, Lodi, N.J.

Filed Jun. 3, 1981, Ser. No. 269,998

Int. Cl.<sup>3</sup> A23G 9/20

U.S. Cl. 62-308

17 Claims



1. In an apparatus for producing and dispensing an aerated frozen confection, the apparatus having a reservoir for holding a supply of liquid ingredients to be frozen, a pump assembly for pumping the liquid ingredients from the reservoir and air to be mixed with the liquid ingredients, a freezer compartment for receiving the mixture of liquid ingredients and air from the pump assembly and freezing the mixture, a dispenser communicating with the freezer compartment for selectively dispensing the aerated frozen confection by means of pressure within the freezer compartment, and an agitator within the freezer compartment for agitating the mixture within the freezer compartment, the improvement in which the pump assembly comprises:

a pump housing;  
a conduit within the pump housing, the conduit having an inlet end communicating with the reservoir, an outlet end communicating with the freezer compartment, and a pump cavity within the conduit intermediate the inlet end and the outlet end;  
a pumping member mounted for longitudinal reciprocation within the pump cavity through a suction stroke and a feed stroke, the pumping member having an internal passage extending generally longitudinally, essentially parallel to the direction of reciprocation of the pumping member and along a path of flow of mixture from the pump cavity to the outlet end of the conduit;  
a first check valve placed in the path of flow, and a second check valve placed within the conduit, between the inlet end of the conduit and the first check valve, such that mixture will be drawn through the second check valve into the pumping cavity during the suction stroke of the pumping member and then will pass through the first check valve to be discharged at the outlet end during the feed stroke of the pumping member;  
air metering means in the pump housing and communicating with the conduit between the inlet end of the conduit and the second check valve for passing a metered amount of air into the conduit in response to movement of the pumping member during the suction stroke; and  
pressure regulating means in the pump housing for limiting

the pressure within the freezing compartment to a predetermined maximum pressure.

4,412,429

## ICE CUBE MAKING

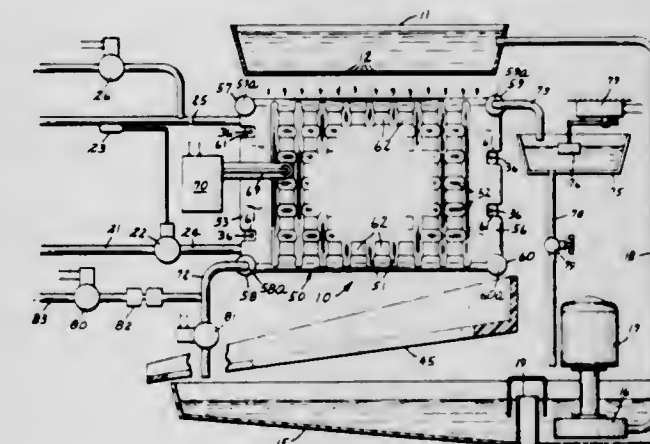
Vance L. Kohl, New Hope, Minn., assignor to McQuay Inc., Minneapolis, Minn.

Filed Nov. 27, 1981, Ser. No. 325,200

Int. Cl.<sup>3</sup> F25C 1/04

U.S. Cl. 62-347

12 Claims



1. Ice making apparatus, comprising:  
an evaporator member having an outer surface and having an inner passageway for conducting refrigerant fluid;  
a jacket member at least partially enclosing said evaporator member, said jacket having internal passageways and having external sites cooled by said evaporator member for forming ice cubes or particles and including a plurality of intersecting ridge portions whose inner surfaces form portions of said internal passageways, and whose outer surfaces form the side walls for the sites for forming said ice cubes;  
means for supplying cooling refrigerant to said evaporator member and for applying water to the outside of said jacket across said sites in a freezing mode of operation; and  
means for introducing water into said internal passageways of said jacket during an ice harvest mode of operation to uniformly warm the ice cubes or particles formed on said jacket at said sites to free them from said jacket.

4,412,430

## INFLATABLE-STRUCTURE APPARATUS FOR COOLING A HEAT EXCHANGE FLUID

Claude Leroy, Marseilles, France, assignor to Sorelec, Loiret, France

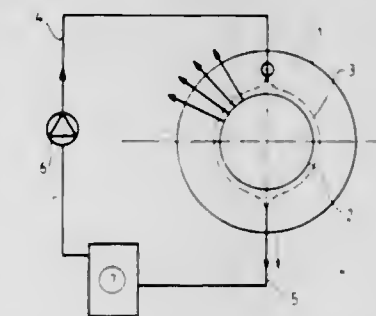
Filed Jun. 2, 1982, Ser. No. 384,370

Claims priority, application France, Aug. 24, 1981, 81 16185

Int. Cl.<sup>3</sup> F25B 23/00

U.S. Cl. 62-467 R

4 Claims



1. An apparatus for cooling a heat exchange fluid, comprising a first inflatable, flexible, cylindrical casing of plastic material which is permeable to infra-red rays, said casing being



maintained in its cylindrical form by an increased internal pressure, a wall means disposed within said casing, said wall means being reflective in the direction of said casing and over which flows the heat exchange fluid to be cooled, a supply duct for supplying the heat exchange fluid to the interior of said casing and a discharge duct for removing the heat exchange fluid from the interior of said casing.

4,412,431

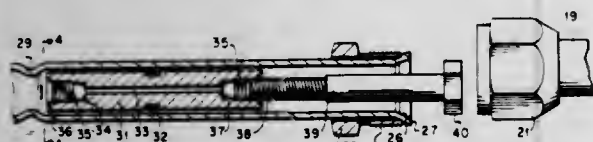
# **AUTOMOTIVE AIR CONDITIONER EXPANSION TUBE UNIT**

Henry D. Waldrep, 906 S. Third St., Celina, Tex. 75009  
Filed Sep. 29, 1981, Ser. No. 306,816

Int. Cl.<sup>3</sup> F25B 41/06

U.S. Cl. 62—511

3 Claims



1. An end to end reversible expansion tube unit used in air conditioning systems comprising: a body having an axially extended circular bore therethrough communicating at each end with an enlarged diameter internally threaded bore chamber; and a tool for insertion and removal of said expansion tube unit including: a bolt unit having a shank with a threaded section threadable into corresponding threads of the enlarged diameter internally threaded bores, said shank extended to turning means thereof for manually thread turn engaging and unthread turn disengaging said tool from said threaded bores.

4,412,432

# **REFRIGERATION SYSTEM AND A FLUID FLOW CONTROL DEVICE THEREFOR**

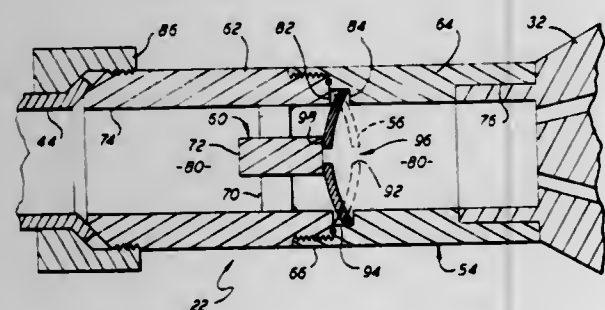
Thomas E. Brendel, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,829

Int. Cl.<sup>3</sup> F25B 39/02

U.S. Cl. 62—504

6 Claims



1. A refrigeration system comprising: a compressor, a condenser, expansion means, and an evaporator including first and second evaporator circuits; means to vary the capacity of the refrigeration system; and refrigerant flow means connecting the compressor, the condenser, the expansion device, and the evaporator together to form a closed loop, vapor compression refrigeration circuit and including first evaporator inlet line means for conducting refrigerant to the first evaporator circuit, and including a refrigerant flow control device for controlling vapor flow through the first evaporator inlet line means, and second evaporator inlet line means for conducting refrigerant to the second evaporator circuit; wherein the refrigerant flow control device comprises a tubular body defining a body inlet, a body outlet, a fluid

flow passage axially extending therebetween, and first and second axially spaced apart shoulders, a Belleville spring positioned within the fluid flow passage, and including an inside edge defining a spring port for conducting fluid flow through the Belleville spring, and an outside edge annularly extending in a close fit with the surfaces of the body and axially located and held between the first and second shoulders, and stop means defining a stop surface disposed within the body and completely overlying the spring port, the Belleville spring having a first position, where the inside edge of the Belleville spring engages the stop surface to close the spring port and prevent fluid flow therethrough, and a second position, where the inside edge of the Belleville spring is spaced from the stop surface to allow fluid flow through the spring port, and the Belleville spring being actuated from the first position to the second position by a predetermined fluid pressure force acting thereon.

4,412,433

# **PANTYHOSE WITH INTEGRALLY KNIT CROTCH AREA**

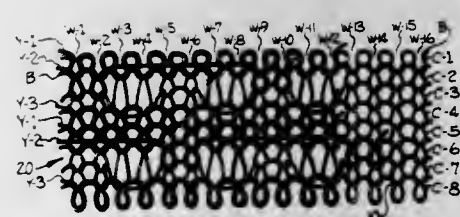
Sam C. Safrut, Pfafftown; Edward L. Cassidy, and Melvin C. Euliss, both of Burlington, all of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Sep. 8, 1981, Ser. No. 300,035

Int. Cl.<sup>3</sup> A41B 9/04

U.S. Cl. 66—177

4 Claims



1. A panty hose including a panty portion, and integrally knit leg and foot portions, said panty portion being knit of a hydrophobic body yarn in every course, said body yarn being stretchable and providing stretchability and smooth conforming fit characteristics to said panty portion, said panty portion including an integrally knit crotch area characterized by ventilating and moisture-absorbing characteristics, said crotch area comprising a plurality of course portions, said course portions of said crotch area including a repeating four-course pattern comprising a first course portion of jersey stitches of said body yarn in every wale and with an additional yarn knit in plated relationship with said body yarn in every wale, a second course portion of jersey stitches of said body yarn in every wale and with an additional hydrophobic yarn knit in plated relationship with said body yarn in adjacent pairs of spaced-apart wales and floating inside of multiple wales between said selected spaced-apart wales, a third course portion of pairs of adjacent jersey stitches and alternating with two-wale tuck loops knit only of said body yarn, and a fourth course portion of jersey stitches of said body yarn in every wale and with a hydrophilic yarn knit

in plated relationship and on the inside of said body yarn, said repeating course portions with alternating jersey stitches and two-wale tuck loops of said body yarn providing openings in said crotch area to provide ventilation thereto, said second and third course portions including wales of jersey stitches knit of said body yarn only and positioned between pairs of said two-wale tuck loops at said multiple wales to provide plural wales of said body yarn only between the openings provided by said two-wale tuck loops, and said repeating course portions with said hydrophilic yarn on the inside providing moisture-absorbing characteristics to said crotch area.

4,412,434

# **APPARATUS FOR THE DYEING AND FIXING OF KNITTED ARTICLES OF CLOTHING**

Willi Witte, Gevelsberg, and Wulf Böing, Hagen, both of Fed. Rep. of Germany, assignors to Dr. Böing GmbH & Co. Anlagen und Maschinen KG, Hagen, Fed. Rep. of Germany

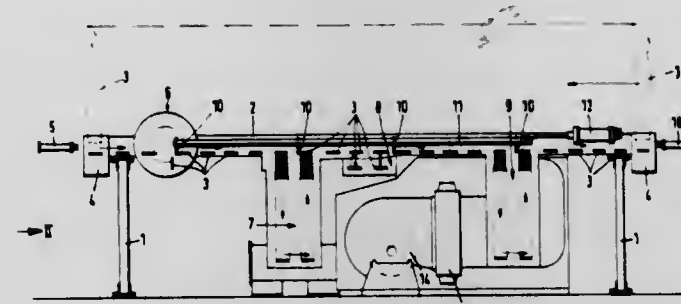
Division of Ser. No. 191,473, Sep. 26, 1980, Pat. No. 4,365,373.  
This application Jul. 28, 1982, Ser. No. 402,707

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940267

Int. Cl.<sup>3</sup> D06B 3/30

U.S. Cl. 68—3 R

9 Claims



1. In an apparatus for continuous dyeing and fixing of articles of clothing having fibers and comprising knitted socks, stockings, panty hose or similar knitted articles of clothing of highly elastic material, having individual treatment stations for at least dyeing, fixing, and drying and having a plurality of flat forms onto which the articles of clothing to be treated are pulled and which are movable by means of a transportation device through the individual treatment stations between a pulling-on station and a pulling-off station, the improvement wherein

the flat forms are plate-shaped and are arranged on the transportation device relative to the horizontal by at most an angle of 25 degrees,

the flat forms are elongated defining a lengthwise direction of the articles of clothing,

said transportation device includes means for continuously passing said flat forms fixed, in a non-rotatable orientation with a flat side of the forms lying substantially parallel to the ground with respect to a longitudinal axis as well as a transverse axis of the flat side, through the individual treatment stations with the articles of clothing thereon and with the fibers of the articles of clothing extending in the lengthwise direction of the articles of clothing, with each of said forms being separated from each other and parallel to each other.

4,412,435

# **CONTINUOUS LAUNDERING APPARATUS**

Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201  
Continuation-in-part of Ser. No. 141,952, Apr. 21, 1980, Pat. No. 4,361,018. This application May 5, 1982, Ser. No. 374,932

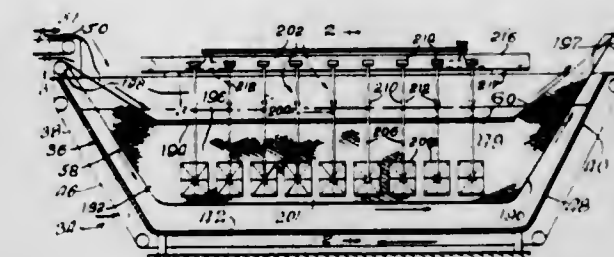
Int. Cl.<sup>3</sup> D06F 15/00, 31/00

U.S. Cl. 68—22 R

17 Claims

1. Laundering apparatus comprising, a tank for holding laundering water and having an inlet end and an outlet end, conveyor means for positively conveying goods continu-

ously from the inlet end through the tank through an operating range and through laundering water therein to the outlet end,



the conveyor means including an endless belt of open-work material, and being of a single piece and surrounding and enclosing the goods, and agitating means operative for engaging the conveyor means and thereby agitating the goods in the conveyor means.

4,412,436

# **TIME LOCK WITH ANTI-SHOCK FEATURES**

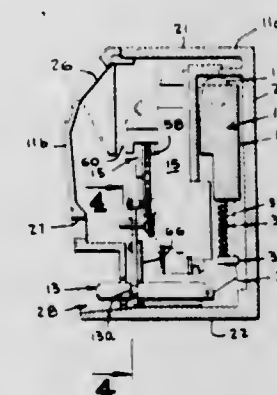
Charles G. Bechtiger, La Chaux-de-Fonds, Switzerland, assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Jun. 16, 1981, Ser. No. 274,273

Int. Cl.<sup>3</sup> E05B 43/00

U.S. Cl. 70—272

29 Claims



1. A time lock for bank vault doors and the like having the door bolting mechanism including a snubber bar, comprising a lock case, a plurality of timer units of the settable dial type mounted in said case, a blocking member in said case movable between blocking and release positions relative to said snubber bar, an elongated plunger movable longitudinally rearwardly and forwardly of the case connected to means for holding the blocking member in blocking position and releasing it therefrom, each of the timer units having a rotatable time-lapse indicating dial and clockwork mechanism intercoupled therewith including manual setting means for rotating the dial to the desired time-lapse indication and a trip member associated with the dial for effecting release of the blocking member when the dial reaches zero time position, an abutment bar forwardly spanning the timer units having abutments to be engaged by the respective trip members when the associated timer dial reaches zero time position for moving the abutment bar through a release stroke, a latch lever pivotally supported for movement in a plane transversely intersecting the plunger and coupled to the abutment bar, the plunger having a latching recess defining a restraining shoulder located at the transverse plane when the plunger is positioned to dispose the blocking member in blocking position, the latch lever having a latching toe interfitted in said latching recess to abut said restraining shoulder and releasably retain said plunger in said last-mentioned position, a second lever coupled to said abutment bar defining a parallelogram type linkage therewith in coaction with said latch lever, and means at the pivotal coupling between said abutment bar and said latch lever for fine adjustment of the angular position of the latch lever relative to the



abutment bar to thereby adjust the time of release stroke movement of the abutment bar by the timer trip members.

4,412,437

**REKEYABLE LOCK METHOD AND APPARATUS**

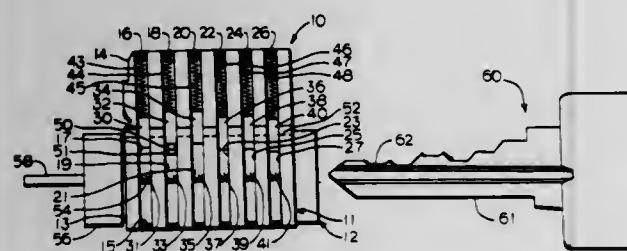
Jerry R. Smith, Littleton, Colo., assignor to Innovative Research Corporation, Littleton, Colo.

Continuation-in-part of Ser. No. 327,787, Dec. 7, 1981. This application Sep. 23, 1982, Ser. No. 422,027

Int. Cl.<sup>3</sup> E05B 25/00, 35/08

U.S. Cl. 70—338

3 Claims



1. In rekeyable lock apparatus, including a lock cylinder housing with a cylindrical bore extending longitudinally there-through an elongated top pin chamber in said housing perpendicular to and extending radially outward from said cylindrical bore, a cylindrical core positioned rotatably in said bore, said core having a longitudinal keyway therein for receiving a key bit and a bottom pin chamber extending radially inward from the peripheral surface thereof into said keyway, said bottom pin chamber being adapted to axially align with said top pin chamber, a top tumbler pin slideably positioned in said top pin chamber and a bottom tumbler pin slideably positioned in said bottom pin chamber, said core being rotatable when the interface between said top and bottom pins is aligned with the shear plane between the core and the cylinder housing and not being rotatable where a pin is positioned through said shear plane, the improvement comprising:

a disc-shaped spacer member positioned in said bottom pin chamber between said top pin and said bottom pin for providing an additional interface between said top and bottom pins adapted for alignment with the shear plane between said core and said cylinder housing, one interface being on the top of said spacer means and a second interface being on the bottom of said spacer means, said spacer member having a diameter less than said top tumbler pin, and

removal means for removing said spacer means from said pin chamber and ejecting it out of said lock apparatus, said removal means including an elongated key bit adapted for insertion into said keyway and having a bitting thereon adapted to position said spacer member in said top pin chamber with said second interface between said spacer member and said bottom pin aligned with the shear plane between said core and said cylinder housing such that said core can be rotated within said cylinder housing, said key bit also having a cut therein opposite said bitting and of a depth corresponding to the thickness of said spacer member and a length less than said top tumbler pin and greater than said spacer member, said cut being adapted to receive said spacer member therein when aligned with said top pin chamber and to carry said spacer member out of said core when said key bit is withdrawn from the core with the spacer member in said cut.

4,412,438

**PIPE BENDING MACHINE**

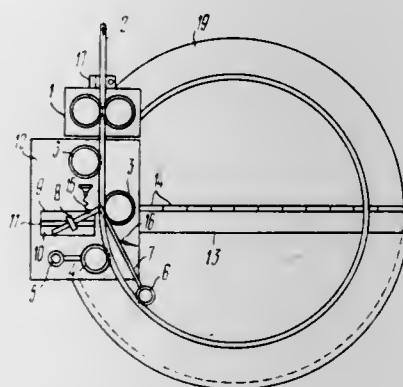
Vladimir M. Tjushevsky; Vladimir E. Ermakov; Fikrat S. O. Seidaliyev; Gennady A. Sjusin; Igor I. Dobkin, and Jury V. Krasovsky, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchnoissledovatel'skiy, Proektny I Konstruktorskiy Institut Splavov I Obrabotki Tsvetnykh Metallov "Giprotsetmetobrabotka", U.S.S.R.

Filed Jul. 24, 1981, Ser. No. 286,686

Int. Cl.<sup>3</sup> B21D 7/08, 7/14; B21F 3/02

U.S. Cl. 72—10

7 Claims



1. A pipe bending machine, comprising pipe feeding means for feeding incoming pipe; a pipe bending device including a bending roller for bending said pipe drive means coupled to said pipe bending device for displacing said bending roller in a plane of pipe bending; a two-arm lever having a pivot axis intersecting the center line of said incoming pipe; a follow-up roller mounted on one arm of said lever and contacting said pipe after said pipe has been subjected to the action of said bending roller; said drive means having a movable contact mounted on the other arm of said lever for displacing said bending roller, said movable contact being movable about the axis of said other arm and two stationary contacts for displacing said bending roller, said stationary contacts alternately making electrical contact with said movable contact; and a coil carrier for accommodating a coil of bent pipe.

4,412,439

**COOPERATIVE ROLLING MILL APPARATUS AND PROCESS**

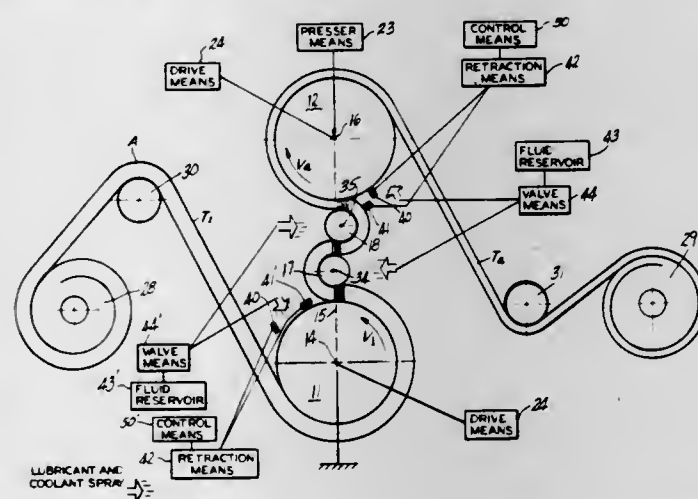
William L. Brenneman, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 4, 1981, Ser. No. 260,491

Int. Cl.<sup>3</sup> B21B 45/02

U.S. Cl. 72—41

42 Claims



1. A rolling mill apparatus for reducing metal or metal alloy strip thickness comprising:

a plurality of roll bites, each of said roll bites causing a reduction in said strip thickness as said strip passes through said mill;

each said roll bite being formed by adjacent rolls between which said strip passes, each said roll having a coefficient of friction;

means for providing a forward tension to said strip as said strip passes through said mill; and

means for creating a first differential friction force between at least said adjacent rolls of a most downstream one of said roll bites, but not between said adjacent rolls of at least one other of said roll bites, for causing a reduction in said forward tension, said differential friction force means including means for changing the coefficient of friction between a first of said adjacent rolls of said most downstream roll bite and said strip.

4,412,440

**PROCESS FOR MAKING CONTAINER**

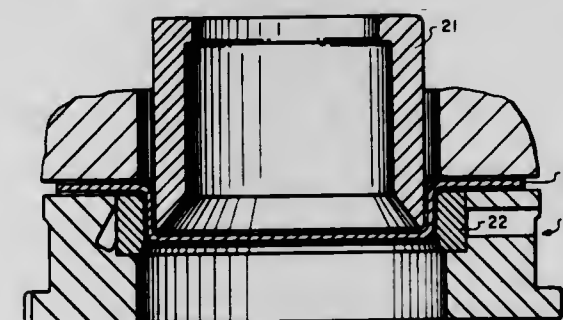
Thomas L. Phalin, Cary, and James J. Ulmes, Palatine, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 13, 1981, Ser. No. 234,451

Int. Cl.<sup>3</sup> B21B 45/00

U.S. Cl. 72—46

10 Claims



1. A method of making a hollow cylindrical container open at one end and closed at the other from a thin sheet of metal including the following steps:

blanking a thin circular preform from metal precoated on the major surfaces thereof, said circle having a diameter about twice the ultimate diameter of the container and then immediately in a first operation concurrently drawing and ironing said preform into a shallow cup by drawing said preform to conform to the draw punch so that a diameter approximately twice its height is achieved and immediately thereafter ironing said drawn portion between said draw punch and an ironing portion of the draw die, and then concurrently redrawing and reironing said shallow cup in a second operation where said concurrent redrawing and ironing is performed apart from out of axial alignment with said first operation to reduce the diameter and side wall thickness of said cup during said second concurrent operation such that its height and diameter are about equal after redrawing said shallow cup to conform to the redraw punch and immediately ironing said redrawn portion between said redraw punch and an ironing portion of the redraw die and finally concurrently redrawing and reironing same in a third operation performed apart from out of axial alignment with said other operations to produce said ultimate diameter of said container being approximately 75% of its height and its side wall thickness slightly thinner than the thickness of said thin circular preform by again redrawing said redrawn cup to conform to said redraw punch and immediately ironing said redrawn portion between said redraw punch and an ironing portion of the redraw die.

4,412,441

**METHOD FOR FORMING AN ENLARGED FLANGED HOLE IN A CURVED SURFACE**

Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Mantta, Finland

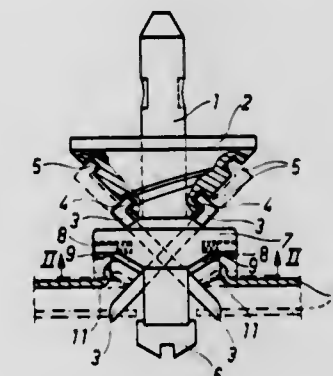
Division of Ser. No. 226,869, Jan. 21, 1981. This application Sep. 17, 1982, Ser. No. 419,126

Claims priority, application Finland, Jan. 30, 1980, 80Q278

Int. Cl.<sup>3</sup> B21D 21/00, 53/00; B23B 35/00

U.S. Cl. 72—71

4 Claims



1. A method of forming a flanged hole in a curved surface comprising the steps of:

forming an initial generally circular hole in said surface; enlarging said initial hole into a larger oval hole with a conical cutting surface to form an edge surface of said hole of frusto conical shape; turning the edge region around said enlarged oval hole outwardly to form a surrounding flange with a free outer edge lying substantially in a common plane; and shaping said outwardly turned free edge.

4,412,442

**METHOD FOR BENDING A METAL PIPE**

Shumpei Kawanami, Hiratsuka; Yasuo Watanabe, Kitakyushu, and Susumu Hanyo, Yokusuka, all of Japan, assignors to Dai-ichi High Frequency Co., Ltd., Tokyo, Japan

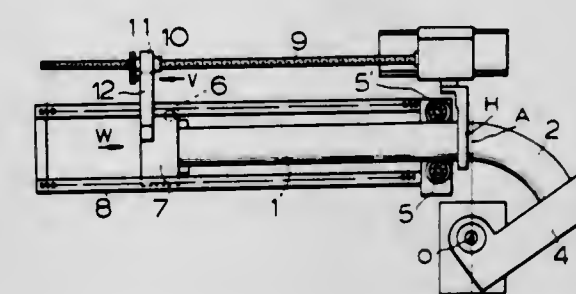
Filed Sep. 17, 1980, Ser. No. 188,052

Claims priority, application Japan, Sep. 21, 1979, 54/120833

Int. Cl.<sup>3</sup> B21D 7/16

U.S. Cl. 72—128

8 Claims



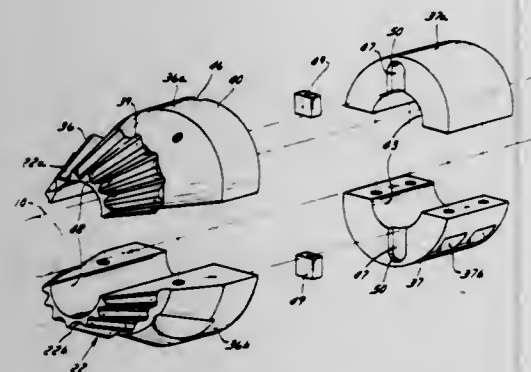
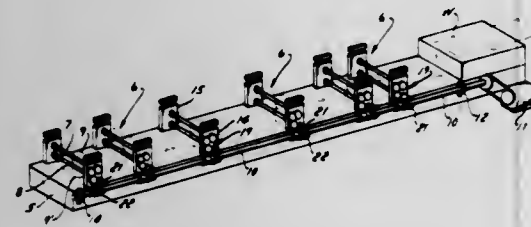
1. In the method of hot bending a metal pipe in which the pipe is passed through a heating zone in a heating/cooling unit while a bending movement is applied and thereafter through a cooling zone in the heating/cooling unit adjacent to the heating zone, and in which the radius of curvature of the bend is larger than the desired radius in the initial and terminal (relatively smaller angle) portions of the bend and greater than the desired radius in the relatively larger angle intermediate portion of the bend, the improvement in which the temperature of the pipe while in the heating zone is maintained a constant.



**4,412,443**  
**ROLLER FORMING MACHINE WITH LENGTHWISE ADJUSTABLE HEADS**  
 Herbert M. Stoehr, New Berlin, Wis., assignor to Artos Engineering Company, New Berlin, Wis.  
 Filed Jul. 30, 1981, Ser. No. 288,468  
 Int. Cl.<sup>3</sup> B21D 5/08

U.S. Cl. 72-181

9 Claims



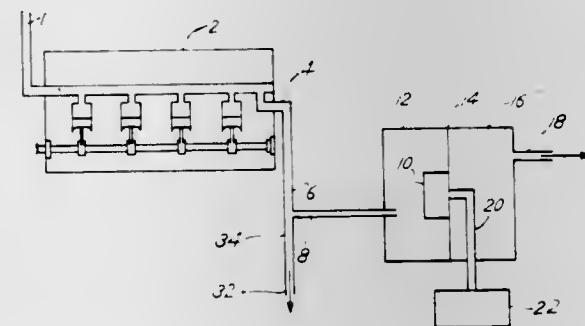
1. A roller forming machine comprising an elongated frame and a plurality of forming heads spaced at intervals along said frame, each forming head comprising a stand that supports a pair of laterally extending roller shafts on which forming rollers are carried and transmission means for rotatably driving said roller shafts, said machine being characterized by:
  - A. cooperating detachable securement means on said frame and on the stand of at least one forming head for securing said stand to the frame at any selected one of a plurality of locations along the length of the frame;
  - B. a rotatable line shaft extending lengthwise along one side of the frame past said locations;
  - C. a driven bevel gear on said one forming head for rotatably driving its roller shafts through its transmission means, said bevel gear having its axis parallel to the axis of the roller shafts; and
  - D. a bevel pinion securable to said line shaft at any selected one of said locations, for transmitting rotation of said line shaft to said driven bevel gear, said bevel pinion comprising
    - (1) a pinion member having a concentric bore there-through of a diameter to closely slidably fit said line shaft and having a concentric frustoconical front face on which there are teeth for meshing engagement with teeth on said driven bevel gear, said pinion member comprising
      - (a) two pinion member parts separable from one another on a plane containing the axis of the pinion member and
      - (b) a screw extending across said plane and normally connecting said parts;
    - (2) a collar member comprising
      - (a) complementary collar parts engageable with the line shaft at opposite sides thereof and which together embrace less than the whole circumference of the line shaft, and
      - (b) screw means normally connecting said collar parts for clamping securement of the collar member to the line shaft rearwardly adjacent to the pinion member; and
    - (3) abutment means on a front of said collar member and on a rear of said pinion member
      - (a) defining opposed eccentric surfaces on the respec-

- tive members that face substantially circumferentially and
- (b) providing a connection between said members whereby they are confined substantially only against rotation relative to one another to thus accommodate a range of positions of the collar parts circumferentially relative to one another and radially relative to the axis of the pinion member.

**4,412,444**  
**METHOD FOR DETECTION OF HYDROCARBONACEOUS FUEL IN A FUEL INJECTION ENGINE**  
 William E. Ketel, II, Royal Oak, Mich., assignor to Sun Electric Corporation, Crystal Lake, Ill.  
 Filed Dec. 29, 1981, Ser. No. 335,348  
 Int. Cl.<sup>3</sup> G01N 27/12

U.S. Cl. 73-23

10 Claims

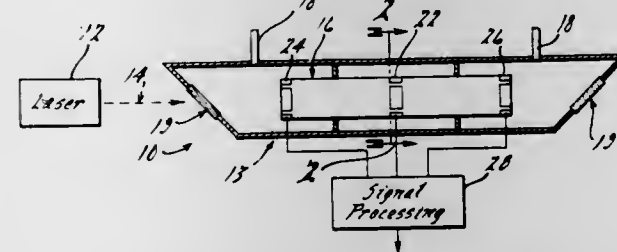


1. A method for detecting the presence of hydrocarbonaceous fuel in the fuel injection flow through the fuel line to the cylinders of a fuel injection engine comprising the steps of:
  - (a) diverting a portion of the flow through the fuel line into a sample tube;
  - (b) reducing the rate of flow of the diverted portion to a rate of 3-6 feet/second;
  - (c) passing the reduced flow over a sensor of the type comprising a fuel vapor sensitive semiconductor having a signal output proportional to the quantity of fuel vapor in the flow;
  - (d) providing means for monitoring the sensor signal including a programmable controller; and
  - (e) monitoring quantitatively the sensor signal change to detect the presence and amount of said hydrocarbonaceous fuel.

**4,412,445**  
**RESONANT SPECTROPHONE SYSTEM NOISE ELIMINATION**  
 Robert L. Spellicy, Las Cruces, N. Mex., assignor to OptiMetrics, Inc., Ann Arbor, Mich.  
 Filed Aug. 27, 1981, Ser. No. 296,774  
 Int. Cl.<sup>3</sup> G01N 29/02

U.S. Cl. 73-24

8 Claims



1. In a spectrophone system wherein radiant energy from a radiant energy source is directed into a chamber containing a fluent sample with respect to which certain absorption data is

to be obtained in the presence of background noise by detecting pressure variations within the chamber and generating a signal containing both absorption data and noise components, the radiant energy having a component corresponding to an absorption characteristic of the fluent sample which is being investigated and said chamber having a geometry allowing a resonant wave to be established in the chamber, the improvement for significantly attenuating the noise component relative to the absorption data component which comprises means of creating a resonant wave in the chamber by excitation from the radiant energy source, means for monitoring pressure variations at a location within the chamber corresponding to a peak of the resonant wave to develop a corresponding peak signal containing both true absorption data and noise components, means for monitoring pressure variations at a location within the chamber corresponding to a nodal point of the resonant wave and generating a corresponding nodal signal representing background noise, and means for modifying the peak signal by the nodal signal to remove the noise component from the peak signal and yield a true absorption data signal.

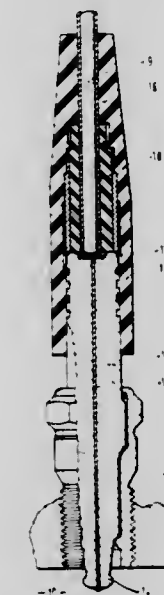
**4,412,446**  
**OPTICAL COMBUSTION SENSOR, PARTICULARLY FOR USE WITH INTERNAL COMBUSTION ENGINES**  
 Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen; Klaus Müller, Tamm, and Helmut Reum, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,408  
 Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110996

Int. Cl.<sup>3</sup> G01L 23/22

U.S. Cl. 73-35

19 Claims

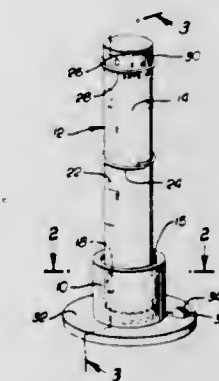


1. Optical sensor arrangement to obtain an optical signal representative of combustion light in a combustion chamber (10), particularly a combustion chamber of an internal combustion engine, having
  - an tubular housing (12) formed with means for securing the housing in a wall (11) defining said combustion chamber at one side thereof;
  - light-responsive means (9, 9a) retained in the housing; and
  - light pick-up means (13, 20, 22, 26) retained in the housing having a sensing end portion in communication with the combustion chamber at one end and being optically coupled to the light responsive means at the other end, and wherein, in accordance with the invention, the sensing end portion of the light pick-up means is mushroom-shaped and formed with an enlarged thickened head (14) at the terminal end.

**4,412,447**  
**DISPOSABLE IRRIGATION GAUGE**  
 Walter C. McMahan, Rte. 6, Box 2115, Escondido, Calif. 92025  
 Filed Jul. 23, 1981, Ser. No. 286,177  
 Int. Cl.<sup>3</sup> G01F 23/02

U.S. Cl. 73-73

3 Claims

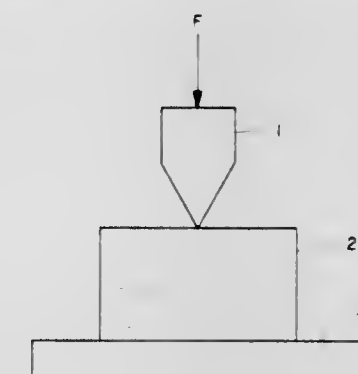


1. An irrigation gauge for use in an agricultural field comprising:
  - (a) a cup having a rim;
  - (b) a hollow translucent tube for containing water, said tube being closed at one end and open at the other end;
  - (c) means determining a fitted relationship between the cup and the open end of the tube;
  - (d) said tube and cup determining a space between them at the region of the cup rim for containing water exposed to the environment;
  - (e) said hollow tube having a lateral opening providing access for passage of air into the tube and allowing water in the tube to drop, thereby replenishing said space upon evaporation and/or transpiration of water therefrom;
  - (f) means cooperable with the change in the level of water in the tube to indicate the amount of moisture loss in the field.

**4,412,448**  
**BLOCKING TEST FOR CHLORINATED POLYETHYLENE**  
 James H. Flynn, Denham Springs, and Donald E. McLemore, Baton Rouge, both of La., assignors to The Dow Chemical Company, Midland, Mich.  
 Filed Jan. 18, 1982, Ser. No. 339,914  
 Int. Cl.<sup>3</sup> G01N 3/48

U.S. Cl. 73-81

10 Claims



1. A method for measuring the tendency to and degree which a synthetic resinous particulate solid will agglomerate, comprising the steps of:
  - (a) forming a cake of a synthetic resinous particulate solid by compressing the particulate solid between substantially parallel surfaces; and
  - (b) measuring the force required to break the cake by an elongated triangular-shaped wedge which is forced into the cake at a constant rate of speed.



4,412,449

# **APPARATUS FOR MEASURING THE FLOW VELOCITIES OF GASES AND LIQUIDS**

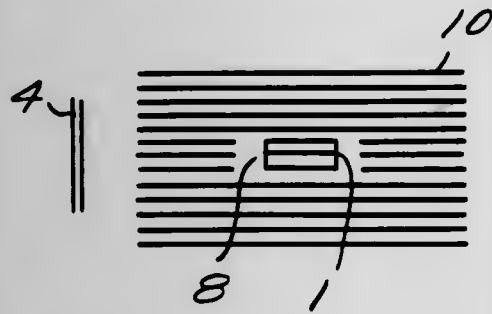
Kurt Eiermann, Pfungstadt, and Wolfgang Schafer, Frankfurt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Mar. 10, 1981, Ser. No. 242,405

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009382

Int. Cl.<sup>3</sup> G01F 1/68

U.S. Cl. 73—204

4 Claims



1. In an apparatus for measuring the flow velocity of gases and liquids, especially the intake air of combustion engines, having at least one temperature dependent resistance and where at least one of the resistances is heated, wherein the heated resistance is disposed downstream from a protective shield means, the improvement comprising, positioned between the protective shield means and the heated resistance, means for producing a laminar flow, and means for producing laminar flow positioned behind the heated resistance, said means for producing a laminar flow before and after the heated resistance comprising connecting honeycombs having a hollow space therein and wherein said resistance is positioned in said hollow space.

4,412,450

# **ARRANGEMENT FOR DETERMINING THE LEVEL IN A CONTAINER**

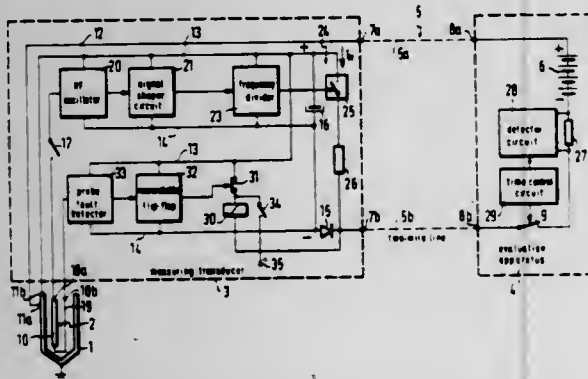
Hans-Jürgen Franz, Schopfheim, and Volker Dreyer, Lorrach-Haagen, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany  
Filed Jul. 22, 1981, Ser. No. 285,763

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029279; Jul. 13, 1981, 3127637

Int. Cl.<sup>3</sup> G01F 23/26

U.S. Cl. 73—304 C

13 Claims



1. An arrangement for determining the level of material in a container, comprising:  
a capacitive probe disposed in said container and defining a probe capacitance between said probe and said container dependent upon the material level in the container;  
transducer means including a capacitance responsive circuit, disposed in the vicinity of said container, for producing a

signal dependent on the capacitance existing at the input of said capacitance responsive circuit;  
evaluation means disposed remote from said container;  
a two-wire line connecting said evaluation means with said transducer means, said line comprising a means for transmitting a current supply DC voltage for operating said transducer means from said evaluation means to said transducer means, and for transmitting said signal from said transducer means to said evaluation means;  
switching means, disposed in said transducer means, for switching, upon actuation, the input of said capacitance responsive circuit from said probe capacitance to said test capacitance;  
time-controlled means, provided in said evaluation means, for changing the current supply DC voltage on said two-wire line periodically in a pulse-like manner;  
a control circuit, disposed in said transducer means, responsive to said pulse-like changes of the current supply DC voltage, for actuation of said switching means;  
whereby in each period of said pulse-like changes in current supply DC voltage said signal produced by said transducer means is a measured value signal which corresponds to said probe capacitance during a measuring time interval when said switching means is not actuated, and a test signal which corresponds to said test capacitance upon actuation of said switching means during a test time interval.

4,412,451

# **METHOD AND APPARATUS FOR THE DETERMINATION OF THE AVERAGE PARTICLE SIZE IN A SLURRY**

Seppo J. Uusitalo; Georg C. von Althaus, both of Espoo; Tor S. Andersson, Luoma; Väinö A. Paukku, Espoo; Lasse S. Kähärä, Espoo, and Erkki S. Kiuru, Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

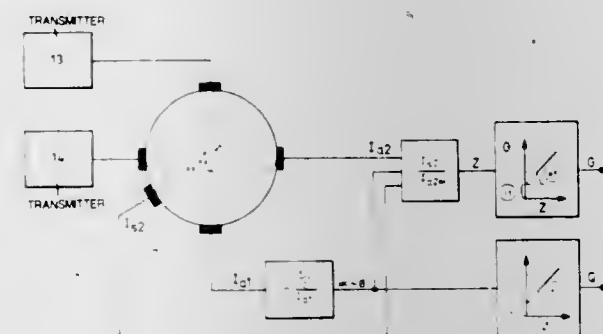
Continuation of Ser. No. 151,778, May 21, 1980, abandoned.

This application Jul. 16, 1982, Ser. No. 399,002

Int. Cl.<sup>3</sup> G01N 29/00, 15/00, 7/00

U.S. Cl. 73—432 PS

7 Claims



1. A method for the determination of the average particle size in a slurry, which comprises  
transmitting at least one beam of ultrasonic rays, having a certain frequency, into the slurry,  
detecting ultrasonic radiation which has passed through the slurry,  
creating a first signal corresponding to the intensity  $I_a$  of the detected radiation,  
detecting in a selected direction ultrasonic radiation scattered in the slurry,  
creating a second signal corresponding to the intensity  $I_s$  of the detected scattered radiation,  
determining the scattering attenuation factor on the basis of the first and second signals thus obtained,  
determining the total attenuation factor with the aid of the intensity  $I_o$  of passed-through ultrasonic radiation obtained in pure water, and  
determining a measure descriptive of the average particle size with the aid of the scattering attenuation factor, whereby the ratio of the scattering attenuation factor and

the total attenuation factor is formed in order to eliminate the influence of slurry density.

4,412,452

# **HARMONIC OSCILLATOR FOR MEASURING DYNAMIC ELASTIC CONSTANTS OF ROCK MATERIALS**

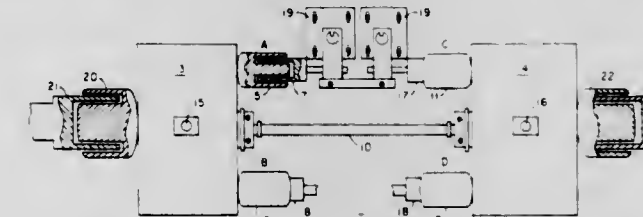
Maurice A. Biot, Brussels, Belgium; William L. Medlin, and Lucien Masse, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,716

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—579

8 Claims



1. A harmonic oscillator for measuring dynamic elastic constants of rock materials at seismic frequency, comprising:  
(a) a pair of masses,  
(b) means for independently and vertically suspending each of said masses from a support position such that said masses can swing or vibrate in pendulum-like fashion,  
(c) a permanent magnet mounted on one of said masses,  
(d) a coil positioned in the air gap of said magnet,  
(e) means for connecting a sinusoidal seismic frequency to said coil for applying a driving force through said magnet to said mass,  
(f) means for horizontally supporting a rock material between said masses, the weight of said masses being large relative to the weight of said rock material to permit said rock material to vibrate at seismic frequencies, thereby forming a simple harmonic oscillator with said rock material acting as the spring element connecting said masses as they vibrate in pendulum-like fashion, and  
(g) means for measuring the relative displacements of said masses said relative displacements being a measure of the dynamic elastic constant of said rock material.

4,412,453

# **METHOD FOR DETECTING BRAZING DEFECTS IN PLATE-FIN TYPE HEAT EXCHANGERS**

Nobuyuki Nagai, Kobe; Eiji Takahashi, Akashi; Yoji Matsumoto, Akashi, and Hideaki Ohtsu, Akashi, all of Japan, assignors to Kabushiki Kaisha Kobe Sekio Sho, Kobe, Japan

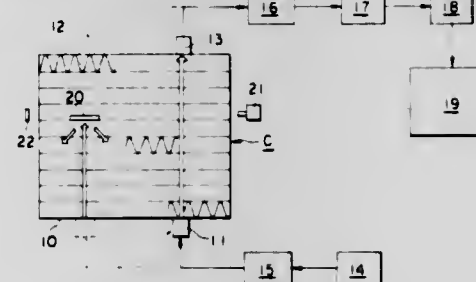
Filed Oct. 15, 1981, Ser. No. 311,599

Claims priority, application Japan, Oct. 16, 1980, 55-145528

Int. Cl.<sup>3</sup> G01N 29/04

U.S. Cl. 73—601

8 Claims



1. A method for detecting brazing defects in a plate-fin type heat exchanger utilizing a pulser and a sensor and including a brazed core structure having a number of wavy fin members positioned alternately with a number of parallel spaced plate members, with comprises:  
directing a pulsed sound across said fin and said plate mem-

bers in a frequency range of from several tens KHz to several hundreds KHz from said pulser located on one outermost plate member to said sensor located oppositely on the other outermost plate member; and  
two-dimensionally detecting the position and size of a brazing defect on a plane of a plate on the basis of the level of the sound received by said sensor.

4,412,454

# **PRESSURE SENSING UNIT FOR A PRESSURE SENSOR**

Ichiro Yamashita, Yawata, and Yukihiko Ise, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

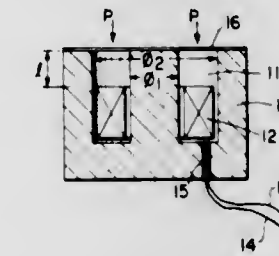
Filed Jul. 17, 1981, Ser. No. 284,568

Claims priority, application Japan, Jul. 17, 1980, 55-98378

Int. Cl.<sup>3</sup> G01L 9/16

U.S. Cl. 73—728

10 Claims



1. A pressure sensor unit comprising:  
a casing having at least in part thereof of a magnetic body and said casing forming an interior space isolated from the space around said sensor unit, said magnetic body having at least in a part thereof an amorphous magnetic alloy thin plate in a magnetic circuit with said magnetic body and which plate has a magnetostriction property and which is exposed to said inner space and the space around said sensor unit on opposite sides thereof; and  
a coil in magnetic relationship with said magnetic circuit for exciting said magnetic circuit.

4,412,455

# **METHOD AND APPARATUS FOR MEASURING THE TORQUE OR POWER OF A BOAT MOTOR IN PLACE**

Kjell I. Borgersen, Hjälsjö, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Oct. 6, 1981, Ser. No. 309,115

Claims priority, application Sweden, Oct. 6, 1980, 8006973

Int. Cl.<sup>3</sup> G01L 3/16

U.S. Cl. 73—862.12

5 Claims



1. A process for measuring at least the torque of a motor installation in a boat having a propeller carried by a propeller shaft, comprising removing the propeller from the propeller shaft, mounting on the propeller shaft a brake disc and a sup-



porting element which is rotatable relative to the brake disc about the axis of the brake disc and that carries braking means and has force actuated means for applying the braking means to the brake disc, mounting a force measuring instrument between, on the one hand, a member fixed relative to the boat, and, on the other hand, said supporting element with said force measuring instrument spaced from the axis of rotation of the supporting element, test driving the motor with the boat lying in the water and the brake disc immersed in and in contact with the water, thereby using the water as a cooling agent for cooling the brake disc, and observing measurements of said force measuring instrument.

4,412,456

## LOAD SENSING PROBE

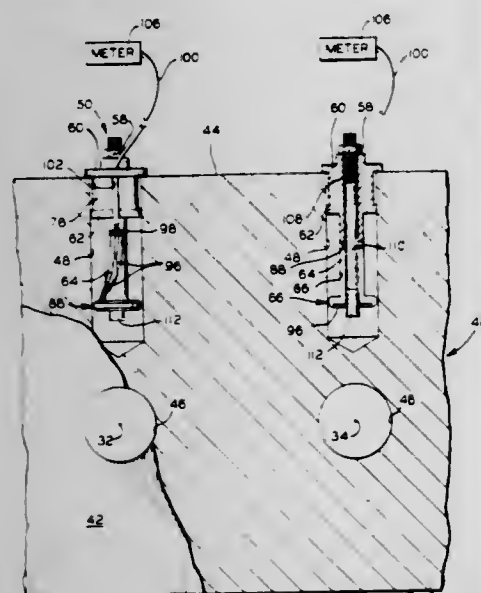
Donald F. Wilhelm, Maumee, and Robert L. Moser, Toledo, both of Ohio, assignors to Helm Instrument Company, Inc., Toledo, Ohio

Filed Feb. 16, 1982, Ser. No. 348,992

Int. Cl.<sup>3</sup> G01L 1/22, 5/00

U.S. Cl. 73—862.65

17 Claims



1. In a machine tool having a back-up member arranged to support a tool at a working station during a working period by sustaining work forces and subject to strain from the work forces applied to the tool, the back-up member having a cavity formed therein, a load sensing probe confined in said cavity for measuring the work forces applied to the back-up member comprising:

a generally cylindrical member adapted for insertion in the cavity including an elongate stem and sensing portions disposed at one end of said stem, said member having a slot formed between said sensing portions and a part of said stem to define a pair of sensing arms;

strain gauge means attached to each of said sensing portions of said sensing arms for measuring the amount of force applied thereto; and

preloading means for flexibly moving said sensing arms outwardly such that said sensing portions engage an inside wall of the cavity at a predetermined initial level of compression, whereby when work forces applied to the back-up member cause relative closing movement of the cavity, said closing movement can be measured as a change from the amount of preload compression applied to said sensing portions.

16. A method of measuring the work forces applied to a back-up member in a machine tool, the back-up member being arranged to support a tool at a working station during a working period by sustaining work forces, comprising the steps of:

a. forming an elongate cavity in the back-up member, the cavity extending laterally from a point adjacent the working station to a face of the back-up member;

b. inserting a generally cylindrical member into the cavity, said cylindrical member including an elongate stem, sens-

ing portions disposed at one end of the stem, a slot formed between the sensing portions and a part of the stem defining a pair of sensing arms, and strain gauge means attached to each of the sensing portions of the sensing arms for measuring the amount of force applied thereto;

c. flexibly moving the sensing arms outwardly such that the sensing portions engage an inside wall of the cavity at a predetermined initial level of compression; and

d. measuring the work forces applied to the back-up member as relative closing movement of the cavity caused by work forces applied to the back-up member, which movement can be measured as a change in the amount of the predetermined initial level of compression applied to the sensing portions.

4,412,457

## IN-LINE ENGINE CRANKING MOTOR DRIVE HAVING REDUCTION GEAR SET

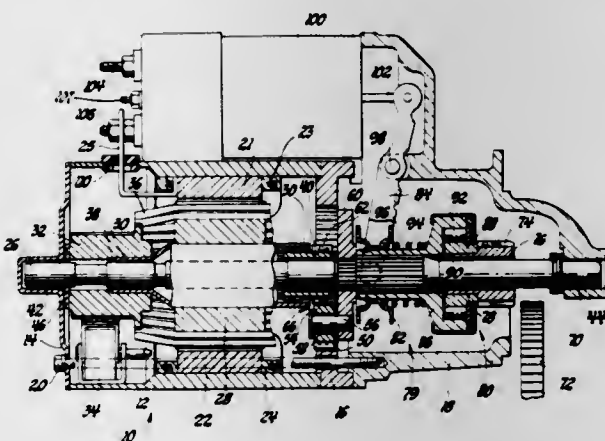
Jack A. Colvin, and John M. McClellan, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1981, Ser. No. 258,685

Int. Cl.<sup>3</sup> F02N 15/06

U.S. Cl. 74—7 A

3 Claims



1. An electric cranking motor drive for an internal combustion engine comprising: a housing, a central shaft rotatably supported at both ends by said housing, an electric motor having an armature carried on a hollow armature shaft, said armature shaft being disposed about a portion of said central shaft and rotatably supported thereon, means defining a gear set connected between said armature shaft and said central shaft for establishing a power path through which said armature shaft may drive said central shaft, and a pinion gear shiftably coupled to said central shaft so as to be driven thereby, said pinion gear being adapted to be shifted into engagement with the flywheel gear of said engine for cranking.

4,412,458

## VEHICLE PARKING BRAKE ACTUATING MECHANISM

John G. Derringer, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1981, Ser. No. 234,026

Int. Cl.<sup>3</sup> F16C 1/10; G05G 1/10

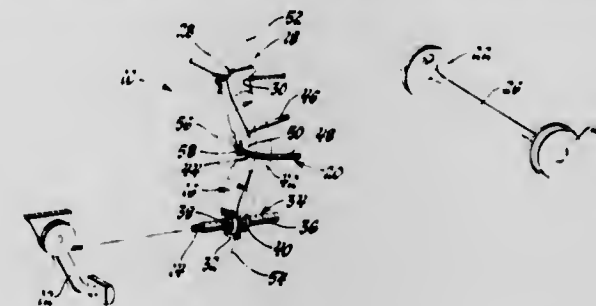
U.S. Cl. 74—512

2 Claims

1. In a vehicle parking brake actuating mechanism for mechanically actuating a set of laterally oppositely disposed vehicle wheel brakes by a parking brake lever moved by the vehicle operator to apply tension on an apply cable which in turn moves an equalizer bar to equally tension a brake actuating cable having segments leading to each wheel brake of said brake set, the improvement comprising:

said equalizer bar having one end pivotally attached to a fixed vehicle portion for substantially planar pivotal movement about said one end, and having another end provided with an adjustable effective length link attached thereto and secured to the apply cable, said equalizer bar

being pivoted about said one end in a brake applying direction when said apply cable is moved by tension force from said parking brake lever, and having a center section receiving a loop of a brake actuating cable thereabout, said brake actuating cable segments extending from said loop to said wheel brakes and being tensioned and moved when said apply cable is tensioned and moved, the portion of said center section engaging said brake actuating cable



loop being angularly displaced toward said wheel brakes relative to said equalizer bar ends such that lines from said bar ends to said cable-engaging center portion intersect at said cable-engaging center portion at an angle other than 180° in the plane of pivotal movement of said equalizer bar, and means retaining said brake actuating cable loop in position on said cable-engaging center section portion of said equalizer bar.

4,412,459

## CONTROLLED DIFFERENTIAL

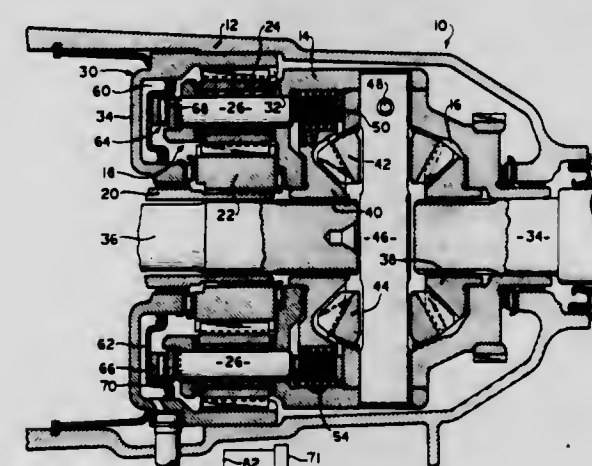
Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 15, 1981, Ser. No. 254,355

Int. Cl.<sup>3</sup> F16H 1/44

U.S. Cl. 74—711

30 Claims



1. A differential assembly comprising a casing, a carrier, a planetary gear set supported by said carrier, an input for driving said planetary gear set to effect rotation of said carrier, pinion means supported by said carrier for rotation therewith, a pair of side gears meshing with said pinion means, a first output driven by one of said side gears, a second output driven by the other of said side gears, and clutch means having an actuated condition for retarding the relative rotation of one of said side gears and said carrier and an unactuated condition, said planetary gear set including means movable to move said clutch means toward said actuated condition to retard relative rotation of one of said side gears and said carrier upon the occurrence of a predetermined condition.

4,412,460

## TWO-SPEED COUPLINGS

Andre J. Barthelemy, St. Remy-les-Chevreuse, France, assignor to S.A. Automobiles Citroen and Societe dite Automobiles Peugeot, both of Paris, France

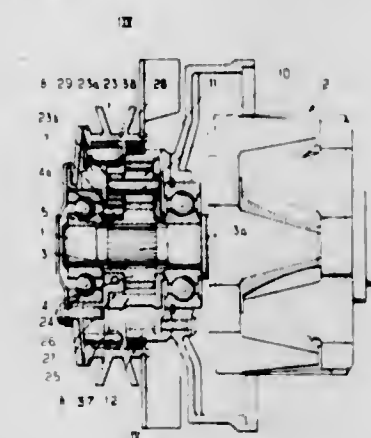
Filed Sep. 15, 1980, Ser. No. 187,162

Claims priority, application France, Jun. 23, 1980, 80 14282

Int. Cl.<sup>3</sup> F16H 3/74, 5/46; F16D 43/16

U.S. Cl. 74—752 E

5 Claims



1. A driving device for motor vehicle accessories comprising:

a driving member;  
a driven member;  
a crown gear fixed against rotation;  
a sun gear fixed on the driven member;  
a planet gear holder capable of rotation relative to the driving member and the sun gear;  
at least two planet gears rotatably mounted on said holder and meshing with both said crown gear and said sun gear;  
a unidirectional coupling between the driving and driven members; and

a centrifugal clutch between said driving member and said holder, said centrifugal clutch comprising a plurality of spaced-apart pivoting members pivotally secured to said driving member and having free ends engageable with a contact surface of said holder, and respective springs acting upon said pivoting members and urging same into engagement with said contact surface, whereby at rotational speeds of the driving member below a predetermined rotational speed determined by the centrifugal clutch, said pivoting members engage said holder to transmit drive from the driving member to the driven member through said planet gears and said sun gear to rotate the driven member by higher speed than the driving member and at a rotational speed of the driving member above said predetermined rotational speed, said pivoting members are disengaged from said holder to permit direct transmission of drive from said driving member to the driven member through the unidirectional couplings.

4,412,461

## ROTARY TRANSMISSION ELECTRONIC CONTROL SYSTEM PROVIDING AUTOMATIC CHANGES OF SPEED RATIO

Harry M. Windsor, Harbury, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Feb. 24, 1981, Ser. No. 237,691

Claims priority, application United Kingdom, Feb. 28, 1980, 8006846

Int. Cl.<sup>3</sup> B60K 41/28

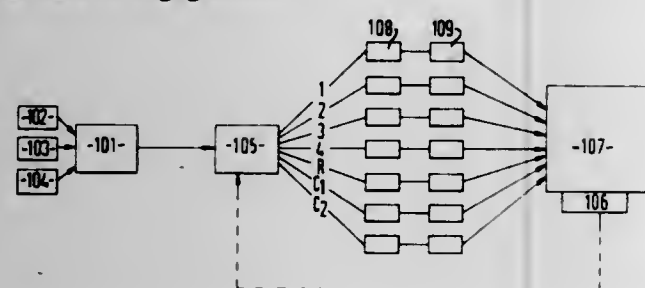
U.S. Cl. 74—866

4 Claims

1. A control system for a rotary power transmission having:  
a common input shaft;  
a common output shaft;  
a set of gear trains between said input and output shafts and providing a series of increasing speed ratios;  
a first clutch engageable to establish driving connection be-



tween said input and output shafts, through at least one of said gear trains;  
 a second clutch engagable to establish driving connection between said input and output shafts, through one other of said gear trains;  
 the gear trains of alternate speed ratios in the set being arranged for drive to be established respectively through said first clutch and said second clutch;  
 said control system comprising:  
 sensor means for each of said clutches and each of said speed ratios for sensing and producing a feedback signal indicating a state of engagement;



Command means responsive to transmission operating parameter signals to produce a command signal indicating a required speed ratio;  
 control means arranged to combine said feedback signals and said command signal to produce control signals to control clutch and speed ratio engagement and disengagement through an array of electronic logic elements in a given sequence of discrete steps, each discrete step being initiated by a change in state of a feedback signal; and  
 operating means arranged to engage and disengage each clutch and each speed ratio in response to said control signals.

#### 4,412,462 DRILL ADJUSTING TOOL

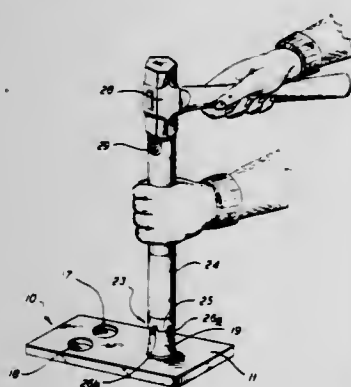
Hubert P. McGavin, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,296

Int. Cl.<sup>3</sup> B21K 5/06

U.S. Cl. 76-5 R

5 Claims

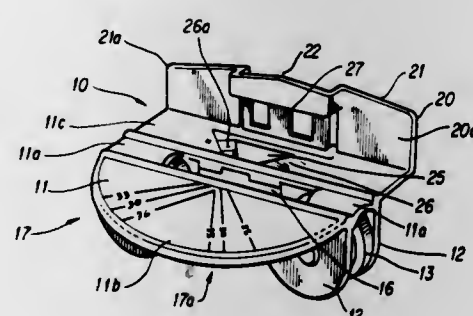


1. A core drill adjusting tool, comprising:  
 a base plate of a predetermined size and thickness and formed of a preselected material,  
 test means on said base plate to provide an indication of the correct diameter of said core drill, and  
 cone means supported by said base plate at its larger end to project therefrom,  
 so that a core drill, that has become too small in diameter through use, will have its cutting surfaces spread an amount indicated by said test means as correct by applying said cutting surfaces forcefully over said cone means.

4,412,463  
CHAIN SAW SHARPENING GUIDE  
 Cornelis J. M. Beerens, 40-42 Berkshire Rd., NSunshine, Vic., Australia  
 PCT No. PCT/AU80/00093, § 371 Date Jul. 14, 1981, § 102(e)  
 Date Jul. 14, 1981, PCT Pub. No. WO81/01379, PCT Pub. Date May 28, 1981  
 PCT Filed Nov. 20, 1980, Ser. No. 285,080  
 Claims priority, application Australia, Nov. 23, 1979, PE1462  
 Int. Cl.<sup>3</sup> B23D 63/10

U.S. Cl. 76-36

7 Claims



1. A saw sharpening guide comprising:  
 a support member adapted to be positioned on a saw blade in a straddling relation thereto with a portion thereof resting on the tips of the teeth of the saw blade;  
 a pair of rollers each having a continuous peripheral groove and mounted on the support member for rotation on their respective axes in a common plane;  
 said rollers being arranged so that, when the support member is in its straddling relation, the pair of rollers are located on opposite sides of the saw blade and a file seated in the continuous peripheral grooves of both of the pair of rollers can reciprocate in a line in said common plane and transverse to the saw blade while in rolling contact with the pair of rollers;  
 a pair of sight lines on the support member oriented at an incline at equal and opposite angles to said common plane and located to be viewed by an operator when the support member is in its straddling relation;  
 said support member being positionable and manually retainable on the saw blade in its straddling position with either of the pair of sight lines parallel to the saw blade;  
 said incline of the pair of sight lines being the complement of the cutting angle of the teeth of the saw blade to be sharpened;  
 said portion of the support member which rests on the tips of the teeth of the saw blade being spaced from the axes of the pair of rollers a distance selected to position the file seated in the continuous peripheral grooves at a predetermined height relative to the teeth of the saw blade to be sharpened;  
 wherein the support member has an edge located to be positioned adjacent to and substantially parallel to the length of a tooth to be sharpened when the guide is in use on the saw blade, and further wherein the support member has linear graduations along said edge.

4,412,464  
COMBINATION CAN OPENING TOOL  
 Jeffrey J. Cook, 6533 N. Seventh Ave., Apt. 3, Phoenix, Ariz. 85013

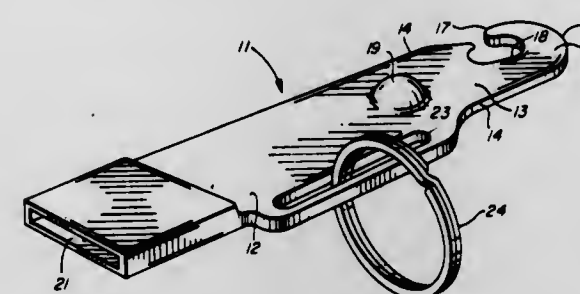
Filed Sep. 1, 1982, Ser. No. 413,970  
 Int. Cl.<sup>3</sup> B67B 7/44

U.S. Cl. 81-3.1 R

5 Claims

4. The combination of a key ring and a tool for opening scored closures for cans, said tool comprising an elongated body having means at one end thereof for pulling away closures and means at the other end thereof for opening displaceable closures which remain attached to the can and means providing an elongated slot in said body and running length-

wise thereof for receiving said key ring, the arrangement being such that said ring can be moved in said slot along the body of fluid to and from said closed fluid circuit whereby to vary the extent to which said piston is displaced when said pressure chamber is pressurized.



#### 4,412,466 TUBULAR KNIFE

Walter J. Jurkowski, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.  
 Division of Ser. No. 92,617, Nov. 8, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 295,195

Int. Cl.<sup>3</sup> B26D 1/38

U.S. Cl. 83-200

3 Claims

the tool away from the end of the body having the opening means selected for use.

#### 4,412,465 TOOL COMPENSATOR

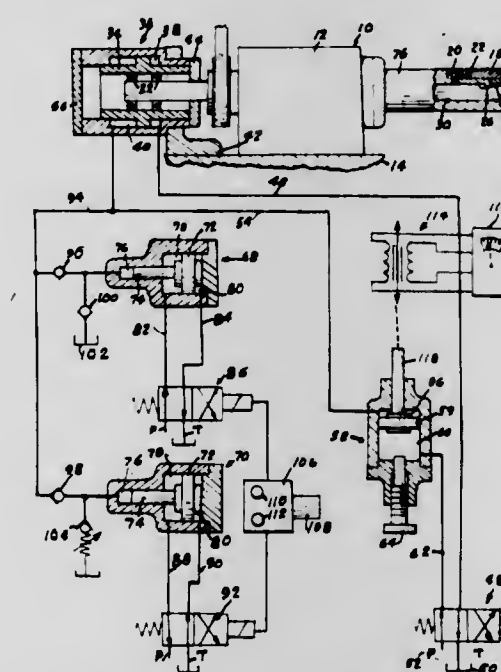
Lawrence B. Wright, Berkley, Mich., assignor to Lamb Technicon Corp., Warren, Mich.

Filed Dec. 7, 1981, Ser. No. 328,205

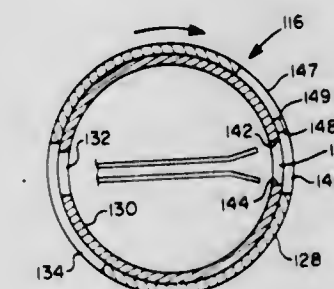
Int. Cl.<sup>3</sup> B23B 49/00, 47/18

U.S. Cl. 82-1.2

14 Claims



1. In a machine tool, a tool compensating device for reciprocating a cutting tool when the dimension of a machined workpiece deviates from a predetermined desired dimension comprising a tool positioning cylinder having a piston axially displaceable therein and dividing the cylinder into a control chamber and a pressure chamber which vary inversely in size in response to axial displacement of the piston, means operatively connecting the cutting tool and the piston such that the tool moves to increase and decrease its depth of cut in response to displacement of the piston in opposite directions, means for optionally connecting said pressure chamber to a source of pressurized hydraulic fluid for displacing the piston in a direction to decrease the size of the control chamber, a variable volume reservoir having a predetermined maximum volume, a conduit connecting the control chamber with said variable volume reservoir to form a closed fluid circuit so that the volume of hydraulic fluid in the control chamber, the conduit and the reservoir remains constant except when varied by the hereinafter mentioned metering means, the arrangement being such that when the pressure chamber is pressurized the piston is displaced to decrease the size of the control chamber and hydraulic fluid is displaced therefrom, through said conduit and into said reservoir until the reservoir increases in size to its maximum volume and metering means for optionally injecting or extracting predetermined volume increments of hydraulic



1. A tubular knife for cutting sheet material, comprising:  
 a stationary, inner cylindrical member having a forward slot extending substantially longitudinally thereof, said slot having a longitudinally extending upper cutting edge and a longitudinally extending lower cutting edge;  
 a rotatable, outer tube concentric and substantially contiguous with said inner member, said outer tube having a first forward slot and a second forward slot above said first forward slot, said first forward slot having an upper cutting edge inclined at a slight angle with respect to the lower cutting edge of the inner member, and said second forward slot having a lower cutting edge inclined at a slight angle with respect to the upper cutting edge of the inner member, each of said first and second forward slots being substantially co-extensive with said forward slot of said inner member; and  
 means for rotating the upper cutting edge of the first forward slot past the lower cutting edge of the forward slot of the inner cylindrical member to a first home position and for rotating the lower cutting edge of the second forward slot past the upper cutting edge of the forward slot of the inner cylindrical member to a second home position.

#### 4,412,467 CYLINDER-MOUNTED CUTTER

Ronald F. DeSanto, Palos Hills, Ill., assignor to Lehigh Steek Warlick, Broadview, Ill.

Filed Sep. 14, 1981, Ser. No. 301,947

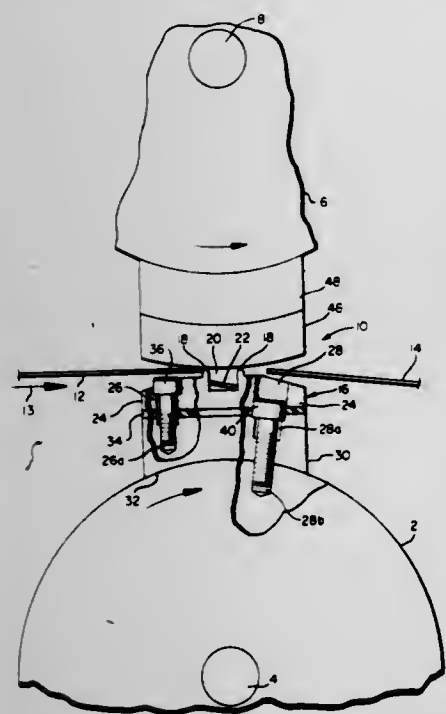
Int. Cl.<sup>3</sup> B26D 1/62

U.S. Cl. 83-346

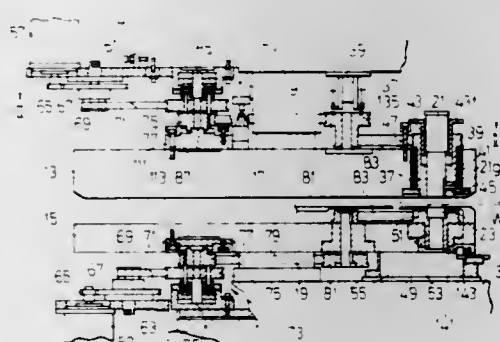
3 Claims

1. In a printing press, a cut-off mechanism for cutting a traveling web into a number of pieces subsequent to printing on the web, said mechanism comprising a die cylinder assembly and a cooperating anvil cylinder assembly, the two assemblies being rotatable about parallel axes in timed relation to the travel of the web therebetween, said anvil cylinder assembly having an anvil on its periphery, said die cylinder assembly comprising a die cylinder, a base member mounted on the periphery of said die cylinder, a first group of fasteners projecting through the base member and threaded into the die cylinder for securing the base member to the die cylinder, a cutting die carried by said base member radially outwardly thereof and having at least one radially outwardly presented cutting edge for engagement with said anvil to cut the web repeatedly, a resilient sheet of elastomeric material interposed between said die and said base and yielding within its elastic limits as said cutting edge engages said anvil to take up relative radial dis-



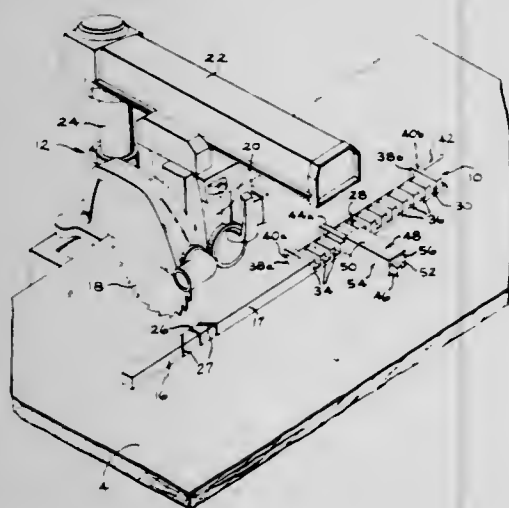


**4,412,469**  
**TURRET PUNCH PRESSES HAVING TOOL HOLDERS**  
**ROTATABLY MOUNTED IN THE TURRETS**  
 Tadashi Hirata, Yamato, and Katsuyoshi Sakamoto, Isehara,  
 both of Japan, assignors to Amada Company, Ltd., Japan  
 Filed Mar. 18, 1981, Ser. No. 244,900  
 Claims priority, application Japan, Mar. 18, 1980, 55/033330  
 Int. Cl.<sup>3</sup> B26F 1/14



1. A turret punch press having motor-driven rotatable upper and lower turrets for punching holes in sheet materials, comprising:

- a plurality of upper punching tools rotatably attached to said upper turret;
- a plurality of lower punching tools rotatably attached to said lower turret;
- a vertically movable ram attached to said punch press in such a manner that, upon activation, it drives at least one of said plurality of upper and at least one of said plurality of lower punching tools through said sheet material;
- means for synchronously rotating said upper and lower punching tools to desired positions; and
- said means for synchronously rotating said upper and lower punching tools including servomotors connected to drive said rotatable plurality of upper and lower punching tools, whereby holes of the same shape but with different orientations may be punched in said sheet material.



**4,412,470**  
**SYSTEM FOR COMMUNICATING DATA AMONG**  
**MICROCOMPUTERS IN AN ELECTRONIC MUSICAL**  
**INSTRUMENT**  
**Edward M. Jones, Cincinnati, Ohio, assignor to Baldwin Piano**  
**& Organ Company, Cincinnati, Ohio**  
**Filed Jun. 8, 1981, Ser. No. 271,133**  
**Int. Cl.<sup>3</sup> G10H 7/00**

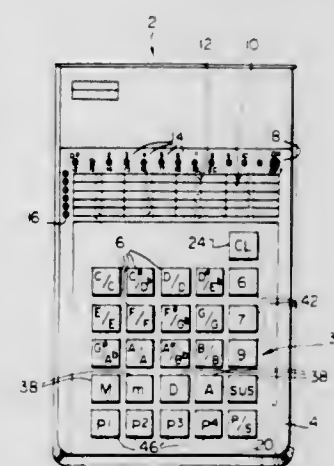
**U.S. Cl. 84—1.01** **14 Claims**  
**1.** In an electronic musical instrument having microprocessors for controlling the sounding of music, apparatus for communicating data among the microprocessors, said apparatus comprising:  
synchronizing signal means for generating a synchronizing signal having a pulse of a predetermined width;  
a plurality of microprocessors having external interrupt terminals for receiving said synchronizing signal and

the times of initiation of operation of said first and second automatic play features.

This diagram shows an exploded view of a mechanical assembly. The components are labeled with numbers: 6, 6', 6'', 14, 16, 18, 8, 7', 19, 20, 13, 15, 56, 72, 21, 27, 20, 69, and 55. The assembly includes a curved bracket (6, 6', 6''), a central block (8, 14, 16, 18), a long thin rod (15, 56, 72), a rectangular housing (21, 27, 20, 69), and a curved arm (55). The diagram illustrates how these parts fit together to form a complete unit.

**4,412,471**  
**SYNCHRONIZATION SYSTEM FOR AN ELECTRONIC**  
**MUSICAL INSTRUMENT HAVING PLURAL**  
**AUTOMATIC PLAY FEATURES**  
**Glenn R. Stier, Vernon Hills, and Moshe Mizrachi, Des Plaines,**  
**both of Ill., assignors to Norlin Industries, Inc., White Plains,**  
**N.Y.**

**S** **4,412,473**  
**CALCULATOR FOR GUITAR CHORDS**  
**Daniel C. Laflamme, Vancouver, Canada, assignor to D C L**  
**Microelectronics, Inc., Vancouver, Canada**  
**Filed Apr. 7, 1981, Ser. No. 251,950**  
**Int. Cl.<sup>3</sup> G09B 15/00**  
**U.S. Cl. 84—485 R** **8 Claims**



1. An electronic device in the nature of a hand held calculator, for illustrating on a display area the required string and fret positions of a fretted stringed instrument to be fingered to play the notes making up a particular chord, comprising:
  - (a) a series of manually operable basic chord information buttons, each associated with a corresponding chord information switch, one chord information switch for each chord for which finger position information is desired;
  - (b) a visual representation of the strings of the fretted instrument and of the frets over a particular range;
  - (c) electronically actuated fret and string finger position



indicator means associated with the fret and string representation, each of the string finger positions for each of the frets having electronically actuatable indicator means associated with it;

- (d) electronically actuated open string position indicator means associated with each string of the fret and string representation to indicate when a corresponding string is not fingered;
- (e) electronically actuated first fret reference indicator means to represent a fret reference point for a selected chord;
- (f) manually operable select means associated with select switch means;
- (g) ROM means programmed with chord table information relating chords to desired keys with related fret and string finger position information;
- (h) microprocessor means electronically associated with the chord information switches, open string position indicator means, first fret reference indicator means, fret and string finger position indicator means and select switch means, the microprocessor adapted to store information concerning the particular chord information switch or switches actuated until the select switch means is actuated, and then search the ROM for fret and finger position information corresponding to the chord information switch or switches actuated, and display that information on the appropriate fret and string finger position indicator means, open string position means and first fret reference indicator means;
- (i) manually operable switch means electronically associated with the microprocessor and fret and string finger position indicator means to clear information displayed on the fret and string representation as required; whereby the device provides an accurate visible indication on the fret and string representation, of the strings and fret positions to be fingered for a selected predetermined chord.

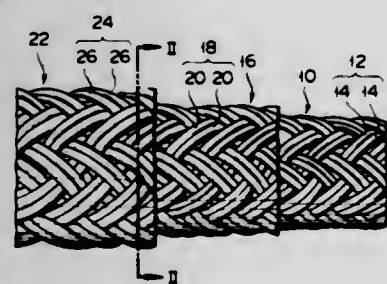
4,412,474

## FIBER CORDAGE

Hiromasa Hara, Toyokawa, Japan, assignor to Tokyo Rope Manufacturing Co., Ltd., Japan  
Filed Aug. 21, 1981, Ser. No. 295,068  
Claims priority, application Japan, Aug. 29, 1980, 55-122931[U]

Int. Cl.<sup>3</sup> D04C 1/12

U.S. Cl. 87—6



1. A fiber cord comprising:  
a core element which is formed by braiding a plurality of strands, each comprising at least one organic fiber of high elongation;  
an outer layer element which surrounds said core element and which is formed by braiding a plurality of strands, each comprising at least one organic fiber of low elongation; and  
a protective layer which surrounds said outer layer element and which is formed by braiding a plurality of strands, each comprising at least one organic fiber of high elongation.

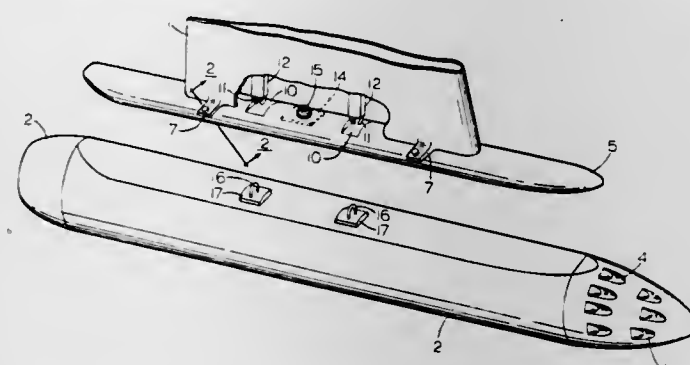
4,412,475  
AIRCRAFT ROCKET AND MISSILE LAUNCHER  
Thomas W. Hornby, Mesa, Ariz., assignor to Northrop Corporation, Hawthorne, Calif.

Filed May 27, 1980, Ser. No. 153,314

Int. Cl.<sup>3</sup> F41F 3/06

U.S. Cl. 89—1.816

9 Claims



1. Missile launcher apparatus for carrying missiles on an aircraft having a pylon member and release hook means mounted in said pylon member, the apparatus comprising:  
a hardback portion fixable adjustably to said pylon member and having spaced lug receiving openings therethrough;  
a jettisonable missile launcher portion for holding and firing a plurality of missiles therefrom, having support lug means arranged in spaced relation on the upper side thereof, and an upper surface configuration for receiving said hardback portion, said launcher portion having an installed position abutting the lower side of said hardback portion with said lugs of said launcher portion positioned through said lug receiving openings in said hardback portion for engagement with said hook means of said aircraft, and release therefrom.

4,412,476

TANDEM MACHINE WITH OPPOSED FREE PISTONS  
Henry Benaroya, 41, Bld du Commandant Charcot, Neuilly-sur-Seine 92200, France

PCT No. PCT/FR80/00070, § 371 Date Jan. 7, 1981, § 102(e) Date Dec. 31, 1980, PCT Pub. No. WO80/02442, PCT Pub. Date Nov. 13, 1980

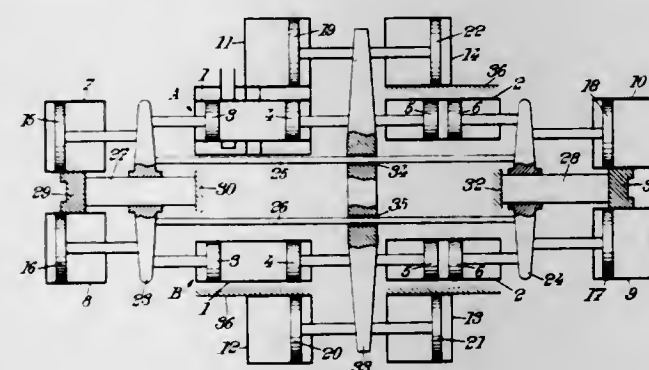
PCT Filed May 6, 1980, Ser. No. 229,561

Claims priority, application France, May 7, 1979, 79 11513

Int. Cl.<sup>3</sup> F01B 7/02, 1/00

U.S. Cl. 92—75

10 Claims



1. A tandem free piston machine comprising:  
at least two groups of motor cylinders located parallel to a common axis, each said group including two aligned motor cylinders arranged on opposite sides of a transversal midplane of the machine and each cylinder reciprocally locating an outer drive piston and an inner drive piston arranged for movements in opposite directions,  
two pluralities of compressor pistons each reciprocally located in a compressor cylinder,  
first connecting means including a pair of outer cross mem-

bers and mechanical cross member linking means, said first connecting means rigidly interconnecting said outer drive pistons and a first one of said pluralities of compressor pistons to constitute an outer reciprocating train, second connecting means including an inner cross member and rigidly interconnecting said inner drive pistons and a second one of said pluralities of compressor pistons to constitute an inner reciprocating train, wherein said compressor pistons of said outer train are located outside of said outer cross members in the axial direction while all said drive pistons, said linking means of said outer train and said inner cross-member are located between said outer cross members in the axial direction.

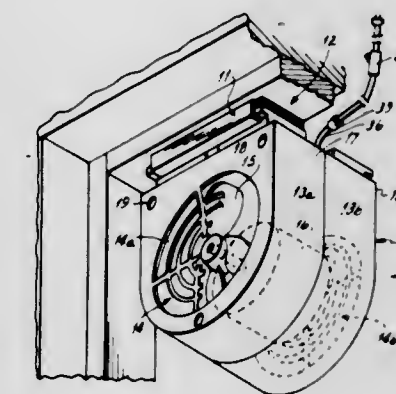
4,412,478  
AIR DISTRIBUTION METHOD AND APPARATUS FOR EFFECTING THE SAME

John D. Osher, 8366 Gwillada Dr., Cincinnati, Ohio 45236, and Tom Rattray, 233 Fleming Rd., Cincinnati, Ohio 45215  
Filed Nov. 19, 1981, Ser. No. 322,780

Int. Cl.<sup>3</sup> F24F 7/00

U.S. Cl. 98—33 R

6 Claims



1. An apparatus for distributing air between rooms separated by a doorway, comprising  
an electric fan having a motor, a blade mounted on the motor shaft and a casing surrounding said motor blade and shaft, said casing having a substantial dimension in the direction of the axis of said shaft,  
a single elongated mounting element secured in said doorway and extending generally parallel to the plane of said doorway, said element being spaced off-center away from said door,  
a pair of spaced parallel elongated mounting elements secured to the upper surface of said casing and extending perpendicular to the axis of said motor,  
each of said pair of spaced mounting elements being selectively engageable with said single mounting element to provide the sole support for said fan,  
whereby the orientation of said fan may be selectively reversed by reversing the engagement of the spaced mounting elements with said single mounting element with the bulk of said casing located remote from said door to avoid interference with said door regardless of the position of said fan.

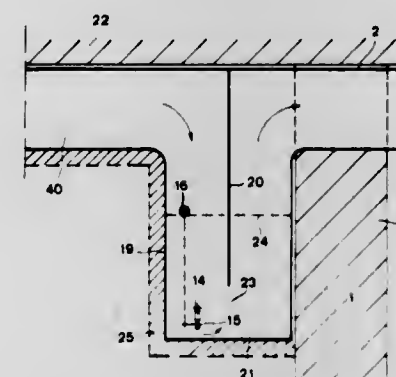
4,412,477  
ARRANGEMENT TO COUNTERACT OR PREVENT SPREADING OF FIRE OR SMOKE

Knut Bergdahl, Kvartsgård 4, S-852 52 Sundsvall, Sweden  
Continuation of Ser. No. 35,824, May 4, 1979, Pat. No. 4,294,165. This application Jul. 10, 1981, Ser. No. 282,026  
Claims priority, application Sweden, May 8, 1978, 7805197

Int. Cl.<sup>3</sup> F16K 9/00

U.S. Cl. 98—1

4 Claims



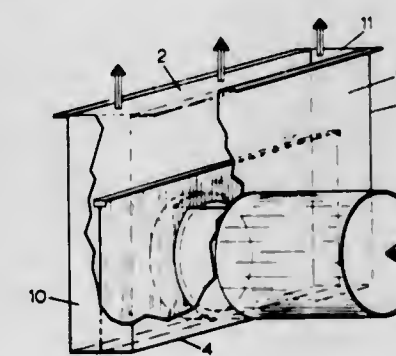
1. An arrangement to counteract or prevent the spreading of fire or smoke comprising means for defining a partition between two chambers of a static structure, means for defining an aperture in said partition for normally placing said two chambers in fluid communication with each other, means for normally maintaining said aperture open while being operative to close said aperture in response to the detection of fire or smoke, said last-mentioned means including a drain trap-like conduit portion through which air can normally flow to pass through said aperture between said two chambers, means for detecting a predetermined level of smoke or temperature, means for responding to said detecting means for filling and closing said drain trap-like conduit portion with a non-combustible fluid thereby closing communication between said two chambers through said aperture, said drain trap-like conduit portion being located substantially entirely in one of said two chambers, said partition being a vertical wall common to said two chambers and said aperture being contiguous ceilings of said two chambers, said drain trap-like conduit portion being defined by a bight conduit portion and a pair of upwardly opening conduit leg portions all located in one of said chambers, and a conduit connecting one of said upwardly opening conduit leg portions to the other of said chambers through said aperture, and said one upwardly opening conduit leg portion being located adjacent said vertical wall.

4,412,479  
GAS FLOW ARRANGEMENT  
Johannes H. W. Ouwerkerk, Drielhuis; Albert Kramer, Enkhuiszen, and Johannes W. Mooij, IJmuiden, all of Netherlands, assignors to Estel Hoogovens B.V., Netherlands  
Filed Apr. 21, 1981, Ser. No. 256,014  
Claims priority, application Netherlands, May 8, 1980, 8002639

Int. Cl.<sup>3</sup> F24F 13/02

U.S. Cl. 98—36

8 Claims



1. In a gas flow arrangement in which gas flowing axially along a cylindrical pipe is directed into a flow chamber having



a gas exit at one side thereof and communicating with said pipe at right angles to the axis of said pipe in which the gas flow is generally at right angles to the flow in the pipe, the improvement that:

in order to achieve a highly uniform flow at a given cross sectional area transverse to the flow in said flow chamber the pipe is closed by an end wall and has, at one side thereof and close to said end wall, at least two mutually axially spaced apertures opening into said flow chamber for flow of gas from the pipe into the chamber toward said exit, each of said apertures having four edges located in planes radial to and at right angles to the axis of said pipe, and there being, in the pipe between each axially adjacent pair of said apertures, a flow constricting partition wall having through it a circular apertures concentric with the pipe axis.

4,412,480

## DIRECTIONAL OUTLET ASSEMBLY

Raymond S. Cardiff, 40 Carnaby St., Macgregor Queensland, Australia

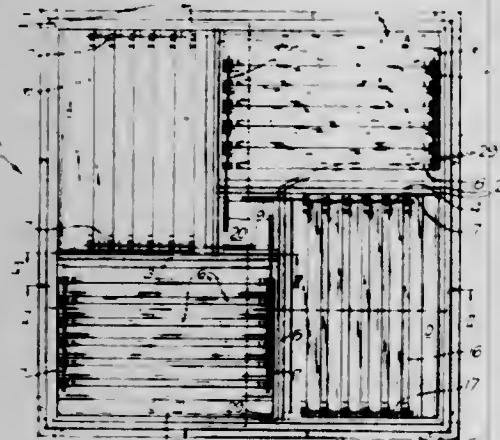
Filed Sep. 1, 1981, Ser. No. 298,413

Claims priority, application Australia, Sep. 3, 1980, PE 5387

Int. Cl.<sup>3</sup> F24F 13/06

U.S. Cl. 98—40 D

9 Claims



1. A multi-directional air outlet assembly including a plurality of louvre assemblies each comprised of a plurality of parallel pivoted louvre blades and each operable by common control means between a closed attitude and an open attitude for deflecting air flow through said outlet assembly for simultaneous discharge, said blades of each assembly being disposed at an angle to said blades of each adjacent assembly so that air discharge from each assembly is in a different direction to air discharge from an adjacent assembly, said common control means being so interconnected to said louvre assemblies that upon actuation of said common control means each said louvre assembly will be opened from its closed attitude to a preselected extent.

4,412,481

## COFFEE MAKER

Hiroyuki Oota, Iwakura, and Ryuho Narita, Nagoya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 19, 1982, Ser. No. 340,634

Claims priority, application Japan, Jan. 22, 1981, 56-8194; Jan. 23, 1981, 56-9431; Jan. 23, 1981, 56-9432; Jan. 23, 1981, 56-9433; Jan. 23, 1981, 56-9434

Int. Cl.<sup>3</sup> A47J 31/42

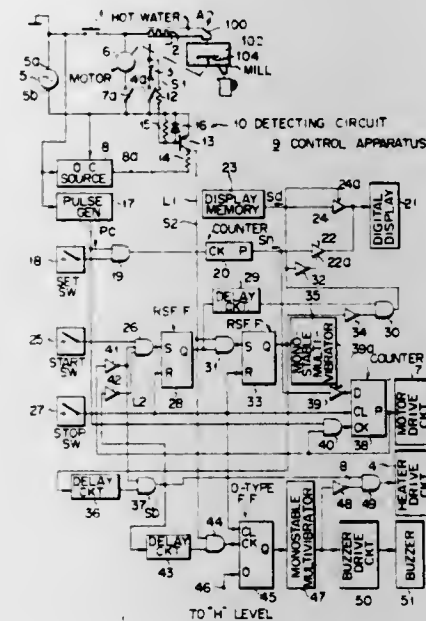
U.S. Cl. 99—280

20 Claims

19. The coffee maker comprising a mill mechanism for milling coffee beans held in a case to provide coffee powder and a drip mechanism for pouring hot water into the coffee powder to make coffee:

a heater circuit with a series circuit connected across an AC power source and including a main switch, a heater con-

tained in said drip mechanism, a normally closed thermal switch which is turned off when the temperature of said heater exceeds a given value, and a heater switch for said heater which is turned on after said main switch is turned on; and



a detecting circuit connected with a signal take-out node of a given end of said series circuit and for detecting that said main switch is ON and at least one of said thermal switch and said heater switch is OFF.

4,412,482

## DISPOSABLE COOKING BAGS

Alexander P. Janssen, 28 Old Farm Rd., Bellair, Charlottesville, Va. 22903

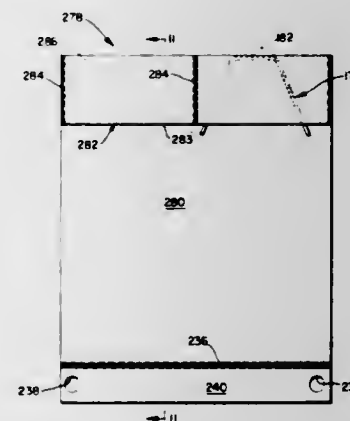
Continuation of Ser. No. 890,791, Mar. 27, 1978, abandoned, which is a continuation of Ser. No. 702,090, Jul. 2, 1976, which is a continuation-in-part of Ser. No. 637,966, Dec. 5, 1975, Pat.

No. 4,005,645, which is a continuation-in-part of Ser. No. 327,658, Jan. 29, 1973, Pat. No. 3,946,654. This application Apr. 14, 1980, Ser. No. 139,742

Int. Cl.<sup>3</sup> A47G 27/10

U.S. Cl. 99—403

13 Claims



1. A disposable comestibles-containable bag for cooking utensils and accessories having a vertically extending bag-supporting means, said bag consisting in its entirety of a flexible, impermeable material and having side walls and closable open and closed ends at the opposite ends of the side walls, said bag being adapted to be disposed in said bag-supporting means in a generally vertical orientation with its closable end uppermost; said bag also having means at the closed end of the bag which are adapted to be used to effect connections between the bag and the bag-supported means, the means at the closed end of the bag being spaced at intervals around said bag and being so

constructed as to be capable of producing mechanical connections between the closed end of the bag and the lower part of the bag-supporting means; and said bag further having means adjacent and at intervals around the closable end of the bag which are adapted to be used to effect connections between the closable end of the bag and the bag-supporting means and thereby make it possible to open and close said end of the bag by manipulation of said bag-supporting means.

4,412,483

## SPIRAL MEAT SLICER

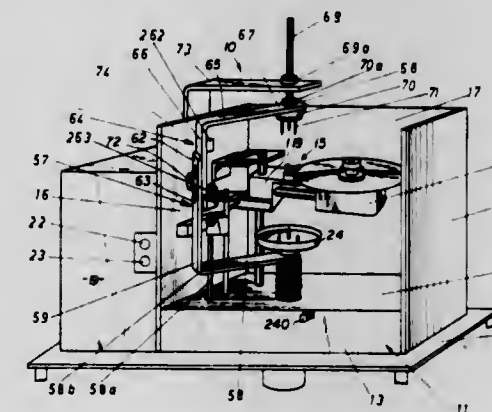
Poul E. Hoegh, San Jose, Calif., assignor to Country Baked Hams, Inc., San Jose, Calif.

Filed Nov. 20, 1980, Ser. No. 209,197

Int. Cl.<sup>3</sup> A23N 7/00; A47J 17/00

U.S. Cl. 99—538

6 Claims



1. A spiral meat slicer for automatically forming a continuous spiral slice on a cut of meat having an irregularly shaped bone extending therein, comprising means for mounting said cut of meat on a rotatable platform, with said bone as a substantially vertical axis about which to rotate said cut of meat, means for clamping said cut of meat on said rotatable platform, blade support means pivotally mounted in said spiral meat slicer for rotation about an axis substantially parallel to rotative axis of said rotatable platform, said blade support means pivoting in a stationary, substantially horizontal plane, a disk blade mounted rotatably and substantially horizontally on said blade support means, drive motor means mounted on said spiral meat slicer, means for rotating said rotatable platform and means for moving said rotatable platform vertically upwards with respect to said blade to spirally slice said cut of meat, means for automatically engaging and disengaging said means for rotating and moving said rotatable platform upwards, means for moving said rotatable platform up to uppermost start position after said cut of meat has been sliced, means for selectively retaining said blade away from said rotational axis of said rotational platform, means for biasing said blade toward said rotational axis of said rotational platform, transmission means from said drive motor means to said blade to rotate said blade and to said rotatable platform to rotate said rotatable platform and to move said rotatable platform vertically upwards and electric circuit means including switches and solenoids for rendering operation of said spiral meat slicer automatic.

4,412,484

## STRAPPING MACHINE

William J. Beethem, Cheboygan, and Lynn D. Rumsey, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1982, Ser. No. 408,633

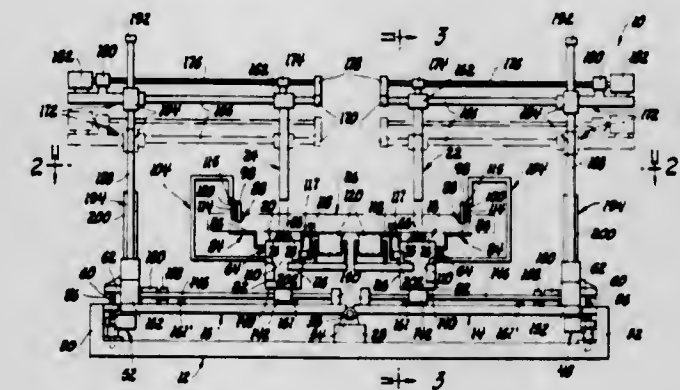
Int. Cl.<sup>3</sup> B65B 13/04

U.S. Cl. 100—7

5 Claims

1. A strapping machine for applying a pair of straps about a package, said strapping machine comprising first and second strap-feeder and tensioning devices each of which includes a strap-feed guide member and a strap-return guide member

aligned along a first axis; first and second chutes located adjacent said first and second strap-feeder and tensioning devices respectively, each of said first and second chutes having a strap-entry portion and a strap-exit portion; means operatively connected to each of said chutes for moving said chutes between a first position wherein said strap-entry portion and said strap-exit portion are axially aligned with said strap-feed guide member and said strap-return guide member respectively of the associated strap-feeder and tensioning device for applying one strap to said package, and a second position wherein said



strap-entry portion and said strap-exit portion are spaced vertically from said strap-feed guide member and said strap-return guide member of said associated strap-feeder and tensioning device for receiving said package; and means supporting each of said first and second strapping feeder and tensioning devices and its associated chute for adjustable and coordinated movement along a second axis which is perpendicular to said first axis so as to vary the distance between said first and second strap-feeder and tensioning devices and thereby vary the distance between said pair of straps.

4,412,485

PRESS FOR EXPRESSING LIQUID FROM A MASS  
Douglas B. Brown, Ottawa, Canada, assignor to Stake Technology Limited, Ottawa, Canada

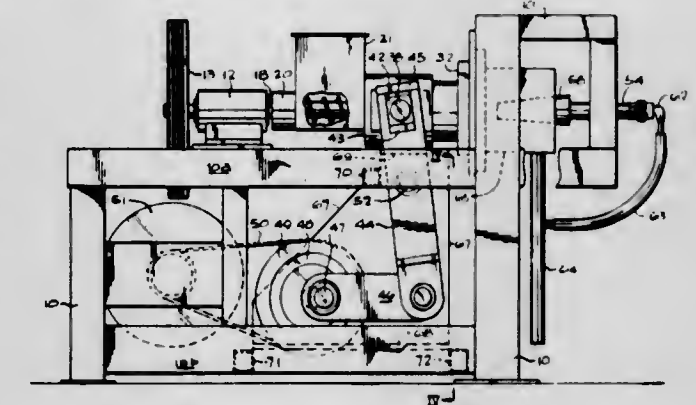
Filed Mar. 16, 1981, Ser. No. 243,699

Claims priority, application Canada, Mar. 27, 1980, 348560

Int. Cl.<sup>3</sup> B30B 9/12

U.S. Cl. 100—117

4 Claims



1. A press for expressing liquid out of a mass comprised of a particulate solid material portion and a liquid material portion, said press being of the type having feeding means for feeding the mass through an inlet portion of the press; compression means for compressing said mass along a predetermined path within a housing means while advancing said mass to a discharge end thereof, and liquid passage means comprised in a portion of a wall of said housing means for removal of a part of the liquid portion to this reduce liquid content in said mass, wherein:

(a) said housing means is a hollow tubular housing whose



one axial end is generally coincident with said inlet portion, the other axial end of said housing means being generally coincident with said discharge end;

(b) said compressor means is of the type including a conveyor screw combined with a reciprocating annular sleeve, said conveyor screw being co-axial with said housing means, a portion of said conveyor screw being rotatably disposed inside said annular sleeve whose outside diameter generally corresponds to the inside diameter of said housing means;

(c) said annular sleeve is slidable within said hollow housing means and is operatively associated with a first drive means for imparting to said sleeve a reciprocating motion relative to said housing means and to said conveyor screw, in a direction generally co-axial with said housing means; the frequency of the reciprocating motion being in excess of three cycles per second;

(d) said annular sleeve has a free end face portion of a generally flat, annular configuration, facing said discharge end;

(e) said liquid passage means is a plurality of closely spaced passage openings extending generally radially through a portion of the wall of said housing means to thus form a perforate section of said wall, said perforate section having an inside axial end relatively remote from said discharge end and an outside axial end relatively close to the discharge end;

(f) said annular sleeve and said liquid passage means being so arranged that said free end face portion thereof is disposed between said inside axial end and said outside axial end of the perforate section when the free end face portion of the sleeve is at the end of the stroke directed toward said discharge end, the axial distance travelled by said face portion within said perforate section being less than one-half of the total axial distance of said perforate section.

4,412,486

## PRESS CONSTRUCTION

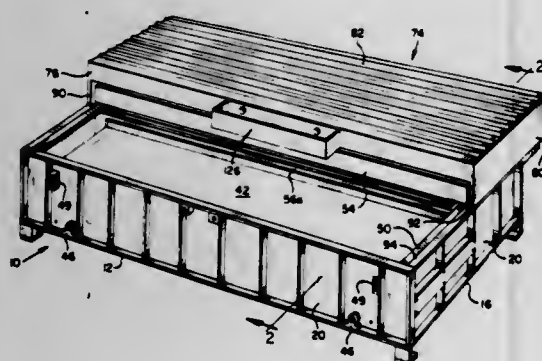
Frank W. Leonard, P.O. Box 5634, Boise, Id. 83705

Filed Aug. 31, 1981, Ser. No. 298,075

Int. Cl.<sup>3</sup> B30B 15/06

U.S. Cl. 100—229 R

6 Claims



1. A press construction comprising:

(a) support means including an upright frame having front, rear and side portions as well as top and bottom portions,

(b) first platen means,

(c) said first platen means having a pressing surface for supporting articles in the press and being movable upwardly in a pressing position and downwardly in a retracted position,

(d) lift means between said support means and said first platen means arranged to move said first platen means upwardly to a pressing position,

(e) second platen means having a longitudinal pressing surface facing the pressing surface of said first platen means to form an abutment for articles being compressed upon operation of said lift means,

(f) movable support means on said frame and second platen means extending from front to rear,

(g) said movable support means being disposed adjacent an upper portion of said frame,

(h) said second platen means being movable on said movable support means relative to said first platen means in a plane parallel with said pressing surfaces to move between an advanced pressing position in overlapping relation with said first platen means for pressing articles by operation of said lift means and a retracted position for loading and unloading articles onto said first platen means,

(i) an opening in said frame above said first platen means for loading articles onto said first platen means and removing them,

(j) said second platen means in its advanced pressing position spanning said opening and closing the same,

(k) a hood supported on said frame,

(l) said hood having a front opening for receiving and concealing said second platen means in its retracted position,

(m) said hood having a rear extension projecting beyond the rear portion of said frame to accommodate said second platen means in said retracted position,

(n) and releasable means securing said hood either in its rearwardly extending position for use of the press in pressing operations or for securing said hood in a forward position for compacting the press for shipment.

4,412,487

## APPARATUS FOR MANUFACTURING A PRINTED PLASTIC ARTICLE

Roelof Muis, Vroomshoop, and Kornelis Herder, Goor, both of Netherlands, assignors to Wavin B.V., Netherlands

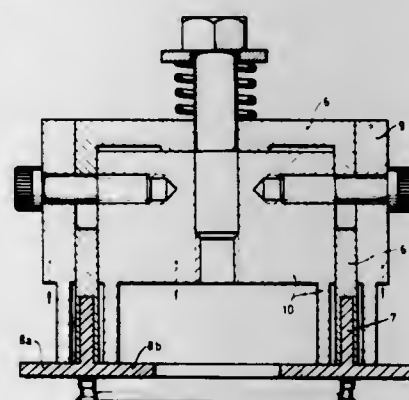
Filed Dec. 30, 1980, Ser. No. 221,305

Claims priority, application Netherlands, Jan. 8, 1980, 8000104

Int. Cl.<sup>3</sup> B41F 17/00

U.S. Cl. 101—41

4 Claims



1. Apparatus for printing on a plastic article having an upwardly bent portion between a flat center section and a drooping circumferential rim, said apparatus comprising:

an annular deformable carrier for carrying a coloring composition;

axially movable means, cooperating with said carrier, for bending a part of the carrier adjoining the upwardly bent portion and a part of the carrier adjoining the circumferential rim of the plastic article, said axially movable means having been adapted for embracing part of the upwardly bent portion perpendicularly of the flat center section;

wherein said axially movable means are concentrically positioned adjoining a part of the carrier which is adapted to be pressed against the top of the upwardly bent portion; and

wherein said axially movable means include a first cylinder being connected to the carrier and being positioned between two concentrically positioned cylinders, said first cylinder and said two concentrically positioned cylinders being adapted for axial displacement with respect to each other in order to deform annular parts of the carrier.

4,412,488

## AUTOMATIC PRINTING MACHINE

Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

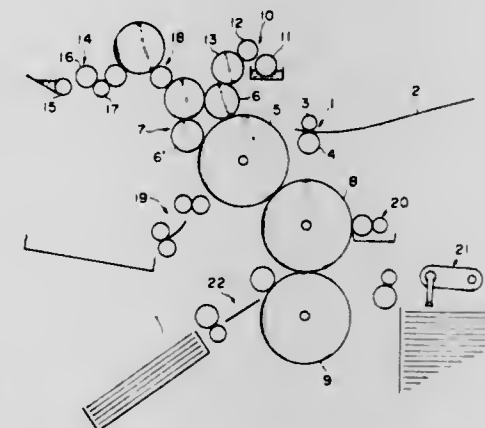
Filed May 20, 1981, Ser. No. 265,320

Claims priority, application Japan, May 26, 1980, 55-70684

Int. Cl.<sup>3</sup> B41F 7/00

U.S. Cl. 101—142

6 Claims



1. An automatic printing machine comprising plate loading device for delivering a printing plate onto a plate cylinder; an operating shaft;

an operating lever rigidly coupled to said operating shaft and movable sequentially to a plurality of operating positions;

a plurality of cams provided on said operating shaft; said plate loading device, a water duct roller mechanism and a form roller mechanism being operatively coupled to said operating shaft and said cams in such a manner that said plate loading device, water duct roller mechanism and form roller mechanism are operated as said operating shaft is turned;

said cams each having a shape and orientation relative to each other and said shaft so that, as said operating lever is turned from a first neutral position to a second position said water duct roller mechanism is activated, as said operating lever is turned to a third position said form roller mechanism is activated to cause form rollers to contact said plate cylinder, and then said plate loading device is activated to perform a plate loading operation.

4,412,489

## SMALL PRINTING MACHINE

Claude-Alain Duhamel, Paris, France, assignor to Librairie Fernand Nathan, Paris, France

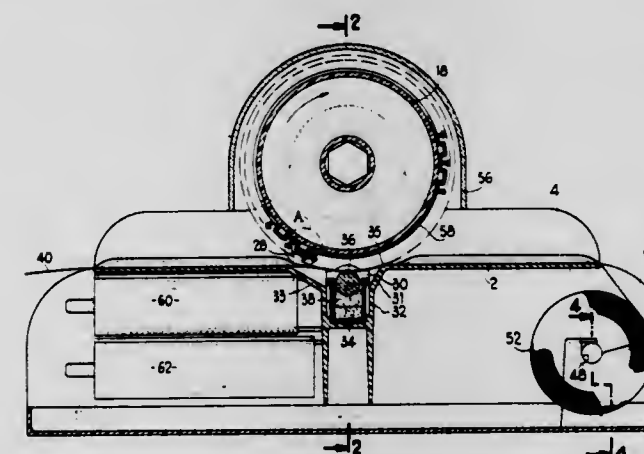
Filed Sep. 4, 1981, Ser. No. 299,488

Claims priority, application France, Feb. 11, 1981, 81 02666

Int. Cl.<sup>3</sup> B41F 5/00, 27/06

U.S. Cl. 101—212

14 Claims



1. A printing machine comprising a table for guiding paper to be printed, means defining a slot extending transversely of

the table, a stick of coloured greasy chalk disposed parallel to and located in said slot, a rotary drum located above said slot and rotatable about an axis parallel to said slot and having on a part of an outer surface thereof ribs which are disposed on a first imaginary geometric cylinder coaxial with said drum and are for receiving and hooking printing forms, printing forms which are in hooked relation to said ribs and have reliefs, the reliefs defining outer surfaces which are disposed on a second imaginary geometric cylinder which is coaxial with said drum and has a radius which exceeds the radius of said first imaginary geometric cylinder, and means for biasing the stick of chalk and said outer surfaces of said printing forms against one another whereby, upon rotation of the drum with a sheet of paper between the drum and the stick of chalk, said outer surfaces of the reliefs apply the paper against the stick of chalk which prints the shape of the outer surfaces of the reliefs on a side of the paper remote from the drum as the paper is displaced transversely across the stick of chalk by the rotation of the outer surfaces of the reliefs about said axis.

4,412,490

## PAPER WEB GUIDING MECHANISM

Heinrich K. Grosshauser, Würzburg, Fed. Rep. of Germany, assignor to Koenig &amp; Bauer AG, Würzburg, Fed. Rep. of Germany

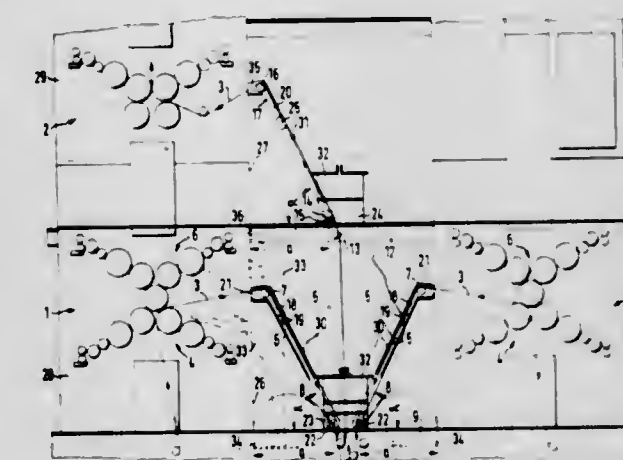
Filed Jan. 20, 1982, Ser. No. 341,027

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104562

Int. Cl.<sup>3</sup> B41F 5/04

U.S. Cl. 101—219

3 Claims



1. A paper web guiding mechanism for use with a printing unit in a web-fed printing machine to afford access to component parts of printing couples in the printing unit, said paper web guiding mechanism comprising:

a paper guide frame which is capable of being inclined at an angle  $\alpha$  against side frames of the printing unit;

paper guide rollers rotatably secured to upper and lower ends of said paper guide frame, said paper guide rollers defining a path of paper web travel;

an operating floor pedestal secured to the printing machine adjacent said lower end of said paper guide frame; and

a cover sheet secured to said paper guide frame on a side of said paper guide frame away from the printing unit.

4,412,491

## SYSTEM FOR SENSING AN INKING MEMBER IN A VALUE PRINTING DEVICE

Danilo P. Buan, Easton, and Alton B. Eckert, Jr., Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,955

Int. Cl.<sup>3</sup> B41F 3/40

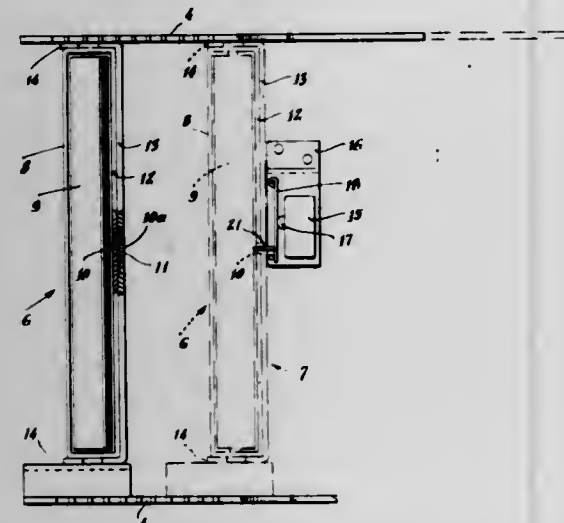
U.S. Cl. 101—363

7 Claims

1. In a value printing device, a system for electronically sensing the presence of a new inking member, comprising:



- a) a cartridge having a housing containing an inking member, the housing having an opening with a detachable member therein;
- b) sensing means comprising:
- i. contacting means mounted in said device substantially in alignment with said housing opening; and
  - ii. electrical sensing means mounted stationary within the device and activatable by said contact means for generating signals; and



- (c) means for moving said cartridge with respect to said sensing means such that said contact means is caused to enter said housing opening upon movement of said cartridge; wherein when said contacting means contacts said detachable member is displaced the same from said opening; said electrical sensing means is caused to generate at least one of said signals in response to the force exerted on said contacting means by said detachable means.

4,412,492

## PRIMING COMPOSITION AND TECHNIQUES

Richard N. Knights, 163 Huclecote Rd., Gloucester Gloucestershire GL3 3TX, England, and Peter H. Whittall, Penkridge, England, assignors to IMI Kynoch Limited, Birmingham, England, by said Peter H. Whittall

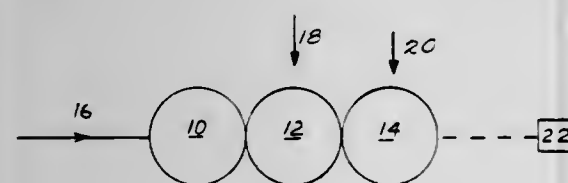
Continuation of Ser. No. 722,071, Sep. 3, 1976, abandoned. This application Apr. 1, 1980, Ser. No. 132,665

Claims priority, application United Kingdom, Sep. 11, 1975, 37385/75

Int. Cl.<sup>3</sup> C06C 7/00

U.S. Cl. 102—204

8 Claims



1. In a method of priming explosive devices by incorporating a discrete body of priming explosive comprising a primary explosive compound in a hollow container forming part of each device, the improvement comprising the steps of providing in each said container predetermined quantities of materials comprising relatively insensitive components that can chemically react together forming said primary explosive compound and chemically reacting together said components in situ in each of said containers so as to form the primary explosive compound of each of said discrete bodies.

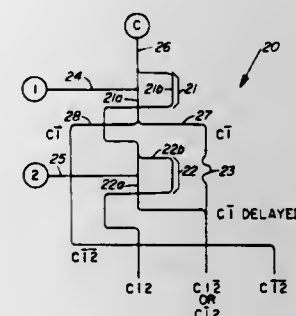
4,412,493  
EXPLOSIVE LOGIC SAFING DEVICE  
Denis A. Silvia, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1981, Ser. No. 317,961

Int. Cl.<sup>3</sup> F42B 3/10, 15/00

U.S. Cl. 102—275.9

30 Claims



25. A device for initiating selectable warhead options, comprising:

- i. an inlet explosive trail having an inlet detonation signal;
- ii. a plurality of outlet explosive trails conveying the detonation signal to one or more warhead options; and
- iii. an explosive logic network connecting the inlet explosive trail and plurality of outlet explosive trails such that the inlet detonation signal can be conveyed to one or more of the warhead options.

4,412,494

Patent Not Issued For This Number

4,412,495

## TOTAL BODY PROTECTIVE SHIELD

Wilfred A. Sankar, 3209 Snyder Ave., Apt. 10, Brooklyn, N.Y. 11226

Filed May 7, 1981, Ser. No. 261,603

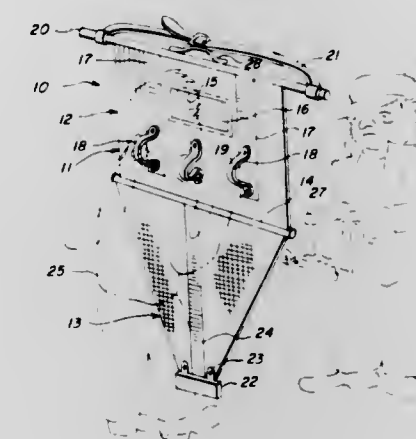
Int. Cl.<sup>3</sup> F41H 5/06

U.S. Cl. 109—49.5

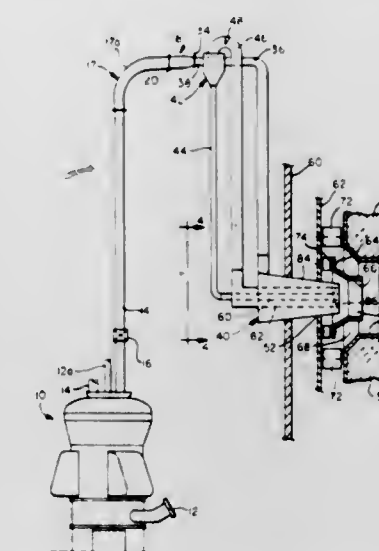
1 Claim

1. A total body protective device, comprising, in combination, a pair of flexible panel pieces made of bullet-proof fabric for serving as a shield in front of a person, one said panel piece comprising an upper panel piece while the other comprises a lower panel piece assembled together; an upper rod mounted at the top edge of said upper panel piece and a center rod mounted between said upper and said lower panel pieces; an upper of said panel pieces including a plurality of three handles on one side thereof for holding said device vertically and also including a central window of bullet-proof material so as to observe therethrough; both said panel pieces including elongated flexible spring steel strips secured onto one side thereof so as to permit rolling up said panel piece when not in use and quickly unrolling of said panel pieces for instant use and retain said panel pieces flat when use requires such; two of said strips being secured onto said upper panel piece spaced apart and parallel to each other, both extending from said upper rod and terminating spaced from said middle rod, said lower panel

piece having a single of said strips secured thereto and extending from said center rod to the lower edge of said lower panel, two of said handles being respectively secured onto said two



strips, said strips together with said rods forming a rigid frame for said panel pieces when unrolled, and a lower of said panel piece has a detachable weight snap fastened to a lower edge thereof and coupled to the strip terminating at that edge.



air into said furnace through a third nozzle in a combustion supporting relationship to said remaining portion of said mixture.

4,412,497

## APPARATUS FOR DRIVING THREAD LEVERS ON EMBROIDERY MACHINES

Wolfgang Teetz, Kerken; Heinz-Georg Slomma, Viersen, and Hans-Gerd Ripkens, Goch, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

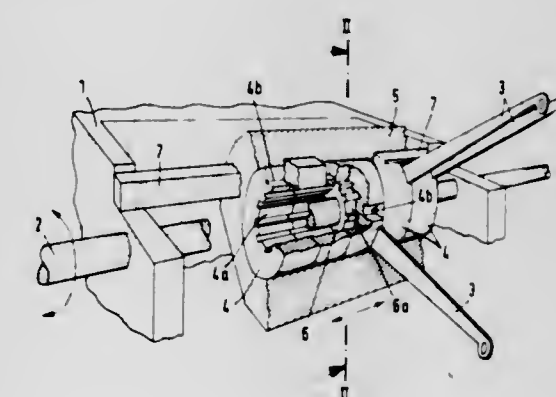
Filed Feb. 2, 1981, Ser. No. 230,198

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007473

Int. Cl.<sup>3</sup> D05C 11/16

U.S. Cl. 112—96

7 Claims



4,412,496  
COMBUSTION SYSTEM AND METHOD FOR A COAL-FIRED FURNACE UTILIZING A LOW LOAD COAL BURNER

Norman K. Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corp., Livingston, N.J.

Filed Apr. 27, 1982, Ser. No. 372,269

Int. Cl.<sup>3</sup> F23D 1/00

U.S. Cl. 110—347

15 Claims

1. A combustion system for a coal fired furnace, said system comprising a source of a mixture of pulverized coal and air, splitting means for splitting said mixture into two separate streams, a first nozzle means connected to said splitting means for receiving one of said streams and discharging said stream into said furnace, separating means connected to said splitting means for receiving the other of said streams and for separating a quantity of air from the mixture of coal and air in said other stream, second nozzle means connected to said separating means for discharging the remaining portion of said mixture into said furnace, and third nozzle means connected to said separating means for discharging said quantity of air into said furnace in a combustion supporting relationship to said remaining portion of said mixture.

12. A method of operating a coal fired furnace, said system comprising the steps of splitting a mixture of pulverized coal and air into two separate streams passing one of said streams directly into said furnace through a first nozzle, separating a quantity of air from the mixture of coal and air in said other

1. In a device for driving at least one of a plurality of thread levers on multi-needle embroidery machines in which the thread levers of the needles disconnected at the time can be uncoupled by displaceable coupling elements from an oscillating drive shaft, the improvement wherein said coupling elements comprise coupling sleeves, a housing, said coupling sleeves are formed with grooves, respectively, and are mounted jointly in said housing, the thread levers are arranged on said coupling sleeves, respectively, said coupling sleeves surround the drive shaft and are mounted displaceable with said housing in the longitudinal direction of the drive shaft, holding rails mounted fixed in position extend parallel to the drive shaft and are adapted to engage in said grooves of said coupling sleeves,



a coupling piece means is fastened to the drive shaft, at least one of the coupling sleeves respectively can be coupled to the drive shaft by said coupling piece means, while the other of said coupling sleeves are held fast, in non-rotatable manner, together with said housing by said holding rails which engage into said grooves of said other coupling sleeves.

4,412,498

# CONTROL DEVICE FOR A DIFFERENTIAL FEED OF A SEWING MACHINE

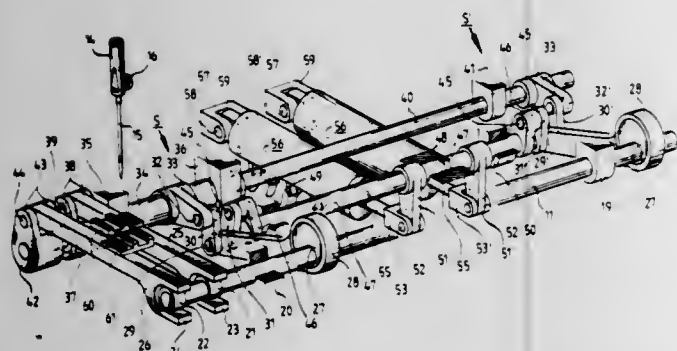
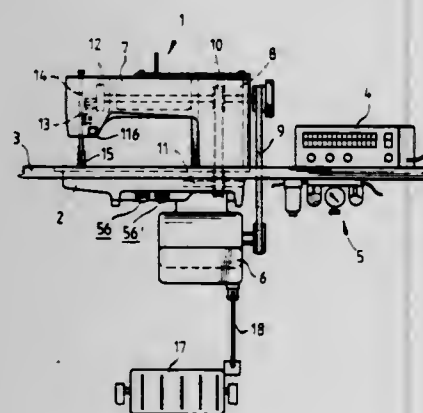
Hans Scholl, Oerlinghausen-Lipperheide, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany  
Filed Apr. 22, 1982, Ser. No. 370,797

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118964

Int. Cl.<sup>3</sup> D05B 27/08

U.S. Cl. 112—313

6 Claims



1. A control device for a sewing machine with stitch forming means including a needle and differential feed means for advancing a workpiece having at least one ply in a sewing direction comprising:

first feed means arranged behind said needle with respect to a first feed unit imparting a feed rate to said first feed means; second feed means arranged in front of said needle with respect to said sewing direction; and a second feed unit imparting a feed rate to said second feed means;

said control device including:

a control box;

a control device controlled by said control box for regulating the relation of said feed rates imparted to said first and said second feed means comprising:

solenoid valves operated by said control box and a pneumatic cylinder having individual cylinders arranged in series and operated by said solenoid valves.

4,412,499

# RIGGING CONNECTION ASSEMBLY

Eric R. D. Hall, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.

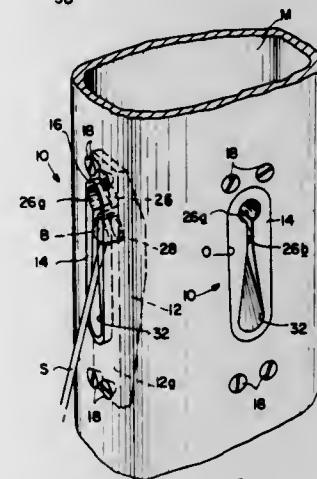
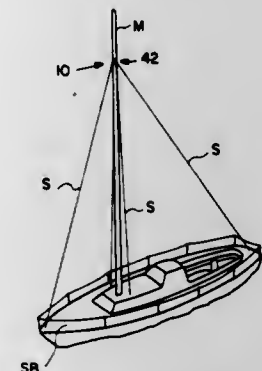
Continuation of Ser. No. 164,537, Jul. 2, 1980, abandoned, which is a continuation of Ser. No. 923,824, Jul. 12, 1978, abandoned.

This application Apr. 29, 1981, Ser. No. 258,680

Int. Cl.<sup>3</sup> B63H 9/04

U.S. Cl. 114—108

3 Claims



1. A rigging connection assembly for connecting a stay to a mast or other support structure comprising:

A. a round ball on one end of the stay,

B. a tang adapted to be connected to the mast or other support structure, said tang having an exposed front face with a recessed edge margin defining a flange and a rear face for positioning inside the mast so that the flange engages the inside wall of the mast and the front face is flush with the outside wall of the mast;

C. means defining a vertical keyhole in said tang, said keyhole having a cylindrical upper head portion extending from the front face completely through to the rear face of said tang and being sized to snugly receive said ball, and a lower neck portion communicating with said upper head portion and being sized to receive the stay, said lower neck portion including a downwardly extending trough which is recessed below the front face of said tang but which does not extend completely through to the rear face of said tang and which is tapered such that its depth below the front face decreases, and its width increases, with distance from said upper head portion, and

D. means at the rear face of said tang defining a ball-retaining pocket, said pocket being generally cylindrical and being spaced vertically away from said keyhole head portion so that when the stay is in a first orientation relative to said tang, said ball can be inserted through said keyhole head portion from the front face of said tang and engaged in said pocket at the rear face of said tang and when the stay is in a second orientation relative to said tang, said ball is retained in said pocket with the stay projecting through said keyhole neck portion and said trough, said ball is free to swivel both laterally and vertically in said pocket and the stay is free to swivel both laterally and vertically in said trough.

4,412,500

# DRIVE MECHANISM FOR SHIPS OR THE LIKE COMPRISING A MAIN PROPELLER AND AN AUXILIARY MECHANISM

Franz Krautkremer, Spay, Fed. Rep. of Germany, assignor to Schottel-Werft, Josef Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany

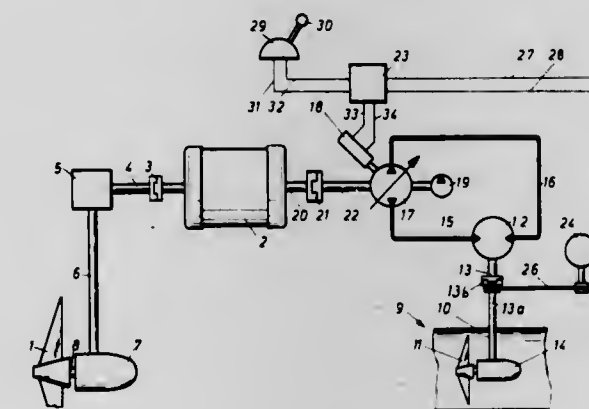
Continuation of Ser. No. 299,284, Sep. 4, 1981, abandoned, which is a continuation of Ser. No. 82,203, Oct. 5, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 424,794

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900254

Int. Cl.<sup>3</sup> B63H 25/46

U.S. Cl. 114—151

2 Claims



1. A drive mechanism for ships or the like, comprising:

a main motor;

a main propeller or the like driven by said main motor for propelling the ship, said main motor being connected to drive said main propeller and having a speed adjustable to provide the desired main propeller speed and hence ship speed;

a maneuvering propeller or the like for lateral maneuvering of the ship;

drive means for also driving the maneuvering propeller from the main motor, the drive means comprising

(a) an adjustable hydraulic pump driven by said main motor, and

(b) a hydraulic motor driven by said adjustable hydraulic pump and connected for driving said maneuvering propeller;

a regulating means associated with said drive means for maintaining the maneuvering propeller at a chosen speed independent of main propeller speed, during and despite adjustments of the speed of the main motor in a part of its speed range to make desired changes in main propeller speed, said regulating means comprising

(a) an adjusting mechanism for the energy emitted by said adjustable hydraulic pump or absorbed by said hydraulic motor, and

(b) a regulator for adjusting said adjusting mechanism to a preselected energy output, said regulator being an actual value-desired value comparison mechanism, wherein the actual value is taken from said maneuvering propeller, and the desired value is adjustable by an advancing mechanism by means of a lever or the like, the actual value being taken from said maneuvering propeller by means of a tachogenerator;

said main motor and said maneuvering propeller being sized such that in the higher part of the speed range of said main motor, starting with a main motor speed  $n_1$  which is approximately 75% of the maximum main motor speed, the sum of the output of said main propeller and the maximum output of said maneuvering propeller permitted by said regulating means exceeds the output available from said main motor;

the stroke volume of said pump being dimensioned such that with said lever at maximum deflection, in the range from the main motor idling speed  $n_2$  up to a main motor speed  $n_2$  of approximately 50% of the main motor maximum

speed, the output of the pump is determined by its stroke volume, and above main motor speed  $n_2$  the output of said pump is limited by said regulating means; and

first and second clutch means interposed between said main motor and respective ones of said main propeller and said adjustable hydraulic pump, and individually actuable for alternately applying energy from said main motor (1) to said main propeller, (2) to said maneuvering propeller or (3) at low speeds of said main motor, simultaneously to said main propeller or the like and maneuvering propeller, such that at said low speeds said lever is actuable to vary the amount of energy supplied by said main motor to said maneuvering propeller independent of variations in the amount of energy supplied by said main motor to said main propeller.

4,412,501

# SHIP-BURNE OIL DISPERSANT PROCEDURE AND APPARATUS

Murray A. Davis, 4874 Cote des Neiges Blvd., Apartment 1001, Montreal, Canada H3V 1H4

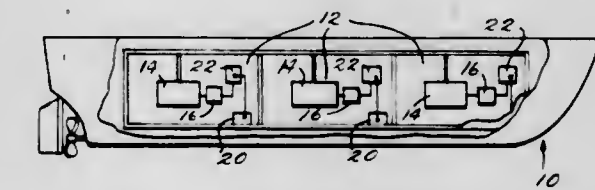
Continuation of Ser. No. 45,333, Jun. 4, 1979, Pat. No. 4,301,006. This application Jun. 5, 1981, Ser. No. 270,872

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B63B 35/00

U.S. Cl. 114—270

20 Claims



1. An oil disperser system comprising:

means for automatically detecting a leak of oil from a first container, comprising an oil tank in a ship, into a body of water;

means for holding an oil dispersant;

means, responsive to said detecting means, for automatically releasing said oil dispersant from said dispersant holding means into said oil so that said oil is dispersed in said body of water; and

said ship supporting said holding means and said detecting means.

4,412,502

# APPARATUS FOR THE ELIMINATION OF EDGE GROWTH IN LIQUID PHASE EPITAXY

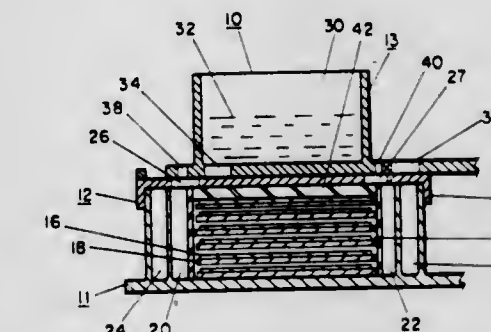
Suei-Yuen P. Lien, West Windsor Township, Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 277,412, Jun. 25, 1981, Pat. No. 4,390,379. This application Feb. 17, 1983, Ser. No. 467,402

Int. Cl.<sup>3</sup> B05C 3/109; H01L 21/208

U.S. Cl. 118—412

6 Claims



1. An apparatus useful for growing single crystal semiconductor layers by liquid phase epitaxy comprises a substrate



carrier having at least one recess therein for holding one or more substrates and a growth solution source carrier which is slidable over the substrate carrier, said source carrier having at least one hole therein for containing molten growth material and including a well around the periphery of the recess for containing a material capable of reducing the heat loss from the edges of the recess.

4,412,503

# SINKER ASSEMBLY FOR HOT-DIP COATING APPLICATIONS

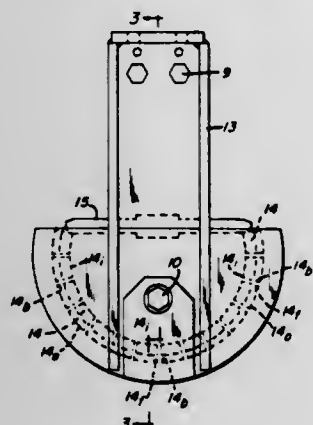
Frank W. Bakewell, Apollo; Thomas E. Nicely, Delmont, and C. Donald Stricker, Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1982, Ser. No. 402,472

Int. Cl.<sup>3</sup> B05C 3/132; B60B 7/04

U.S. Cl. 118—420

8 Claims



1. A sinker assembly for guiding wire through a coating bath, comprising:  
a frame member, a lower portion of which has an arcuate peripheral surface;  
a series of at least three truncated, pie-shape segments formed from a refractory material and shaped such that when the radial edges thereof are abutted against each other, they form a concentric annular belt encircling at least a major portion of said frame arcuate peripheral surface, the outer arcuate surfaces of said segments having a groove, said series of segments being arranged such that the grooves therein line up to form a circumferential axis for conducting wire therealong;  
a housing, maintaining the inner arcuate surfaces of said segments in sliding contact with said frame arcuate peripheral surface and preventing lateral movement of the segments such that said circumferential groove axis is maintained in a substantially vertical plane through which said wire travels.

4,412,504

# DEVICE FOR HOLDING SUBSTRATE WAFERS

Bonu Bonu, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

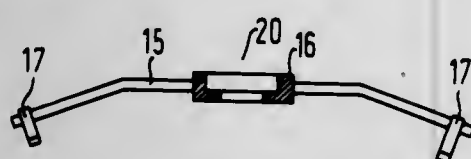
Filed Jul. 13, 1981, Ser. No. 282,716

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028536

Int. Cl.<sup>3</sup> B05C 11/14, 13/00

U.S. Cl. 118—664

17 Claims



1. Device for holding substrate wafers comprising a plurality of circular rings disposed concentrically about a middle part and having disposed thereon at least one bearing surface, re-

spectively, extending towards the interior of the respective ring, and means for yieldingly pressing the substrate wafers against the respective bearing surfaces, said means for yieldingly pressing the substrate wafers against the respective bearing surfaces comprising pressure springs secured to respective holding arms, said plurality of rings including a hub fastenable to said middle part, said holding arms extending radially outwardly spiderlike from said hub.

4,412,505

# APPARATUS FOR APPLYING ATOMIZED LIQUID TO A RUNNING LAYER OF FILAMENTARY MATERIAL OR THE LIKE

Nikolaus Häusler, Oststeinbek, and Adolf Helms, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 254,521, Apr. 15, 1981, Pat. No. 4,344,382. This application Aug. 5, 1982, Ser. No. 405,346

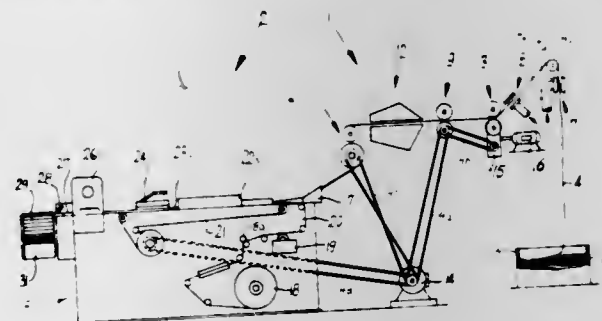
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014807

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B05B 13/02

U.S. Cl. 118—674

9 Claims



1. Apparatus for applying a liquid to a running layer, comprising a source of liquid; means for continuously transporting the layer along a predetermined path; an ultrasonic atomizing device adjacent to said path and including an atomizing surface extending at least substantially across the full width of the layer in said path, said device being operable to spray atomized liquid onto successive increments of the running layer in said path; and means for supplying liquid from said source to said atomizing device, including means for delivering to said device metered quantities of liquid.

4,412,506

# ADHESIVE COATING MACHINE

Shigeru Morita, Suita, and Masami Furuhashi, Tokyo, both of Japan, assignors to Nippon Flute Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 419,064

Claims priority, application Japan, May 31, 1982, 57-92495

Int. Cl.<sup>3</sup> B05C 5/02

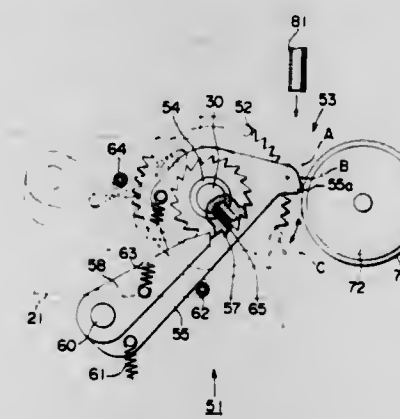
U.S. Cl. 118—683

3 Claims

1. An adhesive coating machine comprising:  
a nozzle disposed so as to face the passage of an object matter to be coated;  
a gear pump for pressure-feeding an adhesive into said nozzle;  
a drive wheel disposed with the circumferential surface thereof positioned inside said passage and rotated by said object matter to be coated during the passage thereof, thereby driving said gear pump;  
a ratchet wheel disposed concentrically and integrally with said drive wheel;  
a swing arm fitted loosely and concentrically with said ratchet wheel and with said drive wheel and urged in the direction opposite the driving rotating direction of said drive wheel;  
a first stopper disposed so as to face said swing arm and an-

choring said swing arm while the tip of said swing arm projects into said passage;  
a ratchet pawl turnably supported by said swing arm and urged in such a direction that the tip thereof engages with said ratchet wheel; and  
a second stopper disposed so as to oppose said ratchet pawl in the arrangement such that it comes into contact with said ratchet pawl and disengages the tip of said ratchet pawl from said ratchet wheel when the tip of said swing arm is pushed by said object matter to be coated and rotates in the same

direction as the driving rotating direction of said drive wheel and the tip moves back from said passage during the passage of said object matter to be coated;  
said gear pump being driven by the passage of said object matter to be coated via said drive wheel;  
said ratchet wheel being rotated by the return rotation of said swing arm after the passage of said object matter to be coated, thereby rotating said drive wheel in a direction opposite the driving rotating direction of said drive wheel and reversely rotating said gear pump.



# MAGNETIC RECORDING MEDIUM MANUFACTURING DEVICE

Tatsuji Kitamoto, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

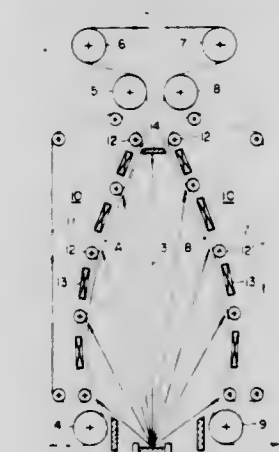
Filed Jul. 20, 1981, Ser. No. 284,863

Claims priority, application Japan, Aug. 14, 1980, 55-112084

Int. Cl.<sup>3</sup> B05C 11/14

U.S. Cl. 118—718

9 Claims



1. A magnetic recording medium manufacturing device comprising: a molten metal evaporating source; and means for transporting a flexible belt-shaped support above said evaporating source along a curved path formed such that all evaporated metal flow lines originating from a central point on an evaporation surface of said molten metal and contacting points on a line of said support which extends over a longitudinal length of said support where said evaporated metal flow lines contact said support from a substantially constant angle of incidence with respect to tangent lines formed at respective contact points of said support line, said tangent lines extending

4,412,508  
NOZZLE BEAM SOURCE FOR VAPOR DEPOSITION  
Robert J. Ney, St. Petersburg, Fla., and Erich Hafner, Tinton Falls, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Continuation of Ser. No. 216,092, Dec. 15, 1980, abandoned.  
This application Aug. 11, 1982, Ser. No. 407,019  
Int. Cl.<sup>3</sup> C23C 13/12

U.S. Cl. 118—726

3 Claims



1. Apparatus for generating a beam of metal vapor to plate a workpiece comprising a graphite housing having top, bottom and side walls, said bottom and side walls including graphite sealing plugs, a graphite partition connected to the housing top wall and extending longitudinally within the housing parallel to the side walls, said partition dividing the housing into a source chamber, and a collimation chamber, an aperture provided in said partition interconnecting said chambers, a supply of metal to be vaporized provided in said collimation chamber, said metal having the property of not wetting or penetrating graphite, the lower end of said partition being spaced from the bottom wall of the housing to provide a flow passage between the collimation chamber and the source chamber, a graphite source tube mounted in the source chamber, the upper end of said source tube extending through the top wall of said housing, the lower end of said tube communicating with said flow passage, a wick mounted within said source tube, the lower end of said wick communicating with said flow passage, a source aperture provided in the side wall of said source tube adjacent said partition aperture, the upper end of said wick extending adjacent said source aperture, a collimation aperture formed in the side wall of said housing communicating with said collimation chamber and aligned with said source aperture, means for heating said collimation chamber to maintain a temperature below the melting point of said metal and for periodically raising the temperature to the melting point of said metal, thereby maintaining a relatively low metal vapor pressure in said collimation chamber, and means for heating said source tube to a temperature sufficient to vaporize said metal and to maintain a high metal vapor pressure within said source tube, whereby the pressure differential between the collimation chamber and the source tube creates a vapor flow through said source aperture, a substantial portion of said flow striking the wall of the collimation chamber surrounding the collimation aperture and condensing the metal to liquid, the remaining portion of the flow passing through the collimation aperture to impinge upon said workpiece, said flow passage recirculating the liquid metal from the collimation chamber to said wick.



within said source tube, and including a clearance formed between said metal and said graphite walls and sealing plugs and graphite partition and source tube when said metal is in a cool state between heating cycles, said metal expanding into said clearance upon heating to the melting point without exerting force on said walls and plugs and partition and source tube.

4,412,509

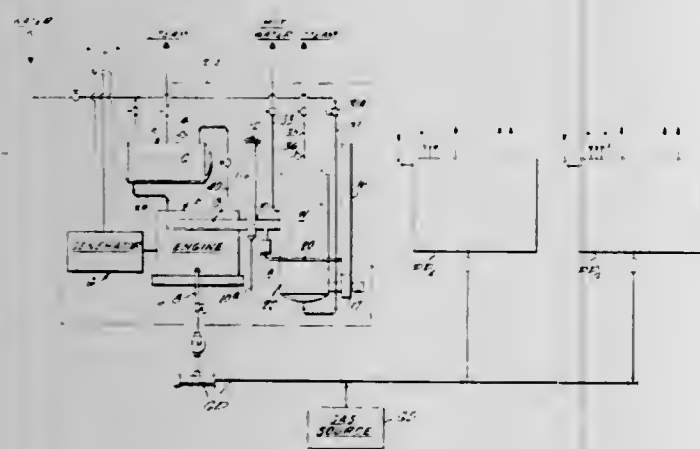
# ENERGY CONVERSION SYSTEM AND COMPONENTS THEREOF

Robert B. Black, 2925 Denver St., Corpus Christi, Tex. 78404  
Division of Ser. No. 58,779, Jul. 19, 1979, abandoned, and a continuation of Ser. No. 46,240, Jun. 7, 1979, Pat. No. 4,271,789, which is a continuation-in-part of Ser. No. 813,667, Jul. 7, 1977, Pat. No. 4,199,831, which is a continuation-in-part of Ser. No. 794,044, May 5, 1977, abandoned, which is a continuation of Ser. No. 620,327, Oct. 3, 1975, abandoned, which is a division of Ser. No. 568,699, Apr. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,094, Apr. 18, 1974, Pat. No. 4,025,291, which is a division of Ser. No. 369,084, Jun. 11, 1973, abandoned, which is a division of Ser. No. 192,262, Oct. 26, 1971, Pat. No. 3,844,270. This application Apr. 2, 1981, Ser. No. 250,172

Int. Cl.<sup>3</sup> F22B 5/00

U.S. Cl. 122—17

14 Claims



1. A heat exchanger for heat transfer between two fluids, the exchanger having a first bundle of tubes having tube sheets at its ends, a second bundle of tubes extended through the tubes of the first bundle and having tube sheets at its ends, the tubes of the second bundle having a smaller outside diameter than the inside diameter of the tubes of the first bundle to provide annular flow channels, the tube sheets of the second bundle being spaced axially beyond the tube sheets of the first bundle, means including the tube sheets for both bundles providing header chambers at each end of the exchanger for the tubes of the first bundle, the chamber at one end having an inlet connection for one fluid and the chamber at the other end having an outlet connection for said one fluid, and means providing headers for the tubes of the second bundle arranged axially beyond the tube sheets for the second bundle, a double walled shell, with both walls surrounding the tube bundles and having an annular chamber between the shell walls communicating with the headers for the tubes of the second bundle, the header for the second bundle at one end having an inlet connection for the other fluid and the header for the second bundle at the other end having an outlet connection for said other fluid, the inlet connections for the two fluids being located at opposite ends of the exchanger to provide directional counterflow of the two fluids respectively through the interior of the tubes of the second bundle and through said annular flow channels.

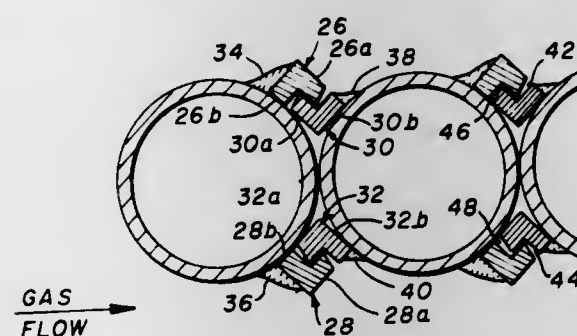
4,412,510

# FLEXIBLE TIE FOR TANGENT TUBE CONSTRUCTION

Glenn M. Perry, and Robert P. Sullivan, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Del.  
Filed Nov. 3, 1978, Ser. No. 957,623  
Int. Cl.<sup>3</sup> F26B 37/24

U.S. Cl. 122—510

6 Claims



1. In a superheater assembly designed for employment in the flow path of a gas, the combination comprising:
  - a. a first tubular member supported within the superheater assembly so as to define a plane therewithin;
  - b. a second tubular member supported in tangential relation to said first tubular member so as to define an area of tangential engagement between said first and second tubular members, said area of tangential engagement between said first and second tubular members lying within said plane;
  - c. a first tie means operative for tying together said first and second tubular members at a location spaced in a first direction from said plane, said first tie means including a first tie member and a second tie member, said first tie member being attached to said first tubular member at a point spaced in said first direction from said plane so as to face in the same direction as that in which the gas flows, said second tie member being attached to said second tubular member at a point spaced in said first direction from said plane such that said second tie member is located in closer proximity to said plane than is said first tie member, said second tie member being attached to said second tubular member so as to face in a direction opposite to the direction in which the gas flows, said first tie member having a portion thereof projecting inwardly relative to said plane, said second tie member having a portion projecting outwardly relative to said plane, said inwardly projecting portion of said first tie member being engageable with said outwardly projecting portion of said second tie member in sliding relation thereto so as to effectuate a tying together of said first and second tubular members at said location spaced in said first direction from said plane; and
  - d. a second tie means operative for tying together said first and second tubular members at a location spaced in a second direction from said plane, said second tie means including a third tie member and a fourth tie member, said third tie member being attached to said first tubular member at a point spaced in said second direction from said plane so as to face in the same direction as that in which the gas flows, said fourth tie member being attached to said second tubular member at a point spaced in said second direction from said plane such that said fourth tie member is located in closer proximity to said plane than is said third tie member, said fourth tie member being attached to said second tubular member so as to face in a direction opposite to the direction of gas flow, said third tie member having a portion thereof projecting inwardly relative to said plane, said fourth tie member having a portion projecting outwardly relative to said plane, said inwardly projecting portion of said third tie member being engageable with said outwardly projecting portion of said fourth tie member in sliding relation thereto so as to effectuate a tying together of said first and second tubular

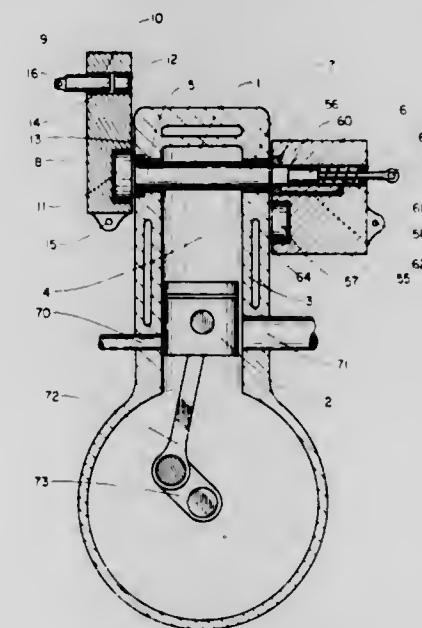
members at said location spaced in said second direction from said plane.

4,412,511

# CHAR AND OIL BURNING ENGINE

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115  
Continuation-in-part of Ser. No. 183,182, Sep. 2, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,019  
Int. Cl.<sup>3</sup> F02B 45/02; F02D 19/04  
U.S. Cl. 123—23

44 Claims



1. A char burning engine comprising:
  - a. an internal combustion engine mechanism, comprising at least one cylinder with pistons operative therein;
  - b. a combustion chamber comprising: means for containing char fuel and ashes, so that said char fuel and ashes are mechanically separated from the piston and cylinder of the engine, said means for containing having a refuel end, with passages through said means for containing char fuel and ashes, so that air can flow readily into said char fuel during engine compression, and so that gases can flow readily out of said char fuel during engine expansion, whereby combustion of said char fuel can occur within said means for containing char fuel and ashes, each cylinder of said internal combustion engine being equipped with at least one of said combustion chambers;
  - c. means for sealing the refuel end of said means for containing char fuel and ashes through which refueling takes place, during engine compression and expansion processes, and for refueling fresh char fuel at intervals into said means for containing char fuel and ashes, said means being a refuel mechanism;
  - d. means for reloading a quantity of fresh char fuel at intervals into said refuel mechanism;
  - e. means for controlling the density of the engine intake air in order to control engine torque;
  - f. whereby said internal combustion engine becomes a char burning engine capable of running on char fuels.

4,412,512

# FUEL SUPPLY SYSTEM

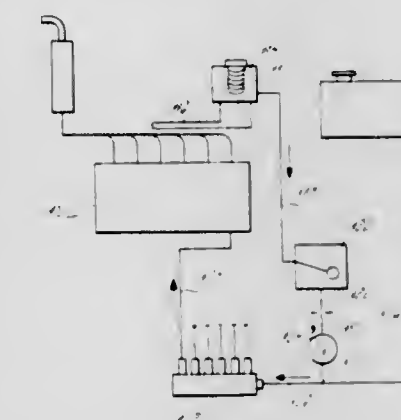
Eric C. Cottell, Private Rd., Bayville, N.Y. 11709  
Continuation of Ser. No. 2,626, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 968,316, Dec. 11, 1978, abandoned.  
This application Oct. 23, 1980, Ser. No. 199,782  
Int. Cl.<sup>3</sup> F02M 25/02

U.S. Cl. 123—25 E

9 Claims

1. A fuel supply system comprising a pump and nozzle means, a source of fuel, a source of water, first conduit means through which a mixture of fuel and water is delivered to said pump, means establishing liquid flow communication from said fuel source and water source to said first conduit means at at

least one location spaced from said pump, second conduit means through which the fuel and water mixture is delivered from said pump to said nozzle means, and means disposed within said second conduit means for agitating said fuel and water flowing within said second conduit means from said pump to said nozzle whereby an intimate mixture of fuel and



water is delivered to said nozzle where final emulsification takes place, said means for agitating said fuel and water in said second conduit means, said pump and said nozzle constituting means for emulsifying the fuel and water, said pump comprising pressure means for supplying pressure in said first and second conduit means and through said agitating means.

4,412,513

# WATER-COOLED INTERNAL COMBUSTION ENGINE WITH DIRECT FUEL INJECTION

Bertram Obermayer; Josef Greier, both of Graz, and Walter Mandl, St. Pölten, all of Austria, assignors to Simmering-Graz-Pauker AG, Vienna and AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbH, Graz, both of, Austria

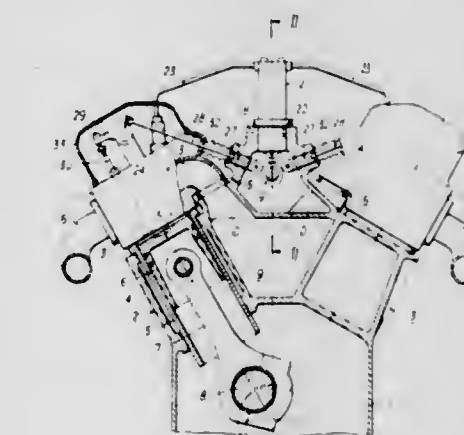
Filed Feb. 9, 1981, Ser. No. 232,550

Claims priority, application Austria, Feb. 8, 1980, 704/80

Int. Cl.<sup>3</sup> F02M 39/02; F02B 67/02

U.S. Cl. 123—55 VE

2 Claims



1. A water-cooled, four stroke internal combustion engine which includes
  - a. a V-shaped cylinder block which includes a number of cylinders, the cylinders being arranged in two banks, said V-shaped cylinder block defining a V-shaped space between the two cylinder banks therein, the cylinders in each said bank being spaced apart and including operable inlet and exhaust valves at their upper ends and individual liners which define coolant spaces therearound,
  - b. a flat upper wall means extending from said cylinder banks at a point coincident with the upper ends of the cylinders in each said bank across the V-shaped space so as to form a receiving chamber for combustion air therewith, said wall



means being unitary with the cylinder block and providing structural reinforcement thereto,  
 means forming a housing above the receiving chamber in the V-shaped space, said upper wall means also constituting the lower wall of the housing, said means forming the housing also being unitary with the cylinder block,  
 a camshaft located within said housing and centrally positioned above the receiving chamber, said camshaft being oriented in parallel with said cylinder banks in the cylinder block,  
 a number of push rods, each push rod extending between a respective inlet valve and exhaust valve of a cylinder to a point cooperable with the camshaft in the housing, and  
 a number of individual pumps, each pump being cooperable with the camshaft in the housing for injecting fuel into a respective cylinder.

4,412,514

# LOW NOISE LEVEL INTERNAL COMBUSTION ENGINE

Yoshikazu Hayakawa, Yokosuka, and Naoki Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

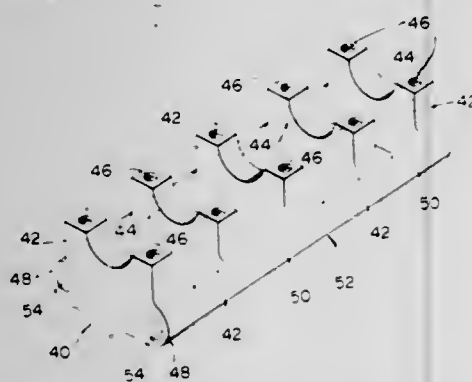
Filed Apr. 20, 1981, Ser. No. 255,768

Claims priority, application Japan, Apr. 21, 1980, 55-44256[U]

Int. Cl.<sup>3</sup> F02F 7/00

U.S. Cl. 123—195 R

6 Claims



1. An internal combustion engine having a cylinder block extending along a longitudinal axis and being formed with a plurality of main bearing carrying sections having downwardly facing ends, comprising:

a bearing support beam structure extending along a longitudinal axis and being secured to the cylinder block and including a plurality of main bearing carrying sections having upwardly facing ends which are made of an aluminum alloy and which cooperate respectively with said main bearing carrying sections of the cylinder block, the longitudinal axis of said bearing support beam structure extending parallel to the longitudinal axis of the cylinder block; and

a steel pipe securely disposed through and in contact with all the main bearing carrying sections of said bearing support beam structure and extending in parallel with the longitudinal axes of the cylinder block and said bearing support beam structure, wherein said main bearing carrying sections of said cylinder block are located above said main bearing carrying sections of said bearing support beam structure and are aligned along the longitudinal axis of the cylinder block with the ends of respective main bearing carrying sections being secured together and vertically disposed with respect to the cylinder block.

## 4,412,515 LINE MULTICYLINDER INTERNAL COMBUSTION ENGINE

Josef Fritzenwenger, Anzing, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

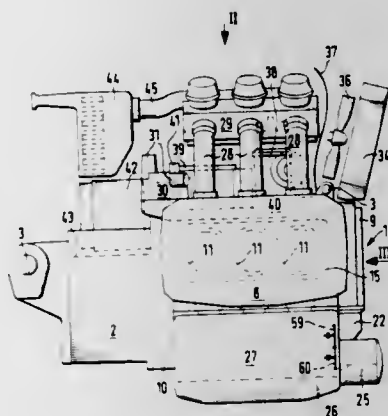
Filed Jun. 2, 1980, Ser. No. 155,661

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922695

Int. Cl.<sup>3</sup> F02B 77/14

U.S. Cl. 123—198 E

6 Claims



3. An internal combustion engine comprising an engine block including a cylinder-crank housing means having disposed therein a plurality of approximately horizontal cylinders and a cylinder head mounted on the housing means, a piston means reciprocally mounted in each cylinder, an approximately horizontally disposed crank shaft means for reciprocally displacing the piston means in the respective cylinders, a housing part connected to and disposed below the cylinder-crank housing means, an exhaust system beginning at an underside of the cylinder head, a part of the exhaust system extending next to said housing part, a first housing cover means disposed on the cylinder-head and extending in a longitudinal direction of the crank shaft means, a second housing cover means disposed on the cylinder-crank housing means in an area of the crank shaft means and extending in a longitudinal direction of the crank shaft means, means for cooling the engine mounted on the front end of the engine above an upper forward edge of the engine block, at least one first auxiliary unit for the engine disposed on top of the engine block behind the cooling means, at least one second auxiliary unit for the engine accommodated by the housing part, a first auxiliary drive shaft being located in the housing immediately below the cylinders, means are provided for drivingly connecting one end of the auxiliary drive shaft to one end of the crank shaft means, a drive flange means is provided on said one end of said first auxiliary drive shaft for forming a power take-off from the engine, a second auxiliary shaft is located in the cylinder crank housing means directly above the cylinders, driving means are provided for drivingly connecting said second auxiliary shaft with said crank shaft means, a starting spur gear being provided at one end of the second auxiliary shaft in the vicinity of said driving means, the second auxiliary shaft driving a dynamo which forms one of the first auxiliary units disposed on the top of the engine, and said starting gear being disposed on a portion of the second auxiliary shaft extending beyond the means for drivingly connecting the same with the crank shaft means.

4,412,516

# LOW-NOISE LEVEL INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

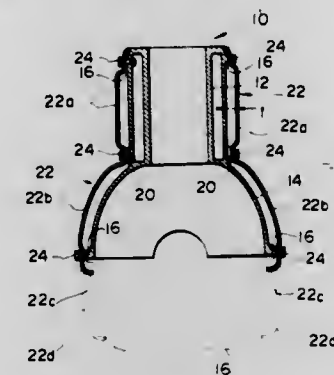
Filed Dec. 23, 1980, Ser. No. 220,184

Claims priority, application Japan, Dec. 25, 1979, 54-180108[U]

Int. Cl.<sup>3</sup> F02B 77/00

U.S. Cl. 123—198 E

7 Claims



1. A low-noise level internal combustion engine having a cylinder block with opposed side portions, comprising:  
 an endless ridge extending along the entire peripheral portion of each of the side portions said ridge extending continuously along the entire upper, lower and side regions of each side portion to enclose a major portion of each side portion; and  
 a soundproof board mounted for sealingly contacting the entire surface of said ridge in a manner to cover at least the major portion enclosed by said ridge, said soundproof board, major portion and ridge defining a sealed air space (1) between the outer surface of said major portion and the inner surface of said soundproof board, said soundproof board being constructed of a material having high vibration damping effect.

4,412,517

# IDLING SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Mamoru Kobashi, Aichi; Shinichiro Tanaka, Toyota, and Hideo Saji, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Nippondenso Co., Ltd., Kariya, both of Japan

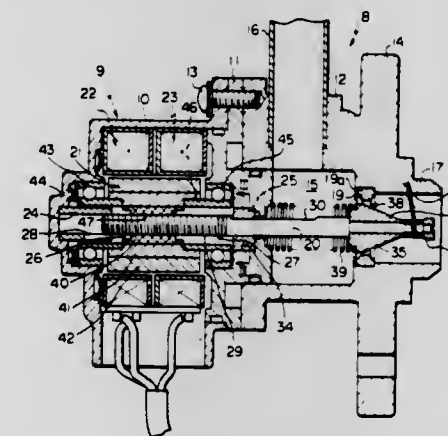
Filed Apr. 21, 1981, Ser. No. 256,188

Claims priority, application Japan, Oct. 6, 1980, 55-141493; Oct. 6, 1980, 55-141494

Int. Cl.<sup>3</sup> F02M 3/00

U.S. Cl. 123—339

13 Claims



1. An idling speed control device for an internal combustion engine having an intake passage for delivering combustion air to the engine, a throttle valve arranged in the intake passage, a bypass passage having a first end connected to the intake passage upstream of the throttle valve and a second end connected

to the intake passage downstream of the throttle valve, a valve member arranged in the bypass passage, a valve shaft connected to the valve member, and drive means for axially moving the valve shaft for controlling the flow area of the bypass passage in response to at least one engine operating condition, wherein said drive means comprises:

a step motor comprising a motor housing, a stator fixed in said motor housing, a rotor rotatably mounted in said motor housing, the rotor having an internally threaded bore coaxial with its axis of rotation and matingly engaging an externally threaded portion of said valve shaft, the motor housing having a bearing receiving hole; and bearing means having an outwardly projecting arm engaging an inner wall of said bearing receiving hole having a contour shape the same as that of the bearing for fixedly mounting the bearing means in said motor housing, said bearing means having a bearing hole of non-circular cross section and said valve shaft having a portion of complementary non-circular cross-section slidably received in said bearing hole, whereby rotation of said rotor is converted to linear motion of said valve shaft.

4,412,518

# IDLE SPEED CONTROL SYSTEM

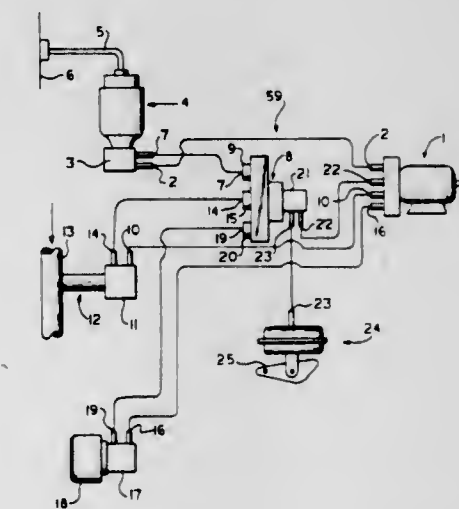
Andrew A. Kenny, Roselle, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 18, 1981, Ser. No. 322,806

Int. Cl.<sup>3</sup> F02B 77/00

U.S. Cl. 123—339

19 Claims



1. A fluid pressure control system for maintaining a desired idling speed of an internal combustion engine comprising:

fluid pressure supply means,  
 idle speed fluid pressure actuator means, said means adapted to maintain the desired engine idling speed by movement of a force member thereof in response to a fluid pressure control signal received thereby,

engine speed sensing means, said means adapted to monitor the rotational speed of the engine and having means associated therewith for converting changes in the engine rotational speed into an output signal proportional to the engine rotational speed that is conveyed to a fluid pressure regulation means that is connected to the fluid pressure supply means and adapted to regulate the fluid pressure supply conveyed thereto to provide a first fluid pressure signal,

at least one fluid pressure signal in addition to said first fluid pressure signal, said pressure signal provided by at least one engine operating condition other than the rotational speed thereof that is desired for use in maintaining the idling speed of the engine having means associated therewith for converting said change into an output signal proportional to the condition monitored that is conveyed to a fluid pressure regulation means that is connected to the fluid pressure supply means and has means associated



therewith for providing said additional fluid pressure signal;

integration means, said means adapted to receive said first and said at least one additional fluid pressure signal and having means associated therewith for combining said signals in the manner desired into a single integrated output signal that is conveyed to a fluid pressure regulation means connected to the fluid pressure supply means and to the idle speed fluid pressure actuator means and has means associated therewith for utilizing said signal to regulate the fluid pressure supply conveyed thereto to provide the fluid pressure control signal for controlling the idle speed fluid pressure actuator means, and

at least one of said engine speed sensing means, said additional engine operating condition sensing means, said fluid pressure regulation means, said integration means, and said actuator means calibratable such that the fluid pressure control signal is able to maintain the desired engine idling speed in response to a change in the rotational speed of the engine.

4,412,519

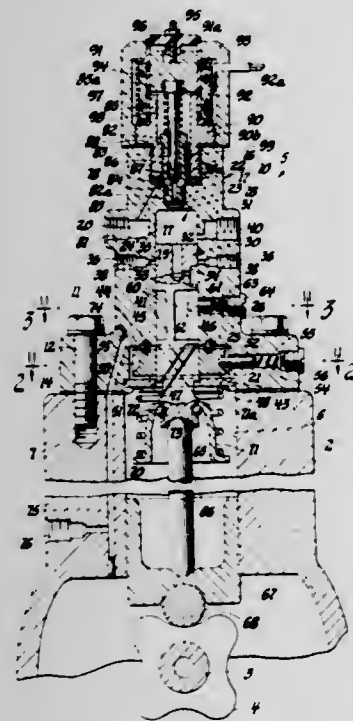
**DIESEL FUEL DISTRIBUTOR TYPE INJECTION PUMP**  
Martin M. Hoch, Rochester, and Donald Stoltman, Henrietta, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 13, 1982, Ser. No. 417,385

Int. Cl.<sup>3</sup> F02M 41/00

U.S. Cl. 123—449

4 Claims



1. A fuel injection pump for the sequential delivery of fuel to the cylinders of an internal combustion engine, said pump including a housing means defining a pump cylinder with a plurality of circumferentially spaced apart discharge passages extending therefrom, the number of said discharge passages corresponding in number to the number of engine cylinders, and a fuel inlet passage to said pump cylinder axially spaced apart from said discharge passages; a pump plunger reciprocally received in the pump cylinder to define therewith a pump chamber with the inlet passage being uncovered by the plunger during the suction stroke thereof and being covered by the plunger during the pumping stroke thereof; a discharge means including a discharge slot on said plunger for effecting flow communication between the pump chamber and one of said discharge passages; drive means including a driven means operatively associated with the opposite end of the plunger to effect reciprocation thereof in timed relationship to engine operation; a pawl and ratchet means including an indexing means operatively associated with said plunger whereby during a pump stroke of said plunger, said pawl and ratchet means is operative to prevent rotation of said plunger and whereby.

during a suction stroke of said plunger, said plunger will be rotatably indexed so that said discharge slot of said plunger is moved into registration with the next in line said discharge passage; and, a solenoid valve controlled spill passage means in flow communication with said pump chamber for the controlled spill flow of fuel from said pump chamber during a pump stroke of said plunger whereby to control the start and end of fuel injection.

4,412,520

**FUEL INJECTION CONTROL APPARATUS**

Masaki Mitsuyasu, Keiji Aoki, and Takayoshi Nakatomi, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

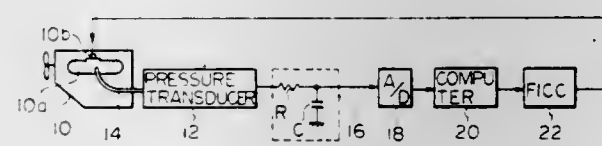
Filed Jul. 28, 1981, Ser. No. 287,806

Claims priority, application Japan, Jul. 30, 1980, 55-106872[U]

Int. Cl.<sup>3</sup> F02B 3/00; F02M 7/00

U.S. Cl. 123—488

4 Claims



1. Fuel injection control apparatus for an internal combustion engine having an intake manifold, comprising:  
a pressure transducer for converting the pneumatic pressure in the intake manifold to an electrical signal;  
a low-pass filter electrically connected to said pressure transducer in series for transmitting said electrical signal below a cutoff frequency which is determined to be a frequency equal to or lower than 40 Hz;  
an analog to digital converter means connected to said low-pass filter in series for converting the output signal from the low-pass filter to a binary number signal;  
means for calculating the pulse width of fuel injection signals in response to said binary number signal from said analog to digital converter means, said pulse width corresponding to the fuel requirements of the engine during steady state and transient operating condition; and  
means for adjusting the amount of fuel injected into the engine in response to said fuel injection signals.

4,412,521

**EVAPORATIVE CARBURETOR AND ENGINE**

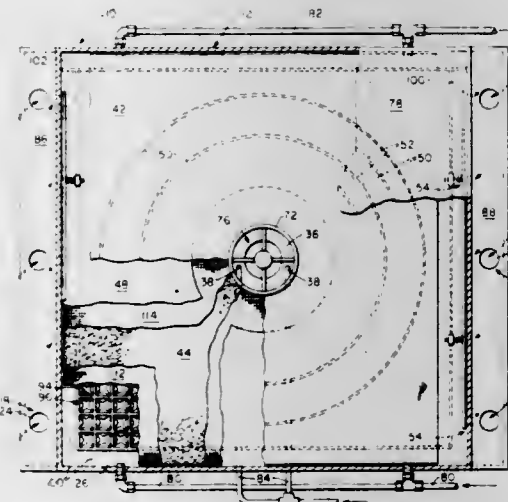
John C. Silva, Jr., 11 Colonial Rd., Ipswich, Mass. 01938

Filed Jul. 10, 1981, Ser. No. 282,226

Int. Cl.<sup>3</sup> F02M 31/00, 13/04

U.S. Cl. 123—522

17 Claims



1. Evaporative carburetor apparatus comprising

A. means forming a normally pressure-tight carburetor chamber having an outlet port for communication with an internal-combustion engine intake manifold;  
B. normally horizontal evaporator tray means mounted within said chamber for containing a selected level of liquid gasoline;  
C. a first valved air inlet for admitting air to the interior of said chamber, said inlet being normally closed and opening automatically in response to the difference in pressure between ambient and a lower pressure in the chamber interior;  
D. means providing a first air passage within said chamber between said first inlet and a level in said tray means below said selected level, so that air drawn into said first inlet and said first passage to said outlet port passes through liquid gasoline in said tray means;  
E. means providing a second air passage within said chamber in series with said first passage and communicating between said tray means and said outlet port;  
F. means for heating fluid passing in said second passage from said tray means to said outlet port, and  
G. a second valved air inlet for admitting air to said chamber along said second passage, said second inlet being externally operable between a substantially airtight closed position and an air passing open position.

4,412,522

**MAGNET IGNITION DEVICE**

Takanori Fujimoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

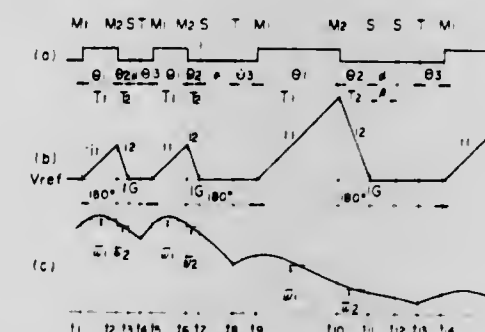
Division of Ser. No. 178,440, Aug. 16, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,221

Claims priority, application Japan, Aug. 27, 1979, 54-109497; Aug. 27, 1979, 54-109498

Int. Cl.<sup>3</sup> F02P 3/12

U.S. Cl. 123—602

3 Claims



1. A magnet ignition device comprising a power source which produces positive and negative output signals in synchronism with rotation of an engine, rectifies the output signals, and applies the rectified signals into an ignition coil;  
a switching element for controlling the current passage of said ignition coil;  
a first angular position detecting device for producing in synchronism with the rotation of said engine a first angular signal corresponding to a given crank angle position of said engine;  
a second angular position detecting device for producing in synchronism with the rotation of said engine a second angular signal supplied directly to said switching element, which second angular signal corresponds to a crank angular position delayed by a given angle relative with respect to said given angular position where said first angular signal is produced and said second angular signal has a wider angular width than that of said first angular signal;  
an ignition timing operation circuit which starts its operation by establishing a reference position in response to the occurrence of said first angular signal to compute an ignition timing in accordance with a running condition of the engine regardless of the amplitude and shape of said first angular signal; and  
a control circuit for bypassing said second angular signal by

a signal obtained by the operation result of said ignition timing operation.

4,412,523

**CATALYTIC GAS-FIRED FURNACE SYSTEM AND METHOD**

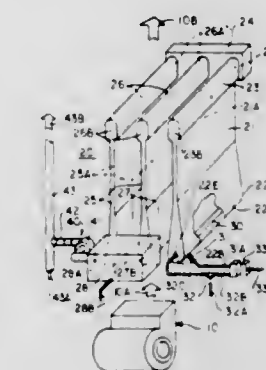
Richard J. Schreiber; John P. Kesseling, both of Mountain View, and Robert M. Kendall, Sunnyvale, all of Calif. assignors to Alzeta Corporation, Mountain View, Calif.

Division of Ser. No. 177,368, Aug. 11, 1980, Pat. No. 4,318,392. This application Oct. 5, 1981, Ser. No. 308,514

Int. Cl.<sup>3</sup> F24C 3/04

U.S. Cl. 126—92 C

3 Claims



1. In a method of operating a gas-fired furnace system, the steps of:  
mixing gas and air components to produce a reactant fuel mixture having a percentage of excess air preselected to be equal to or greater than ten percent;  
burning said reactant fuel mixture across the surface of a fiber matrix burner element contained in a substantially closed combustion chamber disposed in a stream of air to be heated to produce combustion products containing an emission level of nitrogen oxides substantially less than fifteen parts per million on an air-free basis, with CO and HC emissions substantially comparable to those in existing furnaces;  
passing said combustion products through a heat exchanger disposed in said stream of air to be heated and having a wall surface area of a magnitude sufficient to produce substantial condensation of moisture in said combustion products and to produce an overall system thermal efficiency of at least about ninety percent; and  
venting residual combustion products from said heat exchanger to the outside atmosphere.

4,412,524

**FIRE-GUARD**

John B. Ratelband, Utrechtsestraat 55-34, Rynstateflat, 6811 LV Arnhem, Netherlands

Continuation-in-part of Ser. No. 105,566, Dec. 20, 1979, Pat. No. 4,304,216, which is a continuation-in-part of Ser. No. 86,768, Oct. 22, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 303,844

Claims priority, application Netherlands, May 14, 1979, 7903778

Int. Cl.<sup>3</sup> F24B 7/00

U.S. Cl. 126—121

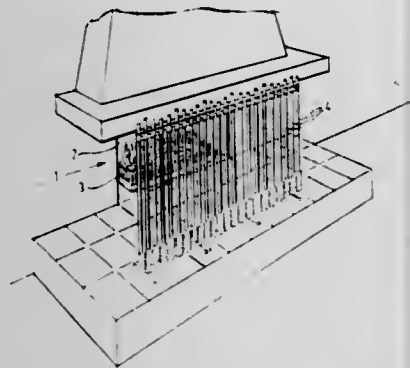
5 Claims

1. A fire-guard for the conversion of radiation heat into convection heat adapted to be placed in front of a source of



radiant energy located in a room to be heated by the source, the fire-guard comprising:

- a plurality of adjacent upwardly extending pipes, each of said pipes having an inlet opening and an outlet opening;
- a plurality of pieces of tubing, each of said pipes being joined to one of said pieces of tubing, each of said pieces of tubing having at least one inlet opening in communication with said inlet opening of one of said pipes; and



hinge means interconnecting pairs of said adjacent pipes to secure said adjacent pipes together so that each of said pipes is pivotable about a vertical axis, said hinge means including overlapping eyes having coaxial vertical holes, said overlapping eyes being formed using adjacent pieces of tubing, said hinge means further including at least one removable vertical pivoting pin extending through eye holes of two adjacent pieces of tubing.

4,412,525

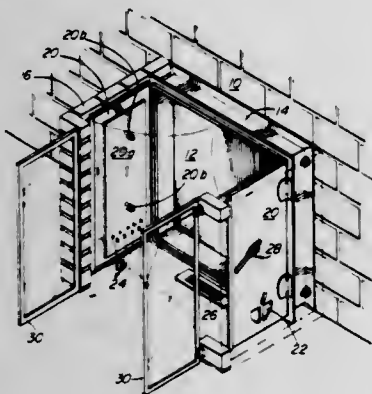
## HIGH EFFICIENCY FIREPLACE MODIFICATION

Harold Aidla, 4027-75 St., Edmonton, Alberta, Canada T6K 0X2

Filed Jun. 10, 1981, Ser. No. 272,174  
Int. Cl.<sup>3</sup> F24B 11/00

U.S. Cl. 126—140

1 Claim



1. Apparatus for improving the function of a fireplace having a front wall and an opening therein, comprising a unitary box-like extension comprising a pair of side walls and a top wall and bottom, said extension extending forwardly of said front wall of said fireplace and having its rear edges sealed with the front wall of said fireplace to surround the opening therein, a first set of impervious doors with said extension, hinged to the walls of said extension adjacent the opening of said fireplace and adapted to close the same, a second set of impervious doors spaced forwardly of said first set of doors to close said extension; a fresh air duct means opening into said extension between said first and second sets of doors; and variable damper means in said first set of doors to permit flow of air from said fresh air duct through said first set of doors into said opening.

4,412,526

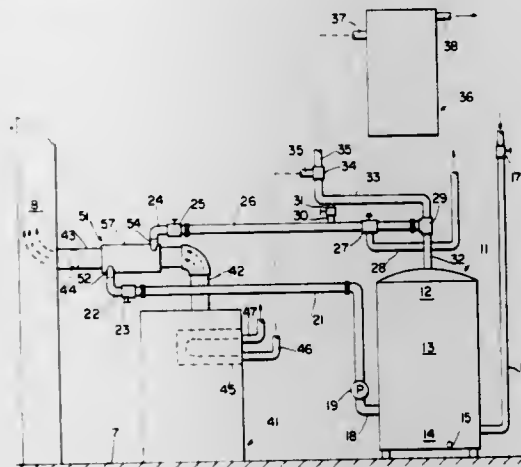
## WATER TEMPERING SYSTEM

Louis DeGrose, 154 Elizabeth St., Pittston, Pa. 18640  
Filed Jan. 16, 1981, Ser. No. 225,034

Int. Cl.<sup>3</sup> F24H 9/12

U.S. Cl. 126—365

7 Claims



1. A water heating apparatus for recovering energy from exhaust gases flowing through an exhaust duct connected to a source of heat, said water heating system comprises:

- a heat exchange means mounted to receive the exhaust gases and containing fluid passage means extending there-through for conveying water through said heat exchange means so that the water is heated by the exhaust gases;
- a storage tank for storing tempered water from said heat exchange means;
- a first conduit means for conveying water from said storage tank to said heat exchange means; and
- a second conduit means for conveying heated water from said heat exchange means to said storage tank, said second conduit means includes an outlet tube for conveying tempered water out of the water heating apparatus, wherein said second conduit means comprises:
- a discharge pipe section connected to an outlet of said heat exchange means, said discharge pipe is slightly inclined with respect to a horizontal plane for encouraging uniform flow of heated water therethrough;
- an outlet duct connected to said discharge pipe section in which one end portion of said outlet duct is connected to the upper portion of said storage tank and the other end portion of said outlet duct is connected to said outlet tube of the water heating apparatus; and
- a bypass pipe section connected to said discharge pipe and said outlet tube of the water heating apparatus for conveying heated water directly from said heat exchange means to the outlet of the water heating apparatus without mixing with the water in said outlet duct.

4,412,527

## GREENHOUSE OF AN UNDERGROUND HEAT ACCUMULATION SYSTEM

Kunio Fujie, Tokyo; Akinari Uchida, Ibaraki, and Kazuhiko Abe, Urawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1981, Ser. No. 251,544  
Claims priority, application Japan, Apr. 9, 1980, 55-45594  
Int. Cl.<sup>3</sup> F24H 7/00; F24J 3/02

U.S. Cl. 126—400

14 Claims

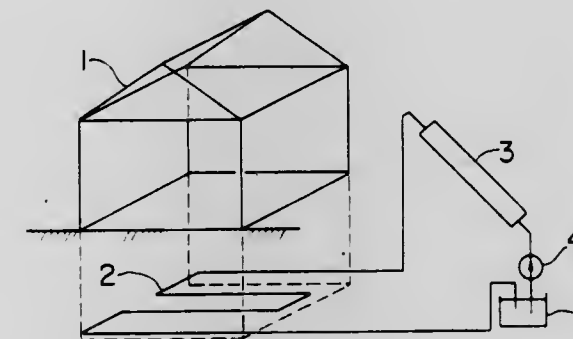
1. A greenhouse having an underground heat accumulation system comprising a main body having heat from a heat source accumulated underground below a floor thereof for use in heating an interior of the greenhouse, comprising:

- an underground radiator located at a predetermined depth below the floor of the greenhouse, said underground radiator cooperation with soil in a vicinity thereof to constitute an underground heat accumulating section;

a solar heat collector for collecting radiant energy from the sun, said solar heat collector being thermally connected to said underground radiator of said underground heat accumulating section;

a fluid heated by the radiant energy collected by said solar collector, said fluid being circulated through the underground radiator of the underground heat accumulating section; and

wherein the predetermined depth of the underground radiator is determined by the relationship:



$$x = t/C$$

where:

$x$  = predetermined depth of the underground radiator,  
 $t$  = a time period, in months, from a moment at which an accumulation of solar heat has begun until a moment at which the solar heat is used in the greenhouse, and  
 $C$  = a constant determined in accordance with a physical property of the soil under the floor of the greenhouse; whereby the solar energy is accumulated in the underground heat accumulating section and utilized as a heat source in the greenhouse after an elapse of the time  $t$ .

4,412,528

## HEAT STORAGE WINDOW

Eugene R. Elzinga, Jr., Warren, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.  
Continuation of Ser. No. 139,290, Apr. 11, 1980, abandoned.  
This application Jun. 1, 1982, Ser. No. 383,721

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—417

5 Claims



1. A window comprising: a light transmissive planar window panel and a heat storage means, said planar window having four edges, said heat storage means disposed on one edge of said planar window panel, the remaining edges of said planar window panel having light reflective material on the surface thereof, said planar window panel including fluorescent material for absorbing a portion of solar radiation incident on said window and re-emitting the absorbed radiation at a different wavelength in random directions whereby the re-emitted radiation will be trapped by the phenomenon of total internal reflection and transmitted through the panel toward said heat storage means whereby the radiation directed toward said heat storage means is stored therein for subsequent use and whereby the solar radiation incident on said window which is

not absorbed by said fluorescent material is transmitted through the panel.

4,412,529

## CLOSED LOOP SOLAR COLLECTOR SYSTEM WITH DUAL RESERVOIRS AND FLUID BYPASS

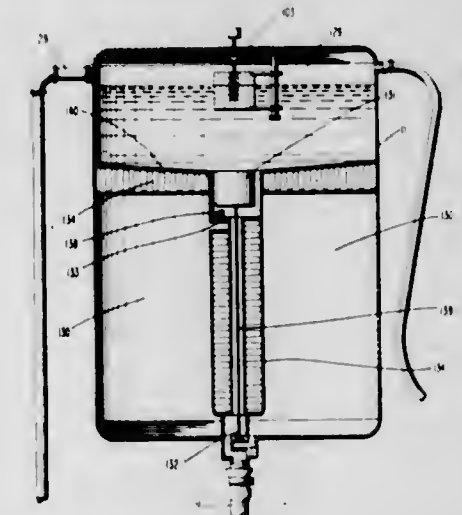
Barry W. Johnston, 1622 Que St., NW., Washington, D.C. 20009

Division of Ser. No. 146,424, May 5, 1980, Pat. No. 4,354,483, which is a continuation-in-part of Ser. No. 43,799, May 30, 1979, Pat. No. 4,286,579. This application Apr. 13, 1982, Ser. No. 368,084

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—419

4 Claims



1. A closed loop solar collector system comprising:

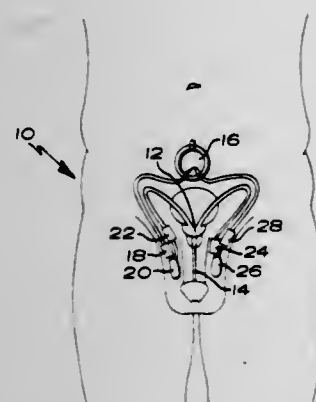
- a fluid receiver for collecting solar heat;
- fluid supply means, connected to said fluid receiver, for supplying a quantity of vaporizable heat transfer fluid to said fluid receiver;
- means, attached to said receiver, for precisely metering a quantity of heat transfer fluid into said receiver from said supply means;
- valve means connected to said fluid receiver for controlling fluid flow from said fluid receiver, said valve means being responsive to the pressure of the vaporized heat transfer fluid from said fluid receiver and to the pressure of condensed heat transfer fluid in said fluid supply means;
- heat exchanger means connected to said valve means for receiving said heat transfer fluid and for absorbing heat energy from said heat transfer fluid which is vaporized in said receiver, said vaporized heat transfer fluid condensing after releasing its latent heat of vaporization to said heat exchanger, said condensed fluid flowing out of said heat exchanger under pressure provided by said vaporized fluid entering said heat exchanger means;
- first reservoir means connected to said heat exchanger for receiving said heat transfer fluid which flows out of said heat exchanger;
- second reservoir means connected to said first reservoir means for receiving heat transfer fluid flowing out of said first reservoir means, said second reservoir means additionally connected to said fluid supply means and to said fluid receiver for receiving heat transfer fluid from said receiver and returning said heat transfer fluid to said fluid supply means;
- said valve means causing fluid to flow to the second reservoir, bypassing the first reservoir, when pressure of condensed fluid falls below a predetermined level.



4,412,530

## DUAL-MODE VALVE PRESSURE REGULATING SYSTEM

John H. Burton, Minnetonka, Minn., assignor to American Medical Systems, Inc., St. Louis Park, Minn.  
 Filed Sep. 21, 1981, Ser. No. 303,992  
 Int. Cl.<sup>3</sup> A61F 1/00; A61B 17/00  
 U.S. Cl. 128—1 R 9 Claims

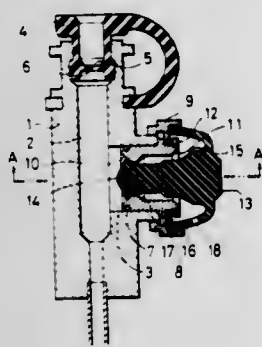


1. A dual-mode valve pressure regulating system in a prosthetic sphincter for controlling incontinence of the type comprising a fluid reservoir, an inflatable cuff for selective occlusion of a vessel, means for pumping fluid to said reservoir from said cuff and means for controlling flow from said pump means to said reservoir connected in fluid flow relationship, the improvement in said flow controlling means comprising:  
 cracking valve means allowing flow from said cuff to said reservoir only upon attainment of a first predetermined pressure in said cuff, said first predetermined pressure being low enough to prevent physiological damage;  
 holding valve means allowing flow from said cuff to said reservoir only upon attainment of a second predetermined pressure in said cuff, said first predetermined pressure being greater than said second predetermined pressure and said second predetermined pressure is at least that required to maintain continence; and  
 flow resistor means in series with said holding valve means.

4,412,531

## SUCTION DEVICE FOR ENDOSCOPE

Miyoshi Chikashige, Kawagoe, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Kawagoe, Japan  
 Filed Oct. 6, 1980, Ser. No. 194,701  
 Claims priority, application Japan, Oct. 6, 1979, 54-138814[U]  
 Int. Cl.<sup>3</sup> A61B 1/00  
 U.S. Cl. 128—4 10 Claims



1. A suction device for an endoscope, the endoscope having a forceps receiver which has a closable forceps insertion bore therein, comprising:  
 means for forming a suction path extending from said forceps insertion bore; and  
 a plug assembly detachably inserted in said suction path in close contact with said suction path forming means, said plug assembly comprising: a ring, a piston, at least one

portion of which is made of a deformable material; and a cylinder member into which said piston is slidably fitted, said cylinder member having valve seats formed at first and second portions thereof, said piston having first and second abutting portions for alternatively engaging said first and second valve seats, wherein abutment with the first valve seat allows passage of ambient air into said bore and wherein abutment with the second valve seat allows for suction in said bore said piston further having an elastic extended member extending outwardly away from said forceps insertion bore from said portion made of said elastic material, said extended member having an end portion abutting against said ring, said extended member biasing said piston so that said piston tends to move outwardly away from said forceps insertion bore, said cylinder member being provided with a suction hole; and a suction pump coupled to said suction hole.

4,412,532

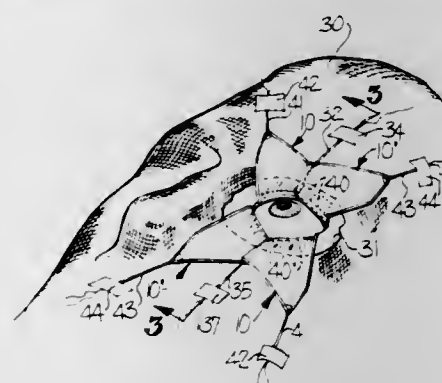
## EYELASH RETRACTOR

Richard R. Anthony, 304 West Union St., Morganton, N.C. 28655

Filed Dec. 21, 1981, Ser. No. 332,617  
 Int. Cl.<sup>3</sup> A61B 17/02

U.S. Cl. 128—20

7 Claims



1. An eyelash retractor for covering and shielding the eyelashes and adjacent portion of the eyelid during the examination of and/or surgery on the eyeball of a patient, said eyelash retractor comprising two separate body members of thin film material including inner and outer edges and opposed sides, a hooked portion extending along the full length of said inner edge of each of said body members and including a lip extending substantially parallel to and spaced from an adjacent portion of said body member, said lip of each of said body members being adapted to extend beneath substantially one-half of the full width of the eyelid of the patient with the portion of said body member adjacent said hooked portion covering and shielding the eyelashes and substantially one-half of the full width of the adjacent portion of the eyelid, each of said body members including inner free edges adapted to mate in abutting or overlapping relationship when said eyelash retractor is in position on the eyelid to substantially completely cover and shield the full width of the adjacent portion of the eyelid, to maintain the eyelashes out of the area of the eyeball, and to provide a clear and unobstructed field for examination of and/or surgery on the eyeball.

4,412,533

## SLEEP-INDUCING DEVICE

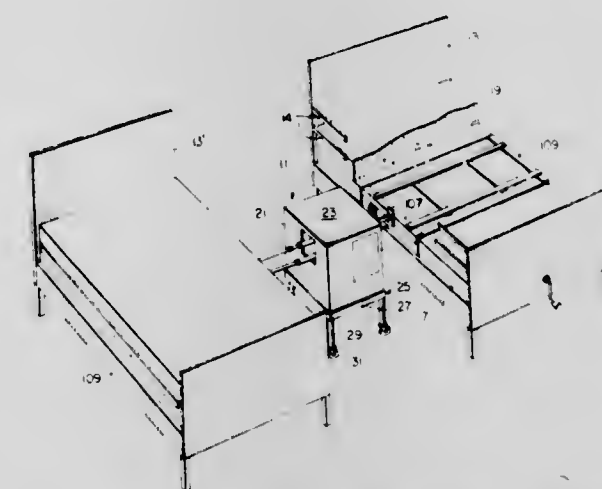
Doris S. Callahan, 2712 Thomas, Fort Worth, Tex. 76117  
 Filed Dec. 31, 1981, Ser. No. 336,100  
 Int. Cl.<sup>3</sup> A61H 1/00

U.S. Cl. 128—33

9 Claims

1. A sleep-inducing device for attachment to more than one bed of the type having a frame, a spring assembly supported by the frame and a mattress supported on the spring assembly, the device comprising:

a base member;  
 a motor mounted on said base member;  
 means for connecting said base member to more than one bed frame;  
 a plurality of rotatable disks;  
 means for driveably and adjustably coupling said motor to each of said crank disks;  
 said crank disks each having a link arm connecting each of said disks to a different spring assembly;  
 each link arm being arranged to oscillate said spring assembly in response to the rotation of said crank disk; and



means for independently varying the degree of oscillation imparted to each spring assembly to which said device is attached, wherein said varying means comprises a guide channel in each of said disks and a lockable sliding pin member arranged to slide in said guide channel when in an unlocked condition, means for rotatably connecting said link arm to said pin member and means for locking each sliding member at any selective position along said guide channel, whereby said link arm is rotatably connected to said sliding member when in a locked condition.

4,412,534

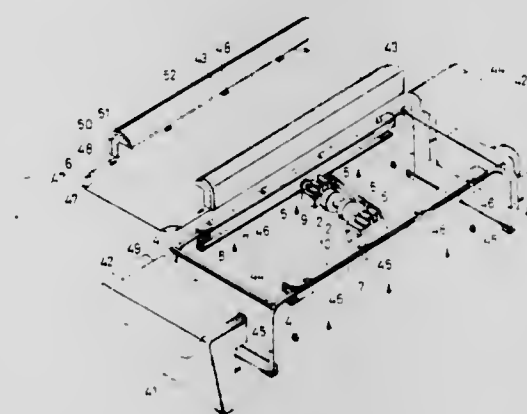
## MASSAGING APPARATUS

Takafumi Hamabe, and Hiroshi Moriwaki, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 257,003  
 Claims priority, application Japan, Jun. 6, 1980, 55-77003  
 Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128—52

9 Claims



7. A massaging apparatus comprising a motor, a rotary shaft axially rotated by the output of said motor, massaging wheels fitted to said rotary shaft and a shifting shaft for shifting the rotary shaft in directions perpendicular to the axial direction of the rotary shaft with the output of the motor, wherein said motor is connected to said rotary shaft and shifting shaft through a gearing including a planetary mechanism, said gearing comprises an input shaft receiving the input of said motor and secured to a sun part in the form of an inner race of said

planetary mechanism, a first output shaft connected between a planetary carrier of said planetary mechanism and either one of the rotary shaft and shifting shaft and a second output shaft connected between a rotary ring in the form of an outer race of the planetary mechanism and the remainder of the shifting shaft and rotary shaft, a plurality of antifriction members are arranged between said inner and outer races, said planetary carrier is formed of a retainer for regulating the operation of said antifriction members, and precompressed springs bias either one of said inner and outer races in a thrusting direction.

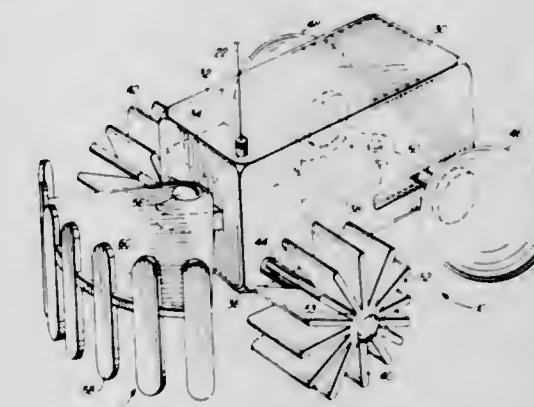
4,412,535

REMOTELY CONTROLLED MASSAGING APPARATUS  
 Dorothy R. Teren, 7795 N. Pines View Dr., Scottsdale, Ariz. 85258

Filed Aug. 17, 1981, Ser. No. 293,135  
 Int. Cl.<sup>3</sup> A61H 15/00

U.S. Cl. 128—57

6 Claims



1. A self-massaging apparatus for massaging one's back, said apparatus comprising in combination:  
 (a) a self-propelled vehicular unit;  
 (b) drive means for propelling said vehicular unit across one's back, said drive means including wheels having angularly displaced radially oriented flexible plates for imparting a varied pressure massaging action to the surface of the back traversed  
 (c) selectively actuatable means for steering said vehicular unit right or left; and  
 (d) a control unit for directing the forward/backward movement and left/right movement of said vehicular unit across one's back, said control unit including a remotely located transmitter for generating command signals relative to speed and direction of said vehicular unit and a receiver located at said vehicular unit for receiving the command signals and translating the command signals into signals for actuating said drive means and said steering means.

4,412,536

## ORTHOPEDIC FOOT SPLINT

Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch, Farmingdale, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,555  
 Int. Cl.<sup>3</sup> A61F 3/00

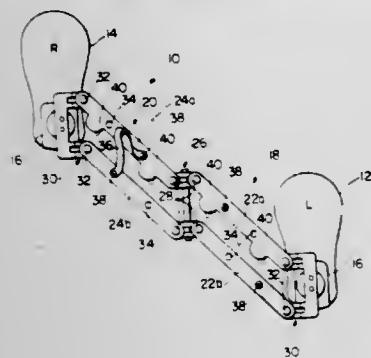
U.S. Cl. 128—80 A

8 Claims

1. An orthopedic foot splint comprising:  
 a pair of shoe engaging plates for engaging shoes having longitudinal axis;  
 linkage means for interconnecting said pair of shoe engaging plates, said linkage means including two pairs of parallelogram links which are pivotable in a horizontal plane relative to each other and to the respective shoe engaging plate; and  
 a flexible nonextensible tether attached to opposed links of one of said pair of parallelogram links, said tether being

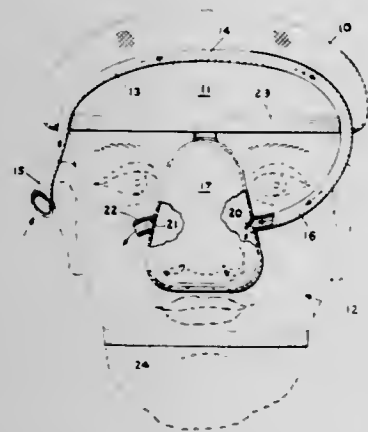


positioned at an angle across said one pair of parallelogram links when said links are extending perpendicular from the shoe such that said one pair of links are pre-



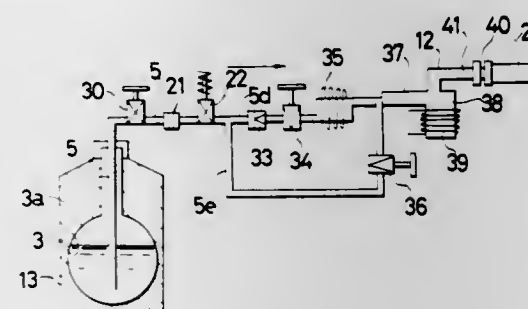
vented from pivoting in the horizontal plane beyond a predetermined angle with respect to the longitudinal axis of the adjacent shoe but which can pivot in the opposite direction freely.

**4,412,537**  
**FRESH AIR BREATHING MASK WITH EXTERIOR HEAT EXCHANGER**  
Howard L. Tiger, Eagle Ridge Way, West Orange, N.J. 07052  
Filed Jul. 27, 1981, Ser. No. 287,309  
Int. Cl.<sup>3</sup> A61M 15/00  
U.S. Cl. 128—204.17



1. A breathing mask for wear on the head comprising a tubular fresh air inlet, a heat exchanger in fluid communication with said fresh air inlet, said heat exchanger being sufficiently flexible to conform with the scalp and being generally thin in order to absorb heat from the scalp, a flexible tube in fluid communication with said heat exchanger, and a check valve for selectively interrupting said flexible tube fluid communication to establish air flow only from said heat exchanger through said flexible tube, a nose mask in fluid communication with said tube and said check valve, another check valve for establishing fluid communication with said mask, a discharge tube for providing fluid communication selectively from said mask and directly to the atmosphere through said another check valve, a cap for securing said heat exchanger to the head, and means for securing said mask to the head.

**4,412,538**  
**APPARATUS FOR REFRIGERATION TREATMENT**  
Toshima Yamauchi, Oita; Sadao Nogami, Beppu; Kengi Sawada, Oita; Jyunichiro Moriya, Kokubunji; Hiroomi Sawada, Ichikawa, and Keizou Kobayashi, Hanno, all of Japan, assignors to Kabushiki Kaisha Kurio-Medikaru, Tokyo, Japan  
Division of Ser. No. 109,271, Jan. 3, 1980, Pat. No. 4,292,973, which is a division of Ser. No. 944,079, Sep. 20, 1978, abandoned.  
This application Jul. 31, 1981, Ser. No. 288,918  
Claims priority, application Japan, Sep. 25, 1977, 52-114967; Feb. 28, 1978, 53-22900  
Int. Cl.<sup>3</sup> A61B 17/36  
U.S. Cl. 128—303.1



1. An apparatus for refrigeration treatment comprising a liquefied gas source, an evaporator for evaporating the liquefied gas at an optimum temperature, an exhaust tube connected between said gas source and said evaporator to conduct the liquefied gas from said gas source to said evaporator, a conduit for introducing the gas vaporized by said evaporator and being connected to said evaporator by means of an outflow port, and a cup provided with a non-return expansion valve attached at the end of said conduit, said cup adapted to apply said vaporized gas to an affected portion of a patient in order to refrigerate said portion with said vaporized gas, said evaporator being provided with an evaporator chamber in which said liquid is accommodated and then evaporated by heat conduction from the wall surface thereof for evaporating the liquefied gas to a gaseous state to be blown out from the cup at a specified temperature and wherein said evaporator is provided with a first flow path having the evaporating chamber therein and a second flow path, said apparatus further comprising a mixing cylinder at the outlets of said evaporating chamber and said second flow path, the liquid and gas flowing through the respective paths being mixed in a spray in said mixing cylinder, and said exhaust tube comprises a valve for preventing the inflow of liquefied gas into said evaporating chamber when the liquid of the liquefied gas fed to said evaporating chamber reaches a specified flow rate.

**4,412,539**  
**REPEATING HEMOSTATIC CLIP APPLYING INSTRUMENTS AND MULTI-CLIP CARTRIDGES THEREFOR**

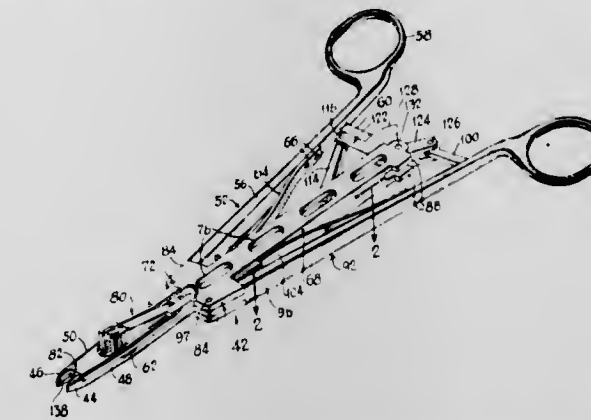
Robert K. Jarvik, Salt Lake City, Utah, assignor to United States Surgical Corporation, Stamford, Conn.  
Continuation of Ser. No. 71,033, Aug. 30, 1979, abandoned, which is a continuation of Ser. No. 730,933, Oct. 8, 1976, Pat. No. 4,166,466. This application May 11, 1981, Ser. No. 262,759  
Int. Cl.<sup>3</sup> A61B 17/12

U.S. Cl. 128—325

5 Claims

4. In a hemostatic clip applying instrument having a pair of jaws for applying hemostatic clips, a pair of closable handle shafts operated in a manner similar to the handle shafts of a conventional hemostat, a channel member having a channel for hemostatic clips leading to the jaws and a pusher for advancing a clip down said channel toward said jaws; a reciprocating mechanism operated by closing the handle shafts for reciprocating the pusher along the center line thereof, comprising: pivotal means for effecting a pivotal connection to the end of said pusher remote from said jaws; and

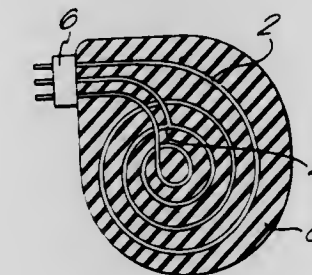
a bell crank rotatable about an axis fixed with respect to said channel for at least a portion of the rotatable movement of said bell crank, and having one leg pivotally connected to



said pivotal means, and another leg being associated with one of said handle shafts so that said bell crank can be rotatably actuated thereby.

**4,412,540**  
**METHOD FOR HIGH FREQUENCY ELECTROMAGNETIC THERAPY**  
Richard H. C. Bental, P.O. Box 47, London, W11, England  
Division of Ser. No. 205,749, Nov. 10, 1980, which is a division of Ser. No. 74,926, Sep. 13, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 429,982  
Int. Cl.<sup>3</sup> A61N 1/40  
U.S. Cl. 128—422

4 Claims



1. A method for promoting healing of body tissue, comprising the steps of:  
generating a high frequency, low-energy electromagnetic field at a treatment frequency determined by an inductive-capacitive tuned circuit;  
radiating the electromagnetic field from a flexible inductor-antenna into an area of body tissue to be treated, at a field strength which promotes healing of body tissue, but which is too small to significantly heat body tissue; and  
controlling the frequency of the field by including the inductor-antenna as a part of the tuned circuit, whereby the strength of the radiated field is independent of the differences in capacitive coupling between the inductor-antenna and the body tissue to be treated.

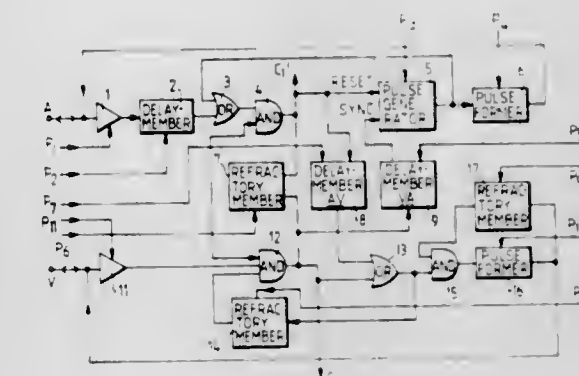
**4,412,541**  
**CARDIAC PACEMAKER**  
Max Schaldach, Königsmarckstr. 12, 1000 Berlin 33, Fed. Rep. of Germany, and J. Walter Keller, 8600 - SW. 54th Ave., Miami, Fla. 33143  
Filed Apr. 12, 1982, Ser. No. 367,791  
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3115124  
Int. Cl.<sup>3</sup> A61N 1/36

U.S. Cl. 128—419 PG

15 Claims

1. A cardiac pacemaker constructed for terminating tachyarrhythmias and including an atrial electrode implantable in a patient's heart for supplying atrial stimulation pulses thereto and at which a pulse appears in response to each atrial contraction, and a ventricular electrode implantable in the

patient's heart for supplying ventricular stimulation pulses thereto, and at which a pulse appears in response to each ventricular contraction, said pacemaker further comprising: separately switchable means connected to each said electrode for causing one said electrode to produce a stimulation pulse at a given time after the occurrence of a pulse on the other said electrode; first time delay means connected to be actuated by signals derived from the heart behavior for supply-



ing a stimulating pulse to said ventricular electrode at a time after the occurrence of a pulse on said atrial electrode, which is shorter than the physiological atrial-ventricular transfer time; and second time delay means connected to be actuated by signals derived from the heart behavior for supplying a stimulating pulse to said atrial electrode at a time after the occurrence of a pulse on said ventricular electrode which is shorter than a selected physiological period in the operation of the heart.

**4,412,542**  
**ROBE GARMENT FOR MASTECTOMY PATIENT**  
D. Jeanie Reichert, E. 1415 - 18th Ave., Spokane, Wash. 99203  
Filed Jul. 19, 1982, Ser. No. 399,199  
Int. Cl.<sup>3</sup> A41C 3/08, 1/06, 3/10  
U.S. Cl. 128—455

9 Claims



1. A robe garment for a mastectomy patient, comprising: an inner garment panel having a closable front opening for circumscribing the upper torso of the patient; said inner garment panel having an elongated lower tension member for circumscribing the patient's torso below the breastline; said inner garment panel having a back panel section extending vertically from a rear garment neckline to the lower tension member and laterally across the back of the garment; said inner garment panel having a pair of interconnectable breast cup members affixed to the lower tension member for receiving and supporting either natural breasts or breast prosthesis; said inner garment panel having elongated shoulder straps



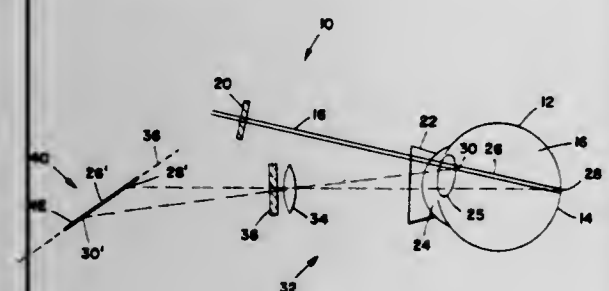
interconnecting the breast cup members and the back panel section for extending upward over the respective shoulders of the patient;  
an elongated outer garment panel affixed to inner garment panel along the shoulder strap members and draped downward over the inner garment panel and of sufficient length to extend below the patient's waist and having a front opening to enable the patient to ingress and regress from the garment through the front opening when the breast cups are unconnected.

#### 4,412,543 APPARATUS FOR DETERMINING THE CONCENTRATION OF A FLUORESCENT MATERIAL IN AN EYE

Arthur Vassiliadis, Palo Alto; Michael H. Brewer, Felton, and Robert E. Myers, Menlo Park, all of Calif., assignors to Nanar, Inc., Colorado Springs, Colo.  
Filed Apr. 9, 1981, Ser. No. 248,881  
Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128—633

6 Claims



1. An apparatus for determining the concentration of an administered fluorescent material at a plurality of locations in an eye which comprises:

- (a) light source means for exciting the fluorescent material along a path length in the eye to emit fluorescence; and
- (b) means for imaging fluorescence responsive to said excitation simultaneously at a plurality of locations along said path length.

#### 4,412,544 ULTRASONIC METHOD AND APPARATUS FOR IMAGING AND CHARACTERIZATION OF BODIES USING AMPLITUDE AND POLARITY DETECTION

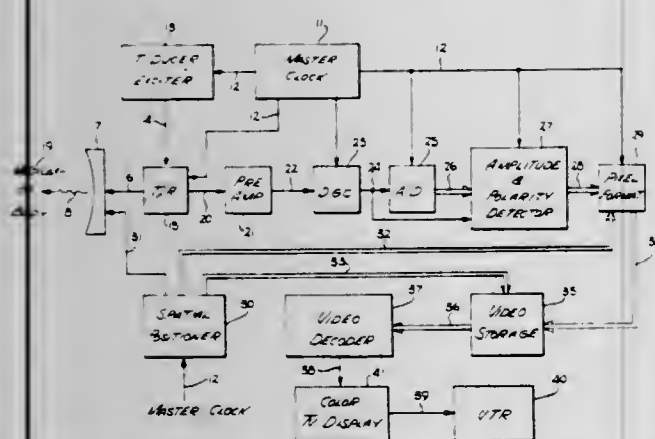
Irwin Beretsky, New City, N.Y.; David E. Arnold, Bergenfield, N.J., and Bruno Pellegrini, Yonkers, N.Y., assignors to Chromasonics, Inc., New City, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,049

Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—660

23 Claims



1. An improvement in an apparatus for processing multiple cycle, ultrasonic pulse echo signals having amplitude and polarity in combination with a transceiver to send and receive ultrasound echoes comprising:

- integrator means for accumulating said ultrasound echo signals for each half wave of said multicycle ultrasound

pulse echo signals and for generating an integrated, absolute value, half-wave signal from said half-wave of said multicycle pulse echo signal; and  
means for examining a plurality of said absolute value, half-wave signals and analyzing said plurality of half-wave signals to determine if a predetermined pattern indicative of a pulse echo among said plurality of half-wave signals is present, said means coupled to said integrator means, whereby individual echoes reflected from complex body media are detected without deconvolutional computation and without the use of specialized ultrasound transducers.

#### 4,412,545 ELECTROMAGNETIC BLOOD FLOWMETER

Haruka Okino, Tokyo; Keitkitsu Ogawa, Tokorozawa; Sunao Takeda, Ichikawa; Hiromichi Mohri, Fujimi, and Shigeru Hiraide, Tokyo, all of Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

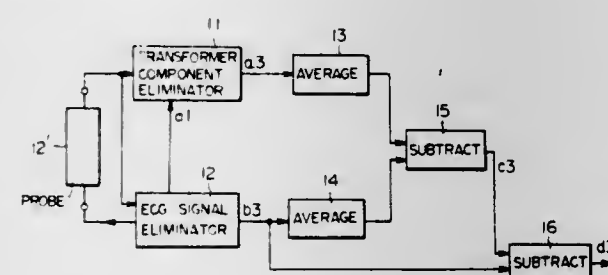
Filed Jun. 25, 1981, Ser. No. 277,115

Claims priority, application Japan, Jul. 2, 1980, 55-89177

Int. Cl.<sup>3</sup> A61B 5/02

U.S. Cl. 128—691

3 Claims



1. An electromagnetic blood flowmeter comprising: means for exciting an excitor coil with alternating rectangular pulses to effect a magnetic field; a probe including the excitor coil for applying to the blood flow an alternative rectangular magnetic field with a non-excitation period interposed between each excitation period and detector electrodes for detecting the induced voltage corresponding to the velocity of the blood flow; ECG signal eliminator circuit means including sample-and-hold circuit means sampling induced voltage output signals of said detector electrodes at the end portion of one of a pair of adjacent non-excitation and excitation periods and holding said sampled signals, means for subtracting each of said sampled signals from each of said output signals for the directly succeeding other of the pair of excitation and non-excitation periods, synchronous detector circuit means detecting the sampled output signals of said subtracting means at a point spaced from the end portion of the succeeding one of excitation and non-excitation periods, and hold circuit means producing the envelope of output signals of said synchronous detector circuit means; transformer-component eliminator circuit means; transformer-component extracting means averagely subtracting output signals of said transformer-component eliminator circuit means from those of said ECG signal eliminator circuit means; and means for subtracting output signals of said transformer-component extracting means from those of said ECG signal eliminator circuit means; said transformer-component eliminator circuit means including means for generating a voltage corresponding to the transformer component  $V_{TM}$  of induced voltage output signal of said detector electrodes for each excitation period on the basis of the transformer component  $V_T$  of sampled induced voltage output signal of said detector electrodes for each non-excitation period in accordance with the relation  $V_T = KV_{TM} + V_O$  ( $K$ : the constant of proportion,  $V_O$ : offset voltage), means for subtracting said voltage  $V_{TM}$  from the output signal of said probe directly before or after each excitation period, synchronous detector circuit means detecting the sampled output signals of said subtracting means for each excitation period and hold

circuit means producing the envelope of output signals of said synchronous detector circuit means.

#### 4,412,546 CARDIAC MONITORING APPARATUS

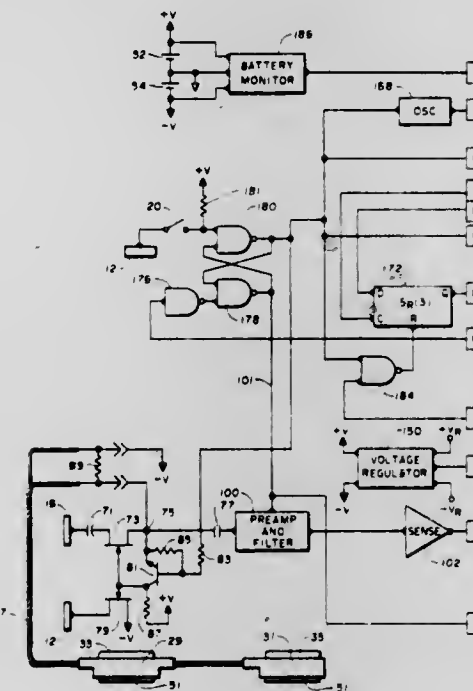
Richard N. Barthels, Mesa, Ariz., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 37,407, May 9, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,559

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—709

7 Claims



1. In an electrical cardiac monitoring system including signal processing means, enabling means for enabling said signal processing means, an input circuit path for coupling electrocardiac signals to said signal processing means, switch means coupled so as to change the state of said enabling means from a first state to a second state when said switching means is operated, a first electrode sensing means coupled to a user at a first point, a second electrode sensing means coupled to the user at a second point, power supply means coupled to supply the electrical energy through said user in a first current path between said first and said second points so as to generate a first electrocardiac signal wherein electrocardiac signals supplied along said input circuit path to said signal processing means are processed by said signal processing means only when said enabling means is in said second state, the improvement comprising: a third electrode sensing means coupled to the user at a third point, a fourth electrode sensing means coupled to the user at a fourth point wherein said power supply means is coupled to supply electrical energy in a second current path to said user between said third and fourth points so as to generate a second electrocardiac signal, control means and interconnecting means selectively coupled between said third and said fourth electrode sensing means and said control means wherein said control means is constructed to prevent said first electrocardiac signal being coupled through said first current path and to allow said second electrocardiac signal to be coupled through said input circuit path to said signal processing means when said interconnection means is coupled to said control means and said enabling means is in its second state and further wherein said first electrocardiac signal is coupled through said input circuit path to said signal processing means when said interconnecting means is not coupled to said control means.

#### 4,412,547 NEUROLOGICAL MONITORING DEVICE

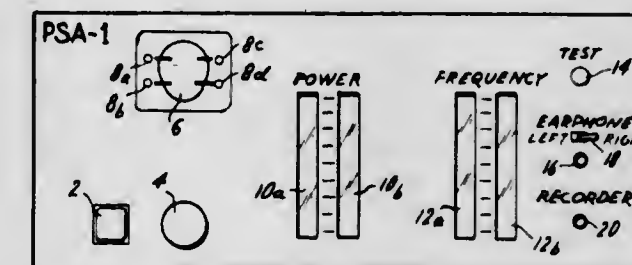
Alfred S. Callahan, Mobile, Ala.; James S. Rhodes, and Timothy L. Johnson, both of Wellesley, Mass., assignors to Neurologics, Inc., Nashville, Tenn.

Filed Apr. 29, 1981, Ser. No. 258,588

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—731

7 Claims



3. A brain wave analyzer adapted to receive brain wave signals from a patient undergoing an operation, analyze said brain wave signals, and provide brain wave frequency and amplitude information, said brain wave analyzer comprising:

- filter means for receiving said brain wave signal and having a predetermined pass band, said filter means providing a filtered output;
- detector means for receiving said filtered output for detecting the amplitude of said brain wave signal and for providing said brain wave amplitude information in accordance with said detected amplitude;
- converter means for receiving said filtered output for detecting, over a frequency range greater than said predetermined pass band, the instantaneous frequency of said brain wave signals having amplitudes above a predetermined amplitude, and for providing said brain wave frequency information in accordance with said detected frequency, to thereby allow the frequency of said brain wave signal to be tracked over said frequency range greater than said pass band;
- and linear amplitude and frequency displays for displaying said amplitude and frequency information.

#### 4,412,548 MULTIPLE SAMPLE NEEDLE ASSEMBLY

Louis Hoch, Nutley, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Jul. 30, 1981, Ser. No. 288,640

Int. Cl.<sup>3</sup> A61B 5/14

U.S. Cl. 128—764

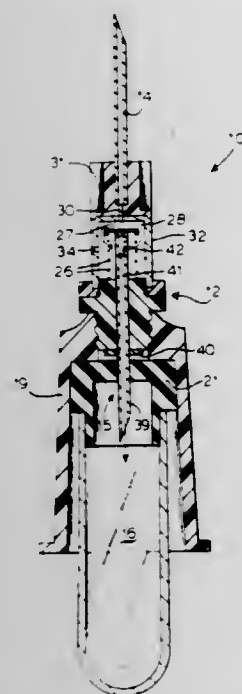
8 Claims

1. A multiple sample needle assembly for determining vein entry when collecting blood samples from a patient comprising:

- a housing having a forward end, a rearward end and a chamber within, said housing being translucent at least around the chamber so that said chamber is viewable by a user of said assembly;
- a first cannula in fluid communication with said chamber extending outwardly from said forward end adapted for insertion into a patient;
- a second cannula slidably positioned in said rearward end and having a first end portion extending outwardly from said rearward end and a second end portion extending inwardly into said chamber with an access opening extending through the wall of said second end portion and providing fluid communication between said second end portion and said chamber; and
- a tightly wound coil spring inside said chamber surrounding the interior portion of said second cannula, said spring being sealingly affixed to the rearward end of said housing; a cap extending over and sealing the end of said spring opposite said end affixed to said rearward end of said



housing, said cap being connected to said second cannula, said tightly wound coils and said cap adapted to prevent blood in said chamber from entering into said access opening in the compressed position of said spring, said second cannula adapted to slide inwardly into said chamber under the influence of a force applied to said first end portion to thereby expand said spring and produce spaces between



said coils so that blood in said chamber flows through said spaces into said access opening for collection through said second cannula, said spring adapted to become tightly compressed upon removal of said force, said compressing movement sliding said second cannula outwardly from said chamber, and said compressed spring preventing blood from flowing through said access opening.

4,412,549

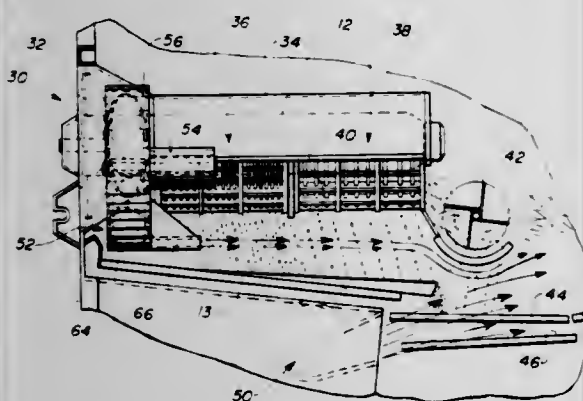
**COMBINE HARVESTER WITH IMPROVED CLEANING**  
E. William Rowland-Hill, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Oct. 29, 1981, Ser. No. 316,253

Int. Cl.<sup>3</sup> A01F 12/48

U.S. Cl. 130—27 T

6 Claims



1. A harvester comprising:  
rotary means in the harvester for threshing and separating crop material, said rotary means having an infeed portion; means connected to the harvester for feeding crop material to the infeed portion;  
a grain pan operably connected for receiving crop material from said rotary means and transporting the crop material received thereon, said grain pan being spaced below said rotary means;  
means for cleaning grain moving from said rotary means to said grain pan, said means for cleaning including a first fan mounted in a housing, said housing including a plenum

portion and a substantially flat, elongated spout for moving a substantially flat sheet of forced air between said rotary means and said grain pan, said first fan being operable to clean crop material before being received on said grain pan;  
a sieve operably connected for receiving crop material from said grain pan, said sieve being spaced from said grain pan; and  
further means for cleaning grain moving from said grain pan to said sieve, said further means including a second fan for moving air between said transport means and said sieve.

4,412,550

**COIN ACCUMULATOR ASSEMBLY**  
Kenkichi Watanabe, and Setsuo Hata, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

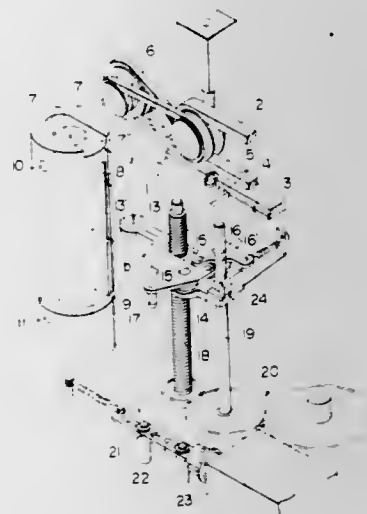
Filed May 7, 1981, Ser. No. 261,573

Claims priority, application Japan, May 8, 1980, 55-61162

Int. Cl.<sup>3</sup> G07D 9/06

U.S. Cl. 133—8 A

4 Claims



1. A coin accumulator assembly for use in a coin wrapping machine, comprising a coin accumulator tube, a shutter movably inserted into said coin accumulator tube for supporting coins stacked in the accumulator tube until a predetermined number of coins is accumulated and for opening to pass coins for a further treatment when said predetermined number of coins is accumulated in said coin accumulator tube, and means for stepwisely lowering said shutter, wherein said coin accumulator tube has a vertically-extending slit and a circumferential slit formed at the lower portion of the tube, and said shutter includes substantially symmetrical shutter plates each having a generally semicircular free end, an elongated stem portion and a generally trapezoidal base portion, said shutter plates being closed during the counting and accumulating operation with their free ends snugly received in the cavity of said coin accumulator tube to form the bottom of the tube and with their stem portion extending through said vertically-extending slit.

4,412,551

**APPARATUS FOR CLEANING HYDRAULIC FLUID SYSTEM**

LeRoy W. Peters, 155 Canal St., #17, and Walter E. Moore, 647 Francisco Blvd., both of San Rafael, Calif. 94901

Filed Jan. 7, 1982, Ser. No. 337,562

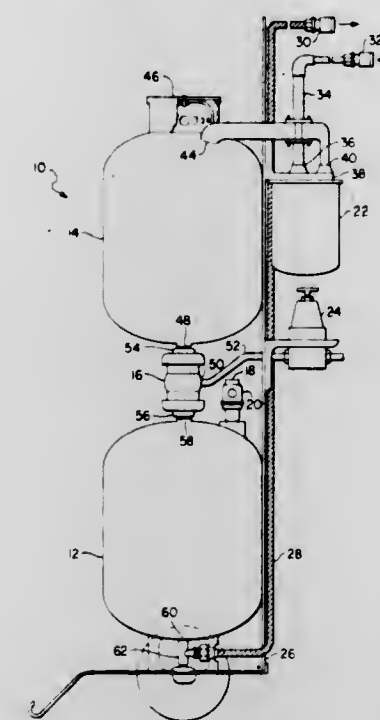
Int. Cl.<sup>3</sup> B08B 9/00

U.S. Cl. 134—104

6 Claims

1. An apparatus for flushing solvent through a machine such as a hydraulic cooling system having a first fluid inlet and a first fluid outlet, said apparatus comprising:  
a first reservoir for supplying solvent to said first fluid inlet, said first reservoir being pressurizable and having a second fluid inlet and a second fluid outlet, said second fluid outlet for coupling to said first fluid inlet;

a second reservoir for recovering solvent from said fluid valves 8, 9 of the compression reactor 1 and to keep them in a closed state is supplied.  
an outlet, said second reservoir having a third fluid inlet and a third fluid outlet; and



means having a fourth fluid inlet coupled to said third fluid outlet and a fourth fluid outlet coupled to said fluid inlet for communicating solvent from said second reservoir to said first reservoir and for pressurizing said first reservoir to propel solvent through said second fluid outlet.

4,412,552

**METHOD OF CONTROLLING INLET VALVES OF COMPRESSION REACTOR AND DEVICE FOR EFFECTING SAME**

July A. Kolbanovsky, Moscow; Romeo V. Tsagareli, Tbilisi, and Viktor S. Schipachev, Moscow, all of U.S.S.R., assignors to Institut Neftekhimicheskogo Sinteza Imeni A.V. Topchleva Akademii Nauk SSSR, U.S.S.R.

PCT No. PCT/SU80/00076, § 371 Date Dec. 24, 1981, § 102(e)

Date Dec. 24, 1981, PCT Pub. No. WO81/03130, PCT Pub.

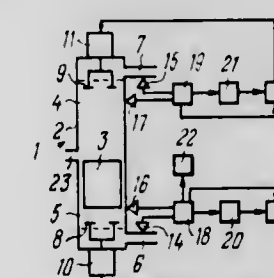
Date Nov. 12, 1981

PCT Filed May 5, 1980, Ser. No. 336,372

Int. Cl.<sup>3</sup> B01J 3/00

U.S. Cl. 137—14

4 Claims



1. A method of controlling inlet valves of a compression reactor by way of opening and closing the inlet valves which open towards the inside of the compression reactor, characterized in that in the process of operation of the compression reactor 1 the sign of a pressure differential ( $\Delta P$ ) between a working space 4, 5 of the reactor 1 and a respective supply line 7, 6 is determined, at the instant the sign of the pressure differential ( $\Delta P$ ) changes from "minus" to "plus" a command to relieve the inlet valves 8, 9 of all control actions keeping the inlet valves 8, 9 in a closed state is produced, and at the instant the sign of the pressure differential ( $\Delta P$ ) changes from "plus" to "minus" a command to read a preset time interval ( $\tau$ ) within which the inlet valves 8, 9 are open is produced, at the expiration of the preset time interval ( $\tau$ ) a command to close the inlet

4,412,553

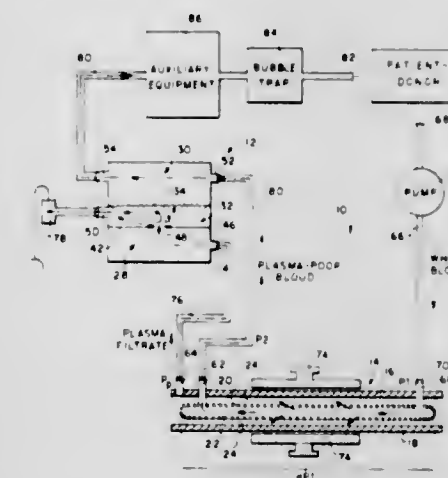
**DEVICE TO CONTROL THE TRANSMEMBRANE PRESSURE IN A PLASMAPHERESIS SYSTEM**  
Clinton V. Kopp, and James Hitchcock, both of Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 25, 1981, Ser. No. 277,449

Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 137—118

5 Claims



1. A device for controlling the transmembrane pressure of a membrane which filters plasma from whole blood in a plasmapheresis system which includes a fluid line for conducting plasma-poor blood from the membrane to the donor and another fluid line for simultaneously conducting plasma filtrate from the membrane for collection, said device comprising:

an upper member and a lower member which are peripherally sealed together to collectively form a housing having an interior area;  
a generally flexible first interior wall and a second interior wall, said walls being peripherally sealed between the peripheries of said upper and lower members and positioned one atop the other within said interior area to compartmentalize said interior area into a first chamber, which extends between said upper member and said flexible first wall; a second chamber, which extends between said lower member and said second wall; and an interior fluid path, which extends between said flexible first wall and said second wall,

first and second tubular members sealingly engaged between the peripheries of said upper member and said flexible first wall at diagonally opposite sides of said housing and extending from said first chamber outwardly of said housing along generally parallel and coplanar axes, said first and second tubular members communicating with the plasma-poor blood line for directing the plasma-poor blood in a uniform, laminar path across said first chamber,

a third tubular member sealingly engaged between the peripheries of said lower member and said second wall and extending from said second chamber outwardly of said same housing side as said first tubular member along an axis which is generally parallel to the axis of said first tubular member, said third tubular member communicating with the plasma filtrate line for directing plasma filtrate into said second chamber,

means defining an opening in said second wall essentially in the mid-portion thereof for directing the plasma filtrate from said second chamber into said interior fluid path,

a fourth tubular member diagonally oppositely spaced from said third tubular member, said fourth tubular member being sealingly engaged between the peripheries of said first and second interior walls and extending from said interior fluid path outwardly of said housing along an axis which is generally parallel to the axis of said second tubu-



lar member, said fourth tubular member communicating with the plasma filtrate line for directing plasma filtrate out of said interior fluid path for collection, and said generally flexible first wall being operative for relative movement toward and away from said second wall opening to variably restrict the flow of plasma filtrate through said opening in response to pressure differentials between the plasma-poor blood in said first chamber and the plasma filtrate in said second chamber to establish and thereafter maintain substantial equilibrium between the pressure of the plasma filtrate and the pressure of the plasma-poor blood.

4,412,554

## FIRE SAFE EXPANSIBLE TUBE TYPE VALVE

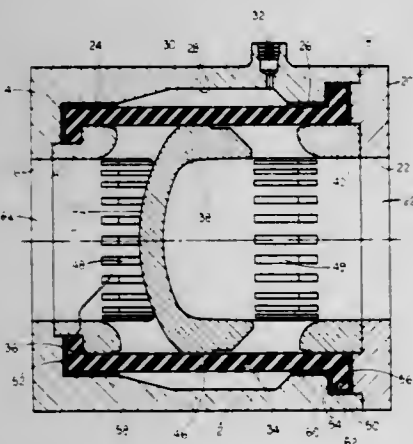
Peter C. M. Chow, Newark, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Jul. 29, 1981, Ser. No. 288,107

Int. Cl.<sup>3</sup> F16L 7/00

U.S. Cl. 137—375

2 Claims



1. An expansible tube valve comprising:
  - a valve body;
  - end closures on said body defining inlet and outlet passages;
  - generally cylindrical slotted core within said body with annular end portions, a circular barrier extending across said core intermediate said end portions with a sealing surface around it, and flow slots through and around said core on both sides of said barrier;
  - flexible, expansible tube around said core snugly embracing said sealing surface;
  - pair of cylindrical inner surfaces near the ends of said body closely embracing said expansible tube;
  - intermediate inner surfaces of said body being in spaced relationship to said tube to enable radial expansion thereof;
  - one of said cylindrical inner surfaces terminating in an outward facing shoulder; and
  - an out-turned integral radial flange around one end of said tube clamped between said shoulder and an end closure to form a seal therewith; said valve being characterized in the provision of means for protecting said expansible tube from external heat comprising:
    - a pair of thin tubular rings of heat insulation material in said body, each coextensive with one of said cylindrical inner surfaces and interposed between said one cylindrical surface and said expansible tube;
    - a third tubular ring of heat insulation material coextensive with the edge of said out-turned flange and interposed between said edge and said valve body; and
    - flat rings of heat insulation material in said body interposed between the sides of said radial flanges and said shoulder and end closure, respectively.

#### 4,412,555 OVER PRESSURE RELEASE VALVE FOR A HYDRAULIC INSTALLATION

Gilles Combes, Grenoble, France, assignor to Societe Anonyme d'Alstom-Atlantique, Paris, France

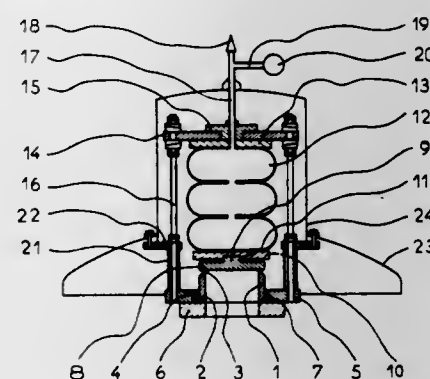
Continuation of Ser. No. 194,479, Oct. 6, 1980, abandoned. This application May 28, 1982, Ser. No. 383,309

Claims priority, application France, Oct. 12, 1979, 79 25427

Int. Cl.<sup>3</sup> F16K 15/00

U.S. Cl. 137—524

3 Claims



1. An over-pressure release valve for a hydraulic installation, said valve including:
  - a circular seat,
  - a disk having an annular surface on one side which cooperates with the seat, said one side of the disk being subject to pressure of a liquid in a hydraulic installation;
  - a thrust member positioned on the other side of the disk; and
  - means for supporting the thrust member relative to the seat so as to press the disk against the seat, wherein the improvement comprises:
    - said thrust member being substantially cylindrical longitudinally flexible chamber mounted coaxially with the disk and the seat, the thrust exerted by said chamber against the other side of the disk being a function only of gas pressure therein;
    - the means for supporting the thrust member comprising a plurality of circumferentially spaced rods extending parallel to the axis of said chamber and spaced radially therefrom, such that the chamber is laterally unsupported and a substantially unrestricted flow area is provided around the seat between said rods; and
    - the diameter of the disk being from 1.20 to 1.25 times that of the opening in the seat, and the disk being unguided and restrained only by said flexible chamber such that liquid from the hydraulic installation can flow in an unrestricted sheet when the disk lifts off the seat due to a sudden over-pressure in said installation.

4,412,556

## DEVICE FOR SHUTTING OFF LARGE PIPES

Hans-Jürgen Janich, Regelkamp 12, D-4720 Beckum, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,516

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023639

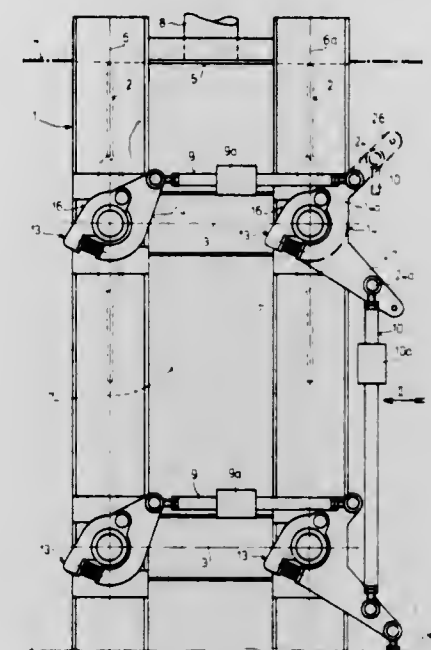
Int. Cl.<sup>3</sup> F16K 1/22

U.S. Cl. 137—614.11

15 Claims

1. In apparatus for regulating the flow of fluid through a large, elongate pipe including a number of shafts spaced from one another and mounted on said pipe for rotation about parallel axes transverse to the longitudinal axis of said pipe, a plurality of flaps corresponding to the number of said shafts and connected to the latter for rotation therewith between one rotary position in which said flaps oppose the flow of fluid longitudinally of said pipe and a second rotary position facilitating the flow of fluid longitudinally of said pipe, and common drive means connected to said shafts for rotating them concurrently, the improvement wherein said drive means comprises first and second double-arm levers for each of said shafts, one

of said levers being fixed to the associated shaft and having one arm thereof pivotally connected to one arm of the second of said levers; and an actuating rod connecting said one arm of



each of said second levers to the corresponding arm of an adjacent one of said second levers, whereby rotation of any one of said levers is imparted to the remainder thereof.

4,412,557

## VALVE APPARATUS FOR FLUID CONVEYING SYSTEM

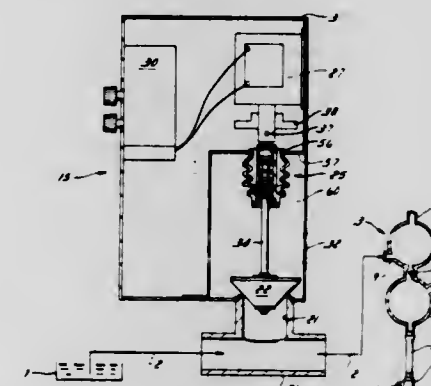
Rolyn A. Schmid, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.

Filed Nov. 25, 1981, Ser. No. 324,838

Int. Cl.<sup>3</sup> F16K 31/02

U.S. Cl. 137—624.13

4 Claims



1. A valve apparatus for use in a fluid conveying system and including:
  - a housing including a plate defining a lower chamber in said housing, said plate having an aperture therethrough;
  - a fluid conveying conduit connected to said housing which is capable of being under vacuum and having an opening communicating with said lower chamber and from thence to atmosphere, said opening having a valve seat therearound;
  - a stopper plug located in said lower chamber above said opening and movable between a closed position wherein it engages said valve seat and is held thereagainst by vacuum in said conduit to prevent air entry into said conduit and an open position above said valve seat to permit air entry into said conduit through said opening from said lower chamber;
  - timed drive means including a solenoid mounted in fixed position on said housing above said plate and having a stationary coil and a vertically movable armature;
  - a hollow bushing pivotally connected to and movable with said armature and extending downwardly through said

aperture in said plate, said bushing including a bore closed at its upper end and open at its lower end;

- a stop member on said bushing near said lower end of said bore;
- a connecting rod having a lower end connected to said plug and having its upper end extending into the open end of said bore in said hollow bushing;
- a projection on said connecting rod near said upper end thereof;
- a cushion disposed in said bore between the closed end thereof and said upper end of said connecting rod;
- a compression type biasing spring in said bore and disposed around said rod between said stop member on said bushing and said projection on said connecting rod;
- a flexible boot connected to said bushing and to said plate around said aperture in said plate to prevent contaminants from entering said lower chamber;
- said solenoid coil when energized initially operating to effect upward vertical movement of said armature and of said bushing relative to said connecting rod thereby effecting compression of said spring, said solenoid coil effecting subsequent further upward vertical movement of said armature to effect movement of said plug away from said valve seat as said bushing, the compressed spring and said connecting rod are moved upwardly together by said armature, whereupon said spring decompresses and moves said connecting rod upwardly within said bushing and moves said plug rapidly upward away from said valve seat, said solenoid coil when de-energized allowing said armature, said bushing, said connecting rod and said plug to descend under the force of gravity so that said plug re-engages said valve seat.

4,412,558

## TURBULATOR

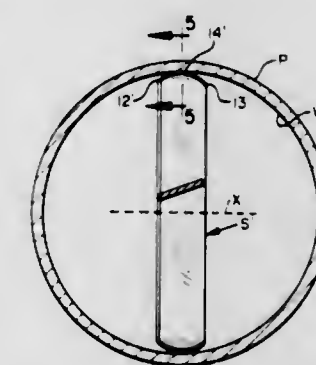
Michael J. Burke, Boring, and Harry E. Fowler, Corbett, both of Oreg., assignors to Western Fuel Reducers, Inc., Troutdale, Oreg.

Continuation-in-part of Ser. No. 107,844, Dec. 28, 1979, abandoned. This application Aug. 25, 1981, Ser. No. 296,198

Int. Cl.<sup>3</sup> F15D 1/02; B01F 15/06

U.S. Cl. 138—38

6 Claims



1. A turbulator comprising a strip bent into zig-zag form to provide two spaced essentially parallel series of apices for contact with the interior wall of a gas conducting tube, each apex being so formed as to present an outwardly facing convex surface including a central area of contact surrounded on all sides by areas of double curvature, the side edges of the strip at the apices being located closer to the midplane of the strip than are said central areas of contact, the height of the turbulator being a number of times greater than the width of the strip, said central areas of contact providing for each apex a single area of contact with the tube.



4,412,559

## DOG LOCKING SLEEVE

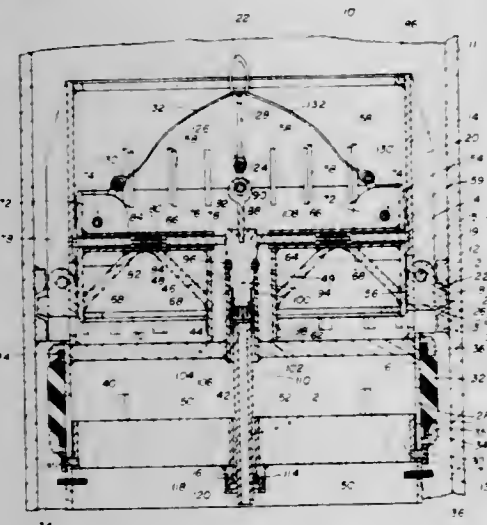
Steven G. Streich; R. Benton Nickles, and Harold O. Treece, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 194,316, Oct. 6, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,990

Int. Cl.<sup>3</sup> F16L 55/12, 55/10

U.S. Cl. 138—89

4 Claims



1. A removable plug for temporarily sealing the interior of an annular member to prevent the flow of fluid therethrough, said removable plug comprising:

plug body means adapted to be disposed within said annular member, the plug body means comprising:

packer mandrel means having a plurality of apertures therein and having a plug therein for preventing the flow of said fluid therethrough, the plug having a centrally located sleeve therein;

packer member means located on the packer mandrel means for sealingly engaging the interior of said annular member;

packer setting sleeve means located on the packer mandrel means for compressing the packer member means into sealing engagement with the interior of said annular member;

locking dog means pivotally mounted on the packer mandrel means for retaining said plug from axial movement when installed in said annular member, the locking dog means comprising:

a plurality of members pivotally mounted on the packer mandrel means, each member having a portion thereof adapted to engage a portion of the interior of said annular member when said plug is installed therein and being rotatable through an aperture of the plurality of apertures in the packer mandrel means;

pressure equalization means releasably secured within the centrally located sleeve of the packer mandrel for allowing the flow of said fluid through said plug when said plug is installed in said annular member thereby allowing the pressure of said fluid to substantially equalize in said annular member and across said plug before the removal of said plug from said annular member;

annular dog locking sleeve means slidable within the packer mandrel means between a first position wherein the locking dog means abut a portion of the exterior surface of the dog locking sleeve means thereby preventing rotation of the locking dog means through the apertures in the packer mandrel means and a second position wherein the locking dog means are free to rotate through the apertures in the packer mandrel means thereby disengaging the interior of said annular member when said plug is installed therein to allow the removal of said plug from said annular member; and

dog locking sleeve extension means secured to one end of the annular dog locking sleeve means, the dog locking sleeve extension means adapted to slidably engage the

interior of the packer mandrel means, the dog locking sleeve extension means comprising:

a plurality of elongate members, each member having a portion thereof secured to the annular dog locking sleeve means and the remaining portion extending beyond the annular dog locking sleeve means to slidably engage the interior of the packer mandrel means such that the combination of the annular dog locking sleeve means and dog locking sleeve extension means has a ratio of axial length to the diameter of the exterior surface of the dog locking sleeve means of greater than approximately 0.3.

4,412,560

## TUBE FOR A CRACKING PLANT

Johannus J. Broodman, Breskens, Netherlands, assignor to B. V. Koninklijke Maatschappij "De Schelde", Vlissingen, Netherlands

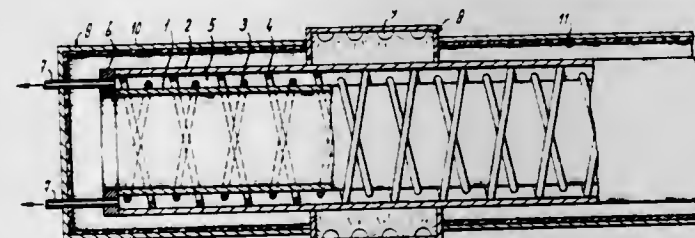
Continuation-in-part of Ser. No. 126,715, Mar. 3, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,298

Claims priority, application Netherlands, Mar. 2, 1979, 7901692

Int. Cl.<sup>3</sup> F16L 9/16

U.S. Cl. 138—143

7 Claims



1. A cracking tube for a cracking plant in which tube the cracking reaction occurs at a temperature of 900° and 1300° C. and at a pressure 200–500 kPa, said cracking tube having a corrugated structure prepared from an inner tube consisting of a metal capable of withstanding at, above said temperature, an aggressive corrosive medium which may prevail inside the inner tube, a reinforcement having been placed about said inner tube, said reinforcement being provided with a plurality of openings between the reinforcement parts and consisting of a metal capable of withstanding, at above said temperature compressive and tensile forces, to be exerted on the tube at above said pressures, an outer tube coaxially positioned about the inner tube and the reinforcement and consisting of a metal capable of withstanding at above said temperature an aggressive corrosive medium which may prevail outside the outer tube, said reinforcement being made of tungsten, molybdenum or tantalum or alloys of tungsten, molybdenum or tantalum, said inner tube and the outer tube being made of nickel or nickel alloy and having been bonded together in the openings between the reinforcement parts upon application of heat and pressure on the inner surface of the inner tube and outer surface of the outer tube while applying vacuum to the openings between the reinforcement parts.

4,412,561

## GLASS FIBER-REINFORCED CEMENT NON-PLATE ARTICLES

Keizo Sakaguchi, Kawanishi, and Shigeru Takeuchi, Osaka, both of Japan, assignors to Kurimoto Iron Works, Ltd., Osaka, Japan

Filed Jan. 7, 1981, Ser. No. 222,861

Claims priority, application Japan, Jan. 11, 1980, 55-2834; Apr. 28, 1980, 55-58227

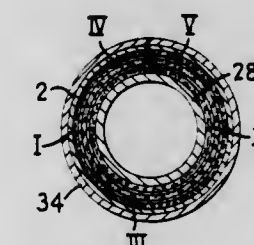
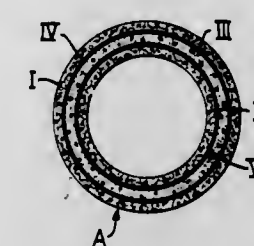
Int. Cl.<sup>3</sup> F16L 9/08

U.S. Cl. 138—174

10 Claims

1. A glass fiber-reinforced, cement mortar article having a non-planar shape, which comprises an inner layer comprised of a mixture of Portland cement and chopped glass fiber strands; a first layer of continuous glass fibers located on said inner

layer; an outer layer comprised of a mixture of Portland cement and chopped glass fiber strands; a second layer of contin-



uous glass fibers located on said outer layer; and an intermediate layer comprised of regulated set cement interposed between said inner and outer layers.

4,412,562

## APPARATUS FOR FORMING SELVAGES IN WEAVING MACHINES

Takeshi Kobayashi, Aichi, and Hajime Suzuki, Anjo, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan

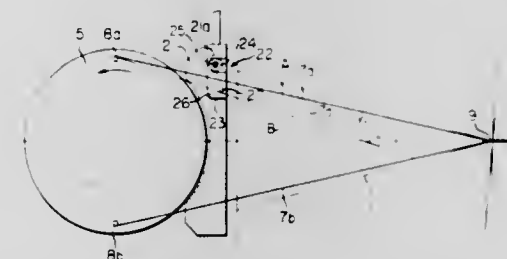
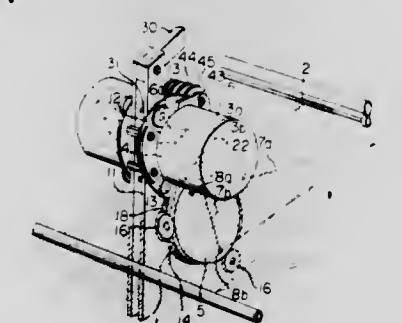
Filed Oct. 14, 1981, Ser. No. 311,255

Claims priority, application Japan, Oct. 15, 1980, 55-143842

Int. Cl.<sup>3</sup> D03C 11/00; D03D 47/40

U.S. Cl. 139—54

4 Claims



1. Apparatus for forming a selvage in a weaving machine, comprising a moveable shed forming member having selvage thread guide eyelets through which selvage threads pass to provide each of the selvage threads with upward and downward movements when said shed forming member moves, thereby allowing the selvage threads to catch a weft thread, and a device for detecting abnormal conditions of the selvage threads disposed between said shed forming member and the

fell of the cloth and within the range of the upward and downward movements of the selvage threads, said detecting device comprising a pair of legs disposed on opposite sides of said upwardly and downwardly moving selvage threads and photocell means comprising light emitting and receiving elements mounted on the inner sides of said legs so as to face each other for producing a light beam and detecting an interruption of the light beam by the selvage threads upon their upward and downward movements, means for counting the number of said light interruptions, and means for comparing the counted number with a predetermined number to thereby decide whether or not an abnormal condition of the selvage threads exists.

4,412,563

## MULTIPOSITION DOBBY

Walter Kleiner, Hirzel-Zurich, Switzerland, assignor to Staebli Ltd., Horgen-Zuerich, Switzerland

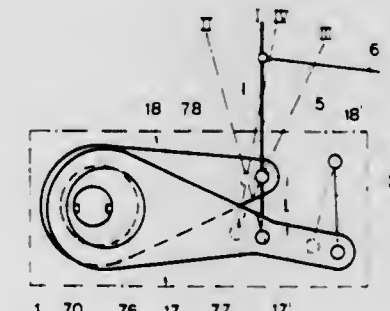
Filed Jun. 22, 1981, Ser. No. 276,544

Claims priority, application Switzerland, Jul. 1, 1980, 5047/80

Int. Cl.<sup>3</sup> D03C 1/00, 1/06

U.S. Cl. 139—66 R

13 Claims



1. A dobbie for controlling a multi-position heddle frame, comprising first and second rotation lifting units arranged adjacent each other on a common rotationally driven drive shaft and respectively having first and second connecting rods which extend and are supported for movement in directions generally radial of said drive shaft and form an acute angle with respect to each other, a lever pivotally supported on said first connecting rod at a first location spaced from said drive shaft and pivotally supported on said second connecting rod at a second location spaced from said drive shaft and from said first location, a third connecting rod pivotally supported on said lever at a third location spaced from said first and second locations, means operatively coupling said third connecting rod to said heddle frame for effecting movement of said heddle frame in response to movement of said third connecting rod effected by pivotal movement of said lever, and means for preventing angular movement of said first and second connecting rods with respect to the axis of said drive shaft.

4,412,564

## APPARATUS FOR FORMING AN INTERPOLE CROSSOVER WIRE BETWEEN STATOR COILS

Tokuhiro Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 23, 1981, Ser. No. 237,404

Int. Cl.<sup>3</sup> B21F 3/00

U.S. Cl. 140—92.1

3 Claims

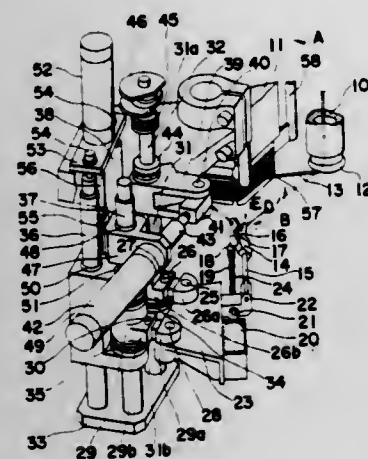
1. An apparatus for forming an interpole crossover wire between a succession of continuous stator coils each wound around the spool of a winding apparatus with successive coils being wound in opposite directions, said forming apparatus comprising:

a pair of wire engaging pawls relatively movable toward and away from each other to engage and release a wire; pawl driving means connected to said pawls for relatively moving said pawls;

a link mechanism on which said pawls are mounted for



movement in a circular arc between a position adjacent the spool where said pawls are positioned to engage a wire extending between the coil being wound and the means for winding the wire and a position spaced away from the spool, the movement in the circular arc drawing wire out



to form the interpole crossover wire, said link mechanism including means for adjusting the dimensions thereof for changing the arc along which the pawls are moved during movement of the link mechanism; and link mechanism drive means connected to said link mechanism for driving said link mechanism.

4,412,565

## WIRE STRAIGHTENER TOOL

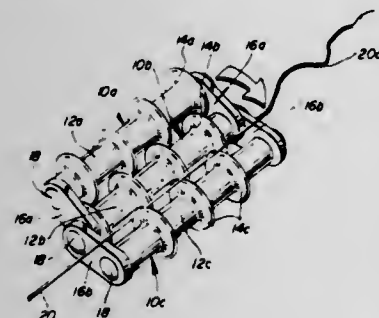
Dewey O. Broberg, Jr., Long Grove, Ill., assignor to Du-Bro Products, Inc., Wauconda, Ill.

Filed Apr. 15, 1982, Ser. No. 368,826

Int. Cl.<sup>3</sup> B21F 1/02

U.S. Cl. 140—123

15 Claims



1. A hand tool for straightening wire, comprising: at least three elongated wire straightener members each having a plurality of wire engaging surfaces spaced longitudinally of the respective straightener member; and means interconnecting said wire straightener members for pivotal movement about axis means extending generally parallel to the longitudinal axes of the wire straightener members between an open position and a closed position with the wire straightener members in said closed position defining a longitudinal passageway between said wire engaging surfaces extending generally parallel to the longitudinal axes of the wire straightener members for receiving a wire and straightening the wire in response to relative longitudinal movement of the wire in said passageway as pressure is applied exteriorly of the wire straightener members.

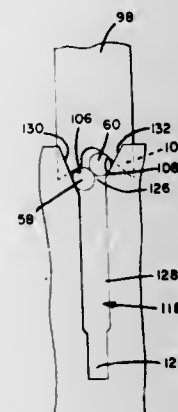
4,412,566  
APPARATUS FOR TRANSPOSING A PAIR OF  
PARALLEL AND ADJACENT CONDUCTORS INTO A  
VERTICAL RELATIONSHIP  
Clifton W. Huffnagle, Camp Hill; LeRoy J. Morningstar, Middletown, and Charles I. Tighe, Jr., Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 23, 1979, Ser. No. 97,015

Int. Cl.<sup>3</sup> B21F 1/02

U.S. Cl. 140—147

8 Claims



1. Apparatus for transposing a pair of conductors from a horizontal, axially parallel and adjacent orientation to a non-horizontal orientation, comprising: template means having a profiled channel means extending therein, said channel means having a transition region dimensioned for closely receiving said conductors therein and being defined by first and second conductor directing surface means, said first conductor directing surface means adapted to delay movement of one of the pair of conductors when the one of the pair of conductors is moved into engagement therewith while the other of the pair of conductors in engaging said second conductor directing surface means is directed and guided to a central position of the channel means underneath the delayed one of the pair of conductors so that the conductors will be overlapped; and blade means for pushing the conductors of the pair of conductors along said first and second conductor directing surface means including bight means and first and second conductor pushing surface means, one of said first and second conductor pushing surface means being longer than the other, said first and second conductor pushing surface means adapted to engage respectively the other and the one of the pair of conductors, pushing the other of the pair of conductors along said second conductor directing surface means to said central position while the one of the pair of conductors in moving along said first conductor directing surface means is also moved along said second conductor pushing surface means into said bight means thereby placing the one of the pair of conductors over the other of the pair of conductors whereafter said blade means moves the overlapped conductors to the bottom of said channel means.

4,412,567

## SILO BAG FILLING MACHINE

Larry J. Kusters, Sioux Center, Iowa, assignor to Roto Press Limited, Sioux Center, Iowa

Filed Nov. 2, 1981, Ser. No. 317,497

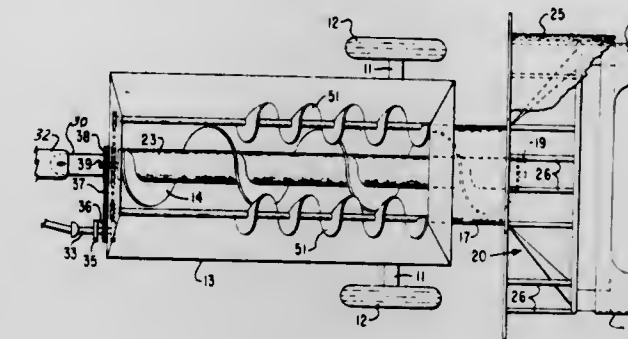
Int. Cl.<sup>3</sup> B65B 3/08

U.S. Cl. 141—114

19 Claims

1. A device for filling material into a horizontal silo bag at its inlet, said device comprising: a frame; traverse means, mounted on said frame and engageable with the ground, for moving said frame relative to the ground; means on said frame for receiving material, said material

receiving means being formed to hold said silo bag, said material receiving means including a hopper, chute means for projecting the material into said bag, and means for delivering the material from said hopper to said chute means, said delivering means including an auger and an auger housing, said auger housing having a discharge end,



said bag having an inlet end, said discharge end being substantially centered with respect to said inlet end, said chute means having walls inclining outwardly from said discharge end of said auger housing to said inlet end of said bag; and means for driving said auger at one end of said auger.

4,412,568

## FILL VALVE

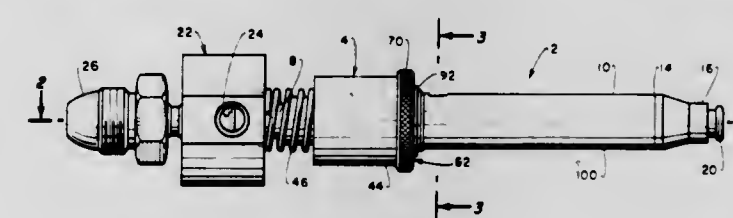
Richard E. Hughes, Hermosa Beach, Calif., assignor to Otto K. Henke, San Pedro, Calif.

Filed Aug. 24, 1981, Ser. No. 295,644

Int. Cl.<sup>3</sup> B65B 3/04

U.S. Cl. 141—392

16 Claims



1. A fill valve for at least two fluids comprising the combination: a body member having a fluid pathway therethrough and having an inlet portion adapted for connection to a first fluid under pressure, and an outlet portion defining a venturi configuration, said body member having a first orifice communicating said fluid pathway to the exterior of said body member, and a second, spaced orifice adapted to communicate said fluid pathway to a second fluid supply; a pneumatically responsive closure member operably disposed in fluid tight relationship against the exterior of said body member adjacent said first orifice and being biased into a first position normally closing said second orifice and a second position opening said second orifice for communication to said second fluid; and a metering member cooperatively associated with said body member to selectively meter said second fluid supplied to said second orifice.

4,412,569

## TREE HARVESTING METHODS AND MACHINES

John S. Barnett, Putaruru, and Sydney D. B. Cochrane, Tokoroa, both of New Zealand, assignors to Waratah General Engineering Ltd., Tokoroa, New Zealand

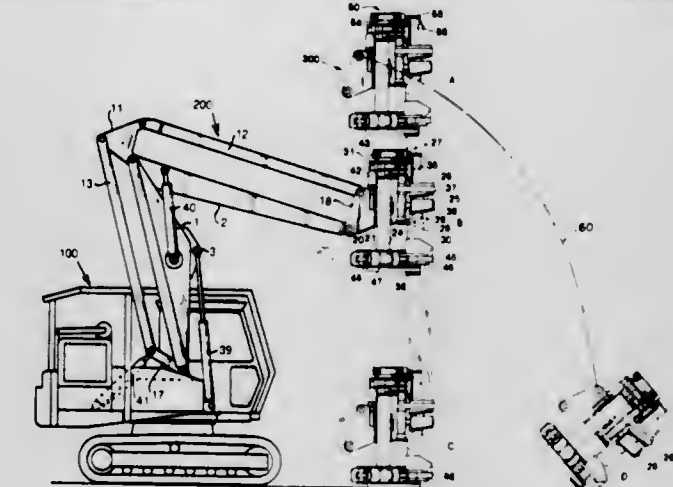
Filed Sep. 2, 1980, Ser. No. 182,980

Claims priority, application New Zealand, Aug. 31, 1980, 191447

Int. Cl.<sup>3</sup> A01G 23/08

U.S. Cl. 144—3 D

19 Claims



1. A method of harvesting a tree comprising the steps of: (i) positioning a vehicle-mounted tree harvester apparatus including a head member adjacent to the upper trunk of a standing tree by support means extending from said vehicle; (ii) clamping delimbing means of said head member about the tree in a close fitting relationship; (iii) delimbing the tree by releasing said support means for said head member so that the head member gravitates down said tree independently of support from said tree, with the delimbing means in a clamped relationship about the tree, and controlling the alignment of said head member relative to said tree by control means during said downward gravitation; (iv) clamping said head member about the base of the tree; (v) shearing off said tree; (vi) operating said support member so as to position the tree clamped within said head member where required, and releasing the tree from said head member.

4,412,570

## WOOD SPLITTER

L. Douglas Nickerson, 306 Reid St., Sault Ste. Marie, Ontario, Canada (P6B 4V1)

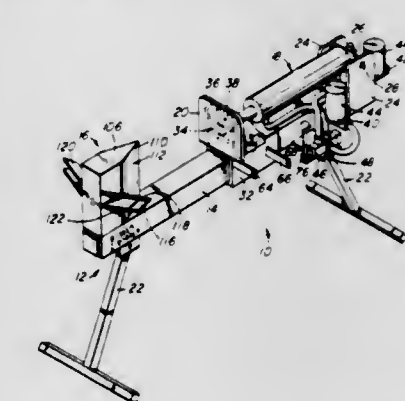
Filed May 11, 1981, Ser. No. 262,487

Claims priority, application Canada, Apr. 23, 1981, 376097

Int. Cl.<sup>3</sup> B27L 7/00

U.S. Cl. 144—193 A

5 Claims



1. A splitting head for a wood splitting device, said head comprising a vertical knife adapted for mounting on a support



beam of the splitting device with the cutting edge of said vertical knife being at right angles to said support, said vertical knife having side surfaces and a V-shaped leading edge in plan view, and a pair of wing knives secured to and extending outwardly from the sides of said vertical knife, each wing knife of said pair having upper and lower planar surfaces converging to a single leading edge that is located substantially at right angles to the side surfaces of the V-shaped leading edge of the vertical knife; the lower surface of each wing knife being parallel to the support beam on which the head is to be mounted, and the upper surface of each wing knife extending upwardly and rearwardly from the leading edge of said wing knife; the leading edges of the wing knives being set well back from the leading edge of the vertical knife to provide a two stage splitting action on a wood block driven into the head.

#### 4,412,571 POWER CHISEL

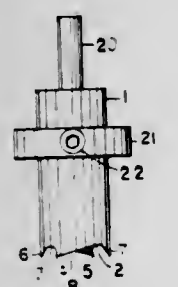
John F. Czerniewicz, 337 Foch Blvd., Mineola, N.Y. 11501

Filed Jun. 11, 1981, Ser. No. 272,739

Int. Cl.<sup>3</sup> B27G 13/00; B27C 5/10

U.S. Cl. 144—219

3 Claims



1. A laterally movable motor driven cutting means adapted to cut grooves of predetermined depth comprising: cutting means having a hollow tubular cutting end, a plurality of peripheral chisel cutting edges formed in said tubular end, and semi-elliptical knife-like portions in said tubular end separating the cutting edges.

#### 4,412,572 SPLITTING AXE

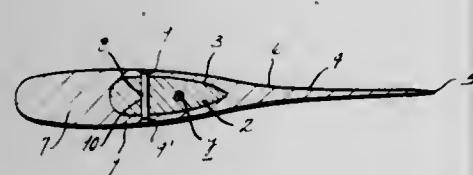
Thomas A. Clark, Star Rte. 287, Box 5780, Potosi, Mo. 63664

Filed Aug. 19, 1981, Ser. No. 294,318

Int. Cl.<sup>3</sup> B26B 23/00

U.S. Cl. 145—2 R

3 Claims



1. A splitting axe having a head unbalanced with respect to a handle of said axe, said head having an eye, said handle having a portion received within said eye, said head having an anterior portion extending from one end of said eye and terminating in a cutting edge at one end of said head and a posterior portion extending from the opposite end of said eye to the end of said head remote from said cutting edge, the mass of said head having a weight distribution for providing an unbalanced disposition of said head on said handle whereby the center of gravity of said head is located within said eye and upon an axis passing through said center of gravity and parallel to the longitudinal center line of said eye, said axis being located anteriorly of said longitudinal center line, said center of gravity axis accordingly lying between said longitudinal center line and the anterior limit of said eye, said posterior portion being weighted

and oriented posteriorly relative to said longitudinal center line.

#### 4,412,573 INJECTION SITE

Brian D. Zdeb, Round Lake Park, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 28, 1981, Ser. No. 335,133

Int. Cl.<sup>3</sup> B65D 41/50

U.S. Cl. 604—415

21 Claims



1. A needle-pierceable injection site comprising: a generally tubular port including a base end and a top end; a needle-pierceable membrane extending across and closing said base end; said generally tubular port and needle-pierceable membrane defining a volume, said top end defining a substantially circular opening to said defined volume; and a needle-pierceable compressed situs of self-sealing material having the form of a sphere in its unstressed state, disposed in said generally tubular port and retained in compressive sealing relation thereto.

#### 4,412,574 ELEMENT FOR REMOVING DIRT OR SNOW FROM TIRE, AND TIRE PROVIDED THEREWITH

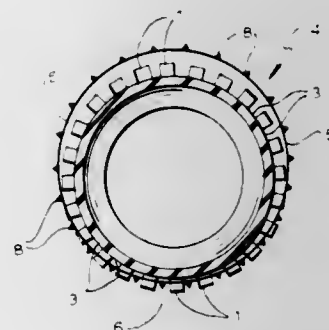
Gregory Popok, 8003 "B" Woodgate Ct., Baltimore, Md. 21207

Filed Sep. 29, 1982, Ser. No. 426,653

Int. Cl.<sup>3</sup> B60C 27/00, 11/00

U.S. Cl. 152—151

6 Claims



1. An element for removing dirt or snow from tires having grooves, comprising:

a closed substantially rigid member arranged so that it can be fitted onto a tire and at least partially received in its circumferentially extending groove, said member having such a radial dimension that one portion of said member is pressed by the ground into the circumferential groove at the location of contact of the tire with the ground, and upon rotation of the tire when the one portion moves out of the location of contact and a new portion of said member moves into the location of contact, said one portion of said member displaces radially outwardly and dislodges dirt and snow from the tire.

6. A tire unit, comprising

a tire having an outer surface provided with grooves and an element for removing dirt or snow from the tire and formed as defined in claim 1.

#### 4,412,575

#### HEAVY LOAD PNEUMATIC RADIAL TIRE

Muneyoshi Maeda, Kodaira, and Masaru Abe, Sayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,355

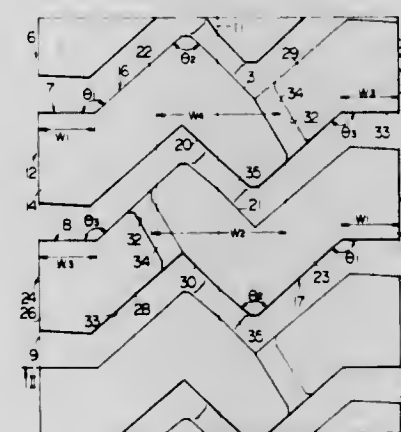
Claims priority, application Japan, Jun. 13, 1980, 55-80620

The portion of the term of this patent subsequent to Jul. 6, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> B60C 11/04

U.S. Cl. 152—209 R

6 Claims



1. A heavy load pneumatic radial tire provided with a tread portion having an outer peripheral configuration which is formed to have a radius of curvature ranging from 195 to 255 percentage of the width of said tire;

said tread portion being constructed by a long block group and a short block group which are alternately arranged at substantially equal intervals in the circumferential direction of said tread portion;

said long block group consisting of a plurality of long blocks staggeredly arranged and extending substantially laterally across the mid-circumferential plane of said tread portion from opposite sides of said tread portion, each of said long blocks being formed by a base portion extending substantially laterally from a said side toward said mid-circumferential plane and a V-shaped portion extending from said base portion over said mid-circumferential plane, said V-shaped portion having a laterally outer half adjacent said base portion and a laterally inner half remote from said base portion and intersected by said mid-circumferential plane; said V-shaped portion also having an inner side face and an outer side face, the inner side face of said laterally inner half of said V-shaped portion being spaced apart from and in face-to-face and substantially parallel relationship to the outer side face of the laterally inner half of the V-shaped portion of an adjacent long block;

said short block group consisting of a plurality of short blocks staggeredly arranged between two adjacent long blocks and extending substantially laterally from a said side toward and terminating outwardly from said mid-circumferential plane, each of said short blocks being formed by a base portion adjacent a said side and spaced apart from and in parallel relationship to adjacent said base portions of said long blocks and a slanted portion extending toward said mid-circumferential plane in parallel relationship to said laterally outer halves of the V-shaped portions of adjacent said long blocks;

each of said short blocks having a lateral inner end face which is spaced apart from and in face-to-face relationship with an opposed face of said V-shaped portion of a long block for forming a first groove, said first groove having a center spaced apart from that of an adjacent first groove in the lateral direction of said tread portion at a predetermined lateral distance which ranges from 30 to 42 percentage of the width of said tread portion.

#### 4,412,576

#### PNEUMATIC SNOW TIRE

Yukio Nakajima, Higashimurayama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

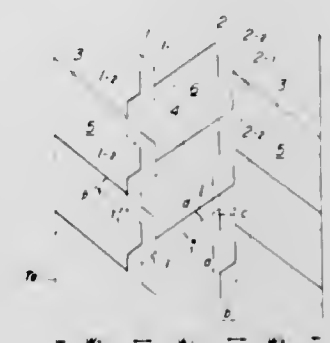
Filed Jun. 18, 1982, Ser. No. 389,799

Claims priority, application Japan, Jun. 29, 1981, 56/101017

Int. Cl.<sup>3</sup> B60C 11/00

U.S. Cl. 152—209 R

7 Claims



1. A pneumatic snow tire comprising: a pair of sidewalls and a tread extending therebetween, said tread having a pair of main circumferential grooves substantially equally dividing said tread along circumferential directions and bias grooves oblique to the circumferential directions connecting between said main circumferential grooves and between said main grooves and tread edges to form a number of blocks defined by said main and bias grooves;

(a) said main circumferential grooves each consisting of circumferential groove components substantially in parallel with the circumferential direction and bias groove components oblique to the circumferential direction alternately connected to form a staggered groove and being shifted relative to one another in the circumferential direction, wherein the shifted length (a) of said main circumferential grooves is in a relation of  $0.25l \leq (a) \leq 0.75l$ , where l is a pitch length of the main circumferential grooves;

(b) an amplitude b of said main zigzag grooves in width directions of the tread and a width c of said main circumferential grooves being in a relation  $b > c$ , and

(c) said bias groove extending from connections of said circumferential and bias groove components of said main circumferential grooves in directions of the bias groove component, and

(d) a width of said circumferential groove being wider than an average width of said bias grooves.

#### 4,412,577

#### CONTROL OF SEED MELT-BACK DURING DIRECTIONAL SOLIDIFICATION OF METALS

Richard W. Salkeld, South Windsor; Neal P. Anderson, Broad Brook, and Anthony F. Glamei, Middletown, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 27, 1982, Ser. No. 343,083

Int. Cl.<sup>3</sup> B22D 25/00

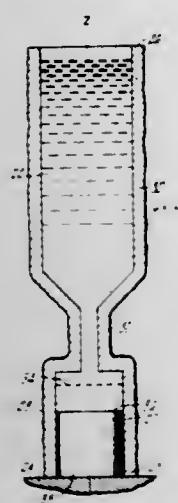
U.S. Cl. 164—122.2

6 Claims

1. The process of directional solidification from molten metal of an article having a structure which is epitaxial with a seed which comprises forming a mold, placing an original seed within the mold, heating the mold, melting a portion of the seed by contacting a seed surface with molten metal placed in the mold, and epitaxially solidifying the molten metal, characterized by melting a portion of the seed length which is at least 25% of the original seed length, the melted portion of the seed length being measured from the original molten metal contacting surface before melting to the location of the liquidus interface after melting, the melting being sufficient to cause physical disruption of surface films on the surface of the seed where it is contacted by molten metal to be epitaxially solidified, and



insufficient to raise above the metal solidus temperature the portion of the seed which is most distant from the region



where it is contacted by the molten metal to be epitaxially solidified.

4,412,578

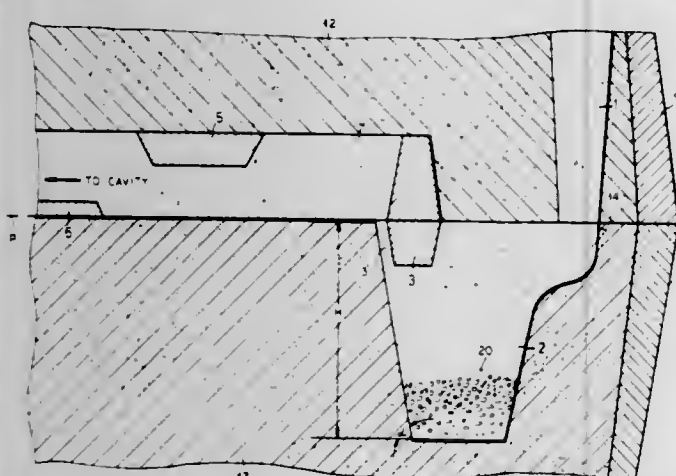
**APPARATUS FOR TREATING MOLTEN CAST IRON**  
Ernst J. Doliwa, Niddatal; Karl J. Reifferscheid, Karben, and Friedrich Wolfsgruber, Teicherting, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main and SKW Trostberg, Trostberg, both of, Fed. Rep. of Germany  
Filed Mar. 18, 1981, Ser. No. 244,955

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010623

Int. Cl.<sup>3</sup> B22D 27/00

U.S. Cl. 164—349

1 Claim



1. A casting mold for making castings of cast iron containing vermicular and spheroidal graphite, comprising:  
means forming a runner leading to a mold cavity;  
a sprue for feeding metal into said cavity;  
a reaction chamber between and below said sprue and said runner for receiving a graphitizer and reacting said graphitizer with a cast iron melt, said reaction chamber being of downwardly convergent cross section and having a wide end lying in a parting plane of the mold, said chamber being of frustopyramidal configuration having:  
a broad rectangular base in said parting plane of said mold, wall extending upwardly at an angle of 50° to 80° to the horizontal,  
height which is substantially two to three times the width of one of the bases of said chamber, and  
at least one of said bases generally of square configuration; and  
a bar of trapezoidal cross section extending downwardly from said runner into said reaction chamber and having a flank parallel to said wall at an upper end thereof whereby said flank and said wall define an outlet from said reaction

chamber into said runner which lies below the inlet from said sprue into said reaction chamber.

4,412,579

**APPARATUS FOR HANDLING A CONTINUOUS CASTING MACHINE STARTER BAR**

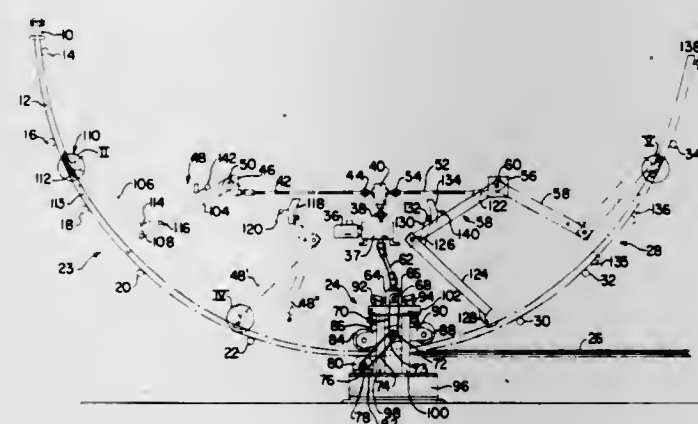
Tamas Zavodszky, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 7, 1982, Ser. No. 376,019

Int. Cl.<sup>3</sup> B22D 11/16, 11/08

U.S. Cl. 164—413

15 Claims



1. In a continuous metal casting machine having an elevated vertical flow through casting mold connected at its lower end to a downwardly curving strand conveying structure having a lower discharge end oriented in a substantially horizontal direction, a strand starting bar engageable with the lower end of the mold and conformable in curvature to the strand conveying structure, a strand receiving structure laterally extending from the discharge end of the downwardly curving strand conveying structure, a curved starting bar receiving structure vertically displaced above said strand receiving structure and extending upwardly and away from the discharge end of the downwardly curving strand conveying structure, and a strand straightener and starting bar advancing apparatus having at least one set of rotating roller members interposed between said discharge end of the downwardly curving strand conveying structure and said strand and starting bar receiving structures, wherein the improvement comprises:

- (a) a first arm member having a fixed end that is pivotally mounted at a point vertically displaced above at least a portion of the downwardly curving strand conveying structure so that said first arm member pivots from an upper position adjacent the mold to a lower position adjacent the straightener apparatus through a vertical arc substantially coplanar with said downwardly curving strand conveying structure;
- (b) selectively connectable first starter bar engagement means terminally mounted on said first arm member;
- (c) control means for releasing said first starter bar engagement means when the starter bar has been engaged by the straightener apparatus;
- (d) a second arm member having a fixed end that is pivotally mounted at a point vertically displaced above at least a portion of the upwardly curving starter bar receiving structure so that said second arm member pivots from a lower position adjacent the straightener apparatus to an upper storage position through a vertical arc substantially coplanar with said upwardly curving starter bar receiving structure;
- (e) selectively connectable second starter bar engagement means terminally mounted on said second arm member; and
- (f) control means for engaging said second starter bar engagement means when the starter bar has been discharged from the straightener apparatus, such that after the starter bar has been displaced from the mold to the straightener apparatus by movement of the first arm member from its

upper to its lower position and the starter bar is advanced through the straightener apparatus by rotation of the roller members, the starter bar will then be engaged by the second arm member and withdrawn to said upper storage position.

4,412,580

**COOLING APPARATUS FOR WHEEL-BAND CONTINUOUS CASTING MACHINES**

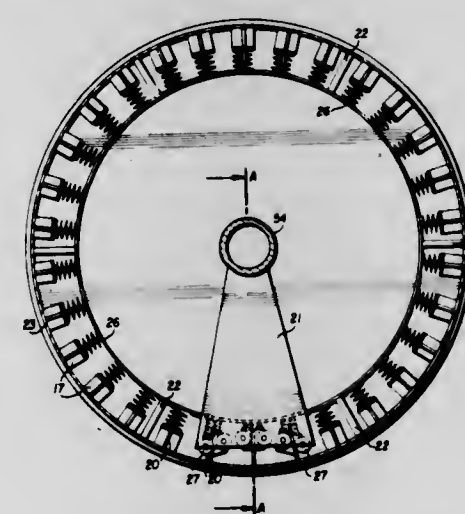
Kenneth E. Chadwick; E. Henry Chia; Robert H. Ogletree; Frank M. Powers, all of Carrollton, and Larry S. Richardson, Bowdon, all of Ga., assignors to Southwire Company

Filed Nov. 26, 1980, Ser. No. 210,655

Int. Cl.<sup>3</sup> B22D 11/06, 11/00

U.S. Cl. 164—433

5 Claims



1. In a continuous metal casting machine of the type having an arcuate mold cavity formed by a peripheral groove in a rotatable casting wheel and an endless metallic band which seals a portion of said groove, and having multiple band support wheels, one of which is tangent to the casting wheel at the entrance to the mold and functions to press the band against said casting wheel, the improvement comprising:

- conduit means for supplying a flow of coolant to the interior of said one of band support wheels; sealable passageways, in the periphery of said support wheel, which communicate with the interior of said support wheel; movable means for sealing said passageways; and means for moving said sealing means thereby unsealing said passageways and allowing coolant to flow from the interior of said support wheel to and through the periphery of said support wheel and thence onto the band and wherein said movable means for sealing said passageways further comprises:  
a resilient block adapted to sealingly cover said passageways, spring means for urging said block to cover said passageways, and lifting means attached to said block for moving the block against the urging of the spring means so as to uncover said passageways.

4,412,581

**HEATING INSTALLATION COMPRISING A BOILER AND A HEAT PUMP**

Kristian Iversen, Sønderborg, and Henning Hansen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 1, 1982, Ser. No. 353,576

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109843

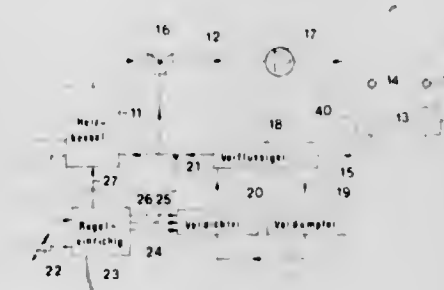
Int. Cl.<sup>3</sup> F25B 29/00

U.S. Cl. 165—29

3 Claims

1. A heating installation comprising a boiler, a heat pump, at least one radiator with a preceding temperature control valve, supply and return lines extending from said boiler to said radiators, a mixer valve between said supply and return lines, internal and external temperature sensors, control means for said

boiler and heat pump having said sensors as inputs, said heat pump having in a closed circuit a multi-stage compressor, a condenser in said return line and an evaporator subjected to external heat, said internal temperature sensor being in said return line between said boiler and said condenser, a graded set of threshold valve operating switches for said multi-stage compressor and a threshold valve operating switch for said boiler having a higher threshold than any switch of said set of switches, temperature converter means connected to said



external temperature sensor for providing an inverse signal relative thereto, limiter means connected to said temperature converter means for limiting said inverse signal thereof to the upper temperature operating limit of said compressor, comparator means having inputs connected to said internal temperature sensor and the output of said limiter means, and integrator means between said comparator means and said switches for selecting compressor and boiler outputs in response to comparisons between indoor and outdoor temperatures made by said comparator means.

4,412,582

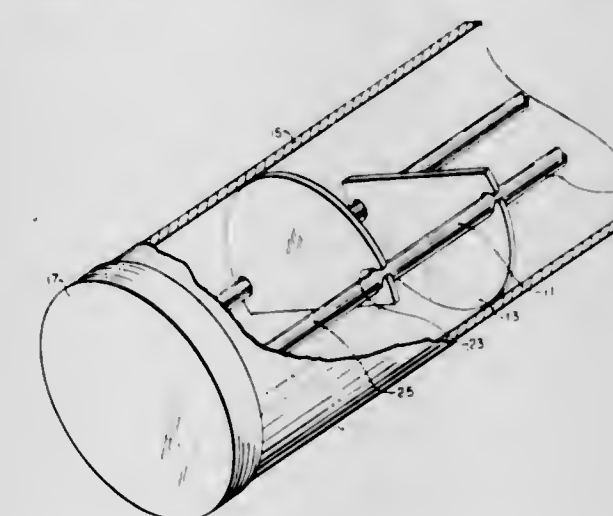
**BAFFLE ARRAY FOR HEAT EXCHANGE APPARATUS**  
Walter P. Mecozzi; Gary C. Mager, both of North Tonawanda, and Stephen A. Maliszewski, Lockport, all of N.Y., assignors to Hiross, Inc., Niagara Falls, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,850

Int. Cl.<sup>3</sup> F28F 7/00

U.S. Cl. 165—76

7 Claims



1. An internal baffle array for a heat exchange unit comprising a plurality of longitudinal spacer rods, each having a body portion and a protruded portion along the length thereof, said protruded portions having a plurality of slots therein at spaced intervals, and a plurality of baffle plates positioned at right angles to said spacer rods, said baffle plates each having a plurality of openings at the periphery thereof adapted to receive at least the body portions of said rods, with said spacer rods passing through the openings in said baffle plates and holding the baffle plates in desired spacing relationship by engagement of the widths of said plates within said spaced slots



in said protruded portions of said rods upon rotations of the rods.

4,412,583

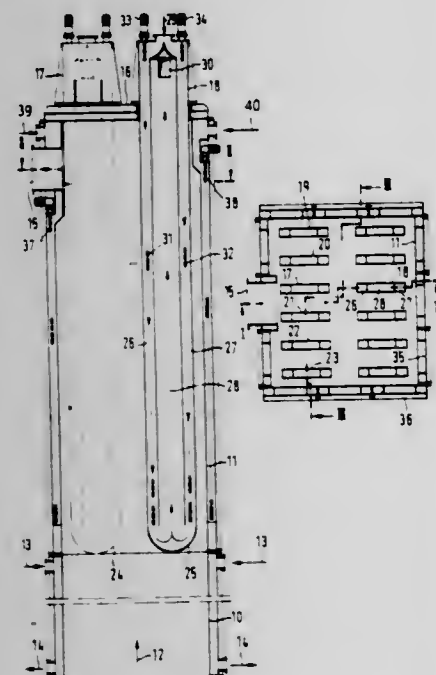
**APPARATUS AND METHODS FOR COOLING EXHAUST GAS STREAMS CONTAINING SUSPENDED PARTICLES**  
Friedrich Megerle, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany  
Filed Oct. 31, 1980, Ser. No. 202,483

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1979, 2944581

Int. Cl.<sup>3</sup> F28G 3/12, 7/00

U.S. Cl. 165—95

2 Claims



1. A cooler for cooling a hot gas stream containing suspended finely divided particles comprising:

- a large flow housing,
- means for introducing said hot gas stream at the base of said large flow housing,
- a plurality of fluid circulating tubular cooling elements of rectangular cross section supported in said flow housing with their major axes vertical and means defining inner and outer passages of substantially rectangular cross-section, said cooling elements being supported in depending relation within said large flow housing and having closed lower ends,
- means for circulating a cooling fluid through said cooling elements into heat exchange relationship with said hot gas stream surrounding said cooling elements, said hot gas stream being passed through a substantially larger cross-sectional area than occupied by said cooling elements, and
- cleaning means including freely oscillatable free-hanging devices positioned and located inside said cooling elements and in said outer passages in depending relation terminating short of said closed lower ends and arranged to impact said cooling elements to dislodge particles adhering externally thereto, and
- rotary drive means for rotating said cleaning elements within said cooling elements.

4,412,584

**DOWNHOLE TOOL INTAKE PORT ASSEMBLY**

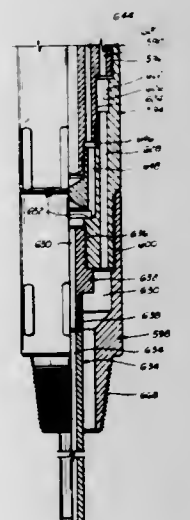
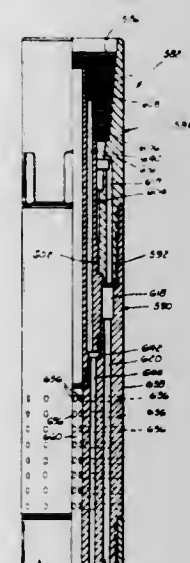
John T. Brandell, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 255,252, Apr. 17, 1981, Pat. No. 4,366,862, which is a continuation of Ser. No. 204,057, Nov. 4, 1980, Pat. No. 4,372,387, and Ser. No. 204,058, Nov. 4, 1980, Pat. No. 4,386,655, which is a division of Ser. No. 57,093, Jul. 12, 1979, Pat. No. 4,246,964. This application Aug. 26, 1982, Ser. No. 411,728

Int. Cl.<sup>3</sup> E21B 33/124, 33/127, 49/08

U.S. Cl. 166—169

4 Claims



1. An intake port assembly, comprising:
  - a top port assembly adapter having an internally threaded portion for threadedly connecting said intake port assembly to an apparatus located thereabove;
  - a port adapter having an upper end connected to a lower end of said top port assembly adapter;
  - a seal mandrel engaging and connected to said top port assembly adapter and having a lower end received in said port adapter;
  - a spacer connector having an upper end engaging and connected to said port adapter;
  - a lower port assembly adapter having an upper end connected to said spacer connector;
  - a flow passage means, disposed in said intake port assembly, for flowing a well fluid from a well bore located about said intake port assembly to said apparatus located above said intake port assembly;
  - an inflation passage means for communicating an inflation fluid under pressure from an upper end of said intake port assembly to a lower end of said intake port assembly; and
  - a bypass passage means for communicating well fluid from said upper end of said intake port assembly to said lower end of said intake port assembly.

4,412,585

**ELECTROTHERMAL PROCESS FOR RECOVERING HYDROCARBONS**

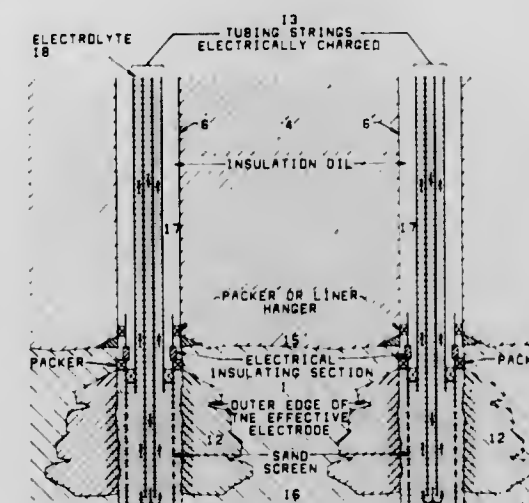
Larry S. Bouck, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed May 3, 1982, Ser. No. 374,582

Int. Cl.<sup>3</sup> E21B 36/04, 43/24

U.S. Cl. 166—248

2 Claims



1. An electrothermal process for recovering hydrocarbon values from an underground hydrocarbon-bearing formation having at least two separated boreholes penetrating the hydrocarbon-bearing formation, comprising the steps of:

- (a) placing a heating device in the first borehole,
- (b) energizing the device to heat the surrounding formation to a temperature high enough to produce coking of at least a portion of the hydrocarbon-bearing formation, thus forming a coked zone, which, having conductive properties, acts as an electrode,
- (c) maintaining the temperature of step (b) for a length of time to obtain a coked zone electrode having an effective radius at least twice that of the borehole,
- (d) repeating steps (a-c) in a second borehole,
- (e) applying a voltage between the coked zone electrodes of the first and second boreholes, to heat the formation between the boreholes to a temperature at which the hydrocarbon values are mobile, and
- (f) recovering hydrocarbon values from one of said boreholes.

4,412,586

**METHODS OF INHIBITING THE FLOW OF WATER IN SUBTERRANEAN FORMATIONS**

Thomas R. Sifferman, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 121,551, Feb. 14, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,745

Int. Cl.<sup>3</sup> E21B 33/138

U.S. Cl. 166—294

4 Claims

1. A method of reducing the water loss from an aqueous subterranean well formation treating fluid into a water permeable subterranean formation penetrated by a well bore comprising the steps of:

- injecting a gelling agent into said formation having the property of forming a highly viscous gel in the presence of water;
- and then introducing said aqueous treating fluid into said well bore whereby water therefrom and water contained in said water permeable subterranean formation forms a highly viscous gel with said gelling agent in said formation which reduces the flow of water thereinto;
- wherein said gelling agent is selected from the group consisting of ethoxylated surface active agents and mixtures of such agents.

4,412,587

**SOIL WORKING MACHINE**

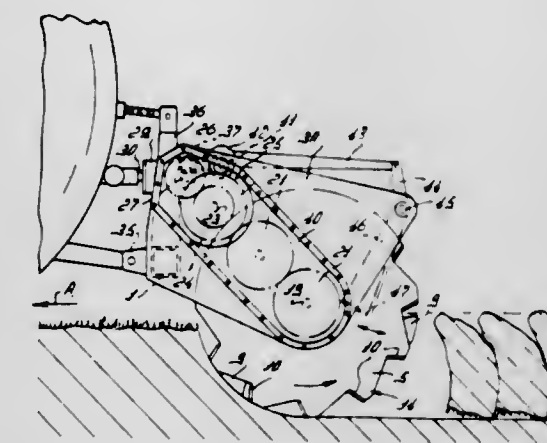
Cornelis van der Lely, 7, Brüschennrain, Zug, Switzerland  
Continuation of Ser. No. 27,365, Apr. 5, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,530

Claims priority, application Netherlands, Apr. 12, 1978, 7803852; Apr. 12, 1978, 7803853; Apr. 12, 1978, 7803854; Apr. 12, 1978, 7803855

Int. Cl.<sup>3</sup> A01B 9/00

U.S. Cl. 172—39

2 Claims



1. A soil working machine comprising a frame and at least one working member rotatably mounted on said frame, driving means connected to rotate said member about a horizontal axis, elongated opposing elements on pairs of supports of said member and a further member being displaceably mounted on said frame to the rear of said working member, said further member comprising a plurality of clod depositing means that project between adjacent elements of the working member, said clod depositing means being movable adjacent surfaces of said elements and co-operating with these elements during operation, said clod depositing means being arranged on arms positioned substantially midway between said supports of the working member, said arms being connected to an eccentric mechanism of the driving means and the respective arms being mounted on a shaft which extends substantially parallel to said axis.

4,412,588

**SOIL CULTIVATING IMPLEMENTS**

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

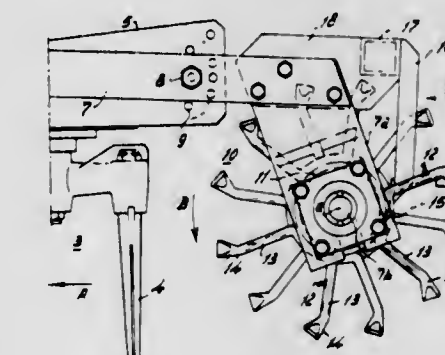
Filed Aug. 27, 1981, Ser. No. 296,815

Claims priority, application Netherlands, Aug. 29, 1980, 8004888

Int. Cl.<sup>3</sup> A01B 33/06, 29/04

U.S. Cl. 172—68

15 Claims



1. A rotary harrow including a frame and soil working means comprising a plurality of soil working members arranged in a transverse row, said members being rotatable about upwardly extending axes defined by respective shafts journaled in a transverse frame portion, a supporting roller being connected to the frame and positioned at the rear of said soil working members.



working members, said roller being pivotably interconnected to said frame portion via arms with adjusting means to support the frame portion and said arms being adjustable to a number of fixed positions to preselect the working depth of the soil working members, said roller comprising assemblies of outwardly extending projections mounted along the length of an elongated central carrier and said projections comprising integral portions that are angled to one another, said projections terminating in outer free ends which increase in width in substantially the direction of said roller's working direction of movement as they extend outwardly and said ends being bent over laterally from adjacent portions to increase the support of said roller on the ground during operation, said ends also being inclined relative to planes perpendicular to the axis of roller rotation, the end portions of successive projections around the surface of the carrier being bent over laterally in relatively opposite directions.

4,412,589

## EARTH CLOD PULVERIZER

Thomas E. Francis, 1814 Lakeside Dr., Quinton, Va. 23141  
Continuation-in-part of Ser. No. 399,939, Jul. 19, 1982. This application Sep. 29, 1982, Ser. No. 427,363  
Int. Cl.<sup>3</sup> A01B 27/00

U.S. Cl. 172-148

9 Claims



1. An earth clod pulverizing and earth smoothing implement of a type to be moved across the surface of the earth in a forwardly direction of travel while engaging the earth to break apart relatively large clods near the earth's surface and otherwise prepare the earth's surface for further use, said implement comprising a frame for defining a supporting surface to be approximately parallel to the earth's surface while said implement is in use and for supporting earth-engaging members extending from said supporting surface downwardly, said earth-engaging members including teeth;

the improvement wherein said teeth are wedge-shaped in cross section taken on a plane parallel to the earth's surface, with the cutting edge of each wedge defining a substantially vertical line facing the forwardly direction and with the relatively flat sides of the wedge flaring rearwardly and laterally of the forwardly direction, said teeth having pointed tips at the lower ends of said cutting edges with the trailing sides of said teeth sloping upwardly from said pointed tips toward the backs of said teeth, said pointed tips being directed downwardly into the earth's surface, said teeth being constructed of a cast metal and each tooth being at least 6 inches in vertical length and heavy in weight with cross-sectional sides of said teeth being substantially greater in length than half of the vertical lengths of said teeth;

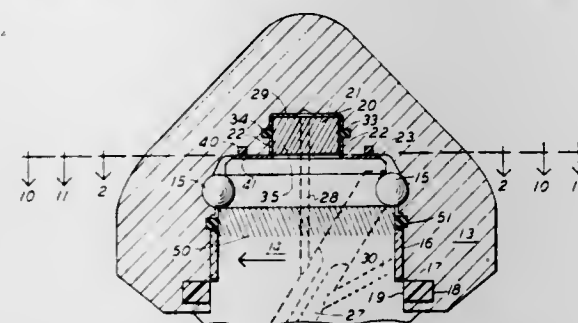
said earth-engaging means further including lateral, downwardly-extending bars rigidly mounted on said supporting surface positioned behind rows of said teeth, said downwardly extending bars being channel-iron means for providing pairs of front and back adjacent legs, said legs being directed substantially vertically downwardly, the front legs of said leg pairs being shorter than back legs thereof, said channel-iron means being rigidly mounted to said supporting surface on successively larger spacers so that bottom edges of said channel-iron means extend downwardly from the frame deeper than bottom edges of preceding channel-iron means.

4,412,590  
ROCK BIT INTERNAL LUBRICANT PUMP  
Jeffery E. Daly, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Jan. 23, 1981, Ser. No. 227,822  
Int. Cl.<sup>3</sup> E21B 10/22

U.S. Cl. 175-229

4 Claims



2. A bearing assembly for a rolling cutter drill bit comprising:

- a generally cylindrical bearing journal constituting a first bearing member, and having a generally cylindrical shank portion and a generally cylindrical pin portion concentric with but of small diameter than the shank portion at the end of the shank portion, thereby forming an annular shoulder of the journal;
- a roller cutter constituting a second bearing member, and having a recess of generally circular section therein receiving the journal;
- bearing means between the journal and the roller cutter for rotatably mounting the roller cutter on the journal; and
- a lubricant circulation system for circulating grease past the bearing means comprising seal means between the roller cutter and the journal for holding grease in the space therebetween, passing in the journal having a first channel opening to the space between the journal and the roller cutter generally at one side of said bearing means and a second channel in fluid communication with the first channel and opening to the space between the journal and the roller cutter generally at the opposite side of the bearing means, grooving in the surface of one of said bearing members, and a ring of elastomeric material carried on the other of said bearing members and engageable with said grooving for partially entering the grooving, whereby, upon rotation of the roller cutter on the journal, the ring forces grease to move through said grooving for pumping the grease past the bearing means, through the space between the journal and the roller cutter, and through said channels to circulate the grease.

4,412,591

## METHOD AND APPARATUS FOR SELECTING OPERATING MODES OR PARAMETERS IN AN ELECTRICAL SCALE

Arthur Reichmuth, Greifensee, and Willy Kunz, Zurich, both of Switzerland, assignors to Mettler Instruments AG, Greifensee, Switzerland

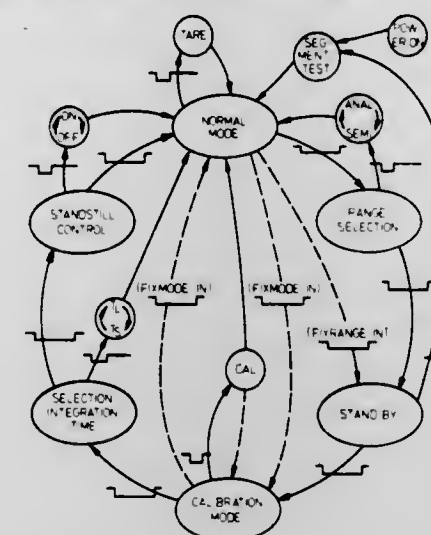
Filed Nov. 18, 1981, Ser. No. 322,520  
Claims priority, application Switzerland, Feb. 6, 1981, 802/81  
Int. Cl.<sup>3</sup> G01G 23/22, 13/14; G06F 15/20

U.S. Cl. 177-1

7 Claims

1. Method for operator-controlled selection of one of a plurality of operating modes available in an electrical scale having a single selector element, comprising the steps of selecting each of said operating modes in sequence and furnishing a corresponding mode identification signal to

said operator during continuous activation by said operator of said single selector element; and



wherein said scale subsequently operates in accordance with the mode present when said operator releases said single selector element.

4,412,592

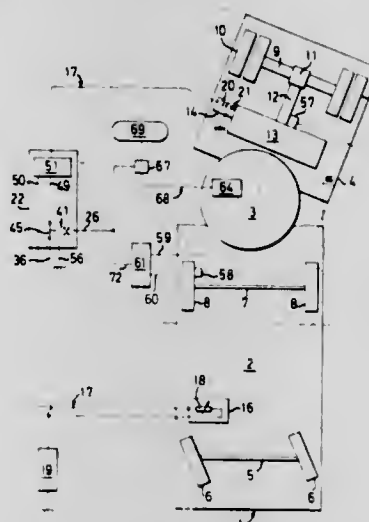
## ARRANGEMENT FOR LIMITING UNCONTROLLED ARTICULATION MOVEMENTS AT A PIVOT BETWEEN VEHICLE UNITS

Hans I. Bergman, and Björn D. Nyman, both of Katrineholm, Sweden, assignors to Saab-Scania Aktiebolag, Södertälje, Sweden

Filed Jun. 30, 1981, Ser. No. 279,012  
Claims priority, application Sweden, Jul. 3, 1980, 8004927  
Int. Cl.<sup>3</sup> B62D 53/00

U.S. Cl. 180-14 A

5 Claims



1. An arrangement in articulated vehicles for limiting uncontrolled articulation movements between a leading vehicle unit and a trailing vehicle unit articulately connected thereto and equipped with driving wheels which are driven by means of a driving unit, characterized in

that at least one transducer is adapted to sense instantaneous speed of at least one driving wheel on the trailing vehicle unit and to send a signal corresponding to said speed to a comparator circuit where the transducer signal is compared with a reference signal representing a normal value for the wheel speed at the instantaneous vehicle speed, and

that another transducer is adapted to sense instantaneous speed on at least one free-rolling vehicle wheel on the leading vehicle unit and to send a signal corresponding thereto to the comparator circuit for constituting the reference signal, the comparator circuit being adapted to give, if the difference between the instantaneous wheel speed signal and the reference signal exceeds a predeter-

mined value, an outlet signal to at least one power control means for the driving unit which apportions transmittable force to the driving wheels in response to said signal, and/or to at least one regulating means regulating mechanical means directly affecting the articulation movement in response to said signal.

4,412,593

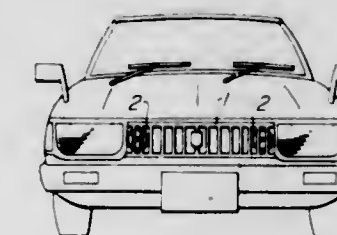
## STRUCTURE FOR SUPPORTING AUTOMOBILE HORN

Toshiju Taira, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 22, 1981, Ser. No. 227,245  
Claims priority, application Japan, Jan. 24, 1980, 55-6606  
Int. Cl.<sup>3</sup> B60Q 5/00

U.S. Cl. 180-68 P

3 Claims



1. A structure for supporting an automotive horn having a circular peripheral flange to an automotive vehicle provided with a synthetic resin radiator grille having a rear side portion, comprising:

- an annular synthetic resin frame integrally incorporated with said radiator grille at said rear side portion and defining a rearwardly facing annular recess for receiving the peripheral flange of the horn;
- a cushioning member disposed in said recess and having a radially-inwardly-facing annular groove for receiving the peripheral flange of the horn; and
- an annular locking member attachable to said frame to retain said member and the horn in said recess.

4,412,594

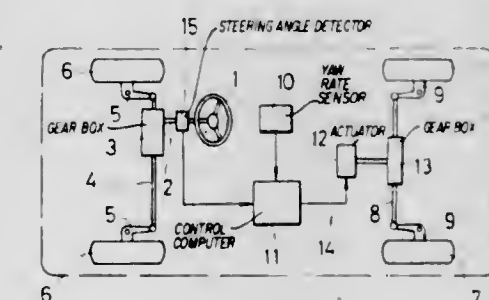
## STEERING SYSTEM FOR MOTOR VEHICLES

Yoshimi Furukawa, Tokyo, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kaisha, Kaisha, Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,070  
Claims priority, application Japan, Aug. 27, 1980, 55-118101;  
Sep. 2, 1980, 55-121586; Oct. 20, 1980, 55-146571  
Int. Cl.<sup>3</sup> B62D 5/06

U.S. Cl. 180-140

7 Claims



1. A steering system for a motor vehicle having rearward steered wheels, comprising:

- a sensor for sensing at least a turning motion of the vehicle; drive means responsive to a signal from said sensor for steering the rearward wheels; and
- wherein the steered angle ratio  $\gamma$  of the rearward wheels to forward wheels of the motor vehicle is selected to be in the range of  $0 < \gamma \leq 0.6$  when the vehicle is moving at a



speed of 80 km/h or higher, so as to provide optimal steering operation characteristics.

4,412,595

## THREE WHEELED VEHICLE

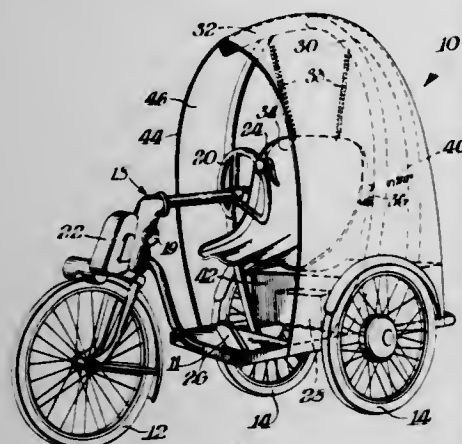
Augustus B. Kinzel, 1738 Castellana Rd., La Jolla, Calif. 92037

Filed Apr. 10, 1981, Ser. No. 253,076

Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 180—211

11 Claims



1. In a motor powered vehicle having a body with a plurality of wheels mounted to said body and with power driving means associated with at least one of the wheels for imparting motion to the vehicle and with a steering mechanism associated with the wheels for steering the vehicle and with a seat disposed in back of the steering mechanism, the improvement being a vertical transverse roll bar extending from one side of said body to the other perpendicular to the longitudinal axis of said body forward of and parallel to its rear axle, a vertical longitudinal roll bar extending from the back of said body and secured to said transverse roll bar midway thereof and perpendicular to said transverse roll bar, said seat being suspended from said roll bars in the plane of said transverse roll bar by spring means, said spring means including a back spring secured to the back of said seat and secured to said longitudinal roll bar rearward of said seat.

4,412,596

## SPRING SUSPENSION FOR THE BACK WHEEL OF A MOTORCYCLE

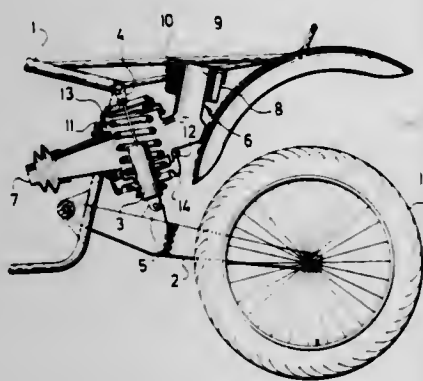
Frantisek Pudil, and Jaromir Trhlik, both of Strakonice, Czechoslovakia, assignors to Ceske zavody motocyklove, narodni podnik, Strakonice, Czechoslovakia

Filed Aug. 14, 1981, Ser. No. 292,734

Int. Cl.<sup>3</sup> B62K 25/28

U.S. Cl. 180—227

4 Claims



1. A springing and damping arrangement for the back wheel of a motorcycle provided with a back swinging fork for the mounting of the rear wheel thereof, comprising a springing and damping member disposed between the back swinging fork and the frame of the motorcycle, the springing and damping member passing through a part of an enclosed air intake suc-

tion area for the engine between a filter element at the intake end thereof and a discharge branch for connecting a carburetor for the engine thereto, and flexible means sealing the respective ends of the springing and damping member at the motorcycle frame and the back swinging fork thereof to the respective portions of the means which encloses the suction area for the engine.

4,412,597

## ENGINE SUPPORT STRUCTURE FOR MOTORCYCLES

Yasuaki Aiba, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

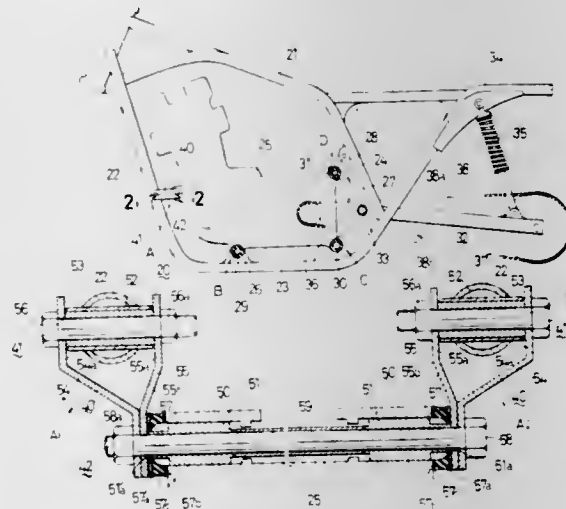
Filed Sep. 11, 1981, Ser. No. 301,274

Claims priority, application Japan, Sep. 22, 1980, 55-132072; Oct. 24, 1980, 55-149037; Oct. 28, 1980, 55-150967

Int. Cl.<sup>3</sup> B60K 5/12

U.S. Cl. 180—228

25 Claims



1. In a motorcycle of chain drive type comprising a frame, an engine, coupling means attaching the engine to the frame at a plurality of locations; a chain and a drive sprocket for driving a drive wheel of the motorcycle, said chain transmitting output power from the engine to the drive sprocket, the improvement wherein said coupling means includes at least at one of said plurality of locations, a link coupling coupled to said frame and engine for pivotal movement in a vertical plane, said frame including a down tube portion at the front thereof, said link coupling having a front end pivotably connected to said down tube portion and a rear end pivotably connected to said engine, said down tube portion including a pair of left and right tubes, said link coupling including a pair of substantially parallel link means associated with each of said tubes.

4,412,598

## PERSONNEL TRANSFER APPARATUS AND METHOD

Peter M. Kimon, Mendham, N.J., and Yves Bertrand, Paris, France, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 227,708, Jan. 23, 1981. This application Apr. 28, 1982, Ser. No. 372,651

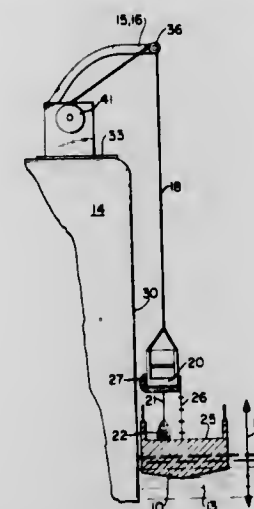
Int. Cl.<sup>3</sup> B65G 67/58; E04G 3/10; B66D 1/48

U.S. Cl. 182—19

22 Claims

1. A personnel transfer system, comprising a personnel carrier; a first means associated with said personnel carrier for operating said personnel carrier in a substantially motion balanced mode when said carrier is disposed upon a launch, wherein said personnel carrier will follow the fluctuating motion of said launch as it moves up and down in the sea; second means associated with said personnel carrier for operating said personnel carrier in a hoisting mode for lowering or lifting said personnel carrier; switching means associated with said first means and said second means for switching said personnel carrier between

said substantially motion balanced mode and said hoisting mode; and said first means including means extending between the personnel carrier and the launch for applying an increased downward



ward load on said personnel carrier when said personnel carrier assumes a position greater than desired above said launch, and to remove said increased downward load when said personnel carrier assumes the desired position above said launch.

4,412,599

## LADDER ATTACHMENT

Edward McCrudden, 311 Stonechurch Rd., E., Hamilton, Ontario, Canada L9B 1B1, and Frank Shandalan, Hamilton, Canada, assignors to Edward McCrudden, Hamilton, Canada

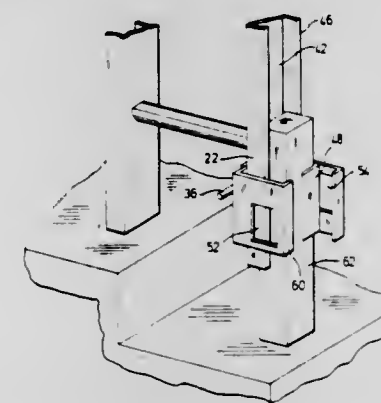
Filed Mar. 22, 1982, Ser. No. 360,155

Claims priority, application Canada, Feb. 12, 1982, 396148

Int. Cl.<sup>3</sup> E06C 7/44, 7/48

U.S. Cl. 182—201

10 Claims



1. A ladder attachment for securement to the stile or leg of a ladder comprising, in combination, a channel having a web of adjustable width and side walls substantially perpendicular to the web, a reversible angle having securing means for connecting one flange of the angle to the interior of one of said side walls whereby the other flange of said angle is upstanding from said side wall either towards or away from said web relative to the securing means to receive a stile of a ladder between said angle flange and the channel web, means extending through the channel web for biasing the ladder stile away from the channel web, an opening formed in each of the channel side walls for receiving an elongated member therethrough, whereby said elongated member can be inserted through said channel wall openings as a standoff or inserted between a ladder leg and an angle flange as a ladder leg extension and the ladder leg secured to the elongated member by biasing the ladder leg away from the channel web.

1036 O.G.—4

4,412,600

## HYDRAULIC ELEVATOR

Takuzo Ito, Tadashi Suzuki, and Tatsuro Miyake, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

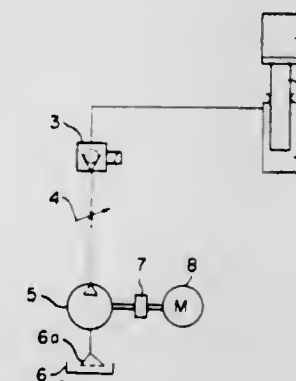
Filed Mar. 26, 1981, Ser. No. 247,716

Claims priority, application Japan, Mar. 26, 1980, 55-38782

Int. Cl.<sup>3</sup> B66B 11/04

U.S. Cl. 187—17

5 Claims



1. A hydraulic elevator comprising: a car; hydraulic means coupled to the car for raising and lowering the car using a hydraulic fluid; a hydraulic pump for supplying the hydraulic fluid to the hydraulic means during raising of the car and for discharging the hydraulic fluid from the cylinder thereof during lowering of the car; a motor coupled to the hydraulic pump, said motor positively rotated during raising of the car and reversely rotated during lowering of the car; flow rate control means connected between the hydraulic pump and the hydraulic means for controlling a flow rate of the hydraulic fluid flowing between the pump and the hydraulic means; and one-way clutch means connected between the motor and the pump for transmitting a positive driving force of the motor to the pump during raising of the car, and for transmitting a reverse rotating force from the pump to the motor when the revolution speed of the pump exceeds the synchronous speed of the reverse rotation of the motor during lowering of the car, whereby the motor is utilized as a dynamo to apply regenerative braking force to the pump.

4,412,601

## ELEVATOR STORAGE SYSTEM

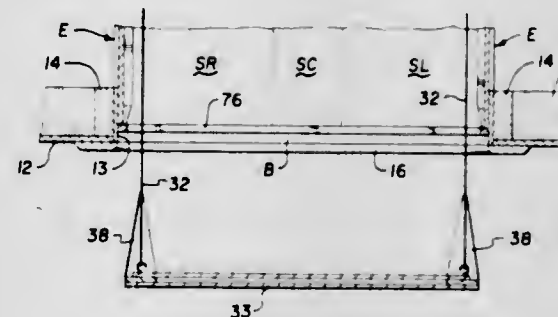
Gary D. Cooper, 3720 Danbury Dr., Arlington, Tex. 76016

Filed Apr. 17, 1981, Ser. No. 255,211

Int. Cl.<sup>3</sup> B66B 11/04

U.S. Cl. 187—27

13 Claims



1. An elevator storage system, for use in association with a ceiling structure, comprising a storage chamber defined by a ceiling entry opening and overlying above-ceiling space;



an elevator unit, for normal disposition within said storage chamber, comprising an upper transverse support member, a base platform defining a closure for said ceiling opening, and suspension members connected between said support member and said base platform;

an elevating mechanism comprising hoist means disposed in said chamber including at least one lift cable having its lower end connected to said support member, and means for actuating said hoist means to lower and raise said elevator unit;

said base platform having corner guides mounted on peripherally spaced corners thereof; said corner guides extending upwardly from said base platform, and providing upwardly and inwardly inclined, outward facing camming surfaces for engaging confronting inward facing surfaces of said ceiling opening to guide said base platform into said ceiling opening.

4,412,602

**BRAKING SYSTEM FOR RAILWAY TRUCK**

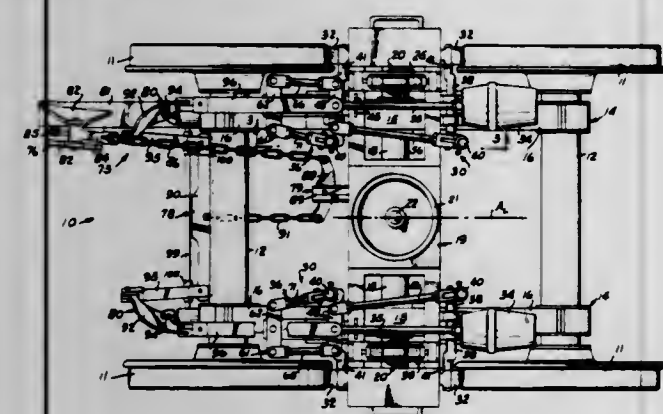
William T. Beatty, Oakwood, Ga., assignor to Rail-Or-Trail Corp., Gainesville, Ga.

Filed Sep. 16, 1981, Ser. No. 302,954

Int. Cl.<sup>3</sup> B61A 13/24

U.S. Cl. 188—53

4 Claims



1. A railway truck for a railway car body including a pair of spaced apart side frames, each of said frames including a generally horizontally oriented central section and a pair of upwardly angled end sections integral with opposite ends of said central section;
- a cross tube extending transversely of and pivotally connecting said central sections of said side frames so that said side frames can pivot with respect to each other about said cross tube;
- a pair of axles extending transversely of said side frames with each of said axles resiliently connected between the transversely aligned end portions of said side frames so that said axles are located on opposite sides of said cross tube and generally parallel thereto and so that each of said axles can pivot with respect to each other about a horizontal axis parallel to said side frames;
- a pair of railway track engaging wheels rotatably mounted on opposite ends of each of said axles outboard of said side frames;
- a truck bolster extending transversely over the central sections of side frames to support the car body thereon;
- a pair of spring assemblies resiliently connecting said truck bolster to opposite ends of said cross tube inboard of said wheels;
- a pair of brake assemblies, one of said brake assemblies mounted on each of the side frames and applying braking forces to said track engaging wheels adjacent that side frame, each of said brake assemblies comprising:
  - a pair of crank members pivotally mounted on said central section of said side frame mounting said brake assembly on opposite sides of said truck bolster, each of said crank members including a depending pad mounting

portion outboard of said side frame extending into the space between said wheels adjacent that side frame and an upstanding drive portion inboard of said side frame and projecting above said truck bolster;

- a brake shoe mounted on the pad mounting portion of each of said crank members so that, as said pair of crank members are pivoted in opposite directions, said brake shoes mounted thereon will engage and brake said track engaging wheels adjacent said side frame;
- a brake cylinder mounted on said side frame on one side of said truck bolster and including a horizontally extending brake rod projecting therefrom over said truck bolster and having a projecting end located on that side of said truck bolster opposite said brake cylinder;
- a horizontally oriented drive link having opposed ends located on that side of said truck bolster opposite said brake cylinder with the projecting end of said brake rod pivotally connected to said drive link intermediate its ends;
- a first connecting link extending over said truck bolster and pivotally connecting one end of said drive link to said drive portion projecting above said truck bolster of said crank member on the same side of said truck bolster as said brake cylinder;
- a motion reversing linkage pivotally mounted on said side frame on that side of said truck bolster opposite said brake cylinder, said motion reversing linkage pivotally connecting the other end of said drive link to said drive portion of said crank member on that side of said truck bolster opposite said brake cylinder so that said pair of crank members are pivoted in opposite directions as said brake rod moves said drive link in a first direction to force said brake shoe against the wheels with equal braking force.

4,412,603

**DUAL PRESSURE, DUAL PISTON ACTUATOR**

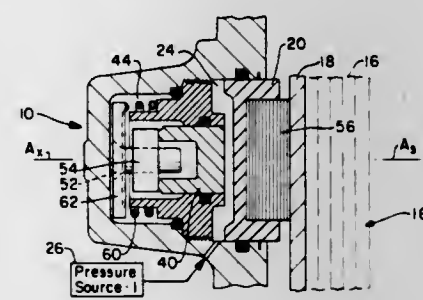
Andrea L. Bischoff, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 28, 1981, Ser. No. 334,706

Int. Cl.<sup>3</sup> F16D 65/22

U.S. Cl. 188—106 P

7 Claims



1. A dual source hydraulic actuator comprising:
  - a housing defining a primary bore having a closed end and an open end and a central axis;
  - a first piston slidably and sealingly mounted within the primary bore toward the open end thereof to move axially within the bore;
  - an insert threadably received within the primary bore and inwardly with respect to the first piston, said insert defining a secondary bore axially aligned with respect to said primary bore;
  - a second piston slidably and sealingly mounted within the secondary bore to move axially within the bore, said insert and second piston defining a first pressure chamber with respect to the first piston and defining a second pressure chamber with respect to the closed end of the housing;
  - a first source of hydraulic fluid pressure communicating with the first chamber to provide a pressure force on the first piston; and
  - a second source of hydraulic fluid pressure communicating

with the second chamber to provide a pressure force on the second piston; said second piston movable only in response to a fluid pressure from the second source to move said second piston into engagement with the first piston, both said pistons thus responding to the second source to provide an output actuating force, said first piston being solely and separately movable in response to the first source of fluid pressure to provide a substantially equal output actuating force.

4,412,604

**MULTI-PURPOSE SUITCASE**

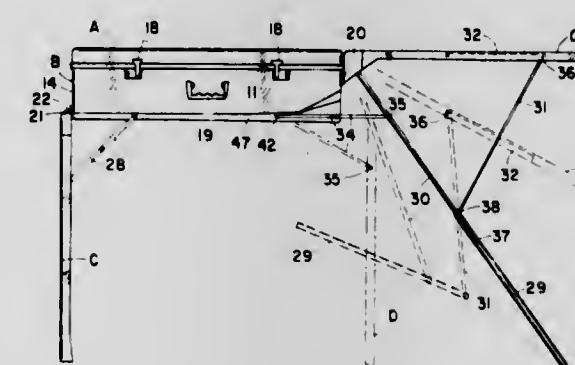
Harry A. Bell; Howard A. Bell, both of 3534 S. Hudson, Seattle, Wash. 98118, and Harry W. Bell, 5215 Paul Brown Rd., Lakeland, Fla. 33805

Filed Jan. 6, 1982, Ser. No. 337,423

Int. Cl.<sup>3</sup> A47B 85/00; A45G 9/00

U.S. Cl. 190—1

5 Claims



1. A composite, rectangular, molded suitcase, table and ironing board; the suitcase comprising a molded, hollow, rectangular cover and body portion; a molded, truncated V-shaped ironing board hinged to one end of the body portion; a molded, fork-shaped support hinged to the other end of the body portion and receiving the truncated V-shaped ironing board to form a smooth-surface rectangular bottom; the four corners of the composite suitcase, table and ironing board being recessed inwardly in the depth dimension.

4,412,605

**ENGINE FAN CLUTCH**

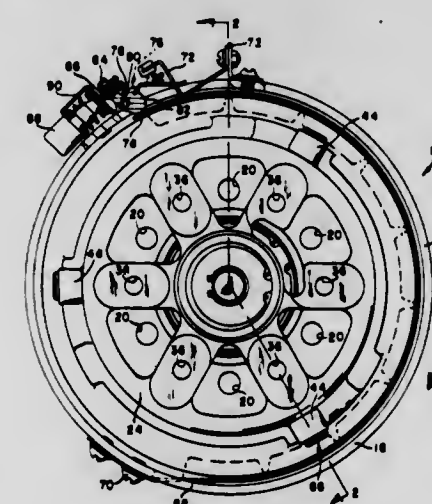
Brian C. Deem, Avon Lake, and Richard J. Reitz, Amherst, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 22, 1980, Ser. No. 218,902

Int. Cl.<sup>3</sup> F16D 43/25, 43/04

U.S. Cl. 192—82 T

13 Claims



1. In a clutch, a pair of relatively rotatable coaxial members comprising a driving member and a driven member, said driven member including a pair of axially extensible portions responsive to relative rotation between said portions to effect

extension thereof to drivingly engage said members by frictionally engaging one of said portions with said driving member, a flexible elongate belt having a free end and an attached end, means securing said attached end to said driving member for preventing relative movement between the attached end and said driving member, a friction surface carried by one of said portions for engagement by said belt, yieldable means engaging a section of said belt adjacent the free end thereof to hold said section into frictional engagement with said friction surface, said yieldable means yielding to movement of said section of said belt against said yieldable means due to centrifugal forces on said belt generated by rotation of said driving member above a predetermined speed, the portion of said belt between said section and said attached end flexing in response to relative movement between said section and said attached end when the latter is urged against said friction surface whereby said portion of said belt is also forced into frictional engagement with said friction surface as the clutch is engaged, and temperature responsive means carried by the driving member for engaging said section of said belt to hold the latter in frictional engagement with said friction surface when the temperature sensed by said temperature responsive means is above a predetermined level.

4,412,606

**TORSION DAMPER DEVICE FOR AUTOMOTIVE VEHICLE CLUTCH FRICTION DISC**

Pierre Loizeau, Ville d'Avray, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

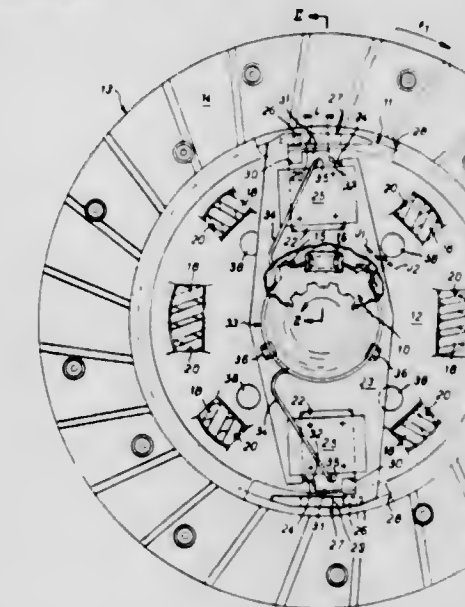
Filed Feb. 21, 1980, Ser. No. 123,509

Claims priority, application France, Feb. 23, 1979, 79 04719

Int. Cl.<sup>3</sup> F16D 3/14

U.S. Cl. 192—106.2

21 Claims



1. Torsion damping device, particularly a clutch plate, of the type comprising at least two coaxial parts mounted for rotation relative to each other within limits of predetermined angular displacement counter to a first circumferentially acting elastic means adapted to act circumferentially therebetween for at least one range of said angular displacement, at least one locking element sensitive to centrifugal force counter to return means and reversibly movable because an inoperative standby position for permitting freedom of action of said first circumferentially acting elastic means and an operative position, above a predetermined speed of rotation associated with said return means for producing a positive circumferential abutment of one of said parts against the other of said parts for at least one of the directions of rotation, and thereby rendering said first circumferentially acting elastic means inoperative at least for a portion of said range of angular displacement.



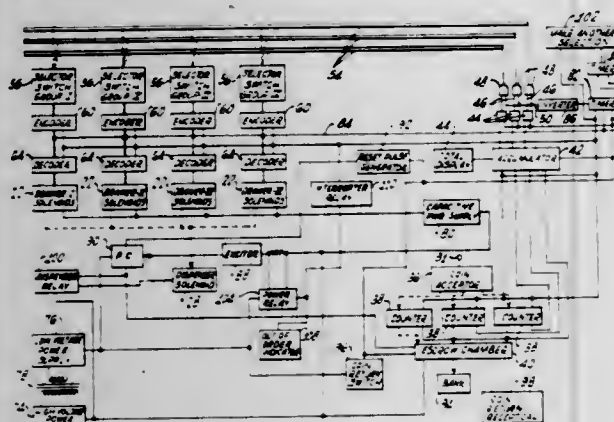
4,412,607

**VENDING MACHINE WITH IMPROVED MEANS FOR DISPENSING PRODUCTS AT A PREDETERMINED PRICE**

Robert J. Collins, Rte. 1, Box 60D, Culver, Oreg. 97734, and Erich F. Feigl, 1315 Granville Ave., Los Angeles, Calif. 90049  
Continuation of Ser. No. 255,170, Apr. 17, 1981, abandoned, which is a continuation of Ser. No. 48,046, Jun. 13, 1979, abandoned. This application Mar. 18, 1982, Ser. No. 359,471  
Int. Cl.<sup>3</sup> G07F 9/04

U.S. Cl. 194—1 D

13 Claims



1. A vending machine comprising:  
at least one receptacle for storing a plurality of articles to be vended;  
article-releasing means for releasing said articles sequentially upon actuation thereof;  
a bank chamber for storing tender;  
escrow chamber means for temporarily holding tender accepted by said machine and for supplying said tender to said bank chamber upon actuation thereof; and  
article-sensing means for sensing an article that has been released by said article-releasing means and for actuating said escrow chamber in response thereto, said article-sensing means comprising exciter means for producing a radiant energy beam and means for detecting said beam; and  
exciter sensing means for sensing whether said exciter means is operative to prevent actuation of said article-releasing means if said exciter means becomes inoperative.

4,412,608

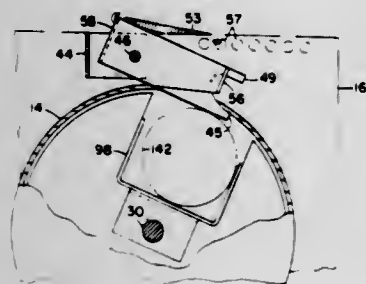
**COIN DISPENSING MACHINE FOR NON-FERROUS BEVERAGE CANS**

Arthur H. Kaspar; Johnny J. Valis; Weldon J. Aschenbeck, all of Shiner, Tex.; Josephine A. Kaspar (executrix of said Arthur H. Kaspar, deceased), and Don G. Kaspar (executor of said Arthur H. Kaspar, deceased), assignors to Kaspar Wire Works, Inc., Shiner, Tex.

Filed Jul. 31, 1981, Ser. No. 288,793  
Int. Cl.<sup>3</sup> G07F 7/06

U.S. Cl. 194—4 D

6 Claims



1. A machine for dispensing coins in response to receipt and checking of non-ferrous cans comprising:  
housing having a can opening from outside said housing to inside said housing to receive said non-ferrous cans there-through;  
cylinder means rotatably carried in said housing on a shaft

means extending from said housing to form a handle, said cylinder means having a carriage for receiving said non-ferrous can through said can opening and rotating said non-ferrous can therewith via said handle;  
check means for checking said non-ferrous can during rotation of said cylinder means to insure defined characteristics of said non-ferrous can;  
plate means rotated by said shaft means, said plate means engaging said check means to stop rotation of said cylinder means if said defined characteristics are not met;  
magnetic means pivotally mounted on said housing adjacent said cylinder means, said magnetic means checking articles inserted in said can opening and rotated adjacent thereto to determine if said article is ferrous and if so moving said magnetic means toward said article;  
a partial shell around said cylinder means, said partial shell having a non-metallic sheet between said magnetic means and said cylinder means;  
linkage means operatively connecting said magnetic means through said pivotal amount of said magnetic means to said plate means to prevent said rotation of said plate means and said cylinder means if said article is ferrous;  
coin dispensing means operated by rotation of said shaft for dispensing said coins upon a substantially complete rotation of said cylinder means; and  
can receiving means operated by rotation of said shaft receiving said non-ferrous can upon a substantially complete rotation of said cylinder means.

4,412,609

**TRANSPORT SYSTEM**

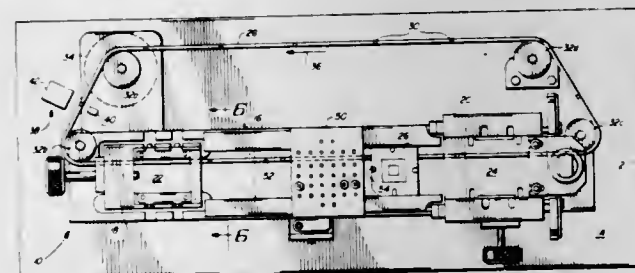
Edmund H. Schieve, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 29, 1981, Ser. No. 278,255

Int. Cl.<sup>3</sup> B65G 43/00

U.S. Cl. 198—341

6 Claims



1. A transport system for transporting fixtures serially from a fixture transferor station to a fixture transferee station, comprising:  
fixture guide rail means interconnecting the transferor station and the transferee station, said rail means having means forming a chain guide recess extending from the transferor station to the transferee station;  
a plurality of sprockets;  
a continuous plastic timing chain cable having transverse links mounted on said sprockets, said sprockets being positioned relative to said guide rail means so that the timing chain is positioned in the chain guide recess of the guide rail means with the transverse links being substantially vertical;  
means for causing one of said sprockets to rotate in a given direction;  
drive pins having a head and a shank mounted in selected ones of the links of the chain by inserting the shanks of the drive pins into the selected ones of said links, the heads of the pins projecting from the side of said chain so as to project beyond the chain guide recess to initially contact a fixture positioned in the transferor station; the distance between drive pins being substantially constant; and  
control means for controlling said means for causing one of said sprockets to rotate in a given direction.

4,412,610

**MEAT COOKING APPARATUS AND METHOD**

David B. Flavan, Jr.; Merrill M. E. Jenkins, Sr., both of St. Louis; James S. White, Webster Groves, and James E. Pate, Fenton, all of Mo., assignors to Three Rivers Development Corporation, St. Charles, Mo.

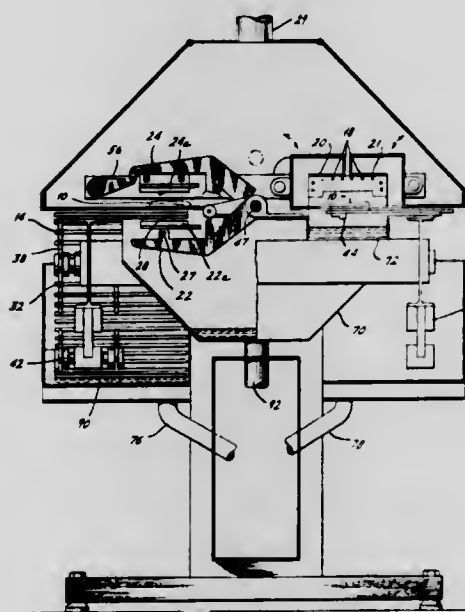
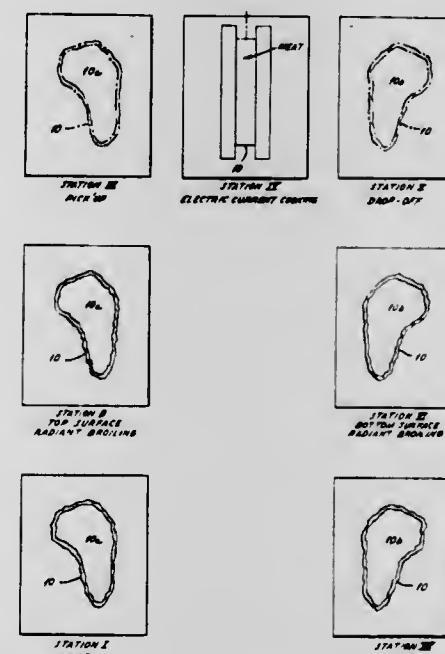
Division of Ser. No. 42,747, May 29, 1979, Pat. No. 4,244,284.

This application Nov. 3, 1980, Ser. No. 203,177

Int. Cl.<sup>3</sup> B65G 47/24

U.S. Cl. 198—403

5 Claims



1. A conveying mechanism for transporting an article comprising:  
a first endless conveyor for carrying said article, said first conveyor having a first plurality of cantilevered rods disposed perpendicular to the movement of said first conveyor and secured at their outer ends to a first chain;  
a second endless conveyor for carrying said article, said second conveyor having a second plurality of cantilevered rods disposed perpendicular to the movement of said second conveyor and secured at their outer ends to a second chain;  
first and second transfer members each having a plurality of fingers disposed perpendicular to the movements of said conveyors and sized and spaced from each other to pass between said cantilevered rods, said first and second transfer members adapted to engage opposite surfaces of said article;  
means for mounting said first and second transfer members between said conveyors for pivotal movement between

said conveyors through an arc perpendicular to the movements of said conveyors;  
and means for driving said conveyors and said transfer members at prescribed times.

4,412,611

**TRANSPORT MECHANISM**

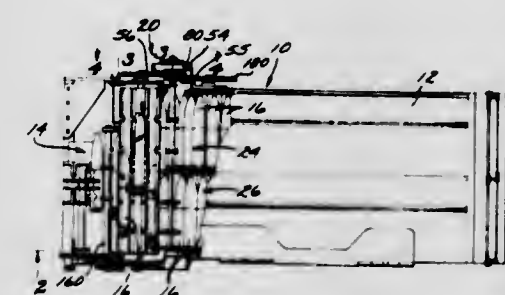
Michael D. Golden, Costa Mesa, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Oct. 26, 1981, Ser. No. 314,666

Int. Cl.<sup>3</sup> B65G 47/26

U.S. Cl. 198—450

15 Claims



1. For use in a material handling system for transporting a plurality of like objects from a storage compartment thereof to a predetermined location, a transport mechanism comprising in combination,  
means forming a plurality of inlet openings and one outlet opening, each of which is adapted to sequentially pass a plurality of said objects,  
means operatively interposed between said inlet openings and said outlet opening including a spacing unit having a rotatable shaft for each inlet opening individually adapted to retain said objects as said shafts are rotated, and a variable speed mechanism for varying the angular speed of each shaft to thereby vary the space between adjacent objects thereon for interleaving said objects from said inlet openings to form a single row of objects at said outlet opening.

4,412,612

**DRIVE BELT CONNECTION FOR AN AGRICULTURAL PICKUP DEVICE**

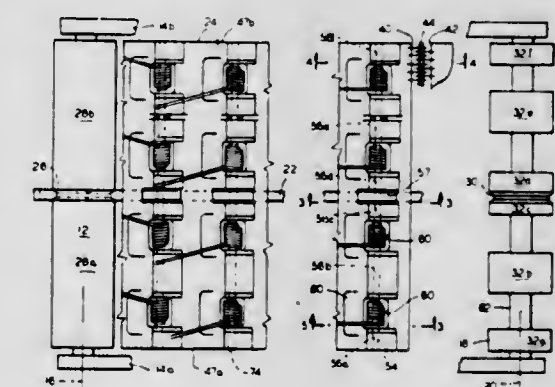
LaVern L. Ackerman, Bismarck, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 914,247, Jun. 9, 1978, abandoned. This application Dec. 20, 1979, Ser. No. 109,706

Int. Cl.<sup>3</sup> B65G 15/44

U.S. Cl. 198—697

8 Claims



1. An agricultural pickup device of the type having a pair of spaced-apart rollers, each of said rollers having a recessed portion, a flexible drive belt drivingly engaging said rollers at said recessed portions, an endless conveyor apron being disposed over said drive belt and around said rollers, said apron having a plurality of raised portions arranged in transverse rows, each of said rows of raised portions having a coaxial bore in each of said respective raised portions, a plurality of pins,



each of said pins threaded through respective coaxial bores of a respective row of said raised portions, said apron having at least one apron opening intermediate respective raised portions in each of said rows of said raised portions, a material-engaging element positioned in each of said apron openings and mounted on respective pins, wherein the improvement comprises said apron having lug openings, each of said lug openings intermediate respective raised portions in a respective row of said raised portions, said drive belt having an outwardly extending lug through each of said lug openings, each of said lugs having an aperture coaxial with respective coaxial bores of a respective row of said raised portions, a respective pin threaded through a respective aperture, whereby said pins used to connect said material-engaging elements to said apron also connect said drive belt to said apron so that said drive belt and said apron connection allows individual flexing of both said drive belt and said apron as they bend over said rollers at different pitch radii.

4,412,613

### MICROSURGICAL FOAM NEEDLE CONTROL PACKAGE

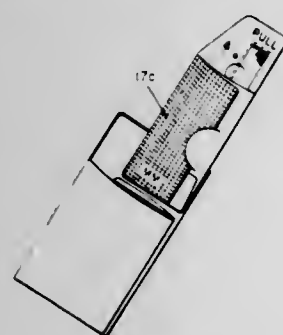
Robert J. Kubas, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 215,598, Dec. 12, 1980. This application Oct. 19, 1981, Ser. No. 311,857

Int. Cl.<sup>3</sup> A61L 17/02

U.S. Cl. 206—63.3

5 Claims



1. A direct dispensing surgical suture package comprising a center panel; a foam receptacle affixed to said panel; a single-armed surgical suture with the needle engaged in the receptacle; and at least a first flap adjacent and placed onto said panel allowing said receptacle to be visible, the improvement comprising a folder containing a second center panel and a plurality of side flaps, at least two adjacent side flaps of said folder being folded to form a pocket, said suture package placed into said pocket and the remaining side flaps of said folder being folded, whereby said package can be dispensed from said folder, and a grid on the exterior suture package surface whereby said suture can be dispensed from said package by disengaging and then pulling said needle, and said suture can be oriented and measured by placing it on said grid.

4,412,614

### THREE PANEL NEEDED SUTURE HOLDER

Konstantin Ivanov, Edison, and Jack Cascio, Bridgewater, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 16, 1982, Ser. No. 349,427

Int. Cl.<sup>3</sup> A61L 17/02

U.S. Cl. 206—63.3

10 Claims

1. An improved retainer for needed surgical sutures comprising:

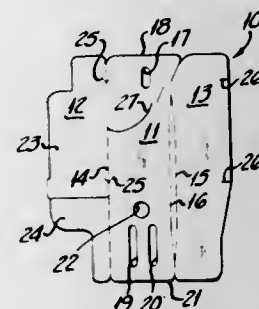
- a center panel;
- a pair of side panels;
- said center panel being substantially rectangular in shape;
- a side panel foldably connected to each of the longitudinal edges of the center panel;
- a single aperture located adjacent one transverse edge of

said center panel through which a pin may protrude on which the suture may be wound;

(f) at least one aperture located adjacent the opposite transverse edge of said center panel through which a pin may protrude on which the suture may be wound;

(g) one of said side panels being configured so that when it is folded upon the center panel it is substantially coextensive with the center panel in the central portion thereof but does not cover the apertures;

(h) said side panel being sectioned transversely so that the needle of the needed surgical suture may be placed on the center panel adjacent the single aperture and the first section of said side panel folded over on to the center



panel to cover and enclose the needle without covering the aperture, whereby when the suture is wound about the pins protruding from the apertures the initial winding of the suture will hold the needle in place while the suture is being wound about the pins;

(i) the second section of said side panel being foldable over the center panel to contain the lower portion of the wound sutures;

(j) the second side panel being substantially coextensive with the center panel and foldable about the longitudinal edge thereof connecting said side panel to the center panel; and

(k) said folder including locking means to maintain the folded panels in place and maintain the needed surgical suture in the desired configuration.

4,412,615

### ENGINE CRADLE

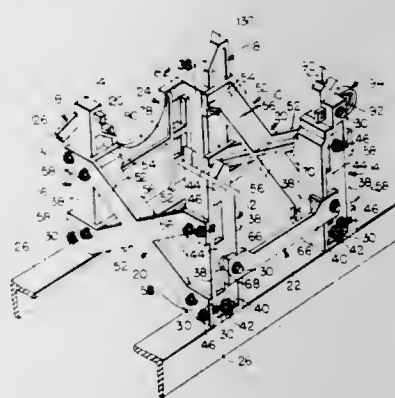
David J. Forshee, 11 Misty Morning Dr., Hilton Head Island, S.C. 29228, assignor to David J. Forshee

Filed Apr. 13, 1981, Ser. No. 253,260

Int. Cl.<sup>3</sup> B65D 85/68

U.S. Cl. 206—319

18 Claims



1. A plastic engine cradle fully open at its top and bottom sides for securement to a pair of longitudinally extending support rails or a supporting platform or rack of a material handling system comprising

a plurality of integrally molded unitary spaced apart upstanding plastic corner posts,

an integrally molded unitary front transverse plastic bar connected at its lateral distal ends terminating in two adjacent bifurcated flanges disposed in right angle planes to a first pair of said corner posts, an integrally molded

unitary rear plastic yoke plate member connected at its lateral distal ends terminating in two adjacent bifurcated flanges disposed in right angle planes to a second pair of said corner posts,

a pair of integrally molded unitary rigid plastic x-shaped cross members defining the lateral sides of said cradle and connected at their lateral distal ends terminating in two adjacent bifurcated flanges disposed in right angle planes to said pairs of corner posts,

said bifurcated flanges comprising an outwardly facing flange and an inwardly directed flange,

means secured to said inwardly directed flanges and affixed to said front transverse bar, said yoke plate member and said x-shaped cross members reinforcing and/or bracing said inwardly directed flanges against said corner posts, and fastening means removably securing the aforesaid integrally molded unitary plastic components rigidly together into an engine supporting cradle.

4,412,616

### MULTICOMPARTMENT EQUIPMENT CASE AND COVER

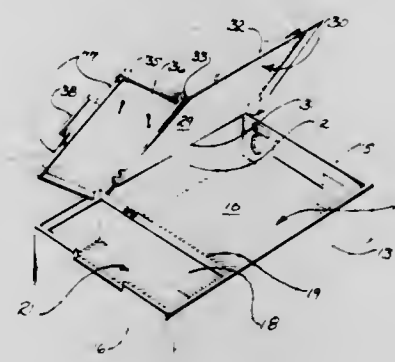
Paul M. Williams, Minneapolis, Minn., assignor to Williams Sound Corporation, Eden Prairie, Minn.

Filed Oct. 14, 1982, Ser. No. 434,221

Int. Cl.<sup>3</sup> B65D 51/18

U.S. Cl. 206—333

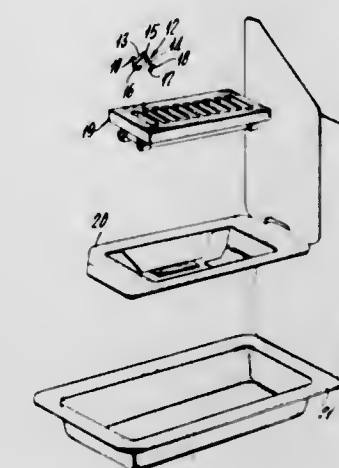
4 Claims



1. In an equipment case of the class providing multiple compartments to which periodic access is necessary, the combination, comprising:

a hollow one-piece plastic case including a plurality of compartments, each having an access opening, said access opening including means for latchable receiving a latch on a cover member therefore; and

a foldable one-piece plastic cover member including a like plurality of segments shaped and configured to coact with corresponding access openings in said case, and including a latch disposed and shaped to coact with corresponding ones of said means for latchably receiving said latch, one of said segments being hingedly attached to said case by resilient plastic material bridging to said case along one of said access openings and another of said segments being hingedly attached to said one segment by resilient plastic material along an edge of said one segment orthogonal to said case hinged attachment, only said last-identified segment having a lift tab attached thereto for unlatching said segment, thereby to require preferred sequential unlatching and latching of said segments.



4,412,617

### LIGATING CLIP PACKAGE

Robert J. Cerwin, Pittstown, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jul. 20, 1981, Ser. No. 284,413

Int. Cl.<sup>3</sup> B65D 85/24

U.S. Cl. 206—339

5 Claims

1. A package comprising:

- disposable means for holding a plurality of ligating clips in spaced apart relationship to facilitate dispensing of a clip;
- a plurality of sterile, dry, hydrolyzable surgical ligating clips disposed in spaced apart relationship in said disposable holding means, each of said clips having a narrowed resilient hinge portion, said hinge portions being more sensitive to hydrolysis than the remainder of said clip;
- absorbing means adjacent to said holding means, said absorbing means having a greater affinity for moisture than any portion of said clip whereby any moisture present in said package, including moisture in the area around each clip, is preferentially absorbed by said absorbing means, said absorbing means having sufficient absorbent capacity to maintain the clips dry and sterile while in the unopened package;
- a moisture impermeable outer wrap disposed in sealing relationship with respect to the disposable holding means, clips, and moisture absorbing means, whereby said initially dry and sterile clips are maintained dry and sterile until the package is opened to maintain the resiliency of the hinge portion of the clips for an extended shelf life period.

4,412,618

### TRAY FOR GROOMING INSTRUMENTS

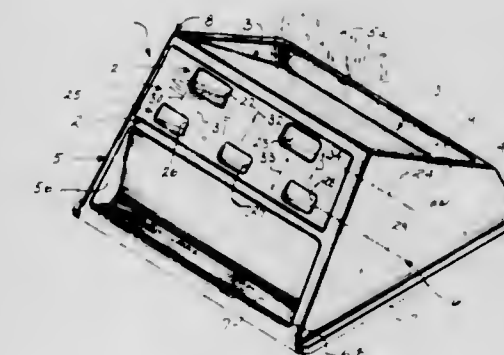
Ruth A. La Conte, 4529 N. Cramer, Whitefish Bay, Wis. 53211

Filed Sep. 29, 1981, Ser. No. 306,603

Int. Cl.<sup>3</sup> B65D 1/36, 6/04; C82F 1/70, 3/00

U.S. Cl. 206—581

4 Claims



1. A tray for removably holding grooming instruments, comprising:

a first wall operatively connected to a base and located in a plane inclined with respect to said base, said first wall including an upper portion having a plurality of spaced openings and a lower portion having a trough formed



herein for horizontally receiving a grooming instrument therein,  
a second wall located in a plane inclined with respect to said base, said second wall sloping downwardly from the apex of said first wall in a direction opposite from said first wall and including an abutment at the lower end of said second wall to form a recess for horizontally receiving a grooming instrument therein, said second wall further including a pair of opposite end walls extending between said apex and said abutment for enclosing the sides of said recess, support means providing an elongate tubular compartment associated with each of said openings and extending from the inner surface of said first wall to longitudinally retain a grooming instrument projected lengthwise from said first wall in an inclined position with respect to said base, each of said compartments having a length substantially greater than its width and an open bottom, and a plurality of side walls supporting said first and second walls.

4,412,619

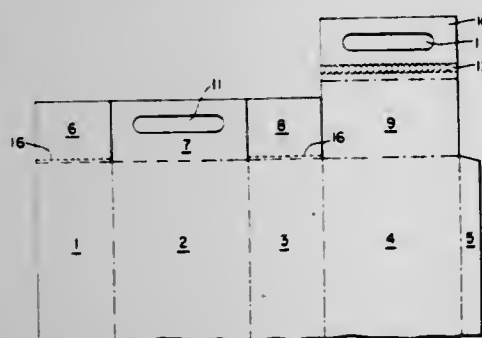
## RECLOSABLE CARRY-CARTON

Albert Van Laer, Beveren-Melsele, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Jan. 25, 1982, Ser. No. 342,340  
Claims priority, application United Kingdom, Jun. 17, 1980, 80-19681

Int. Cl.<sup>3</sup> B65D 27/38

U.S. Cl. 206-611

2 Claims

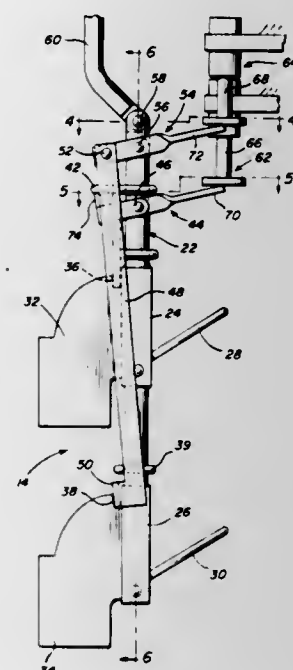


1. A seal-end carton in the form of a sleeve of rectangular cross-section and having alternating face and side panels, said carton provided with an easily opened reclosable end closure with an integrated handle, said end closure comprising two inner top flaps articulated from said side panels along integral score lines and having lines of weakness formed adjacent said score lines across substantially the entire width of said inner top flaps, an upright back top flap extending upwardly from one of said face panels and having a hand hold cut-out therein, an outer top flap articulated from the other of said face panels along an integral score line and having its inner surface adhesively attached to the outer surfaces of said inner top flaps, an extension flap articulated from the distal edge of said outer top flap along a second integral score line and having a cut-out therein corresponding to the hand hold cut-out of said upright back top flap, said extension flap being bent back along said second score line and adhesively joined to said upright back top flap with the hand hold cut-outs in registry, and a tear strip extending substantially across the full width of said extension flap intermediate the hand hold cut-out and said second score line and spaced from said second score line, whereby removal of said tear strip permits access to the carton interior by tearing open said top flaps along said lines of weakness of said inner top flaps while leaving a portion of said extension flap articulated from said outer top flap for reclosure of the carton.

4,412,620  
PLURAL HOOK POULTRY GRADING CARRIER SYSTEM

William F. Altenpohl, 1315 Robin Hood Rd., and Paul J. Altenpohl, 704 N. Westchester Dr., both of High Point, N.C. 27260  
Filed Mar. 19, 1981, Ser. No. 245,693  
Int. Cl.<sup>3</sup> B65G 17/20; A22C 21/00  
U.S. Cl. 209-3.1

10 Claims



6. A carrier adapted to be suspended from a conveyor comprising an elongated body, a plurality of hooks operatively mounted on the body and projecting laterally therefrom in the same direction, on only one side of the body, a plurality of separate latch elements mounted on the body for independently holding the hooks in latched positions on said one side of the body, and force transfer means through which latch releasing forces are applied to the latch elements for release of the hooks associated therewith.

4,412,621  
MAGAZINE ASSEMBLY FOR HOLDING INFORMATION BEARING CARDS AND THE LIKE

Falk-Jürgen Eichner, Coburg, Fed. Rep. of Germany, assignor to Eichner Organisation KG, Coburg, Fed. Rep. of Germany  
Filed Apr. 22, 1981, Ser. No. 256,520  
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016178

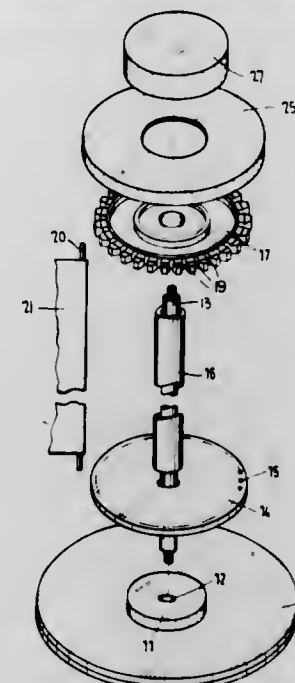
Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211-58

2 Claims

1. A rotary magazine assembly for holding information bearing cards and the like having support pins attached along one of the sides of the cards, comprising, a vertical axle having a support base, a pair of spaced plates rotatably mounted on said axle, a disc having a central aperture and overlying an upper one of said plates, said plates having a plurality of openings therein spaced along the outer peripheries thereof for the pivotal reception of opposite ends of said support pins, said openings in said plates respectively lying inwardly of said outer peripheries, said upper plates having slots each defined by a pair of diverging walls extending between each of said openings and said outer periphery thereof, each of said openings in said upper plate having a predetermined diametral size, and inner ends of each said pair of diverging walls being spaced apart a distance less than said size to thereby define

snap openings for the reception of upper ends of said pins, said disc having a plurality of projections extending radially in-



wardly into said slots for positive locking said upper ends of said pins in place against unintentional removal.

4,412,622

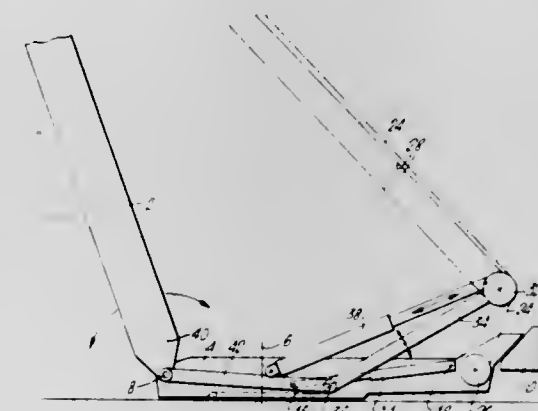
## TELESCOPING STRUT CRANE

Karl M. Gyomrey, Belmont, England, assignor to Coles Cranes Limited, England  
Continuation of Ser. No. 179,616, Aug. 18, 1980, abandoned.  
This application Sep. 15, 1982, Ser. No. 418,134  
Claims priority, application United Kingdom, Aug. 17, 1979, 7928797

Int. Cl.<sup>3</sup> B66C 23/42

U.S. Cl. 212-187

20 Claims



1. A vehicle mounted mobile crane comprising:  
a variably extendible telescopic jib having at least head and base sections, the foot of said base section releasably pivotally mounted to a first point at a first and forward position on the vehicle;  
a swing link pivotally connected at a first end to the foot of said base section and at a second end to a second point at a second position on the vehicle;  
means for swinging said swing link and the foot of said base section therewith about said second end to a third and rearward position on the vehicle so as to stow said jib, said foot and first end rising during swinging movement between said first and third positions;  
said second position being intermediate said first and third positions;  
a derrick mast pivotally mounted at one end at the second position on the vehicle;

pulleys mounted to the top of said head section and to the outer end of said derrick mast;  
a fixed length tie rope passed around said pulleys so as to support the jib head a fixed distance from the outer end of the derrick mast; and  
luffing means for angularly positioning said derrick mast acting between the mast and vehicle whereby the jib may be luffed when the base section is pivoted at the first position and whereby the mast and jib can be closely stowed when the base section is moved to the third position.

4,412,623

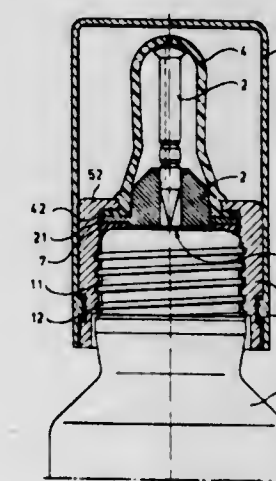
TEAT FEEDING BOTTLE HAVING A PIERCEABLE WALL AND SPIKE OPENING MEANS

Manfred Schmidt, Butzbacher Pfad 14, D-6365 Rosbach, Fed. Rep. of Germany  
Filed Dec. 28, 1981, Ser. No. 334,551  
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104861

Int. Cl.<sup>3</sup> A61J 9/00, 11/00, 15/00

U.S. Cl. 215-11 R

9 Claims



1. In a teat feeding bottle comprising a container, a screw cap, a teat and a spike, said teat having a peripherally extending flange sealingly clamped by the flange of said screw cap against a neck portion of said container, said teat freely extending outwardly from said screw cap, said spike extending to the top of said teat and positioned substantially vertically and the pointed tip of said spike being spaced from a pierceable wall of said container, the improvement characterized by a longitudinal guiding portion for the pointed tip of said spike, said guiding portion being clamped between said pierceable wall and said flange of said screw cap; and a pushbutton-like enlargement of said spike positioned within the interior of said teat and provided on the opposite end from said pointed tip of said spike.

4,412,624

HANGING MEMBER FOR HANGING A CONTAINER IN AN INVERTED POSITION

Nobuyoshi Tanaka, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan  
Filed Apr. 2, 1982, Ser. No. 364,643  
Claims priority, application Japan, Apr. 3, 1981, 56-48793[U]

Int. Cl.<sup>3</sup> B65D 25/22

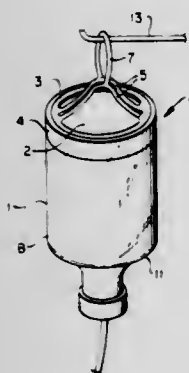
U.S. Cl. 215-100 A

20 Claims

1. A hanger for hanging a container in an inverted position, comprising:  
a ring member adapted to be placed on the bottom of the container;  
a pair of semi-circular hanger members lying along and spaced from the inner peripheral edge of said ring member and in the plane of said ring member in the non-use condition of said hanger, said semi-circular hanger members



having the ends integrally attached to the inner peripheral edge of said ring member at substantially diametrically opposite points of said ring member; and  
 a transverse hanger member attached to and extending between substantially the midpoints of said semi-circular hanger members transverse to a line between the points at which said semi-circular hanger members are integrally attached to said ring member, and in the plane of said ring member in the non-use condition of said hanger, all of said members being made of a bendable resin material and the



integral attachments of said semi-circular hanger members to said ring member and said transverse hanger member to said semi-circular hanger members are flexible and permit said members to hinge relative to each other, whereby said semi-circular hanger members can be pivoted upwardly out of the plane of said ring member and said transverse hanger member is looped upwardly for hooking over a laterally extending support member or hook on a stand, wall hook or the like for supporting the container in an inverted position.

4,412,625

**CHILD-PROOF PILL CONTAINER FOR HANDICAPPED**

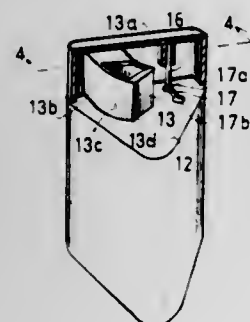
Patricia J. Zander, 508 Brevoort La., Rye, N.Y. 10580

Filed Feb. 16, 1982, Ser. No. 348,678

Int. Cl.<sup>3</sup> B65D 43/14, 47/08, 55/02, 83/04

U.S. Cl. 215—223

10 Claims



1. A safety container and cap comprising:
  - a container component provided with a storage compartment covered by a top with an opening therethrough for dispensing contents of the container;
  - a cap component provided with a means to seal the opening in the top of the container;
  - means for securing the cap slidably and rotatably to the top of the container and means for guiding the motion of the cap relative to the container, which motion comprises two discrete steps to uncover the opening of the container, wherein the means for securing the cap to the container comprises: a rotatable member from a first component inserted within a guide portion of a second component, which guide portion permits a lateral motion of the rotatable member followed by a rotational movement of the rotatable member, and the rotatable member comprises a cylindrical shaft protruding from the cap, which shaft is provided with an enlarged end with an abrupt increase in

diameter adjacent to the shaft and a tapered tip, and wherein the guide portion comprises providing the top of the container with an elongated slot having a circular enlargement of the slot at least at one end of the slot, wherein the slot width is narrower than the diameter of the protrusion, and the circular enlargement is approximately equal to the diameter of the shaft to admit the shaft without release and permit rotation of the shaft therein.

4,412,626

**FREIGHT CONTAINER WITH MEANS FOR LOCKING THE TENSIONING RINGS**

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Gerhard KG, Weitefeld, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,135

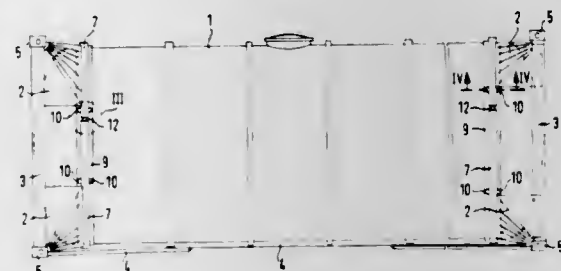
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034512

The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B65D 88/06, 88/12, 90/00

U.S. Cl. 220—1.5

19 Claims



1. A freight container for fluids, comprising
  - (a) an outer frame,
  - (b) a substantially cylindrical tank,
  - (c) a pair of tensioning rings surrounding said tank near both ends thereof, each ring being composed in the peripheral direction of said tank of at least two sections,
  - (d) means for interconnecting said sections of each said ring to tension the same about said tank,
  - (e) metal pieces welded to said tank for locking each said ring in both axial directions of said tank, and
  - (f) saddle pieces connected to said frame at corner regions thereof, each saddle piece having a border portion welded to a respective one of said rings.

4,412,627

**DRAWN AND IRONED CAN BODY**

Timothy J. Houghton; Carl J. Szwargulski, Jr.; Jerry A. Bentrup, all of St. Louis County, and Donald L. Smidt, Jefferson County, all of Mo., assignors to Metal Container Corporation, St. Louis, Mo.

Filed May 29, 1981, Ser. No. 268,321

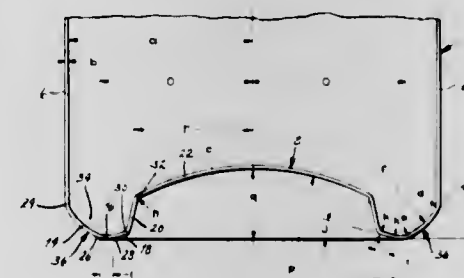
Int. Cl.<sup>3</sup> B65D 6/02, 7/42

U.S. Cl. 220—66

22 Claims

21. A metal can body that is capable of undergoing a controlled deformation when subjected to elevated internal pressures, said can body comprising: a cylindrical side wall and an end wall connected to the side wall and closing one end of the can body, the end wall including an annular peripheral section that extends downwardly from the side wall and inwardly toward the center axis of the can body, a circular, dome-shaped center section located inwardly from the peripheral section with its concave surface being presented downwardly, and at least two additional sections located between the peripheral section and the center section and serving to connect the peripheral section and the center section, one of the additional sections being connected to the peripheral section and extending generally inwardly therefrom, said one additional section being substantially the frustum of a shallow cone that is inclined upwardly away from the peripheral section, the width of said one additional section being substantially less than the

radius of the dome-shaped center section, another of the additional sections being oriented in a generally upright disposition and being connected to the center section at a band in the metal of the end wall, with the bend being located substantially above said one additional section and the dome-shaped center section being located entirely above the two additional sections, said other additional section extending generally downwardly from the center section and being disposed at a steep



angle with respect to said one additional section, the can body when the end wall is subjected to elevated internal pressures being adapted to permanently yield along the periphery of said one additional section such that the inclination of the one additional section changes and the one additional section becomes a downwardly and inwardly directed continuation of the peripheral section, whereby the other additional section and the dome-shaped center section shift downwardly to increase the volume of the can body.

4,412,628

**THERMOPLASTIC DRUM APPARATUS**

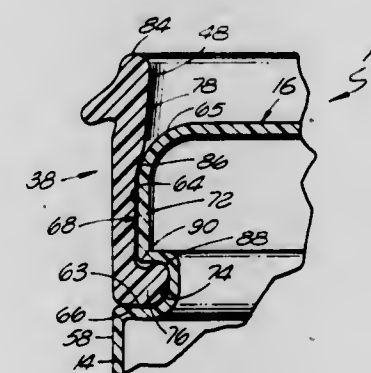
Floyd A. Whitney, Riverside, Calif., assignor to Born Free Plastics, Inc., Gardena, Calif.

Filed Apr. 17, 1981, Ser. No. 255,141

Int. Cl.<sup>3</sup> B65D 1/46, 6/36, 25/22

U.S. Cl. 220—71

2 Claims



1. A thermoplastic drum comprising:
  - a performed drum body having a top, a bottom, and a cylindrical sidewall between the top and bottom, the sidewall having a radially recessed region adjacent the top of the drum and a cylindrical indenture between the recessed region and the remaining non-recessed portion of the sidewall, the recessed region being radially recessed by a first distance; and
  - a rim attached to the recessed region of the drum body, said rim having a cylindrical wall, a grasping beak projecting away from the cylindrical wall about its circumference and a protuberance projecting inwardly from the cylindrical wall into the indenture, the cylindrical wall having a thickness substantially the same as the first distance so that the cylindrical wall of the rim is in colinear alignment with the non-recessed portion of the sidewall, the inwardly projecting protuberance of the rim having an annular, upwardly projecting lip extending from the pro-

tubance for modifying the cross-sectional shape of the protuberance whereby an enclosed annular space is formed between the recessed region of the sidewall and the protuberance adjacent to the lip.

4,412,629

**NON-SPILL DRINK-THROUGH LID**

William A. Dart, and Kenneth B. Dart, both of Okemos, Mich., assignors to Dart Container Corporation, Mason, Mich.

Filed Nov. 4, 1981, Ser. No. 317,789

Int. Cl.<sup>3</sup> A47G 19/22

U.S. Cl. 220—90.4

3 Claims



1. A non-spill drink-through lid for use on a drinking cup comprising:
  - a lid having a central cover portion, said lid adapted to matingly engage the upper peripheral edge of a drinking cup so as to selectively maintain said lid in a covering relationship on said cup;
  - a tab portion defined in said central cover portion of said lid, said tab portion selectively depressible so as to provide a drinking opening in said lid, said tab portion biased so as to selectively return to its normally closed position within the plane of said central cover portion upon removal of pressure thereagainst; and
  - a hollow lip-engaging buttress member integrally formed in said tab portion, said buttress member configured to provide increased heat-dissipating surfaces thereon so as to insulatively engage the upper lip of a user drinking from said cup through said drinking opening in said lid, said buttress member having a corrugated configuration comprising a plurality of arcuate narrow spaced-apart ridges having corresponding arcuate grooves positioned therebetween so as to insulatively engage the upper lip of a user drinking from said cup through said drinking opening in said lid, said ridges comprising narrow raised portions which define corresponding pockets on the bottom surfaces thereof so as to provide increased heat-dissipating surfaces on said buttress member so as to insulatively engage the upper lip of a user drinking from said cup through said drinking opening in said lid.

4,412,630

**CONTAINER CLOSURE ALIGNMENT DEVICE**

Robert H. C. M. Daenen, Hekelegem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Mar. 9, 1982, Ser. No. 356,601

Int. Cl.<sup>3</sup> B65D 43/04, 43/08

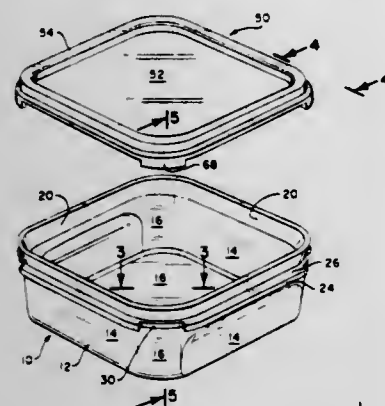
U.S. Cl. 220—353

8 Claims

1. A container having a wall structure and a bottom wall at one end of said wall structure;
  - said wall structure including at least two sidewalls joined by at least two curved walls;
  - said wall structure further including a sealing rim positioned at the end of the container opposite the bottom wall;
  - a cover having a central portion and a sealing member positioned about said central portion and adapted to mate with said sealing rim;



alignment means on said cover and said side wall structure cooperating to align the sealing member with respect to



the sealing rim such that the cover can be properly fitted onto the container.

4,412,631

## CAROUSEL CARD DISPENSER

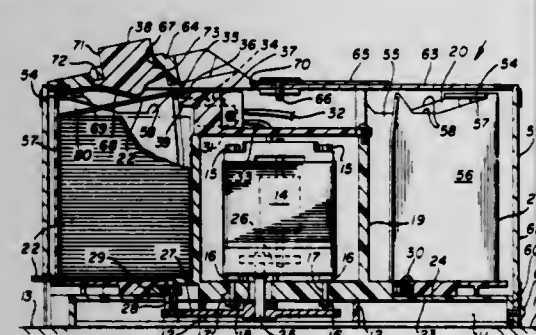
Floyd H. Haker, 6546 Linden La., Dallas, Tex. 75230

Filed Sep. 17, 1981, Ser. No. 303,293

Int. Cl.<sup>3</sup> A47F 1/10

U.S. Cl. 221-66

16 Claims



1. In a dispenser for the controlled one at a time dispensing of cards from a quantity of cards stored in the dispenser, to which a card must be returned to activate the dispensing of the next successive card to be dispensed: card storage means; card dispense extending means for extending one card at a time from said card storage means for removal by an operator and use in a repetitive use operational cycle; card to storage insertion means; and dispenser actuating means positioned for activation with a card reinserted in said card to storage insertion means; wherein said card storage means includes a card storage compartment; and said card dispense extending means includes a card extend drive cam, and drive means for driving said storage compartment and said card extend drive cam in relative movement for cam drive dispense extending a card from said card storage compartment; and wherein said drive means includes electric motor means; and said dispenser actuation means includes a drive means activating switch subject to activation to the on state by each card reinserted in said card to storage insertion means as the card is being moved to a card storage compartment.

4,412,632

## SELF-CLEANING VALVE

Richard F. Berger, 30 Cold Spring Hills Rd., Huntington, N.Y. 11743; Greg Pardes, 425 E. 58th St., New York, N.Y. 10022, and Bernard R. Gerber, 172-12 133rd Ave., Jamaica, N.Y. 11434

Filed May 28, 1981, Ser. No. 267,876

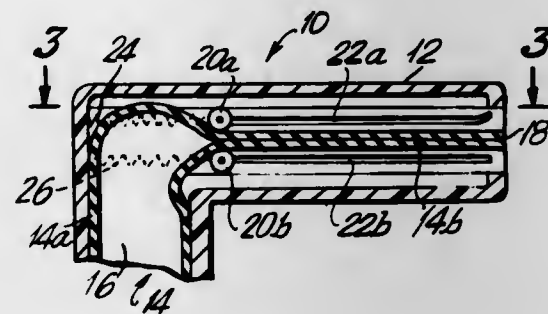
Int. Cl.<sup>3</sup> B05B 11/04

U.S. Cl. 222-148

12 Claims

1. Self-cleaning valve for use at the outlet of a container for dispensing a material from the valve comprising an axially elongated flexible flattenable outlet tube having an inlet end through which the material enters the valve and an outlet end from which the material is dispensed after passing through said

outlet tube with the axis of said outlet tube extending in the inlet end-outlet end direction, said outlet tube having an at-rest condition and a dispensing condition, said outlet tube forms a passageway between said inlet end and said outlet end, said passageway in the at-rest condition of said outlet tube is flattened for a portion of the axial length of said tube forming a closure of said passageway blocking flow through said valve, in the dispensing condition the force of the material being displaced from a container through said valve opens the flattened section of said passageway so that the material can flow out of said outlet end, means for maintaining said passageway



in said tube in the flattened condition in the at-rest condition of said valve including first means in aligned contact with opposite sides of said outlet tube at a location spaced from said outlet end and for moving in the axial direction of and relative to said outlet tube from the location of the at-rest condition to the outlet end of said outlet tube with said first means remaining in opposite aligned contact with said outlet tube whereby said valve is in the dispensing condition for permitting flow out of the outlet end of said tube and for effecting a cleaning of the flattened section of said outlet tube at the termination of the dispensing operation.

4,412,633

## VENTED SYNTHETIC-RESIN JUG

Vincent Guerrazzi, Nanterre, and Valerio Vendramini, Maubeuge, both of France, assignors to Seprosy Societe Europeenne pour la Transformation des Produits de Synthese, Paris, France

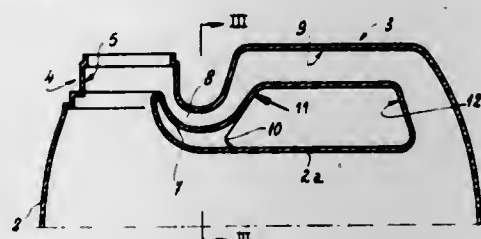
Filed Feb. 16, 1982, Ser. No. 349,172

Claims priority, application France, Feb. 17, 1981, 81 03482; May 26, 1981, 81 10835

Int. Cl.<sup>3</sup> B65D 23/10

U.S. Cl. 222-468

9 Claims



1. A jug comprising:

- a hollow body shaped to contain a liquid and having a bottom, a top wall, and opposite front and rear walls extending between said bottom and top walls;
- a collar formed in and projecting upward from said top wall adjacent said front wall and defining an upwardly open pour mouth, whereby a closure can be engaged sealingly with said collar;
- a tubular handle having
  - a rear end opening into said body and connected to said top wall adjacent said rear wall and
  - a front end connected to said top wall spacedly adjacent said collar; and
- structure unitary with said handle and top wall forming a passage extending from said front end of said handle and

opening upward directly into said collar in said mouth, whereby when said jug is forwardly tipped to pour liquid from said mouth, air can enter said body through said passage and tubular handle.

4,412,634

## CAP AND NECK UNIT FOR FLUID DISPENSER

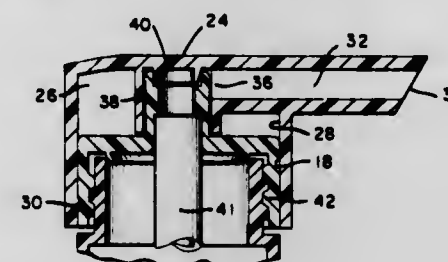
Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Nov. 10, 1981, Ser. No. 319,947

Int. Cl.<sup>3</sup> B65D 41/04, 47/20

U.S. Cl. 222-519

3 Claims



1. A cap and neck unit for a fluid dispenser, said unit comprising:

- a vertical neck adapted for use with a fluid container, said neck having interconnected upper and lower sections, the lower section defining a first hollow vertical cylinder having a first diameter, said first cylinder having a closed top end with a central circular opening having a second and smaller diameter, said upper section defining a second hollow vertical cylinder having said second diameter and open at its upper and lower ends, the lower end being coincident with said central opening, the outer surface of said first cylinder having a single continuous endless groove which has upper and lower horizontal regions interconnected by inclined regions;
- a cap having a top and a vertical interior chamber extending downwardly from the top and terminating in a hollow cylindrical region open at bottom, said region having a third cylindrical diameter larger than said first diameter and disposed concentrically about said neck, said region having an inwardly extending horizontal prong engaging said groove, said cap being rotatable about said neck between a first position at which said prong engages said lower horizontal region and the vertical separation between said top and said upper end of the upper section is a minimum and a second position at which said prong engages said upper horizontal region and said separation is a maximum;

an elongated hollow discharge conduit open at both first and second ends and secured to said top, the second end of the conduit being disposed outside the chamber and constituting a discharge orifice, said first conduit end being horizontally spaced from and disposed above the upper end of the upper section; and

sealing means secured to said top and disposed within said chamber, said sealing means including a third vertical hollow cylinder secured at its upper end to said top and open at its lower end, said third cylinder having a fourth diameter larger than said second diameter and smaller than said first diameter, said third cylinder being disposed concentrically about said second cylinder, and further including a sealing member secured to said top and disposed within the third cylinder, said first conduit end being connected to the third cylinder and communicating with the interior thereof, said means closing the upper end of the upper section and closing said first conduit end with said member being in sealing engagement with the upper end of the upper section when said cap is in the first position, said means leaving the upper end of the upper section open with said member being spaced above the upper end of the upper section to establish communication between

4,412,635

## TRAILER HITCH-MOUNTED UTILITY CARRIER FOR VEHICLES

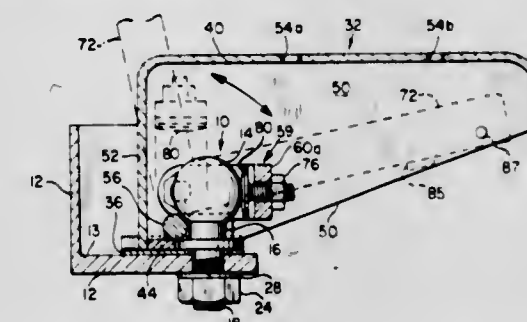
Franklin B. Bateman, 3040 Table Rock Rd., Medford, Oreg. 97501

Filed Aug. 12, 1982, Ser. No. 407,575

Int. Cl.<sup>3</sup> B60R 9/06

U.S. Cl. 224-42.03 R

12 Claims



1. A utility carrier for attachment to a trailer hitch of a vehicle in which the hitch includes a hitch ball and an underlying support for the carrier, said carrier comprising:

- a carrier member including an upper wall for attaching and supporting a load, and a slotted lower wall for receiving a neck portion of the hitch ball; and
- force-applying means cooperable with said carrier member for selectively applying a clamping force to clamp a portion of said carrier member between said ball and said underlying support to secure said carrier member to the vehicle.

4,412,636

## GARMENT HANGING APPARATUS FOR PASSENGER AUTOMOBILES

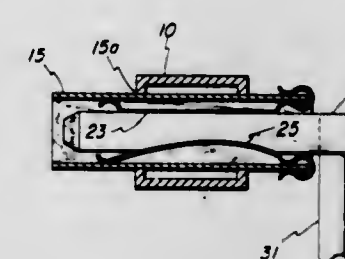
Thomas K. Greene, 190 Weeks Rd., Glen Falls, N.Y. 12801

Filed Aug. 13, 1982, Ser. No. 407,779

Int. Cl.<sup>3</sup> B60R 7/00; A47F 7/24

U.S. Cl. 224-313

10 Claims



1. Garment hanging apparatus for passenger automobiles comprising an elongated hanger beam shaped and adapted for secure attachment in fixed position to an automobile roof structure and having a plurality of transverse apertures, a hollow hanger receptacle post disposed in each aperture and secured to the hanger beam, a plurality of garment hangers having terminal portions to be received in the hanger receptacle post in the hanger beam, and resilient means disposed within the hanger receptacle post for resiliently and releasably engaging garment hanger portions inserted into the said post in assembling the hanger with the hanger beam.

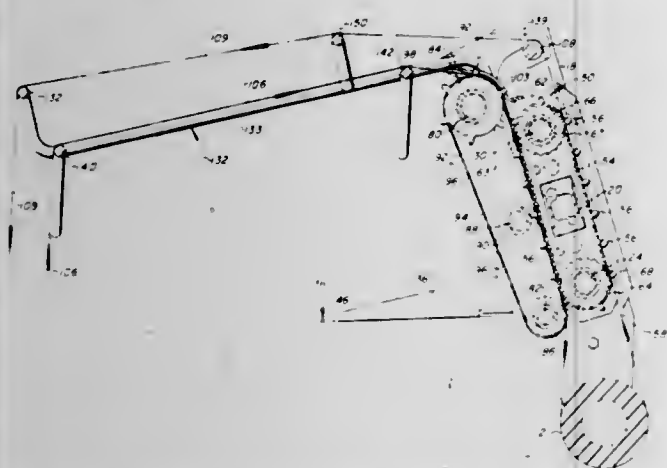


4,412,637

**BIDIRECTIONAL DOCUMENT FEED TRACTOR UNIT**  
Michael A. Berger, Richardson, Tex., assignor to Datamarc, Inc., Dallas, Tex.Filed Oct. 5, 1981, Ser. No. 309,462  
Int. Cl.<sup>3</sup> B65H 29/12, 17/38

U.S. Cl. 226—172

20 Claims



1. A document feeding tractor unit adapted to be mounted on a printer having a rotatable platen, said tractor unit comprising:

- a frame;
- a pair of document tractor mechanisms mounted spaced apart on said frame, said tractor mechanisms each including a tractor belt supported for linear traversal along oppositely moving runs, said tractor belt including a plurality of spaced apart projections engageable with said document at spaced apart perforations formed along a longitudinal side of said document;
- a support member associated with each of said tractor mechanisms;
- an endless flexible support belt engaged with spaced apart rotatable members mounted on said support member, said support belt being movable along one run of said tractor belt in supportive relationship with said document for maintaining said document engaged with said tractor belt, said support belt including spaced apart apertures formed therein and engageable with respective ones of said projections on said tractor belt whereby said support belt is driven by said tractor belt; and
- a sprocket rotatably mounted on said support member and in driven engagement with said support belt, said sprocket being drivably engageable with said document for positively driving said document in timed relation with said tractor belt.

4,412,638

**PINCH PRESSURE-ADJUSTING DEVICE FOR A PAIR OF PINCH ROLLERS USED WITH DUAL CAPSTAN TYPE TAPE-RUNNING APPARATUS**

Hideo Tomabechi, Higashiyamato, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,950

Claims priority, application Japan, Sep. 30, 1980, 55-139410[U]

Int. Cl.<sup>3</sup> B65H 17/20; G11B 5/54

U.S. Cl. 226—190

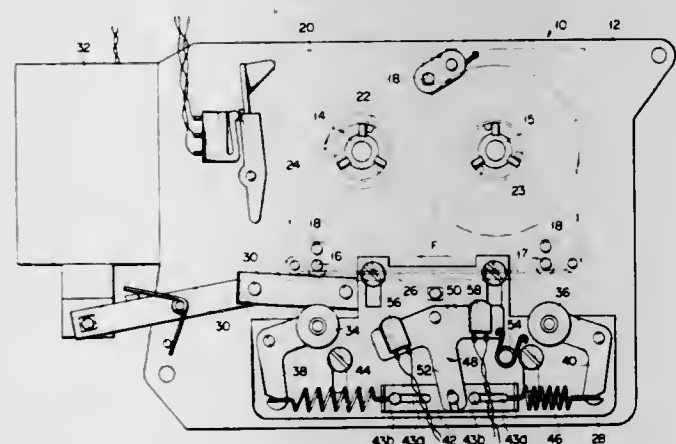
14 Claims

1. A pinch pressure-adjusting device for a pair of pinch rollers used with a bidirectional dual capstan type tape-running apparatus which is provided with first and second capstans jointly rotated in either of two opposite directions at an equal speed, and first and second pinch rollers respectively associated with said first and second capstans for clamping a tape in cooperation with the respective corresponding first and second capstans to let said tape travel in either of said two opposite directions, said pinch rollers being mounted on respective rotary shafts, the pinch pressure-adjusting device comprising: urging means mounted on said first and second pinch rollers

to urge them to be pressed against their corresponding respective first and second capstans; and urging force-adjusting means mounted on said urging means such that when the tape travels in a direction from said first pinch roller to said second pinch roller the urging means causes said second pinch roller to be urged toward its respective capstan with a greater force than said first pinch roller, whereby said second pinch roller applies greater pinch pressure to the tape than said first pinch roller, and said urging force adjusting means causing, when the tape travels in a direction from said second pinch roller to said first pinch roller, said first pinch roller to be urged toward its respective capstan with a greater force than said second pinch roller whereby said first pinch roller applies a greater pinch pressure to the tape than said second pinch roller;

said urging means comprising:

- first and second pinch roller-supporting members which rotatably hold said first and second pinch rollers respectively, each pinch roller-supporting member having a pivotal shaft which is in parallel with said rotary shafts of said pinch rollers;
- a first urging member having two ends, one end of which is fixed to said first pinch roller-supporting member which rotatably holds said first pinch roller; and



- a second urging member having two ends, one end of which is fixed to said second pinch roller-supporting member which rotatably holds said second pinch roller; and

said urging force-adjusting means comprising a movable member which is connected to another end of said first urging member and to another end of said second urging member, said movable member being shiftable between a first position in which said movable member is more spaced from said first pinch roller-supporting member than from said second pinch roller-supporting member and a second position in which said movable member is more spaced from said second pinch roller-supporting member than from said first pinch roller-supporting member, and when the tape travels from said second pinch roller to said first pinch roller, said movable member takes said first position to cause said first urging member to produce a greater urging force than said second urging member, and, when the tape travels from said first pinch roller to said second pinch roller, said movable member takes said second position to cause said second urging member to produce a greater urging force than said first urging member.

4,412,639

**DEFLECTOR AND INVERTER DEVICE FOR STRIPS OF WEB MATERIAL**

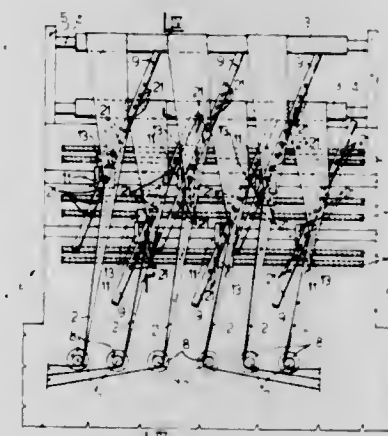
Bruno Caletti, Casale Monferrato, Italy, assignor to Officine Macchiniche Giovanni Cerutti S.p.A., Alessandria, Italy

Filed Sep. 14, 1981, Ser. No. 301,825

Claims priority, application Italy, Nov. 4, 1980, 68685 A/80  
Int. Cl.<sup>3</sup> B65H 23/32, 19/04

U.S. Cl. 226—197

4 Claims



1. A deflector and inverter device for axially movable strips of flexible sheet material comprising for each of the strips: an input roller perpendicular to the direction of advance of the strip; an output roller disposed at substantially 90° relative to said input roller; and a deflector bar disposed in an intermediate position with respect to said input and output rollers and operable to support a portion of the strip extending between said rollers means for supporting said bar for rotation; about an axis parallel to said output roller to assume, selectively, two symmetrical positions with respect to said portion of the strip; in each of said positions said bar forming an angle less than 45° with said portion of the strip.

4,412,640

**APPARATUS FOR ATTACHING A PLURALITY OF STUDS ON FLEXIBLE SHEET MATERIAL**

Akira Sugiyama, Nagoya, and Kunio Hirota, Aichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

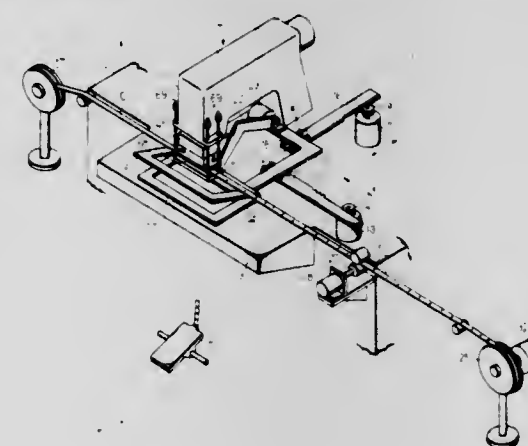
Filed Dec. 14, 1981, Ser. No. 330,084

Claims priority, application Japan, Dec. 20, 1980, 55-181076; Jan. 20, 1981, 56-7586

Int. Cl.<sup>3</sup> B27F 7/21

U.S. Cl. 227—85

8 Claims



1. Apparatus for attaching a plurality of studs to a flexible sheet material, each of said studs having a head portion and at least one leg portion, said apparatus comprising, a frame having a work table, a holder for holding said flexible sheet material on said work table,

supply means for supplying said studs one by one to said flexible sheet material, plastic working means including a punch and die set for attaching said studs on said flexible sheet material, said punch and die set being disposed oppositely on both sides of said flexible sheet material and relatively movable for plastic working action between a closed position and a separate position, said punch and die set being adapted to cause said leg portion of said stud to pierce through flexible sheet material and subsequently to cause said plastic working action against said leg portion for attaching said stud to said flexible sheet material according to the movement of said set of punch and die to said closed position, drive means for varying the relative position between said holder and said plastic working means, and control means for controlling the operation of said supply means and said drive means during said movement of said punch and die set in said separate position.

4,412,641

**DESOLDERING APPARATUS**

Gottfried Fuchs, Dorfprozelten; Ewald Garrecht, Wertheim-Sachsenh.; Lothar Rieck, Wertheim; Wolfgang Rüppel, Kreuzwertheim-Röttbach; Rudolf Schwarz, Schwieberdingen, and Erich Siegle, Eberdingen-Hochdorf, all of Fed. Rep. of Germany, assignors to Ersa Ernst Sachs GmbH &amp; Co. KG, Wertheim am Main, Fed. Rep. of Germany

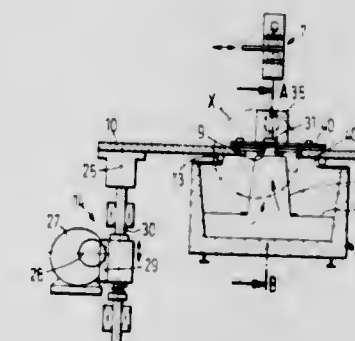
Filed Sep. 14, 1981, Ser. No. 302,077

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3040274

Int. Cl.<sup>3</sup> B23K 3/00

U.S. Cl. 228—37

6 Claims



1. Apparatus for desoldering electronic components from conductor boards, including a solder nozzle at the lower side of the conductor board and an arrangement for the removal of residual solder from the bores of the conductor board, comprising in combination: a second means defining a sub-atmospheric pressure space at the lower side of the conductor board; means accommodated to the dimensions of the component to be desoldered and removably defining an inlet opening to the sub-atmospheric pressure space; and opening means in the second means forming a delimitation for a solder wave issuing from said solder nozzle from below the second means.

4,412,642

**CAST SOLDER LEADS FOR LEADLESS SEMICONDUCTOR CIRCUITS**

John R. Fisher, Jr., Plainsboro, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,412

Int. Cl.<sup>3</sup> B23K 31/02

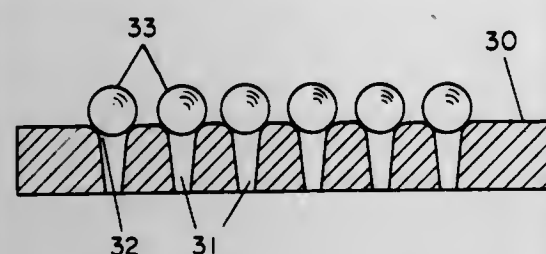
U.S. Cl. 228—173 R

11 Claims

1. A method for forming an electrically conductive lead comprising the steps of: positioning an electrically conductive preform in alignment with a mold cavity of a molding plate;



heating the molding plate to a predetermined reflow temperature;  
applying a force on the preform during the heating step



thereby forcing molten preform material into said mold cavity;  
cooling the molding plate; and  
removing the applied force.

4,412,643

# METHOD FOR BONDING OF A POROUS BODY AND A FUSION-MADE BODY

Tomio Sato; Kunio Okimoto, and Toshio Yamakawa, all of Tosu, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,214

Claims priority, application Japan, May 26, 1980, 55-69975

Int. Cl.<sup>3</sup> B23K 1/04

U.S. Cl. 228—221

5 Claims



1. A method for bonding a porous body and a fusion-made body which comprises the steps of

- bringing a surface of the porous body and a mating surface of the fusion-made body into contact with each other;
- placing an infiltrator material having a lower melting point than the porous body and the fusion-made body at a side of the contacting surfaces between the porous body and the fusion-made body; and
- heating the infiltrator material and the porous body and the fusion-made body in contact with each other, while maintaining a contacting pressure of at least 5 Kg/cm<sup>2</sup> at the contact surfaces, to a temperature exceeding the melting point of the infiltrator material but lower than the melting points of the porous body and the fusion-made body in an inert atmosphere.

4,412,644

# SPILL RESISTANT DISPOSABLE PAPER DRINKING CUP

William C. La Fever, Box 2958 Star Rt. 31, Las Vegas, Nev. 89101

Filed Jul. 20, 1981, Ser. No. 284,779

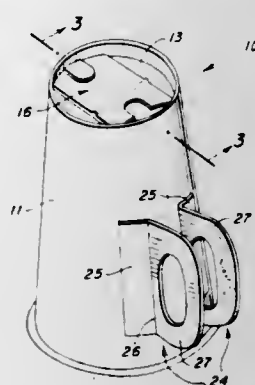
Int. Cl.<sup>3</sup> B65D 3/26

U.S. Cl. 229—1.5 B

5 Claims

1. A spill resistant, invertable, disposable paper drinking cup, comprising in combination, a side wall rolled around a small sized end wall at one end thereof, and a spaced apart larger sized open end at the other end thereof, an opening formed in said end wall, reusable tab means for covering said opening, sealing means for initially sealing said tab means over said opening in a leak proof manner, means for retaining said tab means in a closed condition over said opening after being

unsealed, cover means for closing said open end, and additional sealing means for sealing said cover means to said open end in a leak proof manner, whereby said cup can be used with the open end upward prior to unsealing of the tab whereby said end walls forms the bottom of the cup, and said cup can also be



used in an inverted manner by sealing of said cover means to the open end and unsealing said tab means to utilize said opening for access to the cup, whereby said cover means forms the bottom of the cup and the cup has an outward flare in a downward direction for greater stability.

4,412,645

# SELF-SEALING BAG SLEEVE

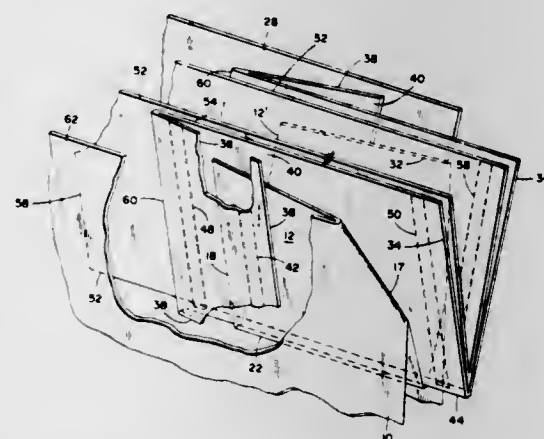
J. George Lepisto, Middletown, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 29, 1981, Ser. No. 316,223

Int. Cl.<sup>3</sup> B65D 30/24

U.S. Cl. 383—48

6 Claims



1. In a bag having opposed side walls for containing a flowable product therein, the bag also having first and second opposed closed ends, one of said ends having a self-sealing sleeve formed therein through which flowable product may be delivered into the bag, the improvement comprising said self-sealing sleeve including:

- a first generally tubular sleeve formed by folding one side of said one end of said bag inwardly so that the opposed side walls of said bag extend into said bag at said one side of said one end;
- a second generally tubular support sleeve located at least partially inside of said first sleeve, one end of said second tubular sleeve being folded back on itself to form a U-shape into which said first tubular sleeve is placed and adhesively attached in a strip along the entire width thereof; and
- a third generally tubular sleeve of substantially reduced thickness and greater flexibility than said second sleeve adhesively attached inside of said second sleeve along two spaced parallel strips extending across the entire width of said third sleeve, the third sleeve extending in length beyond the end of said second sleeve into the interior of said bag between said opposed side walls,

wherein said second tubular sleeve and said third tubular sleeve extending beyond said second tubular sleeve are held in place by closing and sealing said one end of said bag over said second and third sleeves.

4,412,646

# TWO-PIECE MECHANICAL FLAG

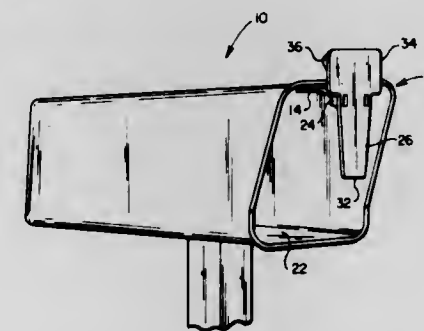
David A. Hollenbach, 777 Irvin-Shoots Rd., Marion, Ohio 43302

Filed Apr. 28, 1982, Ser. No. 372,577

Int. Cl.<sup>3</sup> A47G 29/12

U.S. Cl. 232—34

8 Claims



1. In the combination of a generally linearly extending tube for receiving printed matter inserted therein and a signaling device for visually indicating to an observer who is remote from the tube that something has been inserted in the tube, the tube having an axis and being elongated with one end being open at least part of the time,

the signaling device including a mounting member which extends in the same linear direction as the tube, said mounting member having one end rigidly fixed to said tube and the other end extending beyond the open end, a pivoting arm pivotally attached to said other end of said mounting member,

said pivoting arm having the physical property of being able to pivot through an angle of 180°, except for the angle superintended by the thickness of the mounting member, when said mounting member is not attached to said tube, said pivoting arm being limited to pivoting through an angle not substantially greater than 90° when said mounting member is attached to said tube, said 90° angle being one where the pivoting arm extends generally parallel with the axis of the tube at one extreme and perpendicular to that axis in the other extreme,

the pivoting arm including portions extending in two directions from its pivotal attachment to said mounting member, said directions being about 180° apart, one said portion being pivotable from a location parallel with the axis of the tube to a location where it extends across the end of the tube which is open at least part of the time, the one portion of the pivoting arm extendable across the end of the tube being of such a width and length that anything being pushed into or pulled from the inside of the tube will engage said one portion to thereby pivot it about 90° to orient it generally parallel with the axis, the other portion of the pivoting arm extending in its one extreme in a plane generally parallel with a plane defining the opening into said tube but beyond the tube surface a distance sufficient that it may easily be observed by said remote observer,

said mounting member including a flat portion coated with adhesive at the end fixed to the tube, said mounting member further including an angled portion intermediate said flat portion and the pivot connection with the pivoting arm whereby the pivot is radially off-set from the point said mounting member is fixed to the tube.

4,412,647

# MEASURING USE OF HEAT OR THE LIKE AT INDIVIDUAL ZONES SUPPLIED FROM ONE SOURCE

Heinz Lampert, Buchs, Switzerland, assignor to Willy Lanker, Zumikon, Switzerland, a part interest

Continuation-in-part of Ser. No. 143,265, Apr. 24, 1980,

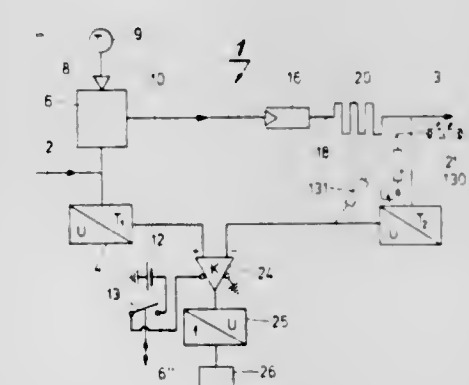
abandoned. This application Aug. 2, 1982, Ser. No. 404,383

Claims priority, application Switzerland, Apr. 25, 1979, 3875/79; Apr. 10, 1980, 2754/80

Int. Cl.<sup>3</sup> G01K 17/00

U.S. Cl. 236—36

7 Claims



1. In a system wherein a fluid medium is conducted from a pressurized source thereof through each of a plurality of zones of use, to satisfy demands at said zones for a characteristic of said medium that has a measurable and variable magnitude, and wherein each of said zones has an independently varying demand for said characteristic, measuring means for determining the total amount of said characteristic supplied to each said zone during a predetermined time interval, said measuring means comprising,

for each said zone:

- control means at the zone for producing a demand output at times when flow of said medium through the zone is required;
- an on-off valve connected between said source and the zone and operatively connected with said control means, for permitting said medium to flow through the zone only when said demand output is being produced;
- an automatic flow control device connected in series with said on-off valve for maintaining a predetermined substantially constant rate of flow of said medium through the zone whenever such flow is permitted;
- sensing means for producing a continuous difference output which is at every instant proportional to the existing difference in said magnitude as between said medium flowing into the zone and said medium flowing out of the zone;
- integrating means connected with said sensing means for producing a unit output each time the integral of said difference output with respect to time attains a predetermined value;
- recording means connected with said integrating means for recording the number of said unit outputs issued during said predetermined time interval; and
- switch means controlled by said control means and connected between said sensing means and said recording means to prevent unit outputs from being fed to said recording means at times when no demand output is produced.



# 4,412,648 CONTROL VALVE ASSEMBLY FOR STEAM RADIATORS

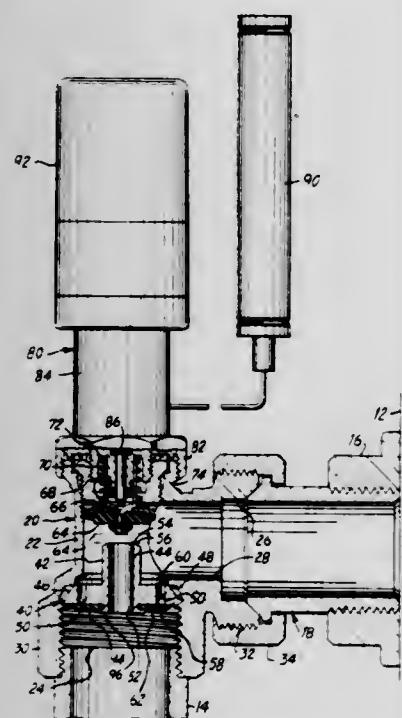
Thomas H. Ford, Tarrytown, N.Y., and Arend Sasserath, Monchen-Gladbach, Fed. Rep. of Germany, assignors to Ammark Corporation, Fair Lawn, N.J. and Hans Sasserath & Co. KG, Fed. Rep. of Germany, a part interest

Filed Apr. 1, 1982, Ser. No. 364,427

Int. Cl.<sup>3</sup> G05D 23/12

U.S. Cl. 236-42

8 Claims



1. A control valve assembly for use in a one-pipe steam heating system in which incoming steam and outgoing condensate are carried to and from a radiator by a single pipe connected to the radiator through the valve assembly for supplying heat to the ambient atmosphere at the radiator, the valve assembly comprising:

- a valve body;
- first and second ports in the valve body;
- a conduit within the valve body, the conduit interconnecting the first and second ports;
- means for enabling connection of the first port to said single pipe;
- means for enabling connection of the second port to said radiator;
- a valve element affixed within the conduit between the first and second ports, the valve element including an axially-extending tubular portion and a radially-extending flange portion;
- a first valve passage located in the valve element and passing axially through the tubular portion thereof, the first valve passage interconnecting the first and second ports and including a first end adjacent the first port and a second end adjacent the second port;
- a first valve seat located at the second end of the first valve passage;
- a first valve member movable into and out of contact with the first valve seat to close and open the first valve passage;
- temperature-responsive means coupled to the first valve member for moving the first valve member in response to the temperature of the ambient atmosphere at the radiator for controlling the passage of incoming steam from the single pipe to the radiator;
- a second valve passage located in the valve element and passing axially through the flange portion thereof, the second valve passage interconnecting the first and second ports and including a first end adjacent the first port and a second end adjacent the second port;
- the second end of the first valve passage being spaced axially from the second end of the second valve passage by the

tubular portion of the valve element such that the first valve seat is spaced axially away from the second end of the second valve passage to assure access to the second valve passage by the outgoing condensate when the first valve member is in contact with the first valve seat and to separate incoming steam at the second end of the first valve passage from condensate at the second end of the second valve passage when the first valve member is out of contact with the first valve seat;

- a second valve seat located at the first end of the second valve passage; and
- a second valve member movable in response to pressure differences between the first and second ports into and out of contact with the second valve seat to close and open the second valve passage, the second valve member being movable into contact with the second valve seat in response to a higher pressure at the first port to preclude the passage of incoming steam through the second passage and being movable out of contact with the second valve seat in response to a higher pressure at the second end of the second valve passage to enable the passage of outgoing condensate from the radiator to the single pipe.

# 4,412,649 ARRANGEMENT IN CLIMATIZATION SYSTEMS Kjell Claesson, Huddinge; Stig Rönnerholm, Handen, and Rolf Strand, Huddinge, all of Sweden, assignors to Tour & Andersson Aktiebolag, Stockholm, Sweden

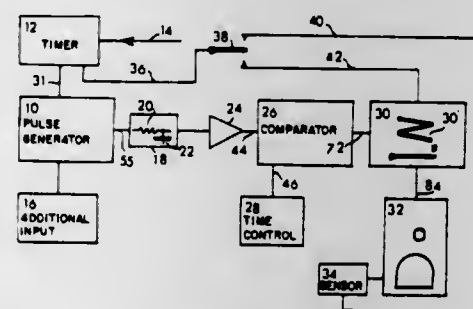
Filed Apr. 5, 1982, Ser. No. 365,475

Claims priority, application Sweden, Jun. 12, 1981, 8103698

Int. Cl.<sup>3</sup> F23N 5/20; H03K 5/00

U.S. Cl. 236-46 R

10 Claims



1. An arrangement for starting and stopping, respectively, a climatization system, e.g. a heating system for a locality, dependent upon, at least, the interior temperature proper of the locality and the out door temperature, characterized thereby that said arrangement comprises a pulse generator for creating pulses forming a pulse train of successively changed pulse-time-relation, said train of pulses being fed to an equalization device and from this, in the form of a successively changed, preferably D.C. voltage which is at least approximately free from A.C. components, to a comparator which is also fed with a voltage from a means indicating the outdoor temperature so that when a state of balance is obtained between the two voltages, a signal is transmitted for starting the climatization system.

# 4,412,650 SNAP ACTING HEAT MOTOR OPERATED GAS VALVE Kevin L. Young, Garrett, and Jesse H. Turner, Auburn, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 25, 1982, Ser. No. 361,949

Int. Cl.<sup>3</sup> G05D 23/10

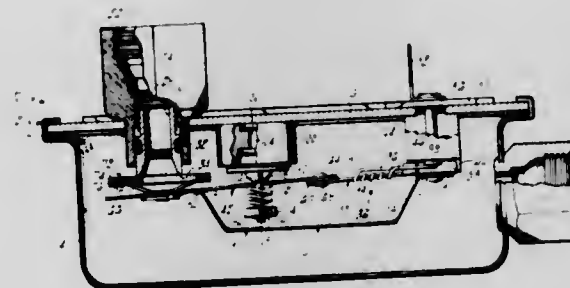
U.S. Cl. 236-48 A

5 Claims

1. In a heat motor operated gas valve having a housing provided with a valve seat extending into said housing from a gas outlet in one wall of said housing, and further having a valve member normally biased to a closed position seated on said valve seat and operable by a control bimetal strip carrying an electric heater to remove said valve member from said

valve seat when said heater is energized to heat said control bimetal strip; an improved heat motor operator comprising:

- means for fixedly support said control bimetal strip by one end portion within said housing, the other end portion of said control bimetal strip being free to move in response to temperature changes;
- a spring blade having opposed ends, one of said ends of said spring blade being secured to said other end portion of said control bimetal strip, said valve member being carried on the other end of said spring blade;
- an ambient temperature compensating bimetal member mounted in said housing at its one end and having an outer cantilever portion offset from its fixed end in generally parallel and spaced relation to said bimetal strip, said cantilever portion being arranged to flex relative to its fixed end and having a free end acting on said spring blade adjacent said other end thereof; said ambient temperature compensating bimetal member and said control bimetal strip being arranged to deflect in opposite directions upon similar changes in the temperatures thereof; said ambient temperature compensating bimetal member having a substantially greater effective length and a correspondingly substantially lower deflection constant than said control bimetal member such that respective changes in the forces due to thermal stresses exerted upon said spring blade by said control bimetal strip and said ambient temperature



compensating bimetal member upon a change in ambient temperature substantially offset each other;

magnetic means operable in conjunction with said control bimetal strip and said spring blade for effecting a snap action in movement of said valve member from and toward said valve seat, said magnetic means comprising an armature member and a permanent magnet member disposed adjacent said armature member in a position to attract said armature member, one of said magnetic means members being carried by said spring blade intermediate the ends thereof and the other of said magnetic means members being mounted in said housing in a position for urging movement of said valve member toward said valve seat;

said control bimetal member being operable upon a predetermined heating thereof by said heater to apply an operating force to said spring blade of a magnitude sufficient to overcome the magnetic attractive force between said armature member and said permanent magnet member and to thereby remove said valve member from said valve seat with a snap action; said armature member and said permanent magnet member cooperating to effect a snap action closing of said valve member on said valve seat upon return movement of said spring blade after sufficient cooling of said control bimetal strip following deenergization of said heater.

# 4,412,651 HEATING UNIT

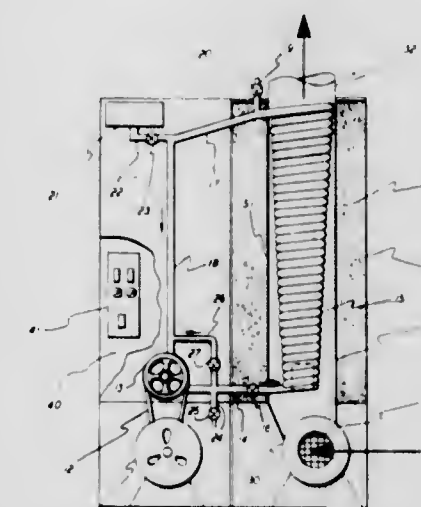
John E. Webster, Jr., 180 High Range Rd., Londonderry, N.H. 03053

Filed Apr. 26, 1982, Ser. No. 371,824

Int. Cl.<sup>3</sup> F24C 9/00

U.S. Cl. 237-1 R

4 Claims



1. A space heater comprising:
    - (a) a motor driven pump adapted to the forcing of a working fluid through a hydraulic circuit;
    - (b) a hydraulic circuit filled with said working fluid and receiving said working fluid from the outlet of said pump and returning said working fluid to the inlet thereof;
    - (c) flow restricting means in said hydraulic circuit effecting a substantial pressure drop in and shearing of said working fluid circulating therethrough to produce turbulent flow of said fluid;
    - (d) fluid circulating means for circulating fluid to be warmed by heat exchange contact with at least a portion of said hydraulic circuit; and
    - (e) a phase change heat store means comprising in at least one of its operable phases thereof a solid in heat exchange relationship with a portion of said hydraulic circuit and said working fluid therein, said phase change heat store means by reason of a phase change thereof removing heat energy from said hydraulic circuit when the temperature of said working fluid therein exceeds a predetermined level and returning said heat energy thereto when said temperature falls below said predetermined level;
- wherein said hydraulic circuit includes an elongated coil, said circulating fluid is circulated over the surface of the coil and said solid of said phase change heat store means is disposed around the exterior thereof and there is a by-pass conduit connecting with said hydraulic circuit after the outlet of said pump and upstream of said flow restricting means and after said cylindrical coil.

# 4,412,652 ECONOMIZER FOR BUILDING HEATING SYSTEMS Herman Voss, and Fern E. Voss, both of 155 Vista Ter., Wolf Lake, Muskegon, Mich. 49442

Filed Feb. 27, 1981, Ser. No. 238,814

Int. Cl.<sup>3</sup> F24H 3/06

U.S. Cl. 237-16

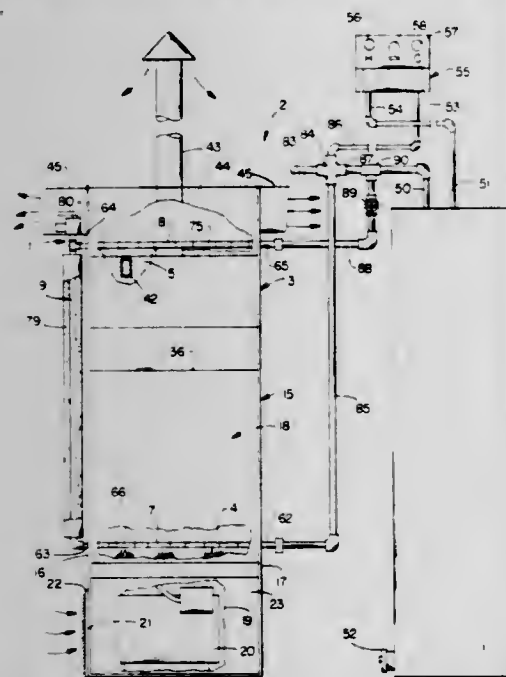
23 Claims

1. In a heating system for buildings having a conventional, forced-air furnace and a hot water reservoir, wherein said conventional furnace has a combustion chamber with burners mounted therein, and a heat exchange chamber through which air is flowed and heated by said burners, the improvement of an economizer, comprising:

a first heat transfer coil, having inlet and outlet sides, and being mounted in communication with the combustion chamber of said furnace;



means for communicating the inlet side of said first heat transfer coil with a source of water;  
 a second heat transfer coil, having inlet and outlet sides, and being mounted in communication with the heat exchange chamber of said furnace;  
 means for communicating the outlet side of said first heat transfer coil with the inlet side of said second heat transfer coil, and comprising an insulated standpipe extending along an exterior side of said conventional furnace;



means for communicating the outlet side of said second heat transfer coil with an inlet side of said hot water reservoir; and  
 means for selectively flowing water from said source through said economizer, whereby during operation, the water is heated in said first heat transfer coil by said burners, and flowed through said second heating coil to transfer additional heat to the air flowing through said heat exchange chamber and simultaneously heat the water fed into said water reservoir.

4,412,653

## SONIC ATOMIZING SPRAY NOZZLE

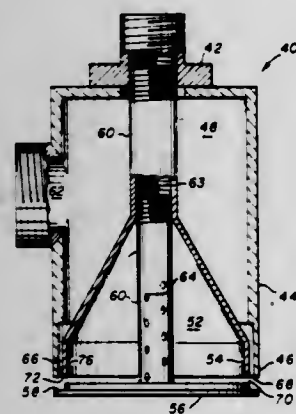
Gerald E. Bresowar, Homewood, and Thomas K. Benton, Birmingham, both of Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 2, 1981, Ser. No. 308,002

Int. Cl.<sup>3</sup> B05B 3/14

U.S. Cl. 239—102

4 Claims



1. A spray nozzle comprising:
  - a. a support body;
  - b. an open-ended outer cylindrical shell extending from said support body;
  - c. a support stem extending from said support body coaxially through said outer cylindrical shell and open end thereof;
  - d. an open-ended inner shell disposed coaxially within and in

spaced relationship from said outer shell so as to define a first plenum chamber between said inner shell and said outer shell and a second plenum chamber within the interior of said inner shell, the open end of said inner shell extending to the open end of said outer shell in closely spaced relationship therewith thereby defining a circumferentially continuous

- e. a resonator plate supported from said stem in spaced relationship from and facing the open end of said inner shell and disposed substantially coaxially therewith thereby defining a continuous circumferential slit between said resonator plate and the open end of said inner shell about the outer edge thereof, said continuous circumferential slit providing a liquid passage for flow communication between the second plenum chamber and the open end of said outer shell, said circumferential slit and said annular channel disposed at substantially right angles along the outer edge of said inner shell, said annular discharge outlet discharging on said resonator plate;
- f. atomizing gas-feeding means communicating with said first plenum chamber; and
- g. liquid-feeding means communicating with said second plenum chamber.

4,412,654

## LAMINAR MICROJET ATOMIZER AND METHOD OF AERIAL SPRAYING OF LIQUIDS

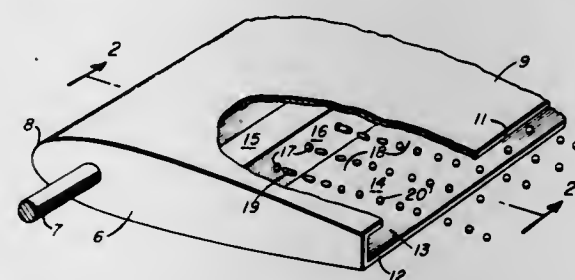
Wesley E. Yates; Robert E. Cowden; Norman B. Akesson, all of Davis, and Paul M. Horgan, Woodland, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 11, 1981, Ser. No. 301,432

Int. Cl.<sup>3</sup> B64D 1/18

U.S. Cl. 239—171

4 Claims



1. A laminar microjet atomizer comprising a hollow support of a streamlined configuration having an upstream portion adapted to lead in a predetermined direction of advance and having a closed leading edge and an open trailing edge, said trailing edge being bifurcated to establish a slot, a source of spray liquid within said hollow support, and means within said hollow support defining a small orifice open to said source and open opposite to said predetermined direction and disposed well upstream of said slot.

4,412,655

## LAND IRRIGATION SYSTEM AND METHOD

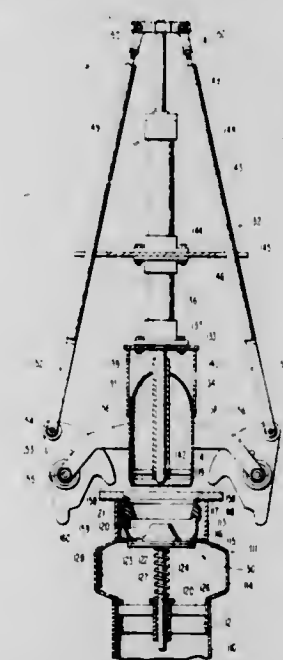
Allen T. Noble, Boise, Id., assignor to Noble Linear Irrigation, Inc., Boise, Id.

Continuation of Ser. No. 146,122, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 80,060, Sep. 28, 1979, Pat. No. 4,274,584, and Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Sep. 17, 1982, Ser. No. 419,321. The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A01G 25/09

U.S. Cl. 239—183

70 Claims



1. For use in connection with a land irrigation system including an elongated movable connector conduit means having a downwardly directed open end portion adapted to be connected to a water hydrant, a plurality of fixed water hydrants each having an opening in its top for receiving the open end portion of the connector conduit means, and support means operable to move the connector conduit means to position its open end portion above the opening in the top of successive hydrants and for lowering and raising the open end portion of the connector conduit means for connection with and disconnection from a hydrant positioned therebelow,

cooperating coupling means on the movable connector conduit means and on the hydrants for releasably coupling the open end portion of the connector conduit means to respective hydrants comprising,

- a plurality of movable cam members mounted on the connector conduit means and projecting downwardly below and in outwardly spaced relation to the open end portion thereof, said cam members movable from a first position to a second position to releasably couple the connector conduit means to a hydrant and from the second to the first position to uncouple the connector conduit means from the hydrant,

means adjacent the top of each hydrant defining an outwardly extending ledge in position to be engaged by the movable cam members,

cam surface means on said cam members for engaging said ledge on a hydrant upon movement of said movable cam members from the first position to the second position to align the open end of the connector conduit means with the opening in the top of the hydrant and to forcibly draw the open end of the connector conduit means into the opening in the top of the hydrant and to withdraw the open end of the connector conduit means from the opening in the top of the hydrant upon movement of the cam members from the second to the first position, and actuating means for moving the cam members between the first and second positions.

4,412,656

## FLUID DELIVERY VALVE EXTENDER FOR EXTERMINATING APPARATUS AND THE LIKE

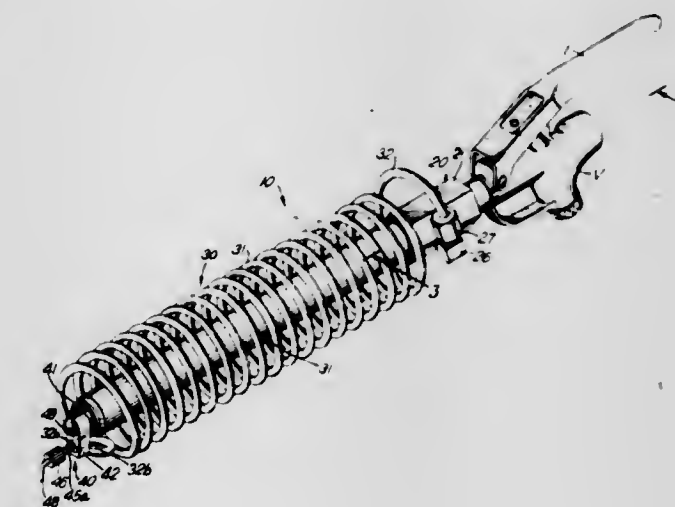
Barry Beck, 67-41 Burns St., Forest Hills, N.Y. 11375

Filed Apr. 23, 1982, Ser. No. 371,099

Int. Cl.<sup>3</sup> B05B 9/04

U.S. Cl. 239—373

9 Claims



1. A fluid delivery valve extender comprising:

- a. a telescopic rod comprising a plurality of telescoping tubular sections and having a first end and a relatively movable second end and means for releasably locking the sections in their fully telescoped positions;
- b. adapter means connected to said rod at said first end and comprising an elongated body with one internally threaded end for connecting to said first end of the rod, means forming a fluid passage in the body having an inlet and an outlet, first means for releasably connecting the adapter means to a fluid delivery valve outlet to put the inlet of the fluid passage in fluid communication with the valve outlet comprising an internal thread at the other end of the body, wherein the means forming the fluid passage comprises a bore having one end extending into said other internally threaded end and the other end opening along the side wall of the body with an L-shaped fitting connected thereto;
- c. a normally contracted, elastically deformable, coiled nylon hose disposed coaxially and loosely around the rod and having one end connected by the L-shaped fitting to the outlet of said fluid passage and in fluid communication therewith; and
- d. second means connecting the other end of the hose to said second end of the rod for movement therewith including means connected in fluid communication with said hose to effect discharge of fluid passing through the hose comprising a first member fixed to said second end of the rod and having a throughbore therein parallel to the rod and closely receiving the other end of the hose therein, an elongated discharge nozzle having a gradually tapering frusto-conical tube configured to be tightly received in the other end of the hose disposed in the throughbore with the internal passage thereof in communication with the hose and a cylindrical tip holding portion having a substantially cylindrical bore therein receptive of a nozzle tip for disposing same in fluid communication with the internal passage of the nozzle tube; whereby the fluid discharge means is disposable at desired distances from a delivery valve by the extension of the rod and the expansion of the coiled hose.



4,412,657

**FUEL INJECTION NOZZLES**

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

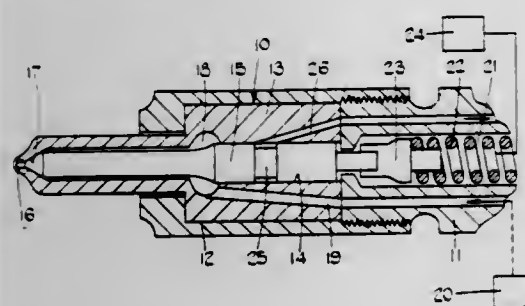
Filed Jun. 16, 1981, Ser. No. 274,204

Claims priority, application United Kingdom, Jul. 18, 1980, 8023517

Int. Cl.<sup>3</sup> F02M 61/20

U.S. Cl. 239—533.9

4 Claims



1. A fuel injection nozzle for supplying liquid fuel to an internal combustion engine and of the kind comprising a nozzle body in which is defined a blind bore, an orifice or orifices communicating with the blind end of the bore, a valve seat defined adjacent the blind end of the bore, a valve member slidable within the bore and shaped at its inner end for co-operation with said valve seat, a fuel passage leading to a space surrounding the valve member, the valve member defining a surface exposed to the fuel pressure in said space whereby when fuel under pressure is supplied through said passage, a force will act upon the valve member to lift the valve member from the valve seat to permit flow of fuel through said orifice or orifices from said space, a single groove defined between the cooperating surfaces of the valve member and the bore, and means for supplying lubricating medium to the working clearance defined between said co-operating surfaces, said means for supplying lubricating medium supplying the lubricating medium at the end of the working clearance remote from the valve seat, said groove acting to collect fuel leaking in one direction along the working clearance and lubricating medium leaking along the working clearance in the other direction.

4,412,658

**METHOD AND A DEVICE FOR MANUFACTURING PARTIALLY OXIDIZED LEAD DUST**

Rainer Heubach, Goslar; Reinhard Marx, Bad Harzburg, and Dieter Hauke, Vienenburg, all of Fed. Rep. of Germany, assignors to Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG, Langelsheim, Fed. Rep. of Germany

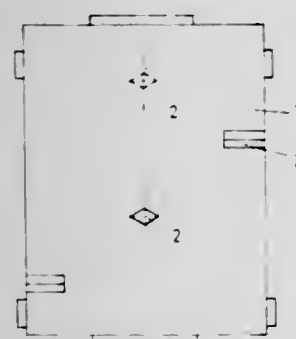
Filed Apr. 13, 1981, Ser. No. 253,532

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 3015022

Int. Cl.<sup>3</sup> B02C 17/18

U.S. Cl. 241—26

2 Claims



1. A method for manufacturing partially oxidized lead dust from lead pieces, comprising:  
feeding a charge of small pieces of lead, along with air, to a rotatable drum;

rotating said drum so that said small pieces of lead are crushed to form lead dust;  
mechanically disturbing the lead dust within said rotating drum in addition to dust movement caused by drum rotation alone so that the air within said rotating drum will contact substantially all of the lead dust to produce partially oxidized lead dust,  
wherein mechanically disturbing the lead dust is caused by bar-like guide plates radially extending into said rotating drum and being arranged in pairs and displaced towards each other by 180° in the direction of the circumference of the drum, the guide plates of each pair of plates being axially apart.

4,412,659

**SHREDDING MILL**

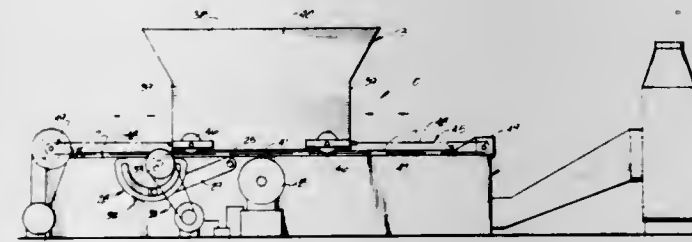
Roger Crawford, and Duane Sanders, both of Spokane, Wash., assignors to Thermoguard Insulation Co., Spokane, Wash.

Filed Jan. 30, 1981, Ser. No. 229,661

Int. Cl.<sup>3</sup> B02C 13/02

U.S. Cl. 241—35

7 Claims



1. A shredding mill for shredding material to produce particulate material of a uniform size, comprising:  
a frame extending in a longitudinal direction;  
a flat table top surface extending in the longitudinal direction on the frame having a shredding wheel opening formed in the surface intermediate ends of the table top surface;  
said shredding wheel opening being defined by spaced end edges transverse to the longitudinal direction;  
a material feed hopper reciprocally mounted on the frame for linear movement in the longitudinal direction immediately above the flat table top surface in continuous overlap of the shredding wheel opening;  
said feed hopper having a top opening for receiving material to be shredded and upright end walls for directing the received material downward to a hopper bottom opening that is in open communication with the shredding wheel opening;  
said hopper bottom opening having a longitudinal dimension between end edges substantially greater than the spaced distance between the transverse edges of the shredding wheel opening so that a portion of the received material is always supported on the table top surface and a portion of the material is always exposed to the shredding wheel opening;  
a shredding wheel mounted on the frame in the shredding wheel opening for rotation about an axis transverse to the longitudinal dimension;  
wheel drive means for rotating the shredding wheel as the feed hopper is being reciprocated to shred the material exposed to the shredding wheel opening;  
hopper drive means on the frame for reciprocating the hopper in a defined stroke in which the bottom opening of the hopper is always in open communication with the shredding wheel opening and the shredding wheel is never exposed by being covered by the material;  
feed grate means at the shredding wheel opening for guiding the material over the shredding wheel opening and for defining a selected cut of the material by the rotating shredding wheel;  
chute means on the frame below the hopper and adjacent the shredding wheel for receiving the particulate material and

4,412,661

**SPOOL FABRICATED FROM CORRUGATED MATERIAL**

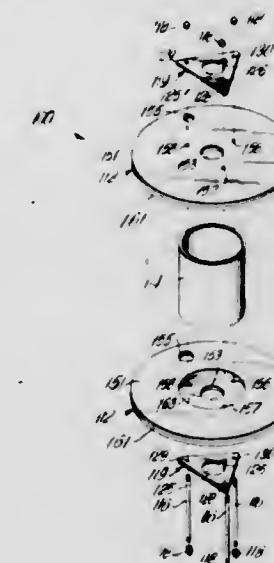
Frederick M. Wise, Arvada, and Carl F. DeWitt, Westminster, both of Colo., assignors to Capitol Packaging Corporation, Denver, Colo.

Filed Oct. 20, 1981, Ser. No. 312,942

Int. Cl.<sup>3</sup> B65H 75/28

U.S. Cl. 242—77.4

3 Claims



1. A spool suitable for receiving wound pliable strands comprising:  
a hollow circular cylindrical core;  
two flanges, each flange being composed of at least two layers of circular corrugated material, one layer of which constitutes an innermost layer and another of which constitutes an outermost layer, the corrugations in each layer of corrugated material being arranged at an angle of about 90° with the corrugations in any adjacent layer, the innermost layer in each flange having a circular central opening in which one end of the core is received;  
a plurality of reinforcing rods which pass inside the core and extend through the flanges; and  
two reinforcing plates of a material more resistant to tearing than the material of the flanges, each of which is substantially smaller in area than each of the two flanges, one plate being held firmly against the outermost layer of each flange by connection to the plurality of reinforcing rods whereby a lightweight and durable spool suitable for use with conventional winding devices is formed wherein each of the reinforcing plates has a central opening there-through and at least one of the reinforcing plates has a slot extending radially outward from its central opening, the slot being included to allow a set screw of a winding device to be screwed into the flange and to prevent excessive tearing of the flange when winding force is applied.

4,412,662

**SPOOLED MATERIAL DISPENSER/HOLDER**

Daniel J. Rutecki, 119 Whitley Dr., Norristown, Pa. 19403

Filed Aug. 11, 1982, Ser. No. 407,250

Int. Cl.<sup>3</sup> B65H 75/28, 49/02

U.S. Cl. 242—125.3

2 Claims

1. A spooled strand material dispenser/holder comprising a central spool core, said central spool core having integrally attached spool ends or spool end flanges, each said integrally attached spool end or spool end flange having a contoured peripheral edge, a self-lubricious movable member incorporating a congruently contoured retaining aperture or retaining profile frictionally attached and retained on a said contoured peripheral edge, said congruently contoured retaining aperture or retaining profile providing means by which the said movable member is frictionally attached to and guided by the said contoured peripheral edge of a spool end or a spool end flange,

for directing the particulate material away from the shredding wheel;  
wherein the chute means includes an upwardly open housing partially enclosing the shredding wheel and a discharge duct in open communication with the wheel through the housing and directed in the longitudinal direction;  
air bleed means on the housing for allowing air into the housing from an area remote from the hopper and for directing the air across the wheel below the feed grate means to receive particulate material from the shredding wheel and carry it through the discharge duct.

4,412,660

**FOREST RESIDUES SWEEPER**

Armand Morin, 1034 - 3rd Ave., Val d'Or, Province of Quebec, Canada (J9P 1T6)

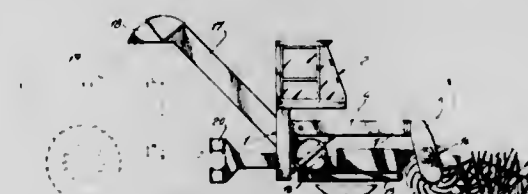
Filed Apr. 2, 1981, Ser. No. 250,110

Claims priority, application Canada, Dec. 11, 1980, 366587

Int. Cl.<sup>3</sup> B02C 9/04

U.S. Cl. 241—101.7

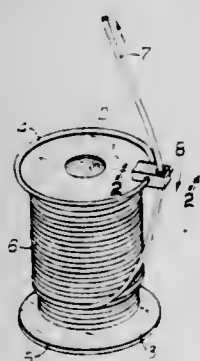
2 Claims



1. A forest residues sweeper for collecting, cutting and chipping tree branches, small trees and the like forest residues lying on a forest floor after removal of bigger trees, said sweeper comprising a first frame having a front portion and a rear portion, a single pair of ground-engaging and power-operated driving wheels supporting said first frame about an axis transverse to said first frame, a hitch carried by said rear portion for hitching and pulling a wheeled wagon behind said sweeper, a second frame extending over the first frame and pivoted to the first frame about a second axis substantially parallel to said first axis and located rearwardly of and above the first frame, power means to pivot said second frame about said second axis upwardly and downwardly relative to said first frame, a third frame extending transversely of and in front of said first frame and having a central portion pivoted to the front end of said second frame about a third axis extending longitudinally of said first frame and in the plane of said second frame for tilting movement of said third frame relative to said second frame, said third frame carried by said second frame and pivotable therewith about said second axis, a pair of sweeper drums rotatably carried by said third frame in spaced end-to-end relationship for rotation about their respective drum axes, said drum axes extending transversely of said first frame and mutually inclined in a horizontal plane with the outer ends of said sweeper drums forwardly offset relative to their inner center ends, catching fingers secured to and projecting from said sweeper drums, abutment fingers secured to said third frame and interdigitated with said abutment fingers, power means for rotating said sweeper drums in a direction opposite that of said ground-engaging wheels, whereby forest residues are collected by said fingers and cut between said fingers and said abutment members, a power-operated wood chipper carried by a rear portion of said first frame, conveyor means carried by said first frame longitudinally thereof and extending between said sweeper drums and said wood chipper, and chute means carried by said first frame and in communication with an outlet of said wood chipper for discharging wood chips into said wagon.



thereby providing means by which the said movable member can move along bi-directionally and continuously along the said contoured peripheral edge of the spool end or spool end flange with a predetermined amount of frictional resistance, said movable member also incorporating a congruently contoured material dispensing aperture, said congruently contoured material dispensing aperture allowing the passage therethrough of the spooled strand material with a predetermined amount of frictional resistance when the said spooled strand material is pulled away from the plane of the spool end or spool end flange and generally parallel to the said central spool core axis causing the said movable member to move along the said contoured peripheral edge of the said spool end or spool end flange thereby dispensing the said spooled strand material from the said spool central core as required and



whereas when the pulling force on the spooled strand material is halted and the said spooled strand material is severed near the outlet of the said congruently contoured material dispensing aperture, the said spooled strand material end is held in tension by the dispensing aperture within the movable member, the said movable member being also held in position on the said contoured peripheral edge of the said spool end or spool end flange by a sufficiently intimate contact between the said contoured peripheral edge of the said spool end or spool end flange and the said congruently contoured retaining aperture or retaining profile of the said movable member thereby preventing the loosening of the remaining spooled material into a disorderly state while also holding the end of the said strand material for ready access, the said movable member also being transferrable from spool to spool.

4,412,663

# MAGNETIC TAPE CASSETTE COMPRISING AN INDEXING DEVICE FOR THE UNWINDING OF THE TAPE

Dimitri M. Martinesco, Villa "Les Pins", Boulevard Maritime, 50270 Barneville Carteret, France

PCT No. PCT/FR81/00011, § 371 Date Oct. 7, 1981, § 102(e) Date Oct. 7, 1981, PCT Pub. No. WO81/02356, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 2, 1981, Ser. No. 309,891

Claims priority, application France, Feb. 8, 1980, 80 02848; May 9, 1980, 80 10506

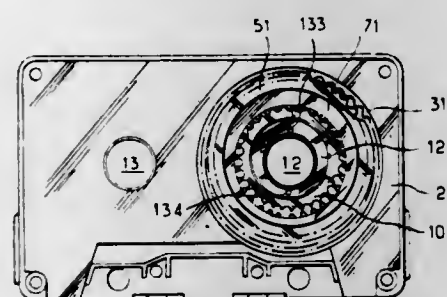
Int. Cl.<sup>3</sup> G03B 1/04; G11B 15/32

U.S. Cl. 242—200

18 Claims

1. A standard magnetic tape cassette, comprising: a case having a fixed index; two reels housed in the case; and at least one indexing device means for indexing the tape length unwound from one of said reels, said indexing device means including a two stage reduction gear assembly formed of coaxial flat rings, two of which are provided with graduations adapted to pass by said fixed index, wherein the first reduction stage of the gear assembly includes a ring (127) provided with means (133, 134) for coupling said ring to said one of said reels so that said one of said reels rotationally drives said ring and having an eccentric circular peripheral surface (128), a first circular annular gear (101) mounted around said ring

(127) and having external gear teeth (105), said first gear being mounted for oscillation with play about a fixed axis (158), and a second circular annular gear (71) rotatably mounted around said first gear and having internal gear teeth (81, 92) meshing with the external gear teeth of the first gear (101), said second gear (71) having an eccentric circular outer surface (73), and



wherein the second reduction stage of the gear assembly includes a third circular annular gear (51) rotatably mounted with play around said second gear (71) and having external gear teeth (54), and a fixed external annular gear (31) surrounding the third gear (51) and having internal gear teeth (32) meshing with external teeth (53) of said third gear (51).

4,412,664

# FAMILY OF AIRFOIL SHAPES FOR ROTATING BLADES

Kevin W. Noonan, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 392,096

Int. Cl.<sup>3</sup> B64C 3/14

U.S. Cl. 244—35 R

2 Claims



1. An airfoil for a rotating blade such as a helicopter blade comprising: airfoil means; said airfoil means having upper surface means, lower surface means, a leading edge area, and a trailing edge; said upper surface means having a surface slope which is positive and continuously decreasing from the position where it fairs into said upper surface leading edge area to a position at approximately 35% chord, a surface slope from approximately 35% chord to approximately 70% chord which is negative and continuously decreasing, and from approximately 70% chord to said trailing edge has a slope which is negative and continuously increasing; said lower surface means having a slope from a position where it fairs into said lower surface leading edge to a position of approximately 44% chord which is negative and continuously increasing, a surface slope from approximately 44% chord to approximately 65% chord which is positive and continuously increasing, from approximately 65% chord to approximately 75% chord a surface slope which is positive and continuously decreasing, and a surface slope from approximately 75% chord to said trailing edge that is positive and continuously increasing; whereby the airfoil means pitching moment coefficient is minimized, a zero pitching moment coefficient at Mach numbers near 0.80 is maintained and the drag divergence Mach number is increased over a wide range of lift coefficients.

4,412,665

# 3-WHEELED LEVERED TRAILING BEAM LANDING GEAR

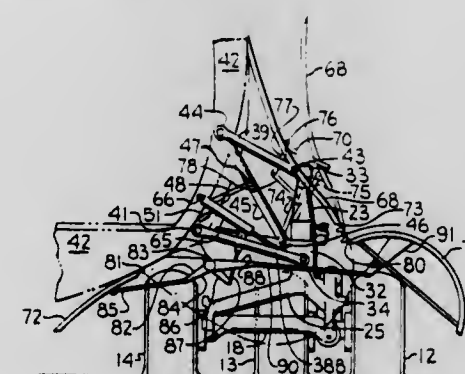
Louis T. Kramer; Franklin H. Butler, both of Long Beach, and Donald C. Callas, Fullerton, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 2, 1981, Ser. No. 317,005

Int. Cl.<sup>3</sup> B64C 25/10

U.S. Cl. 244—102 R

13 Claims



1. An aircraft articulated landing gear of the type having a lever trailing the lever hinge axis, comprising: a rigid axle beam, generally u-shaped with a thru axle attached at the first end and a second axle attached at the second end of said u-shaped axle beam with said axles axially parallel; a pair of wheels attached to said thru axle on either side of said first end of said rigid axle beam and a third wheel attached to said second axle with sufficient spacing between wheels to permit removal of any wheel without first removing another wheel; support structure pivotally attached about a pivot axis on said axle beam so that said axles rotate parallel to and about said pivot axis; and a shock strut, one end of which is attached to said axle beam near said thru axle and the other end attached to said support structure so that said axles can rotate about said pivot axis by extending and retracting said shock strut.

4,412,666

# METHOD OF MANUFACTURE OF A SUPPORT WING AND FLAP

Burkhard Grob, Wendelsteinstrasse 8, 8023 Grosshesselohe, Fed. Rep. of Germany

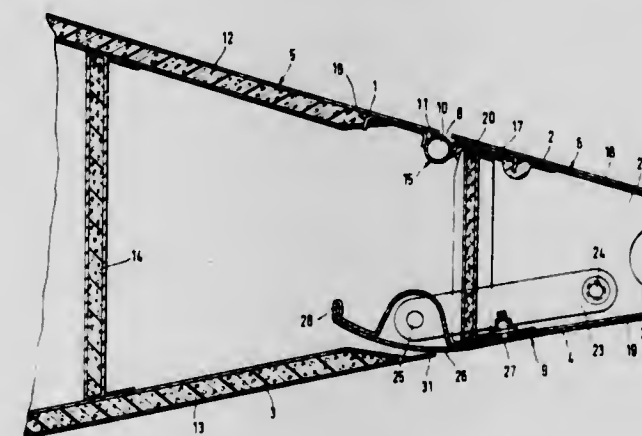
Filed Feb. 23, 1981, Ser. No. 236,972

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010895

Int. Cl.<sup>3</sup> B64C 3/24

U.S. Cl. 244—123

2 Claims



1. A method of manufacture of a wing assembly including a support wing having a flap connected thereto by a hinge means, and said support wing and flap having upper and lower outer faces comprised of a skin of synthetic material, compris-

ing, forming the upper face skin of the support wing and flap integrally from a continuous sheet of material in a first mold, attaching the hinge means to said upper face skins on the inner sides thereof, forming the lower face skin of the support wing in a second mold, forming the lower face skin of the flap, positioning the lower face skin of the flap in the second mold adjacent said lower face skin of the support wing so that said lower face skins are unconnected, positioning said integral continuous upper face skins and said lower face skins together for joining to form the final assembly, joining said upper and lower face skins together, and cutting said integral continuous upper face skins to separate said upper face skin of said flap from said upper face skin of said support wing at said hinge means.

4,412,667

# LEG FOR CHAIR BASE AND CAP THEREFORE

Frank Doerner, 138 Aberdeen Rd., Kitchener, Ontario, Canada N2M 2Y7

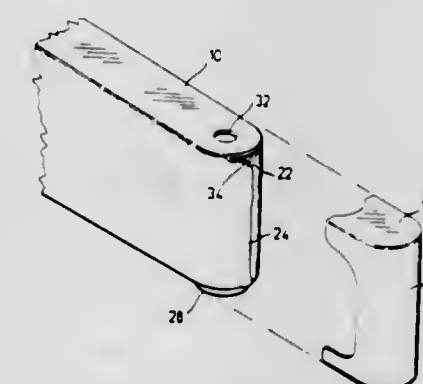
Filed Jul. 27, 1981, Ser. No. 286,890

Claims priority, application Canada, Feb. 12, 1981, 370735

Int. Cl.<sup>3</sup> A47B 91/00

U.S. Cl. 248—188.7

6 Claims



1. A chair leg and a protective cap therefore, said chair leg consisting of a leg portion and an end portion, said chair leg being rectangular in cross-section with a rounded end portion, with a first aperture in the top surface thereof, and a second aperture in the bottom surface thereof, a caster socket being inserted through said second aperture, the length of said caster socket being greater than the length of said end portion, said socket being welded inside of said end portion of said chair leg, said cap being adapted to fit over and be secured to said end portion of said leg and having a small protrusion on the inside top surface which is adapted to fit into and be secured by said first aperture.

4,412,668

# APPARATUS FOR ORIENTING HEAVY MOLD BASES

D. James Musiel, Racine, and James E. Buhler, Waterford, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 6, 1980, Ser. No. 204,445

Int. Cl.<sup>3</sup> A47B 91/00

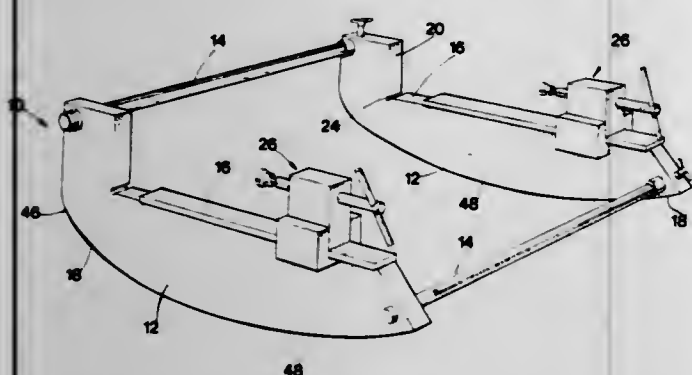
U.S. Cl. 248—346

11 Claims

1. Apparatus for orienting heavy mold bases of varying sizes comprising: a pair of similar rockers, each having a lower curved surface, an upper substantially planar support surface, and an abutment defining a fixed end point at one end of the support surface, the curve surface having a shorter radius at points near the abutment than at points remote therefrom; means interconnecting the rockers in spaced, aligned relation; means on each rocker at the opposite end of the support surface for clamping a mold base against the abutment, the clamping means defining an adjustable end point on the support surface; and



the curved surface, abutment, and clamping means of each rocker being arranged such that the tangent point of the line which is parallel to the support surface and tangent to the curved surface is closer to the adjustable end point than to the fixed end point for any adjustment of the clamping means, said support surface extending between



said abutment and said clamping means, said clamping means movable along said support surface to vary the effective length of said support surface whereby the said apparatus when carrying a mold base will in the absence of restraining means tip said mold base contained on said planar support surface in the direction of said abutment to lay said mold in a position for storage or maintenance.

4,412,669

**FREED-CONTROL VALVE WITH CONTRACTABLE TUBE**  
Yoshiyuki Hanyu, 71-23 Toyoni, Kashiwa-shi, Chiba-ken, and Yasuaki Takekoshi, 1-25-8 Midori, Sumida-ku, Tokyo, both of Japan

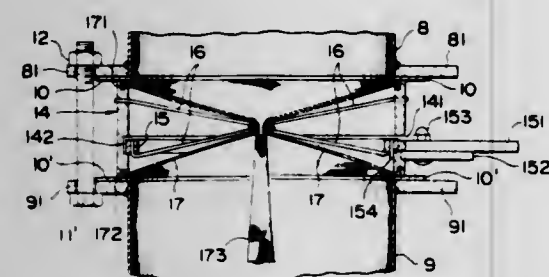
Filed Dec. 10, 1981, Ser. No. 329,525

Claims priority, application Japan, Dec. 11, 1980, 55-175169

Int. Cl.<sup>3</sup> F16L 55/14

U.S. Cl. 251-4

10 Claims



1. A feed control valve comprising:
  - a tubular valve housing comprises a tubular wall having an annular guide recess, an inner surface, and an outer surface;
  - a valve ring angularly movably fitted in said annular guide recess and having an inner surface corresponding to the inner surface of said valve housing;
  - a plurality of flexible, strong and highly stretch-resistant cord spans connected between said tubular valve housing and said valve ring at substantially equally spaced angular positions along the inner surfaces of said valve housing and said valve ring;
  - a flexible and strong inner tube having axial ends and mounted in said valve housing and said valve ring and disposed radially inwardly of said plurality of cord spans, said inner tube having annular retainer ribs on said axial ends thereof;
  - said valve housing having annular grooves in which said annular retainer ribs are fitted;
  - said valve ring having a handle projecting radially outwardly therefrom for angularly moving said valve ring with respect to said valve housing to enable said cord spans to contract said inner tube radially inwardly from a fully-open position to a fully-closed position;
  - said valve housing having an arcuate slot through which said

handle extends out of said valve housing, whereby said valve ring is angularly movable through an angle defined by said arcuate slot.

4,412,670

**FAIL-SAFE ACTUATOR AND HYDRAULIC SYSTEM INCORPORATING THE SAME**

Lorin P. Card, 16944 Plummer St., Sepulveda, Calif. 91343, and Otto W. Borsting, 2204 Stanbridge Ave., Long Beach, Calif. 91342

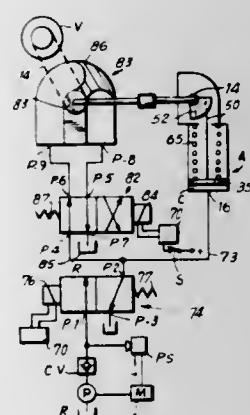
Division of Ser. No. 65,368, Aug. 9, 1979, Pat. No. 4,295,630.

This application Jul. 7, 1981, Ser. No. 281,087

Int. Cl.<sup>3</sup> F16K 31/00

U.S. Cl. 251-14

2 Claims



1. A fail-safe valve operating assembly including a valve member having a shaft, a hydraulic rotary vane actuator member having drive shaft means operatively connected to said shaft of said valve member for shifting the position of said shaft of said valve member and hence said valve responsive to the rotated position of said actuator member, a fail-safe actuator member operatively connected to said drive shaft means and said shaft of said valve member for shifting the positions of said shaft means and shaft, said actuator member including a casing having a cylindrical bore formed therein and having a port at one end thereof, a piston mounted for reciprocal movement within said bore between extended and retracted positions and defining with said bore a variable volume pressure chamber, spring means in said casing biased between said piston and the other end of said casing for urging said piston to said extended position whereat said piston lies adjacent said port end of said chamber, a housing on said casing, a drive shaft journaled in said housing for rotation about an axis normal the axis of said bore, a quadrant shaped yoke member mounted on said drive shaft, and including an outwardly open peripheral guide track coaxially arranged with respect to said drive shaft, a flexible cable having one end operatively connected to said piston, said cable being disposed in said guide track of said yoke member, the other end of said cable being operatively connected to said yoke member at a position to induce rotation of said drive shaft responsive to movement of said piston from said retracted to said extended condition, said cable, in said retracted condition of said piston being in slack condition whereby said drive shaft means and said shaft of said valve may be freely rotated without interference from said cable, movement of said piston from said retracted to said extended condition being effective to rotate said drive shaft and hence shift the position of said drive shaft means and said shaft of said valve member, means for introducing fluid under pressure of said port of said fail-safe actuator to shift said piston from said extended to said retracted position against the force of said spring means, and pilot valve means operatively connected to said port for venting said port responsive to a sensed failure condition to thus cause said piston to shift from said retracted to said extended condition under the force of said spring means, said rotary actuator further including a movable vane connected to the shaft thereof, said actuator having two control ports, a control

valve having two operating positions and having a pressure inlet port and a discharge port as well as two operating ports connected to the control ports of said rotary actuator, means connecting the outlet port of said pilot valve to the pressure inlet port of said control valve, and means in one operating position of said control valve to connect one of said operating port to the discharge port and, in a second operating position, to connect said first operating port to said discharge port and the other operating port to the pressure inlet port.

4,412,671

PLATE VALVE

Edelbert Tiefenthaler, Elgg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

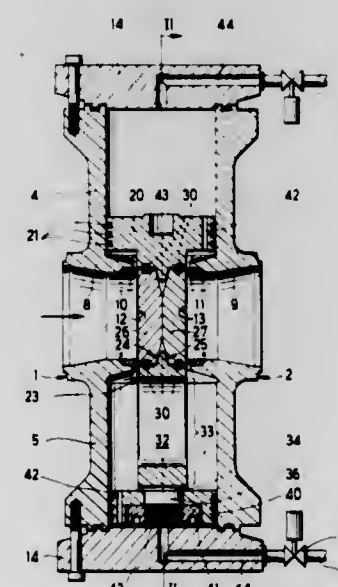
Filed Nov. 10, 1981, Ser. No. 320,101

Claims priority, application Switzerland, Nov. 26, 1980, 8745/80

Int. Cl.<sup>3</sup> F16K 25/00, 31/122

U.S. Cl. 251-31

7 Claims



1. A plate valve comprising
  - a housing having an inlet spigot with a sealing surface and an outlet spigot with a sealing surface;
  - a valve member movably mounted between a closed position and an open position in said housing between and radially of said spigots, said valve member including at least one closure plate for selectively seating against one of said sealing surfaces to close said spigots from each other in said closed position and an orifice plate for selectively communicating said spigots with each other in said open position; and
  - a servo-piston system for moving said valve member in said housing, said system including a pair of cylinders disposed in diametrically opposed relation about said spigots, a first piston disposed in one cylinder to define a first chamber and a second chamber therein, a second piston disposed in the second cylinder to define a third chamber and a fourth chamber therein, said second chamber and said third chamber communicating with said inlet spigot to receive a flowable medium therefrom, each said piston being fixed to said valve member and having a throttle bore extending therethrough to communicate said chambers in a respective cylinder with each other to conduct a throttled flow of medium therebetween, and a pair of valves, each valve selectively connecting an outlet chamber of said chambers in a respective cylinder with a pressure medium at a pressure different from the pressure of the medium in said inlet spigot whereby during movement of said valve member to said open position, one of said valves is opened to permit pressure medium to flow from said first chamber through said one valve while pressure medium flows from said second chamber into said first chamber through said throttle bore in said one piston to create a differential pressure on said one piston sufficient to move said valve member to said open position while pressure medium flows from said

third chamber into said fourth chamber through said throttle bore in said second piston; and during movement of said valve member to said closed position, the other of said valves is opened to permit pressure medium to flow from said fourth chamber through said other valve while pressure medium flows from said third chamber into said fourth chamber through said throttle bore in said second piston to create a differential pressure on said second piston sufficient to move said valve member to said closed position while pressure medium flows from said second chamber into said first chamber through said throttle bore in said first piston.

4,412,672

FEEDER GUIDE

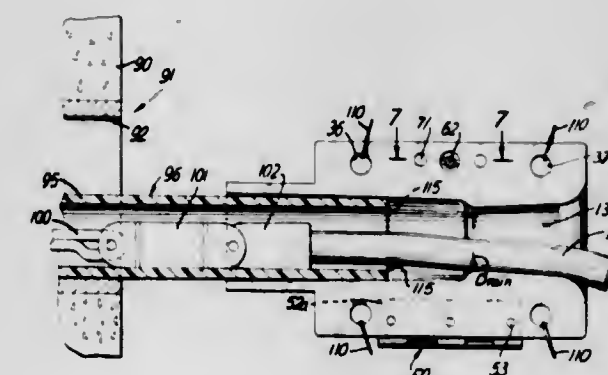
Ronald P. Zelins, Rockaway, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 19, 1981, Ser. No. 313,053

Int. Cl.<sup>3</sup> B65M 59/00

U.S. Cl. 254-134.3 R

3 Claims



1. A feeder guide adapted for use with products being introduced into the opening of an end length of synthetic resinous pipe, said guide comprising:
  - (a) a pair of tube segments corresponding to the halves of a tube produced by its vertical bisection along its longitudinal axis;
  - (b) said segments having similar interior channels each flaring outwardly to a front opening thereof, and each extending longitudinally through its segment from such front opening of such channel to a rear opening thereof;
    - (i) each such channel comprising front and rear sections extending from respectively, said front and rear openings of such channel towards each other to respective inward-section ends;
    - (ii) each such channel having a minimum transverse dimension at the inward end of its front channel section;
    - (iii) each such rear channel section having formed between its inward end and its rear opening a taper divergent towards such opening, the transverse dimension of such section being greater than said minimum dimension over the length of such section;
    - (iv) each such channel having formed at the inward end of the rear section thereof an internal shoulder extending transversely in such channel to provide a transition between said minimum transverse dimension thereof and said taper, said shoulder having a greater inclination to the axis of said channel than does said taper;
    - (v) said shoulder in each such channel and said divergent taper thereof being relatively proportioned such that the transverse dimension of such shoulder between that shoulder's transversely inner and outer extremities is greater than the difference between the transverse dimensions of such taper at, respectively, that taper's longitudinally inner and outer extremities;
    - (vi) the longitudinal extent in each such channel of the divergent taper thereof being several times greater than said minimum transverse dimension of such channel;



c) coupling means pivotally connecting said segments so as to render said segments relatively movable between an open position at which they are spread apart and a closed position at which they register to jointly form an assemblage having the configuration of said tube and having formed therein a central bore with an internal annular shoulder and a rearward taper provided by, respectively, the shoulders and the said tapers of said channels; and  
 d) fastening means for releasably holding said segments in said closed position;  
 said guide when in the form of said assemblage being adapted to have said end length of said pipe inserted into the rear opening of said bore and forcibly driven into said bore taper so as to make with the wall of said bore a wedging engagement by which such guide is frictionally held on such end length of such pipe.

4,412,673

**BEADED LIQUID APPARATUS AND METHOD**

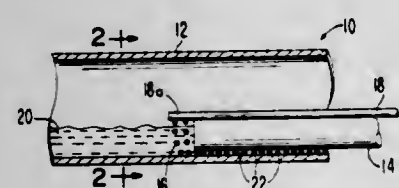
Scott C. Ramsden, Houston, Tex., and John C. Braman, San Rafael, Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Continuation of Ser. No. 26,617, Apr. 2, 1979, abandoned. This application Apr. 20, 1982, Ser. No. 370,029

Int. Cl.<sup>3</sup> B65H 59/00

U.S. Cl. 254—134.3 FT

4 Claims



1. In combination: an outer conduit having an entrance end and containing a liquid therein; an inner member having a front end and movable through the liquid in the outer conduit; and a tube carried by said inner member and extending along the inner member, the tube having a forward portion near the front end of the inner member, said tube adapted to be coupled with a source of beads near the entrance end of the outer conduit, the tube having an opening near the front end of the inner member to permit the beads to be dispensed from the tube and into the liquid.

4,412,674

**HIGH-TEMPERATURE REDUCED IRON PRODUCTION**

Kimiaki Ohtawa, Hiroyoshi Takahashi, and Yasuo Fukada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,603

Claims priority, application Japan, May 9, 1980, 55-60739; May 14, 1980, 55-62782

Int. Cl.<sup>3</sup> C21D 11/00

U.S. Cl. 266—91

7 Claims

6. An installation for transferring high temperature granular reduced iron from a furnace to a storage tank located at a position remote from said furnace, said installation comprising:

a transportable container having an inner chamber and a charge/discharge section defining an opening extending into said inner chamber, said container being arranged for rotation through 180° between a charge position, whereas said charge/discharge section and said opening are directed upwardly to receive reduced iron from the furnace, and a discharge position, whereas said charge/discharge section and said opening are directed downwardly to discharge reduced iron from said container into the storage tank;

said container including leg means for supporting said container in said discharge position thereof;

valve means for selectively unblocking said opening dur-

ing charging and discharging there through and sealingly closing said opening during movement of said container between said charge and discharge positions thereof;

a cluster remover adapted to be positioned within a mouth of the storage tank, said cluster remover having means for forming a fluid-tight seal with said charge/discharge section of said container when said container is in said discharge position, and said cluster remover having a passage through which passes the reduced iron during discharge thereof from said container into the storage tank;



weighing means, adapted to be interposed between said container and the storage tank when said container is in said discharge position, for determining whether or not the reduced iron in said container has been discharged into the storage tank and for generating detection signals representative thereof; and

sealing valve means, provided on said cluster remover and operable in response to said detection signals from said weighing means, for unblocking said passage of said cluster remover when said container is charged with reduced iron and for sealingly closing said passage of said cluster remover when the reduced iron has been discharged from said container.

4,412,675

**CARBON SPRING AND PROCESS FOR PREPARING THE SAME**

Takamasa Kawakubo, Shinmachi, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,772

Claims priority, application Japan, May 11, 1981, 56-069293

Int. Cl.<sup>3</sup> C01B 31/02

U.S. Cl. 267—167

13 Claims

1. A carbon spring prepared by a process, comprising: shaping an organic linear material, the organic constituent of which is selected from the group consisting of a thermoplastic resin, a thermosetting resin, a pitch, a natural high molecular weight substance, a synthetic high molecular weight substance containing a condensed polycyclic aromatic base structure which is high in carbon yield and mixtures thereof, into the form of a coiled spring; and then carbonizing the spring shaped organic linear material.

4,412,676

**VICE FOR WORKBENCH**

Ronald A. Jackson, Brockville, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Dec. 24, 1981, Ser. No. 334,453

Int. Cl.<sup>3</sup> B25B 1/22

U.S. Cl. 269—101

2 Claims

1. For use with a workbench having a table top provided with a longitudinal front edge, a vise comprising a pair of spaced brackets secured to the underside of the table top, a pair of substantially-parallel tubular beams slidably received telescopically within the brackets, respectively, manually-manipulatable independently-operable indexing means be-

4,412,678

**SADDLE FOR BAR AND BAR-TYPE WEIGHT**

William R. Baynes, DuQuoin, Ill., assignor to Turco Manufacturing Co., DuQuoin, Ill.

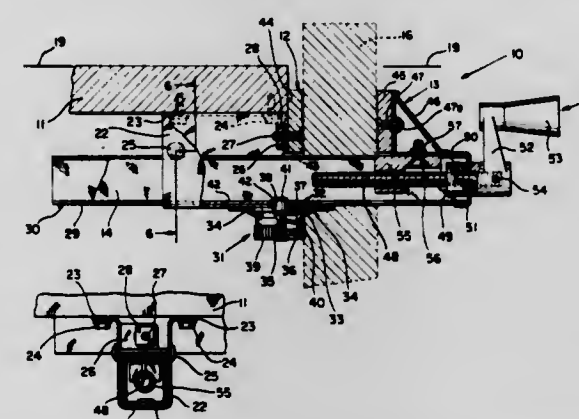
Continuation of Ser. No. 49,234, Jun. 18, 1979, abandoned. This application Jan. 22, 1982, Ser. No. 341,323

Int. Cl.<sup>3</sup> A63B 21/00

U.S. Cl. 272—123

4 Claims

tween the beams and brackets, respectively, the indexing means including a spring-loaded pin carried by the bracket, a knob carried by the pin and projecting below the bracket, and the beam having a lower longitudinal side provided with a plurality of spaced apertures for receiving the pin, selectively, whereby a plurality of coarse adjustments is provided between the beams and brackets, respectively, a longitudinally-extending rear vise jaw disposed above the beams transversely thereof and abutting the lower portion of the longitudinal front edge of the table top, means fixing the rear vise jaw to the brackets, whereby the vise is cantilever mounted to the under-



side of the table top and projects forwardly thereof beneath the extended plane of the table top, a longitudinally-extending movable front jaw slidably disposed on top of the beams transversely thereof, and means mounting the movable front vise jaw on the respective beams for movement towards and away from the fixed rear vise jaw, thereby providing for a fine adjustment in the clamping pressure exerted on a workpiece positioned between the jaws.

4,412,677

**PORTABLE EXERCISE APPARATUS**

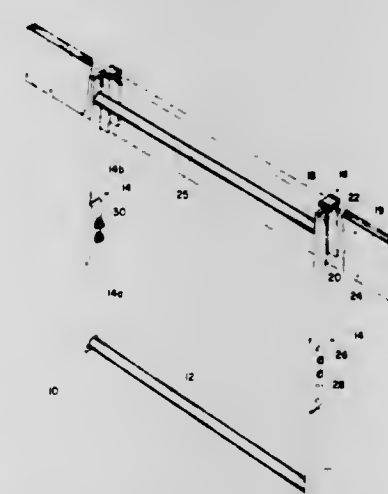
Michael B. Viramontes, 142 Princeton, Vallejo, Calif. 94590

Filed Feb. 25, 1982, Ser. No. 352,253

Int. Cl.<sup>3</sup> A63B 1/00

U.S. Cl. 272—62

3 Claims



1. A portable chinning apparatus comprising:  
 a pair of vertical posts;  
 a bar interconnecting said posts near the lower ends thereof;  
 a pair of mounting brackets, of flat steel bar stock, each of inverted U-shaped configuration including a flat horizontal top bar and parallel vertical bars at least three inches long depending therefrom and spaced to slide snugly down over a wooden rafter of nominal two inch thickness; and  
 means securing said posts to said brackets to be suspended therefrom;  
 said posts being free of lateral extensions for engagement with a vertical wall.

1. A saddle, which is mountable on the upper end of an upwardly-directed part of a support for a bar of a bar-type weight used by a weight lifter and which can selectively receive and support part of a bar of a bar-type weight, and which has a bar-receiving portion, a first arm which inclines upwardly and forwardly from said bar-receiving portion, a second arm which inclines upwardly and rearwardly from said bar-receiving portion, said bar-receiving portion and said arms coacting to define a saddle-like space which can selectively receive and confine said part of said bar of said bar-type weight, a socket-forming portion which extends downwardly from said bar-receiving portion and which defines a socket with an upper end that underlies at least a part of said bar-receiving portion and with a sidewall that extends downwardly from said upper end and downwardly relative to said arms and that is dimensioned to telescope down over, and to closely engage, said upper end of said upwardly-directed part of said support for a bar of a bar-type weight, said socket having an open lower end that is dimensioned to telescope down over said upper end of said upwardly-directed part of said support for a bar of a bar-type weight, said saddle being molded or cast from a readily-molded or readily-cast plastic material so it is unitary in nature and so it is wholly devoid of joints between any of said bar-receiving portion, said arms and said socket-forming portion, said socket-forming portion having the walls of said socket tapered upwardly and inwardly to provide intimate engagement between the upper, inner end of said recess and said upper end of said upwardly-directed part of said support for a bar of a bar-type weight, a reinforcing portion that is part of, and that extends between, said socket-forming portion and said first arm, said reinforcing portion extending forwardly and upwardly from said socket-forming portion to merge into said first arm, said reinforcing portion being generally tangential relative to one side of said socket-forming portion and thereby defining one side of said first arm, a second reinforcing portion that is part of, and that extends between, said socket-forming portion and said first arm, said second reinforcing portion extending forwardly and upwardly from said socket-forming portion to merge into said first arm, said second reinforcing portion being generally tangential relative to the opposite side of said socket-forming portion and thereby defining the opposite side of said first arm, second reinforcing portion being spaced from the first said reinforcing portion and coacting with said first said reinforcing portion and with said first arm to define a supporting arm which is an inverted U in end view and which is sturdy and rugged but light in weight, and said first arm and said bar-receiving por-



tion merging at a point which is immediately adjacent the upper end of said socket and said second arm and said bar-receiving portion merging at a further point which is immediately adjacent the upper end of said socket to thereby limit the moment arm of any force which a bar-type weight can apply to said bar-supporting portion.

4,412,679

**FOLDABLE BASKETBALL GOAL MEANS**

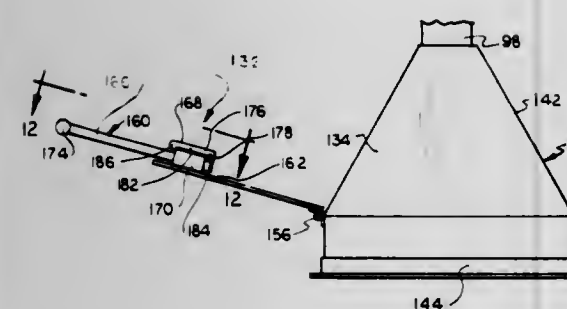
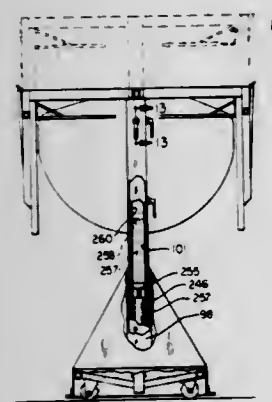
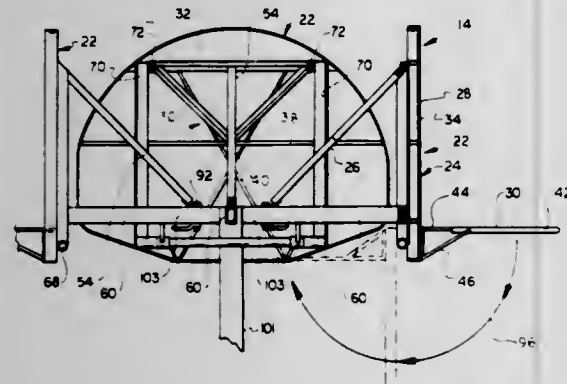
Elmo J. Mahoney, deceased, late of Dorrance, Kans. (by Regina B. Mahoney, executrix), and Kenneth J. Mahoney, Dorrance, Kans. 67634

Continuation of Ser. No. 946,386, Sep. 27, 1978, abandoned. This application May 15, 1981, Ser. No. 264,127

Int. Cl.<sup>3</sup> A63B 63/08

U.S. Cl. 273-1.5 R

12 Claims



8. A foldable basketball goal means used to practice exercises therewith, comprising:

- (a) a basketball goal means having an individual basketball goal assembly;
- (b) a goal support means having one end connected to said basketball goal assembly;
- (c) a main base support means connected to a lower end of said goal support means;
- (d) said main based support means includes an actuator wheel assembly mounted within a base support assembly;
- (e) said base support assembly includes a main support housing having a door and handle assembly connected thereto;

- (f) said door and handle assembly having a handle assembly connected to a door member;
- (g) said door member is pivotally connected to said main support housing and movable to an inclined, open position and said handle assembly having a handle member slidably mounted in a connector tube secured to said door member, said handle member grasped to move the entire said foldable basketball goal means to a desired position; and
- (h) said handle member movable within said connector tube to an extended position to move said foldable basketball goal means.

10. A foldable basketball goal means used to practice basketball exercises therewith, comprising:

- (a) a basketball goal means having an individual basketball goal assembly;
- (b) a goal support means having one end connected to said basketball goal assembly;
- (c) a main base support means connected to a lower end of said goal support means;
- (d) an actuator control means mounted on said main base support means and operably connected to said goal support means;
- (e) said goal support means having a main support tube member and an upper telescoping tube member mounted in said main support tube member for axial movement relative thereto;
- (f) said actuator control means operable to selectively move said upper telescoping tube member axially to raise and lower said basketball goal assembly as desired for the proper playing height or at a lower transport and storage height;
- (g) said basketball goal assembly includes a goal and rim assembly connected to said goal support means through a foldable support assembly;
- (h) said goal and rim assembly having a basketball ring mounted on a conventional type basketball goal member;
- (i) said foldable support assembly includes a horizontal support assembly having said basketball goal member pivotally connected to an outer end thereof for movement of at least 180 degrees, a goal support assembly connected to an outer end thereof; a goal support assembly connected to a back side of said basketball goal member, and an inclined connector assembly mounted between said horizontal support assembly and said goal support assembly; and
- (j) said inclined connector assembly may be selectively released from said horizontal support assembly to pivot a major portion of said goal and rim assembly about 180 degrees forward and downwardly to an inverted transport position.

4,412,680

**FLOATING ARCADE**

Thomas E. Zorn, 3302 Burt St., No. 20, Omaha, Nebr. 68131

Filed Mar. 26, 1979, Ser. No. 23,648

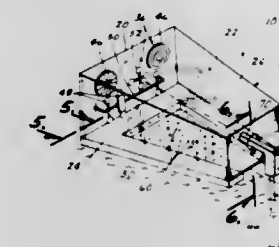
Int. Cl.<sup>3</sup> A63F 7/06, 7/38, 9/02

U.S. Cl. 273-85 H

10 Claims

1. A floatable toy apparatus comprising an elongated housing having opposite ends, means for floatably supporting said housing on a body of water, water gun means operatively connected to said housing adjacent one end thereof, and target means supported on said housing in spaced relation from said water gun means, said water gun means being operative to direct a jet of water toward said target means for striking the same, said water gun means including a siphon tube having one end operatively connected to said water gun means for supplying water thereto and an opposite end adapted for immersion in the body of water on which said housing is floatably supported to draw water therefrom in response to operation of said water gun means, and said housing comprising a substantially transparent enclosure

sure around said target means whereby the jet of water directed at the target means by said water gun means is substantially confined within said housing.



said housing including means for draining water therein back to said body of water.

4,412,681

**TWO DIMENSIONAL LOGICAL TOY**

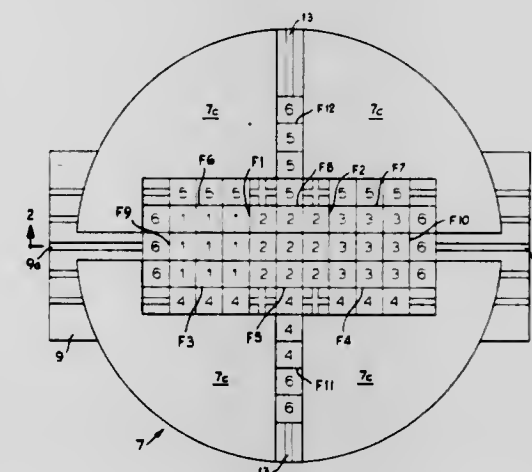
Thomas J. Irwin, 1678 Nottingham Way, N.E., Atlanta, Ga. 30309

Filed Feb. 22, 1982, Ser. No. 350,725

Int. Cl.<sup>3</sup> A63F 9/08

U.S. Cl. 273-153 S

12 Claims



1. A two dimensional logical toy comprising a frame structure having a slide passage formed therein, a slide plate slidably mounted in said slide passage and having a plurality of parallel grooves formed in a surface thereof and an aperture extending therethrough, a lift having a platform normally disposed in said aperture and having a first group of parallel grooves formed in a surface thereof and normally in alignment with the grooves formed in said guide plate respectively, said lift being movable so as to cause said platform to move out of said aperture and being rotatable and having a second group of parallel grooves formed in said surface of said platform which are disposed in normal relation to said first group of grooves, so that predetermined rotation of said lift and movement of said platform back into said aperture causes said second group of grooves to become aligned with the grooves formed in said slide plate, and a plurality of unitary elements slidably mounted in said grooves formed in said guide plate and in said platform.

4,412,682

**ACTION GAME DEVICE**

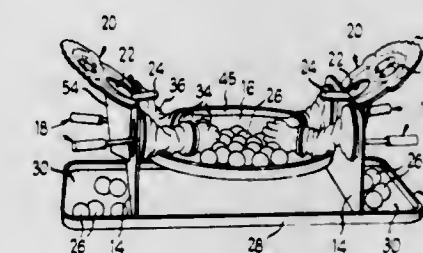
Steven F. Rehkemper, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1982, Ser. No. 347,534

Int. Cl.<sup>3</sup> A63F 7/00

U.S. Cl. 273-1 GG

12 Claims



1. A game apparatus comprising:  
a plurality of objects;  
an object receptacle for said objects;  
a manually manipulatable elongate member, including one end capable of engaging one of said objects and another end capable of being manipulated by the user;  
means for limiting the range of movement of said member including an upstanding barrier adjacent said receptacle, said barrier including a port for permitting said member to extend through said barrier into communication with said receptacle and a flexible sleeve connected on one end to the member adjacent the end of the member capable of engaging one of said objects and connected on the other end to the barrier around said port; and  
a receiver for said objects spaced from said object receptacle and arranged to allow said objects to be transferred to said receiver from said receptacle with said member.

4,412,683

**APPARATUS FOR SUPPLYING FLUID TO A ROTATING TUBE COMPRISING END CAP WITH PURGING FLUID**

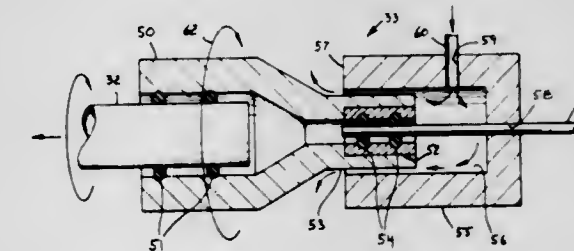
Eugene A. Haney, Lawrenceville, and Fred P. Partus, Marietta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 242,775, Mar. 11, 1981, Pat. No. 4,347,069. This application Jun. 17, 1982, Ser. No. 389,329

Int. Cl.<sup>3</sup> F16J 15/40, 15/44

U.S. Cl. 277-3

6 Claims



1. A protective end member for a rotatable tubular member comprising a housing having a bore therein of greater inside dimensions than the outside dimensions of the tubular member for receiving an end of said tubular member without making contact therewith, means within said housing for permitting the introduction of fluid into the interior of said tubular member, and means within said housing for permitting the introduction of a purging fluid into said housing bore at a pressure in excess of ambient pressure to prevent contaminating materials from being introduced into the interior of said tubular member from ambient atmosphere.



4,412,684

**LIQUID SEAL FOR CLOSING AN OPENING OF A REACTION VESSEL**

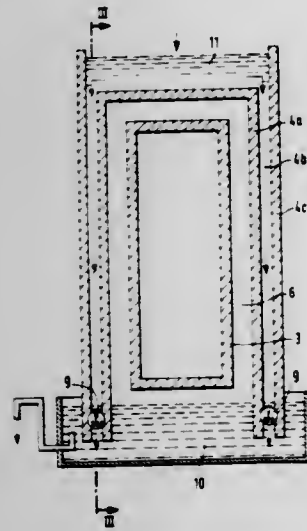
Hans-Josef Giertz, Ratingen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany  
Filed Apr. 8, 1981, Ser. No. 252,131

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013650

Int. Cl.<sup>3</sup> F16J 15/40; C10B 25/16

U.S. Cl. 277—135

13 Claims



1. An arrangement for sealingly closing an opening, particularly of a vessel having an internal chamber for performing chemical reactions therein, comprising, in combination, a frame member surrounding said opening; a closing member movable between a closing position in which it bounds a gap with said frame member and an opening position in which it exposes said opening; means for sealing said gap, including at least one sealing blade mounted on one of said members and extending across said gap into contact with the other member in said closing position, and a liquid seal confined in said gap adjacent to said sealing blade around the entire perimeter of said opening in said closing position; said closing member overlapping said frame member in said closing position so that said gap extends outwardly from said opening between said frame member and said closing member; said sealing blade being outwardly spaced from said opening; said liquid seal being confined in said gap at the outside of said sealing blade; said sealing means further including at least one additional sealing blade mounted on a first of said members and extending across said gap into contact with the second of said members in said closing position, and said additional sealing blade being situated inwardly of said sealing blade and defining with the latter an enclosed sealing space in said gap all around said opening.

4,412,685

**RECREATIONAL SKATE**

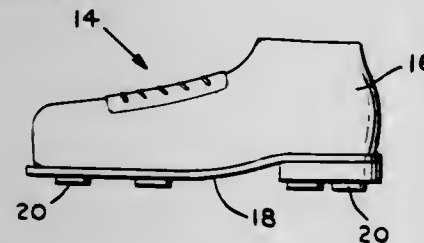
Pierre E. Szamek, 30 Van Velsor Pl., Newark, N.J. 07112

Filed Dec. 26, 1979, Ser. No. 106,652

Int. Cl.<sup>3</sup> A63C 17/00

U.S. Cl. 280—11.19

1 Claim



1. Skate structure including:  
a support platform;

roller means for providing a rolling contact between said skate structure and a support surface; and  
first and second ring bearings for pivotally mounting said roller means to said support platform, each of said ring bearings having an outer race and an inner race, said outer race of said first ring bearing being rigidly secured to said support platform, said outer race of said second ring bearing being rigidly secured to said inner race of said first ring bearing and said roller means being secured to said inner race of said second ring bearing.

4,412,686

**FOLDING STEP FOR VEHICLES**

Erik T. Fagrell, Västra Frölunda, Sweden, assignor to AB Volvo, Gothenburg, Sweden

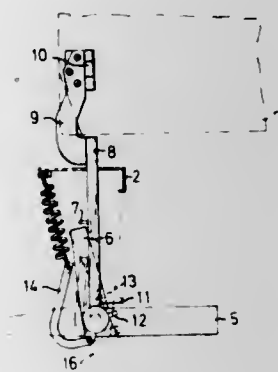
Filed Jun. 23, 1981, Ser. No. 277,202

Claims priority, application Sweden, Jun. 23, 1980, 8004619

Int. Cl.<sup>3</sup> B60R 3/02

U.S. Cl. 280—166

5 Claims



1. In combination with a vehicle having a door, a plate mounted on the vehicle for vertical swinging movement about a horizontal axis between a position in which said plate extends from said axis essentially vertically upwardly and a position in which the plate extends from said axis horizontally outwardly, and means acting between the door and the plate upon opening and closing of the door, to swing the plate between said positions, said means including a shaft secured to the door and extending downwardly from the door in extension of the door hinge line, means on the plate interacting with the shaft such that upon rotation of the shaft, the plate is caused to swing vertically, and over-center spring means acting to bias the plate toward each of said two positions as the plate moves in opposite directions between said two positions.

4,412,687

**SKI**

Wieme Andre, Zwevegem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Continuation of Ser. No. 80,050, Sep. 28, 1979, abandoned. This application Feb. 11, 1982, Ser. No. 347,788

Claims priority, application Netherlands, Sep. 28, 1978, 7809832; Luxembourg, Jan. 31, 1979, 80858

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

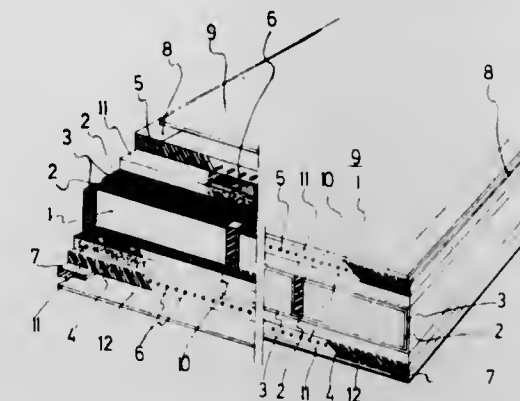
Int. Cl.<sup>3</sup> A63C 5/00

U.S. Cl. 280—610

10 Claims

1. A longitudinally extending ski of the laminated type comprising an elongated core of rigid material, a top external surface, a bottom skiing surface, and a layer of rubberlike material disposed in interbonding relationship between said core and at least one of said surfaces, said rubberlike material

having a loss tangent of about 0.1 and having longitudinally extending twisted filament bundles embedded therein, the



filaments having a tensile strength of at least 2000 N/mm<sup>2</sup> and a modulus of elasticity of at least 7 × 10<sup>4</sup> N/mm<sup>2</sup>.

4,412,688

**WHEELED SUPPORT STRUCTURE FOR A SEAT OR A CARRY-OUT OF A BABY'S PUSH CHAIR OR PERAMBULATOR**

Pietro Giordani, Via Cavallina, 4, 40100 Bologna, Italy

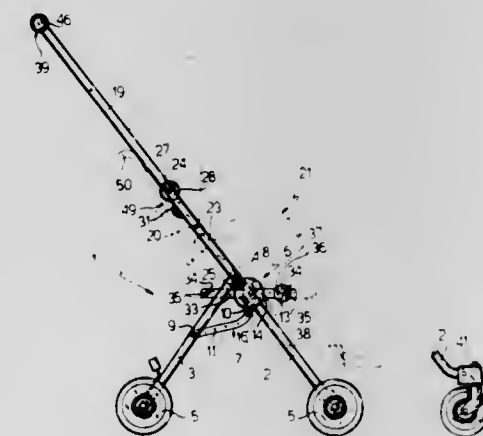
Filed Jul. 17, 1981, Ser. No. 284,496

Claims priority, application Italy, Aug. 1, 1980, 68245 A/80

Int. Cl.<sup>3</sup> B62B 7/08

U.S. Cl. 280—642

9 Claims



1. A support structure having wheels for baby support and containment means, such as a seat or a carry-cot, to form with these a push chair or a perambulator, substantially comprising a pair of flat side frames between which the said means are disposed, and which are connected together by a plurality of crosspieces, characterized by the fact that each of the said side frames substantially comprises a first (2) and a second shaft (3) pivotally connected together in relative angular configuration by means of a first pivot (4) and to each of said shafts there is connected one of said wheels (5), a slide (6) which is slidable on the first of said shafts, a connection element (7) having one end connected by means of a second pivot (8) to said slide and the other end connected by means of a third pivot (9) to said second shaft at a point intermediate between said first pivot and the associated wheel, a third shaft (19) having one end connected by means of a fourth pivot (20) to said first shaft at a point located to one side of said first pivot and the other end connected to a handle, said third shaft being connected to said slide by means of a fourth shaft (23) one end of which is connected by means of a fifth pivot (24) to said third shaft and the other end of which is connected by means of said second pivot to said slide in such a way that upon rotation of said third shaft with respect to said first shaft there is produced a displacement of said slide on the first shaft and therefore an associated rotation of said first and second shaft to change the relative angular configuration of the shafts themselves; said structure further including rigid baby support and containment means (21); two bars (33) each of which is fixed to one of said sliders, said bars

being adapted to support said rigid baby support and containment means; the length of said shafts and of said connection element, and the relative positions of said pivots being selected such that said structure can assume a first or working configuration in which said third and fourth shafts are aligned and superimposed with said first shaft and said first and second shafts form between them a first predetermined angle, and a second configuration for transport, which is obtained by making said third shaft rotate with respect to the first shaft through an angle slightly less than 180° and in which said first and second shafts form between them a second predetermined angle smaller than said first predetermined angle and said two wheels connected to the shafts themselves are substantially in contact with one another; said structure further including means (28) for locking said third and fourth shafts with respect to said first shaft when the structure is located in said first or working configuration.

4,412,689

**FOLDING SUPPORT FRAME FOR STROLLER OR THE LIKE**

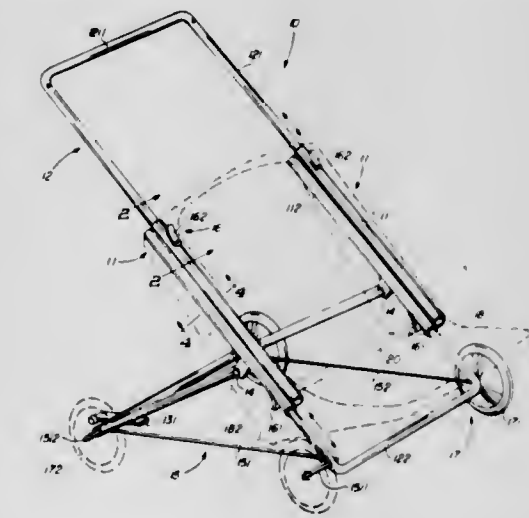
Byron D. Lee, 5010 Cactus Pl., Prescott, Ariz. 86301

Filed Apr. 30, 1981, Ser. No. 259,033

Int. Cl.<sup>3</sup> B62B 7/08, 7/12

U.S. Cl. 280—648

20 Claims



1. A folding support frame comprising:  
a pair of dual conduit slide means;  
first and second U-shaped slide members each slidably coupled to each one of said pair of dual conduit slide members to form a generally rectangular framework of selected variable size; and  
a U-shaped rotating support member pivotally coupled to said pair of dual conduit slide means for rotation at the open end of the U-shaped rotating support member about an axis transverse to said pair of dual conduit slide means.

4,412,690

**SUSPENSION SYSTEM**

B. Robert Prokop, and Terry L. Trindle, both of Elkhart, Ind., assignors to Kelsey-Hayes Co., Romulus, Mich.

Filed Apr. 22, 1981, Ser. No. 256,352

Int. Cl.<sup>3</sup> B60G 5/04

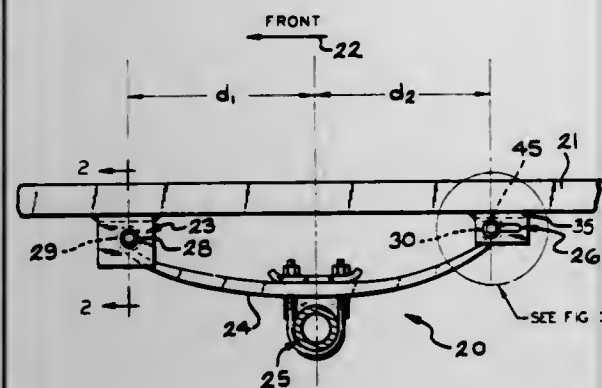
U.S. Cl. 280—718

4 Claims

1. In a vehicle suspension system including a spring means extending between a first and second vehicle attachment means and having axle means attached to said spring means between said first and second vehicle attachment means, the improvement wherein at least one of said vehicle attachment means includes a generally parallel pair of guides defining therebetween a load-transferring surface, wherein said pair of guides have corresponding slots therein extending generally parallel with said load-transferring surface, and pin means protruding from said spring means end and through said slots, said spring,



means having one end thereof in load-transferring slidable engagement with said load-transferring surface and thereby



restrained between said pair of guides, said load-transferring surface and said spring means end having complementary lateral cross-sectional configurations.

4,412,691

## DOOR MOUNTED SEAT BELT RETRACTOR

James E. Murphy, Royal Oak, and Kenneth H. Reid, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 15, 1981, Ser. No. 273,575

Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280—803

2 Claims



1. A seat belt retractor adapted for mounting on a door hingedly mounted for movement between positions opening and closing a door opening defined by a door frame and comprising:

- a retractor frame mounted on the door and having a pendulum support means;
- a reel rotatably journaled on the retractor frame and having ratchet teeth thereon;
- a lock bar pivotally mounted on the retractor frame for movement from a normal disengaged position to a locking position engaged with the reel ratchet teeth to lock the reel against belt unwinding rotation;
- a pendulum having a head mounted on the pendulum support means of the retractor frame to engage the lock bar and an inertia weight movable from a normal position by an inertia stimulus to move the lock bar to the engaged position;

feeler means mounted on the door for sensing movement of the door from the closed position; and  
flexible element having one end attached to the feeler means and the other end attached to the inertia weight of the pendulum, said flexible element having a normal tensionless condition when the door is closed so that the pendulum is free for movement by an inertia stimulus to move the lock bar to the engaged position, said flexible element being tensioned by the feeler means in response to door movement from the closed position so that the flexi-

ble element restrains the pendulum against movement from the normal position by an inertia stimulus induced by door opening movement.

4,412,692

## APPLIANCE FOR A BOOK OR THE LIKE

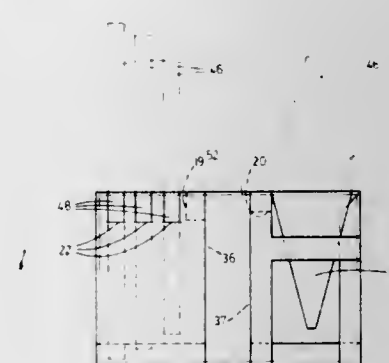
Donald E. Williams, 2479 S. Poppy, Fresno, Calif. 93706

Filed Feb. 17, 1981, Ser. No. 234,767

Int. Cl.<sup>3</sup> B42D 3/04, 3/18, 9/00

U.S. Cl. 281—34

1 Claim



1. An appliance for a book or the like having a multiplicity of pages bound together along a spine and enclosed by a primary cover, the appliance comprising:

- A. a flexible, substantially rectangular outer panel dimensioned to be disposed in covering relation to the primary cover, the outer panel having substantially parallel opposite lateral edges at opposite ends thereof and substantially parallel marginal edges substantially normal to said lateral edges;
- B. a first inner panel secured in facing relation to said outer panel and adapted to receive a portion of said primary cover between the outer panel and the first inner panel;
- C. a second inner panel secured in facing relation to the outer panel and adapted to receive a portion of said primary cover between the outer panel and the second inner panel; and
- D. a plurality of elongated flexible members borne by the appliance in spaced relation to each other along a marginal edge, said members individually having free ends adapted for interposition between selected adjacent pages of said book, one of said inner panels having a plurality of slots therein positioned and dimensioned individually to receive the free ends of said flexible members in stored positions.

4,412,693

## SWIVEL HOSE COUPLING WITH THREADED NIPPLE

Sergio Campanini, 224 E. Miller Rd., Iola, Kans. 66749

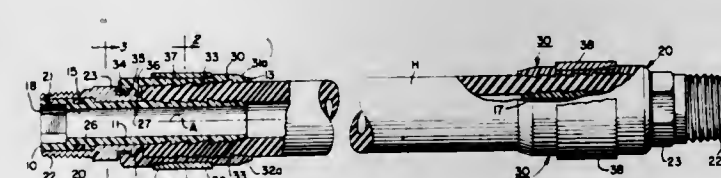
Filed Jul. 31, 1981, Ser. No. 288,710

The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> F16L 33/22

U.S. Cl. 285—39

6 Claims



1. A swivel coupling for terminating the end of a resilient hose having a bore therethrough, the coupling comprising:

- (a) a tubular nipple having a central opening therethrough and having an outer surface including a cylindrical portion near one end and a hose receiving portion near the

other end, the hose receiving portion having a threaded end of diameter slightly greater than the diameter of the hose bore and having an annularly barbed portion between the threaded end and the cylindrical portion, and the central opening through the nipple having therewithin female wrench flats in the vicinity of said cylindrical portion;

- (b) a screw fitting having a passage therethrough with a cylindrical wall portion snugly receiving the cylindrical portion of the nipple, and the fitting having a threaded portion extending away from said hose receiving portion of the nipple.
- (c) interfering means carried by the fitting and by the nipple and operative to keep the fitting rotatably engaged on said cylindrical portion of the nipple; and
- (d) means for surrounding the hose and the hose receiving portion of the nipple to compress the hose on said annular barbed portion.

4,412,695

## SLIDE BOLT LATCH ASSEMBLY

Alfonso Arlauskas, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1981, Ser. No. 224,312

Int. Cl.<sup>3</sup> E05C 1/12

U.S. Cl. 292—173

3 Claims



4,412,694

## CLAMPING DEVICES PARTICULARLY USEFUL AS PIPE COUPLINGS

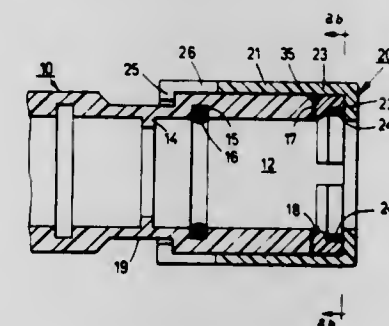
Avner Rosenberg, Moshav Beit Shearim, Israel

Filed Sep. 25, 1980, Ser. No. 190,721

Int. Cl.<sup>3</sup> F16L 37/18

U.S. Cl. 285—178

11 Claims



1. A clamping device particularly useful as a pipe coupling, comprising a housing having a bore through one end face for receiving the pipe to be coupled, and a cap rotationally mounted over the housing end face and including a skirt enclosing the housing, and an end wall having an aperture therethrough for the pipe to be coupled; characterized in that said device further includes a plurality of interposer elements comprising a pair of clamping segments interposed between said end face of the housing and the inner face of the cap end wall on opposite sides of the aperture; each of said clamping segments having a convexly-curved outer face, and a concavely-curved inner edge engageable with the outer face of the pipe to be coupled, said cap including displacing means effective upon rotation of the cap to one position, to displace said clamping segments along a rectilinear path radially inwardly to grip the pipe when inserted into the housing, and upon rotation to a second position, to displace said clamping segments radially outwardly to release the pipe; said displacing means comprising cam surfaces, constituted by radially-extending high points and low points formed on the inner face of said skirt, engageable with the outer convex faces of said clamping segments effective to displace said segments radially inwardly upon the rotation of said cap; the inner edges of said clamping segments engaging substantially the complete circumference of the pipe, and being sharpened for biting into the pipe, when the pipe is received within the housing and the clamping segments are actuated to their clamping positions.

4,412,696

## DOOR HANDLE DEVICE FOR AN AUTOMOTIVE VEHICLE

Katsumi Ishii, Tokyo, and Takayo Chikaraishi, Kawasaki, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 18, 1981, Ser. No. 274,766

Claims priority, application Japan, Jul. 29, 1980, 55-103027

Int. Cl.<sup>3</sup> E05C 13/00

U.S. Cl. 292—336.3

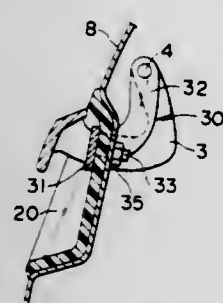
7 Claims

1. A door handle device for an automotive vehicle which comprises:

- (a) a door panel having a recessed portion provided with two arm-admitting holes and a cylinder hole,
- (b) a handle box having two arm-admitting holes and a cylinder hole, said handle box being almost the same in shape as the recessed portion of said door panel so that almost the whole outside surface of said handle box can be closely brought into contact with the recessed portion of said door panel;



- (c) a handle bracket having two arm portions and a flat portion, said handle bracket being fixed to the recessed portion of said door panel with said handle box sandwiched between the flat portion of said handle bracket and the recessed portion of said door panel, the two arm portions being passed through the two arm-admitting



- holes of said handle box and the recessed portion of said door panel; and  
(d) a handle body for unlocking the door, said handle body being rotatably supported by said handle bracket, whereby no bending or shearing force is applied to said handle box when said handle body is rotated to unlock the door.

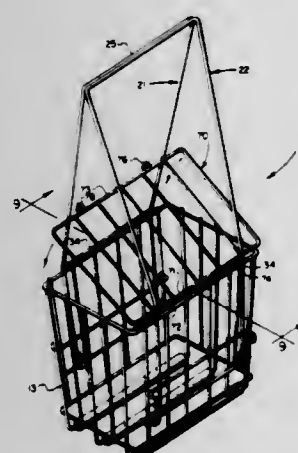
4,412,697

## TENNIS BALL RETRIEVING STORAGE CONTAINER

John Verde, P.O. Box 31249, Dallas, Tex. 75231  
Filed Apr. 17, 1981, Ser. No. 255,053  
Int. Cl.<sup>3</sup> A63B 47/02

U.S. Cl. 294—19 A

2 Claims



1. A tennis ball retrieving apparatus for receiving tennis balls from a playing surface and storing said balls for subsequent use, said apparatus comprising:

- a container having an open top, side and end walls, and a bottom including a plurality of parallel rods spaced from one another a distance greater than the diameter of a ball to be retrieved;

- a pair of cylindrical rollers formed of a resilient material which will not mar a tennis ball playing surface upon frictional engagement therewith, each of said rollers being positioned loosely about each of the bottom rods for movement upon the rods and having a wall-thickness sufficient to prevent contact between the bottom of the container and the playing surface, the spacing between opposing inside surfaces of adjacent ones of said rollers being slightly less than the diameter of a ball to be retrieved and stored within the container;

- means for supporting said container above balls resting on a playing surface for the forced manipulation of said container downwardly over said balls and the passage of said balls between adjacent ones of said rollers for retrieval; and

- a pair of handles hingedly mounted to opposite side walls of said container for rotating between an upwardly and down-

wardly extending position, wherein said handles include elongated hook portions which hingedly connect to said container side walls for allowing transverse and rotational movement relative to said container, and wherein each of said handles further includes at least one hook member disposed upon said handle for engaging and securing said container through transverse movement of said handle relative to said container and the upstanding support thereof when said handle is in a downwardly rotated position.

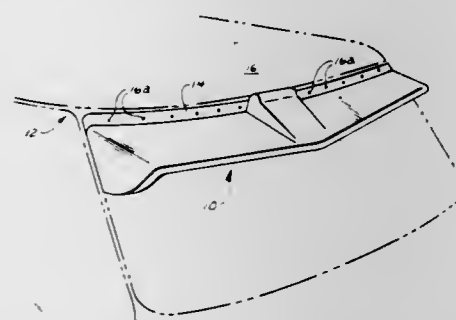
4,412,698

## METHOD AND APPARATUS FOR ATTACHING SUN VISOR TO AN AUTOMOBILE

Michael C. Kingsley, 2221 Ross Way, Tacoma, Wash. 98421  
Filed Aug. 18, 1981, Ser. No. 294,042

Int. Cl.<sup>3</sup> B60J 3/00  
U.S. Cl. 296—97 A

6 Claims



1. A method of joining a visor to an automobile structure at a fastening location where there is relative movement between the two members, said visor being made of a more yielding material, such as plastic, said method comprising:

- providing a fastening member comprising a sleeve having a forward deformable end portion and a rear portion with a flange having a forward bearing surface, and an elongate expanding member positioned within the sleeve and having a forward expanding head, said sleeve having a predetermined diameter,
- positioning said visor at a position to be joined to said structure,
- forming a pair of matching holes in said visor and said structure, with the hole in the visor having a diameter sufficiently greater than the diameter of the sleeve to permit relative lateral motion between the fastener and the visor when the fastener is placed in the hole of the visor,
- placing an insert onto said fastener, said insert having a forward bearing surface to press against the visor and a rear surface to engage said flange,
- inserting the fastening member into the two holes,
- moving said expanding member in a rearward direction with a force sufficient to deform the forward end portion of the sleeve, and pressing said flange against said insert so that the insert presses against the first member, thus securing the visor to the automobile structure, with the relative movement between the visor and the structure being permitted.

4,412,699

## MODULAR FRAME FOR TIPPING BODIES OF TRUCKS ADJUSTABLE IN WIDTH

Luigi Peruzzi, Rome, Italy, assignor to Officine Romanazzi S.p.A., Rome, Italy

Filed Jun. 10, 1981, Ser. No. 272,409  
Claims priority, application Italy, Aug. 13, 1980, 49490 A/80  
Int. Cl.<sup>3</sup> B60P 1/28; B62D 21/12

U.S. Cl. 298—17.7

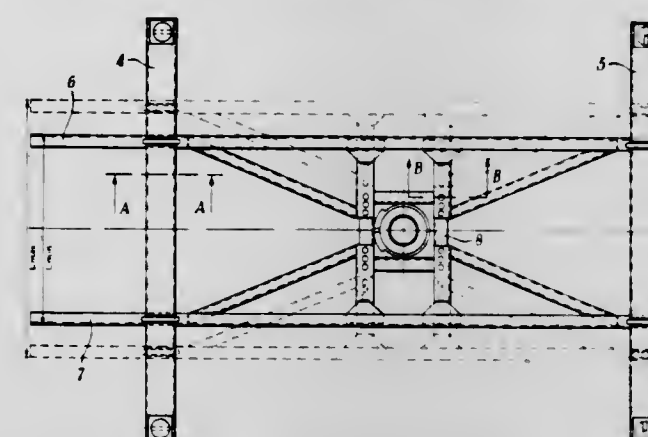
3 Claims

1. A modular frame for dump trucks having two parallel side members and two parallel cross members adjacent the end portions of said side members, comprising

- (a) two pairs of U-shaped half cross members, each pair

- being rigidly secured to each of said side members substantially at the central portion thereof;

- (b) a central cross unit carrying a base for a hoisting jack and adapted to be adjustably connected with said half cross members of each of said side members; and



- (c) disengageable fastening means for adjustably connecting said two cross members to the end portions of said side members.

4,412,700

## SYSTEM FOR MONITORING THE MOVEMENT OF A CUTTING TOOL OF A TUNNEL-DRIVING MACHINE RELATIVE TO A DESIRED PROFILE

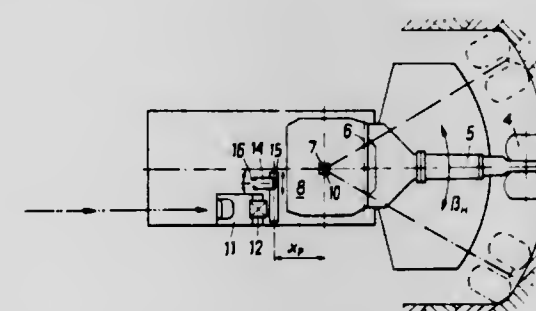
Alfred Zitz, Zeltweg; Erich Drüscher, Scheifling, and Otto Schetina, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Apr. 20, 1981, Ser. No. 255,636  
Claims priority, application Austria, Apr. 21, 1980, 2138/80; Oct. 14, 1980, 5102/80; Oct. 14, 1980, 5103/80

Int. Cl.<sup>3</sup> E21D 9/10

U.S. Cl. 299—1

17 Claims



1. In a tunnel-driving machine having a cutter arm mounted at one end on the machine by means of a swiveling mechanism which pivots the cutter arm for swinging movement about a horizontal axis and a vertical axis and a rotatable cutting tool carried by the other end of the cutter arm for engagement with the breast of a tunnel; a system for monitoring the movement of the cutting tool comprising means for generating a focussed electromagnetic wave train aligned with the tunnel axis; a wave train receiver; means mounting the receiver for displacement transversely to the longitudinal axis of the machine and for pivotable movement between a position in which the receiver is parallel to the longitudinal axis of the machine to a position aligned with the wave train axis; a simulator which includes a three-dimensional model of that part of the desired tunnel profile adjacent the breast of the tunnel, a three-dimensional model of the cutter arm and cutting tool mounted on a three-dimensional model of the swiveling mechanism, an adjusting drive for swinging the cutter arm model analogously to the cutter arm; means mounting the swiveling mechanism model for displacement and/or pivotal movement, an adjusting drive for the swiveling mechanism model; sensors for detecting the displacement and/or pivotal angle of the receiver and

- the cutter arm; and means responsive to the sensors for controlling the adjusting drives.

4,412,701

## HYDRAULIC BRAKE SYSTEM

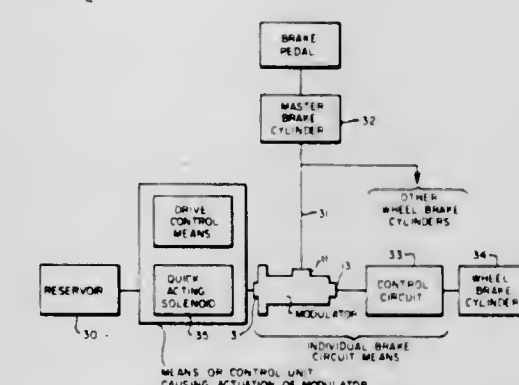
Manfred Burckhardt, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,224  
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006137

Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 303—6 R

14 Claims



1. A hydraulic brake system having at least a single circuit for a motor vehicle, the brake system including a brake pedal means, a master brake cylinder means, a plurality of wheel brake cylinders, and individual brake circuit means for connecting the master brake cylinder means with the respective wheel brake cylinders, a pressure modulator means disposed in each of the individual brake circuit means between the master brake cylinder means and the respective wheel brake cylinders, wherein means are provided for causing an actuation of the pressure modulator means so as to enable a building up of a pressure in the individual brake circuit means when the brake system is not operated by the brake pedal means, and characterized in that the pressure modulator means includes a stepped housing means, a stepped piston adapted to the housing means is displaceably mounted in the housing means, the stepped piston includes a large piston portion and a small piston portion, a pair of axially spaced sealing means are disposed on the small piston portion, means are provided for connecting the housing means with the master brake cylinder means, one of said sealing means is adapted to selectively open and close the means for connecting the housing means with the master brake cylinder means, a first pressure chamber means is provided in the housing and is cooperable with the large piston portion, a second pressure chamber means is provided in the housing means for the small piston portion, means are provided for connecting the second pressure chamber to the individual brake circuit means, and in that means are provided for connecting the first pressure chamber means with the means for causing an actuation of the pressure modulator means.

4,412,702

## FLUID PRESSURE PROPORTIONING VALVE AND PLUG MEMBER THEREFOR

Lloyd G. Bach, South Bend, Ind., and Robert F. Gaiser, Stevensville, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 21, 1981, Ser. No. 265,945  
Int. Cl.<sup>3</sup> B60T 8/26, 11/34

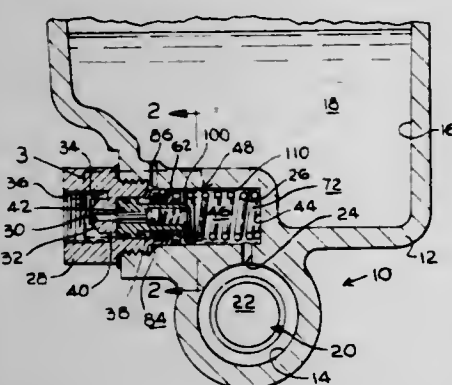
U.S. Cl. 303—6 C

3 Claims

1. A fluid pressure proportioning valve comprising a housing defining a bore therein, first passage means for communicating pressurized fluid from a source thereof into said bore, second passage means for communicating pressurized fluid from said bore to a fluid pressure responsive device, a differen-



ual-area piston member movably received in said bore and dividing the latter into a pair of chambers, one of said chambers communicating with said second passage means, third passage means for interconnecting said pair of chambers, valve means for opening and closing said third passage means to respectively establish and interrupt fluid communication between said fluid source and said device in response to movement of said piston member, resilient means for biasing said piston member toward a first position wherein said valve means opens said third passage means, said piston member moving axially to a second position in response to a prescribed fluid pressure level in said pair of chambers to close said third passage means via said valve means, said piston member shuttling axially between said first and second positions in response to fluid pressure in said one chamber increasing above said prescribed pressure level to proportion pressurized fluid to said device via said other chamber, characterized in that said housing includes a plug member defining a portion of said bore, said bore portion receiving a portion of said piston member, said plug member further defining an abutment surface forming a



manufacturing reference for measuring dimensions of said piston member and said valve means, said piston member engaging said abutment surface to define a rest position for said piston member, said piston member further including an axially extending bore receiving said valve means and defining said third passage means, said valve means including an operating stem extending axially in said axially extending bore and engageable with said abutment surface to define a rest position for said valve means whereby said abutment surface cooperates with both said valve means and said piston member to open said valve means when said piston member and said operating stem are in said rest position engaging said abutment surface, said valve includes an annular bearing member received in said bore portion and secured to said plug member, said bearing member slidably receiving a small diameter part of said piston member and defining an abutment surface confronting a shoulder formed by a large diameter part on said piston member, said shoulder engaging said abutment surface of said bearing member to prevent removal of said piston member from said bore portion.

4,412,703

## DRAWER SLIDE SYSTEM

Jorgen R. Simonson, 8441 Millbridge Cir., Huntington Beach, Calif. 92646

Filed Dec. 10, 1981, Ser. No. 329,394

Int. Cl.<sup>3</sup> F16C 21/00

U.S. Cl. 308—3.6

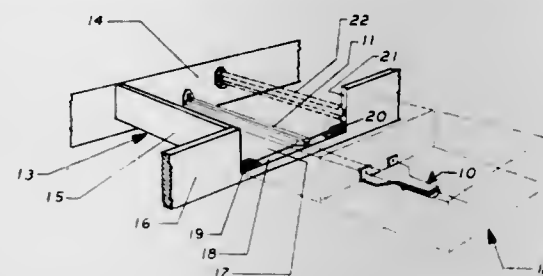
9 Claims

1. A slide and interfitting track system for a drawer, and the like, manufactured from an injection molded plastic material, comprising:

- i. a generally T-shaped, flat drawer support portion defining leading and trailing edges;
- ii. at least one flange rearwardly of the support and integral with the trailing edge;
- iii. means for attaching the flange and support portion to the drawer;
- iv. forward and rear longitudinally aligned slide runners

disposed centrally under the support and integral therewith at the leading and trailing edges, respectively, each slide runner and support edge defining an I-beam shaped cross section, including a channel portion defined on each side of the runner when viewed longitudinally along the slide runner;

B. a slide track defining a bottom portion and generally U-shaped, inwardly folded rail members adapted to interfit with the slide runners for movement therealong; and,



C. end mountings provided for the track, comprising an end piece insertable into the slide track, the end piece including a first and second set of spaced apart twin members, each set of members being oriented at right angles to each other, and an interfitting base member for the end piece mounted centrally under the drawer, the base member defining a horizontal channel adapted to interlock with a set of twin members of the end piece.

4,412,704

## COUPLING MECHANISM

Gustave Gagnebin, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

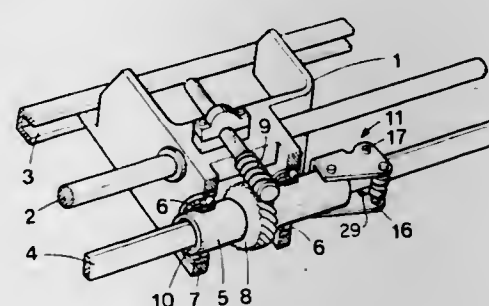
Filed May 5, 1981, Ser. No. 260,804

Claims priority, application Switzerland, May 20, 1980, 3915/80

Int. Cl.<sup>3</sup> F16C 29/12

U.S. Cl. 308—6 R

8 Claims



1. A coupling mechanism between a rotatable part which is displaceable along its axis of rotation and a rod pivotal about its longitudinal axis and extending through an axial passage of the rotatable part, comprising an angular coupling member between the part and the rod, said coupling member being pivotally mounted on the rotatable part about a pivotal axis at right angles to the axis of rotation of the rotatable part and including a part slidably mounted on the rod and angularly secured with said rod, said coupling member, rotatable part and rod being disposed in such a manner to permit a relative displacement between said rod and said rotatable part following a direction substantially parallel to the pivotal axis.

4,412,705

## BEARING ASSEMBLY FOR TRANSMISSION OUTPUT SHAFT

Friedrich Schreiner, Kehlen, and Uwe Staberoh, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

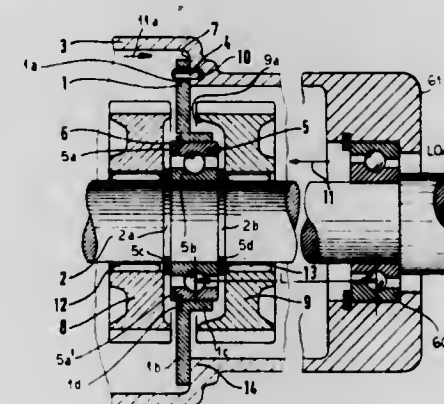
Filed Nov. 20, 1981, Ser. No. 323,408

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044050

Int. Cl.<sup>3</sup> F16C 35/06

U.S. Cl. 308—178

9 Claims



1. In a transmission having a housing, an output shaft journaled in an end of said housing and extending into said housing, and at least one gear on said output shaft in said housing, said output shaft having a free end beyond said gear, the improvement which comprises a bearing assembly in said housing, said bearing assembly including a rolling bearing on said shaft between said free end and said gear, a holding plate receiving and carrying said bearing, and means connecting said holding plate to said housing, said means including a shoulder formed on said housing and contacting one face of said plate whereby said plate is fixed and supported by said shoulder in one axial direction of said output shaft, and further including means for holding said plate against rotation relative to said shoulder whereby said plate is free from attachment to the housing in the opposite axial direction of the output shaft and said plate is free to move axially with said shaft relative to the housing in the said opposite axial direction.

4,412,706

## BICYCLE SEALED BEARING AND METHOD

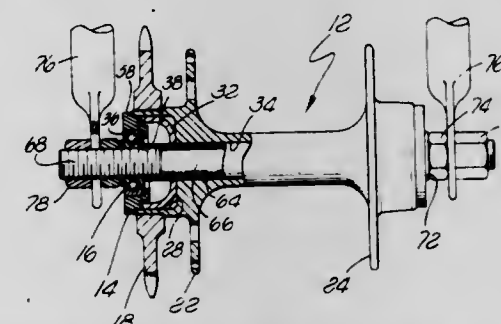
Willard C. Hopper, Jr., 4850 Trail, Norco, Calif. 91760

Filed Jan. 23, 1981, Ser. No. 227,642

Int. Cl.<sup>3</sup> F16C 33/00

U.S. Cl. 308—192

1 Claim



1. A combined sealing bearing unit having an inner race and outer race pre-formed in a generally cylindrical collar for mounting in a bicycle wheel hub bore comprising: an inner bore formed in said collar terminating at an interior shoulder wherein said sealed bearing unit outer race abuts said interior shoulder, said interior shoulder formed in a plane perpendicular to said inner bore axis, said interior shoulder facing in a first direction; said cylindrical collar further comprising a first reduced diameter and a second reduced diameter section; said first

and second reduced diameter sections being axially aligned with said inner bore axis, said first and second reduced diameter sections each terminating at one end at a central shoulder formed in a plane parallel to said interior shoulder and facing in a second direction; said first reduced diameter section terminating at its second end at a second shoulder facing in said second direction, for enabling said first reduced diameter section to form a tight fit in said bicycle wheel hub bore and said second reduced diameter section to be spaced from an irregular surface in said hub bore.

4,412,707

## BEARING DEVICE FOR CENTRIFUGE

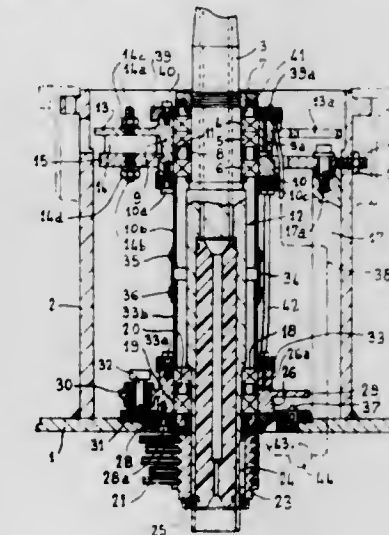
Denis Buffet, Meyzieu, France, assignor to Robatel SLPI, Genas, France

Filed Dec. 30, 1981, Ser. No. 336,108

Int. Cl.<sup>3</sup> F16C 27/00, 35/08

U.S. Cl. 308—228

2 Claims



1. In a centrifuge,  
(a) a vertical shaft;  
(b) a frame having a base plate, and having a sleeve supported by the base plate and surrounding the shaft;  
(c) upper and lower bearing assemblies comprising vertically spaced upper and lower cylindrical bodies surrounding the shaft within the sleeve and respectively carrying bearings supporting the shaft;  
(d) an upper non-rotating annular member within the sleeve surrounding the shaft and the member having vertical columns depending therefrom and resting on the base plate;  
(e) elastic mounting means supporting the upper cylindrical body on the upper non-rotating annular member;  
(f) a lower non-rotating annular member surrounding the shaft and supported on the base plate;  
(g) elastic mounting means supporting the lower cylindrical body on the lower non-rotating annular member;  
(h) tubular means surrounding the shaft in spaced relation thereto and connected with the upper and lower cylindrical bodies to form with the shaft an intermediate oil conducting space between the bearings in the bodies; and  
(i) centering means comprising at least three screws extending radially through the sleeve opposite the periphery of the upper annular member and adjustably engaging the upper annular member to keep it centered in the frame.



4,412,708

**CABINET DOOR HINGE CONSTRUCTION**

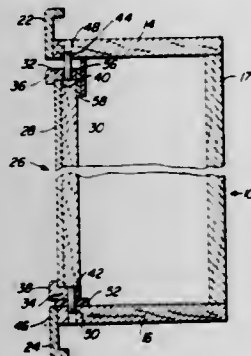
James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.

Filed Sep. 21, 1981, Ser. No. 303,898

Int. Cl.<sup>3</sup> E05D 5/10, 7/08

U.S. Cl. 312—138 R

2 Claims



1. A door hinge construction for cabinets having an open front, said cabinet and door each having top and bottom walls, said door having a lengthwise dimension less than the area between the top and bottom walls of the cabinet, nylon dowels rods partially mounted in said door in alignment with each other adjacent one side thereof and on the top and bottom walls of said door, and having portions of said dowel extending beyond said top and bottom walls, aligned bores in said cabinet, top and bottom walls aligned with said dowel rods, and a thick washer on said lower dowel rod whereby when the door is tilted away from the cabinet walls, the upper dowel rod is inserted in the bore of the top wall and by raising the door in the aforesaid area, the lower dowel rod with the washer is placed in the bore in the bottom wall.

4,412,709

**DIVIDED CASH DRAWER WITH SLOTS AND TWO TRAYS**

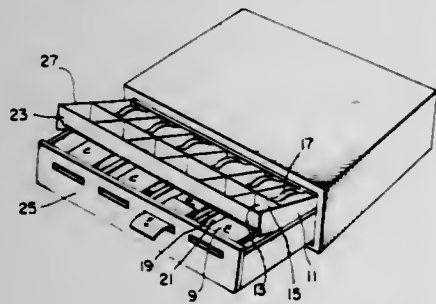
Shiro Ishii, Stanton, Calif., assignor to M-S Corporation, Stanton, Calif.

Filed Oct. 28, 1980, Ser. No. 202,178

Int. Cl.<sup>3</sup> A47B 88/00; G07G 1/00

U.S. Cl. 312—291

2 Claims



1. A cash receptacle for storing different types of media, said receptacle comprising:  
an outer case having an opening in one side thereof;  
a drawer slidably received within said case through said opening therein;  
said drawer having in the bottom thereof a plurality of dividing supports partitioning said bottom of said drawer into a plurality of drawer compartments including one large compartment having adjustable means for dividing said large compartment into two compartments, two smaller compartments located adjacent said large compartment, and a coin compartment located behind said two smaller compartments within said drawer;  
a money tray removably supported in said drawer on said dividing supports;  
said drawer having in a front wall thereof a plurality of slots including a slot corresponding to said large compartment

and two individual slots corresponding to said two smaller compartments, said slots being located in said front wall at a level above the respective said drawer compartments and facing a front wall of said money tray; and  
said front wall of said money tray being curved downwardly and rearwardly from the top front of said money tray, thereby forming means for guiding media inserted through said slots into respective said drawer compartments beneath said money tray.

4,412,710

**GRAVITY-OPERATED LATCH FOR TILT-OUT CONSOLE FOR DISHWASHER**

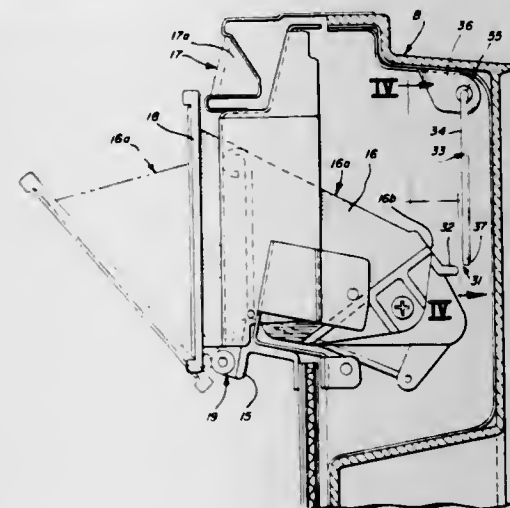
Paul J. Laprad, Lincoln Township, Berrien County, and Gerald L. Wolanin, Baroda Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 10, 1981, Ser. No. 272,385

Int. Cl.<sup>3</sup> A47B 96/00

U.S. Cl. 312—311

10 Claims



1. In a dishwasher having a cabinet defining a vertical access opening, an access door having a control panel assembly for mounting a console and a lower portion hingedly mounted to the cabinet at the bottom of said opening to be swung selectively about a pivot axis of the hinged mounting between a vertical, closed position wherein the door closes said access opening to an outwardly tilted, open position wherein the access opening is open, a control console for operation by the user of the dishwasher for controlling dishwashing operation thereof, a tilt-out door for selectively covering the control console, means for pivotally mounting said tilt-out door to said control panel assembly of said access door, and biasing means for lightly biasing said tilt-out door to a closed position covering said control console and permitting the user to swing the tilt-out door outwardly from said closed position to an open position exposing the control console for access by the user, the improvement comprising  
stop means associated with said access door and said tilt-out door responsive to swinging of said access door beyond a small preselected angle from said closed position for preventing pivoting of said tilt-out door by gravity substantially from its closed position against the biasing action of said biasing means and preventing the user from swinging the tilt-out door to its open position when the access door is so swung beyond said preselected angle while permitting free pivoting of the tilt-out door by the user to its open position against said biasing action when the access door is less than said preselected angle from said closed position thereof.

4,412,711

**TWO KNUCKLE ELECTRICAL HINGE**

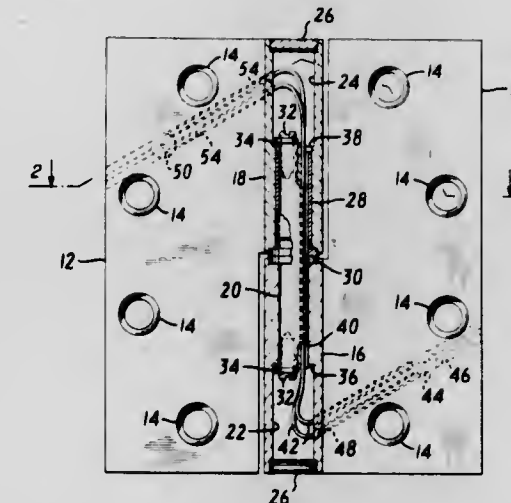
Charles R. Suska, Roxbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 3, 1981, Ser. No. 327,181

Int. Cl.<sup>3</sup> H01R 39/00

U.S. Cl. 339—4

16 Claims



1. A hinge for mounting a door in a frame and for passing electric current between the door and frame through a concealed, tamperproof electrical wire comprising a first hinge leaf having a first hinge knuckle, a second hinge leaf having a second hinge knuckle, said first and second knuckles having axially aligned bores, a solid hinge pin disposed in the bores of said first and second knuckles and having a slot extending between the bores of said first and second knuckles for receiving a wire, first conduit means in said first leaf and knuckle for passing a wire from said first leaf to said slot, and second conduit means in said second leaf and knuckle for passing a wire from said slot to said second leaf.

4,412,712

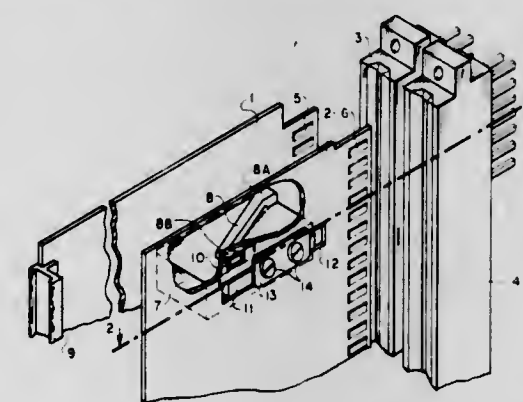
CIRCUIT BOARD POSITIONING ARRANGEMENT  
William A. Reimer, Wheaton, and Ansano Bertellotti, Addison, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Oct. 23, 1981, Ser. No. 314,169

Int. Cl.<sup>3</sup> H01R 23/72

U.S. Cl. 339—17 M

10 Claims



1. A circuit board positioning arrangement for use with at least two circuit boards, each board including a connector engaging edge portion, each of said edge portions sequentially positionable in contact with an associated connector, a first one of said boards initially located farther from its associated connector than a second one of said boards is from its associated connector, said positioning arrangement comprising:  
receiving means included in at least one of said boards;  
support means adapted to position and maintain said boards in parallel and spaced relationship while permitting lateral

movement of at least one of said boards relative to another; and  
sequencing means included in at least another one of said boards and initially positioned in contact with said receiving means;  
whereby, said second board initially located closer to its associated connector is placed in contact with its associated connector in response to the initial application of force to said first board, and in response to the continued application of said force to said first board, said sequencing means is repositioned relative to said receiving means and said first board is positioned in contact with its associated connector.

4,412,713

**SOCKET HAVING MEANS OF NO-LOAD ENGAGING WITH AND RELEASING FROM IC PACKAGE**

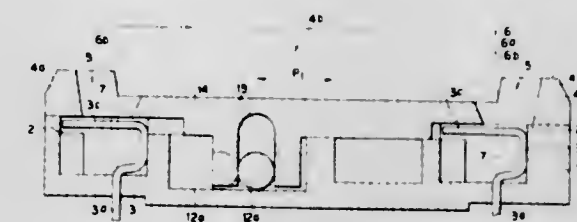
Kinichi Nishikawa, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,477

Int. Cl.<sup>3</sup> H01R 13/54

U.S. Cl. 339—75 M

1 Claim



1. A socket for a substantially rectangular IC package having lengthwise extending parallel rows of depending lead wires, said socket comprising:  
a rectangular base plate having two lengthwise extending parallel rows of contact receiving vertical openings with the rows spaced the same distance as the rows of lead wires and with the openings in the rows spaced at the same distance apart as the leads on said IC package, and each opening having a contact therein for being engaged by a corresponding lead wire from the IC package when the IC package is assembled with the socket;  
a substantially rectangular movable plate having two lengthwise extending parallel rows of through openings corresponding with the rows of vertical openings in said base plate and having the through openings aligned with the corresponding vertical openings in the base plate, said through holes and said vertical openings having a larger cross-section than the depending lead wires on the IC package for permitting the lead wires to pass freely through said through holes and into said vertical openings when the IC package is assembled with the socket, said movable plate being movably mounted on said base plate for movement only in a direction transversely to the length of said rows of openings and through holes; and  
means for moving said movable plate on said base plate in said direction between a lead wire released position in which the lead wires are out of contact with said contacts and a lead wire engaged position in which the lead wires are engaged with said contacts, each contact opening in the direction toward the direction from which said movable plate is moved by said moving means toward said contact engaged position, said movable plate further having two parallel lengthwise extending walls thereon extending parallel to said rows of openings and spaced a distance from each other equal to the width of the IC package, whereby when the IC package is assembled with the socket, the IC package is placed between said walls and the force exerted on the IC package and the depending lead wire during the movement of said movable plate is solely through the sides of the IC package.



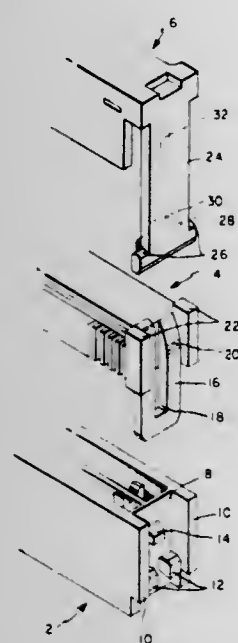
4,412,714

**LATCHING CONNECTOR ASSEMBLY**

Leroy J. Morningstar, 3 Speyer Rd., Middletown, Pa. 17057,  
and Charles Tighe, Jr., 987 Beech Ave., Hershey, Pa. 17033  
Filed Jun. 13, 1980, Ser. No. 159,026  
Int. Cl.<sup>3</sup> H01R 13/627

U.S. Cl. 339—91 R

10 Claims



1. A latching assembly for a multipiece connector comprising:

- first elongate side surface means recessed between two longitudinal, outwardly directed edge flanges, said first side surface means having profiled retention protuberance means projecting outwardly between said edge flanges;
- second elongate side surface means having a T-shaped cantilever spring finger projecting outward, tangentially therefrom, said spring finger having an inwardly directed transverse flange at a forward end, and an inwardly directed camming protuberance located rearward and adjacent said flange, said flange latchingly engaging over said retention protuberance means and said camming protuberance disposed between said retention protuberance means as said spring finger is inserted between said edge flanges, and
- said spring finger having outwardly directed ear portions at a forward end for latchingly engaging over forward ends of said edge flanges.

4,412,715

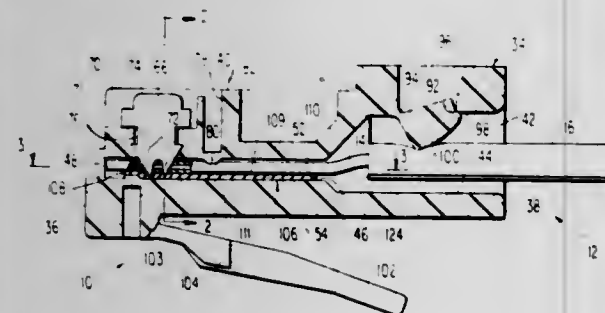
**MODULAR ELECTRICAL PLUG INCORPORATING CONDUCTIVE PATH**

Stephen B. Bogese, II, Salem, Va., assignor to Virginia Patent Development Corp., Roanoke, Va.

Filed Jan. 12, 1981, Ser. No. 224,019  
Int. Cl.<sup>3</sup> H01R 31/08

U.S. Cl. 339—97 P

44 Claims



1. An electronic connector, which comprises:  
a dielectric housing;  
conductive wire means positioned in said housing;  
electrically conductive contact means positioned in said

housing for piercing said conductive wire means for permitting an electrical connection to be made thereto externally of said housing; and  
substrate means positioned in said housing and having an electrically conductive path positioned thereon;  
wherein said conductive wire means comprises a plurality of insulated conductors and said contact means comprises a plurality of insulation-piercing contact terminals, certain of said terminals piercing and thereby making electrical connection with an associated one of said insulated conductors; and  
wherein said substrate means is positioned adjacent said plurality of conductors and wherein said path includes at least one electrically conductive segment which is adjacent the portion of one of said conductors which is pierced by its associated contact terminal so that said segment is also pierced thereby.

4,412,716

**SOCKET FOR BASELESS INCANDESCENT LAMP**

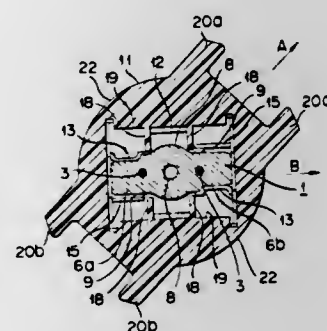
Masaharu Baba, Yokohama, and Kiyokazu Honda, Zushi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 30, 1980, Ser. No. 173,752

Claims priority, application Japan, Aug. 1, 1979, 54-97241  
Int. Cl.<sup>3</sup> H01R 13/48

U.S. Cl. 339—176 L

13 Claims



1. A socket for holding and effecting electrical contact with the terminals of a baseless incandescent lamp of the type comprising a light transmitting container having a squeezed portion with an exhaust tube, a filament contained in said container, and a pair of lead-in wires each having one end connected to said filament and the other extending to the outside through said filament and the other extending to the outside through said squeezed portion so that said pair of lead-in wires may be turned up along the squeezed surfaces of said squeezed portion to form terminals, said socket comprising:

- a socket body having a receiving portion defining a rectangular section including an opposing pair of inner side faces for receiving the squeezed portion of said baseless incandescent lamp;
- a pair of terminal members attached to said socket body for effecting electrical contact with said terminals of said incandescent lamp when said squeezed portion of said incandescent lamp is received in said receiving portion; and

first and second symmetrical pairs of ribs integrally formed with said socket body, said first pair protruding from a predetermined one of said inner side faces, and said second pair protruding from the other of said inner side faces, said first and second pairs disposed in said receiving portion intermediate said exhaust tube and said terminals when said incandescent lamp is received in said receiving portion, the projected edges of said ribs elastically engaging said squeezed portion in the vicinity of said exhaust tube, the projected edges of each set of diagonally opposing ribs of said first and second rib pairs capable of being disposed between said exhaust tube and the terminals of said incandescent lamp regardless of lamp orientation upon insertion

into said receiving portion, thereby preventing said terminals from moving toward said exhaust tube.

4,412,717

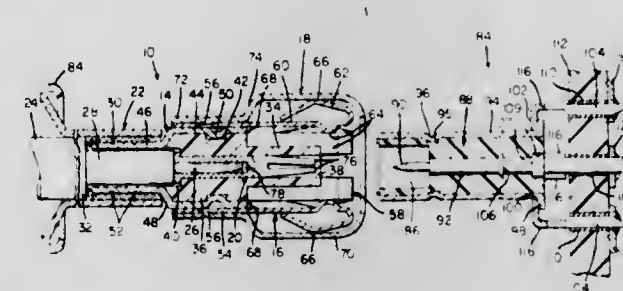
**COAXIAL CONNECTOR PLUG**

Kevin T. Monroe, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 21, 1982, Ser. No. 390,427

Int. Cl.<sup>3</sup> H01R 13/62, 17/18  
U.S. Cl. 339—177 R

5 Claims



1. A coaxial connector comprising:

- a dielectric member having a bore extending therethrough;
- a center contact member for disposition in said bore and for connection with a center conductor of a coaxial cable;
- inner shell means having a first section in which said dielectric member is positioned and a ferrule section on which an outer conductor of the coaxial cable is to be crimped;
- spring contact means including a tubular section and spring contact section means, said tubular section extending about said first section of said inner shell means, said spring contact section means including leaf spring contact means extending parallel relative to the axis of the connector and leaf spring means bent back along respective ones of said leaf spring contact means;
- outer shell means having a first member engaging said tubular section and a second member extending along said spring contact section means, a front end of said second member defining an entrance to said spring contact section means;
- means between said first member and said tubular section securing said first member and said tubular section together; and
- crimping ferrule member means for crimping the outer conductor onto said ferrule section.

4,412,718

**ELECTRIC PLUG CONTACT AND METHOD FOR ITS MANUFACTURE**

Max Pfister, Hunenberg, Switzerland, assignor to CDM Connectors Development & Mfg. AG, Cham, Switzerland  
Division of Ser. No. 189,845, Oct. 15, 1979, Pat. No. 4,341,434.

This application Feb. 18, 1982, Ser. No. 349,862

Claims priority, application Switzerland, Feb. 17, 1978, 1746/78

Int. Cl.<sup>3</sup> H01R 11/22, 43/00

U.S. Cl. 339—256 R

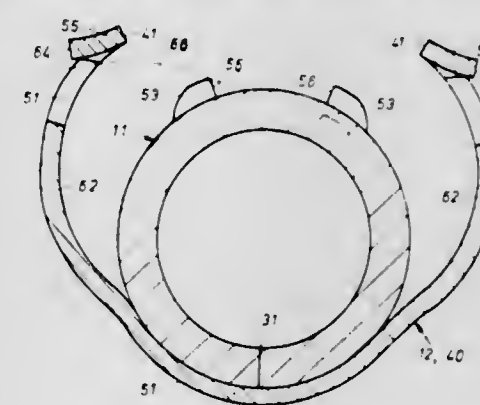
5 Claims

1. A method of fabricating an electric plug contact which comprises the steps of

- (a) providing a prefabricated, elongated, electrically conductive contact body which has a cylindrical portion that includes at least one pair of anchoring members extending outwardly thereof;
- (b) providing an elongated, flat sheet metal blank which includes generally parallel side edges and pairs of perforations therein at least equal in number to the number of pairs of anchoring members on the contact body, each perforation of each pair of perforations being located near an opposite side edge of the sheet metal blank so as to create a holding bridge portion between each perforation and an associated side edge, each perforation being suit-

ably located and shaped to be engagable by a separate anchoring member,

- (c) bending the elongated, flat sheet metal blank into a generally U-shaped configuration, the U-shaped configuration including a middle part and two lateral leg parts, the middle part and the two leg parts, when viewed in cross section, each extending along a circular arc which extends over about 120° and are adaptable to conform to the outer surface of the cylindrical portion of the contact body,
- (d) placing the contact body between the leg parts of the generally U-shaped sheet metal blank and such that it



contacts the middle part, the contact body being oriented such that the anchoring members extending outwardly thereof are on the side opposite the side in contact with the middle part of the generally U-shaped sheet metal blank.

- (e) bending the leg parts of the generally U-shaped sheet metal blank towards the outer surface of the cylindrical portion of the contact body until the side edges thereof are closely positioned and the perforations therein enclose the anchoring members of the contact body, each anchoring member contacting an associated holding bridge of the bent sheet of metal blank.

4,412,719

**METHOD AND ARTICLE HAVING PREDETERMINED NET REFLECTANCE CHARACTERISTICS**

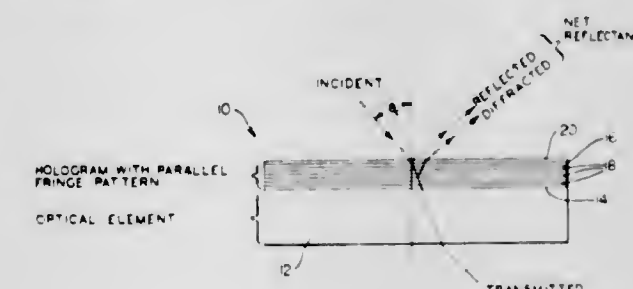
James R. Flenup, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Apr. 10, 1981, Ser. No. 252,774

Int. Cl.<sup>3</sup> G02B 5/32

U.S. Cl. 350—3.7

8 Claims



1. An article having predetermined net reflectance characteristics, said article comprising:

- an optical element having a major surface;
  - a holographic layer on the surface for reflecting light at a given amplitude and phase from the interface between the layer and the surrounding environment above the layer, said holographic layer having fringe patterns parallel with the surface, operative for diffracting light from the fringes at a predefined amplitude and phase with respect to the amplitude and phase of the reflected light;
- whereby the net reflection of light impinging on the article is determined by the amplitude and phase relationship between the reflected and diffracted light from the holographic layer.



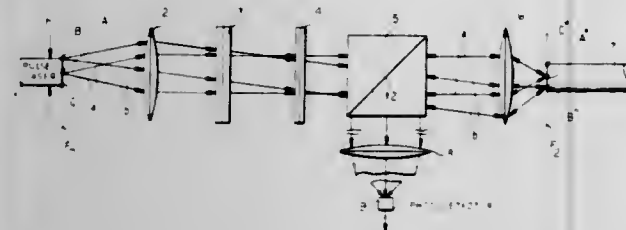
4,412,720

# OPTICAL SYSTEM COUPLING A RECTANGULAR LIGHT SOURCE TO A CIRCULAR LIGHT RECEIVER

Bruno Costa, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy  
Filed Apr. 21, 1981, Ser. No. 256,001  
Claims priority, application Italy, Apr. 23, 1980, 67634 A/80  
Int. Cl.<sup>3</sup> G02B 5/14

U.S. Cl. 350—96.18

8 Claims



1. An optical system for illuminating a substantially circular area of a light receiver by light from a source of substantially rectangular outline,

comprising an anamorphic lens assembly with a first focal plane at said source and with a second focal plane at said area, said lens assembly having a magnification ratio in a plane parallel to the minor sides of said outline exceeding its magnification ratio in a plane parallel to the major sides of said outline;

said lens assembly comprising positively refracting first spherical lens means focused upon said source, positively refracting second spherical lens means coaxial with said first spherical lens means focused upon said area, and an afocal pair of cylindrical lenses in a field of parallel light rays existing between said first and second spherical lens means.

4,412,721

# TRANSITION PIECE FOR THE CONVERSION OF A CIRCULAR CONDUCTOR ARRANGEMENT OF A CABLE OR SUCH INTO A LINEAR CONDUCTOR ARRANGEMENT AND CONVERSELY

Kuno Saatze, Emmering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

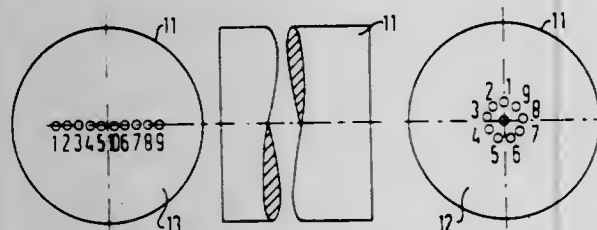
Filed May 14, 1981, Ser. No. 263,415

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1980, 3026631

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20

5 Claims



1. A guide-channel transition piece for conversion of a circular conductor arrangement of a multiconductor cable or such into a linear conductor arrangement and vice-versa, comprising: a formed part with spatially running hollow guide channel means continuously extending between two faces of the transition piece for freely receiving the individual conductors of the cable inserted into the channel means; on one face of the formed part channel inlets for the conductors are arranged in circular fashion corresponding to a structure of the cable, and at the other face channel outlets are arranged corresponding to a desired linear conductor arrangement.

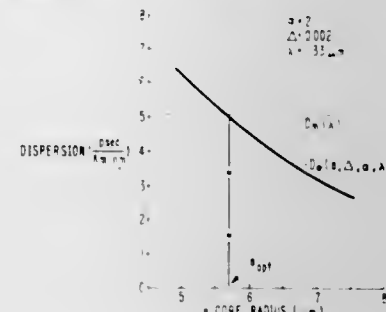
4,412,722

# SINGLE MODE FIBER WITH GRADED INDEX OF REFRACTION

Anthony Carnevale, Warren; Un-Chul Paek, West Windsor Township, Mercer County, and George E. Peterson, Warren, all of N.J., assignors to Western Electric, New York, N.Y. and Bell Telephone Laboratories Incorporated, Murray Hill, N.J.  
Filed Oct. 26, 1981, Ser. No. 315,020  
Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.31

9 Claims



1. An optical fiber comprising a core with a graded index of refraction given substantially by a profile exponent  $\alpha \leq 2$  and a cladding,

the  $\Delta$  index of refraction of the core, core radius, and profile exponent  $\alpha$  of the core being such that

- the fiber supports essentially only one propagating mode in the wavelength range of 0.6–1.7 microns;
- the fiber has a total dispersion  $< 5$  psec/Km.nm in at least a part of the spectral region from 0.6–1.7 microns;
- the total dispersion associated with the fiber is the sum of at least a nonzero waveguide dispersion and a non-zero material dispersion; and
- the wavelength at which the total dispersion is minimized is different than the zero material dispersion wavelength.

4,412,723

# OPTICAL SYSTEM FOR CORRECTING THE ABERRATIONS OF A BEAMSPLITTER IN CONVERGING LIGHT

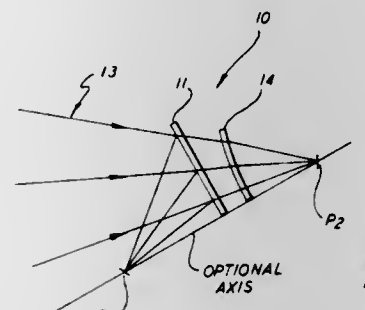
David R. Shafer, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 28, 1981, Ser. No. 267,950

Int. Cl.<sup>3</sup> G02B 27/10

U.S. Cl. 350—171

5 Claims



1. An optical system for providing substantially identical reflected and transmitted images carried in a beam of light, comprising in combination;

- a beamsplitter disposed in the path of the beam of light providing a reflected and transmitted image,
- a lens disposed in the path of said beam of light transmitted through said beamsplitter, said lens bent toward said transmitted image and having front and back radii which terminate on a line connecting said reflected and transmitted images.

4,412,724

# STRIATING LIQUID CRYSTAL DISPLAY SUBSTRATES WITH ULTRASONICALLY CAVITATING BUBBLE BEAMS

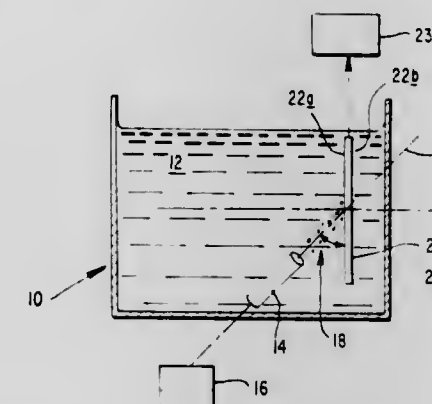
Jaswinder S. Sandhu, Chicago, Ill., assignor to RAJ Technology Partnership, Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,869

Int. Cl.<sup>3</sup> G02F 1/13, 1/137

U.S. Cl. 350—341

5 Claims



1. A method of producing a liquid crystal display which exhibits a high contrast ratio and which includes a pair of substrate members and a liquid crystal film disposed therebetween, said method including treating the surface of the substrate intended to contact the liquid crystal film so as to form striations therein by:

- immersing said substrate in a liquid;
- ultrasonically cavitating the liquid so as to form a beam of cavitation bubbles;
- directing the beam toward the substrate so that bubbles in the beam strike the substrate surface; and
- moving said substrate in a direction at a predetermined speed so that the surface of the substrate is striated by the bubbles in the direction of movement.

4,412,725

# REAR STOP DIAPHRAGM ZOOM LENS

Satoru Tachihara, and Sadao Okudaira, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

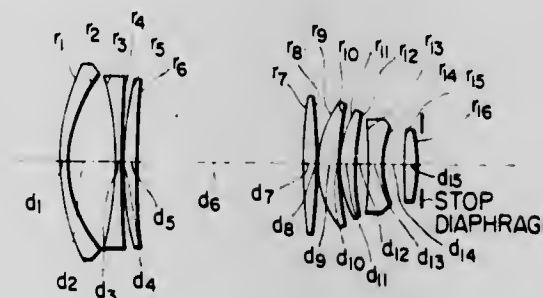
Filed Dec. 9, 1981, Ser. No. 329,107

Claims priority, application Japan, Dec. 20, 1980, 55-181024

Int. Cl.<sup>3</sup> G02B 9/64, 15/16

U.S. Cl. 350—426

4 Claims



1. A rear stop diaphragm type zoom lens composed, in order from the object side, of a first lens group as a whole having a negative refractive power and consisting of two negative lenses and a positive lens and a second lens group as a whole having a positive refractive power and consisting of three positive lenses, a negative lens and a positive lens, in which an aerial space between said lens groups is varied to thereby vary the magnification, and a stop diaphragm is disposed behind the overall lens system with the stop diaphragm being maintained at a constant position with respect to the focusing surface

during variation of magnification, the zoom lens satisfying the following conditions:

$$0.6 \leq f_T/|f_I| \leq 0.9 \quad (1)$$

$$1.2 < Z_r \leq 2.3 \quad (2)$$

$$0.6 \leq f_{IIP}/f_{II} \leq 0.75 \quad (3)$$

$$n_{L4} > 1.70 \quad (4)$$

$$R_{LN} < -2.5f_{IIP} R_{LN} < 0 \quad (5)$$

where  $f_T$  is the focal length of the overall lens system at the telephoto end,

$Z_r$  is the zoom ratio,

$f_I$  is the resultant focal length of the first lens group,

$f_{II}$  is the resultant focal length of the second lens group,

$f_{IIP}$  is the resultant focal length of the positive lenses disposed in front of the negative lens in the second lens group,

$n_{L4}$  is the refractive index of the positive lens disposed closest to the object in the second lens group, and

$R_{LN}$  is the radius of curvature of the object-faced surface of the negative lens of the second lens group.

4,412,726

# FISH EYE LENS SYSTEM

Mitsuaki Horimoto, Sennan, Japan, assignor to Minolta Camera Kabushiki Kaisha, Higashi, Japan

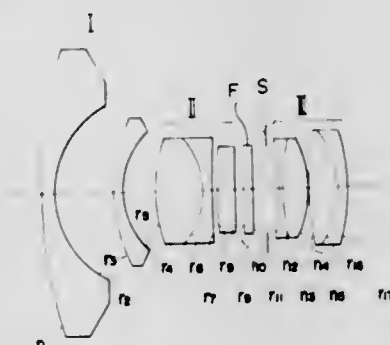
Filed Jan. 13, 1981, Ser. No. 224,791

Claims priority, application Japan, Jan. 17, 1980, 55-4406

Int. Cl.<sup>3</sup> G02B 9/60, 9/62

U.S. Cl. 350—461

15 Claims



1. A fish eye lens system comprising:  
a front lens group consisting of a pair of negative meniscus lens elements both convex to the object side;  
an intermediate lens group consisting of a pair of positive lens elements and a negative lens element; and  
a rear lens group consisting of a pair of doublets, the object side one of which includes an intermediate cemented surface having a positive refractive power.

4,412,727

# OPTICAL SYSTEM FOR TILTABLE LENS BARREL OF A MICROSCOPE

Akio Taira, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Apr. 24, 1981, Ser. No. 257,007

Claims priority, application Japan, Jul. 15, 1980, 55-96386

Int. Cl.<sup>3</sup> G02B 21/20

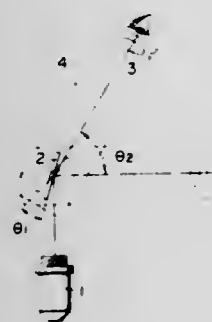
U.S. Cl. 350—514

12 Claims

1. An optical system for a tiltable lens barrel of a microscope, comprising:  
objective lens means, having a first optical axis, for projecting an optical image along said first optical axis;  
first reflecting means disposed on said first optical axis and comprising a reflecting mirror for directing said optical image along a second optical axis different than said first optical axis;



second reflecting means disposed on said second optical axis for directing said optical image along a third optical axis different than said second optical axis;  
 third reflecting means disposed on said third optical axis for directing said optical image along a fourth optical axis different than said third optical axis;  
 a tiltable lens barrel which houses both said third reflecting means and an eyepiece system located on said fourth optical axis and permitting viewing of said optical image, said tiltable lens barrel being rotatable together with said third



reflecting means around said third optical axis so as to change an axial tilt angle of said tiltable lens barrel; and an image rotator which is disposed along one of said axes between said objective lens means and said tiltable lens barrel in order to maintain said optical image as viewed through said eyepiece system at a predetermined orientation irrespective of changes in said axial tilt angle; said image rotator includes a trapezoidal prism which rotates through an angle of rotation which is half the angle of rotation of said tiltable lens barrel around an optical axis of light incident thereupon.

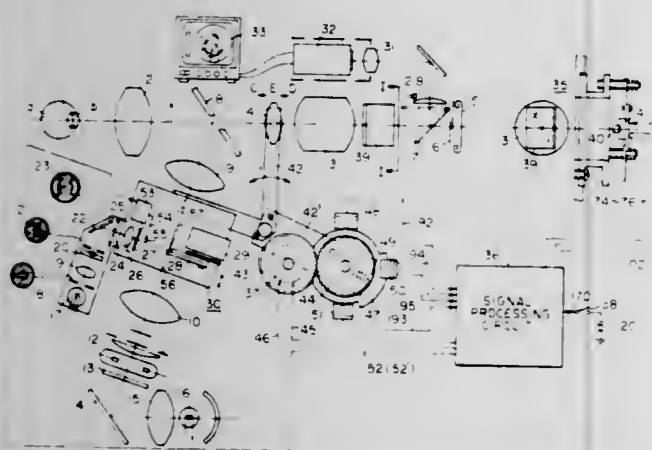
#### 4,412,728 FOCUSING APPARATUS FOR EYE-FUNDUS EXAMINING INSTRUMENT

Toshio Sakane; Haruhisa Madate, and Yoshimi Kohayakawa, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 180,103  
 Claims priority, application Japan, Aug. 24, 1979, 54-107729  
 Int. Cl.<sup>3</sup> A61B 3/14; G03B 29/00

U.S. Cl. 351—206

20 Claims



1. An eye-fundus examining instrument comprising:  
 an optical system for examining the fundus of an eye, said optical system having movable means movable for focusing;  
 an illumination system for illuminating the fundus of the eye;  
 a mark projecting system for projecting a focus mark upon the fundus of the eye that can be focused on the fundus of the eye;  
 a light-receiving system provided with a photosensor array for detecting the position of the focus mark image re-

flected by the fundus of the eye, the detected position of the focus mark image indicating the condition of focus of the focus mark on the fundus of the eye;  
 observation means, coupled to said optical system, for observing therethrough the image of the fundus of the eye and the focus mark image;  
 focusing means for simultaneously focusing said optical system, said mark projecting system and said light-receiving system relative to the fundus of the eye;  
 manual control means for manually controlling said focusing means;  
 drive means for driving said focusing means; and  
 a circuit electrically coupled to said photosensor array for controlling said drive means.

#### 4,412,729 VISION TESTING DEVICE

Erwin Hartmann, Munich, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,801  
 Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946325

Int. Cl.<sup>3</sup> A61B 3/00

U.S. Cl. 351—239

12 Claims



1. A test field for an apparatus for testing the vision of a person as regards ability to work on video display terminals, in which indicia of different sizes and recognizability are presented to the person to be tested, characterized in that the indicia appear in a darker surrounding field, and in that brighter areas having a luminance of between 250-1000 cd/m<sup>2</sup> are provided adjacent the surrounding field, the luminance of the darker surrounding field being about one-fifth to one-eighth of the luminance of the indicia while the luminance of the indicia is about one-fifth to one-tenth of the luminance of the brighter areas.

#### 4,412,730 METERING DEVICE

Takashi Saegusa, Sagami-hara, and Toru Fukuhara, Isehara, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 295,003  
 Claims priority, application Japan, Aug. 28, 1980, 55-118920; Aug. 28, 1980, 55-118921

Int. Cl.<sup>3</sup> G03B 7/08, 7/28; G01J 1/44

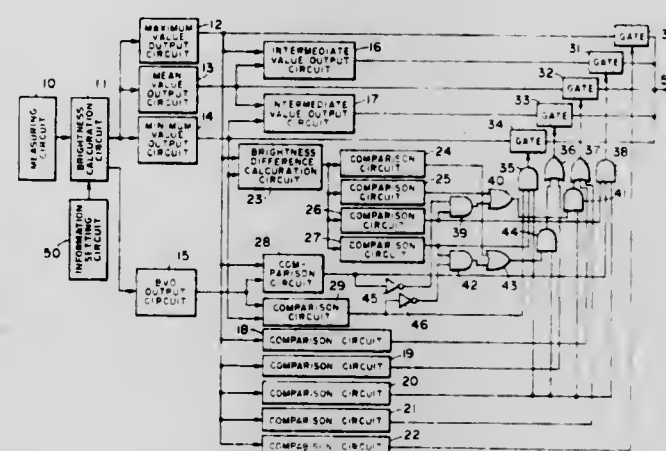
U.S. Cl. 354—31

9 Claims

1. A metering device for metering an object field by dividing it into a plurality of areas and a plurality of photosensitive means producing a plurality of metering outputs corresponding to the brightness of individual areas of said object field, said device including:

(a) means for extracting from said plurality of metering outputs a plurality of reference outputs different in level from one another, said extracting means including a circuit for calculating a maximum value output corresponding to the maximum brightness value of the brightness of said areas, a circuit for calculating a minimum value out-

put corresponding to the minimum brightness value of the brightnesses of said areas, a circuit for calculating a mean value output corresponding to the mean brightness value of the brightnesses of said areas, a circuit for calculating a first intermediate value output corresponding to the intermediate value of said maximum brightness value and said mean brightness value, and a circuit for calculating a



second intermediate value output corresponding to the intermediate value of said minimum brightness value and said mean brightness value;  
 (b) means for evaluating the level of at least one of said reference outputs; and  
 (c) means responsive to said evaluating means to select and put out one of said reference outputs.

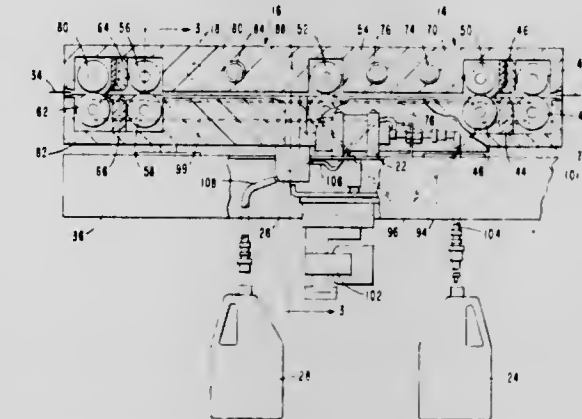
#### 4,412,731 HIGH SPEED LOW TEMPERATURE DIAZO PROCESSOR

Peter E. Herborn, Menlo Park; Thomas T. Liu, Sunnyvale, and Sze-Teh Young, San Jose, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 29, 1981, Ser. No. 287,973  
 Int. Cl.<sup>3</sup> G03D 7/00

U.S. Cl. 354—299

3 Claims

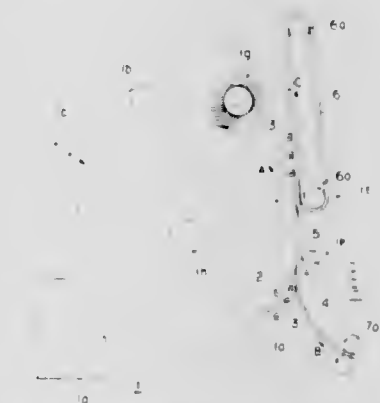


1. A diazo film developing system comprising a first chamber made of aluminum and having a heater for preheating said film, a second chamber made of aluminum and positioned for developing said preheated film, means for heating said second chamber and maintaining a desired operating temperature therein, means for moving said film through said first and said second chambers, and a third chamber directly connected with said second chamber for receiving aqueous ammonia in controlled manner, said third chamber comprising an elongated trough contiguous with and opening into said second chamber and disposed at one end thereof and being entirely of stainless steel material having a lower heat-conducting property than the aluminum material of said second chamber for main-

taining a temperature differential therebetween, said elongated trough having a temperature lower than the temperature of said second chamber whereby said aqueous ammonia is vaporized and the ammonia vapor rises from the elongated trough and contacts the emulsion of said film moving through the second chamber, the temperature differential causing the ammonia to separate from the water prior to contact with said film.

4,412,732  
**TRANSFER MEDIUM SEPARATING DEVICE**  
 Yoshihiro Ogata, Yokohama; Yoshihiro Abe, Tokyo, and Harumi Takahashi, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan  
 Filed Jul. 17, 1981, Ser. No. 284,343  
 Claims priority, application Japan, Jul. 21, 1980, 55-98700; Jul. 21, 1980, 55-98701  
 Int. Cl.<sup>3</sup> G03G 15/00, 15/14  
 U.S. Cl. 355—3 TR

11 Claims



1. A transfer medium separating device for separating a transfer medium from a first carrier means, bearing thereon a toner image, to which said transfer medium has been brought into contact to transfer the toner image onto said transfer medium from said first carrier means, comprising:

second carrier means of an electrically conductive material to which said transfer medium having thereon said toner image is to be gradually brought into contact due to electrostatic forces from its leading edge as separated from said first carrier means;

potential application means for selectively applying at least a first level potential and a second level potential which is different from said first level potential to said second carrier means;

timing control means for controlling the timing of changing from said first level potential to said second level potential to be applied to said second carrier means such that said second carrier means is kept at said first level potential until the leading edge of said transfer medium has reached a predetermined reference point along its traveling path with respect to said second carrier means; and

timing adjusting means connected to said timing control means for adjusting the timing of changing potentials by said timing control means and thus adjusting the location of said reference point in response to conditions of the separating operation.

4,412,733  
**BELT DEVELOPING APPARATUS**  
 George J. Douthey, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.  
 Filed Sep. 2, 1981, Ser. No. 298,714  
 Int. Cl.<sup>3</sup> G03G 15/08, 15/09

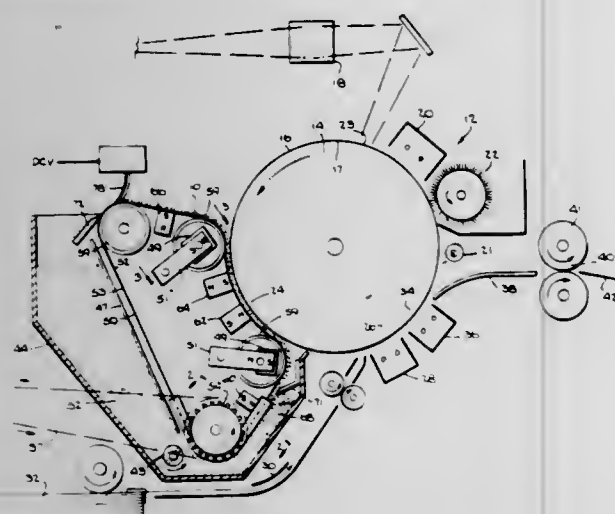
U.S. Cl. 355—3 DD

7 Claims

1. A dry magnetic developing apparatus for use in an electrophotographic copier having a moving photoconductor on which an image is developed, said apparatus comprising:



- a. means for holding a supply of dry magnetic developing material;
- b. an endless web formed of flexible material and having a textured surface which is capable of carrying said developing material therewith;
- c. guide means for guiding said web through said supply of developing material and to and from the moving photoconductor; and



- d. magnetic means fixedly mounted in juxtaposition to a surface of the photoconductor and intermediate said guide means and defining a gap between said magnetic means and said surface of the photoconductor through which said web passes, said gap defining an extended developing zone in which said magnetic means causes the developing material carried by said web to be tumbled thereon as said web passes through said extended developing zone for the purpose of developing a charged image on said surface of the photoconductor.

4,412,734

## ELECTROPHOTOGRAPHIC COPIER WITH COPY PAPER SUPPLY DEVICE

Kunihiko Shibuya, and Yasuhiro Iwata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

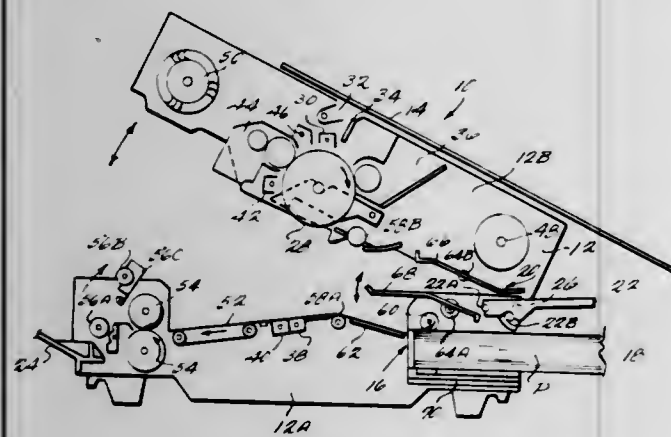
Filed Oct. 1, 1981, Ser. No. 307,579

Claims priority, application Japan, Oct. 30, 1980, 55-153295[U]

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355-3 SH

10 Claims



1. An electrophotographic copier comprising:
  - a housing including a first frame and a second frame pivotally connected on the housing;
  - a first paper supplying means for supplying copy paper within said housing and having a first paper guide plate mounted on said first frame;
  - a second paper supplying means for supplying copy paper

- within said housing and having a second paper guide plate mounted on said second frame;
- a third paper guide plate pivotally mounted on the housing, said third paper guide plate defining a first paper feed guide path with said first paper guide plate and a second paper feed guide path with said second paper guide plate; said first paper supplying means including said first paper feed guide path and said second paper supplying means including said second paper feed guide path; and
- means for receiving paper from either of said first and second paper supplying means and producing an image of an original thereon.

4,412,735

## IMAGE FORMATION APPARATUS

Masaharu Tsukata, Kawasaki, and Koichi Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

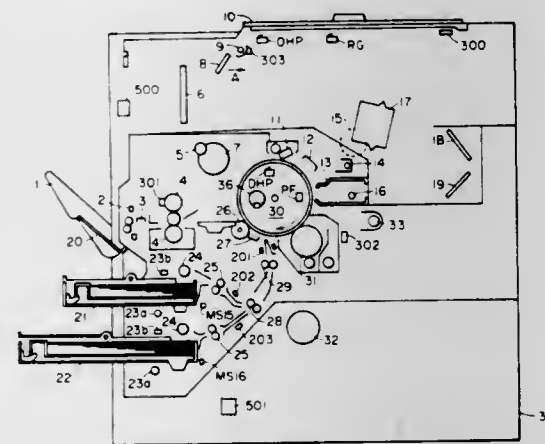
Filed Apr. 24, 1981, Ser. No. 257,359

Claims priority, application Japan, Apr. 26, 1980, 55-56081; Oct. 31, 1980, 55-154457

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355-14 R

45 Claims



1. A copying apparatus comprising:
  - copying process means for forming an image on a copy medium;
  - means for presetting the number of times for which copying is to be repeated;
  - delay means for inhibiting the starting of copying after closing of a main switch;
  - means for instructing to start copying;
  - sequence control means for starting the copying in response to said start means after the delay of said delay means has been released and for rendering said process means ready for the next cycle of copying after the repeated copying by said preset means has been terminated;
  - means for providing an acoustic warning of a malfunction in said apparatus or of the delay of said copying; and
  - means for controlling the tone quality or sound volume of said warning means in accordance with the sequence of said sequence control means.

4,412,736

## COLLECTION OF SUSPENDED TONER PARTICLES

Koji Sakamoto, Tokyo, and Misao Tanzawa, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 22, 1981, Ser. No. 286,041

Claims priority, application Japan, Jul. 24, 1980, 55-101633; Jul. 24, 1980, 55-104869[U]

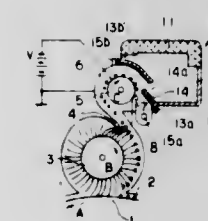
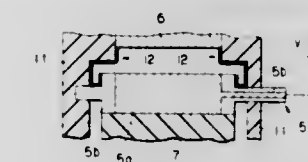
Int. Cl.<sup>3</sup> G03G 21/00

U.S. Cl. 355-15

13 Claims

1. Apparatus for collecting suspended, charged particles comprising:
  - a support member;
  - a roller electrode rotatably supported by said support member and including an electrically insulating section pro-

- vided at least at a part of the peripheral surface of said roller electrode;
- a counter electrode disposed opposite to the peripheral surface of said roller electrode;
- a blade provided in contact with the peripheral surface of said roller electrode, said blade being also in contact with



- at least a part of said insulating section thereby preventing said roller and counter electrodes from being bridged through the particles deposited on said support member; and
- a high voltage source connected between said roller electrode and said counter electrode.

4,412,737

## POSITION DETECTING DEVICE FOR A ZOOM LENS OF A COPYING MACHINE

Hisao Iwanade, and Ikuro Negoro, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

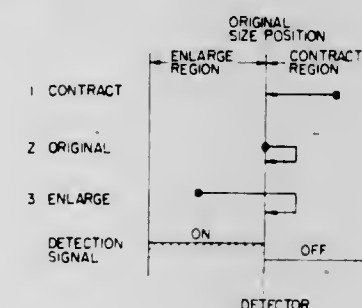
Filed Mar. 17, 1982, Ser. No. 358,948

Claims priority, application Japan, Mar. 19, 1981, 55-38645[U]

Int. Cl.<sup>3</sup> G03B 27/52

U.S. Cl. 355-55

8 Claims



1. A magnification varying device for a copying machine, comprising a zoom lens having lens groups held by holding members, a numerically-controlled motor for moving said zoom lens to obtain a desired magnification, and a lens position detecting device, said position detecting device including a detecting piece provided on one of said holding members; a detector for detecting the presence of said detecting piece; said detector detecting a position of said zoom lens when a power switch of said copying machine is turned on; and circuit means which, according to a detection signal outputted by said detector, drives said numerically-controlled motor to return said zoom lens to a life-size magnification position.

4,412,738

## VACUUM DOCUMENT FEEDER

Douglas K. Ahern, Penfield, and Edwin E. Cleaveland, III, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

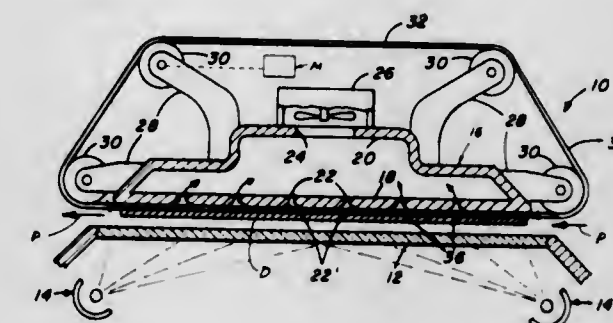
Continuation of Ser. No. 142,534, Apr. 21, 1980, abandoned.

This application Aug. 3, 1981, Ser. No. 289,685

Int. Cl.<sup>3</sup> G03B 27/64

U.S. Cl. 355-76

5 Claims



5. In a feeder for transporting a document page in juxtaposition to an illumination platen of a reproduction apparatus where such document page is illuminated to form a reflected light image thereof, said feeder including a vacuum plenum having a reflective wall defining a plurality of spaced ports overlying the illumination platen, the improvement comprising: a document page transport belt movable along said plenum wall in a direction to feed a document page to the platen, said belt having a reflective surface for contacting such document page and defining means, spaced from the wall ports, providing fluidic passage between said reflective surface and the opposite surface of said belt; and light reflective means operatively associated with said plenum wall and belt for fluidically interconnecting the wall ports and said passage defining means so that vacuum within the plenum is effective to tack a document page to said belt for movement therewith to the illumination platen, and light trapping by such reflective means during illumination is prevented.

4,412,739

## HINGED GLASS PHOTOMASK ASSEMBLY

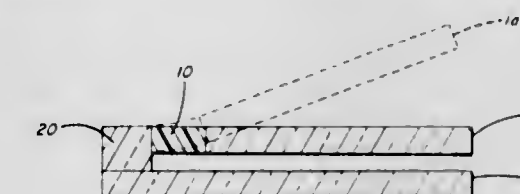
James M. Freiberg, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1981, Ser. No. 224,782

Int. Cl.<sup>3</sup> G03B 27/04

U.S. Cl. 355-89

6 Claims



1. An article of manufacture for use in photolithographic processes which comprises:
  - a. two glass sheets;
  - b. at least one photomask image; and
  - c. a flexible polymeric hinge, wherein said polymeric hinge is directly bonded to both glass sheets.



4,412,740

## VERY HIGH SPEED DUPLICATOR WITH DOCUMENT HANDLING

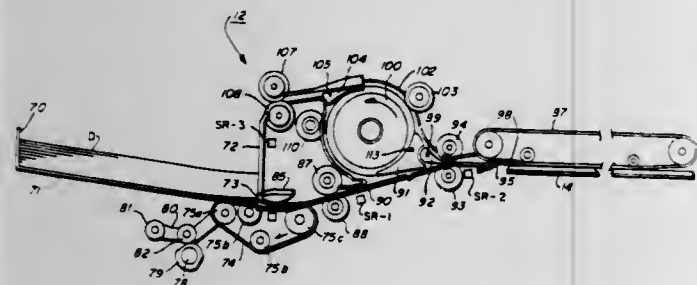
Gerald A. Buddendeck, Penfield, and Karl M. Kau, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1981, Ser. No. 314,633

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 SH

8 Claims



1. In a reproduction machine having a document handling apparatus for feeding document sheets individually from a stack to an exposure platen for the machine and return to the stack for selective repeated copying of one side only or both sides of the document sheets, the improvement comprising:

- a document support member adjacent to one side of the platen for supporting the stack, said support member having means associated therewith for feeding each document sheet from the bottom of the stack,
- means defining a sheet path from the document sheet feed means to the platen without inverting the sheet,
- means defining a sheet path from the platen including a loop for inverting the sheet and to return the sheet to the platen in an inverted orientation,
- deflector means in said loop and being movable to an operative position for directing the document sheet back to the platen in the inverted orientation or movable to another operative position to return the sheet to the top of the stack in its original orientation, and
- control means for selectively actuating said deflector means to either of said operative positions.

4,412,741

## METHOD FOR THE AUTOMATIC OR SEMIAUTOMATIC DISTANCE MEASUREMENT AND FOCUSING OF THE IMAGE OF AN OBJECT ONTO A FOCAL PLANE

Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

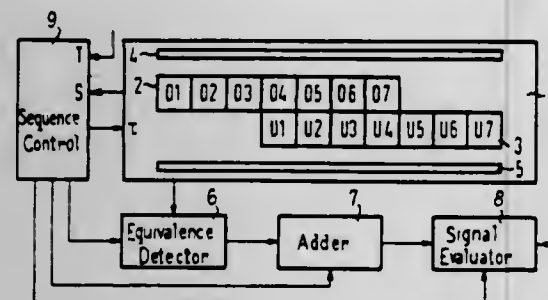
Continuation-in-part of Ser. No. 69,788, Aug. 27, 1979, Pat. No. 4,320,302. This application Aug. 24, 1981, Ser. No. 295,256

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838647

Int. Cl.<sup>3</sup> H01J 40/14; G03B 7/08; G01C 3/00; 5/00

U.S. Cl. 356—1

14 Claims



1. In a method for automatic distance measurement including the steps of

- (a) examining two line shaped image sections so as to locate respective linear image segments thereof which have a

maximum correlation as to respective corresponding light intensities along the lengths of the respective image segments,

- (b) conducting a correlation examination by comparing different image segments of the two line shaped image sections in a predetermined order as a sequence of comparison steps, such that the identification of the comparison step giving rise to a maximum correlation provides a measure of distance, and
- (c) utilizing the identification of the comparison step giving rise to the maximum correlation to provide an automatic distance indication,

the improvement wherein

- (d) the examining of the two line shaped image sections pursuant to step (a) above is effected by storing image element signals in successive stages of first and second shift registers in accordance with the light intensities of successive elemental regions of the respective line shaped image sections, and
- (e) the conducting of the correlation examination pursuant to step (b) above is effected by
  - (e1) during each comparison step, reading out in parallel at one respective end of each shift register from a number of shift register stages corresponding to the number of elemental regions which represent the length of an image segment,
  - (e2) comprising corresponding image element signals of the respective subsets of image element signals read out from the respective shift registers during the comparison step, so as to compare the corresponding segments of the respective line shaped image sections, and
  - (e3) after each reading out of respective subsets of image element signals at the respective one ends of the respective shift registers, alternately shifting the image element signals of the first shift register toward its one end and again executing a comparison step, and alternately shifting the image element signals of the second shift register toward its one end and again executing a comparison step, so that subsets of image element signals corresponding to segments of the two image sections are respectively supplied for comparison with each other in a predetermined order and during a sequence of comparison steps defined by the alternate shifting of the image element signals in the first and second shift registers.

4,412,742

## APPARATUS FOR USE IN INVESTIGATING SPECIMENS

Peter H. Lloyd, Birmingham, England, assignor to National Research Development Corporation, London, England

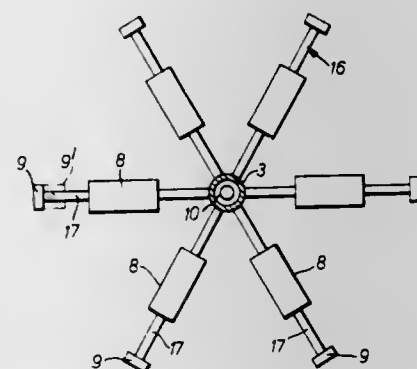
Continuation of Ser. No. 710,556, Aug. 2, 1976, abandoned. This application Nov. 21, 1978, Ser. No. 963,938

Claims priority, application United Kingdom, Aug. 8, 1975, 33250/75

Int. Cl.<sup>3</sup> G01N 21/01, 21/13

U.S. Cl. 356—73

51 Claims



1. Apparatus for monitoring chemical reactions occurring in

4,412,744

## ABSOLUTE SPECTROPHOTOMETER

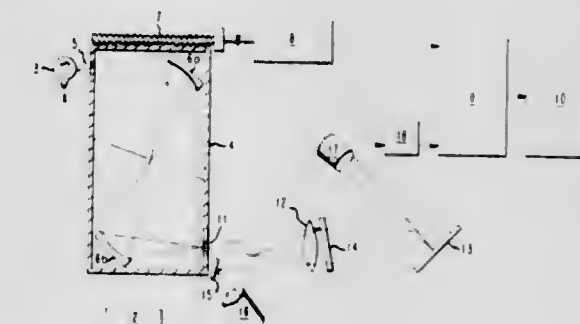
Jerald D. Lee, Mendenhall, Pa., and Charles D. Reilly, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 1, 1981, Ser. No. 268,707

Int. Cl.<sup>3</sup> G01J 3/42

U.S. Cl. 356—319

10 Claims



- a plurality of liquid or like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises: support means,
- a rotor mounted on said support means for rotation thereon on an axis,
- a turntable mounted coaxially with the rotor for rotation relative to said support means, and for holding a plurality of said radiant-energy-transmissive cuvettes in a circular arrangement coaxially with said axis,
- first drive means for rotating the turntable on its axis in a first program of rotation whereby the cuvettes describe an annular path as the turntable rotates,
- second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time, and

photometer means including radiant energy source means fixedly mounted on the rotor for rotation therewith and defining at least one beam path for radiant energy from said source means which extends at least through said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said cuvettes which intersects such beam path during rotation of the turntable,

said photometer means including electrical signal production means fixed on the rotor to rotate therewith for responding to any radiant energy projected along said beam path to produce electrical signals as cuvettes intersect said beam path.

4,412,743

## OFF-AXIS LIGHT BEAM DEFECT DETECTOR

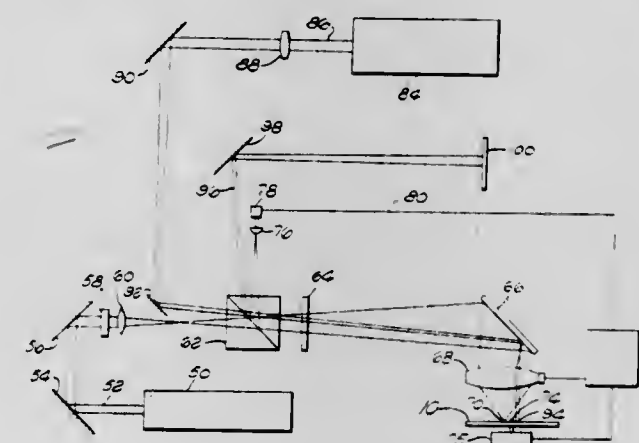
Carlyle J. Eberly, Long Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Sep. 8, 1981, Ser. No. 300,364

Int. Cl.<sup>3</sup> G01N 21/88

U.S. Cl. 356—237

17 Claims



- 1. A beam scanning apparatus for detecting a property of a light beam reflected from a surface to be scanned, comprising:
  - (a) a focusing lens disposed a distance from said surface and having its central axis perpendicular to said surface;
  - (b) means for maintaining a predetermined substantially fixed distance between said focusing lens and said surface;
  - (c) scanning means for providing lateral movement between said lens and said surface;
  - (d) first light beam means for providing a first light beam disposed in a nonparallel relationship with the central axis of said lens, said light beam being directed to pass through said lens to said surface, the axis of said first light beam passing through the focal point of said lens located on the opposite side of said lens from said surface; and
  - (e) light beam sensing means for detecting a spatial property of that portion of said light beam reflected off of said surface and transmitted back through said lens.

4,412,745

## APPARATUS FOR MEASURING LENGTH OR ANGLE

Fumio Ohtomo, Kawagoe, and Kazuaki Kimura, Tokyo, both of Japan, assignors to Tokyo Kogaku Kikai K. K., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,789

Claims priority, application Japan, May 12, 1980, 55-62407

Int. Cl.<sup>3</sup> B01B 11/14

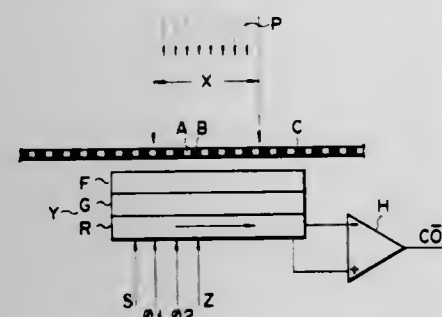
U.S. Cl. 356—373

9 Claims

- 1. An apparatus for measuring length or angle comprising a scale containing length or angle information recorded in the form of a bright and dark bit pattern, illuminating means for illuminating said scale with light in the form of a pulse to let said information to be sent out from said scale, a storage effect type sensor including a photoelement section having a plurality of light receiving elements for converting the information sent out from said scale into electric charge and storing said electric charge and a register section provided to correspond to said photoelement section for simultaneously memorizing the charge stored in the individual light receiving elements in said photoelement section, sensor drive means for effecting the control of transfer of charge from said photoelement section to said register section and data read-out scanning for reading out



data from said register section, said sensor drive means also serving to effect at least one "full emptying scanning", i.e., "emptying scanning" of at least all the bits of said register section, at a scanning frequency higher than the frequency for the data read-out scanning prior to the start of the data read-



out scanning, means for subtracting the read-out data when said scale is not being illuminated by said illuminating means from the read-out data when said scale is being illuminated, and means for processing the data obtained from said subtracting means and outputting the data obtained through the processing.

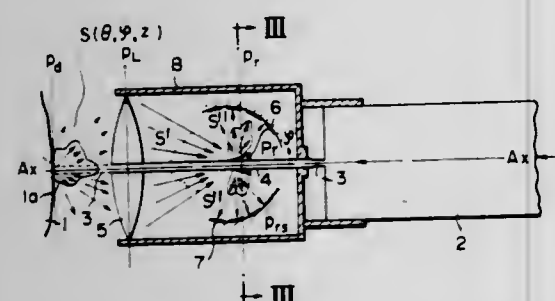
4,412,746

## OPTICAL NONCONTACTING DETECTOR

Hirotaoka Yokouchi, Muroran, Japan, assignor to The President of Muroran Institute for Technology, Hokkaido, Japan  
Filed Mar. 4, 1981, Ser. No. 240,575  
Claims priority, application Japan, Jul. 16, 1980, 55-97375  
Int. Cl.<sup>3</sup> G01N 21/47; G02B 5/14

U.S. Cl. 356-446

11 Claims



1. In an optical noncontacting detector for detecting the roughness of a surface such as ridges and grooves thereon comprising, a light-projecting system for radiating a beam of light on a surface the roughness of which is to be detected and having a tubular barrel having an open front end through which said beam of light is emitted, an elongated light-transmitting means coaxial with the tubular barrel for transmitting the beam of light out of the open end of the tubular barrel without dispersion of light internally of the tubular barrel, a source of light emitting and transmitting said beam of light through said light-transmitting means, a light-receiving system having light-gathering means on said tubular barrel for gathering into the tubular barrel light rays reflected from said surface when said beam of light radiates said surface and having means for converging reflected light rays at an area of reference internally of said tubular barrel, and said light-receiving system comprising reflected-light transmitting means disposed in said tubular barrel outside of said light-transmitting member and shielded therefrom and symmetrically about the longitudinal axis of said tubular barrel for receiving the reflected light rays and converting them into a selected distribution for eventual transducing thereof.

4,412,747

## SEALING DEVICE IN MIXING EQUIPMENT

Masao Moriyama, No. 508-13, Tendocho 17, Nishinomiya, Hyogo, Japan

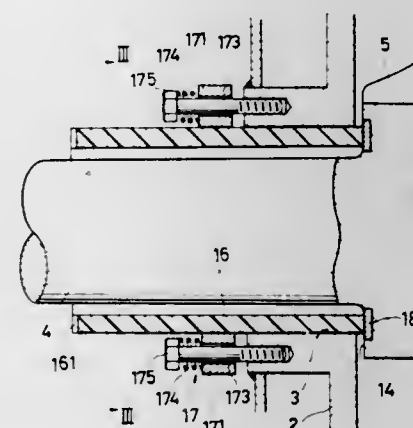
Filed Feb. 8, 1982, Ser. No. 346,594

Claims priority, application Japan, Feb. 6, 1981, 56-17291

Int. Cl.<sup>3</sup> B29B 1/06

U.S. Cl. 366-99

7 Claims



1. In mixing equipment for mixing viscous liquids, including a bowl having side walls, a mixing blade carried on a rotating shaft extending through a bore in said side walls of said bowl and supported on bearings located outside bowl, and a sealing device preventing the mixing liquid from leaking from where the rotating shaft emerges from the bowl, said sealing device comprising:

a cylindrical packing surrounding said emerging portion of said rotating shaft and extending through said bore in said bowl, said cylindrical packing being supported on said side walls of said bowl with a clearance interposed therebetween and such that an inside surface of said packing is exposed to air, said packing further being made of plastic; said mixing blade including a shoulder at each end portion from which said rotating shaft thrusts into the side wall of said bowl to emerge therefrom; said shoulder having an engaging face for engagement with the end face of said cylindrical packing; said cylindrical packing being extended sufficiently to cover said emerging portion of said rotating shaft; means for pressing said cylindrical packing against said engaging face; and said pressing means being adjustably fixed to said side wall of said bowl.

4,412,748

## GRAVITY CIRCULATION MIXER

Norbert Wohnhas, and Wolfgang Siegel, both of Ravensburg, Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,544

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029393

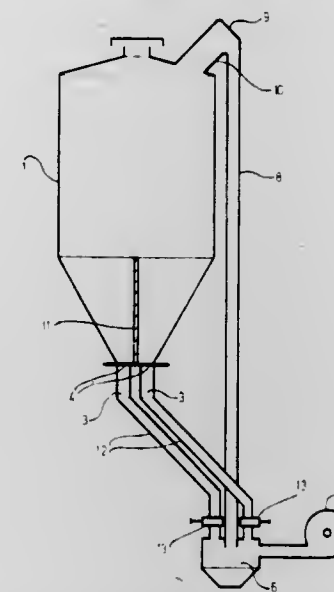
Int. Cl.<sup>3</sup> B01F 5/10, 5/24

U.S. Cl. 366-341

6 Claims

1. A gravity circulation mixer for bulk goods including a mixing container having an upper part and a conical bottom, at least two discharge openings for separating the flow of the bulk goods into two quantity flows, a mixing bowl connected to these openings, the mixing bowl being provided with an opening for supplying feeding air and an ascending pipe connecting the bowl to the upper part of the mixing container, characterized in that the ascending pipe (8) is disposed externally of the mixing container (1) in a vertical position and is connected to a first gravity pipe (10) which extends downwardly into the upper part of the mixing container, that the mixing bowl (6) is laterally offset with respect to the center axis

of the mixing container so as to be coaxially disposed in the ascending pipe (8), and that at least a second gravity pipe (5).



12) is provided which extends obliquely to the ascending pipe and connects the discharge openings (4) with the mixing bowl.

4,412,749

## PROGRAMMABLE ELECTRONIC TIME AND TIDE CLOCK

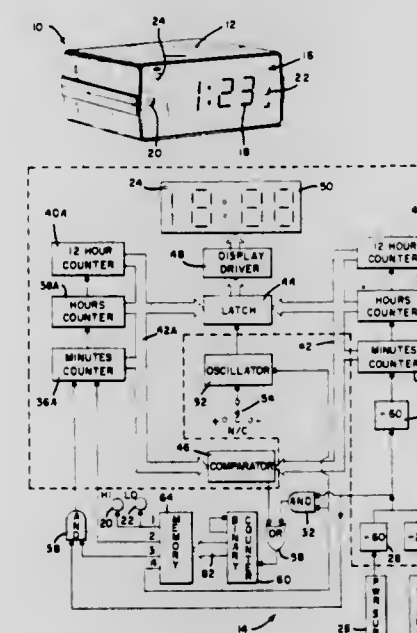
Thomas A. Showalter, Middletown, Pa., assignor to Spectrum Design Co., Oberlin, Pa.

Filed May 3, 1982, Ser. No. 374,404

Int. Cl.<sup>3</sup> G04B 19/26

U.S. Cl. 368-19

10 Claims



1. A programmable electronic time and tide timing device, comprising:  
pulse generating means for generating timing pulses;  
first counter means for receiving said timing pulses and generating real time signals;  
latch means and comparator means for receiving said real time signals;  
oscillator means connected to said latch means for operating said latch means for a specified time;  
memory circuit means and gate means receiving said timing pulses;  
said memory circuit means adapted to generate tide time signals which are transmitted to said gate means;  
second counter means receiving said tide time signals from said gate means and generating tide change signals which are transmitted to said latch means and said comparator means;  
said comparator means triggering operation of said memory

circuit means when said real time signals and said tide change signals are in coincidence thereby causing said memory circuit means to generate said tide change signals; and display means connected to latch means for displaying alternately real time and the time when the next high or low tide is to occur.

4,412,750

TIMING MECHANISM WITH TWO SEPARATE PROGRAMS OPERATING SEPARATE SWITCH ACTUATORS AND HAVING AN ALARM SYSTEM  
Maurice E. Schuder, Indianapolis, and Richard W. Stafford, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

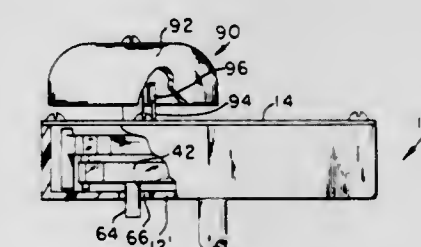
Division of Ser. No. 947,594, Oct. 2, 1978, Pat. No. 4,242,746.

This application Sep. 15, 1980, Ser. No. 187,410

Int. Cl.<sup>3</sup> G04F 8/00; H01H 43/10

U.S. Cl. 368-98

6 Claims



1. A timing mechanism comprising:  
(a) power drive means,  
(b) cam means coupled to said power drive means to be driven thereby, said cam means including a sharp drop contour;  
(c) actuator means engaging said cam means to quickly drop at said sharp drop contour, and stop means quickly limiting said drop;  
(d) alarm means;  
(e) a spring biased striker pivotally carried on said actuator means and engaging said alarm means; whereby said striker drops with said actuator means and continues dropping after said actuator means engages said stop means to strike said alarm means.

4,412,751

## JOINTED ELECTRONIC WATCH

Pierre Jeannot, Chambrelin; Raymond Froidevaux, Bienne, and Claude-Andre Gyga, Evillard, all of Switzerland, assignors to Omega SA, Bienne, Switzerland

Filed Aug. 23, 1982, Ser. No. 410,760

Claims priority, application Switzerland, Aug. 25, 1981, 5463/81

Int. Cl.<sup>3</sup> G04C 03/00; G04B 37/12, 23/12

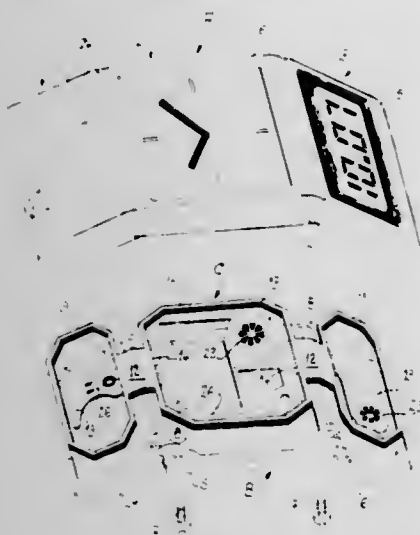
U.S. Cl. 368-276

8 Claims

1. A jointed electronic watch comprising at least two watch-cases coupled together by an articulation, each of said cases comprising a back cover, a case-band and a seal located between the back cover and the case-band wherein the seals are coupled together at the line of articulation by an isthmus formed of the same material as the seals and being integrated



therewith so as to form a moisture and dust blocking seal in one piece, electrical conductors being located within the isthmus



thereby to assure a sealed passage for electric connections between the watch-cases.

4,412,752

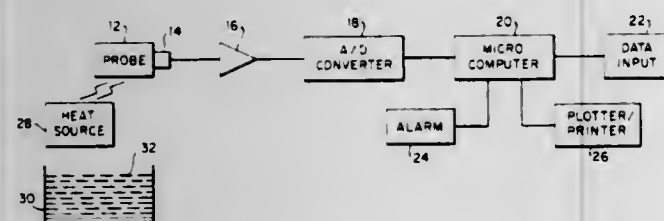
# METHOD AND APPARATUS FOR DETERMINING THE COOLING CHARACTERISTICS OF A QUENCHING MEDIUM

Raymond A. Cellitti, Hinsdale, and John J. Connelly, Naperville, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Sep. 21, 1981, Ser. No. 303,812  
Int. Cl.<sup>3</sup> G01N 25/00

U.S. Cl. 374-43

1 Claim



1. A method for determining an appropriate quenching medium for producing predetermined characteristics in a production part comprising the steps of:

determining the desired characteristics of the production part;

defining on a temperature transformation diagram the cooling characteristic required to obtain said desired characteristic;

immersing a heat test probe into a quenching medium and measuring the time versus temperature characteristic of the test probe, where said test probe has the same shape and same thermal conductivity as said production part; and

adjusting the characteristic of the quenching medium until the desired time versus temperature characteristic is obtained.

4,412,753

# QUICK-OPENING BEARING BLOCK

James F. Linn, P.O. Box 511, Tallmadge, Ohio 44278

Filed Sep. 3, 1981, Ser. No. 299,084  
Int. Cl.<sup>3</sup> F16C 35/02

U.S. Cl. 384-437

5 Claims

1. A quick-opening bearing block comprising:

(a) an elongated block base comprising:

(1) a lower bearing cup at one end;

(2) a lower center half-hinge section at the other end, spaced apart from said cup;

(3) an upwardly-extending post between said cup and said half-hinge;

(4) a lower semicylindrical bearing of fixed cylindrical circumferential length in said lower bearing cup for receiving a cylindrical shaft therein including means for mounting said bearing in said cup; and,

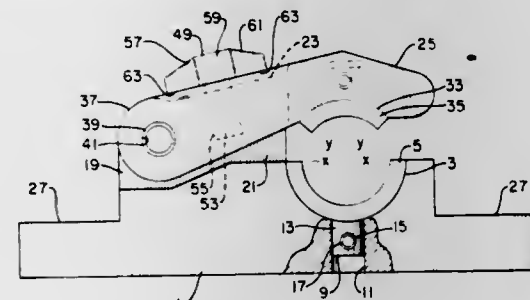
(5) a mount at each end of said base, including a slot therein, for receipt of a pin or bolt to fasten said base to a supporting surface;

(b) an elongated block cover comprising:

(1) an upper bearing cup at one end, adapted to mate with said lower bearing cup;

(2) a spaced apart pair of upper half-hinge sections at the other end thereof, adapted to receive said central lower half-hinge section therebetween and including a pin to connect said half-hinge sections together;

(3) a slot extending, from said spaced apart pair of upper half-hinge sections, toward said bearing cup to permit receipt of said post therethrough; and,



(4) an upper semicylindrical bearing of shorter cylindrical circumferential length in said bearing cup, to accommodate shafts of varying diameter and to compensate for bearing wear, including means for mounting said bearing in said cup;

(c) a T-shaped fastener having a lower portion, threadably received into said post, and an upper portion containing narrow, elongated opposing sides adapted to allow said fastener to pass freely through said slot in said block cover when aligned therewith as said cover is opened and closed comprising:

(1) a slanted upper surface to permit said cover to swing unopposed from full extended open position to full closed position on top of said base; and,

(2) a pair of lower locking surfaces to abut the top of said cover, as said fastener is twisted inward toward said base, to close and hold said block cover tightly down on said base when a cylindrical shaft is to be carried between said bearings.

4,412,754

# SPACE BAR FOR LOW PROFILE KEYBOARDS

Daniel R. Sparks, Temple City, Calif., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Sep. 23, 1982, Ser. No. 421,742  
Int. Cl.<sup>3</sup> B41J 5/08

U.S. Cl. 400-496

7 Claims

1. Space bar module apparatus for insertion into a low profile keyboard, characterized by

(a) an elongated base support having a central opening;

(b) an annular guide body positioned adjacent each end of said base support;

(c) a plunger body positioned over each said guide body;

(d) a plunger on each said support body vertically reciprocable in its respective guide body;

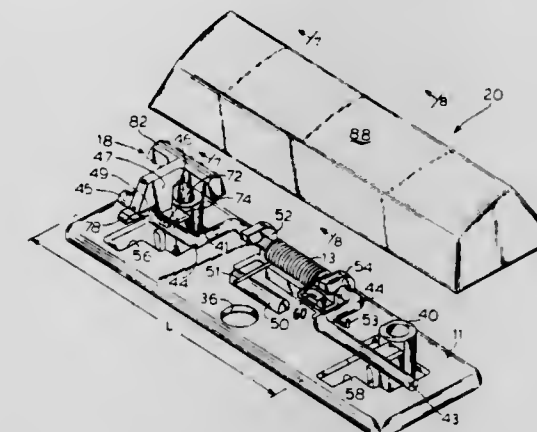
(e) leveling wire means extending between said plunger bodies for moving said plunger bodies in said guide bodies;

(f) cooperating stop means on said base support and each said plunger bar means for limiting the upward movement of said plunger bodies relative to said base support;

(g) resilient means extending between said leveling wire means and said base support for urging said leveling wire

means upwardly for continuously engaging said cooperating stop means; and

(h) an elongated key top extending between said plunger bodies for moving said plunger bodies downwardly against said resilient means;



4,412,755

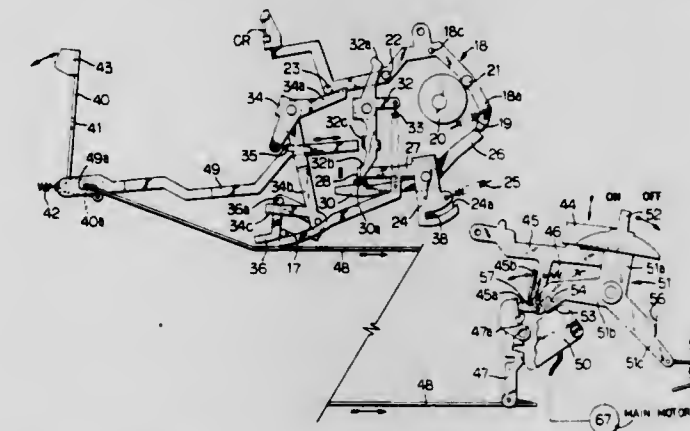
# TYPEWRITER WITH AN ERASING APPARATUS

Hisao Kurachi, Takeo Itoh, and Hiroshi Onoda, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 21, 1981, Ser. No. 332,857  
Claims priority, application Japan, Dec. 29, 1980, 55-187434  
Int. Cl.<sup>3</sup> B41J 29/16

U.S. Cl. 400-697.1

20 Claims



1. A typewriter driven by an electric motor and provided with an erasing apparatus comprising:

means for printing selected characters;

erasing means for supporting an erase ribbon to move the same from an original position to a printing position in response to printing operation of said printing means;

a retaining member disposed movably between a first position and a second position, and normally positioned at the first position to retain said erasing means in a non-operative status;

manual operating means for moving said retaining member to the second position to preset said erasing means in an operative status wherein the erasing means is operable in response to the printing operation of said printing means;

means for locking said retaining member at the second position, said retaining member held at the second position by said locking means being returned to the first position in response to the printing operation of said printing means;

a manual switch member movable between an ON position and an OFF position for controlling the power supply to said electric motor; and

means for returning said retaining member held at the second position by said locking means to the first position in

response to movement of said manual switch member from said ON position to said OFF position.

4,412,756

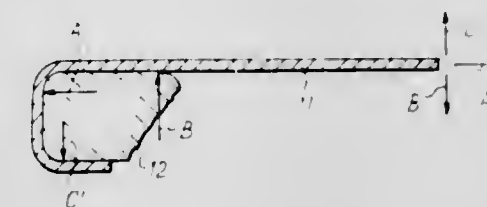
# STRUCTURAL ELEMENT

Edward H. Dunwoodie, Crowthorne, and Ronald W. Elston, Burnham, both of England, assignors to Transequip Limited, Middlesex, Great Britain

Filed Nov. 13, 1980, Ser. No. 206,550  
Claims priority, application United Kingdom, Nov. 22, 1979, 7940377; Jan. 24, 1980, 8002437  
Int. Cl.<sup>3</sup> B25G 3/02; F16D 1/00

U.S. Cl. 403-363

4 Claims



1. An article comprising two sheets and a structural element, wherein each of said sheets has an elongate portion along which it is joined to said element, that portion being shaped to have an elongate, substantially trough-shaped part substantially as long as said portion, and the structural element has for the trough-shaped part of each said sheet a respective complementarily shaped profiled part substantially as long as, and interengaged with, the trough-shaped part of the associated sheet, an intermediate portion interconnecting the profiled parts, the intermediate portion being provided with a plurality of holes, the joint including removable clamping means which, when the interengaged parts are subjected to forces acting substantially transversely thereto, take up components of said forces which act in a direction tending to disengage said parts, the clamping means including a plurality of fasteners passing through at least some of said holes, each fastener having a first closing part and a second closing part between which are situated the sheets and the structural element, the trough-shaped parts and the profiled parts being so shaped that one of the parts is snugly interengageable with the associated part such that, where the parts are in contact with each other, loads transmitted, in use, between the sheet and the element are transmitted substantially by compression, that the parts are interengageable by simple insertion (as hereinbefore defined) of one of the parts into the other, and that the clamping means are, in use, stressed substantially only in tension.

4,412,757

# VIBRATION MACHINE FOR COMPACTING MATERIALS, IN PARTICULAR AN EARTH COMPACTING MACHINE

Friedrich Kümmel, Esslingen-Sulzgries; Rudolf Hennecke, Remshalden-Buoch, Manfred Schubert, Kirchheim; Ludwig Unrath, Esslingen-Neckarhalde, all of, Fed. Rep. of Germany, Assignors to Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co., Esslingen, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,123  
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033476

Int. Cl.<sup>3</sup> E01C 19/38

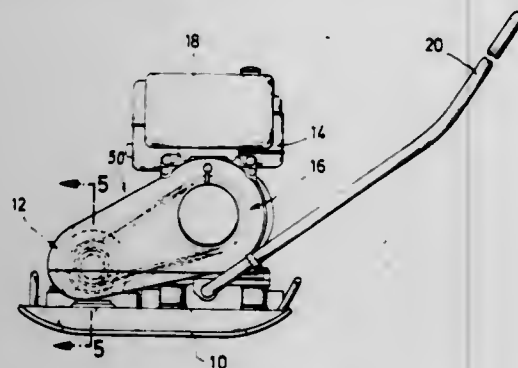
U.S. Cl. 404-113

10 Claims

10. A vibration machine for compacting materials such as earth comprising an imbalance system having first and second coaxial shafts, means mounting said shafts for independent rotary movement, a pair of unbalanced masses, first and second drive elements carried respectively by said shafts for rotation therewith, third and fourth drive elements secured respectively to said masses for rotation therewith, respective driving connections between said first and third drive elements and



between said second and fourth drive elements, a drive shaft and clutch means for selectively coupling said drive shaft to said first and second drive elements, characterized in that the unbalanced masses (46, 48) are adjacent to each other in axial direction and are disposable in at least two angular positions relative to each other in accordance with the direction of drive to achieve different total imbalances, the unbalanced mass not



coupled with the drive shaft being taken along by the other unbalanced mass in at least one of said angular positions, and that for the angular position, in which the unbalanced masses (46, 48) have the smaller angular space between them, a stop (46a) carried by the first driven unbalanced mass for rotation therewith taking along the second unbalanced mass (48), this stop being disposed such that the first unbalanced mass (46) is ahead of the second unbalanced mass (48).

4,412,758

## HYDRAULIC CONTROL MEANS

Herbert Heitkamp, Werne, and Walter Hohn, Selm-Borke, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Lunen, Fed. Rep. of Germany

Filed May 19, 1981, Ser. No. 265,206

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019290

Int. Cl.<sup>3</sup> E21D 9/06; F15B 11/08

U.S. Cl. 405—145

9 Claims



1. Hydraulic control means for controlling the advance rams of a tunnelling knife shield of the type having a plurality of knives positioned side-by-side on a support frame, the rams being positioned between the knives and the support frame, and each ram having first and second working chambers pressurized of which is effective to extend and retract that ram, the hydraulic control means comprising respective first supply lines for supplying pressurized hydraulic fluid to the first working chambers, respective second supply lines for supplying pressurized hydraulic fluid to the second working chambers, and respective discharge lines for discharging hydraulic fluid

from the first working chambers, wherein each discharge line is provided with a flow-regulation valve for controlling the retraction rate of the associated ram, and wherein each discharge line is provided with a pilot-operated check valve, the pilot line of which is connected to the second working chamber of the associated ram so that said check valve opens automatically when said second working chamber is supplied with pressurized hydraulic fluid, each of the check valves being disposed between the associated flow-regulation valve and the associated first working chamber.

4,412,759

## REACH ROD GROUTING SYSTEM

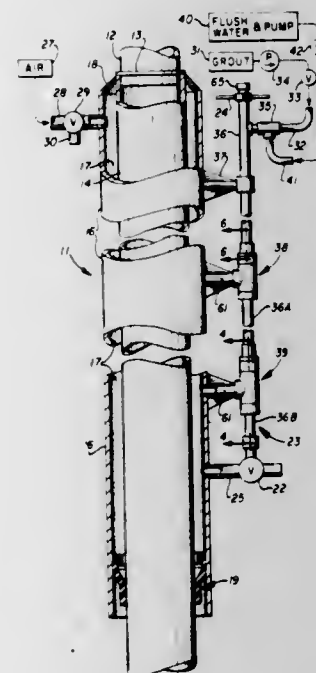
Frederick G. Britton, Bedford, and Don B. Landers, Arlington, both of Tex., assignors to Oil States Industries, Inc., Arlington, Tex.

Continuation-in-part of Ser. No. 904,747, May 11, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 161,734

Int. Cl.<sup>3</sup> E02B 17/02; E02D 21/00

U.S. Cl. 405—225

36 Claims



1. In an offshore marine pile and pile guide structure, generally in an upright orientation when installed in place, with piling driven into a bed at the bottom and on above water platform at the top: a pile guide sleeve adapted to receive a pile driven therethrough with an annulus formed between the sleeve and its pile; seal means set in place low in the annulus; flood valve means connected through fluid passage means to the interior of said annulus above said seal means; a reach rod structure including hollow piping, generally in upright orientation, having upper and lower ends, with the piping lower end connected to said flood valve means for controlled actuation of said flood valve means between open and closed valve positions; a grout supply system including grout feed line means connected to said annulus; wherein hollow piping of said reach rod structure is a part of said grout feed line means; said grout feed line means includes grout passage means interconnecting said reach rod structure hollow piping and said annulus; said grout passage means includes said flood valve means and said fluid passage means; and wherein said flood valve means is a three way valve that has open and close positions to flood water and a third position to feed grout through the flood valve and said fluid passage means to said annulus.

4,412,760

## METHOD FOR PRODUCING A STRUCTURE HAVING COHESION BY MEANS OF A MATERIAL COMPRISING NON-COHERENT SOLID PARTICLES

Henri Vidal, 8 bis Boulevard Maillot, 92200 Neuilly sur Seine, France

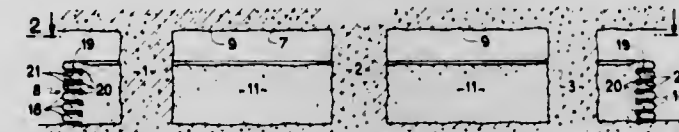
Filed Feb. 11, 1981, Ser. No. 233,458

Claims priority, application South Africa, Feb. 13, 1980, 80/0816

Int. Cl.<sup>3</sup> E02D 27/00, 29/02

U.S. Cl. 405—267

23 Claims



1. A method for consolidating at least one pillar of ground against collapse, said method comprising the steps of constructing around and in spaced relation to said at least one pillar a continuous wall of superimposed cladding elements having integral reinforcing means extending from said cladding elements toward said at least one pillar in a plurality of substantially horizontal vertically spaced-apart planes, filling the space between said wall and said at least one pillar with material including substantially non-coherent solid particles to frictionally contact said reinforcing means and constitute a frictionally stabilized structure that immediately protects said at least one pillar, said material including additional means which when mixed with said particles cause said material to set and become a cohesive structure, the time required for the setting of said material and the quality of said particles and said additional means of said material are not critical for the desired consolidation of said at least one pillar.

4,412,761

## SELF-REGULATING AIR INLET

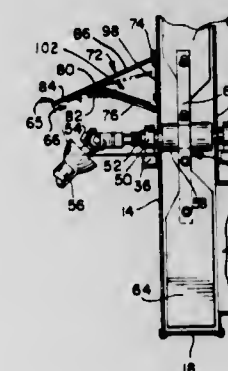
Robert Sorensen, Glen Ellyn; Edward A. Barrett, Glendale Heights, and Thomas J. Scarnato, Barrington, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Sep. 8, 1981, Ser. No. 299,903

Int. Cl.<sup>3</sup> B65G 53/58

U.S. Cl. 406—98

10 Claims



1. A self-regulating air inlet assembly in a material handling apparatus for conveyance of the material comprising: said apparatus having a housing with a material feed inlet, discharge conduit and a rotatable central member conveying the material from said feed inlet into said discharge conduit; an air conducting means connected with said apparatus; said air conducting means facilitating the entry of a secondary air flow supplementing principal air flow entering said apparatus through said material feed inlet; said air conducting means having a movable door displaceable by pressure differential between the housing outside

and inside pressures created by the reduction of the air pressure inside of said housing; and said secondary air flow automatically compensating a continuously varying air need caused by intermittent material feeding affecting supply of said principal air flow.

4,412,762

## PNEUMATIC UNLOADING OF PARTICULATES

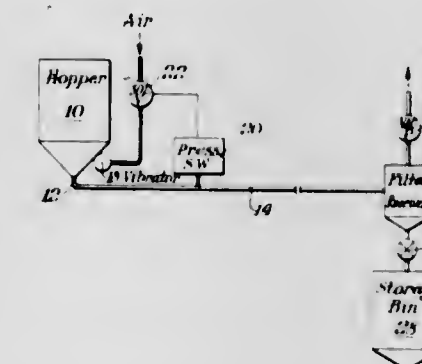
Richard H. Lepley, Easton, and Thomas A. Happel, Nazareth, both of Pa., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,301

Int. Cl.<sup>3</sup> B65G 53/50

U.S. Cl. 406—134

6 Claims



1. Apparatus for pneumatically unloading substantially dry particulate material from a storage hopper through a discharge line, which comprises: impact vibration means for contacting said hopper adjacent the discharge outlet thereof; means for creating a pressure differential between said hopper and a point in said line downstream of said outlet; and means for activating said vibration means when said pressure differential is at a first set value and deactivating said vibration means when said pressure differential is at a second set value, whereby a substantially continuous flow of said material thru said line is maintained.

4,412,763

## DRILL WITH SINGLE CUTTER

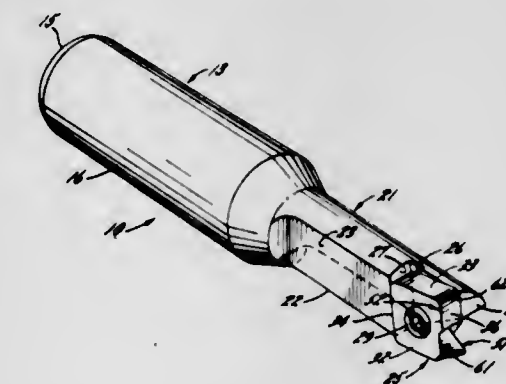
Fred T. Shallenberger, Jr., Caledonia, Ill., assignor to Metal Cutting Tools, Inc., Rockford, Ill.

Filed Jan. 21, 1981, Ser. No. 266,734

Int. Cl.<sup>3</sup> B23B 27/16

U.S. Cl. 408—224

7 Claims



1. A drill for drilling a substantially cylindrical hole of predetermined diameter in a workpiece, said drill having an elongated body adapted to be rotated in a predetermined direction about a predetermined axis coinciding with the axis of the hole, said body having a shank end and a tip end, a single drilling cutter on the tip end portion of said body, said cutter being defined by a single and substantially flat wafer of cutting material in the shape of a substantially equilateral polygon, means







a rear bumper;  
a frame carrying said rear bumper thereon, said frame being adapted for attachment to the truck to mount said bumper thereon in the customary rear bumper position;  
means for connecting said bumper with said frame in a manner permitting the bumper to pivot about a generally horizontal axis between a normal position and a bale carrying position, said bumper being constructed to function in the manner of a customary rear truck bumper in the normal position;  
power means for readily effecting pivotal movement of said bumper between the normal and bale carrying positions; said power means and said frame being located beneath a load bed of the truck in a noninterfering position to permit free access to the load bed;  
a pair of spears each having a sharp tip for piercing a hay bale; and  
means for removably connecting said spears with said bumper at spaced apart locations to project generally horizontally therefrom to the rear in the normal position of the bumper for impaling the bale, said spears extending generally vertically above the bumper in the bale carrying position,  
whereby the truck can be backed toward the bale with said bumper in the normal position to drive said spears into the bale and said power means can be operated to move the bumper to the bale carrying position to raise the bale for transport.

4,412,769

#### APPARATUS FOR CENTERING ALIGNMENT OF PLANAR WORKPIECES

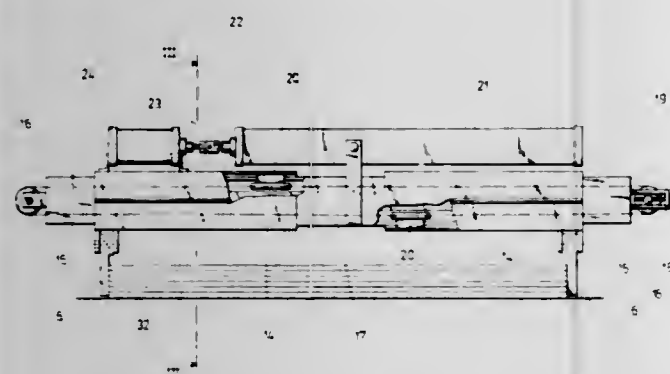
Horst Kollmann, Dornbirn, Austria, assignor to Firma Schelling & Co., Schwarzach, Austria

Filed Mar. 27, 1981, Ser. No. 248,481

Claims priority, application Austria, Mar. 28, 1980, 1711/80  
Int. Cl. B65H 31/38

U.S. Cl. 414—36

7 Claims



1. Apparatus for alignment of planar workpieces on a support table comprising: pivotable stop members adapted to engage said workpieces along the edges thereof; a beam extending in length over at least the dimension of the largest workpiece to be aligned; supports mounted on said beam for movement in the longitudinal direction thereof, each of said supports having mounted thereon at least one of said pivotable stop members; endless cable means circumambulating said beam and having said supports attached thereto; and piston-cylinder means having at least one of said supports connected thereto, the action of said piston-cylinder means being directed in the longitudinal direction of said beam; wherein said beam is in the form of an I-beam having a horizontal web and flanges, wherein there is provided in the plane of said web on the outer side of said flanges profiled battens operating as tracks for rollers arranged on said supports and wherein in the central area on both sides of said web there are arranged battens with longitudinal grooves serving as guide tracks for said endless cable means.

4,412,770

#### CHARGING OF COKE OVENS AND METHOD

Manfred Galow, Essen, and Nikolaus Stefancik, Düsseldorf, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

Continuation of Ser. No. 142,143, Apr. 14, 1980, abandoned.

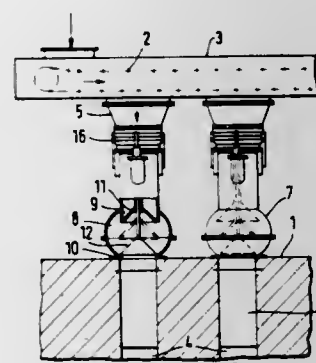
This application Mar. 1, 1982, Ser. No. 353,587

Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2918005

Int. Cl. C10B 31/04

U.S. Cl. 414—162

15 Claims



1. Apparatus for charging particulate coal into charging holes in the ceiling of a coke oven from a conveyor above the ceiling and through passages formed by depending funnels having their lower ends connected to charging tubes, comprising first means for compensating stresses acting between the conveyor and the coke oven ceiling, said first means being a compensator interposed between the funnel and charging tube of a respective passage; second means in said passages for selectively permitting and blocking the flow of coal to the charging holes; third means also in said passages for blocking the escape of gases from the charging holes, said second and third means comprising respective closure elements each having a surface which faces away from, and also tapers in direction away from, the respective charging hole, said closure elements of said second means being mounted in the vicinity of the lower ends of the funnels, said charging tubes each having an upper cylindrical part communicating with the lower end of the funnel, and a plurality of lower tubular chute parts connected to a lower end portion of said cylindrical part and merging with each other in the vicinity of said lower portion; and a diverter flap movable between a plurality of diverting positions in which it diverts coal from the funnel to different ones of said lower chute parts.

11. A method of charging particulate coal into charging holes in the ceiling of a coke oven from a conveyor above the ceiling and through passages formed by depending channels connected to charging tubes through which particulate coal flows in a predetermined direction and extending from the conveyor to the charging holes and each having a stress compensating element, a coal-flow controlling element and a gas outflow-controlling element therein, and wherein each charging tube has an upper cylindrical part communicating with the lower end of the funnel, and a plurality of lower tubular chute parts connected to a lower end portion of the cylindrical part and merging with each other in the vicinity of the lower portion, the method comprising the steps of compensating stresses acting between the conveyor and the coke oven ceiling at a location immediately downstream of the funnels in the coal flow direction; moving the respective gas outflow-controlling element, at a location downstream of the coal-flow controlling element and in immediate vicinity of the respective charging hole, to a position in which the respective charging hole is unblocked; thereupon moving the coal-flow controlling element, at a location downstream of the stress compensating element in the coal flow direction and upstream of the gas outflow-controlling element, to a position in which coal can flow from the conveyor into the charging holes; moving the coal-flow controlling element to a position in which the flow

of further coal is blocked, upon completion of the charging; returning the gas outflow-controlling element to a position in which the charging hole is blocked to prevent the escape of raw gas from the coke oven; and moving a diverter flap between a plurality of diverting positions in which it diverts coal from the funnel to different ones of the lower chute parts; and operatively connecting the respective gas outflow-controlling elements with the flap to move between the blocking and unblocking positions in response to movement of the flap to different ones of said diverting positions.

4,412,771

#### SAMPLE TRANSPORT SYSTEM

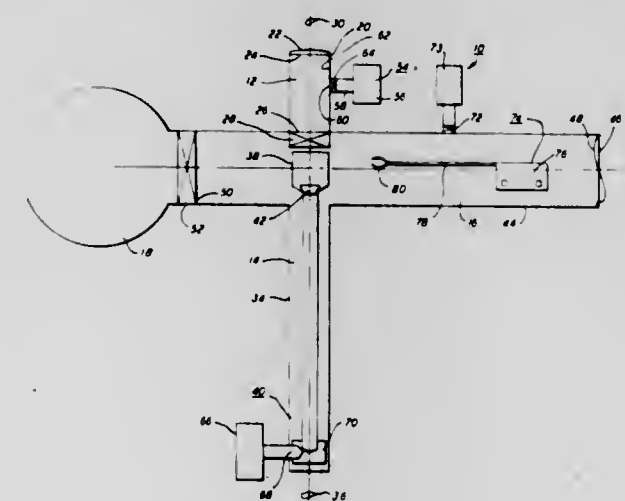
Robert L. Gerlach, Minnetonka; David D. Selbel, Lakeville, and Mark C. Miller, Chanhassen, all of Minn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 30, 1981, Ser. No. 288,439

Int. Cl. B65G 51/02

U.S. Cl. 414—217

19 Claims



1. A transport system useful for introducing and conveying a plurality of workpieces within an ultra-high vacuum apparatus, said system comprising:  
means for retaining a plurality of workpieces in a stacked spaced relationship;  
means for selectively positioning said retaining means within said apparatus;  
means for conveying a selected workpiece from said retaining means to a processing chamber; and  
means for interlocking said retaining means and said positioning means; said interlocking means including a platform assembly having a surface upon which said retaining means can be positioned;  
said interlocking means further including at least one pawl which, when said retaining means is positioned on said assembly surface, extends into a recess in the bottom of said retaining means and which, when said assembly is urged toward said retaining means, grasps an internally extending shelf within said recess.

4,412,772

#### SHIFTABLE ARTICLE STORAGE DEVICE

Han-Ichiro Naito, Akishima; Tsuneo Yamaguchi, Tokyo, and Kiyoshi Harashima, Ome, all of Japan, assignors to Elecompac Company, Ltd., Tokyo, Japan

Division of Ser. No. 124,726, Mar. 16, 1971. This application Feb. 17, 1981, Ser. No. 234,949

Claims priority, application Japan, Mar. 17, 1970, 45-22501; Jun. 29, 1970, 45-56748; Jul. 14, 1970, 45-61662; Dec. 28, 1970, 45-125408

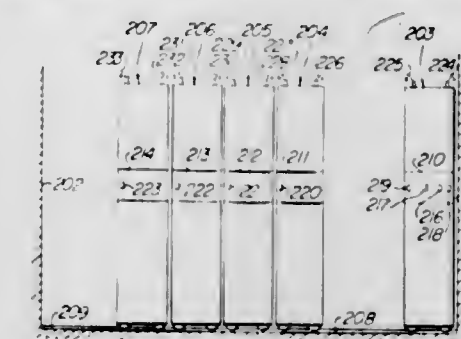
Int. Cl. A47B 53/00; A47F 3/08; B65G 1/00

U.S. Cl. 414—331

13 Claims

1. A shiftable article storage device comprising a plurality of article storage units each movably arranged on a floor and disposed to be put together with no space left between adja-

cent storage units when access to them is not desired, while a selected one of them is shifted to create an aisle between itself and the adjacent storage unit when access to said selected one or ones of said storage units is desired; wherein each of said



4,412,773

#### CONTROL APPARATUS AND METHOD FOR DUMPING TOBACCO

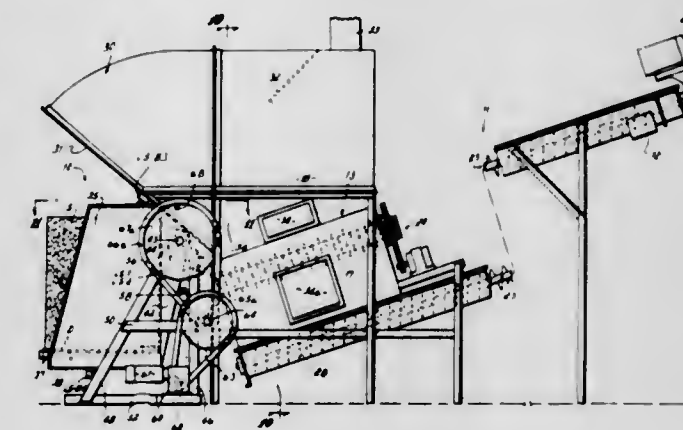
Edwin Wilding, Louisville, and James W. DeVere, Jefferson-town, both of Ky., assignors to Griffin & Company, Inc., Louisville, Ky.

Division of Ser. No. 61,748, Jul. 30, 1979, Pat. No. 4,348,148.  
This application Apr. 15, 1982, Ser. No. 368,674

Int. Cl. B65B 21/02

U.S. Cl. 414—403

2 Claims



1. Control apparatus for a dumper having drive means to move it between a first position and a second dump position, a movable element connected to and moving with said dumper and a movable brake element having brake drive means for selectively operatively engaging said brake element with said movable element to hold said dumper in said second position, said control apparatus comprising:

means for operating said drive means to move said dumper to said second position,  
means for operating said brake drive means for causing said brake element to engage and to hold said movable element in response to said dumper arriving at its second position,  
timer means operating responsive to a control input for moving said dumper from its second to its first position,  
means for operating said brake drive means to withdraw said brake element from said movable element in response to said control input, and  
means responsive to the operation of said timer means and to the withdrawal of said brake element for moving said dumper from its second to its first position.



4,412,774

## APPARATUS FOR THE INSTALLATION OF A JET ENGINE IN AN AIRCRAFT COMPARTMENT

Paul J. Legrand, Vaux le Penil; Andre R. Notheaux, Palaiseau; Guy R. Pachomoff, Corbeil-Essonnes, and Alexis M. G. Romanoff, Cesson, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.-M.A.", France

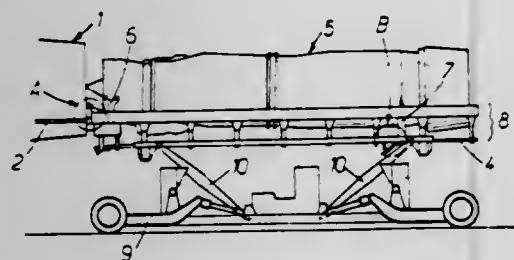
Filed Mar. 16, 1981, Ser. No. 244,311

Claims priority, application France, Mar. 19, 1980, 80 06102

Int. Cl.<sup>3</sup> B66F 19/00

U.S. Cl. 414—589

14 Claims



1. Apparatus for the installation of a jet engine having a casing in an aircraft compartment comprising: a plurality of longitudinal guide rails in said compartment capable of cooperating with a plurality of runners supporting said engine, said apparatus being characterized by that it comprises at least means for the displacement and placing of the engine including at least two lateral guide rails (3) and a median, lower guide rail (4); a foldable and removable front cradle (6) carrying at least two roller elements (20), capable of being attached to the front of the engine casing, the two roller elements cooperating with the two lateral guide rails (3) and the longitudinal guide rails (2) mounted inside the compartment; a removable rear cradle (7) equipped with a roller element (51), capable of being attached to the rear of the engine casing, said element cooperating with the lower median guide rail (4); a frame (8) to which at least the lateral guide rails are adjustably attached; means (10) for the vertical displacement of the frame (8); means for the longitudinal displacement (9) of the frame (8).

4,412,775

## VACUUM ASSISTED MACHINE FOR HANDLING ARTICLES

Edwin A. Molitor; Norman P. Crowe, both of Clermont, and Guy W. Lampe, Hamilton, all of Ohio, assignors to Multifold International, Inc., Milford, Ohio

Filed Mar. 10, 1982, Ser. No. 356,786

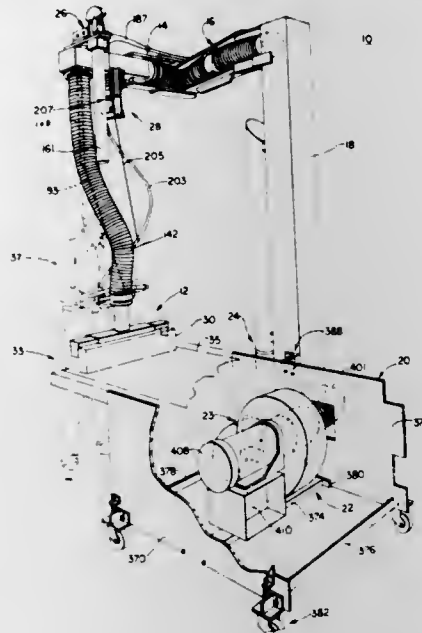
Int. Cl.<sup>3</sup> B66F 11/00

U.S. Cl. 414—626

5 Claims

1. A machine for assisting in the support of a load which comprises a suction head having a hollow interior, a conduit connected to the hollow interior, means for impressing suction on the conduit, there being a downwardly facing opening in the suction head, the opening being arranged to receive the load with the load closing the opening and the load engaging the head at the opening, cable means supporting the suction head, a pressure cylinder having a piston connected to urge the cable means upwardly to support the suction head and the load, means for supplying fluid under pressure to the pressure cylinder at two selected pressures, one selected pressure being sufficient to substantially counterbalance the weight of the load and of the suction head, the other selected pressure being a lesser pressure sufficient to substantially counterbalance the weight of the suction head, a pressure operated switch connected to the conduit and arranged to impress the first selected pressure on the pressure cylinder when the opening in the

suction head is closed by the load and there is a reduced pressure in the conduit and to impress the lesser selected pressure



4,412,776

## APPARATUS FOR OVERHAULING AND REPAIRING DOORS OF HORIZONTAL COKE-OVEN BATTERIES

Hans-Jurgen Kwasnik, Herne, and Hans-Gunter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

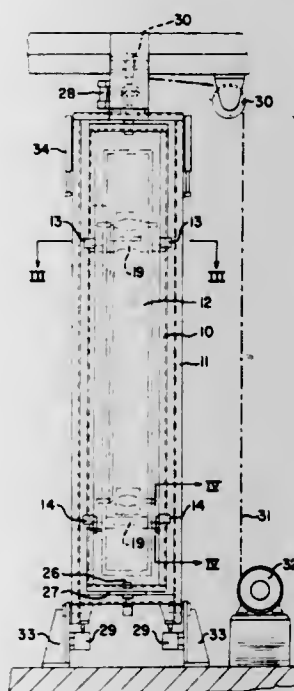
Filed Nov. 23, 1981, Ser. No. 323,975

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044848

Int. Cl.<sup>3</sup> C10B 25/14

U.S. Cl. 414—684.3

4 Claims



1. Apparatus for overhauling and repairing doors of a horizontal coke-oven battery, said doors each having first and second door-lifting beams which are separate and apart from the locking mechanisms for said doors and which extend horizontally outward from the sides of each door, said apparatus comprising, in combination: a first frame having in sides thereof first and second pairs of pocket means for receiving ends of said door-lifting beams, a second frame surrounding said first frame, pivot means connecting said first and second frames to per-

mit said first frame to swivel about its central vertical axis within said second frame, means for swiveling said second frame about a horizontal axis at the vicinity of its bottom, and clamping means associated with at least one of said pairs of pocket means for securing said ends of said door-lifting beams therein.

4,412,777

## DEVICE FOR A FELLING AND GRIPPING UNIT

Erik T. Forslund, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

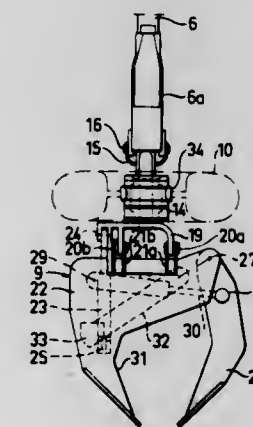
Filed Mar. 25, 1981, Ser. No. 247,244

Claims priority, application Sweden, Apr. 2, 1980, 8002548

Int. Cl.<sup>3</sup> A01G 23/08; E02F 3/32

U.S. Cl. 414—694

6 Claims



1. Apparatus for suspending a tree felling and gripping unit on a jib, said unit having a frame, said apparatus comprising: a rotator between the jib and a felling and gripping unit for rotation of said unit relative to the jib, said rotator having a stationary portion and an inner portion rotatable about an axis, said rotatable portion having a lower end; a horizontal axle pivotally suspending the stationary portion of the rotator from the jib; first hydraulic means connected between the jib and the stationary portion of the rotator for swinging the rotator about said horizontal axle; a further axle extending perpendicularly to the rotation axis of the rotatable portion of the rotator and pivotally suspending the frame of said unit from the lower end of the rotatable portion of the rotator; and second hydraulic means connected between said rotatable portion of the rotator and the frame of said unit for swinging said unit about said further axle.

4,412,778

## TONG ARM ASSEMBLY

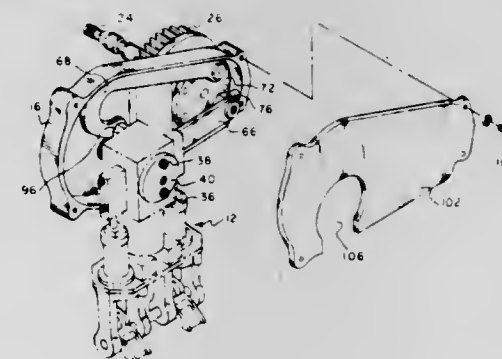
William Wenz, Millville, N.J., assignor to Jeff Company, Inc., Millville, N.J.

Filed Jul. 13, 1981, Ser. No. 282,892

Int. Cl.<sup>3</sup> B66C 23/00

U.S. Cl. 414—733

2 Claims



1. In a tong arm assembly for carrying and moving a tong head arcuately between two horizontally spaced positions

while maintaining the orientation of said tong head, said tong arm assembly including a housing; means for rotating said housing about an arm stud passing into said housing adjacent one end thereof; means including a shaft for rotatably mounting a tong head to a second end of said housing; air passage means between said stud, said housing, said shaft and said tong head, and means within said housing interconnecting said stud and said tong head so as to maintain the orientation of said tong head while the same is being arcuately moved, the improvement comprising: said interconnecting means including a first rigid lever, one end of said first lever being pivotally connected to said arm stud at a point which is a first fixed radial distance from the axis of said stud, the other end of said first lever being pivotally connected to said tong head at a point spaced from the axis of said shaft the same first fixed radial distance, the angular positions of said points with respect to their respective stud and shaft axes being the same and a second rigid lever pivotally connected to each of said arm stud and said tong head at second points which are located at second fixed radial distances from the respective axes, the angular distances between the first mentioned and second pivot points with respect to said stud axis and with respect to said shaft axis being the same, one of said levers being curved at one end thereof so as to prevent interference with the stud or shaft with which it is associated.

4,412,779

## CONTROL METHOD FOR MULTI-STAGE HYDRAULIC MACHINE

Sachio Tsunoda, Yokohama, and Shinsaku Sato, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

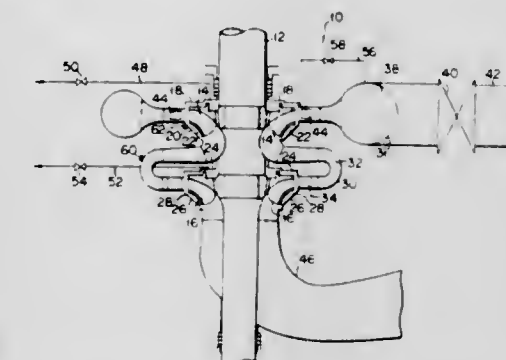
Filed Jan. 27, 1982, Ser. No. 343,215

Claims priority, application Japan, Feb. 3, 1981, 56-13799

Int. Cl.<sup>3</sup> F01D 17/00

U.S. Cl. 415—1

9 Claims



1. A control method for a multi-stage hydraulic machine which comprises a rotatable shaft; a plurality of runners fixed to said shaft and arranged from a highest-pressure stage to a lowest-pressure stage; runner chambers in which are respectively housing said runners; a return channel for connecting adjacent ones of said runner chambers with each other; movable wicket gates provided at least in said highest-pressure stage and capable of moving between a position in which said movable wicket gates block the channel and a position in which said movable wicket gates open the channel; and a casing connected to said highest-pressure stage, said method comprising

- a first step of causing said movable wicket gates to block the channel;
- a second step of feeding air to said runner chamber of the highest-pressure stage to lower a water level in the channel below said runner chamber of the lowest-pressure stage;
- a third step of operating upon said machine for idling said shaft in a direction for the desired mode of machine operation; and
- a fourth step of shifting a mode of operation of said shaft to a turbine generating or pumping operation,



said fourth step including

a first process of feeding highly pressurized water in said casing through a feed water pipe to an outer circumferential portion of said runner chamber of the highest-pressure stage defined inside of said movable wicket gates when said movable wicket gates are completely closed, whereby said runner chamber of the highest-pressure stage is sequentially filled with water from the outer circumferential portion to a middle portion thereof and consequently the air remaining therein is compressed;

a second process of feeding the water in said runner chamber of the highest-pressure stage through said return channel to the lowest-pressure stages sequentially;

a third process of initiating exhaustion of compressed air in said runner chamber of the highest-pressure stage when said return channel adjacent to said runner chamber of the highest-pressure stage is substantially filled with water;

a fourth process of stopping exhaustion of the compressed air when said runner chamber of the highest-pressure stage reaches an underwater cut-off state and simultaneously initiating exhaustion of the compressed air from said runner chamber of the adjacent lower-pressure stages sequentially;

a fifth process of stopping exhaustion of the compressed air when each runner chamber of the lower-pressure stage reaches the underwater cut-off state;

a sixth process of terminating feeding of the highly pressurized water from said casing when the water pressure in said runner chamber of the highest-pressure stage reaches a predetermined level; and

a seventh process of driving said movable wicket gates to a predetermined opening.

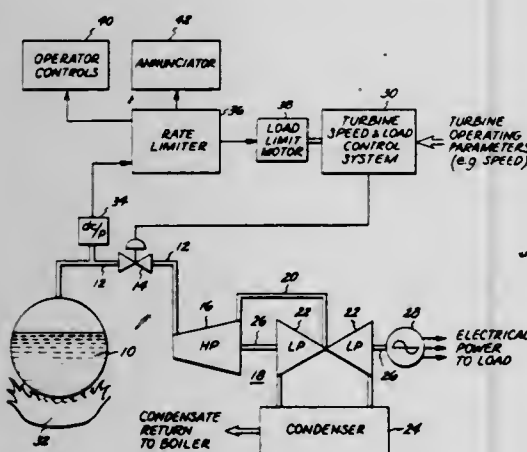
4,412,780

## RATE INITIAL PRESSURE LIMITER

David J. Collins, and James E. Van Doren, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Filed Mar. 27, 1981, Ser. No. 248,529  
Int. Cl.<sup>3</sup> F01D 17/08

U.S. Cl. 415-17

10 Claims



1. In combination with a steam turbine and a turbine speed and load control system, said steam turbine supplying power to a load and operating in a sliding pressure mode of operation wherein a steam generator supplies pressurized steam to said turbine through steam control valves which are positioned fully open during the normal sliding mode of operation, and the turbine's speed and load demand is met by causing said steam generator to increase or decrease as required by said turbine's speed and load demand, a control system for protecting the turbine against the effects of sudden changes in the steam supply pressure, comprising:

pressure sensing means providing a signal indicative of the pressure of said pressurized steam while said turbine is operating in said sliding mode;

rate sensing means providing a rate signal indicative of the time rate of change of said pressure signal;

rate limit detection means providing a correction signal whenever said rate signal exceeds a preselected rate value corresponding to said sudden change in pressure; and

means responsive to said correction signal to generate and impose a load limit value on a load limit motor connected to said turbine speed and load control system, and said speed and load control system responding to said motor by positioning said control valves in a direction to counteract said change in pressure in opposition to said valve's normal position during said sliding mode of operation while said speed and load control system substantially maintains the speed of the turbine at a preselected value.

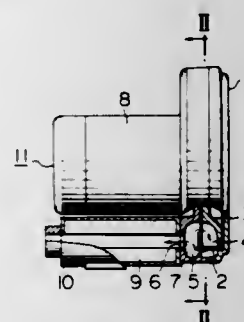
4,412,781

## VORTEX BLOWER

Masahiro Abe, Chiba, and Masayuki Fujio, Yachio, both of Japan, assignors to Hitachi Ltd., Tokyo, Japan  
Filed Jul. 21, 1981, Ser. No. 285,554  
Claims priority, application Japan, Jul. 21, 1980, 55-98755  
Int. Cl.<sup>3</sup> F04D 29/66

U.S. Cl. 415-53 R

14 Claims



1. A vortex blower comprising:

a casing;

an annular air passageway defined in said casing;

an impeller means mounted for rotation in said casing;

a partition wall means extending into said annular air passageway in a direction of said impeller to arcuately partition said annular passageway;

a suction port and a discharge port respectively disposed on a suction side and a discharge side of said partition wall means, said suction port and discharge port being in communication with each other through said annular air passageway;

an extension wall formed by extending at least one wall surface of said partition wall means along a surface of rotation said impeller, said extension wall tapering in a direction extending outwardly from the partition wall means; and

at least one projecting wall extending into the annular passageway is connected to said at least one wall surface of said partition wall means and connected to an inner wall surface of the air passageway in a vicinity of said partition wall means.

4,412,782

## FULL HOOP BLEED MANIFOLDS FOR LONGITUDINALLY SPLIT COMPRESSOR CASES

William G. Monsarrat, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.  
Filed Mar. 28, 1979, Ser. No. 24,635  
Int. Cl.<sup>3</sup> F01D 5/08, 5/18, 11/00, 25/08

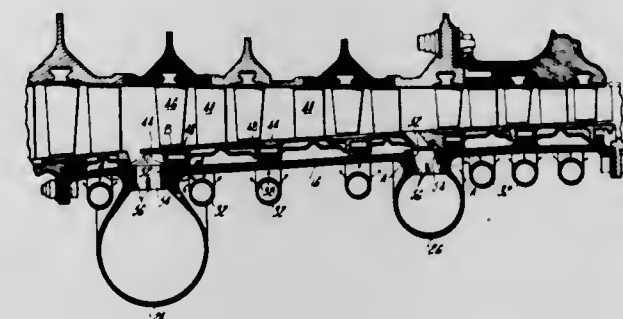
U.S. Cl. 415-175

4 Claims

1. In an axial flow gas turbine engine of the type having rotor and stator elements and wherein the stator element includes a longitudinally split compressor case, the improvement comprising:

a compressor case having an integrally formed manifold of circular cross section extending circumferentially about

the exterior of the case and across the longitudinal split in the case and having a plurality of circumferentially spaced ports extending into the manifold from the interior of the case; and



means for thermally controlling the diameter of the case including apparatus capable of discharging cooling air against the case beneath the circular cross section manifold.

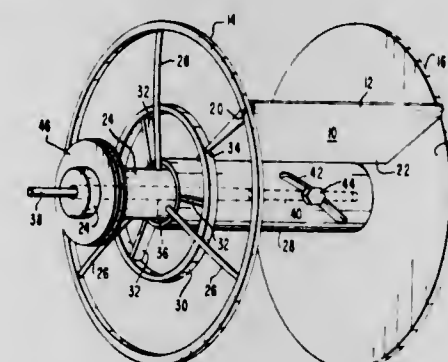
4,412,783

## CENTRIFUGAL FAN WHEEL WITH CHANGEABLE PITCH BLADES

John W. Barlass, Janesville, Wis., assignor to Thermo King Corporation, Minneapolis, Minn.  
Filed Oct. 8, 1981, Ser. No. 309,860  
Int. Cl.<sup>3</sup> F01D 5/22

U.S. Cl. 416-186 A

4 Claims



1. In an air-moving centrifugal fan wheel having an air inlet area including a drive shaft, opposed wheel end means including outer peripheral ring means, as related to said shaft; and connected to the shaft for driving movement, and a series of fan blades spaced around the wheel, each of said blades having opposite ends, a radially outer edge and a radially inner edge portion, an arrangement for varying the pitch of the blades comprising:

means securing said opposite ends of said radially outer edges of said blades to said outer peripheral ring means;

an outer tube encompassing said drive shaft in rotatable relation therewith;

openwork grid means fixedly connected to said outer tube for rotation therewith and having an outer peripheral portion engaging said radially inner portions of said blades for shifting said inner portions in one or another circumferential direction to vary the pitch of said blades in accordance with rotation of said outer tube relative to said drive shaft; and

means for changing the rotative relationship of said outer tube and said drive shaft to accordingly change the pitch of said blades.

1036 O.G.—6

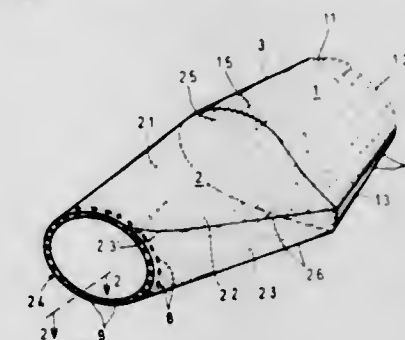
4,412,784

## MONOCOQUE TYPE ROTOR BLADE

Peter-Martin Wackerle, and Michael Hahn, both of Ottobrunn, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany  
Filed Jan. 26, 1982, Ser. No. 342,907  
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103710

Int. Cl.<sup>3</sup> B64C 27/46, 27/48, 11/26  
U.S. Cl. 416-230

9 Claims



1. A rotor blade constructed as a shell or monocoque, comprising a root section (2) and a wing section (1) having a wing tip and a wing end (1.5) with a given cross-section connected to said root section (2), each of said sections (1, 2) having a leading edge zone (1.1; 2.1), a trailing edge zone (1.3; 2.3) and two intermediate zones (1.2; 2.2) connecting the leading and trailing edge zones, said intermediate connecting zones (1.2; 2.2) comprising reinforcing fibers extending in a cross-over relationship relative to one another, said leading and trailing edge zones each comprising reinforcing fibers extending unidirectionally and substantially in parallel to one another in each respective leading edge and trailing edge zone, said root section (2) having a connecting end (2.4) of substantially circular or elliptical cross-section for securing the rotor blade to a rotor hub, and a radially outer end (2.5) connected to said wing end (1.5) and having a cross-section corresponding to said given cross-section, said trailing edge zone (2.3) of said root section having curved extensions (2.3') at said connecting end (2.4), said curved extensions (2.3') reaching substantially toward said leading edge zone (2.1) of said root section (2) at said connecting end (2.4), whereby said intermediate zones (2.2) of the root section (2) form gussets between the leading edge zone and the trailing edge zone.

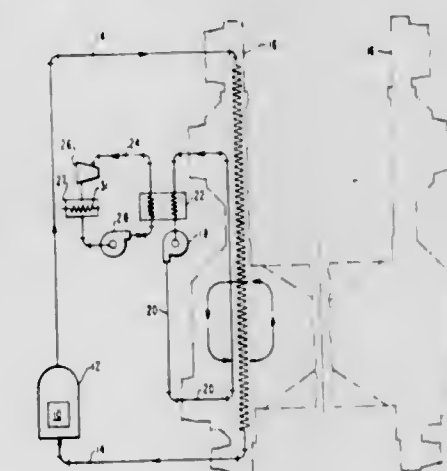
4,412,785

## PUMPING APPARATUS

Walter G. Roman, Belleair Bluffs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Mar. 19, 1981, Ser. No. 245,490  
Int. Cl.<sup>3</sup> F04B 19/00

U.S. Cl. 417-50

5 Claims



1. Apparatus for pumping plural conductive fluids, comprising:



a generally cylindrical inner shell;  
 a generally cylindrical outer shell concentrically spaced about said inner shell so as to form an annular region therebetween;  
 a plurality of tube sets, each said tube set including a plurality of tubes positioned radially between said inner shell and said outer shell, with a flow space between each said tube set and its adjacent tube set, each said tube having an inlet and an outlet;  
 a pole positioned inside of said inner shell;  
 a pole piece positioned outside of said inner shell;  
 excitation windings positioned inside of said inner shell;  
 a permanent magnetic material positioned inside of said inner shell for creating a magnetic flux path radially across a portion of said annular region;  
 means for pumping a first conductive fluid through said flow spaces between said tube sets; and  
 means for flowing a second conductive fluid to said tube inlets;  
 whereby as a result of the interaction among said first pumped conductive fluid, said flux path, and said second conductive fluid, said second fluid is pumped through said tubes and said conducting means.

4,412,786

## POSITIVE DISPLACEMENT PUMP

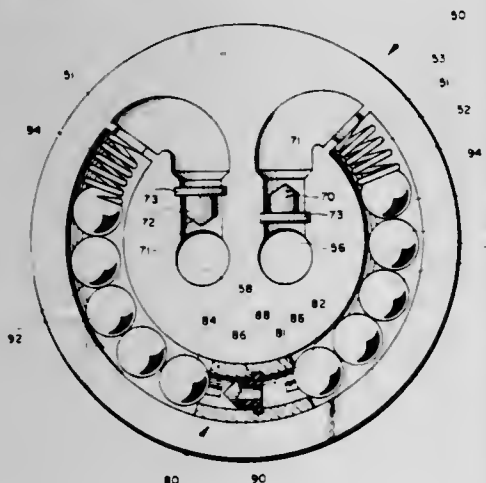
John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008

Filed Nov. 12, 1981, Ser. No. 320,456

Int. Cl.<sup>3</sup> F04F 7/00

U.S. Cl. 417—241

1 Claim



1. A positive displacement fluid pump actuated by a clockwise, counterclockwise rotary motion comprising:  
 a housing, said housing forming fluid inlet and fluid outlet means;  
 an annular channel, circular in cross section, formed by said housing, a first end of said annular channel is in fluid communication with said inlet, a second end of said annular channel is in fluid communication with said fluid outlet means formed in said housing;  
 a first one-way valve means, positioned in said channel between said fluid inlet means in said housing and said first end of said channel;  
 a second one-way valve means positioned in said channel between said fluid outlet means in said housing and said second end of said channel;  
 a first free-moving piston weight mass positioned about halfway between said first and second ends of said channel, said piston forming a passageway therethrough, a third one-way valve means being retained within said passageway by said piston means;  
 a source of fluid connected to said fluid inlet, and  
 a source of rotary oscillatory energy adjacent said housing, said rotary oscillatory motion rotates said housing clockwise and counterclockwise at varying rates of oscillation, as said positive displacement piston weight mass moves away from said first inlet end of said annular channel, fluid is drawn

through said first one-way valve means into an expanded area behind said piston, as said piston reverses direction, said fluid passes through the third one-way valve within said piston into a chamber adjacent said second end of said annular channel, as said piston again reverses direction, the third valve closes in the piston and fluid is forced out past said second one-way valve nearest said outlet end of said housing, thereby pumping fluid through said positive displacement pump.

4,412,787

## SWASH-PLATE TYPE COMPRESSOR HAVING AN IMPROVED LUBRICANT OIL FEEDING ARRANGEMENT

Hiroshi Kondo, and Tsunenori Shibuya, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Saitama, Japan

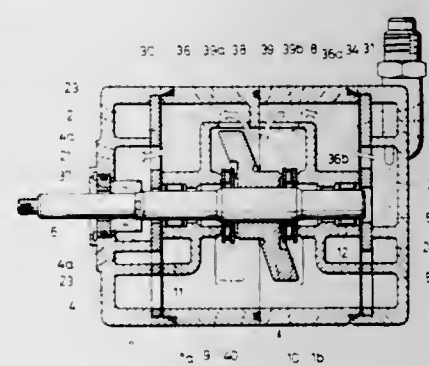
Filed Sep. 28, 1981, Ser. No. 306,249

Claims priority, application Japan, Oct. 6, 1980, 55-139601

Int. Cl.<sup>3</sup> F04B 1/16, 1/18

U.S. Cl. 417—269

12 Claims



1. In a swash-plate type compressor of the type having a pair of cylindrical members joined together in axial alignment and forming a cylinder block; a pair of cylinder heads secured to opposite ends of said cylinder block, said cylinder heads having first and second low pressure chambers defined therein, respectively, said first low pressure chamber having a refrigerant gas suction port opening therein; a pair of valve plates interposed between said cylinder block and said cylinder heads; means defining a suction passageway extending through said cylinder block and said valve plates at a radially outer location in said cylinder block for guiding suction refrigerant gas from said first low pressure chamber to said second low pressure chamber; and means defining a swash plate chamber at a substantially central location in said cylinder block, said swash plate chamber accommodating a swash plate secured on a drive shaft and engaging pistons slidably received within cylinder bores of said cylinder block for causing reciprocating motions of said pistons; said suction passageway defining means and said swash plate chamber defining means including a partition wall partitioning said suction passageway from said swash plate chamber, the improvement comprising a refrigerant gas deflecting wall provided across said suction passageway and radially extending, said deflecting wall being located on substantially the same plane with the axial center of said swash plate chamber, said deflecting wall extending substantially at right angles to the direction of flow of refrigerant gas travelling in said suction passageway to divide said suction passageway into an upstream side and a downstream side; said partition wall having an axially extending portion and a radially extending portion, said axially extending portion of said partition wall being formed with an opening communicating said suction passageway with said swash plate chamber; said opening being divided into an upstream side and a downstream side with respect to said deflecting wall, said upstream side and said downstream side of said opening being located on the same axial plane; said refrigerant gas deflecting wall and said partition wall being in a positional relationship such that refrigerant gas travelling in said suction passageway is guided toward said refrigerant gas deflecting wall along said radially

extending portion of said partition wall and deflected by said refrigerant gas deflecting wall at said upstream side of said suction passageway, hence guided through said opening in said partition wall into a substantially axially central zone in said swash plate chamber, and thereafter delivered from said swash plate chamber into said downstream side of said suction passageway through said opening in said partition wall.

4,412,788

## CONTROL SYSTEM FOR SCREW COMPRESSOR

David N. Shaw, Unionville, Conn., and David J. First, Carlisle, Mass., assignors to Durham-Bush, Inc., West Hartford, Conn.

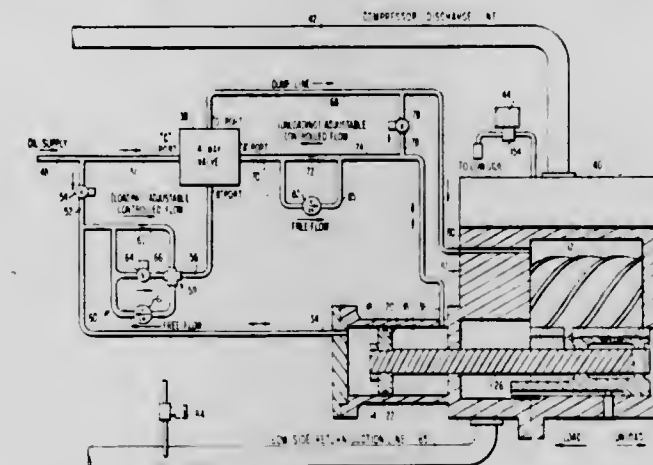
Filed Apr. 20, 1981, Ser. No. 255,410

The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> F04B 49/02

U.S. Cl. 417—280

22 Claims



1. In a screw compressor system including a helical screw compressor having a compressor section including intermeshed screw rotors, a motor for driving said rotors, a compressible working fluid output line and an inlet line for said compressor, a slide valve movable relative to said compressor rotors for varying the capacity of said compressor and a hydraulic piston and cylinder assembly, a source of hydraulic fluid, said piston dividing said cylinder into an inboard and an outboard section and being coupled to said slide valve, the improvement comprising:

valve means connected to said cylinder assembly for controlling hydraulic pressure application to said piston;  
 means for sensing the working fluid pressure in said compressor inlet line;  
 means for sensing loading of said motor;  
 a control circuit responsive to both said means for sensing pressure and said means for sensing motor loading to selectively pulse said valve means to thereby move said piston and vary the capacity of said compressor; and  
 a time delay circuit associated with said control circuit, an unload solenoid interposed between said source of hydraulic fluid and the outboard section of said cylinder, said time delay circuit actuated upon initiation of power to said motor to provide an output signal of limited time duration to said unload solenoid for supplying hydraulic fluid to said outboard section while bypassing said valve to drive said piston in a first direction and unload said compressor section.

4,412,789

## OIL PUMP UNIT

Takeshi Ohe, and Hiroshi Ohsaki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,762

Claims priority, application Japan, Oct. 31, 1980, 55-154470; Jan. 24, 1981, 56-9457

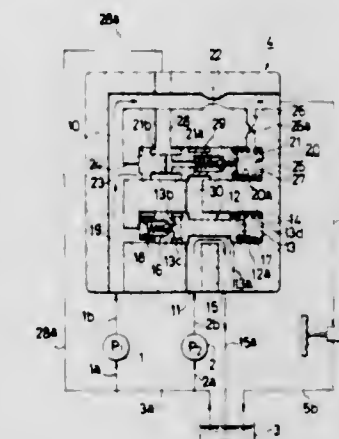
Int. Cl.<sup>3</sup> F04B 49/08

U.S. Cl. 417—288

10 Claims

1. An oil pump unit comprising a first and a second pump for separately discharging a hydraulic fluid, a main passage for

supplying the hydraulic fluid from the first pump to a hydraulic apparatus, a first switching valve normally connecting the second pump with a tank, the first switching valve being responsive to an increased load on the hydraulic apparatus to disconnect the second pump from the tank to connect the second pump with the main passage through a one way valve,



and a second switching valve operative whenever a flow of the hydraulic fluid from the main passage exceeds a given value to vent part of the hydraulic fluid to the tank from the main passage and operative to connect the second pump with the tank if the first switching valve is operated under this condition.

4,412,790

## BALANCED SUPPLEMENTAL WATER BLEED FOR SUCTION DREDGERS

Thomas J. Ruyter, Schagen, Netherlands, assignor to Ballast-Nedam Groep N.V. and Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V., both of Amsterdam, Netherlands

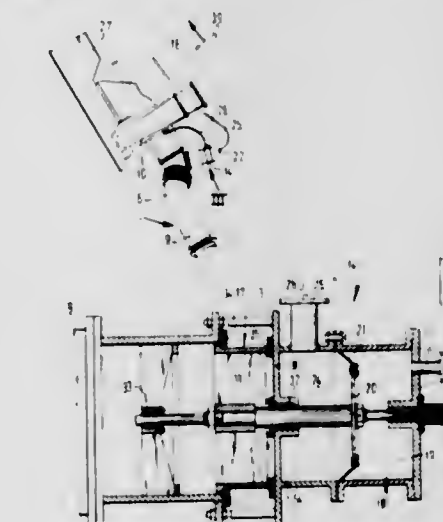
Continuation of Ser. No. 83,284, Oct. 10, 1979, abandoned. This application Oct. 13, 1981, Ser. No. 310,749

Claims priority, application European Pat. Off., Nov. 3, 1978, 78200287.7

Int. Cl.<sup>3</sup> F04B 49/10

U.S. Cl. 417—306

4 Claims



1. In a suction dredger system including a pump having an inlet and an outlet, suction conduit means connected to said inlet for sucking up a suspension of dredging spoil in water and spoil delivery conduit means connected to said outlet for conveying said suspension from the pump, the improvement which comprises:

valve means for bleeding supplemental water into the system adjacent to the inlet of said pump when the suction pressure at said inlet deviates from a preset pressure value; and actuating means responsive to the pressure at said inlet for progressively decreasing the amount of water supplied



mented by said valve means as the pressure at said inlet increases with respect to said preset value and for progressively increasing the amount of water supplemented by said valve means as the pressure at said inlet decreases with respect to said preset value, said actuating means comprising a chamber and a movable wall dividing said chamber into first and second compartments, means for subjecting one compartment to negative pressure less than said preset value and means for subjecting the other compartment to the pressure at said inlet of the pump.

4,412,791

# REFRIGERATION COMPRESSOR APPARATUS AND METHOD OF ASSEMBLY

Mahendra Lal, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

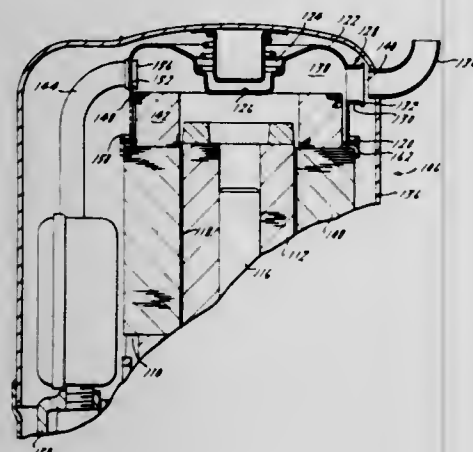
Continuation of Ser. No. 10,749, Feb. 9, 1979, abandoned, which is a continuation of Ser. No. 767,325, Feb. 19, 1977, abandoned.

This application Nov. 17, 1980, Ser. No. 207,611

Int. Cl.<sup>3</sup> F04B 35/04

U.S. Cl. 417-312

10 Claims



1. A refrigeration motor/compressor comprising:
  - a hermetic shell having a suction gas inlet;
  - compressor means within said shell;
  - an electric motor having a rotor drivingly connected to said compressor means and a stator having one axial end engaging said compressor means;
  - a shroud fastening device engaging the opposite axial end of said stator;
  - fasteners securing said shroud fastening device and said stator to said compressor means;
  - a shroud member enclosing said opposite axial end of said stator and having an inlet opening therethrough, said shroud fastening device retaining said shroud in position;
  - tubular member having one end secured to said shroud in communication with said inlet opening and the opposite end outwardly flared; and
  - at least one conduit member external of said motor for communicating suction gas from said shroud to said compressor means, whereby said tubular member and said conduit member cooperate to direct suction gas from said suction gas inlet to said compressor means across said opposite end of said motor to thereby cool said motor and attenuate the noise of said suction gas.

4,412,792

# INTENSIFIER PUMP WITH INTEGRATED CHECK VALVE

Russell G. LaBorde, Shorewood, and Gary S. Jendrzek, Milwaukee, both of Wis., assignors to The Oilgear Company, Milwaukee, Wis.

Filed Jan. 21, 1981, Ser. No. 227,168

Int. Cl.<sup>3</sup> F04B 21/00

U.S. Cl. 417-454

2 Claims

1. A check valve partially inserted in an end of an intensifier cylinder and partially in an end head for said cylinder, said

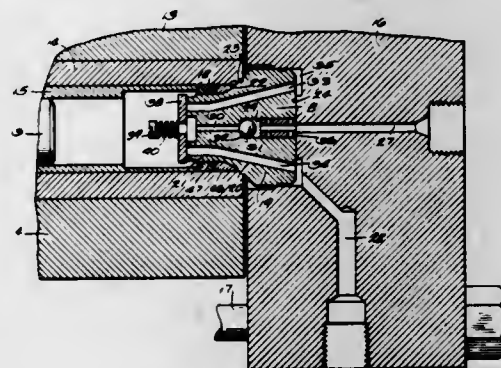
intensifier cylinder having a piston for reciprocating therein to make a pumping stroke and a suction stroke that alternately intensifies the pressure of a low viscosity fluid for passage through a coaxial discharge passage through said check valve and a supply of low pressure low viscosity fluid for passage through an inlet passage spaced laterally of said high pressure discharge passage through said check valve;

said cylinder having an end with an annular surface tapered inwardly to a bore of said cylinder;

said check valve having a small diameter portion extending within said cylinder, a large diameter portion extending out of said cylinder, and an intermediate portion having a tapered annular outer surface joining the cylindrical surfaces of said small and large diameter portions and mating with said tapered end surface of said cylinder, said small diameter portion that extends within said cylinder defines an annular space therebetween, said large diameter portion extends into a recessed bore in said end head and in abutment with a bottom of said recessed bore in said end head;

an annular member fitted in said annular space between said small diameter portion of said check valve and said cylinder and in mating abutment therewith, internal fluid pressure within said cylinder and said annular space acting axially on said annular member urging said annular member axially toward the end of said cylinder in fluid tight engagement with said check valve and said cylinder;

a valve seat located within said high pressure discharge passage intermediate the ends thereof at a point within a radial plane through an inner edge of abutment of said



tapered surfaces of said cylinder and check valve, a check member on said valve seat operates to discharge high internal pressure fluid through said coaxial discharge passage and to block discharged fluid from returning to said cylinder;

a check plate over the internal end face of said check valve, said check plate having a coaxial bore therethrough open to said discharge passage, said check plate resiliently mounted on said end face and held thereagainst by the pressure of fluid within said cylinder when it exceeds the pressure of supply fluid to block a port of said inlet passage and being displaced from said end face by the pressure of supply fluid when it exceeds the pressure within said cylinder;

bolt means axially securing said end head to said cylinder to force said end head against the check valve to axially compress said check valve and hold said mating tapered surfaces of said check valve and said cylinder against each other under compression force and a radial component of said compression force extends on and through said check valve in the radial plane of said abutting mating tapered surfaces;

the small diameter portion of said check valve is subject to the alternating high pressure within said cylinder, within said coaxial discharge passage up to said valve seat, and on the outer cylindrical surface of said small diameter portion of said check valve, whereby the radial compression forces within said cylinder of said alternating high pres-

sure offset the radial tension forces thereof in said coaxial discharge passage;

the large diameter portion of said check valve being outward of said valve seat is subject only to a constant high pressure and not to an alternating high pressure in the coaxial discharge passage and is therefore not subject to alternating stresses;

and the intermediate portion of said check valve within the radial plane of said mating tapered surfaces which radial plane includes said valve seat is a narrow radial plane through said check valve and is under a constant prestressed compression by said radial component of said axial compression forces on said tapered surfaces of said check valve and cylinder;

whereby the construction and arrangement of said cylinder and check valve minimize fatigue stresses in said check valve due to cyclic loading of high pressure in said cylinder and check valve.

4,412,793

# PUMP INCLUDING LOCKING MEANS FOR A FLEXIBLE TUBE

Kaj O. Stenberg, Staffanstorp, and Lars H. Nyström, Veberod, both of Sweden, assignors to Cambro Lundia AB, Sweden

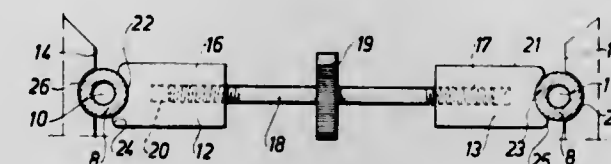
Filed Oct. 28, 1981, Ser. No. 315,924

Claims priority, application Sweden, Nov. 6, 1980, 8007803

Int. Cl.<sup>3</sup> F04B 43/12

U.S. Cl. 417-477

15 Claims



1. A pump for pumping a fluid through a flexible tube comprising a housing for at least a portion of said flexible tube, said housing including an inlet, an outlet, and means for progressively deforming said flexible tube from said inlet to said outlet for transporting said fluid therethrough, said inlet and said outlet including seat means for retaining said flexible tube, and said pump further including adjustable locking means mounted between said seat means for adjustably locking said flexible tube against said seat means, said adjustable locking means including common rod means having a first end and a second end, and a pair of slidable members mounted at said first and second ends of said common rod means, respectively, said pair of slidable members being simultaneously slidably movable towards said seat means at said inlet and said outlet, respectively, whereby said flexible tube may be adjustably retained between said slidable members and said seat means at said inlet and said outlet.

4,412,794

# ULTRA-HIGH TORQUE ACTUATORS

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jan. 30, 1981, Ser. No. 230,161

Int. Cl.<sup>3</sup> F01C 1/063

U.S. Cl. 418-61 R

9 Claims

1. An actuator comprising:
  - an output member rotatably mounted therein;
  - epicyclic transmission means, for driving said output member in response to forces input thereto;
  - rotor means, eccentrically mounted relative to the axis of rotation of said output member, and adapted to rotatably engage said transmission means; wherein said rotor includes radially projecting rectangular poles;
  - first means for producing on a specified member of said poles a force vector directed substantially perpendicular thereto;
  - reaction means for causing said rotor to move in an orbiting,

non-rotating manner relative to said output axes, wherein said rectangular poles contain material reactive to magnetic forces and wherein said rectangular poles are located equidistant from one another; and wherein said first means includes:

stator means responsive to electrical actuation signals for generating a magnetic field proximate to a predetermined number of said rectangular poles, said magnetic field



interacting with said predetermined number of poles and directed perpendicular to the radius vector from the center of said rotor means through each of said poles, said stator means including two stator poles oriented perpendicular to each of said rectangular poles, wherein each of said stator poles carries an electrical coil adapted to receive the electric actuation signal and wherein the plane of each electric coil is parallel to its respective rectangular pole.

4,412,795

# VANE TYPE FLUID MOTOR MANIFOLD

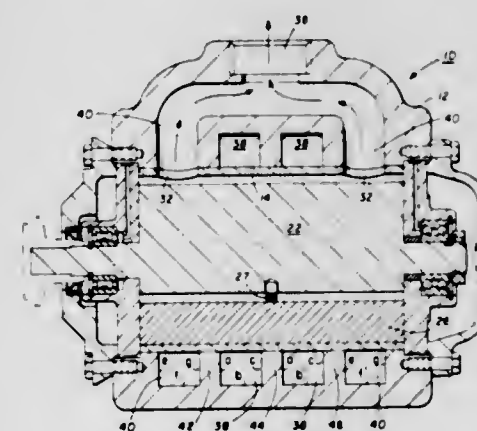
Frank Adams, Waubesa, Canada, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 4, 1980, Ser. No. 212,551

Int. Cl.<sup>3</sup> F03C 2/00, 4/00

U.S. Cl. 418-86

11 Claims



1. In a fluid motor having a housing with a bore therein, a liner within the bore, a rotor rotatably operably mounted in the housing and liner combination, the rotor being provided with a plurality of radially extending slots, and a blade mounted in each of the slots, the blades defining with the rotor and the liner a sealed chamber, inlet and outlet openings in the liner, the improvement comprising:

an inlet manifold having an inlet passageway from the exterior of the housing and communicating with two annular inlet chambers, each extending around the exterior of the liner with said chamber in communication with a liner inlet opening to pass fluid from the inlet to the interior of the liner;

an outlet manifold having an exhaust outlet passageway through the rotor housing communicating with two annu-



lar outlet chambers, each extending around the exterior of the liner with said annular outlet chamber being in communication with a liner opening to pass exhaust fluid from the interior of the liner to said exhaust outlet passageway; and

said annular inlet chambers and said annular outlet chambers each extending completely around said liner and each being defined between walls of said housing extending transverse to said liner and an internal housing surface facing said liner, wherein said walls provide for heat exchange between said liner and said housing and for heat exchange between inlet and exhaust fluids circulating through said inlet and outlet chambers.

4,412,796

## HELICAL SCREW ROTOR PROFILES

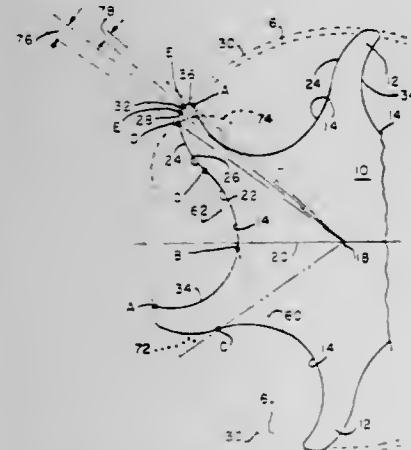
James L. Bowman, Davidson, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 25, 1981, Ser. No. 296,035

Int. Cl.<sup>3</sup> F01C 1/20, 1/16; F04C 18/20

U.S. Cl. 418—201

15 Claims



1. A rotor, having helical lands and intervening grooves rotatable about an axis for coaxing engagement within a machine housing, with a cooperating, meshing rotor, in order that fluid admitted into such housing will be received in said grooves and, due to coaxing mesh and rotation of said rotors, will have the pressure thereof altered, wherein:

each of said grooves has a leading flank and a trailing flank, relative to a given rotary direction of said rotor; and said leading and trailing flanks of said grooves of said rotor are generally concave;

said leading flank is made up of a circular arc at its root, followed by an involute intermediate portion, followed by an elliptical portion which is contiguous with an outermost tip of said rotor.

4,412,797

## APPARATUS FOR FORMING A LINER IN A CONTAINER CLOSURE

Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 99,031, Nov. 30, 1979, abandoned. This application Feb. 4, 1982, Ser. No. 345,915

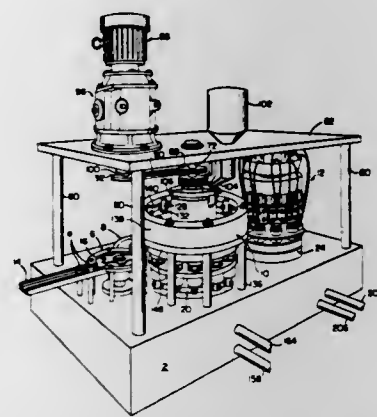
Int. Cl.<sup>3</sup> B28B 5/00; B29F 1/10

U.S. Cl. 425—114

3 Claims

1. An apparatus for forming a liner in a container closure, said apparatus comprising: a container closure conveying means for conveying closures to be lined along a predetermined path including a liner stock feeding section and a liner stock molding section further along said path from said liner stock feeding section, said conveying means including means for continuously conveying the closure along a substantially arcuate path in the liner stock feeding section; an extruder at said liner stock feeding section for extruding a liner stock in the heated and molten state and having an annular shape into a container closure conveyed to the liner stock feeding section

by said conveying means and positioning the annular liner stock in a predetermined location in the closure, said extruder including a heating means for melting the liner stock, a plurality of downwardly open annular extrusion openings arranged above the arcuate path and opening axially of the annular shape thereof, a plurality of shutoff members for changing the respective extrusion openings between a closed and an open condition, a barrel member having therein a space for heat-melting the liner stock, said barrel member being connected with said extrusion openings and said shutoff members, and means for turning said barrel member, said extrusion openings



and said shutoff members continuously and synchronously with the movement of the closures being conveyed along the arcuate path with each of the extrusion openings conveyed along the arcuate path at a position directly above the closures; said heating means including an extruder screw in said space in said barrel member and means for rotating said extruder screw in a direction opposite to the direction of rotation of said barrel member; and a molding machine at said liner stock molding section for molding the liner stock in the closure conveyed to the liner stock molding section from the liner stock feeding section by said closure conveying means into the desired shape while it is still molten.

4,412,798

## MOLD CLEAR DETECTOR

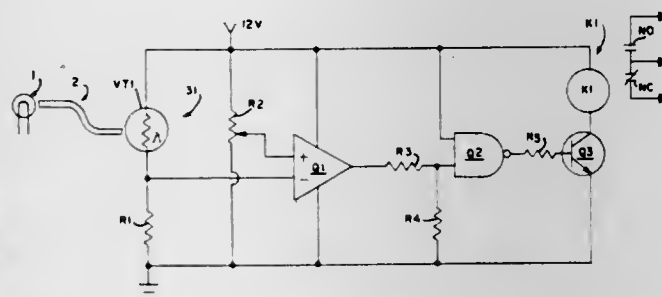
Frank J. Avellino, Russell, and John E. Hoffman, Warren, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 9, 1981, Ser. No. 319,773

Int. Cl.<sup>3</sup> B29C 1/00, 11/00

U.S. Cl. 425—137

3 Claims



1. In a mold machine system for fabricating plastic parts or parts from other suitable materials, a mold clear detector sensitive to the extraction or retention of parts from the mold cavity for inhibiting the operation of the mold machine as a result of the retention of parts upon completion of the mold machine cycle, said detector comprising:

a photocell adapted to be positioned in the mold so as to develop an optical signal in accordance with the retention or extraction of a part from the mold cavity upon completion of the mold machine cycle;

a light-dependent resistor;

a fiber optic cable coupling the photocell to the light-dependent resistor;

a comparator having an input coupled to the light-dependent resistor, said comparator responsive to the optical signal developed by the photocell; and

a switching circuit having an input coupled to an output of the comparator and an output adapted to be coupled to the mold machine, said circuit for inhibiting the operation of the mold machine as a result of the retention of parts upon completion of the mold machine cycle.

4,412,799

## APPARATUS AND METHOD FOR STEREO RELIEF MODELING

Jackson Gates, P.O. Box 145, Kylertown, Pa. 16847

Division of Ser. No. 20,105, Mar. 12, 1979, Pat. No. 4,252,514, Division of Ser. No. 759,159, Jan. 13, 1977, Pat. No. 4,148,645,

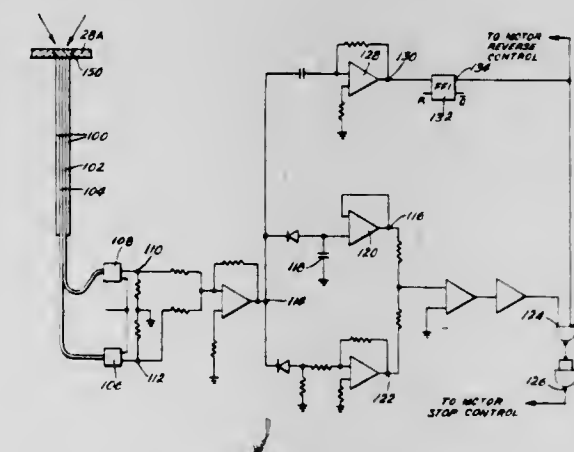
which is a continuation-in-part of Ser. No. 557,612, Mar. 12, 1975, Pat. No. 4,005,932. This application Feb. 24, 1981, Ser. No. 237,693

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.<sup>3</sup> B29C 1/02; G03B 21/00, 21/56; G01C 11/12

U.S. Cl. 425—150

12 Claims



1. An apparatus for automatically adjusting the level of at least one surface point on a flexible platen of a photogrammetry apparatus having photogrammetric images projected thereon in first and second colors, comprising:

means for respectively receiving and transmitting said first and second colored images at said at least one surface point attached to said platen at said at least one surface point, said platen being movable together with the receiving and transmitting means;

means for vertically positioning said receiving and transmitting means;

means for converting said transmitted colored images into electrical signals, said signals being proportional in strength to the intensities of said colored images at said at least one surface point; and,

means for controlling said positioning means in response to said electrical signals, whereby said at least one surface point of said platen is adjusted to a position where said colored images intersect.

4,412,800

## MOLD ASSEMBLY FOR COMPRESSING REFRACTORY MATERIAL AND INCLUDING A QUICK CHANGE MOLD BOX

Robert J. Dorsey, 8554 S. Kenneth Ave., Chicago, Ill. 60652

Division of Ser. No. 965,794, Dec. 4, 1978, Pat. No. 4,265,610. This application Mar. 9, 1981, Ser. No. 241,769

The portion of the term of this patent subsequent to Jan. 12, 2000, has been disclaimed.

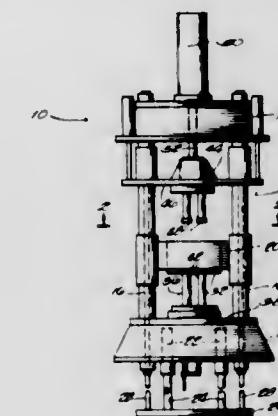
Int. Cl.<sup>3</sup> B28B 3/08; B29C 3/00

U.S. Cl. 425—195

26 Claims

1. A mold assembly for use in a press and comprising a mold table having a central aperture, the boundary of said aperture

being defined by a plurality of discrete portions, each of said portions sloping downwardly and outwardly, a mold box positionable in said central aperture, said mold box including at least one mold cavity therein, said mold box and said mold table being adapted to be supported in the press for relative movement between a position wherein said mold box is housed in said aperture and a position wherein said mold table is removed from said aperture, and means for releasably wedging said mold box in said central aperture when said mold table and said mold box are moved with respect to each other in the press to a position wherein said mold box is housed in said



central aperture, said means for releasably wedging including means for releasing said mold box when said mold table is moved in said press with respect to said mold box away from said position wherein said mold box is housed in said aperture, said means for releasably wedging including a plurality of wedges carried by said mold table within said aperture and adapted to surround said mold box, said wedges being positioned circumferentially around said aperture for releasably securing said mold box in said aperture, and means for forcing at least one of said wedges into clamping engagement with said mold box as said mold box is moved into said aperture.

4,412,801

## PRESSED-BOARD PLANT WITH MULTILEVEL PRESS

Jürgen Pesch, Krefeld-Traar, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

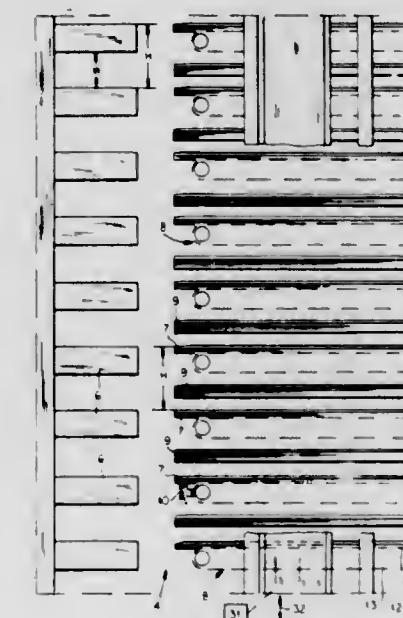
Filed May 1, 1981, Ser. No. 259,675

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016850

Int. Cl.<sup>3</sup> B29J 5/08; B29C 3/04

U.S. Cl. 425—338

3 Claims



1. In an apparatus for the production of pressed board wherein pressable materials on respective press underlays are



pressed between the platens of a multiplaten press, and pressed boards on respective press underlays are transferred to discharge platforms of a discharge rack adjoining the press, the discharge platforms being disposed substantially at levels corresponding to the levels of the platens of said press in an open condition thereof, said discharge rack having transfer means for transferring the boards on the respective underlays, the improvement wherein said rack is provided with a multiplicity of storage platforms interleaved with said discharge platforms and spaced apart corresponding to the spacing of the upper surfaces of said platforms, said transfer means being operable selectively to transfer said pressed boards on respective underlays onto said discharge platforms and onto said storage platforms, and means for shifting said rack between one rack position in which the upper surfaces of said discharge platforms are coplanar with the upper surfaces of respective platens and another rack position in which the upper surfaces of said storage platforms are coplanar with respective platens.

4,412,802

# **MOLDING DEVICE FOR FORMING A SOCKET END ON A PLASTIC PIPE METHOD**

Ryozo Ohta; Tadao Yoshizawa; Masayuki Sakaguchi; Yoshiaki Hara; Junsuke Kyomen; Ryuichi Yoneda, and Hidekazu Enomoto, all of Ishizukita, Japan, assignors to Kubota Ltd., Osaka, Japan

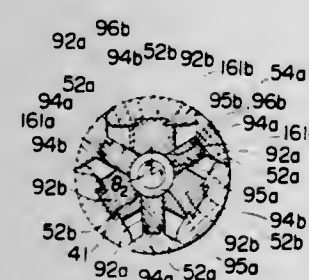
Division of Ser. No. 80,035, Sep. 28, 1979, Pat. No. 4,279,853. This application Apr. 1, 1981, Ser. No. 250,036

Claims priority, application Japan, Oct. 3, 1978, 53-122326; Nov. 28, 1978, 53-147402; Mar. 5, 1979, 54-25899

Int. Cl.<sup>3</sup> B29D 23/00

U.S. Cl. 425—392

6 Claims



1. A molding device for processing the end of a plastic pipe to form a pipe end socket comprising:

a plurality of core pieces divided in a ring to form an inner molding surface for processing the pipe end socket; and means for expanding and/or contracting the core pieces to form an inner molding surface upon expanding and/or to allow the core pieces to pass through a processed shape of the pipe end socket upon contracting wherein said expanding means further comprises:

a guiding shaft upon which said core pieces are mounted; first and second finger members, each having a bottom face portion sliding and supported on said guiding shaft, and also having an upper face portion;

said plurality of core pieces further comprising at least a first and second core piece corresponding to first and second finger members, respectively, bottom face portions of said core pieces being slidably supported by the respective upper face portions of said first and second finger members for shifting between expanded and contracted positions, and an upper face portion of said first and second core pieces having an inwardly slanted portion formed thereon for forming the pipe end socket upon expanding of said first and second core pieces;

first and second restraining ring members for combining and supporting end sides of said first and second finger members, respectively, wherein said second restraining ring member is housed within said first restraining ring member; and

means for moving one of said first and second restraining ring fingers a first predetermined distance;

means for moving the remaining ring member of said first and second restraining ring members a second predetermined distance after moving said one ring member of said first and second restraining ring members said first predetermined distance, wherein the core piece moved by said first finger member is radially outwardly or inwardly shifted to different positions on said guiding shaft a predetermined time which differs in time with respect to the movement of the core piece moved by said second finger member, such that the radially outermost portion of said inwardly slanted portion of said first and second core pieces is positioned radially inwardly of a radially innermost surface portion of the processed pipe end socket.

4. A molding device for processing the end of a plastic pipe to form a pipe end socket comprising:

first and second divided core pieces contacted alternately in a ring to form an inner molding face for a processing and molding space,

first and second finger members corresponding to the first and second divided core pieces, respectively, each finger member having a tapered upper face freely slidably engaged with each respective first and second divided core piece allowing said divided core pieces to be raised or lowered in the radial direction of the pipe, and also having a bottom face;

first and second ring-shaped restraining members which further comprise ring-shaped end portions of each of said first and second finger members, one of said first and second ring-shaped restraining members having a circumferential side thereof in contact with corresponding side portions of said first and second divided core pieces;

a guiding shaft having a guiding surface slidably contacted with each bottom face of said first and second finger members, and

an operation member including means for moving a remaining ring-shaped member of said first and second ring-shaped restraining members a first predetermined distance and means for moving said one of said first and second ring-shaped restraining members a second predetermined distance after said remaining ring-shaped member of said first and second ring-shaped restraining members is moved said first predetermined distance, wherein the divided core pieces moved by one of said first and second finger members is raised or lowered at different positions on said guiding shaft at a point in time which differs relative to the divided core pieces being moved by the other of said first and second finger members such that through use of the force exerted from the pipe, the divided core pieces, around which the heat softened plastic pipe is fed, enable the bottom faces of said first and second finger members to be self-locked into the guiding shaft through the tapered faces thereof whereby the inner molding face formed by the divided core pieces is stabilized.

4,412,803

# **ADJUSTABLE SUPPORT BRACKET FOR CONCRETE FINISHING EQUIPMENT**

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation-in-part of Ser. No. 34,171, Apr. 26, 1979, Pat. No. 4,316,715. This application Jan. 27, 1982, Ser. No. 343,283

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> E01C 19/38

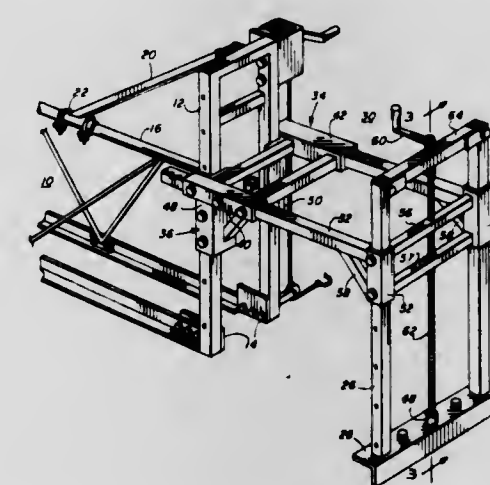
U.S. Cl. 425—456

17 Claims

1. An adjustable support bracket for supporting an end of equipment for finishing a concrete surface including an obstruction extending vertically from the edge area, said adjustable support bracket comprising:

a support means including a vertically extending member for engaging a load bearing surface positioned outboard of the

concrete surface and for permitting translation of said bracket along the load bearing surface; and  
b. adjustment means including a laterally extending member coupled to the end of said equipment and to said support means for maintaining lateral spacing between said end of said equipment and said support means and for permitting



4,412,805

# **HOT SPRUE ASSEMBLY FOR AN INJECTION MOLDING MACHINE**

Rocky V. Morrison, Redondo Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 272,432, Jun. 10, 1981, abandoned. This application Sep. 23, 1981, Ser. No. 304,422

Int. Cl.<sup>3</sup> B29F 1/03

U.S. Cl. 425—549

36 Claims

the contact point between said support means and the load bearing surface to be vertically adjustable while maintaining the end of said equipment in a fixed vertical position, whereby the end of said concrete finishing equipment operates inboard of the vertically extending obstruction while being supported by the load bearing surface located outboard of the concrete surface.

4,412,804

# **APPARATUS FOR INJECTION MOLDING OF PRECISION PARTS**

Werner Hütther, Karlsruhe, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen Union München GmbH, Munich, Fed. Rep. of Germany

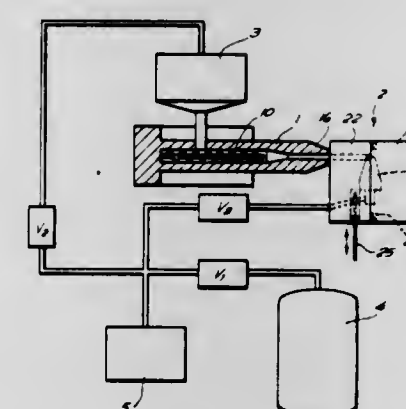
Filed Nov. 4, 1981, Ser. No. 318,282

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042052

Int. Cl.<sup>3</sup> B29F 1/00

U.S. Cl. 425—546

6 Claims



1. Apparatus for injection molding of precision parts, comprising:

a material reservoir for containing material to be injected, a tool having a mold cavity into which the material is injected to form the part,

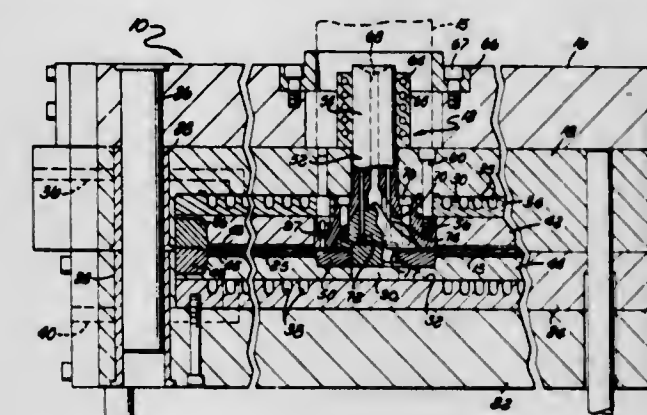
an injection cylinder for receiving material from the reservoir,

an injection nozzle having a passageway therethrough between the injection cylinder and the mold cavity, a plunger within the cylinder for pushing material in the cylinder through the nozzle passageway into the mold cavity,

evacuating means including a vacuum pump and a vacuum

reservoir, the reservoir having a volume many times greater than that of the mold cavity, a vacuum line through which the mold cavity can communicate with both the vacuum pump and the vacuum reservoir, said vacuum line being independent of said nozzle passageway, and

control valve means for selectively connecting the mold cavity to and disconnecting the mold cavity from the vacuum reservoir and for connecting the mold cavity to the vacuum pump even when the mold cavity is disconnected from the vacuum reservoir.



1. In an injection molding machine for producing centrally apertured record discs, apparatus for controlling flow of molten disc-forming material into a disc-shaped mold cavity, comprising:

a sprue assembly forming an open and relatively narrow gate for passage of the molten disc-forming material into the mold cavity, said gate being disposed in a plane recessed slightly from the general plane of the disc to be formed within the mold cavity;

said sprue assembly including a sprue bushing having a central bore formed therein for passage of the molten disc-forming material toward the mold cavity, and dispersion means having a plurality of relatively small extrusion passages formed therein, said dispersion means being mounted generally within the end of said bore adjacent said mold cavity for passage of the molten disc-forming material through said extrusion passages prior to passage through said gate; and

heater means for controlled elevation of the temperature of said sprue assembly to create a preselected temperature gradient between said sprue assembly and the mold cavity for permitting solidification of the disc-forming material within the mold cavity up to the gate without substantial solidification of disc-forming material within said sprue assembly.

4,412,806

# **PARISON EJECTOR FOR AN INJECTION MOLDING APPARATUS**

William R. Gaiser, and James Niepok, both of Dayton, Ohio, assignors to The Broadway Companies, Inc., Dayton, Ohio

Filed May 15, 1981, Ser. No. 263,946

Int. Cl.<sup>3</sup> A23P 1/00

U.S. Cl. 425—554

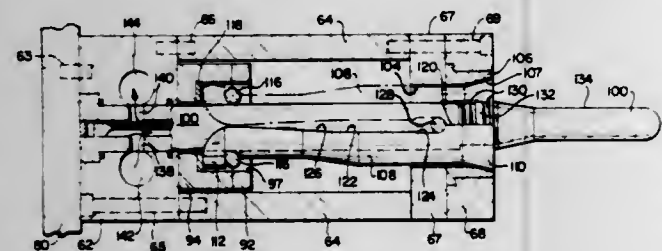
26 Claims

1. In an injection molding machine of the type having an



injector portion including a mold cavity module having a plurality of mold cavities communicating with a source of molten plastic material, an improved ejector portion comprising:

- a platen mounted to said machine for reciprocating movement toward and away from said mold cavity module;
- a frame mounted to said platen and extending toward said mold cavity module;
- a plurality of cores mounted to said frame and extending toward said mold cavity module, said cores positioned to enter and withdraw from said mold cavities upon said reciprocating movement of said platen;
- carriage plate means slidably mounted to said frame for movement toward and away from said platen and including a plurality of bores through which pass said cores;
- a plurality of pairs of opposing jaws pivotally mounted to said carriage plate means, each of said pairs enclosing one



of said cores and forming complementary portions of a parison mold;

said pairs of jaws including mating longitudinal edges defining opposing bearing surfaces having a converging portion proximate said carriage plate means;

cam means mounted to said frame and positioned between said opposing bearing surfaces; and

means for reciprocating said carriage plate means relative to said frame and cores such that movement of said carriage plate means away from said platen in an ejection sequence causes said jaws to move relative to said cores thereby removing molded parisons therefrom and causes said bearing surfaces to slidably engage said cam means whereby said cam means forces said pairs of jaws apart upon encountering said converging portions thereof so that said jaws release molded parisons from said mold portions thereof.

4,412,807

## OFFSET FLOW INJECTION NOZZLE

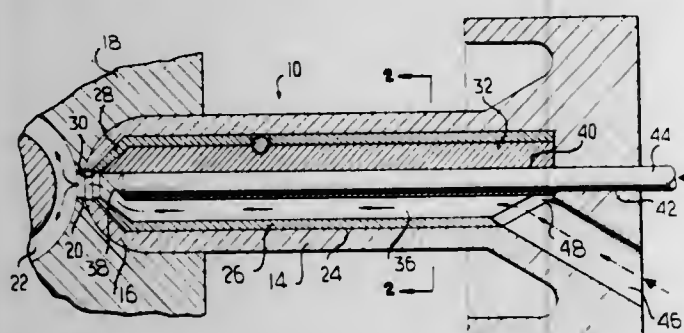
Stuart A. York, Tariffville, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Jan. 28, 1982, Ser. No. 343,148

Int. Cl.<sup>3</sup> B29F 1/05

U.S. Cl. 425-564

8 Claims



1. An injection nozzle for effecting and controlling the flow of plastic material in melt form from a plasticizer to an injection mold, said nozzle comprising a hollow nozzle body having an end portion for seating in sealed relation in an injection mold, an axial delivery orifice opening through said body one end from the interior of said nozzle body, an axially positioned valve gate pin for selectively closing said delivery orifice, a separately formed combined support and guide member in said

nozzle body mounting said valve gate pin for axial movement between a projected position closing said delivery orifice and a retracted position within said nozzle body spaced from said delivery orifice, and a unitary supply passage extending uninterruptedly through said nozzle body to said delivery orifice when said valve gate pin is in its retracted position whereby separation of and rejoining of flowing plastic material within said injection nozzle does not occur, said supply passage being disposed entirely to one side of said combined support and guide member.

8. An injection nozzle for effecting and controlling the flow of plastic material in melt form from a plasticizer to an injection mold, said nozzle comprising a hollow nozzle body having an end portion for seating in sealed relation in an injection mold, an axial delivery orifice opening through said body one end from the interior of said nozzle body, an axially positioned valve gate pin for selectively closing said delivery orifice, combined support and guide means in said nozzle body mounting said valve gate pin for axial movement between a projected position closing said delivery orifice and a retracted position within said nozzle body spaced from said delivery orifice, and a unitary supply passage extending uninterruptedly through said nozzle body to said delivery orifice when said valve gate pin is in its retracted position whereby separation of and rejoining of flowing plastic material within said injection nozzle does not occur, said supply passage being disposed entirely to one side of said combined support and guide means, and said combined support and guide means having a tapered end leading transversely of said valve gate pin and across said delivery orifice, said support and guide means providing support for said valve gate pin for the full length of said valve gate pin.

4,412,808

## DUAL FUELED BURNER GUN

Douglas B. Sheppard, Torrance, Calif.; James A. Kezerle, Cary, N.C., and Ellis W. Sheffield, Littleton, Colo., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 19, 1980, Ser. No. 160,790

Int. Cl.<sup>3</sup> F23C 1/08

U.S. Cl. 431-8

13 Claims



1. A dual fueled burner gun, including: inner, intermediate, and outer tubes arranged concentrically to form an inner annular conduit between said inner and intermediate tubes and an outer annular conduit between said intermediate and outer tubes, and a nozzle at one end of said tubes having first, second, and third ports opening laterally of said tubes, said first ports communicating said inner tube to said inner conduit, said second and third ports communicating said inner and outer conduits, respectively, to the exterior of said gun.

4,412,809

## OXYGEN DENSITY DETECTING DEVICE IN COMBUSTOR

Hiroshi Yamaguchi; Takashi Sekiguchi; Hideyuki Tsukahara; Nobumasa Negishi, and Kisuken Fujita, all of Gunma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,504

Claims priority, application Japan, Jul. 1, 1980, 55-89474

Int. Cl.<sup>3</sup> F23N 5/24

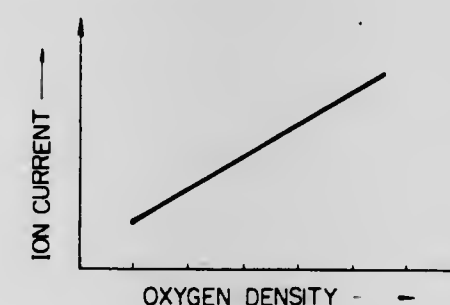
U.S. Cl. 431-76

4 Claims

1. An oxygen density detecting device for a combustor,

which detects an ion current of flame to detect an oxygen density of air for combustion, comprising:

- means for applying a reference current through said flame;
- means for sensing an ion current in said combustor by detecting a voltage produced across said flame by said reference current;
- memory means coupled to said sensing means for storing as a reference value an ion current value sensed by said sensing means a predetermined period of time after a flame is formed in said combustor;



means for determining and producing an output signal representing an oxygen density of air used for combustion by comparing said reference value stored in said memory means with ion current values subsequently and successively provided by said sensing means; and

means for controlling at least one of an electromagnetic pump for supplying fuel to said combustor and a combustion air blower for supplying air to said combustor in response to said output signal.

4,412,810

## PULVERIZED COAL BURNER

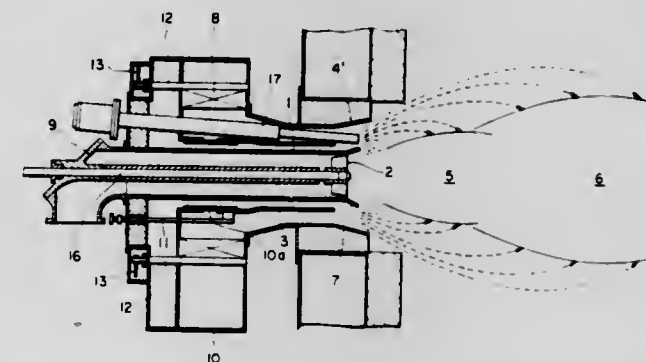
Akira Izuha, Koganei; Tomoyuki Shinano, Yokohama; Yuho Shibayama, Chiba; Chikatoshi Kurata, Akashi, and Kenichi Fujii, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 4, 1981, Ser. No. 240,347

Int. Cl.<sup>3</sup> F23C 5/06

U.S. Cl. 431-186

2 Claims



1. A pulverized coal burner adapted to reduce undesired combustion waste gas, comprising:

- a primary throat for supplying pulverized coal and primary air to a furnace, a flame sustaining plate located at the forward end of said primary throat and diverging outwardly therefrom so that the primary air and the pulverized coal are ejected at a relatively low speed from the primary throat to burn in the furnace at a low temperature for producing char and unburned components thereof;
- a secondary throat located outside said primary throat concentrically therewith for supplying secondary air to the furnace, said secondary throat being movable back and further to adjust the spacing thereof relative to the flame sustaining plate for adjusting the rate of supply of the secondary air through the secondary throat into the furnace; and
- a burner throat located outside said secondary throat con-

centrically therewith for supplying tertiary air to the furnace, said burner throat diverging outwardly at the forward end thereof to form a diffuser so that the tertiary air is directed together with the secondary air to diverge outwardly without substantially mixing with the primary air and the pulverized coal,

whereby the secondary air and the tertiary air burn at a low temperature with the char and unburned components previously burned in the furnace.

4,412,811

## HIGH CAPACITY OIL BURNER

Oswaldo A. Pedrosa Junior; Nilton Castro Couto, and Raul C. Carvalho Figueiro, all of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

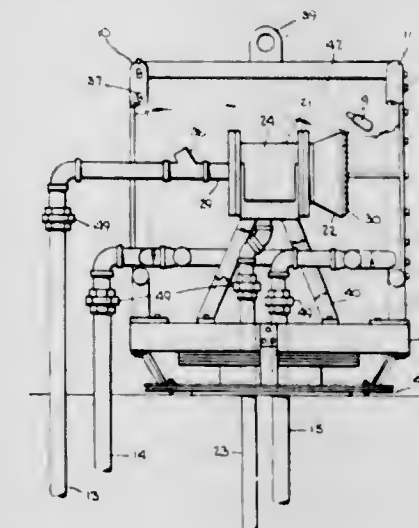
Filed Aug. 27, 1981, Ser. No. 296,904

Claims priority, application Brazil, Aug. 28, 1980, PI8005447

Int. Cl.<sup>3</sup> F23D 11/02; F23J 7/00

U.S. Cl. 431-202

2 Claims



1. High capacity oil burner suitable for burning unwanted liquid fuels, comprising:

- (a) an atomizer (8) including a chamber (24) for accumulating liquid fuels adjacent to a chamber (28) for accumulating compressed air which supplies primary air for the atomization of the liquid fuels at the time of burning, said chamber (24) for accumulating liquid fuels being provided with a plurality of discharge holes (25,26) on its front end, circumferentially positioned, which open to outside the chamber;
- (b) a protective cylindrical housing (42) open at both ends which surrounds completely said atomizer, said housing having at each end a hollow circular ring (10, 11) provided in its external surface with respective holes (37,38), each of said circular rings being connected to a water manifold (14, 15) which injects water under pressure into said rings (10,11) such that the water is expelled to the outside through said holes defining a fan-like water curtain around said cylindrical housing (42);
- (c) means for the admission of liquid fuels into said chamber for the accumulation of liquid fuels, means for the admission of compressed air into said chamber for the accumulation of compressed air and means for the admission of water into said perforated rings which surround the ends of said protective cylindrical housing; and
- (d) means (9) to promote the ignition of said atomized liquid fuels that are expelled to the exterior of said chamber for the accumulation of liquids together with primary air; characterized in that said chamber (28) for the accumulation of compressed air is defined by a frusto-conical hollow body having a conical side wall (22) which is at an angle from 10° to 35° with the longitudinal axis of the atomizer, and which is thick enough so that inside it are positioned holes (25,26) having the shape of straight cylindrical channels which communicate the interior of said chamber for the accumulation of liquid fuels with the outside; the front face of said



body being the smaller base of the frusto-conical body and being adjacent to the chamber (24) for the accumulation of liquid fuels and having a central hole where the conduction manifold (29) that receives the compressed air from outside the burner into said chamber (28) opens; said front face having a plate (31) that seals completely the opening at the larger base of the frusto-conical body; the inner surface of said conical side wall (22) having a plurality of elongated holes (27) that start inside the chamber (28) for the accumulation of compressed air and open to said elongated holes (25,26) which communicate the chamber (24) for the accumulation of liquid fuels with the outside; said fuel discharge holes (25,26) opening at the front end of the atomizer having nozzles (30) that surround said sealing plate (31) at the larger base of the frusto-conical body through which the atomized liquid fuel to be burnt is expelled; the atomizer (8) being positioned within said protective cylindrical housing (42) in such a manner that the front end of said atomizer is spaced apart from said cylindrical housing and the rear end of said atomizer is also spaced apart from the rear end of said cylindrical housing; the inner diameter of said cylindrical housing (42) being from 2 to 3 times the diameter of the front end of said atomizer and the length of said housing being from 1 to 1.5 times the length of said atomizer; the burning efficiency of the burner when measured by the number of barrels of fuel burnt as related to the weight of said burner expressed in kg being above 30 barrels of fuel burnt per day/kg of the apparatus, without producing any soot.

4,412,812

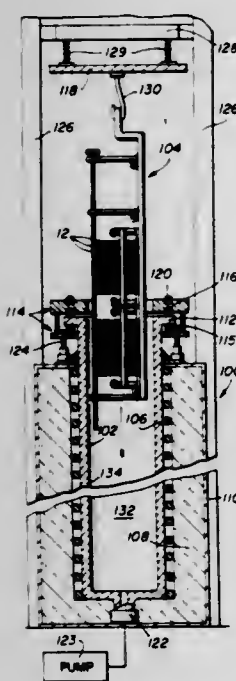
## VERTICAL SEMICONDUCTOR FURNACE

Joseph P. Sadowski, Coppell; Alan E. Lightfoot, Dallas, and Jeffrey M. Kowalski, Coppell, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 28, 1981, Ser. No. 335,170  
Int. Cl.<sup>3</sup> F27B 9/00, 3/22; F27D 5/00

U.S. Cl. 432-121

3 Claims



1. A furnace for heating integrated circuit materials, comprising:
  - a housing;
  - a quartz tube defining a cylindrical interior with vertical sidewalls and having a rim at its upper ends surrounding an opening into the interior and a port through its lower end for evacuating the interior;
  - a mounting plate secured to said housing through a plurality of adjustment screws and supporting said quartz tube about its rim;
  - a manifold secured in sealing relationship with said quartz tube about the opening thereof and further having an

aperture therethrough aligned with the opening in said tube;

a cover for sealing engagement with said manifold to seal the interior of said quartz tube from the atmosphere;

heating means for heating the interior of said quartz tube;

a quartz boat for holding the integrated circuit materials for entering into the interior of said quartz tube; and

means for supporting and vertically moving said quartz boat into and out of the interior of said tube without contact between the sidewalls of the quartz tube and said quartz boat.

4,412,813

## ROTARY HEARTH FURNACE AND METHOD OF LOADING AND UNLOADING THE FURNACE

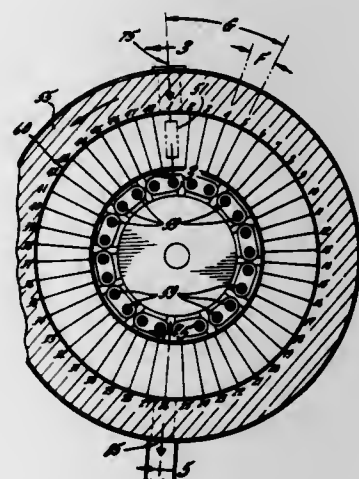
Karl A. Wulf, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Feb. 2, 1982, Ser. No. 345,031

Int. Cl.<sup>3</sup> F27D 3/00; F27B 9/16

U.S. Cl. 432-11

18 Claims



18. A method of operating a rotary hearth furnace having a heated chamber and having a rotatable hearth in said chamber for advancing workpieces around a circle, said hearth having a plurality of angularly spaced workpiece stations which are spaced equally from one another, said method comprising the steps of rotating said hearth in one direction within said chamber, and placing workpieces in said stations at said loading position, said method being characterized in that successive workpieces at said loading position are placed in non-adjacent stations during a first revolution of said hearth and are placed in intervening stations during a second revolution of the hearth.

4,412,814

## APPARATUS AND METHOD FOR OPERATING A BRICK KILN

Silas P. Dennis, Jr., and Tony M. Dennis, both of P.O. Box 279, Albemarle, N.C. 28001

Filed Dec. 21, 1981, Ser. No. 333,174

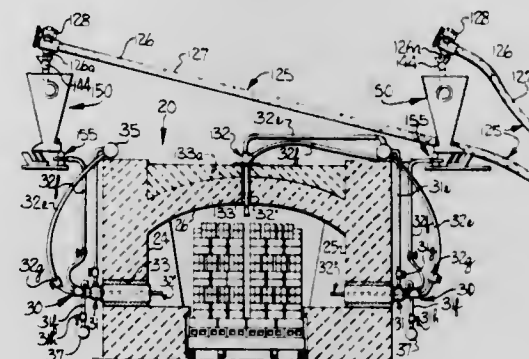
Int. Cl.<sup>3</sup> F27B 9/00

U.S. Cl. 432-146

7 Claims

1. In a kiln having an elongate housing defining a tunnel for the passage therethrough of brick to be treated, the combination therewith of apparatus for utilizing dried sawdust for the fuel to heat the kiln to effect the desired treatment of the bricks, said apparatus comprising a plurality of elongate sawdust burner units positioned along the housing and extending into the tunnel, each of said burner units comprising a pipe having an inner end extending into the tunnel of the kiln and an outer end, aspirator means communicatively connected to the outer end of the pipe, said aspirator means having a pair of outer connections, means for directing an airstream from a source into and through each of the burner units and comprising a first conduit means connecting one of said pair of outer

connections of said aspirator means to the source of the airstream, and means for directing dried sawdust from a source into the airstream in each of the burner units comprising a second conduit means connecting the other of said pair of



outer connections of said aspirator means to the source of the sawdust so that the airstream induces the flow of sawdust from the source of sawdust into each of the burner units and also serves to provide oxygen for combustion of the sawdust.

4,412,815

## LOADING SYSTEM FOR AN ANNEALING FURNACE CHARGE AND COMPONENTS THEREFOR

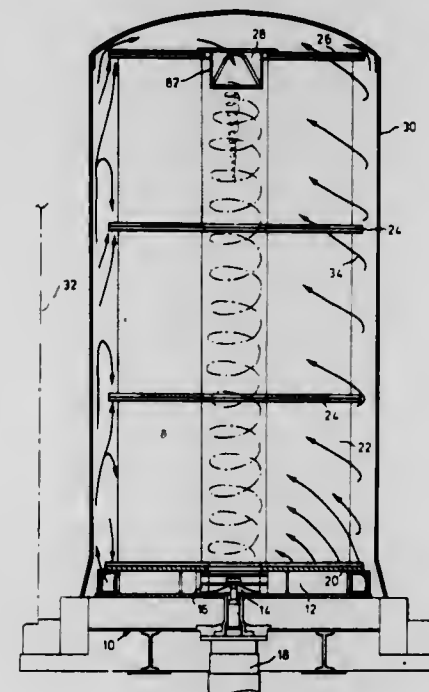
James H. White, Manotick; Bernard C. Stonehill, Mississauga; Brian F. Johnston, Hamilton; Albert R. Perrin, Mississauga, and Roderick I. L. Guthrie, Westmount, all of Canada, assignors to Dofasco Inc., Hamilton, Canada

Filed Oct. 29, 1981, Ser. No. 316,182

Int. Cl.<sup>3</sup> F27B 11/00; C21D 9/00, 1/06

U.S. Cl. 432-206

7 Claims



7. A lowermost diffuser member for use in a loading system for the charge of an annealing furnace of the kind employed for the treatment within a cylindrical inner muffle cover of a plurality of hollow-cored coils of metal products stacked inside the muffle cover one on top of the other with the hollow cores thereof registered vertically with one another, the said diffuser member comprising:

a circular back plate having at its centre an aperture for the reception of a gas impeller adapted to receive gas flowing axially from the said registered hollow cores of the coils and discharge it radially through the diffuser member,

the back plate having thereon a plurality of upstanding circumferentially-spaced diffuser elements providing between themselves a corresponding plurality of radially-outwardly extending gas flow passages from its centre to its periphery, the said passages conveying the impelled gas therethrough

and discharging it radially and circumferentially into the annular space between the furnace muffle inner wall and the stacked furnace charge to move helically upward therein;

each said diffuser element comprising:

- a radially inner diffuser element portion providing respective side wall portions of two adjacent flow path inlets and a sharp vertical forward edge at the radially inner intersection of the two said side wall portions, each radially inner element portion being of height less than the remainder of the respective element so that it is not engaged by the adjacent bottom edge of a coil mounted on the diffuser member;
- a support element portion extending over a substantial radius of the diffuser member for engagement with the adjacent bottom edge of a coil mounted on the diffuser member to thereby support the furnace charge thereon and also providing respective side wall portions of the said two adjacent flow paths; and
- a radially-outer flow guidance element portion providing respective side wall portions of said two adjacent flow paths and directing the radially-outwards gas flow at an increased inclination to a respective tangent to the coil core and also axially of the coil into the said annular space so as to direct the gas flow in the said helical path.

4,412,816

## SLIDING SHOE FOR A PUSHER FURNACE

Jules Schlumberger, and Heinrich Aebli, both of Kreuzlingen, Switzerland, assignors to Gautschi Electro-Fours AG, Tübingen, Switzerland

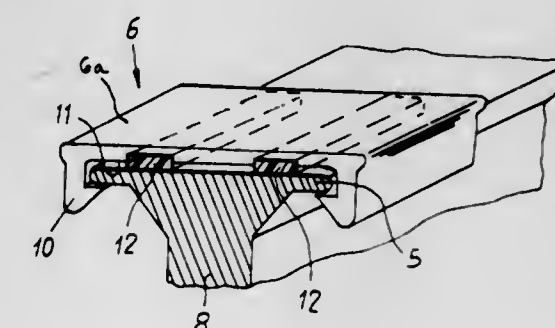
Filed Nov. 23, 1981, Ser. No. 324,199

Claims priority, application Switzerland, Jan. 16, 1981, 272/81

Int. Cl.<sup>3</sup> F27D 3/00; B65G 19/30

U.S. Cl. 432-239

7 Claims



1. A sliding shoe arrangement for pusher-type furnaces and serving for the sliding transport of objects to be heated in a predetermined feed direction and which are placed upon said sliding shoe, comprising:

rail means;

a sliding shoe cooperating with said rail means and having an at least approximately U-shaped cross-sectional shape and including a web;

said sliding shoe containing downwardly protruding legs disposed laterally of said web and engaging with said rail means in order to provide a laterally guided supporting of said sliding shoe on said rail means of the pusher furnace;

at least one sliding element arranged at an inner side of the web of said sliding shoe; and

said sliding element bearing upon said rail means.

4,412,817

## CANOPY KILN SYSTEM

Ronald D. Schmidgall, Mediapolis, Iowa, assignor to Hawkeye Concrete Products Co., Mediapolis, Iowa

Filed Apr. 16, 1982, Ser. No. 369,062

Int. Cl.<sup>3</sup> F27D 1/00; F26B 19/00; E04B 1/12; A45B 9/04

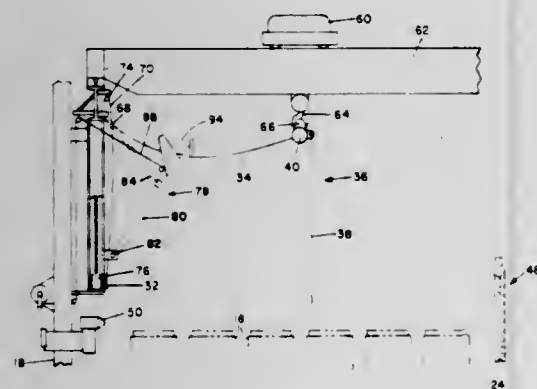
U.S. Cl. 432-247

8 Claims

1. A canopy kiln system comprising generally elongated means for supporting at least one article to be kiln-treated and



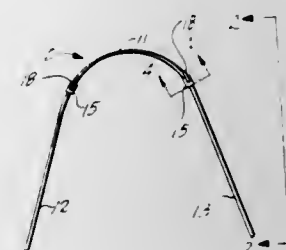
having first and second end portions spaced longitudinally apart, first and second support means disposed respectively at and spaced above the first and second end portions at a level above the height of the article, an elongated canopy of flexible material extending generally horizontally between the two support means and having first and second transverse ends respectively adjacent to the first and second support means, means affixing the first end of the canopy to the first support means, transverse stiffener means at the second end of the canopy and affixed thereto, detachable means for connecting the stiffener means and thus the second end of the canopy to



**4,412,819**  
**ORTHODONTIC ARCH WIRE**  
James L. Cannon, Rte. 2, Dahlonga, Ga. 30533  
Filed Sep. 15, 1982, Ser. No. 418,259  
Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433—20

14 Claims

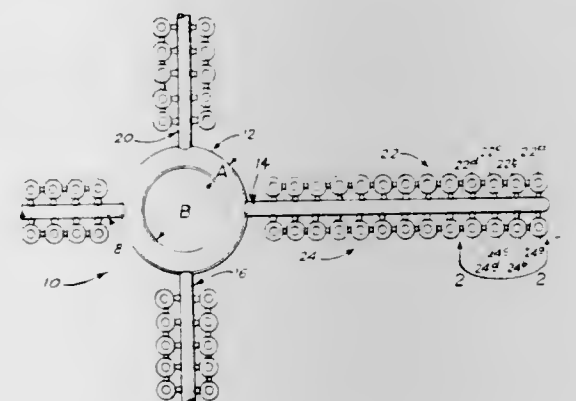


1. An orthodontic arch wire, comprising a generally U-shaped assembly of an elongated anterior segment, and a pair of spaced-apart elongated posterior segments secured to and extending from respective ends of the anterior segment, the anterior segment being made of a material having a flexural rigidity which is lower than the flexural rigidity of material forming at least one of the posterior segments.

**4,412,820**  
**ORTHODONTIC TENSION-APPLYING APPARATUS**  
Gerald G. Brummond, Canby; Paul E. Klein, Lake Oswego, and Roland M. Anderson, Wilsonville, all of Oreg., assignors to Modcom, Inc., Canby, Oreg.  
Filed Apr. 30, 1982, Ser. No. 373,359  
Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433—18

2 Claims



1. Interconnected, plural-article, molded, unitary, elastomeric orthodontic apparatus characterized by uniform elasticity resulting from per-article, controlled flow-gating during molding, said apparatus comprising an elongated dispenser unit, a plurality of endless chain-loop articles distributed along said unit, with each pair of adjacent loop articles being operatively interconnected by an integral tensioning structure, and for each article, a flow-gated isthmus severably connecting the article to the unit.

**4,412,821**  
**DENTAL MOUTH MIRROR**  
Jack E. Sturdivant, Oakwood Rd., Rte. #4, Ames, Iowa 50010  
Filed Jul. 26, 1982, Ser. No. 401,651  
Int. Cl.<sup>3</sup> A61B 1/24

U.S. Cl. 433—30

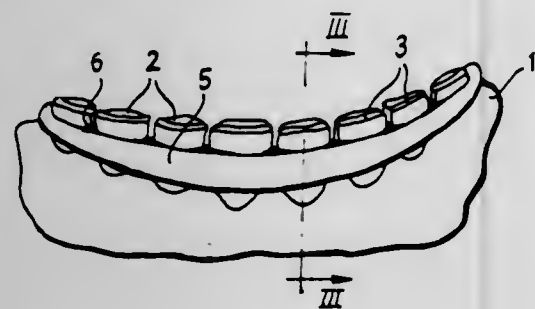
6 Claims

1. A dental mouth mirror, comprising:  
a substantially flat plate means having a mirrored upper surface, opposite side edges, and anterior and posterior edge portions,  
a first arcuate indentation in said posterior edge portion, arcuate posterior lobe portions adjacent opposite edges of

**4,412,818**  
**METHOD FOR SPLINTING ANIMAL TEETH**  
Adam R. Thomson, Edinburgh, Scotland, assignor to Ewesplint Limited, Edinburgh, Scotland  
Filed Sep. 22, 1981, Ser. No. 304,628  
Claims priority, application United Kingdom, Sep. 25, 1980, 8030938  
Int. Cl.<sup>3</sup> A61D 5/00

U.S. Cl. 433—1

4 Claims



1. A method of stabilising the teeth of an isolated group of teeth in the jaw of a ruminant which comprises embracing the group with an apertured brace and a layer of a rapidly hardenable bonding composition to leave the incisal edges of the teeth projecting beyond the brace, and allowing the bonding composition to harden and secure the group within the aperture of the brace.

said first arcuate indentation, said posterior lobe portions adapted to extend into the open mouth of a dental patient, said first arcuate indentation having a radius of curvature greater than the radius of curvature of said lobe portions wherein the lateral span of said arcuate indentation is greater than the lateral width of said lobe portions, said anterior edge portion comprising an outwardly extending arcuate portion,

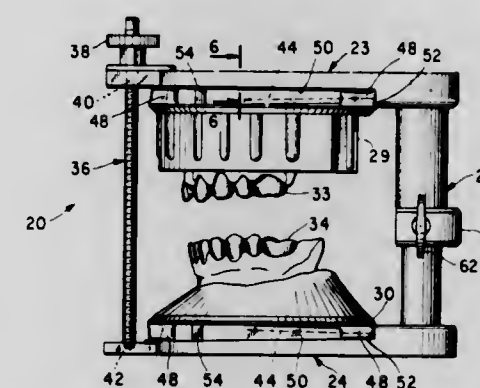


second arcuate indentations in said opposite side edges forming anterior lobe portions with the end of said outwardly extending arcuate portion, said second arcuate indentations being adapted to receive the corners of the mouth of a dental patient to secure the mirror in the open mouth of such patient.

**4,412,822**  
**DENTAL ARTICULATOR WITH REMOVABLE TRAY**  
Charles Blechner, 8 Lighthouse Road, Great Neck, N.Y. 11024  
Continuation of Ser. No. 201,821, Oct. 29, 1980, abandoned.  
This application Apr. 27, 1982, Ser. No. 372,275  
Int. Cl.<sup>3</sup> A61C 11/00

U.S. Cl. 433—60

14 Claims



1. A dental articulator comprising:  
an upper platform and a lower platform;  
means for spacing said upper platform relative to said lower platform including a plurality of legs on which said upper platform can translate relative to said lower platform while maintaining a parallel attitude to said lower platform during a translation of said upper platform relative to said lower platform, and a spacer for holding said upper platform in a selected position relative to said lower platform;  
upper and lower trays releasably secured, respectively, to said upper platform and said lower platform;  
each of said trays including a longitudinally disposed key;  
each of said platforms including a longitudinally disposed keyway for mating with said key;  
each of said keyways has side walls which are resiliently supported to the respective ones of said platforms to permit a yielding in the positioning of a tray relative to a platform to facilitate insertion and removal of a tray relative to its platform; and  
wherein  
each of said trays includes a set of spaced-apart legs, said legs being brought into contact with the corresponding one of said platforms upon insertion of the key of a tray into the

keyway of the corresponding platform to stabilize the orientations of said trays relative to said corresponding platforms.

**4,412,823**  
**ORAL CAVITY CLEANER**  
Hiroaki Sakai, and Tadanori Okazaki, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Jul. 10, 1981, Ser. No. 281,926  
Claims priority, application Japan, Jul. 21, 1980, 55-100400  
Int. Cl.<sup>3</sup> A46B 13/06

U.S. Cl. 433—80

11 Claims



1. An oral cavity cleaner comprising:  
a pump unit including  
a container for storing a fluid; and  
a pump coupled to said container for providing said fluid at high pressure;  
a flexible conduit; and  
a toothbrush unit coupled to said pump unit by means of said flexible conduit, said toothbrush unit including  
a toothbrush;  
a fluid pressure actuating section operated by the pressure of said high pressure fluid, said fluid pressure actuating section having an actuating member;  
a motion transmitting member having a fluid passage therein extending from said fluid pressure actuating section to said toothbrush, said motion transmitting member being driven by said fluid pressure actuating section and transmitting movement to said toothbrush;  
a valve section located within said fluid passage and including a valve body driven by the discharge pressure from said pump unit to close said fluid passage, said valve section being brought to an open position when the actuating member of said fluid pressure actuating section has moved an amount exceeding a predetermined value; and  
an operating section for opening and closing said valve section, said operating section including a locking member for limiting the movement of said valve body.

**4,412,824**  
**REMOVABLE PARTIAL DENTAL PROSTHESIS AND METHOD OF FORMING AND SUPPORTING THE SAME**  
Leonard J. Kulwiec, 9478 La Cuesta Dr., La Mesa, Calif. 92041, and Michael F. X. Kulwiec, 2791 McBride, Unit No. 105, Santa Rosa, Calif. 95401  
Filed Sep. 18, 1981, Ser. No. 303,560  
Int. Cl.<sup>3</sup> A61C 13/28

U.S. Cl. 433—170

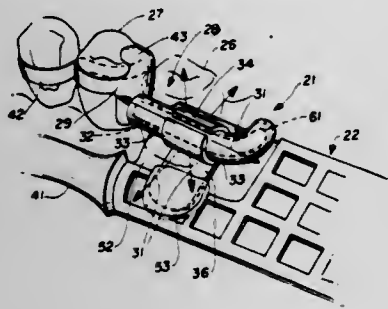
12 Claims

1. A removable partial dental prosthesis including base means formed to mate with oral mucosa for support of said prosthesis thereon, at least one artificial tooth mounted to said



base means, and connector means formed to resiliently couple said base means to an abutment tooth for limited displacement along three mutually perpendicular axes, wherein the improvement in said dental prosthesis is comprised of:

- said connector means is formed with:
- (i) an arm mounted to extend away from one of said abutment tooth and said base means,



- (ii) connector clip means mounted to a remainder of said abutment tooth and said base means, and
- (iii) a resiliently compressible element interposed between said arm and said clip means, said clip means securing said arm to said clip means with said compressible element therebetween.

4,412,825

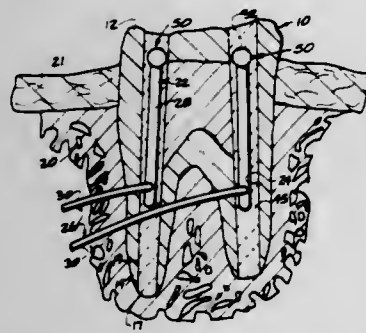
#### MEDICAL ENTRY CONNECTOR FOR TEETH BEARING ANIMALS

Richard D. Tokarz, 4188 Laurel Dr., West Richland, Wash. 99352

Filed Sep. 17, 1981, Ser. No. 303,010  
Int. Cl.<sup>3</sup> A61C 00/00

U.S. Cl. 433-229

30 Claims



15. A permanent subcutaneous body entry communication device for operatively interconnecting an external medical device with a predetermined internal body location of an animal having a tooth with a crown section exposed in a mouth cavity above an attached gingiva and a root section unexposed beneath a free gingiva and supported by a jaw, comprising:

- a first communication pathway means implanted in the tooth and extending from the crown section above the attached gingiva to the root section beneath the free gingiva;
- interface means operatively connected to the pathway means and mounted to the tooth along the crown section thereof, above the attached gingiva, for connection to an external device; and

- a second communication pathway means implanted in the jaw operatively connected to the first communication pathway means and extending subcutaneously toward the internal body location without intersecting the gingiva to enable the medical device to communicate with the predetermined internal body location.

4,412,826

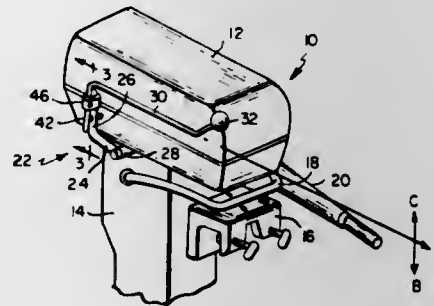
#### SAFETY SHIFT DEVICE FOR OUTBOARD MOTORS

William A. Jones, 70 East Ave., Marion, Mass. 02738, and Hugh M. Young, 98 Swanson Ter., Stoughton, Mass. 02072

Filed Sep. 8, 1981, Ser. No. 299,992  
Int. Cl.<sup>3</sup> B63H 5/13

U.S. Cl. 440-86

1 Claim



1. A device for actuating the gear shift lever of an outboard motor rotatable about the horizontal axis of a shaft extending laterally from the motor, wherein said gear shift lever has an upstanding vertical arm offset rearwardly of and extending upwardly from the axis of the shaft, comprising an elongate control rod provided at one end with an integral right angular downward extension and its other end with a knob, means for securing said downward extension to the upstanding vertical arm of the gear shift lever in parallel relation thereto so that, in the neutral position of the gear shift lever, the control rod is substantially horizontal and the end provided with a knob extends forwardly from the gear shift lever in an inboard direction beyond the motor and means for fastening said extension to said arm, comprising a pivot pin fixed at one end to the lower end of the extension, a hole in the lower end of the arm through which the pivot pin extends from the outer side through the hole to the inner side, a coil compression spring positioned about the pivot pin between the extension and the arm, a cotter pin fixed to the pivot pin at the inner side of the arm, a collar positioned about the extension and the arm adjacent the upper end of the arm and a set screw fixing the collar to the extension.

4,412,827

#### UNIVERSAL JOINT

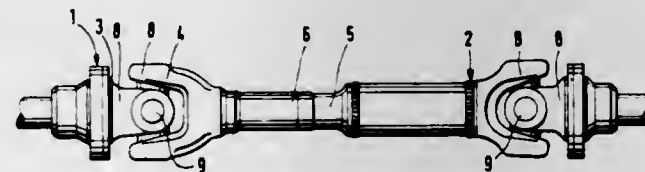
Miloslav Petrzalka, Much-Kranichel, and Herbert Taureg, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Car-dan AG, Siegburg, Fed. Rep. of Germany  
Filed Jul. 18, 1980, Ser. No. 172,362

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933505

Int. Cl.<sup>3</sup> F16D 3/26

U.S. Cl. 464-128

10 Claims



1. In a universal joint having trunnion cross means including trunnion means defining a centerline extending centrally there-through and trunnion cross support means including yoke means defining yoke bore means having inner surface means and bearing bush means having outer surface means received within said inner surface means of the yoke bore means and receiving said trunnion means, the improvement comprising that said trunnion cross support means is formed with conical surface means interfacing between said outer surface means of said bearing bush means and said inner surface means of said yoke bore means, said conical surface means, taken in a direc-

tion outwardly from the center of said universal joint, being formed to extend from radially inwardly to radially outwardly relative to a plane containing said centerline of said trunnion means, said conical surface means operating to define a gap between a part of said outer surface means of said bearing bush means and said inner surface means of said yoke bore means, said gap extending over a part of the spherical area and over a part of the axial length of said inner and outer surface means, said gap being enlarged in relation to the center of said joint from radially inwardly to radially outwardly thereof.

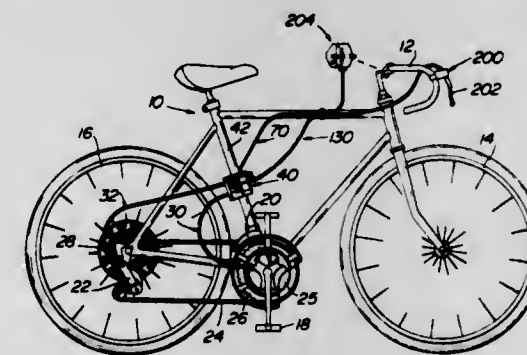
4,412,828

#### CONTROL MEANS FOR SHIFTING GEARS ON DUAL SHIFT BICYCLES

Jack B. Darby, 302 Bunker Hill Rd., Harleysville, Pa. 19438  
Filed May 7, 1981, Ser. No. 261,576

Int. Cl.<sup>3</sup> F16H 9/00, 11/00; B60K 20/00; G05G 9/00  
U.S. Cl. 474-81

30 Claims



1. In a dual shift bicycle having a plurality of drive gears and including a frame, a drive chain, a front sprocket cluster including a plurality of sprockets, a front derailleur associated with the front sprocket cluster and movable to positions for shifting the drive chain into engagement with the sprockets thereof, a rear sprocket cluster including a plurality of sprockets, a rear derailleur associated with said rear sprocket cluster and movable to positions for shifting the drive chain into engagement with the sprockets thereof, a front derailleur shift means operatively connected at one end to the front derailleur and movable for positioning the front derailleur, and rear derailleur shift means operatively connected at one end to the rear derailleur and movable for positioning the rear derailleur, the improvement comprising:

means for shifting between the gears on said dual shift bicycle by moving the front and rear derailleur shift means to position said front and rear derailleurs, including control means including a front control member operatively engaged with said front derailleur shift means and movable through shifting movements between a plurality of control positions and a rear control member operatively engaged with said rear derailleur shift means and movable through shifting movements between a plurality of control positions,

means for selecting for each of said front and rear control members a selected control position to which said front and rear control members are to be moved in a rear shifting movement from a present control position to a selected control position,

and means operatively engageable with said front and rear control members for actuating the same through said shifting movement with said front and rear control members being positioned together in accordance with two selected control positions of the selecting means when said actuating means is actuated,

said selecting means being operable independently of said actuating means so that the shifting between the gears of said dual shift bicycle is performed in two sequential operations, the first operation being the selection of a desired new gear and the second operation being the actual shifting into said selected gear.

4,412,829

#### PRODUCTION OF CIGARETTE FILTER UNITS

Jean-Pierre Lebet, Montreux, and Michel Berner, Bavois, both of Switzerland, assignors to Baumgartner Papiers, S.A., Crissier, Switzerland

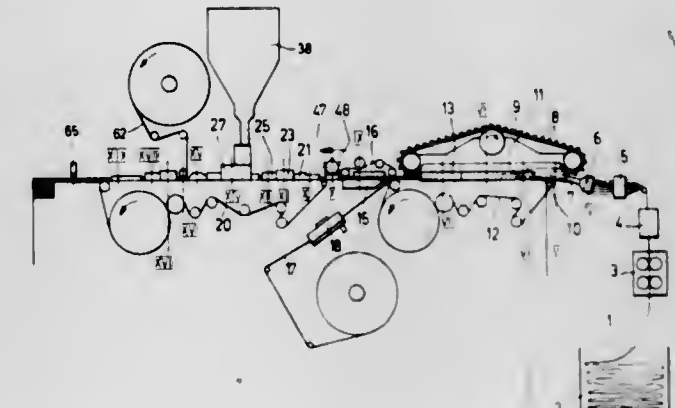
Filed Apr. 2, 1981, Ser. No. 250,390

Claims priority, application Switzerland, Apr. 8, 1980, 2692/80

Int. Cl.<sup>3</sup> A24C 5/50

U.S. Cl. 493-48

10 Claims



1. Apparatus for producing a cigarette filter unit, having supply means for supplying a filter rod provided with chambers comprising filling openings which terminate to the outside surface of the filter rod, a filler member for filling the chambers with pourable and/or fibrous filter material, a closing arrangement for closing the filling openings of the chambers filled with pourable and/or fibrous filter material, by means of a closure strip, and having divider means for dividing into defined length sections the filter rod provided with full chambers, characterised in that the filler member which lies slidingly and sealingly on the filter rod and which terminates by at least one filler opening into the chamber filling openings moving past, is provided with at least one first filter material storage chamber which is directly connected to the filler opening, and with at least one second filter material storage chamber which is connected to the first storage chamber by way of a connecting duct which is closable by means of a first closing arrangement, that both filter material storage chambers are constructed as pressure chambers and are connected to controllable supply means for the controlled supply into the interior thereof of a pressure gas subjected to overpressure, that the second storage chamber comprises at least one supply opening closable by means of a second closing arrangement for supplying to this second storage chamber further pourable and/or fibrous filter material when a certain quantity of filter material located therein is too small, and that the first and the second closing arrangement and the supply means for compressed gas are coupled together in such a manner that always only one of the two closing arrangements can be opened, and that upon opening the first closing arrangement a pressure prevails in the second storage chamber which is at least approximately equal to the pressure in the first storage chamber.

4,412,830

#### COVER FOR CENTRIFUGE ROTOR

David H. Strain, Los Gatos, and John H. Sutton, III, Belmont, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 24, 1982, Ser. No. 391,670

Int. Cl.<sup>3</sup> B04B 7/02

U.S. Cl. 494-12

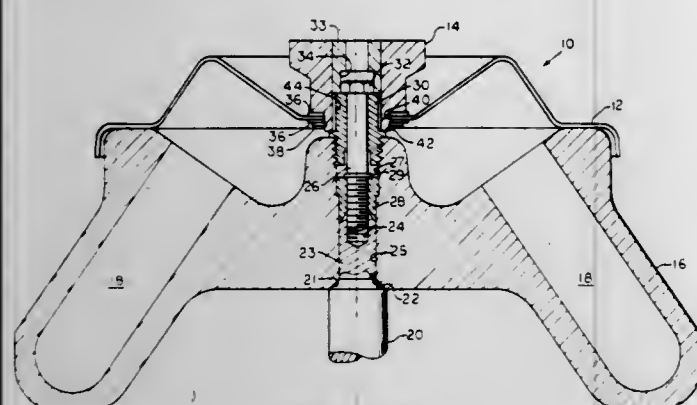
6 Claims

1. A cover for a centrifuge rotor, said rotor having an opening through its center of rotation and being mounted on a drive shaft, said rotor secured to said drive shaft by a threaded fastener at the top of the rotor comprising:

- a cover body having an opening through the center;
- a knob mounted in the center of said cover body, said knob



captively retained but free to turn with respect to said cover body;



tool means in said knob for rotatably coupling said knob to said threaded fastener, thereby enabling said threaded fastener to be tightened and loosened by turning said knob.

4,412,831

## TWO PLANE SELF-BALANCING CENTRIFUGE

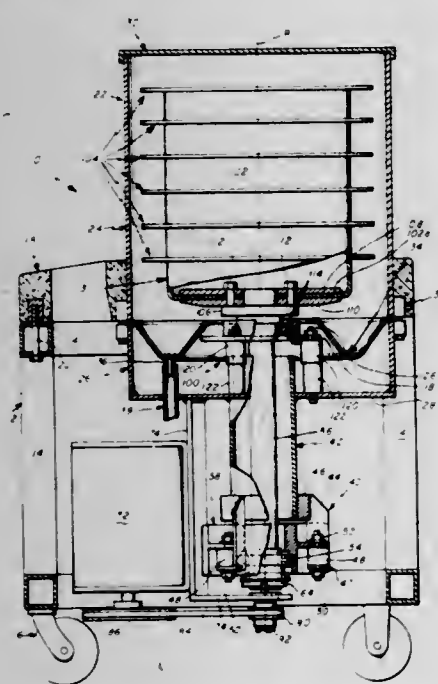
Hollon B. Avery, Worcester, and Donald W. Schoendorfer, Brookline, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Jul. 9, 1981, Ser. No. 281,648

Int. Cl.<sup>3</sup> B04B 9/00

U.S. Cl. 494—46

15 Claims



1. A centrifuge for processing fluids comprising:

- (a) a rotor;
- (b) a bearing shaft attached to said rotor and adapted to be driven by a drive means;
- (c) first and second bearing members each having a first side rigidly affixed to said bearing shaft and located on said shaft in spaced apart relationship to one another;
- (d) first and second spring means being more flexible in one plane than in a plane perpendicular thereto coupled at one point to a second side of the respective first and second bearing members and at another point to a relatively rigid mass means.

4,412,832

## PEELABLE CATHETER INTRODUCTION DEVICE

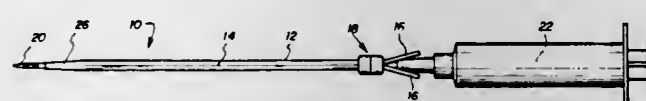
John E. Kling, Larry R. Camin, and Douglas W. Scott, all of Dallas, Tex., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 30, 1981, Ser. No. 259,281

Int. Cl.<sup>3</sup> A61M 25/00

U.S. Cl. 604—164

8 Claims



1. An introducer catheter through which an infusion catheter can be inserted into a lumen comprising:

- (a) an introducer catheter tube having a proximal end and a distal end;
- (b) said introducer catheter tube being provided with score lines along which said catheter may be split apart; and
- (c) a slidable sleeve telescopically disposed on the outer surface of said introducer catheter tube, said sleeve being slidable towards the distal end by force exerted upon it through said introducer catheter tube as it is disrupted.

4,412,833

## TAMPON APPLICATOR

Georg Wiegner, Viersen, and Elmar Reinwald, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

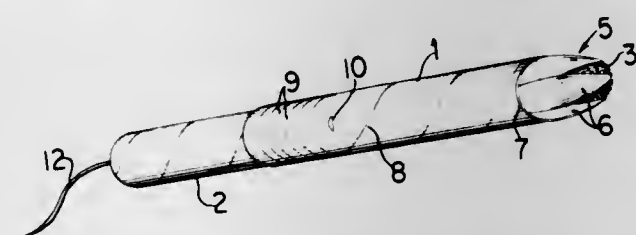
Filed Nov. 10, 1981, Ser. No. 319,914

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121364

Int. Cl.<sup>3</sup> A61F 15/00

U.S. Cl. 604—14

4 Claims



1. An applicator system for hygienic introduction of a tampon which comprises a substantially cylindrical outer sleeve, a substantially cylindrical inner sleeve displaceable therein having an outer diameter substantially the same as the inner diameter of the outer sleeve and a flanged end, and a substantially cylindrical tampon, wherein (a) the front end of the outer sleeve is a conically rounded lamellar shutter means consisting of a ring of tulip-shaped, folded, individual lamellae abutting a circumferential groove, the shutter means being normally closed and opening during ejection of the tampon, the circumferential groove acting as a hinge means; (b) the outer sleeve consists of a high-gloss, plastic-coated paper, said paper being coated on the outer surface and said coated paper being readily water degradable or water dispersible; (c) the inner sleeve is comprised of water degradable or water dispersible paper; (d) the inner surface of the outer sleeve and the outer surface of the inner sleeve have co-efficients of friction such that they do not readily slide without applied pressure but on application of slight manual pressure readily slide, thus facilitating the opening of the lamellar shutter means and ejection of the tampon; (e) the outer sleeve has a grip in the form of a scoring; (f) said inner sleeve has substantially the same length as the outer sleeve; and (g) the outer sleeve, inner sleeve, and tampon form with the closed lamellar shutter means at the front end of the tampon a substantially closed system.

4,412,834

## ANTIMICROBIAL ULTRAVIOLET IRRADIATION OF CONNECTOR FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

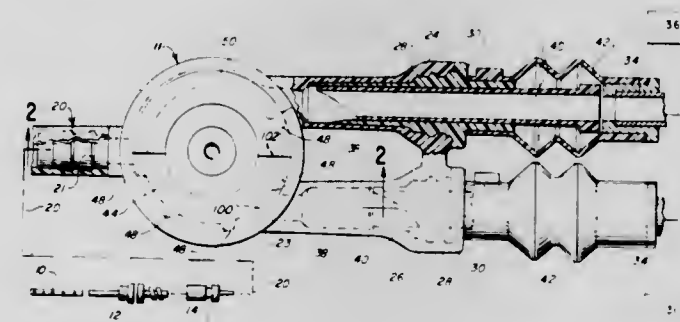
Ralph Kulin, Marengo, Ill.; Jack W. Moncrief; Robert P. Popovich, both of Austin, Tex., and Ronald C. Stauber, Hawthorne Woods, Ill., assignors to Baxter Travenol Laboratories, Deerfield, Ill., by said Ralph Kulin and Ronald C. Stauber

Filed Jun. 5, 1981, Ser. No. 270,743

Int. Cl.<sup>3</sup> A61J 7/00; F16L 35/00

U.S. Cl. 604—29

34 Claims



1. A connector valve for selectively permitting the transfer of fluids therethrough, which comprises multiple-way valve means communicating with a plurality of conduits and selectively permitting and preventing flow between the conduits; said multiple-way valve means comprising outer walls made of substantially ultraviolet-transmissive material; said outer walls of the multiple-way valve means enclosing an elastomeric seal member, said seal member defining rotatable flow channel means for communication with differing conduits at differing rotational positions and providing rotatable seal means against inner surfaces of said outer walls to maintain antimicrobial conditions within said valve, said flow channel means being exposed along its entire length to an inner surface of an outer wall, and means for relatively rotating said seal member relative to said conduits.

4,412,835

## STERILE DOCKING PROCESS, APPARATUS AND SYSTEM

Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jul. 6, 1982, Ser. No. 395,796

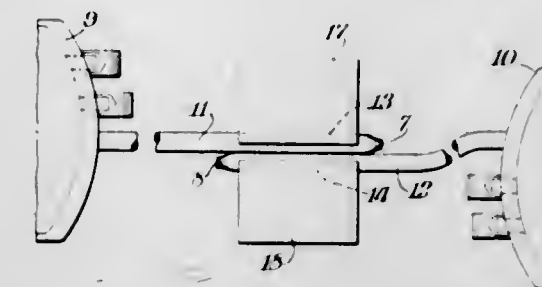
Int. Cl.<sup>3</sup> A61M 5/00; B32B 31/00

U.S. Cl. 604—29

21 Claims

1. A process of joining first and second thermoplastic tubes together comprising juxtaposing said tubes, forming a molten seal between a surface of a heated elongated body placed substantially perpendicularly to the axes of said tubes and an adjacent side section of each of said tubes thereby providing a

seal between the interior and exterior of said tubes and moving the molten side sections of said tubes together while passing



said tubes over an end of said body, thereby forming a joint between said tubes.

4,412,836

## SYRINGE ASSEMBLY

Dominic J. Brignola, Phoenixville, Pa., assignor to The West Company, Incorporated, Phoenixville, Pa.

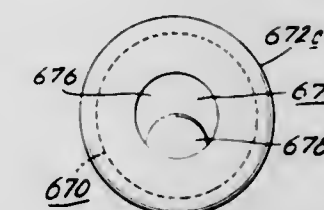
Division of Ser. No. 34,461, Apr. 27, 1979, Pat. No. 4,331,146, which is a continuation-in-part of Ser. No. 753,954, Dec. 23, 1976, abandoned, which is a continuation of Ser. No. 467,790, May 7, 1974, abandoned, which is a continuation-in-part of Ser.

No. 399,729, Sep. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,759, Sep. 22, 1971, abandoned. This application Dec. 11, 1981, Ser. No. 329,661

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—87

1 Claim



1. A plunger for a syringe made of a resilient material comprising a generally cylindrical body portion, a plurality of radial axially spaced ribs on its outer peripheral, a rupturable diaphragm spaced inwardly from opposite axial ends of the body portion, said diaphragm having a localized weakened area to minimize particle formations when the diaphragm ruptures, and also providing a more accurate control of force required to rupture the diaphragm consisting of a crescent-shaped membrane portion of thinner cross section than the remainder defined by the crescent and the circular trace of the diaphragm.



## CHEMICAL

4.412.837

## PROCESS FOR RESIST PRINTING CELLULOSE FIBRES WITH REACTIVE OR DEVELOPING DYES

**Adolf Blum, and Hans D. Opitz, both of Ludwigshafen, Fed.  
Rep. of Germany, assignors to BASF Aktiengesellschaft,  
Ludwigshafen, Fed. Rep. of Germany**

Filed Apr. 30, 1982, Ser. No. 373,409

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118193

Int. Cl.<sup>3</sup> C09D 11/02; D06P 5/12

U.S. Cl. 8-449 11 Claims

1. In the process for printing textiles made from cellulose fibers or cellulose fibers mixed with other fibers employing reactive and/or developing dyes according to the resist process the improvement wherein 1000 parts by weight of the printing paste contains 10 to 100 parts by weight of a compound selected from the group consisting of:

butylglycol,  
butyldiglycol,  
butyltriglycol,  
1,2-butane diol,  
2,5-hexane diol,  
diethylene glycol monoethyl ether,  
and mixtures thereof.

4,412,838

## PROCESS FOR RECOVERING POTASSIUM CHLORIDE

Dietrich Ertl, Königstein, and Dieter Ueberle, Frankfurt am Main, both of Fed. Rep. of Germany, assigns to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

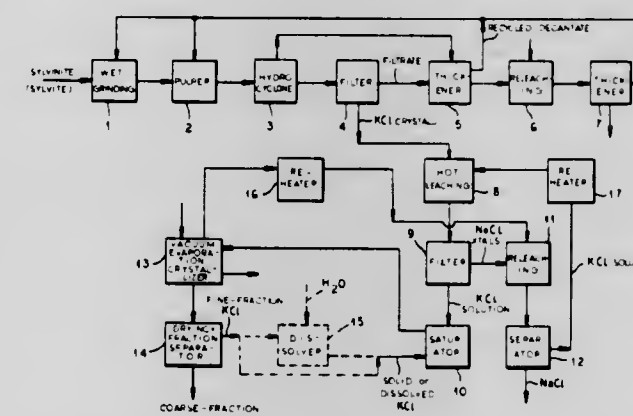
Continuation of Ser. No. 1,320, Jan. 5, 1979, abandoned. This application Nov. 6, 1980, Ser. No. 204,532

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1978, 2801705

Int. Cl.<sup>3</sup> B01D 9/02

U.S. Cl. 23-302 R

## 9 Claims



1. A process for recovering potassium chloride from a starting material consisting predominantly of KCl and NaCl and consisting essentially of the following steps:

- (a) finely grinding the starting material;
- (b) pulping the finely ground starting material at ambient temperature with a solution which is saturated with sodium chloride and potassium chloride to produce a pulped mass;
- (c) classifying the pulped mass formed in step (b) to produce a first phase consisting of the solution and water-insoluble impurities which are mechanically entrained by the solution and a second phase consisting of a moist salt mass which consists substantially of potassium chloride and sodium chloride and from which water-insoluble impurities have been removed to a high degree;
- (d) separating the solution from the water-in-soluble impurities of step (c) and recycling the separated solution at least in part to step (b) for pulping the ground starting material therein;
- (e) contacting the moist salt mass obtained in step (c) and consisting substantially of potassium chloride and sodium

chloride with a solution which comes from a crystallizing stage and which is saturated with sodium chloride and potassium chloride, the contacting being carried out so that a suspension at a temperature of at least 95° C. is obtained:

- (f) separating the solution enriched with potassium chloride of step (e) from a solid residue which contains mainly sodium chloride; and
- (g) crystallizing the solution obtained in step (f), wherein steps (e), (f) and (g) are carried out in isolation from steps (a), (b) and (c) and the water-insoluble impurities contained therein.

**4.412.839**

## COAL TREATMENT PROCESS

David W. Taylor, Edgemont, Pa., assignor to Ergon, Inc., Jackson, Miss.

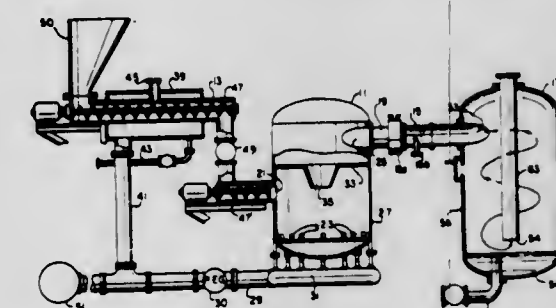
Continuation-in-part of Ser. No. 93,870, Nov. 11, 1979, Pat. No. 4,288,231. This application Sep. 4, 1981, Ser. No. 299,648

The portion of the term of this patent subsequent to Sep. 8, 1998,  
has been disclaimed.

Int. Cl.<sup>3</sup> C10L 9/00, 9/08; B02C 19/06

U.S. Cl. 44-1 B

## 14 Claims



1. A process for treating coal to reduce the level of ash-forming impurities contained therein comprising:
  - a. grinding raw coal to a particle size of less than about 40 microns in a substantially air free environment to form a coal-fraction which comprises a major portion of hydrophobic coal particles and a minor portion of hydrophilic coal particles, and an impurities-fraction comprising hydrophilic impurities particles;
  - b. at least regulating the temperature of the coal at which the grinding step is carried out within the range greater than 220° F. but less than 400° F. to control the amount of said minor portion of hydrophilic coal particles so as to fall substantially below 50% by weight of said raw coal;
  - c. contacting said fractions with an aqueous liquid whereby said hydrophilic impurities particles and said minor portion of hydrophilic coal particles are wetted, but the hydrophobic coal particles are left substantially dry; and
  - d. separating said hydrophobic coal particles from said hydrophilic particles.

**4.412.840**

## PELLETIZING LIGNITE

Mehmet A. Goksel, Houghton, Mich. assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Continuation of Ser. No. 82,666, Oct. 9, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,491

Int. Cl.<sup>3</sup> C10L 5/16, 5/26

U.S. Cl. 44-10 D

## 9 Claims

1. A method for forming high strength pellets from lignite comprising the steps of:
  - (a) comminuting run of the mine raw lignite into finely divided form without substantial drying;
  - (b) uniformly blending a sufficient amount of an aqueous base bituminous emulsion with said finely-divided raw lignite to form a moistened mixture containing at least 3 weight % of the bituminous materials, based on the total dry weight of the solids in said mixture;



- (c) pelletizing said moistened mixture in a balling means to form discrete, generally spherical, green pellets and having a moisture content of about 25 to about 45 weight %; and
- (d) drying said green pellets.
3. A method according to claim 1 wherein said green pellets are dried to a moisture content of no less than about 5 weight % during Step (d).

4,412,841

# COMPACTED CARBONACEOUS SHAPES AND PROCESS FOR MAKING THE SAME

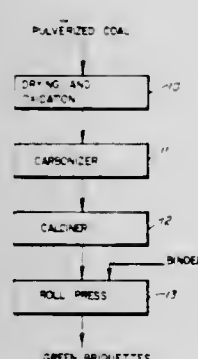
William Du Broff, Munster; George H. Craig, La Porte, and Timothy A. Veslocki, Highland, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jun. 29, 1981, Ser. No. 278,056

Int. Cl.<sup>3</sup> C10B 19/00, 53/08, 57/06; C10L 5/28

U.S. Cl. 44—10 C

16 Claims



1. A process for producing compacted carbonaceous shapes comprising the steps of mixing a particulate carbonaceous material with a volatilizable organic binder, said particulate carbonaceous material comprising a calcined char obtained by carbonizing pulverized coal to remove volatile matter and calcining the resultant char, forming the mixture into pre-formed green shapes, heating said green shapes initially by induction heating at a relatively lower frequency so as to effect substantially uniform heating throughout said shapes, and thereafter heating said shapes by induction heating at a relatively higher frequency sufficient to effect increased heating at the surfaces of said shapes whereby to effect surface graphitization of said shapes.

4,412,842

# COAL BENEFICIATION PROCESS

Charles W. Klayer, Louisville, Ky., assignor to Eric Charles Cottell, Bayville, N.Y.

Continuation of Ser. No. 33,640, Apr. 26, 1979, abandoned, which is a continuation of Ser. No. 888,356, Mar. 20, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,612

Int. Cl.<sup>3</sup> C10L 9/02, 1/32

U.S. Cl. 44—1 SR

10 Claims

1. A method of beneficiating coal which has non-carbonaceous impurities, comprising:
- (a) rendering coal to particles of less than 200 microns in diameter;
  - (b) forming an aqueous slurry consisting of said coal particles of less than 200 microns in diameter and water;
  - (c) then cavitating said slurry with intense agitation at a level of at least 15 joules/cm<sup>2</sup> to thereby further break the coal particles into smaller particles and to impregnate the particles with water and concentrating said slurry while the slurry is still in a cavitating state to a mixture having up to 40% water to thereby remove a portion of the water and non-carbonaceous impurities from the slurry.
2. The method of claim 1 wherein said cavitation is provided by sonic agitation.
5. The method of claim 1 including pulverizing lime with said coal.
10. A fuel consisting essentially of only coal, oil and water

resulting from the steps of: forming a slurry consisting of coal particles and water, cavitating the slurry with intense agitation to break the coal particles into small particles and to impregnate the particles with water and to break off non-carbonaceous impurities from the coal particles, gravitationally separating the coal particles from a major portion of the water and non-carbonaceous impurities while the slurry is in a cavitating state, and slurrying the coal and minor portion of water with oil.

4,412,843

# BENEFICIATED COAL, COAL MIXTURES AND PROCESSES FOR THE PRODUCTION THEREOF

Lester E. Burgess; Karl M. Fox, both of Swarthmore, and Phillip E. McGarry, Palmerton, all of Pa., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 114,414, Jan. 22, 1980, Pat. No. 4,304,573. This application May 28, 1981, Ser. No. 267,773

Int. Cl.<sup>3</sup> C10M 1/32

U.S. Cl. 44—51

22 Claims

1. A process for beneficiating coal comprising admixing coal in an aqueous medium with a surface treating mixture comprising a polymerizable monomer, a polymerization catalyst and a liquid organic carrier, thereby rendering said coal hydrophobic and oleophilic.

4,412,844

# STABLE OIL DISPERSIBLE MAGNESIUM HYDROXIDE SLURRIES

John H. Collins, Bloomingdale; Mei-Jan L. Lin, Naperville, and George T. Kekish, Chicago, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 50,376, Jun. 20, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 277,371

Int. Cl.<sup>3</sup> C10M 1/06, 1/10; C10L 1/12

U.S. Cl. 44—51

2 Claims

1. A stable, oil-dispersible, aqueous dispersion of magnesium hydroxide useful as a vanadium corrosion additive for liquid hydrocarbon fuels comprising in percentages by weight:
- (a) 20–70% magnesium hydroxide having particle size from 1.0–50 microns;
  - (b) 29–79% water;
  - (c) 1.0–8.0% of a water-dispersible, oil-soluble, water-in-oil emulsifying agent having an HLB value of from 4–10;
  - (d) 0.1–6% of a water-soluble, oil-dispersible emulsifying agent having an HLB of from 20–40, said water-soluble oil-dispersible emulsifying agent being characterized as having a surface active functional group from the group consisting of amide, amine, or ammonium; said dispersion having a Brookfield viscosity of 100–5000 cps utilizing a #3 spindle at 12 rpm at 75° F., said dispersion further being characterized as being readily dispersible into a liquid hydrocarbon fuel.

4,412,845

# ETHANOL OR GASOHOL FUEL COMPOSITION CONTAINING AS INHIBITOR A REACTION PRODUCT OF ITACONIC ACID AND MONO-OLEYL-1,3-DIAMINOPROPANE

Benjamin J. Kaufman, and William M. Sweeney, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 16, 1982, Ser. No. 408,324

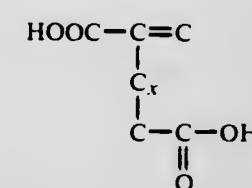
Int. Cl.<sup>3</sup> C10L 1/22

U.S. Cl. 44—53

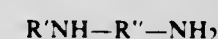
26 Claims

1. A fuel composition for internal combustion engines comprising
- (a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0–50 volumes per volume of alcohol; and

- (b) a minor wear-inhibiting amount of, as a wear-inhibiting additive, a reaction product of one mole of the acid



wherein x is an integer 0–2; and two moles of the amine



wherein R' is alkyl, alkenyl, alkaryl, aralkyl, aryl, cycloalkenyl or cycloalkyl and R'' is an alkylene, cycloalkylene, aralkylene, alkylene, or arylene or polyoxyalkylene.

4,412,846

# FUELS CONTAINING N-SUBSTITUTED AMINO MORPHOLINES

Franklin P. Abbott, Brooklyn, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

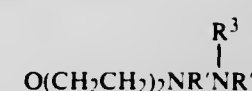
Continuation of Ser. No. 32,440, Apr. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 732,612, Oct. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,575, Oct. 31, 1975, Pat. No. 3,989,476, which is a continuation-in-part of Ser. No. 480,764, Jun. 19, 1974, abandoned. This application May 7, 1981, Ser. No. 261,365

Int. Cl.<sup>3</sup> C10L 1/22

U.S. Cl. 44—63

18 Claims

1. A fuel composition containing a major amount of a normally liquid fuel and a minor but detergent-producing amount of at least one N-substituted morpholine of the formula



wherein R' is a divalent organic radical of at least one to about thirty carbon atoms, R<sup>3</sup> is a hydrogen atom or a monovalent hydrocarbyl, hydroxy-substituted hydrocarbyl or hydroxy hydrocarbyleneoxy-substituted hydrocarbyl radical of at least one carbon and R'' is a hydrocarbyl radical of at least about thirty carbon atoms.

4,412,847

# MOTOR FUEL ADDITIVE

Serge R. Dolhyj, Parma; Louis J. Velenyi, Lyndhurst, and Andrew T. Guttman, Maple Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

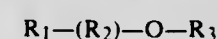
Filed Oct. 3, 1978, Ser. No. 948,351

Int. Cl.<sup>3</sup> C10L 1/18

U.S. Cl. 44—77

15 Claims

1. A motor fuel comprising a blend of (1) a mixture of hydrocarbons boiling within the gasoline range, and (2) an aryl ether, said aryl ether having the structure:



wherein

- R<sub>1</sub> is selected from the group consisting of phenyl, substituted phenyl substituted with one methyl group, substituted phenyl substituted with two methyl groups and substituted phenyl substituted with one ethyl group;
- R<sub>2</sub> is selected from the group consisting of substituted methane substituted with one or two methyl groups, ethane, and substituted ethane substituted with one or two methyl groups;
- R<sub>3</sub> is selected from the group consisting of methyl and ethyl.

4,412,848

# HEAT RECOVERY METHOD FROM GASIFIED PRODUCTS OF HYDROCARBON

Shuntaro Koyama, Hitachi; Tomohiko Miyamoto, Takahagi; Shinji Tanaka, Hitachi; Hiroshi Miyadera, Hitachi, and Sadao Takahashi, Hitachi, all of Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

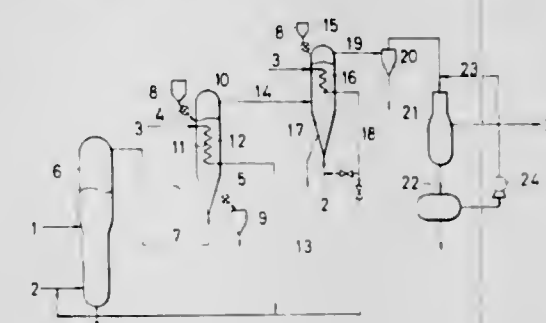
Filed Mar. 24, 1982, Ser. No. 361,270

Claims priority, application Japan, Apr. 28, 1981, 56-63346

Int. Cl.<sup>3</sup> C10J 3/46

U.S. Cl. 48—197 R

2 Claims



1. A heat recovery method from gasified products of hydrocarbon to recover heat by introducing gas containing oily matters produced by gasifying hydrocarbon and by indirect heat exchange between the said product gas and the cooling agent passing through the heat transfer tube provided in the fluidized bed, in which said gas is passed through the said high temperature fluidized bed kept at about 450°–500° C. and then through the low temperature fluidized bed kept at about 250°–300° C. successively and that the heat of said product gas is recovered by heat exchange in said high temperature fluidized bed and low temperature fluidized bed respectively.

4,412,849

# METHOD AND APPARATUS FOR CONTROL OF GAS-BORNE PARTICULATES

Chandru M. Shahani, Bombay, India, assignor to Klenzaid Engineers Private Limited, Bombay, India

Filed Nov. 20, 1981, Ser. No. 323,571

Claims priority, application United Kingdom, Apr. 9, 1981, 8111175; Apr. 29, 1981, 8113173

Int. Cl.<sup>3</sup> B01D 46/00

U.S. Cl. 55—97

5 Claims



1. A method of maintaining the concentration of gas-borne particles in a work space defined by mutually perpendicular X, Y and Z axes to a level of less than 3 particles of 0.5 micron or larger per liter of gas, the plane formed by the X-Y axes being horizontal and impervious and the plane formed by the Y-Z axes being vertical, said method including the steps of
- (a) positioning a filter element having a plurality of straight, parallel pleats which have sequentially decreasing depths in the plane formed by the Y-Z axes such that the pleats extend parallel to the Y axis and the depths of the pleats are parallel to the X axis and decrease from pleat to pleat in the direction of the positive Z axis,
  - (b) causing gas to pass through said filter element so as to provide a plurality of parallel, laminar streamlines of gas to flow in the direction of the positive X axis and parallel to the plane formed by the X-Y axes, the velocities of the



streamlines incrementally decreasing from one streamline to the next in the direction of the positive Z axis.

4,412,850

**ELECTRIC DUST COLLECTOR**

Tonio Kurata, Yokohama, and Hiroshi Fuji, Machida, both of Japan, assignors to Neat Shujinki Kogyo Kabushiki Kaisha, Yokohama, Japan

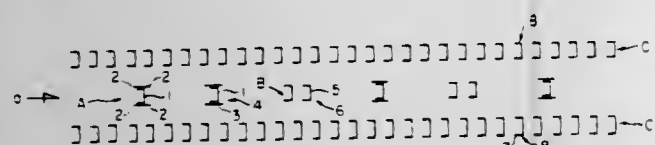
Filed Jul. 12, 1982, Ser. No. 397,162

Claims priority, application Japan, Jul. 11, 1981, 56-108515

Int. Cl.<sup>3</sup> B03C 3/36, 3/40

U.S. Cl. 55—130

1 Claim



1. An electric dust collector which includes a discharge unit comprising an array of a plurality of discharge electrodes each having a plurality of discharge styluses attached to each inner or outer side of a member of a light gauge steel for general structure to be parallel to a gas flow direction, an oppositely charged particle collecting unit comprising an array of a plurality of members of light gauge steel for general structure as dust collecting electrodes located downstream from said discharge unit in the gas flow direction, said discharge unit and said oppositely charged particle collecting unit being alternately arranged to constitute a discharge electrode side, a dust collecting unit consisting of an array of members of light gauge steel for general structure as dust collecting electrodes arranged at predetermined intervals at each side of said discharge electrode side, lines normal to and depending from pointed ends of said discharge electrodes substantially coinciding with central lines of side surfaces of said dust collecting electrodes of said dust collecting unit.

4,412,851

**CRYOGENIC APPARATUS SUITABLE FOR OPERATIONS IN ZERO GRAVITY**

Robert Laine, NL Wassenaar, France, assignor to Agence Spatiale Europeenne, Paris, France

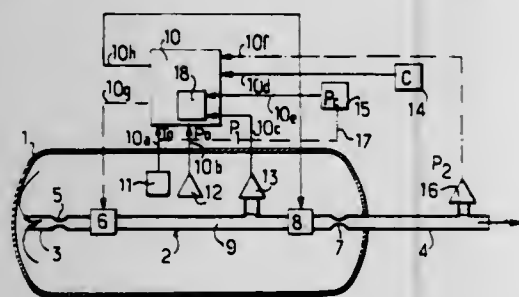
Filed Feb. 10, 1982, Ser. No. 347,651

Claims priority, application France, Mar. 2, 1981, 81 04086

Int. Cl.<sup>3</sup> B01D 19/00; F17C 7/02

U.S. Cl. 55—160

20 Claims



1. Cryogenic apparatus of the open cycle kind comprising a reservoir for storing a cryogenic fluid in liquid-vapour phase equilibrium, and a phase separator comprising an inlet for receiving fluid from within said reservoir and an outlet for liberating fluid outside, said inlet including inlet obturator means for closing and opening said inlet, characterized in that said phase separator comprises a transfer chamber disposed within said reservoir between said inlet and said outlet, said inlet presenting a constriction and said outlet including outlet obturator means for closing and opening said outlet, and control means for alternately closing and opening said obturator means in sequence, whereby to admit fluid from said reservoir

into said transfer chamber, and subsequently to liberate said fluid from said transfer chamber.

11. Cryogenic apparatus of the open cycle kind comprising a reservoir for storing a cryogenic fluid in liquid-vapour phase equilibrium, and a phase separator comprising an inlet for receiving mixed phase fluid from within said reservoir and an outlet for liberating fluid outside, said inlet including inlet obturator means for closing and opening said inlet, characterized in that said phase separator is disposed within said reservoir and comprises a transfer chamber between said inlet and said outlet, said inlet presenting a constriction and said outlet including outlet obturator means for closing and opening said outlet, and control means for alternately closing and opening said inlet and outlet obturator means in sequence, whereby to admit fluid from said reservoir into said transfer chamber, to allow liquid in said transfer chamber to evaporate at a pressure intermediate between the reservoir pressure and the outlet pressure, and subsequently to liberate said fluid from said transfer chamber.

4,412,852

**APPARATUS FOR PRODUCING BRICK-SHAPED BLOCKS OF DRY ICE**

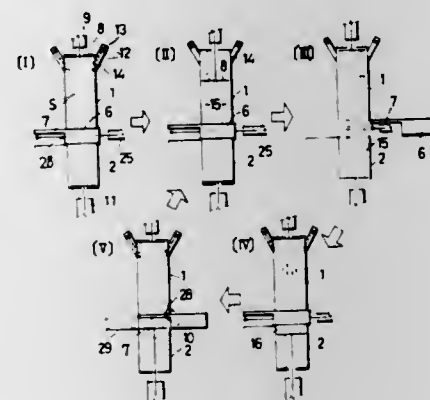
Naotake Umino, 1962-3 Oono, Ichikawashi, Chibaken, and Tatsuo Fukuda, 5-23-405 Takesato Danchi, 6-118 Ooaza Ooeda, Asukabeshi, Saitamaken, both of Japan

Filed Dec. 14, 1981, Ser. No. 330,497

Int. Cl.<sup>3</sup> F25J 1/00

U.S. Cl. 62—35

12 Claims



1. An apparatus for producing blocks of dry ice from liquid carbon dioxide, comprising: a supporting frame; an upper, charging mold mounted on said supporting frame and having an outlet at the lower end thereof; a lower, press mold mounted on said supporting frame beneath said charging mold and spaced therefrom, said press mold having an inlet opening at the upper end thereof in alignment with said outlet opening; a press piston slidably mounted within said press mold; actuator means connected with said press piston, and operable to move it between lowered and elevated positions; nozzle means mounted near the upper end of said charging mold, and arranged to inject liquid carbon dioxide into said charging mold to form dry ice snow; transfer means mounted to confront the space between said upper and said lower molds; and shutter means carried by said supporting frame and received in the space between said upper and said lower molds, said shutter means including: a shutter having an extension projecting forwardly from the front, top edge thereof, the top surfaces of said shutter and said extension being continuous, and said extension and the front face of said shutter defining a recess that is open at the bottom and front thereof; and actuator means arranged to move said shutter forwardly and backwardly between a fully closed position, wherein said shutter closes both said outlet and said inlet, an outlet

closed position, wherein said charging mold outlet is closed by said extension and said recess is positioned over said press mold inlet, and a fully open position wherein both said inlet and said outlet are open and in communication with each other,

whereby dry ice snow is accumulated in said charging mold while said shutter is in said fully closed and said outlet closed positions, and is passed as a charge into said lower, press chamber when said shutter is in said fully open position;

said press piston and said press actuator means being effective to compress said dry ice snow charge into a block of dry ice when said shutter is in said fully closed position, and being further effective to elevate said block of dry ice and place it in said recess when said shutter is in said outlet closed position; and

said shutter and said shutter actuator means being effective to transport said dry ice block to said transfer means when said shutter is thereafter moved from said outlet closed position to said fully closed position.

of definite predetermined shape, heating the formed article to decompose and remove the fugitive binder, hot pressing the



thus treated article to form a composite article of high strength.

4,412,853

**METHOD OF MAKING OPTICAL WAVEGUIDE FIBER PREFORM STARTER TUBES**

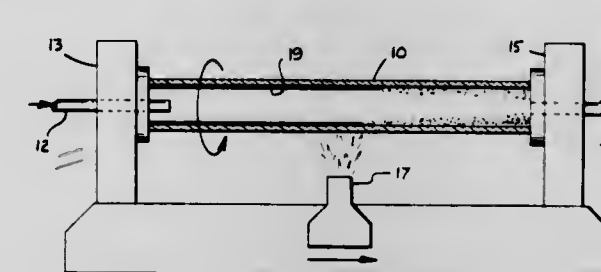
Fred P. Partus, Marietta, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,158

Int. Cl.<sup>3</sup> C03B 23/08, 37/025

U.S. Cl. 65—3.12

1 Claim



1. A method of making an optical waveguide fiber preform starter tube having a tube wall of preselected cross-sectional area comprising the steps of extruding or free-drawing a glass tube having a tube wall cross-sectional area less than said preselected area; measuring the wall cross-sectional area of the glass tube; and fusing successive layers of glass having a composition different from that of the glass tube but an index of refraction substantially equal to that of the glass tube onto the interior surface of the tube by vapor deposition until the tube wall cross-sectional area is substantially equal to said preselected area.

4,412,854

**METHOD OF PRODUCING FIBER REINFORCED GLASS MATRIX COMPOSITE ARTICLES OF COMPLEX SHAPE**

George K. Layden, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1982, Ser. No. 381,803

Int. Cl.<sup>3</sup> B32B 5/00; C03C 27/00; C03B 23/20

U.S. Cl. 65—18.1

3 Claims

1. A method of making fiber reinforced glass composite articles that is particularly adapted to making such articles in complex shapes, comprising applying a layer of carrier liquid containing glass powder and a thermoplastic polymeric binder to a sheet of woven or non-woven high temperature stable fiber reinforcement, cutting a plurality of preforms of predetermined patterns from such sheets, stacking a plurality of the treated preforms on top of each other on a mold surface, warm molding the stacked preforms to form an intermediate article

4,412,855

**2-CHLORO-N-(2'-METHOXYPROPYL)- AND 2-CHLORO-N-(2'-ETHOXYPROPYL)-2',6'-DIMETHYL-ACETANILIDE AS LONG TERM WEED KILLERS**

Christian Vogel, Binningen, and Rudolf Aebi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 860,016, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 688,867, May 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 548,041, Feb. 7, 1975, abandoned, which is a

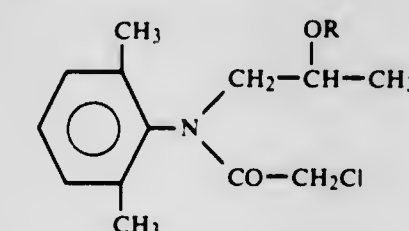
continuation-in-part of Ser. No. 328,202, Jan. 31, 1973, abandoned. This application Sep. 22, 1978, Ser. No. 944,816 Claims priority, application Switzerland, Feb. 7, 1972, 1739/72; May 16, 1972, 7283/72

Int. Cl.<sup>3</sup> A01N 37/22; C07C 103/32

U.S. Cl. 71—118

4 Claims

1. A compound of the formula I



wherein R represents methyl or ethyl.

4,412,856

**HERBICIDAL HETEROCYCLIC AND SUBSTITUTED PHENYL PHENYLACETYLENE AMINES**

Hans-Georg Brunner, Lausen; Rolf Schurter, Binningen, and Henry Szczepanski, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 22, 1981, Ser. No. 266,264

Claims priority, application Switzerland, May 31, 1980, 4232/80

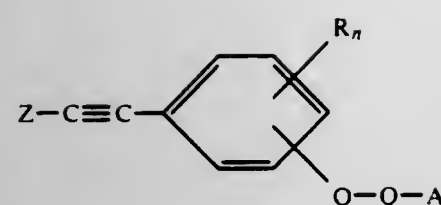
Int. Cl.<sup>3</sup> A01N 33/10, 43/08, 43/10, 43/54, 43/66, 43/78; C07C 93/06

U.S. Cl. 71—121

19 Claims

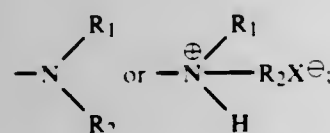
1. A phenylacetylene compound of the formula





wherein

A is an amino group of the formula



each of  $R_1$  and  $R_2$  is hydrogen;  $C_3$ - $C_6$ alkenyl;  $C_3$ - $C_6$ alkynyl;  $C_3$ - $C_8$ cycloalkyl; or  $C_1$ - $C_6$ alkyl optionally substituted by halogen, hydroxy,  $C_1$ - $C_4$ alkoxy, alkoxycarbonyl containing at most 5 carbon atoms, cyano or carboxyl; or together with the nitrogen atom to which they are attached,  $R_1$  and  $R_2$  form a 5- or 6-membered saturated heterocyclic ring system containing altogether at most 2 hetero-atoms and which is optionally substituted by  $C_1$ - $C_6$ alkyl;

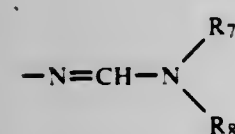
$X^\ominus$  is an anion;

R is hydrogen; nitro; cyano; trifluoromethyl;  $C_1$ - $C_4$ alkoxy;  $C_1$ - $C_4$ alkylthio;  $-NR_5R_6$ ;  $CO-NR_7R_8$ ;  $-COOR_9$ ;  $-CO-SR_{10}$ ; halogen;  $-N_3$ ; or  $C_1$ - $C_4$ alkyl optionally substituted by  $C_1$ - $C_4$ alkyl, hydroxy, cyano or  $-COOR_9$ ; each of  $R_5$ ,  $R_7$ ,  $R_8$ ,  $R_9$  and  $R_{10}$  is hydrogen;  $C_1$ - $C_6$ alkyl;  $C_3$ - $C_8$ alkenyl; or  $C_3$ - $C_8$ alkynyl;

$R_6$  is hydrogen;  $C_1$ - $C_6$ alkyl;  $C_3$ - $C_8$ alkenyl;  $C_3$ - $C_8$ alkynyl;  $-CO-R_{11}$ ;  $-COOR_{12}$ ; or  $-CO-NHR_{13}$ ; in which  $R_{11}$ ,  $R_{12}$  and  $R_{13}$  have the same meanings as  $R_4$ ;

n is an integer from 1 to 4; and

Z is heterocyclic radical selected from the group consisting of furanyl, thienyl, pyridyl, pyrimidinyl, thiazolyl and triazinyl, each of which is optionally substituted by one or more radicals having the same meaning as R, formyl,  $-SO_2-NR_7R_8$ ,  $-NH-NH_2$ ,  $-NHOH$ ,  $-SO-R_9$ ,  $SO_2-R_9$ ,



$COO^\ominus M^\oplus$  in which  $M^\oplus$  is a sodium, potassium, calcium or magnesium cation, or  $C_2$ - $C_6$ alkenyl which optionally substituted by nitro, cyano or  $-COOR_9$ .

13. 1-[4-(4-Methoxyphenylethynyl)phenoxy]-2-diethylaminoethane.

14. 1-[4-(4-Fluorophenylethynyl)phenoxy]-2-diethylaminoethane.

16. A herbicidal composition comprising a herbicidally effective amount of at least one compound according to claim 1, 13 or 14, together with a suitable carrier therefor.

17. A method of controlling weeds, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim 1, 13 or 14.

#### 4,412,857 METHOD OF SMELTING FERRONICKEL IN ORE-SMELTING ELECTRICAL FURNACE UNDER A LAYER OF CHARGE

Vladimir A. Kadykov; Boris P. Onischin, both of Leningrad; Gennady P. Ermakov, Orsk; Valery D. Linev, Leningrad; Viktor P. Khristoforov, Orenburgskaya; Alexandr E. Burochkin; Sergei G. Mittsev, both of Kirovogradskaya; Gennady A. Timofeev, Orenburgskaya; Viktor R. Keller, Kirovogradskaya; Viktor P. Mikshin, and Grigory I. Grodinsky, both of Leningrad, all of U.S.S.R., assignors to Gosudarstvenny Proektny I Nauchno-Issledovatel'skiy Institut "Gipronikel", Leningrad, U.S.S.R.

Filed Apr. 27, 1982, Ser. No. 372,306

Int. Cl.<sup>3</sup> C22D 7/04; C21C 5/52

U.S. Cl. 75-11

12 Claims

1. A method of smelting ferronickel in an ore-smelting electrical furnace under a layer of charge, comprising the steps of: supplying charge into the electrical furnace at it is melted down to maintain the height of the charge layer at a required level.

discharging a slag as said charge is melted down to maintain the depth of a slag bath in the range of from 0.6 to 1.1 of the electrode diameter,

tapping ferronickel as a ferronickel bath is increased, and adjusting the depth of immersion of the electrodes into said slag bath and the specific power at the electrode surfaces wetted with said slag so as to provide conditions ensuring the possibility of maintaining such a temperature of said ferronickel bath that is adequately high for the free ferronickel tapping.

#### 4,412,858 METHOD OF CONVERTING IRON ORE INTO MOLTEN IRON

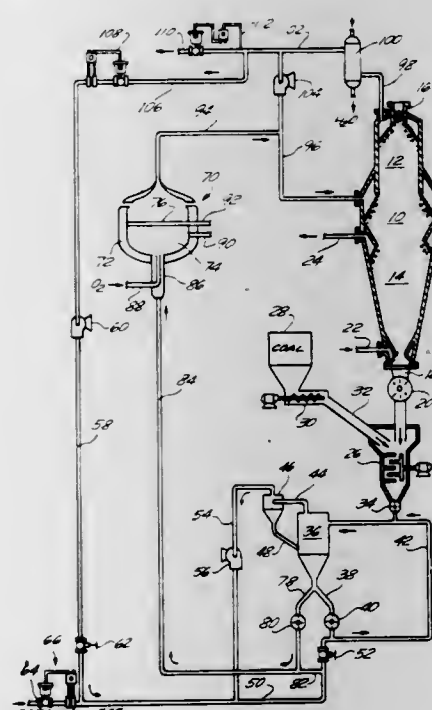
Ricardo Viramontes-Brown, Garza Garcia, and Jorge B. Castanon, San Nicolas de los Garza, both of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Jul. 12, 1982, Ser. No. 397,222

Int. Cl.<sup>3</sup> C21B 13/06

U.S. Cl. 75-38

8 Claims



1. A method for producing molten iron from iron ore which comprises supplying said ore in lump or pellet form to a vertical shaft, moving bed reduction reactor, passing a hot reducing gas upwardly through said moving bed to reduce said ore to sponge iron, establishing a bath of molten iron in a melter-gasifier, preparing a finely ground mixture of coal and said sponge iron, feeding the ground mixture to said molten bath, feeding elemental oxygen to said bath to react with the coal of

said mixture to maintain said bath molten and to produce a reducing gas, utilizing at least a part of the reducing gas thus produced as the reducing gas passed through said moving bed of ore and withdrawing molten iron from said melter-gasifier.

#### 4,412,859 METHOD FOR RECOVERING PLATINUM IN A NITRIC ACID PLANT

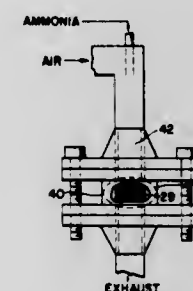
W. Robert Hatfield, Westfield; Ronald M. Heck, Frenchtown, and Thomas H. Hsiung, Piscataway, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 292,113, Aug. 12, 1981, and Ser. No. 292,114, Aug. 12, 1981. This application Aug. 2, 1982, Ser. No. 403,996

Int. Cl.<sup>3</sup> C22B 11/00; B22F 3/00

U.S. Cl. 75-83

16 Claims



1. A method for the recovery of platinum and/or rhodium lost from a platinum-containing catalyst during ammonia oxidation processes at temperatures above 850° C.; which comprises bringing said lost platinum and/or rhodium into contact with a foraminite element fabricated from material consisting essentially of palladium characterized by (a) a novel configuration whereby the initial product of mesh size (N) and wire diameter ( $d_w$ ) for said element is greater than at least about 0.3 and (b) where, for a given nitrogen throughput, the weight recovery efficiency ( $\eta$ ) is a function of the wire diameter ( $d_w$ ) and mesh size (N) combination and weight recovery efficiency is improved by increasing mesh size (N) for a given wire diameter or increasing the wire diameter ( $d_w$ ) for a given mesh size.

#### 4,412,860 PROCESS FOR RECOVERING NIOBIUM FROM URANIUM-NIOBIUM ALLOYS

Steven A. Wallace, Knoxville; Edward T. Creech, and Walter G. Northcutt, both of Oak Ridge, all of Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 425,141

Int. Cl.<sup>3</sup> C22B 34/24

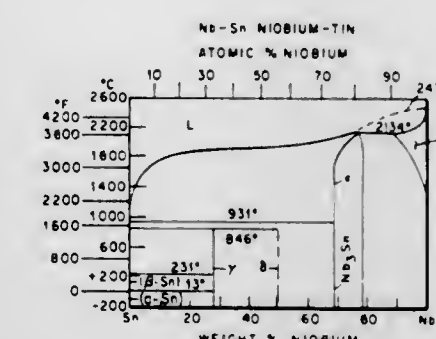
U.S. Cl. 75-84

5 Claims

1. A method of separating niobium from a uranium-niobium alloy, comprising the steps of:

melting tin and a uranium-niobium alloy to disperse the tin in the alloy;  
solidifying the melted tin and uranium-niobium alloy to form a billet;  
heating said billet to combine niobium with tin therein; and

contacting said billet with hydrochloric acid to dissolve uranium in the billet in the acid and leave an insoluble



material selected from the group consisting of  $Nb_6Sn_2H_2$  and  $Nb_6Sn_2$ .

#### 4,412,861 METHOD FOR THE RECOVERY OF URANIUM VALUES FROM URANIUM TETRAFLUORIDE

Alvin R. Kreuzmann, Cincinnati, Ohio, assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 27, 1982, Ser. No. 437,082

Int. Cl.<sup>3</sup> C22B 60/02

U.S. Cl. 75-84.1 R

12 Claims

10. A method for the recovery of uranium from uranium tetrafluoride, comprising:

providing an intimate mixture of particulate uranium tetrafluoride and an alkaline earth metal oxide selected from the group consisting of calcium oxide and magnesium oxide,

heating said mixture in the presence of oxygen to form the corresponding alkaline earth metal uranium and alkaline earth metal fluoride,

treating the resulting mixture of said uranate and metal fluoride with an acidic solution to effect dissolution of said uranate, and recovering uranium from the resulting solution of said uranate.

#### 4,412,862 METHOD FOR THE PRODUCTION OF FERROCHROMIUM

Tsunee Miyashita; Tsutomu Fukushima; Kiyoshi Kawasaki, and Sadayuki Sasaki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

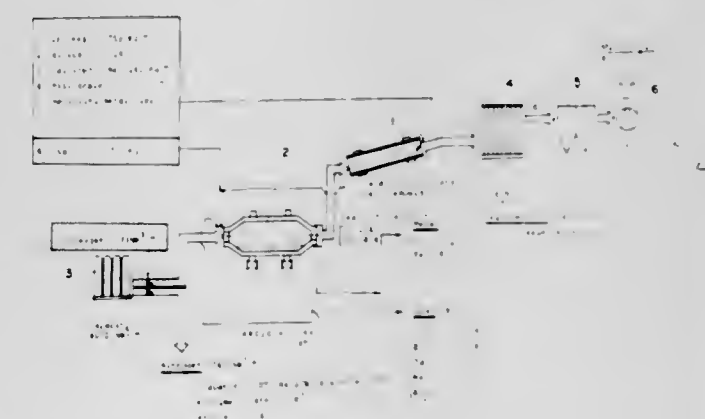
Filed Jul. 20, 1982, Ser. No. 399,974

Claims priority, application Japan, Jul. 21, 1981, 56-112936

Int. Cl.<sup>3</sup> C22C 33/00

U.S. Cl. 75-130.5

7 Claims



1. A method for the production of ferrochromium comprising

(1) preheating or prereducing a mixture comprising chromium ores, fluxes, and a carbonaceous reducing agent in a



- first furnace, said first furnace selected from a rotary kiln, a shaft furnace or a fluidized bed,
- (2) discharging said preheated or prereduced mixture from (1) into a second furnace, said second furnace comprising a rotary furnace having its axis positioned horizontal, or at an angle no greater than 35 degrees to horizontal,
- (3) smelting and reducing the mixture of said second furnace by blowing oxygen or oxygen-enriched air into said second furnace, and
- (4) tapping out the molten metal ferrochrome, the method further characterized in that the exhaust gases from (3) are utilized as the heat source for (1).

4,412,863

# INORGANIC CEMENT COMPOSITIONS HAVING CONTROLLED THERMAL EXPANSION COEFFICIENTS

James E. Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1981, Ser. No. 299,359  
Int. Cl.<sup>3</sup> C04B 19/04

- U.S. Cl. 106—84 16 Claims
1. In an organic silicate cement composition including a water soluble silicate and an inorganic curing agent which combine and cure to form a cement having a coefficient of thermal expansion, the improvement comprising:
- an inorganic filler material of fused silica in an amount to provide a selected coefficient of thermal expansion in the cured inorganic silicate cement composition which is less than said coefficient of thermal expansion of said cement matrix.

wherein the cured inorganic cement composition comprises by weight about 5 to 70 percent silicate, about 1 to 15 percent curing agent, and about 20 to 90 percent fused silica.

4,412,864

# ASPHALT COMPOSITIONS AND A VIBRATION-DAMPING SHEET FORMED BY THE SAME

Tomozo Kurashige, and Hidetoshi Shimada, both of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 253,044  
Int. Cl.<sup>3</sup> C08L 93/00

- U.S. Cl. 106—235 17 Claims
1. An asphalt composition comprising
- (A) 100 parts by weight of asphalt;
- (B) 0.1 to 20 parts by weight of a diene liquid rubber having at least one carboxyl group, epoxy group or amino group in the molecule; and
- (C) 2 to 350 parts by weight of (i) an asbestos fibrous filler having a fiber length of 1 mm or less.

4,412,865

# DEVICE FOR SEPARATING A FILLER MASS

Heinrich Schmidt, Düsseldorf, Fed. Rep. of Germany, assignor to Hein, Lehmann AG, Düsseldorf, Fed. Rep. of Germany

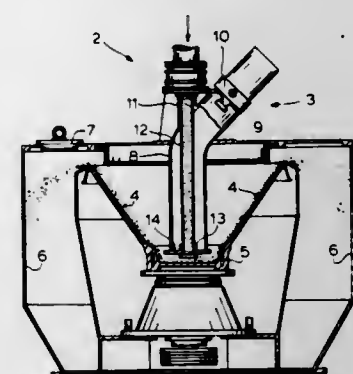
Filed Dec. 12, 1980, Ser. No. 216,214

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951666

Int. Cl.<sup>3</sup> C13F 1/06; H05B 6/78

- U.S. Cl. 127—19 11 Claims
1. In a device for separating a sugar-containing filler mass into a solid and a liquid component of the type including a continuously operating centrifuge, a dosaging device for feeding the filler mass to the centrifuge, and a device for heating the filler mass immediately before being fed to the centrifuge, the improvement comprising:
- said device for heating said filler mass comprising a micro-

wave heater including a substantially straight pipe piece serving as a wave conductor, and a filler feed pipe which



is coaxially coupled to said pipe piece for discharging the filler into said pipe piece.

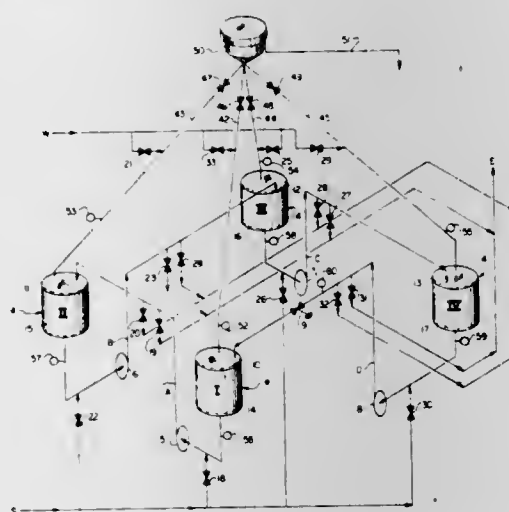
4,412,866

# METHOD AND APPARATUS FOR THE SORPTION AND SEPARATION OF DISSOLVED CONSTITUENTS

Karlheinz W. R. Schoenrock, Ogden, Utah; Michael M. Kearney, and D. Eugene Rearick, both of Twin Falls, Id., assignors to The Amalgamated Sugar Company, Ogden, Utah

Filed May 26, 1981, Ser. No. 267,065  
Int. Cl.<sup>3</sup> C13K 3/00; C13D 3/14

U.S. Cl. 127—46.2 15 Claims



1. A simulated moving bed process for recovering a separated component from a feed solution containing said separated component and a non-separated component, comprising:
- providing a bed of separating medium for said separated component divided into four zones, each including at least one discrete vessel, containing a portion of said bed with an inlet at one end of said portion and an outlet at the opposite end of said portion, said zones being serially designated I, II, III and IV, respectively, and arranged in a loop for series flow by connection of the outlet of each zone to the inlet of the next succeeding zone of the series, the outlet of zone IV being connected to the inlet of zone I;

filling the zones with liquid so that the entire bed is immersed and substantially free from entrapped gas;

circulating liquid through the entire bed in a circulation loop through said zones with pump means located within said loop, and while maintaining said circulation,

introducing feed solution to zone II, thereby displacing a raffinate fraction from said zone for recovery from said bed and creating a front of non-separated component which migrates with the circulation flow through zone IV; and approximately simultaneously

introducing eluant to zone I, thereby displacing an extract fraction from said zone for recovery from said bed;

continuing said introductions to and withdrawals from zones III and I until said front of non-separated component migrates to approximately a first reference location in the loop, with respect to the outlet of zone IV; and then introducing feed solution to zone IV, thereby displacing a raffinate fraction from said zone IV for recovery from said bed; and approximately simultaneously

introducing eluant to zone II, thereby displacing an extract fraction from said zone II for recovery from said bed;

continuing said introductions to and withdrawals from zones IV and II until said front of non-separated component migrates to approximately a second reference location in the loop with respect to the outlet of zone I; and then introducing feed solution to zone I, thereby displacing a raffinate fraction from said zone I for recovery from said bed; and approximately simultaneously

introducing eluant to zone III, thereby displacing an extract fraction from said zone III for recovery from said bed;

continuing said introductions to and withdrawals from zones I and III until said front of non-separated component migrates to approximately a third reference location in the loop with respect to the outlet of zone II; and then introducing feed solution to zone II, thereby displacing a raffinate fraction from said zone II for recovery from said bed; and approximately simultaneously

introducing eluant to zone IV, thereby displacing an extract fraction from said zone IV for recovery from said bed;

continuing said introductions to and withdrawals from zones II and IV until said front of non-separated component migrates to approximately a fourth reference location in the loop with respect to the outlet of zone III; and thereafter

repeating the aforescribed sequence of introductions of feed solution and eluant, respectively, and corresponding withdrawals of raffinate and extract, respectively, in coordination with the migration of said front through the loop to the proximities of said first, second, third and fourth reference locations.

2. A process according to claim 1 wherein the feed solution is an invert sugar solution, the separated component is fructose, the non-separated component comprises the remaining constituents of the inverted sugar solution, and the eluant is water.

4,412,867

# WET MILLING OF STARCH BEARING MATERIALS WITH WATER RECYCLE AFTER REVERSE OSMOSIS OR ULTRAFILTRATION

Amelio Cicuttini, Sterrebeek, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

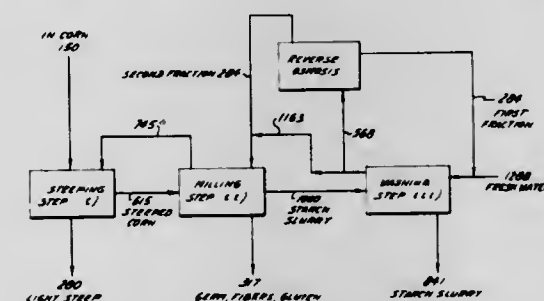
Continuation of Ser. No. 245,558, Mar. 19, 1981, abandoned.

This application Aug. 5, 1982, Ser. No. 405,491

Claims priority, application United Kingdom, Mar. 26, 1980, 8010226; Jan. 20, 1981, 8101643

Int. Cl.<sup>3</sup> C13L 1/00, 1/02

U.S. Cl. 127—66 14 Claims



1. A process for recovering a starch slurry from a starch bearing material by the sequential steps of:

- (i) forming an aqueous slurry of a comminuted starch bearing material,
- (ii) separating a starch rich fraction from said slurry, and
- (iii) washing said starch rich fraction in at least one stage to purify it,

wherein the improvement comprises introducing fresh water at step (iii) and using water that has been used in step (iii) for step (i) and step (ii), wherein at least part of the water that is used in the process but has not yet exited therefrom is separated by reverse osmosis or ultrafiltration into first and second fractions of which the first fraction has lower contents of both soluble matter and insoluble matter than the second fraction, said first fraction being recycled and combined with the fresh water to increase the purity of the starch in step (iii).

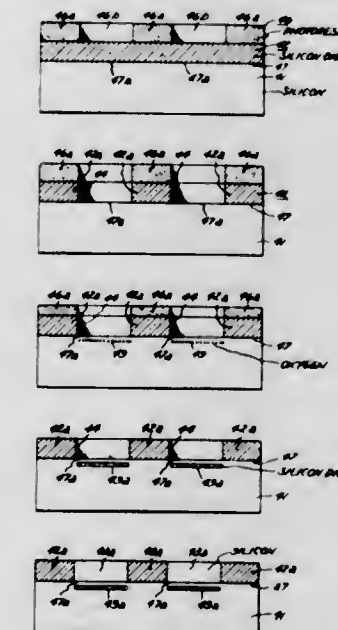
4,412,868

# METHOD OF MAKING INTEGRATED CIRCUITS UTILIZING ION IMPLANTATION AND SELECTIVE EPITAXIAL GROWTH

Dale M. Brown, and Kirby G. Vosburgh, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1981, Ser. No. 333,596  
Int. Cl.<sup>3</sup> H01L 21/20, 21/265, 21/76

U.S. Cl. 148—1.5 5 Claims



1. A method of making an integrated circuit comprising:
- providing a substrate of silicon semiconductor material,
- forming an insulating layer overlying a major surface of said substrate,
- forming a plurality of apertures in said insulating layer which expose a plurality of selected portions of said major surface of said substrate,
- implanting ions of oxygen in said substrate at a predetermined depth under each of said selected portions of said major surface of said substrate,
- annealing said substrate to repair the damage to the crystalline structure of the regions of said substrate adjacent said selected portions of said major surface caused by implanting said activators therein,
- said ions of oxygen being implanted in said substrate in a sufficiently high concentration and the annealing of said substrate being carried out at a temperature and for a time to convert said concentration of ions into a layer of silicon dioxide underlying each of said selected portions of said major surface of said substrate,
- growing epitaxially a layer of silicon on each of said selected portions of said major surface of said substrate.



4,412,869

**ALUMINUM ALLOY TUBE PRODUCT AND METHOD**  
William D. Vernam; Ralph W. Rogers, Jr., and Harry C. Stumpf, all of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1980, Ser. No. 219,572  
Int. Cl.<sup>3</sup> C22F 1/04

U.S. Cl. 148—2



1. A method of producing aluminum tube product characterized by a substantially uniform distribution of relatively fine, generally equiaxed constituents comprised mainly of elemental silicon, comprising the steps of:

- providing in billet form a body of aluminum base alloy consisting essentially of 2 to 13 wt.% Si, 0 to 4 wt.% Zn, 0.005 to 0.5 wt.% Sr, up to 1 wt.% Fe and up to 1 wt.% Cu, the balance essentially aluminum and incidental impurities;
- extruding said billet into a thick-walled tube member;
- drawing said tube member into thin-walled tube stock for use as tubes in a heat exchanger assembly.

4,412,870

**WROUGHT ALUMINUM BASE ALLOY PRODUCTS HAVING REFINED INTERMETALLIC PHASES AND METHOD**

William D. Vernam; Ralph W. Rogers, Jr., and Harry C. Stumpf, all of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1980, Ser. No. 219,573  
Int. Cl.<sup>3</sup> C22F 1/04; C22C 21/06

U.S. Cl. 148—2



1. A wrought aluminum alloy product, the alloy consisting essentially of 0.5 to 10 wt.% Mg, about 0.2 to 1.6 wt.% Mn, 0 to 0.35 wt.% Cr, 0.005 to wt.% Sr, 0.04 to 1 wt.% Fe, 1 wt.% max. Si, 3.5 wt.% max. Zn, 1 wt.% max. Cu, 0.3 wt.% max. Ti, the remainder aluminum and incidental impurities, the product being characterized by the presence of at least one intermetallic phase of the type containing Al-Fe-Si, Al-Fe-Mn and Al-Fe-Mn-Si, wherein at least one of such phases is refined.

49. A method of producing an aluminum alloy flat rolled product, the method comprising the steps of:

- providing a body of an aluminum base alloy consisting essentially of 0.5 to 10 wt.% Mg, about 0.2 to 1.6 wt.% Mn, 0 to 0.35 wt.% Cr, 0.005 to 0.5 wt.% Sr, 0.04 to 1 wt.% Fe, 1 wt.% max. Si, 3.5 wt.% max. Zn, 1 wt.% max. Cu, the remainder aluminum and incidental impurities;
- heating the body to a temperature of not greater than 1100° F., and
- hot rolling said body to produce a flat rolled product being characterized by the presence of at least one inter-

metallic phase of the type containing Al-Fe-Si, Al-Fe-Mn and Al-Fe-Mn-Si, wherein at least one of such phases is refined.

4,412,871

**CAST COPPER ALLOYS**

15 Claims Prakash D. Parikh, Hamden; Louis P. Stone, Naugatuck; Eugene Shapiro, Hamden, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 146,833, May 5, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,212

Int. Cl.<sup>3</sup> C22C 9/02; C22F 1/08

U.S. Cl. 148—2

5 Claims



1. A method for processing a copper base alloy consisting essentially of from 1 to 6% silicon, from 0.2 to 5% tin and the balance essentially copper, said method providing a cast structure of said alloy having good hot workability, said method comprising:

- direct chill casting ingots of said alloy;
- said direct chill casting step comprising: providing a water cooled mold; transferring said alloy in molten form into said mold; forming an ingot shell by solidification due to heat transfer within said mold; and directly impinging water onto said ingot as it emerges from said mold, the improvement wherein, said step of transferring said molten alloy into said mold comprises:

transferring said molten alloy at a melt temperature entering said mold of from 150° C. to 250° C. in excess of the liquidus temperature of said alloy, to provide said alloy which is resistant to edge-cracking during hot working and which comprises a first external inversely segregated surface zone, a second internal bulk ingot zone, and a subsurface denuded zone bridging said first and second zones and exhibiting a uniform coarse grain structure which is devoid of second phases.

4,412,872

**PROCESS FOR MANUFACTURING A COMPONENT FROM A TITANIUM ALLOY, AS WELL AS A COMPONENT AND THE USE THEREOF**

Joachim Albrecht, Deutscher; Thomas Duerig, Nussbaumen, and Dag Richter, Carouge, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 19, 1982, Ser. No. 359,858

Claims priority, application Switzerland, Mar. 23, 1981, 1934/81

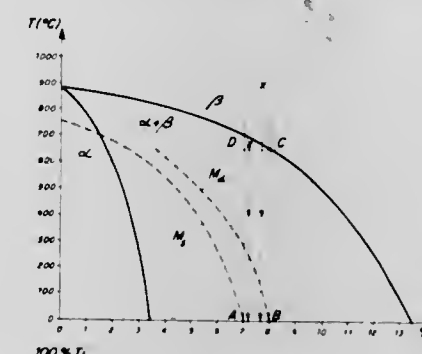
Int. Cl.<sup>3</sup> C22C 34/10

U.S. Cl. 148—11.5 F

21 Claims

1. A process for manufacturing a component from a titanium alloy, which, in the stable starting condition, contains at least some of the body-centered phase at room temperature, in which process the components are mixed, melted and cast, and the workpiece obtained in this manner is hot-worked and subjected to a solution-annealing treatment in the temperature region in which at least some of the stable  $\beta$ -phase exists, and is subsequently quenched to room temperature, after which it is subjected to a mechanical working operation and a further heat treatment, wherein the alloy belongs, in its metallurgical composition, to the class of the mechanically unstable  $\beta$ -

titanium alloys, which are defined by the fact that at least some of their cubic body-centered  $\beta$ -phase can, by applying a permanent deformation, be transformed into the stress-induced martensitic  $\alpha'$ -phase, and wherein the workpiece is quenched to a temperature at which the  $\beta$ -phase is mechanically unstable, at a rate which is sufficiently high to retain the mechanically unstable  $\beta$ -phase and to suppress the formation of any new phase, except for the athermal  $\omega$ -phase and except for a maximum of 10% by volume of martensite, which is thermally



induced by quenching, from the temperature region above the  $\beta$ -transformation or above a temperature which is sufficiently high to cause at least some of a  $\beta$ -phase to form, which, in its turn, is unstable, and wherein the mechanical working operation comprises the application of tension, pressure, shear, or a combination of two or more of these operations, in the temperature range in which the  $\beta$ -phase is mechanically unstable and is carried out in a manner such that a permanent deformation of up to a maximum of 7% is produced, and wherein the further heat treatment at least comprises a heating operation.

4,412,873

**SINTERED METAL ARTICLES AND THEIR MANUFACTURE**

John W. Hone, and Terence M. Cadle, both of Coventry, England, assignors to Brico Engineering Limited, Coventry, England

Filed Nov. 12, 1981, Ser. No. 320,428

Claims priority, application United Kingdom, Nov. 19, 1980, 8037172

Int. Cl.<sup>3</sup> C21D 1/48

U.S. Cl. 148—16.5

14 Claims

1. A method of manufacturing sintered metal articles infiltrated with a selected metal comprising the steps of: taking a sintered metal skeleton, selecting a metal which has a lower melting point than the metal of the skeleton and which, when melted, will infiltrate the skeleton, electro-plating the lower melting point metal onto at least a part of the sintered metal skeleton, and then heating the plated skeleton to a temperature greater than the melting point of the plated metal whereby the plated metal is caused to infiltrate the sintered metal skeleton, whereby to produce a sintered metal article in which the skeleton is infiltrated by the selected metal to increase the strength of the article.

4,412,874

**SILANE BALLISTIC MODIFIER CONTAINING PROPELLANT**

Chester W. Huskins, and Leroy J. Williams, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1981, Ser. No. 322,821

Int. Cl.<sup>3</sup> C06B 45/10

U.S. Cl. 149—19.2

6 Claims

1. A solid propellant composition employing a silicon compound as a burning rate catalyst, said solid propellant composition consisting essentially of said silicon compound, a hydroxyl terminated polybutadiene binder, ultrafine ammonium per-

chlorate of about 1 micrometer particle size, ammonium perchlorate of about 90 micrometers particle size, aluminum metal powder fuel, a curing agent of isophorone diisocyanate, an optional quick cure catalyst of triphenyl bismuthine, and an optional bonding agent which is the reaction product of equimolar quantities of 12-hydroxystearic acid and tris[1-(2-methylaziridinyl)]phosphine oxide, said silicon compound selected from the group of silicon compounds consisting of p-bis(dimethylsilyl)benzene, tris(dimethylsilyl)amine, triethylsilane, hexamethyldisilane, bis(dimethylamino)dimethylsilane, bis(dimethylamino)methylsilane, octylsilane, hexamethylcyclotrisilazane, and dimethyldicyanatosilane.

4,412,875

**NITRAMINE COMPOSITE PROPELLANT COMPOSITION**

Kunio Hasegawa, Aichi, and Michinori Takizuka, Handa, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,770

Claims priority, application Japan, Oct. 7, 1980, 55-139348

Int. Cl.<sup>3</sup> C06B 45/10

U.S. Cl. 149—19.9

6 Claims

1. A nitramine composite propellant containing a polybutadiene binder and a nitramine oxidizer as the main constituent thereof, wherein said polybutadiene binder comprises 100 parts by weight of a carboxyl-terminated polybutadiene or a hydroxyl-terminated polybutadiene, from 0.5 to 10 parts by weight of a polybutadiene having terminal maleic anhydride groups and from 0.5 to 10 parts by weight of an alkanolamine or a mixture of two or more alkanolamines.

4,412,876

**LABELING APPARATUS**

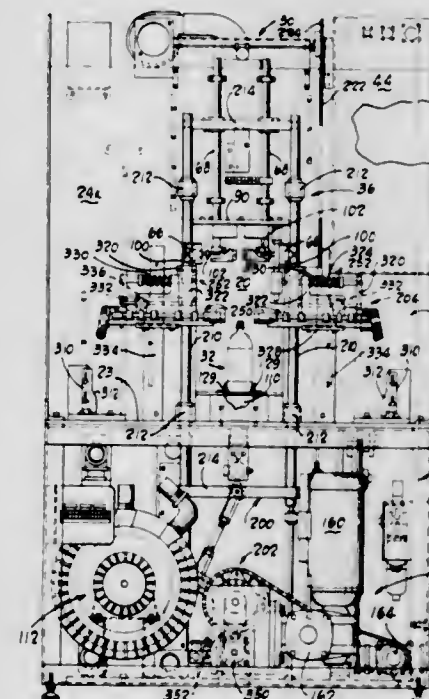
Bernard Lerner, Peninsula, and Dana J. Liebhart, Streetsboro, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Jul. 7, 1981, Ser. No. 281,281

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—64

29 Claims



1. A process of labeling containers comprising:

- bringing a plurality of containers into abutment in a row along a path;
- positioning one of the containers in the row at a labeling station;
- establishing a pressure differential on the one container with a stationary support at the labeling station;



- (d) applying a label to the one container by sliding a sleeve over the one container;
- (e) pushing the row of containers along the path and thereby removing the one container from the station and positioning another container at the station;
- (f) applying a sleeve to said another container after it has been positioned at the station and a pressure differential has been applied to it.

4,412,877

**EMBOSSING SECONDARY BACKINGS OF CARPETS**  
William G. Vosburgh, West Chester, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 251,987, Apr. 6, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,394  
Int. Cl.<sup>3</sup> A46D 1/00; B32B 5/00

U.S. Cl. 156—72

4 Claims

1. In a tufted-carpet process wherein a primary backing is tufted, back-sized and then laminated to a bonded, nonwoven fabric, secondary backing to form a carpet composite, the improvement comprising embossing the secondary backing after it has become an integral part of the carpet composite at a temperature and under a load such that an embossed pattern is formed in the secondary backing and the force required to stretch the carpet composite one-half percent is decreased to less than 70 percent of the force required prior to the embossing step.

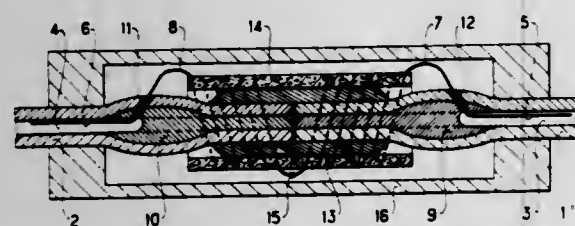
4,412,878

**METHOD OF JOINING TOGETHER OPTICAL FIBRE UNDERSEA CABLES**  
Lucien Guazzo, Calais, France, assignor to Societe Anonyme dite: Les Cables de Lyon, France

Filed Apr. 6, 1982, Ser. No. 366,020  
Claims priority, application France, Apr. 8, 1981, 81 07057

Int. Cl.<sup>3</sup> B32B 7/04; G02B 5/14  
U.S. Cl. 156—91

5 Claims



1. A method of joining together two lengths of optical fibre undersea cable, each length having a core in which at least one optical fibre is disposed, said core being surrounded by a carrier vault formed by metal strands, said method comprising the steps of:

- cutting off a given length of said carrier vault at each cable end to free suitable lengths of said optical fibres,
- inserting each optical fibre free length into a part with the free length passing through an opening within the side of said part and positioning said part within the center of the carrier vault inwardly from the end thereof and passing the fibre free length protruding from the opening within the side of said part outwardly between the strands of the carrier vault,
- bringing the ends of said carrier vaults together and fixing them substantially in contact each with another while placing a first sleeve about the contacting ends of said carrier vaults,
- interconnecting the free ends of said optical fibres, tensioning the free ends of the optical fibres from each of said cable ends, and
- then helically winding the excess length of said fibres around said first sleeve.

2. A method according to claim 1, wherein the step of fixing said cable ends together comprises disposing a second, metal

sleeve about the ends of said carrier vaults internally of said first sleeve.

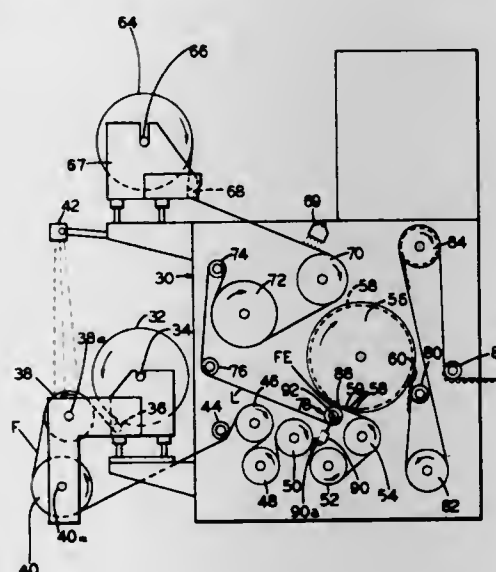
4,412,879

**CUSHIONING DUNNAGE APPARATUS AND METHOD**  
Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Nov. 2, 1981, Ser. No. 317,505  
Int. Cl.<sup>3</sup> B32B 31/12, 3/28

U.S. Cl. 156—145

30 Claims



1. In an energy efficient method of manufacturing air cell cushioning material from a plurality of flexible thermoplastic film with each film comprising a composite of a stratum of high density high melting point thermoplastic material generally impervious to the passage of gas therethrough and at least one other stratum bonded to the first mentioned stratum, with the second mentioned stratum being formed of a low density low melting point thermoplastic, the last mentioned thermoplastic being of a lower density, lower melting point thermoplastic as compared to that of said first mentioned stratum, comprising the steps of heating a first of the composite films to a heated temperature above the melting point temperature of the second mentioned stratum but below the melting point temperature of the first mentioned stratum and to a temperature adequate for permitting thermoforming of said first film, embossing said heated first film by feeding it onto a rotating forming drum maintained at a predetermined temperature range and having a plurality of recesses therein, and forming from the first composite film the air cells in the recesses on said forming drum by vacuum, with said other stratum of said first film facing outwardly of the drum, heating a second composite film of the thermoplastic to a heated temperature below the melting point of said second mentioned stratum of said second film and to a maximum temperature approximating the mean temperature between the heat softening point and the Vicat softening point of said second mentioned stratum, applying said second film with said other stratum thereof facing said first film to said first film with associated pressure, while said first film is at about said heated temperature thereof, whereby the heat in said first film causes a softening of the confronting other stratum of the second film sufficiently in conjunction with said pressure to cause a bonding of said first and second films at the areas of engagement while on the drum so as to seal the air cells in the product, and then cooling the formed air cell product on the rotating drum to a temperature which is below said softening point of said other stratum so as to set the bond between said films.

18. In an energy efficient apparatus for producing embossed air cell cushioning material from a plurality of flexible thermoplastic film stock, each film of which comprises a composite of a stratum of high density high melting point thermoplastic material generally impervious to the passage of gas therethrough and at least one other stratum bonded to the first

4,412,881

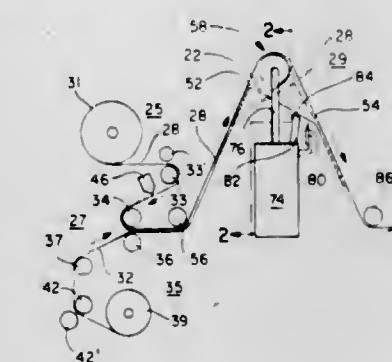
**METHOD AND APPARATUS FOR MANUFACTURING ELASTIC LEG DISPOSABLE DIAPERS**

Wayne C. Sigl, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 29, 1981, Ser. No. 278,619  
Int. Cl.<sup>3</sup> B32B 31/08

U.S. Cl. 156—164

16 Claims



1. In an apparatus for manufacturing elastic leg disposable diapers including means for continuously moving a web of material in the direction of its length and means for attaching portions of a continuously moving elastic ribbon to the web at predetermined spaced apart locations along the length of the web, said predetermined locations corresponding to the leg areas of the finished diapers, the combination comprising:

means acting in the web for separating the path of movement of the web and the elastic ribbon between said attached locations; and

means for removing the unattached portions of the elastic ribbon between said attached locations while the unattached portions are separated from the web whereby the elastic ribbon will have an elasticization affect on the web only along said attached locations corresponding to the leg areas of the finished diapers.

4,412,880

**PROCESS FOR PRODUCING HOLLOW PROFILED STRUCTURES, AND STRUCTURES PRODUCED THEREBY**

Erich Wintermantel, 10 Elsa-Brandstromstrasse, 5300 Bonn-Bad Godesberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 695,960, Jun. 14, 1976, Pat. No. 4,132,577. This application Oct. 18, 1978, Ser. No. 952,454

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1975, 2529185

Int. Cl.<sup>3</sup> B29C 17/06, 17/07

U.S. Cl. 156—156

2 Claims

1. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, treating the fabric with a hardening material, inflating the tubes for expanding the hoses into formed hollow sections, allowing hardening of the hardening material and setting of the fabric with the hoses in expanded condition, and leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure, the hose fabric being woven with weft threads and warp threads being in groups with spacings present between adjacent pairs of groups.

2. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, treating the fabric with a hardening material, inflating the tubes for expanding the hoses into formed hollow sections, allowing hardening of the hardening material and setting of the fabric with the hoses in expanded condition, and leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure, the weft threads and warp threads of the hose fabric being interwoven in a displacement-proof manner at their points of intersection.

4,412,882

**METHOD FOR PRODUCING COMPOSITE PIPES**

Hisao Morimoto, Nagaokakyo; Toshimi Inai, Kyoto, and Takashi Shimizu, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 175,043, Aug. 4, 1980, abandoned, which is a continuation of Ser. No. 3,943, Jan. 16, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,665

Claims priority, application Japan, Jan. 20, 1978, 53-5557

Int. Cl.<sup>3</sup> B65H 81/00; B65C 3/12; B05C 3/02; B29F 3/10

U.S. Cl. 156—188

5 Claims

1. A method of producing a composite pipe which comprises:

- rotating a cylindrical mold around its cylindrical axis and moving said mold axially while rotating it;
- feeding a reinforcing material containing a binder to the mold for wrapping it spirally around the mold to form an inside surface layer;
- providing a thickness regulating roller at a position at a predetermined distance from the surface of said inside layer corresponding to the desired thickness of the pipe;
- maintaining said thickness regulating roller at said position by a contacting roller having a rotating shaft coaxial or parallel with the axis of rotation of said thickness regulating roller and fixed to the supporting structure for said thickness regulating roller by contacting the periphery of said contacting roller with said inside surface layer;
- feeding a molding material containing a binder between said rotating and axially moving mold and said thickness regulating roller in an amount sufficient to maintain a supply of molding material in the converging space between said mold and said thickness regulating roller upstream of the narrowest space between the mold surface and the surface



of the thickness regulating roller, said converging space containing said supply of molding material having a dimension tangential to said thickness regulating roller equal to a substantial part of the radius of said thickness regulating roller for forming an intermediate layer having the desired thickness around the mold; wrapping a reinforcing material containing a binder about the intermediate layer; and hardening the resulting structure.

4,412,883

## VERY THICK SHAPED LAMINATED PLASTIC

Tiziano Rizó, Parma, Italy, assignor to Salvarani S.p.A., Italy  
Filed Jul. 28, 1981, Ser. No. 287,634

Claims priority, application Italy, Aug. 8, 1980, 24066 A/80  
Int. Cl.<sup>3</sup> B29C 19/00; C09J 5/02; B28B 9/00

U.S. Cl. 156—222 8 Claims

1. A process for the production of a very thick, shaped, plastic laminate from sheets of Kraft paper weighing between 120 and 200 g/sq.m. imbued with phenolic resin, comprising forming a pack of at least thirty parallel dimensionally equal superposed Kraft papers imbued with phenolic resin, laying said pack onto a first part of a mold, shaped with bending lines of from 5–14 mm parallel to a main axis of said mold, and closing said mold according to a diagram of pressures which comprises at least a first closing and preheating phase, said mold being held at a constant temperature while the temperature of the pack of Kraft papers rises up to the temperature of polymerization of the resins whereby said resin is softened but polymerization has not yet started, the pressure in said first closing and preheating phase being kept at a rate below 8 kg/sq.cm., and a second processing phase at a substantially constant temperature with thereafter polymerizing a clamping pressure increasing from 8 kg/sq. cm. up to 100 kg/sq. cm.

4,412,884

## ADHESIVE BONDING METHOD EMPLOYING DIENE BIS-IMIDE POLYMERS

Daniel A. Scola, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

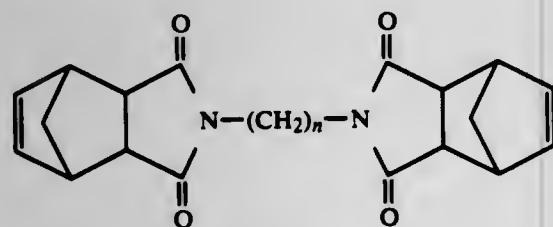
Division of Ser. No. 273,139, Jun. 12, 1981, Pat. No. 4,354,012.

This application Apr. 5, 1982, Ser. No. 365,744

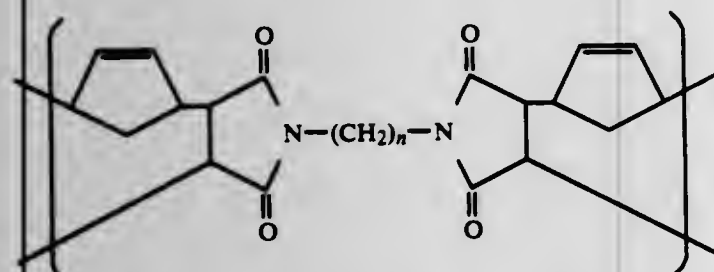
Int. Cl.<sup>3</sup> C09J 5/02

U.S. Cl. 156—307.3 3 Claims

1. A method of adhesion bonding two or more surfaces together comprising applying to at least one surface a moisture resistant polyimide adhesive formed by polymerizing monomers of the formula:



to form a polymer with repeating units



where n is about 8 to about 20, and the polymer has a room

temperature water immersion moisture absorption rate less than about 0.6% by weight for 24 hours and a tensile lap shear strength greater than about 1800 psi ( $1.24 \times 10^7$  NT/M<sup>2</sup>), such properties imparted to the polymer with curing for less than about one hour, followed by placing the two surfaces together with the adhesive in-between and curing for less than about one hour at about 250° C. to about 320° C.

4,412,885

## MATERIALS AND METHODS FOR PLASMA ETCHING OF ALUMINUM AND ALUMINUM ALLOYS

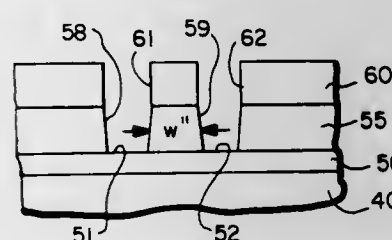
David N. Wang, Cupertino; Frank D. Egitto, Santa Clara, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Nov. 3, 1982, Ser. No. 438,786

Int. Cl.<sup>3</sup> C23F 1/02

U.S. Cl. 156—643

17 Claims



1. In a method for etching a layer of electrically conductive material formed on a semiconductor wafer and comprising aluminum as the principal element, the steps of: disposing said wafer on one of a pair of electrode structures in a closed chamber; communicating into said chamber a reactive gas mixture comprising a principal gas mixture of BCl<sub>3</sub> and Cl<sub>2</sub> doped with a small amount of dopant gas mixture of O<sub>2</sub> and a fluorocarbon gas; and supplying radio frequency electrical energy to one of said electrode structures to create a plasma of said reactive gas mixture for etching said electrically conductive material.

4,412,886

## METHOD FOR THE PREPARATION OF A FERROELECTRIC SUBSTRATE PLATE

Susumu Sakaguchi, Annaka; Kenichi Taguchi, Joetsu; Masaaki Iguchi, and Kunihiro Ito, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,823

Claims priority, application Japan, Apr. 8, 1982, 57-58533  
Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06; H01L 21/306

U.S. Cl. 156—645 5 Claims

1. A method for the preparation of a substrate plate of a single-crystalline ferroelectric material which comprises the steps of:

- slicing a single crystal boule of the ferroelectric material into wafers;
- lapping the wafer on both surfaces to impart an adequate roughness;
- subjecting the thus lapped surfaces of the wafer to chemical etching to remove the strain produced in the steps of slicing and lapping; and
- subjecting one and only one of the surfaces to mirror-polishing.

4,412,887

## EVAPORATION PROCESS WITH LIQUID ENTRAINMENT SEPARATION

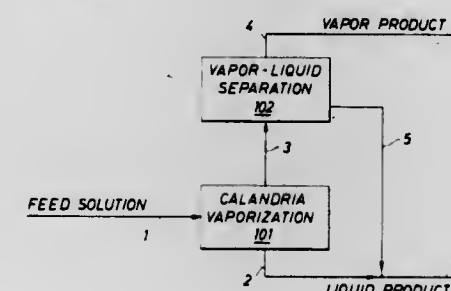
Robert F. Dye, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 23,796, Mar. 26, 1979, abandoned. This application Feb. 1, 1980, Ser. No. 113,141

Int. Cl.<sup>3</sup> B01D 1/14

U.S. Cl. 159—47.1

11 Claims



1. An improved evaporation method for the separation of a liquid feed solution consisting essentially of volatile solvent and non-volatile solute components having a relative volatility of at least 1000 to 1 into a vapor product containing a major portion of the volatile solvent and a minor portion of the non-volatile solute, said minor portion of non-volatile present in the vapor product essentially only in entrained liquid droplets, and a liquid product containing a minor portion of the volatile solvent and a major portion of the non-volatile solute, which comprises

- heating in a calandria a liquid solution consisting essentially of a volatile solvent and the non-volatile solute to produce a calandria vapor stream containing solvent vapor and entrained liquid droplets and a calandria bottoms liquid stream which is the liquid product, said calandria vapor stream containing non-volatile solute essentially only in the entrained droplets;
- contacting, in countercurrent flow in a contact zone containing as a contact media packing or one or more trays, the liquid feed solution with the calandria vapor stream to yield a contact zone overhead vapor stream containing solvent vapor and entrained liquid droplets and a contact zone bottoms liquid, said liquid droplets entrained in the contact zone overhead vapor having a lower concentration of non-volatile solute than the droplets entrained in the calandria vapor, and said contact zone overhead vapor comprising a lesser total quantity of non-volatile than does the calandria vapor;
- separating, in a vapor-liquid separation means, the greater part of the entrained liquid from the contact zone overhead vapor to produce the vapor product and a recovered liquid entrainment stream;
- introducing both the contact zone bottoms liquid stream from (b) and the recovered liquid entrainment stream from (c) into the calandria as the liquid solution to be heated according to (a).

4,412,888

## WOOD PULP FIBER PROCESS AND RESULTANT PRODUCTS

Henry A. Fremont, Wyoming, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 145,981, May 2, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,009

Int. Cl.<sup>3</sup> D21C 9/00

U.S. Cl. 162—54

4 Claims

1. The process of making a wood pulp fiber product selected from a wood pulp fiber or a wood pulp fiber web having a lower specific volume for a given surface area than conventionally prepared cellulosic wood pulp fibers or webs comprising utilizing a fiber or a web made from a fiber hydrated to a freeness of about 0 to 650 CSF, freezing the wood pulp fiber while in the form of an aqueous slurry or web having a fiber

solids content of about 3 to 60 percent solids by weight to a fiber temperature of at least -5° C. or below, and thawing the aqueous slurry or web, said freezing and thawing occurring without the presence of chemicals reacting with the wood pulp fibers.

4,412,889

## PYROLYSIS REACTION APPARATUS

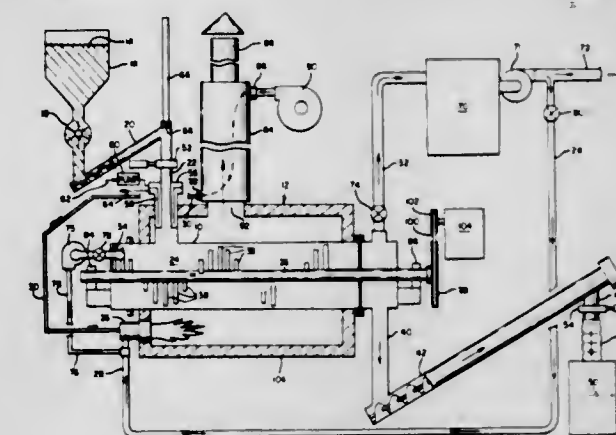
Robert C. Oeck, Portland, Oreg., assignor to Kleenair Products Co., Inc., Clackamas, Oreg.

Filed Mar. 22, 1982, Ser. No. 360,574

Int. Cl.<sup>3</sup> C10B 1/06, 43/06, 43/14

U.S. Cl. 202—117

10 Claims



1. Pyrolysis reaction apparatus, comprising:
- a pyrolysis reaction chamber for the pyrolytic decomposition of material by heat in the absence of oxygen;
  - furnace means including a furnace wall surrounding the reaction chamber, for applying heat to said reaction chamber;
  - input means for feeding the material to be treated into said reaction chamber while excluding the entry of oxygen containing gas, downward through an inlet conduit extending substantially vertical through the furnace wall along an input feed path to an inlet region within the reaction chamber where the temperature is above the vaporization temperature of said material;
  - cooling means for cooling the inlet conduit to prevent said material from melting within said inlet conduit sufficiently to cause clogging, said cooling means including a cooling jacket surrounding said inlet conduit and means for flowing cooling fluid through said jacket;
  - impeller conveyor means rotating about an axis of rotation for conveying said material through said reaction chamber along its longitudinal axis to cause said material to decompose, said input feed path being horizontally spaced from said axis of rotation; and
  - output means for transmitting the residue of the decomposition of said material from said reaction chamber while excluding the entry of oxygen containing gas, through at least one output conduit.

4,412,890

## COKE OVEN BATTERY FOR PRODUCTION OF COKE AND GAS

Heinz Thubeauville, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,005

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111476

Int. Cl.<sup>3</sup> C10B 21/06, 21/12

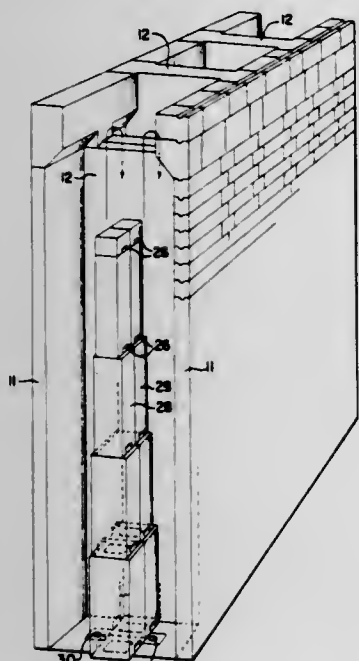
U.S. Cl. 202—139

6 Claims

1. In a coke oven battery for the production of coke and gas, said coke oven battery having chambers with heating flues extending vertically between said chambers, regenerators below said chambers connected to said heating flues, midfeath-



ers separating said heating flues from one another in the space between adjacent pairs of chambers, a plurality of hollow shaft members within said heating flues for conducting preheated gaseous combustion-supporting agents from said regenerators, said shaft members having a rectangular cross section which decreases upwardly in a stepwise fashion for correspondingly



decreasing the flow of said agents while correspondingly increasing the flow space for burning of gases therein, said shaft members including first and second pairs of opposed walls extending respectively, parallel and perpendicular to the longitudinal axis of a heating flue, said first pair of walls extending into recesses in said midfeathers, and a plurality of exit orifices within said first pair of walls of said shaft members.

4,412,891

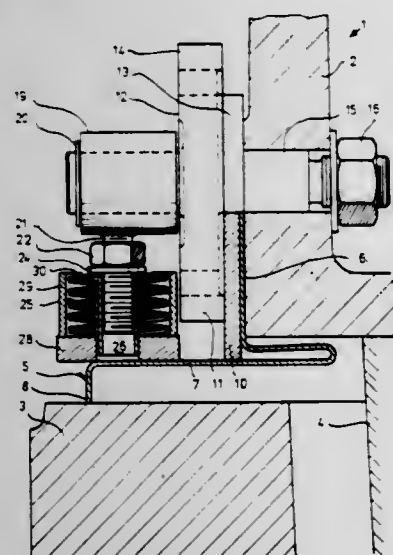
#### COKE OVEN DOOR HAVING PROFILED SEALING DIAPHRAGM

Werner Abendroth, Haltern, Fed. Rep. of Germany, assignor to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany  
Filed Aug. 5, 1982, Ser. No. 405,584

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131157

Int. Cl.<sup>3</sup> C10B 25/06, 25/16

U.S. Cl. 202—248



1. A coke oven door assembly engageable in a coke oven frame, comprising a door body, a stopper connected to said door body and spaced from an edge of said door body, a sealing diaphragm having a clamp leg portion disposed over a portion of said door body edge and a free leg portion extending substantially at right angles to the clamp leg portion, said free leg portion having an end part adapted to bear in sealing en-

gagement with the frame and substantially parallel to said clamp portion, said sealing diaphragm including a loop formation between said clamp leg portion and said free leg portion having a first part extending toward said stopper from said clamp portion and a second part extending toward said end part to said free leg portion, said first and second parts extending in the space between said door body edge and stopper, an adjusting element overlying at least a portion of said clamp leg portion, a clamp assembly mounted on said door body and clamping said adjusting element over said free leg portion, spring indicating means carried by said clamp assembly including a fixed part and a movable part bearing against said free leg portion, and spring means biasing said movable part into engagement with said free leg portion.

4,412,892

#### PRETREATMENT OF SUPERALLOYS AND STAINLESS STEELS FOR ELECTROPLATING

Edward S. Chen, Clifton Park, and William Baldauf, Altamont, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Jul. 13, 1981, Ser. No. 282,909

Int. Cl.<sup>3</sup> C25D 5/34

U.S. Cl. 204—34

8 Claims

1. A process for electroplating a metal on a substrate of superalloy, which comprises activating the substrate surface by anodic etching in an aqueous solution consisting essentially of about from 55% to 80% by volume of 95–98% sulfuric acid and about from 1 to 10% by volume of 52% hydrofluoric acid at a current density of at least 20 A/dm<sup>2</sup>, and electroplating the activated surface with a metal of the group consisting of chromium, nickel, cobalt, copper and iron.

4,412,893

#### ANODE-ASSISTED CATION REDUCTION

Derek J. Fray, Trumpington; John P. Chilton, and Arthur V. Cooke, both of Cambridge, all of England, assignors to National Research Development Corporation, London, England  
Continuation-in-part of Ser. No. 244,772, Mar. 17, 1981. This application Feb. 8, 1983, Ser. No. 464,867

Claims priority, application United Kingdom, Mar. 17, 1980, 8008953

Int. Cl.<sup>3</sup> C23F 1/04; C23C 1/06, 1/10, 1/08

U.S. Cl. 204—105 R

11 Claims

1. A method of reduction of cations more noble than iron by anode-assisted electrolysis comprising electrolyzing cations at a cathode of a cell in which the anolyte contains ferrous ion as a reducing agent, the electrolysis conducted while the anolyte is agitated or the anode is moved with respect to the anolyte thereby providing relative motion between the anode and the anolyte such as to promote contact of the anode with ferrous ion despite their mutual electrostatic repulsion, while at the same time maintaining a static relationship between the cathode and the catholyte, and the anolyte is in free communication with the catholyte

wherein the concentration of the ferrous ion is from 0.5 to 10 g/l and the anode is of platinum, graphite, platinized titanium, platinized titanium including therein platinum oxide, titanium coated with iridium oxide, or iridium oxide on a platinum support.

4,412,894

#### PROCESS FOR ELECTROWINNING OF MASSIVE ZINC WITH HYDROGEN ANODES

Walter Juda, Lexington; Robert J. Allen, Saugus, and Amiram Bar-Ilan, Newtonville, all of Mass., assignors to Prototech Company, Newton, Mass.

Filed Jul. 6, 1981, Ser. No. 280,795

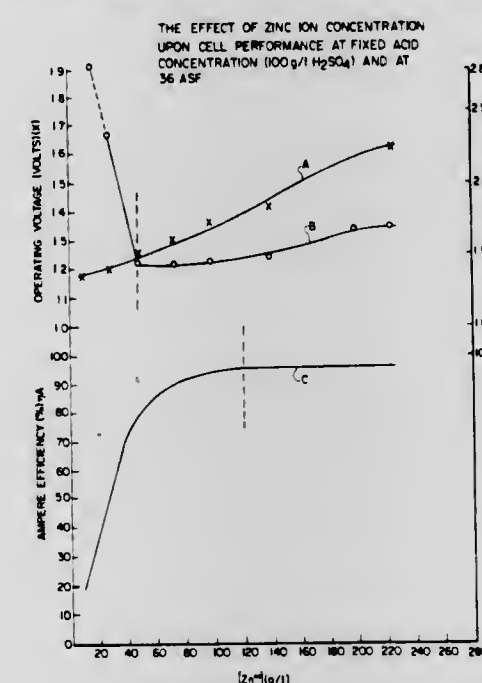
Int. Cl.<sup>3</sup> C25C 1/16

U.S. Cl. 204—119

4 Claims

1. A process for electrowinning massive zinc at a tempera-

ture between about ambient and about 75° C. and at a cathodic ampere efficiency in excess of about 85% in a driven single-compartment cell comprising a zinc cathode electrode and a spaced porous hydrophobic hydrogen anode electrode, the process comprising the steps of providing said cell with a common electrolyte contacting both said electrodes, said electrolyte being a purified aqueous solution of zinc sulfate and free sulfuric acid, said solution being doped with an organic additive capable of sustaining the ampere efficiency throughout the electrolysis; adjusting said solution to contain a sufficient concentration of zinc, as zinc sulfate, to enable cathodic deposition



of zinc at said ampere efficiency, and to contain free sulfuric acid in amount within a concentration range that enables attainment of the voltage benefit of the anodic hydrogen gas-hydrogen ion reaction without adversely affecting said cathodic ampere efficiency; passing an electrolysis current through said cell; supplying hydrogen gas to said anode in amount sufficient to prevent anodic oxygen evolution during said electrolysis; and maintaining said zinc and free acid concentrations during said electrolysis, said concentration of zinc being maintained between about 50 g/l and about 200 g/l and said concentration range of free sulfuric acid being between about 80 g/l and about 300 g/l.

4,412,895

#### SYSTEM USING SO<sub>2</sub> AS AN ANODE DEPOLARIZER IN A SOLID OXIDE ELECTROLYTE ELECTROLYSIS CELL FOR H<sub>2</sub> PRODUCTION FROM STEAM

Wen-Tong P. Lu, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1981, Ser. No. 307,137

Int. Cl.<sup>3</sup> C25B 1/02

U.S. Cl. 204—129

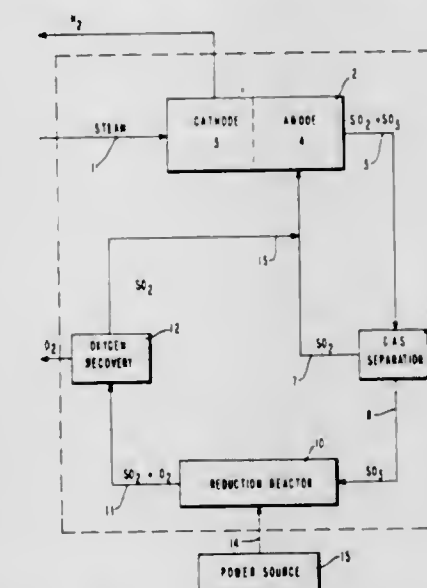
8 Claims

1. A method of decomposing water vapor into hydrogen and oxygen comprising the steps of:

- (1) supplying SO<sub>2</sub> gas to the anode and water vapor to the cathode of an electrolysis cell utilizing a solid oxide electrolyte between the anode and cathode of the cell, said solid oxide electrolyte having a high oxygen ion conduction, said cell operating at a temperature of between 350° C. and 1,000° C., to provide H<sub>2</sub> gas, and a gas mixture consisting of SO<sub>2</sub> gas and SO<sub>3</sub> gas;
- (2) collecting the H<sub>2</sub> gas;
- (3) passing SO<sub>3</sub> into a reduction reactor operating at a tem-

perature effective to catalytically decompose the SO<sub>3</sub> and provide a mixture of SO<sub>2</sub> gas and O<sub>2</sub> gas;

(4) collecting the O<sub>2</sub> gas from step (3); and



(5) passing SO<sub>2</sub> gas to the anode of the solid oxide electrolysis cell.

4,412,896

#### PROCESS OF PREPARATION OF GRAFT COPOLYMER OF STYRENE AND AN EPDM RUBBER

Maurice Lemattre, Cambronne Les Ribecourt; Robert Roussel, Mazingarbe, and Rene Wirth, Lens, all of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Jul. 8, 1981, Ser. No. 281,533

Claims priority, application France, Jul. 10, 1980, 80 15343

Int. Cl.<sup>3</sup> C08F 2/02; C08J 3/28; C08F 255/06

U.S. Cl. 204—159.2

20 Claims

1. A process for preparing a crosslinked graft copolymer of styrene and an EPDM rubber, consisting essentially of mass polymerizing a solution of the EPDM rubber in styrene and recovering the resultant graft copolymer and thereafter crosslinking the resultant copolymer by irradiation treatment.

4,412,897

#### PROCESS FOR RENDERING POLYMERS RESISTANT TO IONIZING RADIATION, AND COMPOSITIONS OBTAINED THEREBY

Simon Kornbaum, Caluire, and Jean-Yves Chenard, Pau, both of France, assignors to Ato Chimie, France

Filed Oct. 9, 1981, Ser. No. 310,121

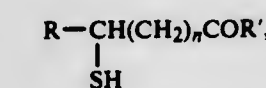
Claims priority, application France, Oct. 13, 1980, 80 21816

Int. Cl.<sup>3</sup> C08F 8/00, 8/06

U.S. Cl. 204—159.2

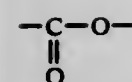
16 Claims

1. In a process for the ionization radiation of a vinylic halide polymer at doses sufficient to cause sterilization, the polymer incorporating a composition which is effective for preventing the discoloration produced thereby, the improvement which comprises said composition comprising an organotin or organic antimony containing heat stabilizer, and a mercaptan of the formula



$\text{R}(\text{CH}_2)_m\text{COOR}''\text{SH}$  or  $\text{HS}(\text{CH}_2)_x-\text{Z}(\text{CH}_2)_y-\text{Z}(\text{CH}_2)_x\text{SH}$  in which R is hydrogen or C<sub>1-20</sub> alkyl, R' is C<sub>1-18</sub> alkyl or alkenyl, R'' is C<sub>1-18</sub> alkylene or alkenylene, n and m are integers of 0–6, Z is





in which the carbon atom is bound to a chain carbon atom, x is an integer of 1-9, y is an integer of 1-18, the sum (2x+y) is at least 4, and in which the (CH<sub>2</sub>)<sub>x</sub> and (CH<sub>2</sub>)<sub>y</sub> groups are unsubstituted or are —OH or —SH substituted, and hydroquinone.

4,412,898

# PROCESS FOR CHLORINATION OF PVC IN WATER WITHOUT USE OF SWELLING AGENTS

Alan J. Olson, Westlake, and Robert G. Vielhaber, Doylestown, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 181,521, Aug. 26, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,982  
Int. Cl.<sup>3</sup> C08F 8/18

U.S. Cl. 204—159.18

6 Claims

1. A process for producing chlorinated poly(vinyl chloride) resin having a density within the range from about 1.50 to 1.65 g/cc at 25° C., comprising:

- introducing an aqueous suspension of poly(vinyl chloride) containing from about 15 to about 35% by wt poly(vinyl chloride) into a reactor operable under elevated pressure;
- removing essentially all oxygen from said suspension and reactor;
- introducing chlorine into the reactor until the pressure therewithin is in the range from about 10 psig to about 100 psig;
- soaking the poly(vinyl chloride) under said pressure for a period of from about 1 minute to about 45 minutes at a "soak" temperature in the range from about 60° C. to about 85° C.;
- irradiating the poly(vinyl chloride) with ultraviolet light at a relatively high and constant intensity in the range from about 2 watts to about 50 watts per gallon of said aqueous suspension;
- increasing the temperature of said suspension by at least 5° C. autogenously from said soak temperature to a finishing temperature in the range from about 80° C. to about 120° C.;
- maintaining a finishing temperature in the range from about 80° C. to about 120° C. during chlorination;
- continuing to introduce chlorine into the reactor as the reaction proceeds, so that the pressure in the reactor is maintained substantially constant within said range of pressure;
- stopping flow of chlorine into the reactor when sufficient chlorine has been added to produce a suspension of chlorinated poly(vinyl chloride) having said density upon completion of the reaction; and,
- separating solid macrogranular chlorinated poly(vinyl chloride) from said suspension of chlorinated poly(vinyl chloride) product characterized by having a heat distortion temperature measured by ASTM Test Method D648 which is in the range from about 100° C. to about 135° C.

4,412,899

# CUBIC BORON NITRIDE PREPARATION UTILIZING NITROGEN GAS

Harry A. Beale, Columbus, Ohio, assignor to Applied Coatings International, Inc., Columbus, Ohio

Filed Feb. 7, 1983, Ser. No. 464,300

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 R

7 Claims

1. A method for depositing cubic boron nitride on a substrate, comprising the steps of:

- heating a supported substrate in a vacuum;
- supplying metal vapors into a zone between said sub-

strate and a metals source, said source comprising a material selected from the group consisting of:

boron,  
boron and a material selected from the group consisting of the elements chromium, nickel, cobalt, and manganese, a metal alloy consisting essentially of from 0.1 weight percent to 5.0 weight percent of at least one of the elements chromium, nickel, cobalt, and manganese, the balance being boron,

and a metal alloy consisting essentially of at least 60 percent by weight to the balance of boron with from 0.2 to 12 percent by weight of aluminum, and at least 0.2 to 24 percent by weight of at least one of cobalt, nickel, manganese, or other aluminide-forming element;

- introducing nitrogen gas into said zone;
- generating an electrical field in said zone ionizing the metal vapors and gas atoms in the zone; and
- maintaining an electrically negative bias impressed on said substrate depending upon the process employed and in accordance with the following schedule:

Process	Bias Voltage	s
Reactive Evaporation (Electron Beam)	—500 to —3000 volts	
Reactive Sputtering (DC)	—200 to —3000 volts	
Reactive Sputtering (RF)	—100 to —3000 volts	
Reactive Sputtering (Magnetron)	—500 to —3000 volts	
Arc Discharge	—20 to —2000 volts	

whereby cubic boron nitride is deposited on the surface of said substrate.

4,412,900

# METHOD OF MANUFACTURING PHOTODENSITORS

Yasuo Tanaka, Kokubunji; Akira Sasano, Hinodemachi; Toshihisa Tsukada, Tokyo, and Yasuharu Shimamoto, Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,076

Claims priority, application Japan, Mar. 13, 1981, 56-35313; Oct. 21, 1981, 56-16720

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 P

27 Claims

1. A method of manufacturing a photosensor comprising the steps of:

- forming a photoconductor film of amorphous material made chiefly of silicon and containing hydrogen on a substrate;
- forming a transparent conductive film capable of transmitting light and of conducting electricity on said photoconductor film by sputtering, and
- heating said photosensor with said transparent conductive film in a temperature range of from at least about 140° C. to not greater than about 280° C.

4,412,901

# METHOD FOR THE MANUFACTURE OF SOLID ELECTROLYTE LAYERS FOR GALVANIC CELLS

Peter Hartwig, Hirschberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,902

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205919

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 C

7 Claims

1. A method for the manufacture of solid electrolyte layers for galvanic cells which comprises depositing a very thin, firmly adhering, coherent, compact layer of at least one lithium nitride halogenide onto a substrate, wherein the lithium nitride halogenide is deposited onto the substrate by atomizing it from a pressed or sintered target of lithium nitride halogenide in a cathode sputtering system with a discharge voltage of at least

about 300 volts, at a pressure of less than about  $1 \times 10^{-1}$  mb and utilizing a plasma-generating gas that comprises at least about 55% by weight of a gas selected from the group consisting of helium, nitrogen and mixtures thereof.

4,412,902

# METHOD OF FABRICATION OF JOSEPHSON TUNNEL JUNCTION

Osamu Michikami, Tohoku; Yujiro Katoh, Mito; Keiichi Tanabe, Mito; Hisataka Takenaka, Mito, and Shizuka Yoshii, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Musashino, Japan

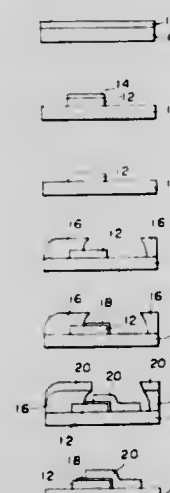
Filed Jun. 18, 1982, Ser. No. 390,116

Claims priority, application Japan, June 22, 1981, 56-96129; Jul. 6, 1981, 56-105345; Aug. 3, 1981, 56-121577; Aug. 3, 1981, 56-121578; Aug. 17, 1981, 56-128439; Feb. 16, 1982, 57-24194

Int. Cl.<sup>3</sup> C23C 15/00; H01L 39/22

U.S. Cl. 204—192 E

30 Claims



1. A method for the fabrication of a Josephson tunnel junction device which comprises the steps of:

- forming a base electrode film of a first superconductor metal on a substrate;
- subjecting a surface of the base electrode film to sputter cleaning in the presence of a halogenated hydrocarbon selected from the group consisting of fluorinated hydrocarbons (CnF<sub>2n+2</sub>; n=1-4), trifluoromethane (CHF<sub>3</sub>), trichlorofluoroethane (CCl<sub>3</sub>F), trifluorobromomethane (CBrF<sub>3</sub>), dichlorodifluoromethane (CCl<sub>2</sub>F<sub>2</sub>), trifluoroethane (C<sub>2</sub>H<sub>3</sub>F<sub>3</sub>) and pentafluoroethane (C<sub>2</sub>HF<sub>5</sub>);
- oxidizing the cleaned surface of the base electrode in the presence of a gas mixture of oxygen and inert gas to form an oxide layer on the base electrode; and
- forming a counter electrode film of a second superconductor metal on the oxide layer.

4,412,903

# COATING INFRA RED TRANSPARENT SEMICONDUCTOR MATERIAL

Geoffrey W. Green, Malvern, and Alan H. Lettington, Worcester, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 14, 1981, Ser. No. 292,433

Claims priority, application United Kingdom, Aug. 21, 1980, 8027279

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 C

7 Claims

1. A method of coating an infra red transparent germanium or silicon element with a layer of hard carbon comprising the steps of:

- placing the element on a cathode structure in a vacuum chamber,
- substantially evacuating the chamber,
- heating the substrate to a temperature not exceeding 300° C.,

(iv) admitting a hydrocarbon gas into the chamber while maintaining a substantial vacuum,

(v) applying a D.C. voltage between the cathode and an anode in the chamber, and

(vi) maintaining the substrate temperature below 300° C., whereby a glow discharge is initiated and maintained in the chamber so that carbon ions strike the element and build up a hard carbon layer substantially transparent to infra red radiation.

4,412,904

# ELECTROCHEMICAL MEASURING CELL

Franz-Josef Rohr, Abtsteinach, and Andreas Reich, Heidelberg, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,549

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128738

Int. Cl.<sup>3</sup> G01N 27/26

U.S. Cl. 204—424

7 Claims

1. In an electrochemical measuring cell, in particular for the determination of the oxygen content in gases, having a solid electrolyte and at least one electrode connected to the electrolyte for the transfer of an electric current by the flow of electrons therebetween, the improvement comprising disposing the electrode on the electrolyte in the form of a layer containing electron-conducting ceramic material together with a metallic material having an electron-conductivity greater than the electron-conductivity of the ceramic material in an amount sufficient to increase the electron-conductivity of the electrode to a predetermined value, said metallic material consisting of small solid particles containing only metallic material, and said small particles embedded in the layer without substantial loss of particulate identity.

4,412,905

# VACUUM DEPOSITION APPARATUS

Mohammed N. Khan, Wembley, England, assignor to Dowty Electronics Limited, Acton, England

Filed Apr. 27, 1983, Ser. No. 489,162

Claims priority, application United Kingdom, May 12, 1982, 8213847

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—298

1 Claim

1. A vacuum deposition apparatus including a cathode, an anode associated with the substrate to be coated, and means providing a magnetic field whose lines of force are directed substantially parallel to the surface of the substrate to be coated, are at least closely adjacent to that surface and are of such strength as substantially to direct high-energy electrons away from the surface.

4,412,906

# SPUTTERING APPARATUS

Yasuhiko Sato; Takamasa Sakai, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,996

Claims priority, application Japan, Dec. 27, 1980, 55-185709

Int. Cl.<sup>3</sup> C23C 15/00

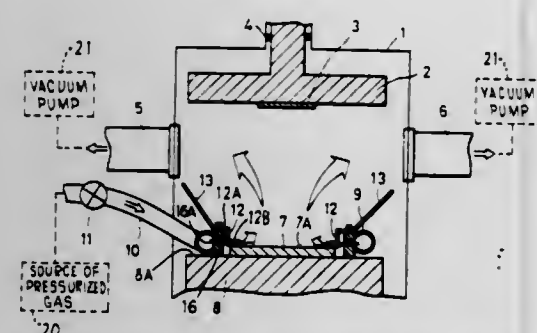
U.S. Cl. 204—298

3 Claims

1. A sputtering apparatus, comprising a vacuum chamber, substrate holding means supported within said vacuum chamber for holding a substrate, target supporting means supported within said vacuum chamber for supporting a target in opposition to said substrate, a plurality of gas withdrawal conduits communicating with said vacuum chamber at locations adjacent said substrate holding means, gas supply means for supplying a gas to said vacuum chamber in a manner so that the gas pressure gradually decreases from the region of said target to the region of said substrate, said gas supply means including gas jet opening means located near a surface of said target, means defining a fin near said gas jet opening means for guid-



ing the gas flow as it leaves said target, and gas guide means in the region of said gas jet opening means for jetting the gas



entering said vacuum chamber through said gas jet opening means directly toward said surface of said target.

#### 4,412,907 FERROMAGNETIC HIGH SPEED SPUTTERING APPARATUS

Akio Ito; Kyuzo Nakamura; Yoshifumi Ota, all of Yachimata, and Taiki Yamada, Chiba, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 23, 1982, Ser. No. 401,079  
Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—298 7 Claims  
1. A ferromagnetic, high speed, sputtering apparatus comprising:

- a vacuum chamber;
- a target means of ferromagnetic material, positioned in said vacuum chamber, said target means comprising at least two segments positioned adjacent to one another with a gap therebetween, wherein said gap has at least a portion thereof which does not extend in the direction of the thickness of said target means;
- substrate means in said vacuum chamber positioned facing one side of said target means; and
- magnetic field generating means positioned on the other side of said target means such that the magnetic field therefrom leaks through said gap.

4,412,908  
PROCESS FOR THERMAL HYDROCRACKING OF COAL  
Kunihiko Yamashita, Kurashiki, and Muneaki Kimura, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan  
Filed Apr. 7, 1982, Ser. No. 366,125  
Claims priority, application Japan, Apr. 7, 1981, 56-52162;  
Jun. 8, 1981, 56-87813  
Int. Cl.<sup>3</sup> C10G 1/00

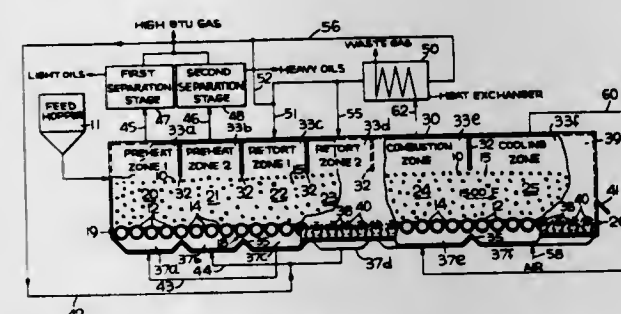
U.S. Cl. 208—8 R 10 Claims  
1. A process for liquefying and gasifying coal by thermal treatment in the presence of hydrogen gas for hydrocracking, said process comprising the following sequential uninterrupted three steps:

- injecting coal fines into a heated hydrogen gas stream at a pressure of from 35 to 250 kg/cm<sup>2</sup>G such that they are rapidly heated to a temperature of from 750° to 1100° C. for thermal cracking thereof; immediately thereafter
- reducing the temperature of the reaction product stream while subjecting the resulting product to hydrocracking for a period of from 1.0 to 60 seconds at a temperature that is lower than the temperature used in step (1) and which is in the range of from 570° to 850° C.; and
- rapidly quenching the reaction product of step (2) to not lower than 350° C. to stop the hydrocracking.

4,412,909  
PROCESS FOR RECOVERY OF OIL FROM SHALE  
Bobby P. Faulkner, New Berlin, and Michael H. Weinecke, Franklin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.  
Filed Dec. 31, 1981, Ser. No. 336,266  
Int. Cl.<sup>3</sup> C10B 53/06; C10G 1/00

U.S. Cl. 208—11 R

21 Claims



1. A method of recovering oil from oil bearing shale particles comprising the steps of forming a non-fluidized bed of said particles on a plurality of rotatable horizontal apertured cylindrical rollers having elongated filler members in the nip between adjacent rollers with the upper surfaces of said filler members disposed below the upper surfaces of said rollers, transporting said bed along a path of travel transverse to the axes of said rollers by rotating said rollers to frictionally engage their cylindrical surfaces with said particles and transfer said particles onto and across said filler members and continuously agitate said particles as they are transported, said roller rotating step being at a circumferential velocity substantially higher than the velocity of said bed along said path of travel,

passing through the apertures in said rollers and said bed at spaced apart points along said path of travel a plurality of discrete streams of nonoxidizing gas free of products of combustion and heated to different temperatures sufficiently high to vaporize and educe different weight fractions of the oil from said particles as vapors into said gas streams, said temperatures being below the cracking temperatures of said fractions, individually withdrawing said gas streams along said bed, and separating said different weight oil fractions from said gas streams.

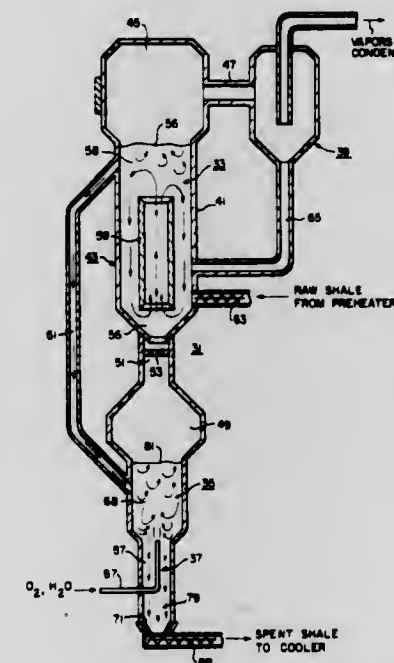
4,412,910  
RECOVERY OF FUEL FROM OIL SHALE  
David H. Archer, Ross Township, Allegheny County, and M. Mushtaq Ahmed, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Oct. 21, 1981, Ser. No. 313,447  
Int. Cl.<sup>3</sup> C10G 1/00; C10B 53/06, 49/10

U.S. Cl. 208—11 R

10 Claims

1. The method of recovering fuel from oil shale with apparatus including a pyrolyzer and a gasifier, wherein a stream of particles of raw shale is fed into the pyrolyzer and is to be heated in said pyrolyzer to thereby produce shale oil, product gas, including volatile compounds from said shale, and pyrolyzed shale containing residual carbon, the said method comprising supplying to said gasifier gas including oxygen and steam, transferring said pyrolyzed shale from said pyrolyzer to said gasifier, passing said gas in said gasifier through said pyrolyzed shale, to produce a fluidized bed of said pyrolyzed shale, reacting said oxygen and steam chemically with said pyrolyzed shale in said fluidized bed in said gasifier to produce hot fuel gas and hot spent shale, the quantity of oxygen supplied being substantially less than that required to react completely with said residual carbon contained in said pyrolyzed shale and the quantity of steam supplied being sufficient to react with substantially the remainder of said residual carbon whereby said

fuel gas is produced, transmitting said hot fuel gas to said pyrolyzer, passing said hot fuel gas through said raw shale at the bottom of said fluidized bed to produce a fluidized bed of said raw shale, contacting said hot fuel gas with said raw shale in said fluidized bed in said pyrolyzer thermally to heat said



raw shale, the heating of said raw shale by said hot fuel gas separating said oil and product gas from said raw shale, transmitting said product gas and fuel gas resulting from the reaction of the steam and oxygen with said residual carbon from said pyrolyzer to a facility for separating said product gas as a fuel, and collecting the oil separated from said raw shale.

4,412,911  
PROCESS FOR REACTIVATING PEROVSKITE CATALYSTS AND HYDROCARBON TREATING PROCESSES UTILIZING THE REACTIVATED CATALYSTS  
Robert C. Schucker, and Kenneth S. Wheelock, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.  
Filed Feb. 24, 1982, Ser. No. 351,967  
Int. Cl.<sup>3</sup> C10G 11/02, 45/04, 47/02; B01J 37/16

U.S. Cl. 208—121 23 Claims  
1. A process for reactivating the activity of a partially deactivated catalyst comprising a perovskite having at least one alkaline earth metal constituent selected from the group consisting of barium, beryllium, magnesium, calcium, strontium and mixtures thereof, said catalyst having been partially deactivated by exposure to steam and an oxidizing agent, which comprises the step of contacting said partially deactivated catalyst with a reducing gas, at reducing conditions for a time sufficient to reactivate said catalyst.

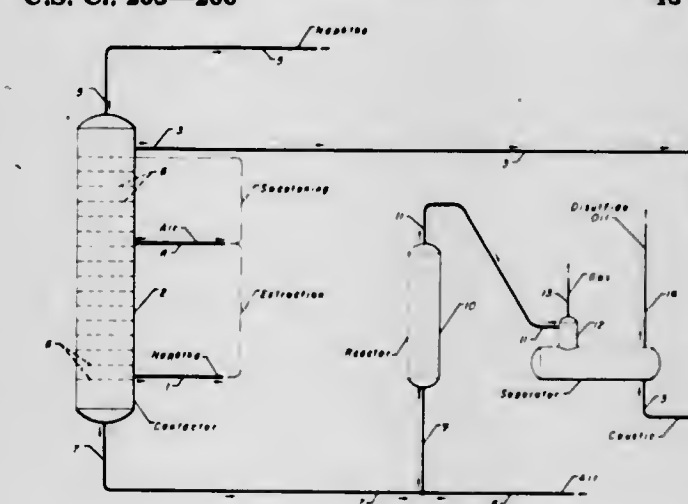
11. A hydrocarbon treating process which comprises contacting a hydrocarbonaceous feed at hydrocarbon treating conditions with a catalyst that has been reactivated by a process which comprises contacting a partially deactivated catalyst comprising a perovskite having at least one alkaline earth metal constituent selected from the group consisting of barium, beryllium, calcium, strontium and mixtures thereof, said catalyst having been partially deactivated by exposure to steam and an oxidizing agent, with a reducing gas, at reducing conditions for a time sufficient to reactivate said catalyst.

11. A hydrocarbon treating process which comprises contacting a hydrocarbonaceous feed at hydrocarbon treating conditions with a catalyst that has been reactivated by a process which comprises contacting a partially deactivated catalyst comprising a perovskite having at least one alkaline earth metal constituent selected from the group consisting of barium, beryllium, calcium, strontium and mixtures thereof, said catalyst having been partially deactivated by exposure to steam and an oxidizing agent, with a reducing gas, at reducing conditions for a time sufficient to reactivate said catalyst.

4,412,912  
HYDROCARBON TREATING PROCESS HAVING MINIMUM GASEOUS EFFLUENT  
George Asdigian, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.  
Filed Mar. 1, 1983, Ser. No. 471,116  
Int. Cl.<sup>3</sup> C10G 19/02

U.S. Cl. 208—206

18 Claims



1. A process for treating hydrocarbons which comprises the steps of:

- countercurrently contacting a liquid-phase alkaline aqueous stream and a liquid-phase feed stream comprising mercaptans and hydrocarbons having boiling points under about 650° F. along the height of a vertical contacting zone; and,
- injecting an oxygen-containing stream into an intermediate point in the contacting zone, with the oxygen reacting with mercaptans in the presence of a mercaptan oxidation catalyst, and thereby effecting a sweetening treatment of the feed stream above the point at which the oxygen-containing stream enters the contacting zone and a mercaptan extraction treatment of the feed stream below the point at which the oxygen-containing stream enters the contacting zone.

4,412,913  
USE OF ALKANOLAMINES IN SWEETENING SOUR LIQUID HYDROCARBON STREAMS  
Truman P. Moote; Myron L. Dunton, both of Tulsa; Russell L. McGalliard, Broken Arrow, all of Okla., and Lyman Yarborough, Kingwood, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.  
Filed Aug. 5, 1982, Ser. No. 405,493  
Int. Cl.<sup>3</sup> C10G 29/02

U.S. Cl. 208—207 7 Claims  
1. A method for sweetening a liquid hydrocarbon stream containing mercaptans by converting the latter into their corresponding hydrocarbon soluble disulfides, which consists essentially of

contacting said liquid hydrocarbon stream with an agent and an oxygen containing gas under effective oxidizing conditions, and wherein the agent consists essentially of an alkanolamine.

4,412,914  
ENDOTHERMIC REMOVAL OF COKE DEPOSITED ON SORBENT MATERIALS DURING CARBO-METALLIC OIL CONVERSION  
William P. Hettinger, Jr., Russell, Ky.; James F. Hoffman, Huntington, W. Va., and Stephen M. Kovach, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.  
Filed Aug. 10, 1981, Ser. No. 291,656  
Int. Cl.<sup>3</sup> C10G 29/04

U.S. Cl. 208—253 38 Claims  
1. In a process combination for preparing premium products



from residual oils comprising metal contaminants and Conradson carbon producing components by contact with solid sorbent clay particle material to lay down metal contaminants and Conradson carbon hydrocarbonaceous material components on said clay particles from said residual oil before effecting fluid catalytic cracking of a resultant demetallized and decarbonized residual oil product and regenerating the solid sorbent particle material comprising substantial Conradson carbon hydrocarbonaceous material and metal deposits by combusting said hydrocarbonaceous material with an oxygen containing gas, the improvement for limiting and controlling temperatures encountered during combustion of substantial hydrocarbonaceous deposits on said solid particles which comprises:

- A. initially contacting said solid sorbent clay particle material comprising hydrocarbonaceous material and metal deposits with a quantity of oxygen containing gas under conditions restricting the regeneration temperature within the range of 1350° to 1600° F. during partial removal of deposited hydrocarbonaceous material by combustion and
- B. removing at a sufficiently high rate greater than 40 weight percent of carbonaceous material deposits from said solid sorbent material with carbon dioxide following said initial oxidation step at temperatures up to 1600° F. while maintaining at least 0.5 weight percent of metal additive elements on said sorbent particles selected from the group comprising one or more of Li, Na, Sr, Re, Fe, Co, Ni, Ru, Rh, Pt, Pd, Os, Ir, Cu, Ag and Au during said contact with carbon dioxide.

4,412,915

#### SPECIFIC GRAVITY RESPONSIVE CONTROL OF BMCI IN AROMATIC EXTRACT OILS

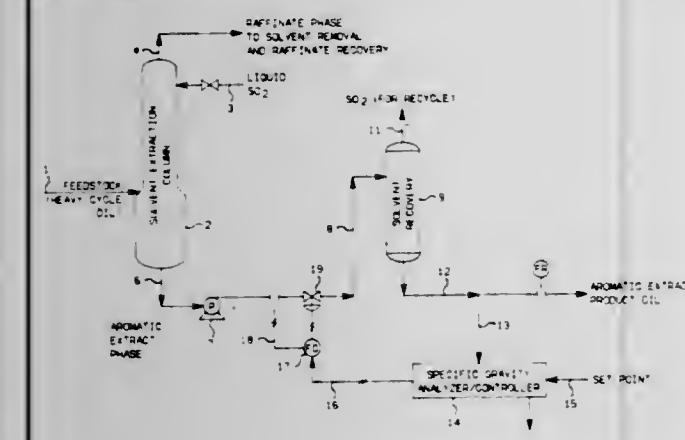
James G. Kettinger, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1981, Ser. No. 300,148

Int. Cl.<sup>3</sup> C10G 21/30

U.S. Cl. 208—311

3 Claims



1. In a solvent extraction process a method for maintaining a constant BMCI for an aromatic extract oil which comprises controlling the removal rate of the aromatic extract oil from a solvent extraction zone in response to the specific gravity of the aromatic extract oil removed from said solvent extraction zone.

4,412,916

#### AIRLESS ARTIFICIAL KIDNEY ASSEMBLY

Michael J. Kell, Decatur, Ga., assignor to Cordis Dow Corp., Miami, Fla.

Filed Jun. 24, 1981, Ser. No. 276,751

Int. Cl.<sup>3</sup> B01D 31/00

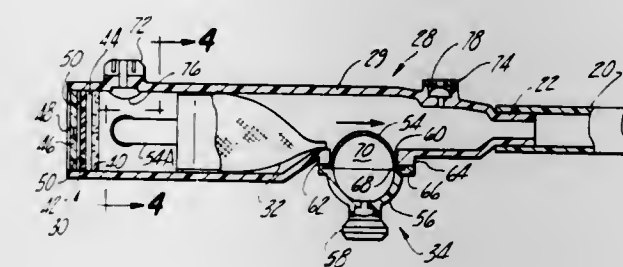
U.S. Cl. 210—90

14 Claims

1. An airless artificial kidney assembly comprising
  - (1) an artificial kidney having inlet and outlet ports,
  - (2) a liquid-tight subassembly having a filter, microporous vent means for venting to atmosphere gas bubbles separated from liquid in said subassembly and preventing gas entry through said vent means into said subassembly,

pressure measuring means for continuously monitoring the pressure of liquid in said subassembly, a housing for blood having an upper region and an outlet connector communicating with said housing for discharging blood therefrom,

- (3) a first tube secured at one end to said kidney inlet port and terminating at its opposite end in a connector for connecting said first tube with a patient,
- (4) a second tube secured at one end to said outlet connector of said subassembly and terminating at its opposite end in,



a connector for connecting said second tube with a patient,

- (5) said kidney outlet port opening into said housing for discharging blood thereinto, said filter being arranged for filtering blood flowing from said kidney outlet port to said outlet connector, said vent means comprising an upwardly opening microporous hydrophobic vent in communication with said upper region of said housing for receiving and discharging air bubbles therefrom, and means containing an aqueous solution overlying said vent for preventing downward flow of air through said vent into said housing.

4,412,917

#### WEIGHT CONTROLLED AND HYDROSTATIC PRESSURE ADJUSTABLE PERITONEAL DIALYSIS APPARATUS

Hannu T. Ahjopalo, Helsinki, Finland, assignor to Instrumentarium Oy, Helsinki, Finland

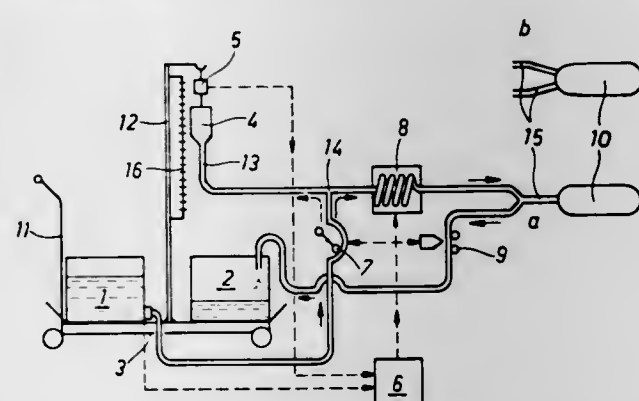
Filed May 22, 1981, Ser. No. 266,285

Claims priority, application Finland, May 28, 1981, 801718

Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—104

7 Claims



1. An apparatus for peritoneal dialysis, comprising a first vessel to contain a dialysis fluid; a second vessel to contain spent dialysis fluid; conduit means for interconnecting said first and second vessels with the abdominal cavity of a patient; pumping means in said conduit means for pumping the dialysis fluid directly into the abdominal cavity; flow control means in said conduit means for controlling the amount of dialysis fluid removed from said abdominal cavity; a branch conduit inter-connected with said conduit means at a location between said pumping means and said abdominal cavity and having a hydrostatic pressure equalizing section disposed at a higher level than said abdominal cavity, said pumping means and conduit means providing fluid flow into the abdominal cavity simulta-

neously with pumping against hydrostatic liquid pressure in said pressure equalizing section; weighing means for measuring the weight of said first vessel, said second vessel, and said equalizing section; and control means operably connected to said pumping means and to said flow control means and responsive to the weight as determined by said weighing means for controlling the operation of said pumping means and said flow control means to obtain the desired flow of fluid through said conduit means.

4,412,918

#### AUTOMATIC AND CONTINUOUS CHEMICAL FEED SYSTEM

David A. Rickett, 15600 Del Prado Dr., Hacienda Heights, Calif. 91745

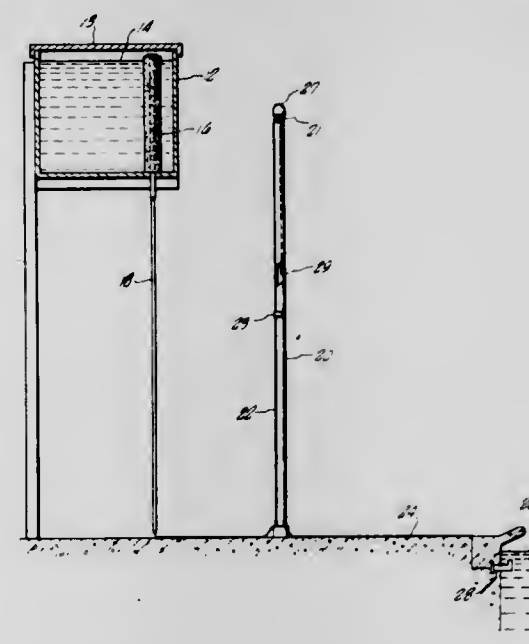
Continuation-in-part of Ser. No. 171,983, Jul. 24, 1980, Pat. No. 4,349,437. This application Mar. 5, 1982, Ser. No. 354,148

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B01D 33/38

U.S. Cl. 210—169

14 Claims



1. An automatic and continuous chemical feed system for the introduction of a chemical solution into a liquid body comprising:

- a vessel vented to maintain atmospheric pressure which contains the chemical solution to be introduced into the liquid body, said vessel being fixably positioned such that the level of the chemical solution in the vessel is above the high liquid level of the liquid body, and said vessel having an opening near the base thereof;
- a means for filtering said chemical solution as the solution flows out of the vessel;
- a downcomer means connected to said filter means and extending towards the ground, said downcomer means having an inner diameter sufficiently large to spontaneously vent any gases which are formed in the chemical solution back through said filter means and into said vessel;
- a standpipe means to regulate changes in the flow of the chemical solution;
- a tubular connecting means to connect said downcomer means and said standpipe means so that the chemical solution flows therebetween, said tubular connecting means initially determining the flow rate of the chemical solution;
- a tubular conveyance means attached to said standpipe means to convey the chemical solution to a selected location in or above the liquid body.

4,412,919

#### WATER PURIFICATION DEVICE

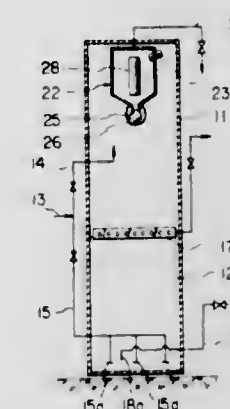
Yoshihiko Ueda, Yamaguchi, Japan, assignor to Takara Kogyo Co., Ltd., Tokyo, a part interest

Filed Apr. 26, 1982, Ser. No. 372,235

Int. Cl.<sup>3</sup> B01D 29/38

U.S. Cl. 210—189

7 Claims



1. A water purification device comprising:
  - a filter tank having water inlet means for the admission of water to be filtered and washing water thereinto, and filtered water outlet means;
  - granular filter material for filtering of water and the like filling the lower portion of said filter tank with a space in said filter tank above said filter material;
  - a separation tank mounted in said space in said filter tank and having a washing water inlet in the upper portion thereof from said space and directed generally tangentially of said separator tank;
  - a washing water outlet means lying generally along the central vertical axis of said separation tank and communicating with the outside of the filter tank;
  - a rod-like member positioned along said vertical axis of said separation tank, whereby when washing water is caused to flow into the tank and entrains the filter material and fills the tank, the filter material carrying washing water is directed by said washing water inlet in a vortex down along the inside surface of the wall of the separation tank, then inwardly thereof, and then along the peripheral surface of said rod-like member in reverse flow of water traveling upwards of the member with a gyratory motion and is discharged through said washing water outlet means; and
  - a granular filter material outlet at the bottom of said filter material separation tank and having a cover means for closing and opening said outlet.

4,412,920

#### FILTER WITH TOP SPRAY

Joseph A. Bolton, Summit La., Glens Falls, N.Y. 12801, and Armond A. Brown, Burgoyne Rd., #6, at the Point, Saratoga Spa., N.Y. 12866

Continuation-in-part of Ser. No. 92,045, Nov. 7, 1979, abandoned. This application Mar. 25, 1981, Ser. No. 247,336

Int. Cl.<sup>3</sup> B01D 29/38

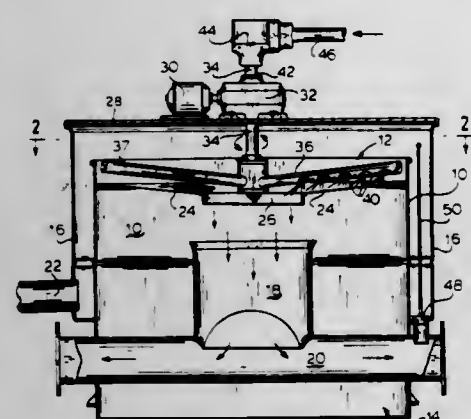
U.S. Cl. 210—409

7 Claims

1. A filter separation device including a filter screen, a surface of said filter screen, means for flowing a first liquid containing particulate over said surface, a particulate receiving opening formed in said screen, and spray nozzles above said surface and arranged with respect to said screen to impinge cleansing liquid on said surface at an angle thereto in the range of 10° to 45° to direct particulate disposed thereon by said first liquid towards said opening, rotary support means for rotating said spray nozzles about an axis which passes through said



opening, said spray nozzles further being arranged on said rotary support means such that said cleansing liquid can carry



particulate continuously and in a spiral fashion towards said particulate receiving opening.

4,412,921

# **DRY, PARTICULATE, INORGANIC ULTRAFILTRATION MEMBRANES AND THE PRODUCTION THEREOF**

Pat S. Leung, Highland Mills, and Anthony R. Cacciola, Pleasantville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 879,391, Feb. 21, 1978, abandoned.

This application Apr. 15, 1981, Ser. No. 254,488

Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—500.2

21 Claims

1. A process for the production of a dry, inorganic ultrafiltration membrane comprising:

- pretreating a microporous membrane support with a volatile liquid medium prior to the coating of said support with a membrane coating material, said liquid medium being non-solvating to said coating material and capable of drawing said coating material into said support and of desolvating said coating material;
- coating the surface of said pretreated microporous membrane support with said membrane coating material; and
- exposing the thus-coated membrane to a temperature capable of volatilizing said liquid medium to remove said liquid medium from the microporous membrane support and said membrane coating material, whereby the desolvation of said coating material prior to completion of removal of said liquid medium results in a shrinking of the coating material and the consequent filling, by said coating material, of voids produced as a result of said shrinking, thus avoiding the development of microscopic cracks that otherwise occur upon desolvation of the coated membrane, thereby forming an essentially crack-free mechanically and chemically stable membrane.

21. A dry inorganic ultrafiltration membrane produced by the process defined in any one of claims 1, 19, 20 and 2 to 18, inclusive.

4,412,922

# **POSITIVE-CHARGED ULTRAFILTRATION MEMBRANE FOR THE SEPARATION OF CATHODIC/ELECTRODEPOSITION-PAINT COMPOSITIONS**

Leon Mir, Newton, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Continuation of Ser. No. 165,279, Jul. 2, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,012

Int. Cl.<sup>3</sup> B01D 13/00

U.S. Cl. 210—638

14 Claims

1. A method for the concentration of an aqueous cationic electrodeposition-paint composition, which method comprises: (a) providing a foul-resistant polyvinylidene fluoride polymer membrane prepared by treating a negative-charged polymer membrane material, having fixed negative-

charged groups in the polymer, with a polyelectrolyte polymer having fixed positive-charged nitrogen groups in an amount sufficient to provide for an excess of positive-charged groups in the treated membrane polymer; and (b) employing the foul-resistant polymer membrane in the ultrafiltration concentration of a cationic electrodeposition-paint composition, whereby concentration of the paint composition is accomplished with high flux rate and with a long membrane use life.

4,412,923

# **PROCESS AND APPARATUS FOR EXTRACTING IONS FROM A CLEAR LIQUID OR A LIQUID CONTAINING MATERIALS IN SUSPENSION BY CONTACT WITH AN EXCHANGE SUBSTANCE**

Enzo Capitani, Saignes, and Jean Teissie, Chamarande, both of France, assignors to Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs Scumra, Paris, France

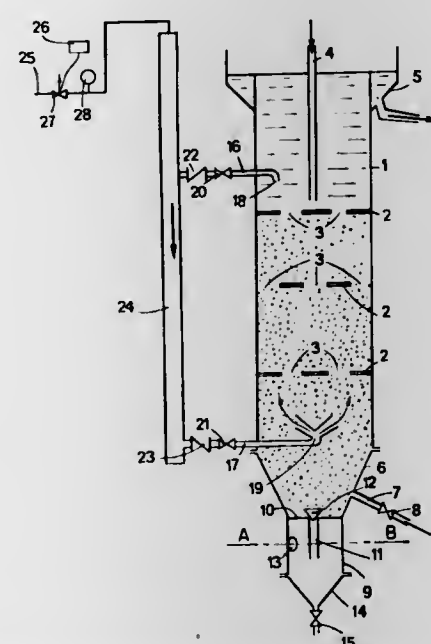
Filed Mar. 1, 1982, Ser. No. 353,169

Claims priority, application France, Mar. 5, 1981, 81 04900

Int. Cl.<sup>3</sup> B01J 47/10

U.S. Cl. 210—661

7 Claims



1. A process for continuous ion exchange between a liquid and a mobile bed of grains of ion exchange substances disposed in a vertical column and comprising the steps of: continuously introducing liquid to be treated into the lower end of the column and upwardly through the bed to continuously maintain the grains in a fluidized state; introducing regenerated grains of the ion exchange substances into the upper end of the column to maintain the bed with generally downward movement of the grains in countercurrent flow relation to the upward movement of the liquid; subjecting the fluidized bed to cyclic pulsation by withdrawing treated liquid from the upper end of the column and rapidly and continuously periodically introducing the treated liquid upwardly into the lower end of the bed whereby density grading of grains is effected; and continuously removing spent grains from the lower end of the column without interfering with the feed of liquid to be treated.

4,412,924

# **WATER PURIFICATION SYSTEM**

Orval R. Feather, 2464 Bunker Hill, Ann Arbor, Mich. 48105

Filed Dec. 29, 1981, Ser. No. 335,536

Int. Cl.<sup>3</sup> C02B 1/10

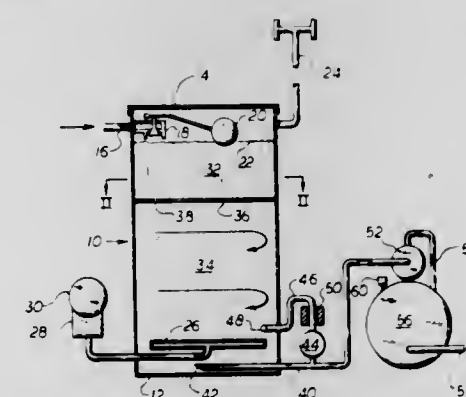
U.S. Cl. 210—744

14 Claims

1. The method of treating water utilized by a water system

pressurized by an intermittently operated pump to remove high concentrates of hydrogen sulfide, the water system having a known average volume requirement within a predetermined interval, comprising the steps of:

- (a) storing a volume of water greater than that required during the known requirement interval within first and second chambers,
- (b) air-stripping the stored water within the first chamber by aeration to rapidly reduce the high hydrogen sulfide concentrate,



- (c) transferring the air-stripped water to the second chamber at a rate determined by the pump during normal water usage,
- (d) intermixing ozone with the air-stripped water within the second chamber to remove low concentrates of hydrogen sulfide from the water, and
- (e) removing water from the second chamber by the pump during normal water usage.

4,412,925

# **ASSISTED OIL RECOVERY WITH USE OF FERMENTATION FLUIDS**

Daniel Ballerini, Saint Germain en Laye; Odile Chaudé, Sevres; Guy Chauveteau, Ruell Malmaison; Norbert Kohler, Paris, and Jean-Paul Vandecasteele, Fourqueux, all of France, assignors to Institut Français du Pétrole, Ruell-Malmaison and Rhone-Poulenc Industries, Paris, both of, France

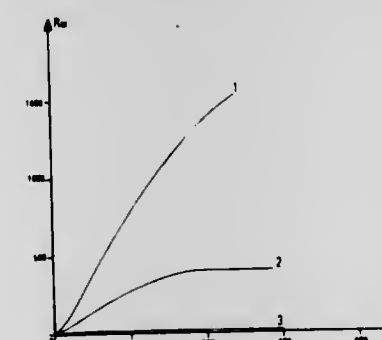
Filed Jun. 29, 1978, Ser. No. 920,522

Claims priority, application France, Jul. 25, 1977, 77 23008

Int. Cl.<sup>3</sup> C09K 3/00

U.S. Cl. 252—8.55 D

22 Claims



1. An aqueous composition suitable for direct use in waterflood oil recovery processes, which comprises a clarified and stabilized fermentation fluid containing at least one bactericidal agent, said clarified and stabilized fermentation fluid being obtained by a process consisting essentially of the steps of:

- (a) culturing a polysaccharide-producing microorganism in an aqueous culture medium to produce an aqueous culture containing dissolved polysaccharide therein; and
- (b) clarifying and stabilizing the resultant aqueous culture from step (a), the clarification being effected by at least one of centrifugation and filtration, and the stabilization being effected by introducing therein at least one bacteri-

cidal agent, and recovering the resultant clarified and stabilized fermentation fluid containing said at least one bactericidal agent;

whereby said aqueous composition is obtained without precipitation and recovery of a solid polysaccharide and dissolution thereof in an aqueous medium and is suitable for direct use in waterflood oil recovery processes.

4,412,926

# **ALKYL NORBORNYL ETHER SULFONATES USEFUL FOR SOLUBILIZING PETROLEUM SULFONATES IN OIL FLUID BRINE SOLUTIONS**

Edward C. Y. Nleh; Carter G. Naylor, both of Austin, and Clifford L. Lambert, Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

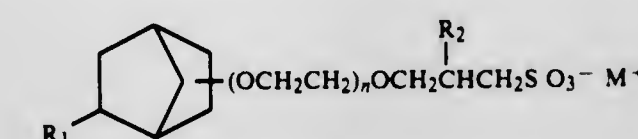
Filed Apr. 28, 1982, Ser. No. 372,493

Int. Cl.<sup>3</sup> E21B 43/22; C07C 143/20

U.S. Cl. 252—8.55 D

8 Claims

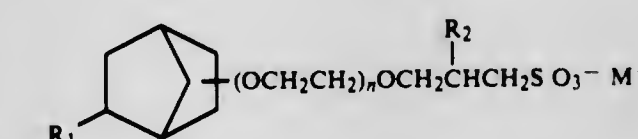
1. An alkyl norbornyl ether sulfonate of the formula:



wherein R<sub>1</sub> is a substantially linear alkyl group of 4 to 12 carbon atoms; R<sub>2</sub> is selected from the group consisting of hydrogen and methyl; M is a cation selected from the group consisting of potassium, sodium and ammonium and n is an integer of from 1 to 12.

6. An aqueous brine solution comprising:

- (a) about 0.1 wt% to about 2 wt% of an alkyl norbornyl ether sulfonate of the formula:



wherein R<sub>1</sub> is a substantially linear alkyl group of 4 to 12 carbon atoms; R<sub>2</sub> is selected from the group consisting of hydrogen and methyl; M is a cation selected from the group consisting of potassium, sodium and ammonium and n is an integer of from 1 to 12 and;

- (b) about 0.1 weight % to about 4 weight % of a petroleum sulfonate.

4,412,927

# **PROCESS FOR THE PREPARATION OF SUPERALKALINIZED METALLIC DETERGENT-DISPERSANTS FOR LUBRICATING OILS AND PRODUCTS OBTAINED THEREFROM**

Bernard Demoures, Puteaux, and Jean-Louis Le Coent, Le Havre, both of France, assignors to Orogil Corporation, Courbevoie, France

Continuation of Ser. No. 49,958, Jun. 19, 1979, abandoned. This application Feb. 19, 1982, Ser. No. 350,282

Claims priority, application France, Jun. 26, 1978, 78 18947 The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C10M 1/40

U.S. Cl. 252—33.3

20 Claims

1. A process of preparing a detergent-dispersant composition from an alkaline-earth metal alkylbenzene sulfonate, a sulfurized alkylphenate of an alkaline-earth metal, an alkaline-earth metal compound, an alkylene glycol, and carbon dioxide comprising the steps of:

- (1) carbonating, with carbon dioxide, at a temperature of



between about 100° C. and 250° C., a reaction medium which comprises:

- a sulfurized alkylphenate of an alkaline-earth metal of a TBN of between 0 and 170, the said alkylphenate bearing one or more C<sub>6</sub>-C<sub>60</sub> alkyl substituents;
  - an alkaline-earth metal alkylbenzene sulfonate of a molecular weight of more than 300 and a TBN of less than or equal to 150;
  - an alkaline-earth metal compound; and
  - an alkylene glycol;
- in a dilution oil in accordance with the following quantities of reagents:
- from about 5 to 60 parts by weight of sulfurized alkylphenate for 100 parts by weight of mixture of sulfurized alkylphenate plus alkylbenzene sulfonate;
  - from about 40 to 95 parts by weight of alkylbenzene sulfonate for 100 parts by weight of mixture of sulfurized alkylphenate plus alkylbenzene sulfonate;
  - from about 3 to 30 parts by weight of alkaline-earth metal compound for 100 parts by weight of a mixture of sulfurized alkylphenate plus alkylbenzene sulfonate;
  - from 4 to 60 parts by weight of alkylene glycol for 100 parts by weight of mixture of sulfurized alkylphenate plus alkylbenzene sulfonate; and
  - the amount of carbon dioxide necessary for the carbonation being between that which can be completely absorbed by the reaction medium and an excess of 30 percent of said amount;
- removing the alkylene glycol; and
  - separating the superalkalinized metallic detergent-dispersant composition thus obtained.

4,412,928

#### CORROSION INHIBITORS FOR BORON-CONTAINING LUBRICANTS

Richard A. Holstedt, Whittier, Calif., and Peter Jessup, Millington, N.J., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 319,073, Nov. 9, 1981, and a continuation-in-part of Ser. No. 329,385, Dec. 10, 1981. This application Dec. 23, 1981, Ser. No. 333,998

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

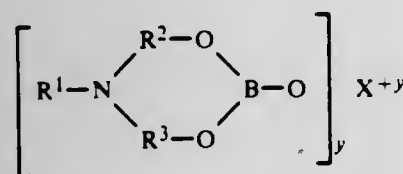
Int. Cl.<sup>3</sup> C10M 1/20, 1/32, 1/38, 1/54

U.S. Cl. 252—46.4

26 Claims

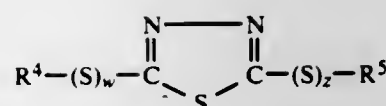
1. A lubricating composition comprising a major amount of a lubricating oil and a minor amount of:

- An extreme pressure, anti-wear and friction reducing boron compound of the formula:



wherein R<sup>1</sup> is hydrogen, alkyl, cyclic, alicyclic, aryl, alkylaryl, or arylalkyl radicals having from 1 to about 24 carbon atoms, R<sup>2</sup> and R<sup>3</sup> are the same or different, straight or branched carbon chains, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radicals having from 2 to about 20 carbon atoms, y is a number from 1 to 4, and X is either hydrogen, a transition metal having an atomic number between 21 and 30 or a Group IVA metal of the Periodic Table and mixtures thereof;

- A copper corrosion inhibitor comprising a hydrocarbon polysulfide derivative of 2,5-dimercapto-1,3,4-thiadiazole having the formula



wherein R<sup>4</sup> and R<sup>5</sup> are moieties selected from hydrogen or straight or branched chain alkyl, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radicals having from 2 to about 30 carbon atoms, provided that R<sup>4</sup> and R<sup>5</sup> are not both hydrogen and w and z are numbers from 1 to about 8; and (C) a lead corrosion inhibitor comprising terephthalic acid.

4,412,929

#### MAGNETIC WALL COVERING COMPOSITION

Paul D. Lysenko, and Natalie Lysenko, both of 214 Hungerford St., Pittsfield, Mass. 01201

Filed Mar. 10, 1982, Ser. No. 356,968

Int. Cl.<sup>3</sup> H01F 10/02

U.S. Cl. 252—62.53

1 Claim

1. A magnetic coating composition consisting of 100 parts by weight of magnetic iron oxide particles, 60–90% of which pass 325 mesh, and 15–25 parts of weight of glue.

4,412,930

#### HEAT-STORING COMPOSITION

Keiichi Koike, Matsudo, and Michio Yanadori, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of Tokyo, Japan

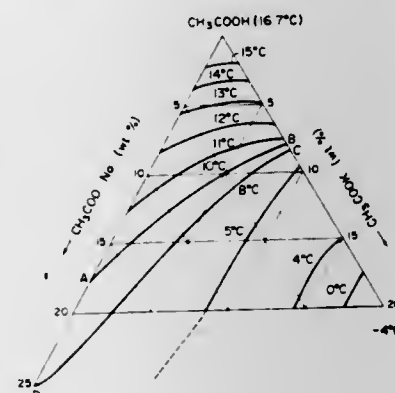
Filed Mar. 10, 1982, Ser. No. 356,921

Claims priority, application Japan, Mar. 13, 1981, 56-35192

Int. Cl.<sup>3</sup> C09K 3/18

U.S. Cl. 252—70

9 Claims



1. A heat-storing composition which comprises acetic acid and one of ammonium acetate and calcium acetate in an amount sufficient to cause the melting point of the composition to be lower than that of acetic acid.

4,412,931

#### REVERSIBLE PHASE CHANGE COMPOSITIONS OF CALCIUM CHLORIDE HEXAHYDRATE WITH A POTASSIUM SALT

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1982, Ser. No. 417,275

Int. Cl.<sup>3</sup> C09K 5/06

U.S. Cl. 252—70

31 Claims

1. A reversible liquid/solid phase change composition comprising an admixture of hydrated CaCl<sub>2</sub> and a potassium salt whose anion forms a substantially less soluble salt with calcium, wherein the potassium salt is added in an amount sufficient to modify the semi-congruent melting behavior of CaCl<sub>2</sub>·6H<sub>2</sub>O to the extent that the mixture approaches the congruent melting behavior of a congruently melting mixture and to reduce, during retrieval of the stored heat by crystalliza-

tion of the mixture, the formation of crystalline CaCl<sub>2</sub> hydrate phases other than CaCl<sub>2</sub>·6H<sub>2</sub>O.

4,412,932

#### METHOD OF CLEANING FIBREGLASS

Barry R. Howson, 21 Rochdale Rd., Mount Claremont, Western Australia, Australia

Continuation of Ser. No. 208,573, Nov. 20, 1980, Pat. No.

4,324,678. This application Jan. 7, 1982, Ser. No. 337,822

Claims priority, application Australia, Nov. 23, 1979, PE1455

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B60S 1/00; B63B 59/00; C11D 7/08, 7/26

U.S. Cl. 252—136

1 Claim

1. A method of cleaning stains from fiberglass by simply applying a chemical solution without the necessity of scrubbing or removing the residue by washing it off, or the like, which consists of the single step of applying to a fiberglass surface an aqueous solution consisting of (1) water, (2) about 0.25% to 1.0% by weight of a particulate material of the group consisting of ferrous sulphate and ferrous ammonium sulphate expressed as FeSO<sub>4</sub>, (3) acid of a pH between 0.5 and 2 containing 20 to 55 percent W/W of acid from the group consisting of phosphoric and oxalic acid and (4) 0.1 to 3 percent by weight of a non-ionic detergent, and letting the solution dry on the fiberglass surface without washing off.

4,412,933

#### COLOR STABILIZED NONIONIC SURFACTANTS

Erhard Klahr; Wolfgang Trieselt; Wolf-Dieter Balzer, all of Ludwigshafen; Rainer Strickler, Heidelberg, and Dieter Stoeckigt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,166

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018714

Int. Cl.<sup>3</sup> C11D 17/00

U.S. Cl. 252—174.19

4 Claims

1. A color-stabilized nonionic surfactant composition consisting of a nonionic surfactant which contains chemically bonded polyalkylene oxide groups having terminal hydroxyl groups and in which is dissolved 0.1 to 5% by weight of a color stabilizing additive selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> alkyl esters of C<sub>4</sub>-C<sub>8</sub> alkyl dicarboxylic acids, mixtures thereof, and a mixture of C<sub>4</sub>-C<sub>8</sub> alkyl dicarboxylic acids.

4,412,934

#### BLEACHING COMPOSITIONS

Stanley Y. Chung, Cincinnati, and Gianfranco L. Spadini, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 393,843, Jun. 30, 1982, abandoned. This application Mar. 7, 1983, Ser. No. 472,683

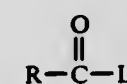
Int. Cl.<sup>3</sup> D06L 3/02; C11D 3/395, 7/54

U.S. Cl. 252—186.38

22 Claims

1. A bleaching composition comprising:

- a peroxygen bleaching compound capable of yielding hydrogen peroxide in an aqueous solution; and
- a bleach activator having the general formula:



wherein R is an alkyl group containing from about 5 to about 18 carbon atoms wherein the longest linear alkyl chain extending from and including the carbonyl carbon contains from about 6 to about 10 carbon atoms and L is a leaving group, the conjugate acid of which has a pK<sub>a</sub> in the range of from about 6 to about 13;

4,412,935

#### STORAGE MATERIAL FOR HYDROGEN UTILIZING AMORPHOUS SILICON AND A METHOD FOR PRODUCING THE SAME

Rolf Plaettner, Ottobrunn, and Wolfgang Kruehler, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

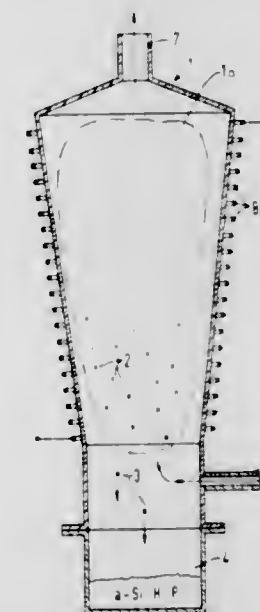
Filed Mar. 8, 1982, Ser. No. 356,231

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110290

Int. Cl.<sup>3</sup> C01B 33/04; B01J 20/10

U.S. Cl. 252—188.1

10 Claims



1. A storage material for hydrogen comprised of amorphous silicon containing phosphorous, in addition to hydrogen.

4,412,936

PIGMENT FOR COLOR-CHANGING HEAT INDICATOR  
Stanislav F. Khmelkov, prospekt Lenina, 39, kv. 34; Mnaidar R. Ramazanov, ulitsa Lermontova, 7; Mikhail P. Soldatov, ulitsa Gogolya, 71, kv. 2; Vadim V. Beskaravainy, ulitsa Solnechnaya, 3, kv. 2; Viktor L. Aranovich, ulitsa Gogolya, 61, kv. 2, and Lev K. Soldaev, ulitsa Kommunalnaya, 2, kv. 2, all of Almalyk, U.S.S.R.

Filed May 7, 1981, Ser. No. 261,638

Claims priority, application U.S.S.R., Jun. 20, 1980, 2932951  
Int. Cl.<sup>3</sup> C01K 11/14; C09K 3/00; C01G 3/00, 3/04, 13/00, 13/04

U.S. Cl. 252—408.1

7 Claims

1. A method of producing a pigment for a color-changing heat indicator which comprises:

- mixing an aqueous solution containing ions of bivalent copper and mercury with an aqueous solution of a nitrogen containing compound selected from the group consisting of an amide of carbonic or thiocarbonic acid, and a tertiary amine in an amount equal to 0.8–8.0% of the total content of copper and mercury; and
  - adding to the resulting mixture, an aqueous solution containing iodine ions to thereby form a pigment wherein the atomic ratio of Cu:Hg:I in said pigment is 2:1.5:3–5.
7. The product produced by the process of claims 1, 2, 3, 4, 5 or 6.



4,412,937

## METHOD FOR MANUFACTURE OF ACTIVATED CARBON FIBER

Shigeru Ikegami, Mishima; Minoru Hirai, Shizuoka; Kazuo Izumi, Shizuoka, and Kenji Shimazaki, Shizuoka, all of Japan, assignors to Toho Belsol Co., Ltd., Tokyo, Japan  
Filed Apr. 23, 1982, Ser. No. 371,164

Claims priority, application Japan, Apr. 23, 1981, 56-61646; May 13, 1981, 56-72067

Int. Cl.<sup>3</sup> B01J 37/28, 37/00; D01F 9/12

U.S. Cl. 502—423

23 Claims

1. A method for manufacturing activated carbon fiber, comprising the steps of:

- (1) causing an acrylic fiber to contain therein a treating agent, wherein the treating agent is selected from the group consisting of phosphorus and boron compounds in a concentration of 0.01 to 0.3% by weight as phosphorus, boron, or a mixture thereof, based on the weight of the fiber;
- (2) preoxidizing the acrylic fiber in an oxidizing atmosphere at a temperature exceeding 200° C. and giving a core ratio of not more than 18% until the amount of bonded oxygen becomes not less than 15% by weight based on the weight of fiber thereby producing a preoxidized fiber;
- (3) adjusting the concentration of the treating agent in the preoxidized fiber to a level in the range of 0.04 to 1% by weight based on the thus obtained preoxidized fiber; and
- (3) activating the fiber at a temperature in the range of 900° to 1,300° C., until said activated carbon fiber has a specific surface area of not less than 300 m<sup>2</sup>/g.

4,412,938

## SEMICONDUCTING RESIN COMPOSITIONS

Tetsuji Kakizaki, and Toshikazu Mizutani, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Oct. 20, 1980, Ser. No. 198,922

Claims priority, application Japan, Oct. 29, 1979, 54-139492  
Int. Cl.<sup>3</sup> H01B 5/16; C08K 3/04

U.S. Cl. 252—511

4 Claims

1. A semiconducting resin composition useful as a semiconducting layer of an insulated electric cable comprising:

- (A) 100 to 40 parts of a modified ethylene-vinyl acetate copolymer which is a product of graft processing of 100 parts of an ethylene-vinyl acetate copolymer of a vinyl acetate content of less than 35 percent with 25 to 200 parts of an aromatic vinyl monomer;
- (B) 0 to 60 parts of a rubber; and
- (C) 3 to 150 parts of an electrically conductive carbon black selected from the group consisting of furnace black, acetylene black, and ketjen black with respect to 100 parts of the above described components (A) and (B), all quantities in "parts" and "percent" being by weight.

4,412,939

## REACTION PRODUCTS OF TRANSITION METAL COMPOUNDS AND BORON COMPOUNDS AND CATALYSTS PREPARED THEREFROM

Randall S. Shipley, Alvin, and Larry E. Freyer, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,301

Int. Cl.<sup>3</sup> C08F 4/64

U.S. Cl. 502—115

13 Claims

5. The catalytic reaction product of

- (A) the reaction product or complex formed from the admixture of
- (1) at least one transition metal compound represented by the empirical formulae  $Tm(OR)_pX_{q-y}$  or  $Tm(OR)_{x-2}O$ , wherein  $Tm$  is a transition metal selected from groups IVB, VB or VIB; each  $R$  is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; each  $X$  is independently a halogen;  $x$  has a value equal

to the valence of  $Tm$  and  $y$  has a value from 1 to the valence of  $Tm$ ; and

- (2) at least one boron compound represented by the empirical formula  $BX_3$  wherein  $X$  is a halogen; and

(B) a magnesium halide resulting from the reaction of

- (1) an organomagnesium compound represented by the empirical formula  $MgR''_2xMR''$ , wherein  $M$  is aluminum or zinc, each  $R''$  is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms,  $x$  has a value from zero to 10 and  $y$  has a value corresponding to the valence of  $M$ ; with
- (2) a halide source selected from

- (a) an active non-metallic halide, said non-metallic halide corresponding to the formula  $R'X$  wherein  $R'$  is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and  $X$  is halogen or
- (b) a metallic halide corresponding to the empirical formula  $MR_yX_a$  wherein  $M$  is a metal of Group IIB, IIIA or IVA of Mendeleev's Periodic Table of Elements,  $R$  is a monovalent hydrocarbyl radical,  $X$  is halogen,  $y$  is a number corresponding to the valence of  $M$  and  $a$  is a number from 1 to  $y$ ; and

- (C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound represented by the empirical formula  $AlR_yX_{y'}$  wherein  $R$  and  $X$  are as defined above,  $y'$  has a value of 2 or 3 and  $y''$  has a value of zero or one with the sum of  $y'$  and  $y''$  being three; and

wherein the components are employed in quantities which provide an atomic ratio of the elements  $Mg:Tm$  of from about 1:1 to about 200:1;  $B:Tm$  at least about 0.1:1;  $Al:Tm$  of from about 0.1:1 to about 200:1 and an excess  $X:Al$  of from about 0.0005:1 to about 5:1.

4,412,940

## METHOD FOR PREPARING MALEIC ANHYDRIDE CATALYST

Ramon A. Mount, and Harold Raffelson, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1980, Ser. No. 217,731

Int. Cl.<sup>3</sup> B01J 27/14

U.S. Cl. 502—209

5 Claims

1. In a method for the preparation of a phosphorus-vanadium-oxygen-containing complex catalyst comprising:

- (a) contacting vanadium and phosphorus compounds under conditions which will provide a catalyst precursor wherein greater than 50 atom % of the vanadium is in the tetravalent state;
- (b) recovering the catalyst precursor;
- (c) forming the catalyst precursor into agglomerates; and
- (d) calcining the catalyst precursor agglomerates at a temperature between about 300° C. and 600° C.

the improvement consisting essentially of calcining in one temperature range at 325°–375° C. the catalyst precursor in the presence of a 0.1–1.5 mole percent concentration of a saturated aliphatic hydrocarbon in air.

4,412,941

## RECORDING DISC COMPOSITIONS COMPRISING POLYMERS OF MONOVINYL-SUBSTITUTED HYDROCARBONS, CONDUCTIVE CARBON BLACK AND LUBRICANTS

Nicolas J. Probst, Brussels; Jean Iker, Overijse, and Jacques Autin, Brussels, all of Belgium, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 22, 1981, Ser. No. 313,928

Int. Cl.<sup>3</sup> C08K 3/04

U.S. Cl. 252—511

57 Claims

1. A conductive molding composition comprising

- (a) from about 65 to 85 weight percent of a resin component selected from the group consisting of

- (1) a normally solid, resinous block copolymer of a monovinyl-substituted aromatic hydrocarbon containing from 8 to 12 carbon atoms per molecule and a minor amount of at least one conjugated alkadiene containing from 4 to 8 carbon atoms per molecule, and one or more optional modifying polymers selected from the group consisting of

- (A) a normally solid resinous homopolymer of a monovinyl-substituted aromatic hydrocarbon, and
- (B) a normally solid, elastomeric copolymer of a major amount of at least one conjugated alkadiene containing from 4 to 8 carbon atoms per molecule and a minor amount of a monovinyl-substituted aromatic hydrocarbon containing from 8 to 12 carbon atoms per molecule and,

- (2) a normally solid, resinous homopolymer of a monovinyl-substituted aromatic hydrocarbon and one or more modifying polymers selected from the group consisting of

- (A) elastomeric copolymers, as defined above, and
- (B) normally solid resinous block copolymers as defined above,

- (b) from about 10 to 30 weight percent of finely divided extra-conductive carbon black particles, and

- (c) from about 1 to 5 weight percent of at least one lubricant, wherein said carbon black and lubricant are uniformly dispersed within said composition.

4,412,942

## PREPARATION OF ELECTRICALLY CONDUCTIVE POLYMERS

Herbert Naarmann, Wattenheim; Klaus Penzlen, Frankenthal; Johannes Schlag, and Petr Simak, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,158

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118630

Int. Cl.<sup>3</sup> H01B 1/06

U.S. Cl. 252—518

4 Claims

1. A process for the preparation of a stable electrically conductive polymer from a polyacetylene, the polymer having an electrical conductivity greater than  $10^{-2}$  S/cm, which process consists essentially of treating the polyacetylene with from 1 to 100% by weight of tosylmethyl isocyanide and from 0.1 to 70% by weight of a dopant selected from the group consisting of an alkali metal, an alkali metal amide or a Lewis acid, the percentages being based on the polyacetylene.

4,412,943

## LIQUID DETERGENT COMPOSITION

Hajime Hirota, Tokyo, and Hiroshi Watanabe, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,675

Claims priority, application Japan, Feb. 23, 1981, 56-25257; Jan. 8, 1982, 57-1604

Int. Cl.<sup>3</sup> C11D 1/38, 3/26

U.S. Cl. 252—546

9 Claims

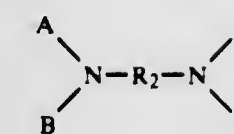
1. A liquid detergent composition which consists essentially of:

- (A) from 5 to 25 wt. % of an ammonium alkyl sulfate having the formula

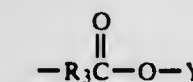


wherein  $R_1$  is alkyl having from 8 to 18 carbon atoms on the average,

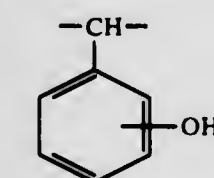
- (B) from 0.05 to 5 wt. % of one or a mixture of two or more alkylenediaminecarboxylic acid derivatives having the formula



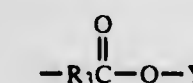
wherein  $R_2$  is alkylene having 2 or 3 carbon atoms; A, B, C and D, which are the same or different, each is



or hydrogen, in which  $R_3$  is  $-C_nH_{2n}-$  or



$n$  is 1 or 2 and  $Y$  is hydrogen or a cation, with the proviso that from 0 to 2 of the groups, A, B, C and D are hydrogen and the remainder are



- (C) from 0.1 to 5 wt. % of one or a mixture of two or more compounds selected from the group consisting of carboxylic acids selected from the group consisting of lower fatty acids having from 1 to 8 carbon atoms, dicarboxylic acids having the formula  $HOOC-(CH_2)_n-COOH$  wherein  $n$  is an integer of from 0 to 5, glycolic acid, lactic acid, hydroacrylic acid,  $\alpha$ -hydroxybutyric acid,  $\beta$ -hydroxybutyric acid, glyceric acid, tartronic acid, malic acid, tartaric acid, citric acid, maleic acid, fumaric acid, mesaconic acid and citraconic acid, and amino acids selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, phenylalanine, tryptophane, sarcosine,  $\beta$ -alanine,  $\gamma$ -aminobutyric acid,  $\epsilon$ -aminocaproic acid, glutamic acid, aspartic acid, cysteine acid, homocysteic acid, lysine, ornithine, arginine, serine, homoserine, tyrosine, threonine, proline, hydroxyproline, cystine, cysteine and methionine, and salts of said carboxylic acids and said amino acids, and
- (D) the balance is essentially water.

4,412,944

## HIGH FOAMING, LOW EYE IRRITATION CLEANING COMPOSITIONS CONTAINING ETHOXYLATED ANIONIC (C13-C30) SULPHATES

George W. Panzer, Tlmonium, and Louis J. Nehmsmann, Ellicott City, both of Md., assignors to Alcolac, Inc., Baltimore, Md.

Continuation of Ser. No. 120,762, Feb. 12, 1980, abandoned.

This application Jul. 6, 1981, Ser. No. 280,369

Int. Cl.<sup>3</sup> C11D 1/29

U.S. Cl. 252—551

2 Claims

1. A high foaming, low eye irritation cosmetic cleaning composition comprising an alkyl ether sulphate consisting essentially of a mixture of 60% sodium myristyl ether (12) sulphate and 40% sodium cetyl ether (12) sulphate.

2. A high foaming, low eye irritation cosmetic cleaning composition comprising an alkyl ether sulphate consisting essentially of a mixture of 65% sodium cetyl ether (12) sulphate and 35% sodium stearyl ether (12) sulphate.



4,412,945

## AQUEOUS HIGH CONCENTRATION SLURRY OF ALCOHOL ETHOSULFATE

Masatoshi Takahashi, Fujisawa; Mituo Sugiyama, Tokyo; Osamu Toisawa, Chiba, and Yasuo Ishizaki, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,827

Int. Cl.<sup>3</sup> C11D 1/831, 1/14

U.S. Cl. 252—551

5 Claims

1. An aqueous high concentration slurry of an alcohol ethosulfate comprising:

- (a) at least 50% by weight based on the weight of the slurry of a higher alcohol ethosulfate and
- (b) 0.05 to 10% by weight based on the weight of the slurry of a polyoxyethylene alkyl ether having an average molecular weight of about 4,000 to about 10,000, the alkyl group of said ether having 8 to 16 carbon atoms.

4,412,946

## IMMUNOSTIMULATING GLYCOPROTEINS

René Zalisz, Saint Ouen l'Aumône, and Marie-France Salles, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 10, 1981, Ser. No. 300,910

Claims priority, application France, Sep. 19, 1980, 80 20188

Int. Cl.<sup>3</sup> A61K 37/02, 39/108, 39/40; C07G 7/00

U.S. Cl. 260—112 R

2 Claims

1. A process for the preparation of a water-soluble immunostimulating glycoprotein extracted from *Klebsiella pneumoniae* containing 30 to 45% by weight of proteins, 30 to 40% by weight of neutral saccharides, up to 4% by weight of glucuronic acid, 2 to 5% by weight of osamines and having a molecular weight of about 350,000 daltons comprising treating a solution of glycoproteins obtained by diafiltration of an extract of a lysate of *Klebsiella pneumoniae* culture with a quaternary ammonium compound, isolating a supernatant by removal of the resulting precipitate, treating supernatant corresponding to a saline solution of glycoproteins in the cold with a lower molecular weight alcohol, recovering the resulting precipitate, dissolving the precipitate in water and subjecting the resulting solution to dialysis and then lyophilization, dissolving the product, filtering the solution through a gel, recovering the first eluted fraction and concentrating the eluant, optionally to dryness.

4,412,947

## COLLAGEN SPONGE

Georghe Cloca, Coatesville, Pa., assignor to Seton Company, Newark, N.J.

Continuation-in-part of Ser. No. 184,536, Sep. 5, 1980, abandoned, and Ser. No. 190,372, Sep. 24, 1980, Pat. No. 4,374,121, which is a continuation-in-part of Ser. No. 74,738, Sep. 12, 1979, Pat. No. 4,279,812. This application May 26, 1982, Ser. No. 382,133

Int. Cl.<sup>3</sup> C07G 7/00; C08H 1/06; C08L 89/04, 89/06

U.S. Cl. 260—123.7

9 Claims

1. A process of preparing a coherent, porous collagen sheet material comprising:

- forming natural insoluble particulate collagen in substantially pure form;
- suspending said particulate collagen in a weak aqueous organic acid solution while maintaining said collagen in particulate form; and
- freeze-drying said suspension to form a coherent, porous native collagen sheet material.

4,412,948

## REACTIVE DISAZO BLUE DYE

Takashi Omura, Ashiya; Yasuo Tezuka, Ibaraki, and Masaki Sunami, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 30, 1980, Ser. No. 164,243

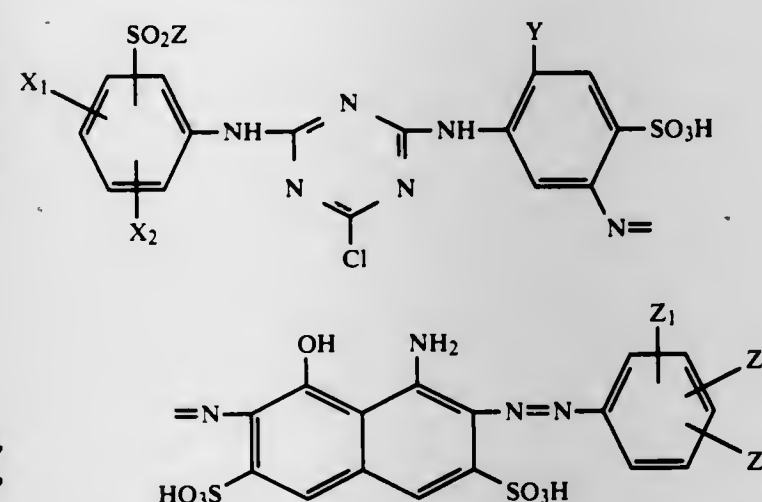
Claims priority, application Japan, Jul. 6, 1979, 54-86349

Int. Cl.<sup>3</sup> C09B 31/047

U.S. Cl. 260—153

4 Claims

1. A compound represented by a free acid of the formula,



wherein X<sub>1</sub> and X<sub>2</sub> are each a hydrogen atom, a methyl or methoxy group, a chlorine atom, or a carboxylic acid or sulfonic acid group. Y is a hydrogen atom, a methyl or sulfonic acid group. Z is —CH<sub>2</sub>CH<sub>2</sub>OSO<sub>3</sub>H, —CH<sub>2</sub>CH<sub>2</sub>OPO<sub>3</sub>H<sub>2</sub>, —CH<sub>2</sub>CH<sub>2</sub>Cl or —CH=CH<sub>2</sub>, and Z<sub>1</sub>, Z<sub>2</sub> and Z<sub>3</sub> are each a hydrogen or chlorine atom, a methyl, methoxy, sulfonic acid or carboxylic acid group.

4,412,949

## PIGMENTS COMPRISING CYANOMETHYLQUINAZOLONES COUPLED TO DIAZO COMPOUNDS PREPARED FROM 1-AMINOANTHROQUINONES

Peter Dimroth, Mannheim, and Wolfgang Lotsch, Beindersheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,542

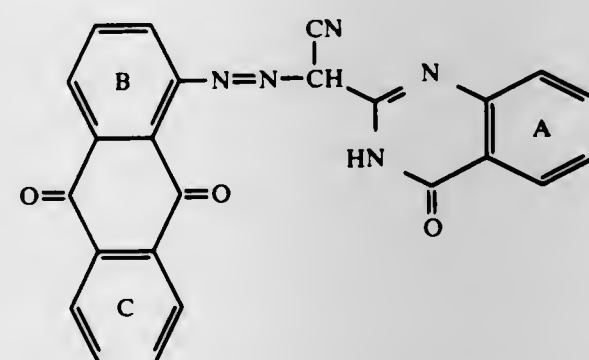
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3024957

Int. Cl.<sup>3</sup> C09B 6/00, 29/52; C09D 3/48, 11/02

U.S. Cl. 260—154

3 Claims

1. A pigment of the formula



where ring A is unsubstituted or is substituted by halogen and ring B is unsubstituted or is substituted by chlorine.

4,412,950

## MONOAZO AND DISAZO COLORANTS

Nathan N. Crounse, Myrtle Beach, S.C., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 195,128, Oct. 8, 1980, Pat. No. 4,376,729.

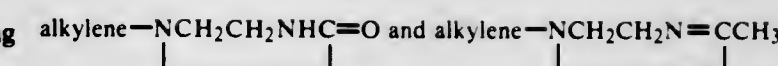
This application Mar. 24, 1982, Ser. No. 361,187

Int. Cl.<sup>3</sup> C09B 46/00

U.S. Cl. 260—157

19 Claims

1. A disazo compound bearing (N-substituted sulfonamido) groups said disazo compound selected from the group consisting of



in which alkylene represents —CH<sub>2</sub>CH<sub>2</sub>— and —CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>—,

R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> represent hydrogen, C<sub>1</sub>–C<sub>3</sub> alkyl or C<sub>1</sub>–C<sub>3</sub> alkoxy; or the acid-addition salt forms of said disazo compounds.

4,412,951

## REAGENTS FOR MEASURING LIPASE ACTIVITY

Yoshio Inagaki; Masaki Okazaki, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1981, Ser. No. 316,025

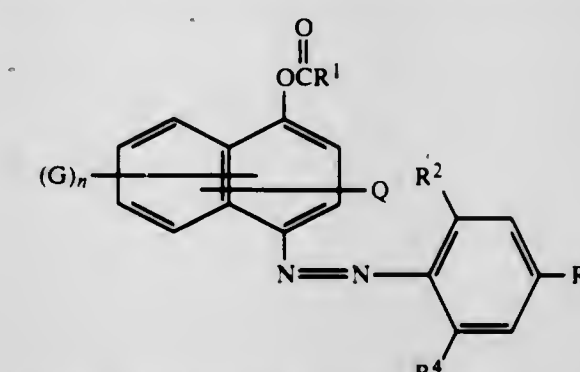
Claims priority, application Japan, Oct. 28, 1980, 55-151043

Int. Cl.<sup>3</sup> C07C 107/08

U.S. Cl. 260—202

15 Claims

1. A reagent for measuring a lipase activity comprising a higher fatty acid ester represented by the general formula



wherein R<sup>1</sup> represents an alkyl group having 9 to 17 carbon atoms; R<sup>2</sup> represents a hydrogen atom or a halogen atom; R<sup>3</sup> and R<sup>4</sup>, which may be the same or different, each represents a nitro group, an alkylsulfonyl group having 1 to 8 carbon atoms, an alkylsulfonyl group having 1 to 8 carbon atoms substituted by a sulfo group or an alkoxy group, or a trifluoromethyl group; G represents —SO<sub>3</sub>M or an atomic group having at least one —SO<sub>3</sub>M, where M represents sodium or potassium, or, when R<sup>4</sup> has a sulfonic acid group, may be a hydrogen atom; Q represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy-substituted alkyl group, an alkoxy group, an alkoxy-substituted alkoxy group, a sulfonamido group, a sulfamoyl group, a carbonamido group, a carbamoyl group, or an alkylsulfonyl group; the carbon atom number of these substituents being 8 or less than 8; and n is an integer of 1 to 3.

4,412,952

## PROCESS FOR 3-HYDROXY BENZODIAZEPINONES

Goetz E. Hardtmann, Morristown; Oljan Repic, Hopatcong, and Susi Vogt, Chatham, all of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

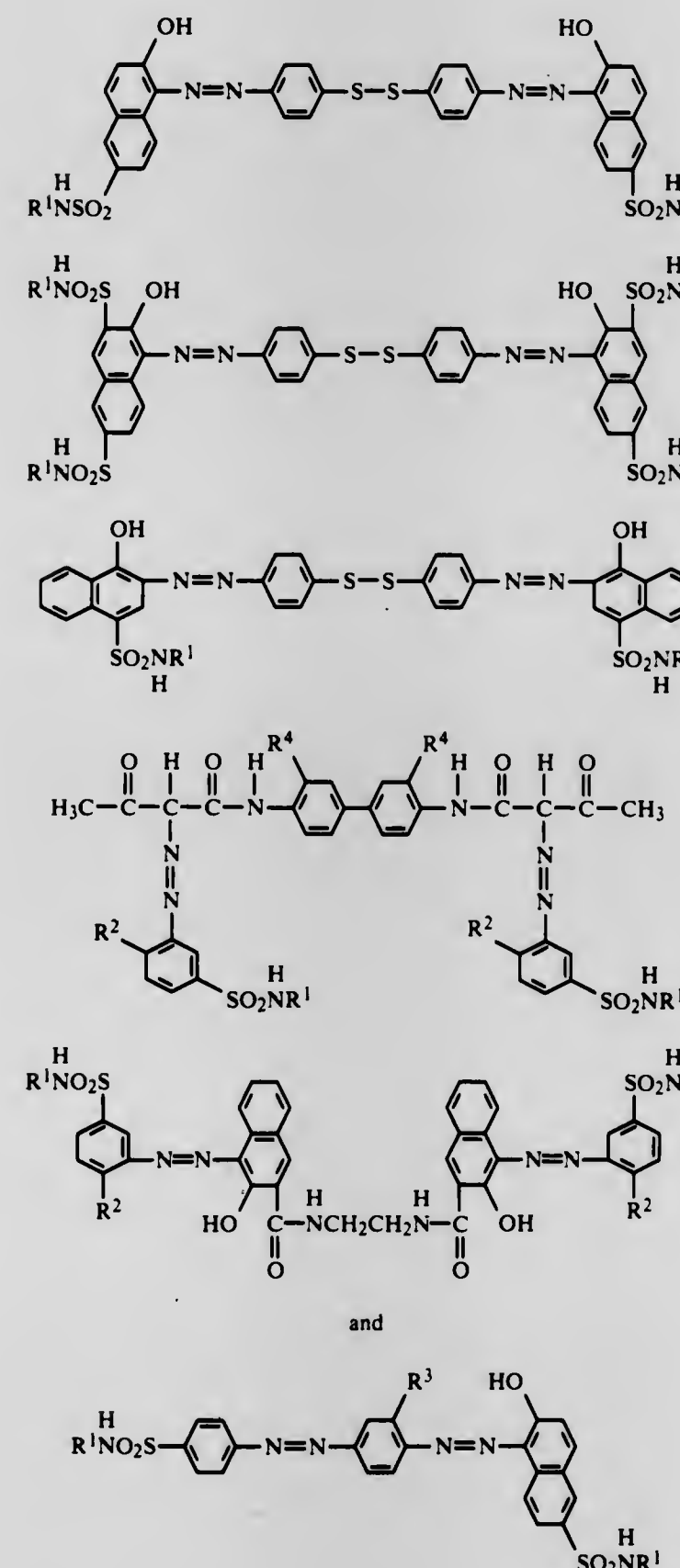
Filed Apr. 30, 1982, Ser. No. 373,450

Int. Cl.<sup>3</sup> C07D 243/26

U.S. Cl. 260—239.3 D

8 Claims

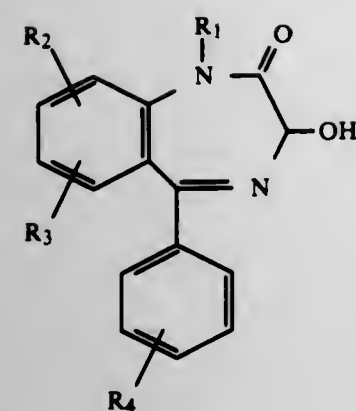
1. A process for preparing a compound of the formula:



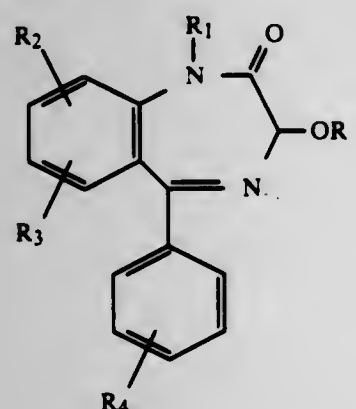
in which

R<sup>1</sup> represents a moiety selected from the group consisting of alkylene-NH-alkylene-NH<sub>2</sub>, alkylene-N-(non-tertiary C<sub>1</sub> to C<sub>14</sub> alkyl)<sub>2</sub>,





from a compound of the formula:



where

R represents C<sub>2-8</sub> alkanoyl, phenoyl, phenoyl substituted with a loweralkyl, fluoro or chloro moiety, phen C<sub>2-5</sub> loweralkanoyl, or haloacyl,  
 R<sub>1</sub> represents C<sub>1-3</sub> loweralkyl,  
 R<sub>2</sub> and R<sub>3</sub>, independently, represent H, chloro, bromo, nitro, trifluoromethyl or methylsulfonyl, and  
 R<sub>4</sub> represents H, chloro, fluoro, methoxy, methyl or trifluoromethyl, which comprises treating the latter with potassium hydroxide or 1-3 carbon potassium alkoxide as catalyst in a reaction medium comprising C<sub>1-3</sub> lower alkanol at a pH of 11 to 11.5.

4,412,953

#### PROCESS FOR PREPARING

16 $\alpha$ -HYDROXY-17 $\alpha$ -AMINOPREGNANE DERIVATIVES  
 Giorgio Winters, Milan, Italy, assignor to Gruppo Lepetit, S.p.A., Milan, Italy

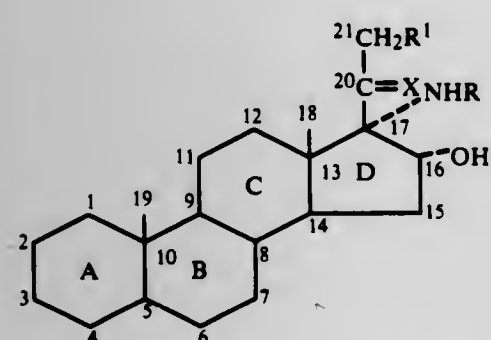
Filed Nov. 18, 1981, Ser. No. 322,485

Claims priority, application Italy, Nov. 26, 1980, 26229 A/80  
 Int. Cl.<sup>3</sup> C07J 43/00

U.S. Cl. 260—239.5

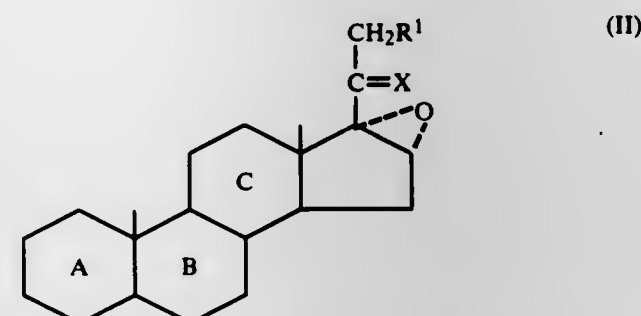
9 Claims

1. A process for preparing 16 $\alpha$ -hydroxy-17 $\alpha$ -aminopregnane derivatives represented by the following general formula



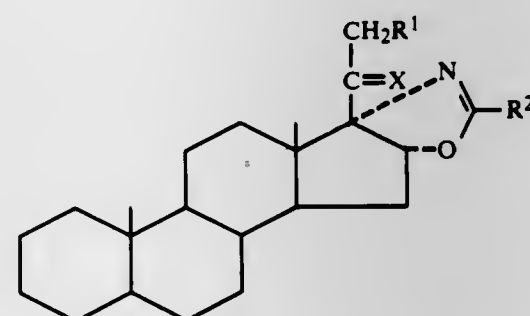
wherein R is hydrogen, alkyl, aralkyl; R<sup>1</sup> is hydrogen hydroxy, alkanoyloxy, or aryloxy, X is O or an easily removable hydrazine or hydroxylamine protecting group for the carbonyl function, rings A, B, C of the pregnane skeleton may be substituted at the 3- and 11-positions with oxo, hydroxy, alkoxy, aralkoxy

and acyloxy groups and bear one or more noncumulated double bond at the 1-2, 3-4, 4-5, 5-6, and 6-7, and 9-11 positions, characterized in that a compound of formula



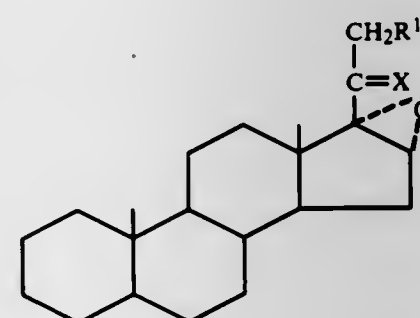
(II) wherein R<sup>1</sup> has the same meanings as above, rings A, B, and C may be substituted and bear double bonds as described above, and X is a N-containing protecting group of the keto function which may be easily removed in order to restore the keto function itself, is contacted with an amine of formula RNH<sub>2</sub> wherein R is hydrogen, alkyl or aralkyl and, when a compound of formula I is desired wherein X is oxygen, the N-containing protecting group is removed to restore the keto function.

7. A process for the preparation of pregnano[17 $\alpha$ ,16 $\alpha$ -d]oxazoline derivatives having the formula

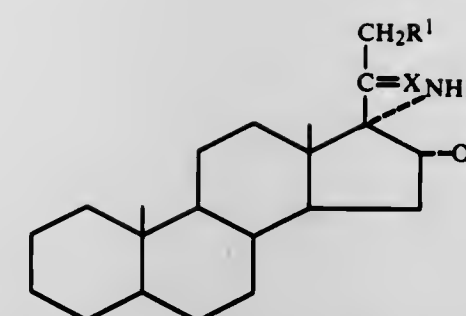


wherein R<sup>1</sup> is hydrogen, hydroxy, alkanoyloxy, aryloxy, carboalkoxy or carboaralkoxy; R<sup>2</sup> is alkyl, aryl, or aralkyl; X is O or an easily removable protecting group of the carbonyl function, rings A, B, C are substituted at C-3 with an oxo, hydroxy, alkoxy, aralkoxy or acyloxy group, may be substituted at C-11 with a group selected from oxo, hydroxy and acyloxy, and may bear one or more non-cumulated double bonds at the 1-2, 3-4, 4-5 and 5-6 positions, which comprises:

(a) contacting a 16 $\alpha$ ,17 $\alpha$ -epoxypregnane, having the formula



wherein R<sup>1</sup> and X are as described above with an amine of the formula RNH<sub>2</sub> wherein R is alkyl or aralkyl to form a 16 $\alpha$ -hydroxy-17 $\alpha$ -aminopregnane derivative having the formula



wherein R<sup>1</sup> and X are as described above and R is alkyl or aralkyl;

(b) treating said 16 $\alpha$ -hydroxy-17 $\alpha$ -aminopregnane derivative with a mixture of an anhydride having the formula (R<sup>2</sup>CO)<sub>2</sub>O, wherein R<sup>2</sup> is as defined above, and the corresponding acid;  
 (c) removing the carbonyl protecting group, if any; and  
 (d) isolating the desired pregnano[17 $\alpha$ ,16 $\alpha$ -d]oxazoline derivative therefrom.

4,412,954

#### PROCESS FOR PRODUCING 1,4,4A,9A-TETRAHYDROANTHRAQUINONE COMPOUND

Tatsuyoshi Komatsu, Kamakura, and Kenji Usui, Nihonbashi, both of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,174

Int. Cl.<sup>3</sup> C07C 50/10

U.S. Cl. 260—369

2 Claims

1. A process for producing a 1,4,4a,9a-tetrahydroanthraquinone compound which consists essentially of reacting by Diels-Alder reaction 1,4-naphthoquinone with a conjugated diolefin in 1,4,4a,9a-tetrahydroanthraquinone compound as a reaction medium in substantial absence of other organic solvent and wherein the amount of said tetrahydroanthraquinone is at a ratio of 0.5 to 5 parts by weight per part of naphthoquinone.

4,412,955

#### PREPARATION OF CORTICOIDS FROM 17-KETO STERIODS

Jerry A. Walker, Oshtemo Township, Kalamazoo County, and Edward J. Hessler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 264,593, May 18, 1981, Pat. No. 4,257,279.

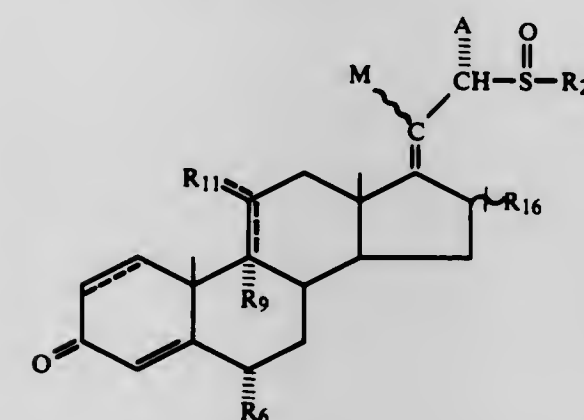
This application May 17, 1982, Ser. No. 378,938

Int. Cl.<sup>3</sup> C07J 7/00

U.S. Cl. 260—397.45

22 Claims

1. A 20,21-dihalo steroid of the formula



where A is a fluorine, chlorine or bromine atom; M is a fluorine, chlorine or bromine atom; R<sub>6</sub> is a hydrogen or fluorine atom or methyl group; R<sub>9</sub> is a hydrogen or fluorine atom, hydroxyl group, —OSi(R)<sub>3</sub> or nothing; R<sub>11</sub> is (H), (H,H), (H,  $\beta$ -OSi(R)<sub>3</sub>), or (O); R<sub>16</sub> is a hydrogen atom or methyl group;

R<sub>22</sub> is alkyl of 1 thru 5 carbon atoms, trichloromethyl, phenyl, phenyl substituted with 1-4 carbon atoms or substituted with 1 thru 3 nitro or trifluoromethyl groups, aralkyl of 7 thru 12 carbon atoms or —N—(R<sub>122</sub>)<sub>2</sub> or phthalimide; ~ indicates the attached group can be in either the  $\alpha$  or  $\beta$  configuration; is a single or double bond.

4,412,956

#### PROCESS FOR FORMING ALKYL VANADATES USING A CATALYST

Alan Abramson, White Plains; George C. Ciomo, Hastings-on-Hudson; Gershon J. Davis, White Plains, and Edward D. Weil, Hastings-on-Hudson, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 27, 1981, Ser. No. 287,390

Int. Cl.<sup>3</sup> C07F 9/00

U.S. Cl. 260—429 R

8 Claims

1. In a process for the formation of alkyl vanadates by the reaction of an alkyl alcohol and vanadium pentoxide in an azeotropic solvent, wherein the improvement comprises the use of a catalytically effective amount of a basic nitrogenous catalyst to increase the yield of product.

4,412,957

#### PROCESS FOR PREPARING DIALKYL PROPANEDIIMIDE DIHYDROHALIDES

Jeffrey S. Gramm, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

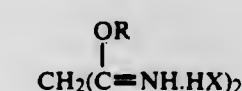
Filed Jun. 15, 1982, Ser. No. 388,625

Int. Cl.<sup>3</sup> C07C 119/055

U.S. Cl. 260—453.7

16 Claims

1. An improved process for preparing a dialkyl propanediimide dihydrohalide of the formula:



where

R is alkyl of 1 to 3 carbon atoms, and  
 X is chlorine or bromine, by reacting malononitrile, an alcohol ROH and anhydrous hydrogen halide HX, wherein the improvement comprises conducting the reaction in a chlorofluorocarbon solvent having a boiling point in the range of about -45° to 100° C.

4,412,958

#### STEREOSPECIFIC SYNTHESIS OF 5-PHENYL-2S-PENTANOL

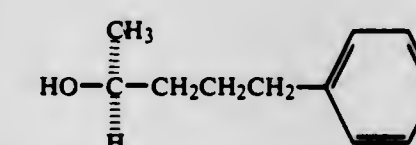
Berkeley W. Cug, Jr., Gales Ferry, and Bernard S. Moore, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 312,012, Oct. 16, 1981, abandoned. This application Aug. 5, 1982, Ser. No. 404,075  
 Int. Cl.<sup>3</sup> C07C 137/00, 29/132, 49/213

U.S. Cl. 260—456 R

17 Claims

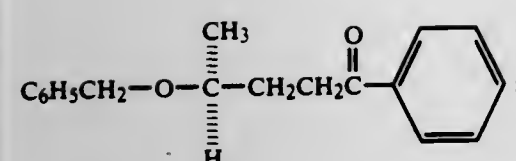
5. A process for the preparation of a 2S chiral alcohol of the formula



which comprises:

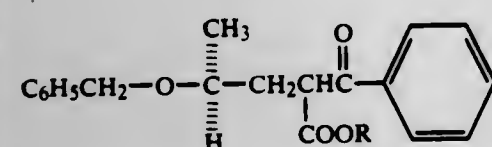
(a) hydrogenation over a noble metal catalyst of a chiral ketone of the formula





(II)

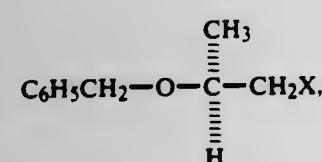
(b) preparation of the chiral ketone of the formula (II) by hydrolysis and decarboxylation of a chiral ester of the formula



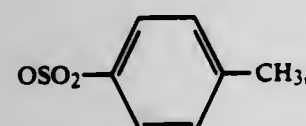
(III)

wherein R is (C<sub>1</sub>-C<sub>4</sub>)alkyl;

(c) preparation of the chiral ester of the formula (III) by reaction of an alkali metal salt of a (C<sub>1</sub>-C<sub>4</sub>)alkyl benzoylacetate with chiral compound of the formula

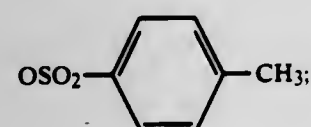


wherein X is I, Br, Cl, OSO<sub>2</sub>CH<sub>3</sub> or

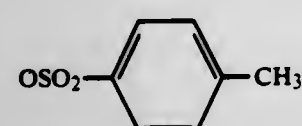


optionally in the presence of iodide ion;

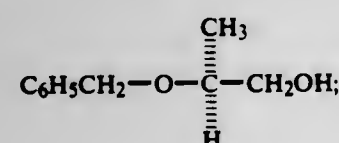
(d) when X is I, Br or Cl, preparation of the chiral halide compound of the formula (IV) wherein X is I, Br or Cl by reaction of halide ion with a sulfonate ester compound of the formula (IV) wherein X is OSO<sub>2</sub>CH<sub>3</sub> or



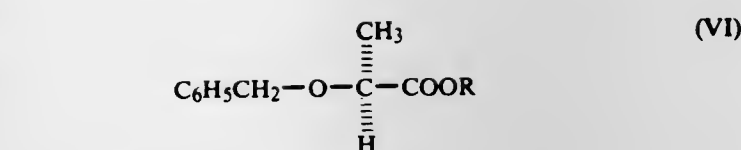
(e) formation of the sulfonate ester of the formula (IV) wherein X is OSO<sub>2</sub>CH<sub>3</sub> or



by reaction of methanesulfonyl chloride or p-toluene sulfonyl chloride with a chiral compound of the formula

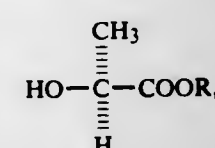


(f) formation of the chiral compound of the formula (V) by hydride reduction of a chiral ester of the formula



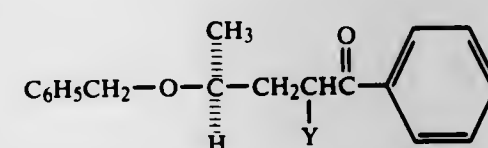
(VI)

wherein R is (C<sub>1</sub>-C<sub>4</sub>)alkyl; and  
(g) preparation of the chiral ester of the formula (VI) by reaction of benzyl methanesulfonate neat with an excess of a chiral 2S lactate ester of the formula

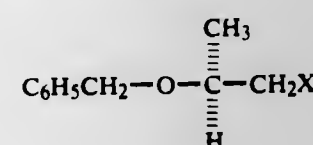


(VII)

wherein R is (C<sub>1</sub>-C<sub>4</sub>)alkyl.  
11. A chiral ketone of the formula



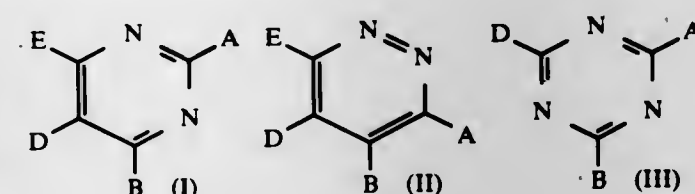
wherein Y is hydrogen or -COOR and R is (C<sub>1</sub>-C<sub>4</sub>)alkyl.  
15. A chiral compound of the formula



wherein X is I, Br, Cl or OSO<sub>2</sub>CH<sub>3</sub>.

4,412,959  
**PROCESS FOR THE PRODUCTION OF MICROCAPSULES**  
Christian Wegner, Cologne; Gert Jabs, Odenthal, and Manfred Dahm, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jun. 8, 1981, Ser. No. 271,607  
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022453  
Int. Cl.<sup>3</sup> B01J 13/02

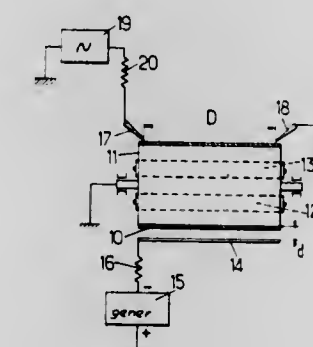
U.S. Cl. 264-4.1 6 Claims  
1. A process for the production of microcapsules by interfacial polyreaction, which comprises mixing a first reactant with an emulsion of a solution of a material to be encapsulated and a second reactant whereby the first and second reactants react to form a capsule containing the said material and wherein the second reactant dissolved in the disperse phase is a nitrogen-containing heterocyclic compound corresponding to one of the formulae (I), (II) or (III):



wherein at least two of the radicals A, B, D and E are halogen atoms, ammonium, hydrazinium, sulfonium, optionally substituted alkyl sulfonyl, aryl sulfonyl, aralkyl sulfonium, azido, aryloxy, thiocyanate, arylthio and sulfonic acid residues which are reactive under the conditions of the capsule-forming reaction and the remaining radicals A, B, D, E are hydrogen, alkyl, aryl, alkoxy, phenoxy, alkylamino or phenylamino radicals

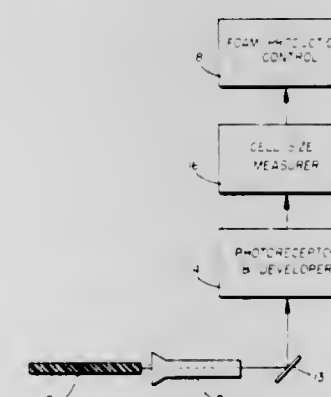
which are not reactive under the conditions of the capsule-forming reaction.

4,412,960  
**METHOD FOR PROCESSING A STRIP OF POLYMER MATERIAL BY ELECTRICAL DISCHARGE**  
Alice Goldman, and Daniel Le Fur, both of Gif Sur Yvette, France, assignors to Electricite De France, Paris, France  
Filed Mar. 9, 1981, Ser. No. 241,644  
Claims priority, application France, Mar. 11, 1980, 80 05441  
Int. Cl.<sup>3</sup> H01T 19/04; B01J 19/12  
U.S. Cl. 264-22



1. Method for processing dielectric polymer material in strip form by electrical discharge, comprising circulating a strip of polymer material of predetermined width along a path for passing it successively at a first location and at a second location, depositing electrical charges on one surface of the strip as it passes at said first location and maintaining a sliding arc transversal to said path, throughout said width along said surface of the strip between electrodes subjected to an alternating high voltage at said second location.

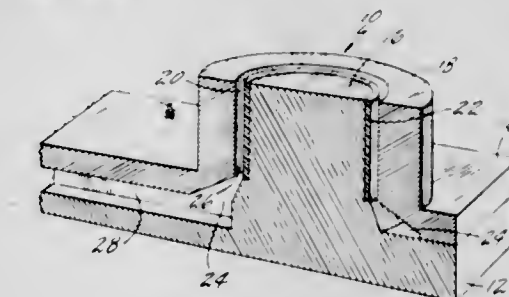
4,412,961  
**METHOD AND APPARATUS FOR MEASUREMENT AND CONTROL OF CELL SIZE IN A FOAM STRUCTURE**  
Daniel J. DiBiasi, and Charles M. Krutchen, both of Pittsford, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.  
Filed Dec. 23, 1981, Ser. No. 334,093  
Int. Cl.<sup>3</sup> B29D 27/00  
U.S. Cl. 264-40.1



1. A method for monitoring the average cell size of a plastic foam structure continuously emerging from a production extrusion source which comprises:  
presenting a cross-section of an area of said structure of the in-line extruded product to an optical projection means capable of projecting a magnified image of said area;  
projecting a magnified image of said area through said means to a photoreceptor device to form thereon a latent image of said area;  
developing said image to form a visible image of said area;  
determining the average cell size of said area from said

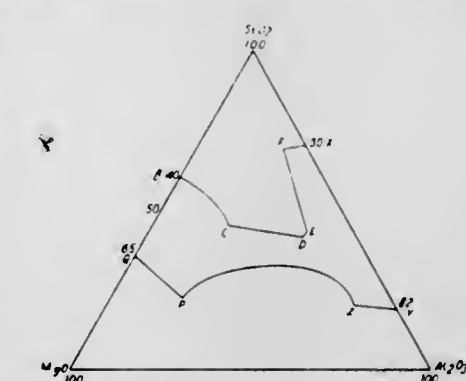
visible image by comparison with a known standard representing acceptable cell size limits; and  
in response to said size, controlling process parameters to obtain a foam structure at least generally corresponding to said known standard.

4,412,962  
**METHOD OF MOLDING A MECHANICALLY FROTHED URETHANE RESIN FOAM AND AN OPEN-TOP INJECTION MOLD THEREFORE**  
Michael D. Bessette, Storrs, Conn., and Robert B. Jerard, Hanover, N.H., assignors to Rogers Corporation, Rogers, Conn.  
Continuation of Ser. No. 175,319, Aug. 4, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,507  
Int. Cl.<sup>3</sup> B29D 27/00  
U.S. Cl. 264-46.4



1. A method of molding products comprised of a foam material comprising the steps of:  
delivering an uncured foam to a runner about the base of a mold cavity, the foam separating into a pair of oppositely flowing streams upon flow into the runner;  
directing the uncured foam from the runner into the mold cavity through an opening of reduced cross-sectional area when compared to the runner whereby a back pressure is exerted on the foam material thereby causing the foam material to substantially completely fill the runner before beginning to flow through the restriction into the mold cavity;  
allowing the mold cavity to fill with the foam material; and  
curing the foam.

4,412,963  
**METHOD OF PRODUCING DISCHARGE LAMP ARC TUBES**  
Peter Hing, 13, Malling Close, Birstall Leicester, England  
Filed Dec. 18, 1981, Ser. No. 331,990  
Claims priority, application United Kingdom, Dec. 20, 1980, 8040905  
Int. Cl.<sup>3</sup> C04B 35/64  
U.S. Cl. 264-61



1. A method of producing an arc tube for a discharge lamp which method comprises forming an assembly of one sintered cermet end closure member hermetically sealed to a ceramic arc tube of polycrystalline alumina, sapphire or a spinel by means of the following steps:  
providing an arc tube in the incompletely fired state, provid-



ing an end closure member in the incompletely fired state complete with an electrode assembled thereto, applying a layer of sealing composition between said end closure member and said arc tube and sintering the assembled arc tube and end closure complete with electrode at a temperature of from 1800° C. to 1900° C. in a vacuum, inert gas or a hydrogen atmosphere wherein said sealing composition comprises silica, alumina and magnesia in proportions such that said composition falls between the area BCDEFXYZPQ on the accompanying ternary phase diagram.

4,412,964

## CENTRIFUGAL PELLETIZING SYSTEMS AND PROCESS

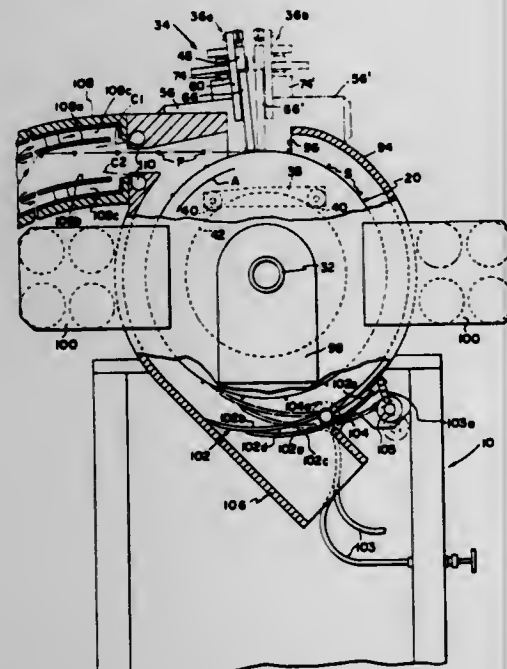
David B. Todd, Saginaw, and James D. Layfield, Bay City, both of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Feb. 16, 1982, Ser. No. 348,734

Int. Cl.<sup>3</sup> B28B 11/16

U.S. Cl. 264—143

5 Claims



1. In a method for forming pellets of thermoplastic material by centrifugally expressing strands of flowable thermoplastic material from orifices in the rim portion of a rotating hollow rotor bounded radially by a non-rotating housing chamber and severing said strands at a selected location adjacent the periphery of said rotor to form pellets; the steps of:

- supplying said material to said rotor and initially positioning cutter means adjacent the rotor at a first peripheral location in which the cutter means extends across the path of rotation of strands extruded from the rotor and functions during start-up of the pelletizer to sever extruded scrap material;
- removing the cutter means from said first location and positioning cutter means at a second peripheral location across the path of rotation of portions of said strands which have extruded from said rotor and are carried with the rotor in the path of revolution thereof;
- moving pellets cut from said strand portions at said second location in a path tangential to the path of revolution of said rotor across and out of the chamber;
- cooling the tangentially moved pellets severed from said strands before they agglomerate; and
- collecting the pellets separately from the initially severed scrap material.

4,412,965

## METHOD OF MAKING AN AIR SPRING

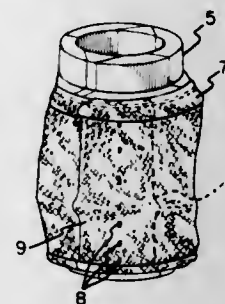
Donald R. Thompson, Wadsworth, and Robert H. Vogliano, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1981, Ser. No. 299,762

Int. Cl.<sup>3</sup> B29D 3/02; B29H 3/08

U.S. Cl. 264—257

3 Claims



1. A method for making an air spring comprising, spreading a fabric around a core having a desired air spring shape, overlapping ends of said fabric in an axially extending region of said core, anchoring the overlapping ends of said fabric to said core, placing the core and fabric in a mold, injecting an elastomeric material in said mold and curing said material in said mold to form an air spring having a fabric reinforcement.

4,412,966

## NECK ORIENTING METHOD OF BOTTLES OF SATURATED POLYESTER RESINS

Yataro Yoshino; Sadao Suzuki, and Takuzo Takada, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

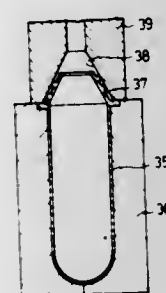
Division of Ser. No. 92,428, Nov. 7, 1979, Pat. No. 4,297,306.

This application Jun. 4, 1981, Ser. No. 270,291

Int. Cl.<sup>3</sup> B29C 17/02, 17/07

U.S. Cl. 264—521

7 Claims



1. A method of forming the neck portion of a synthetic resin bottle, the method comprising the steps of:

- forming a parison of synthetic resin, the parison having a neck and a body and capable of being further formed into a bottle;
- heating at least a portion of the neck to a temperature sufficient to permit molding thereof;
- pressing the heated neck portion into a tapered shape converging inwardly in a direction away from the body of the parison;
- further heating the tapered neck portion of the parison to an orientable temperature; and
- operating on the tapered neck portion at the orientable temperature by means of an orienting device inserted into the neck portion of the parison to outwardly expand the neck portion from its inwardly converging shape so as to achieve orientation within the neck portion.

4,412,967

## MULTISTAGE HIGH VOLTAGE ACCELERATOR FOR INTENSE CHARGED PARTICLE BEAMS

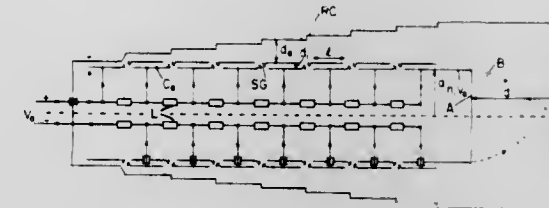
Friedwardt M. Winterberg, P.O. Box 11661, Reno, Nev. 89510

Filed Apr. 9, 1980, Ser. No. 138,602

Int. Cl.<sup>3</sup> G21B 1/02

U.S. Cl. 376—106

1 Claim



1. A method of achieving charged particle beams of at least  $10^7$  volts using conductors in stages and wherein breakdown is prevented by magnetic self-insulation comprising:

concentrically arranging a plurality of axially aligned vacuum insulated identical cylindrical capacitors inside a conductive vessel and coaxial therewith, said vessel serving as a common return current conductor for said capacitors, said cylindrical capacitors being comprised of inner and outer cylindrical conductors wherein said vessel together with said axially aligned outer cylindrical conductors comprises a multi-stage transmission line, connecting said plurality of cylindrical capacitors in series by means of triggered spark gap switches;

placing a charged particle beam producing diode means at one end of said transmission line, said diode means serving to produce a charge particle beam of at least  $10^7$  volts; matching the impedance of said transmission line to that of said diode means such that electrons emitted from the cathode of said diode means are prevented from crossing the cathode-anode gap so as to insure magnetic self-insulation;

charging said cylindrical capacitors in parallel by means of a central axially arranged charging line which contains inductances between the connections of said central charging line to said capacitors, said inductances being sufficient to prevent discharging of the capacitors through said central charging line;

discharging said plurality of capacitors in series through said triggered spark gap switches, said discharge beginning at the end of said vessel opposite to said one end of said transmission line, said discharging taking place in a predetermined manner such that the closing of said switches proceeds with a phase velocity equal to the velocity of light and causes the formation of an electromagnetic wave which moves down said transmission line to the other end thereof in a predetermined time period with said electromagnetic wave growing in amplitude as it moves down said transmission line and producing a magnetic field, said predetermined time period being sufficiently short so as to ensure magnetic self-insulation, the spacing between said outer cylindrical conductors and said vessel increasing in the direction towards said one end of the transmission line in such a manner as to accommodate said increase in amplitude;

applying said electromagnetic wave to said beam producing diode means to produce a charged particle beam.

4,412,968

## NUCLEAR REACTOR CONTROL APPARATUS

Bettadapur N. Sridhar, Cupertino, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,308

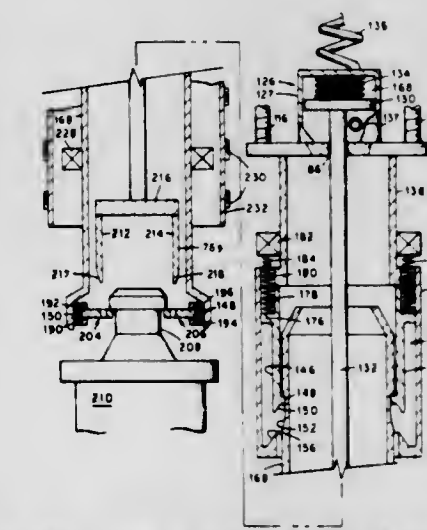
Int. Cl.<sup>3</sup> G21C 7/08

U.S. Cl. 376—233

9 Claims

1. Apparatus for controlling fission in a nuclear reactor core, comprising:

a vertically movable carriage; a vertically disposed control rod support tube carried by and positioned under said carriage; a vertically disposed control rod carrying a neutron absorber at its lower end and having a detent notch at its upper end, said control rod being mounted for reciprocation along its longitudinal axis between (1) a raised position wherein its detent notch is positioned at the lower end of said control rod support tube and said absorber is above said core, and (2) a lowered position wherein said absorber is positioned within said core; a latch mounted on the lower end of said control rod support tube for pivotal movement between (1) a first position wherein a portion of said latch is disposed in the detent



notch in said control rod, and (2) a second position wherein said latch portion is displaced from said detent notch;

an actuator shaft supported by said carriage and extending through said control rod support tube to the lower end thereof, said actuator shaft having a cam means at its lower end and being mounted for reciprocation along its longitudinal axis between (1) a raised position relative to said control rod support tube wherein it permits said latch to remain in said first position thereof, and (2) a lowered position relative to said control rod support tube wherein said cam means displaces said latch to said second position thereof; and

means mounted on said carriage for moving said actuator shaft between said raised and lowered positions.

4,412,969

## COMBINATION PIPE RUPTURE MITIGATOR AND IN-VESEL CORE CATCHER

Roger W. Tillbrook, Monroeville, Pa., and Franz J. Markowski, Richard, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 9, 1982, Ser. No. 356,569

Int. Cl.<sup>3</sup> G21C 15/00

U.S. Cl. 376—280

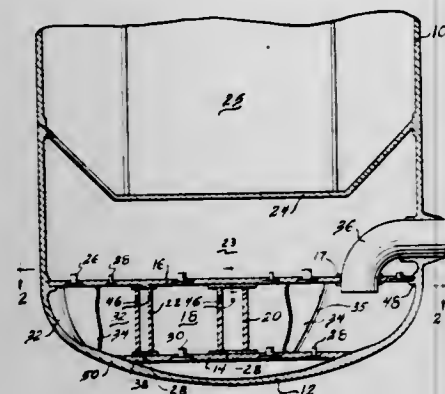
11 Claims

1. In a liquid-cooled nuclear reactor having a plurality of coolant loops for supplying coolant to a reactor core supported on a core support structure and which is positioned within a reactor vessel, a device for mitigating the effects of a failed coolant loop and for catching particulated material from the core, comprising:

a first plate capable of retaining particulated core material, the first plate being positioned beneath said core support structure and spanning the cross-section of said reactor vessel such that the first plate and the bottom wall of said reactor vessel form a chamber, means comprising imperforate partitions extending downwardly from the first plate for dividing the chamber into a plurality of separate sections such that there is one section of the chamber for each coolant loop,



at least one inlet pipe from each coolant loop, each inlet pipe entering said reactor vessel and positioned such that it discharges into a separate one of said sections of the chamber, and



a plurality of nozzles extending through the first plate, the nozzles being designed such that the pressure drop from the core region to the chamber is greater than the pressure drop from the chamber to the core region, thus reducing the volume of fluid flowing out of the reactor vessel through a failed coolant loop.

4,412,970

## PALLADIUM BASED DENTAL ALLOYS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Dec. 6, 1982, Ser. No. 447,012

Int. Cl.<sup>3</sup> C22C 5/02

U.S. Cl. 420—463

4 Claims



1. A grain-refined palladium based dental alloy for porcelain-fused-to-metal restorations consisting by weight of essentially about 75–80% palladium, 8–10% cobalt, 0–5% indium, 0–10% tin, 0.05–0.2% aluminum and 0.15–0.50% rhodium, the total of the constituents being 100%.

4,412,971

## ELECTRICAL CONTACT MATERIALS OF INTERNALLY OXIDIZED AG-SN-BI ALLOY

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Filed Feb. 11, 1982, Ser. No. 348,142

Int. Cl.<sup>3</sup> C22C 5/06

U.S. Cl. 420—501

2 Claims

1. An electrical contact material made from a silver alloy containing solute metal elements of a total amount of from 3—less than 5 weight % of Sn, and 0.01–1.0 weight of Bi, said silver alloy having been internally oxidized.

4,412,972  
ALUMINUM BASE BEARING ALLOY  
Sanae Mori, Nagoya, Japan, assignor to Daido Metal Co., Inc., Japan

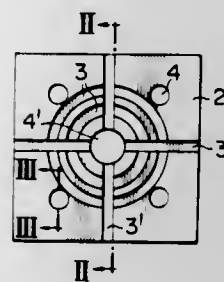
Filed Aug. 3, 1982, Ser. No. 404,674

Claims priority, application Japan, Mar. 31, 1982, 57-52398

Int. Cl.<sup>3</sup> C22C 21/14

U.S. Cl. 420—530

4 Claims



1. An aluminum base bearing alloy consisting essentially, by weight, of over 9.0% and below 40% lead, 0.2–5% copper, 0.2–10.0% tin, 0.1–10.0% silicon, 0.01–3% at least one element selected from the group consisting of, vanadium, titanium, zinc, cobalt and zirconium, and the balance being incidental impurities and aluminum.

4,412,973

## AUTONOMOUS SIMULTANEOUS ANALYSIS APPARATUS AND A METHOD OF USING IT

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

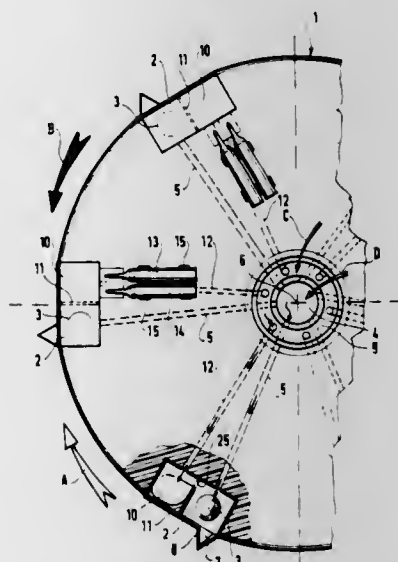
Filed Dec. 14, 1981, Ser. No. 330,430

Claims priority, application France, Dec. 15, 1980, 80 26528

Int. Cl.<sup>3</sup> G01N 21/07, 33/54

U.S. Cl. 422—72

14 Claims



1. Analysis apparatus of the kind which uses a reaction support to hold successively a quantity of a liquid which contains a substance to be analysed and then a quantity of a liquid reagent to react therewith, said apparatus comprising an analysis rotor having: a plurality of peripheral reaction cells each containing a solid reaction support; means for centrifuging a washing liquid directly into each reaction cell; a peripheral liquid-removal orifice for each reaction cell; the improvement comprising: a buffer cell operatively associated with each reaction cell; separate means for successively centrifuging at least said liquid containing a compound to be analysed and a first reagent directly into said buffer cell; means for storing predetermined quantities of said first reagent in sealed receptacles and for opening said receptacles when it is required to centrifuge the first reagent into said buffer cells; means for communicating said reaction cells and said buffer cells; and

the buffer cell-reaction cell pairs being so arranged that liquid in the buffer cells moves into the associated reaction cells when centrifuging stops.

4,412,975

## FIRED PROCESS HEATER

William D. Parizot; Paul D. O'Lenick, both of Katy, and Lowell D. Fraley, Sugarland, all of Tex., assignors to Pullman Incorporated, Chicago, Ill.

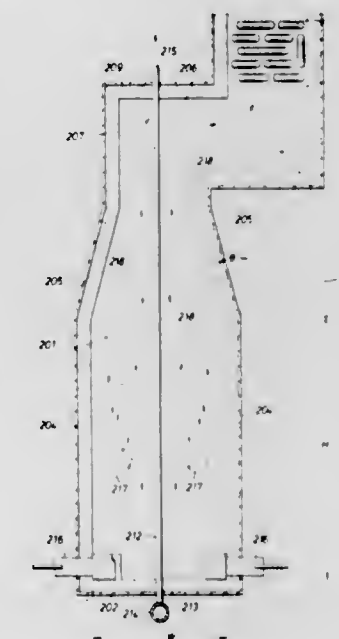
Division of Ser. No. 166,880, Jul. 8, 1980, Pat. No. 4,324,649.

This application Dec. 17, 1981, Ser. No. 331,485

Int. Cl.<sup>3</sup> B01J 19/24

U.S. Cl. 422—197

4 Claims



1. A fired tubular heater which comprises:  
(a) a radiant chamber for passage of combustion gas having a floor, opposed vertical end walls contiguous with the floor, opposed planar vertical lower side walls contiguous with the floor and the end walls, opposed intermediate side walls contiguous with the end walls and the lower side walls, the intermediate side walls sloping inwardly from the lower side walls, at least one upper side wall contiguous with the end walls and one of the intermediate side walls and, a roof contiguous with the end walls and an upper side wall, the end walls, lower side walls, intermediate side walls, upper side walls, and roof having no burners;  
(b) a plurality of straight, vertical, tubular heat exchange means having a single pass in heat exchange relationship with the combustion gas which are parallel the lower side walls, disposed centrally within and extend through the radiant chamber, and terminate at their upper extremities proximate the roof; and  
(c) a plurality of burners proximate the floor which are disposed to direct combustion gas upwardly into the radiant chamber.

4,412,976

## ADJUSTABLE WHEEL ASSEMBLY IN A ROTARY SOLVENT EXTRACTOR

Donald A. Gessler, Verona, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Sep. 8, 1981, Ser. No. 300,380

Int. Cl.<sup>3</sup> B01D 11/02

U.S. Cl. 422—270

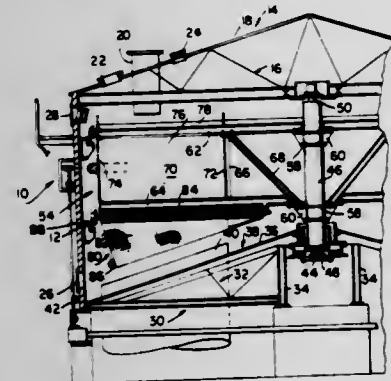
6 Claims

1. In a rotary solvent extractor including a vessel in which there is disposed a plurality of cells formed by a plurality of radially-extending side walls arranged in circumferential fashion on a generally horizontal plane around a vertically-disposed rotor, a feed conduit for introducing solids to be treated into said cells, a solid-retaining cell bottom closure including a wheel member for each cell of said cells, a track mounted to said vessel proximate said side walls of said plurality of cells on which track said wheel member rides to maintain said bottom closure in substantially closed position during a predetermined portion of a rotational path of each cell, conduits for successively introducing solvent into said cells from above said pre-



determined portion of said rotational path, a liquid collection zone disposed beneath said cells and including a plurality of compartments for receiving miscellas, an improved wheel housing assembly to permit elevational adjustment of said wheel with respect to said track, which comprises:

- an axle housing member including a cylindrically-shaped chamber mounted to said cell bottom closure;
- a wheel axle including a housing shaft portion and a wheel shaft portion, the axis of said wheel shaft portion being



parallel and offset from the axis of said housing shaft portion, said housing shaft portion being initially rotatable positionable within said cylindrically-shaped chamber of said axle housing member; and

a wheel member rotatably mounted on said wheel shaft portion whereby rotation of said housing shaft portion within said cylindrically-shaped chamber of said axle housing member permits elevational adjustment of said wheel member with respect to said track.

4,412,977

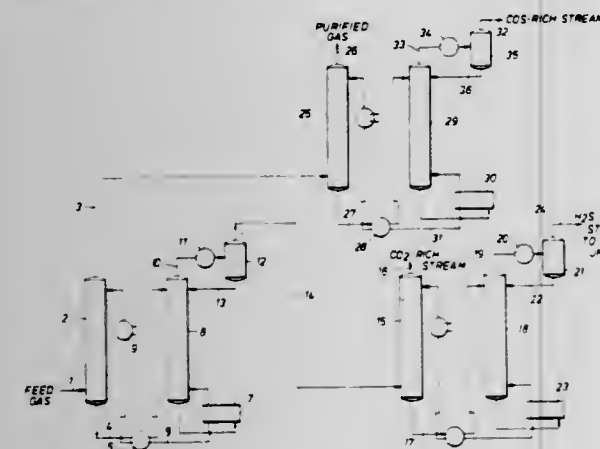
## SELECTIVE ACID GAS REMOVAL

Edwin J. Fisch, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,454

Int. Cl.<sup>3</sup> B01D 53/34

U.S. Cl. 423-226



1. A process for the selective removal of acidic compounds from a feed gas stream containing CO<sub>2</sub>, H<sub>2</sub>S and COS which comprises:

- (a) contacting said feed gas stream in a first stage at a temperature of from 32° C. to 57° C. and a pressure of from 23 atmospheres to 82 atmospheres with a first aqueous absorbent solution, said solution containing between 30 and 50 percent by weight water, between 30 and 60 percent by weight of a secondary or tertiary alkanolamine and between 10 and 40 percent by weight of a tetramethylene sulfone, thereby producing (i) a gaseous COS-rich stream containing greater than about 80 percent by volume of the COS in said feed gas stream, and (ii) an acid gas-loaded first absorbent stream, the ratio of said first aqueous absorbent solution to said feed gas stream being such that the

amount of H<sub>2</sub>S plus CO<sub>2</sub> in said acid gas-loaded first absorbent stream is 85% or more of equilibrium;

- (b) stripping said acid gas-loaded first absorbent stream and producing an acid gas stream containing principally H<sub>2</sub>S and CO<sub>2</sub>;
- (c) selectively absorbing H<sub>2</sub>S from said acid gas stream in a second stage with a second absorbent solution containing water and a secondary or tertiary alkanolamine to produce (i) a stream containing predominately CO<sub>2</sub> and (ii) an H<sub>2</sub>S-rich absorbent stream;
- (d) regenerating said H<sub>2</sub>S-rich absorbent stream to produce a stream containing predominately H<sub>2</sub>S;
- (e) contacting said gaseous COS-rich stream from step (a) with a third absorbent solution containing between 10 and 15 percent by weight water, between 30 and 45 percent by weight diisopropanolamine and between 40 and 60 percent by weight of a tetramethylene sulfone in a third stage to produce (i) an acid gas-free stream and (ii) a COS-rich absorbent stream; and
- (f) regenerating said COS-rich absorbent stream to produce a stream containing predominately COS.

4,412,978

## METHOD AND APPARATUS FOR MANUFACTURING IMPROVED PUFFED BORAX

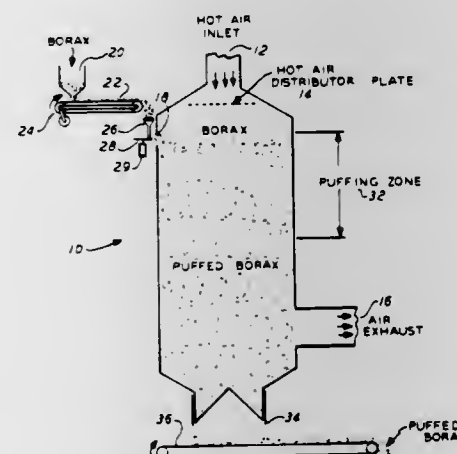
Raymond T. Ertle, Pompton Plains, N.J., assignor to Stokely-Van Camp, Inc., Indianapolis, Ind.

Filed Mar. 15, 1982, Ser. No. 358,050

Int. Cl.<sup>3</sup> C01B 35/12

3 Claims U.S. Cl. 423-279

16 Claims



1. A method for producing a free-flowing, agglomerate-free puffed borax product having high bead strength, comprising the steps of:

- (a) establishing a top to bottom laminar flow of heated air through a vertical tower;
- (b) introducing hydrated borax particles at a given point in said heated laminar flow air stream to be carried by the air stream in the direction of flow for a time sufficient to produce said puffed particles; said hydrated borax particles being introduced into the air stream in the form of a horizontally dispersed sheet of particles; and
- (c) recovering the puffed particles downstream from the point of introduction of the particles.

4,412,979

## PROCESS FOR PREPARING ALUMINUM OR MAGNESIUM PHOSPHIDE

Franziskus Horn, Rodgem, and Ekkehard Fluck, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Degesch, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,481, Oct. 3, 1980, Pat. No. 4,331,642. This application Apr. 5, 1982, Ser. No. 365,322

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 2945647

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C01B 25/08

U.S. Cl. 423-299

6 Claims

1. A process of preparing the phosphide of aluminum or magnesium comprising slowly adding both the finely divided metal or an alloy of the two metals and liquid yellow phosphorus to the reaction vessel at a temperature between 300° and 600° C. in an inert gas atmosphere and in the presence of a catalytically effective amount of the element chlorine, bromine, or iodine or a compound of such element with phosphorus, sulfur, hydrogen, ammonium, zinc, or the metal being reacted.

4,412,980

## METHOD FOR PRODUCING A DIAMOND SINTERED COMPACT

Kazuo Tsuji, Shuji Yazu, and Akio Hara, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 158,136, Jun. 10, 1980, Pat. No. 4,333,986.

This application Feb. 25, 1982, Ser. No. 352,249

Claims priority, application Japan, Jun. 11, 1979, 54-73670; May 30, 1980, 55-73570

Int. Cl.<sup>3</sup> C01B 31/06

U.S. Cl. 423-446

11 Claims

DIAMOND GROWTH DIRECTION

DIAMOND CRYSTAL

CATALYTIC METAL

DIAMOND GROWTH DIRECTION

1. A method for producing a diamond sintered compact having diamond crystal particles uniformly oriented in a particular direction, which comprises placing a carbonaceous material as a raw material for producing diamond, and a catalytic metal for crystallizing diamond, in layered or concentric relationship to each other the catalytic metal comprising between 5 to 50 weight % of the total weight of the carbonaceous material and catalytic metal, a metal inert to synthesis of diamond or a metal having a higher melting point than the catalytic metal being interposed at the interface between the carbonaceous material and catalytic metal, subjecting the resultant assembly to temperature and pressure under conditions of a pressure higher than 65 kb, and a temperature higher by 200° C. than the eutectic temperature of the catalytic metal and carbon and lower by 100° C. than the thermodynamic equilibrium line of diamond versus graphite, the rate of temperature rise beyond the eutectic temperature being at least 100° C./min. predetermined pressure and temperature conditions within these limits being maintained for a time sufficient for formation and growth of diamond crystals and sintering of each diamond particle, thereby enabling synchronous transformation of the carbonaceous material into diamond and sintering of the diamond.

4,412,981

## CONVERSION OF HYDROGEN SULFIDE TO SULFUR BY DIRECT OXIDATION

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 16, 1981, Ser. No. 302,942

Int. Cl.<sup>3</sup> C01B 17/04; B01D 53/34

U.S. Cl. 423-573 R

9 Claims

1. A process for the absorption and subsequent conversion of hydrogen sulfide to sulfur by direct oxidation, comprising contacting a gaseous or liquid feedstock containing hydrogen sulfide with a reaction system consisting essentially of

- (a) a hydroxyl-containing liquid or liquids represented by the formula ROH, where R equals hydrogen or an alkyl or alkylene radical having from 1 to 6 carbon atoms or a mixture of two or more of said liquids;
- (b) at least one base, selected from the group consisting of (1) ammonium hydroxide, (2) amines having from 1 to about 6 carbon atoms and 1 or 2 amine groups, and (3) metal hydroxides represented by the formula M(OH)<sub>n</sub>, where M is an alkali or alkaline earth metal and n is 1 or 2 depending upon the valence of M, and
- (c) free oxygen introduced as an oxidant by using air, a mixture of air and oxygen, or a mixture of oxygen with inert gases,

wherein said reaction is carried out in the absence of ions or particles of metals of the iron group, and said reaction optionally is carried out in the presence of an inert hydrocarbon solvent.

4,412,982

ZIRCONIUM-TITANIUM-MANGANESE-IRON ALLOY CHARACTERIZED BY ZRMN<sub>2</sub> STOICHIOMETRY

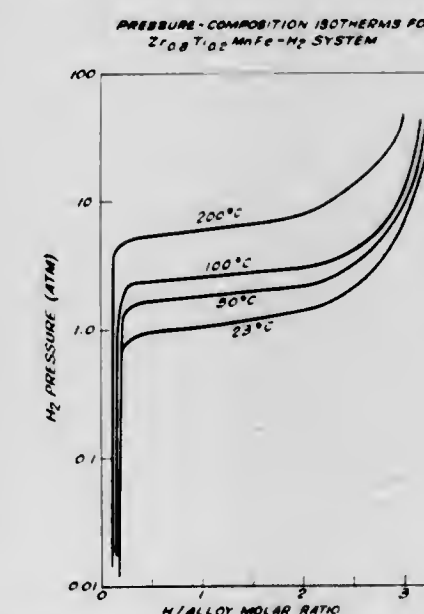
William E. Wallace, Pittsburgh, Pa.; Vijay K. Sinha, Bihar, India, and Faiz Purarian, Qazvin, Iran, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1982, Ser. No. 373,672

Int. Cl.<sup>3</sup> C22C 30/00; C01B 6/00

U.S. Cl. 423-644

19 Claims



1. A quaternary alloy of elements expressed by the following formula



wherein "x" has a value in a range from about 0.2 to about 0.3, and "y" has a value in a range from about 0.1 to about 1.



4,412,983

**DENTIFRICES CONTAINING AMORPHOUS SILICA**  
Robert L. Mitchell, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 58,600, Jul. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,451, Dec. 4, 1978, abandoned, which is a division of Ser. No. 770,344, Feb. 22, 1977, Pat. No. 4,141,969. This application Sep. 27, 1982, Ser. No. 423,951

Int. Cl.<sup>3</sup> A61K 7/18

U.S. Cl. 424—52

12 Claims

1. A dental cream composition compatible with the surface of an unlined aluminum container and contained in said container, comprising dental vehicle and dispersed therein synthetic precipitated silica essentially free of alumina which silica has an aggregate particle size of about 2 to 20 microns and an essentially amorphous X-ray structure, a compound which provides fluorine in amount of about 0.01% to 1% by weight and a calcium salt selected from the group consisting of calcium carbonate, calcium metasilicate and calcium phosphate in amount to provide at least about 0.01% to about 0.3% by weight of calcium in water.

4,412,984

# FLAVOR POTENTIATED ORAL COMPOSITIONS CONTAINING THAUMATIN OR MONELLIN

Henricus E. van der Loo, and Charles Wiener, both of Middletown, N.Y., assignors to Talres Development (N.A.) N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 899,113, Apr. 24, 1978, Pat. No. 4,300,576. This application Sep. 10, 1981, Ser. No. 300,807 Claims priority, application United Kingdom, Apr. 26, 1977, 17335/77

Int. Cl.<sup>3</sup> A61K 7/26; A23L 1/22

U.S. Cl. 424—58

8 Claims

1. A flavoured oral composition containing thaumatin or monellin at a flavour potentiating level, which level is below the detectable sweetness threshold of thaumatin or monellin respectively in the composition.

4,412,985

# DEPYROGENATION PROCESS

Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92705 Continuation-in-part of Ser. No. 194,263, Oct. 6, 1980, Pat. No. 4,315,919. This application Jan. 4, 1982, Ser. No. 336,916

Int. Cl.<sup>3</sup> A61K 31/74; A61L 2/16

U.S. Cl. 424—78

9 Claims

1. The method of depyrogenating a biomedical product or material comprising treating said product or material by prolonged contact with a solution or suspension of about 0.1% to about 10% by weight of a nonionic amphiphile selected from the group consisting of substances having the general formula  $RC_6H_4(OC_2H_4)_nOH$  wherein R is octyl or nonyl and n is at least 3, followed by separating said amphiphile from the resulting depyrogenated product or material by liquid phase separation.

4,412,986

# NIFEDIPINE-CONTAINING SOLID PREPARATION COMPOSITION

Hiroitsu Kawata, Kawagoe; Tadayoshi Ohmura, Niiza; Katsuhiko Yano, Omiya; Mikio Matsumura, Tokyo; Saburo Higuchi, Hasuda, and Yoshiaki Soeishi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan

Division of Ser. No. 908,510, May 22, 1978, abandoned. This application Apr. 16, 1981, Ser. No. 254,882 Claims priority, application Japan, Jun. 7, 1977, 52-67039; Jul. 14, 1977, 52-84372

Int. Cl.<sup>3</sup> A61K 31/79, 31/455, 47/00

U.S. Cl. 424—80

15 Claims

1. A nifedipine-containing solid composition comprising a coprecipitate (a) of nifedipine and (b) about 1 to 20 times its

weight of a member selected from the group consisting of polyvinylpyrrolidone, methylcellulose, hydroxypropylcellulose and hydroxypropylmethylcellulose.

4,412,987

# ADDITION AGENT FOR MEDICINES OR COSMETICS

Kazuharu Nakazawa, No. 105 Oji-Mansion, 7-8, 3-chome, Hara-da-dori, Nada-ku, Kobe-shi, Japan

Filed Sep. 24, 1981, Ser. No. 305,345

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 55-144589

Int. Cl.<sup>3</sup> A61K 35/32

U.S. Cl. 424—95

8 Claims

1. An addition agent for medicines and cosmetics obtained by (1) heating fats and bones of a pig in two stages, the first stage being at a temperature of 700° to 1,000° C., and the second stage being at a temperature of 1,300° to 1,400° C., (2) filtering the resultant hot solution to remove precipitates therefrom, and (3) allowing the resultant filtrate to stand at room temperature.

4,412,988

# HEXAPEPTIDES

Jean-Claude Gasc, Bondy; Serge Geoffre, Cestas; Michel Hospital, Talence, and Jacques Laurent, Issy-les-Moulineaux, all of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 9, 1981, Ser. No. 310,392

Claims priority, application France, Oct. 14, 1980, 80 21919 Int. Cl.<sup>3</sup> C07C 103/52; A61K 37/02

U.S. Cl. 424—177

24 Claims

1. A compound selected from the group consisting of hexapeptides of the formula

Cys-X-Y-D-Lys-Z

1

wherein x is a sequence selected from the group consisting of Ala-Ala and Glu-His, Y is selected from the Group consisting of Cys and Phe, Z is Phe when Y is Cys or Z is Cys when Y is Phe, the two Cys groups in the molecule being joined by a disulfide bridge, their non-toxic, pharmaceutically acceptable acid addition salts; their salts of non-toxic, pharmaceutically acceptable bases, their non-toxic, pharmaceutically acceptable esters and their amides and N-alkyl or N,N-dialkyl amides of 1 to 5 carbon atoms and their metallic complexes with a metal selected from the group consisting of cobalt, nickel, copper, iron and zinc.

4,412,989

# OXYGEN CARRIER

Yuji Iwashita, Kawasaki; Katsumi Ajisaka, Yokohama, and Keiji Iwasaki, Kawasaki, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,606

Claims priority, application Japan, Jun. 10, 1981, 56-89315

Int. Cl.<sup>3</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177

12 Claims

1. An oxygen carrying material containing hemoglobin or a hemoglobin derivative covalently coupled through an amide bond to a polymer selected from the group consisting of polyethylene glycol, polypropylene glycol, and copolymers of ethylene oxide and propylene oxide.

4,412,990

# COMPOSITION HAVING ENHANCED OPSONIC ACTIVITY

John L. Lundblad, El Cerrito; Miriam D. Budinger, Berkeley, and Richard S. Schwartz, Burlingame, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Jul. 2, 1982, Ser. No. 394,977

Int. Cl.<sup>3</sup> A61K 37/00, 35/14

U.S. Cl. 424—177

22 Claims

1. A pharmaceutical composition comprising purified immune globulin and fibronectin in amounts sufficient to produce an opsonic activity in the composition that is greater than the additive opsonic activity of the immune globulin and fibronectin alone.

4,412,991

# 22-HYDROXY DERIVATIVES OF C-076 COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Robert E. Ormond, Edison, N.J., assignor to Merck & Co., Inc., Rayway, N.J.

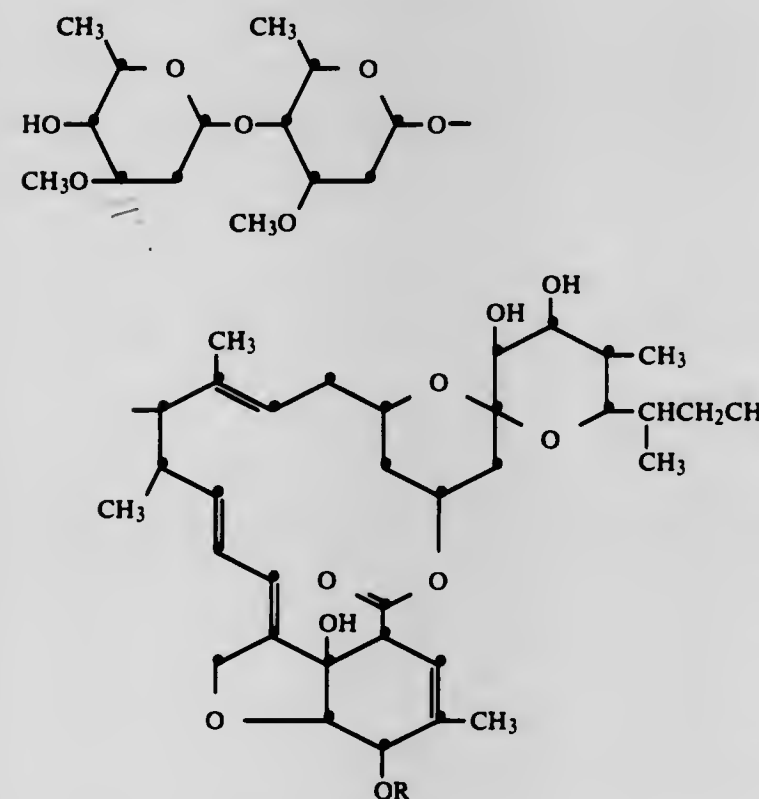
Filed Aug. 28, 1981, Ser. No. 297,442

Int. Cl.<sup>3</sup> A61K 31/71; C07H 17/08; C12P 19/62

U.S. Cl. 424—180

5 Claims

1. A compound having the formula:



wherein R is hydrogen or methyl.

5. A method for the treatment of helminth, acarid, nematode and insect infections which comprises administering to an animal infected with parasitic infection, an effective amount of one or more of the compounds of claim 1.

4,412,992

# 2-HYDROXY-5-PHENYLAZOBENZOIC ACID DERIVATIVES AND METHOD OF TREATING ULCERATIVE COLITIS THEREWITH

Rosalind P. K. Chan, London, England, assignor to Biorex Laboratories Limited, England

Filed Jul. 8, 1981, Ser. No. 281,504

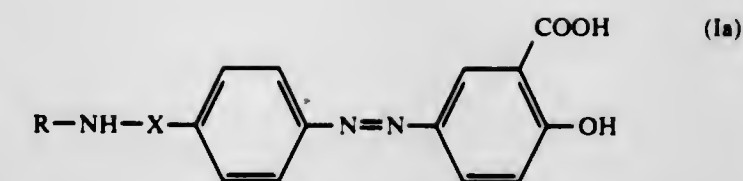
Claims priority, application United Kingdom, Jul. 21, 1980, 8023826

Int. Cl.<sup>3</sup> A61K 31/655; C07C 107/06

U.S. Cl. 424—226

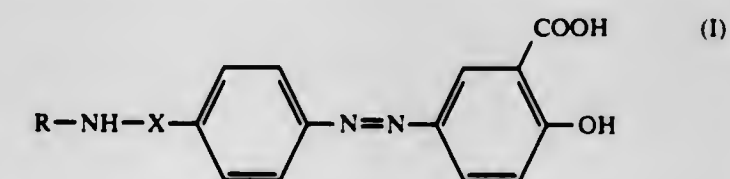
13 Claims

1. 2-Hydroxy-5-phenylazobenzoic acid derivatives of the general formula:



wherein X is an  $-SO_2-$  or  $-CO-$  group and R is either a phenyl or carboxymethylphenyl radical or is a radical of the formula  $-(CH_2)_n-Y$ , in which Y is a hydroxyl group, an amino group, a monoalkyl- or dialkyl-amino group, the alkyl moieties of which contain up to 6 carbon atoms or a carboxylic or sulphonic acid group and n is a whole number of from 1 to 6 and in which one or more of the hydrogen atoms in the alkylene radical can be replaced by amino groups, monoalkyl- or dialkyl-amino groups, the alkyl moieties of which contain up to 6 carbon atoms or alkyl radicals and in which the  $-(CH_2)_n-Y$  radical is either attached directly to the nitrogen atom or via a benzene ring, with the proviso that  $R-NH-X-$  is other than a  $-CO-NH-CH_2-COOH$  radical; and the esters and non-toxic, pharmacologically acceptable salts thereof.

12. A pharmaceutical composition for the treatment of ulcerative colitis in humans, containing an effective amount to treat ulcerative colitis, of at least one compound of the formula:



wherein X is an  $-SO_2-$  or  $-CO-$  group and R is either phenyl or carboxymethylphenyl radical or is a radical of the general formula  $-(CH_2)_n-Y$ , in which Y is a hydroxyl group, an amino group or a monoalkyl- or dialkyl-amino group, the alkyl moieties of which contain up to 6 carbon atoms or a carboxylic or sulphonic acid group and n is a whole number of from 1 to 6 and in which one or more hydrogen atoms in the alkylene radical can be replaced by amino groups, monoalkyl- or dialkyl-amino groups, the alkyl moieties of which contain up to 6 carbon atoms or alkyl radicals and in which the  $-(CH_2)_n-Y$  radical is either attached directly to the nitrogen atom or via a benzene ring; and/or containing at least one ester thereof and/or at least one non-toxic, pharmaceutically acceptable salt thereof, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,412,993

# METHOD OF TREATING PSEUDOPREGNANCY, GALACTORRHEA AND MASTITIS IN MAMMALS

James H. Sokolowski, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 115,473, Jan. 25, 1980, abandoned. This application Jan. 28, 1981, Ser. No. 229,255

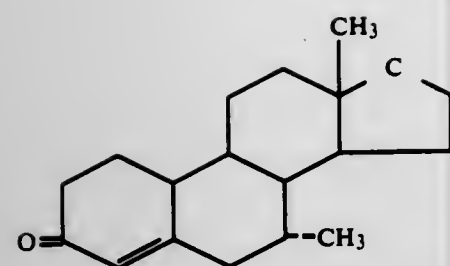
Int. Cl.<sup>3</sup> A61K 31/56

U.S. Cl. 424—243

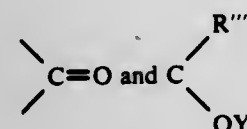
11 Claims

1. A method for treating a mammal suffering from a disease selected from the group consisting of pseudopregnancy and galactorrhea which comprises treating said mammal with 30-500 mcg/kg of a compound having the formula





wherein C represents a group selected from the class consisting of



wherein R''' is selected from the class consisting of hydrogen and a lower aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms, inclusive, and Y is selected from the class consisting of hydrogen and the acyl radical of a hydrocarbon carboxylic acid containing from 1 to 12 carbon atoms, inclusive.

4,412,994

#### MANNICH-BASE HYDROXAMIC ACID PRODRUGS, COMPOSITIONS AND USE

Kenneth B. Sloan, Eudora, Kans., and Roy Little, Gainesville, Fla., assignors to INTERx Research Corporation, Lawrence, Kans.

Continuation of Ser. No. 143,520, Apr. 24, 1980, abandoned.

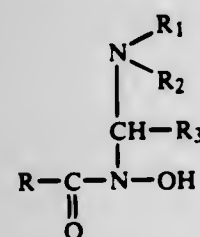
This application May 28, 1982, Ser. No. 383,375

Int. Cl.<sup>3</sup> A61K 31/405, 31/535; C07D 209/18, 413/12

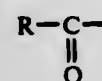
U.S. Cl. 424-248.53

34 Claims

1. A compound of the formula



wherein



is the acyl residue of indomethacin; R<sub>1</sub> and R<sub>2</sub>, which can be the same or different, each represent a member selected from the hydrocarbon group consisting of alkyl of 1 to 20 carbon atoms; alkenyl or 2 to 20 carbon atoms; aryl or 6 to 10 carbon atoms; cycloalkyl of 3 to 8 carbon atoms; cycloalkenyl of 4 to 8 carbon atoms; alkynyl of 2 to 20 carbon atoms; aralkyl, alkaryl, aralkenyl, aralkynyl, alkenylaryl, and alkynylaryl, wherein the alkyl, alkenyl, alkynyl, and aryl portions are defined as above; or R<sub>1</sub> and R<sub>2</sub> are combined so that -NR<sub>1</sub>R<sub>2</sub> together represent the residue of a saturated heterocyclic compound containing one secondary nitrogen atom; R<sub>3</sub> is hydrogen or R<sub>1</sub>; or a non-toxic pharmaceutically acceptable acid addition salt or oxide thereof.

32. A pharmaceutical composition of matter comprising an anti-inflammatory effective amount of a compound of claim 1, in combination with a nontoxic pharmaceutically acceptable inert carrier therefor.

#### 4,412,995 PENTACYCLIC PHENYLPYRAZOLE COMPOUNDS AS ANTI-INFLAMMATORY AGENTS

Malcolm R. Bell, East Greenbush, and John L. Herrmann, Jr., Kinderhook, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

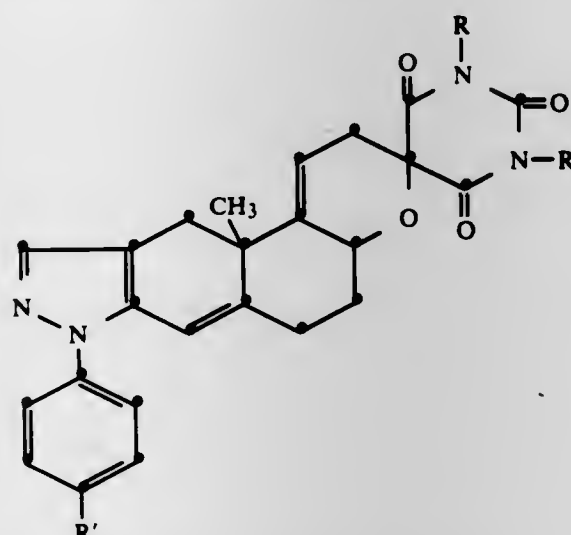
Continuation-in-part of Ser. No. 236,215, Feb. 19, 1981, abandoned. This application Jan. 13, 1982, Ser. No. 339,116

Int. Cl.<sup>3</sup> A10K 31/505; C07D 231/54, 491/20

U.S. Cl. 424-251

12 Claims

1. A compound having the formula:



wherein R is selected from the group consisting of hydrogen, methyl, ethyl, propyl, 2-propenyl and 2-propynyl; and R' is selected from the group consisting of hydrogen and fluoro.

11. A pharmaceutical composition for treating inflammation in mammals which comprises an anti-inflammatorily effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,412,996

#### PYRIDOXINE DERIVATIVES AND RELATED PHARMACEUTICAL COMPOSITIONS

(1) Alberto Reiner, Como, Italy, assignor to Crinos Farmacologica Spa, Como, Italy

Filed Oct. 20, 1981, Ser. No. 313,311

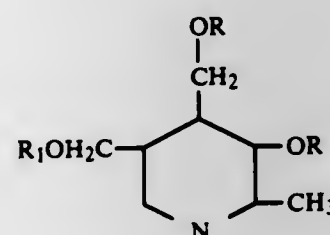
Claims priority, application Italy, Oct. 21, 1980, 25473 A/80 The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/435; C07D 401/112, 213/67

U.S. Cl. 424-256

10 Claims

1. A derivative of pyridoxine and isopropylidene pyridoxine having the formula:



wherein the R radicals represent a hydrogen atom or, conjointly, an isopropylidene group, and R<sub>1</sub> represents the residue of an acid selected in the group comprising 1-(p-chlorobenzoyl)-2-methyl-5-methoxy-indol-3-acetic acid and 5-(2,4-difluorophenyl)-salicylic acid, and the related addition salts with non toxic and pharmaceutically acceptable, inorganic and organic acids.

6. An anti-inflammatory composition comprising an anti-inflammatory amount of a derivative of pyridoxine or of isopropylidene pyridoxine according to one of claims 1, 3, 4 or 5, together with pharmaceutically acceptable excipients and/or vehicles.

4,412,997

#### INSECT REPELLENT COMPOUNDS

Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 10, 1981, Ser. No. 329,365

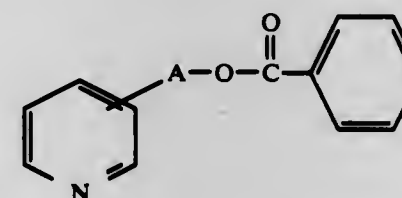
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A01N 43/40; C07D 213/55

U.S. Cl. 424-263

8 Claims

1. A method of repelling insects from a locus to be protected therefrom, comprising applying to said locus an effective insect repelling amount of a compound having the formula



in which A is an alkylene group having from 1 to 3 carbon atoms.

4,412,998

CERTAIN 4-(1-PIPERIDINO)-PHENYL-NICOTINATES  
Arthur Scherm, Bad Homburg; Dezae Peteri, Hattersheim, and Klaus Hummel, Frankfurt, all of Fed. Rep. of Germany, assignors to Merz & Company, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 222,679, Jan. 5, 1981, Pat. No. 4,321,268, which is a continuation-in-part of Ser. No. 119,576, Feb. 7, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,290

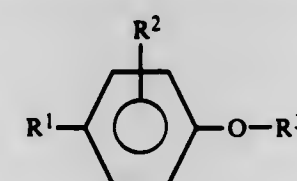
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904757; Mar. 10, 1980, 3009099

Int. Cl.<sup>3</sup> C07D 401/10; A61K 31/455

U.S. Cl. 424-267

6 Claims

1. Compounds having the general formula:



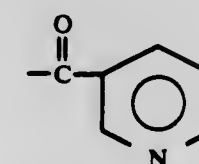
wherein R<sup>1</sup> = 1-piperidiny

and

R<sup>2</sup> =

- (-CH<sub>2</sub>-)<sub>n</sub>, where n=4 forming the 5,6,7,8-tetrahydro-1-naphthyl ring
- Halogen
- C<sub>1</sub>-C<sub>6</sub>-alkyl or C<sub>3</sub>-C<sub>6</sub>-cycloalkyl
- Methoxy
- Ethoxy
- Trifluoromethyl
- Nitro
- Hydrogen,

and R<sup>3</sup> =



and pharmaceutically-acceptable acid addition salts thereof.

5. Method for the treatment of hyperlipidemia comprising the step of administering to a subject in need of such therapy, by the oral or parenteral route, an effective hyperlipidemic amount of a compound of claim 1.

1036 O.G.—8

4,412,999

#### ANTI-EMETIC ESTERS OF CYPROHEPTADINE-3-CARBOXYLIC ACID AND STRUCTURALLY RELATED COMPOUNDS

David C. Remy, North Wales, and Bradley V. Clneschmidt, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

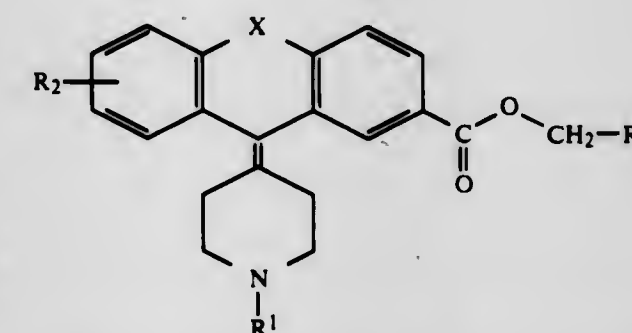
Filed Apr. 14, 1982, Ser. No. 368,257

Int. Cl.<sup>3</sup> A61K 31/445; C07D 401/12

U.S. Cl. 424-267

20 Claims

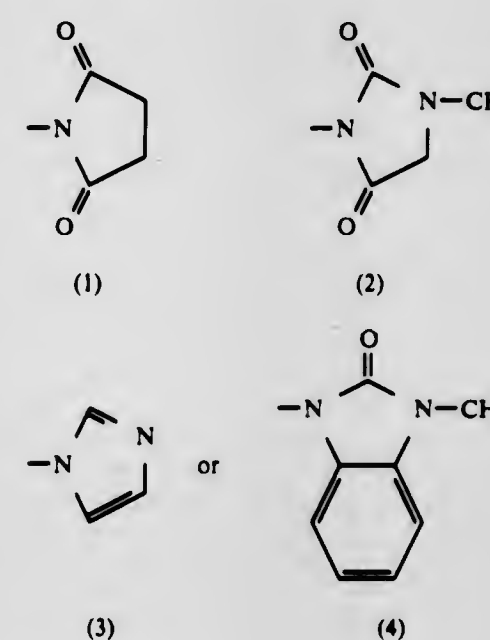
16. A method of treating emesis, gastro-oesophageal reflux and/or dyspepsia comprising the prophylactic or therapeutic administration to a patient in need of such treatment of an effective dopamine antagonistic amount of a compound of structural formula:



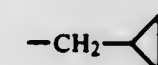
or a pharmaceutically acceptable salt thereof, wherein

X is (1) -CH=CH-, or (2) -CH<sub>2</sub>-CH<sub>2</sub>-;

R is



R<sup>1</sup> is (1) C<sub>1</sub>-alkyl, or (2)



and R<sup>2</sup> is (1) hydrogen, (2) C<sub>1</sub>-alkyl, or (3) fluoro.



4,413,000

 **$\beta$ -LACTAM ANTIBIOTICS, THEIR PREPARATION AND USE**

Alfred J. Eglington, Betchworth, England, assignor to Beecham Group Limited, England

Filed Jul. 8, 1981, Ser. No. 281,553

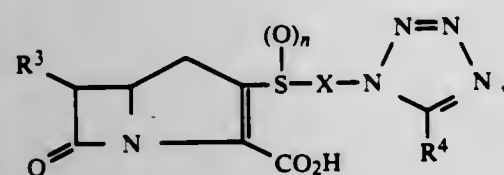
Claims priority, application United Kingdom, Jul. 11, 1980, 8022830

Int. Cl.<sup>3</sup> C07D 403/14; A61K 31/41

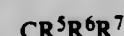
U.S. Cl. 424-269

33 Claims

1. A compound of the formula (II):

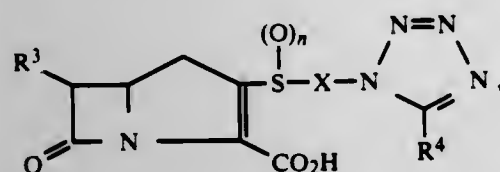


a salt thereof or an ester thereof convertible to the free acid or salt thereof by biological or chemical methods wherein  $R^3$  is hydrogen or a group of the formula (i):



wherein  $R^5$  is hydrogen, sulphonato-oxy or a salt or ester thereof, hydroxy, alkoxy of 1 to 4 carbon atoms,  $OCOR^8$  or  $OCO_2R^8$  wherein  $R^8$  is alkyl of 1 to 4 carbon atoms, phenyl or benzyl unsubstituted or substituted by fluoro, chloro, bromo, alkoxy of 1 to 3 carbon atoms or nitro;  $R^6$  is hydrogen or alkyl of 1 to 4 carbon atoms; and  $R^7$  is hydrogen or alkyl of 1 to 4 carbon atoms,  $n$  is zero or one,  $X$  is a saturated or unsaturated hydrocarbon unsubstituted or substituted by bromo or chloro, and  $R^4$  is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cyclobutyl, cyclohexyl, hydroxymethyl, hydroxyethyl, hydroxypropyl, methoxymethyl, methoxyethyl, ethoxymethyl, ethoxyethyl, phenoxymethyl, phenoxyethyl, hydroxyphenoxymethyl, aminomethyl, aminoethyl, aminopropyl, phenacylmethyl, benzyloxycarbonylmethyl, benzyloxycarbonylethyl, methoxycarbonylmethyl, methoxycarbonylethyl, fluoromethyl, fluoroethyl, cyclopentenyl, cyclohexenyl, benzyl, phenethyl, thienylmethyl, furylmethyl,  $\alpha$ -hydroxybenzyl,  $\alpha$ -carboxy(p-hydroxy)benzyl,  $\alpha$ -azidobenzyl,  $\alpha$ -tetrazolylbenzyl,  $\alpha$ -aminobenzyl,  $p$ -hydroxybenzyl,  $\alpha$ -amino( $p$ -hydroxy)benzyl,  $\alpha$ -carboxy( $p$ -hydroxy)benzyl, phenyl, furyl, thienyl, hydroxyphenyl, naphthyl, methoxyphenyl, chlorophenyl or methoxycarbonylphenyl.

12. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula (II):



a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof convertible to the free acid or salt thereof by biological or chemical methods wherein  $R^3$  is hydrogen or a group of the formula (i):



wherein  $R^5$  is hydrogen, sulphonato-oxy or a salt or ester thereof, hydroxy, alkoxy of 1 to 4 carbon atoms,  $OCOR^8$  or  $OCO_2R^8$  wherein  $R^8$  is alkyl of 1 to 4 carbon atoms, phenyl or benzyl unsubstituted or substituted by fluoro, chloro, bromo, alkoxy of 1 to 3 carbon atoms or nitro;  $R^6$  is hydrogen or alkyl of 1 to 4 carbon atoms; and  $R^7$  is hydrogen or alkyl of 1 to 4 carbon atoms,  $n$  is zero or one,  $X$  is a saturated or unsaturated hydrocarbon unsubstituted or substituted by bromo or chloro, and  $R^4$  is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon

atoms, cyclobutyl, cyclohexyl, hydroxymethyl, hydroxyethyl, hydroxypropyl, methoxymethyl, methoxyethyl, ethoxymethyl, ethoxyethyl, phenoxymethyl, phenoxyethyl, hydroxyphenoxymethyl, aminomethyl, aminoethyl, aminopropyl, phenacylmethyl, benzyloxycarbonylmethyl, benzyloxycarbonylethyl, methoxycarbonylmethyl, methoxycarbonylethyl, fluoromethyl, fluoroethyl, cyclopentenyl, cyclohexenyl, benzyl, phenethyl, thienylmethyl, furylmethyl,  $\alpha$ -hydroxybenzyl,  $\alpha$ -carboxybenzyl,  $\alpha$ -azidobenzyl,  $\alpha$ -tetrazolylbenzyl,  $\alpha$ -aminobenzyl,  $p$ -hydroxybenzyl,  $\alpha$ -amino( $p$ -hydroxy)benzyl,  $\alpha$ -carboxy( $p$ -hydroxy)benzyl, phenyl, furyl, thienyl, hydroxyphenyl, naphthyl, methoxyphenyl, chlorophenyl or methoxycarbonylphenyl, in combination with a pharmaceutically acceptable carrier.

4,413,001

**N-ARYL OXAZOLIDINONES, OXAZOLIDINETHIONES, PYRROLIDINONES, PYRROLIDINES AND THIAZOLIDINONES**

Guy R. Bourgerie, Colombes; Colette A. Douzon, Paris; Jean-Francois R. Ancher, Rueil-Malmaison; Alain P. Lacour, La Varenne; Patrick G. Guerret, Rueil-Malmaison; Michel Langlois, Buc, and Philippe L. Dostert, Le Vesinet, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 45,143, Jun. 4, 1979, Pat. No. 4,348,393. This application Jun. 16, 1982, Ser. No. 388,867

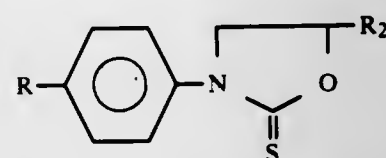
Claims priority, application France, Jun. 9, 1978, 78 17388; Aug. 17, 1978, 78 24024

Int. Cl.<sup>3</sup> A61K 31/42, 31/44; C07D 263/14, 263/46

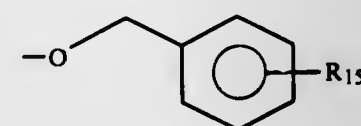
U.S. Cl. 424-272

7 Claims

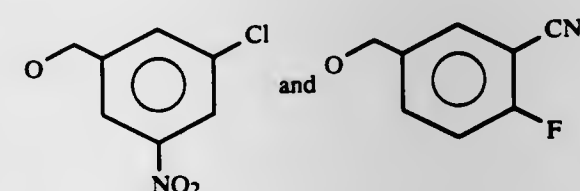
1. A compound having the formula



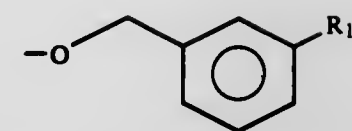
in which  $R_2$  is  $-CH_2OH$ ,  $-CH_2OR_{16}$  wherein  $R_{16}$  is alkyl having from 1 to 3 carbon atoms, or  $-CH_2OCOR_{18}$ , wherein  $R_{18}$  is methyl or ethyl, and when  $R_2$  is  $-CH_2OH$ ,  $R$  is selected from the group consisting of alkoxy having from 2 to 5 carbon atoms, cyclopentylmethoxy, cyclohexylmethoxy, (cyclohexen-1-yl)methoxy, (tetrahydropyran-4-yl)methoxy, cyanomethoxy, 2-cyanoethoxy, 3-cyanopropoxy, 4-cyanobutoxy,



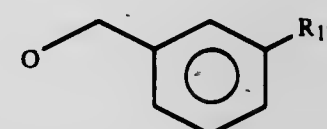
wherein  $R_{15}$  is 3-Cl, 4-Cl, 3-F, 4-F, 3- $NO_2$ , 3-CN or 3- $CF_3$ .



when  $R_2$  is  $-CH_2OR_{16}$ ,  $R$  is selected from the group consisting of 3-methylbutoxy, cyclopentylmethoxy, cyclohexylmethoxy, 4-cyanobutoxy,



wherein  $R_{17}$  is CN or  $NO_2$ , 3-cyano-5-nitrobenzyloxy or pyridinyl-3-methoxy; and when  $R_2$  is  $-CH_2OCOR_{18}$ ,  $R$  is cyclohexylmethoxy or



wherein  $R_{17}$  is CN or  $NO_2$ .

4,413,002

**BRONCHODILATING HYDANTOIN DERIVATIVES**

Gordon Wootton, Sawbridgeworth, England, assignor to Beecham Group Limited, England

Filed Jan. 16, 1980, Ser. No. 112,693

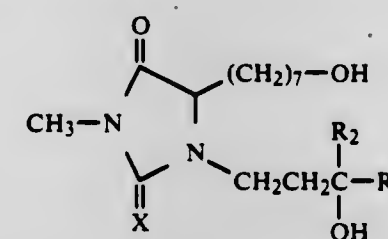
Claims priority, application United Kingdom, Jan. 18, 1979, 7901887

Int. Cl.<sup>3</sup> A61K 31/415; C07D 233/78

U.S. Cl. 424-273 R

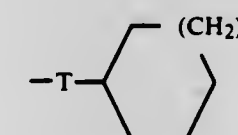
6 Claims

1. A compound selected from the group consisting of an alcohol of the formula:



and the pharmaceutically acceptable salts thereof wherein

$X$  is oxygen or sulfur;  
 $R_2$  is methyl or ethyl; and  
 $R_3$  is alkyl of 4 to 9 carbon atoms or a group of the formula:



in which  $T$  is a carbon-carbon bond or methylene and  $r$  has a value of 0 to 3.

5. A pharmaceutical composition for the treatment or prophylaxis of bronchoconstriction comprising an effective amount of a compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,413,003

 **$\beta$ -HYDROXYARYLETHYLIMIDAZOLES**

George A. Miller, Maple Glen, and Hak-Foon Chan, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

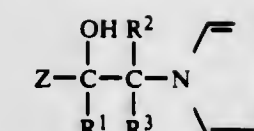
Filed Jul. 29, 1977, Ser. No. 820,274

U.S. Cl. 424-273 R

Int. Cl.<sup>3</sup> A01N 43/50; C07D 233/64

13 Claims

1. A compound of the formula



wherein  $Z$  is an unsubstituted phenyl or naphthyl group or a phenyl or naphthyl group substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano,  $(C_1-C_4)$ alkyl,  $(C_1-C_4)$ alkoxy,  $(C_1-C_4)$ alkylthio,  $(C_1-C_4)$ alkylsulfinyl,  $(C_1-C_4)$ alkylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl and phenoxy, phenylthio, phenylsulfinyl or phenylsulfonyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl;  $R^1$  is an unsubstituted phenyl or benzyl group or a phenyl or benzyl group substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl; and  $R^2$  and  $R^3$  are independently cyano,  $(C_2-C_8)$ alkenyl,  $(C_3-C_8)$ cycloalkenyl,  $(C_2-C_8)$ alkynyl, an unsubstituted phenyl or benzyl group or a phenyl or benzyl group substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylsulfinyl and methylsulfonyl; and its agronomically acceptable enantiomorphs, acid addition salts and metal salt complexes thereof.

4,413,004

**PHARMACEUTICAL COMPOSITIONS**

Andrea Lietti, and Attilio Bonati, both of Milan, Italy, assignors to Inverni Della Beffa S.p.A., Milan, Italy

Division of Ser. No. 881,892, Feb. 27, 1978, Pat. No. 4,376,781, which is a continuation-in-part of Ser. No. 829,913, Sep. 1, 1977, abandoned. This application Nov. 29, 1982, Ser. No. 445,075

Claims priority, application United Kingdom, Sep. 8, 1976, 37252/76

Int. Cl.<sup>3</sup> A61K 31/35

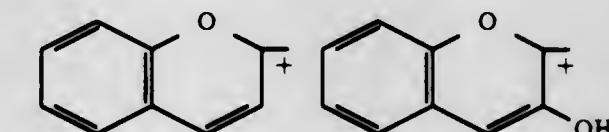
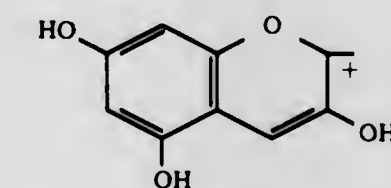
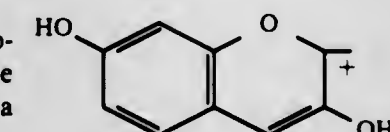
U.S. Cl. 424-283

5 Claims

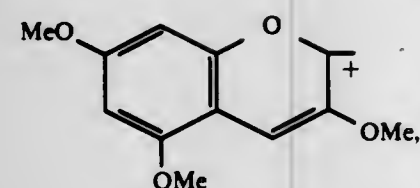
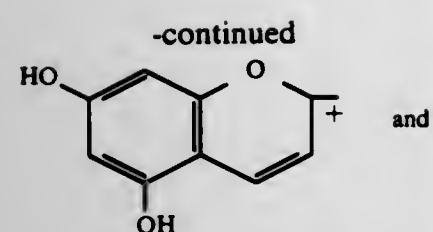
1. A method of eliciting a vaso-protective response in a subject in need of a vaso-protective response, which comprises administering to the subject an effective dose of a flavylum salt of the structure



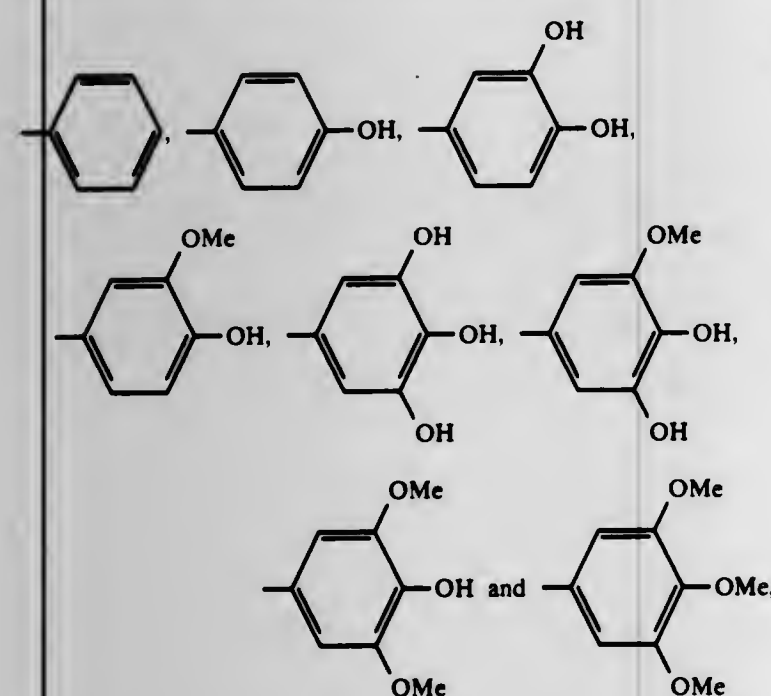
containing at least one hydroxy or methoxy substituent and wherein  $A^+$  is selected from the group consisting of







B is selected from the group consisting of



and X<sup>-</sup> is a pharmaceutically acceptable anion.

4,413,005

**CARBAMATE DERIVATIVES AND INSECTICIDAL, MITICIDAL OR NEMATOCIDAL COMPOSITIONS CONTAINING THE SAME**

Takeshi Goto, Naruto; Hisashi Takao, Tokushima; Takashi Soeda, Naruto; Nobuyoshi Asai; Sadahiko Iida, both of Tokushima; Mitsuyasu Kawata, Naruto; Norio Osaki, Naruto; Norio Yasudomi, Naruto; Tadateru Murata, Tokushima; and Akira Tanaka, Naruto, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

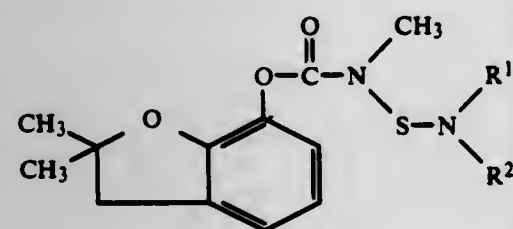
Filed Feb. 26, 1982, Ser. No. 352,862  
Claims priority, application Japan, Jun. 2, 1981, 56-85093; Jun. 2, 1981, 56-85094; Aug. 7, 1981, 56-124422; Aug. 7, 1981, 56-124423

Int. Cl.<sup>3</sup> A01N 47/24; C07D 307/86

U.S. Cl. 424-285

12 Claims

1. A carbamate derivative represented by the formula (I):



wherein R<sup>1</sup> and R<sup>2</sup>, which may be the same or different, each represents (1) —X—COOR<sup>3</sup>, in which X represents an alkylene group having 1 to 6 carbon atoms, and R<sup>3</sup> represents an alkyl group having 1 to 8 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms; or (2) —Y—CN, in which Y

represents an alkylene group having 1 to 6 carbon atoms; and R<sup>2</sup> further represents an alkyl group having 1 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms; a benzyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms; a phenyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms; or —Z—R<sup>4</sup>, in which Z represents a carbonyl group or a sulfonyl group, and R<sup>4</sup> represents an alkyl group having 1 to 6 carbon atoms which may be substituted with a halogen atom, a phenyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms, a benzyl group, an alkoxy group having 1 to 3 carbon atoms, a phenoxy group.

11. A method for controlling noxious insects, mites or nematodes applying thereto an insecticidally, miticidally, or nematocidally effective amount of the carbamate derivative according to claim 1.

4,413,006

**N-ARYL-N-PHENOXY-ALKYL-PIPERAZINE COMPOUNDS USEFUL IN DECREASING INTRACRANIAL PRESSURE**

Takeshi Kanno; Mitsunori Gano, both of Omiya; Michio Yamamura, Tondabayashi; Ryuichi Ishida, and Keiichi Shimoto, both of Suita, all of Japan, assignors to Tanabe Seliyaku Co., Ltd., Osaka, Japan

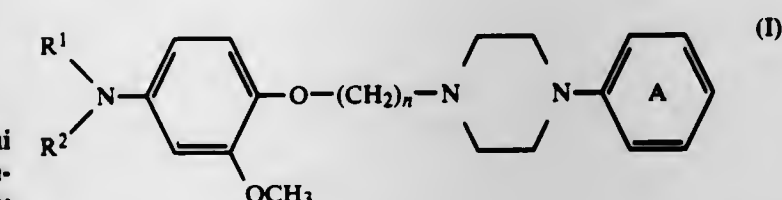
Division of Ser. No. 231,094, Feb. 3, 1981, abandoned. This application May 3, 1982, Ser. No. 374,106

Claims priority, application Japan, Feb. 18, 1980, 55-18855 Int. Cl.<sup>3</sup> C07D 295/00; A01N 43/48; A61K 31/495; C07D 403/00, 241/04

U.S. Cl. 424-250

19 Claims

1. A method of reducing increased intracranial pressure in a warm-blooded animal which comprises administering to a warm-blooded animal in need of such reduction of intracranial pressure a therapeutically effective amount of a piperazine compound of the formula:



wherein R<sup>1</sup> is hydrogen, alkyl (C<sub>1-8</sub>), alkyl (C<sub>1-4</sub>)-sulfonyl or an acyl group of the formula: R<sup>3</sup>CO— (wherein R<sup>3</sup> is hydrogen, alkyl (C<sub>1-7</sub>), halogenoalkyl (C<sub>1-4</sub>), alkoxy (C<sub>1-4</sub>)-carbonyl-alkyl (C<sub>1-4</sub>), cycloalkyl (C<sub>3-6</sub>), alkenyl (C<sub>2-5</sub>), alkoxy (C<sub>1-4</sub>), amino, alkyl (C<sub>1-4</sub>)-amino or anilino), R<sup>2</sup> is hydrogen, alkyl (C<sub>1-4</sub>), alkoxy (C<sub>1-4</sub>)-carbonyl-alkyl (C<sub>1-4</sub>), carboxy-alkyl (C<sub>1-4</sub>), alkenyl (C<sub>2-5</sub>) or alkyl (C<sub>1-4</sub>)-sulfonyl, or R<sup>1</sup> and R<sup>2</sup> are combined together to form succinyl group, Ring A is phenyl, alkyl (C<sub>1-4</sub>)-phenyl or halogenophenyl, and n is an integer of 2 to 6, or a pharmaceutically acceptable acid addition salt thereof.

4,413,007

**PESTICIDAL SYMMETRICAL N-SUBSTITUTED BIS-CARBAMOYLOXIMINO DISULFIDE COMPOUNDS**  
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

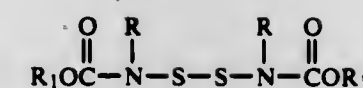
Division of Ser. No. 781,997, Mar. 28, 1977, Pat. No. 4,327,110. This application Aug. 18, 1978, Ser. No. 934,973

Int. Cl.<sup>3</sup> A01N 33/02; C07C 121/50, 125/06, 119/20

U.S. Cl. 424-298

29 Claims

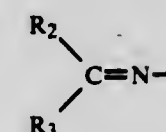
1. A compound of the formula:



wherein:

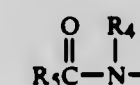
R is alkyl having from 1 to 4 carbon atoms;

R<sub>1</sub> is:



wherein:

R<sub>2</sub> is hydrogen, chloro, cyano, alkyl, alkylthio, cyanoalkylthio; R<sub>3</sub> is alkyl, alkylthio, alkoxy, alkanyol, benzoyl alkoxy-carbonyl, alkylsulfinyl, alkylsulfonyl, alkenyl, alkynyl or phenyl all of which may be substituted with one or more cyano, nitro, fluoro, bromo, chloro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, phenoxy, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl or



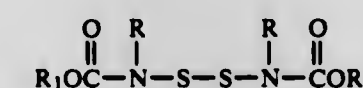
wherein:

R<sub>4</sub> is hydrogen or alkyl;

R<sub>5</sub> is hydrogen, alkyl, alkoxy or alkylthio;

with the proviso that R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> substituents individually may not include more than eight aliphatic carbon atoms.

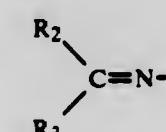
9. An insecticidal, miticidal and nematocidal composition comprising an acceptable carrier and as the active toxicant and insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein:

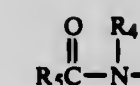
R is alkyl having from 1 to 4 carbon atoms;

R<sub>1</sub> is:



wherein:

R<sub>2</sub> is hydrogen, chloro, cyano, alkyl, alkylthio, cyanoalkylthio; R<sub>3</sub> is alkyl, alkylthio, alkoxy, alkanyol, benzoyl, alkoxy-carbonyl, alkylsulfinyl, alkylsulfonyl, alkenyl, alkynyl or phenyl all of which may be substituted with one or more cyano, nitro, fluoro, bromo, chloro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, phenoxy, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl or



wherein:

R<sub>4</sub> is hydrogen or alkyl;

R<sub>5</sub> is hydrogen, alkyl, alkoxy or alkylthio;

with the proviso that R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> individually may not include more than eight aliphatic carbon atoms.

4,413,008

**THIOHYDROXIMIDIC ACID ESTERS AND INSECTICIDAL USE THEREOF**

Jozef Drabek, Oberwil, Switzerland, and Manfred Bieger, Weil am Rhein, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

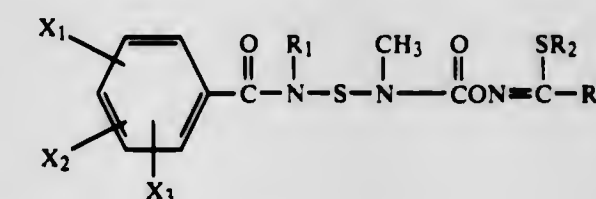
Filed Sep. 24, 1981, Ser. No. 305,306

Int. Cl.<sup>3</sup> C07C 119/20; A01N 37/52

U.S. Cl. 424-298

8 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is alkyl of 1 to 10 carbon atoms;

R<sub>2</sub> is alkyl of 1 to 3 carbon atoms or allyl;

R<sub>3</sub> is methyl, —CONH<sub>2</sub> or —CON(CH<sub>3</sub>)<sub>2</sub>; and

each of X<sub>1</sub>, X<sub>2</sub> and X<sub>3</sub>, independently of the others, is hydrogen, halo, alkyl of 1 to 4 carbon atoms or haloalkyl of 1 to 4 carbon atoms.

7. A pesticidal composition for the control of insects, mites, and ticks which comprises an effective amount of a compound according to claim 1 in combination with a carrier therefor.

4,413,009

**N-((ALKYLAMINO)CARBONYL)-N-((ALKYLAMINO)CARBONYLOXY)ACYLAMIDES WITH ANTINEOPLASTIC ACTIVITY**

Walter Relfschneider, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

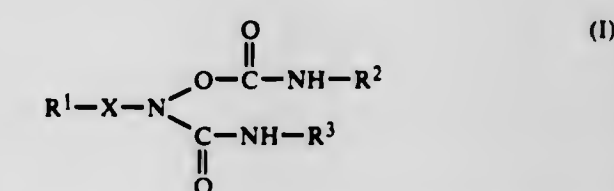
Filed Feb. 17, 1982, Ser. No. 349,502

Int. Cl.<sup>3</sup> A61K 31/215, 31/325

U.S. Cl. 424-298

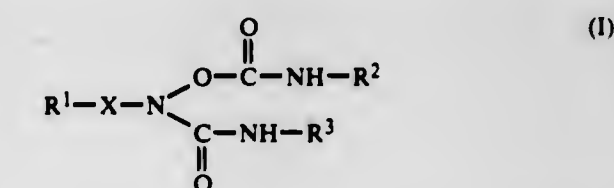
8 Claims

1. A composition useful for inhibiting the growth of P<sub>388</sub> leukemia or MX-1 carcinoma comprising a pharmaceutically-acceptable carrier in combination with an effective P<sub>388</sub> leukemia or MX-1 carcinoma inhibiting amount of a compound corresponding to the formula



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may each independently represent hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, phenyl or phenyl substituted with from 1 to 5 alkyl groups of 1 to 4 carbon atoms and X represents carbonyl or sulfonyl.

5. A method for inhibiting the growth of P<sub>388</sub> leukemia or MX-1 carcinoma in a mammal afflicted therewith which comprises administering to said mammal, in an amount effective to inhibit said growth, a compound corresponding to the formula



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may each independently represent hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of from 3 to



6 carbon atoms, phenyl or phenyl substituted with from 1 to 5 alkyl groups of 1 to 4 carbon atoms and X represents carbonyl or sulfonyl in admixture with a pharmaceutically-acceptable carrier therefor.

4,413,010

**CARBAMIC ACID ESTERS AND USE AS PESTICIDES**  
Rene Zurflüh, Bülach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 14, 1981, Ser. No. 301,612

Claims priority, application Switzerland, Sep. 23, 1980, 7/20/80; Jun. 30, 1981, 4307/81

Int. Cl.<sup>3</sup> A01N 47/10; C07C 125/06

U.S. Cl. 424—300

6 Claims

1. Ethyl [2-(p-phenoxyphenoxy)ethyl]methylcarbamate.  
3. A pesticidal composition which comprises an inert carrier material and, as the active ingredient, an amount which is effective as a pesticide of a compound according to claim 1.

4,413,011

SUBSTITUTED

**2,2-DIMETHYL-5-PHENOXPENTANOIC ACID BENZAMIDES AS ANTI-ARTERIOSCLEROTIC AGENTS AND METHOD**

Il Sircar, Ann Arbor, and Ann Holmes, Dexter, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

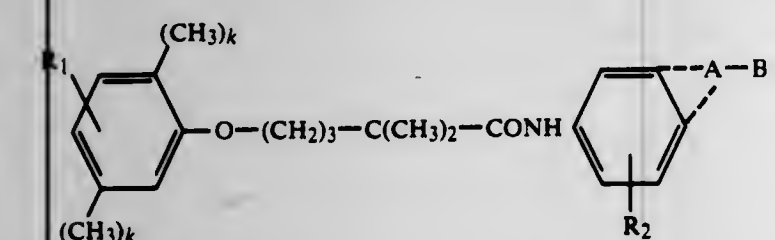
Filed Feb. 26, 1981, Ser. No. 238,398

Int. Cl.<sup>3</sup> A61K 31/24, 31/19; C07C 63/52, 69/76

U.S. Cl. 424—309

19 Claims

1. A compound having the structural formula:



wherein R<sub>1</sub> is hydrogen, hydroxy, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, benzyloxy or trifluoromethyl; R<sub>2</sub> is hydrogen, hydroxy, halogen, alkyl of from 1 to 6 carbon atoms or alkoxy of from 1 to 6 carbon atoms; A is (CH<sub>2</sub>)<sub>m</sub> wherein m is an integer of from 1 to 3, or CR<sub>4</sub>=CR<sub>5</sub> wherein R<sub>4</sub> and R<sub>5</sub> are trans to each other and are hydrogen or alkyl of from 1 to 6 carbon atoms, and the dotted lines indicate the presence of only one substituent which must be located at one of the specified positions; B is

CO<sub>2</sub>X wherein X is hydrogen, alkyl of from 1 to 6 carbon atoms, ammonium or a pharmaceutically acceptable metal or organic amine cation;

k is 0 or 1 with the proviso that when k is 0, R<sub>1</sub> may not be alkyl of from 1 to 6 carbon atoms and when k is 1, R<sub>1</sub> must be in the 4-position.

13. The compound defined in claim 1 which is ethyl 3-[4-[[5-(2,5-dimethylphenoxy)-2,2-dimethyl-1-oxopentyl]amino]-3-hydroxyphenyl]-2-propenoate.

4,413,012

METHOD FOR TREATING DEPRESSION

Michael G. Palfreyman, Fegersheim, and Ian A. McDonald, Truchtersheim, both of France, assignors to Merrell Torade et Compagnie, Strasbourg, France

Division of Ser. No. 268,554, Jun. 1, 1981, Pat. No. 4,346,110.

This application May 26, 1982, Ser. No. 382,264

Int. Cl.<sup>3</sup> A61K 31/15, 31/24, 31/195

U.S. Cl. 424—319

9 Claims

1. A method for treating depression which comprises administering to a depressed patient an antidepressant effective amount of 2-amino-3-(3'-hydroxyphenyl)-3-butenic acid or 2-amino-3-(3',4'-dimethoxyphenyl)-3-butenic acid, or a (C<sub>1</sub>-C<sub>8</sub>) alkyl ester thereof or a pharmaceutically acceptable

salt thereof; in combination with an AADC inhibitor selected from carbidopa, benserazide, or a 2-amino-3-(mono-fluoromethyl or difluoromethyl)-3-(monohydroxyphenyl or dihydroxyphenyl)-propionic acid, the amount of said AADC inhibitor being effective to substantially block the AADC catalyzed decarboxylation of said antidepressant compound extracerebrally without substantially blocking the AADC catalyzed decarboxylation of said antidepressant compound in the brain.

4,413,013

**SULFONAMIDE COMPOUNDS, COMPOSITIONS AND METHODS FOR COMBATING INSECTS**

Victor L. Rizzo, Almena Township, Van Buren County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

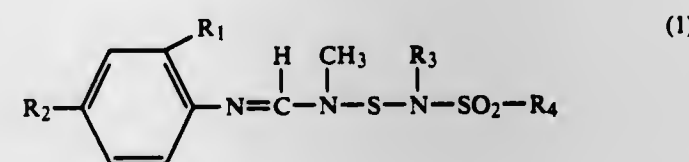
Continuation of Ser. No. 51,258, Jun. 22, 1979, abandoned, which is a continuation of Ser. No. 898,570, Apr. 21, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,740

Int. Cl.<sup>3</sup> A01N 9/16; C07C 143/75, 143/79

U.S. Cl. 424—321

39 Claims

1. A compound of the formula



wherein

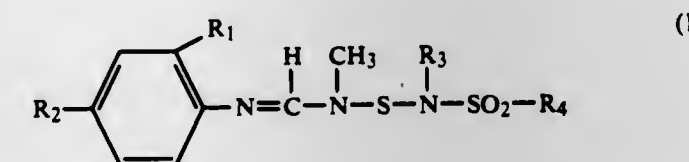
R<sub>1</sub> is chloro, bromo, or alkyl of one through four carbon atoms;

R<sub>2</sub> is hydrogen, chloro, bromo, or alkyl of one through four carbon atoms;

R<sub>3</sub> is phenalkyl wherein alkyl is one or two methylene units in length, or phenyl where the phenyl is unsubstituted or substituted with one through three substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano; and

R<sub>4</sub> is phenalkyl wherein alkyl is one or two methylene units in length and where the phenyl is unsubstituted or substituted with one through three substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano, or phenyl where the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of methyl, chloro and bromo.

13. A process for controlling arthropodal pest populations which comprises applying to a situs an effective amount of a compound of the formula:



wherein

R<sub>1</sub> is chloro, bromo, or alkyl of one through four carbon atoms;

R<sub>2</sub> is hydrogen, chloro, bromo, or alkyl of one through four carbon atoms;

R<sub>3</sub> is phenalkyl wherein alkyl is one or two methylene units in length, or phenyl where the phenyl is unsubstituted or substituted with one through three substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano; and

R<sub>4</sub> is phenalkyl wherein alkyl is one or two methylene units in length and where the phenyl is unsubstituted or substituted with one through three substituents selected from

the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano, or phenyl where the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of methyl, chloro and bromo.

4,413,014

**FISH BAIT AND METHOD OF MANUFACTURING THE SAME**

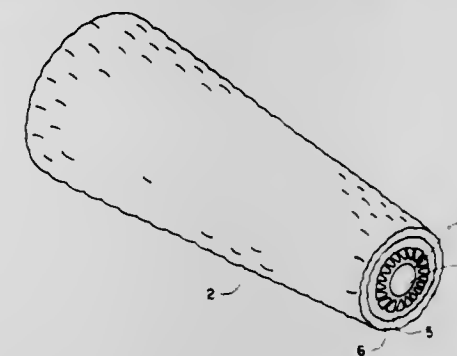
Ronald D. Melancon, 1604 E. Bridge, Breaux Bridge, La. 70517

Filed Feb. 26, 1981, Ser. No. 238,544

Int. Cl.<sup>3</sup> A23K 1/18; A23B 7/16

U.S. Cl. 426—1

7 Claims



1. A process for manufacturing articles for consumption by fish, which comprises:

saturation a dried ear of corn with a fish attractant liquid wherein said fish attractant material includes salt and blood, forming a cavity in the central portion of said ear of corn and filling said cavity with an edible solid.

4,413,015

**STORAGE STABLE WATER-DILUTABLE ACID ADDUCTED EPOXY BASED COATING FOR METAL FOOD CONTACT SURFACES**

Ronald W. Anderson, Allison Park, and Richard A. Lamanna, McMurray, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 50,722, Jun. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 828,584, Aug. 29, 1977, abandoned. This application May 11, 1981, Ser. No. 262,088

Int. Cl.<sup>3</sup> A21D 10/02

U.S. Cl. 426—131

19 Claims

1. A water-solubilizable resin prepared in the absence of dicarboxylic acid consisting essentially of (A) an adduct of a monocarboxylic acid having between 8 and 18 carbon atoms and a diglycidyl ether of a bisphenol, or (B) of a monocarboxylic acid having between 8 and 18 carbon atoms, a bisphenol; and a diglycidyl ether of a bisphenol, in an equivalent ratio of total monocarboxylic acid and bisphenol, to diglycidyl ether between about 1:1 and about 1.2:1; (A) or (B) being further adducted with an anhydride selected from the group consisting of trimellitic anhydride, succinic anhydride, methyl succinic anhydride, tricarballic anhydride, phthalic anhydride, hexahydrophthalic anhydride, and maleic anhydride, in an amount sufficient to provide an acid number between about 35 and about 150.

9. A coating composition comprising the resin of claim 1 and an aminoplast, in a weight ratio between about 95:5 and about 70:30 solubilized with a volatile tertiary amine, ammonia, or ammonium hydroxide to a pH of about 7.0 to about 9.1 in at least one solvent of the group of alcohols, having between about 2 and about 8 carbon atoms, alkoxyethanols, ketones, and alkyl ethers of diethylene glycol, each present in between about one weight percent and about 20 weight percent of the weight of the final composition, and diluted with water to a

4,413,016

PELLET DIE

Leroy V. Skoch, Glencoe, and Keith E. Pike, Washington, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo. Division of Ser. No. 268,036, May 28, 1981, Pat. No. 4,380,424. This application Jul. 19, 1982, Ser. No. 399,551

Int. Cl.<sup>3</sup> A01N 35/00

U.S. Cl. 426—454

10 Claims

1. A method of pelleting animal feeds having improved production efficiency with good pellet quality comprising:

(a) heat conditioning the feed at a moisture level of between about 17 to 21% by weight and a temperature above about 200° F.

(b) pelleting said feed by passing through a die having a compression and discharge side, and at least one die hole extending through said die, having a countersink on the compression side, said die hole having a working section for pellet formation, said section having a diameter that defines pellet size and a length that defines the effective thickness for the die hole, said die hole having a ratio of effective thickness to countersink diameter which is at least about 1.8 to 1 and a countersink diameter which is at least about 137% of the working section diameter.

4,413,017

**FOOD PRODUCT CONTAINING JUICE PULP AND ACIDIFIED MILK COMPONENTS**

Mary A. Loader, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 11, 1981, Ser. No. 272,446

Int. Cl.<sup>3</sup> A23L 1/187, 1/212, 1/34; A23C 23/00

U.S. Cl. 426—616

14 Claims

1. A food composition having a pudding-like texture consisting essentially of a pasteurized, uniform blend of:

A. from about 42% to 55% by weight (wet basis) is dated, washed, homogenized raw juice pulp whose water content has not been reduced by thermal and/or mechanical means;

B. from about 11% to 15% of sour cream on a solids basis;

C. from about 5% to 15% by weight of a nutritive carbohydrate sweetening agent;

D. sufficient edible organic acid to provide the food composition with a pH of about 3.0 to about 4.5; and

E. sufficient moisture to have a water content ranging from about 65% to 85% by weight; and wherein said blend has a viscosity of 7,000 to 18,000 cp. at 40°±2° F.

4,413,018

**METHOD FOR PREPARING WHOLE GRAIN OAT PRODUCT**

Francis Webster, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jun. 1, 1981, Ser. No. 268,927

Int. Cl.<sup>3</sup> A23B 9/00; A23L 1/172

U.S. Cl. 426—618

7 Claims

1. A method for preparing quick-cooking oats, in whole form, comprising the steps of:

a. conditioning dehulled uncut, unrolled oats, by indirect steam heat at a temperature in the range approximately 170°-220° F. until the moisture level of the oats is approximately 7-8% based on the weight of the oats to yield conditioned oats, in whole form;

b. tempering the conditioned oats by a method selected from the group consisting of steaming or boiling in water, to yield tempered oats, in whole form, having a moisture



content in the range 12-35% by weight based on the weight of the oats; and  
 c. drying and toasting the tempered oats at a temperature insufficient to oxidize the oat lipids but sufficient to reduce the moisture content of the oats to a moisture in the range 5-8% inclusive;  
 thereby producing a quick-cooking oat product in which the oats are in whole form.

4,413,019

# **RADIATION CURABLE ADHESIVE COMPOSITIONS AND COMPOSITE STRUCTURES**

Walter Brenner, Teaneck, N.J., assignor to The Standard Products Company, Dearborn, Mich.

Division of Ser. No. 45,863, Jun. 6, 1979, Pat. No. 4,319,942.

This application Dec. 2, 1981, Ser. No. 326,904

Int. Cl.<sup>3</sup> B05D 3/06

U.S. Cl. 427-36

5 Claims



1. A method of curing an adhesive composition on a rubber substrate which comprises:  
 providing a rubber substrate,  
 coating said rubber substrate with a solvent-free adhesive composition comprised of an elastomer, an ethylenically unsaturated polymerizable monomer, a tackifier, and an adhesion promoter,  
 depositing flock on the top side of the adhesive coated rubber substrate, and  
 exposing the composite to high energy ionizing radiation to effect a cure of said adhesive.

4,413,020

# **DEVICE FABRICATION INCORPORATING LIQUID ASSISTED LASER PATTERNING OF METALLIZATION**

William R. McKee, Plano; Russell H. Murdock, and Eric F. Schulte, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 1, 1982, Ser. No. 344,446

Int. Cl.<sup>3</sup> B05D 3/06, 5/12; B23K 9/00

U.S. Cl. 427-53.1

7 Claims

3. A method for patterning metal in an integrated circuit, comprising the steps of:  
 providing a substrate having a layer of metal to be patterned on a surface thereof;  
 maintaining a thin film of liquid in direct contact with said layer of metal to be patterned, for confinement and collection of removed metal; and  
 subjecting said metal and overlying liquid film to a laser process for removing areas of metal not wanted.

4,413,021

# **PROCESS FOR BRINGING LIQUIDS INTO CONTACT**

Klaus Hentschel, Voßwaldestrasse 5, 6450 Hanau 9; Friedrich Bittner, Mozartstrasse 38, 6232 Bad Soden; Gerd Schreyer, Wildaustasse 22, 6450 Hanau 9, and Georg Franz, Erbstadter Strasse 4, 6369 Niederau 1, all of Fed. Rep. of Germany  
 Division of Ser. No. 94,803, Nov. 15, 1979, Pat. No. 4,377,344.

This application Aug. 17, 1982, Ser. No. 408,923

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1978, 2850271

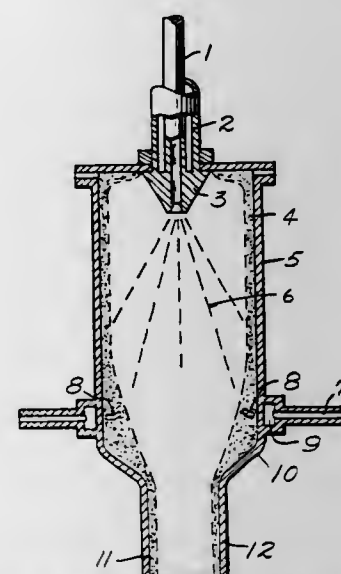
Int. Cl.<sup>3</sup> B05D 1/02, 1/34, 7/22

U.S. Cl. 427-236

7 Claims

1. A process for the production of a suspension or solution by mixing a plurality of liquids at least one of which is a viscous liquid comprising providing an apparatus comprising a tubular container having a first spray nozzle means in the upper portion of the container and at least one other nozzle means in the

form of tangential spray means lower than said first spray nozzle means, said tubular container being closeable at the top and being constricted in breast shaped manner slightly downwardly from said other nozzle means to form a discharge opening, said constriction being in the form of a flat S curve going from the wall of the tubular container to the discharge



opening, introducing the viscous liquid through said first spray nozzle means into the container, spraying at least one other liquid through said other tangential nozzle means and into said tubular container in the direction of said first spray nozzle means to form a liquid layer on the wall of the container which is thickest in the region of the breast shaped constriction.

4,413,022

# **METHOD FOR PERFORMING GROWTH OF COMPOUND THIN FILMS**

Tuomo S. Suntola; Arto J. Pakkala, and Sven G. Lindfors, all of Espoo, Finland, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

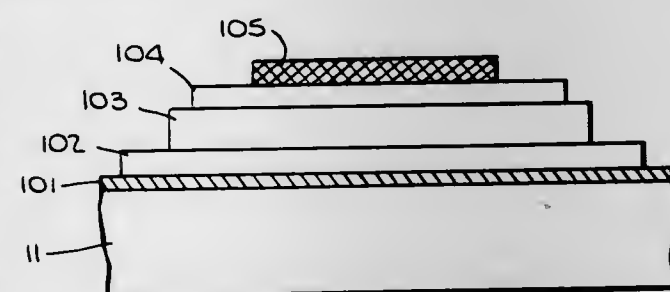
Filed Jun. 21, 1979, Ser. No. 50,606

Claims priority, application Finland, Feb. 28, 1979, 790680

Int. Cl.<sup>3</sup> C23C 11/00, 13/00

U.S. Cl. 427-255.2

5 Claims



1. A method of growing a compound thin film of different elements on a substrate surface by providing alternate surface reactions, in a single chamber, of different substances respectively containing said different elements, comprising the steps of supplying vapors of said substances repeatedly and alternately to a chamber housing said substrate, supplying a gas phase medium to said chamber at least during periods between the alternate supply of said substances, wherein said vapors react with the surfaces of the substrate to produce a film, said vapors alternately and subsequently reacting with the film to cause said film to grow to provide a solid state product at the temperature of said substrate surface, and wherein the supply of said gas phase medium alternately voids the chamber of each of said substances thereby substantially preventing a simultaneous interaction of said alternately supplied vapors

during the growth of said compound thin film on said substrate.

4,413,023

# **METHOD OF TREATING WOOD TO PREVENT STAIN AND DECAY**

Suezone Chow, Richmond, Canada, assignor to Canadian Forest Products Ltd., Canada

Filed Feb. 11, 1982, Ser. No. 347,804

Claims priority, application Canada, Aug. 28, 1981, 384798

Int. Cl.<sup>3</sup> B05D 1/18, 3/00, 3/12

U.S. Cl. 427-325

8 Claims

1. A method of treating wood to prevent stain and decay comprising:

- extracting from a decay resistant species of wood material fungi growth inhibiting material;
- wetting the surface of wood to be treated with a solution of the extracted material.

4,413,024

# **METHOD FOR CHEMICAL TREATMENT OF WOODS**

Hideo Miyata, Shizuoka, and Hitoshi Ishii, Yaizu, both of Japan, assignors to Fuji Kogyo Company, Limited, Shizuoka, Japan

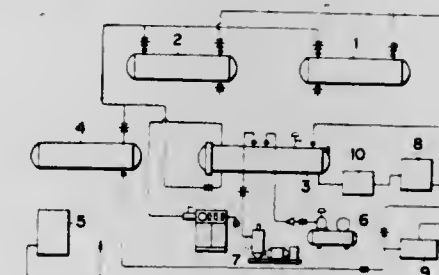
Filed Nov. 21, 1980, Ser. No. 209,303

Claims priority, application Japan, Mar. 17, 1980, 55-34409; Aug. 28, 1980, 55-118778

Int. Cl.<sup>3</sup> B05D 1/18, 3/12

U.S. Cl. 427-370

8 Claims



1. A method of treating timber with chemicals, comprising the steps of:

- introducing into a pressure vessel, in which timber has been placed, such an amount of a solution of chemicals that permits all of the timber to be soaked therein, with an empty space of a small height in an upper portion of the interior of the pressure vessel;

heating the timber and solution of chemicals in the pressure vessel to a temperature which is not less than about 100° C., and no higher than that temperature at which high-temperature trouble, such as discoloration, begins to occur on the timber; and

pneumatically increasing the pressure in said empty space in the upper portion of the interior of the pressure vessel to a level greater than that of the pressure of saturated steam at that temperature to which said timber and solution are heated in said heating step, to allow the chemicals to be permeated into the timber.

4,413,025

# **COATING COMPOSITION FOR POLYCARBONATE MOLDINGS CONTAINING PARTIALLY HYDROLYZED ALKYLTRIALKOXYSILANE AND POLYVINYL BUTYRAL**

Mitsunobu Haga, and Yasuzi Omori, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Oct. 20, 1981, Ser. No. 313,130

Claims priority, application Japan, Nov. 12, 1980, 55-159317

Int. Cl.<sup>3</sup> C08L 83/06; B05D 3/02

U.S. Cl. 427-387

10 Claims

1. A coating composition which is curable to provide a

tenacious, transparent, mar-resistant, flexible coating on a polycarbonate molding, which comprises a mixture of  
 (A) 100 parts by weight of an organic-solvent-soluble, partially hydrolyzed condensate of an alkyltrialkoxysilane having the formula



wherein R<sup>1</sup> is alkyl having 1 to 4 carbon atoms and R<sup>2</sup> is alkyl having 1 to 4 carbon atoms, said condensate being free of tetraalkoxysilanes and copolycondensates of tetraalkoxysilanes, and

(B) 0.5 to 6 parts by weight of polyvinylbutyral resin.

4,413,026

# **METHOD FOR WEATHERPROOFING SUBSTRATES**

Stanley A. Sherno, Columbia, S.C., assignor to Aperm of South Carolina, Greenwood, S.C.

Continuation of Ser. No. 279,062, Jun. 30, 1981, abandoned, which is a division of Ser. No. 129,249, Mar. 11, 1980,

abandoned, which is a continuation-in-part of Ser. No. 103,438,

Dec. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 41,592, May 23, 1979, abandoned. This application Jul. 7,

1982, Ser. No. 395,956

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427-407.1

13 Claims

1. A method of providing a weatherproof coating on an exterior surface which comprises providing an aqueous coating composition comprising an aqueous thermoplastic synthetic resin latex prepared by emulsion polymerization and capable of forming a film, and dispersed therewith, a plurality of discrete multicellular particles of foamed polystyrene, said particles having a particle size of 0.03 to 0.3 inch and a thickening agent, the resin latex being present in an amount of 2-60 parts by volume of resin solids per 100 parts by volume of polystyrene particles, and said thickening agent being present in an amount sufficient to increase the viscosity of the aqueous coating composition to a paint-like consistency, applying the aqueous composition onto said exterior surface, and permitting water to evaporate from the coating whereby there is formed a tenaciously adherent, weatherproof, lightweight, heat insulating coating on said exterior surface, said coating having a thickness of about 30 mils to one inch comprising said polystyrene particles and from 2-60 parts by volume of said latex resin per 100 parts by volume of said polystyrene particles.

2. A method according to claim 1 wherein the composition is applied a plurality of times.

3. A method according to claim 2 wherein a first application of said composition has a relatively low content of resin latex and a subsequent application thereof has a relatively high content of resin latex.

4,413,027

# **PROTECTIVE AND DECORATIVE MOLDING**

Horst Bildl, Fürth, Fed. Rep. of Germany, assignor to Rehau Plastiks A.G. & Co., Rehau, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,575

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020037

Int. Cl.<sup>3</sup> B32B 3/30; B60R 13/04

U.S. Cl. 428-31

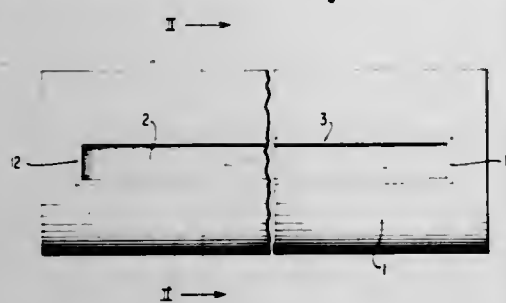
5 Claims

1. A molding comprising

- a one-piece elongated plastic molding body having a length and opposite ends bounding said length; said molding body including an elongated, channel-like recess having opposite ends situated at a distance from respective said opposite ends of said molding body; said recess having a bottom, longitudinal side walls, end walls and an open top; said molding body further including lips surrounding said recess at the top; said lips defining a closed perimeter of said recess and reducing the area of opening of said recess at the top; and



b) an elongated metal strip received in said recess; said strip extend substantially perpendicularly to the perimeter of said base, and some of said panels being porous to gas and substan-



closed line on said outer face; said lips extending over and engaging said marginal zone of said metal strip in its entirety.

4,413,028

## MASS CONNECTOR DEVICE

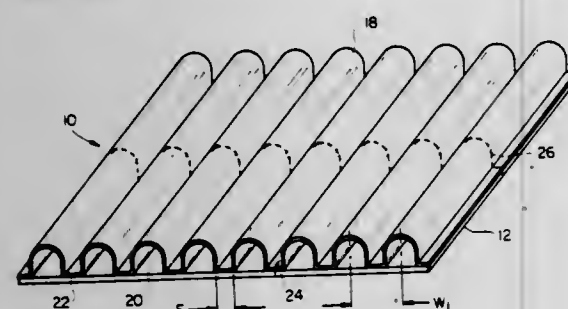
Stephen H. Diaz, Los Altos Hills, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 172,897, Jul. 28, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,427

Int. Cl.<sup>3</sup> H01R 4/00; H02G 13/06

U.S. Cl. 428—36

34 Claims



1. A connector device for connecting substrates, which comprises:

a first sheet having an original dimensionally stable shape; a second sheet having an original heat-stable shape, said shape being expanded relative to said first sheet to a second heat-unstable shape and thereafter being formed into alternate working and bonding zones, said working and bonding zones having horizontal center lines; inserts positioned between said first and second sheets at least within said working zones; said sheets being such that they will not melt at a temperature high enough to activate said inserts, and said sheets being bonded together at the bonding zones, whereby application of heat causes the working zones to conform to substrates to be connected when the substrates are inserted therein while said first sheet maintains the original center line spacing of the working zones.

4,413,029

## PROTECTIVE COVER FOR PILE OF PARTICULATE MATERIAL

Gary R. Handwerker, Glencoe, Ill., assignor to Midwest Canvas Corp., Chicago, Ill.

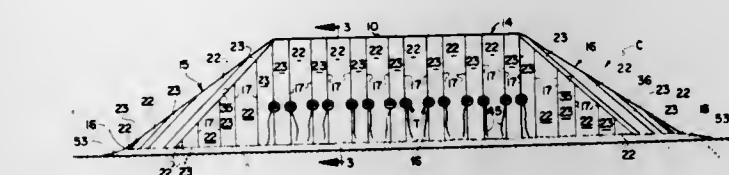
Filed Mar. 8, 1982, Ser. No. 356,251

Int. Cl.<sup>3</sup> E04D 1/34; B32B 3/06

U.S. Cl. 428—61

14 Claims

1. A protective cover for a pile of particulate material having an apex and a base and sides sloping downwardly and outwardly from said apex toward the perimeter of said base, said cover comprising a plurality of elongated panels adapted to overlie said pile and extend lengthwise between the apex and perimeter of said base, the laterally spaced, side edges of said panels being joined together by seams that are adapted to



tially nonporous to liquid and other of said panels being substantially nonporous to both gas and liquid.

4,413,030

## FIBER AGGREGATE

Günter Tesch, Fribourg, and Siegfried Geldanowski, Schmitt, both of Switzerland, assignors to Breveteam S.A., Fribourg, Switzerland

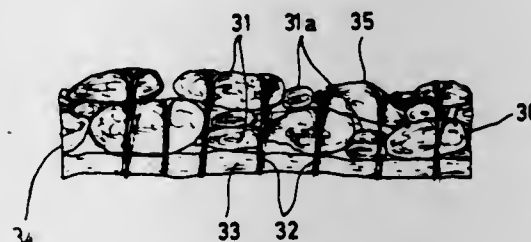
Continuation of Ser. No. 109,304, Jan. 3, 1980, abandoned. This application May 26, 1981, Ser. No. 266,921

Claims priority, application Switzerland, Jan. 9, 1979, 157/79

Int. Cl.<sup>3</sup> B32B 3/02

U.S. Cl. 428—85

13 Claims



1. A fiber aggregate being unconnected to any other fiber aggregate prior to needle processing and having a smallest diameter of 3 mm. and comprising fibers, each fiber having a length of at least 15 mm., at least some of said fibers being intertwined to form a body of a substantially spherical to an elongate shape, and said body having a density ranging from about 0.01 to about 0.1 grams per cubic centimeter, the intertwining being such that a needle commonly used in needle processing technology to stitch materials together may penetrate said body and grip and withdraw any fiber from said body free from encountering any substantial resistance so that the pulled length would extend out of the body without losing its cohesion with the body.

4,413,031

## MULTI-LAYER PLATE OF LIGNOCELLULOSE-CONTAINING PARTICLES PROVIDED WITH AT LEAST ONE BINDER

Klaus Poppelreuter, Springe, Fed. Rep. of Germany, assignor to Bison-Werke Böhre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,193

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3034772

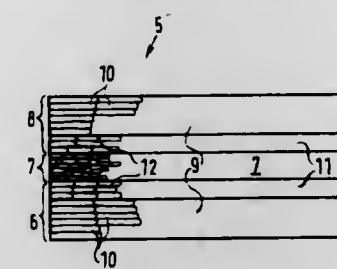
Int. Cl.<sup>3</sup> B32B 7/02

U.S. Cl. 428—212

3 Claims

1. Plate having several layers of a pressed fleece, said fleece having two outer cover layers of preferably lignocellulose-

containing slender oriented particles mixed with at least one binder material, at least in a region of the cover layer facing



away from the center layer the length of the slender particles increasing with their distance from the center layer.

4,413,032

## NON-WOVEN FABRIC WITH WICK ACTION

Ludwig Hartmann, and Ivo Ruzek, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Carl Freudenberg, Fed. Rep. of Germany

Filed Oct. 6, 1981, Ser. No. 309,223

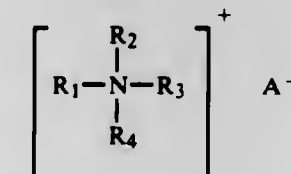
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044631

Int. Cl.<sup>3</sup> D04H 1/58

U.S. Cl. 428—288

5 Claims

1. A non-woven fabric covering for absorbent cellulose material which comprises a surface-treated non-woven fabric, having a wick action, made up from synthetic fibers which are surface treated with an effective amount of a wetting agent, said wetting agent being capable of being chemisorbed on cellulose, said wetting agent being a cationic surfactant which causes a rapid transport of liquid to the absorbent cellulose materials while substantially blocking the return of the liquid to the fabric covering, said cationic surfactant having the formula:



wherein  $R_1$  to  $R_4$  are chosen from the group consisting of alkyl of 1 to 20 carbon atoms, aryl, alkylaryl having 1 to 20 carbon atoms in the alkyl group, ethoxy, alkylethoxy having 1 to 20 carbon atoms in the alkyl group, aryloxy, or alkylaryloxy having 1 to 20 carbon atoms in the alkyl group, and A is an anion.

4,413,033

## WIRE CARRIER AND EDGE PROTECTOR TRIM STRIP FORMED THEREFROM

Edward C. Welchman, Rock Hill, S.C., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,798

Int. Cl.<sup>3</sup> E04F 19/02; E06B 7/22

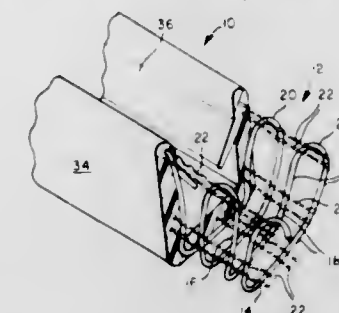
U.S. Cl. 428—122

2 Claims

1. A bendable substantially U-shaped wire carrier for use in forming an edge protector trim strip when coated with an elastomeric material comprising:

a continuous metallic wire looped to form looped ends at the edges of said U-shaped carrier, said looped ends being joined by lengths of wire extending transversely and spaced from one another longitudinally of said carrier, each of said lengths of wire forming a base and side flanges joined by substantially right angle corners; a plurality of strands of material extending longitudinally of said carrier and selectively interwoven with said base and

side flanges only of said wires to maintain the spaced relation thereof with said corners free of strands; and



at least two of said strands being located along said looped ends at each edge of said carrier and forced together by the curvature of said looped ends to form at least a pair of grouped edge strands.

4,413,034

## RECORD HANDLER

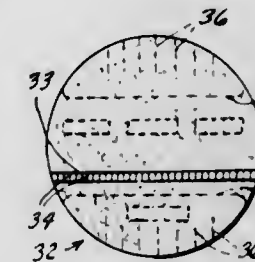
Chester L. Anderson, 5712 Manor Rd., P.O. Box 12, Austin, Tex. 78723

Filed Mar. 2, 1982, Ser. No. 353,956

Int. Cl.<sup>3</sup> B32B 3/00; 27/00; D04H 1/58

U.S. Cl. 428—172

2 Claims



1. A record handler, comprising, in combination, a flat pad formed by a layer of plastic vinyl material on one side thereof and a layer of soft felt material on its other side, said layers being bonded together, a fold line across said pad for folding over said pad with said soft felt material being located on a folded over inner side thereof, a plurality of finger and thumb receiving straps formed on said plastic vinyl layer, said straps being located at both opposite sides from said fold line, and a strip of soft rubber impregnated on a surface of said soft felt along said fold line for frictionally grasping an edge of said phonograph record disc when said holder is folded therearound, said soft rubber strip having a plurality of raised transverse ridges.

4,413,035

## FRAMING ASSEMBLY

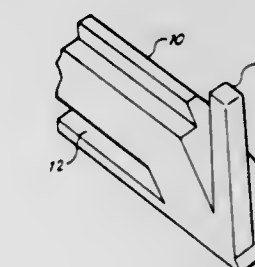
Albert A. DiIola, 2594 Carrell La., Willow Grove, Pa. 19090

Filed Nov. 25, 1981, Ser. No. 324,641

Int. Cl.<sup>3</sup> G09F 1/12; A47G 1/08

U.S. Cl. 428—397

1 Claim



1. A framing kit comprising the combination of four molded elongated plastic members each of which is mitered on at least



one end, and having a tabular member of essentially rectangular cross section oriented perpendicularly with respect to the longitudinal axis of each said elongated member and projecting from the mitered end thereof, all four sides of said tabular member being of substantially equal dimension, a groove of essentially the same cross sectional dimensions as said tabular member and extending substantially the entire length of said elongated member, and a mitering guide for assisting in the cutting of each of said elongated members to a desired length and for providing each such member with a mitered surface which angularly relates to a cooperating one of said longitudinal members, said mitering guide comprising a tabular projection of substantially the same dimensions as those of the tabular projection of said elongated member, said mitering guide further comprising a guide portion attached to said tabular projection and angularly oriented with respect to said tabular projection such that when said tabular projection is positioned within the groove of one of said elongated members said mitering guide may be readily shifted to any desired position along said elongated member thereby enabling said elongated member to be cut to any desired length at a mitered angle which cooperatively relates to the mitered end of said longitudinal members, whereby said four longitudinal members after being cut to their desired length are joined together by inserting the tabular projection of one such longitudinal member into the groove of an adjacent longitudinal member to complete the fabrication of a frame of desired dimension.

4,413,036

#### TWO-LAYER METAL-EFFECT COATING AND A PROCESS FOR ITS PRODUCTION

Hermann-Josef Drexler, Guntersleben, and Ulrich Poth, Münster, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany  
Filed Oct. 29, 1981, Ser. No. 316,405

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041648

Int. Cl.<sup>3</sup> B32B 9/02; B05D 1/36; C09D 5/38

U.S. Cl. 428—458 28 Claims

1. In an article having a substrate and a two-layer metal-effect coating adhered thereto, said coating comprising a base layer which contains metal pigments and a clear top coating, the improvement comprising at least said base layer obtained from a coating composition containing as a film-forming binder a polymer resin obtained by a copolymerizing olefinically unsaturated compounds wherein said polymer resin is a copolymerization product of:

- 1.0 to 50.0% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof;
- 0.1 to 10.0% by weight of a compound having 2 or more polymerizable olefinic double bonds; and
- 40.0 to 98.9% by weight of other copolymerizable compounds; and admixed to the composition
- up to 5% by weight cellulose ester, with the total amount of the components (a), (b), (c), and (d) being 100% by weight.

10. In a process for the production of an article having a substrate and a two-layer metal-effect coating adhered thereto comprising applying to said substrate a first coating composition containing metal pigments and a second clear coating composition over said first coating composition and stoving to produce said article, the improvement comprising said first coating composition prepared by copolymerizing:

- 1.0 to 50.0% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof;
- 0.1 to 10.0% by weight of a compound having 2 or more polymerizable olefinic double bonds; and
- 40.0 to 98.9% by weight of other copolymerizable compounds; and admixed to the composition
- up to 5% by weight cellulose ester; with the total amount of the components (a), (b), (c), and (d) being 100% by weight;

and dispersing a polymer resin thus obtained together with metal pigments and organic solvents.

21. In a coating composition containing as the film-forming binder a polymer resin which was obtained by copolymerizing olefinically unsaturated compounds, for the base layer on a substrate of a two-layer metal-effect coating which has a clear top coating as the top finish, wherein said polymer resin is a copolymerization product of:

- 1.0 to 50.0% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof;
  - 0.1 to 10.0% by weight of a compound having 2 or more polymerizable olefinic double bonds; and
  - 40.0 to 98.9% by weight of other copolymerizable compounds; and admixed to the composition
  - up to 5% by weight cellulose ester;
- with the total amount of the components (a), (b), (c), and (d) being 100% by weight.

4,413,037

#### ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE HYDROXYETHYL (METH)ACRYLATE COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 274,590, Jun. 17, 1981, Pat. No. 4,360,641.

This application Sep. 29, 1982, Ser. No. 426,530

Int. Cl.<sup>3</sup> B32B 15/08

U.S. Cl. 428—461

7 Claims

1. A coating composition comprising:

- a graft copolymer of an acrylic monomer or monomers or of acrylic monomer or monomers and other monomers copolymerizable therewith, on a backbone comprising a random copolymer of a styrene and between about 20 weight percent and about 30 weight percent of the random copolymer of hydroxyethyl (meth)acrylate, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both, said graft copolymer being neutralized with ammonia, ammonium hydroxide, or a tertiary amine; and
- a cross-linking agent;

said composition being diluted with water to a solids content of between about 10 weight percent and about 40 weight percent.

4,413,038

#### ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE POLYSTYRENE

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 274,589, Jun. 17, 1981, Pat. No. 4,366,293.

This application Sep. 29, 1982, Ser. No. 426,533

Int. Cl.<sup>3</sup> B32B 15/08

U.S. Cl. 428—461

8 Claims

1. A coating composition comprising:

- a graft copolymer of an acrylic monomer or monomers or of acrylic monomer or monomers and other monomers copolymerizable therewith and a polystyrene in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both, said graft copolymer being neutralized with ammonia, ammonium hydroxide, or a tertiary amine; and
- a cross-linking agent;

said composition being diluted with water to a solids content of between about 10 weight percent and about 40 weight percent.

4,413,039

#### STEEL SHEET PLATED WITH LAYERS OF NISN AND PB-SN ALLOY FOR AUTOMOTIVE FUEL TANK

Seizun Higuchi; Minoru Kamada, both of Kitakyushu; Kazuhiro Tano, Nakama; Tetsuo Fushino, Kitakyushu, and Minoru Fujinaga, Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 245,973

Claims priority, application Japan, Mar. 22, 1980, 55-35762; Aug. 8, 1980, 55-108362; Aug. 25, 1980, 55-115967

Int. Cl.<sup>3</sup> B32B 15/01, 15/18

U.S. Cl. 428—643

4 Claims

1. A steel sheet plated with an Pb-Sn alloy for automobile fuel tanks comprising:

- a steel sheet as a base material;
  - a first layer of a Ni-Sn alloy consisting only of stoichiometric NiSn phase, said NiSn phase alloy being formed on the surface of said steel sheet base material and optionally a Ni backing layer, the total of both said Ni-Sn layer and said Ni backing layer, when present, being 0.035 to 1 microns in thickness; and,
  - a second layer of a plated Pb-Sn alloy formed on said NiSn phase alloy layer.
3. A steel sheet plated with an Pb-Sn alloy for automobile fuel tanks adapted to contain a fuel having an alcohol content, said steel sheet comprising:
- a steel sheet as the base material;
  - a first layer of a Ni-Sn alloy consisting only of stoichiometric NiSn phase, said NiSn phase alloy being formed on the surface of said steel sheet and optionally a Ni backing layer, the total of both said Ni-Sn layer and said Ni backing layer, when present being 0.035 to 1 microns in thickness; and
  - a second layer of a plated Pb-Sn alloy formed on said NiSn alloy layer.

4,413,040

#### HYDROGEN/HALOGEN REACTOR SYSTEM FOR METAL HALOGEN BATTERIES

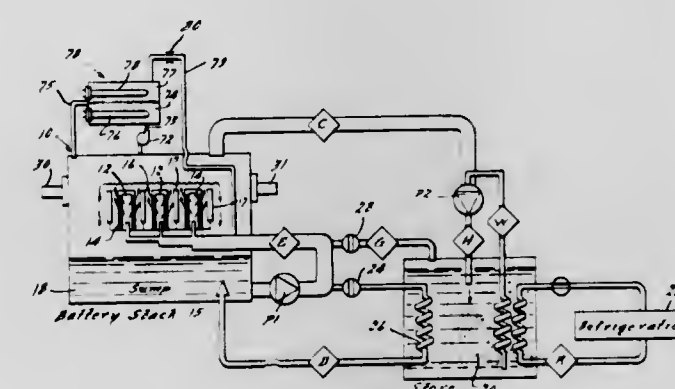
Peter Carr, Utica, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Apr. 26, 1982, Ser. No. 372,089

Int. Cl.<sup>3</sup> H01M 8/18

U.S. Cl. 429—19

7 Claims



- In a metal halogen battery construction, the improved combination of,
  - at least one cell having a positive electrode and a negative electrode, separated by aqueous electrolyte containing the material of said metal and halogen,
  - sump means wherein the electrolyte is collected,
  - store means wherein halogen hydrate is formed and stored as part of an aqueous material,
  - means for circulating electrolyte through the cell,
  - conduit means for transmitting halogen gas formed in the cell to hydrate forming means associated with the store means,
  - a reactor means associated with said construction whereby

halogen gas formed in the cell can be reacted to form hydrogen halide by controlled chemical reaction, said reactor means including at least two reaction zones operative to prevent self-propagation of the reaction into other areas of the battery construction, the first reaction zone being comprised of a reaction initiator means submersed in an aqueous medium to which hydrogen/halogen gas mixtures from the cell are introduced and reacted to form hydrogen halide, the second reaction zone being comprised of a chamber means in communication with the first zone, and with said chamber also including a reaction initiator means to cause the reaction of any remaining hydrogen and halogen, and means for returning the hydrogen halide formed in the reactor means for re-dispersion in the aqueous electrolyte.

4,413,041

#### CROSS-FLOW MONOLITH REACTOR

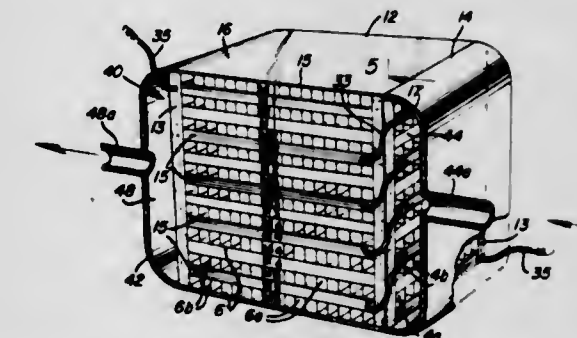
Louis Hegedus, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,145

Int. Cl.<sup>3</sup> H01M 8/12

U.S. Cl. 429—33

22 Claims



- A one piece integral reactor, adapted for use in a fuel cell, comprising a plurality of stacked essentially planar parallel sheets of a fluid-impermeable solid electrolyte capable of transporting oxygen ions, each sheet possessing a plurality of parallel elongated channels separated by ribs, said sheets divided into first and second groups wherein the sheets of said groups are interposed in an alternate manner, the channels of said first group forming an angle with the channels of said second group, the channels of said first group having a catalytic, oxygen-dissociating material disposed therein and the channels of the second group having a catalyst for promoting oxidation reactions disposed therein.

4,413,042

#### INERT GAS REJECTION SYSTEM FOR METAL HALOGEN BATTERIES

Peter Carr, Utica, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Apr. 26, 1982, Ser. No. 372,088

Int. Cl.<sup>3</sup> H01M 2/38

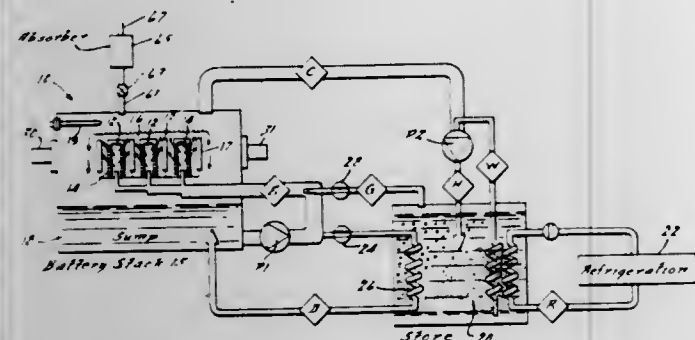
U.S. Cl. 429—51

5 Claims

- A method of removing inert gases from a metal halogen electrolyte battery system in which hydrogen is generated along with other inert gases, such as carbon dioxide, carbon monoxide, oxygen, or the like, said battery including a stack, sump, and electrolyte store, said method comprising,
  - circulating electrolyte over the battery stack with the stack being at least partially charged while preventing halogen replenishment to the battery stack from the battery store, thereby generating hydrogen from the metal electrode to cause a positive pressure above ambient in the gas space associated with the battery sump,



subsequently removing the hydrogen and other inert gases from the system by venting the gases through an absorber



means which removes trace quantities of chlorine from the gases.

4,413,043

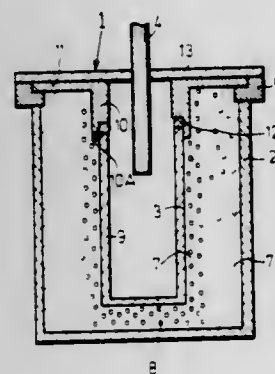
**ELECTROCHEMICAL STORAGE CELL**

Günther Steinleitner, Schriesheim, and Wilhelm Haar, Sandhausen, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Kaferthal, Fed. Rep. of Germany  
Filed Aug. 18, 1981, Ser. No. 293,886

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033130

Int. Cl.<sup>3</sup> H01M 4/36, 4/48, 6/20

U.S. Cl. 429—104



1. Electrochemical storage cell or battery of the alkali metal and chalcogen type with at least one anode space for the alkali metal anolyte and a cathode space for the chalcogen catholyte, with the cathode space and the anode space separated from each other by an alkali ion-conducting solid electrolyte in the form of a cup-shaped solid electrolyte connected at its top open end to an annular insulating body, the combination thereof wherein the annular insulating body containing alpha-aluminum oxide is fastened by means of a joining material to the open end of the cup-shaped solid electrolyte of beta-aluminum oxide, said joining material containing a mixture of a glass powder and a ceramic powder, said glass powder contained in the joining material having a composition of about 50% by weight B<sub>2</sub>O<sub>3</sub>, about 40% by weight of BaO, and about 10% by weight of Al<sub>2</sub>O<sub>3</sub>, said ceramic powder is an alpha-aluminum oxide powder, said joining material applied as a suspension in glycerin, said glycerin being expelled from the suspension after said suspension is applied.

4,413,044

**ELECTROPHOTOGRAPHIC COPYING PROCESS**

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

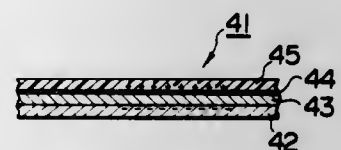
Filed Nov. 18, 1981, Ser. No. 322,412

Claims priority, application Japan, Dec. 23, 1980, 55-182321

Int. Cl.<sup>3</sup> G03G 13/22

U.S. Cl. 430—53

7 Claims



1. An electrophotographic copying process utilizing a photosensitive member which includes a conductive layer carrying a sequential lamination of a photoconductive layer which is sensitive to visible light and a function layer different therefrom, forming an electrostatic latent image by trapping charge on opposite sides of either the photoconductive layer or the function layer in such a condition that the layer which is not retaining the charge is a photoconductive layer forming the photosensitive member, the function layer being formed of a layer taken from the group of layers consisting of a photoconductive layer and an electrically insulating layer, and repeatedly employing a copying step for developing the electrostatic latent image and transferring the toner deposited on said latent image to produce a plurality of copies, characterized in that the photosensitive member is subjected to at least one uniform exposure by radiation which activates that photoconductive layer forming the photosensitive member which is not retaining the charge during at least one of the copying steps for producing a plurality of copies of substantially uniform quality.

5. An electrophotographic copying process according to claim 1 in which the photosensitive member has a screen-shaped configuration.

4,413,045

**MULTILAYER ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISES DISAZO CHARGE GENERATOR LAYER, HYDRAZONE TRANSPORT LAYER**

Shozo Ishikawa, Sayama; Kazuharu Katagiri, Mitaka; Katsunori Watanabe, Yamato; Kiyoshi Sakai, Mitaka, and Makoto Kitahara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,450

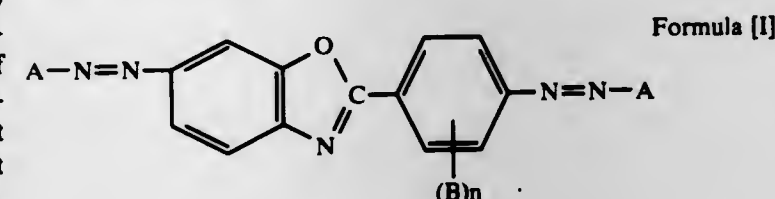
Claims priority, application Japan, May 26, 1981, 56-80620

Int. Cl.<sup>3</sup> G03G 5/14

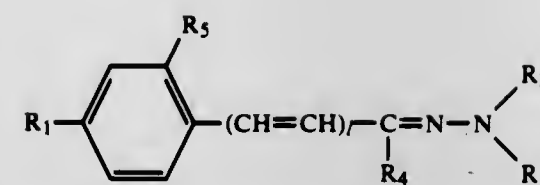
U.S. Cl. 430—59

7 Claims

1. An electrophotographic photosensitive member characterized by comprising a charge generation layer containing at least one disazo pigment represented by the following formula [I] and a charge transport layer containing at least one hydrazone compound represented by the following formula [II]:



wherein A is a coupler residue, B represents hydrogen, halogen, alkyl, or alkoxy, and n is an integer of 1 to 4;



wherein R<sub>1</sub> represents N,N-dialkylamino, or N,N-diarylamino, or N-alkyl-N-arylamino, or alkoxy or aryloxy, each being substituted or unsubstituted; R<sub>2</sub> and R<sub>3</sub> each represent alkyl, aralkyl, or aryl, each being substituted or unsubstituted, or R<sub>2</sub> and R<sub>3</sub>, together with the nitrogen atom which links them, represent nitrogen-containing heterocyclic ring; R<sub>4</sub> represents hydrogen, or alkyl, aralkyl, or aryl, each being substituted or unsubstituted; R<sub>5</sub> represents hydrogen, alkyl, or alkoxy; and l is 0 or 1.

4,413,046

**DISAZO PHOTOCONDUCTOR WITH NITROPHthalic ANHYDRIDE SENSITIZER**

Toru Nakazawa, Kumatori, and Akira Fushida, Suita, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 2, 1982, Ser. No. 365,050

Claims priority, application Japan, Apr. 6, 1981, 56/52208

Int. Cl.<sup>3</sup> G03G 5/06, 5/09

U.S. Cl. 430—83

5 Claims

1. A photosensitive composition for electrophotography, which consists essentially of (A) Dian Blue (C.I. 21180) or a nucleus halogen substituted derivative thereof as a photoconductor (B) 4-nitrophthalic anhydride as a sensitizer, and (C) an electrically insulating, electrophotographically inactive resin binder having a volume resistivity of at least  $1 \times 10^{14} \Omega\text{-cm}$ , the sensitizer (B) being present in an amount of 1 to 200 parts by weight per 100 parts by weight of the photoconductor (A) and the binder (C) being present at a weight ratio of from 1/20 to 1/1.

4,413,047

**CADMIUM PHOTOCONDUCTOR WITH (DIALKYLPHOSPHATO) ORGANIC TITANATE ADDITIVE**

Yoshiaki Kato, Hirakata; Akira Fushida, Suita; Hideo Fukuda, Katano; Toru Nakazawa, Osaka; Yasushi Kamezaki, Sakai, and Hideyuki Sasaki, Morioka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 12, 1982, Ser. No. 367,252

Int. Cl.<sup>3</sup> G03G 5/087, 5/09

U.S. Cl. 430—94

11 Claims

1. A photosensitive material for electrophotography comprising a conductive substrate and a layer of a composition comprising a dispersion of a cadmium sulfide containing photoconductive pigment in a binder resin, which is formed on the conductive substrate, wherein 0.05 to 5 parts by weight per 100 parts by weight of the photoconductive pigment of a (dialkylphosphato) organic titanate is incorporated into said composition.

4,413,048

**DEVELOPING COMPOSITION FOR A LATENT ELECTROSTATIC IMAGE FOR TRANSFER OF THE DEVELOPED IMAGE ACROSS A GAP TO A CARRIER SHEET**

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,351

Int. Cl.<sup>3</sup> G03G 9/16

U.S. Cl. 430—115

13 Claims

1. A composition for developing latent electrostatic images including in combination a major portion of a normally fluid insulating liquid, a minor portion of charged resinous toner particles, and a minor portion of nonconductive spacer particles,

each of said spacer particles having a portion enclosing a gas bubble, and each of said spacer particles having a diameter larger than the diameter of said toner particles.

4,413,049

**ANODIZED ELECTROSTATIC IMAGING SURFACE**

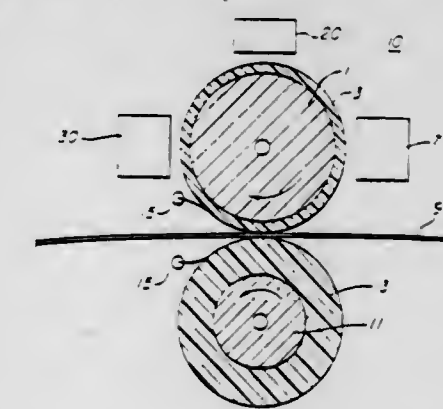
Leo A. Beaudet, Milford, and Donald J. Lennon, Acton, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 164,482, Jun. 30, 1980, which is a continuation-in-part of Ser. No. 155,354, Jun. 2, 1980. This application Feb. 5, 1982, Ser. No. 346,349

Int. Cl.<sup>3</sup> G03G 13/22

U.S. Cl. 430—126

17 Claims



1. An electrostatic imaging method comprising the steps of: (a) forming a latent electrostatic image on a dielectric image member, said image member being produced by: hardcoat anodizing an aluminum member to form an oxide surface layer having a plurality of pores, dehydrating the oxide surface layer to thoroughly remove water from the pores, impregnating the dehydrated surface layer with a material selected from the group consisting of compounds of Group II or Group III metals with fatty acids, while maintaining the member in a moisture-free state, and removing excess material from the member's surface; (b) toning the latent electrostatic image; (c) transferring the toned image to an image receptor solely by means of pressure exerted at the site of transfer.

4,413,050

**PHOTOGRAPHIC PROCESS OF PRODUCING PHOTOGRAPHIC PRINTS UPON INSTANT PRINT FILM**

W. Gregory Erf, 74 Cobbs Hill Dr., Rochester, N.Y. 14610  
Continuation of Ser. No. 164,671, Jun. 30, 1980, abandoned.

This application May 7, 1981, Ser. No. 261,462

Int. Cl.<sup>3</sup> G03C 1/16

U.S. Cl. 430—203

17 Claims

1. A process for making photographic color prints from a color positive transparency film of an object comprising, sequentially:

- over-exposing the color positive transparency film in a camera while focused upon the object to produce a latent image upon the film;
- developing the latent image upon the film, by immersion in developing materials sequentially, with immersion time in the first developer material reduced from effective normal to produce a low contrast actual image on the film;
- projecting and exposing the actual image which is on the transparency film onto an instant print film according to the prescribed normal effective exposure procedures, times and temperatures; and
- developing the instant print film according to the normal prescribed procedure.

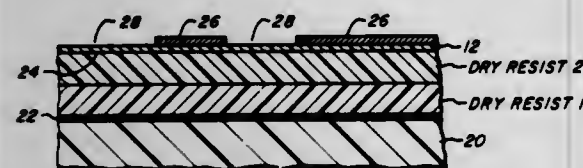


4,413,051

**METHOD FOR PROVIDING HIGH RESOLUTION, HIGHLY DEFINED, THICK FILM PATTERNS**

Lowell E. Thomas, Tewksbury, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed May 4, 1981, Ser. No. 260,266

Int. Cl.<sup>3</sup> G03C 5/00; B05D 5/12; C25D 5/02; C23F 1/02  
U.S. Cl. 430—312 20 Claims

1. A method of patterning conductive films having a thick film conductivity with resolution and line uniformity comparable to that obtainable with thin film techniques, comprising the steps of:

- laminating a number of layers of dry film photo resist to a substrate without a baking step;
- selectively exposing the laminated resist in a single exposure step;
- developing the resist in a single step by applying a pressurized mist to the top surface of the exposed laminated resist, thereby to expose selected portions of the substrate; and,
- depositing material at the exposed portions of the substrate to a level established by the laminated layers.

4,413,052

**PHOTOPOLYMERIZATION PROCESS EMPLOYING COMPOUNDS CONTAINING ACRYLOYL GROUP AND ANTHRYL GROUP**

George E. Green, Stapleford, England; Ewald Losert, Rheinfelden, Switzerland, and John G. Paul, Falkirk, Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

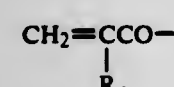
Filed Mar. 25, 1982, Ser. No. 361,701

Claims priority, application United Kingdom, Feb. 4, 1981, 110403

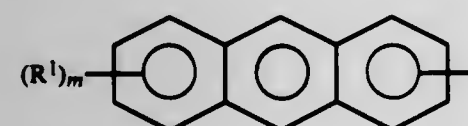
Int. Cl.<sup>3</sup> G03C 5/00

U.S. Cl. 430—327 16 Claims

1. A process for production of an image which comprises (1) exposing to actinic radiation a layer, supported on a carrier, of a liquid composition containing a photoinitiator and a compound (A) having in the same molecule both at least one group of formula



and at least one group of formula



- where R denotes a hydrogen atom or a methyl group, R<sup>1</sup> denotes a chlorine or bromine atom, a methyl group, or a nitro group, and m is zero, 1, or 2, such that the layer solidifies and becomes essentially non-tacky due to photopolymerisation of (A) through the group or groups of formula III but remains substantially photocrosslinkable, and subsequently,
- (2) exposing the layer so solidified through an image-bearing transparency consisting of substantially opaque and substantially transparent parts to a substantially greater amount of actinic radiation such that the further exposed

part or parts of the photopolymerised layer undergo photocrosslinking through the group or groups of formula IV, and

- (3) developing the image by dissolving in a solvent the part or parts of the layer which have not become photocross-linked.

4,413,053

**RADIOGRAPHIC ELEMENTS EXHIBITING REDUCED CROSSOVER**

Thomas I. Abbott, Rochester, and Cynthia G. Jones, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,910

Int. Cl.<sup>3</sup> G03C 1/76

U.S. Cl. 430—502 15 Claims

1. In a radiographic element comprised of first and second imaging means, at least said first imaging means including a silver halide emulsion comprised of a dispersing medium and radiation-sensitive silver halide grains, and a support interposed between said imaging means capable of transmitting radiation to which said second imaging means is responsive the improvement comprising said first imaging means containing tabular silver halide grains having a thickness of less than 0.2 micron and an average aspect ratio of from 5:1 to 8:1 accounting for at least 50 percent of the total projected area of said silver halide grains present in said silver halide emulsion and spectral sensitizing dye adsorbed to the surface of said tabular silver halide grains in an amount sufficient to substantially optimally sensitize said tabular grains.

4,413,054

**SILVER HALIDE COLOR PHOTOSENSITIVE MATERIALS**

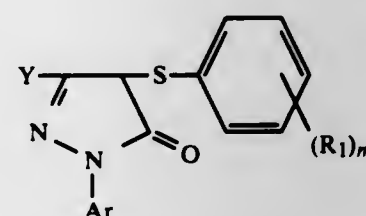
Akio Mitsui, and Kotaro Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1982, Ser. No. 363,736

Claims priority, application Japan, Jul. 7, 1981, 56-105837  
Int. Cl.<sup>3</sup> G03C 1/40

U.S. Cl. 430—555 8 Claims

1. A silver halide color photosensitive material containing a 4-arylthio-5-pyrazolone coupler represented by Formula (I)



wherein Ar represents a phenyl group substituted with one or more substituents selected from halogen atoms, alkyl groups, alkoxy groups, alkoxycarbonyl groups, or cyano groups, R<sub>1</sub> represents hydrogen, a halogen atom, an acylamino group, a sulfonamido group, a carbomoyl group, a sulfamoyl group, an alkylthio group, an alkoxycarbonyl group, a hydroxyl group, an alkyl group, an alkoxy group, or an aryl group, m represents an integer of from 1 to 5 and R<sub>1</sub> may be same or different when m is 2 or more, and Y represents an acylamino group or an anilino group and said silver halide coupler photosensitive material comprising a layer containing an emulsion of light-insensitive fine silver halide particles having an average particle diameter from 0.01 to 0.20μ.

4,413,055

**SILVER HALIDE EMULSION, A PHOTOGRAPHIC MATERIAL AND A PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES**

Edith Weyde, Kuerten; Harald von Rintelen, Leverkusen; Wilhelm Saleck, Bergisch Gladbach, and Heinz-Horst Teitscheid, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,143

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037383

Int. Cl.<sup>3</sup> G03C 5/26, 1/02

U.S. Cl. 430—567 9 Claims

1. A photosensitive material for the production of vesicles in imagewise distribution containing at least one silver halide emulsion layer comprising as silver halide essentially silver bromide and having a silver content (expressed as silver nitrate) of 1 to 800 mg, and optionally further layers, wherein the silver halide grains of the silver halide emulsion have an average grain size of utmost 0.1 μm and wherein the grains of the emulsion have been precipitated in the presence of at least one Co<sup>2+</sup>, Ce<sup>3+</sup>, Ce<sup>4+</sup>, Cu<sup>+</sup>, or Cu<sup>2+</sup> salt said salt being in a quantity of from 10<sup>-1</sup> to 10<sup>-8</sup> moles per mole of silver halide.

4,413,056

**PROCESS FOR THE PREPARATION OF PENICILLINS AND PENICILLIN DERIVATIVES**

Ian R. Chester, Littlehampton; Lawson W. Powell, Worthing, and David G. Roberts, Storrington, all of England, assignors to Beecham Group Limited, England

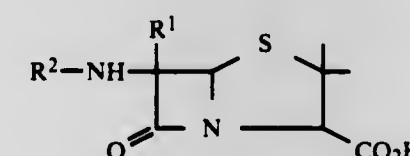
Filed Oct. 19, 1981, Ser. No. 312,667

Claims priority, application United Kingdom, Nov. 5, 1980, 8035454

Int. Cl.<sup>3</sup> C12P 37/00

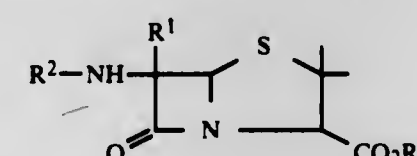
U.S. Cl. 435—43 14 Claims

1. A process for the preparation of a compound of formula (I):



wherein

- R<sup>1</sup> is hydrogen, hydroxy, mercapto radical, a substituted or unsubstituted methoxy, ethoxy, methyl, ethyl, methyl thio, or ethylthio radical, a carbamoyloxy, carbamoylthio, C<sub>1-6</sub> alkanoyloxy, C<sub>1-6</sub> alkanoylthio, cyano, carboxy or carbamoyl radical; and R<sup>2</sup> represents an acyl group which comprises hydrolysis of a compound of formula (II):



wherein R<sup>1</sup> and R<sup>2</sup> are as defined with respect to formula (I) hereinbefore and R<sup>3</sup> represents benzyl or substituted benzyl; characterised in that the hydrolysis is catalysed by a microbial serine proteinase.

4,413,057

**GROUP B STREPTOCOCCAL CAPSULAR POLYSACCHARIDES**

Dennis J. Carlo, Bound Brook; Karl H. Nollstadt, Clark; Thomas H. Stoudt, Westfield, and Robert Z. Maigetter, Summit, all of N.J., assignors to Merck &amp; Co., Inc., Rahway, N.J. Continuation-in-part of Ser. No. 140,031, Apr. 14, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 343,305

Int. Cl.<sup>3</sup> C12P 19/04; C08B 37/00; A61K 39/02

U.S. Cl. 435—101 8 Claims

1. A process for the preparation of an antigenic type-specific polysaccharide of Group B Streptococcus comprising (a) growing the Group B Streptococcus bacteria types I<sub>a</sub>, I<sub>b</sub>, II, or III in a high glucose, soy bean and yeast extract fermentation medium; (b) separating the cell paste from the liquid medium; (c) treating the liquid medium from step (b) with a strong ionic salt and a water-miscible lower alkanol to precipitate impurities or alternatively digesting the cell paste with an enzyme to obtain a liquid extract; (d) precipitating the crude polysaccharide from the treated liquid medium, or if desired, the liquid extract from digested cell paste with a sufficient amount of water-miscible lower alkanol; (e) suspending the crude polysaccharide of step (d) in deionized water and adding thereto sufficient cationic detergent to precipitate the polysaccharide; (f) redissolving the polysaccharide in 15% (wt/wt) sodium acetate aqueous solution; and (g) precipitating the semi-purified polysaccharide from the solution with alcohol and, optionally, digesting the resulting precipitate with a proteolytic enzyme, followed by precipitating the enzyme-treated polysaccharide with a sufficient amount of water-miscible alkanol.

4,413,058

**CONTINUOUS PRODUCTION OF ETHANOL BY USE OF FLOCCULENT ZYMONOMAS MOBILIS**

Edward J. Arcuri, Del Mar, Calif., and Terrence L. Donaldson, Lenoir City, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 28, 1982, Ser. No. 343,610

Int. Cl.<sup>3</sup> C12P 7/06

U.S. Cl. 435—161 4 Claims

1. A method for producing ethanol, comprising: placing flocculent *Zymomonas mobilis* "F" NRRL B-12526 in a reactor column; and passing a stream containing water, sugar, and yeast extract through said reactor column at a flow rate which permits conversion of sugar in said stream to ethanol in said column and retention of said flocculent *Zymomonas mobilis* "F" NRRL B-12526 in said reactor column.

4,413,059

**APPARATUS FOR PREPARING SINGLE CELL SUSPENSION**

Claude Tihon, Manlius, and M. Elaine Curry, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y. Division of Ser. No. 188,710, Sep. 19, 1980, Pat. No. 4,350,768. This application Feb. 1, 1982, Ser. No. 344,498

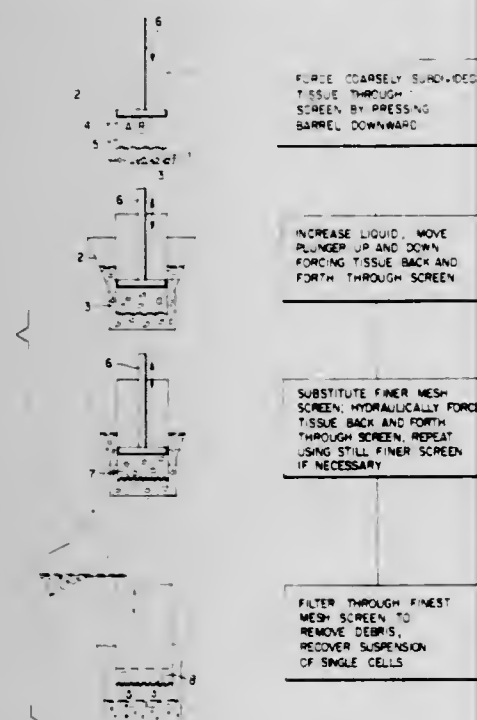
Int. Cl.<sup>3</sup> C12M 3/02, 1/16; B02C 1/00; B02D 33/00

U.S. Cl. 435—286 7 Claims

1. An apparatus for preparing a suspension of single tissue cells comprising the combination of confining means for confining a quantity of a liquid suspension of animal tissue; a screen; means supporting the screen; pump means for passing the liquid suspension of tissue from the confining means back and forth through the screen; the pump and the confining means comprising at least two



telescopically-related members defining an expansible and contractible chamber having an open end;  
the screen being detachably secured across the open end of the chamber;  
relative movement of the telescopically-related members in one direction causing the chamber to expand and relative movement of said telescopically-related members in the other direction causing the chamber to contract;  
at least one of the telescopically-related members being free to be moved to cause expansion and contraction; and



the confining means being constructed and arranged to confine a quantity of the liquid suspension of tissue with the screen in contact therewith whereby relative movement of the telescopically-related members in a direction to expand the chamber will cause the suspension to flow through the screen in one direction and relative movement of the telescopic members in a direction to contract the chamber will cause the suspension to flow through the screen in the opposite direction.

4,413,060

#### PROCESS AND APPARATUS FOR DISTRIBUTION AND PREPARATION OF SAMPLES FROM PRIMARY VESSELS

Gerd Assmann, and Horst-Dietrich Helb, both of Münster, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Zentrale GmbH, Fed. Rep. of Germany

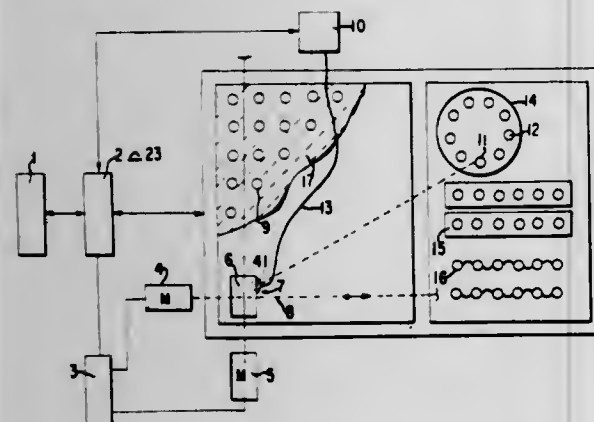
Filed Sep. 10, 1981, Ser. No. 300,929

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035340

Int. Cl.<sup>3</sup> G01N 35/00, 35/06

U.S. Cl. 436—47

3 Claims



1. A method of sampling and distributing a liquid material

which comprises drawing a liquid sample from a source thereof and placing it in a primary vessel, sealing said sample in the primary vessel with a sealing means which has one or more passages through which a positive pressure or a partial vacuum may be applied to the interior of the primary vessel and a relatively narrow dispensing passage from the interior of the primary vessel to the outside thereof, inverting the primary vessel containing the liquid therein by the combination of the sealing means, the walls of the vessel, the narrowness of the passage to the outside and by the equal or slightly negative pressure within the primary vessel with respect to the ambient pressure; moving the inverted primary vessel in a predetermined sequence to positions over secondary receiving vessels, increasing the pressure above the liquid in the primary vessel sufficiently to expel a predetermined amount of said liquid into a secondary vessel, reducing the pressure to equilibrium or to a slight vacuum, moving the primary vessel to successive positions and repeating the steps, recording data to relate the source of the sample in the primary vessel to the portions thereof dispensed into the secondary vessels and upon completing the desired providing of samples to various secondary vessels returning the primary vessel to its starting point.

4,413,061

#### GLASS-CERAMIC STRUCTURES AND SINTERED MULTILAYER SUBSTRATES THEREOF WITH CIRCUIT PATTERNS OF GOLD, SILVER OR COPPER

Ananda H. Kumar, Wappingers Falls, N.Y.; Peter W. McMillan, Warwick, England, and Rao R. Tummalala, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

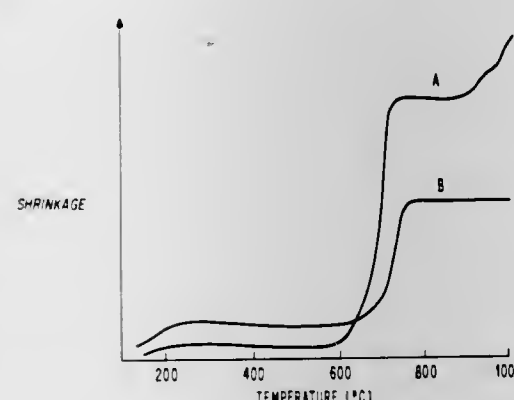
Division of Ser. No. 875,703, Feb. 6, 1978, Pat. No. 4,301,324.

This application Jun. 22, 1981, Ser. No. 276,236

Int. Cl.<sup>3</sup> C03C 3/22; H05K 3/34

U.S. Cl. 501—7

20 Claims



1. A non-porous sintered glass ceramic article comprising: a microstructure of a pervasive continuous network of 2 to 5  $\mu\text{m}$  crystallite selected from the group consisting of  $\beta$ -spodumene and alphasialon with the interstices of said  $\beta$ -spodumene network occupied by residual glass having dispersed therein discrete secondary 1 to 2  $\mu\text{m}$  crystallites of lithium metasilicate and the interstices of said alphasialon network occupied by residual glass having dispersed therein 1 to 2  $\mu\text{m}$  crystallites of clinostate.
2. A method of making a glass ceramic article comprising forming a glass from a batch containing, by weight

65 to 75%	SiO <sub>2</sub>	3.5 to 11%	Li <sub>2</sub> O
12 to 17%	Al <sub>2</sub> O <sub>3</sub>	0 to 2.5%	B <sub>2</sub> O <sub>3</sub>
0 to 2%	MgO	0 to 2.5%	P <sub>2</sub> O <sub>5</sub>
0 to 2%	ZnO	0 to 3%	F

and including from 0 to 2% of at least one oxide selected from the group consisting of CaO and BaO, and from 1.0

to 3.5% of at least one oxide selected from the group consisting of Na<sub>2</sub>O and K<sub>2</sub>O;  
pulverizing said glass to particle sizes of about 2 to about 7  $\mu\text{m}$ ;  
shaping said glass particles into a desired configuration;  
heating said shaped particles to a temperature in the range of about 870° to about 1000° C. at a rate not exceeding 2° C./minute;  
sintering said shaped particles at said temperature for times in the range of 1 to 5 hours to coalesce and crystallize said particles; and  
cooling said sintered particles at a rate not exceeding 4° C. per minute to a temperature of at least about 400° C.

4,413,062

#### MOLDING COMPOSITION AND PRODUCT PRODUCED THEREFROM

Irvin C. Huseby; Jan W. Szymaszek, both of Schenectady, N.Y., and Eldon B. Heft, West Hartford, Conn., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 284,867, Jul. 20, 1981, abandoned. This application May 27, 1982, Ser. No. 382,848

Int. Cl.<sup>3</sup> C04B 35/16

U.S. Cl. 501—123

10 Claims

1. A process of producing a polycrystalline ceramic which comprises calcining wollastonite powder to produce a calcined powder at least significantly free of calcite, forming a mixture comprised of from about 15% by weight to about 30% by weight of phosphoric acid and from about 70% by weight to about 85% by weight of said calcined wollastonite, said phosphoric acid ranging in concentration of P<sub>2</sub>O<sub>5</sub> from about 61% by weight to about 76% by weight of the total weight of said acid, die-pressing the resulting mixture to impart at least sufficient green strength to the pressed piece to allow its removal from the press, and firing the pressed piece in air at or about atmospheric pressure at a firing temperature ranging from about 500° C. to about 900° C.

4,413,063

#### PROCESS FOR OPERATING HIGHLY EXOTHERMIC REACTIONS

Francois Audibert, Ecully; Andre Sugier, Rueil Malmaison, and Hugo Van Landeghem, Oytier Saint Oblas, all of France, assignors to Institut Francais du Pétrole, Rueil-Malmaison, France

Filed Nov. 25, 1981, Ser. No. 324,758

Claims priority, application France, Nov. 25, 1980, 80 25031

Int. Cl.<sup>3</sup> C07C 1/04, 27/06

U.S. Cl. 518—700

11 Claims

1. In a process for synthesizing hydrocarbons or alcohols, comprising reacting carbon monoxide with hydrogen, in the presence of a catalyst for synthesis of hydrocarbons or alcohols, and in the presence of an inert diluent, the improvement comprising downwardly flowing the carbon monoxide and hydrogen, as a gas phase, in admixture with a liquid phase of said inert diluent, through a reaction zone comprising a fixed bed of said catalyst, the superficial velocities of the gas phase and of the liquid phase each being at least 1.5 centimeters per second under the temperature and pressure conditions of the reaction.

4,413,064

#### FLUID BED CATALYST FOR SYNTHESIS GAS CONVERSION AND UTILIZATION THEREOF FOR PREPARATION OF DIESEL FUEL

Harold Beuther, Cheswick; Charles L. Kibby, Gibsonia; T. P. Kobylinski, Prospect, and Richard B. Pannell, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 13, 1981, Ser. No. 310,977

Int. Cl.<sup>3</sup> C07C 1/04

U.S. Cl. 518—715

17 Claims

1. A process for the conversion of synthesis gas to a product

4,413,065

#### PROCESS FOR MAKING LOW DENSITY CHLORINATED POLYVINYL CHLORIDE FOAM

Dale R. Hall, Avon Lake, and Charles N. Bush, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 425,838, Sep. 28, 1982, Pat. No. 4,383,048.

This application Feb. 9, 1983, Ser. No. 465,130

Int. Cl.<sup>3</sup> C08J 9/06, 9/14

U.S. Cl. 521—82

7 Claims

1. A low density foam product comprising expanded chlorinated polyvinyl chloride polymer said polymer having a chlorine content of from 60% to 73% by weight having an essentially closed-cell cellular structure composed predominantly of cells having a cell size less than 500 microns, said cells containing a gas derived from a primary blowing agent and hydrogen gas derived from the activation of a nucleating system composed of an alkali metal borohydride and a proton donor activator compatible with said polymer selected from the group consisting of hydrated salts and organic acids, said foam having a density less than 20 lbs/ft<sup>3</sup>.

4,413,066

#### CROSSLINKABLE POLYETHYLENE RESIN COMPOSITIONS

Tsutomu Isaka; Mitsugu Ishioka; Takeo Shimada, and Takayuki Inoue, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Japan

Division of Ser. No. 54,474, Jul. 3, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,749

Claims priority, application Japan, Jul. 5, 1978, 53-80952; Jul. 5, 1978, 53-80953

Int. Cl.<sup>3</sup> C08J 9/22

U.S. Cl. 521—149

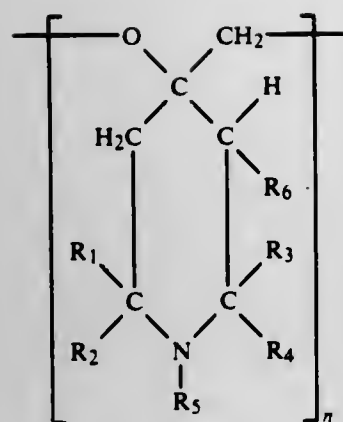
14 Claims

1. An expandable crosslinkable polyethylene resin composition comprising  
a copolymer formed by the copolymerization of ethylene and vinyltrimethoxysilane, wherein the content of vinyltrimethoxysilane in said copolymer is about 0.01 to 5 percent by weight and wherein said copolymer has been prepared by copolymerization under elevated pressure in the presence of a radical polymerization initiator,  
a silanol condensation catalyst and  
a foaming agent in the amount of 0.2 to 30 percent by weight based on the total weight of the copolymer and foaming agent, wherein said resin composition is capable of forming an expanded and crosslinked product having a gel content of about 23% to 78%.









wherein:

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, either like or unlike one another, are each an alkyl radical containing 1 to 4 carbon atoms, or R<sub>1</sub> and R<sub>2</sub>, and/or R<sub>3</sub> and R<sub>4</sub>, together, form a cyclo-alkylene radical containing 3 to 12 carbon atoms;  
R<sub>5</sub> is hydrogen, an alkyl, hydroxyalkyl or alkyl-oxy radical containing 1 to 6 carbon atoms; an aryl or arylalkyl radical containing 6 to 18 carbon atoms; an alkenyl radical containing 2 to 6 carbon atoms or a  $-(CH_2)_xCO_2R_7$  radical in which X is zero or an integer from 1 to 12 and R<sub>7</sub> is H, a metal selected from the alkaline metals, the alkaline-earth metals, and the transition metals, an alkyl, alkylene, alkenyl, alkenylene radical, each containing 1 to 20 carbon atoms;  
R<sub>6</sub> is hydrogen or an alkyl radical containing 1 to 4 carbon atoms, and  
n is an integer from 2 to 100.

6. A composition comprising a thermoplastic synthetic polymer stabilized to light, to oxygen and to heat, and characterized in that it contains, in an amount sufficient to prevent degradation of the thermoplastic synthetic polymer, a substituted poly-oxy-methylene-piperidine having the general formula (I) according to claim 1.

4,413,076

#### POLYALKYLPIPERIDINE SIDE CHAIN STABILIZERS FOR SYNTHETIC POLYMER COMPOSITIONS

Nobuo Soma, Syoji Morimura, Takao Yoshioka, and Tomoyuki Kurumada, all of Hiromachi, Japan, assignors to Sankyo Company Ltd., Tokyo, Japan

Continuation of Ser. No. 183,153, Sep. 2, 1980, abandoned, which is a continuation of Ser. No. 957,100, Nov. 3, 1978, abandoned. This application Aug. 30, 1982, Ser. No. 412,806

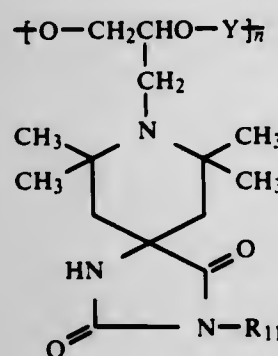
Claims priority, application Japan, Nov. 8, 1977, 52-133776

Int. Cl.<sup>3</sup> C08K 5/16

U.S. Cl. 524-102

7 Claims

1. A synthetic polymeric material composition containing from 0.01 to 5 percent by weight of a stabilizer to stabilize it against photo- and thermal-deterioration, the stabilizer comprising a polymer having the formula



wherein

Y represents a saturated aliphatic diacyl group having from 4 to 12 carbon atoms, a benzenedicarbonyl group, a cyclohexanedicarboxyl group, a 4-cyclohexene-1,2-dicarboxyl group, a 3-(or 4-methyl-4-cyclohexene-1,2-dicarboxyl group or a 5-norbornene-2,3-dicarboxyl group,

(1) R<sub>11</sub> represents an alkyl group having from 1 to 12 carbon atoms, a group of formula  $-CH_2CH_2OR_{18}$  (in which R<sub>18</sub> represents an alkanoyl group having from 2 to 12 carbon atoms, a benzoyl group or a 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionyl group), and  
n is an integer of from 2 to 50.

4,413,077

#### OLIGOMERIC AROMATIC POLYPHOSPHITES

Leo L. Valdiserri, Belpre, Ohio, and Ingenuin Hechenbleikner, West Cornwall, Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

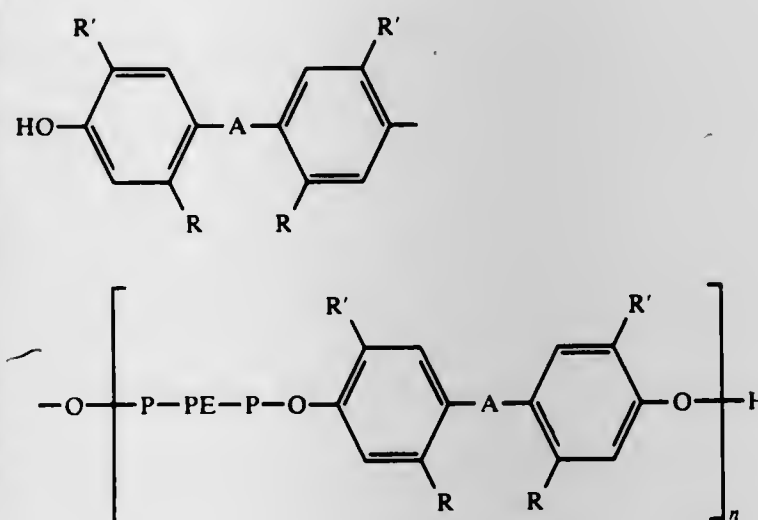
Filed Jun. 22, 1981, Ser. No. 275,575

Int. Cl.<sup>3</sup> C07F 9/15; C08K 5/52

U.S. Cl. 524-120

10 Claims

1. An oligomeric, phenol-free, polyphosphite conforming to the structural formula:



where R is methyl or hydrogen R' is a tertiary alkyl, cycloalkyl or phenylalkyl group of 4-10 carbon atoms, A is alkylidene or sulfur, PE is a pentaerythritol residue and n is at least 2.

4. A polymer composition comprising a major proportion of a polymer normally subject to deterioration at elevated temperatures and a minor proportion effective to inhibit such deterioration of the composition of claim 1.

4,413,078

#### LIGHT-STABLE POLYOLEFINS

Elyse B. Lewis, Williamstown, W. Va., and Leo L. Valdiserri, Belpre, Ohio, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

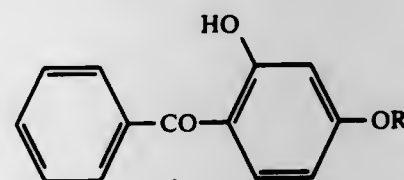
Filed May 7, 1982, Ser. No. 375,946

Int. Cl.<sup>3</sup> C08K 5/13, 5/52

U.S. Cl. 524-120

8 Claims

1. A light-stable olefin polymer composition comprising in combination an olefin polymer and minor proportions sufficient to improve the light-stability of said olefin polymer of each of (a) a hydroxybenzophenone having the structure



where R is an alkyl group of 1-10 carbon atoms, and (b) a bis-(dialkylphenyl)pentaerythritol diphosphite where the alkyl groups each contain 3-9 carbon atoms.

4,413,079

#### POWDER ENAMELS FREE OF BLOCKING AGENTS

Josef Disteldorf, Rainer Gras, and Horst Schnurbusch, all of Herne, Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,709

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030588

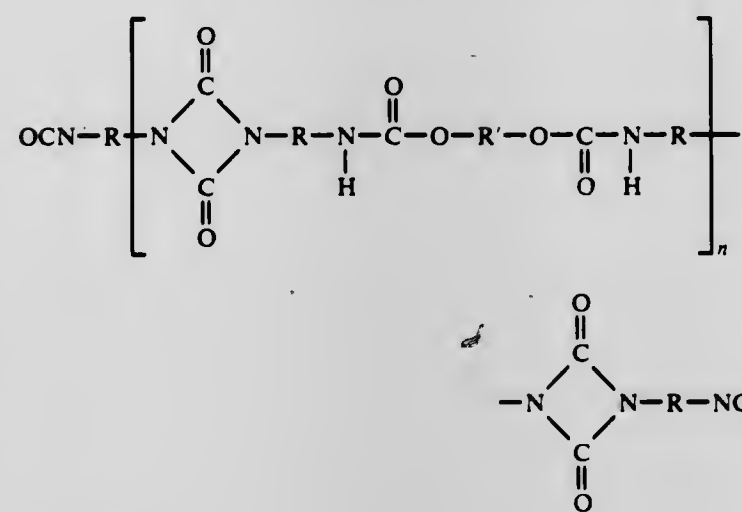
Int. Cl.<sup>3</sup> C08L 75/00

U.S. Cl. 524-169

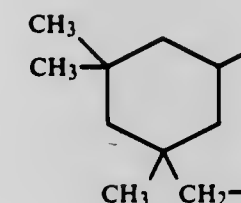
11 Claims

1. A storage-stable polyurethane powder enamel comprising a mixture of:

(a) an adduct of a uretidinedione dimer of isophorone diisocyanate and a diol having the following formula



wherein: R =



n ≥ 1, and

R' = a divalent aliphatic, cycloaliphatic, araliphatic, or aromatic hydrocarbon radical, which is the residue of the diol,

wherein the ratio of NCO to OH groups in the formation of said adduct is from 1:0.5 to 1:0.9, the mole ratio of uretidinedione to diol is from 2:1 to 6:5, the content of free isocyanate groups in said adduct is not greater than 8% by weight, and said adduct has a molecular weight between 500 and 4000 and a melting point between 70° C. and 130° C., and

(b) a polyol having an OH-functionality of 2.2 to 3.5, an average molecular weight of 2000 to 4500, a hydroxyl number of 30 to 100 mg KOH/g, a viscosity of <80,000 mPa.s at 160° C. and a melting point between 65° C. and 120° C.,

wherein the proportions of (a) and (b) are chosen so that the ratio of NCO groups in said adduct to OH groups in said polyol is between 0.8:1 and 1.2:1.

4,413,080

#### WATER-DISPERSIBLE PRESSURE-SENSITIVE ADHESIVE AND TAPE MADE THEREWITH

Frederick D. Blake, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Jun. 21, 1982, Ser. No. 390,638

Int. Cl.<sup>3</sup> C09J 3/26, 5/02, 7/04

U.S. Cl. 524-187

7 Claims

1. Normally tacky and pressure-sensitive water-dispersible adhesive comprising the blended reaction product of

(a) 100 parts by weight of a copolymer of monomers consisting essentially of

(1) about 75-85 weight percent of at least one monomeric acrylic acid ester of nontertiary alkyl alcohol, and, correspondingly,

(2) about 25-15 weight percent of vinyl carboxylic acid, (b) about 35-100 parts by weight of acidic rosin or rosin derivative,

(c) sufficient potassium hydroxide to neutralize about 30-45% of the combined carboxyl groups of the copolymer and rosin or rosin derivative,

(d) sufficient sodium hydroxide, lithium hydroxide, or a combination of sodium and lithium hydroxide to neutralize about 20-45% of said carboxyl groups, and

(e) about 100-225 parts by weight of oily plasticizing water-soluble polyoxyethylene compound.

4,413,081

#### POLYMER STABILIZATION

Ronald D. Mathis, and Jerry O. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 1, 1983, Ser. No. 462,848

Int. Cl.<sup>3</sup> C08K 5/39

U.S. Cl. 524-202

12 Claims

1. A polymer composition exhibiting improved heat stability comprising a major amount of an arylene sulfide polymer containing a small effective stabilizing amount sufficient to retard polymer curing and cross-linking of at least one Group 8 metal dihydrocarbyldithiocarbamate.

4,413,082

#### WATER-SOLUBLE, PRESSURE SENSITIVE, SELF-ADHESIVE COMPOSITIONS AND ARTICLES MADE THEREWITH

Peter Gleichenhagen, and Ingrid Wesselkamp, both of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,901

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105894

Int. Cl.<sup>3</sup> C08K 5/17

U.S. Cl. 524-243

13 Claims

1. A water-soluble, pressure-sensitive self-adhesive composition comprising based on 100 parts by weight of solids,

(a) 30 to 80 parts by weight of a copolymer comprising (i) 70 to 88% by weight acrylic acid butyl ester, and (ii) 12 to 30% by weight vinyl carboxylic acid wherein (i) may be substituted in an amount of 3 to 12 weight % by acrylic acid-2-ethylhexyl ester and/or 5 to 25 weight % by a mixture of vinyl acetate and fumaric or maleic acid dialkyl ester, and

(b) 20 to 70 parts by weight of a water soluble plasticizer taken from the class consisting of ethoxylated phenols, ethoxylated alkyl phenols, ethoxylated alkyl mono- or diamines and ethoxylated alkyl ammonium compounds, wherein said (ii) is substantially completely neutralized with KOH.

4,413,083

#### POLYARYLENE SULPHIDE COMPOSITIONS

Glyndwr J. Davies, Southall, England, assignor to The Glacier Metal Company Limited, Wembley, England

PCT No. PCT/GB81/00125, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00152, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 2, 1981, Ser. No. 359,664

Claims priority, application United Kingdom, Jul. 4, 1980, 8022067

Int. Cl.<sup>3</sup> C08K 5/09

U.S. Cl. 524-299

9 Claims

1. A composition of matter comprising polyarylene sulphide



having a molecular weight in the range of between 5,000 and 17,500, intimately admixed with an aryl ester of an aryl alcohol in an amount sufficient to solvate said polyarylene sulphide.

4,413,084

# PAINT COMPOSITION COMPRISING HYDROXY FUNCTIONAL FILM FORMER AND IMPROVED STABILIZED FLOW CONTROL ADDITIVE

Stanley K. Horvath, Rochester, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 199,776, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,794, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,805, Oct. 23, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,843

Int. Cl.<sup>3</sup> C08F 255/06; C08G 12/32; C08L 61/28; C09D 3/52 U.S. Cl. 524—315 26 Claims

1. A coating composition comprising:  
(I) a film forming component comprising hydroxy functional copolymer having a number average molecular weight ( $M_n$ ) of from greater than about 150 up to about 20,000 and a glass transition temperature ( $T_g$ ) ranging from between about  $-25^\circ\text{C}$ . and about  $70^\circ\text{C}$ ., said copolymer being formed from about 5 to about 50 weight percent of hydroxy functional monoethylenically unsaturated monomers and between about 95 and about 50 weight percent of other monoethylenically unsaturated monomers;  
(II) crosslinking agent selected from amino compounds and isocyanate compounds; and  
(III) a flow control additive in an amount ranging from about 0.5 to about 30 parts of resin solids in said flow control additive per 100 parts of total resin solids in said composition, said flow control additive comprising a stable, crosslinked dispersion containing microgel particles, said dispersion  
(i) being formed by addition polymerization of (a) between about 1 and about 10 mole percent each of first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other and (b) between about 98 and about 80 mole percent of at least one other monoethylenically unsaturated monomer in the presence of: (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer comprising the reaction product of ethylenically unsaturated monomers (A) and copolymer reactant (B), said ethylenically unsaturated monomers (A) bearing functionality capable of condensation reaction with complementary functionality of said copolymer reactant (B) which comprises a random copolymer of  
(x) between about 20 and about 45 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially insoluble in said organic liquid,  
(y) between 40 and about 75 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially soluble in said organic liquid; and  
(z) between about 2 and about 15 weight percent of ethylenically unsaturated monomers bearing said complementary functionality capable of condensation reaction with said ethylenically unsaturated monomers (A), said ethylenically unsaturated monomers (A) being reacted with said copolymer reactant (B) in an amount sufficient to react with at least about 10 percent of said complementary functionality of said copolymer reactant (B), wherein said addition polymerization is carried out at elevated temperature such that the dispersion polymer is first formed and then crosslinked; and  
(ii) being stabilized further by inclusion therein of a further stabilizer which, except for solvent, consists essentially of butylated melamine formaldehyde resin having a number average molecular weight in the range of about 700 to about 2,500, said further stabilizer being included in said

crosslinked dispersion in an amount ranging from about 25 to about 75 parts of resin solids per 100 parts of total resin solids in said crosslinked dispersion.

4,413,085

# STORAGE STABLE POLYOLEFIN COMPATIBLE NON-CROSSLINKING SIZE FOR FIBER GLASS STRANDS

Chester S. Temple, McKees Rocks, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 191,792, Sep. 29, 1980, abandoned, which is a division of Ser. No. 935,275, Aug. 21, 1978, Pat. No. 4,248,935. This application Dec. 10, 1981, Ser. No. 329,442 The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 5/09

U.S. Cl. 524—321

8 Claims

1. An aqueous sizing composition to provide storage, stable glass fiber strands, consisting essentially of: coupling agents, surfactant, softener, ethylenically unsaturated carboxylic acid or anhydride stabilizer in an amount of about 1 to about 15 percent by weight of the solids of the sizing composition, a maleonated or acrylic modified polypropylene lubricant, and a non-crosslinkable homopolymer film forming polymer selected from the group consisting of epoxies, polyesters, polyurethanes, polyvinyl acetates, polyvinyl alcohols and acrylics, and water in an amount of about 80 to about 99 percent of the aqueous composition.

4,413,086

# COATING COMPOSITIONS CONTAINING ORGANOSILANE-POLYOL

Wen-Hsuan Chang, Gibsonia, Pa.; Kyu-Wang Lee, Danville, Calif., and John B. Saunders, Jr., Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 4, 1982, Ser. No. 354,561

Int. Cl.<sup>3</sup> C08K 5/05

U.S. Cl. 524—386

15 Claims

1. A water reducible coating composition comprising:  
A. An organosilane-polyol having a hydroxyl number equal to or greater than 70 which is a reaction product of  
(1) a hydrophilic polyol having a hydroxyl number equal to or greater than 300; and  
(2) an organosilicon material selected from the group consisting of an organosilane, a hydrolyzed and condensed organosilane, and a mixture thereof; and  
B. a curing agent for said coating composition selected from the group consisting of an aminoplast resin, a phenoxiaz resin, and a blocked polyisocyanate.

4,413,087

# STABLE POLYMER SOLUTIONS FOR SPRAY DRIFT CONTROL

Robert Bernot, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 23, 1982, Ser. No. 410,217

Int. Cl.<sup>3</sup> C08K 5/05

U.S. Cl. 524—389

4 Claims

1. A dilute solution of an acrylamide polymer having a molecular weight greater than 1,000,000 which is stable against viscosity loss reduction due to aging which comprises a major portion of water, from 0.01–3% by weight of an acrylamide polymer, and from 0.1–5% by weight of a water-soluble monohydric alcohol which contains from 1–3 carbon atoms.  
3. A dilute solution of a high molecular weight acrylamide polymer which is stable against viscosity loss reduction due to aging which comprises a major portion of water, from 0.01–3% by weight of a high molecular weight acrylamide polymer, and from 0.1–5% by weight of a water-soluble monohydric alcohol which contains from 1–3 carbon atoms.

4,413,088

# SILICONE RESIN COATING COMPOSITION ESPECIALLY SUITED FOR PRIMERLESS ADHESION TO CAST ACRYLICS

Robert B. Frye, Menands, N.Y., assignor to General Electric Co., Waterford, N.Y.

Continuation-in-part of Ser. No. 964,911, Nov. 30, 1978, Pat. No. 4,277,287. This application Apr. 27, 1979, Ser. No. 34,164 Int. Cl.<sup>3</sup> C08K 5/06, 5/32, 5/54; C08L 83/00

U.S. Cl. 524—714

21 Claims

1. An aqueous coating composition comprising:  
(i) a dispersion of colloidal silica in an aqueous-organic solvent solution of the partial condensate of a silanol of the formula  $\text{RSi}(\text{OH})_3$ , wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being  $\text{CH}_3\text{Si}(\text{OH})_3$ , wherein said organic solvent comprises aliphatic alcohol and a mixture of water miscible polar solvents which are aggressive to plastic in an amount sufficient to etch plastic; and  
(ii) a small amount effective to control flow of a polysiloxane polyether copolymer;  
said composition containing 10 to 40% solids, said solids consisting essentially of 10 to 70 weight % colloidal silica and 30 to 90 weight % of the partial condensate and wherein said composition has a pH of from 7.1 to about 7.8.

4,413,089

# USE OF IRON OXIDE PIGMENTS IN A POLYMETHYL METHACRYLATE ARTICLE

Francis M. Gavin, Chadds Ford, and Anne M. Kruglewicz, Aston, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1982, Ser. No. 356,717

Int. Cl.<sup>3</sup> C08K 3/10

U.S. Cl. 524—785

1 Claim

1. In a process for preparing a filled polymethyl methacrylate article, said article consisting essentially of 20 to 85% by weight alumina trihydrate and 15 to 80% by weight polymethyl methacrylate and having properties of translucency and an appearance of visual depth, said process comprising curing a polymerizable composition consisting essentially of polymerizable methyl methacrylate and alumina trihydrate, the improvement whereby a dispersion of iron oxide pigments having a particle size of 10 microns or less is prepared and blended thoroughly with said polymerizable composition prior to curing, whereby upon curing said article has properties of uniform color in addition to maintaining said properties of translucency and an appearance of visual depth.

4,413,090

# CYANOETHYLATED OLEFIN-VINYL ALCOHOL COPOLYMER AND DIELECTRIC MATERIAL AND ADHESIVE COMPRISING THE SAME

Masubiro Sboji, Teruo Sakagami, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,031

Claims priority, application Japan, Apr. 6, 1981, 56-50516; Apr. 7, 1981, 56-51243

Int. Cl.<sup>3</sup> C08F 8/30

U.S. Cl. 525—59

5 Claims

1. A cyanoethylated olefin-vinyl alcohol copolymer containing 10 to 70 mol percent olefin content, wherein the olefin has from 2 to 4 carbon atoms.

4,413,091

# PHOTOSENSITIVE POLYMER AND PHOTOSENSITIVE MATERIAL FOR PHOTOMECHANICAL PROCESS

Hidekazu Iwasaki, Samukawa; Yukio Urata, Hino, and Shunichi Kasukawa, Yamato, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

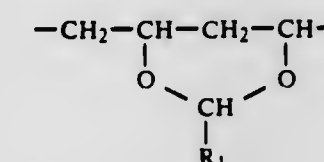
Filed Dec. 31, 1981, Ser. No. 336,058

Claims priority, application Japan, Jan. 20, 1981, 56-005910 Int. Cl.<sup>3</sup> C08F 8/30

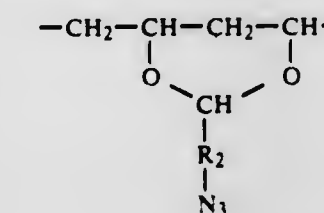
U.S. Cl. 525—61

14 Claims

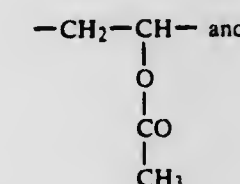
1. A polyvinyl alcohol derivative characterized as being a solid at ambient temperature and composed of a recurring structural unit comprising  
(a) from 5 to 40% by mole of a structural unit represented by the general formula



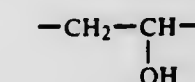
- in which  $\text{R}_1$  is a hydrogen atom or an alkyl group;  
(b) from 5 to 35% by mole of a structural unit represented by the general formula



- in which  $\text{R}_2$  is an aryl group;  
(c) from 1 to 45% by mole of a structural unit represented by the formula



- and  
(d) from 1 to 60% by mole of a structural unit represented by the formula



4,413,092

# VINYL HALIDE POLYMER BLENDS OF ENHANCED IMPACT RESISTANCE

Gilbert Witschard, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 92,119, Nov. 7, 1979, abandoned, which is a continuation of Ser. No. 901,913, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,226, Mar. 31, 1978, Pat. No. 4,192,828, which is a continuation-in-part of Ser. No. 881,949, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 172,929, Jul. 28, 1980, Pat. No. 4,319,002. This application Feb. 24, 1982, Ser. No. 351,792

Int. Cl.<sup>3</sup> C08L 27/06, 53/02, 55/02

U.S. Cl. 525—71

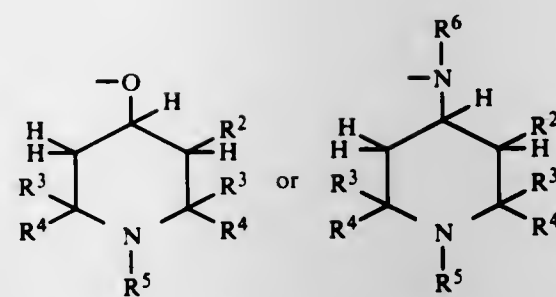
14 Claims

1. In a vinyl halide polymer composition which is capable of being molded to an impact resistant article and which com-

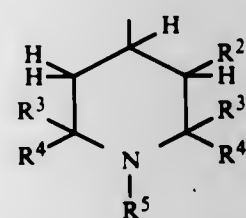


prises a blend of a vinyl halide polymer wherein the major proportion of the monomer units are vinyl halide monomer residues and an acrylonitrile-1,3-butadiene-styrene polymeric impact modifier for polyvinyl halide, said modifier comprising (1) a mixture of a copolymer of styrene and acrylonitrile with a minor amount of a copolymer of acrylonitrile and 1,3-butadiene, or (2) a mixture of a copolymer of styrene and acrylonitrile with a minor amount of a graft of said styrene-acrylonitrile copolymer onto poly-1,3-butadiene,

the improvement wherein the blend also comprises a block thermoplastic elastomer wherein the major proportion of the monomer units are residues of (1) a mono-alkenyl-substituted aromatic compound of the benzene or naphthalene series of 8 to 20 carbon atoms and (2) a conjugated alkadiene hydrocarbon of 4 to 10 carbon atoms, said block elastomer being normally incompatible with said vinyl halide polymer, said vinyl halide polymer being present in a proportion of about 50 to about 99 weight percent in said blend, and said acrylonitrile-1,3-butadiene-styrene polymeric modifier and said block elastomer together being present in a proportion of about one to about 50 weight percent in said blend.



wherein R<sup>2</sup> represents hydrogen, C<sub>1</sub>-C<sub>8</sub> alkyl, or benzyl; R<sup>3</sup> and R<sup>4</sup> independently represent C<sub>1</sub>-C<sub>8</sub> alkyl, benzyl or phenethyl, or together with the carbon to which they are attached form a C<sub>5</sub>-C<sub>10</sub> cycloalkyl; and R<sup>5</sup> represents hydrogen, C<sub>2</sub>-C<sub>3</sub> hydroxylalkyl, C<sub>1</sub>-C<sub>8</sub> alkyl, hydroxyl, or oxyl; R<sup>6</sup> represents hydrogen, C<sub>1</sub>-C<sub>8</sub> alkyl, or the group



Y and Y', which may be the same, or different, represent oxy, or

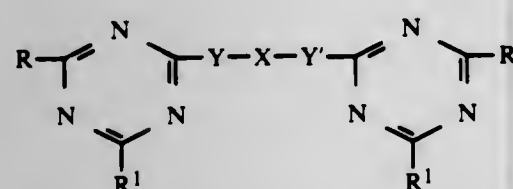


X represents C<sub>2</sub>-C<sub>12</sub> alkylene, wherein the alkylene chain may be interrupted by an oxo, thio or

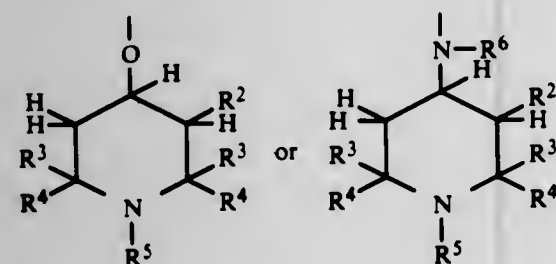


radical, C<sub>5</sub>-C<sub>10</sub> cycloalkylene,

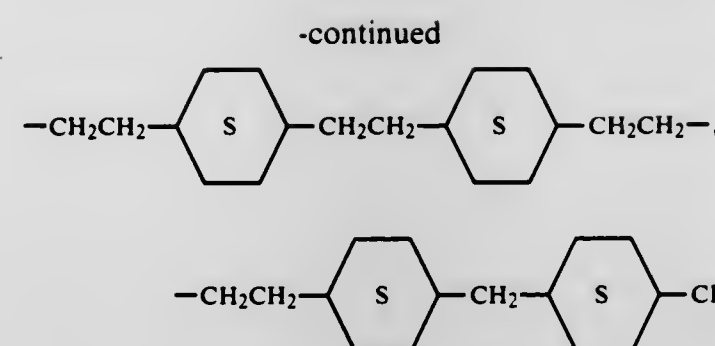
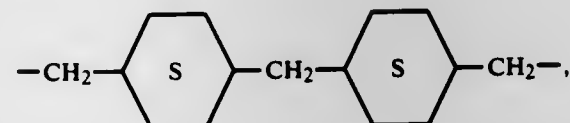
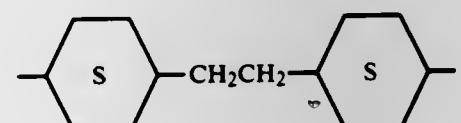
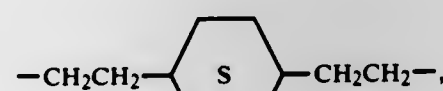
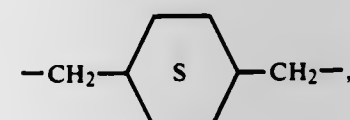
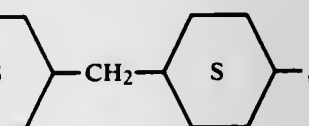
(I)



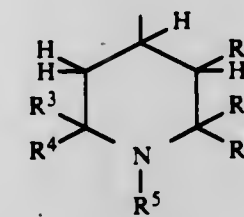
wherein R represents C<sub>3</sub>-C<sub>1</sub> alkenyloxy, C<sub>3</sub>-C<sub>6</sub> alkenylamino, or di(C<sub>3</sub>-C<sub>6</sub> alkenyl)amino; R<sup>1</sup> represents C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> alkoxy, halo, C<sub>1</sub>-C<sub>8</sub> alkylthio, C<sub>3</sub>-C<sub>6</sub> alkenyloxy, amino, C<sub>3</sub>-C<sub>6</sub> alkenylamino, di(C<sub>3</sub>-C<sub>6</sub> alkenyl)amino, the groups



C<sub>1</sub>-C<sub>18</sub> alkylamino, di(C<sub>1</sub>-C<sub>18</sub>)alkylamino, morpholino, pyrrolidyl, piperidino, a substituted C<sub>1</sub>-C<sub>18</sub> alkylamino, or a substituted di(C<sub>1</sub>-C<sub>18</sub>)alkylamino, wherein the substituents are selected from amino, cyano, carboxy, alkoxy, carbonyl wherein the alkoxy moiety has 1 to 8 carbon atoms, and the group



C<sub>6</sub>-C<sub>12</sub> arylene, or C<sub>8</sub>-C<sub>14</sub> aralkylene; with the proviso that at least one substituent in said compound is, or contains,



**4,413,094**  
**PERFLUOROELASTOMER BLENDS**  
Carl A. Aufdermarsh, Jr., Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.  
Filed Sep. 29, 1982, Ser. No. 427,412  
Int. Cl.<sup>3</sup> C08L 27/18, 71/00

U.S. Cl. 525-187 8 Claims  
1. A co-vulcanizable fluoroelastomer blend consisting essentially of

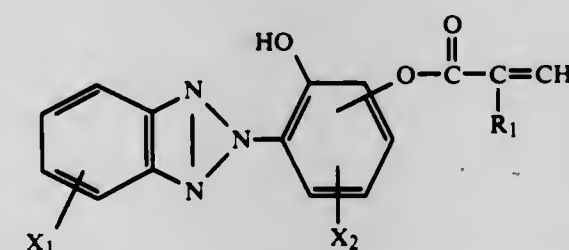
- (a) 50-95 weight percent of at least one tetrafluoroethylene/perfluoro(methylvinyl ether)/cure-site monomer terpolymer and
  - (b) 5-50 weight percent of at least one hexafluoropropylene oxide/cure-site monomer dipolymer,
- wherein the reactive functional group of the cure-site monomer in the terpolymer is the same as in the dipolymer and is selected from the group consisting of -C<sub>6</sub>F<sub>5</sub> and -CN.

**4,413,095**  
**VINYLDENE FLUORIDE RESIN-BASED SHAPED PRODUCT**

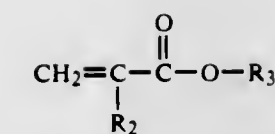
Toshiya Mizuno, and Naohiro Murayama, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,436  
Claims priority, application Japan, Nov. 20, 1981, 56-186234  
Int. Cl.<sup>3</sup> C08L 27/16, 33/08, 33/14

U.S. Cl. 525-199 9 Claims  
1. A vinylidene fluoride resin-based shaped product of a composition comprising 100 parts by weight of a vinylidene fluoride resin and from 1 to 200 parts by weight of a copolymer comprising a monomer (A) having the formula:

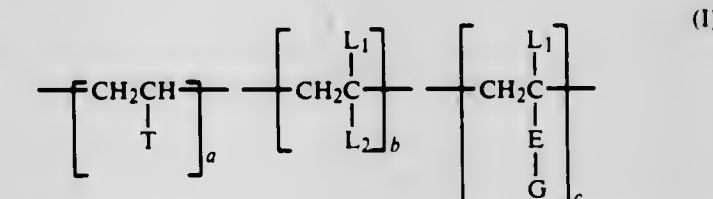


wherein R<sub>1</sub> is H or CH<sub>3</sub>, and X<sub>1</sub> and X<sub>2</sub> are each a saturated hydrocarbon group containing from 1 to 4 carbon atoms, H or halogen and a monomer (B) having the formula:

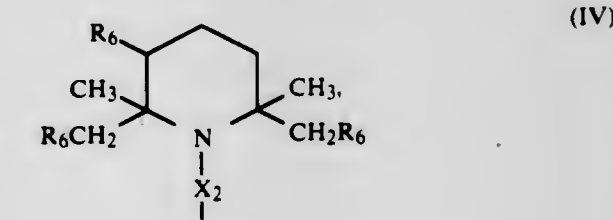
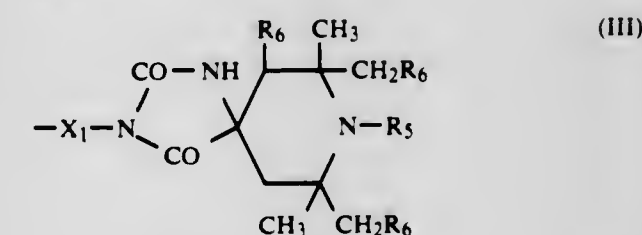
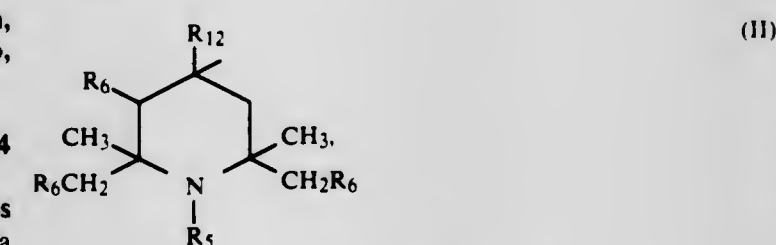


wherein R<sub>2</sub> is H or CH<sub>3</sub> and R<sub>3</sub> is a saturated hydrocarbon group containing from 1 to 5 carbon atoms, the molar ratio of the monomer (A) to the monomer (B) being not more than 1, and the monomer (A) which is a constituent unit of said copolymer being present in a quantity of at least 1 × 10<sup>-4</sup> moles per square meter of light-receiving area of said shaped product.

**4,413,096**  
**α-OLEFIN COPOLYMERS CONTAINING PENDANT HINDERED AMINE GROUPS**  
Frank T. Fu, Taipei, Taiwan, and Roland A. E. Winter, Armonk, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Continuation-in-part of Ser. No. 253,484, Apr. 13, 1981, abandoned. This application Jan. 26, 1982, Ser. No. 342,876  
Int. Cl.<sup>3</sup> C08L 75/04, 39/04, 77/00  
U.S. Cl. 525-204 20 Claims  
1. An α-olefin copolymer having recurring structural units, joined in essentially a random fashion, of the formula I

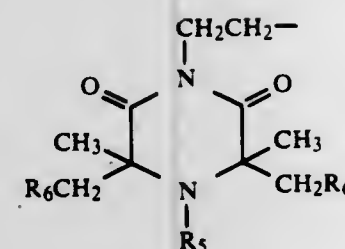
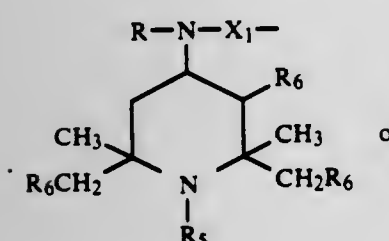
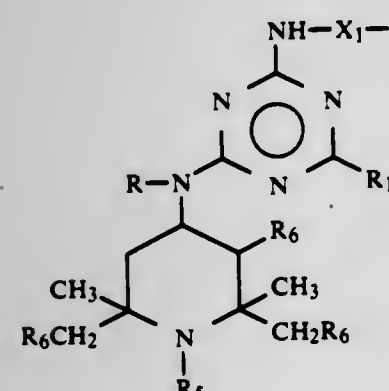
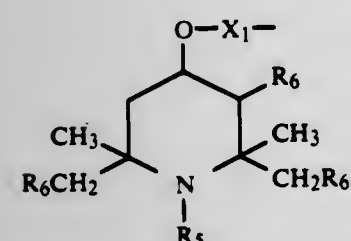
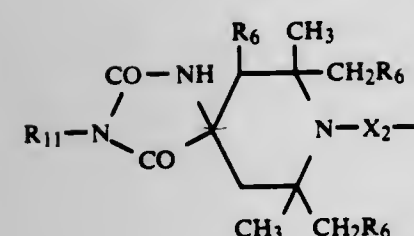


wherein  
T is hydrogen, alkyl of 1 to 18 carbon atoms or mixtures thereof,  
L<sub>1</sub> is hydrogen or methyl,  
L<sub>2</sub> is hydroxyl, -OCOCH<sub>3</sub> or -COOL<sub>3</sub>,  
L<sub>3</sub> is hydrogen or alkyl of 1 to 6 carbon atoms,  
E is -COO-, -OCO-, -O- or -CONR-,  
R is hydrogen, alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 12 carbon atoms, cyclohexyl, hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 2 to 10 carbon atoms or dialkylaminoalkyl of 3 to 12 carbon atoms,  
G is a group containing an N-heterocyclic ring of the formula

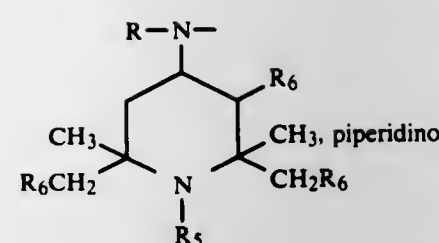




-continued



in which  $R_5$  is hydrogen, oxyl,  $C_1$ - $C_{18}$  alkyl,  $C_3$ - $C_8$  alkenyl,  $C_3$ - $C_6$  alkynyl,  $C_7$ - $C_{12}$  aralkyl,  $-\text{CH}_2\text{CN}$ ,  $C_2$ - $C_{21}$  alkoxyalkyl, an aliphatic acyl group having 1-4 carbon atoms or one of the groups  $-\text{CH}_2\text{COOR}_7$  or  $-\text{COOR}_8$  in which  $R_7$  is  $C_1$ - $C_{12}$  alkyl,  $C_3$ - $C_8$  alkenyl, phenyl,  $C_7$ - $C_8$  aralkyl or cyclohexyl, and  $R_8$  is  $C_1$ - $C_{12}$  alkyl, phenyl, benzyl or cyclohexyl, and  $R_6$  is hydrogen or  $C_1$ - $C_4$  alkyl and  $X_1$  is  $C_3$ - $C_{12}$  alkylene,  $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$  or a group of the formula  $-\text{CH}(\text{R}_{10})-\text{CH}_2-$  (VI), in which  $R_{10}$  is hydrogen, methyl, ethyl, phenoxyethyl or phenyl, and  $X_2$  is a group of the formula VI, in which  $R_{10}$  is as defined above, or a group of the formula  $-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-$  (VII),  $R_{11}$  is  $C_1$ - $C_{18}$  alkyl or cyclohexyl, phenyl or benzyl which are unsubstituted or substituted by  $C_1$ - $C_4$  alkyl or  $C_1$ - $C_4$  alkoxy,  $R_1$  is alkoxy of 1 to 12 carbon atoms, phenoxy,



(V)

or  $\text{NR}_2\text{R}_3$  where  $R_2$  and  $R_3$  are hydrogen, alkyl of 1 to 12 carbon atoms, cyclohexyl or benzyl,  $R_{12}$  is hydrogen or hydroxyl, with the proviso that, when  $R_{12}$  is hydroxyl, E is  $-\text{OCO}-$ ,

$a+b+c=4$  to 2600

$a=2$  to 2400

$b=0$  to 198

$c=2$  to 200

$a/a+b+c=0.50$  to 0.99

$b/a+b+c=0$  to 0.49, and

$c/a+b+c=0.01$  to 0.50.

4,413,097

#### POLYMER COMPOSITIONS OF LDPE AND E/P COPOLYMER

Kazuo Matsuura, Tokyo; Noboru Yamaoka; Shinichi Yanahashi, both of Yokohama; Katumi Usui, Yokosuka, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

Continuation-in-part of Ser. No. 257,647, Apr. 27, 1981, abandoned. This application Apr. 20, 1982, Ser. No. 370,272 Claims priority, application Japan, Apr. 30, 1980, 55-56363 Int. Cl.<sup>3</sup> C08L 23/16, 23/06

U.S. Cl. 525-240

5 Claims

1. A polymer composition having a melt index of 0.01 to 5.0 and a density of 0.870 to 0.940, said polymer composition comprising a blend of:

- (1) 30 to 80 parts by weight of an ethylene/propylene copolymer having an intrinsic viscosity determined in decalin at 135° C. of 5.0 to 10 dl/g and a density in the range of from 0.850 to 0.930 which copolymer is obtained by copolymerizing ethylene with propylene in a substantially liquid solvent-free vapor phase condition and in the presence of a catalyst comprising a solid substance and an organoaluminum compound, said solid substance containing magnesium and titanium and/or vanadium, and
- (2) 70 to 20 parts by weight of a high-pressure process polyethylene having an intrinsic viscosity determined in decalin at 135° C. of not higher than 0.7 dl/g and a density of 0.915 to 0.935.

4,413,098

#### ISOPRENE-BUTADIENE COPOLYMER RUBBER HAVING IMPROVED PROCESSING PROPERTIES

Yasuo Hattori; Takeshi Ikematu, both of Yokohama; Toshio Ibaragi, Kawasaki, and Makoto Honda, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 61,248, Jul. 27, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,787

Claims priority, application Japan, Aug. 18, 1978, 53-100006 Int. Cl.<sup>3</sup> C08F 297/04, 236/08, 236/10

U.S. Cl. 525-314

4 Claims

1. An isoprene-butadiene copolymer rubber having improved processing properties which comprises a microstructure of the butadiene portion having from 70% to 90% of trans-1,4 linkage and from 2% to 8% of vinyl linkage, an isoprene content of from 3 to 25 wt %, and a styrene content of from 0 to 30 wt %, said copolymer rubber having a Mooney Viscosity of from 30 to 150, and a molecular weight distribution,  $M_w/M_n$  of from 1.2 to 3.5, said rubber, in the uneloned

gated state, not exhibiting a melting point measured by the differential scanning calorimeter analysis method.

4. The isoprene-butadiene copolymer rubber as claimed in claim 1 or 2, wherein the isoprene is substantially block copolymerized.

4,413,099

#### POLYMER COMPOSITION AND PROCESS FOR PREPARING SAME

Edward E. Sowers, Mooresville; Gerald L. Goe, Greenwood, and Michael L. Prunier, Greenfield, all of Ind., assignors to Reilly Tar & Chemical Corp., Indianapolis, Ind.

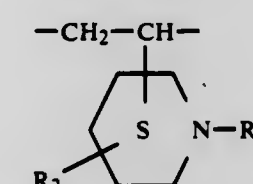
Filed Sep. 10, 1981, Ser. No. 301,040

Int. Cl.<sup>3</sup> C08F 8/04

U.S. Cl. 525-327.1

46 Claims

1. A polymer composition comprised substantially of monomeric units having the formula



or its acid salt, wherein:

$R_1$  is an alkyl group having from 1 to about 20 carbon atoms or an arylalkyl group having from 7 to about 12 carbon atoms; and

$R_2$  is hydrogen or an alkyl group having from 1 to about 10 carbon atoms.

4,413,100

#### ALKYLATED METHYLOL MELAMINE RESIN CONDENSATE COMPOSITIONS HAVING LOW FORMALDEHYDE RELEASE

William F. Herbes, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 429,901

Int. Cl.<sup>3</sup> C08G 6/00; C08L 61/02

U.S. Cl. 525-398

1 Claim

1. A methylated methylol melamine resin condensate composition exhibiting reduced release of formaldehyde when textile materials treated therewith are exposed to elevated temperatures, which comprises a methylated methylol melamine resin condensate represented by the empirical formula:



wherein M represents a melamine moiety, F represents a formaldehyde moiety and Me represents a methyl group moiety, and from about 5 to about 30 percent by weight, based on the resin solids content of said condensate, of urea.

4,413,101

#### THERMOPLASTIC POLYURETHANE COMPOSITIONS OF IMPROVED FLAME RETARDANCE

Manfred Schmidt, Krefeld, Fed. Rep. of Germany, and Robert P. Yeater, Moundsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

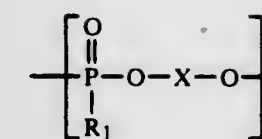
Filed Nov. 6, 1981, Ser. No. 318,730

Int. Cl.<sup>3</sup> C08F 283/00

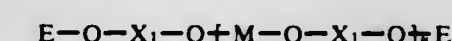
U.S. Cl. 525-440

5 Claims

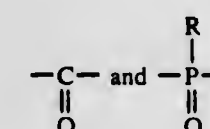
1. A thermoplastic molding composition comprising thermoplastic polyurethane and a high molecular weight resin selected from the group consisting of polyarylphosphonate and polyarylphosphonate carbonate wherein said polyarylphosphonate is characterized by the recurring structural units



wherein  $R_1$  is  $C_6$ - $C_{30}$  aryl and X is an aromatic residue of a dihydroxy compound and wherein said polyarylphosphonate carbonate is characterized by the recurring structural units



wherein E denotes H or  $-\text{M}-\text{O}-\text{Ar}$  and where Ar is a  $C_6$ - $C_{14}$  aryl radical and M denotes



having a molar ratio of between 5:95 to 95:5 and R denotes a  $C_6$  to  $C_{30}$  aryl and  $X_1$  denotes a residue of a dihydroxy compound.

4,413,102

#### COMPOSITION FOR PROTECTING CEMENTWARE FROM FROST-DAMAGE COMPRISING URETHANE RESIN AND ORGANOPOLYSILOXANE

Michio Tanaka, Takatsuki; Kohji Nasu, and Tetsuaki Kanemoto, both of Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 133,291, Mar. 24, 1980, Pat. No. 4,330,595. This application Jan. 28, 1982, Ser. No. 344,080

Claims priority, application Japan, Mar. 26, 1979, 54-35791

Int. Cl.<sup>3</sup> C08L 75/04

U.S. Cl. 525-453

7 Claims

1. A composition for protecting cementware from frost-damage, which comprises a moisture-cure type urethane resin coating and a web-like or three-dimensionally structured organopolysiloxane compound represented by the rational formula



wherein R is alkyl of not less than 4 carbon atoms or hydroxy-alkyl of about 0.5 to 50 parts by weight relative to 100 parts by weight of resin portion in the urethane resin coating.

4,413,103

#### HALOGEN-CONTAINING POLYCARBONATE RESIN AND PROCESS FOR PRODUCING SAME

Kohyama Katsuhisa; Nakamura Katsuhiko, and Matsuno Akira, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 25, 1982, Ser. No. 352,187

Claims priority, application Japan, Mar. 20, 1981, 56-41079

Int. Cl.<sup>3</sup> C08L 69/00; C08G 63/62

U.S. Cl. 525-469

13 Claims

1. A halogen-containing polycarbonate resin formed by copolymerizing an admixture of monomers consisting essentially of the following oligomers (a) and (b) in the presence of caustic alkali, an organic solvent, water and in the substantial absence of residual bisphenol A and in the absence of added bisphenol A;

- (a) 10 to 85 parts by weight of a polycarbonate oligomer with terminal groups consisting of chloroformate groups or chloroformate groups plus hydroxyl groups less in a molar amount than the chloroformate groups, having a number average molecular weight of 500 to 10,000 and



containing no aromatic halogen or less than 4% by weight of aromatic halogen, and  
 (b) constituting the balance for a total of 100 parts by weight of oligomer, an aromatic halogen-containing polycarbonate oligomer with terminal groups consisting of chloroformate groups or chloroformate groups plus hydroxyl groups less in a molar amount than the chloroformate groups, having a number average molecular weight of 1,000 to 10,000 and containing 6 to 30% by weight of aromatic halogen.

4,413,104

# PROCESS FOR PREPARING ORGANOPOLYSILOXANES AND COPOLYMERS THEREOF

Bernward Deubzer, Burghausen; Norbert Egarter, Emmerting, and Volker Frey, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,140

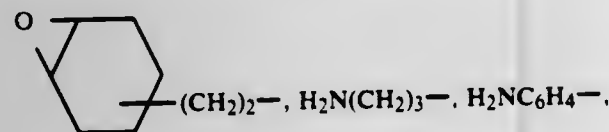
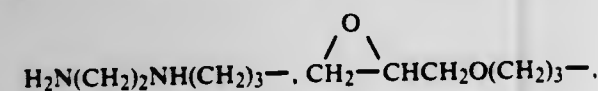
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106186

Int. Cl.<sup>3</sup> C08F 283/00

U.S. Cl. 525-479

9 Claims

5. A process for preparing a modified organopolysiloxane polymer which comprises copolymerizing a monomer or polymer containing aliphatic double bonds with an organopolysiloxane which is obtained from the reaction of an organopolysiloxane having Si-bonded groups selected from the class consisting of hydroxyl groups, alkoxy groups and mixtures thereof and having an average of from 0.85 to 1.8 SiC-bonded radicals selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals per silicon atom and an organosilicon compound having Si-bonded groups selected from the class consisting of alkoxy groups, =Si-O-Si= groups and mixtures thereof, and at least one SiC-bonded organofunctional radical per molecule, in which the SiC-bonded organofunctional radical is selected from the group consisting of

$$\text{CH}_2=\text{CH}-, \text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{CH}_2)_3-, \text{HS}(\text{CH}_2)_3-,$$


$$\text{HO}(\text{CH}_2)_3- \text{ and } \text{Cl}(\text{CH}_2)_3-$$

in the presence of an organic solvent and a catalyst selected from the group consisting of alkali metal carbonates, alkali metal hydroxides, alkali metal alcoholates, alkali metal oxyacrylates, potassium methylsilicate and quaternary ammonium compounds at the reflux temperature of the solvent at atmospheric temperature.

4,413,105

# STABILIZED THERMOSETTABLE ETHYLENICALLY UNSATURATED EPOXY ESTER RESIN COMPOSITIONS

Raymond Koenig, Vendenheim, France, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 12, 1982, Ser. No. 377,495

Claims priority, application European Patent Office, May 15, 1981, 81-103738

Int. Cl.<sup>3</sup> C08L 61/12; C08G 283/10; C08L 63/10

U.S. Cl. 525-482

6 Claims

1. A thermosettable ethylenically unsaturated epoxy ester resin composition having improved storage stability comprising the reaction product of a bisphenol-base epoxy resin, a novolac-base epoxy resin, or mixtures thereof with an ethylenically unsaturated monocarboxylic acid dissolved in a polymer-

izable monomer containing a  $>\text{C}=\text{CH}_2$  group and an anaerobically effective polymerization selected from the group consisting of 4-chloro-2-nitrophenol, 2,4-dichloro-6-nitrophenol, and mixtures thereof.

4,413,106

# HETEROGENEOUS SULFONATION PROCESS FOR DIFFICULTLY SULFONATABLE POLY(ETHER SULFONE)

Myron J. Coplan, Natick, and Gertrud Götz, Brookline, both of Mass., assignors to Albany International Corp., Albany, N.Y.

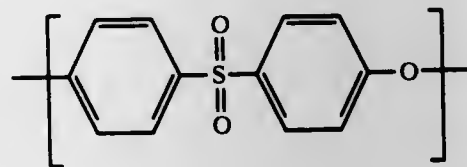
Filed Dec. 27, 1982, Ser. No. 453,162

Int. Cl.<sup>3</sup> C08G 65/48, 75/23

U.S. Cl. 525-534

3 Claims

1. A process for the sulfonation of a poly(ether sulfone) consisting essentially of repeating units of the formula:



which comprises;

providing said poly(ether sulfone) in the form of a polymer/solvent intercrystalline solid, suspended in a fluid, chlorinated hydrocarbon; and  
 sulfonating the solid form in said suspension at a temperature within the range of from  $-50^\circ$  to  $+80^\circ$  C. with a sulfonating agent in sufficient proportion to obtain a ratio of the number of sulfur atoms in the sulfonation agent to the number of sulfur atoms in the polymer, which is within the range of between 0.4:1 to 5:1.

4,413,107

# IMIDO THERMOSETTING COMPOSITIONS STORAGE-STABILIZED AGAINST RECRYSTALLIZATION OF BIS-IMIDES THEREFROM

Jean-Louis Locatelli, Vienne, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 223,715, Jan. 9, 1981, abandoned. This application Feb. 6, 1981, Ser. No. 232,253

Claims priority, application France, Jan. 9, 1980, 80 00369

Int. Cl.<sup>3</sup> C08F 26/06

U.S. Cl. 526-262

11 Claims

1. In a thermosetting composition, homogeneous at ambient temperature, and comprising the prepolymerization product obtained by reacting (i) an N,N'-diphenylene-bis-imide with (ii) at least one non-imido comonomer copolymerizable therewith, the improvement which comprises, as storage-stabilizer therefor, (iii) a bis-imide recrystallization preventing amount of an N,N'-tolylene-bis-maleimide.

4,413,108

# ANAEROBICALLY-CURING COMPOSITIONS

Edward W. Janssen, Roseville, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

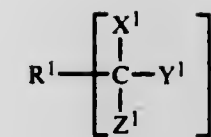
Continuation-in-part of Ser. No. 203,683, Nov. 3, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,702

Int. Cl.<sup>3</sup> C08F 20/20

U.S. Cl. 526-301

16 Claims

1. An anaerobically-curing composition comprising a first part and a second part, with at least one of said first part and said second part comprising as a major constituent a polymerizable monomer having at least one of  $\alpha,\beta$ -unsaturated carboxyl functionality per molecule of monomer, and with said first part comprising as a first initiator component a halogen-containing compound selected from the group consisting of compounds of the formula



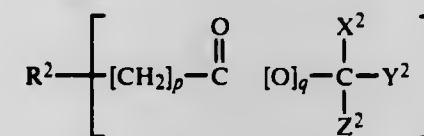
wherein:

X<sup>1</sup> is selected from the group consisting of H, CH<sub>3</sub>, Cl, and Br;

Y<sup>1</sup> and Z<sup>1</sup> are each selected independently from the group consisting of Cl and Br;

R<sup>1</sup> is selected from the group consisting of aromatic and heteroaromatic residues; and

n is an integer from 1 to 3 inclusive;  
 compounds of the formula



wherein

X<sup>2</sup> is selected from the group consisting of H, Cl, Br and CN;

Y<sup>2</sup> and Z<sup>2</sup> are each selected independently from the group consisting of Cl and Br;

R<sup>2</sup> is selected from the group consisting of —NH<sub>2</sub>, an alkyl radical comprising 1 to about 10 carbons, an aryl radical comprising 1 to about 10 carbons, a methoxy-substituted aryl radical comprising 1 to about 10 carbons and a methyl-substituted aryl radical comprising 1 to about 10 carbons;

p is 0 or 1;

q is 0 or 1; and

r is 1 or 2; and

1, trichloromethyl-cis-perhydropentalene; and

1,1,1-trichloro-2-methyl-2-propanolhydrate;

and with said second part comprising as a second initiator component an organic thiol selected from the group consisting of a compound of the formula

R<sup>4</sup>—SH

wherein:

R<sup>4</sup> is an unsubstituted hydrocarbon group of 1 to about 20 carbons;

a mercapto ester, 2,3-dimercaptosuccinic acid, thiomalic acid, oxydibenzyl mercaptan, and pentachlorothiophenol.

4,413,109

# EMBOSSSED FILMS OBTAINED FROM ETHYLENE-PROPYLENE COPOLYMERS, AND A PROCESS AND APPARATUS FOR MANUFACTURING THE FILMS

Armand Haas, Mazingarbe, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, Paris La Defense, France

Continuation of Ser. No. 232,589, Feb. 9, 1981, abandoned. This application Mar. 20, 1981, Ser. No. 245,757

Claims priority, application France, Feb. 8, 1980, 80 02748

Int. Cl.<sup>3</sup> B29D 7/14; C08F 210/16

U.S. Cl. 526-348

1 Claim

1. An embossed film comprising an ethylene-propylene copolymer, said embossed film having a thickness of less than or equal to 24 microns, and said ethylene-propylene copolymer having a density ( $\rho$ ) between 0.900 and 0.935 g/cm<sup>3</sup>, a melt index between 0.4 and 2 dg/mn, a proportion (m) of methyl groups between 22 and 62 per 1000 carbon atoms, and wherein  $\rho$  and m are such that  $0.9534 \leq \rho + 0.83m \leq 0.9568$ .

4,413,110

# HIGH TENACITY, HIGH MODULUS POLYETHYLENE AND POLYPROPYLENE FIBERS AND INTERMEDIATES THEREFOR

Sheldon Kavesch, Whippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 259,266, Apr. 30, 1981, abandoned. This application Mar. 19, 1982, Ser. No. 359,019

Int. Cl.<sup>3</sup> C08F 10/02, 10/06; D01F 6/04, 6/06

U.S. Cl. 526-348.1

19 Claims

1. A stretched polyethylene fiber of substantially indefinite length being of weight average molecular weight of at least about 500,000 and having a tenacity of at least about 20 g/denier, a tensile modulus at least about 500 g/denier, a creep value no more than about 5% (when measured at 10% of breaking load for 50 days at 23° C.), a porosity less than about 10% and a main melting temperature of at least about 147° C. (measured at 10° C./minute heating rate by differential scanning calorimetry).

13. A stretched polypropylene fiber of substantially indefinite length being of weight average molecular weight of at least about 750,000 and having a tenacity of at least about 8 g/denier, a tensile modulus of at least about 160 g/denier and a main melting temperature of at least about 168° C. (measured at 10° C./minute heating rate by differential scanning calorimetry).

4,413,111

# ISOCYANATE-TERMINATED PREPOLYMERS WITH LOW FREE MONOMER CONTENTS

Peter H. Markusch, McMurray, Pa., and Terry A. Potter, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 426,301

Int. Cl.<sup>3</sup> C08G 18/10

U.S. Cl. 528-59

14 Claims

1. A process for the preparation of an isocyanate-terminated prepolymer having a content of unreacted diisocyanate of less than 2% by weight, based on the weight of said isocyanate-terminated prepolymer, and containing internal urethane groups based on 4,4'-diisocyanato-dicyclohexyl-methane which comprises

(a) preparing an OH-terminated prepolymer from  
 (i) a high molecular weight polyol component, and/or  
 (ii) a low molecular weight isocyanate-reactive component, and  
 (iii) a polyisocyanate component comprising 4,4'-diisocyanate-dicyclohexyl-methane

at an NCO/OH equivalent ratio of about 0.5:1 to 0.9:1;  
 (b) forming said isocyanate-terminated prepolymer by reacting said OH-terminated prepolymer with a polyisocyanate other than 4,4'-diisocyanato-dicyclohexyl-methane containing aromatically-, aliphatically- and/or cycloaliphatically-bound isocyanate groups at an NCO:OH equivalent ratio, based on the free —OH groups of component (a), of about 1.6:1 to 15:1; and

(c) reducing the amount of unreacted diisocyanate to less than about 2% by weight, based on the weight of said isocyanate-terminated prepolymer.



4,413,112

# EMULSIFIERS, AQUEOUS ISOCYANATE EMULSIONS CONTAINING THEM AND THEIR USE AS BINDERS IN A PROCESS FOR THE MANUFACTURE OF MOLDED ARTICLES

Helmut Reiff, Leverkusen, and Hanns I. Sachs, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

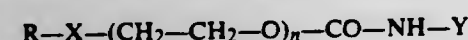
Filed May 16, 1980, Ser. No. 150,487

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921681

Int. Cl.<sup>3</sup> C08G 18/28

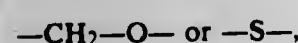
U.S. Cl. 528—73

1. Emulsifiers comprising



wherein

X is selected from the group consisting of —O—,



n represents a number from 10 to 50,

R' represents a C<sub>1</sub>-C<sub>3</sub> alkyl group,

R represents a radical selected from the group consisting of an aromatic radical having 6 to 9 carbon atoms, a cycloaliphatic radical having 3 to 9 carbon atoms and a heterocyclic radical having from 2 to 9 carbon atoms in the ring, and

Y represents a group obtained by removal of an isocyanate group from an organic polyisocyanate.

4,413,113

# CONTINUOUS PRODUCTION OF PHENOL-FORMALDEHYDE RESIN AND LAMINATES PRODUCED THEREFROM

Paul J. Gelling, Whitley Bay; James E. B. Hunt, Staines, and John D. Marshman, Wokingham, all of England, assignors to Formica Limited, North Shields, England

Filed Mar. 17, 1982, Ser. No. 358,780

Claims priority, application United Kingdom, Apr. 3, 1981, 8110533

Int. Cl.<sup>3</sup> C08G 8/10

U.S. Cl. 528—165

6 Claims

1. A process for the continuous production of water-soluble, phenol-formaldehyde resins comprising:

- continuously producing a slurry of molten phenol and particulate paraformaldehyde,
- mixing said slurry with an alkaline catalyst,
- reacting the resultant mixture in a coil container which is of sufficient length to enable substantially complete reaction of the phenol and paraformaldehyde to a water-soluble resinous state and which is immersed in a fluid at a temperature of from 90° C. to 120° C., for a period of time such that a clear, viscous, homogeneous, liquid resin solution is formed
- cooling said homogeneous, liquid, resin solution to a temperature such that reaction between the phenol and paraformaldehyde is suppressed and
- recovering the resultant resin, in the absence of water removal, as a solution of at least 70% solids.

4,413,114

# AROMATIC COPOLYAMIDE CONTAINING 3,4'-DIPHENYLENE MOIETY

Keizo Shimada; Hiroshi Mera; Noriaki Sasaki, and Akihiro Aoki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 120,992, Feb. 13, 1980, Pat. No.

4,355,151. This application Mar. 30, 1982, Ser. No. 363,485

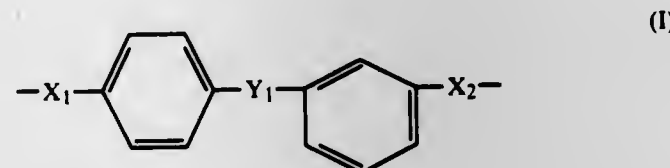
Claims priority, application Japan, Feb. 26, 1979, 54-20685

Int. Cl.<sup>3</sup> C08G 69/32

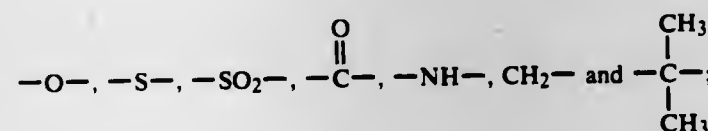
U.S. Cl. 528—183

10 Claims

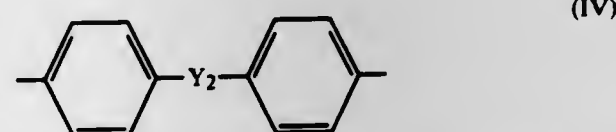
1. A fiber- or film-forming aromatic copolyamide which comprises at least one recurring unit (A) of the formula (I), at least one recurring unit (B) of the formula (II) and at least one recurring unit (C) of the formula (III):



in which formulae (I), (II) and (III), Y<sub>1</sub> represents a divalent radical selected from the group consisting of



Ar<sub>1</sub> represents a member selected from the group consisting of phenylene, naphthylene and biphenylene radicals, each having two valence bonds oriented meta; Ar<sub>2</sub> represents a member selected from the group consisting of phenylene, naphthylene and biphenylene radicals, each having two valence bonds oriented coaxially or in parallel to each other and radicals of the formula (IV):



wherein Y<sub>2</sub> represents a divalent radical selected from the same group as that set forth above for Y<sub>1</sub> and is the same as or different from Y<sub>1</sub>; and X<sub>1</sub> and X<sub>2</sub> respectively represent a —NH— moiety of X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub> and X<sub>6</sub> respectively represent a moiety —NH— or —CO— of an amide group —NHCO— or —CONH— and the molar proportions of said recurring units (A), (B) and (C) represented by a triangular composition diagram fall on or within the quadrilateral shown in FIG. 1 and defined by the co-ordinates:

P (A 50, B 5, C 45)

Q (A 5, B 5, C 90)

R (A 5, B 40, C 55) and

S (A 50, B 15, C 35)

except for the side defined by the coordinates P, Q,

4,413,115

# COPOLYIMIDES-POLYAMIDES FROM ALIPHATIC AND AROMATIC ANHYDRIDES, DICARBOXYLIC ACIDS, AND DIAMINES

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 286,697, Jul. 24, 1981, Pat. No.

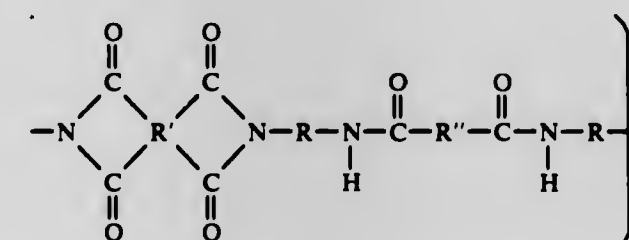
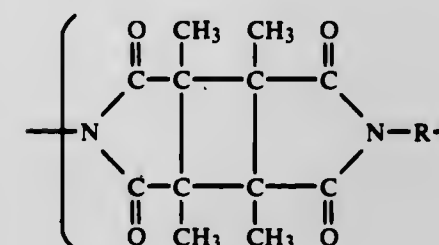
4,366,304. This application Sep. 29, 1982, Ser. No. 427,018

Int. Cl.<sup>3</sup> C08G 73/10

U.S. Cl. 528—189

8 Claims

1. A copolyimide-polyamide comprising the following recurring structure:



wherein R and R' are the same or different divalent aliphatic or aromatic hydrocarbon radicals and R' a tetravalent aliphatic or aromatic radical.

4,413,116

# PROCESS FOR THE PREPARATION OF POLYESTERS OR ALKYD RESINS, RESINS WHICH MAY BE OBTAINED ACCORDING TO THIS PROCESS AND THE USE THEREOF AS LACQUER BINDERS

Knud Reuter; Rolf Dheln, and Lothar Fleiter, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,584

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115072

Int. Cl.<sup>3</sup> C08G 63/12, 63/48; C09D 3/64

U.S. Cl. 528—307

8 Claims

1. A process for the preparation of polyesters, which are optionally modified with fatty acids, from di- to hexahydric alcohols, polycarboxylic acids (or the derivatives thereof capable of esterification), optionally monocarboxylic acids and/or monohydric alcohols, characterised in that

- at least 10% by weight of all the alcohols used consist of penta- or hexahydric sugar alcohols, and
- from 50 to 100% by weight of all the polycarboxylic acid components used consist of cycloaliphatic polycarboxylic acids or the derivatives thereof capable of esterification, provided that the polycarboxylic acid components used do not contain more than 50% by weight of aromatic polycarboxylic acids or the derivatives thereof capable of esterification.

1036 O.G.—9

4,413,117

# PREPARATION OF POLYIMIDE POWDER

Udo Reiter, Mutterstadt; Jenoe Kovacs, Bobenheim-Roxheim, and Hans-Uwe Schenck, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,273

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124401

Int. Cl.<sup>3</sup> C08G 73/10

U.S. Cl. 528—497

4 Claims

1. A process for the preparation of polyimide powder which comprises: adding an inert entraining agent for water to a solution of an aromatic polyamido-acid having an intrinsic viscosity of from 1.5 to 2.5 dl/g, said polyamido-acid being dissolved in an aprotic dipolar organic solvent; heating the formed mixture to the boiling point of the entraining agent to convert the polyamido-acid to polyimide with the formation of water and to azeotropically distill off the formed water along with the entraining agent; and thereafter filtering the polyimide powder which precipitates out of the solution and drying the powder.

4,413,118

# PROCESS FOR REMOVAL OF HOMOGENEOUS CATALYST GROUP VIII METALS FROM PROCESS STREAMS

F. Edward Roberts, Princeton, and Victor J. Grenda, Warren, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 2, 1981, Ser. No. 239,726

Int. Cl.<sup>3</sup> C07H 17/08

U.S. Cl. 536—7.1

6 Claims

1. A process for removing homogenous triphenylphosphine substituted Group VIII metal catalysts selected from RhCl(PPh<sub>3</sub>)<sub>3</sub>, IrH<sub>3</sub>(PPh<sub>3</sub>)<sub>3</sub>, IrH(CO)(PPh<sub>3</sub>)<sub>3</sub>, PdCl<sub>2</sub>(PPh<sub>3</sub>)<sub>2</sub>, naphthyl BrNi(PPh<sub>3</sub>)<sub>2</sub>, Br<sub>2</sub>Ni(PPh<sub>3</sub>)<sub>2</sub> from toluene solvent-containing reaction process streams, which comprises adding about 2 to about 12 moles of an organic sulfur compound containing a carbon sulfur double bond selected from N-benzyl-dithiocarbamoylglycine, β-dithiocarbamylpropionic acid, thiohydantoin, thiourea, ammonium dithiocarbamate, thiobarbituric acid, thiosemicarbazide, rhodamine or 2-mercapto-4-aminopyrimidine, per mole of said Group VIII metal, warming to 50° to 100° C. for from 2 to 10 hours, cooling to 0° to 5° C. and separating the metal-organic sulfur complex that forms.

2. In a process for preparing ivermectin which comprises the steps of:

- hydrogenating avermectin B<sub>1a</sub> in the presence of tris-(triphenylphosphine)rhodium (I) chloride in an organic solvent selected from benzene, toluene, o-, m- or p-xylene, tetrahydrofuran and methylene chloride;
  - evaporating the organic solvent;
  - dissolving the residue in ethanol;
  - treating the ethanol solution with formamide and water to cause crystallization of the product;
- wherein the improvement comprises after the hydrogenation step (a) and before the evaporation step (b), adding about 2 to about 12 moles of an organic sulfur compound containing a carbon sulfur double bond selected from the group consisting of N-benzyl-dithiocarbamoylglycine, β-dithiocarbamylpropionic acid, thiohydantoin, thiourea, ammonium dithiocarbamate, thiobarbituric acid, thiosemicarbazide, rhodamine or 2-mercapto-4-aminopyrimidine, per mole of tris-(triphenylphosphine)rhodium (I) chloride; warming to 50° to 100° C. for from 2 to 10 hours; cooling to 0° to 5° C. and separating the rhodium-organic sulfur complex that forms.



4,413,119

## SEMI-SYNTHETIC MACROLIDES

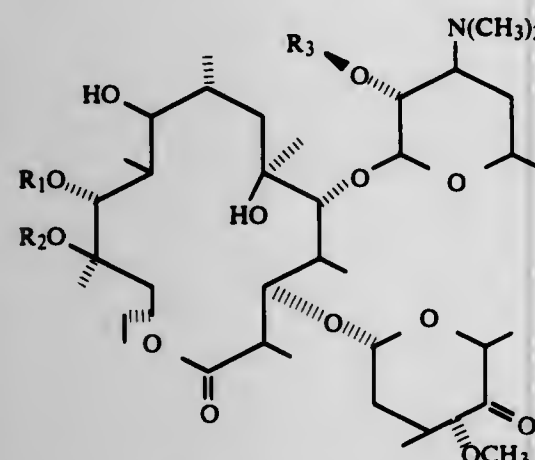
James R. Hauske, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 354,124, Mar. 1, 1982, Pat. No. 4,363,803. This application Apr. 26, 1982, Ser. No. 371,858  
Int. Cl.<sup>3</sup> C07H 17/08

U.S. Cl. 536—7.2

4 Claims

1. A compound selected from the group consisting of those of the formula:

wherein R<sub>1</sub> and R<sub>2</sub> when taken separately are each hydrogen, R<sub>1</sub> and R<sub>2</sub> when taken together are (CH<sub>3</sub>)<sub>2</sub>C; and R<sub>3</sub> is alkanoyl having two to three carbon atoms.

4,413,120

## PROCESS FOR PRODUCING ACOSAMINE, DAUNOSAMINE, 1-THIOACOSAMINE AND RELATED COMPOUNDS

Roy L. Whistler, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

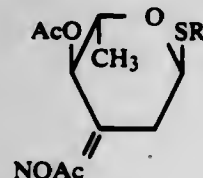
Filed Apr. 6, 1981, Ser. No. 251,636  
Int. Cl.<sup>3</sup> C07H 1/00

U.S. Cl. 536—18.6

6 Claims

4. A process for producing L-thioacosamine derivatives which comprises:

oxidizing L-rhamnal to produce 1,5 anhydro-2,6-dideoxy-α-L-erythro-hex-1-en-3-ulose,  
 reacting said 1,5 anhydro-2,6-dideoxy-α-L-erythro-hex-1-en-3-ulose with an alkylthiol or salt thereof in the presence of a strong base to produce alkyl 2,6-dideoxy-1-thio-α-L-erythro-hexopyranosid-3-ulose by Michael addition,  
 reacting said alkyl 2,6-dideoxy-1-thio-α-L-erythro-hexopyranosid-3-ulose with hydroxylamine to introduce an oximino group at the 3-position;  
 reacting the resultant 3-oximino compound with acetic anhydride to produce the di-O-acetyl compound;



and stereospecifically reducing said di-O-acetyl compound with borane in tetrahydrofuran to convert the 3-oximino group to a 3-amido group of the arabino configuration.

4,413,121

## CELLULOSE ETHERS AND CELLULOSE MIXED ETHERS HAVING AT LEAST ONE PHOSPHORUS-CONTAINING SUBSTITUENT, AND PROCESS FOR THEIR MANUFACTURE

Lothar Brandt; Arno Holst, both of Wiesbaden, and Hans-Jerg Kleiner, Kronberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,148

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112945

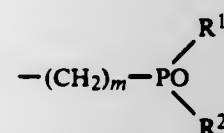
The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08B 11/145, 11/193

U.S. Cl. 536—44

17 Claims

1. A cellulose ether having at least one phosphorus-containing substituent or a mixed ether of said cellulose ether having in addition at least one phosphorus-free substituent comprising alkyl, hydroxyalkyl, carboxyalkyl, sulfonalkyl, aminoalkyl, or diaminoalkyl, wherein the phosphorus-containing substituent(s) comprise(s) groups of the formula



wherein

R<sup>1</sup> and R<sup>2</sup> are OX; or R<sup>1</sup> is OX and R<sup>2</sup> is OY; or R<sup>1</sup> is OX and R<sup>2</sup> is (CH<sub>2</sub>)<sub>n</sub>-CH<sub>3</sub>; or R<sup>1</sup> and R<sup>2</sup> are (CH<sub>2</sub>)<sub>n</sub>-CH<sub>3</sub>; or R<sup>1</sup> is (CH<sub>2</sub>)<sub>n</sub>-CH<sub>3</sub> and R<sup>2</sup> is (CH<sub>2</sub>)<sub>p</sub>-CH<sub>3</sub>, whereby

X, Y are identical or different and comprise a hydrogen atom or a monovalent cation;

m is an integer from 1 to 4; and

n, p are identical or different and are 0 or 1; with the proviso that when m is 1 or 2, R<sup>1</sup> and R<sup>2</sup> may not be OX and R<sup>1</sup> and R<sup>2</sup> may not be OX and OY, respectively.

4,413,122

## OPTIONALLY N-SUBSTITUTED AMINODESOXY-1,4;3,6-DIANHYDROHEXITOL DERIVATIVES

Klaus Klessing, Ettlingen, Fed. Rep. of Germany, assignor to Fa. Wilmar Schwabe GmbH &amp; Co., Karlsruhe, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,358

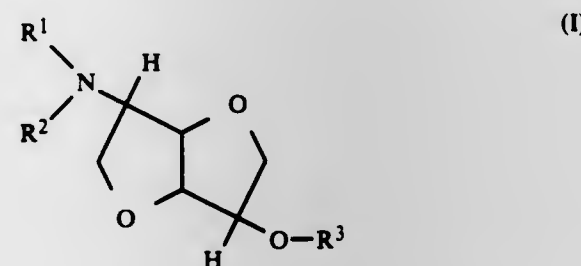
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028288

Int. Cl.<sup>3</sup> C07D 493/04

U.S. Cl. 544—153

20 Claims

1. Aminodesoxy-1,4;3,6-dianhydrohexitol derivatives of the general formula I,



wherein R<sup>1</sup> and R<sup>2</sup>, in each case independently of one another, signifies a hydrogen atom or a lower alkyl group with 1 to 4 carbon atoms or wherein R<sup>1</sup> signifies a hydrogen atom and R<sup>2</sup> an adamant(1)yl radical or wherein R<sup>1</sup> and R<sup>2</sup>, together with the nitrogen atom to which they are attached, signify the residue of a cyclic, non-aromatic secondary amine or the residue of a cyclic, non-aromatic secondary amine containing an additional hetero atom; and R<sup>3</sup> signifies a hydrogen atom, a

methanesulphonyl or toluene sulphonyl group, as well as their acid addition salts, with the proviso that when R<sup>1</sup> and R<sup>2</sup> are both methyl, R<sup>3</sup> is not toluene sulphonyl.

4,413,123

## SOLUTION SYNTHESIS OF

## 1,3,5-TRIACRYLYLHEXAHYDRO-S-TRIAZINE

Louis B. Conte, Jr., Newark, and Walter T. Reichle, Warren, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1982, Ser. No. 363,108

Int. Cl.<sup>3</sup> C07D 251/04

U.S. Cl. 544—215

12 Claims

1. A process for producing 1,3,5-triacrylylhexahydro-s-triazine comprising reacting acrylonitrile and trioxane in contact with a catalytic amount of an acid having a Hammet activity function (H<sub>a</sub>) in excess of about 7.3 utilizing methylene chloride as the reaction medium.

4,413,124

## 2-ALKYL-5-ALKYLSULFONYL-4,6-DIHALOPYRIMIDINES AND THE PRODUCTION THEREOF

Karl Hoegerle, Basel, and Kurt Ohnemus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 329,169, Dec. 10, 1981. This application Sep. 16, 1982, Ser. No. 418,936

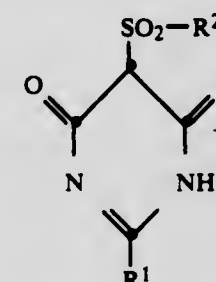
Claims priority, application Switzerland, Dec. 17, 1980, 9301/80

Int. Cl.<sup>3</sup> C07D 239/54

U.S. Cl. 544—319

1 Claim

1. A compound of the formula IV



wherein each of R<sup>1</sup> and R<sup>2</sup> independently is straight chain or branched chain C<sub>1</sub>-C<sub>5</sub>alkyl, or a salt thereof.

4,413,125

## α-HYDROXY PHOSPHONATES

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

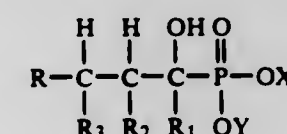
Filed Jul. 1, 1981, Ser. No. 279,371

Int. Cl.<sup>3</sup> C07F 9/40, 9/65

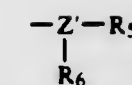
U.S. Cl. 546—22

10 Claims

1. An α-hydroxy phosphonate compound of the formula



wherein X and Y are each independently selected from the group consisting of lower alkyl or benzyl; R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each independently selected from the group consisting of hydrogen, lower alkyl; R is a —Z—R<sub>4</sub> group wherein Z is oxygen or sulfur, and R<sub>4</sub> is lower alkyl, lower alkanol, aryl or R is piperidinyl or,



wherein —Z' is nitrogen, and R<sub>5</sub> is lower alkyl, or lower alkoxyalkyl and R<sub>6</sub> is lower alkyl or hydrogen.

4,413,126

## PREPARATION OF ISOQUINOLINE DERIVATIVES USEFUL AS IMMUNE REGULANTS

Jack B. Campbell, and Edward R. Lavagnino, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 9, 1982, Ser. No. 386,833

Int. Cl.<sup>3</sup> C07D 471/06; A61K 31/47

U.S. Cl. 546—52

4 Claims

1. A method for preparing 10- or 11-trifluoromethyl-7H-benzimidazo[2,1-a]benz[de]isoquinoline-7-one which comprises: (Step A) treating naphthalimide with a 4- or 5-trifluoromethyl-substituted o-nitrohalobenzene in an inert solvent at about 50°-200° C. in the presence of an alkali metal carbonate or hydroxide to form the intermediate N-substituted naphthalimide and (Step B) reducing the intermediate N-substituted naphthalimide and heating in an inert solvent at about 50°-180° C.

4,413,127

## PREPARATION OF 1,2-DIHYDRO-6-(LOWER ALKYL)-2-OXO-5-(PYRIDINYL)NICOTINONITRILES

Baldev Singh, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

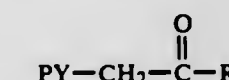
Filed May 24, 1982, Ser. No. 381,062

Int. Cl.<sup>3</sup> C07D 213/64

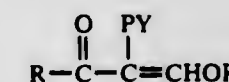
U.S. Cl. 546—249

6 Claims

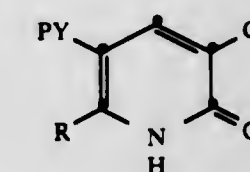
(IV) 1. The process which comprises reacting pyridinylmethyl lower-alkyl ketone of the formula



with tri(lower-alkyl) orthoformate, acetic anhydride and acetic acid to produce 2-(lower-alkoxy)-1-(pyridinyl)-ethenyl lower-alkyl ketone of the formula

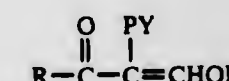


and reacting said ketone with malononitrile in a lower-alkanol to produce 1,2-dihydro-6-R-2-oxo-5-PY-nicotinonitrile of the formula



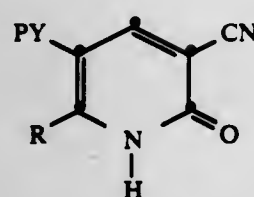
where R and R' are each lower-alkyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4. The process which comprises reacting 2-(lower-alkoxy)-1-(pyridinyl)-ethenyl lower-alkyl ketone of the formula





with malononitrile to produce 1,2-dihydro-6-R-2-oxo-5-PY-nicotinonitrile of the formula



where R and R' are each lower-alkyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,413,128

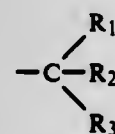
**NITROPYRIDINE-N-OXIDE MOLECULAR CRYSTALS**  
Daniel S. Chemla, 50, Avenue Jean Jaures, Jean-Louis Oudar, 27, Avenue du Plessis, both of 92290 Chateaufort, and Georges Tsoucaris, 13, rue Andre Theuriot, 92340 Bourg la Reine, all of France

Continuation-in-part of Ser. No. 214,989, Dec. 10, 1980, abandoned. This application May 18, 1982, Ser. No. 379,486  
Int. Cl.<sup>3</sup> C07D 213/89

U.S. Cl. 546—312

1 Claim

1. A molecular crystal material comprising (1) p-nitropyridine-N-oxide substituted by at least one chiral radical in the ortho- or meta- position, wherein said chiral radical has the formula:



in which R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are all different and represent H, CH<sub>3</sub> or COOR<sub>4</sub> wherein R<sub>4</sub> is H or CH<sub>3</sub> and C is an asymmetric carbon atom.

4,413,129

**PROCESS FOR PREPARING THE H<sub>2</sub>-RECEPTOR ANTAGONIST CIMETIDINE**

Saburo Uchikuga, Yokohama; Tomoyasu Tashiro, Hatano, and Yasuko Osawa, Tokyo, all of Japan, assignors to Sogo Pharmaceutical Company, Ltd., Kanagawa, Japan

Division of Ser. No. 38,265, May 11, 1979, abandoned. This application Jan. 17, 1980, Ser. No. 113,135

Claims priority, application Japan, Dec. 27, 1978, 53-159895  
Int. Cl.<sup>3</sup> C07D 233/64

U.S. Cl. 548—342

2 Claims

1. A process for preparing cimetidine comprising reacting 4-methyl-5-hydroxymethylimidazole in the form of mineral acid salt or free base, with 2-aminoethanethiolsulfuric acid in acetic acid, to obtain 4-methyl-5-[(2-aminoethyl)thiomethyl]imidazole;  
reacting said 4-methyl-5-[(2-aminoethyl)thiomethyl]imidazole with O-alkyl-S-alkyl ester of cyanamidethiocarbonic acid to yield N-cyano-N'-[2-[(4-methyl-5-imidazolyl)methylthio]ethyl]-O-alkylisourea; and  
reacting said N-cyano-N'-[2-[(4-methyl-5-imidazolyl)methylthio]ethyl]-O-alkylisourea with monomethylamine, and thereby obtaining cimetidine.

4,413,130

**SULPHOXIDES**

George R. White, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 197,430, Oct. 16, 1980, Pat. No. 4,338,328, which is a division of Ser. No. 960,364, Nov. 13, 1978, Pat. No. 4,255,425, which is a division of Ser. No. 824,121, Aug. 12, 1977, Pat. No. 4,140,783, which is a division of Ser. No. 689,013, May 24, 1976, Pat. No. 4,056,620, which is a division of Ser. No. 627,418, Oct. 30, 1975, Pat. No. 3,979,398, which is a division of Ser. No. 436,285, Jan. 24, 1974, Pat. No. 3,932,443. This application Mar. 26, 1982, Ser. No. 362,220

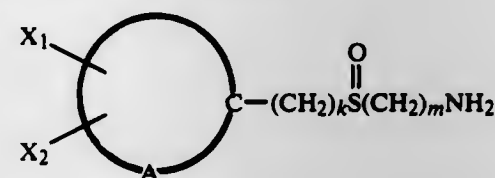
Claims priority, application United Kingdom, Feb. 8, 1973, 6153/73; Oct. 23, 1973, 49257/73

Int. Cl.<sup>3</sup> C07D 233/64

U.S. Cl. 548—342

2 Claims

1. A compound of the formula:



wherein A is such that the heterocyclic nucleus formed is an imidazole ring; X<sub>1</sub> and X<sub>2</sub>, which may be the same or different, are hydrogen, lower alkyl, trifluoromethyl, hydroxyl, halogen, or amino; k is 0 to 2 and m is 2 or 3 provided that the sum of k and m is 3 or 4.

4,413,131

**4,5,6,7-TETRAHALO-ISOINDOLIN-1-ONE DERIVATIVES**  
Dimitrios Karanatsios, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jul. 11, 1977, Ser. No. 814,559

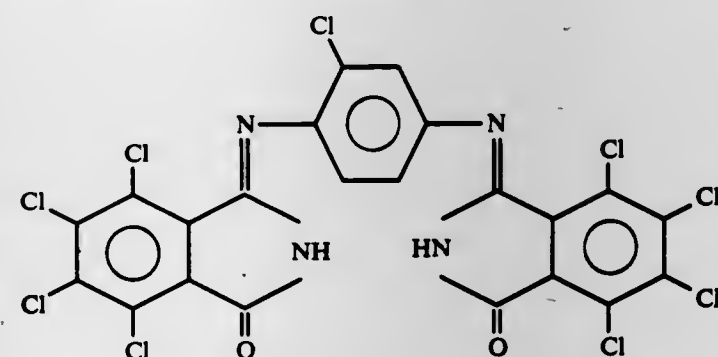
Claims priority, application Switzerland, Jul. 16, 1976, 9135; Oct. 20, 1976, 13256

Int. Cl.<sup>3</sup> C07D 209/50

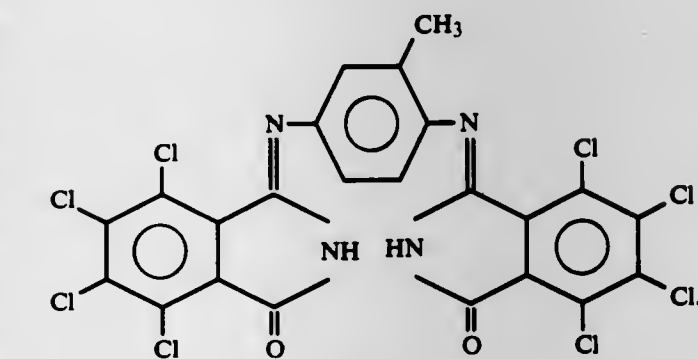
U.S. Cl. 548—461

3 Claims

1. A compound of the formula



2. A compound of the formula



3. A compound of the formula

4,413,134

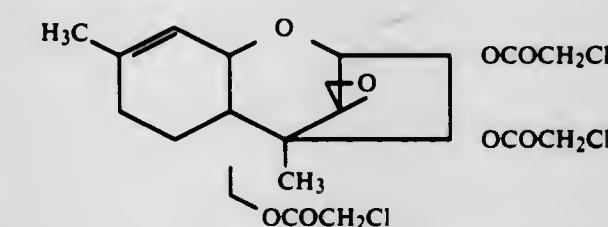
**TRIACYLATED DERIVATIVE OF SCIRPENTRIOL**  
Henry Schmitz, Syracuse; Takushi Kaneko, Fayetteville; John M. Essery, Pleasantville, and Terrence W. Doyle, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 240,340, Mar. 4, 1981, Pat. No. 4,332,732, which is a division of Ser. No. 137,336, Apr. 4, 1980, Pat. No. 4,284,568. This application Jan. 15, 1982, Ser. No. 339,581  
Int. Cl.<sup>3</sup> C07D 311/78

U.S. Cl. 549—332

1 Claim

1. The compound having the formula



4,413,132

**ANTIBIOTIC CC-1065 INDOLINE INTERMEDIATES**  
Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

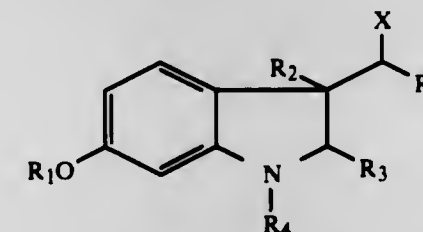
Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,463

Int. Cl.<sup>3</sup> C07D 209/12

U.S. Cl. 548—491

2 Claims

1. A compound of the formula



wherein R<sub>1</sub> is selected from the group consisting of CH<sub>3</sub>, —CH<sub>2</sub>Ph, CH<sub>2</sub>=CHCH<sub>2</sub>—, —CH<sub>2</sub>SCH<sub>3</sub>, —CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, —CH<sub>2</sub>CCl<sub>3</sub>, and —CH<sub>2</sub>CH<sub>2</sub>Si(R<sub>2</sub>)<sub>3</sub>; R<sub>2</sub> and R<sub>3</sub> are H, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; R<sub>4</sub> is selected from the group consisting of SO<sub>2</sub>R<sub>2</sub>, SO<sub>2</sub>CH<sub>2</sub>CO phenyl, CO<sub>2</sub>CH<sub>2</sub>Z where Z is selected from the group consisting of CH<sub>2</sub>I, CCl<sub>3</sub>, CH<sub>2</sub>SO<sub>2</sub>R<sub>2</sub>, Ph (phenyl), and fluoroenylmethyl, and X is selected from the group consisting of OSO<sub>2</sub>R<sub>2</sub>, Cl, Br, and I.

4,413,133

**PROCESS FOR MANUFACTURING CHLOROLACTONES FROM UNSATURATED CARBOXYLIC ACIDS**

Bernard Damin, Oullins; Alain Forestiere, Vernaison, and Bernard Sillion, Rocquencourt, all of France, assignors to Institut Francais du Pétrole, Rueil-Malmaison, France

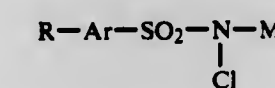
Filed Nov. 13, 1981, Ser. No. 321,145

Claims priority, application France, Nov. 14, 1980, 80 24393  
Int. Cl.<sup>3</sup> C07D 307/32

U.S. Cl. 549—265

9 Claims

1. A selective, one-step process for manufacturing chlorolactones by chlorolactonization of unsaturated carboxylic acids, comprising reacting, in an anhydrous organic solvent, a metal N-chlorosulfonamide of the general formula:



wherein R is a hydrogen atom, an alkyl radical or a halogen atom; Ar is a divalent aromatic radical containing one or more rings; and M is an alkali metal, with an aliphatic or alicyclic carboxylic acid having at least one ethylenic unsaturation separated from the carboxyl group by at least two carbon atoms, in the presence of a strong acid whose conjugate base is weakly nucleophilic.

4,413,135

**INTERMEDIATES IN THE PREPARATION OF RANITIDINE**

John W. Clitherow, Hertfordshire, England, assignor to Glaxo Group Limited, London, England

Division of Ser. No. 223,484, Jan. 8, 1981, abandoned. This application Jun. 4, 1982, Ser. No. 385,075

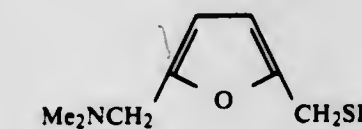
Claims priority, application United Kingdom, Jan. 8, 1980, 8000581; Aug. 12, 1980, 8038336

Int. Cl.<sup>3</sup> C07D 307/52, 307/54

U.S. Cl. 549—495

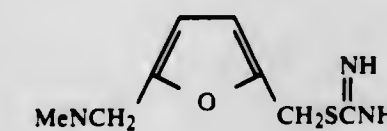
2 Claims

1. The thiol of formula (II)



in the form of a stable acid addition salt.

2. The isothioureia of formula (IV)



and stable acid addition salts thereof.

4,413,136

**PURIFICATION OF TETRAHYDROFURAN**

Richard E. Ernst, Kennett Square, Pa., and Harry B. Copelin, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 2, 1982, Ser. No. 404,374

Int. Cl.<sup>3</sup> C07D 307/08

U.S. Cl. 549—509

5 Claims

1. In the multi-stage refining of tetrahydrofuran made from acetylene and formaldehyde, a method of reducing the content of methacrolein impurity, which method comprises treating the tetrahydrofuran before any of the distillation stages with hydrogen peroxide in about the same weight as the methacrolein to be destroyed and from 10 to 100 milliequivalents excess of base at a temperature of from 20° to 65° C., and then separat-



ing tetrahydrofuran and the resulting chemically modified impurity.

4,413,137

## PROCESS FOR MAKING VICINAL EPOXIDES

James M. Renga, Midland, Mich., and Roy A. Periana-Pillai, Berkeley, Calif., assignors to The Dow Chemical Company, Midland, Mich.

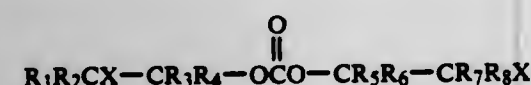
Filed Jun. 21, 1982, Ser. No. 390,438

Int. Cl.<sup>3</sup> C07D 301/02; C07C 17/33, 19/045

U.S. Cl. 549—518

10 Claims

1. A process for making a vicinal epoxide and an alkylene dihalide which comprises contacting a mixture comprising ethylene carbonate and a  $\beta$ -haloalkyl carbonate corresponding to the formula:



with an initiator at a temperature from about 25° C. to about 250° C., wherein:

each  $R_1$ — $R_5$  independently is hydrogen, a hydrocarbon group of up to about 20 carbons,  $-CH_2X$  or  $-CH_2Y$ , where Y is an alkoxy group of up to 10 carbons or an aryloxy group of up to about 20 carbons; and X is chloro or bromo.

4,413,138

## GLYCIDYL ETHERS OF AMINOPOLYOLS

Elizabeth J. Gladfelter, St. Paul, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

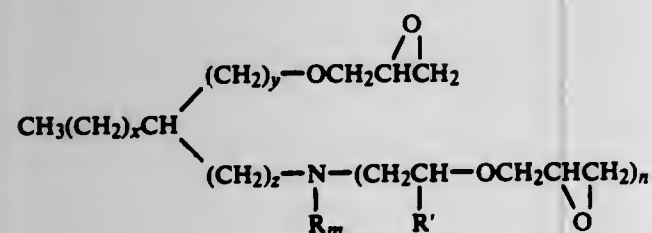
Filed Nov. 16, 1981, Ser. No. 321,969

Int. Cl.<sup>3</sup> C07D 303/36, 303/27

U.S. Cl. 549—551

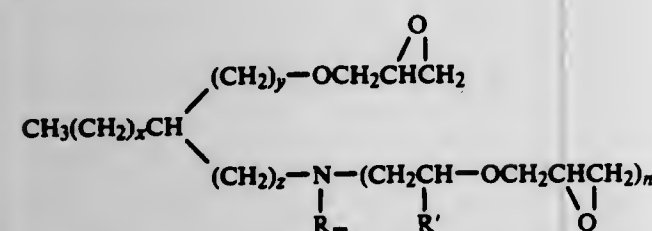
4 Claims

1. The glycidyl ethers of a tertiary amino polyol of the following structure:



and mixtures thereof; wherein x is 7(8); y is 9(8); z is 1; n is 2; m is 0; and  $R'$  is H.

3. The glycidyl ethers of a tertiary amino polyol of the following structure:



and mixtures thereof; where x is 7(8); y is 1; z is 9(8); n is 2; m is 0; and  $R'$  is H.

4,413,139

## INTERMEDIATES USED IN THE PROCESS FOR PREPARING

## 1(4-PENTENOYL)-3,3-DIMETHYLCYCLOHEXANE

John B. Hall, Rumson, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

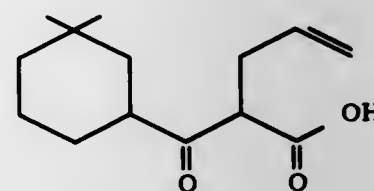
Filed May 6, 1982, Ser. No. 375,767

Int. Cl.<sup>3</sup> C07C 59/80, 69/73

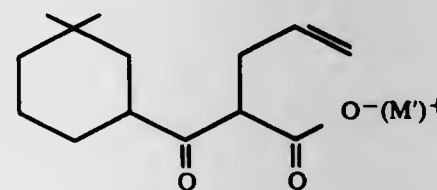
U.S. Cl. 560—126

5 Claims

1. The compound defined according to the structure:

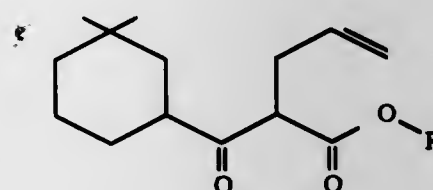


2. The compound defined according to the structure:



wherein  $M'$  represents alkali metal.

4. The compound defined according to the structure:



wherein R represents  $C_1$ — $C_3$  lower alkyl.

4,413,140

## LIQUID EXTRACTION OF DIACETOXYBUTANE WITH HALOGENATED PARAFFINS

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 26, 1977, Ser. No. 791,106

Int. Cl.<sup>3</sup> C07C 67/58, 69/16, 27/02, 27/34, 51/48, 53/08

U.S. Cl. 560—248

6 Claims

1. A process for separating 1,4-diacetoxybutane from a mixture comprising 1,4-diacetoxybutane, 4-acetoxy-1-butanol, 1,4-butanediol, acetic acid, and water, which comprises the steps of:

- contacting said mixture in a liquid extraction zone with at least one solvent selected from halogenated paraffins having normal boiling points below about 392° F. under conditions which produce an extract containing 1,4-diacetoxybutane and solvent and a raffinate containing water, 1,4-butanediol, acetic acid, and 4-acetoxy-1-butanol;
- withdrawing from the liquid extraction zone said extract and said raffinate; and
- separating said withdrawn extract into solvent and 1,4-diacetoxybutane.

4,413,141

## 2-(DIFLUOROMETHYL)-2,5-DIAMINOPENTANOIC ACID

Philippe Bey, Strasbourg, and Michel Jung, Illkirch-Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Continuation-in-part of Ser. No. 53,937, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 814,765, Jul. 11, 1977, abandoned. This application Sep. 17, 1982, Ser. No. 419,347

Int. Cl.<sup>3</sup> C07C 101/24

U.S. Cl. 562—561

3 Claims

1. 2-Difluoromethyl-2,5-diaminopentanoic acid, or a pharmaceutically acceptable salt thereof.

4,413,144

## 4-ISOPROPYL-4'-NITROBENZOPHENONE AND A PROCESS FOR THE PREPARATION OF 4'-NITROBENZOPHENONES SUBSTITUTED IN THE 4-POSITION

Horst Tappe, Dietzenbach, and Herbert Wille, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 362,977

Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120747

Int. Cl.<sup>3</sup> C07C 49/786

U.S. Cl. 568—306

1 Claim

1. 4-Isopropyl-4'-nitrobenzophenone.

4,413,142

## METHOD FOR PREPARING L-CARNITINE

Mario Fiorini, and Claudio Valentini, both of Rome, Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Mar. 15, 1982, Ser. No. 358,326

Claims priority, application Italy, Mar. 18, 1981, 20396 A/81

Int. Cl.<sup>3</sup> C07C 101/30

U.S. Cl. 562—567

44 Claims

1. A process for the preparation of L-carnitine starting from D-mannitol comprising the steps of reacting D-mannitol with a ketone, subjecting the thusly obtained D-mannitol diketone to an oxidative splitting reaction to obtain a glyceraldehyde ketone, treating the latter compound with a reducing agent of the aldehyde class, substituting the alcoholic group of the glycerol acetone thus obtained by a halogen atom, subjecting the halogenated derivative to acidic hydrolysis to obtain the halogenated dihydroxypropane, esterifying the primary alcoholic group of the latter compound with the acid chloride of a sulphonic acid, reacting said ester with a salt of hydrogen cyanide to obtain the corresponding nitrile, treating said nitrile with trimethylamine so as to obtain the carnitinnitrile, subjecting the nitrile group thereof to acidic hydrolysis to build up the corresponding carboxyl group, effecting an ion-exchange between the halide ion of the L-carnitine acid halide and a hydroxyl ion and separating the thusly obtained L-carnitine.

4,413,145

## PROCESS FOR THE SYNTHESIS OF 3-KETO-CYCLOPENTENE-5-OXY DERIVATIVES HAVING INSECTICIDE ACTIVITY

Giovanni Piancatelli, Arrigo Scettri, and D'Auria Maurizio, all of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Jul. 28, 1981, Ser. No. 287,667

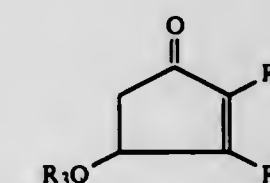
Claims priority, application Italy, Feb. 11, 1981, 47769 A/81

Int. Cl.<sup>3</sup> C07C 45/45; C07G 13/00

U.S. Cl. 568—345

20 Claims

1. A process for the synthesis of the 3-keto-cyclopentene-5-oxy derivatives (rethrolones) with general formula:



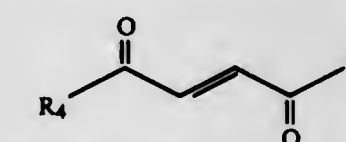
wherein:

$R_1$  = Hydrogen, saturated or unsaturated  $C_1$ — $C_{10}$  alkyl

$R_2$  = Saturated or unsaturated  $C_1$ — $C_{10}$  alkyl

$R_3$  = Hydrogen

having insecticide activity characterized by the operations of: (a) Photoisomerizing by artificial illumination in polar and non polar solvents a trans-enedicarbonylic intermediate with general formula:

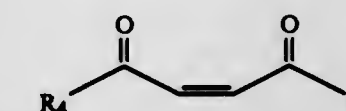


wherein:

$R = C_4$ — $C_{10}$  alkyl and

$R_4 = R_2$

to the cis-enedicarbonylic compound with formula



(b) Cyclizing the (III) compound to the corresponding rethrolone of formula (I) by treatment with organic or inorganic bases in solvents constituted of water and an aprotic dipolar solvent at temperature of 20°—100° C.

4,413,143

## METHOD OF PRODUCING ACRYLAMIDE FROM WATER-IN-OIL EMULSION OF ACRYLONITRILE

Kenneth G. Phillips, River Forest, and John G. Premo, Western Springs, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 213,278, Dec. 5, 1980, which is a continuation of Ser. No. 89,817, Oct. 31, 1979, abandoned. This application Dec. 9, 1981, Ser. No. 329,011

Int. Cl.<sup>3</sup> C07C 102/08

U.S. Cl. 564—128

5 Claims

1. A method of producing acrylamide from acrylonitrile in the presence of a metallic conversion catalyst which comprises contacting a water-in-oil emulsion of acrylonitrile which is contained in the dispersed aqueous phase of the emulsion under conditions whereby a substantial portion of the acrylonitrile is converted to acrylamide which remains in the aqueous phase of the emulsion.



4,413,146

# TRANSITION METAL CARBONYL COMPLEXES INTERCALATED WITH LAMELLAR MATERIALS AND USE OF THE INTERCALATED COMPLEXES IN THE CATALYSIS OF ORGANIC REACTIONS

James A. Hinnenkamp, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 207,166, Nov. 17, 1980, Pat. No. 4,324,695.

This application Nov. 25, 1981, Ser. No. 325,179

Int. Cl.<sup>3</sup> C07C 45/50

U.S. Cl. 568—451

6 Claims

1. In the catalyzed hydroformylation reaction of, propylene, hydrogen and carbon monoxide under hydroformylation conditions to provide n-butyraldehyde and/or isobutyraldehyde, the improvement which comprises using as catalyst an intercalate composition comprising graphite intercalated with transition metal, said transition metal being present substantially as transition metal carbonyl.

4,413,147

# CONVERSION OF ISOBUTANE TO METHACROLEIN

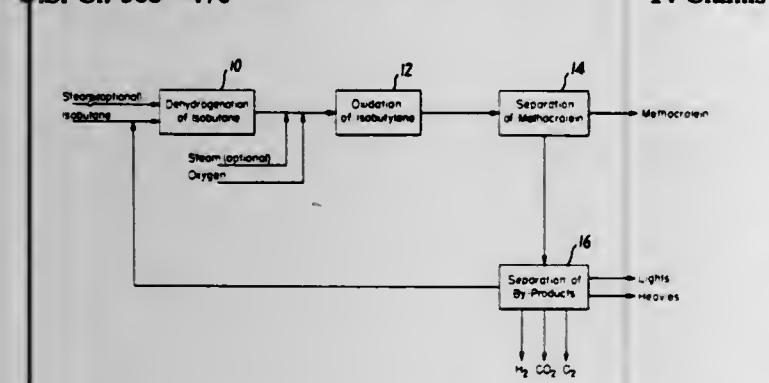
Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Apr. 14, 1982, Ser. No. 368,196

Int. Cl.<sup>3</sup> C07C 45/35

U.S. Cl. 568—476

14 Claims



1. A process for the preparation of methacrolein from isobutane comprising:

- dehydrogenating isobutane to isobutylene, optionally in the presence of steam, over a dehydrogenation catalyst comprising a Group VIII noble metal or base metal oxide on a support at a temperature in the range of about 300°-700° C. and up to about 10 kg/cm<sup>2</sup> gauge pressure to form an effluent stream comprising isobutylene, hydrogen, carbon oxides and unreacted isobutane;
- mixing oxygen and optionally steam with said effluent stream of (a) and passing the mixture over a molybdenum-based oxidation catalyst at conditions selected to produce methacrolein and producing an effluent stream comprising methacrolein, unreacted isobutylene and isobutane, and oxygen, and carbon oxides;
- recovering the methacrolein from said effluent of (b).

4,413,148

# PROCESS FOR PRODUCING DICUMYLPEROXIDE

Mitsukuni Kato; Takuya Demachi; Hidehiko Hagii, and Takeshi Arai, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,413

Claims priority, application Japan, Feb. 19, 1981, 56-23526

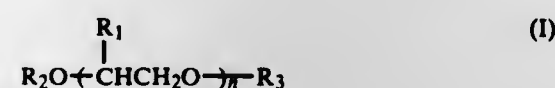
Int. Cl.<sup>3</sup> C07C 179/035, 179/06

U.S. Cl. 568—578

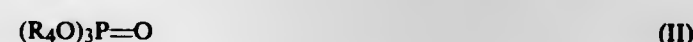
6 Claims

1. In a process for producing dicumyl peroxide by reacting cumene hydroperoxide and  $\alpha,\alpha$ -dimethyl benzyl alcohol, in the presence of an acid catalyst, while continuously removing water which is formed in the reaction system therefrom, the improvement which comprises: the reaction is carried out at a temperature in the range of 30° to 80° C., in the presence of one or more polar solvents which are selected from the group consisting of hexamethyl phosphoramide, 1,3-dimethyl-2-

imidazolidinone and compounds having the following formulae (I), (II), (III), and (IV):



wherein R<sub>1</sub> is hydrogen or methyl, R<sub>2</sub> and R<sub>3</sub> each is hydrogen, alkyl having 1 to 4 carbon atoms, or phenyl, and  $\pi$  is an integer of from 1 to 10;



wherein R<sub>4</sub> is alkyl having 1 to 4 carbon atoms or phenyl;



wherein R<sub>5</sub> is alkyl having 1 to 4 carbon atoms, phenyl or benzyl; and



wherein R<sub>6</sub> is hydrogen or methyl; and said acid catalyst is selected from the group consisting of sulfuric acid, hydrochloric acid, perchloric acid, p-toluene sulfonic acid and trichloroacetic acid.

4,413,149

# PROCESS FOR THE CATALYTIC HYDROGENOLYSIS OF P-SUBSTITUTED BENZALDEHYDE-DIMETHYLACETALS TO PRODUCE THE CORRESPONDING BENZYL METHYL ETHER DERIVATIVES

Hartmut Fischer, Hofheim, and Detlef H. Skaletz, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 333,012

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048993

Int. Cl.<sup>3</sup> C07C 43/205, 41/28

U.S. Cl. 568—636

5 Claims

1. A process for the catalytic hydrogenolysis of p-substituted benzaldehyde-dialkylacetals to produce the corresponding p-substituted benzyl alkyl ether derivatives, comprising the step of:

hydrogenolyzing a p-substituted benzaldehyde-dialkylacetal compound selected from the group consisting of 4-methoxy-benzaldehyde-dimethylacetal, 4-phenoxy-benzaldehyde-dimethylacetal, and 4,4'-diphenyl ether-dialdehydebis-dimethylacetal, in the presence of a catalyst system comprising a cobalt carbonyl and at least one heterocyclic compound containing at least one heterocyclic nitrogen atom selected from the group consisting of pyridine, pyrrole, pyrrolidone and piperidine.

4,413,150

# TWO PRODUCT PROCESS FOR METHYL TERTIARY BUTYL ETHER PRODUCTION

Bruce A. Briggs, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 18, 1981, Ser. No. 332,381

Int. Cl.<sup>3</sup> C07C 41/05

U.S. Cl. 568—697

9 Claims

1. A hydrocarbon conversion process which comprises the steps of:

- reacting isobutylene with a C<sub>1</sub> to C<sub>3</sub> aliphatic alcohol in an etherification zone and producing an etherification zone effluent stream which comprises C<sub>4</sub> hydrocarbons, unconverted alcohol and a reaction product ether;
- separating the entire etherification zone effluent stream

in a single fractionation column into a net overhead stream comprising C<sub>4</sub> hydrocarbons, the unconverted alcohol and a portion of the reaction product ether and a net bottoms stream comprising the remainder of the reaction product ether and which is substantially free of the alcohol;

- passing between about 70 to 90 weight percent of said net overhead stream into the etherification zone;
- admixing between 5 to 40 weight percent of said net overhead stream with a first portion of said net bottoms stream to form a first product stream; and,
- removing a second portion of said net bottoms stream as a second product stream.

4,413,151

# PROCESS FOR HYDROXYLATING OLEFINS USING A SUPPORTED OSMIUM CATALYST

Robert C. Michaelson, Waldwick; Richard G. Austin, and Donald A. White, both of Ridgewood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 14, 1982, Ser. No. 397,997

Int. Cl.<sup>3</sup> C07C 29/03, 31/20

U.S. Cl. 568—860

51 Claims

1. A process for hydroxylating olefins which comprises reacting in admixture at least one olefinic compound having at least one ethylenic unsaturation, with water and an oxidant selected from the group consisting of organic hydroperoxide, H<sub>2</sub>O<sub>2</sub>, and oxygen, in the presence of a catalyst composition under conditions and in a manner sufficient to convert at least one of said ethylenic unsaturation to its corresponding diol, said catalyst composition comprising:

- at least one osmium compound adsorbed on at least one support to form a supported osmium catalyst, said osmium compound being capable of catalyzing said hydroxylation reaction when adsorbed on said support, said supported osmium catalyst being insoluble in said admixture under hydroxylation reaction conditions; and optionally
- at least one co-catalyst capable of increasing at least one of the rate and selectivity of the hydroxylation reaction to product diol relative to the rate and selectivity in the absence of said co-catalyst.

4,413,152

# HYDROGENATION IN AQUEOUS SOLUTIONS

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1982, Ser. No. 411,156

Int. Cl.<sup>3</sup> C07C 31/26, 31/24, 31/18

U.S. Cl. 568—863

11 Claims

1. A method for the hydrogenation of a carbohydrate to its polyol(s) comprising at hydrogenation conditions an aqueous solution of the carbohydrate with hydrogen and a catalyst consisting essentially of a zerovalent Group VIII metal selected from the group consisting of osmium, rhodium, ruthenium, nickel, palladium and platinum dispersed on titanated alumina, and recovering the formed polyol(s).

4,413,153

# INTEGRATED PROCESS FOR MAKING TRANSPORTATION FUELS AND LUBES FROM WET NATURAL GAS

William E. Garwood, Haddonfield, and Wooyoung Lee, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 22, 1982, Ser. No. 436,158

Int. Cl.<sup>3</sup> C07C 1/04

U.S. Cl. 585—304

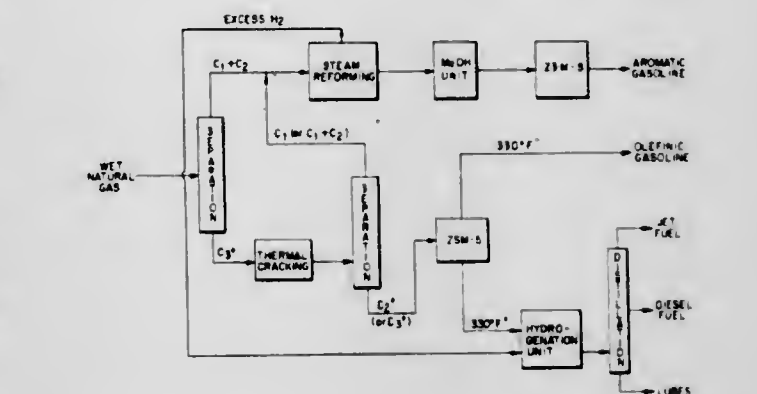
10 Claims

10. A process for making heavier hydrocarbon products from wet natural gas comprising the steps of: separating wet natural gas into a dry gas fraction consisting essentially of methane and ethane and a C<sub>3</sub><sup>+</sup> paraffin rich fraction;

converting the dry gas fraction to a synthesis gas comprising carbon monoxide and hydrogen;

cracking the C<sub>3</sub><sup>+</sup> fraction to yield an olefinic product comprising a C<sub>3</sub><sup>+</sup> olefinic fraction and a C<sub>1</sub>/C<sub>2</sub> hydrocarbon fraction;

separating at least a portion of the C<sub>1</sub>/C<sub>2</sub> hydrocarbon fraction and mixing same with the dry gas fraction for conversion to synthesis gas;



contacting at least a portion of the C<sub>3</sub><sup>+</sup> olefinic fraction with ZSM-5 type catalyst for conversion of C<sub>3</sub><sup>+</sup> olefin to heavier hydrocarbons comprising olefinic gasoline and distillate hydrocarbons;

hydrogenating heavier distillate hydrocarbons with a fraction of hydrogen from the synthesis gas; and

converting synthesis gas to gasoline hydrocarbons.

4,413,154

# DIELS-ALDER CYCLODIMERIZATION OVER A CARBON MOLECULAR SIEVE CATALYST

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,774

Int. Cl.<sup>3</sup> C07C 3/035, 3/10

U.S. Cl. 585—366

4 Claims

1. A process for cyclodimerization of a conjugated alkadiene which comprises contacting a conjugated alkadiene-containing feedstock with a large-pore carbon molecular sieve.

4,413,155

# AMMOXIDATION OF OLEFINS WITH NOVEL ANTIMONATE CATALYSTS

Dev D. Suresh, Macedonia; Robert K. Grasselli, Chagrin Falls, and David A. Orndoff, Windsor, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

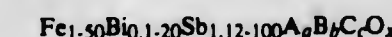
Continuation of Ser. No. 108,326, Dec. 31, 1979, abandoned, which is a division of Ser. No. 57,853, Jul. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 862,268, Dec. 20, 1977, abandoned. This application Mar. 30, 1981, Ser. No. 249,034

Int. Cl.<sup>3</sup> C07C 11/12

U.S. Cl. 585—417

5 Claims

1. In an oxydehydrogenation process wherein an olefin having four or more contiguous carbon atoms and oxygen are contacted at elevated temperature in the vapor phase with a catalyst, the improvement wherein said catalyst is free of uranium and tellurium and defined by the following general formula:



wherein

- A is at least Cu and optionally Ce, V, Cr and/or Mn;
  - B is earth alkali, Co, Ni, Zn, Cd, rare earth metal other than Ce, Ga, In, Tl and/or Th;
  - C is Mo, W, Nb, Ta, Sn, Ge, Ti, Zr, P, B and/or As; and
- wherein a is 0.01 to 20;



b is 0 to 20;  
c is 0.01 to 20;

x is a number determined by the oxygen requirements of the other elements present; and wherein the amount of Sb in said catalysts on an atomic basis is greater than the sum of the amounts of all other elements in said catalyst excluding oxygen.

4,413,156

**MANUFACTURE OF SYNTHETIC LUBRICANT ADDITIVES FROM LOW MOLECULAR WEIGHT OLEFINS USING BORON TRIFLUORIDE CATALYSTS**  
Lewis W. Watts, Jr., and Edward T. Marquis, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,742  
Int. Cl.<sup>3</sup> C07C 5/00

U.S. Cl. 585—254

17 Claims

1. A process for converting C<sub>3</sub>-C<sub>4</sub> linear olefins to a synthetic lubricant component comprising

- a. isomerizing a linear olefin feedstock selected from the group of olefins consisting of propylene, butene-1, butene-2 and mixtures thereof, over a heterogeneous isomerization catalyst selected from the group of catalysts consisting of cobalt oxide, iron oxide and manganese oxide, each of which is supported on alumina, and sodium and potas-

sium carbonate supported on gamma alumina, at a temperature of about 70° C.,

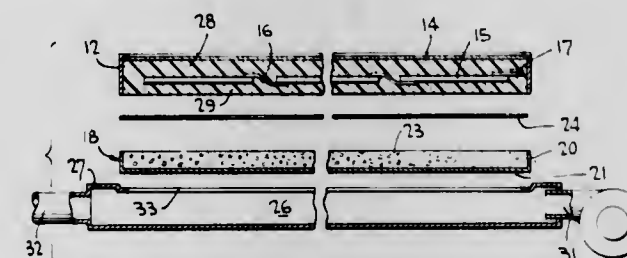
- b. disproportionating the mixture resulting from the isomerization step by passing the mixture over a heterogeneous disproportionation catalyst selected from the group of catalysts consisting of molybdenum, tungsten and rhenium, each of which is supported on alumina, and a mixture of molybdenum and cobalt supported on alumina, at a temperature in the range of about 100° to 175° C. and at a pressure of greater than 200 psig,
- c. separating from the mixture resulting from the disproportionation step a mixture of olefins having carbon numbers ranging from 9 to 24, and being comprised of 99 weight percent or more internal olefins,
- d. oligomerizing the mixture of internal olefins separated in the previous step by contacting the mixture with a catalyst comprising boron trifluoride and a protonic promoter being selected from the group of promoters consisting of alcohols, carboxylic acids and water, at a temperature between about 25° and about 150° C.,
- e. mildly stripping off any unreacted olefin monomers from the mixture of oligomerized olefins resulting from the oligomerization step, and
- f. hydrogenating the oligomerized olefins from the previous step in the presence of hydrogen and a hydrogenation catalyst to produce a synthetic lubricant component.

## ELECTRICAL

4,413,157

**HYBRID PHOTOVOLTAIC-THERMAL DEVICE**  
Douglas A. Ames, 1301 20th St., NW., Washington, D.C. 20036  
Continuation-in-part of Ser. No. 242,101, Mar. 9, 1981, Pat. No. 4,389,533. This application Jun. 24, 1981, Ser. No. 276,824  
Int. Cl.<sup>3</sup> H01L 31/04; F24J 3/02  
U.S. Cl. 136—248

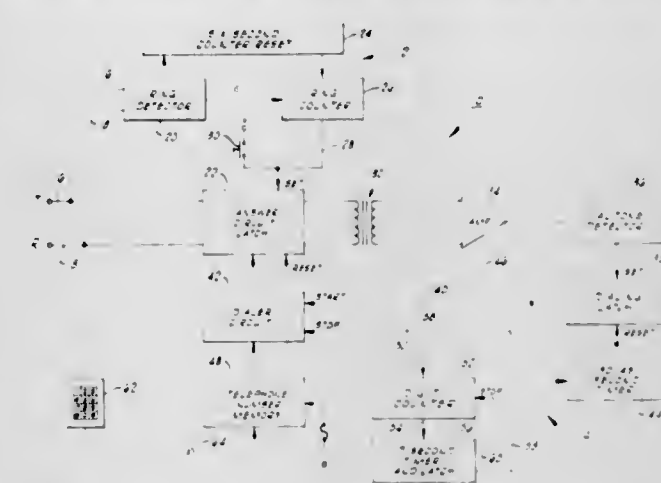
9 Claims



1. A photovoltaic device for transforming light energy into usable electrical energy, comprising

- (a) a solar panel having side walls forming an enclosure with an upper portion adapted to receive light therethrough, and a lower portion;
- (b) photovoltaic cells positioned in said enclosure beneath said upper portion and above said lower portion of said enclosure, said cells being enclosed in and supported and protected by an encapsulant and having light-receiving, upwardly facing surfaces and electrical contacts for collecting and channeling electrical energy generated by said cells to perform work;
- (c) said lower portion of said enclosure being free of any materials that substantially inhibit the passage of heat therethrough so that heat also generated during operation of said cells passes beneath said cells and into said lower portion of said enclosure, and
- (d) a container housing salt hydrate materials that are solid at ambient temperatures of use of said solar panel and can be melted by the heat generated during operation of said photovoltaic cells,
- (e) said container being positioned in proximity to said lower portion of said enclosure so that heat generated during the operation of said photovoltaic cells will pass freely to and through said lower portion of said enclosure and melt said salt hydrate materials, thereby effectively storing heat in said materials and lowering the operating temperature of said photovoltaic cells with minimal inhibition from the structure of said solar panel.

unanswered for a pre-set duration for alternative operation to energize said means programmable to effect call



forwarding of said subsequent calls when said switch means is unactuated.

4,413,159

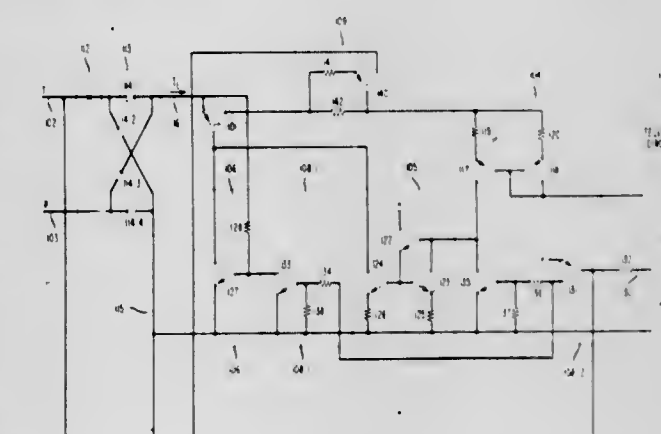
**DIAL PULSING CIRCUIT**

Donald D. Huizinga; Donald R. Means, both of Indianapolis, and Edward W. Underhill, Knightstown, all of Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1982, Ser. No. 364,752  
Int. Cl.<sup>3</sup> H04M 1/31

U.S. Cl. 179—90 K

13 Claims



1. A dial pulsing circuit for converting a pulse train representing a dialed digit into corresponding interruptions of the line current on a telephone line comprising in combination, a pulsing transistor, means for connecting said pulsing transistor in series with said telephone line, pulsing means for turning said pulsing transistor ON and OFF in response to said pulse train, an adjustable current source connected to said pulsing transistor for biasing said transistor in the conductive ON state, and means for adjusting said current source in response to the magnitude of the line current on said telephone line.

4,413,158

**AUTOMATIC CALL FORWARDING TELEPHONE APPARATUS**

Glenn S. Danford, 329 NW. 21st St., Oklahoma City, Okla. 73103

Filed May 13, 1982, Ser. No. 377,628  
Int. Cl.<sup>3</sup> H04M 1/26

U.S. Cl. 179—90 BD

13 Claims

1. Telephone apparatus for connection to a subscriber line for a subscriber station, comprising:
- means programmable to contain an electronic switching system call forwarding access code and designated station telephone number and energizable to dial out on said subscriber line to effect call forwarding of subsequent calls to said designated station;
- switch means actuable to energize said means programmable to effect call forwarding of said subsequent calls; and
- circuit means responsive to detection of an incoming call

4,413,160

**RIBBON-TYPE LOUDSPEAKER**

Takashi Ohnaka, and Yoichi Suzuki, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,244  
Claims priority, application Japan, Mar. 10, 1981, 56-32226[U]

Int. Cl.<sup>3</sup> H04R 11/00

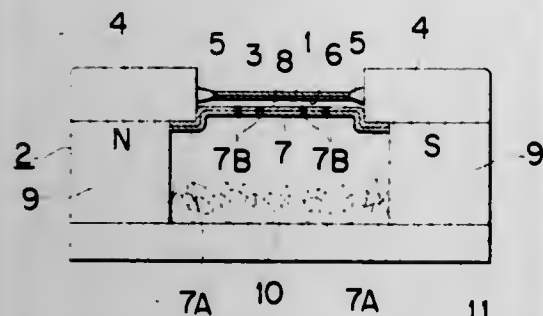
U.S. Cl. 179—115 V

7 Claims

1. A ribbon-type loudspeaker comprising magnet means; an electrically conductive diaphragm provided within said



magnet means to complete a magnetic circuit, said diaphragm forming an electric circuit transversely of said magnetic circuit, at least one side of said diaphragm being formed with an electrically insulating layer; and



heat absorbing plate extended within said magnet means and attached in contacting relation thereto over an extended area, said heat absorbing plate being formed with an electrically insulating layer in facing relation to the electrically insulating layer of the diaphragm.

4,413,161

## ELECTRO-ACOUSTIC TRANSDUCER

Toyosaku Matsumoto, and Takao Nakaya, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

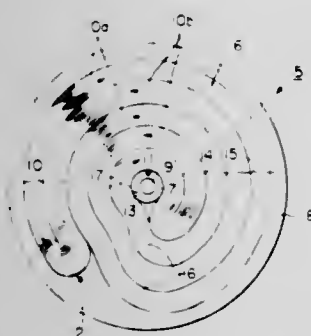
Filed Feb. 4, 1981, Ser. No. 231,296

Claims priority, application Japan, Feb. 9, 1980, 55-15303[U]; Feb. 9, 1980, 55-15304[U]

Int. Cl.<sup>3</sup> H04R 9/02

U.S. Cl. 179—115.5 PV

20 Claims



1. An electro-acoustic transducer, comprising:  
a diaphragm made of a non-magnetizable, non-electroconductive flexible planar material having a vibratable portion and a stationary portion;  
a continuous circular coil made of electrically conductive material formed on a surface of said diaphragm and having a plurality of turns, wherein at least one half of each turn is circular and concentric with the other turns; and  
a magnet plate having a pair of opposite magnetic poles formed on its surface with a pattern corresponding in its entirety to the pattern of said coil,  
said opposite magnetic poles being disposed alternately in radial direction of said magnet plate while forming transitional zones between adjacent opposite magnetic poles, said magnet plate being positioned with respect to the diaphragm so that said transitional zones are confronted by respective turns of the coil,  
said stationary portion of the diaphragm being fixed relative to said magnet plate.

4,413,162  
MOVING COIL TRANSDUCERS USING  
MULTIPLE-STRANDED COILS

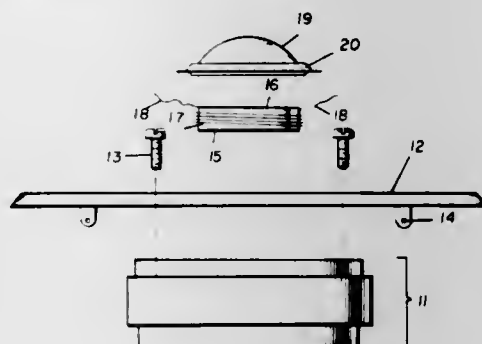
Stuart W. Lumsden, and Matthew S. Polk, both of Baltimore, Md., assignors to Polk Audio, Inc., Baltimore, Md.

Filed May 28, 1982, Ser. No. 383,233

Int. Cl.<sup>3</sup> H04R 9/00, 9/04

U.S. Cl. 179—115.5 VC

2 Claims



1. A moving coil transducer including a rigid mounting structure and a stationary magnetic structure, a moving coil structure mounted on said rigid mounting structure, said moving coil structure having a diaphragm means adapted to move with respect to said mounting structure and stationary magnetic structure in response to electrical signals within said coil structure whereby the moving coil transducer functions as a loudspeaker, said coil structure comprising at least one turn of wire, said wire extending from the coil in leads having first and second ends, said wire comprising a stranded wire having a plurality of individual conductors, said rigid mounting structure having terminal means thereon, said wire leads extending continuously from the coil structure through apertures in said diaphragm means to said terminal means, said wire being twisted to a predetermined lay within a range from and including  $\frac{1}{4}$  inch to and including  $\frac{1}{2}$  inch throughout its length.

4,413,163

PORTABLE LINE TESTER FOR  
TELECOMMUNICATION SYSTEM

Bruno Basini, Rome, Italy, assignor to Selenia, Industrie Eletttroniche Associate, S.p.A., Rome, Italy

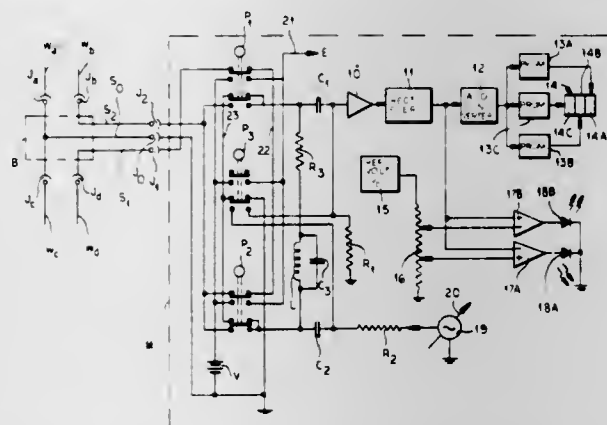
Filed Dec. 23, 1981, Ser. No. 334,066

Claims priority, application Italy, Jan. 6, 1981, 47520 A/81

Int. Cl.<sup>3</sup> H04B 3/46

U.S. Cl. 179—175.3 R

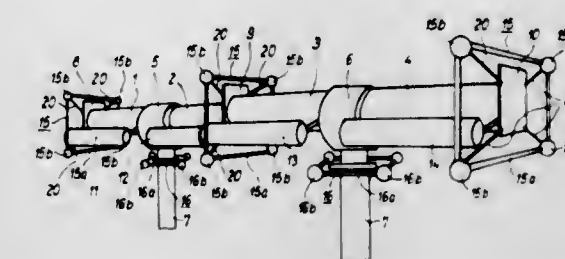
10 Claims



1. A portable metering unit for testing a subscriber line of a telecommunication system while having one input terminal connected to a first line conductor and two other input terminals respectively connected to a second line conductor and to one wire of a service telephone also having another wire joined to said one line conductor, comprising:  
a first and a second switch having contacts serially connected across said two other input terminals for normally

completing a calling circuit between said second line conductor and said one wire of said service telephone enabling extension of said line to a remote station;  
level-measuring means connectable to said second line conductor via a first capacitor in series with other contacts of said first switch in an actuated position of the latter for registering the attenuation of an incoming pilot tone generated at the remote station;  
an oscillator connectable to said second line conductor via a second capacitor in series with other contacts of said second switch in an actuated position of the latter for emitting a locally generated pilot tone to the remote station; and  
circuit means including an impedance path extending ahead of said capacitors between said other contacts of said first and second switches for closing a resistive loop across said line conductors by way of said one input terminal in the actuated position of either of said switches.

parts, the improvement comprising shielding electrodes in the form of angular frames, each of said frames being formed of



hollow cylindrical rods and of substantially spherical corner pieces, said corner pieces interconnecting said rods.

4,413,166

## DISCONNECT SWITCH

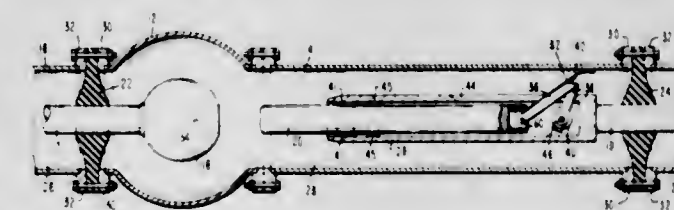
Jeffrey R. Meyer, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1981, Ser. No. 245,489

Int. Cl.<sup>3</sup> H01H 33/60

U.S. Cl. 200—148 B

9 Claims



1. A gas insulated disconnect switch, comprising:  
a sealed electrically grounded chamber having an insulating gas contained therein;  
a pair of electrical conductors each entering from an end of said chamber;  
insulating support means for preventing said conductors from contacting said chamber;  
a fixed contact member, electrically attached to the first of said pair of electrical conductors in said chamber;  
a movable contact member in said chamber, said movable contact member being electrically attached to the second of said pair of electrical conductors;  
movement means in said chamber for displacing said movable member so as to make and break contact with said fixed member; and  
grounding means electrically attached to said movable member so as to make electrical contact with said ground chamber shortly after the breaking of contact between said contact members.

4,413,167

## MICROWAVE EGG COOKER

Thomas J. Martel, North Reading, and Robert F. Bowen, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 11, 1982, Ser. No. 338,692

Int. Cl.<sup>3</sup> H05B 6/64

U.S. Cl. 219—10.55 E

15 Claims

1. A utensil for steam cooking in a microwave oven, comprising:  
a microwave transparent container for holding water, said container having a side wall with an outwardly extending lip at the top;  
a microwave reflective tray for supporting food to be cooked, said tray being removably supported by said lip, said tray having a substantially horizontal peripheral flange, the outer perimeter edge of said flange being spaced above said lip; and

4,413,165

## OUTDOOR HIGH VOLTAGE CIRCUIT BREAKER

Thomas Schultz, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 242,910

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009993

Int. Cl.<sup>3</sup> H01H 33/24

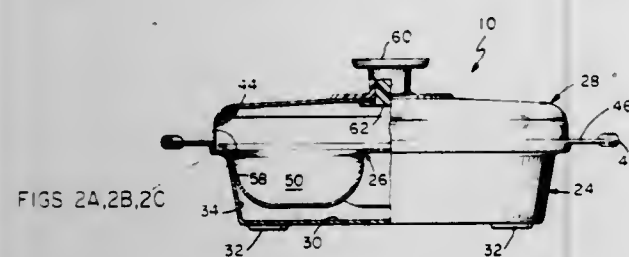
U.S. Cl. 200—148 H

11 Claims

1. In an outdoor high voltage circuit breaker containing parts carrying said high voltage and shielding electrodes for preventing spraying or corona discharges in the area of said



a microwave reflective lid removably supported by said lip of said container, said outer perimeter edge of said flange



being spaced from the inner surface of said lid by a gap of less than 0.5 inches.

4,413,168

### HEATING TIME COUPLING FACTOR FOR MICROWAVE OVEN

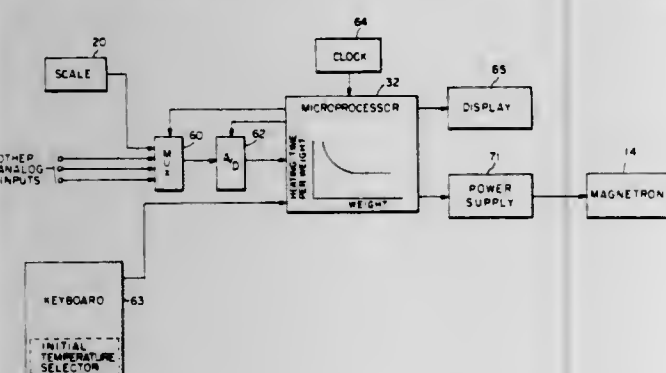
Wesley W. Teich, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 190,142, Sep. 24, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 356,058

Int. Cl.<sup>3</sup> H05B 6/68

U.S. Cl. 219—10.55 B

2 Claims



#### 1. A microwave oven comprising:

- a conductive cavity;
- a magnetron for supplying microwave energy to said conductive cavity;
- a weight sensitive device coupled to said cavity for generating a signal corresponding to the initial weight of food positioned in said cavity; and
- a microprocessor responsive to said signal and an operator actuated control corresponding to the initial temperature of said food for determining a time period of exposure of said food to microwave energy and for controlling said magnetron in accordance with said time period, said time period being determined as a nonlinear function of said initial weight and calculated by an equation including a denominator term equal to said initial food weight divided by the sum of said initial food weight plus a constant; wherein said constant corresponding to microwave energy losses to said oven, said losses being expressed in terms of equivalent food weight and said constant being approximately 0.1.

4,413,169

### ELECTRO-SLAG WELDING PROCESS FOR IRREGULAR SECTIONS

John Cameron, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed Jan. 11, 1982, Ser. No. 338,591

Claims priority, application Canada, Jan. 23, 1981, 369258

Int. Cl.<sup>3</sup> B23K 25/00

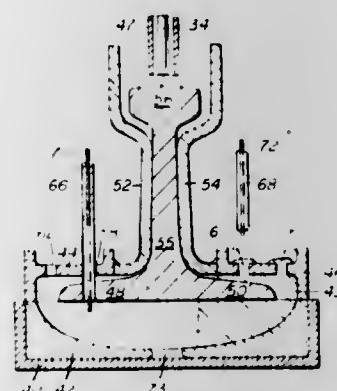
U.S. Cl. 219—73.1

14 Claims

1. A method of welding a butt-joint between spaced opposing end faces of elongated metallic members having an irregu-

lar cross sectional area, corresponding to head, web and flange parts of a railroad rail, which comprises:

- (a) providing a ceramic-lined crucible, including electrically conductive means, to substantially completely enclose said flange parts adjacent the end faces to be welded;
- (b) positioning a consumable metal central electrode substantially vertically in said crucible in alignment with said web;
- (c) positioning at least two additional electrodes substantially vertically in said crucible adjacent respective outer ends of said flanges;
- (d) providing means in said crucible whereby an arc may be struck between said electrodes and said electrically conductive means;
- (e) locating wall molds on opposite sides of said web and head parts adjacent said end faces to be welded thereby forming a mold space adjacent and in fluid communication with said crucible;



- (f) adding a submerged melt welding slag composition to said crucible;
- (g) supplying electric welding current to said central electrode and electrically conductive means to melt said welding composition, said central electrode at the tip thereof and adjacent metal of said end faces and at least partially fill said crucible with weld metal under a blanket of molten submerged melt welding composition;
- (h) supplying electric welding current to said additional electrodes and weld metal while continuing to supply welding current to said central electrode so as to completely fill said crucible and fusion weld said flange parts together; and
- (i) continuously melting said central electrode downwardly into the melt until the mold space between said wall molds and said web and head end faces is filled with weld metal under a blanket of molten submerged-melt welding composition, thereby fusion welding said web and head parts together.

4,413,170

### THERMAL PRINTING HEAD

Christian Val, and Didier Pribat, both of Paris, France, assignors to Thomson-CSF, Paris, France

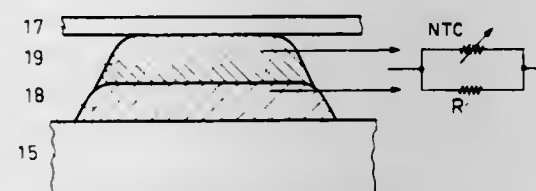
Filed Jun. 17, 1981, Ser. No. 274,376

Claims priority, application France, Jun. 24, 1980, 80 13967

Int. Cl.<sup>3</sup> H05B 1/00

U.S. Cl. 219—216

6 Claims



1. A thermal printing head comprising at least one strip of linear heating resistors, wherein each resistor is deposited on

an insulating glass or ceramic substrate, whose thermal capacity is well above that of the heating resistor, and wherein it comprises at least a first layer of a material having a relatively constant resistivity as a function of the temperature and which is deposited in direct contact with the substrate and at least a second surface layer of a material whose resistivity varies in non-linear manner with the temperature and having a negative temperature coefficient, said second layer being deposited on the first layer.

4,413,171

### ELECTRIC COOKING OVEN FOR DOMESTIC USE

Gerard Klammers, Thionville-Garche, France, assignor to Etablissements Eugene Scholtes, Lagrange-Thionville, France

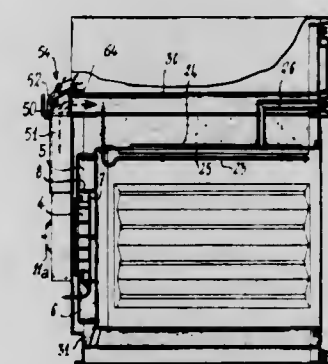
Continuation-in-part of Ser. No. 218,747, Dec. 22, 1980, abandoned. This application Dec. 8, 1981, Ser. No. 328,643

Claims priority, application France, Dec. 27, 1979, 79 31753

Int. Cl.<sup>3</sup> F27D 11/02

U.S. Cl. 219—400

4 Claims



1. An electric cooking oven for domestic use comprising a cooking enclosure in which an air convection is produced, this air being heated by at least one electrical heating resistance and circulated by a centrifugal turbine mounted in a compartment formed in one of the enclosure walls, said turbine being surrounded by a perforated sleeve contacting said heating resistance so as to be brought to a red-hot condition when said resistance is energized, wherein an electric circuit is provided for controlling the cleaning of said enclosure by pyrolysis, said circuit comprising a pivoting shutter connected to a first control thermostat and to said turbine connected in turn to a second control thermostat so adjusted as to close at a predetermined critical temperature beyond which said turbine must be ventilated to protect same against overheating, said second thermostat being connected, when open, to an electric grill resistance capable of producing the pyrolytic cleaning operation, whereby said turbine will start up automatically when closing said second thermostat at said predetermined critical temperature in order to cause said shutter to pivot to a position in which said pivoting shutter keeps supplying electric power to said turbine while said second thermostat opens after the oven temperature has dropped to a value lower than said predetermined critical temperature.

4,413,172

### METHOD OF HEAT CONTROL IN A SKIN PACKAGING MACHINE

Stephen H. Jones, LaFrance, S.C., assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 245,752, Mar. 20, 1981, Pat. No. 4,338,769.

This application Jan. 18, 1982, Ser. No. 340,031

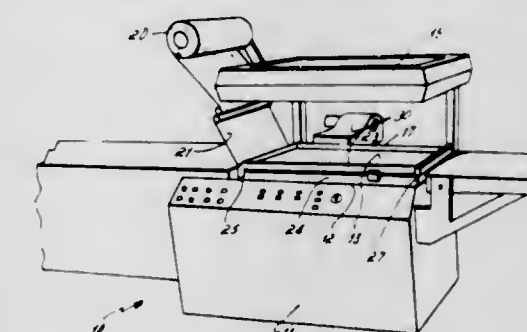
Int. Cl.<sup>3</sup> H05B 1/02

U.S. Cl. 219—411

6 Claims

1. In a skin packaging machine having an oven having heating elements, a horizontal surface below said oven to which vacuum is applied, a film receiving frame between said oven and surface, means for raising and lowering said frame, a film supply adjacent said frame, and a power supply connected to

said heating elements, the method of operating said skin packaging machine comprising the steps of, pulling film onto said frame, raising said frame to a position adjacent said oven, placing a substrate and object on said surface, lowering said frame to place said film on said substrate and object, and applying power to said heating elements as follows:



4,413,173

### ELECTRIC TOASTER CONTROL

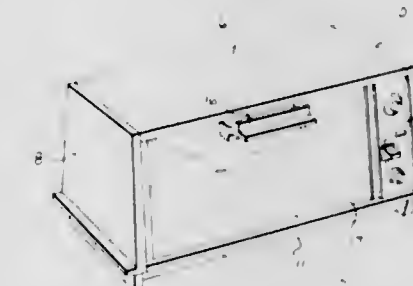
Lawrence L. Grove, Lyme, Conn., and Donald G. Benner, Whitehall, Pa., assignors to General Electric Company, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,983

Int. Cl.<sup>3</sup> A47J 37/08; H05B 1/02

U.S. Cl. 219—412

2 Claims





noid for holding the lever and said switch in a closed position against the spring bias of said switch;  
 e. said toasting period controller including means for actuating said solenoid at the end of the toasting cycle to move said movable core to release said latch arm from said movable core at the end of a toasting cycle to permit the switch to be opened under the force of its spring bias and to move the lever to an off position;  
 f. a toast cycle interrupt lever pivotally mounted on said toaster oven, said interrupt lever having a front facing surface and a rear facing surface; and  
 g. a door link connected to said door and movable therewith, the door link being engageable with the rear facing surface of said interrupt lever to move the interrupt lever front facing surface forwardly to engage the manually operable lever for releasing said latch arm from the movable core member of said toasting period controller when the door is opened so that the switch is opened and the leg of said manually operable lever is moved to return the toasting period controller to its starting position to thereby require a user to start a new full toast cycle when the door is reclosed.

4,413,174

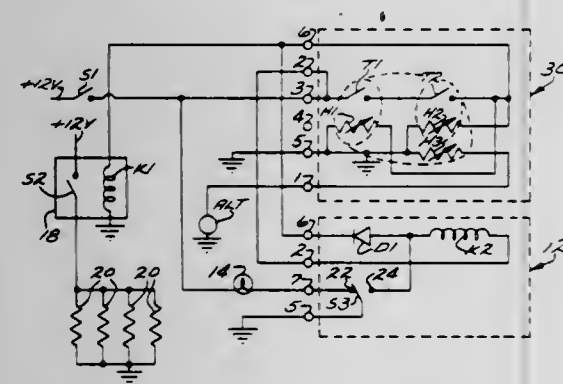
**GLOW PLUG DUTY CYCLE MODULATING APPARATUS**  
 Youn H. Ting, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 118,362, Feb. 4, 1980, abandoned. This application May 10, 1982, Ser. No. 376,482

Int. Cl.<sup>3</sup> H05B 1/02

U.S. Cl. 219—511

8 Claims



1. Apparatus for modulating power supplied to a load comprising electrical energization means for energizing the load, a thermally responsive switch having a thermally responsive element, the switch being connectable to the electrical energization means, the thermally responsive switch having contacts which are normally closed but which will open when the thermally responsive element is subjected to preselected temperature conditions, heating means having a positive temperature coefficient (PTC) of resistance operatively connected to the thermally responsive switch by a thermal coupling, means to energize the heating means when the contacts of the thermally responsive switch are closed so that the thermally responsive switch will cycle on and off, a cut-off heater operatively connected to the PTC heating means by a thermal coupling, and means to energize the cut-off heater to cause the thermally responsive switch to be maintained in its contacts open configuration after a selected number of on-off cycles of the thermally responsive switch have been completed.

#### 4,413,175 HEAT LEVEL INDICATION METHOD AND APPARATUS

Wilfried Schilling, Kraichtal; Siegfried Lorenz, Bretten, and Friedrich Koch, Oberderdingen, all of Fed. Rep. of Germany, assignors to E.G.O. Regeltechnik GmbH, Fed. Rep. of Germany

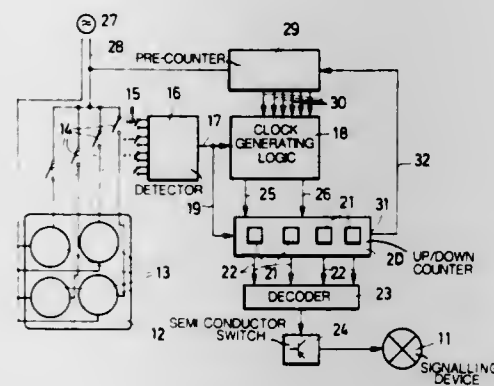
Filed Jan. 22, 1981, Ser. No. 227,506

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003419

Int. Cl.<sup>3</sup> G06G 7/00; G01K 1/00

U.S. Cl. 377—25

23 Claims



1. A method for indicating the thermal state of cooking appliances with an optical and/or acoustic signalling device, comprising the steps of:  
 continuously counting forward from a starting number in response to the heating means of the cooking appliance being switched on; and,  
 continuously counting backwards only after the heating means of the cooking appliance has been switched off, the signalling device being switched on when the count exceeds a first number and being switched off when the count falls below a second number.

4,413,176

#### PORTABLE TAPE READER

Tadayoshi Onuki, Sagami, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

PCT No. PCT/JP81/00160, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00375, PCT Pub. Date Feb. 4, 1982

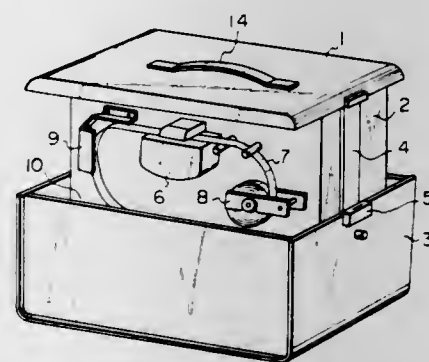
PCT Filed Jul. 10, 1980, Ser. No. 355,722

Claims priority, application Japan, Jul. 10, 1980, 55-96182[U]

Int. Cl.<sup>3</sup> G06K 7/04

U.S. Cl. 235—445

3 Claims



1. A portable tape reader characterized in that a lid provided with a handle is integrally formed on the upper portion of a body provided with a reading head, the body is contained in a container box so that the body can be drawn out upwardly, and when the body is drawn out, the container box is held in the lower portion of the body and an opening of the container box is located below said reading head.

4,413,177

#### OPTICAL SCANNING APPARATUS INCORPORATING COUNTER-ROTATION OF PRIMARY AND SECONDARY SCANNING ELEMENTS ABOUT A COMMON AXIS BY A COMMON DRIVING SOURCE

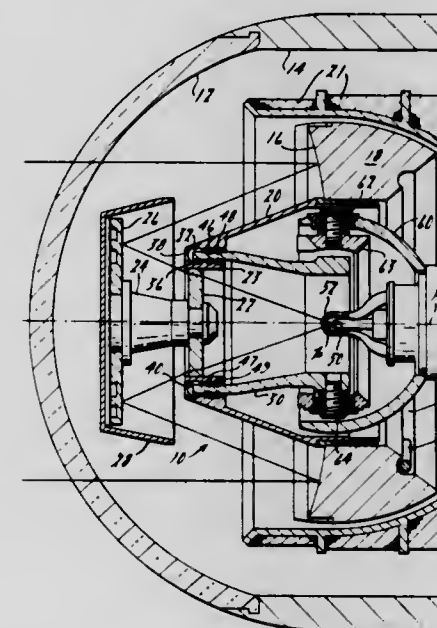
Paul K. Godwin, Jr., Farmington, Mich., and Ronald T. Honda, Irvine, Calif., assignors to Ford Motor Company, Dearborn and Ford Aerospace & Communications Corp., Detroit, both of, Mich.

Filed Nov. 30, 1981, Ser. No. 325,953

Int. Cl.<sup>3</sup> G01J 1/20

U.S. Cl. 250—203 R

9 Claims



5. An optical scanning apparatus for providing a rosette scan pattern of focused images over the field of view of said apparatus, including:

a focused primary mirror means for defining said field of view and for conically scanning said defined field of view at a first rate and direction of rotation;  
 secondary mirror means in said optical path adjacent said primary mirror means for conically scanning said defined field of view at a second rate of rotation that is directly proportional to said first rate and in a rotational direction opposite to said first direction of rotation; and  
 a single motor means for producing the rotation of said primary mirror means and the counter-rotation of said secondary mirror means.

4,413,178

#### SWEEP DRIVE CIRCUIT FOR A STREAK CAMERA

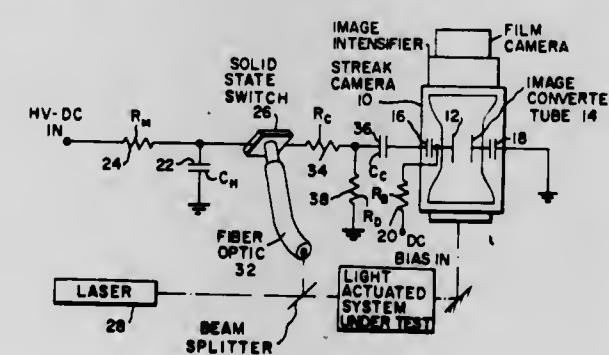
Gerard A. Mourou, and Wayne H. Knox, both of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,830

Int. Cl.<sup>3</sup> H01J 31/50

U.S. Cl. 250—213 VT

24 Claims



1. A streak camera sweep drive circuit for use with a streak camera for studying transient events having an image converter tube which has deflection plates, said circuit comprising a

radiation activated solid state switch, means for providing at the beginning of said sweep a charged circuit to a high voltage in kilovolt range which respect to a reference potential, said circuit including the capacitance presented by said deflection plates, a resistor connected to said deflection plates for providing a time constant long compared to the life time of the transient event, said switch being connected between one of said deflection plates and a point at said reference potential, and means for applying radiation to said switch for activating the same to initiate the sweep.

4,413,179

#### MECHANICAL VIBRATOR FOR LIGHT BEAM CHOPPER

Shoji Matsuoka, Tokyo; Ikutaro Kobayashi, and Junichiro Minowa, both of Yokosuka, all of Japan, assignors to Anritsu Electric Company Limited and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

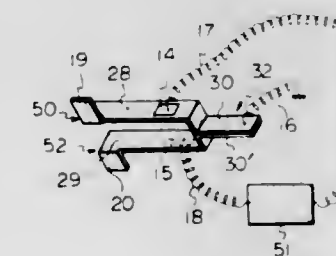
Filed Feb. 24, 1981, Ser. No. 237,790

Claims priority, application Japan, Feb. 29, 1980, 55-24133

Int. Cl.<sup>3</sup> G01D 5/36

U.S. Cl. 250—232

8 Claims



1. A vibrator for an optical chopper in a photosensor, which vibrator oscillates at a single frequency, said vibrator comprising:

a pair of separate vibrating plates of a thickness ranging from 0.1 to 1 mm and facing each other with a predetermined spacing therebetween;  
 a light chopping member formed at an end of one of said vibrating plates to interrupt a light beam to be measured, at said single frequency and having a thickness equal to that of one of said vibrating plates; and  
 a balancing member formed at an end of another one of said vibrating plates to maintain a balance relative to said light chopping member and having a thickness equal to that of one of said vibrating plates;  
 said vibrating plates having their other ends formed with flat portions bent from said vibrating plates, respectively, in symmetry relative to one another which flat portions are bonded to one another to form a stem portion to be supported.

4,413,180

#### METHOD AND APPARATUS FOR IMAGE ACQUISITION UTILIZING A HOLLOW SHAFT MOTOR AND A CONCAVE, CYLINDRICAL REFLECTOR

Charles J. Libby, West Roxbury, Mass., assignor to Automatix Incorporated, Billerica, Mass.

Continuation-in-part of Ser. No. 352,597, Feb. 26, 1982. This application Jan. 18, 1983, Ser. No. 458,836

Int. Cl.<sup>3</sup> H01J 3/14

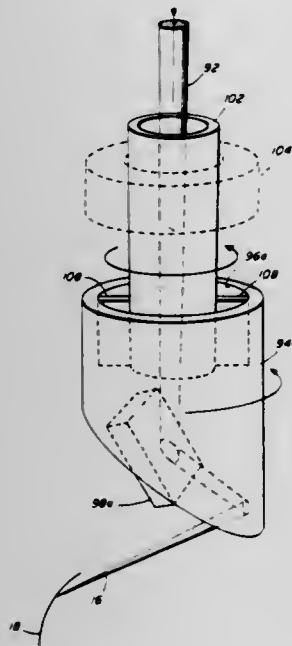
U.S. Cl. 250—236

28 Claims

1. Method for image acquisition comprising the steps of:  
 A. passing a beam of collimated light through a hollow, rotatable motor shaft to a beam directing mirror that is secured with respect to and rotatable with said hollow, rotatable motor shaft;  
 B. reflecting said beam of collimated light from said beam directing mirror  
 C. impinging the resulting reflected beam of collimated light



on a concave, cylindrical reflective surface to produce a conical beam of light having an angular arc that is a function of the radius of the concave, cylindrical reflective surface and the width of the collimated light beam impinging thereon;



- D. illuminating at least a portion of an object with said conical beam of light; and,  
E. imaging at least part of said light beam illuminated portion of the object on an array of photosensitive elements to produce corresponding signals representative of the image on said array.

#### 4,413,181 ARRANGEMENT FOR STROBOSCOPIC POTENTIAL MEASUREMENTS WITH AN ELECTRON BEAM TESTING DEVICE

Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

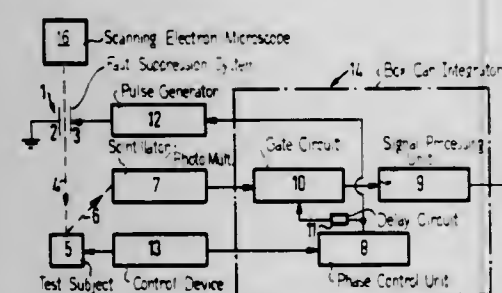
Filed Jul. 27, 1981, Ser. No. 287,134

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036660

Int. Cl.<sup>3</sup> G01N 23/00

U.S. Cl. 250—310

4 Claims



1. An electron beam testing device system for stroboscopic potential measurements of a test subject, comprising: a scanning electron microscope having a beam suppression or blanking system in which an electron beam is deflected across an aperture in the blanking system during each edge of a blanking pulse connected to control the blanking system such that two electron pulses are generated per blanking pulse; blanking pulse generator means for producing said blanking pulse; detector means for producing a signal responsive to a secondary electron beam resulting from impact of each of the electron pulses on the test subject on which the potential measurements are being made; a signal processing means with an associated gate circuit for processing only the signal associated with one of said two electron pulses associated with each blanking pulse;

and phase control means connected to control said gate circuit and said blanking pulse generator means.

#### 4,413,182 LEVEL DETECTOR

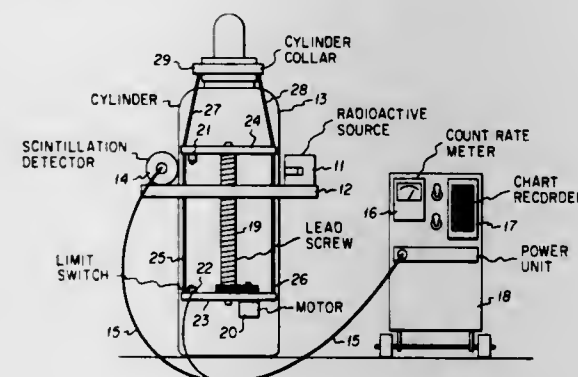
Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1980, Ser. No. 221,144

Int. Cl.<sup>3</sup> G01F 23/00

U.S. Cl. 250—357.1

1 Claim



1. An apparatus for detecting the level of a nongaseous substance in a cylindrical chamber comprising a radioactive source means and a detector means mounted on a movable means in horizontally spaced fixed relation to each other, said source means and said detector means having a source-detector spacing angle at least as great as 90°, said source of radiation being adapted to emit a signal of energy whose magnitude is attenuated by the presence of nongaseous substances, said detector means being adapted to receive said radiation signal emitted by said source means and adapted to produce an electrical signal correlating to the strength of the radiation signal received by said detector, drive means adapted to move said movable means vertically, and recorder means being synchronized with movement of said movable means and adapted to record the magnitude of the electrical output signal produced by said detector means.

#### 4,413,183 GAMMA CAMERA

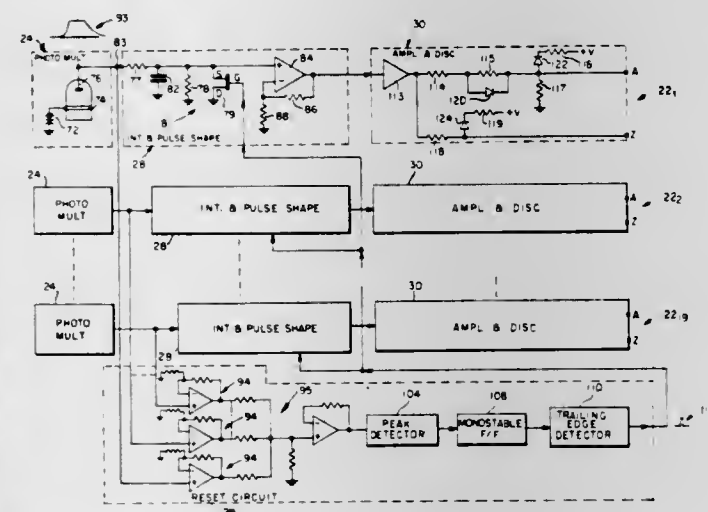
Israel Metal, New York, N.Y., and Vincent Berluti, Jr., Southbury, Conn., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 29, 1980, Ser. No. 221,225

Int. Cl.<sup>3</sup> G01T 1/20

U.S. Cl. 250—363 S

5 Claims



3. A camera system comprising:  
(a) an array of photodetectors arranged to locate flashes of light produced by a scintillator in response to an incident

gamma ray photon, a current pulse being produced by each one of such photodetectors in response to each incident gamma ray photon, the amount of charge produced by each one of such photodetectors being related to the portion of the energy of the photon detected by such one of the photodetectors, such current pulse rising from an initial level to a peak level and then returning to such initial level;

- (b) a plurality of integrator means coupled to a corresponding one of the photodetectors for integrating the current pulses producing a voltage which increases from an initial reference level to a peak level representative of the amount of charge in the current pulse fed thereto, such peak level providing a measure of the portion of the energy of the photon detected by such one of the photodetectors;  
(c) means responsive to the voltages for providing the location of flashes of light produced by the scintillator; and,  
(d) means responsive to the current pulses for detecting the peak level of such current pulses and for resetting the voltage produced by the integrator means to the initial reference level a predetermined time after detection of the peak level of the current pulses.

#### 4,413,184 OPTICAL FIBER RADIATION DETECTOR AND REAL-TIME DOSIMETER

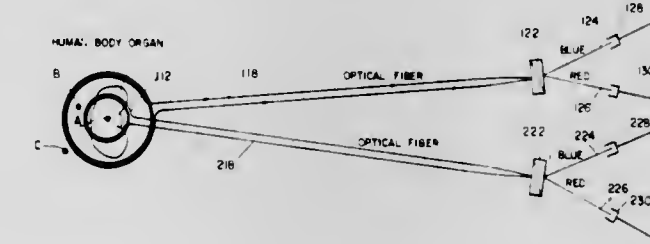
Michael J. Marrone, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1981, Ser. No. 262,658

Int. Cl.<sup>3</sup> G01T 1/20; H05B 33/00; G02B 5/14

U.S. Cl. 250—368

18 Claims



1. A method of monitoring an area for the presence of ionizing radiation and measuring its accumulated dosage comprising:

providing a considerable length of silica core optical fiber in proximity to an area susceptible of receiving ionizing radiation, whereby, said optical fiber upon receiving ionizing radiation, luminesces at its ends substantially only in combined blue and red having peaks at around 450 nm and 650 nm, respectively;  
dividing optical fiber end luminescence into two separate beams at near 450 nm and 650 nm, respectively; and,  
measuring the intensity of the divided beams in which the intensity of red luminescence indicates the immediate presence of ionizing radiation and the intensity of blue luminescence indicates accumulated dosage of ionizing radiation.

#### 4,413,185 SELECTIVE PHOTOIONIZATION GAS CHROMATOGRAPH DETECTOR

Richard C. Leveson, Willowdale, and Nicholas J. Barker, Don Mills, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Apr. 29, 1981, Ser. No. 258,575

Int. Cl.<sup>3</sup> H01J 37/00

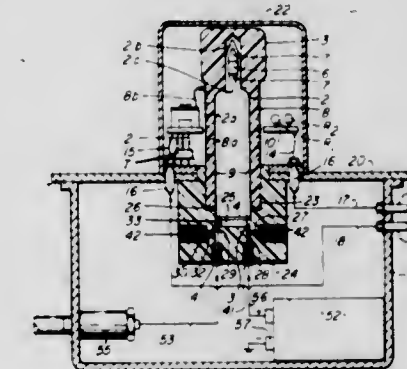
U.S. Cl. 250—423 P

13 Claims

1. A detector system, for use in the detection of gaseous or

vaporous ionizeable chemical species entrained in air as a carrier gas, said system comprising:

- a source of high purity air as a carrier gas;  
a gas chromatograph column for separating the chemical species to be detected from a mixture of said carrier gas and an ambient air sample containing said chemical species;  
conduit means for connecting said source of high purity air to one end of said chromatograph column;  
valve means associated with said conduit means for controlling the flow of air to said column;  
injection port means in said conduit between said valve means and said one end of the chromatograph column for injecting a sample containing said chemical species into said conduit in gaseous or vaporous form to provide said mixture and



a photoionization detector, said detector including a cylindrical ionization chamber, said ionization chamber being closed at one end by a crystal window composed of a transmissive material and including electrodes for detecting the ionization of the chemical species and an external gas discharge tube disposed adjacent to and in alignment with said window, wherein the mixture is flowed through said ionization chamber to ionize the chemical species by continuous UV radiation from said discharge tube, said UV radiation being axially directed from said discharge tube into said ionization chamber through said window such that the radiation intensity is substantially uniform in any plane of the ionization chamber perpendicular to the direction of radiation into the chamber.

#### 4,413,186 METHOD FOR DETECTING A POSITION OF A MICRO-MARK ON A SUBSTRATE BY USING AN ELECTRON BEAM

Kenyu Uema, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

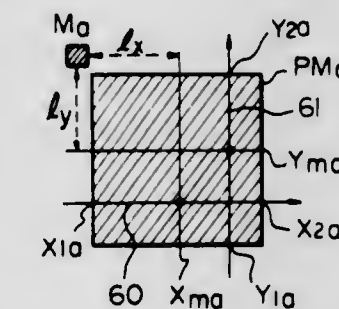
Filed Aug. 25, 1980, Ser. No. 180,946

Claims priority, application Japan, Aug. 29, 1979, 54-109894

Int. Cl.<sup>3</sup> H01J 37/00

U.S. Cl. 250—491.1

12 Claims



1. A method for detecting the position of a substrate utilizing a micro-mark on a substrate by detecting reflected electrons or secondary electrons radiated from said substrate when scanned



by an electron beam, to determine a position where a predetermined exposure pattern should be formed by said electron beam into said substrate, the method comprising the steps of:

- providing on said substrate a plurality of spaced-apart position mark chip areas and a plurality of device chip areas in which said predetermined exposure pattern is to be formed, each of said position mark chip areas being provided with a corresponding said micro-mark and at least one pilot mark which has a predetermined position relative to said micro-mark and is larger than said micro-mark, and each of said device chip areas being provided with a position mark,
- scanning one of said position mark chip areas by said electron beam so as to detect and read out the position of said pilot mark therein,
- determining the relative position of said read out position of said pilot mark with respect to said micro-mark so that the position of said micro-mark in said one of said position mark chip areas is determined,
- scanning said micro-mark in said one of said position mark chip areas by said electron beam so as to detect precisely the position of the same,
- repeating said scanning of said position mark chip area step, said relative position determining step, and said micro-mark scanning step on another of said position mark chip areas thereby to determine the exact position of said substrate and correspondingly the position of each said device chip area on said substrate where said predetermined exposure pattern should be formed, and scanning each device chip area to detect said position mark therein to establish precise alignment of said predetermined exposure pattern with the scanned said device chip area and exposing said device area in accordance with said exposure pattern, in individual succession for said plurality of device chip areas.

4,413,187

## METHOD FOR EXPOSING AN ELECTRON BEAM

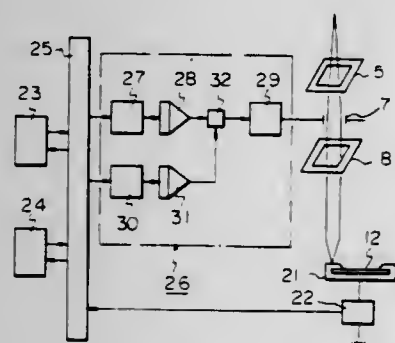
Yuji Akazawa, Kawasaki; Toshihiko Osada, Ebina; Takaharu Shima, Sagami; Yuji Tanaka, and Masayuki Hattori, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 24, 1981, Ser. No. 295,584

Claims priority, application Japan, Aug. 26, 1980, 55-117412  
Int. Cl.<sup>3</sup> H01J 37/00

U.S. Cl. 250—491.1

6 Claims



1. A method for providing an electron beam with a desired shape on the surface of a sample to form a desired pattern on said surface by using an electron-beam exposure apparatus, said apparatus comprising a first diaphragm having a first aperture for shaping the cross section of the electron beam into a polygon, a second diaphragm having a second aperture arranged so as to selectively stop the shaped electron beam corresponding to the image of the first aperture, wherein the position of the real image of said first aperture changes from the initial position of the ideal image during the operation of said electron-beam exposure apparatus, and a deflection unit for deflecting the electron beam having passed through said first aperture so as to position the shaped electron beam on a

desired area on the second diaphragm according to said desired shape, said method comprising the steps of:

- positioning a selected one of said ideal and real images of said first aperture on said second diaphragm;
- moving said positioned image, by the operation of said deflection unit, between a position where at least a part of said shaped electron beam passes through said second aperture and a position where no part of said shaped electron beam passes through said second aperture;
- detecting the part of the shaped electron beam passing through said second aperture;
- determining the critical amount of deflection at which the shaped electron beam begins to pass through said second aperture from the results of said moving and detecting;
- determining an offset value between the real image of the first aperture from the ideal image thereof; and
- correcting the amount of deflection of the shaped electron beam having passed through said first aperture according to said offset value;

wherein the change in the position of the real image with respect to the ideal image, arising during operation of said exposure apparatus, may be corrected during said operation for providing said desired shape at the surface of the sample.

4,413,188

## CAMERA TUBE APPARATUS FOR READING DOCUMENTS

Takashi Ozawa, and Mutsuo Takenouchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

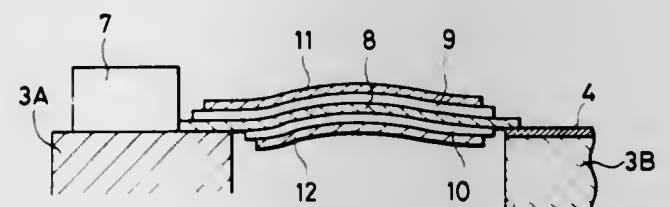
Filed Jul. 2, 1981, Ser. No. 279,873

Claims priority, application Japan, Dec. 10, 1980, 55-173227

Int. Cl.<sup>3</sup> H01J 40/14

U.S. Cl. 250—578

5 Claims



1. A document-reading camera tube apparatus comprising:

- a photoconductive layer;
- a plurality of split electrodes provided on one surface of said photoconductive layer;
- a plurality of common electrodes provided on the other surface of said photoconductive layer, each said common electrode overlying an end portion of a corresponding split electrode forming a light-receiving device therebetween, at least one of said split electrodes and common electrodes being transparent;
- a plurality of reading switches, each said reading switch being connected between a corresponding light-receiving device and a corresponding output terminal;
- a plurality of connecting electrodes, each said connecting electrode having a first end connected to a corresponding split electrode and a second end connected to a corresponding reading switch;
- at least one insulating layer disposed adjacent said connecting electrodes; and
- at least one conducting layer disposed on an outer surface of said at least one insulating layer opposite said electrodes, wherein capacitances formed between said electrodes and said conducting layer are significantly greater than capacitances of said light receiving devices.

4,413,189

## DEMAND REDUCTION SYSTEM FOR REGULATED ELECTRIC UTILITY DISTRIBUTION CIRCUITS

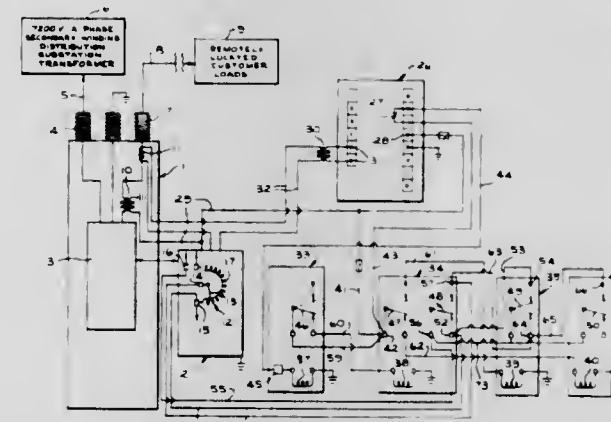
Dudley Bottom, Jr., 900 Craig Ave., Shelbyville, Ky. 40065

Filed Nov. 9, 1981, Ser. No. 319,205

Int. Cl.<sup>3</sup> H02J 3/12

U.S. Cl. 307—31

5 Claims



1. In association with a voltage regulator used for regulating the voltage on a single phase primary customer distribution circuit of an electric utility system of the conventional type which includes an auto-transformer, control circuitry for operating said auto-transformer, instrument transformers for sensing the voltage on and load current flowing in said distribution circuit, and negative resistance line drop compensating means operatively connectable to said control circuitry for reducing the regulated load voltage on said distribution circuit, a circuit for reducing the energy demand or load on said distribution circuit during periods of peak energy demand or load comprising

- means connected to said current transformer for sensing when said load current increases to a first predetermined value and for thereafter sensing when said load current decreases to a second predetermined value, said second value being less than said first value,
- a time delay relay responsively connected to said load current sensing means and adapted to actuate at a preselected time after said load current increases to said first value and to thereafter de-actuate when said load current decreases to said second value, and
- means responsively connected to said time delay relay for introducing said compensating means into said control circuitry upon activation of said time delay relay and for effectively removing said compensating means from said control circuitry upon de-activation of said time delay relay while maintaining continuity in a secondary circuit of said load current sensing instrument transformer.

4,413,190

## AUTOMATIC CONTROL DEVICE

Friedemann J. Schulz, 11 Richard St., Touraine by Gatineau Pt., Province of Quebec, Canada J8T 1G3

Filed Jun. 9, 1981, Ser. No. 269,267

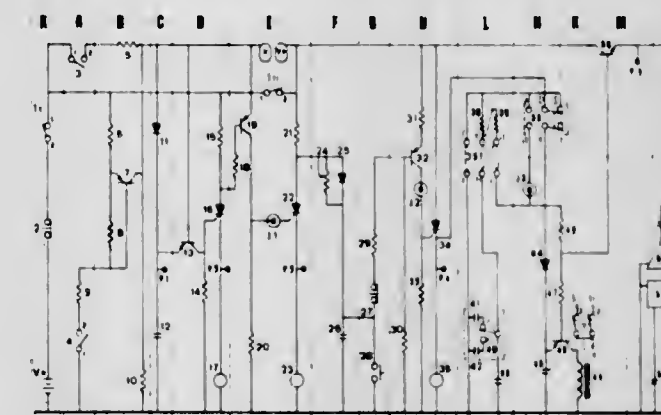
Int. Cl.<sup>3</sup> H03K 17/00

U.S. Cl. 307—241

9 Claims

1. A programmable control device for producing control power outputs in response to primary, secondary, delayed or directly applied input signals, and including programmable circuit means for resetting the control device, and comprising further means for controlling a number of intermediate power outputs in response to applied secondary input signals, whereas said means for controlling determine also a number of final power output repetitions before resetting of said control device is initiated and whereas said means for controlling comprises a basic subroutine circuit unit connected to an input data bus line and joined to a gated input signal storage circuit that is connected to a first inverted input gate circuit, whose output is joined to the input control gate of a first intermediate power output silicon controlled rectifier (SCR) and whereas the output of this device connects to the input of a secondary

control gate, that responds only to repeatedly applied signal inputs to said input data bus line and whereas the output of said secondary control gate connects to the control gate of a second intermediate power output SCR, to trigger this device into conduction and comprising means whereas the output of said second intermediate power output SCR is joined to final means for extending said basic subroutine circuit units function by connecting a rapid charge-up timing circuit to the anode of said second intermediate power output SCR for selectively delaying and applying said second intermediate power output



potential to a third inverted input gating circuit, whose output is joined to the gate of a succeeding constantly on control power output SCR to trigger this device into conduction while comprising additional means to connect said constantly on control power output to power output connectors and input connections of an output mode selector, whose output functions comprises means for activating selectively a primary output control timer, a selective automatic control device reset circuit, an output cycle repetition extension circuit and final DC and AC control power outputs.

4,413,191

## ARRAY WORD LINE DRIVER SYSTEM

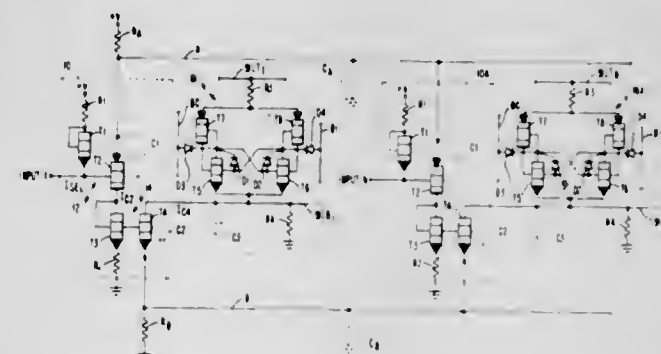
Russell J. Houghton, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1981, Ser. No. 260,576

Int. Cl.<sup>3</sup> H03K 17/04, 17/16, 17/62

U.S. Cl. 307—254

16 Claims



1. A driver system comprising:

- a first common conductive line,
- a plurality of load lines,
- a plurality of switching means, each of said means having a given capacitive element coupled to said common line and each of said means being connected between said common line and a respective one of said plurality of load lines, means for precharging said common line and said plurality of load lines during a first period of time, and
- means for selectively actuating one of said plurality of switching means during a second period of time for discharging said precharged common line to thereby effect the discharge of the respective load line of said actuated switching means.



4,413,192

## TRANSISTOR FIRING CIRCUIT

Linhard Niemetz, Nuremberg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

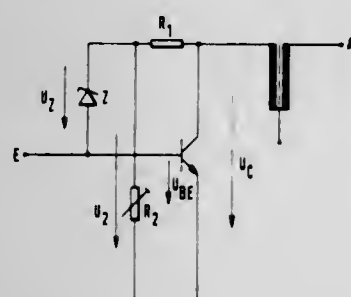
Filed May 13, 1981, Ser. No. 263,101

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019162

Int. Cl.<sup>3</sup> H03K 3/00, 3/26; H01J 29/70, 29/76

U.S. Cl. 307—278

4 Claims



1. A transistor firing circuit comprising: a firing transformer having a primary winding across which a flyback voltage appears; means defining a circuit ground; a transistor having a base and a collector-emitter path, with said collector-emitter path being connected between said primary winding and said circuit ground; a resistive voltage divider connected in parallel with said collector-emitter path and including first and second resistors connected together at a center point, with said first resistor being connected between said center point and said primary winding and said second resistor being connected between said center point and said circuit ground; means defining a circuit input connected directly to said transistor base; and a Zener diode connected between said center point and said circuit input; wherein said first resistor has a temperature coefficient of resistance which is opposite in sign to the temperature coefficient to said Zener diode and of a value to compensate the temperature coefficient to said Zener diode in a manner to maintain the flyback voltage amplitude within narrow, defined limits over the operating temperature range of said circuit.

4,413,193

## OPTICALLY COUPLED SOLID STATE RELAY

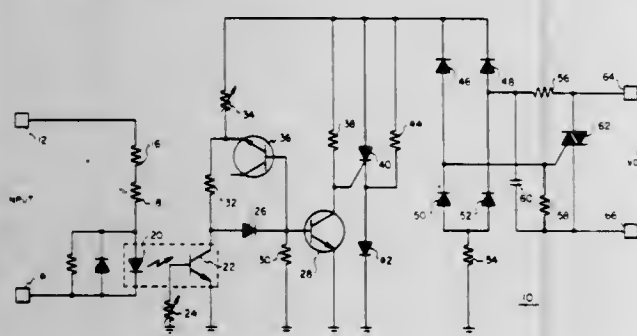
Charles R. Crockett, Arlington, Tex., assignor to Teccor Electronics, Inc., Euless, Tex.

Filed Jun. 11, 1981, Ser. No. 272,518

Int. Cl.<sup>3</sup> H03K 17/60, 23/12

U.S. Cl. 307—311

11 Claims



1. An optically coupled switching circuit adapted for controlling an alternating current power source, said switching circuit comprising:

means for emitting light in response to the application of an input signal;  
a photosensitive transistor for detecting said light and for commencing conduction in response thereto;  
detecting means including a reversed biased transistor emitter-base junction for precisely detecting the point at

which said alternating current power source equals a particular voltage;  
a gate controlled bilateral switching device for connection in series with said alternating current power source; and means coupled to said photosensitive transistor and said detecting means, for triggering said gate controlled bilateral switching device in response to the conduction of said photosensitive transistor, if said alternating current power source is less than said particular voltage.

4,413,194

## TTL OUTPUT CIRCUIT HAVING MEANS FOR PREVENTING OUTPUT VOLTAGE EXCURSIONS INDUCED BY NEGATIVE CURRENT REFLECTIONS

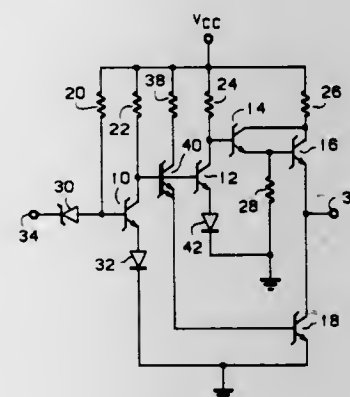
William A. Birch, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1981, Ser. No. 282,116

Int. Cl.<sup>3</sup> H03K 19/003, 19/084, 19/088

U.S. Cl. 307—456

5 Claims



1. In a logic circuit having input means for receiving one or more binary logic signals, a pull-up output transistor, a pull-down output transistor having at least a base terminal, a first switching transistor having at least a base terminal, coupled to said input means, a first current drive transistor having at least a collector terminal, for supplying drive to said pull-up transistor when said binary logic signals reach said first logic level, the improvement comprising:

second current drive transistor means having base, emitter and collector terminals, said base coupled to the collector of said first switching transistor, said collector being connectable to a first source of supply voltage and said emitter coupled to the base of said pull-down transistor for supplying drive to said pull-down transistor when said binary logic signals reach said second logic level; and second switching transistor means having base, emitter and collector terminals, said base coupled to the collector of said first switching transistor, said collector coupled to the base of said first current drive transistor, and said emitter being connectable to a second source of supply voltage, said second switching transistor means for diverting drive from the base of said first current drive transistor when said binary logic signals reach said second logic level.

4,413,195

## TRANSISTOR-TRANSISTOR-LOGIC CIRCUITS HAVING IMPROVED BREAKDOWN PROTECTION CIRCUITRY

William A. Birch, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1981, Ser. No. 282,118

Int. Cl.<sup>3</sup> H03K 3/013, 17/16, 19/088, 19/20

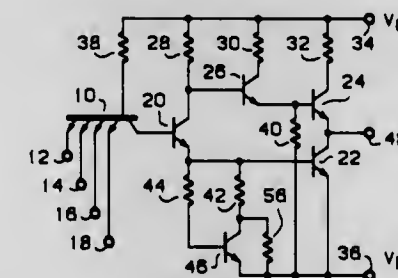
U.S. Cl. 307—456

7 Claims

1. In a logic circuit having input means for receiving one or more binary logic signals, an output transistor having base, emitter, and collector terminals, an output terminal coupled to said collector terminal of said output transistor, and a current drive transistor coupled between the input means and the output transistor for providing turn on drive current for the

output transistor when binary logic signals concurrently applied to the input means reach a determined logic level, the improvement comprising:

a turn off drive transistor having an emitter, a base and a collector, said emitter of said turn off drive transistor being coupled to said emitter of said output transistor;  
a first resistor coupled between said collector of said turn off drive transistor and the base of said output transistor;  
a second resistor coupled between the base of said turn off drive transistor and the base of said output transistor, said turn



off drive transistor and said first and second resistors providing a discharge path from the output transistor when the latter is turned on; and

means coupled to said turn off drive transistor for sourcing leakage current away from said output transistor so as to prevent said output transistor from turning on due to said leakage current.

2. A logic circuit according to claim 1 wherein said means comprises a third resistor coupled in parallel with the collector-emitter path of said turn off drive transistor.

4,413,196

## THREE JOSEPHSON JUNCTION DIRECT COUPLED ISOLATION CIRCUIT

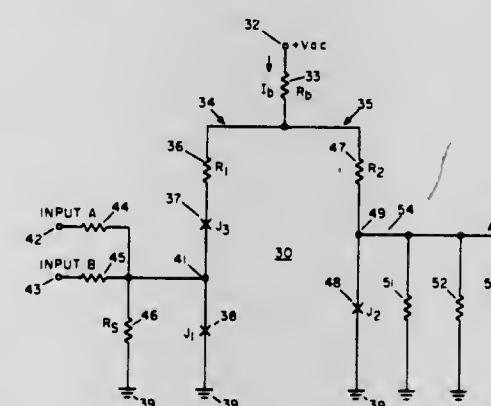
Richard M. Josephs, Willow Grove, and Tsing-Chow Wang, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,148

Int. Cl.<sup>3</sup> H03K 19/195

U.S. Cl. 307—462

11 Claims



1. A three Josephson junction direct coupled isolation OR gate circuit comprising:

a biasing current source;  
a low reference voltage;  
a first branch electrically connected in series between said biasing current source and said low reference voltage, said first branch comprising a first resistor, a first and third Josephson junction in series with said biasing current source and said low reference voltage,  
a signal input node,  
a sink resistor connected between said signal input node and said low reference voltage,  
said sink resistor being connected in parallel with said first Josephson junction,

a second branch electrically connected in series between biasing current source and said low reference voltage, said second branch comprising a second resistor and a second Josephson junction in series between said biasing current source and said low reference voltage,  
a signal output node,  
a load impedance connected between said signal output node and said low reference voltage, and  
said load impedance being connected in parallel with said second Josephson junction,  
said Josephson junction circuit having a biasing current input flowing in said branches before, during and after the presence of an input signal at said signal input node to produce a signal at said signal output node,  
the critical current of said first Josephson junction and the critical current of said third Josephson junction being selectively predetermined to cause switching of said first, second and third Josephson junctions to occur in numerical order of said junctions.

4,413,197

## FOUR JOSEPHSON JUNCTION DIRECT-COUPLED AND GATE CIRCUIT

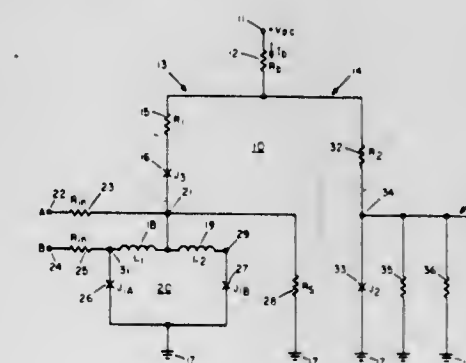
Richard M. Josephs, Willow Grove, and Tsing-Chow Wang, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,149

Int. Cl.<sup>3</sup> H03K 19/195

U.S. Cl. 307—462

8 Claims



1. A four Josephson junction direct coupled isolation AND gate circuit, comprising,  
a biasing current source,  
a low reference voltage,  
a first branch electrically connected in series between said biasing current source and said low reference voltage, said first branch comprising a first resistor, a third Josephson junction and an interferometer in series between said biasing current source and said low reference voltage,  
a first signal input connected intermediate said third Josephson junction and said interferometer,  
a second signal input connected to said interferometer,  
a sink resistor connected between said interferometer and said reference voltage and being connected parallel to said interferometer,  
a second branch electrically connected in series between said biasing current source and said low reference voltage, said second branch comprising a second resistor and a second Josephson junction in series between said biasing current source and said low reference voltage,  
a signal output node intermediate said second resistor and said second Josephson junction device, and  
a load impedance connected between said signal output node and said low reference voltage,  
said interferometer and said second and said third Josephson junctions having a predetermined critical current, said critical current of said interferometer and said Josephson junctions being selectively predetermined to cause the switching of said interferometer to switch before said



second Josephson junction and said second Josephson junction to switch before said third Josephson junction.

4,413,198

## PIEZOELECTRIC TRANSDUCER APPARATUS

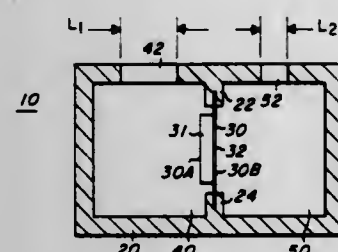
Jonathan R. Bost, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1981, Ser. No. 335,933

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—324

4 Claims



1. An electroacoustic device comprising: piezoelectric driver means, having opposed major surfaces, for converting electrical signals applied thereto into acoustic energy radiating from each of said major surfaces, said driver means exhibiting a first predetermined resonant frequency; first Helmholtz resonator means, acoustically coupled to one major surface of said driver means, and exhibiting appropriate dimensions for resonating at a second resonant frequency less than said first resonant frequency, and second Helmholtz resonator means, acoustically coupled to the remaining major surface of said driver means, and exhibiting appropriate dimensions for resonating at a third resonant frequency greater than said first resonant frequency.

4,413,199

## ELECTRICAL TOOTH CLEANER APPARATUS

Franz Fischer, Triengen, Switzerland, assignor to Trisa Bürstenfabrik AG, Triengen, Switzerland

PCT No. PCT/CH80/00014, § 371 Date Oct. 5, 1980, § 102(e)

Date Aug. 19, 1980, PCT Pub. No. WO80/01533, PCT Pub.

Date Aug. 7, 1980

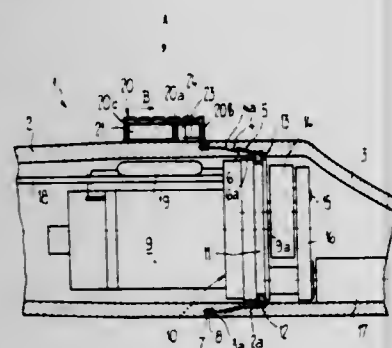
PCT Filed Feb. 1, 1980, Ser. No. 207,957

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904327

Int. Cl.<sup>3</sup> H02K 7/14

U.S. Cl. 310—50

15 Claims



1. An electrical tooth cleaning apparatus, comprising: a housing composed of at least two mutually interconnected housing portions; a drive motor arranged in said housing; a support for a tooth brush arranged to be driven by said drive motor; a vibration dampening element fixedly clamped between both of said housing portions;

said drive motor is mounted in said housing and is fixed in position by means of said vibration dampening element; a snap connection for interconnecting both of said housing portions with one another; and said snap connection is constituted by cooperating connecting elements provided on each of said housing portions.

4,413,200

## DYNAMOELECTRIC MACHINE WITH CARTRIDGE BRUSH HOLDER

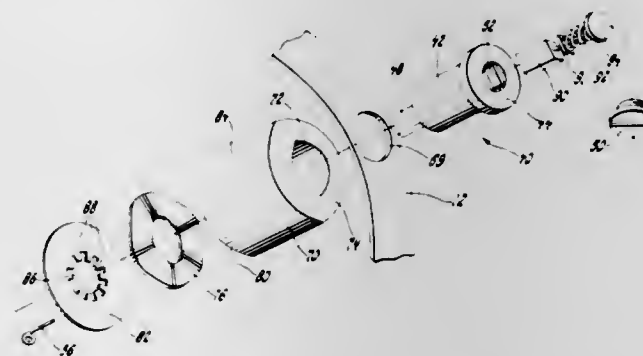
Robert D. Fenicle, Sylvania, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 4, 1981, Ser. No. 318,082

Int. Cl.<sup>3</sup> H02K 13/00

U.S. Cl. 310—239

4 Claims



1. A dynamoelectric machine, including: a tubular frame member having an inner surface and an outer surface, said inner surface and said outer surface being curved planar surfaces; means for producing a stationary magnetic field affixed to said inner surface; an armature rotatably disposed within said tubular frame adjacent said means for producing a stationary magnetic field and including an armature contact surface; said tubular frame defining at least first and second apertures connecting said inner surface and said outer surface; at least first and second cartridge brush holder means, each said brush holder means including a generally cylindrical body having a retaining flange at one end thereof, each said cartridge brush holder means being disposed through one said aperture and having said retaining flange disposed adjacent said outer surface; at least two plano-convex members, each said plano-convex member having a first convex surface and a second flat surface and defining a bore therethrough connecting said first surface and said second surface, each said bore being adapted to receive one said generally cylindrical body of one said cartridge brush holder means therethrough; each said plano-convex member being disposed about said generally cylindrical body of one said cartridge brush holder means and having said first surface disposed adjacent said inner surface; at least two spring means, each said spring means defining an aperture therethrough, said aperture being adapted to receive one said generally cylindrical body therethrough; each said spring means being disposed about one said generally cylindrical body adjacent one said plano-convex member adjacent said second surface; at least two retaining ring means, each said retaining ring means defining an aperture therethrough, said aperture being adapted to frictionally receive one said generally cylindrical body therethrough; each said retaining ring means being disposed about one said generally cylindrical body adjacent said spring means, to compress said spring means between said retaining ring means and said second surface, said spring means firmly drawing said retaining flange adjacent said outer surface to firmly retain said cartridge brush holder means in said tubular frame member.

4,413,201

## DEVICE FOR ATTACHMENT OF COIL ENDS IN GENERATOR STATOR HIGH-VOLTAGE WINDING

Pavel Z. Nikitin, ulitsa Stroitelei, 5 korpus 1, kv. 2, Moscow; Yanush B. Danilevich, ulitsa Tipanova, 29, kv. 681, Leningrad; Konstantin N. Maslennikov, ulitsa Petukhova, 138, kv. 87; Konstantin F. Potekhin, ulitsa Stanislavskogo, 11, kv. 186, both of Novosibirsk; Lev A. Zolotov, bulvar Yana Rainisa, 9, kv. 55, Moscow; Veniamin S. Turutlin, ulitsa Perovskaya, 8, korpus 1, kv. 26, Moscow; Tibor M. Nemeni, ulitsa Khalturinskaya, 11, kv. 245, Moscow; Alexandr I. Nikolsky, ulitsa Dubninskaya, 14, korpus 2, kv. 59, Moscow; Pavel S. Kabanov, ulitsa Sevanskaya, 19, korpus 1, kv. 22, Moscow; Genady A. Bezchastnov, Polesky proezd, 4, korpus 2, kv. 33, Moscow, and Andrei M. Sharashkin, ulitsa S. Elzenshteina, 6, kv. 164, Moscow, all of U.S.S.R.

PCT No. PCT/SU80/00161, § 371 Date Jun. 25, 1981, § 102(e)

Date May 11, 1981, PCT Pub. No. WO81/01223, PCT Pub.

Date Apr. 30, 1981

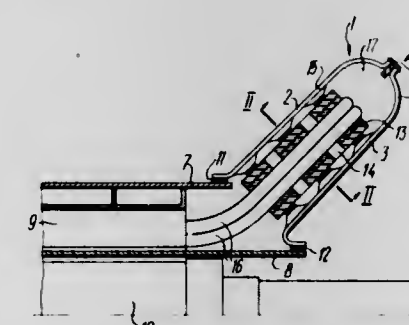
PCT Filed Sep. 25, 1980, Ser. No. 269,043

Claims priority, application U.S.S.R., Oct. 25, 1979, 2824887

Int. Cl.<sup>3</sup> H02K 3/46

U.S. Cl. 310—260

1 Claim



1. A device for attachment of generator stator high-voltage winding coil ends, comprising insulation spacers disposed on external surfaces of the coil end bars, extra spacers disposed between the coil end bars, characterized in that it also comprises a case (1) made of two coaxial truncated cone members (2 and 3) and a part of a torus member (4) made integral therewith and provided with a joint (5) with a sealing (6), said case (1) accommodating insulation spacers (13), extra spacers (18), spring stops (15) secured inside the case (1) to the side surface thereof and located opposite each insulation spacer (13), and platens (14), each said platen (14) being disposed between two insulation spacers (13) and attached to one of them, the insulation spacers (13) being disposed between the winding coil end bars (16) and spring stops (15), each surface part of the insulation spacers (13), platens (14) and spring stops (15) and an inner side surface of the case (1) being used as cooling passages.

4,413,202

## TRANSDUCER WITH A FLEXIBLE SENSOR ELEMENT FOR MEASUREMENT OF MECHANICAL VALUES

Peter Krempl, Vienna; Peter Claassen, and Helmut List, both of Graz, all of Austria, assignors to Hans List, Graz, Austria

Continuation of Ser. No. 107,315, Dec. 26, 1979, abandoned,

which is a continuation of Ser. No. 927,929, Jul. 25, 1978,

abandoned. This application Apr. 11, 1983, Ser. No. 482,279

Claims priority, application Austria, Jul. 27, 1977, A5505/77

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—338

10 Claims

1. An apparatus for determining the pressure of a fluid, said apparatus comprising means forming a hollow enclosure in which the fluid whose pressure is to be measured is contained, said means including a wall member which has an edge surface that is configured to provide a cylindrical orifice that communicates with the interior of said hollow enclosure, said edge surface of said wall member including a continuous step portion which extends into said cylindrical orifice and a

threaded portion, said step portion being positioned closer to the interior of said hollow enclosure than said threaded portion,

a domed membrane which has a diameter that is greater than the diameter defined by the step portion of said wall member, said domed membrane being positioned in said cylindrical orifice such that the periphery thereof is positioned between said step portion and said threaded portion of said wall member and is oriented such that the center thereof is positioned further from the interior of said hollow enclosure than said periphery,

a transducer means which has opposite ends and is positioned against the domed membrane on the side thereof facing away from the interior of said hollow enclosure,



said transducer means comprising at least one flexible piezoelectric film, at least one flexible piezoelectric film in said transducer means having opposite sides and an electrically conducting surface associated with at least a portion of at least one of the opposite sides thereof,

attachment means for stretching said transducer means across said domed membrane and thus across said orifice, said attachment means comprising an annular screw which has a threaded outer surface, said threaded outer surface of said annular screw being engaged with the threaded portion of said wall means such that the annular screw will cause the opposite ends of said transducer means to be clamped and the transducer means to be stretched over said domed membrane.

4,413,203

## CATHODE-G; SPACING MATERIAL AND METHOD OF APPLICATION

Kenneth Speigel, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

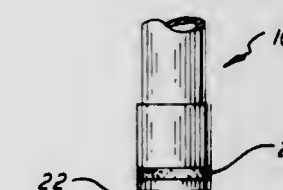
Division of Ser. No. 140,033, Apr. 14, 1980, Pat. No. 4,316,313.

This application Sep. 30, 1981, Ser. No. 307,125

Int. Cl.<sup>3</sup> H01J 1/88, 19/42

U.S. Cl. 313—446

2 Claims



1. A structure for achieving critical spacing between the cathode and the control grid of an electron gun, said structure comprising:

a cathode, a layer of potentially electron emissive material on an end of the cathode, and a spacer having a thickness substantially equal to said critical spacing, and in contact with said potentially emissive layer, said spacer containing at least one component which is selectively soluble in a solvent.



4,413,204

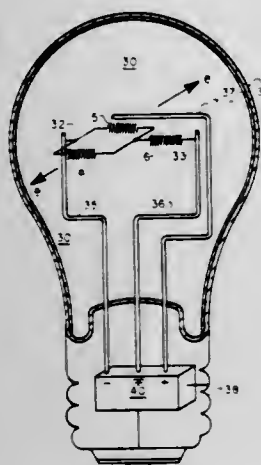
## NON-UNIFORM RESISTANCE CATHODE BEAM MODE FLUORESCENT LAMP

Wojciech W. Byszewski, Arlington; A. Bowman Budinger, Westford; Joseph M. Proud, Wellesley Hills, and Leslie A. Riseberg, Sudbury, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 336,815

Int. Cl.<sup>3</sup> H01J 1/62

U.S. Cl. 313-491



1. A non-uniform resistance cathode beam mode fluorescent lamp comprising:
  - a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;
  - a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;
  - a power source external to said envelope;
  - at least one thermionic cathode having first and second ends located within said envelope for emitting electrons;
  - an anode located within said envelope for accelerating said electrons and forming an electron beam in response to a voltage applied between said anode and said cathode;
  - a drift region within said envelope through which said electron beam drifts after passing through said anode;
  - means for connecting said cathode and said anode to said power source;
  - said thermionic cathode including resistance means for providing for increasing the emission of said electrons along an area proximal to said first end of said cathode and said means for decreasing the emission of said electrons proximal to said second end of said cathode whereby the emission of said electrons is substantially uniform along said cathode length.

4,413,205

## HALOGEN INCANDESCENT LAMP WITH INTERNAL CURRENT CONDUCTORS OF TUNGSTEN-RHENIUM ALLOY

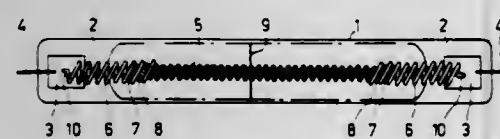
Leo F. M. Ooms, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1981, Ser. No. 266,574

Claims priority, application Netherlands, Jun. 26, 1980, 8003698

Int. Cl.<sup>3</sup> H01K 1/20

U.S. Cl. 313-579



1. A halogen incandescent lamp having a vacuum-tight sealed glass lamp envelope which has a filling comprising bromine and an inert gas, and in which lamp a filament substan-

tially of tungsten is connected to internal current conductors consisting substantially of tungsten and which extend inwardly from the wall of the lamp envelope, the internal current conductors consisting at least at their surface of tungsten containing at least 0.1% by weight of rhenium.

4,413,206

## METAL HALIDE ARC DISCHARGE LAMP HAVING ELECTROLYSIS PREVENTION MEANS

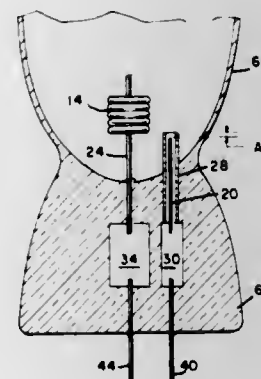
Robert J. Karlotski, Weare; Joseph S. Kulik, Jr., Allentown, and Martin E. Muzeroll, Merrimack, all of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 4, 1981, Ser. No. 270,289

Int. Cl.<sup>3</sup> H01J 61/00

U.S. Cl. 313-601

6 Claims



1. An arc discharge lamp comprising:
  - an arc tube containing an ionizable discharge-sustaining fill including mercury and a metal halide;
  - first and second main electrodes disposed within the arc tube;
  - a starting electrode disposed within the arc tube adjacent the first main electrode; and
  - a sleeve of electrically insulating material disposed about said starting electrode with said starting electrode recessed within said insulating sleeve, the lengths of said sleeve and said starting electrode being substantially shorter than but not less than about one-half the length of said first main electrode within said arc tube, said sleeve having an open end whereby said starting electrode is exposed to the internal atmosphere of said arc tube, and said starting electrode not projecting beyond the open end of said sleeve; whereby conduction between said first main electrode and said starting electrode is minimized or prevented during normal lamp operation, thereby minimizing or preventing electrolysis.

4,413,207

## MULTICAVITY KLYSTRON

Takao Kageyama; Yoshiaki Suzuki, and Eichi Watanabe, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,817

Claims priority, application Japan, Dec. 5, 1979, 54-157676; Dec. 5, 1979, 54-157677

Int. Cl.<sup>3</sup> H01J 23/20

U.S. Cl. 315-5.52

6 Claims

1. A multicavity klystron comprising:
  - (a) an electron gun for emitting a beam of electrons;
  - (b) an input cavity resonator disposed adjacent to said electron gun for being supplied with an input signal to be amplified;
  - (c) at least one intermediate driver cavity resonator disposed adjacent to said input cavity resonator;
  - (d) an output cavity resonator disposed adjacent to said intermediate driver resonator for producing an amplified output signal;

4,413,209

## SERIES-CONNECTED DISCHARGE DEVICE BALLAST APPARATUS

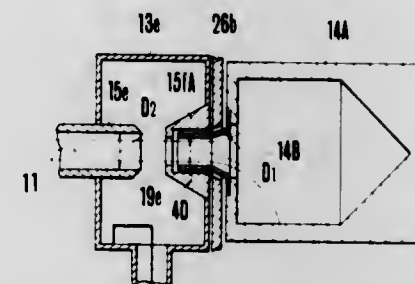
William J. Roche, Merrimack, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 5, 1981, Ser. No. 308,295

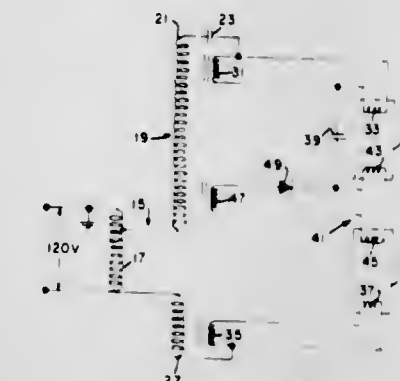
Int. Cl.<sup>3</sup> H05B 41/16

U.S. Cl. 315-101

12 Claims



- (g) said electron gun, said input, intermediate driver, and output cavity resonators, and said drift tubes being coaxially arranged; and
- (h) one of said drift tubes which is mounted in said output cavity resonator and next to said collector having an inside diameter which is smaller than that of the other drift tubes.



1. A ballast apparatus for starting and operating at least one pair of series-sequenced gaseous discharge devices wherein a transformer is coupled to a potential source and to opposite ends of said pair of series-sequenced gaseous discharge devices, a starting capacitor shunts one of the gaseous discharge devices and a filament of each of said gaseous discharge devices is connected in series by a circuit means and coupled to a filament winding of said transformer by way of a rectifier means whereby said rectifier means prevents operation of one discharge device when the other discharge device is operative.

4,413,208

## HIGH GAIN CROSSED FIELD AMPLIFIER TUBE AND RADIO TRANSMISSION SYSTEM EQUIPPED WITH SUCH A TUBE

Jean Paul Morizot, Paris, France, assignor to Thomson-CSF, Paris, France

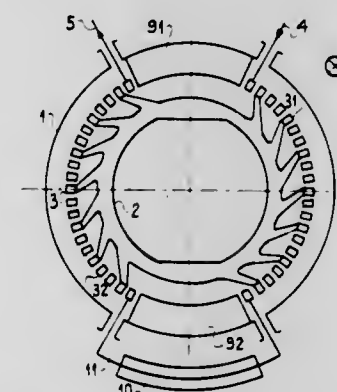
Filed Jun. 30, 1981, Ser. No. 279,198

Claims priority, application France, Jul. 1, 1980, 80 14626

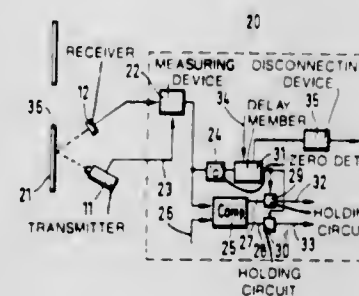
Int. Cl.<sup>3</sup> H01J 25/34

U.S. Cl. 315-39.3

5 Claims



1. A crossed field amplifier tube comprising in a vacuum space
  - a cylindrical cathode
  - a delay line concentric thereto and which faces it over its entire height, a magnetic field parallel to the axis of the cathode being provided in the annular interaction region between the cathode and the delay line
  - an input for receiving the signal to be amplified located at one of the ends of the line, and
  - an output for supplying the amplified signal located at the other end, the output and the input being separated by a degrouching space wherein the common width of the delay line and the cathode parallel to the magnetic field is less at the input than at the output and at least one of the other parameters of the amplifier tube, such as the magnetic field, the cathode-line spacing, the pitch of the line is modified to maintain the synchronism  $V_{\phi} = V_e$  wherein  $V_{100}$  is the phase velocity and  $V_e$  is the average azimuth speed.



1. An automatic guiding device for guiding a travelling vehicle in a path parallel to a stationary lateral surface at a predetermined distance from the lateral surface, the guiding device comprising:
  - transmitter means for transmitting a propagating wave signal to the lateral surface;
  - receiver means for receiving the wave signal reflected from the lateral surface;
  - measuring means responsive to the transmitter means and the receiver means, for determining the transit time of the wave signal from the transmitter means to the receiver means, and providing a signal indicative of the measured lateral distance from the vehicle to the lateral surface and for providing an outside range signal when the measured lateral distance is outside a predetermined range;



comparison means for comparing the measured lateral distance signal with a predetermined reference distance signal;  
steering means responsive to the comparison means, for steering the vehicle so that the vehicle maintains a predetermined distance from the lateral surface; and  
holding means responsive to the measuring means, for holding the steering means in response to the outside range signal so that the vehicle continues on the course set immediately prior to the measured lateral distance falling outside the predetermined range.

4,413,211

**CONTROL CIRCUIT FOR ELECTRICAL APPLIANCES**

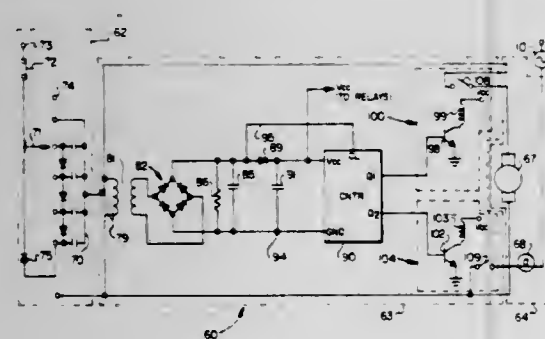
Ricky C. Fowler, 2426 Village Green, Garland, Tex. 75042

Filed Dec. 23, 1981, Ser. No. 333,637

Int. Cl.<sup>3</sup> H02P 7/74

U.S. Cl. 318—257

14 Claims



1. A circuit for connection to a ceiling-type fan to control same comprising:

switch means responsive to a control signal, connectable to the fan to control the fan,

means for generating a control signal connected to control said switch means, and having an input for producing a change in the generated control signal responsive to a signal level change applied to the input,

a manual switch connected to apply an AC source to said input signal producing means and wherein said input signal producing means comprises means for converting a voltage of the AC source to a DC voltage having a first level when said manual switch is open and a second level when said manual switch is closed, whereby operation of said manual switch produces an interruption of said DC voltage to create a control signal to control said electrical device,

means connected to the manual switch and to the input of said control signal generating means for producing an input signal thereto, operative to produce a signal level change in response to the operation of said manual switch, diode isolation means connected to receive the DC voltage and a capacitor connected to receive the DC voltage said capacitor connected to said diode to be charged by said DC voltage, said diode being connected to supply DC voltage to said control signal generating means and to said switch means, said capacitor being isolated by said diode isolation means from discharging into said AC converting means and being sufficiently large as to not discharge upon the occurrence of said control signal.

4,413,212

**MOTOR CONTROL APPARATUS**

Kiyokazu Okamoto, and Masayoshi Isomura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,233

Claims priority, application Japan, Feb. 4, 1981, 56-15483

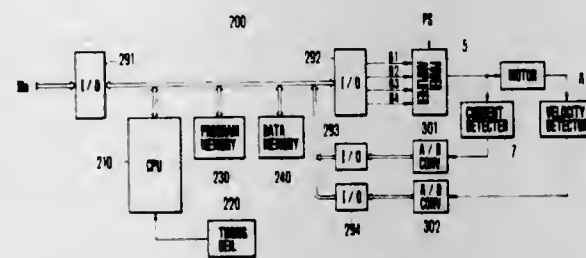
Int. Cl.<sup>3</sup> H02P 5/16

U.S. Cl. 318—317

3 Claims

1. A motor control apparatus comprising:  
rotary drive means for driving an object to be controlled;

velocity detecting means for detecting the velocity of said rotary drive means;  
current detecting means for detecting the operating current of said rotary drive means;  
a digital processor having a first arithmetic function for producing a current command data from an external velocity command data and a velocity detection data corresponding to an output of said velocity detecting means, a second arithmetic function for producing a drive command data from the current command data and a current detection data corresponding to an output of said current detecting means, and a third arithmetic function for converting the drive command data into on-off pulse signals,



said digital processor including input ports for receiving digital data of the velocity command data, velocity detection data and current detection data, a program memory for storing programs for performing a series of data processings on said digital data to apply a desired response characteristic to said rotary drive means, a reference timing generator which produces a signal necessary for executing said programs in synchronism with time, and an output port for delivering out the results of the data processing on the program as the on-off pulse signals; and  
power amplifier means including switching elements for amplifying said on-off pulse signals to control the operation of said rotary drive means.

4,413,213

**ELECTRONIC MOTOR PROTECTION FOR VARIABLE SPEED MOTORS**

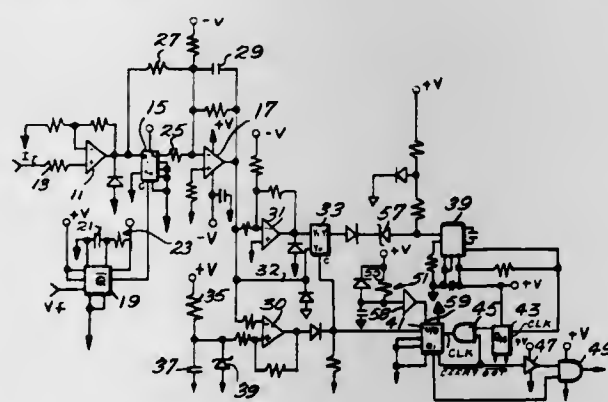
Arthur A. Baumgarten, Jr., Manhattan Beach, Calif., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Nov. 4, 1981, Ser. No. 317,940

Int. Cl.<sup>3</sup> G05B 5/00; H02H 5/04

U.S. Cl. 318—332

8 Claims



1. A motor protection circuit comprising:  
means for generating a motor current signal having a value proportional to the magnitude of the input current to said motor;  
means for generating a motor speed signal having a value proportional to the difference between the rated motor speed and the actual motor speed;  
means responsive to said motor current signal and said motor speed signal for generating a product signal having a value proportional to the product of said motor speed signal and said motor current signal;

means for summing said motor current signal and said product signal;  
means for determining if said product signal is greater than a preset level;  
means responsive to said determining means for generating a clock pulse train when said product signal exceeds said preset signal, said product signal having a frequency proportional to said product signal level; and  
counter means responsive to said clock pulse train when said sum signal exceeds said preset signal for counting said clock pulses, said counter generating a control output signal when said count reaches a predetermined level.

4,413,214

**VENTED PNEUMATIC FOOT CONTROLLER**

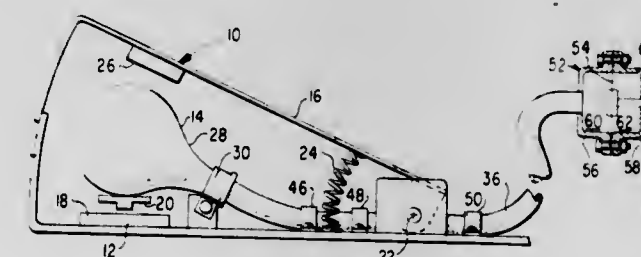
Jack Brown, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 12, 1981, Ser. No. 320,393

Int. Cl.<sup>3</sup> G05B 5/00

U.S. Cl. 318—488

6 Claims



1. In combination, a pneumatic foot controller including a base, a foot pedal mounted for movement on the base, a bulb of an elastomeric material which is held at a defined location against movement relative to the base but which is movable about the defined location by foot pressure on the pedal, an insert in the bulb with a vent hole in the insert, a pad of elastomeric material which is affixed to an inside surface of the controller in a position to be forcibly engaged by the insert and to close the vent hole following movement of the bulb about said defined location, and spring means for moving the foot pedal away from the bulb whereby the insert is permitted to separate from the pad and open the vent hole when foot pressure is removed from the pedal; a pneumatic-electric transducer; tubing which connects the bulb to the transducer and through which the bulb controls pressure in the transducer; and an electric motor which is connected to the transducer and which has its speed regulated in accordance with pressure in the transducer.

4,413,215

**MARINE TRIM AND TILT POSITIONING SYSTEM**

David T. Cavil, Menomonee Falls, and William R. Krueger, West Allis, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 1, 1981, Ser. No. 268,723

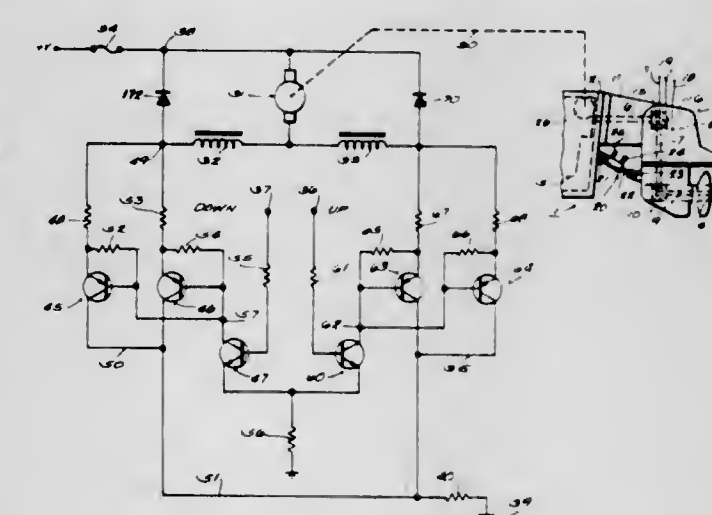
Int. Cl.<sup>3</sup> G05D 1/00

U.S. Cl. 318—588

8 Claims

1. Apparatus for controlling angulation, about a nominally horizontal axis, of a stern leg having a propeller and mounted outboard of a water craft for angulating between substantially vertical and a first angular limit defined as the trim range and a second angular limit defined as the tilt range, which apparatus comprises reversible electric motor means and means operatively coupling said motor means to said stern leg for said stern leg to be driven up through an increasing angle from vertical when said motor runs in one direction and down through a decreasing angle when said motor runs in the opposite direction, motor control circuit means connected with said motor means and responsive to being provided with first and second control signals by energizing said motor means from an electric power source to run in the one or the opposite direction, respectively, a trim angle control circuit having electric

power input means, said circuit including manually settable means for producing a reference signal corresponding to the stern leg trim angle desired and position signal generating means for producing a signal corresponding to the present angle of the stern leg and varying with changes in said angle, comparator means for comparing the reference signal with the position signal and means responsive to said comparator means determining that said position signal corresponds to a stern leg angle less than the desired trim angle by providing said first control signal to thereby cause said motor means to run in said one direction for driving said stern leg up until the difference between the desired and present trim angle is nulled, and said means being responsive to said comparator means determining that said position signal corresponds to a stern leg angle greater



than the desired trim angle by providing said second control signal to thereby cause said motor means to run in said opposite direction for driving said stern leg down until the difference between the desired and present trim angle is nulled, and tilt control switch means comprising one and another switch each of which is manually actuable from one state to another for commanding said stern leg to tilt up and down, respectively, said switches being in a circuit wherein when they are both in one state they connect said power source to said power input means of said trim angle control circuit for energizing it to enable the trim function, and when either is actuated to its other state it will disconnect said power input means to disable and override the trim function and provide one or other of said first and second control signals to said motor control circuit for causing said stern leg to tilt up or down, respectively.

4,413,216

**STATIC FREQUENCY CHANGER FOR FEEDING SYNCHRONOUS MACHINES**

Detlef Knuth, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 936,518, Aug. 24, 1978, abandoned.

This application Dec. 16, 1981, Ser. No. 331,304

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738562

Int. Cl.<sup>3</sup> H02P 5/40

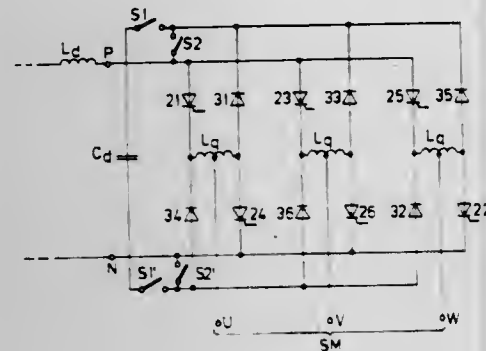
U.S. Cl. 318—721

3 Claims

1. In a static frequency changer for feeding a synchronous machine, including a mains side static converter, a primary machine side static converter for which the commutation power is made available by the synchronous machine, and a smoothing inductance connecting the converters together, the improvement comprising: means defining an additional static converter composed of a plurality of diodes; a direct voltage capacitor connected in parallel to said additional static converter to form an intermediate circuit providing a direct voltage; means for connecting said primary machine side static converter and said additional static converter to the synchronous machine; and switch elements and control means therefor



selectively connecting said capacitor and said additional converter in parallel with said primary machine side converter, with said additional converter connected in parallel opposition to said primary machine side converter, said switch elements



and said control means therefor being switchable in dependence on the speed of rotation of the synchronous machine for connecting said additional converter to said primary machine side converter at least during operation of the machine in the upper portion of its speed range.

4,413,217

## POWER FACTOR CONTROLLER

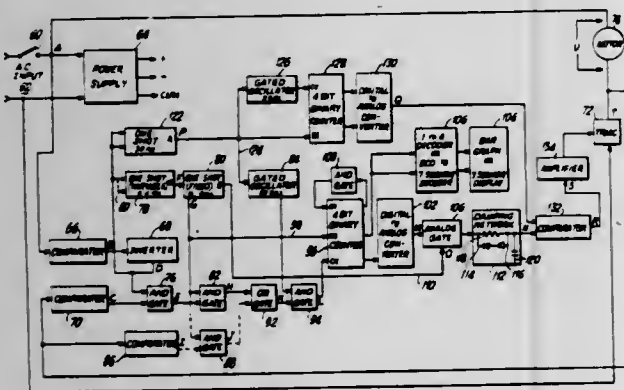
Dan Green, Cranford, N.J., and Sandor Goldner, Brooklyn, N.Y., assignors to Cyrex Manufacturing Corporation, Hillside, N.J.

Continuation-in-part of Ser. No. 166,046, Jul. 7, 1980. This application Feb. 5, 1981, Ser. No. 231,611

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—729

3 Claims



1. A digital power factor controller for an AC induction motor comprising: control means adapted to be electrically connected in series with the motor for controlling a voltage applied across the motor; sensing means for providing gated clock signals whose count varies in accordance with a difference in phase between a current through the motor and the line voltage across the motor; reference means for providing reference clock signals whose count represents a full cycle of the line voltage and wherein the count is reset for each zero crossing of the line voltage; comparison means for comparing an output of said sensing means with an output of said reference means and producing a phase lag control signal, said control signal being applied to said control means for controlling a conduction angle of the voltage applied to the motor to thereby provide power to the motor commensurate with the motor loading; said sensing means including first circuit means for sensing the line voltage and providing a square wave output in phase therewith, second circuit means coupled to said control means and providing a square wave output in phase with the current therethrough, and gating means for

combining said square wave outputs from said first and second circuit means to provide square wave pulses representative of the phase difference between the voltage and current; and

a variable trigger circuit responsive to said first circuit means and providing an output whose duration is calibrated to equal a full load phase lag of the motor, a fixed trigger circuit activated by the end of said variable trigger circuit output providing an output of fixed duration, the output of said fixed trigger circuit limiting the operation of said gating means to correct for the full load phase lag.

4,413,218

## AUTOMATIC LOAD SEEKING CONTROL FOR A MULTITORQUE MOTOR

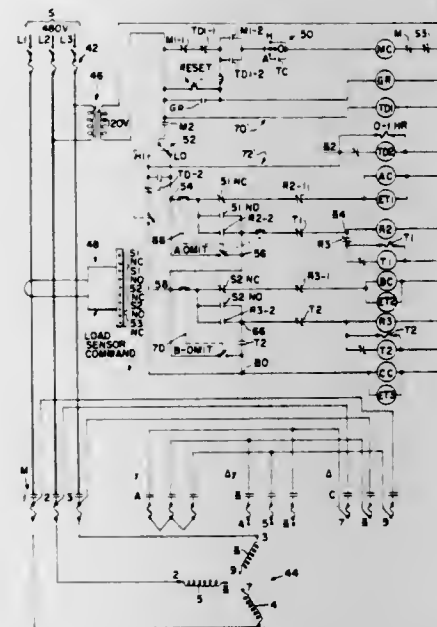
Noel R. Taylor, and Paul A. Taylor, both of Odessa, Tex., assignors to CMD Enterprise, Inc., Odessa, Tex.

Continuation-in-part of Ser. No. 27,798, Apr. 6, 1979, Pat. No. 4,220,440, which is a continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Jun. 24, 1980, Ser. No. 162,475

Int. Cl.<sup>3</sup> H02P 1/32

U.S. Cl. 318—771

9 Claims



1. In a conveyor apparatus which conveys material from one location to another, wherein the mass of the conveyed material varies from one to another time interval, a three phase motor connected to move said conveyor, said motor having an automatic load seeking control circuitry for changing the stator winding of the motor from a high speed, high torque to a low speed, low torque configuration, comprising: a motor starter means for connecting each stator winding to a source of current; circuit means, including a first conductor means, for connecting the stator windings into a Y configuration; sensor means responsive to a predetermined maximum average current flow which is actuated after said average current flow has occurred during a first time interval; circuit means, including a second conductor means for connecting the stator windings into a Δ configuration when said second conductor means is energized; means by which said sensor means, when actuated, deenergizes said first conductor means and thereafter energizes said second conductor means; a timer device connected to cause said second conductor means to be de-energized and said first conductor means to be energized a finite interval of time following energization of said second conductor means; said starter means includes circuit means by which said stator windings are selectively connected in one of said Y and Δ configuration to thereby enable the motor to start in either a high torque or a low torque mode;

so that the motor can be started in Y or Δ configuration, and thereafter, said first and second conductor means will automatically change the winding configuration to either a high speed, high torque or low speed, low torque configuration depending upon the load imposed upon the motor.

4,413,219

## FORK TRUCK BATTERY CHARGING SYSTEM

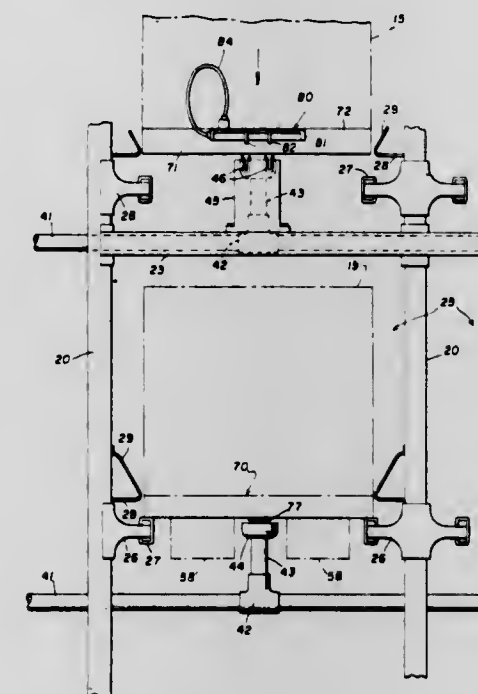
Ronald L. Ducharme, Grand Rapids, Mich., and Robin Taylor, Homewood, Ill., assignors to Interlake, Inc., Oak Brooks, Ill.

Filed Apr. 2, 1982, Ser. No. 364,677

Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 320—15

36 Claims



14. A battery charging system for supporting and interconnecting industrial storage batteries and associated chargers, said system comprising: rack means defining a plurality of battery locations and a plurality of charger locations; one or more pallets, each of said pallets including a body having a support surface for supporting an associated battery thereon, a plurality of recesses in said support surface communicating with one another to form a trough for receiving fluids from the associated battery, said trough having an outlet, and a connection block mountable on said body, said connection block including coupling means electrically connectable to a battery supported on said support surface and a first connector electrically connected to said coupling means; pallet support means at each of said battery locations for supporting a pallet thereat in a charging position; charger support means at each of said charger locations for supporting a charger thereat; fluid connection means on said rack having a plurality of fluid inlets respectively disposed at said battery locations for cooperation with the fluid outlet of said pallet when disposed in a charging position thereof in a selected one of said battery locations for collecting fluids from said fluid receiving means on said pallet; and a plurality of second connectors respectively disposed at said battery locations and respectively electrically connected to associated chargers at said charger locations, said first and second connectors being arranged for electrical interconnection in response to movement of a pallet to its charging position at a selected one of said battery locations to charge the battery on said pallet and for electrical disconnection in response to movement of said pallet from said charging position.

4,413,220

## BATTERY DISCHARGE RATE CONTROL CIRCUITRY

Keith R. Wainio, Farmington Hills, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Filed Apr. 15, 1982, Ser. No. 368,560

Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 320—15

4 Claims



3. An electrical system comprising: a first load having at least one electrical component therein needing a positive supply voltage with a given power demand; a second load having at least one electrical component therein needing a negative supply voltage with a different power demand; an A/C power source; a rechargeable battery supply having at least two batteries of substantially the same capacity connected together in series; a battery charging circuit connected in parallel across said series connected batteries and being powered from said A/C power source; and switching means interconnected between the batteries and the loads for periodically switching the connection therebetween, operative in a first position to connect one battery across said first load and the other battery across said second load, and being further operative in a second position to reverse the connection such that said one battery is connected across said second load and said other battery is connected across said first load whereby said batteries are discharged at substantially the same rate when said loads are powered by said batteries and wherein said batteries are automatically recharged in series from said battery charging circuit when the loads are powered by said A/C power source.

4,413,221

## METHOD AND CIRCUIT FOR DETERMINING BATTERY CAPACITY

Fred Benjamin, Fullerton, and Robert H. Heil, Harbor City, both of Calif., assignors to Christie Electric Corporation, Torrance, Calif.

Filed Dec. 18, 1980, Ser. No. 217,897

Int. Cl.<sup>3</sup> G01R 31/36

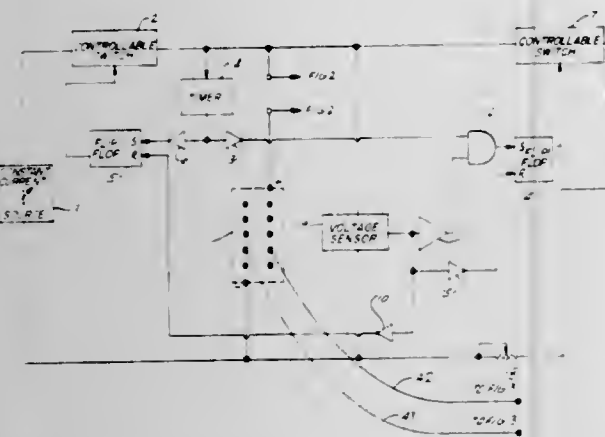
U.S. Cl. 320—48

11 Claims

1. A method of determining the capacity of a battery comprising the steps of: imposing an increasing charge on a battery during a plurality of charge intervals and a plurality of discharge intervals interspersed with the charge intervals by applying a charge current to the battery during each charge interval; applying a load to the battery during each discharge interval until the battery voltage decreases to a selected level;



removing the load in response to the attainment of the selected level to end the discharge interval; and



sensing the duration of each discharge interval as an indication of the capacity of the battery.

4,413,222

# SELF-CONTAINED, PARTICULARLY VEHICULAR NETWORK WITH MALFUNCTION INDICATION

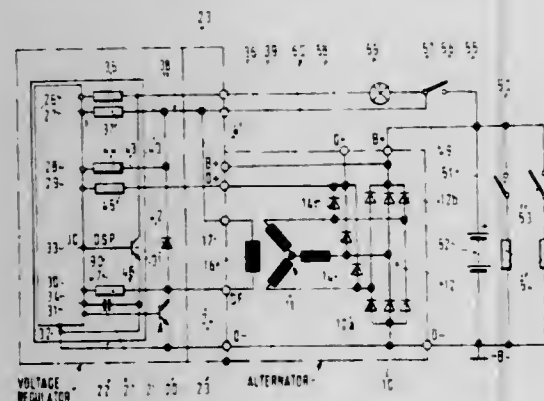
Willi Gansert, Kornwestheim; Ulrich Munz, Kirchheim, and Edgar Kuhn, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Oct. 23, 1981, Ser. No. 314,493

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042194

Int. Cl.<sup>3</sup> H02J 7/16

U.S. Cl. 320—48

16 Claims



1. For combination with a self-contained electrical network having

- an a-c generator (10) having a field-winding (16);
- a power rectifier (12) connected to the generator and providing d-c output power at output terminals (B+, B-);
- a battery (52) having positive and negative terminals (50, B-) and providing a battery or system voltage ( $u_s$ );
- a battery cable (49) connected between the positive output terminal (B+) of the rectifier and the positive terminal (50) of the battery (52);
- a plurality of loads (54) selectively connectable (53) between the battery terminals;
- a voltage regulator (20) connected to the generator terminals and having a controlled power switch (21) which is serially connected to the field winding (16), and reference means (62, 63, 64) connected to compare the voltage of the output of the generator with a reference determined by the reference means and controlling the controlled power switch to conduct, or block current flow there-through;
- a network component malfunction indicator system having sensing means (82) connected (24, 30, 47) to the controlled power switch (21) and sensing the state of conduction thereof;

a malfunction indicator (59), and controlled switch means (91) connected thereto;

and logic circuit means connected to and controlling the controlled switch means of the malfunction indicator including

threshold stage means (67, 69) connected to a terminal having thereon a voltage representative of the voltage of the output of the generator to respond to the voltage of the output of the generator, and control said controlled switching means (91) to provide a malfunction output indication if the voltage of the generator output is beyond a predetermined range,

and comprising

means (14) deriving a generator sensing signal ( $u_g$ ) of generator voltage solely due to the generator excitation and independent of battery voltage;

and wherein the threshold stage means comprises

a first threshold stage (67) receiving said generator sensing signal and providing a first control signal if the generator voltage ( $u_g$ ) exceeds a predetermined level ( $u_{g,max}$ ),

and a second threshold stage (69) receiving a signal representative of battery, or system voltage ( $u_s$ ) and providing a second control signal if the battery or system voltage ( $u_s$ ) passes below a predetermined level ( $u_s - \Delta u_1$ ).

4,413,223

# INDUCTION GENERATOR FREQUENCY CONTROL SYSTEM

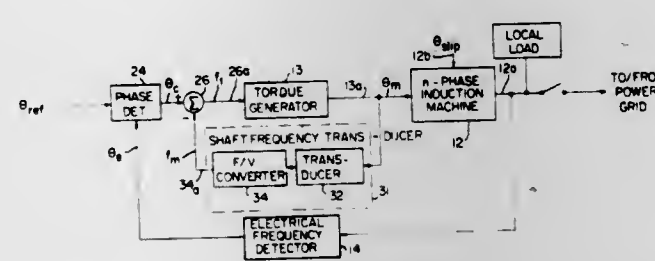
George B. Yundt, Cambridge, and William P. Curtiss, Winthrop, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 27, 1981, Ser. No. 257,534

Int. Cl.<sup>3</sup> H02P 9/42

U.S. Cl. 322—32

9 Claims



1. A frequency control system for an induction generator including an n-phase induction machine having an input shaft and at least one output line, where n is an integer, comprising:
  - A. means for generating an electrical frequency control signal,  $\theta_c$ , representative of the difference between the frequency of the voltage on said output line and a reference value,
  - B. means for generating a mechanical frequency control signal,  $f_m$ , representative of the frequency of rotation of said input shaft,
  - C. means for generating a torque generator control signal,  $f_t$ , representative of the difference between  $f_m$  and  $\theta_c$ ,
  - D. torque generating means responsive to  $f_t$  for applying a torque to said input shaft, said applied torque being related to  $f_t$ .

4,413,224

# MICROPOWER SYSTEM

Yaakov Krupka, 8 Derech Yavne, Rehovot; Avi Bachar, 27 Cirlson St., Petah Tiqua, and Shmuel Yerushalmi, 38 Hanassi Harishon St., Rehovot, all of Israel  
Continuation-in-part of Ser. No. 145,245, Apr. 30, 1980, abandoned. This application May 18, 1982, Ser. No. 379,338  
Claims priority, application Israel, Apr. 30, 1979, 57186

Int. Cl.<sup>3</sup> G05F 1/46

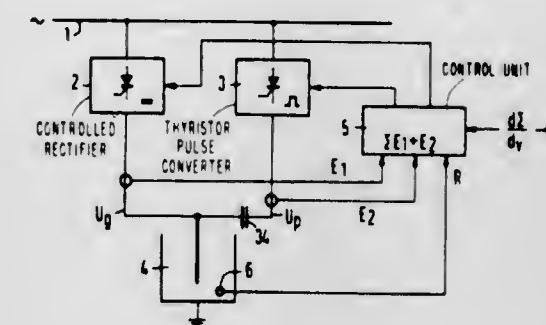
U.S. Cl. 323—222

2 Claims

1. A DC/DC power conversion system including a power

source for providing a stabilized voltage that is greater than a voltage provided by said power source, said conversion system employing a switching regulator and comprising:

- at least one primary electrochemical cell disposed in said power source;
- pulse generator means for providing a pulse train output;
- AND gate means for receiving a control input and responsive thereto for passing said pulse train output of said pulse generator means as a gate output;
- pulse driver means connected to said power source and to said AND gate means, and responsive to said gate output for providing a pulse driver output;
- MOS-FET switching means connected to said pulse driver means and responsive to said pulse driver output for issuing a commutation output;
- an inductor connected to said power source and to said MOS-FET switching means and responsive to said commutation output thereof for being commutated first across



approaches a minimum, while a predetermined mean value of the dust charge of the purified gas is maintained.

4,413,226

# VOLTAGE REGULATOR CIRCUIT

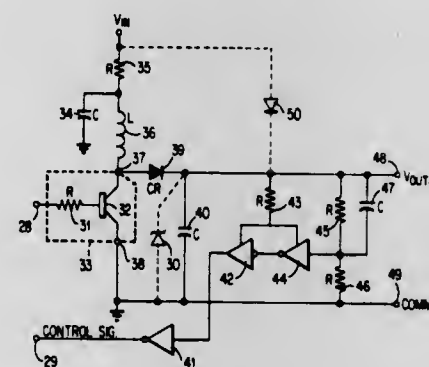
Robert B. Davies, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1982, Ser. No. 352,906

Int. Cl.<sup>3</sup> G05F 1/56

U.S. Cl. 323—303

9 Claims



- said power source to be charged and thereafter released providing a discharge output;
- a catch diode connected to said inductor for receiving said discharge output thereof, and issuing a diode output;
- an output capacitor connected to said catch diode for receiving and being charged by said diode output, and providing a capacitor output voltage which increases as long as said commutation of said inductor continues;
- a voltage-divider connected in parallel with said output capacitor for voltage dividing to produce a divided output; and
- a voltage detector circuit comprising a pair of C-MOS inverters, drained via a common regenerative feedback resistor, the threshold of the C-MOS inverters serving as a voltage reference, said resistor also constituting current limiting means thereby resulting in an extremely low current drain of said inverters, said inverters being controlled by said divided output of said voltage-divider and issuing said control input to the said AND gate means.

4,413,225

# METHOD OF OPERATING AN ELECTROSTATIC PRECIPITATOR

Gerhard Dönig, Erlangen; Walter Schmidt, Uttenreuth; Helmut Schummer, Heusenstamm, and Franz Neulinger, Dietzenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed Jul. 17, 1981, Ser. No. 284,491

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027172

Int. Cl.<sup>3</sup> B03C 3/68; G05F 1/56

U.S. Cl. 323—246

4 Claims

1. A method for the operation of an electrostatic precipitator having a filter through which a gas containing dust is passed to result in a purified gas with a predetermined dust charge, with a DC voltage, the level of which can be varied, and with superimposed pulses, in which at least one of the parameters, pulse amplitude, pulse width, pulse repetition frequency and pulse rate of rise is variable, comprising automatically changing the DC voltage and/or one of the parameters of the pulses

1. An integrated voltage regulator circuit for providing a DC regulated voltage at an output thereof, comprising:
  - a current source for producing first and second output currents at first and second outputs respectively, the magnitudes of said first and second currents being independent to ripple variations in a supply voltage applied thereto, said current source including a plurality of current sourcing transistors of a first conductivity type having emitter-base paths coupled in parallel to each other with the emitters being commonly adapted to receive said supply voltage, at least two of said transistors having respective collectors coupled to said first and second outputs of said current source, said commonly connected bases being adapted to be connected to an external terminal of the integrated circuit;
  - load circuit means coupled between said first and second outputs of said current source and a first terminal adapted to receive a ground reference potential, said load circuit means being adapted to receive a reference bias potential at an input thereof for producing the DC regulated voltage, the magnitude of which is proportional to the magnitude of said reference bias potential;
  - frequency compensation compensation circuit means coupled between said first and second outputs of said current source for enhancing the supply voltage ripple rejection performance of the voltage regulator circuit; and
  - an external capacitor coupled between said external terminal and a second terminal at which said supply voltage is applied to the regulator circuit.



4,413,227

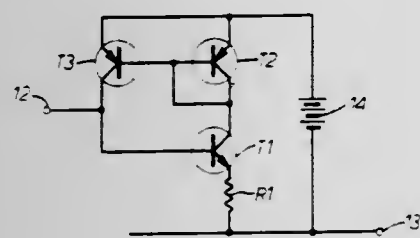
## NEGATIVE RESISTANCE ELEMENT

Kenneth C. Johnson, Cheadle, England, assignor to International Computers Limited, Stevenage, England  
 Filed Nov. 23, 1981, Ser. No. 323,801  
 Claims priority, application United Kingdom, Nov. 27, 1980, 8038142

Int. Cl.<sup>3</sup> G05F 3/08

U.S. Cl. 323—315

3 Claims



1. A voltage controlled negative resistance element comprising:
- a first and second terminals;
  - a first current path between the terminals such that on application of a voltage drop between the terminals a current is caused to flow through the first path in the direction of the applied voltage drop;
  - a second current path between the first and second terminals;
  - a first current mirror arrangement connected between said first and second current paths for controlling the magnitude and sense of the current in dependence of the value of the current in the first path such that variations in the second path are greater than and in the opposite sense to those of the first path, said first current mirror arrangement including a transistor connected in each said current path, with the effective base areas of the two transistors inter-connected, said transistors having similar characteristics except that the effective base area of one of the transistors exceeds that of the other transistor.

4,413,228

## ELECTRICAL HARNESS ANALYZER

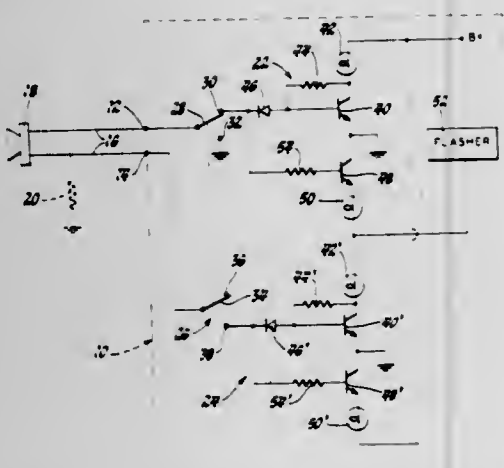
Hilton A. Turner, Jr., Rolla, Mo., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1981, Ser. No. 305,472

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—51

2 Claims



1. A harness analyzer circuit for testing an electrical harness for electrical resistance to ground and a short to ground comprising:
- first and second indicators,
  - a first transistor of a first conductivity type having its emitter and collector serially connected with the first indicator between a voltage source and ground, a resistor con-

nected between the collector and the base, and having its base adapted to be connected to one end of the harness under test, said resistor and the harness-to-ground circuit forming at least a part of voltage divider means connected to the base of said transistor whereby a base bias is developed such that if the harness is not connected to ground the transistor conducts to energize the first indicator and if the harness-to-ground resistance is less than a first value the transistor and the first indicator are turned off, and a second transistor of conductivity type opposite that of the first transistor having its emitter and collector serially connected with the second indicator between the voltage source and ground and having its base adapted to be connected to the said one end of the harness, whereby a base bias is developed such that if the harness is not connected to ground the second transistor and second indicator are turned off, and if the harness-to-ground resistance is less than a second value which is higher than the first value the second transistor conducts to energize the second indicator, and if the harness-to-ground resistance is between the first and second values both transistors conduct to energize both indicators.

4,413,229

## METHOD AND APPARATUS FOR REMOTE INDICATION OF FAULTS IN COAXIAL CABLE R-F TRANSMISSION SYSTEMS

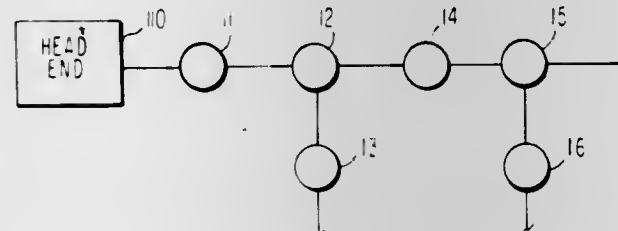
William O. Grant, 9667 Lindenbrook St., Fairfax, Va. 22031

Filed Jun. 2, 1981, Ser. No. 269,624

Int. Cl.<sup>3</sup> G01R 31/08

U.S. Cl. 324—52

17 Claims



1. A method of remote fault location for a coaxial cable R-F transmission system comprising the steps of:
- (1) inserting a predetermined fault locator signal frequency into said system;
  - (2) locating a plurality of passive R-F emitting coupler-filter units each tuned to said predetermined fault locator signal frequency at points in said system where it is desired to detect possible system faults, and each radiating said R-F fault locator signal into free space;
  - (3) traveling to and observing said predetermined fault locator signal frequency which is radiated into free space from each of said coupler-filter locations; and
  - (4) investigating for a possible fault at each coupler-filter location where a fault locator signal frequency is absent.

4,413,230

## ELECTRIC ENERGY METER HAVING A MUTUAL INDUCTANCE CURRENT TRANSDUCER

Robert C. Miller, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 121,070, Feb. 13, 1980, abandoned, and a continuation-in-part of Ser. No. 13,938, Feb. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 923,619, Jul. 11, 1978, abandoned. This application Mar. 20, 1982, Ser. No. 360,738

Int. Cl.<sup>3</sup> G01R 11/48, 1/20

U.S. Cl. 324—142

14 Claims

1. An AC electric energy meter having an electronic measuring circuit processing analog signals responsive to current and voltage components of an alternating current electric

4,413,231

## EDDY CURRENT INSPECTION PROBE FOR NON-DESTRUCTIVE INSPECTION OF TUBES WITH A PROBE BODY HAVING AN OUTER COILED SPRING SHEATH AND AN INNER PLASTIC MATERIAL SHEATH

Albert Amedro; Bernard Audemard, and Rene De Mul, all of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

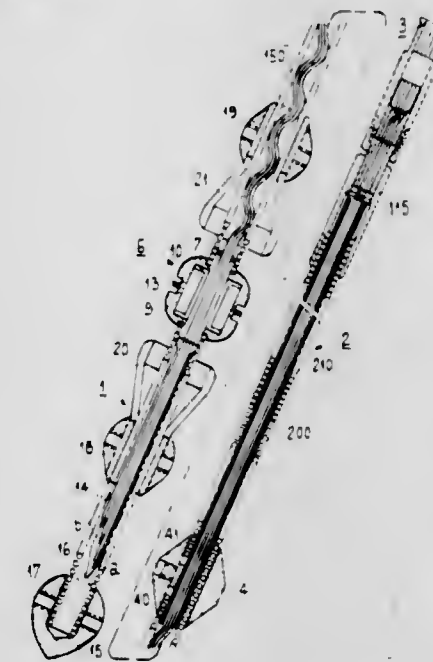
Filed Jul. 17, 1980, Ser. No. 169,779

Claims priority, application France, Jul. 24, 1979, 79 19080

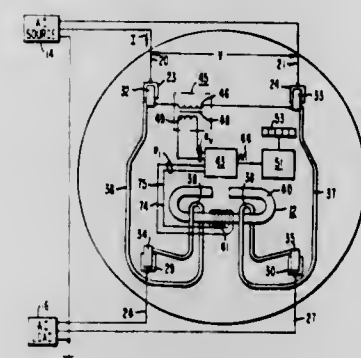
Int. Cl.<sup>3</sup> G01N 27/72, 27/82

U.S. Cl. 324—220

1 Claim



1. An eddy current inspection probe for the non-destructive inspection of long tubes, said probe comprising: a measuring head, a probe body and connecting members, said probe body comprising a first, outer sheath constituted by a spiral spring having round contiguous turns, a second, inner sheath made from a plastic material having a low elongation strain co-efficient and cooperating with said first sheath in such a way that during the introduction of the probe into the tube to be inspected said first outer sheath has a limited deformation, while during the extraction of the probe from the tube, after an inspection, the second, inner sheath opposes any risk of elongation.



secondary winding means comprising first and second toroidal windings each separately receiving one of said current conductors, each of said toroidal windings being wound on separate non-magnetic cores so as to include multiple turns each wound with a substantially rectangular cross section having a longer side substantially parallel to the single turn primary winding formed by said current conductors with the center openings of said toroidal windings being each mounted on separate non-magnetic cylindrical mounting sleeves carried by said current conductors so that said toroidal windings are inductively coupled to said magnetic flux variations of the associated current conductor through an effectively non-magnetic air gap space, and said toroidal windings further comprising lead wire conductors connected so that said secondary winding means produces a current responsive analog voltage signal linearly proportional to the sums of the time derivatives of the separate current flows in each of said current conductors throughout a ratio of combined current variations of at least four hundred to one with both of said voltage and current responsive analog voltage signals being effective for connection to high impedance and low level signal inputs of said electronic measuring circuit.

4,413,232

## METHOD FOR DETECTING METAL OBJECTS IN A NON-METAL CONTAINER BY ROTATING THE CONTAINER THROUGH A PLANE OF DETECTION

Lynn W. Most, 1787 N. Rivercrest Rd., Lakeland, Minn. 55043, and Allen F. Most, 11701 Leeward Ave. South, Hastings, Minn. 55033

Continuation of Ser. No. 941,042, Sep. 11, 1978, Pat. No.

4,266,193. This application Feb. 11, 1981, Ser. No. 233,672

Int. Cl.<sup>3</sup> G01R 33/12; G01N 27/72

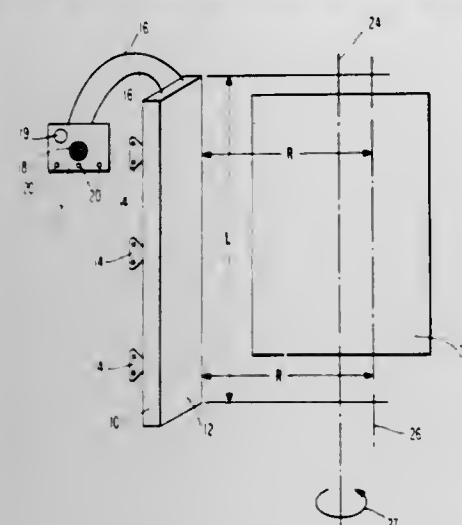
U.S. Cl. 324—236

1 Claim

1. A method of detecting metallic objects in a quantity of non-metal, comprising the steps of:
- generating a plane of detection having a length "L" and a width "R";
  - bringing a container holding a quantity of non-metal which potentially contains metallic objects into said plane of detection, and rotating said container about an axis substantially parallel to length L and less than distance R from the generator of said plane and;



operably connecting an alarm means to be responsive to disturbances in said plane of detection during the rotation of



said container in said plane caused by the presence of metal therein.

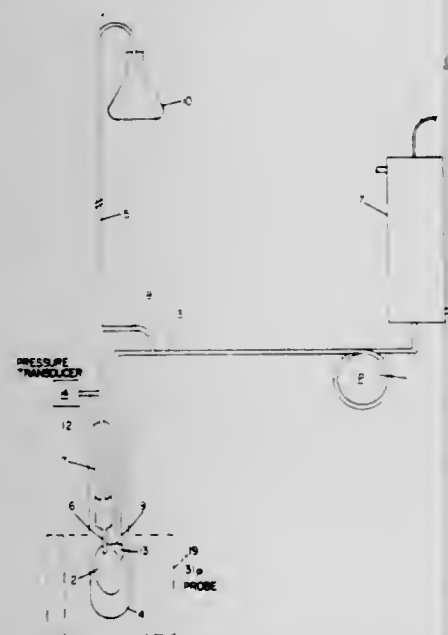
#### 4,413,233 DYNAMIC NMR MEASUREMENT

Eric T. Fossel, and Joanne S. Ingwall, both of W. Newton, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jul. 2, 1981, Ser. No. 279,721  
Int. Cl.<sup>3</sup> G01R 33/08

U.S. Cl. 324—300

10 Claims



1. Apparatus for dynamically measuring a chemical entity in living biological tissue having a physical characteristic capable of fluctuation, comprising

an NMR pulse spectrometer capable of providing an observation pulse for instantaneously measuring the spectrum of said chemical entity in said biological tissue, sensing means for sensing said physical characteristic and providing an output signal, and triggering means responsive to said sensing means output signal and connected to said spectrometer for triggering said spectrometer to produce said observation pulse at a selected point in the course of said fluctuation of said physical characteristic of said tissue.

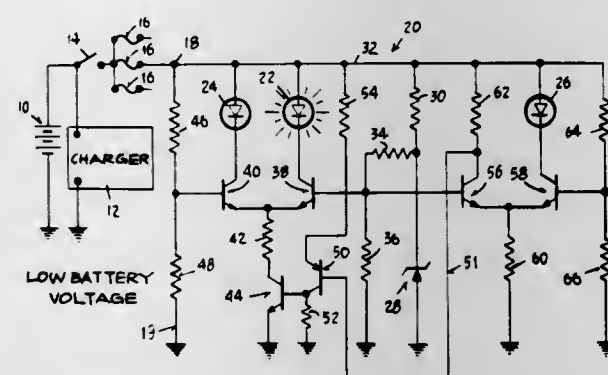
#### 4,413,234 BATTERY-OPERATED CONDITION MONITOR

Peter J. Lupoli, Hamden, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,282  
Int. Cl.<sup>3</sup> G01N 27/46

U.S. Cl. 324—435

11 Claims



1. A battery-condition tester for a vehicle having a storage battery and a charger connected with the storage battery, comprising in combination:

- a pair of light-emitting indicators connected in circuit with one side of the battery,
- current-control means connected respectively to control said indicators and in circuit with the other side of the battery,
- voltage-responsive means connected in circuit with both sides of the battery, for controlling said current control means to selectively energize one or the other of the indicators in response to a low battery voltage or else a normal battery voltage,
- a third light-emitting indicator connected in circuit with one side of the battery,
- over-voltage current-control means connected to control said third indicator and in circuit with the other side of the battery,
- an additional voltage-responsive means connected in circuit with both sides of the battery, for turning on said over-voltage current-control means to energize said third indicator in response to an over-voltage of the battery, and
- means controlled by said over-voltage current-control means, for turning off said first-mentioned current-control means to extinguish said pair of light-emitting indicators when the over-voltage current-control means is operative to energize the third indicator.

#### 4,413,235 LOW TEMPERATURE COEFFICIENT LOGARITHMIC ELECTRONIC GAIN CONTROLLED AMPLIFIER

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1981, Ser. No. 236,944  
Int. Cl.<sup>3</sup> H03F 3/45; H03G 3/10

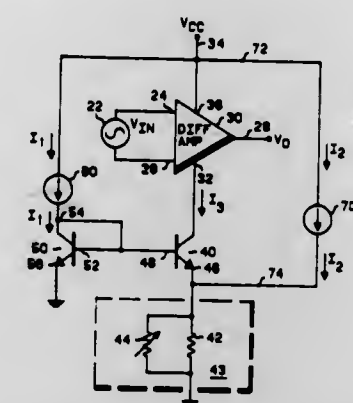
U.S. Cl. 330—254

5 Claims

1. A low temperature coefficient, logarithmic gain controlled amplifier circuit, comprising:

- an amplifier having a supply terminal and having a gain which is proportional to the supply current of the amplifier through the supply terminal;
- an impedance network having one end coupled to a reference level and having a variable resistance;
- a first active current source, having a current linearly dependent upon temperature;
- a second active current source, having a current linearly dependent upon temperature;
- current control means coupled to the first current source, the second current source and the impedance network, and coupled to the amplifier, for controlling the supply

current through the amplifier in response to the currents of the first and second current sources and the impedance of the impedance network whereby the gain of the ampli-



#### 4,413,236 CIRCUIT FOR DERIVING A TIMING SIGNAL FROM DIGITAL INPUT SIGNALS

Josef Sochor, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

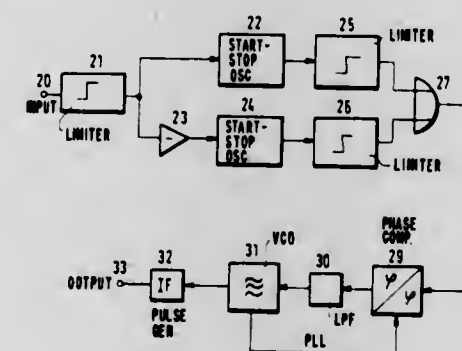
Filed Dec. 16, 1980, Ser. No. 216,938

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951134

Int. Cl.<sup>3</sup> H03L 7/06

U.S. Cl. 331—25

2 Claims



1. Electrical circuit for producing a timing signal for the regeneration of pulses, said circuit comprising a first start-stop oscillator (22), a second start-stop oscillator (24), a combining circuit (27), a phase comparator circuit (29), a low pass filter (30), a variable oscillator (31), a pulse generator (32), means (20,21) for supplying input signals to said first start-stop oscillator (22), means (20,21,23) for supplying inverted input signals to said second start-stop oscillator (24), means (25) for supplying the output signals of said first start-stop oscillator (22) to said combining circuit (27), means (26) for supplying the output signals of said second start-stop oscillator (24) to said combining circuit (27), means for supplying the output of said combining circuit (27) to a first input terminal of said phase comparator circuit (29), means for supplying the output signal of said phase comparator circuit (29) to said low pass filter (30), means for supplying the output signal of said low pass filter (30) to said variable oscillator (31), means for supplying the output signal of said variable oscillator (31) to a second input terminal of said pulse generator circuit (29) and to said pulse generator (32).

#### 4,413,237 SAWTOOTH WAVE OSCILLATOR

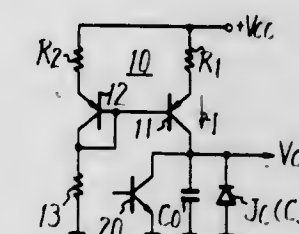
Yasuharu Baba, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,394

Claims priority, application Japan, Mar. 14, 1980, 55/32954  
Int. Cl.<sup>3</sup> H03K 4/50

U.S. Cl. 331—108 C

4 Claims



1. A sawtooth wave oscillator comprising:

- a series circuit of a first capacitor means and a charging means for producing a first current;
- a discharging means connected in parallel with said first capacitor means; and
- a second capacitor means having a capacitance which decreases in accordance with increase of the reverse bias across said second capacitor means and connected in parallel with said first capacitor means and their terminals connected together wherein decrease of said current due to increase of voltage at the junction point of said charging means and said first capacitor means corresponds to the decrease of capacitance of said second capacitor means, so that the non-linearity sawtooth wave caused by decrease of said first current is improved.

#### 4,413,238 PRECISION DIFFERENTIAL RELAXATION OSCILLATOR CIRCUIT

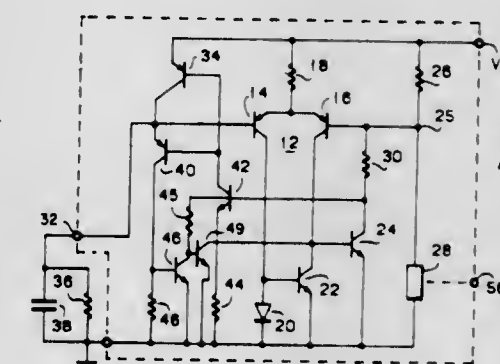
W. David Pace, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1981, Ser. No. 298,127

Int. Cl.<sup>3</sup> H03K 4/50

U.S. Cl. 331—111

10 Claims



1. Differential relaxation oscillator, comprising:

- frequency determining means including a capacitor which is charged and then discharged between upper and lower voltage levels;
- comparator means having first and second inputs and an output, said first input receiving a threshold voltage, said second input being coupled to said capacitor, said comparator means being switched from a first operating state to a second operating state when the voltage across said capacitor exceeds a first threshold voltage level supplied at said first input;
- charge circuit means for producing charging current when enabled to cause charging of said capacitor;



control circuit means coupled between said first input and said output of said comparator means and having an output coupled to said charge circuit means which when enabled both causes said threshold voltage to be reduced to a second voltage level and said charge circuit means to be disabled thereby allowing said capacitor to be discharged;

current detecting means coupled between an output of said charge circuit means and said output of said comparator means which detects a current produced at said output of said charge circuit means when said capacitor is charged to said upper voltage level for enabling said control circuit means such that said capacitor is discharged to said lower voltage level at which said comparator means switches to said first operating state thereby disabling said control circuit means which then enables said charge circuit means.

4,413,239

# FIELD EFFECT TRANSISTOR CIRCUIT FOR MODULATOR AND DEMODULATOR APPLICATIONS

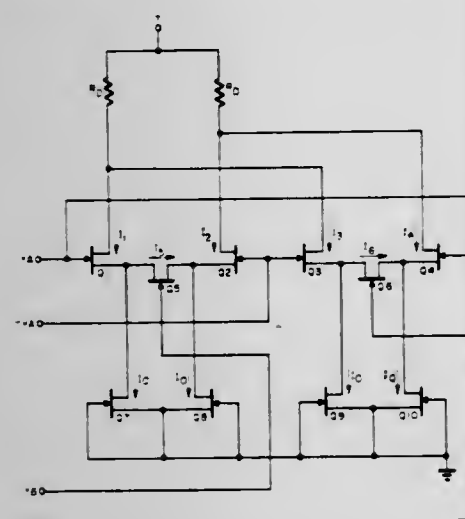
Donald E. Romeo, Westminster, and George W. McIver, Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,224

Int. Cl.<sup>3</sup> H03C 1/00; H03D 1/18; G06G 7/161

U.S. Cl. 332—16 T

2 Claims



1. Apparatus for producing a signal proportional to the product of two differential input signals comprising: first and second pairs of field effect transistors, each of the field effect transistors of said first and second pairs having gate, source and drain electrodes, a first series connected field effect transistor having a source electrode and a drain electrode connected in series between the source electrodes of one of said pairs of field effect transistors and having a gate electrode, a second series connected field effect transistor having a source electrode and a drain electrode connected in series between the source electrodes of the other of said pairs of field effect transistors and having a gate electrode, said source electrodes of said pairs of field effect transistors being held at a common reference potential, means for applying a first differential input signal across the gate electrodes of each of said pairs in parallel, means for applying a second differential input signal across the gate electrodes of said first and second series connected field effect transistors, and loading circuit means connected to the drain electrodes of said pairs of field effect transistors for providing an output signal proportional to the product of said first and second differential input signals.

## 4,413,240 AUTOMATIC LINE BUILDOUT CIRCUIT FOR DIGITAL DATA TRANSMISSION

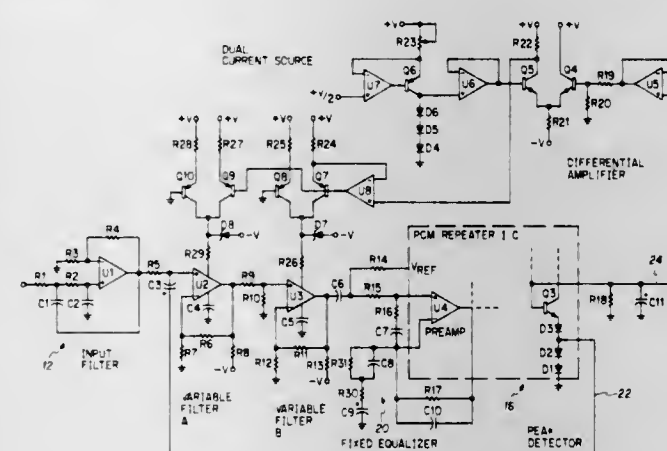
Harry J. Dyke, Oak Forest, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 9, 1981, Ser. No. 319,840

Int. Cl.<sup>3</sup> H03H 11/06

U.S. Cl. 333—17 R

5 Claims



1. An automatic line buildout circuit for equalizing a cable in response to a signal therefrom, comprising: a variable filter in the path of said signal, having a transconductance operational amplifier connected to provide a transfer function pole with a frequency which is directly related to a control current to be applied to the filter; peak detector means responsive to the signal in said path after filtering by said variable filter, for providing an output level approximately proportional to the length of said cable; and current source means for generating said control current as a selected function of said peak detector means output level, thereby causing the frequency associated with said pole to vary with the cable length according to said selected function, said selected function being defined by said control current increasing exponentially with increasing peak detector means output level.

4,413,241

# TERMINATION DEVICE FOR AN ULTRA-HIGH FREQUENCY TRANSMISSION LINE WITH A MINIMUM STANDING WAVE RATIO

Sylviane Bitoune; Pierre Dufond; Francois Herrbach, and Maurice Lecruff, all of Paris, France, assignors to Thomson-CSF, Paris, France

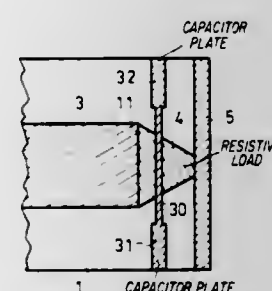
Filed Jul. 8, 1981, Ser. No. 281,393

Claims priority, application France, Jul. 11, 1980, 80 15497

Int. Cl.<sup>3</sup> H01P 1/26

U.S. Cl. 333—22 R

8 Claims



1. A load device adapted to the characteristic impedance of a transmission line with a flat structure, comprising a conductor constituted by a metal strip deposited on an insulating substrate and at least one earth electrode, the metal strip being connected by its end to a resistive film, which is itself connected to earth, wherein the resistive film is of a decreasing width along the entire length between its points of connection to the metal strip and to earth, and wherein said resistive film is adapted to the characteristic impedance of a transmission line.

is shaped like a trapezoid, whose large base is connected to the conductor and whose small base is connected to the earth plane.

4,413,242

# HYBRID TEE WAVEGUIDE ASSEMBLY

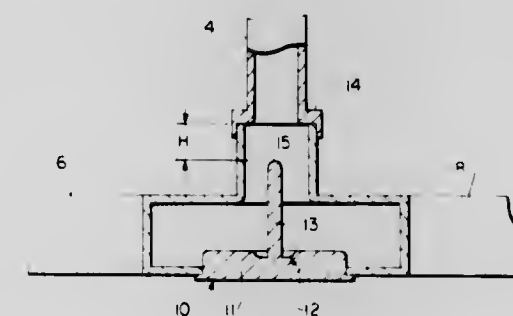
Albert H. Reeves, Linden, and Joseph S. Michalski, Morris Township, Morris County, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Aug. 31, 1981, Ser. No. 298,225

Int. Cl.<sup>3</sup> H01P 5/20

U.S. Cl. 333—122

9 Claims



1. A hybrid junction having enhanced power handling capacity, said hybrid junction having an H-plane arm, an E-plane arm and two collinear side arms formed of waveguide sections, said power being suppleable to said hybrid junction at the input of the H-plane arm, said hybrid junction including an H-plane arm matching post located in the junction formed by the intersection of the E-plane arm, the H-plane arm and the two collinear side arms and extending into the E-plane arm said E-plane arm having a known height, said matching post having a diameter such that the ratio of the E-plane arm height to the post diameter would yield a characteristic impedance of approximately 60 ohms in a transmission line having a circular center conductor extending between parallel ground planes having dimensions and a geometric relationship equivalent to the dimensions and geometric relationship of said matching post in relation to said E-plane arm, whereby the maximum power transfer without breakdown is achieved in said hybrid junction.

4,413,243

# OPTIMIZED TRANSMISSION LINE SWITCH

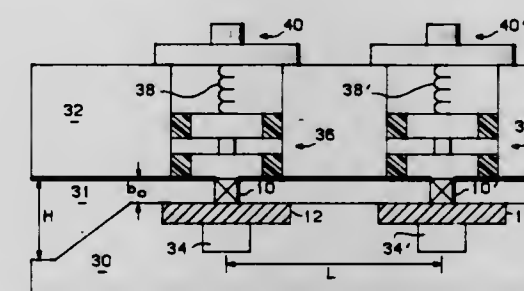
Michael Dydik, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 19, 1981, Ser. No. 312,206

Int. Cl.<sup>3</sup> H01P 1/15

U.S. Cl. 333—258

12 Claims



1. In a transmission line an optimized switch, comprising: a first switchable element in the transmission line, said first switchable element introducing a predetermined first capacitance across the transmission line while said first switchable element is in a first state; capacitive means in the transmission line for counteracting said first capacitance; and at least one portion of the transmission line interposed between said first switchable element and said capacitive means along a propagation direction of said transmission line.

line, said at least one portion having a predetermined impedance and an electric length not equal to an integral multiple of 90°, said predetermined impedance of said at least one portion being identical to an impedance of at least a local region of the transmission line.

4,413,244

# ELECTROMAGNET

Udo Hafner, Lorch, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

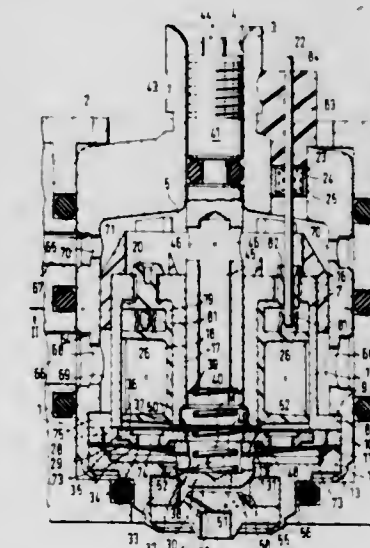
Filed Mar. 26, 1982, Ser. No. 362,370

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111938

Int. Cl.<sup>3</sup> H01F 7/10

U.S. Cl. 335—250

4 Claims



1. A housed electromagnet device for the actuation of a fuel injection valve for fuel injection systems of internal combustion engines, a carrier body having a magnetic coil mounted on a core of ferromagnetic material and an armature, said device further including a supply of electric current to said magnetic coil via contact prongs which protrude into said housing and are connected with said magnetic coil in an electrically conductive manner, characterized in that said housing is further provided with means defining an opening through which electrical contact means is arranged to extend, a conically tapering centering opening in said carrier body for the protrusion of said contact means therethrough, said electrical contact means having at least a terminus which engages fully enclosed loop elements provided on said magnetic coil, and said loop elements at least partially encircling said terminus of said electrical contact means, whereby said terminus of said electrical contact means is brought into engagement with said loop elements.

4,413,245

# INDUCTIVE MEASURING TRANSDUCER FOR A FLUIDIC ADJUSTING MEMBER

Reiner Bartholomäus, Neuendorf; Christoph Gibas, Neunkirchen; Hans Wölfiges; Ferdinand Hess, both of Lohr, and Karl Schiene, Sulzbach, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 136,327, Apr. 1, 1980, abandoned. This application Aug. 19, 1981, Ser. No. 294,214

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914195

Int. Cl.<sup>3</sup> H01F 15/04, 21/06

U.S. Cl. 336—84 M

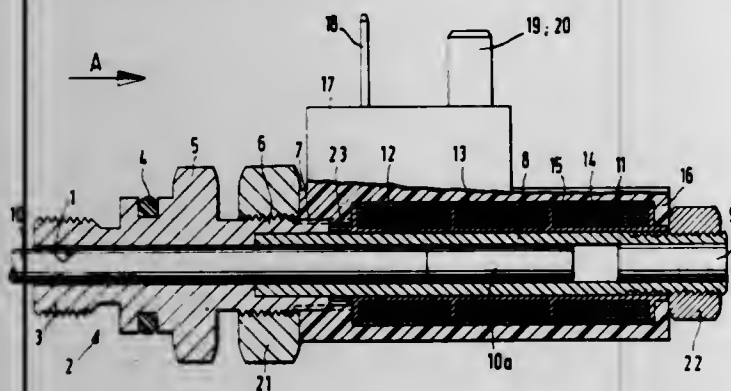
4 Claims

1. An improved inductive measuring transducer which is impermeable to fluid pressure agents for use with a fluidic adjustable member such as a multiple position valve or flow valve, the transducer being of the type comprising a receiving casing of non-magnetic material for receiving a plural-



ity of coils surrounding said receiving casing and the core, a housing surrounding said coils, and a connecting member, the improvements wherein

said receiving casing comprises a single continuous, hollow cylindrical tube having a plug seated directed in and closing one end thereof in fluid tight relationship; said connecting member is formed as a separate component from said receiving casing and is fixedly connected to the exterior of the other end of said tube in fluid tight relationship, said connecting member being spaced from said coils to permit adjustment of the relative positions thereof; said housing comprises a body of polymeric material completely enclosing said coils; said housing and said coils surround said receiving casing



and are axially movable as a unit relative to said receiving casing between said connecting member and said one end of said receiving casing;

said core is disposed on one end of a rod, and said core and rod have substantially equal transverse cross-sectional dimensions;

first and second adjusting nut means are mounted at opposite ends of said housing for adjusting the axial position of said housing and coils relative to said casing and for firmly holding said housing and coils against movement; and means are provided on said housing and said connecting member for preventing relative rotation between said coils and said casing, said means for preventing rotation including a plurality of mating projections and recesses formed in said housing and said connecting member.

4,413,246

## METALLIC COATING FOR A CADMIUM FUSE

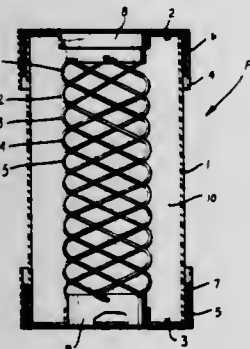
Arthur C. Westrom, Stone Mountain; Billy R. Livesay, Atlanta, and James W. Larsen, East Point, all of Ga., assignors to Kearney-National Inc., Atlanta, Ga.

Filed Aug. 27, 1981, Ser. No. 296,986

Int. Cl.<sup>3</sup> H01H 85/04

U.S. Cl. 337-159

15 Claims



1. A fusible element for use in an electric fuse, said fusible element comprising an elongated element formed of cadmium and a metallic coating having a thickness between 0.1 and 10 microns and covering substantially the entire exterior surface of said elongated element for effectively prohibiting pre-melting deterioration including sublimation, corrosion, mechanical fatigue and fretting of said elongated element, said metallic

coating being substantially non-porous and being formed of a metal having a melting temperature greater than the melting temperature of cadmium and which does not significantly diffuse into the bulk of the cadmium element and is selected from a group consisting of nickel, iron, aluminum, chromium, manganese, and beryllium.

4,413,247

## THERMALLY RESPONSIVE ELECTRICAL SWITCH MEANS AND METHOD OF MANUFACTURE

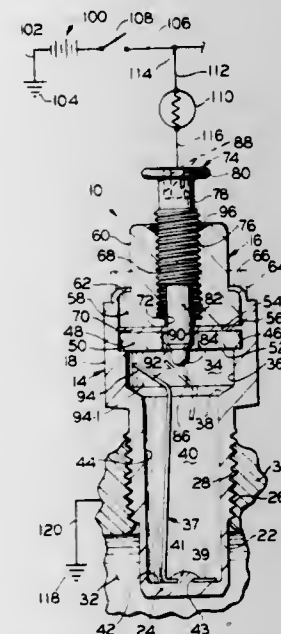
Charles J. Hire, Mansfield, Ohio, assignor to Hi-Stat Manufacturing Co., Inc., Lexington, Ohio

Filed Feb. 12, 1982, Ser. No. 348,589

Int. Cl.<sup>3</sup> H01H 37/28

U.S. Cl. 337-368

25 Claims



1. An electrical switch assembly, comprising switch housing means, said switch housing means comprising a housing portion molded of dielectric material, a passageway extending through said housing portion, at least a portion of the axial length of said passageway comprising an internal thread integrally molded as to be an integral part of said housing portion, an electrically conductive contact means, an external thread carried by said electrically conductive contact means, said electrically conductive contact means being received by said passageway as to have said external thread in cooperative engagement with said integrally molded internal thread, and friction generating means operatively engaging said electrically conductive contact means, said friction generating means being effective to exert a frictional force against said electrically conductive contact means as to resist without preventing the threadable adjustment of said electrically conductive contact means relative to integrally molded internal thread.

4,413,248

## LOW FUEL PRESSURE MONITOR FOR INTERNAL COMBUSTION ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Fond du Lac, Wis.

Filed Dec. 31, 1980, Ser. No. 221,625

Int. Cl.<sup>3</sup> B60Q 1/00

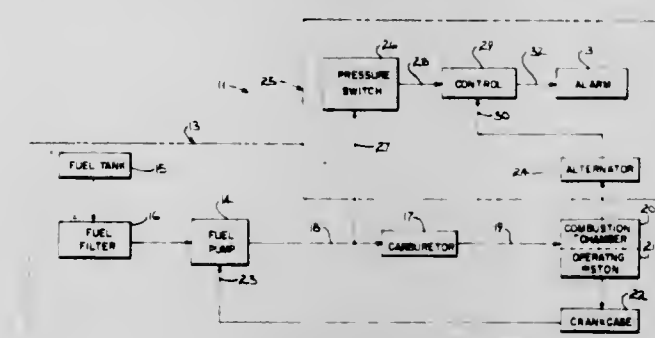
U.S. Cl. 340-52 R

3 Claims

1. A low fuel pressure monitor for a two cycle engine having an operating piston initially cooled by pressurized fuel, comprising

a speed sensor connected to sense the operating speed of said engine,  
a pressure sensor connected to sense the fuel pressure supplied to said engine,  
a connecting circuit connected to an engine driven alterna-

tor provided by said speed sensor to provide a series of pulses having a frequency proportional to engine speed, a timing circuit to operate from a first condition providing a disable signal to a second condition providing an enable signal in response to a decrease in fuel pressure for a predetermined period of time, an integrator connected through a gate circuit to operatively respond to said enable signal and said frequency proportional pulses to provide a varying D.C. output proportional to the frequency of said pulses, and



an oscillator connected to said integrator to operate from a non-oscillating condition to an oscillating condition in response to a predetermined D.C. output indicative of a decrease in fuel pressure and an operating speed above a predetermined magnitude to operatively provide a signal indicating a condition where said operating piston may become over-heated in response to a decrease in fuel pressure and an operating speed above a predetermined magnitude.

4,413,249

## VEHICLE FUEL-EFFICIENCY WARNING DEVICE

Yoshio Ohtani, Higashimatsuyama; Michio Wakiya, Yoshimi, and Tadamu Kakishima, Kamifukuoka, all of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

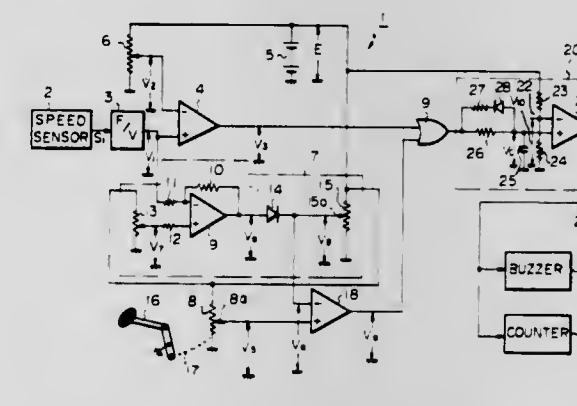
Filed Mar. 19, 1982, Ser. No. 359,852

Claims priority, application Japan, Mar. 23, 1981, 56-04073

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 340-52 R

8 Claims



1. A vehicle fuel-efficiency warning device used for a vehicle driven by an internal combustion engine, comprising: means for generating a first signal showing a rotational speed being related to an engine speed of said internal combustion engine; means responsive to said first signal for producing a first detecting signal when said rotational speed exceeds a predetermined upper limit speed; means for generating a second signal related to the position of a member for adjusting the amount of fuel supplied to said internal combustion engine; means for generating a third signal corresponding to an upper limit characteristic of the position of said member, said upper limit characteristic including a portion having

a decrease tendency in accordance with the increase of said rotational speed; means responsive to said second and said third signals for producing a second detecting signal when the position of said member exceeds the upper limit of the position of said member determined by said third signal; and means for issuing a warning in response to the occurrence of said first and or said second detecting signals.

4,413,250

## DIGITAL COMMUNICATION SYSTEM FOR REMOTE INSTRUMENTS

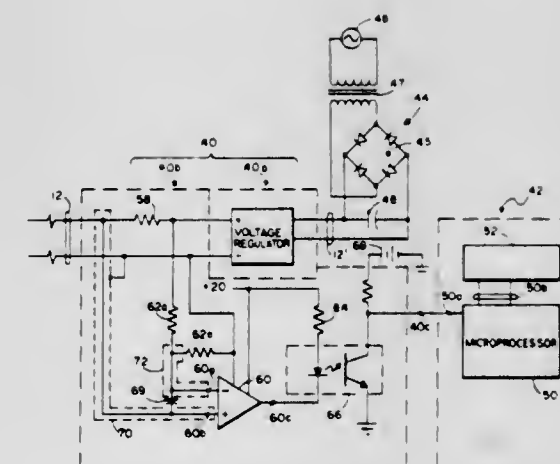
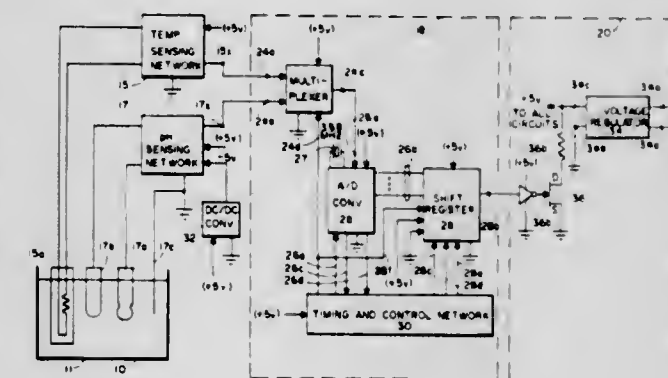
Ronald G. Porter, Anaheim; Richard E. LeBlanc, Orange, and Rolf W. Siemon, Brea, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 3, 1981, Ser. No. 298,870

Int. Cl.<sup>3</sup> G08C 19/02; H04B 3/60; H04Q 9/00

U.S. Cl. 340-310 A

18 Claims



1. In a communication system for communicating data from a remote station to a central station, in combination, (a) a power distribution line for supplying d-c operating power from the central station to the remote station, (b) a first voltage regulator at the central station for applying a regulated d-c voltage to the power distribution line, (c) a second voltage regulator at the remote station for providing a regulated d-c station operating voltage from the voltage and current applied thereto over the power distribution line, said second voltage regulator being of the type which draws an approximately constant d-c operating current, (d) transmitting means connected to the output of the second voltage regulator to modulate the current flowing in the power distribution line in accordance with a digital signal to be transmitted to the central station, said transmitting means having a first state in which it draws a first predetermined current from said output and a second state in which it draws approximately no current from said output, (e) signal receiving means at the central station for producing a digital signal that varies in accordance with the modulated current in the power distribution line, (f) whereby the operating voltage of the remote station re-



mains approximately constant during the operation of the transmitting means.

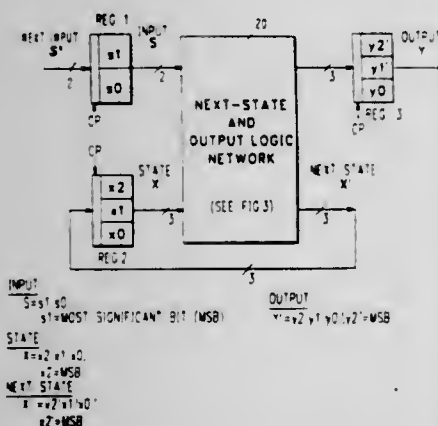
**4,413,251**  
**METHOD AND APPARATUS FOR GENERATING A NOISELESS SLIDING BLOCK CODE FOR A (1,7) CHANNEL WITH RATE 1/2**

Roy L. Adler; Martin Hassner, and John P. Moussouris, all of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 16, 1981, Ser. No. 283,758  
Int. Cl.<sup>3</sup> H03K 13/00

U.S. Cl. 340—347 DD

3 Claims



1. An encoder for producing a run length limited (RLL) code for use in a structurally constrained environment having a minimum of 1 and a maximum of seven 0's between adjacent 1's and a coding rate 1/2, said encoder comprising means for receiving as an input vector for a given encoding operation two new message bits (S) and a three bit state vector (X) derived from the immediately preceding encoding operation, logic circuit means for producing a channel vector (Y) obeying said RLL coding rules and a next state vector (X') which becomes the state vector (X) for use in the next encoding operation wherein the vectors Y' and X' are functions of all five input bits to the encoder logic circuit means.

**4,413,252**  
**CAPACITIVE SWITCH AND PANEL**

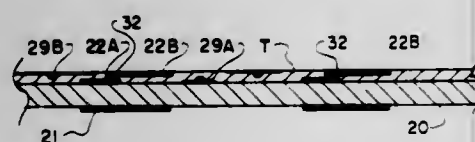
Hugh J. Tyler, Santa Ana, Calif., and William H. Conway, Midlothian, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 114,596, Jan. 23, 1980, which is a continuation of Ser. No. 932,086, Aug. 8, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,390

Int. Cl.<sup>3</sup> G06F 3/02; H01H 1/06

U.S. Cl. 340—365 C

2 Claims



1. A user, touch actuable capacitive switch panel for changing the level of an output signal to an electrical circuit means comprising: a first dielectric panel having a plurality of external, user touchable capacitive plates formed thereon arranged as a keyboard; a second flexible dielectric panel having a plurality of pairs of internal capacitive plates formed thereon affixed to said first dielectric panel, two internal capacitive plates forming each pair of capacitive plates being oppositely disposed from one of said external capacitive plates on opposite sides of said second flexible dielectric panel forming a plurality of capacitive switches on said switch panel; electrically conductive paths formed on said second flexible

dielectric panel for interconnecting said internal capacitive plates to said electrical circuit means; and trim means formed on said second flexible dielectric panel for adjusting the change of level of the output signal upon actuation of each of said capacitive switches.

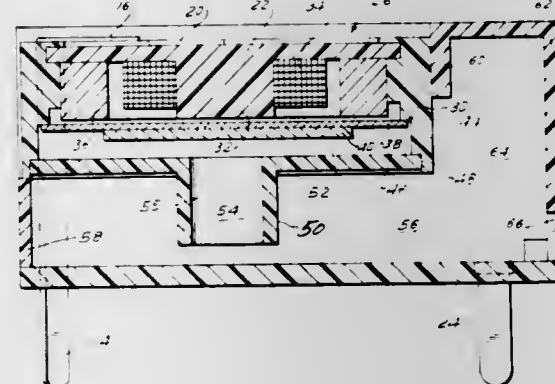
**4,413,253**  
**MINIATURE SOUNDER WITH DOUBLE TUNED CAVITY**

Alan Hofer, Wantaugh, and Frank M. Yama, Massapequa, both of N.Y.

Filed Feb. 19, 1981, Ser. No. 236,001  
Int. Cl.<sup>3</sup> G08B 3/10

U.S. Cl. 340—388

4 Claims



1. A miniature sounder comprising: a diaphragm; a surrounding rectangular housing disposed about said diaphragm; a chamber within said housing having a first open end closed by said diaphragm and an opposite open end communicating with the interior of said housing; an armature affixed to said diaphragm; a magnetic circuit operatively connected to said armature for driving said diaphragm at a desired frequency; said chamber and said housing being dimensioned so that each occupies a volume tuned to said desired frequency for driving said diaphragm so that said chamber resonant frequency comprises a multiple of said diaphragm driving desired frequency and a multiple of said housing resonant frequency and said diaphragm and chamber extend from one wall of said housing to a partial partition, and a pocket is defined between said partition and an opposite wall of said housing and an outlet opening is provided in said housing opposite wall.

**4,413,254**  
**COMBINED RADIO AND MAGNETIC ENERGY RESPONSIVE SURVEILLANCE MARKER AND SYSTEM**

George G. Pinneo, Fort Lauderdale, and Jon N. Weaver, Boca Raton, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

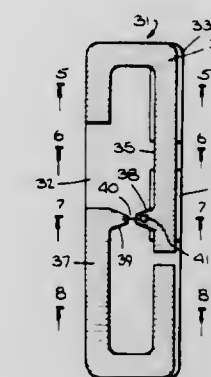
Filed Sep. 4, 1981, Ser. No. 299,304  
Int. Cl.<sup>3</sup> G08B 13/24

U.S. Cl. 340—572

15 Claims

1. A marker comprising in combination first passive means including at least one conductive antenna element and being responsive to the energy in a field of radio waves when immersed therein for reradiating a portion of said energy as a detectable and distinguishable radio signal, and second passive means including at least one body of high permeability and low coercivity material and being responsive to the energy in a field of low frequency electromagnetic waves when immersed therein for reradiating a separately detectable signal, both said

passive means being united in a common tag structure with said antenna element and said body of high permeability material



interrelated for independent electrical operation in spite of electromagnetic coupling therebetween.

**4,413,255**  
**FLUID LEVEL INDICATOR**

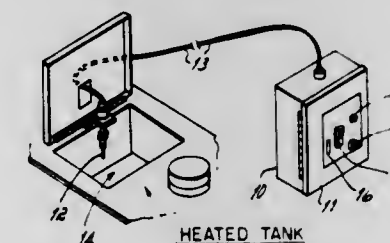
Sherman E. Cohen; Dario Ramazzotti, both of Atlanta, and Michael D. Hartley, Roswell, all of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Jun. 12, 1981, Ser. No. 273,098

Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—622

5 Claims



1. A level indicator for heated glue in a hot melt glue tank which includes a heater for heating the glue comprising: a thermistor positioned in the tank intermediate its top and bottom; a thermistor controller coupled to the thermistor and operable to produce a first output when the thermistor is below an operating temperature for the heated glue and to produce a second output when the thermistor is at or above the operating temperature; an indicator; a relay coupled to the thermistor controller and to a source of power and operable to become latched in an energized condition by the source of power in response to said second output and operable when latched to couple the indicator to the energizing source of power when the thermistor controller produces the first output; and a switch for permitting unlatching the relay by decoupling the relay from the source of power.

**4,413,256**  
**DRIVING METHOD FOR DISPLAY PANELS**

Shuhei Yasuda; Katsubumi Koyanagi; Yutaka Ishii, and Tomio Wada, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1981, Ser. No. 236,582

Claims priority, application Japan, Feb. 21, 1980, 55-21129

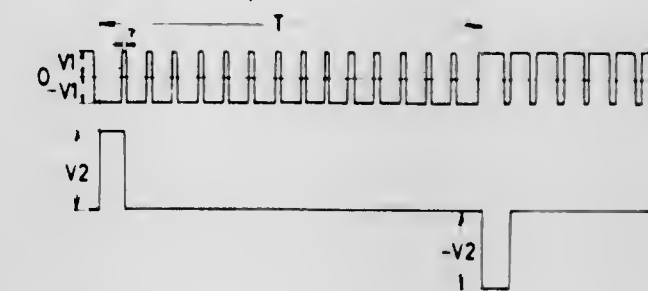
Int. Cl.<sup>3</sup> G09G 3/36

U.S. Cl. 340—784

2 Claims

1. A display device comprising: a dynamic scattering mode liquid crystal structure including at least one first display electrode oriented in a first direc-

tion and a plurality of second display electrodes oriented in a second direction; means for supplying said plurality of second display electrodes with a plurality of scanning signals of sequentially shifted phases with polarity inverted at a predetermined interval of time;



means for supplying said first display electrode with frame signals indicative of information to be displayed and having polarity inverted at said predetermined interval; and means for adding a plurality of pulse signals having a pulse width shorter than the pulse width of said scanning signals to said frame signals.

**4,413,257**  
**CONDUCTIVE PARTICLE LEAD TERMINATION FOR AN ELECTRO-OPTIC DISPLAY**

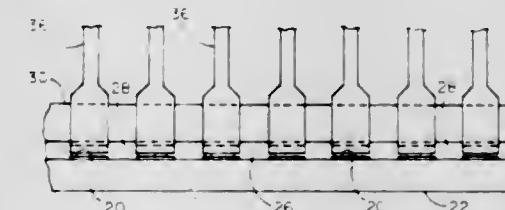
Gordon Kramer, Huntington Beach; Elias J. Lara, Elsinore, both of Calif., and Andrew F. Wollmann, Chandler, Ariz., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 13, 1981, Ser. No. 282,673

Int. Cl.<sup>3</sup> G08B 5/00

U.S. Cl. 340—815.01

9 Claims



1. An electro-optic display comprising: a pair of plates in face-to-face relation forming a sealed envelope; means within said envelope responsive to exterior addressing electronics for selectively displaying visible characters through a viewing window of said envelope; means for connecting said addressing electronics with said displaying means; and an adhesive composition for supporting said connecting means on at least one of said plates, said adhesive composition having conductive particles to provide electrical interface between said connecting means and said displaying means, said particles having a dimension such that no electrical connection exists between adjacent connecting means of said display.

**4,413,258**  
**INTERCONNECTION FOR LOCAL AREA CONTENTION NETWORKS**

Roy F. Quick, Jr., and John E. Spracklen, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 14, 1981, Ser. No. 330,714

Int. Cl.<sup>3</sup> H04J 3/02; H04Q 9/00

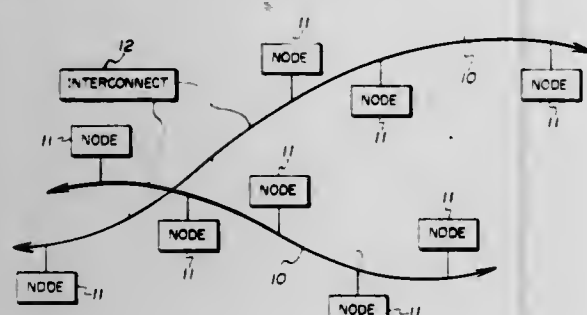
U.S. Cl. 340—825.5

10 Claims

1. In a system of local area contention networks including a plurality of channels, each channel having a plurality of stations coupled thereto for transmission thereon, and an inter-



connection means for connecting said plurality of channels, each station being adapted to sense its corresponding channel for activity when it is ready to transmit, wait a random period of time and, then, begin transmission if there is still no activity on said channel, said interconnection means comprising: a pair of output drivers each coupled to one of said channels; a pair of input receivers each coupled to one of said channels;



latch means to set the input receiver from one of said channels for transmission to the output driver for the other of said channels for transmission from said one channel to said other of said channels; and detection means to detect when transmission is received from the other of said channels while transmission is being received from said one of said channels and to cause each of said output drivers to place a jamming signal on the respective channels to block transmission.

4,413,259

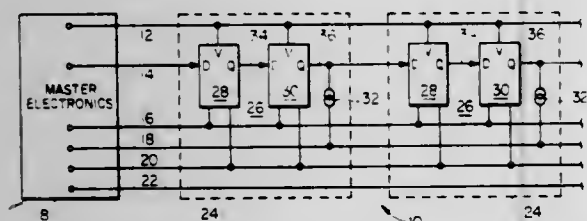
## CASCADE MONITORING APPARATUS

Michael A. Lutz, San Carlos; Howard B. Kroymann, Menlo Park; Abdul M. Tayeb, San Leandro, and Edward H. Softky, Menlo Park, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 18, 1981, Ser. No. 303,327  
Int. Cl.<sup>3</sup> G08B 19/00; H04Q 9/14

U.S. Cl. 340—825.06

6 Claims



1. An apparatus for monitoring a value of at least one physical parameter at a plurality of points, comprising: a plurality of monitoring modules, each module having a logic section and a transducer section associated therewith, wherein the logic sections are connected in series and identical in their response to a logic signal, wherein each logic section activates its associated transducer section upon receipt of the logic signal, and each logic section sequentially passes the logic signal to the next module; and each activated transducer transmits a continuous electrical signal in response to and in correspondence with the physical parameter sensed, for continuously monitoring changes in the parameter sensed; master electronics for sending an initial logic signal to the module to which it is connected and utilizing the continuous electrical signal for monitoring purposes; the master electronics including a clock circuit for generating a clock pulse for timing the transfer of the logic signal through each module, and means for electrically interconnecting the modules to each other and the master electronics.

4,413,260  
REMOTE-CONTROL SYSTEM FOR COIN-OPERATED PHONOGRAPHS

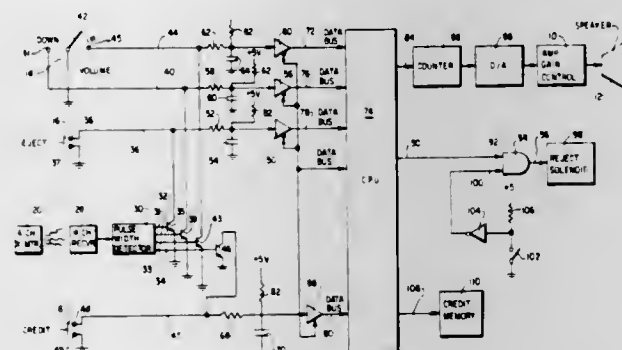
Lawrence Siegel, Chicago; Edward L. Polanek, Woodstock; Anthony J. Miller, Skokie, and Alan L. Woodman, Mount Prospect, all of Ill., assignors to Stern Electronics, Inc., Elk Grove Village, Ill.

Filed Aug. 31, 1981, Ser. No. 297,990

Int. Cl.<sup>3</sup> H04Q 9/00; H04B 1/32

U.S. Cl. 340—825.25

3 Claims



1. A remote-controlled phonograph which comprises: a volume control switch that is manually-operable; an amplifier with gain control; a multi-channel receiver adapted for receiving modulated carrier signals, said multi-channel receiver including one channel corresponding to a first modulated carrier signal representing lower volume and a second channel corresponding to a second modulated carrier signal representing higher volume, each of said modulated carrier signals comprising a pulse-width modulated carrier signal; detector means connected to said receiver for detecting said modulated carrier signals, said detector means comprising a pulse-width detector; a transmitter for transmitting a plurality of modulated carrier signals; switch means coupled to said detector means and operable in response to detection of predetermined modulated carrier signals, said switch means comprising a separate switch for each modulated carrier signal, each switch being operable to aid in controlling a selected parameter; volume control means coupling said switch means to said amplifier to vary the gain of said amplifier in response to operation of said switch means, said volume control means comprising gating means coupling both said switch means and said manually-operable volume control switch to said amplifier; said gating means comprising a separate gate for each modulated carrier signal; and means for providing an enable signal for each gate.

4,413,261

## CODED CONTROL FOR VEHICLE ENGINE IGNITION CIRCUIT

Melvin B. Greenberg, North Miami Beach, Fla., assignor to Arthur F. Glaeser, Deerfield Beach, Fla.

Filed Apr. 2, 1981, Ser. No. 250,121

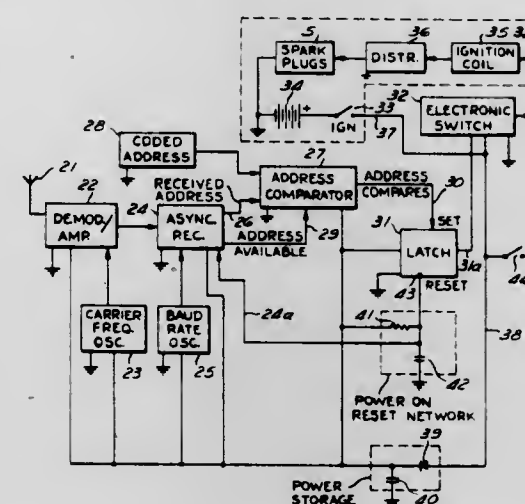
Int. Cl.<sup>3</sup> H04Q 7/00; F02N 11/12

U.S. Cl. 340—825.72

12 Claims

1. A coded control system for a vehicle engine ignition circuit comprising: a radio transmitter operative to broadcast at a selected carrier frequency, a source of a digital coded address, means in said transmitter for modulating said carrier with the bits of said coded address sequentially at a predetermined baud rate; a radio receiver responsive only to said selected carrier frequency modulated at said predetermined baud rate only to recover said digital coded address broadcast by the transmitter;

comparator means operatively coupled to said receiver to compare the received digital coded address with a stored digital coded address;



and means operatively coupled to said comparator means for enabling said ignition circuit to start the vehicle engine when said received coded address matches said stored coded address.

4,413,262

## MULTIPLE FREQUENCY TUNED CIRCUIT

Robert H. Johns, 3379 Papermill Rd., Huntingdon Valley, Pa. 19006

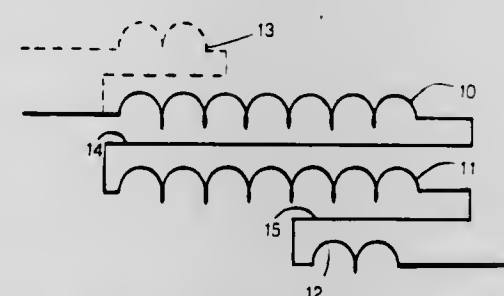
Continuation-in-part of Ser. No. 249,440, Mar. 31, 1981, Pat. No. 4,334,228, which is a continuation-in-part of Ser. No. 222,241, Jan. 2, 1981, Pat. No. 4,335,386, which is a

continuation-in-part of Ser. No. 162,928, Jul. 17, 1980. This application Dec. 4, 1981, Ser. No. 327,359

Int. Cl.<sup>3</sup> H03H 7/00; H01Q 1/00

U.S. Cl. 343—722

4 Claims



1. A circuit having more than one resonant frequency comprising a main bifilar winding of two capacitively coupled wire coils with an electrical cross-connection between opposite ends of said main coils, the turns of said coils being insulated from one another and one coil located outside the other, a third coil having fewer than half the turns of wire than either of said main coils, capacitively coupled to one of said main coils near an end thereof, with an electrical cross-connection between the end of the main coil to which the third coil is capacitively coupled and the opposite end of said third coil.

4,413,263

## PHASED ARRAY ANTENNA EMPLOYING LINEAR SCAN FOR WIDE ANGLE ORBITAL ARC COVERAGE

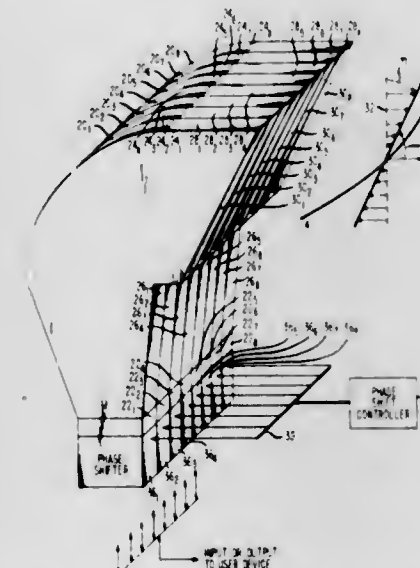
Noach Amitay, Tinton Falls, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 11, 1981, Ser. No. 272,751

Int. Cl.<sup>3</sup> H01Q 3/36, 19/20, 15/24

U.S. Cl. 343—756

7 Claims



1. A phased array antenna arrangement comprising: a plurality of feed elements (20, 62, 70) arranged in a linear array and capable of launching or receiving a planar wavefront at an aperture of the array; and phase shifting means (36) for selectively producing a predetermined linear plane taper along a first axis across the aperture of the array characterized in that the aperture of the linear array formed from the plurality of feed elements is cut at a predetermined bias angle ( $\alpha$ ) to a ray directed from the center of the aperture to the center of the field of view of the antenna arrangement to produce a fixed linear phase taper along a second axis of the aperture of the array orthogonal to the first axis thereof to produce a predetermined squinted beam, the predetermined bias angle producing a beam which traverses a predetermined arc ( $A'-A'$ ) when linearly scanned along the first axis.

4,413,264

## PRINT MATERIAL SUPPLY CONTROL APPARATUS AND METHOD

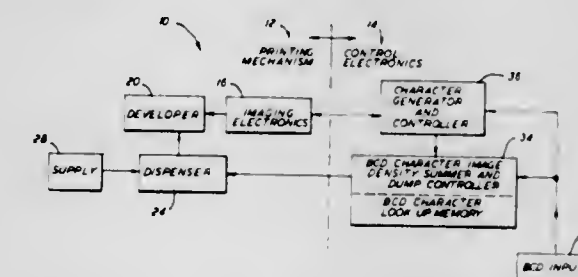
Antonio S. Cruz-Urbe, Cobalt, and Peter C. Di Giulio, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 11, 1982, Ser. No. 338,691

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 346—1.1

1 Claim



1. A method for controlling the amount of print material supplied to an electronic printer, the steps comprising: supplying information relative to a text to be printed, storing the text information, operating a printer to reproduce the text in response to the stored text information, performing a statistical



study of the expected character usage, determining the amount of print material required to print each type of character, determining the amount of print material required to print the text information stored based upon the number of characters to be printed and the weighted average of the amount of print material required per characters, and supplying print material to the printer in accordance with the amount determined.

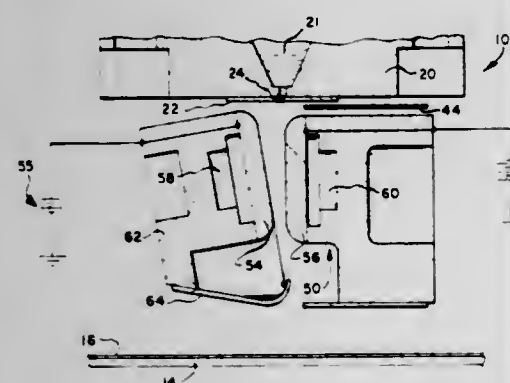
#### 4,413,265 INK JET PRINTER

Harry C. Kockler, Lewisville; Theodore S. Geiselman, Plano, and Gerda N. Black, Garland, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,799  
Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346—1.1

11 Claims



1. In an ink jet printer, having a print head defining a plurality of orifices from which fluid filaments emerge to break up into jet drop streams, said jet drop streams being arranged in a row and directed toward a print receiving medium transport, a charge plate including a plurality of open sided charge electrodes for selectively charging drops in said jet drop streams, a deflection electrode positioned to one side of said row of jet drop streams between said print head and said print receiving medium transport, means for supplying an electrical deflection potential to said deflection electrode, and a catcher positioned between said print head and said print receiving medium transport, the method of initiating printer operation, comprising the steps of:

- initiating operation of said print head to produce a plurality of said jet drop streams, while maintaining said charge plate in a position remote from said jet drop streams, and while maintaining said catcher in a full catch position between said print head and said print receiving medium transport and extending a substantial distance to either side of said row of jet drop streams so as to catch the drops in said jet drop streams,
- translating said charge plate toward said row of jet drop streams into a position such that said charge electrodes partially surround associated fluid filaments at the points of break up to provide shielding thereof,
- applying said electrical deflection potential to said deflection electrode so as to produce a deflection field while utilizing said charge electrodes to shield said jet drop streams from said field,
- pivoting said catcher into an operating position in which deflected drops strike said catcher while charging said drops sufficiently to deflect said drops to said catcher, and
- initiating selective charging of said drops in said jet drop streams by selective application of charge potentials to said charge electrodes, whereby selected drops may be deflected to strike a print receiving medium carried by said print receiving medium transport.

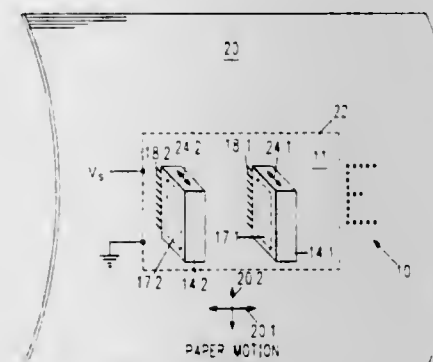
#### 4,413,266 METHOD AND APPARATUS FOR ERASING INK JET PRINTING

Ari Aviram, Yorktown Heights, N.Y.; Zalata Kovac, Holzgerlingen, Fed. Rep. of Germany, and Robert A. Myers, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,299  
Int. Cl.<sup>3</sup> G01G 15/16

U.S. Cl. 346—21

6 Claims



1. In an ink jet printer wherein ink droplets are utilized to form indicia on a paper medium, the improvement comprising: said ink is based on an azo dye; and means for selective erasure of said indicia including: means for chemically reducing said indicia in a selected area on said paper medium; means for warming said indicia in said selected area to enhance the erasure of said indicia by said reducing means; and means for neutralizing said area to establish said area in condition again to receive ink droplets forming other indicia.

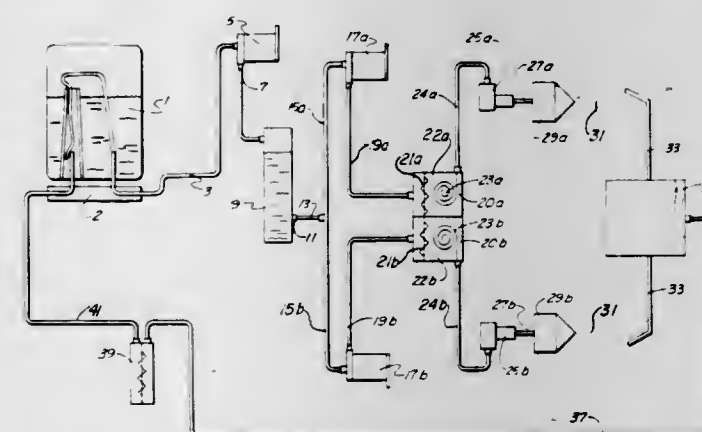
#### 4,413,267 INK SUPPLY SYSTEM FOR INK JET PRINTING APPARATUS

Richard A. Hein, Rochester, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Dec. 18, 1981, Ser. No. 332,041  
Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346—75

12 Claims



1. In liquid ink supply system for an ink jet printing apparatus which discharges ink drops from a print head toward a record receiving member, selectively utilizes some of said ink drops for printing desired symbols on said second receiving member, the remainder of said emitted ink drops not impinging upon said record receiving member, but being collected by a catcher means, said liquid ink supply system being provided with a primary reservoir for said ink, and conduit means for connecting said primary reservoir with said print head, the improvement comprising: a first pump connected by said conduit means intermediate said primary reservoir and said print head;

an intermediate reservoir connected by said conduit means intermediate said first pump and said print head; and a second pump connected by said conduit means intermediate said intermediate reservoir and said print head.

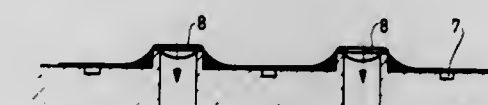
#### 4,413,268 JET NOZZLE FOR AN INK JET PRINTER

Horst Bentin, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,877  
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048259

U.S. Cl. 346—140 R

4 Claims



1. A jet nozzle plate for an ink jet printer, comprising a plurality of substantially cylindrical jet nozzles each having a discharge orifice, the plane of the orifice being perpendicular to the longitudinal axis of the jet nozzle, the orifice being surrounded by a nozzle brim having sharp edges, the width of the nozzle brim being between 0 and 20  $\mu$ m, a trough (6) being provided around the jet nozzle brim.

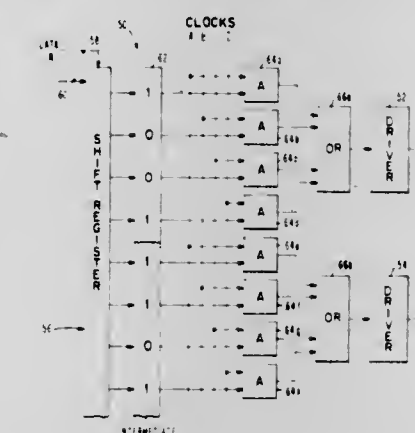
#### 4,413,269 METHOD OF AND APPARATUS FOR CONTROLLING GRAY SCALE WHILE PRINTING ON CHARGE SENSITIVE RECORDING MEDIUMS

Joseph P. Pawletko, Endwell, and Charles R. Pigos, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,843  
Int. Cl.<sup>3</sup> G01D 15/06; H04C 15/34

U.S. Cl. 346—154

12 Claims



1. Apparatus for controlling the intensity of a pixel which is to be printed by an electrode on a charge sensitive recording medium, over a write cycle having a predetermined number of equal subdivisions and duration, in a matrix printer having a plurality of print electrodes and driving circuits therefor, said apparatus comprising:

- storage means for receiving and storing coded multibit words that represent pixel intensity data for said electrodes;
- first circuit means for generating a predetermined number of intensity clock signals of equal amplitude, said number of clock signals being equal to the number of bits in said intensity coded words with each clock signal being associated with a different one of said bits, each of said intensity clock pulse signals including a different number of write cycle subdivision pulses, the positive going por-

tions of which pulses correspond in width to the subdivisions of said write cycle; and

- second circuit means, connected to said first circuit means to receive said intensity clock signals, to said storage means to receive said coded intensity words and to said print electrode driving circuits, for generating a write pulse waveform in response to receipt of said intensity words and said intensity clock pulse signals for each of said print electrode driving circuits and electrodes.

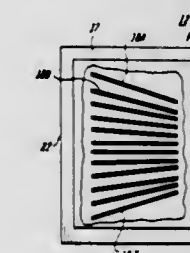
#### 4,413,270 MULTIGATE LIGHT VALVE FOR ELECTRO-OPTIC LINE PRINTERS HAVING NON-TELECENTRIC IMAGING SYSTEMS

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,057  
Int. Cl.<sup>3</sup> G01D 15/14, 9/42; G02F 1/01

U.S. Cl. 346—160

9 Claims



5. An electro-optic line printer comprising a multigate light valve, a photosensitive recording medium which advances in a cross line direction relative to said light valve, non-telecentric imaging optics for imaging said light valve onto said recording medium, said imaging optics having a predetermined entrance pupil, and means for illuminating said light valve with a light beam which converges toward said entrance pupil with a predetermined angle of convergence.

#### 4,413,271 INTEGRATED CIRCUIT INCLUDING TEST PORTION AND METHOD FOR MAKING

Walter S. Gontowski, Jr., Thompson, Conn., and James F. Mayrand, Shrewsbury, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 30, 1981, Ser. No. 248,142  
Int. Cl.<sup>3</sup> H01L 27/04

U.S. Cl. 357—40

8 Claims

8. An integrated circuit wafer consisting essentially of a matrix of crystalline semiconductor integrated circuit blocks, each of said blocks being comprised of (a) at least a plurality of bipolar transistors, a plurality of resistors interconnected to form the principal circuit thereof; (b) a plurality of metal pads on said block being connected to and providing electrical access to various points, respectively, of said principal circuit; (c) a separate test circuit including: one bipolar transistor having been formed all together simultaneously with at least some of said plurality of transistors; and



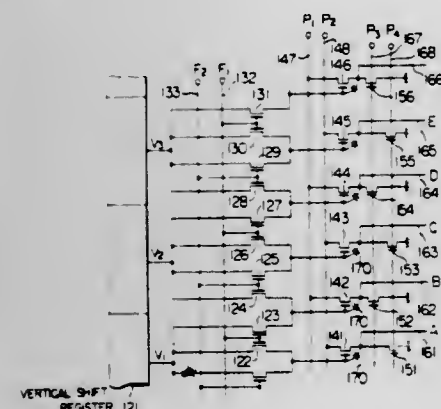








including a photo-electric conversion element and a switching insulated gate field effect transistor for reading an optical signal from said photo-electric conversion element;  
vertical gate lines each connected to the gates of the switching insulated gate field effect transistors for the picture elements on the same row;  
a vertical shift register for producing vertical scan pulses;  
a simultaneous two-line selection circuit for simultaneously



selecting two of said vertical gate lines to simultaneously read the two lines; and  
a buffer circuit inserted between said vertical gate lines and said simultaneous two-line selection circuit for first turning off the vertical gate line for the picture element row which has a coupling capacitance with only one of the two selected vertical gate lines and thereafter turning off the gate vertical line for the picture element row which has coupling capacitances with the two selected vertical gate lines.

4,413,284

## NOISE REDUCER FOR A SOLID STATE IMAGER

Morishi Izumita, Inagi; Toshiyuki Akiyama, Kodaira; Kazuhiko Sato, Tokyo, and Shusaku Nagahara, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

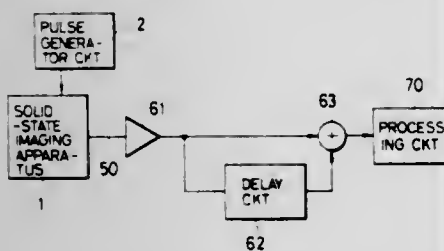
Filed Dec. 31, 1981, Ser. No. 336,322

Claims priority, application Japan, Jan. 21, 1981, 56-6403

Int. Cl.<sup>3</sup> H04N 3/15, 5/21, 9/07

U.S. Cl. 358-213

5 Claims



1. In a solid-state imaging apparatus wherein photo signal outputs of a plurality of photosensors arrayed in horizontal and vertical directions are read out onto vertical signal lines through a first group of switches which are driven by vertical scanning pulses and wherein the photo signal outputs on the respective vertical signal lines are fetched onto an output line through a second group of switches which are driven by horizontal scanning pulses; a solid-state imaging apparatus characterized by comprising a delay circuit which delays the output from said output line a period that is shorter than one horizontal scanning period by approximately a duration of one horizontal scanning pulse, and an adder which adds an output of said delay circuit and said output of said output line, an output of said adder being delivered as a video signal.

4,413,285

## FACSIMILE APPARATUS

Masayasu Anzai, Hitachi; Kiyohiko Tanno, Katsuta; Hideo Hirane, Hitachi; Akira Shimada, Hitachi, and Masaharu Tadauchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

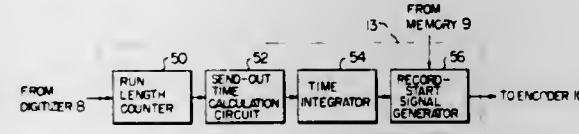
Filed Sep. 23, 1981, Ser. No. 304,899

Claims priority, application Japan, Sep. 24, 1980, 55/131518

Int. Cl.<sup>3</sup> H04N 1/40

U.S. Cl. 358-260

7 Claims



1. A facsimile apparatus having a transmitting unit for scanning an image of a text to produce an image information signal and converting the image information signal to a coded information signal in a band compressed transmission system for transmission through a transmission line, and a receiving unit for decoding the coded information signal transmitted through the transmission line to reproduce the image information on a recording medium, said facsimile apparatus comprising:

memory means for storing the information signals representing the image of the text to be transmitted and received, said memory means having a memory capacity of at least one page information of said text;

said transmitting unit comprising:

photo-electric conversion means for converting optical information obtained by scanning the image of the text into an electric information signal;

first clock generating means for generating a timing clock for reading out the electric information signal from said photo-electric conversion means; and

first converting means for converting the electric information signal read out from said photo-electric conversion means in response to the output from said first clock generating means to the coded information signal to be transmitted through the transmission line;

said receiving unit comprising:

second clock generating means for generating a timing clock for reading out the received information signal stored in said memory means;

second converting means for converting the information signal read out from said memory means into analog information signals;

scanning type recording means for feeding said recording medium at a constant speed and recording the image on said recording medium in accordance with the analog information signal read from said second converting means;

first switch means selectively changed over between a first state where the output of said second clock generating means is allowed to be applied to said memory means and a second state;

second switch means selectively changed over between a first state where the output of said first clock generating means is allowed to be applied to said photo-electric conversion means and a second state where the output of said second clock generating means is allowed to be applied to said photo-electric conversion means when said first switch means is in the second state;

third switch means selectively changed over between a first state where the output of said second converting means is allowed to be applied to said recording means and a second state where the output of said photo-electric conversion means is allowed to be applied to said recording means;

said facsimile apparatus operates as a facsimile when each of

said first, second and third switch means is in said first state and

said memory means is responsive to the timing clock from said second clock generating means to sequentially read out the information signal such that a scanning-start timing at each scanning line in said recording means is repeated with a constant period; and

said facsimile apparatus operates as a copying means for recording the image information signal obtained at the transmitting unit on the recording medium at the receiving unit thereof and said photo-electric conversion means is responsive to the timing clock from said second clock generating means to sequentially read out the information signal such that a scanning-start timing at each scanning line in said recording means is repeated with a constant period.

4,413,286

## METHOD AND APPARATUS INVOLVING DIGITAL SCREEN GENERATION

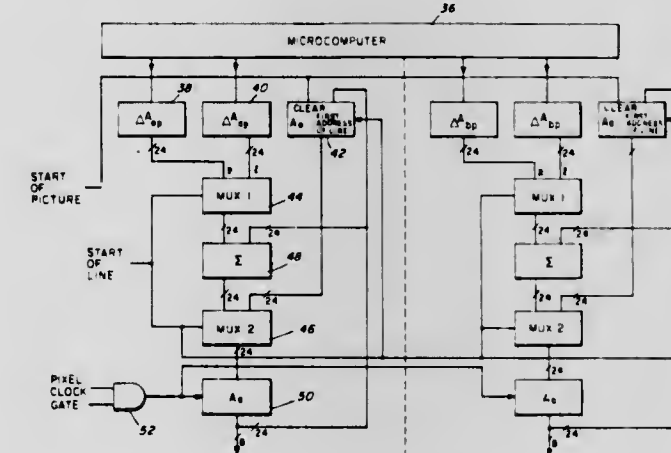
William T. Boston, Melrose, Mass., assignor to Optronics International, Inc., Chelmsford, Mass.

Filed Aug. 24, 1981, Ser. No. 295,573

Int. Cl.<sup>3</sup> H04N 1/40, 1/22

U.S. Cl. 358-283

9 Claims



1. A method of reproducing an image comprising the steps of:

- (a) scanning an image to be reproduced;
- (b) generating first optical density values at selected address locations of said scanned image;
- (c) generating a screen cell having a selected optical density pattern with second optical density values at selected address locations, a map of said second optical density values having a sinusoidal profile;
- (d) repeating said screen cell in first and second directions to form a large area screen having a repetition of said second optical density values at selected address locations;
- (e) comparing said first and second optical density values at corresponding address locations; and
- (f) generating output data signals representing said comparison and defining a reproduction of said image to be reproduced.

4,413,287

## WHITE LINE SKIPPING

John D. Torple, Dallas; Robert F. Lozen, Denton, and Shing-Chang R. Haleh, Richardson, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1982, Ser. No. 368,258

Int. Cl.<sup>3</sup> H04N 1/17, 1/40

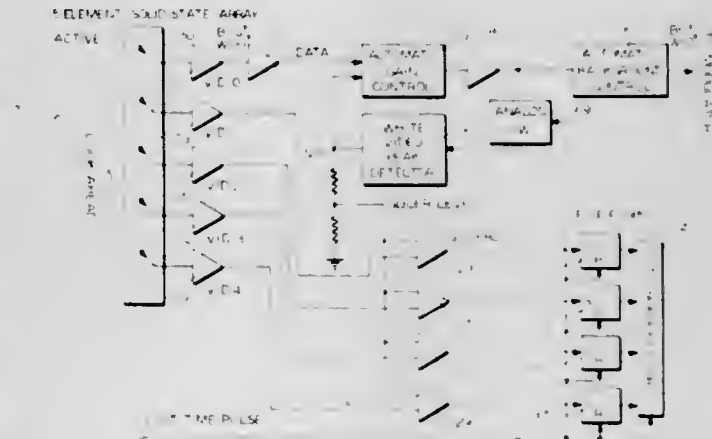
U.S. Cl. 358-288

8 Claims

1. A white line skipping system for use in data reduction in a facsimile transmission system, wherein the improvement is characterized by:

optical detector array means (50) including an element for detecting the active data during a single scan line and a

plurality of look ahead elements for detecting only the presence of data along a plurality of scan lines, video processing means (52) for receiving the active data from said optical detector array means and processing said data into an acceptable video signal, microprocessor means (54) for receiving and sampling the look ahead data and generating enabling signals depending on the combination of look ahead data lines which have and do not have video information thereon,



frequency generator means (58) responsive to said enabling signals from said microprocessor means (54) for generating a predetermined frequency signal for each of said combination of look ahead lines containing video information, means (56) for modulating the video signals as processed by said video processing means, and switch means (60) for transmitting either said modulated video signals or said predetermined frequency signals.

4,413,288

## INDICATOR CONTROL SIGNAL GENERATOR FOR VIDEO TAPE RECORDER

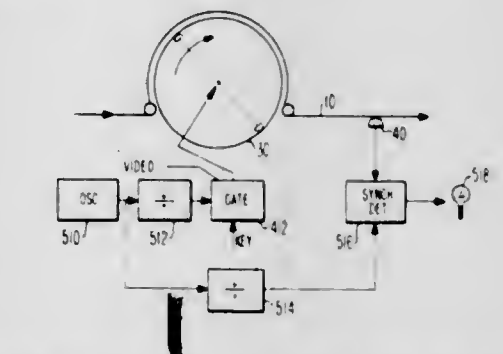
Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,438

Int. Cl.<sup>3</sup> G11B 27/36

U.S. Cl. 360-31

8 Claims



1. A helical scan television video tape recorder comprising: a headwheel; a recording transducer mounted on said headwheel; coupling means coupled to a source of television signals and to said recording transducer for enabling transduction; tape transport means adapted for driving a magnetic tape along a tape path past said headwheel at a first rate for presenting unrecorded tape portions for recording; headwheel drive means coupled to said headwheel for driving said headwheel at a second rate for translating said transducer at a rate allowing high video frequencies to be transduced; a playback transducer arranged adjacent said tape path for transducing signals from the tape during recording by said recording transducer; and frequency-sensitive detection means coupled to said play-



back transducer for responding to recorded signals for producing a record-indicating signal; wherein the improvement comprises: signal generating means coupled to said recording transducer for recordation of a signal having a preselected frequency characteristic; and frequency-changing means coupled to said signal generating means and to said detection means for changing the frequency of the signal of said signal generating means and for applying the frequency-changed signal to said detection means.

4,413,289

## DIGITAL RECORDING AND PLAYBACK METHOD AND APPARATUS

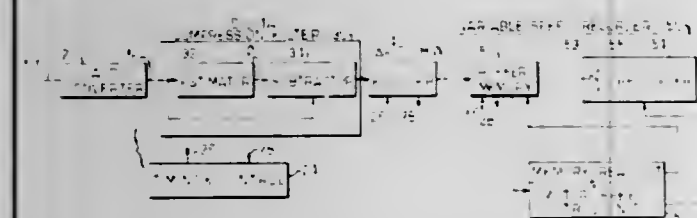
Charles S. Weaver, Palo Alto, and Joseph H. Chadwick, Menlo Park, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 13, 1981, Ser. No. 243,593

Int. Cl.<sup>3</sup> G11B 5/09, 5/00

U.S. Cl. 360—51

24 Claims



1. In a digital recording system for recording a bit stream in which bits occur at a varying bit rate on a recording medium with a high and substantially constant bit density, the combination comprising

buffer memory means for temporarily storing said bits to be recorded, variable speed recording means for recording bits from said buffer means on a recording medium, and means responsive to the number of bits contained in said buffer memory means for continuously controlling both the rate at which bits are read from said buffer memory means to said recording means and the speed of said recording means for recording said varying bit rate stream with a substantially constant high bit density on said recording medium.

4,413,290

## TAPE RECORDER WITH A VOICE SIGNAL RESPONSIVE CIRCUIT

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

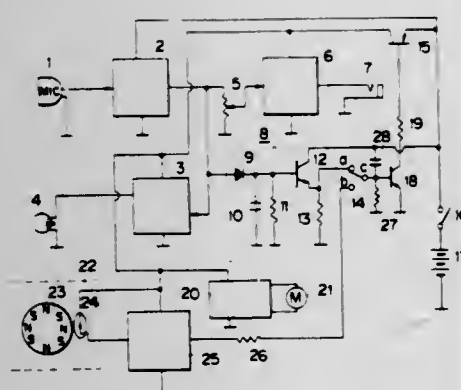
Continuation of Ser. No. 116,763, Jan. 30, 1980, abandoned. This application May 24, 1982, Ser. No. 381,466

Claims priority, application Japan, Feb. 2, 1979, 54-012542

Int. Cl.<sup>3</sup> G11B 15/02, 19/02

U.S. Cl. 360—69

7 Claims



1. A tape recorder for use with a power source comprising

a tape recorder circuit; a motor circuit; an on-off switch that connects or disconnects the power source; a semiconductive switching circuit arranged to be enabled but otherwise unactuated in response to the on-off switch; a sound actuating circuit responsive directly to the on-off switch and, on the basis of sound input received, actuates and deactuates the motor circuit and starts and stops the recorder circuit; an auto-off circuit arranged to be enabled in response to both said on-off switch and said switching circuit being on for detecting tape travelling to its end and for producing a stop signal to stop the operation of the recorder circuit and motor circuit; and a switching arrangement that serves to actuate the semiconductive switching circuit in response to one of the sound actuating circuit and the auto-off circuit so that either said sound actuating circuit can turn the switching circuit on and off or said auto-off circuit can turn the switching circuit off.

4,413,291

## CASSETTE TAPE PLAYER-RECORDER

Yoshiharu Ueki, and Shouzaburo Sakaguchi, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

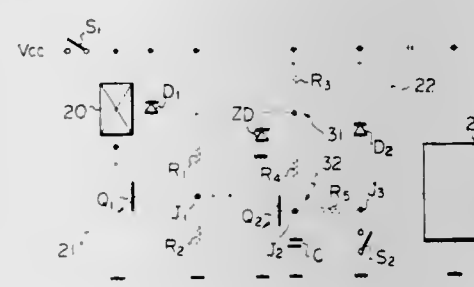
Filed Sep. 28, 1981, Ser. No. 306,399

Claims priority, application Japan, Sep. 29, 1980, 55-135617

Int. Cl.<sup>3</sup> G11B 15/00

U.S. Cl. 360—71

4 Claims



1. In a cassette tape player-recorder of slot-in type which includes a cassette receiving tunnel opened through a cassette insertion slot to the outside, a carriage movable in said tunnel for carrying a cassette inserted into said tunnel through said cassette insertion slot, a carriage control mechanism connected to said carriage for actuating said carriage so as to position said cassette at an operable or inoperable position, a tape advancing mechanism for advancing a recording tape contained in said cassette when said cassette is placed at said operable position, a head positioning mechanism for positioning a magnetic head relative to said recording tape, and a controller for controlling said tape advancing and head positioning mechanisms so as to perform predetermined modes of operation, the improvement comprises:

first detecting means placed within said cassette receiving tunnel, for detecting the insertion of a cassette into said tunnel; second detecting means for detecting that said cassette is placed at said operable position; a reset signal generator connected to said first and second detecting means, for producing a reset signal when a time longer than a predetermined period lapses from the insertion of said cassette into said tunnel until said cassette is positioned at said operable position; a cassette eject controller connected to said carriage control mechanism for ejecting said cassette in response to said reset signal.

4,413,292

## ROTARY RECORDING MEDIUM REPRODUCING APPARATUS CAPABLE OF PERFORMING AUTOMATIC SEARCH REPRODUCTION

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryuzo Abe, both of Yokohama; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

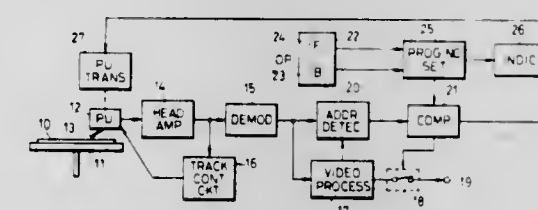
Filed Jul. 28, 1981, Ser. No. 287,823

Claims priority, application Japan, Jul. 29, 1980, 55-103998

Int. Cl.<sup>3</sup> G11B 17/00, 27/28

U.S. Cl. 360—72.2

5 Claims



1. An apparatus for reproducing a rotary recording medium in which an information signal comprising a plurality of programs and an address signal for identifying each program by a number are recorded, said reproducing apparatus comprising: reproducing means for reproducing said information signal and said address signal from said rotary recording medium; detection means responsive to said reproducing means for detecting said address signal from signals reproduced by said reproducing means; setting means for setting a program number of a program which is to be reproduced after an automatic searching operation; transferring means for transferring said reproducing means in forward and backward directions across said rotary recording medium; and comparing means responsive jointly to said reproducing means and said setting means for comparing the program number set in said setting means with an address of a program of the information signal being reproduced by said reproducing means, and for producing and supplying a search signal to said transferring means so that said reproducing means is transferred in a direction which makes the program and address coincide, said comparing means producing a signal to initiate a reproduction of a predetermined mode from the beginning of the program identified by the program number set in said setting means when the program number coincides with the address, said setting means having a first manipulation part for setting a program number of the program being reproduced when operated once and setting a program number of a previous program which is (N-1)-programs before the program being reproduced when operated N-times, where N is an integer which is greater than or equal to two, a second manipulation part for setting a program number of a program which is M-programs after the program being reproduced when operated M-times, where M is an integer, and means for memorizing the program numbers which are set by said first and second manipulation parts.

4,413,293

## MAGNETIC TAPE TRANSPORT

Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 17, 1981, Ser. No. 255,127

Int. Cl.<sup>3</sup> G11B 5/08, 5/10, 15/00

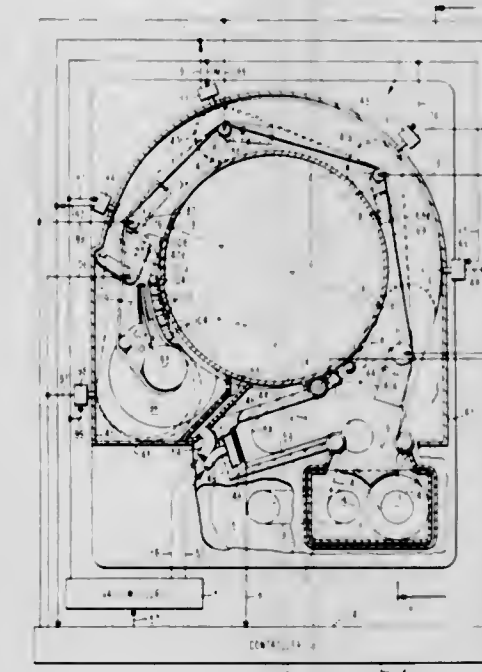
U.S. Cl. 360—85

12 Claims

1. A magnetic tape transport for the automatic threading and replay of cassette-mounted tapes produced upon a recorder having a first-speed rotating head and guide assembly around which the tape is helically wrapped in a substantially 360-

degree omega path, said replay transport being characterized in that:

a two-headed rotating head and guide drum assembly is provided having substantially twice the diameter of said first-speed assembly; means are provided for driving the two-headed assembly at substantially half the rotational speed of said first-speed assembly; means are provided for mounting said cassette adjacent to said two-headed assembly; threading means are provided for pulling a loop of tape from said mounted cassette and for extending said loop in a threading path to form a helical wrap around a substantially 180-degree sector of said two-headed drum; and means are provided to be operable at a predetermined length of said loop to ensure separation of the opposite shanks of said loop during a threading mode of the transport, and to



become inoperable for such separation during a de-threading mode of the transport;

said shank separating means including a plurality of retractable guides each having a retracted position remote from said threading path of said loop, and an operating position on said path and between the shanks of said loop; said guides being positioned along said loop-threading path in spaced relation such that in said operating positions thereof the radially outer shank of tape from guide to guide, during the operating mode, is spaced at all points away from the guide drum and from the radially inner shank in contact with the drum; and said shank separating means also includes means for causing each of said guides to move from retracted to operating position sequentially as said tape loop passes the guide during the threading mode, but also causing all of said guides to retract simultaneously at the beginning stage of said de-threading mode.

4,413,294

## MECHANISM FOR CONTROLLING THE DISPLACEMENT OF A POSITIONER CONE RELATIVE TO A FLOPPY DISC

Gene Beljer, Los Angeles, Calif., assignor to Magnum Division of Tandon Corporation, Chatsworth, Calif.

Filed May 4, 1981, Ser. No. 259,914

Int. Cl.<sup>3</sup> G11B 5/016, 17/02, 25/04

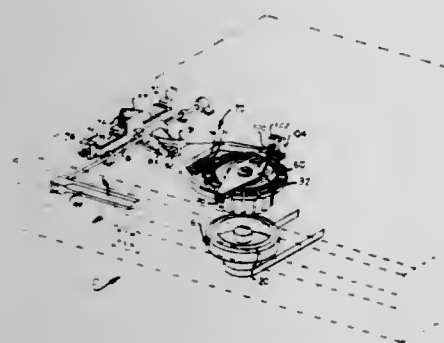
U.S. Cl. 360—99

15 Claims

1. A mechanism for controlling the lowering and clamping of a positioner cone device onto a floppy disc and associated spindle, comprising: a pivotable assembly having a free end coupled to support



the positioner cone device in pivotable relationship relative to an axis perpendicular to the direction of lowering; guide means coupled to the positioner cone device for controlling the attitude of the device relative to the pivot axis during lowering; and



means including overtravel means engaging the pivotable assembly and spring means coupled to the pivotable assembly for shifting the pivotable assembly when lowered against the floppy disc to act against the spring force and effect spring clamping of the positioner cone device against the floppy disc and spindle.

4,413,295

## MAGNETIC HEAD

Hiroaki Kato, Machida; Junji Hamana, Chichibu; Akeo Sakai, Yokoze; Yoshio Kawakami, Chichibu; Atsushi Goto, Hanno; Saichiro Amano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of Japan

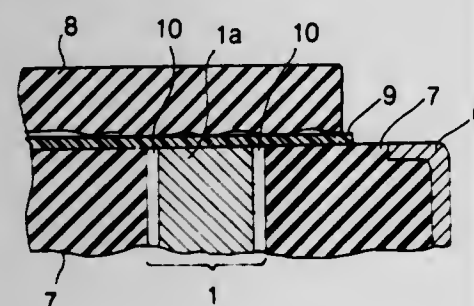
Continuation of Ser. No. 230,107, Jan. 29, 1981, Pat. No. 4,468,496, which is a continuation of Ser. No. 14,849, Feb. 26, 1979, abandoned. This application Apr. 28, 1982, Ser. No. 372,556

Claims priority, application Japan, Mar. 1, 1978, 53-23221; Mar. 7, 1978, 53-25611; Jan. 23, 1979, 54-7321

Int. Cl.<sup>3</sup> G11B 3/08, 5/08

U.S. Cl. 360—110

6 Claims



1. A magnetic head, comprising:

a head core including a plurality of core halves joined to each other, each of said core halves comprising at least one thin plate of predetermined thickness composed of a high-magnetic permeability material and at least two adhesive layers adhered to and solidified on opposing surfaces of said plate, said adhesive layers being composed of an electrically insulative resin and fine inorganic granular particles of a material harder than said high magnetic permeability material, said particles being added to said resin in an amount of from 20 to 70 percent by weight of said resin such that said adhesive layers have a higher degree of abrasion resistance than said plate, the thickness of said adhesive layers being in a range of from one-hundredth to one-thirtieth said predetermined thickness of said plate;

a coil wound on said head core;

a case enclosing said head core and coil; and

a fixing material for enclosing said head core and said coil

within said case, said fixing material comprising a second resin mixed and solidified with a powder chosen from the group consisting of powdered SiO<sub>2</sub> and powdered alumina and said fixing material having a degree of hardness intermediate the relatively low degree of hardness of said high-magnetic permeability material and the relatively high degree of hardness of said adhesive layers, such that the hardness of the fixing material approximates the average hardness of the plate and adhesive layers in composite and such that said plate, said adhesive layers and said fixing material all abrade at a substantially uniform rate, whereby degradation of performance due to uneven abrasion of said plate, said layers, and said fixing material is mitigated.

4,413,296

## THIN FILM MAGNETORESISTIVE HEAD

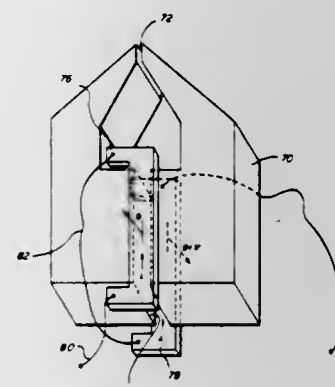
Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 57,619, Jul. 16, 1979, Pat. No. 4,306,215, which is a continuation-in-part of Ser. No. 23,433, Mar. 23, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,186

Int. Cl.<sup>3</sup> G11B 5/30

U.S. Cl. 360—113

3 Claims



1. A magnetic head comprising:

(a) first and second pole pieces disposed with respect to each other so as to form front and back non-magnetic gaps therebetween, said front gap being a transducer gap disposed to coact with a magnetic recording medium,

(b) first and second electrically conductive thin single domain magnetic film means secured to opposing sides of said pole pieces at said back gap, said thin magnetic film means being so disposed with respect to said pole pieces and said back gap that flux bridges said back gap via said thin magnetic film means,

(c) said first thin magnetic film means having first and second electrical contacts respectively for receiving and exiting electrical current therein, the easy axis of said first thin magnetic film means being canted relative to the current flow path between said first and second contacts, and

(d) said second thin magnetic film means having first and second electrical contacts respectively for receiving and exiting electrical current therein, the easy axis of said second thin magnetic film means being (1) canted relative to the current flow path between the first and second contacts of said second thin magnetic film means, and (2), substantially parallel to the easy axis direction of said first thin magnetic film means,

the current path in said second thin magnetic film means being parallel to the current path in said first thin magnetic film means, whereby flux entering the front gap of said head causes the magnetoresistances of said thin magnetic film means to vary inversely.

4,413,297

## MAGNETIC RECORDING AND PLAYBACK APPARATUS OF PERPENDICULAR RECORDING TYPE

Motoharu Tanaka, Numazu; Hazime Machida, Tokyo, and Hiroshi Kobayashi, Kodaira, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

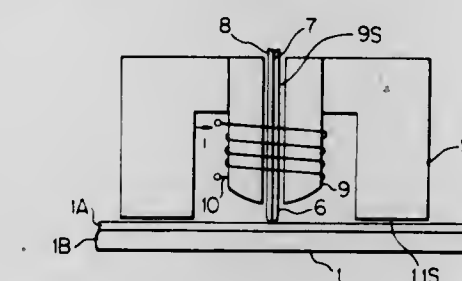
Filed May 22, 1981, Ser. No. 266,330

Claims priority, application Japan, May 23, 1980, 55-68527

Int. Cl.<sup>3</sup> G11B 5/30

U.S. Cl. 360—119

20 Claims



1. A magnetic recording and playback apparatus adapted to record information in a recording surface of a magnetic record medium in a perpendicular orientation thereto; the apparatus comprising a main pole having a magnetic axis adapted to be disposed normal to a recording surface of the record medium, an auxiliary pole disposed in surrounding relationship with the main pole and having a small clearance from the lateral side thereof, a coil disposed around the auxiliary pole for recording information into the record medium and for detecting a change in a magnetic flux produced in the record medium, and a yoke having its one portion connected to the auxiliary pole and another portion of a relatively large area disposed opposite to a recording surface of the record medium, an end of the main pole being disposed in contact with the surface of the record medium while the yoke being disposed at a given distance from the surface of the record medium.

4,413,298

## DISKETTE JACKET

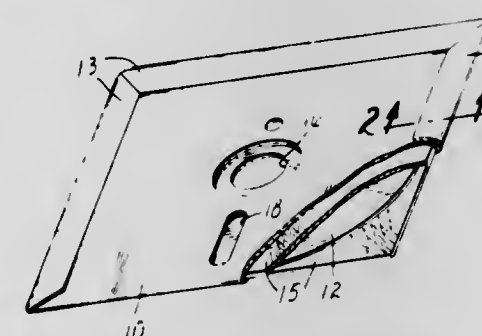
Roger L. Pecaok, Cottage Grove; Ray G. McCrea, Jr., Stillwater, and Craig F. Lamphere, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 5, 1981, Ser. No. 260,709

Int. Cl.<sup>3</sup> G11B 23/02

U.S. Cl. 360—133

8 Claims



1. An opaque diskette jacket comprising biaxially-oriented polyester film containing discrete, uniformly-distributed polymeric particles having an average diameter of 5 to 100 micrometers and comprising 5 to 30% by volume of the polyester film to provide a matte finish, an adhesive layer covering the inner face of the film, and a wiping fabric bonded by the adhesive layer to the inner face of the film.

4,413,299

## STATE INDICATING DEVICE IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryuzo Abe, both of Yokohama; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

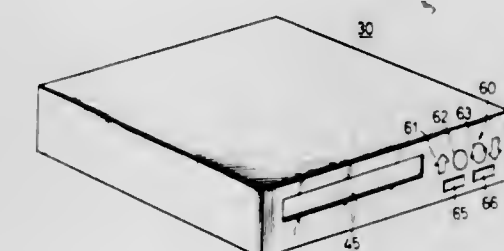
Filed Jul. 29, 1981, Ser. No. 287,986

Claims priority, application Japan, Jul. 29, 1980, 55-107290[U]

Int. Cl.<sup>3</sup> G11B 5/82, 19/10

U.S. Cl. 360—137

5 Claims



1. A state indicating device in an apparatus for reproducing a rotary recording medium having recorded signals, said medium being accommodated within a space in a case, a jacket having an opening through which said rotary recording medium can enter or leave, and a lid plate inserted through the opening of said jacket to close said opening, said reproducing apparatus having an inserting opening through which said case is inserted, a turntable for rotating said rotary recording medium, lid plate locking means and rotary recording medium clamping means respectively provided at the innermost part of said reproducing apparatus opposite to said inserting opening with respect to said turntable, lowering and raising means for lowering and raising said rotary recording medium between a position clamped by said clamping means and a position on said turntable, reproducing means for reproducing recorded signals from said rotary recording medium, and transferring means for transferring said reproducing means over said rotary recording medium, said state indicating device comprising:

first display means for indicating a state when it is possible to insert said case into said reproducing apparatus;

second display means for indicating a reproduction stand-by state in which said rotary recording medium is placed onto said turntable within said reproducing apparatus;

third display means for indicating a reproducing state in which said rotary recording medium is being reproduced by said reproducing means;

fourth display means for indicating a state when it is possible to recover said rotary recording medium from outside of said reproducing apparatus, said recovery being accomplished by inserting an empty jacket into said reproducing apparatus to accommodate said rotary recording medium within said jacket; and

detecting and driving means for detecting the states of said reproducing apparatus and for selectively driving the displays of said first through fourth display means,

said detecting and driving means having a first switch for detecting that said lid plate is at a position in which it may be locked by said lid plate locking means, a second switch for detecting that said case or said jacket has been inserted into said inserting opening, a third switch for detecting the position of said reproducing means, a fourth switch for detecting the operational state of said lowering and raising means, and a circuit for detecting the state of said reproducing apparatus according to the detection state of said first, second, third, and fourth switch, to produce and supply a display signal to one of said first through fourth display means.



4,413,300

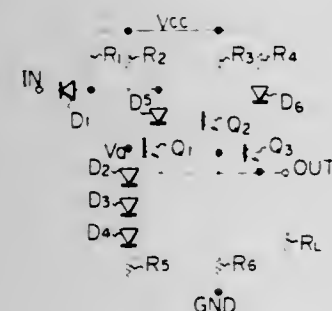
## LINE DRIVER CIRCUIT HAVING A PROTECTIVE CIRCUIT AGAINST EXCESS CURRENTS

Hideji Sumi, Yokohama, and Masayuki Kokado, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan  
Filed Oct. 13, 1981, Ser. No. 310,974

Claims priority, application Japan, Oct. 13, 1980, 55-142603  
Int. Cl.<sup>3</sup> H02H 3/08

U.S. Cl. 361—98

13 Claims



1. A line driver circuit having a protective circuit against excess currents, comprising:  
an output port;  
an emitter-follower circuit having an output connected to said output port and provided in an output stage of said line driver circuit;  
protective means, including a protective transistor having a base, for limiting the output current of said emitter-follower circuit;  
detecting means for detecting the output current of said emitter-follower circuit; and  
pull-up means, including a pull-up transistor which is turned on when the voltage detected by said detecting means exceeds a first predetermined value, that is, when a potential at said output port is lowered to a level lower than a second predetermined value, for pulling up the base potential of said protective transistor to turn on said protective transistor, the base potential of said protective transistor being pulled up until the potential at said output port exceeds said second predetermined value.

4,413,301

## CIRCUIT PROTECTION DEVICES COMPRISING PTC ELEMENT

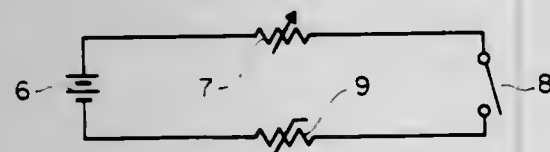
Lee M. Middleman, Portola Valley, and Frank Doljack, Pleasanton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 21, 1980, Ser. No. 141,987

Int. Cl.<sup>3</sup> H02H 5/04, 7/20

U.S. Cl. 361—106

24 Claims



1. An electrical circuit which comprises  
(1) a source of electrical power having a voltage of V volts;  
(2) a circuit protection device comprising at least two electrodes and a PTC element which has a switching temperature  $T_s$  and which comprises a polymer component and, dispersed in said polymer component, a particulate filler component which comprises a conductive filler, each of said electrodes being in the form of a wire or strip which is at least partially embedded in the PTC element so that it has an electrically active surface of generally columnar shape; and  
(3) a damageable circuit component which is damaged if the

current flowing through it exceeds a value  $i_{damage}$  amps for a time t seconds, where t is 30;  
said electrical circuit having a normal operating condition in which said device is in a low temperature low resistance stable operating condition and

- (A) a current  $i_n$  flows through said device;
- (B) said device is at a temperature  $T_{dn}$  and has a resistance  $R_{dn}$ ;
- (C) said device is in contact with a medium which is at a temperature  $T_n$ ;
- (D) a current less than  $i_{damage}$  flows through said damageable circuit component; and
- (E) there is a stable equilibrium between the rate at which the device generates heat by  $I^2R$  heating and the rate at which heat is lost from the device;

said device having an electrical power/temperature relationship and being capable of losing heat at a rate such that if new electrical elements comprising a new power source and a switch are introduced into the circuit or a part of the circuit so that a fault test circuit is created in which, when said switch is closed a test cycle is initiated and,

- (a) there is an initial fault current flowing through said damageable circuit component which exceeds  $i_{damage}$ ;
- (b) there is an initial fault current flowing through said device which results in a computed current density in the PTC element in the first of the test cycles defined below which reaches a maximum of 1000 amps/inch<sup>2</sup>;
- (c) said device and said damageable circuit component are in series; and
- (d) the sum of the initial potential drop over said device and the initial potential drop over said damageable circuit component is  $V_{int}$ , where  $V_{int}$  is at least 120 volts and at least  $1.5 \times V$ ;

then if the fault test circuit is subjected to N successive test cycles, where N is 5, in each of which test cycles the switch is closed for 5 seconds, the switch is then opened and the device is allowed to cool to  $T_{dn}$  before the next test cycle is carried out, then in each of said test cycles, the result of closing the switch is that the device generates heat by  $I^2R$  heating at a rate which exceeds the rate at which heat can be lost from the device, thus causing the resistance of the device to rise rapidly and the current to fall, and thereafter the current through the damageable circuit component reaches a stable value which is less than  $i_{damage}$ , the potential drop over the device reaches a stable value which is the higher of 150 volts and  $1.5 \times V$ , and the device reaches a high temperature high resistance stable operating condition in which the rate at which the device generates heat by  $I^2R$  heating is equal to the rate at which heat is lost from the device; and after said test cycles have been completed, the device has a resistance at  $T_{dn}$  which is less than  $3 \times R_{dn}$ .

4,413,302

## STRUCTURAL MEMBER MADE FROM A METALLIC MATERIAL HAVING AN UPPER SURFACE EXPOSED TO THE DANGER OF ELECTRIC CHARGE BUILDING-UP THEREON AND THE USE OF SUCH STRUCTURAL MEMBER

Uwe Maixner, Barum, and Dieter Milferstaedt, Tespe-Buettlingen, both of Fed. Rep. of Germany, assignors to Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schifffahrt GmbH, Tesperbude, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,693

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831791

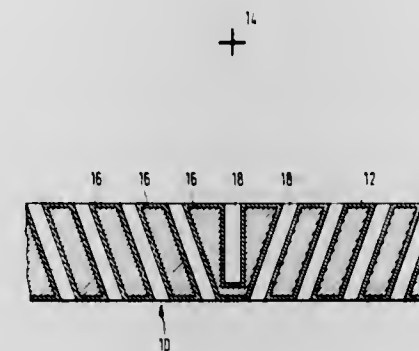
Int. Cl.<sup>3</sup> H01J 43/28

U.S. Cl. 361—212

6 Claims

1. In an electrical apparatus, a structural member having a surface made from an electrically conductive metallic material, said surface being prone to undesired accumulation of electrical charges which degrade the performance of the apparatus, said surface being exposed to a vacuum environment during

operation of the apparatus, said surface comprising a layer selected from the group consisting of titanium silicide and



zirconium nitride, said layer being in intimate and direct electrical contact with the metallic material of said surface.

4,413,303

## IGNITION SYSTEMS

Clifford M. Cheary, Boldmere; David J. Lancaster, Tamworth, and Paul P. Smith, Lichfield, all of England, assignors to Dunlop Limited, London, England

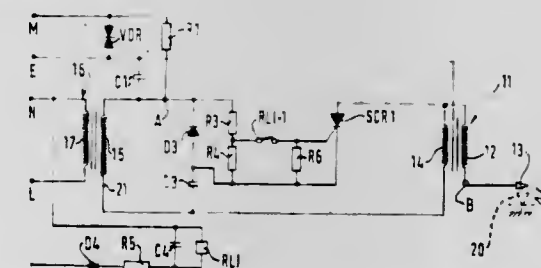
Filed Jun. 23, 1981, Ser. No. 276,539

Claims priority, application United Kingdom, Jul. 5, 1980, 8022109

Int. Cl.<sup>3</sup> F23Q 3/00

U.S. Cl. 361—253

7 Claims



1. An electrical ignition system for a burner comprising a spark generation circuit, means for monitoring the production of a spark comprising a capacitor, means for charging said capacitor in one sense by operation of the spark generation circuit, means for monitoring the presence of a flame at a first location comprising means responsive to the flame for producing a charge on said capacitor in the opposite sense to that produced by operation of the spark generation circuit, and means for detecting the presence and polarity of a charge on said capacitor to detect that sparks have been produced and that said flame has been produced.

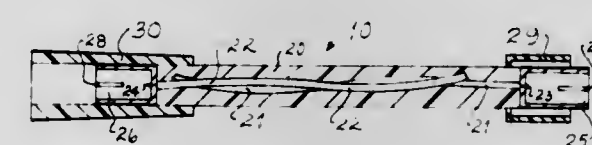
4,413,304

ELECTROMAGNETIC FIELD COMPENSATED CABLE  
Martin E. Gerry, 13452 Winthrop St., Santa Ana, Calif. 92705  
Continuation-in-part of Ser. No. 345,939, Feb. 3, 1982, and Ser. No. 282,755, Jul. 13, 1981. This application May 20, 1982, Ser. No. 380,476

Int. Cl.<sup>3</sup> F23Q 3/00; H01Q 1/52

U.S. Cl. 361—253

13 Claims



1. An electromagnetic field compensated cable, comprising the combination of:  
an electrically insulating casing; and  
means, within said casing and integral with said cable, for effecting cancellation of field components generated by

current flow in said cable, said means constituting a twisted pair of electrically insulated wires, said twisted pair having first and second ends, one of said twisted pair being electrically terminated at said first end and under-terminated at said second end, the other of said twisted pair being electrically terminated at said second end and under-terminated at said first end.

4,413,305

## TERMINAL FOR A CAPACITOR AND A METHOD OF FORMING SAME

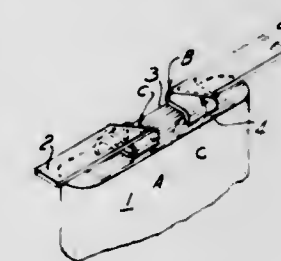
Cecil W. FitzGerald, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 21, 1982, Ser. No. 390,165

Int. Cl.<sup>3</sup> H01G 1/14; H01R 3/00

U.S. Cl. 361—306

8 Claims



1. In combination with a capacitor of the type having a plurality of layers of foil and insulation wound to form a capacitor and at least one electrically conductive strip projecting beyond an edge of the layers of foil to provide a connecting terminal to an electrical conductor, the improvement wherein said terminal further comprises:  
a first fold in said strip in the direction of one of said outside surfaces of said capacitor;  
a second fold in said strip in a direction toward another portion of the outside surface of said capacitor; and  
a third fold at an oblique angle to an edge of said strip.

4,413,306

## TAMPER PREVENTION HOUSING FOR A WATT-HOUR METER AND OVERLOAD PROTECTED SWITCH

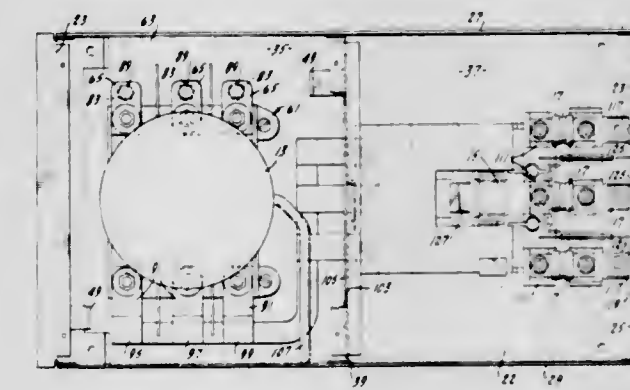
Reuben A. Erickson, Park Ridge, Ill., assignor to Erickson Electrical Equipment Company, Park Ridge, Ill.

Continuation of Ser. No. 401,848, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 314,687, Oct. 26, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,749

Int. Cl.<sup>3</sup> H02B 9/00

U.S. Cl. 361—361

4 Claims



1. A tamper prevention housing assembly mounted on a standard polyphase panelboard chassis which contains at least three rigid bus bars extending the length of the panelboard chassis and approximately symmetrically spaced across the width of the chassis and occupying substantially all of the width of the chassis, the housing assembly being adapted to



enclose a polyphase watt-hour meter and overload protected polyphase switch means arranged in a secure sequence between the bus bars of the panelboard chassis and the terminal lugs for the output load, in which the housing assembly does not extend substantially beyond the lateral confines of the panelboard chassis, the housing assembly including:

- a rectangular housing having back, side and end walls, the housing being mounted on the panelboard chassis with its back to the chassis,
- a security partition extending between two opposed walls of the housing to divide the housing into a meter compartment and a switch compartment,
- a polyphase meter socket installed in the meter compartment in asymmetrical alignment relative to the bus bars,
- an overload protected polyphase switch means installed in the switch compartment,
- a first set of rigid connectors, one for each bus bar, individually electrically connecting the bus bars of the chassis to the meter socket,
- each connector of the first set having a different length to connect the bus bars to the meter socket in proper phase relation in its asymmetrical position relative to the bus bars,
- a second set of connectors, extending through the first security partition and individually electrically connecting each phase from the meter socket to the switch means,
- a removable panel closing the front of the meter compartment and having at least one opening for exposing a meter to view, the removable panel having means to permit securing it in a compartment-closing position against unauthorized displacement or removal,
- a hinged door mounted on the front of the switch compartment, and
- at least one opening formed in a side wall of the switch compartment to afford access for load connections to the switch means.

4,413,307

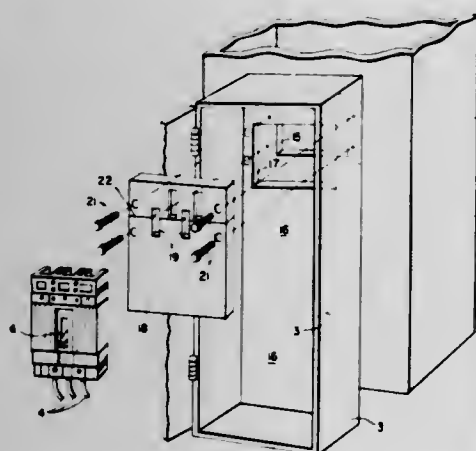
#### BUS BAR EXTENSIONS TO OUTSIDE OF BUSWAY FOR EXTERNAL CONNECTIONS

Joseph A. Butte, 79 Monte Vista Ave., Watsonville, Calif. 95076; Robert C. Foehn, 139 Lincoln Ave., Sausalito, Calif. 94965, and Conrad C. Grieder, 423 Tehema St., San Francisco, Calif. 94103

Filed Jul. 9, 1981, Ser. No. 281,583  
Int. Cl.<sup>3</sup> H02B 1/20

U.S. Cl. 361—378

5 Claims



1. In combination with a busway in a building and a plurality of bus bars within and along the height of the busway, local circuits on spaced floors of said buildings, and a hole through a side of said busway at each local circuit, a feeder connection between each local circuit and said busses comprising: a local circuit breaker box at each hole, the wall of each side box adjacent said busway having a hole

substantially corresponding to one of the holes in the side of the busway, a circuit breaker in one of said box, each said feeder connection comprising connecting lugs having one end welded to each of said bus bars thus becoming an integral part thereof, the opposite end of said of said lugs protruding through said busway into each said box through said holes and disposed for connection to said circuit breakers inside said box.

4,413,308

#### PRINTED WIRING BOARD CONSTRUCTION

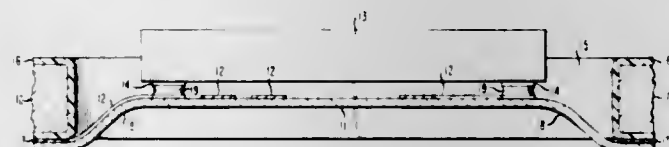
Vernon L. Brown, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1981, Ser. No. 297,862

Int. Cl.<sup>3</sup> H05K 1/14

U.S. Cl. 361—398

17 Claims



1. A printed wiring board construction comprising an electrical component having a pattern of electrical terminals thereon, a supporting substrate having a planar surface having a recess therein for each of said terminals and corresponding in position to the positions of said terminals in said pattern of terminals, and a flexible sheet carrying printed wiring affixed to said planar surface extending over said recess for each of said terminals, said sheet extending beneath the plane of said surface at said positions of said terminals, said terminals being electrically connected to said printed wiring within said recess for each of said terminals.

4,413,309

#### PRINTED CIRCUIT BOARD

Toshio Takahashi, Tokyo, and Mitsuo Ohsawa, Chigasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

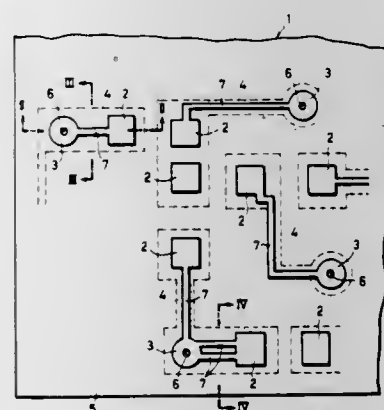
Filed Jul. 8, 1981, Ser. No. 281,422

Claims priority, application Japan, Jul. 17, 1980, 55/101141[U]

Int. Cl.<sup>3</sup> H05K 1/02

U.S. Cl. 361—406

4 Claims



1. A printed circuit board for mounting circuit elements to form an electric circuit thereon, said circuit board comprising: a substrate, a land covering at least part of said substrate, a first land portion without piercing hole for connecting with an electrode of a leadless component; a second land portion with a piercing hole for connecting with the lead wire of an element with leads; and a solder resist pattern leaving an exposed third land portion connecting said similarly exposed first and second land portions for leading melted solder therebetween.

4,413,310

#### LIGHT ASSEMBLY FOR A SEWING MACHINE

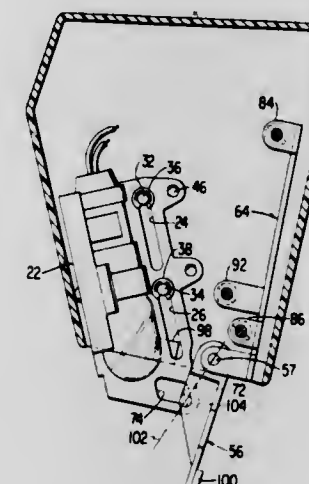
Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 16, 1982, Ser. No. 408,383

Int. Cl.<sup>3</sup> D05B 79/00

U.S. Cl. 362—90

9 Claims



1. In the head end portion of a sewing machine extending over a work supporting bed, a slidable member, a light bulb in a socket which is affixed on the slidable member, and a light transmitting bulb cover at the bottom end of the head end portion of the machine operably connected to said member for moving the member between an elevated position in which the bulb and socket are protected by surrounding structure of the head end portion of the machine and by the bulb cover in a station underlying the bulb, and a lowered position in which the bulb is rendered accessible under the head end portion of the machine for removal and replacement while the socket remains within the head end portion of the machine protected by the surrounding structure.

4,413,311

#### CONNECTION SYSTEM FOR JOINING ILLUMINATED MODULES

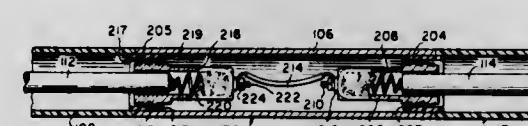
Phillip Orenstein, 34-42 12 St., Long Island, N.Y. 11106

Filed Sep. 1, 1981, Ser. No. 298,303

Int. Cl.<sup>3</sup> F21S 3/00

U.S. Cl. 362—219

4 Claims



1. A connection system for mechanically and electrically joining a plurality of illuminated modules into a decorative lighting display; such system including:
  - (a) a plurality of light impervious rigid connectors with hollow tubular bodies,
  - (b) each module comprising:
    - (I) a rigid transparent plastic sleeve,
    - (II) a neon gas filled tube that extends axially through said plastic sleeve,
    - (III) end caps secured to opposite ends of said plastic sleeve for receiving and retaining the neon filled tube in fixed position,
    - (IV) electrically conductive members located on said end caps for delivering electrical energy to the neon gas to ignite same, and
    - (V) means for retaining the end caps in position,
  - (c) each connector securely receiving an end cap of at least one module therewithin,

- (d) electrical leads extending between end caps of adjacent modules,
- (e) a source of high voltage power for supplying the electrical leads with sufficient voltage to excite the neon filled tubes and cause decorative, low intensity light to radiate outwardly in all directions through said transparent sleeves, and
- (f) said leads being disposed entirely within the hollow tubular bodies of the light impervious connectors, whereby said leads are completely hidden from view.

4,413,312

#### PORTABLE, HANGABLE LAMP WITH OUTLETS

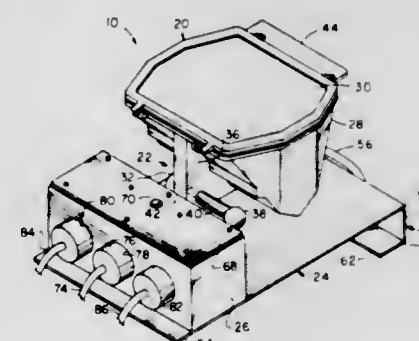
Charles E. Morkosky, Sr., and Charles E. Morkosky, II, both of 809 Philadelphia Rd., Joppa, Md. 21085

Filed May 21, 1982, Ser. No. 380,546

Int. Cl.<sup>3</sup> F21V 21/26

U.S. Cl. 362—269

6 Claims



1. In a system of high intensity reflector-equipped lamp, base, current input means, current output means, and hanging means, the improvement comprising: means for manually adjusting the angle of the high-intensity reflector-equipped lamp relative to said base, means for preventing burning of the hands during said manual adjusting, said hanging means including means for hanging the system on doors and the like free of twisting when hung; the current output means including a junction box; the means for manually adjusting including: a pivotal connection mounting the high intensity reflector-equipped lamp to the junction box and means for clamping said pivotal connection; the means for preventing burning comprising: a thermally insulative strip on said reflector located for gripping during said manual adjusting, a handle on said base thermally remote from the high-intensity reflector-equipped lamp and located for gripping during said manual adjusting, and said means for clamping having an operative end with a standoff, the standoff locating the operative end away from said high intensity reflector-equipped lamp.

4,413,313

#### ELECTRICAL INVERTERS

Jeffrey I. Robinson, Bedfordshire, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 307,351, Sep. 30, 1981. This application Jul. 16, 1982, Ser. No. 399,106

Claims priority, application United Kingdom, Oct. 7, 1980, 8032309

Int. Cl.<sup>3</sup> H02P 13/00

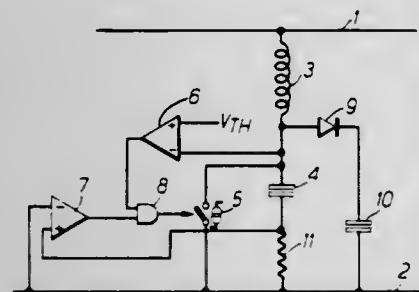
U.S. Cl. 363—80

13 Claims

1. An inverter for converting a d.c. electrical supply into an a.c. electrical supply, including:
  - (i) resonant circuit means for storing electrical energy and for generating sinusoidal electrical oscillations;
  - (ii) current-limiting switch means capable of being enabled and disabled and when enabled for conducting current up to a set limit and holding the current at the set limit for effecting charging of the resonant circuit with electrical energy from a d.c. electrical supply up to the set current limit;



(iii) control circuit means for monitoring the voltage across the switch means to enable the switch means to charge the resonant circuit periodically in synchronism with and to reinforce oscillations in the resonant circuit only while said voltage lies between first and second limits and is changing in a predetermined sense and to disable the



switch means to stop charging of the resonant circuit when said voltage reaches said second limit consequent to current flow being held at said set limit by said switch means; and  
(iv) output circuit means coupled to the resonant circuit for transferring alternating electrical energy to a load circuit when coupled to the output circuit means.

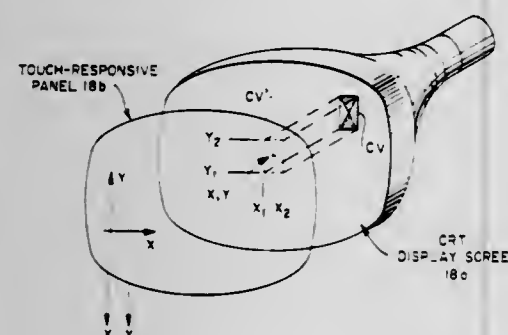
4,413,314

## INDUSTRIAL PROCESS CONTROL SYSTEM

Billy R. Slater, Plano; Dennis W. Simpson, Carrollton, both of Tex., and Clarence T. Carroll, Middletown, N.J., assignors to Forney Engineering Company, Addison, Tex.  
Division of Ser. No. 159,599, Jun. 16, 1980. This application Apr. 20, 1981, Ser. No. 255,842  
Int. Cl.<sup>3</sup> G06F 15/46, 3/153

U.S. Cl. 364-188

6 Claims



1. A control system for controlling an industrial process, said system comprising:

a plurality of controlled devices and associated device controllers for effecting control of process parameters, said controlled devices and associated device controllers interconnected through a communications link means to a control interface, said interface including a visual display means having a visual display surface associated therewith and means for generating symbols displayed simultaneously thereon representative of different process parameters of the system, said symbols each having a displayed analog characteristic representing the value of an associated process parameter;

a touch-responsive means overlying said display surface and through which said symbols are visible;

means for detecting the touching of selected target areas on said touch-responsive means corresponding to said displayed symbols, said target areas including a first area located at each symbol for incrementing the associated parameter and a second area located at each symbol separate from said first area for decrementing the associated parameter; and

means for generating a signal in response to the touching of

said first area and another signal in response to the touching of said second area, said first signal effective to increment the associated process parameter and the second signal effective to decrement the associated process parameter, the change in said process parameter causing a change in the analog characteristic of the corresponding displayed symbol on said visual display surface.

4,413,315

## ADDRESSING SYSTEM

Mitsuo Kurakake, Kokubunji, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

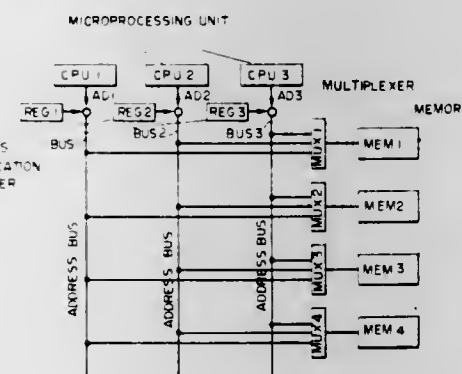
Filed Feb. 4, 1980, Ser. No. 117,992

Claims priority, application Japan, Feb. 5, 1979, 54-12067

Int. Cl.<sup>3</sup> G06F 9/36

U.S. Cl. 364-200

8 Claims



1. An addressing system for a computer system having a plurality of processing units operatively connected to corresponding address buses and a plurality of memories, connectable to any of the address buses, for receiving a series of addresses, comprising:

a plurality of address modification registers, one for each of said plurality of processing units; and

a plurality of adders, each of which is operatively connected to a corresponding one of said plurality of address modification registers and operatively connected between one of said plurality of processing units and the corresponding one of said address buses, each of said plurality of processing units providing an address output within a range of address outputs beginning with a leading address, each of said plurality of processing units being capable of providing, as said address output, said leading address, each of said plurality of adders adding together the address output from the one of said plurality of processing units, to which it is operatively connected, and the content of the one of said plurality of address modification registers, to which it is operatively connected, and providing the added output to the one of said address buses corresponding to the one of said plurality of processing units.

4,413,316

## DATA PROCESSING SYSTEM FOR PRE-PLANNING THE FLIGHT OF AN AIRCRAFT

William Blue, Balerno; George I. C. Bruce, and Stephen E. Cowles, both of Edinburgh, all of Scotland, assignors to Feranti plc, Cheadle, England

Continuation of Ser. No. 31,670, Apr. 19, 1979, abandoned, which is a continuation of Ser. No. 878,796, Feb. 17, 1978, abandoned. This application Aug. 20, 1980, Ser. No. 179,809

Claims priority, application United Kingdom, Feb. 21, 1977, 7279/77

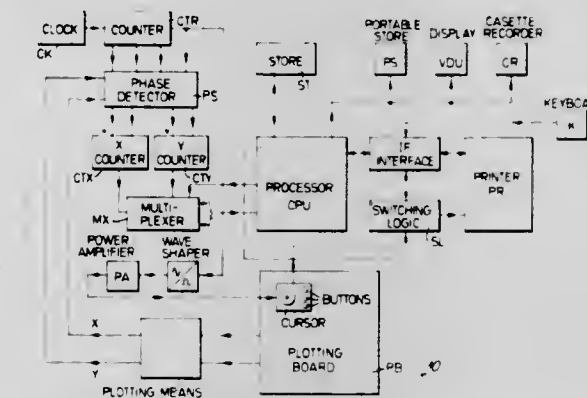
Int. Cl.<sup>3</sup> G06F 3/00, 3/12

U.S. Cl. 364-200

7 Claims

1. A data processing system for pre-planning the flight of an aircraft travelling along straight tracks between successive ones of a number of known selected turning points represented on a chart, which system includes

a plotting board having a surface for receiving the chart, said plotting board including means for determining relative digital position coordinates of each selected turning point on said surface with respect to one another and to output signals indicating the relative digital position coordinates of each of the selected turning points,  
input means for deriving further signals defining at least one known parameter from the group comprising ground speed, bank angle, initial fuel load, and fuel consumption rate,



calculating means responsive to the signals from the plotting means and to the further signals from the input means to calculate for each track between a pair of selected turning points at least one variable factor from the group comprising track heading, fuel remaining, expected time for the track between the pair of selected turning points and including means for calculating the expected total flight time using the individual expected time calculations arrived at for the plurality of tracks, and  
record means for providing a record of the parameters and the variable factors necessary to enable the aircraft to cover the planned route.

4,413,317

## MULTIPROCESSOR SYSTEM WITH CACHE/DISK SUBSYSTEM WITH STATUS ROUTING FOR PLURAL DISK DRIVES

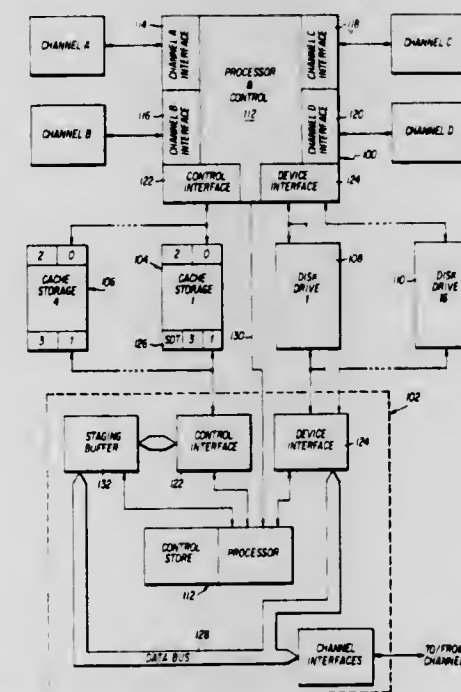
Robert E. Swenson, Mendota Heights, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,092

Int. Cl.<sup>3</sup> G06F 13/00, 13/04, 15/16

U.S. Cl. 364-200

11 Claims



1. A data processing system comprising:

a plurality of host processors for issuing host processor commands;  
a plurality of disk drive devices for driving data storage disks, each of said disk drive devices including means responsive to a seek signal for locating data on a disk and producing an interrupt signal;  
first and second storage control units connected to said disk drive devices;  
connecting paths extending between said storage control units and said host processors;  
means for storing a host processor identification table, said table containing values indicating the connection paths between said storage control units and said host processors;

each of said storage control units including,  
first means responsive to each host processor command for generating a host identification value specifying the host processor which issued the command, and storing said host identification value with said host processor command;

second means for accessing a stored host processor command and issuing a seek signal to a given one of said disk drive devices;

third means responsive to said first means and an interrupt signal from said given one of said disk drive devices for accessing said host processor identification table to read therefrom a value which defines a connection path between the storage control unit which responds to said interrupt signal and the host processor which issued said given host processor command;

fourth means for generating a status indication; and,  
fifth means responsive to said third means and said fourth means for applying said status indication over said defined connection path to the host processor which issued said given command.

4,413,318

## USE OF NODES TO UNIQUELY IDENTIFY PROCESSES

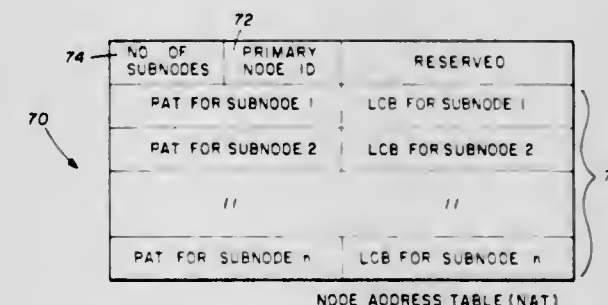
Kenneth M. Herrington, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,622

Int. Cl.<sup>3</sup> G06F 9/06

U.S. Cl. 364-200

6 Claims



1. A method for uniquely identifying processes in an electronic digital signal processing system used to accomplish tasks in response to work requests, wherein a process comprises a predefined stack, a process control block and a predefined sequence of instructions, comprising the steps of:

storing a process identification code for each of said processes in a memory means associated with said system;  
storing one or more subnode addresses in said memory means, each subnode address corresponding to a predetermined grouping of one or more of said processes, wherein at least one of said grouping includes a plurality of processes;

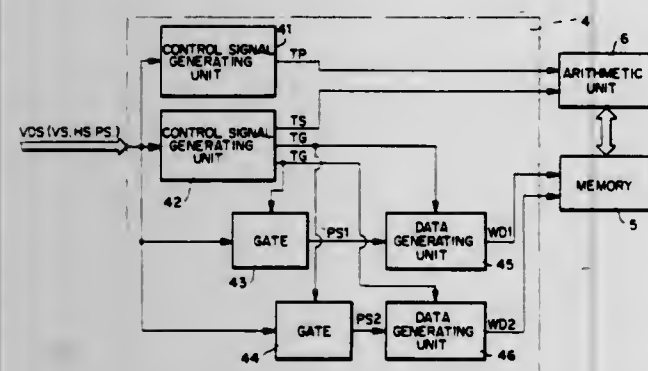
storing a primary node address in said memory means for a processor for identifying that processor, and  
providing a work request to select a subnode address and a process identification code to identify a process to be used by said processor to accomplish a task.







second optical filters which respectively pass different first and second wavelengths of light, determining the level of energy for the respective portions of light passed by the respective filters; and, using the thus determined energy levels, carrying out a two-color temperature determining operation for the respective parts of the area for determining the temperature on



each part of the area of said object by solving the equation  $T = \alpha(E_1/E_2) + \beta$ , wherein  $T$  is the temperature to be determined and  $E_1$  and  $E_2$  are respectively determined energy levels for the first and second wavelengths and  $\alpha$  and  $\beta$  are constants, whereby the temperature pattern of the area of the object can be determined from the temperatures of the parts of the area.

4,413,325

**METHODS AND APPARATUS FOR DETERMINING THE TEMPERATURE OF AN ASYNCHRONOUS MOTOR**  
Bo A. Elfner, and Anders P. P. Comstedt, both of Löddeköping, Sweden, assignors to EL-FI Innovationer AB, Helsingborg, Sweden

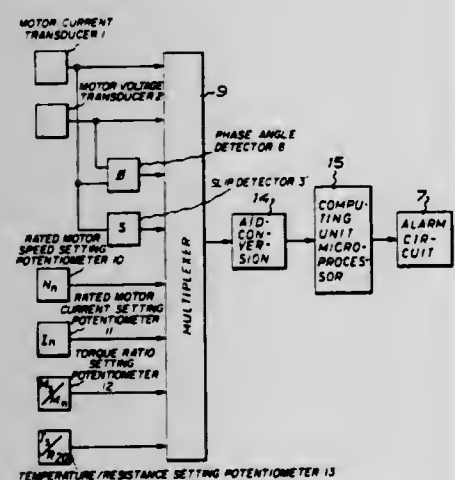
Filed Mar. 24, 1981, Ser. No. 246,949

Claims priority, application Sweden, Mar. 26, 1980, 8002309

Int. Cl.<sup>3</sup> G06F 15/20; H02H 7/08

U.S. Cl. 364—557

6 Claims



1. Apparatus for protecting an asynchronous motor from thermal overload, comprising:

- means for applying electric power to said motor;
- motor current transducer means, coupled to said power applying means, for detecting a current drawn by said motor and providing a current signal indicative thereof;
- motor voltage transducer means, coupled to said power applying means, for detecting a voltage drop across said motor and providing a voltage signal indicative thereof;
- phase angle detector means, coupled to said current and voltage transducer means, for measuring a phase angle difference between said current and voltage signals and providing a phase signal indicative thereof;
- slip detector means, coupled to said current transducer means, for determining an amount of slip of said motor and providing a slip signal indicative thereof;
- means for setting a value of rated motor speed;

- means for setting a value of rated motor current;
- means for setting a torque ratio value equal to  $M_s/M_n$ , where  $M_s$  represents a motor starting torque and  $M_n$  represents a motor torque at rated load;
- means for setting a temperature  $T_{start}$  value and a resistance  $R_x$  value wherein  $T_{start}$  represents a motor starting temperature and  $R_x$  represents motor resistance at a predetermined temperature  $x$ ;
- multiplexer means, having respective inputs coupled to said motor current transducer means, motor voltage transducer means, phase angle detector means, rated motor speed value setting means, rated motor current value setting means, torque ratio setting means and temperature/resistance value setting means, for multiplexing their respective signals onto an output line;
- A/D conversion means, coupled to said multiplexer means output line, for generating digital data signals corresponding to values of said signals coupled to said multiplexer inputs;
- processing means, coupled to an output of said A/D conversion means, for processing said digital data signals to repeatedly determine a winding temperature of said motor and compare the repeatedly determined winding temperature with a previously stored reference value and generating an alarm signal when said winding temperature exceeds said reference value, thereby indicating a thermal overload condition.

4,413,326

**FLOATING POINT DIVISION CONTROL**

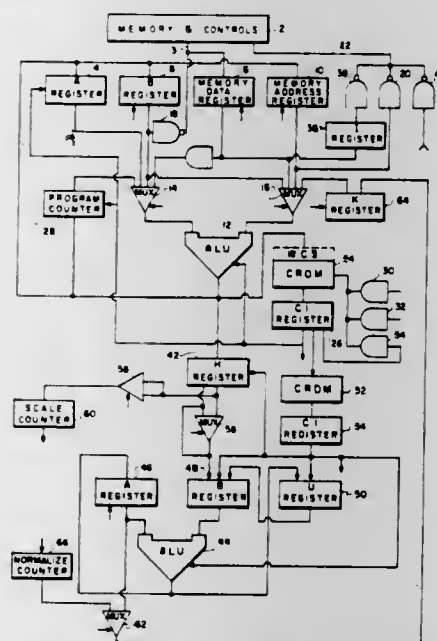
Troy K. Wilson, and Robert J. Handly, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1978, Ser. No. 952,567

Int. Cl.<sup>3</sup> G06F 7/52

U.S. Cl. 364—748

1 Claim



- In a computational apparatus having a first and a second microprocessor unit for performing floating point calculations, a method of effecting a floating point division comprising: manipulating exponent portions of values in said first microprocessor unit; simultaneously therewith, manipulating normalized mantissa portions of the values in said second microprocessor unit; including storing the dividend mantissa in a first register; storing the divisor mantissa in a second register; performing a step-by-step division of said dividend mantissa by said divisor mantissa; inserting the quotient bit resulting from each step in the least significant bit position of a third register and shifting that bit one position toward the most significant bit position on each successive step; and

terminating the division operation when a logical "1" appears in the most significant bit position of the third register.

4,413,327

**RADIATION CIRCUMVENTION TECHNIQUE**

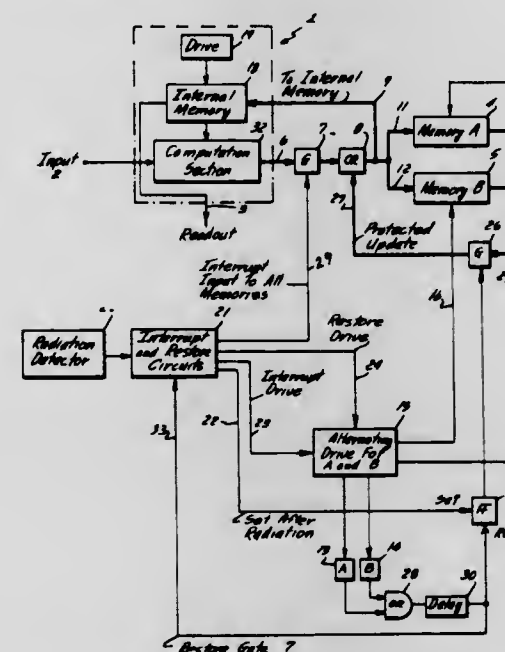
Joseph D. Sabo, Belmont, Mass., and Joel A. Karp, Cupertino, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1970, Ser. No. 59,794

Int. Cl.<sup>3</sup> G06F 1/00

U.S. Cl. 364—900

5 Claims



1. Apparatus for circumventing the effects of ionizing radiation on a computer having a radiation-resistant internal memory into which information can be written which will be unaffected by ionizing radiation levels below the level at which electrical components of the memory are physically damaged, comprising:

- a pair of radiation-resistant memory units into which can be written information which will be unaffected by ionizing radiation below the level at which said physical damage occurs;
- means for transferring information simultaneously to the inputs of said memory units and the input of said internal memory so that said pair of units are fed in parallel with said internal memory;
- means for alternately driving said memory units so as to have the information available at their inputs recorded in first one and then the other of said memory units such that only one of said units is recording the transferred information during any one recording cycle, each of said units being in a dormant state during the recording cycle of the other of said memory units;
- means at said computer responsive to the presence of ionizing radiation above a predetermined background level for isolating said memory units from any further input;
- means for determining which of said memory units was dormant at the onset of radiation above said predetermined background level and which therefore contains information unaffected by said radiation; and
- means coacting with said driving means for transferring the information in that unit which was dormant to the internal memory of said computer after said radiation falls below said predetermined background level so that the internal memory of said computer is updated with information unaffected by said ionizing radiation.

**4,413,328**  
**STORAGE SUBSYSTEMS EMPLOYING REMOVABLE MEDIA AND HAVING A DIGITAL DISPLAY ON EACH RECORDER**

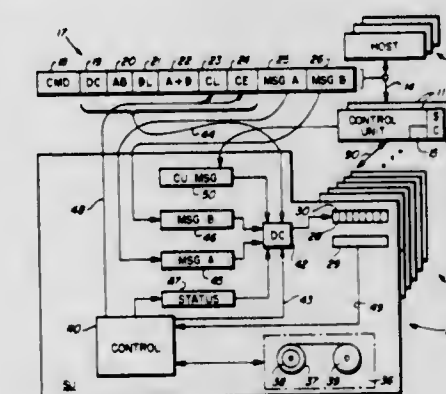
Edwin R. Videki, II, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,168

Int. Cl.<sup>3</sup> G06F 13/04, 15/16

U.S. Cl. 364—900

9 Claims



6. A data storage subsystem (10) adapted to be attached to at least one host computer (12) and having a plurality of addressable record storage units (13), each storage unit having a receiver (29) for an exchangeable record member (39), and being capable of receiving instructions from a host computer through a channel (14) and at least one control unit (11), characterized in that each storage unit has a display (28) adjacent to and aligned with the receiver, whereby identification indicia on a record member in the receiver can be readily compared with symbols of the display, sensing means to supply a signal (49) to indicate the presence in or absence from the receiver of a record member, each storage unit (13) and control unit (11) including computer means (61, 110), the control unit computer means being responsive to a display command having an address for an addressed one of the record storage units and received from a host computer requiring operator intervention to exchange record members or to insert a record member, to control the addressed record storage unit computer means, to remove any display of symbols representing a record member then present in the receiver, to indicate the need for removal of such record member from the receiver, and then to display symbols representing a record member to be inserted in the receiver upon sensing of such removal.

4,413,329

**DYNAMIC MEMORY CELL**

Endre P. Thoma, Colchester, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

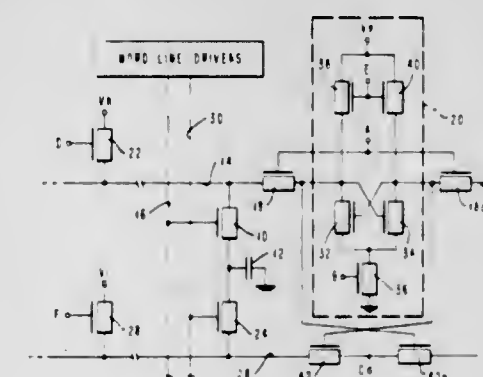
Continuation of Ser. No. 219,697, Dec. 24, 1980, abandoned.

This application Sep. 16, 1982, Ser. No. 419,095

Int. Cl.<sup>3</sup> G11C 11/24, 11/40, 7/00

U.S. Cl. 365—189

9 Claims



1. In a memory system comprising a plurality of dynamic



memory cells, and wherein each cell comprises a switchable cell device and a capacitive node, and wherein said switchable cell device is connected to a bit line to read the charge stored at said node and to a first word line to selectively switch said cell device responsive to a first signal in said word line, and wherein the system includes a sense amplifier to sense the read charge on said bit line, the improvement which comprises, a cell write device, said cell write device being connected to a write line and to said storage node and also connected to a second word line to selectively switch said cell write device responsive to a second signal in said second word line, and means to selectively connect said write line to a low voltage value responsive to a sensed low charge at said capacitive node, whereby a sensed low charge in said cell is rewritten independently of said bit line and a high charge in said cell is rewritten by said bit line upon reading.

4,413,330

#### APPARATUS FOR THE REDUCTION OF THE SHORT-CHANNEL EFFECT IN A SINGLE-POLYSILICON, ONE-DEVICE FET DYNAMIC RAM ARRAY

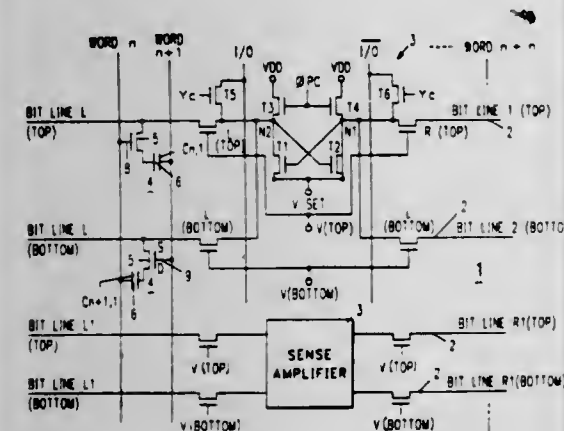
Hu H. Chao, Yorktown Heights, and Robert H. Dennard, Cortlandt, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,143

Int. Cl.<sup>3</sup> G11C 11/40

U.S. Cl. 365—205

15 Claims



1. A memory array comprising at least a pair of storage capacitors, a pair of bit lines and a pair of word lines, one and the other said pair of storage capacitors being connected at one electrode thereof by an actuatable device to one and the other of said pair of bit lines and at the other electrode thereof to one and the other of said pair of word lines said other electrodes being integral with one and the other of said word lines, a sense amplifier responsive to the state of said pair of storage capacitors, and, switchable means interconnecting said sense amplifier and one and the other of said pair of bit lines for decoupling an unselected one of said pair of bit lines from said sense amplifier when one or the other of said pair of word lines is selected.

4,413,331

#### BROAD BEAM TRANSDUCER

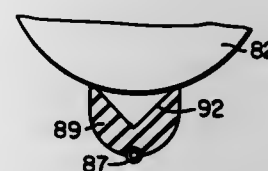
Linwood M. Rowe, Jr., Glen Burnie; Dale D. Skinner, and John H. Thompson, both of Severna Park, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1976, Ser. No. 680,254

Int. Cl.<sup>3</sup> H04B 13/00

U.S. Cl. 367—151

2 Claims



1. Electroacoustic transducer apparatus comprising:
  - (A) a carrier vehicle;
  - (B) a plurality of tubular electrostrictive transducer elements carried by said vehicle and being axially arranged along, and all symmetrically disposed about, a common axis and all operable at the same radial resonant frequency;
  - (C) isolation means separating adjacent ones of said elements for axially decoupling said elements from one another;
  - (D) each said element including electrode means on the end surfaces thereof and being poled in said axial direction;
  - (E) backing means positioned between said carrier vehicle and said plurality of elements to prevent unwanted reflections of acoustic energy and distortion of the beam pattern of said apparatus;
  - (F) said backing means being an acoustic absorbing material; and
  - (G) said backing means including an acoustic reflecting layer disposed over said acoustic absorbing material.
2. Electroacoustic transducer apparatus comprising:
  - (A) a carrier vehicle;
  - (B) a plurality of tubular electrostrictive transducer elements carried by said vehicle and being axially arranged along, and all symmetrically disposed about, a common axis and all operable at the same radial resonant frequency;
  - (C) isolation means separating adjacent ones of said elements for axially decoupling said elements from one another;
  - (D) each said element including electrode means on the end surfaces thereof and being poled in said axial direction;
  - (E) backing means positioned between said carrier vehicle and said plurality of elements to prevent unwanted reflections of acoustic energy and distortion of the beam pattern of said apparatus;
  - (F) said backing means being an acoustic directional reflector; and
  - (G) said reflector including an acoustic absorbing material covering the outside surface of said reflector.

4,413,332

#### SCANNING BEAMFORMER FOR A VERY HIGH RESOLUTION CIRCULAR ARC SONAR

George A. Gilmour, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1981, Ser. No. 277,357

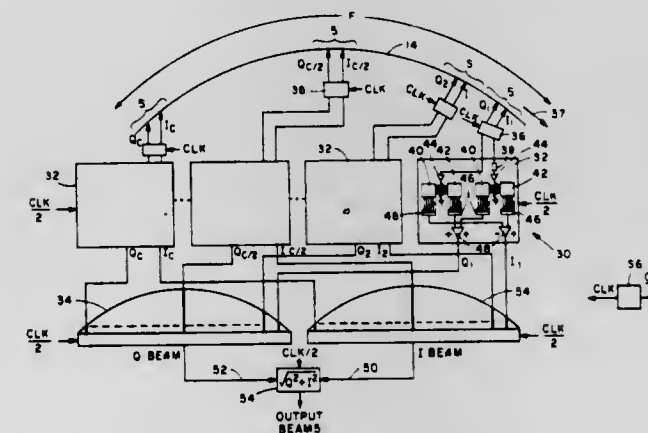
Int. Cl.<sup>3</sup> G01S 3/82

U.S. Cl. 367—123

22 Claims

1. In a sonar of the type comprising a soundhead having an arcuate array of hydrophone elements and wherein a plurality of azimuthally ordered beam patterns are sequentially formed from F adjacent hydrophone elements, and wherein due to the geometry of the soundhead, it takes an impinging spherical longitudinally propagating compressional wave a non-zero time to fill the F elements used to form said beam pattern in a particular azimuthal direction, which time limits the resolution of the sonar, a method for sequentially forming said beam

pattern that accounts for the fill time and focuses at all near-field ranges of interest, comprising the steps of: sampling in quadrature pairs the F elements used to form said beam pattern concurrently in adjacent C groups of S elements each, where C multiplied by S equals F; processing said C groups of S elements of said F quadrature sampled pairs concurrently to provide C Inphase and Quadrature phase beam component signals; applying predetermined delays to preselected ones of said C Inphase and Quadrature phase beam component signals in



a manner that depends upon the differential time it takes for said spherical longitudinally propagating compressional wave to fill adjacent groups of said S elements; combining said selectively delayed Inphase and Quadrature phase beam component signals to provide an Inphase and a Quadrature phase beam; and computing the square root of the sum of the squares of the magnitude of said Inphase and Quadrature phase beams sequentially to scan said beam pattern through a preselected azimuth.

4,413,333

#### ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

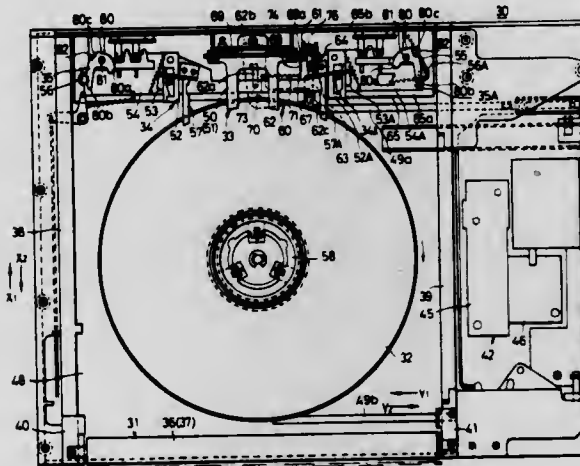
Filed Mar. 11, 1982, Ser. No. 357,207

Claims priority, application Japan, Mar. 12, 1981, 56-35574

Int. Cl.<sup>3</sup> G11B 17/04, 23/04

U.S. Cl. 369—77.2

6 Claims



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for allowing said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

an inserting opening through which said case is inserted; lid member locking and holding means provided at an innermost part of said reproducing apparatus, for locking and leaving said lid member inside said reproducing apparatus when said case is inserted into said reproducing apparatus, and for releasing the locking with respect to said lid member when an empty jacket is inserted into said reproducing apparatus; lid member connection releasing means for releasing connection of said lid member with respect to said jacket when said case is inserted into and then pulled out from said reproducing apparatus, and for connecting said lid member to said empty jacket when said jacket is inserted into and then pulled out from said reproducing apparatus; lid member push-back means for pushing back said lid member released from locking in a direction approaching said empty jacket which is inserted, interrelatedly with the locking releasing operation of said lid member locking and holding means; and means maintained inoperative upon insertion of said case, and rendered operative upon insertion of said empty jacket, for limiting a final insertion position of said empty jacket inside said reproducing apparatus to a halfway position, the halfway position being a position where said lid member locking and holding means operates to release the locking of said lid member and said lid member push-back means operates but where said lid member connection releasing means remains inoperative.

4,413,334

#### PICKUP ARM WITH SERVO-CONTROLLED STYLUS

Kunio Goto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

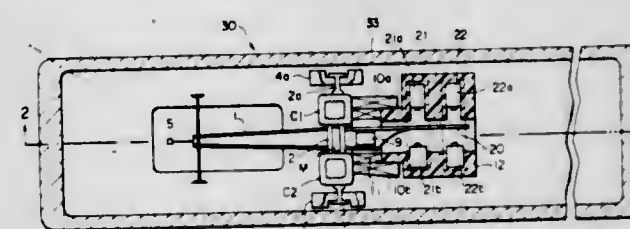
Filed May 1, 1981, Ser. No. 259,486

Claims priority, application Japan, May 4, 1980, 55-58829

Int. Cl.<sup>3</sup> G11B 21/10, 9/06

U.S. Cl. 369—126

6 Claims



1. A system for controlling the orientation of a stylus with respect to the surface of a recording medium having radially spaced apart tracks, said stylus being provided at one end of a pickup arm linearly driven across said tracks, comprising: pivotal support means mounted at said one end of the pickup arm and pivotable in a direction normal to said recording medium surface; a cantilever having said stylus at one end thereof and coupled at the other end thereof to said pivotal support means, said cantilever having a substantially smaller mass than said pickup arm; means for detecting the angular displacement of said cantilever from a predetermined orientation caused by displacement of said recording medium from a normal level and in response generating a control signal; and means for moving said pivotal support means in response to said control signal in the direction of vertical displacement of said recording medium.



4,413,335

# **FAULT RECOVERY APPARATUS FOR A PCM SWITCHING NETWORK**

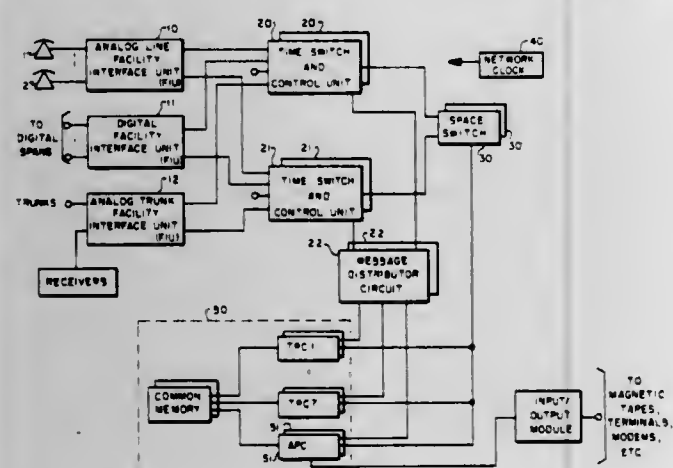
John L. Clements, and Stig E. Magnusson, both of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 27, 1981, Ser. No. 325,252

Int. Cl.<sup>3</sup> H04L 1/22, 1/24; H04M 3/08

U.S. Cl. 370—16

10 Claims



8. In a digital telephone switching office, network fault recovery apparatus comprising:

telephone subscribers;  
a digital switching network for transmitting PCM data samples from specific input time slots to specific output time slots;

means for formulating a test PCM data sampling;  
means for switching connected to said digital switching network and operated to interrupt said transmission of said PCM data samples from said digital switching network to said telephone subscribers;

means for transmitting said test PCM data sample connected to said digital switching network via said switching means, said means for transmitting operated in response to said interruption of said transmission of said PCM data samples;

a connection between said means for transmitting and said digital switching network established in response to said transmission of said test PCM data sample to connect said means for transmitting to said digital switching network; means for trapping said test PCM data sample, said means for trapping connected to said digital switching network; and

means for analyzing said transmitted test PCM data sample with said trapped test PCM data sample whereby, each of said bits of said PCM data sample transmitted to said telephone subscriber are verified for conformity with said transmitted test PCM data sample.

4,413,336

# **PROCESS FOR TRANSMITTING DATA WITH THE AID OF A START-STOP SIGNAL**

Charles Chaillie, Olching, and Konrad Reisinger, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,316

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951914

Int. Cl.<sup>3</sup> H04J 3/06

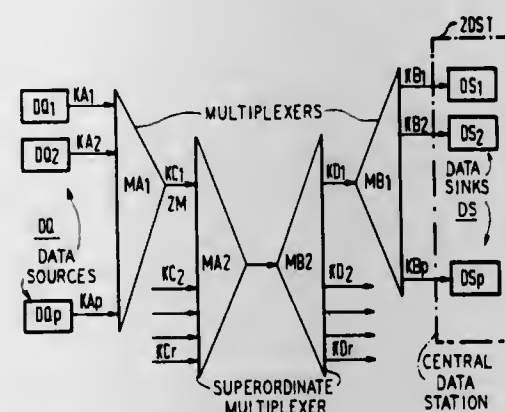
U.S. Cl. 370—48

4 Claims

1. A process for transmitting data from a plurality of groups of data sources as a time-division multiplex signal which is divided into time-division multiplex frame each encompassing a plurality of character frames, comprising the steps of:

forming a respective character frame for each group of data sources by  
transmitting a frame start bit,

transmitting at least one frame stop bit time-spaced from the frame start bit by a plurality of bit positions, transmitting data bits from respective data sources of a group in some of the bit positions between the frame start bit and the frame stop bit, and transmitting a code bit in a bit position between the start and stop bits to identify, with a plurality of successive



code bits which is smaller in number than the number of character frames of a time-division multiplex frames, the individual character frames and the assignment of the data bits from the data sources to the respective bit locations of the character frame; and forming the time-division multiplex frame by sequentially transmitting the character frames.

4,413,337

# **TIME DIVISION SWITCHING SYSTEM FOR CIRCUIT MODE AND PACKET MODE LINES**

Jean-Louis Dauphin, 70, Residence Corlay; Olivier F. Louvet, 22, av. de Bormandie Keruhel, and Jean-Marc Pitie, 6, Residence Corlay, all of Lannion, France 22300

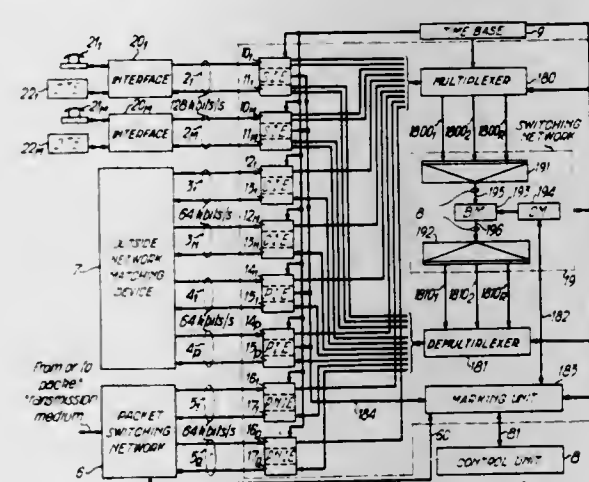
Filed Feb. 4, 1981, Ser. No. 231,936

Claims priority, application France, Feb. 13, 1980, 80 03181

Int. Cl.<sup>3</sup> H04J 3/04

U.S. Cl. 370—58

11 Claims



1. A time division digital switching system for switching, on the one hand, between first PCM circuit mode digital channels and second PCM bidirectional circuit mode digital lines, each of the first channels being multiplexed with a second packet mode digital channel into a first bidirectional line having a first predetermined rate, as well as fourth bidirectional packet mode digital lines, said first and second channels and said second, third and fourth lines having a second rate half said first rate, each of the first, second, third and fourth channels including incoming and outgoing channels, the first bidirectional line including first incoming digital and first second, third and fourth outgoing digital lines, said system comprising:

first means for demultiplexing the incoming first digital lines into the incoming first and second digital channels;

first means for multiplexing the outgoing first and second channels into the outgoing first digital lines;  
second means for multiplexing said incoming first and second channels and the incoming second, third and fourth lines into an incoming digital multiplex having a third predetermined rate;  
means receiving said incoming multiplex for bidirectionally switching said first channel of each first line with the first channel of a first line or with a second line and for bidirectionally switching the second channel of each first line with a fourth line to derive an outgoing digital multiplex; and  
second means for demultiplexing the outgoing digital multiplex having said third rate which results from the switching operations in said means for switching, into said outgoing first and second channels and the outgoing second, third and fourth lines.

4,413,338

# **COMMUNICATION SYSTEM FOR INTERCONNECTING A PLURALITY OF ASYNCHRONOUS DATA PROCESSING TERMINALS**

Roger Renoulin, 29, rue Jean Mailleux Thorigne, Vilaine F-35510 Cesson, and Jean-Yves Le Brun, 34, Boulevard Clemenceau, F-35100 Rennes, both of France

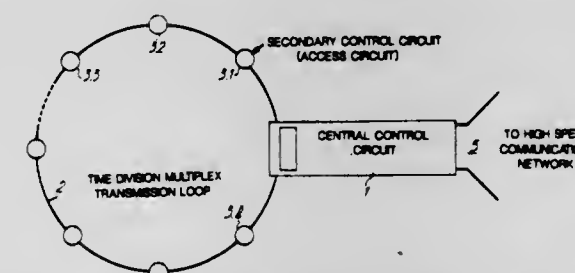
Filed Mar. 16, 1981, Ser. No. 244,170

Claims priority, application France, Mar. 20, 1980, 80 06774

Int. Cl.<sup>3</sup> H04J 3/16, 6/00

U.S. Cl. 370—89

4 Claims



1. A communication system for connecting to each other a number of asynchronous data processing terminals operating at different speeds, or for connecting the terminals to a high speed switching and communication network, said system comprising a central control circuit means and a plurality of secondary control circuit means, each of said secondary control circuit means being associated with a terminal or a group of terminals, a time division multiplex transmission loop means which transmits a time multiplex of signals in time slots grouped into multiframe of frames of information, a particular time slot of a first frame containing multiframe synchronization information and the corresponding particular time slot in other frames being assigned to provide for an information exchange, counter means in each secondary control circuit means for counting time slots and frame, the outputs of said counter means being coupled to time slot and frame number decoder means, said decoder means having outputs coupled to an AND gate, the output of said AND gate being coupled to the enable input terminals on a first serial-to-parallel converter means, means for applying a time division multiplex of signals to a serial input on said first serial-to-parallel converter means, microprocessor means having an input coupled to parallel outputs of said first serial-to-parallel converter means, an output of said microprocessor means being coupled to the parallel input of a second parallel-to-serial converter means, an enable input of said second parallel-to-serial converter means being coupled to the output of a three input AND gate, the first two inputs of said three input AND gate being respectively coupled to the outputs of the said frame and time slot decoders and the third input of said three input AND gate being coupled to the output of a first flip flop, the output of said three input AND gate being coupled to the multiplex loop means, and the

outputs of the time slot and frame number decoders being activated for the duration of said other frames.

4,413,339

# **MULTIPLE ERROR DETECTING AND CORRECTING SYSTEM EMPLOYING REED-SOLOMON CODES**

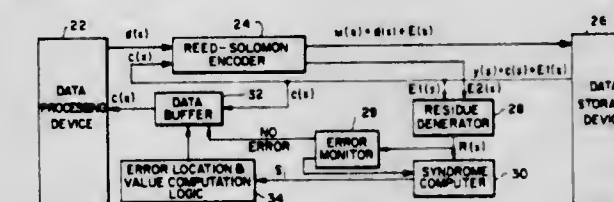
Charles M. Riggle, Acton; Lih-Jyh Weng, Lexington, and Norman A. Field, Maynard, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 24, 1981, Ser. No. 277,060

Int. Cl.<sup>3</sup> G06F 11/12

U.S. Cl. 371—38

19 Claims



1. A circuit for detecting and correcting errors occurring in a Reed-Solomon code word  $w(x)$  constituted by a data word  $d(x)$  having  $k$  data symbols and a checksum word  $E(x)$  having  $n-k$  data symbols, the symbols of said checksum word  $E(x)$  being elements in the Galois Field  $GF(2^m)$ , for any integer  $m$  greater than 0, said checksum word being derived by encoding said data word  $d(x)$  by a predetermined generator polynomial  $g(x)$  having roots  $\alpha^i$  wherein  $\alpha$  is a primitive element in the Galois Field  $GF(2^m)$ , said circuit comprising:

A. receiving means for receiving a word  $y(x)$  that was transmitted as the code word  $w(x)$ , said word  $y(x)$  being comprised of a data word  $c(x)$  having  $k$  symbols and a checksum word  $E1(x)$  having  $n-k$  symbols,

B. Reed-Solomon encoding means for encoding said data word  $c(x)$  by said generator polynomial  $g(x)$  for producing another checksum word  $E2(x)$ , said encoding means comprising successively connected shift register stages and feedback means that enable encoding of the data word  $c(x)$  by said generator polynomial  $g(x)$  during the shifting of the symbols thereof through said shift register,

C. residue generating means connected to said receiving means and to said encoding means for receiving  $E1(x)$  and  $E2(x)$  for producing a residue  $R(x)$  therefrom by modulo-two summing respective symbols thereof,

D. monitoring means connected to said residue generating means for indicating whether errors have occurred in the received word  $y(x)$ ,

E. logic processing means responsive to said monitoring means for computing error syndromes  $S_i$  from said residue  $R(x)$  thereby to enable the computation of error location signals and error value signals corresponding to the respective locations and values of errors occurring in data word  $c(x)$ , and

F. correcting means responsive to said error location and error value signals for correcting errors occurring in data word  $c(x)$  located in said receiving means.

4,413,340

# **ERROR CORRECTABLE DATA TRANSMISSION METHOD**

Kentaro Odaka; Yoichiro Sako; Ikuro Iwamoto; Toshitada Dol, all of Kanagawa, Japan, and Lodewijk B. Vries, Eindhoven, Netherlands, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 263,465, May 20, 1981, abandoned. This application Nov. 12, 1981, Ser. No. 320,492

Claims priority, application Japan, May 21, 1980, 53-67608

Int. Cl.<sup>3</sup> G06F 11/10

U.S. Cl. 371—39

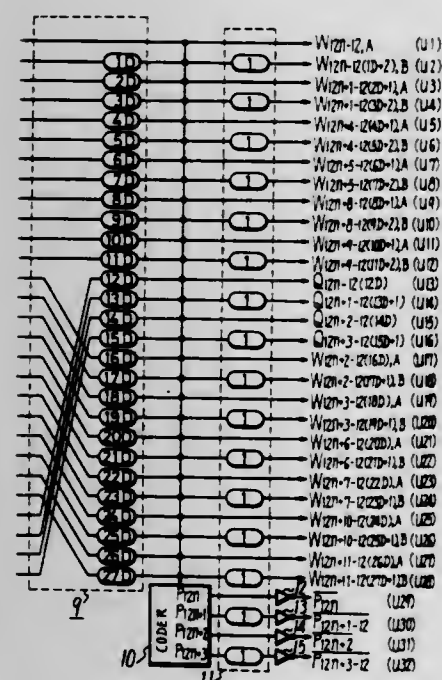
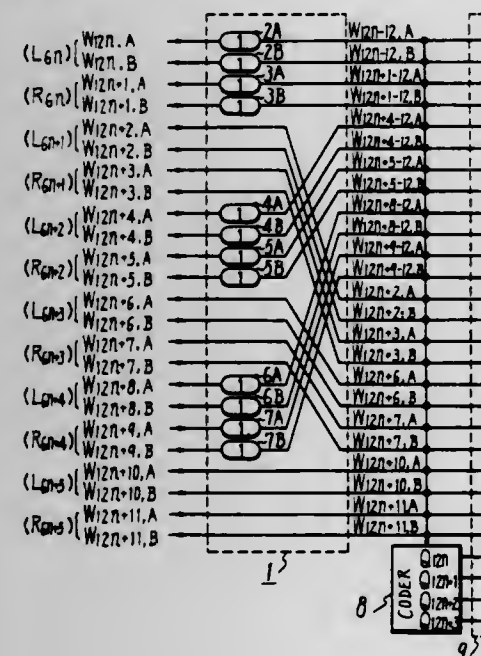
39 Claims

1. A method of transmitting a digital information signal formed of a plurality of sequences of information words, each word being of a predetermined bit length with each such sequence of words occurring in a respective input channel, and



with check words included in the transmitted signal to enable correction of errors occurring in the signal as a result of transmission, comprising the steps of

- applying a first block of words, taken one from each such input channel, and having a first arrangement state, to a first error-correcting encoder to generate a series of  $k$  first check words;
- delaying each of the words in said first block and each of the  $k$  first check words by a respective different delay time to provide a resulting second block of words in a second arrangement state;
- applying said second block of words to a second error-correcting encoder to generate a series of  $k$  second check words; and



transmitting said second block of words together with said second check words; wherein

said first and second check words are generated to satisfy a parity check matrix having  $n$  columns and  $k$  rows, and in which each element of one predetermined row is selected from digital values from zero to  $2^m - 1$ , so that the same value does not appear twice in said predetermined row, and wherein the elements in the remaining rows are selected to be a given power, for all the elements in each respective row, of the corresponding elements in said predetermined row, where  $m$  is the bit length of said data words and  $n$  is the number of words in each block formed

of the digital words of the information signal together with the associated check words.

4,413,341

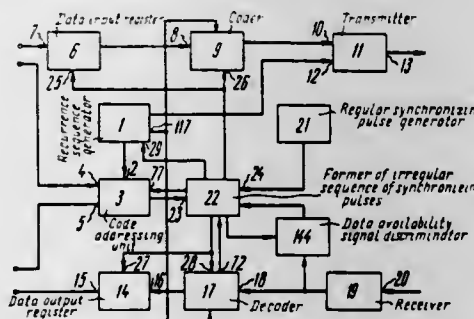
**METHOD FOR EXCHANGE OF DATA BETWEEN CENTRAL STATION AND PERIPHERAL STATIONS**  
Alexandr B. Markhasin, ulitsa Krylova, 41, kv. 22; Gennady V. Belyaev, ulitsa Nikitina, 68, kv. 20; Jury V. Babushkin, ulitsa Turgeneva, 223, kv. 21, and Alexandr K. Petrov, ulitsa Vys-tavchnaya, 11, kv. 51, all of Novosibirsk, U.S.S.R.

Division of Ser. No. 46,640, Jun. 8, 1979. This application May 26, 1981, Ser. No. 267,338

Int. Cl.<sup>3</sup> G06F 11/00; H04J 6/00

U.S. Cl. 371-72

9 Claims



1. A method for an exchange of data through a channel between a central station and peripheral stations, which method comprises the steps of

generating, at said central station, an address signal which is an address sequence including  $M$  non-recurrent subsequences designating the addresses of selected peripheral stations, wherein  $M$  is an integer, said address sequence having elements meeting a predetermined recurrence relation, and said subsequences which designate the addresses of two successive peripheral stations, being partially overlapping in time;

deriving elementary address signals indicating addresses and elementary data signals indicating data from some of said elements of said address sequence and from other control information elements;

transmitting from said central station to said channel, as each next peripheral station is called on, only those elementary address signals which correspond to the non-overlapping part of said subsequence designating the selected address of the next peripheral station;

providing a series of synchronizing address pulses for generating and transmitting from said central station the steps of said elementary address signals;

discriminating, at each peripheral station, said synchronizing address pulses and elements of the sequence being generated from said address signal;

accumulating the discriminated elements of the sequence being generated and producing a subsequence designating the address of a peripheral station from these elements; and

comparing said subsequence elements with the address of one of said peripheral stations and enabling the exchange of data if said accumulated subsequence elements coincides with the address of a given peripheral station, the improvement consisting of

providing modulation patterns and parameters at said central station to form said elementary signals of addresses of said peripheral stations from the elements of the subsequence; providing different modulation patterns and parameters at said central station to form said elementary data signals; successively transmitting from said central station the elementary address signals and elementary data signals of a given peripheral station; determining at said central station the availability of data for transmission by setting intervals of time between successive elementary address signals depending on the availability of data for transmission from a given peripheral

station to said central station and from said central station to a given peripheral station;  
generating, at each peripheral station, an address signal similar to that generated at said central station, said address signal being a sequence having elements having a predetermined recurrence relation;  
multiplying, at said peripheral station, said address signal of said peripheral station by the discriminated address signal of said central station and obtaining an error signal indicating an error in one of said address signals;  
shifting the phrase of the address signal of said peripheral station with reference to the error signals obtained by the multiplication; and  
comparing the accumulated subsequence of elements of the phase-shifted address signal of a given peripheral station with said address of said peripheral station, whereby the accuracy of addressing peripheral stations during successive transmitting of elementary address and data signals is improved.

4,413,342

**METHOD AND APPARATUS FOR FREQUENCY DOUBLING A LASER BEAM**

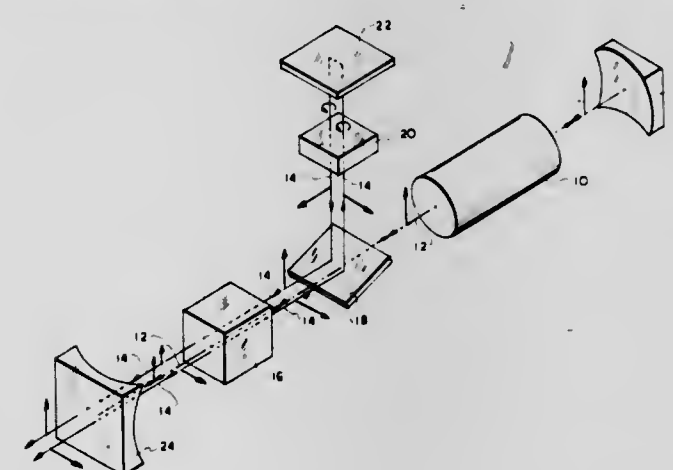
Martin G. Cohen, Huntington, and Kuo-ching Liu, East Setauket, both of N.Y., assignors to Quantronix Corporation, Smithtown, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,511

Int. Cl.<sup>3</sup> H01S 3/10

U.S. Cl. 372-22

10 Claims



1. An apparatus for frequency doubling a laser beam within a laser resonator cavity and providing an output including coincident second harmonic beams of different polarization, comprising:

a laser generating a laser beam of fundamental frequency; means for doubling the fundamental frequency of said beam from said laser by generating frequency doubled beams which travel in opposite directions along a common axis away from said doubling means;

reflecting means positioned between said laser and said means for doubling the fundamental frequency capable of reflecting one of the frequency doubled beams and transmitting said beam of fundamental frequency; means for rotating the polarization of the frequency doubled beam reflected by said reflecting means; means for returning the rotated beam so that it travels along the common axis; and

an output mirror capable of reflecting a beam of the fundamental frequency and transmitting beams of the second harmonic of said fundamental frequency.

4,413,343

**LEAD CHALCOGENIDE SEMICONDUCTOR DEVICE**  
Hirokazu Fukuda, Asahiso, 1-2-7, Matsunouchi Akashi-shi, Hyogo. 673; Koji Shinohara, 4-6-28, Suganodai, Suma-ku Kobe-shi, Hyogo. 654, and Mitiharu Itou, 3-4-34, Seiryodai, Tarumi-ku Kobe-shi, Hyogo. 655, all of Japan

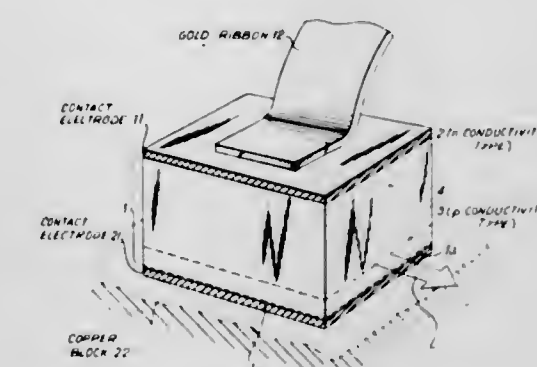
Filed Feb. 20, 1981, Ser. No. 236,611

Claims priority, application Japan, Feb. 22, 1980, 55-21999

Int. Cl.<sup>3</sup> H01S 3/19

U.S. Cl. 372-44

5 Claims



1. A lead chalcogenide semiconductor device having a p conductivity type region, an n conductivity type region, a pn junction between said regions and contact electrodes ohmically contacting the p conductivity type region and the n conductivity type region, respectively, said contact electrode contacting said p conductivity type region consisting of gold and an added element of the component elements of said semiconductor device, said contact electrode functioning as the acceptor.

4,413,344

**METHOD OF OPERATING A GASDYNAMIC CO<sub>2</sub>-LASER**  
Konrad Altmann, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

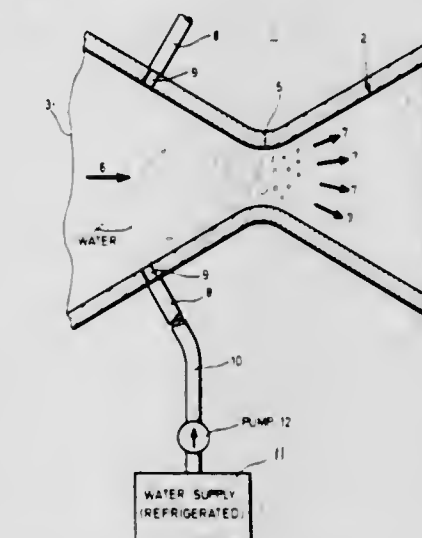
Filed Jun. 1, 1981, Ser. No. 268,762

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021858

Int. Cl.<sup>3</sup> H01S 3/09

U.S. Cl. 372-90

7 Claims



1. A method for operating a gas dynamic CO<sub>2</sub>-laser having a Laval nozzle with a nozzle neck, comprising the steps of flowing a lasing medium through said Laval nozzle to produce a lasing medium flow (6), expanding said flowing lasing medium downstream of said nozzle neck for cooling the flowing lasing medium, introducing a cooling liquid into the lasing medium flow (6) near to said nozzle neck for entraining the liquid in the lasing medium flow flowing at high speed, dispersing said liquid by the high speed of the lasing medium flow to thereby form fine liquid droplets, and evaporating the liquid



droplets in the flowing lasing medium for amplifying the cooling of the expanding lasing medium.

4,413,345

## GASDYNAMIC LASER

Konrad Altmann, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

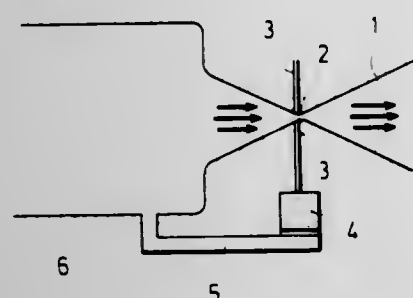
Continuation-in-part of Ser. No. 268,762, Jun. 1, 1981. This application Jun. 9, 1982, Ser. No. 386,767

Claims priority, application United Kingdom, Jun. 11, 1981, 8117973

Int. Cl.<sup>3</sup> H01S 3/09

U.S. Cl. 372-90

11 Claims



1. In a gas dynamic laser having a Laval nozzle with a nozzle neck for expanding and thereby cooling the flowing lasing medium downstream of said nozzle neck, wherein injection means are provided for introducing liquid droplets into the flowing lasing medium for entraining the liquid droplets in the flowing lasing medium, and for evaporating the liquid droplets in the flowing lasing medium for increasing the cooling of the lasing medium.

4,413,346

## GLASS-MELTING FURNACE WITH BATCH ELECTRODES

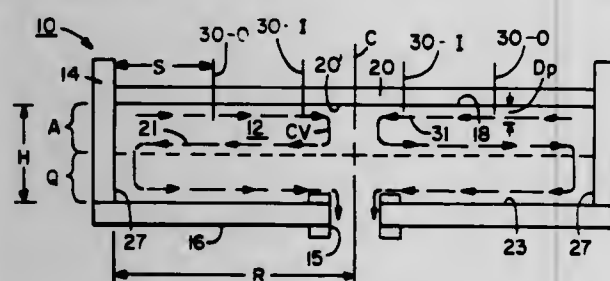
Ronald W. Palmquist, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 4, 1981, Ser. No. 317,994

Int. Cl.<sup>3</sup> C03B 5/027

U.S. Cl. 373-41

16 Claims



1. A method of operating a glass melting furnace having sidewalls, a bottom wall with a central opening therein forming an open top vessel for containing a bath of molten glass, and at least one group of electrodes for electrically firing the bath from a source of electrical energy, the method comprising the steps of:

- selecting individual placement locations for each electrode of each group, said individual placement locations being radially and circumferentially symmetrical relative to a geometric center of the furnace;
- limiting the selected placement locations away from the sidewalls of the furnace by a minimum spacing by about 1 to about 2 feet;
- placing one each of the electrodes of each group at the individual placement locations selected;
- depositing a batch blanket of fusible glass forming batch materials atop the bath of the molten glass;

piercing the batch blanket with said electrodes; immersing from the top of the furnace a tip portion of said electrodes into the molten glass at each respective location to a selected immersion level immediately below the batch blanket, each tip portion being in relatively close proximity thereto;

electrically firing each group of electrodes in a symmetrical electrical pattern relative to each electrode in the group and each other group of electrodes such that energy dissipation is concentrated immediately below and across the batch blanket and away from the sidewalls of the furnace; selecting a furnace having respective vertical and lateral dimensions such that melting and refining occurs in relatively narrow active and quiescent zones respectively below each other and an upper surface of the bath; and selecting an aspect ratio of the vertical dimension of the furnace measured vertically across the active and quiescence zones and a lateral dimension measured across the center from one sidewall to the other of between 1.0 and 0.3.

4,413,347

## TERNARY TO BINARY PULSE REGENERATOR FOR A REGENERATIVE REPEATER

Hirokazu Kobayashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

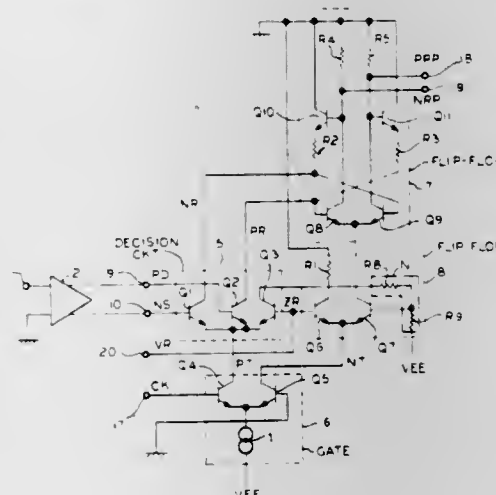
Filed Feb. 6, 1981, Ser. No. 232,234

Claims priority, application Japan, Feb. 25, 1980, 55-22481; Mar. 6, 1980, 55-28522

Int. Cl.<sup>3</sup> H03K 13/24

U.S. Cl. 375-20

11 Claims



2. A pulse regenerator with low power consumption, said regenerator comprising: means responsive to a receipt of an input ternary pulse sequence for generating first and second ternary pulse sequences having opposite phases, one of said generated ternary pulse sequences having a phase coinciding with the phase of said received sequence, means responsive to a clock pulse sequence received with said input ternary pulse sequence for generating first and second timing signals having opposite phases, one of said timing signals having a phase coinciding with the phase of said received clock pulse sequence, means responsive to one of said generated timing signals for comparing said first and second generated ternary pulse sequences with a reference signal, and means responsive to said comparing means for holding a signal selected from said generated ternary pulse sequence.

4,413,348

## SYSTEM FOR PRODUCING PROCESS HEAT

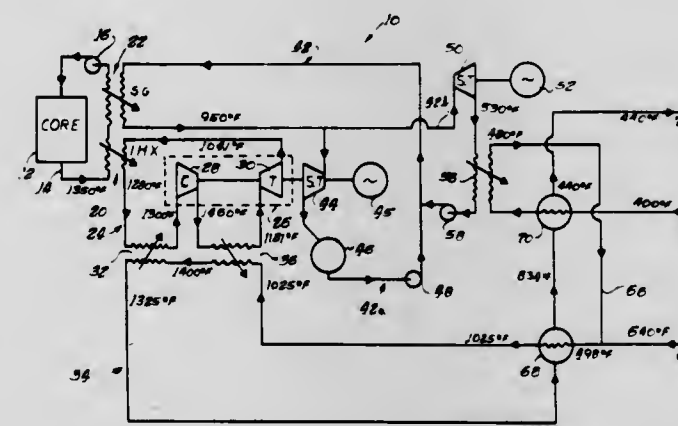
Davorin D. Kapich, Carlsbad, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jan. 12, 1981, Ser. No. 224,322

Int. Cl.<sup>3</sup> G21C 15/00

U.S. Cl. 376-367

7 Claims



1. A system for producing process heat comprising, in combination,

a high temperature gas cooled nuclear reactor having a fuel core and a primary cooling loop through which a coolant is circulated and undergoes an increase in temperature, a closed secondary loop having a working fluid therein, said cooling and secondary loops having cooperative association with an intermediate heat exchanger adapted to receive said working fluid therethrough and effect transfer of heat from said coolant to said working fluid as said working fluid passes through said intermediate heat exchanger,

a heat pump connected in said secondary loop and including a turbine and a compressor through which said working fluid passes so that said working fluid undergoes an increase in temperature and pressure as it passes through said compressor,

a process loop including a process heat exchanger adapted to receive a process fluid therethrough, said process heat exchanger being connected in circuit with said secondary loop so as to receive said working fluid from said compressor and transfer heat from said working fluid to said process fluid as it passes through said process heat exchanger,

said secondary loop being operative to pass said working fluid from said process heat exchanger back to said intermediate heat exchanger through said turbine so as to effect driving relation of said turbine,

and a closed steam circuit including a steam generator operatively associated with said cooling loop so as to receive said coolant therethrough and transfer heat from said coolant to condensed steam passing through said steam generator to produce steam, said steam circuit including a steam turbine operatively associated with the turbine of said heat pump so as to assist in driving said compressor, said process loop including a source of feed gas and a source of process fluid and adapted to mix said feed gas and process fluid and pass the mixture to said process heat exchanger for heating by said working fluid therein.

4,413,349

## NON-CONTACT MEASUREMENT SYSTEM AND METHOD FOR DETERMINING THE CONTOUR OF AN ELECTRICALLY CONDUCTIVE SURFACE

Richard E. Bailey, San Diego, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Oct. 31, 1980, Ser. No. 202,796

Int. Cl.<sup>3</sup> G01B 7/28

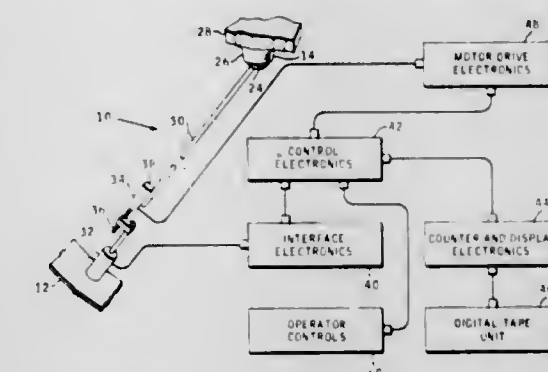
U.S. Cl. 377-24

10 Claims

1. A non-contact measurement system for determining the

contour of an electrically conductive surface relative to a fixed reference point comprising:

- a support arm journaled at one end to a bearing providing a fixed reference point and adapted to extend toward a first surface having a contour to be determined;
- a second separate initial surface is established adjacent to, but separate from the first surface, the contour of which is to be determined whereby a reference length is determined between said fixed reference point and second initial surface without reference to said first surface;
- a non-contact probe means coupled to the support arm by an adjustable means adapted to move said probe means either toward or away from said first surface, the contour of which is to be determined or said second surface, and



which generates an electrical indication of its axial distance from said fixed reference point, the axial distance from said second surface providing said reference length; electrical means coupled to said non-contact means to display the distance symbolized by the electrical signal; and control means coupled to said adjustable means and operable to direct the probe means to extend toward the first surface until it reaches a predetermined distance from the surface;

whereby the length of the axial distance traveled by said probe from the fixed reference point to said predetermined distance from the first surface having the contour to be determined is compared with said reference length to determine said contour.

4,413,350

## PROGRAMMABLE CLOCK RATE GENERATOR

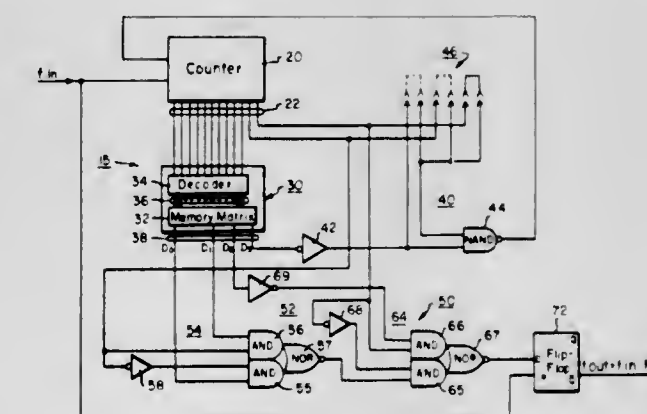
William C. Bond, Bethel, and Gary A. Profet, Watertown, both of Conn., assignors to General DataComm Industries, Inc., Danbury, Conn.

Filed Jan. 12, 1981, Ser. No. 224,336

Int. Cl.<sup>3</sup> G06M 3/00; H03K 21/36

U.S. Cl. 377-47

15 Claims



1. A clock rate generator comprising: a counter to which is applied an input clock signal, a memory having an input to which is applied a portion of the output of said counter and an output on at least three output lines,



counter reset logic connected to one output line from said memory for resetting the counter, means that are controlled by said counter and are connected to at least two other remaining output lines from said memory, for selecting for an output signal the signal on only one of said remaining output lines from said memory, and

means that are connected to said selecting means so as to receive the output signal therefrom for combining successive output signals from said selecting means which have the same binary state, whereby the output signal from said combining means has a clocking rate which is an integral fraction of that of the input clock signal, the denominator of said fraction being determined by the number of counts between successive resets of said counter and the numerator being determined by the number of cycles in said output signal between successive resets of said counter.

4,413,351

## COMPUTER TOMOGRAPHY APPARATUS

Günter Kowalski, Rellingen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

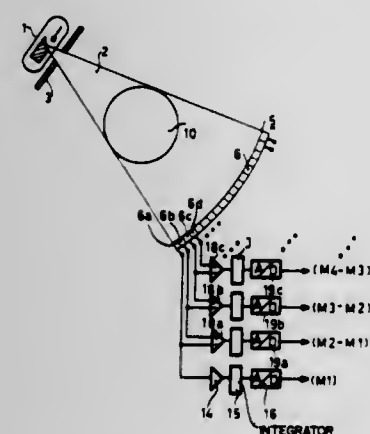
Filed Mar. 27, 1981, Ser. No. 248,631

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012648

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—19

8 Claims



1. In a device for determining the absorption distribution of radiation in a flat examination zone in a body, comprising: a radiation source which is rotatable about the body and which emits a fan-shaped radiation beam which extends in the plane and which completely irradiates the examination zone from different directions; a detector array which comprises individual detectors for generating detector output signals which are a measure of the absorption of radiation; means for amplifying the detector output signals; analog-to-digital converters for converting the amplified signals to digital form; and means for generating and displaying the absorption distribution from the detector output signals; the improvement comprising: means connected to at least a part of the detector array which, for each pair of adjacent detectors therein, form a difference measurement value which is proportional to the difference between the corresponding, non-amplified detector output signals; further means, connected to at least one detector of said part, which form an absolute measurement value which is proportional to its signal; and adding means which add the difference measurement value to the absolute measurement value.

4,413,352  
X-RAY STEREOSCOPIC CINEMATOGRAPHY APPARATUS

Kohsaku Nishio, Ootahara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

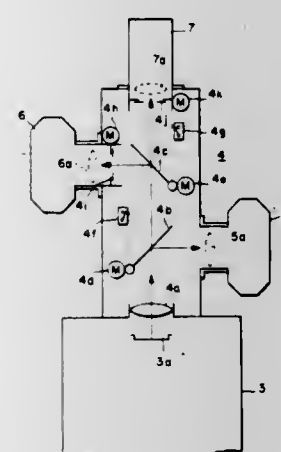
Filed Oct. 30, 1981, Ser. No. 316,674

Claims priority, application Japan, Oct. 30, 1980, 55-152668

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—42

7 Claims



1. An X-ray stereoscopic cinematography apparatus for selectively producing images of an object in a stereoscopic cinematography mode, a single cinematography mode, and a fluoroscopy mode by means of first and second cinecameras, each of the cinecameras including a rotatable shutter and an associated shutter position detector generating shutter position signals, the shutter of the first cinecamera being out of phase with the shutter of the second cinecameras, the apparatus comprising:

an X-ray tube having at least a pair of focal spots from which X-rays are independently irradiated through the object to create an X-ray image thereof;

means for converting said X-ray image to a corresponding optical image;

an optical system device for selectively distributing said optical image, said optical system device including a first half-mirror having a reflection rate of substantially one-half and being positionable in a first position to reflect said optical image to said first cinecamera and in a second position removed from the light path of said optical image and a second half-mirror having a comparatively low transmission rate and being positionable into a first position to reflect said optical image to said second cinecamera and a second position removed from the light path of the optical image;

a television camera for receiving the light intensity of said optical image not reflected by said first and second half-mirrors and for converting said received optical image to corresponding electric signals;

a mode setter for selecting one of said stereoscopic cinematography mode, single cinematography mode, and said fluoroscopy mode;

a radiographic control device for controlling the positioning of said first and second half-mirrors into and out of said first and second positions, for controlling photographing of said optical image by said first and second cinecameras, and for issuing X-ray exposure control switching signals synchronized to the positions of said shutters of said first and second cinecameras in accordance with said shutter position signals; and

means for selectively performing on-off control of the X-rays irradiated from each of said focal spots of said X-ray tube responsive to said X-ray exposure control switching signals.

4,413,353

X-RAY ENCODING SYSTEM USING AN OPTICAL GRATING

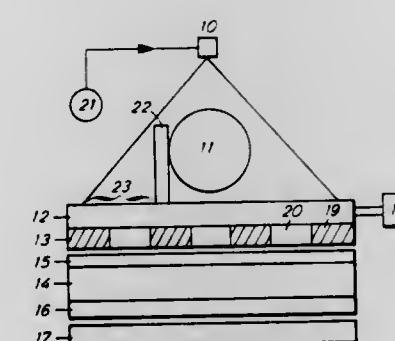
Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025; Bruno Strul, 2633 Waverley St., Palo Alto, Calif. 94306, and Robert E. Alvarez, 2369 Laura La., Mountain View, Calif. 94043

Filed Sep. 3, 1981, Ser. No. 299,208

Int. Cl.<sup>3</sup> A61B 6/00; G01N 23/04; G03B 41/16; H04N 5/32

U.S. Cl. 378—062

26 Claims



6. Apparatus for encoding x-ray image onto a photosensitive surface for subsequent decoding with a scanning operation comprising:

a scintillating screen which converts the impinging x-ray image information into a light image; and

a one-dimensional optical grating having opaque and transparent parallel strips of substantially equal width placed between the scintillating screen and the photosensitive surface whereby the x-ray image is encoded as modulations of the grating pattern.

4,413,354

X-RAY DIFFRACTION CAMERA

Vincent J. Mannors, New South Wales, Australia, assignor to Commonwealth of Australia, Canberra, Australia

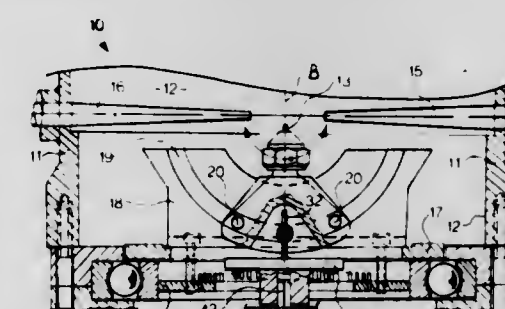
Filed Feb. 3, 1981, Ser. No. 231,081

Claims priority, application Australia, Feb. 5, 1980, PE2248

Int. Cl.<sup>3</sup> G01M 23/20

U.S. Cl. 378—81

4 Claims



1. An x-ray camera comprising a sample mounting including a sample support to position the sample at a predetermined location, means to receive and support a film, means to direct x-rays at the sample so that scattered rays leaving said sample expose said film, and drive means to rotate said sample about two generally normal axes intersecting at said location, said drive means including a hypocycloidal gear train having a base gear to which said mounting is attached, said base gear being rotatable about one of said axes, and a planetary gear meshingly engaged with said base gear and wherein said sample support is coupled to said planetary gear so as to be rotated about the other axis.

4,413,355

ROTARY ANODE TYPE X-RAY TUBE

Toshio Matsumoto, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

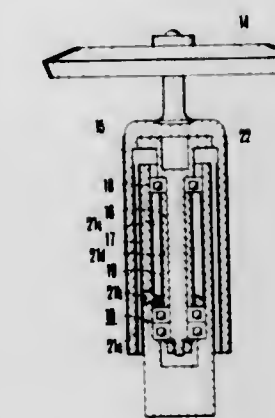
Filed Feb. 12, 1981, Ser. No. 234,010

Claims priority, application Japan, Mar. 26, 1980, 55-37433

Int. Cl.<sup>3</sup> H01J 35/04

U.S. Cl. 378—127

8 Claims



1. A rotary anode type X-ray tube having an enclosure, a target rotatably supported within the enclosure and serving as a source of X-ray generation, a cylindrical rotor connected to the target, for rotating the target by the action of rotating magnetic field produced by a winding provided around the enclosure, a rotary shaft on the central axis of the rotor for rotation of the target, and a stationary cylindrical housing concentric with the rotor interposed between the rotor and rotary shaft, for supporting the rotary shaft through rolling bearing means having inner and outer races, said X-ray tube having means interposed between said rotor and said rotary shaft for reducing the difference of temperature between the inner and outer races of said rolling bearing means to 50° C. or less comprising blackening surface treatment films formed on the opposed surfaces of said shaft mounting said inner race and the inner surface of said stationary cylindrical housing supporting said outer race.

4,413,356

FLAT ROTARY-ANODE X-RAY TUBE

Walter Hartl, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 84,971, Oct. 15, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 315,700

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845007

Int. Cl.<sup>3</sup> H01J 35/04

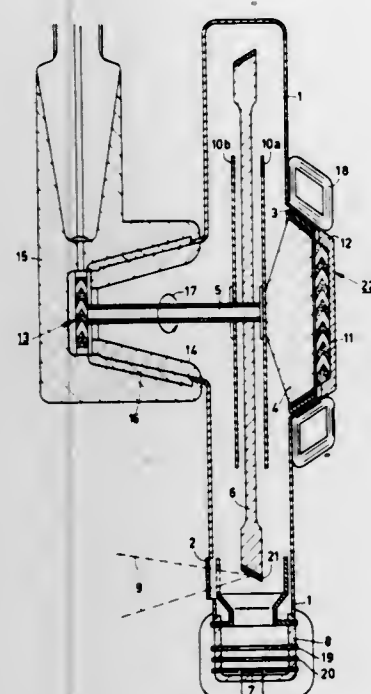
U.S. Cl. 378—132

5 Claims

1. An X-ray tube comprising a housing containing a rotary-anode attached to a shaft for rotation therewith around a longitudinal axis of the shaft, electromotive means for effecting rotation of the shaft, and a plurality of bearings each including first and second parts which are disposed around the axis and rotatable relative to each other, the first part of each bearing being attached to an inner surface of the housing and the second part being attached to the shaft, thereby effecting rotatable mounting of the anode within the housing, the improvement comprising providing at least one of said bearings in the form of a sleeve bearing, the second part of the sleeve bearing being attached to the shaft by means of



an intermediate electrical insulator having a tapered end in closer proximity to the anode than the respective bearing,



the diameter of said tapered end decreasing with decreasing axial distance from the anode.

## DESIGN PATENTS

GRANTED NOV. 1, 1983

### ERRATA

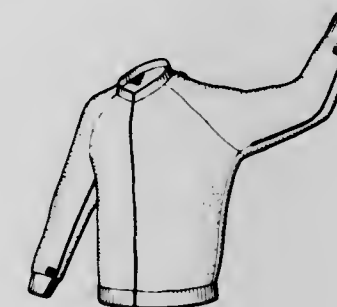
For	See
CLASS	PATENT NO.
D02-159 .....	271,225
D06-093 .....	271,234



## DESIGNS

NOVEMBER 1, 1983

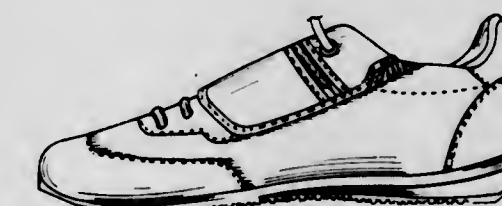
271,154  
SWEATSHIRT OR SIMILAR ARTICLE  
Matthew M. Dowling, 21 Dalton Ct., Pacheco, Calif. 94553  
Filed May 11, 1981, Ser. No. 262,334  
Term of patent 14 years  
Int. Cl. D2-02  
U.S. Cl. D2-184



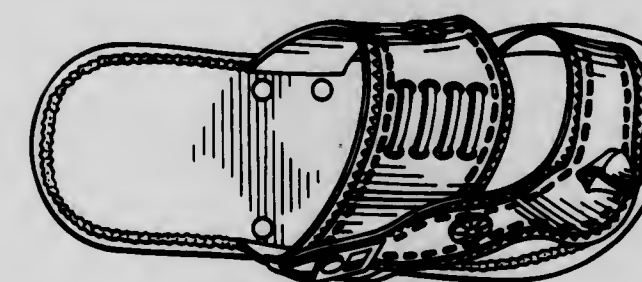
271,156  
PEDICURE SANDAL  
Margaret Williamson, 27303 Dewdrop Ave., Canyon Country, Calif. 91351  
Filed Jul. 20, 1981, Ser. No. 284,934  
Term of patent 14 years  
Int. Cl. D2-04  
U.S. Cl. D2-270



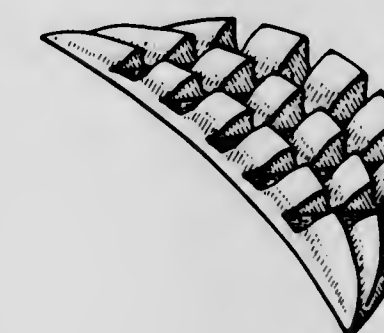
271,157  
ATHLETIC SHOE WITH POCKET  
Robert J. Gamm, Olivette, Mo., assignor to Envoys U.S.A., Inc., Maryland Heights, Mo.  
Filed Sep. 25, 1980, Ser. No. 190,849  
Term of patent 14 years  
Int. Cl. D2-04  
U.S. Cl. D2-309



271,155  
SANDAL OR SIMILAR ARTICLE  
Mansour Mansour, 409 Waldo St., New Castle, Pa. 16101  
Filed Jun. 19, 1981, Ser. No. 275,149  
Term of patent 14 years  
Int. Cl. D2-04  
U.S. Cl. D2-270



271,158  
RUNNING SHOE HEEL  
Thomas P. Hopper, R.F.D. #1, Box 689, Durham, Conn. 06422  
Filed Sep. 15, 1980, Ser. No. 187,200  
Term of patent 14 years  
Int. Cl. D2-04  
U.S. Cl. D2-317





271,159

**BASEBALL SHOE SOLE**

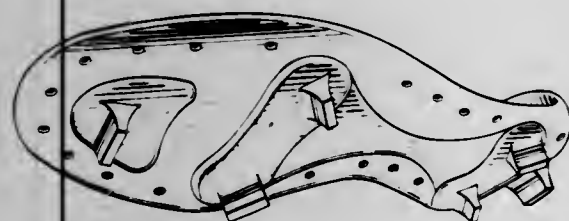
Roberto Muller-Feigelstock, Scarsdale, N.Y., assignor to Pony International, Inc., New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,336

Term of patent 14 years

Int. Cl. D2—04

U.S. Cl. D2—317



271,160

**FLASHLIGHT HOLDER**

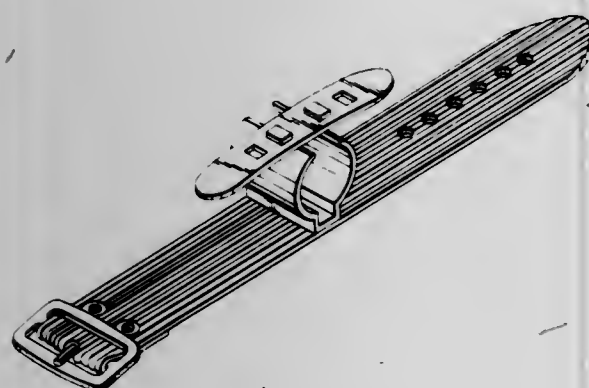
Gerald A. Sherwin, 34740 Jaclyn Dr., Solon, Ohio 44139

Filed Apr. 12, 1982, Ser. No. 367,743

Term of patent 14 years

Int. Cl. D02—07

U.S. Cl. D2—400



271,161

**VIDEO CASSETTE BOOK COVER STORAGE RECEPTACLE PACKAGE**

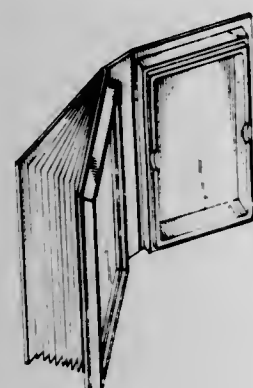
Edward M. Compton, 7116 Three Chopt Rd., Richmond, Va. 23226

Filed Feb. 27, 1981, Ser. No. 238,751

Term of patent 14 years

Int. Cl. D3—02

U.S. Cl. D3—35



271,162

**SPORTS EQUIPMENT CARRIER**

Bobby L. Evans, Box 156, McConnell, W. Va. 25633

Filed Mar. 16, 1981, Ser. No. 244,214

Term of patent 14 years

Int. Cl. D3—02

U.S. Cl. D3—36



271,163

**BICYCLE SADDLE CUSHION**

George F. Johnson, High Meadow Rd., Troy, N.Y. 12180

Filed Aug. 6, 1981, Ser. No. 290,710

Term of patent 14 years

Int. Cl. D12—11

U.S. Cl. D6—48.1



271,164

**SEAT**

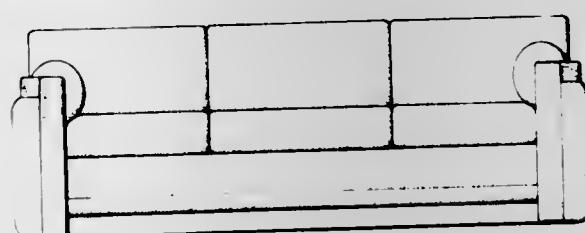
Morris F. Fisher, North Palm Beach, Fla., assignor to Futorian Corporation, Amsterdam, N.Y.

Filed Oct. 16, 1981, Ser. No. 311,854

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—63



271,165

**SOAP DISPENSER**

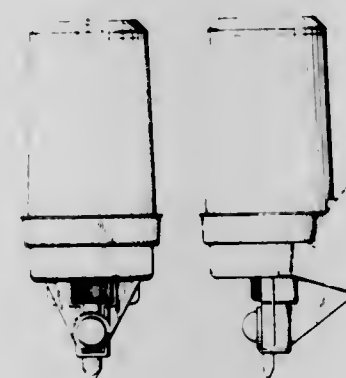
Lars B. Lander, Zug, Switzerland, assignor to Molnlycke AB, Gothenburg, Sweden

Filed Dec. 10, 1979, Ser. No. 102,114

Term of patent 14 years

Int. Cl. D23—02

U.S. Cl. D6—95



271,166

**TABLE**

Anthony J. Morabito, 930 E. Middle Ave., San Martin, Calif. 95046

Filed Jun. 4, 1981, Ser. No. 270,595

Term of patent 14 years

Int. Cl. D6—99

U.S. Cl. D6—152



271,167

**TABLE BASE**

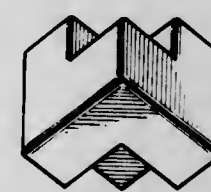
Lawrence F. Caulkett, 2206 Oak St., #E, Santa Monica, Calif. 90405

Filed Dec. 21, 1979, Ser. No. 106,092

Term of patent 14 years

Int. Cl. D6—06

U.S. Cl. D6—196



271,168

**DISPLAY FRAME**

Andrew R. Antonczyk, 1030 N. State, Chicago, Ill. 60610

Filed Jun. 29, 1981, Ser. No. 278,058

Term of patent 14 years

Int. Cl. D6—07

U.S. Cl. D6—242



271,169

**FOOD CONTAINER/HOLDER**

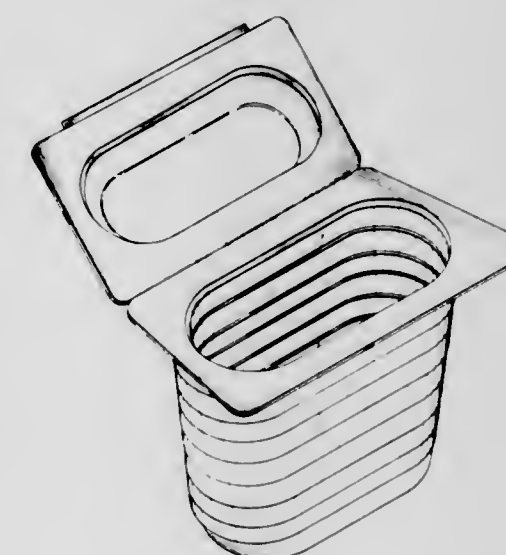
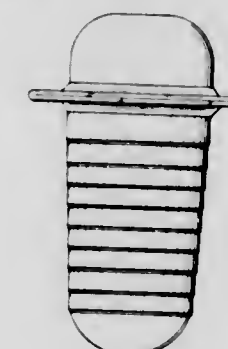
John C. Hollenbeck, c/o Riede, Rosenberg, McCale &amp; Cahill, 1000 Fourth St., San Rafael, Calif. 94901

Filed Apr. 2, 1981, Ser. No. 250,114

Term of patent 14 years

Int. Cl. D07—01

U.S. Cl. D7—16

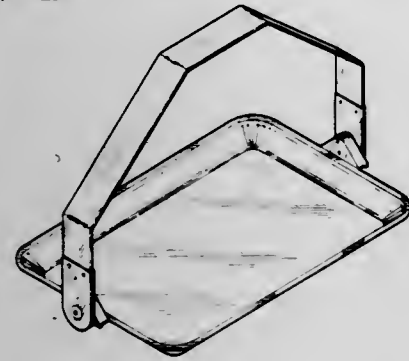




271,170  
TRAY

Arthur Goldstein, School La., Swavesey, Cambridge, England  
Filed May 22, 1981, Ser. No. 266,173  
Term of patent 14 years  
Int. Cl. D07-99

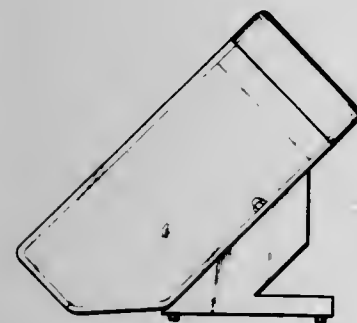
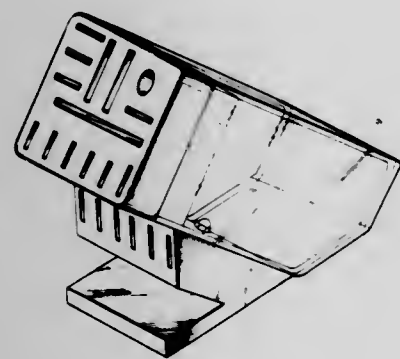
U.S. Cl. D7-19



271,171  
KNIFE HOLDER

Stuart L. Kinkade, 1390 West Evans, Denver, Colo. 80223  
Filed May 26, 1981, Ser. No. 267,088  
Term of patent 14 years  
Int. Cl. D7-06

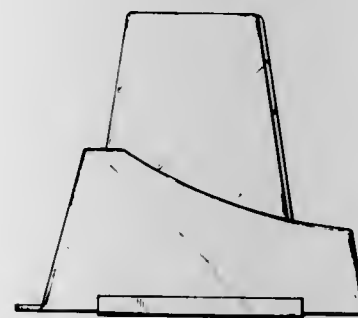
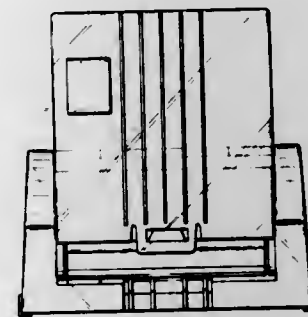
U.S. Cl. D7-74



271,172  
TOOTHPICK DISPENSER

Jack Allen, P.O. Box 3443, Knoxville, Tenn. 37917  
Filed Feb. 2, 1982, Ser. No. 345,088  
Term of patent 14 years  
Int. Cl. D07-06

U.S. Cl. D7-75



271,173  
ICE BUCKET

Antoine H. Keshishian, 8132 Springfield Village Dr., Springfield, Va. 22152  
Filed Apr. 8, 1981, Ser. No. 252,252  
Term of patent 14 years  
Int. Cl. D07-01

U.S. Cl. D7-78

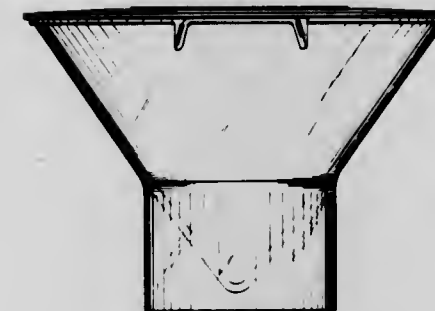
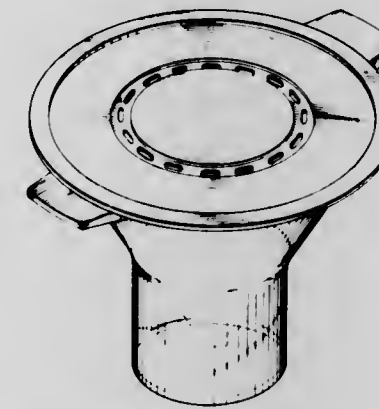


271,174  
MICROWAVE CORN POPPER WITH COVER

Robert F. Bowen, Burlington, and Thomas J. Martel, North Reading, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 18, 1982, Ser. No. 349,746  
Term of patent 14 years  
Int. Cl. D07-02

U.S. Cl. D7-325

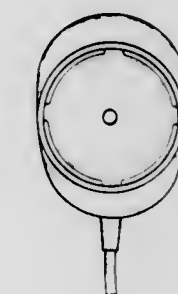
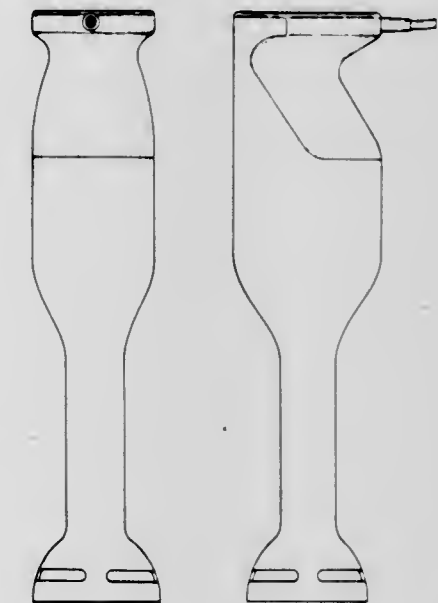


271,176  
HAND HELD ELECTRIC MIXER

Jose Z. Zimnowicz, Barcelona, Spain, assignor to Braun Española, S.A., Spain

Filed Oct. 22, 1980, Ser. No. 199,621  
Claims priority, application Spain, Apr. 23, 1980, 96876  
Term of patent 14 years  
Int. Cl. D7-04

U.S. Cl. D7-379

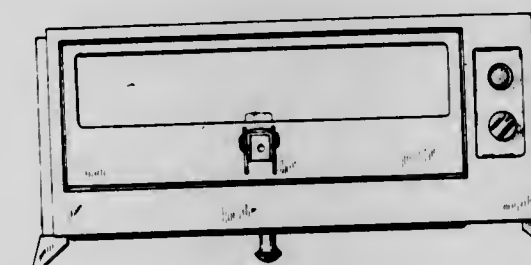


271,175  
PIZZA OVEN

Ferdinand F. Salzmann, Prairie du Sac, and James P. Swinehart, Oregon, both of Wis., assignors to Wisco Industries, Inc., Oregon, Wis.

Filed Jun. 2, 1981, Ser. No. 269,639  
Term of patent 14 years  
Int. Cl. D7-02

U.S. Cl. D7-350

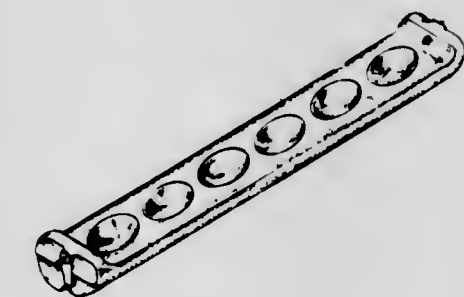


271,177  
PROOFING TRAY

John M. Lucido, Richardson, Tex., assignor to Bettendorf Stanford Inc., Salem, Ill.

Filed Nov. 16, 1981, Ser. No. 321,568  
Term of patent 14 years  
Int. Cl. D7-02

U.S. Cl. D7-387





271,178

**LOCKING PIECE FITTER FOR LABELS, PRICE TAGS  
AND THE LIKE**Tadaaki Suzuki, Saitama, Japan, assignor to Satogosei Co., Ltd.,  
Tokyo, Japan

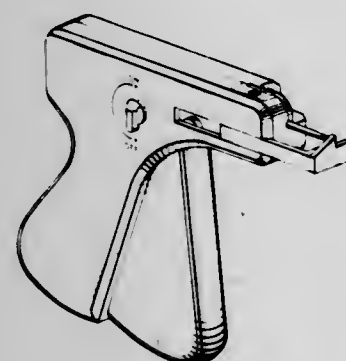
Filed Mar. 18, 1981, Ser. No. 244,862

Claims priority, application Japan, Sep. 19, 1980, 55-38728

Term of patent 14 years

Int. Cl. D8—05

U.S. Cl. D8—51



271,179

**COMBINED TOUCH UP HAIR BRUSH WITH HAIR  
SPRAY DISPENSER**

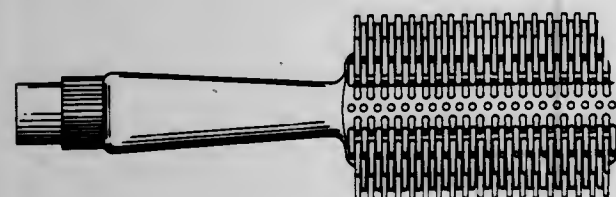
Elbert R. Smith, 311 Spenseth Dr., Montgomery, Ala. 36109

Filed Jul. 2, 1981, Ser. No. 279,820

Term of patent 14 years

Int. Cl. D9—01; D4—02

U.S. Cl. D9—338



271,180

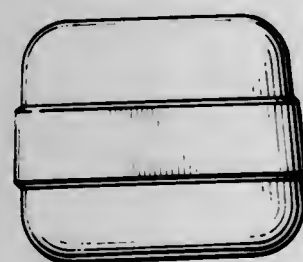
**JAR FOR COSMETICS**Richard Runyon, Los Angeles, Calif., assignor to Celle, Inc.,  
Beverly Hills, Calif.

Filed Jul. 7, 1981, Ser. No. 281,283

Term of patent 14 years

Int. Cl. D9—03

U.S. Cl. D9—370

271,181  
BOTTLERichard Runyon, Los Angeles, Calif., assignor to Celle, Inc.,  
Beverly Hills, Calif.

Filed Jul. 7, 1981, Ser. No. 281,282

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—389



271,182

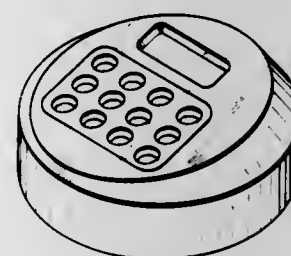
**ELECTRONIC TIMER**Anthony J. Iorio, Providence, R.I., assignor to Avitar, Inc.,  
Rumford, R.I.

Filed Apr. 9, 1981, Ser. No. 252,382

Term of patent 14 years

Int. Cl. D10—03

U.S. Cl. D10—40



271,183

**WIND SOCK**Kenneth L. Conrad, and Suzanne G. Sadow, both of 1518 First  
Ave. South, Seattle, Wash. 98104

Filed Aug. 13, 1981, Ser. No. 292,347

Term of patent 14 years

Int. Cl. D10—04

U.S. Cl. D10—59



271,184

**CASING GAUGE**Jim A. Gentry, Tulsa, Okla., assignor to E. C. Carman Gauge  
Co., Inc., Tulsa, Okla.

Filed Dec. 7, 1981, Ser. No. 308,275

Term of patent 14 years

Int. Cl. D10—04

U.S. Cl. D10—73



271,185

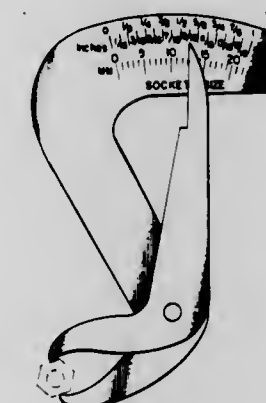
**MEASURING CALIPER**Andrew J. Dermond, c/o Sherry Personnel Service, Inc., 318  
Robinson Building, Philadelphia, Pa. 19102

Filed Nov. 2, 1981, Ser. No. 317,002

Term of patent 14 years

Int. Cl. D10—04

U.S. Cl. D10—73



271,186

**NECKLACE**Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt,  
Vaduz, Liechtenstein

Filed Feb. 9, 1981, Ser. No. 232,802

Claims priority, application Italy, Aug. 13, 1980, 35957[U]

Term of patent 14 years

Int. Cl. D11—01

U.S. Cl. D11—3

271,187  
NECKLACEMarina Bulgari, Athens, Greece, assignor to Zoldia Anstalt,  
Vaduz, Liechtenstein

Filed Feb. 26, 1981, Ser. No. 238,545

Claims priority, application Italy, Sep. 2, 1980, 359788/80[U]

Term of patent 14 years

Int. Cl. D11—01

U.S. Cl. D11—3

271,188  
PENDANTPeter G. Weeks, Toronto, Canada, assignor to Rembrandt Jew-  
elry Manufacturing Limited, Scarborough, Canada

Filed Jul. 27, 1981, Ser. No. 286,829

Term of patent 14 years

Int. Cl. D11—01

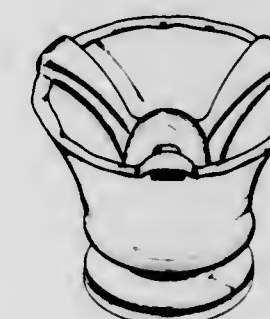
U.S. Cl. D11—79

271,189  
PLANTERPaul D. Peterson, 3310 Azahar Pl., Rancho La Costa, Calif.  
92008Division of Ser. No. 74,880, Sep. 12, 1979, Pat. No. Des.  
268,256. This application Jun. 24, 1982, Ser. No. 391,547

Term of patent 14 years

Int. Cl. D11—02

U.S. Cl. D11—154





**271,190  
FLAGSTAFF**

Muratd Dostourian, Gobernador Vigodet 2837, Montevideo, Uruguay

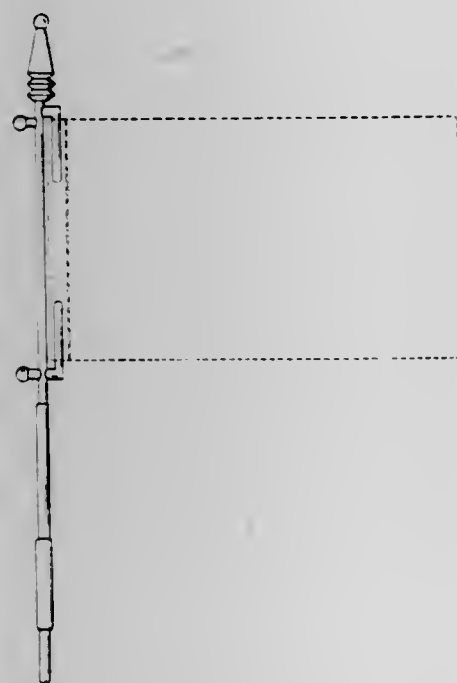
Filed Feb. 4, 1981, Ser. No. 231,434

Claims priority, application Argentina, Aug. 4, 1980, 39973

Term of patent 14 years

Int. Cl. D11-05

U.S. Cl. D11-181



**271,191  
AIR SPOILER**

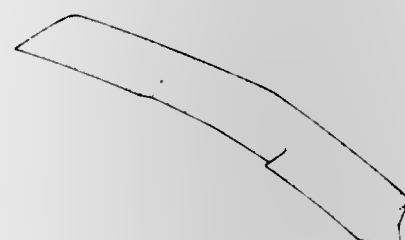
Ralph J. Amprim, Warren; Leif H. Chapman, Sylvan Lake, and Richard Ruzzin, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1982, Ser. No. 354,741

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-181



**271,192  
BOAT**

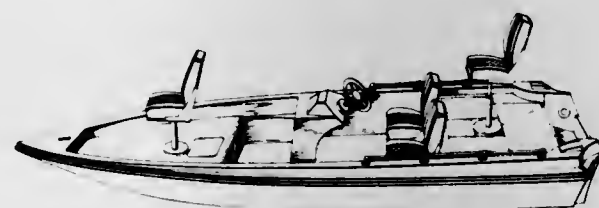
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.

Filed Jun. 5, 1981, Ser. No. 271,004

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-300



**271,193  
BOAT**

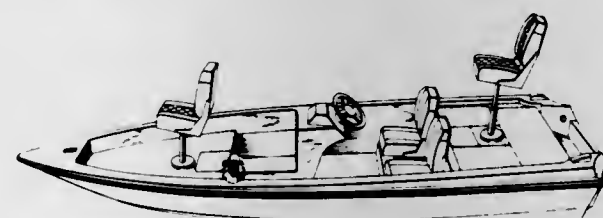
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.

Filed Jun. 5, 1981, Ser. No. 270,834

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-300



**271,194  
BOAT**

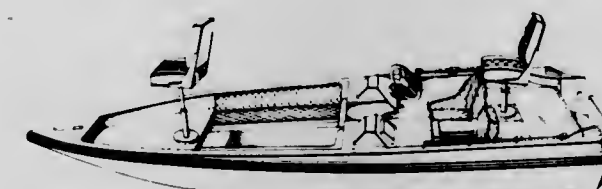
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.

Filed Jun. 4, 1981, Ser. No. 270,562

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-300



**271,195**

**FISH-BREEDING SEA VESSEL**

Aulis U. Nurmi, Sirkkalankatu 27 A 29, SF-20700 Turku 70, Finland

Filed Feb. 17, 1981, Ser. No. 234,493

Claims priority, application Finland, Aug. 19, 1980, 587/80

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-316



**271,196**

**ELECTRICAL CONNECTOR**

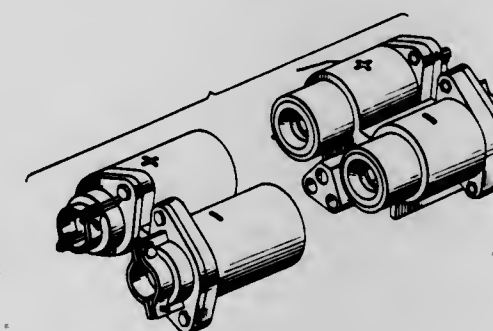
Joseph E. Tetreault, Norwell, Mass., assignor to Anderson Power Products, Inc., Boston, Mass.

Filed Sep. 6, 1979, Ser. No. 72,960

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



**271,197**

**COMBINED INTEGRATED CIRCUIT PACKAGE  
CARRIER AND SOCKET ASSEMBLY**

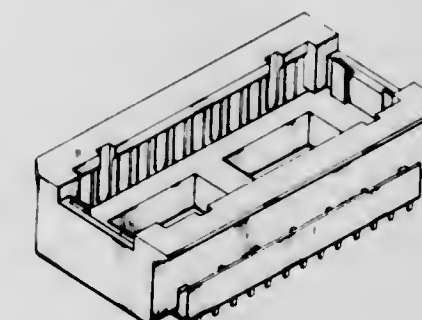
James C. Jones, Floyd County, and James A. Emerson, Washington County, both of Ind., assignors to Robinson-Nugent, Inc., New Albany, Ind.

Filed Feb. 23, 1981, Ser. No. 236,795

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



**271,198**

**TAPE CASSETTE**

Tokuza Shimizu, 4-7, Tamagawa-denenchohfu 2-chome, Setagaya-ku, Tokyo, Japan

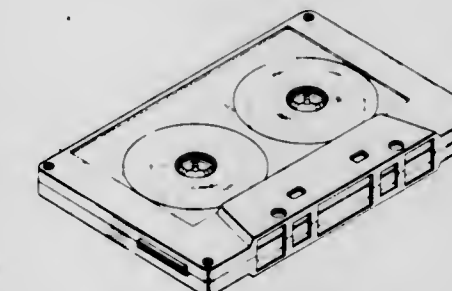
Filed Oct. 30, 1980, Ser. No. 202,202

Claims priority, application Japan, May 16, 1980, 55-19242

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-11



**271,199**

**PICK-UP CARTRIDGE**

Josef F. G. Geraets, Bree, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

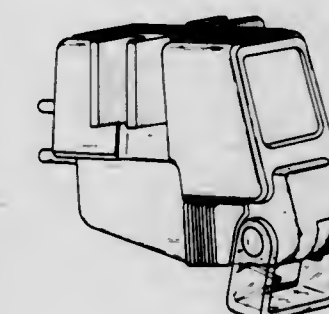
Filed Feb. 4, 1981, Ser. No. 231,533

Claims priority, application Benelux, Aug. 6, 1980, 54901-01

Term of patent 14 years

Int. Cl. D14-07

U.S. Cl. D14-28



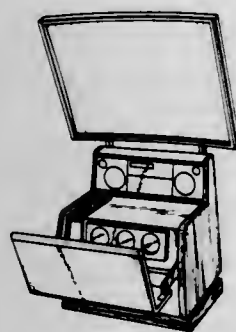


271,200

**PROJECTION TELEVISION RECEIVER**

Kozo Kawasaki, Ikeda, and Hiroyuki Katada, Osaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan  
 Filed May 6, 1981, Ser. No. 261,080  
 Claims priority, application Japan, Nov. 8, 1980, 55-46791  
 Term of patent 14 years  
 Int. Cl. D14—03

U.S. Cl. D14—79

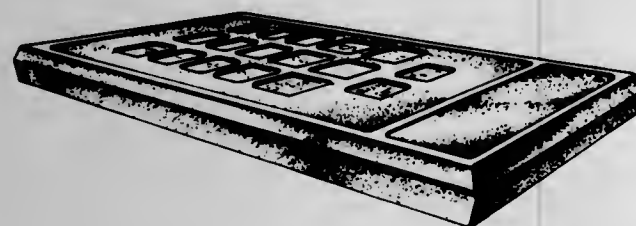


271,201

**REMOTE CONTROL UNIT FOR CABLE TELEVISION CONVERTER OR SIMILAR ARTICLE**

Svein T. Nordberg, El Paso, Tex., assignor to GTE Products Corporation, Stamford, Conn.  
 Filed Aug. 24, 1981, Ser. No. 295,206  
 Term of patent 14 years  
 Int. Cl. D14—03

U.S. Cl. D14—85

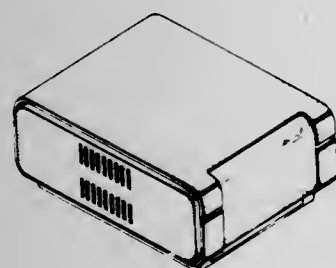


271,202

**COMPUTER DISK DRIVE**

Evert Endt, Paris, France, assignor to Thomson-CSF, Paris, France  
 Filed Jan. 21, 1981, Ser. No. 226,662  
 Claims priority, application Hague, Jul. 21, 1980, DM/000276  
 Term of patent 14 years  
 Int. Cl. D14—02

U.S. Cl. D14—109

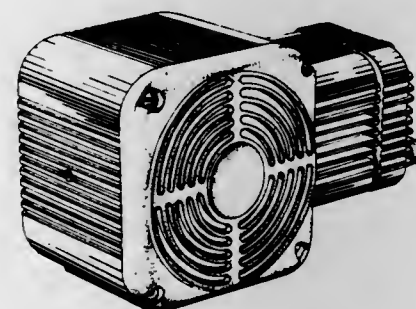


271,203

**AIR COMPRESSOR WITH AXIALLY EXTENDING COOLING FINS**

Peter Schütt; Klaus Nitsche; Horst Grindler; Hans-Joachim Hofmann, and Hans E. Slany, all of Baden-Württemberg, Fed. Rep. of Germany, assignors to Durr-Dental GmbH & Co., KG, Baden-Württemberg, Fed. Rep. of Germany  
 Filed Feb. 27, 1981, Ser. No. 239,166  
 Term of patent 14 years  
 Int. Cl. D15—02

U.S. Cl. D15—9

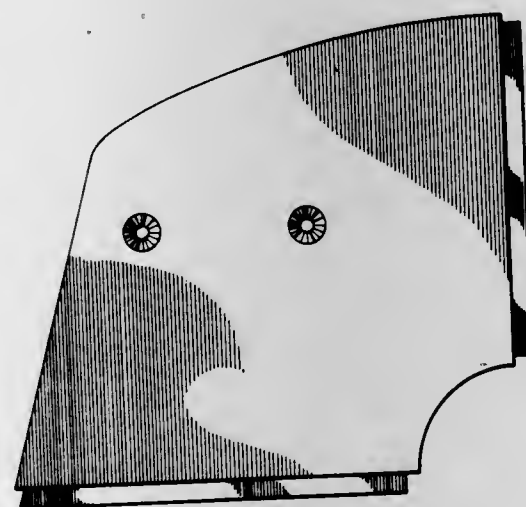


271,204

**ABRASIVE BLASTING WHEEL LINER**

W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362  
 Filed Apr. 22, 1981, Ser. No. 256,608  
 Term of patent 14 years  
 Int. Cl. D15—09

U.S. Cl. D15—126

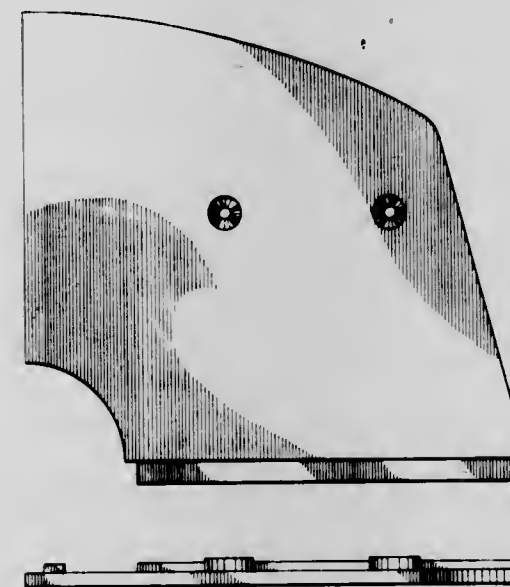


271,205

**ABRASIVE BLASTING WHEEL LINER**

W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362  
 Filed Apr. 22, 1981, Ser. No. 256,498  
 Term of patent 14 years  
 Int. Cl. D15—09

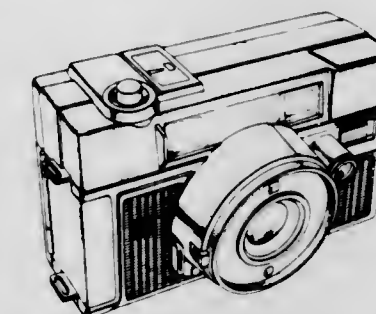
U.S. Cl. D15—126

271,207  
CAMERA

Koichi Soda, Toyko, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 4, 1981, Ser. No. 299,611  
 Claims priority, application Japan, Mar. 4, 1981, 56-8861  
 Term of patent 14 years  
 Int. Cl. D16—07

U.S. Cl. D16—1

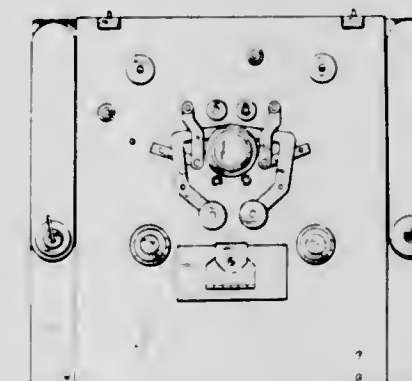


271,208

**FILM TRANSPORT UNIT FOR A MOTION PICTURE PROJECTOR**

Donald G. Daggett, and Barry C. Brown, both of St. Leonards, Australia, assignors to Syncsound Pty. Limited and Donald Daggett Pty. Limited, both of St. Leonards, Australia  
 Filed Jan. 30, 1981, Ser. No. 230,183  
 Claims priority, application Australia, Aug. 15, 1980, 81808  
 Term of patent 14 years  
 Int. Cl. D16—99

U.S. Cl. D16—26



271,206

**DETENT COUPLED DRILL BIT ADAPTER**

William M. Devey, Elk Grove, Calif., assignor to Melvin C. Bell, Elk Grove, Calif.

Filed Mar. 11, 1981, Ser. No. 242,451  
 Term of patent 14 years  
 Int. Cl. D15—09; D24—02

U.S. Cl. D15—138



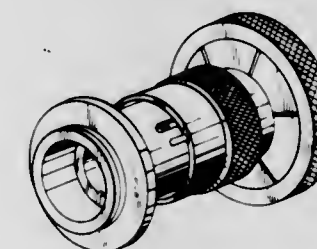
271,209

**OPTICAL COUPLER FOR A MICROSCOPE OR SIMILAR ARTICLE**

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Filed Sep. 17, 1982, Ser. No. 419,124  
 Term of patent 14 years  
 Int. Cl. 16—05

U.S. Cl. D16—38





271,210

**ELECTRONIC FLASH ADAPTER**

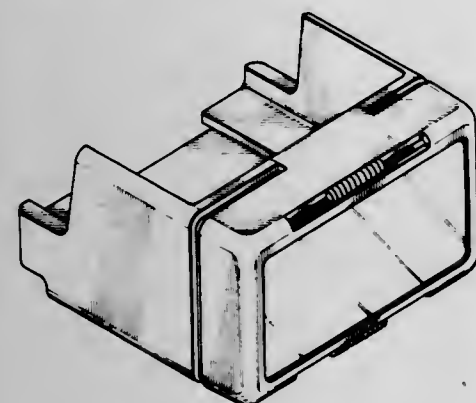
Steven W. Shull, Culver City, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Apr. 3, 1981, Ser. No. 250,688

Term of patent 14 years

Int. Cl. D16—05

U.S. Cl. D16—42



271,211

**SUN GLASSES**

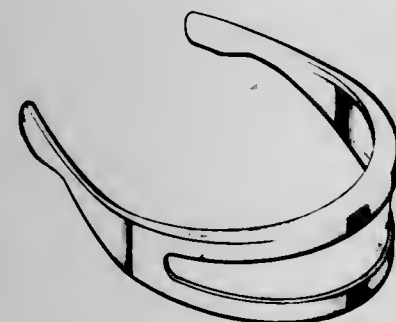
Niclas P. Raicevic, 4700 Colfax, North Hollywood, Calif. 91602

Filed Jun. 2, 1981, Ser. No. 269,644

Term of patent 14 years

Int. Cl. D16—06; D2—03

U.S. Cl. D16—112



271,212

**PEN OR SIMILAR ARTICLE**

Kunio Itoh, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha d.b.a. Pentel Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,798

Claims priority, application Japan, Oct. 28, 1981, 56-48052

Term of patent 14 years

Int. Cl. D19—06

U.S. Cl. D19—48



271,213

**GUMMED STACK OF PAPER CLIPS**

Hisao Sato, Dai-ni Hikari-so, 10 Toyotama Minami 3-chome, Nerima-ku, Tokyo, Japan

Filed Jun. 29, 1981, Ser. No. 278,347

Claims priority, application Japan, May 28, 1981, 56-022960

Term of patent 14 years

Int. Cl. D19—02

U.S. Cl. D19—65



271,214

**PAPER CLIP**

Hisao Sato, Dai-ni Hikari-so, 10 Toyotama Minami 3-chome, Nerima-ku, Tokyo, Japan

Filed Jun. 29, 1981, Ser. No. 278,348

Claims priority, application Japan, May 28, 1981, 56-22961

Term of patent 14 years

Int. Cl. D19—02

U.S. Cl. D19—65



271,215

**COMBINED ADHESIVE CONTAINER AND DISPENSER**

Philip B. Hinkle, West Hartford, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Sep. 14, 1981, Ser. No. 301,782

Term of patent 14 years

Int. Cl. D19—06

U.S. Cl. D19—66



271,216

**AUDIT TAPE SCANNER**

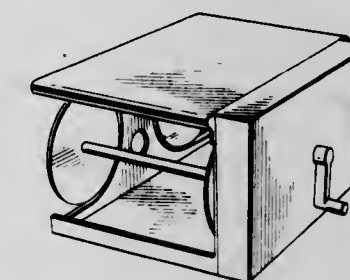
Paul E. Becking, P.O. Box 3200, Monterey, Calif. 93940

Filed Aug. 3, 1981, Ser. No. 289,200

Term of patent 14 years

Int. Cl. D19—02

U.S. Cl. D19—89



271,218

**DISPLAY STAND**

Ian W. Farmer, Waltham Cross, England, assignor to Arken, Inc., Bloomfield Hills, Mich.

Filed Jul. 10, 1981, Ser. No. 282,240

Claims priority, application United Kingdom, Feb. 13, 1981, 998893

Term of patent 14 years

Int. Cl. D20—03

U.S. Cl. D20—10



271,217

**COMBINED COPY STAND AND ELECTRONIC INTERFACE DEVICE**

James W. M. Bee, Palo Alto, and William J. Bauchwitz, Redondo Beach, both of Calif., assignors to Northern Telecom Inc., Nashville, Tenn.

Filed Jun. 15, 1981, Ser. No. 273,405

Term of patent 14 years

Int. Cl. D19—02

U.S. Cl. D19—91



271,219

**DISK FOR MATRIX DISPLAY**

Donald Morrison, Spokane, Wash., assignor to American Sign &amp; Indicator Corporation, Spokane, Wash.

Filed Dec. 11, 1980, Ser. No. 215,364

Term of patent 14 years

Int. Cl. D20—03

U.S. Cl. D20—42





271,220

## VIDEO GAME JOYSTICK APPARATUS

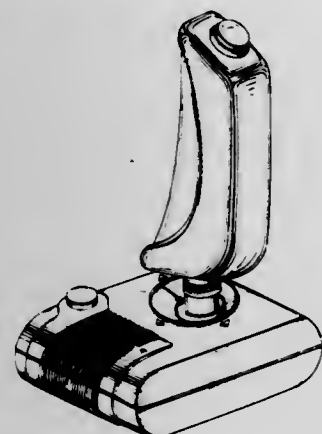
Harry Fox, New York, N.Y., and Peter A. L. Law, Hong Kong, Hong Kong, assignors to Spectravideo International Limited, Hong Kong, Hong Kong

Filed Nov. 9, 1982, Ser. No. 440,359

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-48



271,221

## WATER WHISTLE

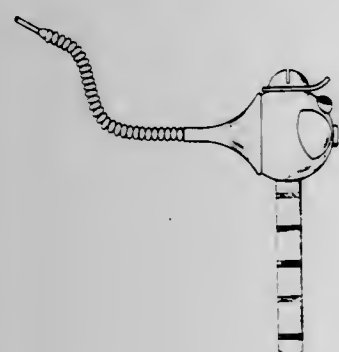
A. Edward Fogarty, and Bonnie R. Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579

Filed Dec. 29, 1980, Ser. No. 220,705

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-64



271,222

## SPINNING TOY

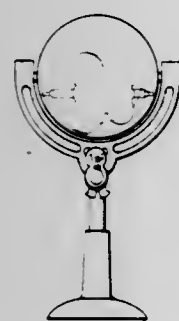
Merry S. Richm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 5, 1982, Ser. No. 346,108

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-92



271,223

## TOY SWIVEL CRANE OR SIMILAR ARTICLE

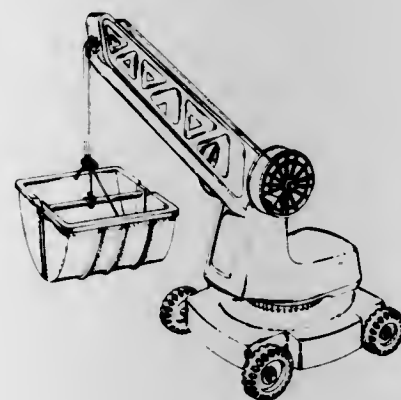
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106

Filed Jan. 28, 1981, Ser. No. 229,164

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-132



271,224

## PERFORATED ANIMAL FIGURE TOY

Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,956

Claims priority, application Japan, Oct. 27, 1980, 55-44837

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-154



271,225

## ANIMAL FIGURE

Donald A. Burrows, 4839 Imperial Dr., Richton Park, Ill. 60471

Filed Dec. 24, 1980, Ser. No. 220,118

Term of patent 14 years

Int. Cl. D21-01; D11-02

U.S. Cl. D21-159

271,226  
GRIP INDEXER FOR SPORTS RACKETS

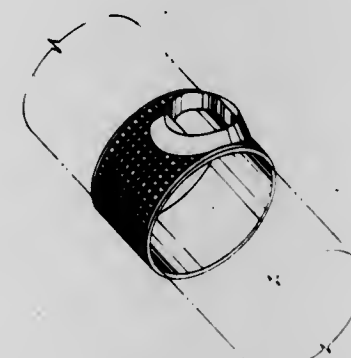
Mitchell J. Slayman, 30701 Fairgreens West, Laguna Niguel, Calif. 92677

Filed Apr. 20, 1981, Ser. No. 255,772

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-221



271,227

## SWIMMING GLOVE

Alicia C. Francisco, Miami, Fla., assignor to Aqua Gloves, Inc., Miami, Fla.

Filed Apr. 6, 1981, Ser. No. 251,516

Term of patent 14 years

Int. Cl. D21-02; D2-06

U.S. Cl. D21-238



271,228

## PLAYGROUND CLIMBER

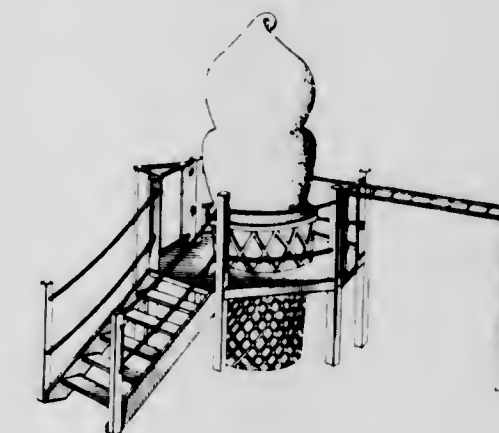
Valentine J. Zimmerman; Mary H. Abel, both of Galesville, and Lloyd J. Rubbelke, Clintonville, all of Wis., assignors to E. E. Industries Inc., Galesville, Wis.

Filed Nov. 24, 1980, Ser. No. 209,418

Term of patent 14 years

Int. Cl. D21-03

U.S. Cl. D21-245



271,229

## GUN GRIP

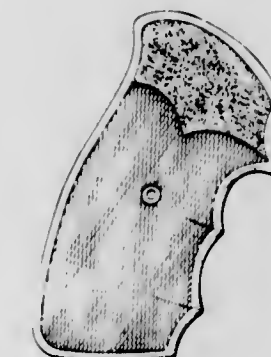
Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed Sep. 4, 1981, Ser. No. 299,409

Term of patent 14 years

Int. Cl. D22-01

U.S. Cl. D22-1





271,230  
RIFLE

Wade R. Ingham, P.O. Box 6422, Midland, Tex. 79701  
Filed Dec. 15, 1981, Ser. No. 330,978  
Term of patent 14 years  
Int. Cl. D22—01

U.S. Cl. D22—6

271,231  
INSECT LURE

Daniel M. Stout, Kirkwood, Mo., assignor to Whitmire Research Laboratories, Inc., St. Louis, Mo.  
Filed Jun. 17, 1981, Ser. No. 274,549  
Term of patent 14 years  
Int. Cl. D22—06

U.S. Cl. D22—19

271,232  
LIVE BAIT FISHING RIG

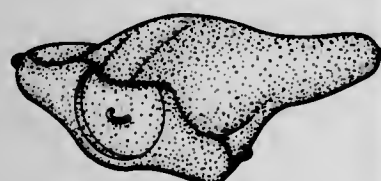
Kevin P. Cole, 326-120th La. NW., Coon Rapids, Minn. 55433  
Filed Jul. 17, 1981, Ser. No. 284,353  
Term of patent 14 years  
Int. Cl. D22—05

U.S. Cl. D22—27

271,233  
FISHING LURE

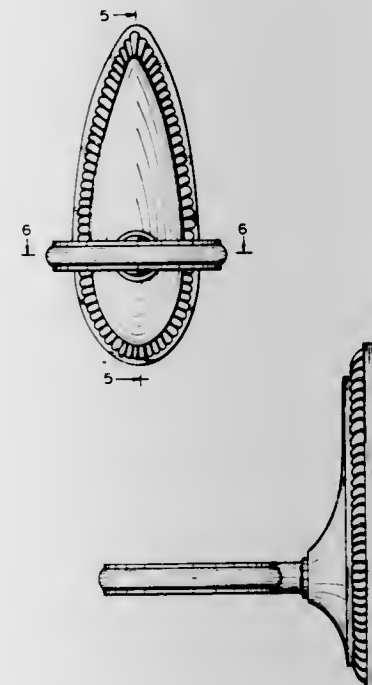
David D. Moore, 4970 Birch Ave., Rockford, Ill. 61111  
Division of Ser. No. 16,337, Feb. 28, 1979, Pat. No. Des. 261,921. This application Aug. 28, 1981, Ser. No. 297,496  
Term of patent 14 years  
Int. Cl. D22—05

U.S. Cl. D22—27

271,234  
GLASS HOLDER

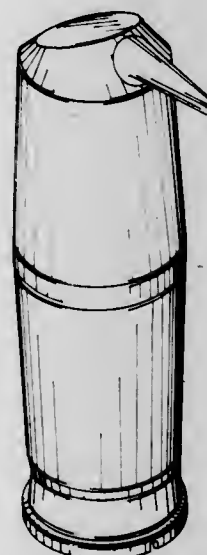
Andre Bennato, Paris, France, assignor to Sanistyl Creations-S.A.R.L., Nogent sur Marne, France  
Filed Sep. 25, 1980, Ser. No. 190,828  
Claims priority, application France, Mar. 26, 1980, 800981  
Term of patent 14 years  
Int. Cl. D23—02

U.S. Cl. D6—93

271,235  
WATER FILTER

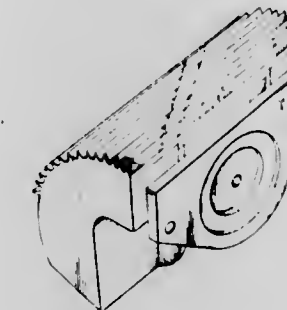
Raymond E. Ward, 3716 E. Main, Mesa, Ariz. 85202  
Filed Feb. 2, 1981, Ser. No. 231,226  
Term of patent 14 years  
Int. Cl. D23—01

U.S. Cl. D23—4



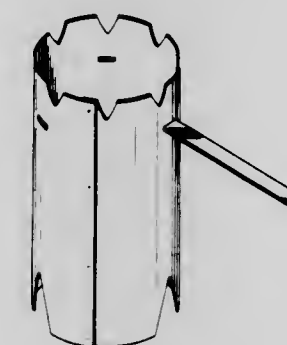
271,236  
SEMI-AUTOMATIC BAILER PLUG  
William C. Patriarca, Annandale, Va., and Leonard J. McGraw, Pittsburgh, Pa., assignors to PAT-N-MAC, Large, Md.  
Filed Oct. 1, 1980, Ser. No. 175,394  
Term of patent 14 years  
Int. Cl. D23—03

U.S. Cl. D23—19



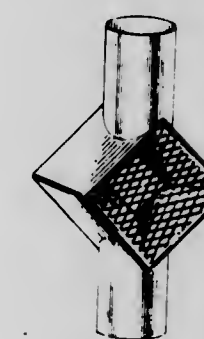
271,237  
CHARCOAL STACK LIGHTER  
Robert G. Palmer, deceased, late of Easton, Pa.; by Mrs. Robert G. Palmer, representative, Box 402 R.D. #4, Easton, Pa. 18042, and Frank Rose, 112 River Rd., Bldg. 1, Clifton, N.J. 07014  
Filed Apr. 27, 1981, Ser. No. 257,826  
Term of patent 14 years  
Int. Cl. D23—03

U.S. Cl. D23—90.1



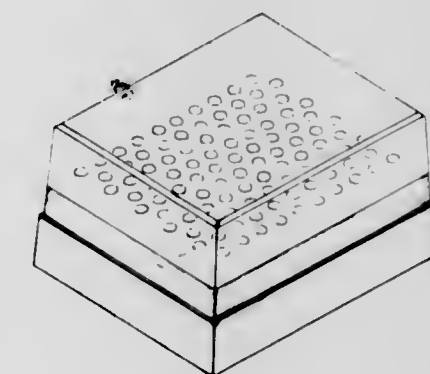
271,238  
PASSIVE HEAT EXCHANGER  
Benjamin L. Valencia, 38 1/2 B New York St., Dover, N.H. 03820  
Filed Aug. 13, 1981, Ser. No. 292,508  
Term of patent 14 years  
Int. Cl. D23—03

U.S. Cl. D23—136



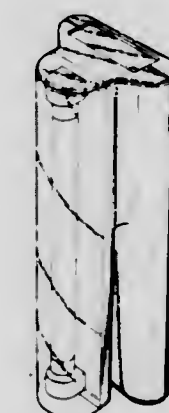
271,239  
CONTAINER AND RACK FOR PIPETTE TIPS OR SIMILAR ARTICLE  
David J. Lemieux, Middleton, Mass., and Kenneth Rainin, Piedmont, Calif., assignors to Rainin Instrument Co., Inc., Woburn, Mass.  
Filed Apr. 3, 1981, Ser. No. 250,139  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D24—32



271,240  
COMBINED FLASHLIGHT AND FLUORESCENT LANTERN  
Shun Yau Tang, Hong Kong, Hong Kong, assignor to Accel Manufacturing Limited, Kowloon, Hong Kong  
Filed Feb. 25, 1981, Ser. No. 238,173  
Claims priority, application United Kingdom, Sep. 1, 1980, 996372  
Term of patent 14 years  
Int. Cl. D26—02

U.S. Cl. D26—42





271,241

## LIGHTING FIXTURE

Guy Vrignaud, Grenoble, France, assignor to Allibert S.A.,  
Grenoble, France

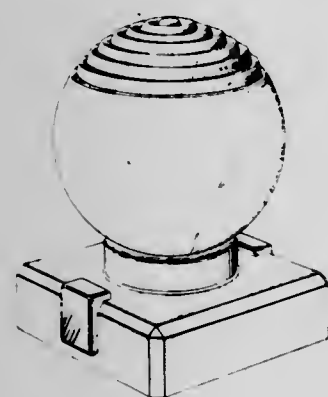
Filed Feb. 4, 1981, Ser. No. 231,349

Claims priority, application Hague, Aug. 18, 1980, DM/000

314

Term of patent 14 years  
Int. Cl. D26—104, 05

U.S. Cl. D26—85

271,243  
SPRAY

Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y  
Fornituras, S.A., Barcelona, Spain

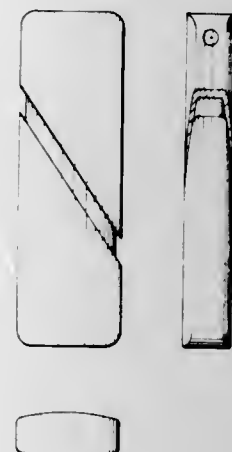
Filed Jul. 22, 1981, Ser. No. 285,774

Claims priority, application Spain, Feb. 14, 1981, 98,814

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—91.1

271,244  
SPRAY

Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y  
Fornituras, S.A., Barcelona, Spain

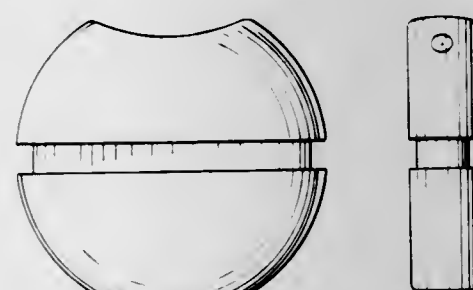
Filed Jul. 22, 1981, Ser. No. 285,775

Claims priority, application Spain, Feb. 14, 1981, 98,814

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—91.1

271,242  
FOGLIGHT LENS

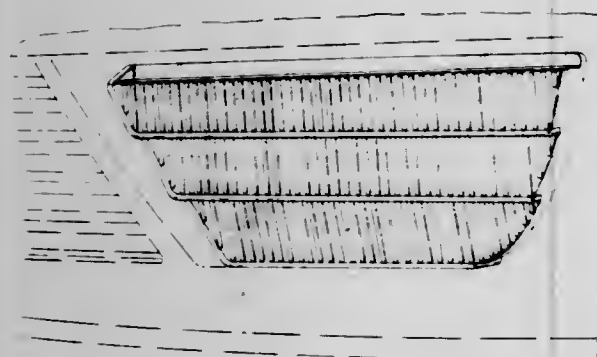
Werner Heinz, Tiefenbrunn; Arno Jambor, Vaihingen, and Adolf  
Schmidt, Sindelfingen, all of Fed. Rep. of Germany, assignors  
to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of  
Germany

Filed Aug. 13, 1980, Ser. No. 177,713

Claims priority, application Fed. Rep. of Germany, Feb. 13,  
1980, 5118

Term of patent 14 years  
Int. Cl. D26—06

U.S. Cl. D26—122

271,245  
SPRAY

Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y  
Fornituras, S.A., Barcelona, Spain

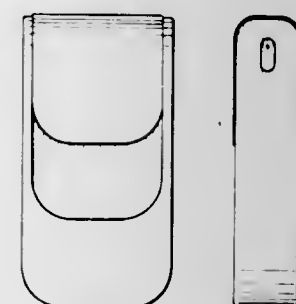
Filed Jul. 22, 1981, Ser. No. 285,776

Claims priority, application Spain, Feb. 14, 1981, 98,814

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—91.1



271,246

COMBINED RESPIRATOR FACE PIECE AND STRAP  
UNITS

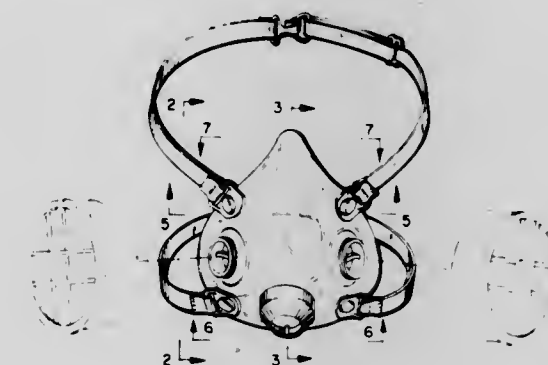
James N. Matheson, Mission Viejo, and Phillip L. Lowry, Costa  
Mesa, both of Calif., assignors to U.S.D. Corp., Santa Ana,  
Calif.

Filed Mar. 2, 1981, Ser. No. 239,693

Term of patent 14 years

Int. Cl. D29—02

U.S. Cl. D29—7



271,247

## TRASH CAN WITH LID

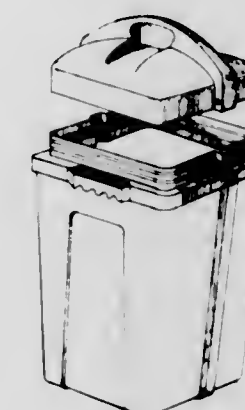
Norman C. Lee, Greensboro, N.C., assignor to Zarn, Inc., Reids-  
ville, N.C.

Filed Oct. 19, 1981, Ser. No. 312,519

Term of patent 14 years

Int. Cl. D7—07

U.S. Cl. D34—07



271,248

## TRASH CONTAINER

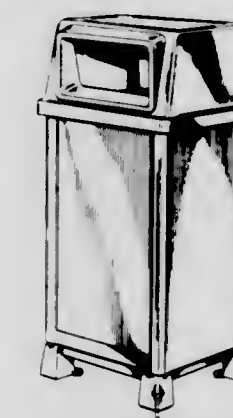
Dale T. Maza, Frederick County; Glen E. Tomblin, and Harold  
E. Ruckman, both of Winchester, all of Va., assignors to  
Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Apr. 1, 1982, Ser. No. 364,450

Term of patent 14 years

Int. Cl. D7—07

U.S. Cl. D34—8





# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- AB Volvo: See—  
Borgesen, Kjell I., 4,412,455, Cl. 73-862.120.  
Fagrell, Erik T., 4,412,686, Cl. 280-166.000.
- Abbott, Franklin P., to Lubrizol Corporation, The. Fuels containing N-substituted amino morpholines. 4,412,846, Cl. 44-63.000.
- Abbott, Thomas I.; and Jones, Cynthia G., to Eastman Kodak Company. Radiographic elements exhibiting reduced crossover. 4,413,053, Cl. 430-502.000.
- Abcor, Inc.: See—  
Mir, Leon, 4,412,922, Cl. 210-638.000.
- Abe, Akira; and Tanimura, Tomihisa, to Tomy Kogyo Co., Inc. Juggling toy. 4,412,399, Cl. 46-47.000.
- Abe, Kazuhiko: See—  
Fujie, Kunio; Uchida, Akinari; and Abe, Kazuhiko, 4,412,527, Cl. 126-400.000.
- Abe, Masahiro; and Fujio, Masayuki, to Hitachi Ltd. Vortex blower. 4,412,781, Cl. 415-53.00R.
- Abe, Masaru: See—  
Maeda, Muneyoshi; and Abe, Masaru, 4,412,575, Cl. 152-209.00R.
- Abe, Ryuzo: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,292, Cl. 360-72.200.  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,299, Cl. 360-137.000.
- Abe, Yoshihiro: See—  
Ogata, Yoshihiro; Abe, Yoshihiro; and Takahashi, Harumi, 4,412,732, Cl. 355-3.0TR.
- Abendroth, Werner, to Carl Still GmbH & Co. KG, Firma. Coke oven door having profiled sealing diaphragm. 4,412,891, Cl. 202-248.000.
- Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., to Stauffer Chemical Company. Process for forming alkyl vanadates as a catalyst. 4,412,956, Cl. 260-429.00R.
- Achtnig, Klaus-Peter: See—  
Forberg, Horst; Achtnig, Klaus-Peter; and Stoewe, Anneliese, 4,412,374, Cl. 29-566.400.
- Ackerman, LaVern L., to Clark Equipment Company. Drive belt connection for an agricultural pickup device. 4,412,612, Cl. 198-697.000.
- Adams, Frank, to Dresser Industries, Inc. Vane type fluid motor manifold. 4,412,795, Cl. 418-86.000.
- Adams, Kenneth D., to Singer Company, The. Light assembly for a sewing machine. 4,413,310, Cl. 362-90.000.
- Adler, Roy L.; Hassner, Martin; and Moussouris, John P., to International Business Machines Corporation. Method and apparatus for generating a noiseless sliding block code for a (1,7) channel with rate 1/2. 4,413,251, Cl. 340-347.0DD.
- Adlerstein, Joseph K.; Nitka, Heinz F.; Naiman, Charles S.; and Weiss, Aryeh, to Xyram Corporation. X-Ray imaging apparatus. 4,413,280, Cl. 358-111.000.
- Aebi, Rudolf: See—  
Vogel, Christian; and Aebi, Rudolf, 4,412,855, Cl. 71-118.000.
- Aebli, Heinrich: See—  
Schlumberger, Jules; and Aebli, Heinrich, 4,412,816, Cl. 432-239.000.
- Agence Spatiale Europeenne: See—  
Laine, Robert, 4,412,851, Cl. 55-160.000.
- Agency of Industrial Science and Technology, The: See—  
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848, Cl. 48-197.00R.
- Agfa-Gevaert Aktiengesellschaft: See—  
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,413,055, Cl. 430-567.000.
- Ahern, Douglas K.; and Cleaveland, Edwin E., III, to Eastman Kodak Company. Vacuum document feeder. 4,412,738, Cl. 355-76.000.
- Ahjopalo, Hannu T., to Instrumentarium oy. Weight controlled and hydrostatic pressure adjustable peritoneal dialysis apparatus. 4,412,917, Cl. 210-104.000.
- Ahmed, M. Mushtaq: See—  
Archer, David H.; and Ahmed, M. Mushtaq, 4,412,910, Cl. 208-11.00R.
- Aiba, Yasuaki, to Honda Giken Kogyo Kabushiki Kaisha. Engine support structure for motorcycles. 4,412,597, Cl. 180-228.000.
- Aichinger, Dietmar; Breuer, Hans-Werner; and Obrist, Albert, to Albert Obrist AG. Method of closing the mouth of a container and a screw cap for use therein. 4,412,409, Cl. 53-485.000.
- Aidla, Harold. High efficiency fireplace modification. 4,412,525, Cl. 126-140.000.
- Ajinomoto Company Incorporated: See—  
Iwashita, Yuji; Ajisaka, Katsumi; and Iwasaki, Keiji, 4,412,989, Cl. 424-177.000.
- Ajisaka, Katsumi: See—  
Iwashita, Yuji; Ajisaka, Katsumi; and Iwasaki, Keiji, 4,412,989, Cl. 424-177.000.
- Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, to Fujitsu Limited. Method for exposing an electron beam. 4,413,187, Cl. 250-491.100.
- Akesson, Norman B.: See—  
Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., 4,412,654, Cl. 239-171.000.
- Akira, Matsuno: See—  
Katsuhisa, Kohyama; Katsuhiko, Nakamura; and Akira, Matsuno, 4,413,103, Cl. 525-469.000.
- Akiyama, Toshiyuki: See—  
Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, 4,413,284, Cl. 358-213.000.
- Albany International Corp.: See—  
Coplan, Myron J.; and Gotz, Gertrud, 4,413,106, Cl. 525-534.000.
- Albert Obrist AG: See—  
Aichinger, Dietmar; Breuer, Hans-Werner; and Obrist, Albert, 4,412,409, Cl. 53-485.000.
- Albrecht, Joachim; Duerig, Thomas; and Richter, Dag, to BBC Brown, Boveri & Company Limited. Process for manufacturing a component from a titanium alloy, as well as a component and the use thereof. 4,412,872, Cl. 148-11.50F.
- Alco Standard Corporation: See—  
Wulf, Karl A., 4,412,813, Cl. 432-11.000.
- Alcolac, Inc.: See—  
Panzer, George W.; and Nehmsmann, Louis J., 4,412,944, Cl. 252-551.000.
- Allen-Bradley Company: See—  
Schultz, Ronald E.; Veres, Jonathan S.; and German, Mark J., 4,413,319, Cl. 364-200.000.
- Allen Engineering Corporation: See—  
Allen, J. Dewayne, 4,412,803, Cl. 425-456.000.
- Allen, J. Dewayne, to Allen Engineering Corporation. Adjustable support bracket for concrete finishing equipment. 4,412,803, Cl. 425-456.000.
- Allen, Robert J.: See—  
Juda, Walter; Allen, Robert J.; and Bar-Ilan, Amiram, 4,412,894, Cl. 204-119.000.
- Allied Corporation: See—  
Fenicle, Robert D., 4,413,200, Cl. 310-239.000.
- Kavesh, Sheldon; and Prevorsek, Dusan C., 4,413,110, Cl. 526-348.100.
- Allis-Chalmers Corporation: See—  
Faulkner, Bobby P.; and Weinecke, Michael H., 4,412,909, Cl. 208-11.00R.
- Altenpohl, Paul J.: See—  
Altenpohl, William F.; and Altenpohl, Paul J., 4,412,620, Cl. 209-3.100.
- Altenpohl, William F.; and Altenpohl, Paul J. Plural hook poultry grading carrier system. 4,412,620, Cl. 209-3.100.
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- Altman, Konrad, to Messerschmitt-Boelkow-Blohm GmbH. Gasdynamic laser. 4,413,345, Cl. 372-90.000.
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Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,869, Cl. 148-2.000.
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- Alvarez, Robert E.: See—  
Macovski, Albert; Strul, Bruno; and Alvarez, Robert E., 4,413,353, Cl. 378-062.000.
- Alzeta Corporation: See—  
Schreiber, Richard J.; Kesselring, John P.; and Kendall, Robert M., 4,412,523, Cl. 126-92.00C.
- Amada Company, Ltd.: See—  
Hirata, Tadashi; and Sakamoto, Katsuyoshi, 4,412,469, Cl. 83-552.000.
- Amalgamated Sugar Company, The: See—  
Schoenrock, Karlheinz W. R.; Kearney, Michael M.; and Rearick, D. Eugene, 4,412,866, Cl. 127-46.200.
- Amano, Saichiro: See—  
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denso Kabushiki Kaisha, 4,413,295, Cl. 360-110.000.
- Amedro, Albert; Audemard, Bernard; and De Mul, Rene, to Compagnie Generale de Radiologie. Eddy current inspection probe for non-destructive inspection of tubes with a probe body having an outer coiled spring sheath and an inner plastic material sheath. 4,413,231, Cl. 324-220.000.



- American Can Company: See—  
Phalin, Thomas L.; and Ulmes, James J., 4,412,440., Cl. 72-46.000.
- American Cyanamid Company: See—  
Herbes, William F., 4,413,100., Cl. 525-398.000.  
Kubas, Robert J., 4,412,613., Cl. 206-63.300.  
Loffelman, Frank F.; and Brady, Thomas E., 4,413,093., Cl. 525-185.000.
- American Medical Systems, Inc.: See—  
Burton, John H., 4,412,530., Cl. 128-1.00R.
- Ames, Douglas A. Hybrid photovoltaic-thermal device, 4,413,157., Cl. 136-248.000.
- Amity, Noach; and Gans, Michael J., to Bell Telephone Laboratories, Incorporated. Phased array antenna employing linear scan for wide angle orbital arc coverage, 4,413,263., Cl. 343-756.000.
- Ammark Corporation: See—  
Ford, Thomas H.; and Sasserath, Arend, 4,412,648., Cl. 236-42.000.
- AMP Incorporated: See—  
Huffnagle, Clifton W.; Morningstar, LeRoy J.; and Tighe, Charles I., Jr., 4,412,566., Cl. 140-147.000.  
Monroe, Kevin T., 4,412,717., Cl. 339-177.00R.
- Ampex Corporation: See—  
Hathaway, Richard A., 4,413,293., Cl. 360-85.000.
- Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) N.V.: See—  
Ruyter, Thomas J., 4,412,790., Cl. 417-306.000.
- Ancher, Jean-Francois R.: See—  
Bourguery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001., Cl. 424-272.000.
- Anderson, Chester L. Record handler, 4,413,034., Cl. 428-172.000.
- Anderson, Neal P.: See—  
Salkeld, Richard W.; Anderson, Neal P.; and Giamei, Anthony F., 4,412,577., Cl. 164-122.200.
- Anderson, Roland M.: See—  
Brummond, Gerald G.; Klein, Paul E.; and Anderson, Roland M., 4,412,820., Cl. 433-18.000.
- Anderson, Ronald W.; and Lamanna, Richard A., to Mobil Oil Corporation. Storage stable water-dilutable acid adducted epoxy based coating for metal food contact surfaces, 4,413,015., Cl. 426-131.000.
- Anderson, Tor S.: See—  
Usaitalo, Seppo J.; von Alfthan, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451., Cl. 73-432.0PS.
- Ando, Haruhisa: See—  
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,413,283., Cl. 358-213.000.
- Andre, Wieme, to N.V. Bekaert S.A. Ski, 4,412,687., Cl. 280-610.000.
- Angelica Corporation: See—  
Carnaghi, Arturo A., 4,412,369., Cl. 24-266.000.
- Apic S.p.A.: See—  
Fiorini, Mario; and Valentini, Claudio, 4,413,142., Cl. 562-567.000.
- Anritsu Electric Company Limited: See—  
Matsuka, Shoji; Kobayashi, Ikutaro; and Minowa, Junichiro, 4,413,179., Cl. 250-322.000.
- Anthony, Richard R. Eyelash retractor, 4,412,532., Cl. 128-20.000.
- Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, to Hitachi, Ltd. Facsimile apparatus, 4,413,285., Cl. 358-260.000.
- Aoki, Akihiro: See—  
Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, 4,413,114., Cl. 528-183.000.
- Aoki, Keiji: See—  
Mitsuyasu, Masaki; Aoki, Keiji; and Nakatomi, Takayoshi, 4,412,520., Cl. 123-488.000.
- Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, to Hitachi, Ltd. Solid-state imaging device, 4,413,283., Cl. 358-213.000.
- Apem of South Carolina: See—  
Shermo, Stanley A., 4,413,026., Cl. 427-407.100.
- Applied Coatings International, Inc.: See—  
Beale, Harry A., 4,412,899., Cl. 204-192.00R.
- Applied Materials, Inc.: See—  
Wang, David N.; Egito, Frank D.; and Maydan, Dan, 4,412,885., Cl. 156-643.000.
- Arai, Takeshi: See—  
Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, 4,413,148., Cl. 568-578.000.
- Aranovich, Viktor L.: See—  
Khmelkov, Stanislav F.; Ramazanov, Mnaidar R.; Soldatov, Mikhail P.; Beskaravainy, Vadim V.; Aranovich, Viktor L.; and Soldaev, Lev K., 4,412,936., Cl. 252-408.100.
- Archer, David H.; and Ahmed, M. Mushtaq, to Westinghouse Electric Corp. Recovery of fuel from oil shale, 4,412,910., Cl. 208-11.00R.
- Arcuri, Edward J.; and Donaldson, Terrence L. Continuous production of ethanol by use of flocculent *zymomonas mobilis*, 4,413,058., Cl. 435-161.000.
- Arena, Blaise J., to UOP Inc. Hydrogenation in aqueous solutions, 4,413,152., Cl. 568-863.000.
- Arlauskas, Alfonso, to General Motors Corporation. Slide bolt latch assembly, 4,412,695., Cl. 292-173.000.
- Arnold, David E.: See—  
Beretsky, Irwin; Arnold, David E.; and Pellegrini, Bruno, 4,412,544., Cl. 128-660.000.
- Artos Engineering Company: See—  
Stoehr, Herbert M., 4,412,443., Cl. 72-181.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098., Cl. 525-314.000.  
Yamashita, Kunihiko; and Kimura, Muneaki, 4,412,908., Cl. 208-8.00R.
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Iwanade, Hisao; and Negoro, Ikuo, 4,412,737., Cl. 355-55.000.  
Tachihara, Satoru; and Okudaira, Sadao, 4,412,725., Cl. 350-426.000.
- Asai, Nobuyoshi: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005., Cl. 424-285.000.
- Aschenbeck, Weldon J.: See—  
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608., Cl. 194-4.00D.
- Asdigian, George, to UOP Inc. Hydrocarbon treating process having minimum gaseous effluent, 4,412,912., Cl. 208-206.000.
- Ashland Oil, Inc.: See—  
Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., 4,412,914., Cl. 208-253.000.
- Assmann, Gerd; and Helb, Horst-Dietrich, to Boehringer Ingelheim Zentrale GmbH. Process and apparatus for distribution and preparation of samples from primary vessels, 4,413,060., Cl. 436-47.000.
- Atlantic Richfield Company: See—  
Hearn, Daniel P., 4,413,182., Cl. 250-357.100.
- Atchimie: See—  
Kornbaum, Simon; and Chenard, Jean-Yves, 4,412,897., Cl. 204-159.200.
- Audemard, Bernard: See—  
Amedro, Albert; Audemard, Bernard; and De Mul, Rene, 4,413,231., Cl. 324-220.000.
- Audibert, Francois; Sugier, Andre; and Van Landeghem, Hugo, to Institut Francais du Petrole. Process for operating highly exothermic reactions, 4,413,063., Cl. 518-700.000.
- Aufdermarsh, Carl A., Jr., to Du Pont de Nemours, E. I., and Company. Perfluoroelastomer blends, 4,413,094., Cl. 525-187.000.
- Austin, Richard G.: See—  
Michaelson, Robert C.; Austin, Richard G.; and White, Donald A., 4,413,151., Cl. 568-860.000.
- Autin, Jacques: See—  
Probst, Nicolas J.; Iker, Jean; and Autin, Jacques, 4,412,941., Cl. 252-511.000.
- Automated Packaging Systems, Inc.: See—  
Lerner, Bernard; and Liebhart, Dana J., 4,412,876., Cl. 156-64.000.
- Automatix Incorporated: See—  
Libby, Charles J., 4,413,180., Cl. 250-236.000.
- Automotive Products Limited: See—  
Windsor, Harry M., 4,412,461., Cl. 74-866.000.
- Avellino, Frank J.; and Hoffman, John E., to GTE Products Corporation. Mold clear detector, 4,412,798., Cl. 425-137.000.
- Avery, Hollon B.; and Schoendorfer, Donald W., to Haemonetics Corporation. Two plane self-balancing centrifuge, 4,412,831., Cl. 494-46.000.
- Aviram, Ari; Kovac, Zalata; and Myers, Robert A., to International Business Machines Corporation. Method and apparatus for erasing ink jet printing, 4,413,266., Cl. 346-21.000.
- AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH: See—  
Obermayer, Bertram; Greier, Josef; and Mandl, Walter, 4,412,513., Cl. 123-55.0VE.
- B. F. Goodrich Company, The: See—  
Hall, Dale R.; and Bush, Charles N., 4,413,065., Cl. 521-82.000.  
Olson, Alan J.; and Vielhaber, Robert G., 4,412,898., Cl. 204-159.180.
- B. V. Koninklijke Maatschappij "De Schelde": See—  
Broodman, Johannes J., 4,412,560., Cl. 138-143.000.
- Baba, Fumio: See—  
Mochizuki, Hirohiko; Nakano, Masao; Baba, Fumio; Nakano, Tomio; and Takemae, Yoshihiro, 4,413,272., Cl. 357-65.000.  
Baba, Masaharu; and Honda, Kiyokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Socket for baseless incandescent lamp, 4,412,716., Cl. 339-176.00L.
- Baba, Yasuharu, to Sony Corporation. Sawtooth wave oscillator, 4,413,237., Cl. 331-108.00C.
- Babushkin, Jury V.: See—  
Markhasin, Alexandr B.; Belyaev, Gennady V.; Babushkin, Jury V.; and Petrov, Alexandr K., 4,413,341., Cl. 371-72.000.
- Bach, Lloyd G.; and Gaiser, Robert F., to Bendix Corporation. The. Fluid pressure proportioning valve and plug member therefor, 4,412,702., Cl. 303-6.00C.
- Bachar, Avi: See—  
Krupka, Yaakov; Bachar, Avi; and Yerushalmi, Shmuel, 4,413,224., Cl. 323-222.000.
- Badische Corporation: See—  
Hagen, Gerry A.; and Donnelly, Edward N., 4,412,371., Cl. 28-272.000.
- Bailey, Richard E., to General Dynamics Corporation/Convair Div. Non-contact measurement system and method for determining the contour of an electrically conductive surface, 4,413,349., Cl. 377-24.000.

- Baker Perkins Inc.: See—  
Todd, David B.; and Layfield, James D., 4,412,964., Cl. 264-143.000.
- Bakewell, Frank W.; Nicely, Thomas E.; and Stricker, C. Donald, to United States Steel Corporation. Sinkers assembly for hot-dip coating applications, 4,412,503., Cl. 118-420.000.
- Baldauf, William: See—  
Chen, Edward S.; and Baldauf, William, 4,412,892., Cl. 204-34.000.
- Baldwin Piano & Organ Company: See—  
Jones, Edward M., 4,412,470., Cl. 84-1.010.
- Ballast-Nedam Groep N.V.: See—  
Ruyter, Thomas J., 4,412,790., Cl. 417-306.000.
- Ballerini, Daniel; Chaudé, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecasteele, Jean-Paul, to Institut Francais du Petrole; and Rhone-Poulenc Industries. Assisted oil recovery with use of fermentation fluids, 4,412,925., Cl. 252-8.55D.
- Ballet Makers, Inc.: See—  
Terlizzi, Nicholas, Jr.; and Terlizzi, Donald, 4,412,393., Cl. 36-113.000.
- Balzer, Wolf-Dieter: See—  
Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoelckigt, Dieter, 4,412,933., Cl. 252-174.190.
- Bar-Ilan, Amiram: See—  
Juda, Walter; Allen, Robert J.; and Bar-Ilan, Amiram, 4,412,894., Cl. 204-119.000.
- Barker, Nicholas J.: See—  
Leveson, Richard C.; and Barker, Nicholas J., 4,413,185., Cl. 250-423.00P.
- Barlass, John W., to Thermo King Corporation. Centrifugal fan wheel with changeable pitch blades, 4,412,783., Cl. 416-186.00A.
- Barnett, John S.; and Cochrane, Sydney D. B., to Waratah General Engineering Ltd. Tree harvesting methods and machines, 4,412,569., Cl. 144-3.00D.
- Barrett, Edward A.: See—  
Sorensen, Robert; Barrett, Edward A.; and Scarnato, Thomas J., 4,412,761., Cl. 406-98.000.
- Barthelemy, Andre J., to S.A. Automobiles Citroen; and Societe d'Automobiles Peugeot. Two-speed couplings, 4,412,460., Cl. 74-752.00E.
- Barthels, Richard N., to Medtronic, Inc. Cardiac monitoring apparatus, 4,412,546., Cl. 128-709.000.
- Bartholomaeus, Reiner; Gibas, Christoph; Wolfges, Hans; Hess, Ferdinand; and Schiene, Karl, to Mannesmann Rexroth GmbH. Inductive measuring transducer for a fluidic adjusting member, 4,413,245., Cl. 336-84.00M.
- BASF Aktiengesellschaft: See—  
Blum, Adolf; and Opitz, Hans D., 4,412,837., Cl. 8-449.000.  
Dimroth, Peter; and Lottsch, Wolfgang, 4,412,949., Cl. 260-154.000.  
Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoelckigt, Dieter, 4,412,933., Cl. 252-174.190.  
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,412,942., Cl. 252-518.000.  
Reiter, Udo; Kovacs, Jenoe; and Schenck, Hans-Uwe, 4,413,117., Cl. 528-497.000.  
Wistuba, Eckehardt, 4,413,071., Cl. 523-411.000.
- BASF Farben & Fasern A.G.: See—  
Drexler, Hermann-Josef; and Poth, Ulrich, 4,413,036., Cl. 428-458.000.
- Basini, Bruno, to Selenia, Industrie Elettroniche Associate, S.p.A. Portable line tester for telecommunication system, 4,413,163., Cl. 179-175.30R.
- Bateman, Franklin B. Trailer hitch-mounted utility carrier for vehicles, 4,412,635., Cl. 224-42.03R.
- Bauer, Alphonse H.: See—  
Bauer, Michael J.; and Bauer, Alphonse H., 4,412,768., Cl. 414-24.500.
- Bauer, Michael J.; and Bauer, Alphonse H. Truck bumper incorporating hay handling device, 4,412,768., Cl. 414-24.500.
- Baumgarten, Arthur A., Jr., to Reliance Electric Company. Electronic motor protection for variable speed motors, 4,413,213., Cl. 318-332.000.
- Baumgartner Papiers, S.A.: See—  
Lebet, Jean-Pierre; and Berney, Michel, 4,412,829., Cl. 493-48.000.
- Baxter Travenol Laboratories: See—  
Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C. (said Ralph Kulin and Ronald C. Stauber assors. to), 4,412,834., Cl. 604-29.000.
- Baxter Travenol Laboratories, Inc.: See—  
Kling, John E.; Camin, Larry R.; and Scott, Douglas W., 4,412,832., Cl. 604-164.000.
- Kopp, Clinton V.; and Hitchcock, James, 4,412,553., Cl. 137-118.000.
- Zdeb, Brian D., 4,412,573., Cl. 604-415.000.
- Bayer Aktiengesellschaft: See—  
Hess, Bernhard; Schulz-Walz, Hansjochen; von Harpe, Hannes; Peltzer, Bernd; and Bottenbruch, Ludwig, 4,413,072., Cl. 523-500.000.  
Reiff, Helmut; and Sachs, Hanns I., 4,413,112., Cl. 528-73.000.  
Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, 4,413,116., Cl. 528-307.000.  
Wegner, Christian; Jabs, Gert; and Dahm, Manfred, 4,412,959., Cl. 264-4.100.
- Bayerische Motoren Werke Aktiengesellschaft: See—  
Fritzenwenger, Josef, 4,412,515., Cl. 123-198.00E.
- Bayn, William H. Firearm safety apparatus and method of using same, 4,412,397., Cl. 42-1.0LP.
- Baynes, William R., to Turco Manufacturing Co. Saddle for bar and bar-type weight, 4,412,678., Cl. 272-123.000.
- BBC Brown, Boveri & Company Limited: See—  
Albrecht, Joachim; Duerig, Thomas; and Richter, Dag, 4,412,872., Cl. 148-11.50F.
- Beale, Harry A., to Applied Coatings International, Inc. Cubic boron nitride preparation utilizing nitrogen gas, 4,412,899., Cl. 204-192.00R.
- Beale, William T., to Sunpower, Inc. Hydrodynamic lubrication system for piston devices particularly Stirling engines, 4,412,418., Cl. 60-520.000.
- Beatty, William T., to Rail-Or-Trail Corp. Braking system for railway truck, 4,412,602., Cl. 188-53.000.
- Beaudet, Leo A.; and Lennon, Donald J., to Dennison Manufacturing Company. Anodized electrostatic imaging surface, 4,413,049., Cl. 430-126.000.
- Bechtel International Corporation: See—  
Ramsden, Scott C.; and Braman, John C., 4,412,673., Cl. 254-134.3FT.
- Bechtiger, Charles G., to Sargent & Greenleaf, Inc. Time lock with anti-shock features, 4,412,436., Cl. 70-272.000.
- Beck, Barry. Fluid delivery valve extender for exterminating apparatus and the like, 4,412,656., Cl. 239-373.000.
- Beckman Instruments, Inc.: See—  
Kramer, Gordon; Lara, Elias J.; and Wollmann, Andrew F., 4,413,257., Cl. 340-815.010.  
Porter, Ronald G.; LeBlanc, Richard E.; and Siemon, Rolf W., 4,413,250., Cl. 340-310.00A.  
Strain, David H.; and Sutton, John H., III, 4,412,830., Cl. 494-12.000.
- Becton Dickinson and Company: See—  
Hoch, Louis, 4,412,548., Cl. 128-764.000.  
Sparks, Daniel R., 4,412,754., Cl. 400-496.000.
- Beecham Group Limited: See—  
Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., 4,413,056., Cl. 435-43.000.  
Eglinton, Alfred J., 4,413,000., Cl. 424-269.000.  
Wootton, Gordon, 4,413,002., Cl. 424-273.00R.
- Beerens, Cornelis J. M. Chain saw sharpening guide, 4,412,463., Cl. 76-36.000.
- Beethem, William J.; and Rumsey, Lynn D., to General Motors Corporation. Strapping machine, 4,412,484., Cl. 100-7.000.
- Beiersdorf Aktiengesellschaft: See—  
Gleichenhagen, Peter; and Wesselkamp, Ingrid, 4,413,082., Cl. 524-243.000.
- Beijer, Gene, to Magnum Division of Tandon Corporation. Mechanism for controlling the displacement of a positioner cone relative to a floppy disc, 4,413,294., Cl. 360-99.000.
- Bell, Harry A.; Bell, Howard A.; and Bell, Harry W. Multi-purpose suitcase, 4,412,604., Cl. 190-1.000.
- Bell, Harry W.: See—  
Bell, Harry A.; Bell, Howard A.; and Bell, Harry W., 4,412,604., Cl. 190-1.000.
- Bell, Howard A.: See—  
Bell, Harry A.; Bell, Howard A.; and Bell, Harry W., 4,412,604., Cl. 190-1.000.
- Bell, Malcolm R.; and Herrmann, John L., Jr., to Sterling Drug Inc. Pentacyclic phenylpyrazole compounds as anti-inflammatory agents, 4,412,995., Cl. 424-251.000.
- Bell Telephone Laboratories, Incorporated: See—  
Amity, Noach; and Gans, Michael J., 4,413,263., Cl. 343-756.000.  
Brown, Vernon L., 4,413,308., Cl. 361-398.000.  
Carnevale, Anthony; Paek, Un-Chul; and Peterson, George E., 4,412,722., Cl. 350-96.310.  
Huizinga, Donald D.; Means, Donald R.; and Underhill, Edward W., 4,413,159., Cl. 179-90.00K.
- Belyaev, Gennady V.: See—  
Markhasin, Alexandr B.; Belyaev, Gennady V.; Babushkin, Jury V.; and Petrov, Alexandr K., 4,413,341., Cl. 371-72.000.
- Benaroya, Henry. Tandem machine with opposed free pistons, 4,412,476., Cl. 92-75.000.
- Bender Machine Works, Inc.: See—  
Schmid, Roly A., 4,412,557., Cl. 137-624.130.
- Bendix Corporation, The: See—  
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- Berger, Michael A., to Datamarc, Inc. Bidirectional document feed tractor unit. 4,412,637, Cl. 226-172.000.
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Metal, Israel; and Berluti, Vincent, Jr., 4,413,183, Cl. 250-363.00S.
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- Bison-Werke Bahre & Greten GmbH & Co. KG: See—  
Poppelreuter, Klaus, 4,413,031, Cl. 428-212.000.
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Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,413,021, Cl. 427-236.000.
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Jackson, Ronald A., 4,412,676, Cl. 269-101.000.
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Assmann, Gerd; and Helb, Horst-Dietrich, 4,413,060, Cl. 436-47.000.
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Drabek, Jozef; and Boger, Manfred, 4,413,008, Cl. 424-298.000.
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Witte, Willi; and Boing, Wulf, 4,412,434, Cl. 68-3.00R.
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- Bolton, Joseph A.; and Brown, Armond A. Filter with top spray. 4,412,920, Cl. 210-409.000.
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Lietti, Andrea; and Bonati, Attilio, 4,413,004, Cl. 424-283.000.
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- Born Free Plastics, Inc.: See—  
Whitney, Floyd A., 4,412,628, Cl. 220-71.000.
- Borsting, Otto W.: See—  
Card, Lorin P.; and Borsting, Otto W., 4,412,670, Cl. 251-14.000.
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Kruiger, Manfred, 4,412,389, Cl. 34-46.000.
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- Bowman, James L., to Ingersoll-Rand Company. Helical screw rotor profiles. 4,412,796, Cl. 418-201.000.
- Brady, Thomas E.: See—  
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- Braman, John C.: See—  
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- Brandell, John T., to Halliburton Company. Downhole tool intake port assembly. 4,412,584, Cl. 166-169.000.
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Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,412,372, Cl. 29-149.50R.
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- Brenneman, William L., to Olin Corporation. Cooperative rolling mill apparatus and process. 4,412,439, Cl. 72-41.000.
- Brenner, Walter, to Standard Products Company, The. Radiation curable adhesive compositions and composite structures. 4,413,019, Cl. 427-36.000.
- Bresowar, Gerald E.; and Benton, Thomas K., to Combustion Engineering, Inc. Sonic atomizing spray nozzle. 4,412,653, Cl. 239-102.000.
- Breuer, Hans-Werner: See—  
Aichinger, Dietmar; Breuer, Hans-Werner; and Obrist, Albert, 4,412,409, Cl. 53-485.000.

- Brevetam S.A.: See—  
Tesch, Gunter; and Gieldanowski, Siegfried, 4,413,030, Cl. 428-85.000.
- Brewer, Michael H.: See—  
Vassiliadis, Arthur; Brewer, Michael H.; and Myers, Robert E., 4,412,543, Cl. 128-633.000.
- Brico Engineering Limited: See—  
Hone, John W.; and Cadle, Terence M., 4,412,873, Cl. 148-16.500.
- Bridgestone Tire Company Limited: See—  
Maeda, Muneyoshi; and Abe, Masaru, 4,412,575, Cl. 152-209.00R.
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- Brignola, Dominic J., to West Company, Incorporated, The. Syringe assembly. 4,412,836, Cl. 604-87.000.
- Bristol-Myers Company: See—  
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,413,134, Cl. 549-332.000.
- Tihon, Claude; and Curry, M. Elaine, 4,413,059, Cl. 435-286.000.
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Thomas, Alan V.; and Bone, Geoffrey E., 4,412,419, Cl. 60-634.000.
- Britton, Frederick G.; and Landers, Don B., to Oil States Industries, Inc. Reach rod grouting system. 4,412,759, Cl. 405-225.000.
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Gaiser, William R.; and Niepokoy, James, 4,412,806, Cl. 425-554.000.
- Broberg, Dewey O., Jr., to Du-Bro Products, Inc. Wire straightener tool. 4,412,565, Cl. 140-123.000.
- Broodman, Johannes J., to B. V. Koninklijke Maatschappij "De Schelde". Tube for a cracking plant. 4,412,560, Cl. 138-143.000.
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- Sugiyama, Akira; and Hirota, Kunio, 4,412,640, Cl. 227-85.000.
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Bolton, Joseph A.; and Brown, Armond A., 4,412,920, Cl. 210-409.000.
- Brown, Boveri & Cie AG: See—  
Rohr, Franz-Josef; and Reich, Andreas, 4,412,904, Cl. 204-424.000.
- Steinleitner, Gunther; and Haar, Wilhelm, 4,413,043, Cl. 429-104.000.
- Brown, Dale M.; and Vosburgh, Kirby G., to General Electric Company. Method of making integrated circuits utilizing ion implantation and selective epitaxial growth. 4,412,868, Cl. 148-1.500.
- Brown, Douglas B., to Stake Technology Limited. Press for expressing liquid from a mass. 4,412,485, Cl. 100-117.000.
- Brown, Jack, to Singer Company, The. Vented pneumatic foot controller. 4,413,214, Cl. 318-488.000.
- Brown, Vernon L., to Bell Telephone Laboratories, Incorporated. Printed wiring board construction. 4,413,308, Cl. 361-398.000.
- Bruce, George I. C.: See—  
Blue, William; Bruce, George I. C.; and Cowles, Stephen E., 4,413,316, Cl. 364-200.000.
- Brummond, Gerald G.; Klein, Paul E.; and Anderson, Roland M., to Modcom, Inc. Orthodontic tension-applying apparatus. 4,412,820, Cl. 433-18.000.
- Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, to Ciba-Geigy Corporation. Herbicidal heterocyclic and substituted phenyl phenylacetylene amines. 4,412,856, Cl. 71-121.000.
- Brunswick Corporation: See—  
Staerzl, Richard E., 4,413,248, Cl. 340-52.00R.
- Wrasidlo, Wolfgang J.; and Mysels, Karol J., 4,413,074, Cl. 524-43.000.
- Brustle, Klaus: See—  
Rock, Erich; and Brustle, Klaus, 4,412,366, Cl. 16-236.000.
- Buan, Danilo P.; and Eckert, Alton B., Jr., to Pitney Bowes Inc. System for sensing an inking member in a value printing device. 4,412,491, Cl. 101-363.000.
- Bucy, James D. Table mounted stop gauge for a cutoff saw. 4,412,468, Cl. 83-468.000.
- Buddendeck, Gerald A.; and Kau, Karl M., to Xerox Corporation. Very high speed duplicator with document handling. 4,412,740, Cl. 355-14.0SH.
- Budinger, A. Bowman: See—  
Byszewski, Wojciech W.; Budinger, A. Bowman; Proud, Joseph M.; and Riseberg, Leslie A., 4,413,204, Cl. 313-491.000.
- Budinger, Miriam D.: See—  
Lundblad, John L.; Budinger, Miriam D.; and Schwartz, Richard S., 4,412,990, Cl. 424-177.000.
- Buffet, Denis, to Robatel SLPI. Bearing device for centrifuge. 4,412,707, Cl. 308-228.000.
- Buhler, James E.: See—  
Musiel, D. James; and Buhler, James E., 4,412,668, Cl. 248-346.000.
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- Burke, Michael J.; and Fowler, Harry E., to Western Fuel Reducers, Inc. Turbulator. 4,412,558, Cl. 138-38.000.
- Burochkin, Alexandr E.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mitsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.;

Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.

Burroughs Corporation: See—  
Quick, Roy F., Jr.; and Spracklen, John E., 4,413,258, Cl. 340-825.500.

Burton, John H., to American Medical Systems, Inc. Dual-mode valve pressure regulating system. 4,412,530, Cl. 128-1.00R.

Bush, Charles N.: See—  
Hall, Dale R.; and Bush, Charles N., 4,413,065, Cl. 521-82.000.

Butler, Franklin H.: See—  
Kramer, Louis T.; Butler, Franklin H.; and Callas, Donald C., 4,412,665, Cl. 244-102.00R.

Butte, Joseph A.; Foehn, Robert C.; and Grieder, Conrad C. Bus bar extensions to outside of busway for external connections. 4,413,307, Cl. 361-378.000.

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C. van der Lely N.V.: See—  
van der Lely, Ary; and Bom, Cornelis J. G., 4,412,588, Cl. 172-68.000.

Cacciola, Anthony R.: See—  
Leung, Pak S.; and Cacciola, Anthony R., 4,412,921, Cl. 210-500.200.

Cadle, Terence M.: See—  
Hone, John W.; and Cadle, Terence M., 4,412,873, Cl. 148-16.500.

Caletti, Bruno, to Officine Meccaniche Giovanni Cerutti S.p.A. Deflector and inverter device for strips of web material. 4,412,639, Cl. 226-197.000.

California Institute of Technology: See—  
Rembaum, Alan, 4,413,070, Cl. 523-223.000.

Callahan, Alfred S.; Rhodes, James S.; and Johnson, Timothy L., to Neurologics, Inc. Neurological monitoring device. 4,412,547, Cl. 128-731.000.

Callahan, Doris S. Sleep-inducing device. 4,412,533, Cl. 128-33.000.

Callas, Donald C.: See—  
Kramer, Louis T.; Butler, Franklin H.; and Callas, Donald C., 4,412,665, Cl. 244-102.00R.

Cambro Lundia AB: See—  
Stenberg, Kaj O.; and Nystrom, Lars H., 4,412,793, Cl. 417-477.000.

Cameron, John, to Queen's University at Kingston. Electro-slag welding process for irregular sections. 4,413,169, Cl. 219-73.100.

Camin, Larry R.: See—  
Kling, John E.; Camin, Larry R.; and Scott, Douglas W., 4,412,832, Cl. 604-164.000.

Campanini, Sergio. Swivel hose coupling with threaded nipple. 4,412,693, Cl. 285-39.000.

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Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: See—  
Leveson, Richard C.; and Barker, Nicholas J., 4,413,185, Cl. 250-423.90P.

Canadian Forest Products Ltd.: See—  
Chow, Suezzone, 4,413,023, Cl. 427-325.000.

Cannon, James L. Orthodontic arch wire. 4,412,819, Cl. 433-20.000.

Canon Denshi Kabushiki Kaisha: See—  
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295, Cl. 360-110.000.

Canon Kabushiki Kaisha: See—  
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045, Cl. 430-59.000.

Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295, Cl. 360-110.000.

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Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., 4,413,022, Cl. 427-255.200.

Tsukata, Masaharu; and Murakami, Koichi, 4,412,735, Cl. 355-14.00R.

Capitani, Enzo; and Teissie, Jean, to Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs Scumra. Process and apparatus for extracting ions from a clear liquid or a liquid containing materials in suspension by contact with an exchange substance. 4,412,923, Cl. 210-661.000.

Capitol Packaging Corporation: See—  
Wise, Frederick M.; and DeWitt, Carl F., 4,412,661, Cl. 242-77.400.

Card, Lorin P.; and Borsting, Otto W. Fail-safe actuator and hydraulic system incorporating the same. 4,412,670, Cl. 251-14.000.

Cardiff, Raymond S. Directional outlet assembly. 4,412,480, Cl. 98-40.00D.

Carl Freudenberg, Firma: See—  
Hartwig, Peter, 4,412,901, Cl. 204-192.00C.

Carl Still GmbH & Co. KG, Firma: See—  
Abendroth, Werner, 4,412,891, Cl. 202-248.000.

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Carnaghi, Arturo A., to Angelica Corporation. Hook-like end for drawstring. 4,412,369, Cl. 24-266.000.



- Carnegie, Anthony; Paek, Un-Chul; and Peterson, George E., to Western Electric; and Bell Telephone Laboratories Incorporated. Single mode fiber with graded index of refraction. 4,412,722, Cl. 350-96.310.
- Carr, Peter, to Energy Development Associates, Inc. Hydrogen/halogen reactor system for metal halogen batteries. 4,413,040, Cl. 429-19.000.
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- Carrier Corporation: See—  
Brendel, Thomas E., 4,412,432, Cl. 62-504.000.
- Carroll, Clarence T.: See—  
Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., 4,413,314, Cl. 364-188.000.
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Pedrosa Junior, Oswaldo A.; Castro Couto, Nilton; and Carvalho Fanguero, Raul C., 4,412,811, Cl. 431-202.000.
- Cascio, Jack: See—  
Ivanov, Konstantin; and Cascio, Jack, 4,412,614, Cl. 206-63.300.
- Cassella Aktiengesellschaft: See—  
Tappe, Horst; and Wille, Herbert, 4,413,144, Cl. 568-306.000.
- Cassidy, Edward L.: See—  
Safrit, Sam C.; Cassidy, Edward L.; and Euliss, Melvin C., 4,412,433, Cl. 66-177.000.
- Castanon, Jorge B.: See—  
Viramontes-Brown, Ricardo; and Castanon, Jorge B., 4,412,858, Cl. 75-38.000.
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Pedrosa Junior, Oswaldo A.; Castro Couto, Nilton; and Carvalho Fanguero, Raul C., 4,412,811, Cl. 431-202.000.
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- Caviron Inc.: See—  
Gallant, Ben J., 4,412,402, Cl. 51-439.000.
- CDM Connectors Development & Mfg. AG: See—  
Pfister, Max, 4,412,718, Cl. 339-256.000.
- Cellitti, Raymond A.; and Connelly, John J., to International Harvester Co. Method and apparatus for determining the cooling characteristics of a quenching medium. 4,412,752, Cl. 374-43.000.
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Hein, Richard A., 4,413,267, Cl. 346-75.000.
- Cerwin, Robert J., to Ethicon, Inc. Ligating clip package. 4,412,617, Cl. 206-339.000.
- Ceske zavody motocyklove, narodni podnik: See—  
Pudil, Frantisek; and Trhlik, Jaromir, 4,412,596, Cl. 180-227.000.
- Chadwick, Joseph H.: See—  
Weaver, Charles S.; and Chadwick, Joseph H., 4,413,289, Cl. 360-51.000.
- Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., to Southwire Company. Cooling apparatus for wheel-band continuous casting machines. 4,412,580, Cl. 164-433.000.
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- Lepisto, J. George, 4,412,645, Cl. 383-48.000.
- Chan, Hak-Foon: See—  
Miller, George A.; and Chan, Hak-Foon, 4,413,003, Cl. 424-273.000.
- Chan, Rosalind P. K., to Biorex Laboratories Limited. 2-Hydroxy-5-phenylazobenzoic acid derivatives and method of treating ulcerative colitis therewith. 4,412,992, Cl. 424-226.000.
- Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., to PPG Industries, Inc. Coating compositions containing organosilane-polyol. 4,413,086, Cl. 524-386.000.
- Chao, Hu H.; and Dennard, Robert H., to International Business Machines Corporation. Apparatus for the reduction of the short-channel effect in a single-polysilicon, one-device FET dynamic RAM array. 4,413,330, Cl. 365-205.000.
- Charles Stark Draper Laboratory, Inc.: See—  
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- Chaude, Odile: See—  
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- Chauveteau, Guy: See—  
Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastelle, Jean-Paul, 4,412,925, Cl. 252-8.55D.
- Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., to Dunlop Limited. Ignition systems. 4,413,303, Cl. 361-253.000.
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- Chen, Edward S.; and Baldauf, William, to United States of America, Army. Pretreatment of superalloys and stainless steels for electroplating. 4,412,892, Cl. 204-34.000.
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Kornbaum, Simon; and Chenard, Jean-Yves, 4,412,897, Cl. 204-159.200.
- Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., to Beecham Group Limited. Process for the preparation of penicillins and penicillin derivatives. 4,413,056, Cl. 435-43.000.
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Ishii, Katsumi; and Chikaraishi, Takayo, 4,412,696, Cl. 292-336.300.
- Chikashige, Kiyoshi, to Kabushiki Kaisha Medos Kenkyusho. Suction device for endoscope. 4,412,531, Cl. 128-4.000.
- Chilton, John P.: See—  
Fray, Derek J.; Chilton, John P.; and Cooke, Arthur V., 4,412,893, Cl. 204-105.000.
- Chow, Peter C. M., to Grove Valve and Regulator Company. Fire safe expandable tube type valve. 4,412,554, Cl. 137-375.000.
- Chow, Suezone, to Canadian Forest Products Ltd. Method of treating wood to prevent stain and decay. 4,413,023, Cl. 427-325.000.
- Christie Electric Corporation: See—  
Benjamin, Fred; and Heil, Robert H., 4,413,221, Cl. 320-48.000.
- Chromasonics, Inc.: See—  
Beretsky, Irwin; Arnold, David E.; and Pellegrini, Bruno, 4,412,544, Cl. 128-660.000.
- Chugai Denki Kogyo K.K.: See—  
Shibata, Akira, 4,412,971, Cl. 420-501.000.
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Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,412,856, Cl. 71-121.000.
- Drabek, Jozef; and Boger, Manfred, 4,413,008, Cl. 424-298.000.
- Fu, Frank T.; and Winter, Roland A. E., 4,413,096, Cl. 525-204.000.
- Green, George E.; Losert, Ewald; and Paul, John G., 4,413,052, Cl. 430-327.000.
- Hoergerle, Karl; and Ohnemus, Kurt, 4,413,124, Cl. 544-319.000.
- Vogel, Christian; and Aebi, Rudolf, 4,412,855, Cl. 71-118.000.
- Cicuttini, Amelio, to CPC International Inc. Wet milling of starch bearing materials with water recycle after reverse osmosis or ultrafiltration. 4,412,867, Cl. 127-66.000.
- Cioca, Gheorghe, to Seton Company. Collagen sponge. 4,412,947, Cl. 260-123.700.
- Ciomo, George C.: See—  
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956, Cl. 260-429.000.
- Cities Service Company: See—  
Bouck, Larry S., 4,412,585, Cl. 166-248.000.
- Claassen, Peter: See—  
Krempel, Peter; Claassen, Peter; and List, Helmut, 4,413,202, Cl. 310-338.000.
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Sato, Yasuhiko; Sakai, Takamasa; and Minagawa, Shoichi, 4,412,906, Cl. 204-298.000.
- Clark Equipment Company: See—  
Ackerman, LaVern L., 4,412,612, Cl. 198-697.000.
- Clark, Thomas A. Splitting axe. 4,412,572, Cl. 145-2.000.
- Cleaveland, Edwin E., III: See—  
Ahern, Douglas K.; and Cleaveland, Edwin E., III, 4,412,738, Cl. 355-76.000.
- Clement, Heinz; and Furrer, Christina, to Rieter Machine Works Limited. Electric stop motion apparatus for a textile machine. 4,412,367, Cl. 19-0.250.
- Clements, John L.; and Magnusson, Stig E., to GTE Automatic Electric Labs Inc. Fault recovery apparatus for a PCM switching network. 4,413,335, Cl. 370-16.000.
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Remy, David C.; and Clineschmidt, Bradley V., 4,412,999, Cl. 424-267.000.
- Clitherow, John W., to Glaxo Group Limited. Intermediates in the preparation of ranitidine. 4,413,135, Cl. 549-495.000.
- CMD Enterprise, Inc.: See—  
Taylor, Noel R.; and Taylor, Paul A., 4,413,218, Cl. 318-771.000.
- Cochrane, Sydney D. B.: See—  
Barnett, John S.; and Cochrane, Sydney D. B., 4,412,569, Cl. 144-3.00D.
- Cohen, Martin G.; and Liu, Kuo-ching, to Quantronix Corporation. Method and apparatus for frequency doubling a laser beam. 4,413,342, Cl. 372-22.000.
- Cohen, Sherman E.; Ramazzotti, Dario; and Hartley, Michael D., to Nordson Corporation. Fluid level indicator. 4,413,255, Cl. 340-622.000.
- Coker, Earnest Z. Dredging suction-jet head. 4,412,394, Cl. 37-57.000.
- Coldelite Corporation of America: See—  
Giannella, Frank; and Pellicciari, Enzo E., 4,412,428, Cl. 62-308.000.
- Coles Cranes Limited: See—  
Gymre, Karl M., 4,412,622, Cl. 212-187.000.
- Colgate-Palmolive Company: See—  
Mitchell, Robert L., 4,412,983, Cl. 424-52.000.
- Collins, David J.; and Van Doren, James E., to General Electric Company. Rate initial pressure limiter. 4,412,780, Cl. 415-17.000.

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- Collins, Robert J.; and Feigl, Erich F. Vending machine with improved means for dispensing products at a predetermined price. 4,412,607, Cl. 194-1.00D.
- Colvin, Jack A.; and McClellan, John M., to General Motors Corporation. In-line engine cranking motor drive having reduction gear set. 4,412,457, Cl. 74-7.00A.
- Combes, Gilles, to Societe Anonyme dite: Alsthom-Atlantique. Over pressure release valve for a hydraulic installation. 4,412,555, Cl. 137-524.000.
- Combustion Engineering, Inc.: See—  
Bresowar, Gerald E.; and Benton, Thomas K., 4,412,653, Cl. 239-102.000.
- Perry, Glenn M.; and Sullivan, Robert P., 4,412,510, Cl. 122-510.000.
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Manners, Vincent J., 4,413,354, Cl. 378-81.000.
- Compagnie Generale de Radiologie: See—  
Amedro, Albert; Audemard, Bernard; and De Mul, Rene, 4,413,231, Cl. 324-220.000.
- Comstedt, Anders P. P.: See—  
Elfner, Bo A.; and Comstedt, Anders P. P., 4,413,325, Cl. 364-557.000.
- Connelly, John J.: See—  
Cellitti, Raymond A.; and Connelly, John J., 4,412,752, Cl. 374-43.000.
- Conoco Inc.: See—  
Sifferman, Thomas R., 4,412,586, Cl. 166-294.000.
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Piancatelli, Giovanni; Scettri, Arrigo; and Maurizio, D'Auria, 4,413,145, Cl. 568-345.000.
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York, Stuart A., 4,412,807, Cl. 425-564.000.
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Tyler, Hugh J.; and Conway, William H., 4,413,252, Cl. 340-365.000.
- Cook, Jeffrey J. Combination can opening tool. 4,412,464, Cl. 81-3.10R.
- Cooke, Arthur V.: See—  
Fray, Derek J.; Chilton, John P.; and Cooke, Arthur V., 4,412,893, Cl. 204-105.000.
- Cooper, Gary D. Elevator storage system. 4,412,601, Cl. 187-27.000.
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Lal, Mahendra, 4,412,791, Cl. 417-312.000.
- Copelin, Harry B.: See—  
Ernst, Richard E.; and Copelin, Harry B., 4,413,136, Cl. 549-509.000.
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- Cordis Dow Corp.: See—  
Kell, Michael J., 4,412,916, Cl. 210-90.000.
- Corning Glass Works: See—  
Palmquist, Ronald W., 4,413,346, Cl. 373-41.000.
- Costa, Bruno, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Optical system coupling a rectangular light source to a circular light receiver. 4,412,720, Cl. 350-96.180.
- Cottell, Eric C. Fuel supply system. 4,412,512, Cl. 123-25.00E.
- Cottell, Eric Charles: See—  
Klayer, Charles W., 4,412,842, Cl. 44-1.05R.
- Country Baked Hams, Inc.: See—  
Hoegh, Poul E., 4,412,483, Cl. 99-538.000.
- Cowden, Robert E.: See—  
Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., 4,412,654, Cl. 239-171.000.
- Cowles, Stephen E.: See—  
Blue, William; Bruce, George I. C.; and Cowles, Stephen E., 4,413,316, Cl. 364-200.000.
- CPC International Inc.: See—  
Cicuttini, Amelio, 4,412,867, Cl. 127-66.000.
- Craig, George H.: See—  
Du Broff, William; Craig, George H.; and Veslocki, Timothy A., 4,412,841, Cl. 44-10.00C.
- Crawford, Roger; and Sanders, Duane, to Thermoguard Insulation Co. Shredding mill. 4,412,659, Cl. 241-35.000.
- Creech, Edward T.: See—  
Wallace, Steven A.; Creech, Edward T.; and Northcutt, Walter G., 4,412,860, Cl. 75-84.000.
- Crinos Farmacologica Spa: See—  
Reiner, Alberto, 4,412,996, Cl. 424-256.000.
- Crockett, Charles R., to Teccor Electronics, Inc. Optically coupled solid state relay. 4,413,193, Cl. 307-311.000.
- Crounse, Nathan N., to Sterling Drug Inc. Monoazo and disazo colorants. 4,412,950, Cl. 260-157.000.
- Crowe, Norman P.: See—  
Molitor, Edwin A.; Crowe, Norman P.; and Lampe, Guy W., 4,412,775, Cl. 414-626.000.
- Cruz-Urbe, Antonio S.; and Di Giulio, Peter C., to Pitney Bowes Inc. Print material supply control apparatus and method. 4,413,264, Cl. 346-1.100.
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Costa, Bruno, 4,412,720, Cl. 350-96.180.
- Cue, Berkeley W., Jr.; and Moore, Bernard S., to Pfizer Inc. Stereospecific synthesis of 5-phenyl-2S-pentanol. 4,412,958, Cl. 260-436.00R.
- Curry, M. Elaine: See—  
Tihon, Claude; and Curry, M. Elaine, 4,413,059, Cl. 435-286.000.
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Yundt, George B.; and Curtiss, William P., 4,413,223, Cl. 322-32.000.
- Cuscher, Casper. Button actuated pop up drain fitting. 4,412,361, Cl. 4-286.000.
- Cutter Laboratories, Inc.: See—  
Lundblad, John L.; Budinger, Miriam D.; and Schwartz, Richard S., 4,412,990, Cl. 424-177.000.
- Cynex Manufacturing Corporation: See—  
Green, Dan; and Goldner, Sandor, 4,413,217, Cl. 318-729.000.
- Czerniewicz, John F. Power chisel. 4,412,571, Cl. 144-219.000.
- D C L Microelectronics, Inc.: See—  
Laflamme, Daniel C., 4,412,473, Cl. 84-485.00R.
- Daenen, Robert H. C. M., to Dart Industries Inc. Container closure alignment device. 4,412,630, Cl. 220-353.000.
- Dahn, Manfred: See—  
Wegner, Christian; Jabs, Gert; and Dahn, Manfred, 4,412,959, Cl. 264-4.100.
- Dai-Ichi High Frequency Co., Ltd.: See—  
Kawanami, Shumpei; Watanabe, Yasuo; and Hanyo, Susumu, 4,412,442, Cl. 72-128.000.
- Dalco Chemical Industries, Ltd.: See—  
Haga, Mitsunobu; and Omori, Yasuzi, 4,413,025, Cl. 427-387.000.
- Daido Metal Co., Inc.: See—  
Mori, Sanae, 4,412,972, Cl. 420-530.000.
- Daimler-Benz Aktiengesellschaft: See—  
Burckhardt, Manfred, 4,412,701, Cl. 303-6.00R.
- Daly, Jeffery E., to Reed Rock Bit Company. Rock bit internal lubricant pump. 4,412,590, Cl. 175-229.000.
- Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, to Institut Francais du Petrole. Process for manufacturing chlorolactones from unsaturated carboxylic acids. 4,413,133, Cl. 549-265.000.
- Danford, Glenn S. Automatic call forwarding telephone apparatus. 4,413,158, Cl. 179-9.00D.
- Danfoss A/S: See—  
Iversen, Kristian; and Hansen, Henning, 4,412,581, Cl. 165-29.000.
- Thomsen, Svend E.; and Kyster, Erik, 4,412,415, Cl. 60-384.000.
- Danilevich, Yanush B.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexander I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201, Cl. 310-260.000.
- Darby, Jack B. Control means for shifting gears on dual shift bicycles. 4,412,828, Cl. 474-81.000.
- Dart Container Corporation: See—  
Dart, William A.; and Dart, Kenneth B., 4,412,629, Cl. 220-90.400.
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Daenen, Robert H. C. M., 4,412,630, Cl. 220-353.000.
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Dart, William A.; and Dart, Kenneth B., 4,412,629, Cl. 220-90.400.
- Dart, William A.; and Dart, Kenneth B., to Dart Container Corporation. Non-spill drink-through lid. 4,412,629, Cl. 220-90.400.
- Datamarc, Inc.: See—  
Berger, Michael A., 4,412,637, Cl. 226-172.000.
- Dauphin, Jean-Louis; Louvet, Olivier F.; and Pitie, Jean-Marc. Time division switching system for circuit mode and packet mode lines. 4,413,337, Cl. 370-58.000.
- Davies, Glyndwr J., to Glacier Metal Company Limited. The Polyarylene sulphide compositions. 4,413,083, Cl. 524-299.000.
- Davies, Robert B., to Motorola, Inc. Voltage regulator circuit. 4,413,226, Cl. 323-303.000.
- Davis, Gershon J.: See—  
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956, Cl. 260-429.000.
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- Deem, Brian C.; and Reitz, Richard J., to Bendix Corporation. The Engine fan clutch. 4,412,605, Cl. 192-82.00T.
- Degesch, See—  
Horn, Franziskus; and Fluck, Ekkehard, 4,412,979, Cl. 423-299.000.
- DeGrose, Louis. Water tempering system. 4,412,526, Cl. 126-365.000.
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Eiermann, Kurt; and Schafer, Wolfgang, 4,412,449, Cl. 73-204.000.
- Delalande S.A.: See—  
Bourgerie, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001, Cl. 424-272.000.
- Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co.: See—  
Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, 4,412,757, Cl. 404-113.000.
- Demachi, Takuya: See—  
Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, 4,413,148, Cl. 568-578.000.
- Dementhon, Daniel, to Tracor Hydraulics, Incorporated. Wave energy converter. 4,412,417, Cl. 60-497.000.



- Demoures, Bernard; and Le Coent, Jean-Louis, to Orogil Corporation. Process for the preparation of superalkalinized metallic detergent-dispersants for lubricating oils and products obtained therefrom. 4,412,927, Cl. 252-33.300.
- De Mul, Rene: See—  
Amedro, Albert; Audemard, Bernard; and De Mul, Rene, 4,413,231, Cl. 324-220.000.
- Dennard, Robert H.: See—  
Chao, Hu H.; and Dennard, Robert H., 4,413,330, Cl. 365-205.000.
- Dennis, Silas P., Jr.; and Dennis, Tony M. Apparatus and method for operating a brick kiln. 4,412,814, Cl. 432-146.000.
- Dennis, Tony M.: See—  
Dennis, Silas P., Jr.; and Dennis, Tony M., 4,412,814, Cl. 432-146.000.
- Dennison Manufacturing Company: See—  
Beaudet, Leo A.; and Lennon, Donald J., 4,413,049, Cl. 430-126.000.
- Derringer, John G., to General Motors Corporation. Vehicle parking brake actuating mechanism. 4,412,458, Cl. 74-512.000.
- DeSanto, Ronald F., to Warlick, Lehigh Steck. Cylinder-mounted cutter. 4,412,467, Cl. 83-346.000.
- Designs for Vision, Inc.: See—  
Feinbloom, Richard E., 4,413,278, Cl. 358-93.000.
- Dessau, Ralph M., to Mobil Oil Corporation. Diels-Alder cyclodimerization over a carbon molecular sieve catalyst. 4,413,154, Cl. 585-366.000.
- Deubzer, Bernhard; Egarter, Norbert; and Frey, Volker, to Wacker-Chemie GmbH. Process for preparing organopolysiloxanes and copolymers thereof. 4,413,104, Cl. 525-479.000.
- DeVere, James W.: See—  
Wilding, Edwin; and DeVere, James W., 4,412,773, Cl. 414-403.000.
- DeWitt, Carl F.: See—  
Wise, Frederick M.; and DeWitt, Carl F., 4,412,661, Cl. 242-77.400.
- Dhein, Rolf: See—  
Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, 4,413,116, Cl. 528-307.000.
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- DiBiasi, Daniel J.; and Krutchen, Charles M., to Mobil Oil Corporation. Method and apparatus for measurement and control of cell size in a foam structure. 4,412,961, Cl. 264-40.100.
- Didier Engineering GmbH: See—  
Galow, Manfred; and Stefancik, Nikolaus, 4,412,770, Cl. 414-162.000.
- Diesel Kiki Company, Ltd.: See—  
Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, 4,412,424, Cl. 62-209.000.
- Kondo, Hiroshi; and Shibuya, Tsunenori, 4,412,787, Cl. 417-269.000.
- Ohtani, Yoshio; Wakiya, Michio; and Kakishima, Todomu, 4,413,249, Cl. 340-52.00R.
- Digital Equipment Corporation: See—  
Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., 4,413,339, Cl. 371-38.000.
- Di Giulio, Peter C.: See—  
Cruz-Urbe, Antonio S.; and Di Giulio, Peter C., 4,413,264, Cl. 346-1.100.
- Diloia, Albert A. Framing assembly. 4,413,035, Cl. 428-397.000.
- Dimroth, Peter; and Lottsch, Wolfgang, to BASF Aktiengesellschaft. Pigments comprising cyanomethylquinazolones coupled to diazo compounds prepared from 1-aminoanthraquinones. 4,412,949, Cl. 260-154.000.
- Director-General of the Agency of Industrial Science and Technology: See—  
Sato, Tomio; Okimoto, Kunio; and Yamakawa, Toshio, 4,412,643, Cl. 228-221.000.
- Discovision Associates: See—  
Eberly, Carlyle J., 4,412,743, Cl. 356-237.000.
- Morrison, Rocky V., 4,412,805, Cl. 425-549.000.
- Disteldorf, Josef; Gras, Rainer; and Schnurbusch, Horst, to Chemische Werke Huls AG. Powder enamels free of blocking agents. 4,413,079, Cl. 524-169.000.
- Dobkin, Igor I.: See—  
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438, Cl. 72-10.000.
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Witte, Willi; and Boing, Wulf, 4,412,434, Cl. 68-3.00R.
- Dr. C. Otto & Comp. G.m.b.H.: See—  
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,412,776, Cl. 414-684.300.
- Thubeauville, Heinz, 4,412,890, Cl. 202-139.000.
- Doerner, Frank. Leg for chair base and cap therefore. 4,412,667, Cl. 248-188.700.
- Dofasco Inc.: See—  
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815, Cl. 432-206.000.
- Doi, Toshitada: See—  
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340, Cl. 371-39.000.
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- Doliwa, Ernst J.; Reifferscheid, Karl J.; and Wolfgruber, Friedrich, to Metallgesellschaft AG; and SKW Trostberg. Apparatus for treating molten cast iron. 4,412,578, Cl. 164-349.000.
- Doljack, Frank: See—  
Middleman, Lee M.; and Doljack, Frank, 4,413,301, Cl. 361-106.000.
- Donaldson, Terrence L.: See—  
Arcuri, Edward J.; and Donaldson, Terrence L., 4,413,058, Cl. 435-161.000.
- Donig, Gerhard; Schmidt, Walter; Schummer, Helmut; and Neulinger, Franz, to Siemens Aktiengesellschaft. Method of operating an electrostatic precipitator. 4,413,225, Cl. 323-246.000.
- Donnelly, Edward N.: See—  
Hagen, Gerry A.; and Donnelly, Edward N., 4,412,371, Cl. 28-272.000.
- Dorsey, Robert J. Mold assembly for compressing refractory material and including a quick change mold box. 4,412,800, Cl. 425-195.000.
- Dostert, Philippe L.: See—  
Bourguery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001, Cl. 424-272.000.
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Flynn, James H.; and McLemore, Donald E., 4,412,448, Cl. 73-81.000.
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- Shipley, Randall S.; and Freyer, Larry E., 4,412,939, Cl. 502-115.000.
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- Doyle, Terrence W.: See—  
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Franz, Hans-Jurgen; and Dreyer, Volker, 4,412,450, Cl. 73-304.00C.
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Zitz, Alfred; Droscher, Erich; and Schetina, Otto, 4,412,700, Cl. 299-1.000.
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Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427, Cl. 62-298.000.
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Moote, Truman P.; Dunton, Myron L.; McGalliard, Russell L.; and Yarborough, Lyman, 4,412,913, Cl. 208-207.000.
- Dunwoodie, Edward H.; and Elston, Ronald W., to Transequip Limited. Structural element. 4,412,756, Cl. 403-363.000.
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Shaw, David N.; and First, David J., 4,412,788, Cl. 417-280.000.
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Thomas, Lowell E., 4,413,051, Cl. 430-312.000.
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Schilling, Wilfried; Lorenz, Siegfried; and Koch, Friedrich, 4,413,175, Cl. 377-25.000.
- Eastman Kodak Company: See—  
Abbott, Thomas I.; and Jones, Cynthia G., 4,413,053, Cl. 430-502.000.
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- Jeffers, Frederick J., 4,413,296, Cl. 360-113.000.
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Lemke, James U.; and French, William W., 4,412,379, Cl. 29-603.000.
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Goscenski, Edward J., Jr., 4,412,459, Cl. 74-711.000.
- Kenny, Andrew A., 4,412,518, Cl. 123-339.000.
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Buan, Danilo P.; and Eckert, Alton B., Jr., 4,412,491, Cl. 101-363.000.
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- Egarter, Norbert: See—  
Deubzer, Bernhard; Egarter, Norbert; and Frey, Volker, 4,413,104, Cl. 525-479.000.
- Egitto, Frank D.: See—  
Wang, David N.; Egitto, Frank D.; and Maydan, Dan, 4,412,885, Cl. 156-643.000.
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Eichner, Falk-Jurgen, 4,412,621, Cl. 211-58.000.
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Elfner, Bo A.; and Comstedt, Anders P. P., 4,413,325, Cl. 364-557.000.
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Naito, Han-Ichiro; Yamaguchi, Tsuneco; and Harashima, Kiyoshi, 4,412,772, Cl. 414-331.000.
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Goldman, Alice; and Le Fur, Daniel, 4,412,960, Cl. 264-22.000.
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Campbell, Jack B.; and Lavagnino, Edward R., 4,413,126, Cl. 546-52.000.
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- Emhart Industries, Inc.: See—  
Schuder, Maurice E.; and Stafford, Richard W., 4,412,750, Cl. 368-98.000.
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Franz, Hans-Jurgen; and Dreyer, Volker, 4,412,450, Cl. 73-304.00C.
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Carr, Peter, 4,413,040, Cl. 429-19.000.
- Carr, Peter, 4,413,042, Cl. 429-51.000.
- Engelhard Corporation: See—  
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., 4,412,859, Cl. 75-83.000.
- Enomoto, Hidekazu: See—  
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junseki; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802, Cl. 425-392.000.
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Fienup, James R., 4,412,719, Cl. 350-3.700.
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Taylor, David W., 4,412,839, Cl. 44-1.00B.
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Erickson, Reuben A., 4,413,306, Cl. 361-361.000.
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Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mitysev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.
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Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438, Cl. 72-10.000.
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Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,413,134, Cl. 549-332.000.
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Young, Kevin L.; and Turner, Jesse H., 4,412,650, Cl. 236-48.00A.
- Etablissements Eugene Scholtes: See—  
Klammers, Gerard, 4,413,171, Cl. 219-400.000.
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Ouwerkerk, Johannes H. W.; Kramer, Albert; and Mooij, Johannes W., 4,412,479, Cl. 98-36.000.
- Ethicon, Inc.: See—  
Cerwin, Robert J., 4,412,617, Cl. 206-339.000.
- Ivanov, Konstantin; and Cascio, Jack, 4,412,614, Cl. 206-63.300.
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Safrit, Sam C.; Cassidy, Edward L.; and Euliss, Melvin C., 4,412,433, Cl. 66-177.000.
- Evanson, Delbert L.: See—  
Patrichi, Mihai D.; and Evanson, Delbert L., 4,412,420, Cl. 60-635.000.
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Thomson, Adam R., 4,412,818, Cl. 433-1.000.
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Elzinga, Eugene R., Jr., 4,412,528, Cl. 126-417.000.
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Klessing, Klaus, 4,413,122, Cl. 544-153.000.
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Paul, Gunter; Patel, Kirati; and Schmitt, Gunter, 4,412,412, Cl. 57-280.000.
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Collins, Robert J.; and Feigl, Erich F., 4,412,607, Cl. 194-1.00D.
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- Fenicle, Robert D., to Allied Corporation. Dynamoelectric machine with cartridge brush holder. 4,413,200, Cl. 310-239.000.
- Ferranti plc: See—  
Blue, William; Bruce, George I. C.; and Cowles, Stephen E., 4,413,316, Cl. 364-200.000.
- Feuerbaum, Hans-Peter, to Siemens Aktiengesellschaft. Arrangement for stroboscopic potential measurements with an electron beam testing device. 4,413,181, Cl. 250-310.000.
- Field, Norman A.: See—  
Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., 4,413,339, Cl. 371-38.000.
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Nimry, Tayseer S.; and Fields, Ellis K., 4,413,115, Cl. 528-189.000.
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- Finike Italiana Marpos S.p.A.: See—  
Sellers, Narciso, 4,412,385, Cl. 33-178.00E.
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- Firth, David J.: See—  
Shaw, David N.; and Firth, David J., 4,412,788, Cl. 417-280.000.
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- FitzGerald, Cecil W., to Bendix Corporation. The Terminal for a capacitor and a method of forming same. 4,413,305, Cl. 361-306.000.
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- Fleiter, Lothar: See—  
Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, 4,413,116, Cl. 528-307.000.
- Fluck, Ekkehard: See—  
Horn, Franziskus; and Fluck, Ekkehard, 4,412,979, Cl. 423-299.000.
- Flynn, James H.; and McLemore, Donald E., to Dow Chemical Company. The Blocking test for chlorinated polyethylene. 4,412,448, Cl. 79-81.000.
- Foehn, Robert C.: See—  
Butte, Joseph A.; Foehn, Robert C.; and Grieder, Conrad C., 4,413,307, Cl. 361-378.000.
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Godwin, Paul K., Jr.; and Honda, Ronald T., 4,413,177, Cl. 250-203.00R.
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Godwin, Paul K., Jr.; and Honda, Ronald T., 4,413,177, Cl. 250-203.00R.
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Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, 4,413,133, Cl. 549-265.000.
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Gelling, Paul J.; Hunt, James E. B.; and Marshman, John D., 4,413,113, Cl. 528-165.000.
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Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., 4,413,314, Cl. 364-188.000.
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- Forslund, Erik T., to Ostbergs Fabriks AB. Device for a felling and gripping unit. 4,412,777, Cl. 414-694.000.
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Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., 4,413,322, Cl. 364-448.000.
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Trozzi, Norman K., 4,412,496, Cl. 110-347.000.
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Burke, Michael J.; and Fowler, Harry E., 4,412,558, Cl. 138-38.000.
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- Fox, Karl M.: See—  
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,412,843, Cl. 44-51.000.
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- Fraley, Lowell D.: See—  
Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,412,975, Cl. 422-197.000.
- Francis, Thomas E. Earth clod pulverizer. 4,412,589, Cl. 172-148.000.
- Franz, Georg: See—  
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,413,021, Cl. 427-236.000.
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Lemke, James U.; and French, William W., 4,412,379, Cl. 29-603.000.
- Freudenberger, Carl: See—  
Hartmann, Ludwig; and Ruzek, Ivo, 4,413,032, Cl. 428-288.000.
- Frey, Volker: See—  
Deubzer, Bernhard; Egarter, Norbert; and Frey, Volker, 4,413,104, Cl. 525-479.000.
- Freyer, Larry E.: See—  
Shipley, Randall S.; and Freyer, Larry E., 4,412,939, Cl. 502-115.000.
- Fricker, Wolfgang-Peter: See—  
Scholz, Manfred; and Fricker, Wolfgang-Peter, 4,412,408, Cl. 52-806.000.
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Schmitt, Wilhelm E., 4,412,365, Cl. 15-184.000.
- Fritzenwenger, Josef, to Bayerische Motoren Werke Aktiengesellschaft. Line multicylinder internal combustion engine. 4,412,515, Cl. 123-198.00E.
- Froidevaux, Raymond: See—  
Jeannot, Pierre; Froidevaux, Raymond; and Gyax, Claude-Andre, 4,412,751, Cl. 368-276.000.
- Frye, Robert B., to General Electric Co. Silicone resin coating composition especially suited for primerless adhesion to cast acrylics. 4,413,088, Cl. 524-714.000.
- Fu, Frank T.; and Winter, Roland A. E., to Ciba-Geigy Corporation.  $\alpha$ -Olefin copolymers containing pendant hindered amine groups. 4,413,096, Cl. 525-204.000.
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- Fuji, Hiroshi: See—  
Kurata, Tonio; and Fuji, Hiroshi, 4,412,850, Cl. 55-130.000.
- Fuji Kogyo Company, Limited: See—  
Miyata, Hideo; and Ishii, Hitoshi, 4,413,024, Cl. 427-370.000.
- Fuji Photo Film Co., Ltd.: See—  
Horiuchi, Hideo; and Yoshida, Kazutaka, 4,413,275, Cl. 358-75.000.
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- Kitamoto, Tatsuji; and Shirahata, Ryuuji, 4,412,507, Cl. 118-718.000.
- Mitsui, Akio; and Nakamura, Kotaro, 4,413,054, Cl. 430-555.000.
- Fuji Xerox Co., Ltd.: See—  
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,413,188, Cl. 250-578.000.
- Fujie, Kunio; Uchida, Akinari; and Abe, Kazuhiko, to Hitachi, Ltd. Greenhouse of an underground heat accumulation system. 4,412,527, Cl. 126-400.000.
- Fujii, Kenichi: See—  
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810, Cl. 431-186.000.
- Fujimoto, Takanori, to Mitsubishi Denki Kabushiki Kaisha. Magnet ignition device. 4,412,522, Cl. 123-602.000.
- Fujinaga, Minoru: See—  
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039, Cl. 428-643.000.
- Fujio, Masayuki: See—  
Abe, Masahiro; and Fujio, Masayuki, 4,412,781, Cl. 415-53.00R.
- Fujita, Kisuake: See—  
Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kisuake, 4,412,809, Cl. 431-76.000.
- Fujita, Shinsaku: See—  
Inagaki, Yoshio; Okazaki, Masaki; and Fujita, Shinsaku, 4,412,951, Cl. 260-202.000.
- Fujitsu Fanuc Limited: See—  
Kurakake, Mitsuo, 4,413,315, Cl. 364-200.000.
- Onuki, Tadayoshi, 4,413,176, Cl. 235-445.000.
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Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187, Cl. 250-491.100.
- Mochizuki, Hirohiko; Nakano, Masao; Baba, Fumio; Nakano, Tomio; and Takemae, Yoshihiro, 4,413,272, Cl. 357-65.000.
- Sumi, Hideji; and Kokado, Masayuki, 4,413,300, Cl. 361-98.000.
- Takagi, Mikio; and Kamioka, Hajime, 4,412,388, Cl. 34-1.000.
- Uema, Kenyu, 4,413,186, Cl. 250-491.100.
- Fujiwara, Michiaki: See—  
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,412,413, Cl. 57-304.000.
- Fukada, Yasuo: See—  
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,412,674, Cl. 266-91.000.
- Fukami, Akira; Noguchi, Hiroki; and Okamoto, Kunio, to Nippon Soken, Inc. Air conditioning and ventilation system. 4,412,425, Cl. 62-244.000.
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Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047, Cl. 430-94.000.
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Umino, Naotake; and Fukuda, Tatsuo, 4,412,852, Cl. 62-35.000.

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- Gaertner, Van R., to Monsanto Company.  $\alpha$ -Hydroxy phosphonates. 4,413,125, Cl. 546-22.000.
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Bond, William C.; and Profet, Gary A., 4,413,350, Cl. 377-47.000.
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Bailey, Richard E., 4,413,349, Cl. 377-24.000.
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Brown, Dale M.; and Vosburgh, Kirby G., 4,412,868, Cl. 148-1.500.
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- Rossi, Anthony J., 4,412,422, Cl. 60-706.000.
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Loader, Mary A., 4,413,017, Cl. 426-616.000.
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Arlauskas, Alfonsas, 4,412,695, Cl. 292-173.000.
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- Turner, Hilton A., Jr., 4,413,228, Cl. 324-51.000.
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Lavender, Michael R., 4,412,358, Cl. 2-412.000.
- Geoffroy, Serge: See—  
Gasc, Jean-Claude; Geoffroy, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988, Cl. 424-177.000.
- Gerber, Bernard R.: See—  
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,412,632, Cl. 222-148.000.
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- Gerkin, William C.: See—  
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- Gerry, Martin E. Electromagnetic field compensated cable. 4,413,304, Cl. 361-253.000.
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- Gessler, Donald A., to Dravo Corporation. Adjustable wheel assembly in a rotary solvent extractor. 4,412,976, Cl. 422-270.000.
- Gewerkschaft Eisenhütte Westfalen: See—  
Heitkamp, Herbert; and Hohn, Walter, 4,412,758, Cl. 405-145.000.
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Salkeld, Richard W.; Anderson, Neal P.; and Giamei, Anthony F., 4,412,577, Cl. 164-122.200.
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- Gibas, Christoph: See—  
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- Gibbs, Paul D.: See—  
Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., 4,413,322, Cl. 364-448.000.
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- Gieldanowski, Siegfried: See—  
Tesch, Gunter; and Gieldanowski, Siegfried, 4,413,030, Cl. 428-85.000.
- Giertz, Hans-Josef, to Bergwerksverband GmbH. Liquid seal for closing an opening of a reaction vessel. 4,412,684, Cl. 277-135.000.
- Gilmour, George A., to United States of America, Navy. Scanning beamformer for a very high resolution circular arc sonar. 4,413,332, Cl. 367-123.000.
- Giordani, Pietro. Wheeled support structure for a seat or a carry-out of a baby's push chair or perambulator. 4,412,688, Cl. 280-642.000.
- Glacier Metal Company Limited, The: See—  
Davies, Glyndwr J., 4,413,083, Cl. 524-299.000.
- Gladfelter, Elizabeth J.; and Rogier, Edgar R., to Henkel Corporation. Glycidyl ethers of aminopolyols. 4,413,138, Cl. 549-551.000.
- Glaeser, Arthur F.: See—  
Greenberg, Melvin B., 4,413,261, Cl. 340-825.720.
- Glaxo Group Limited: See—  
Clitherow, John W., 4,413,135, Cl. 549-495.000.
- Gleason, Edward H.: See—  
Sinclair, Alvin R.; and Gleason, Edward H., 4,413,068, Cl. 523-201.000.
- Gleichenhagen, Peter; and Wesselskamp, Ingrid, to Beiersdorf Aktiengesellschaft. Water-soluble, pressure sensitive, self-adhesive compositions and articles made therewith. 4,413,082, Cl. 524-243.000.
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- Goe, Gerald L.: See—  
Sowers, Edward E.; Goe, Gerald L.; and Prunier, Michael L., 4,413,099, Cl. 525-327.100.
- Goksel, Mehmet A. Pelletizing lignite. 4,412,840, Cl. 44-10.00D.
- Golden, Michael D., to Western Design Corporation. Transport mechanism. 4,412,611, Cl. 198-450.000.



- Goldman, Alice; and Le Fur, Daniel, to Electricite De France. Method for processing a strip of polymer material by electrical discharge. 4,412,960, Cl. 264-22.000.
- Goldner, Sandor: See—  
Green, Dan; and Goldner, Sandor, 4,413,217, Cl. 318-729.000.
- Gontowski, Walter S., Jr.; and Mayrand, James F., to Sprague Electric Company. Integrated circuit including test portion and method for making. 4,413,271, Cl. 357-40.000.
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Bischhoff, Andrea L., 4,412,603, Cl. 188-106.00P.
- Goodyear Tire & Rubber Company, The: See—  
Thompson, Donald R.; and Vogliano, Robert H., 4,412,965, Cl. 264-257.000.
- Gori, Reinhard, to Pfister GmbH. Method for contact-free determination of quality features of a test subject of the meat goods class. 4,413,279, Cl. 358-107.000.
- Goscinski, Edward J., Jr., to Eaton Corporation. Controlled differential. 4,412,459, Cl. 74-711.000.
- Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG: See—  
Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, 4,412,658, Cl. 241-26.000.
- Goudarstvenny Nauchnoissledovatel'sky, Proektny I Konstruktorsky Institut Splavov I Obrabotki Tsvetnykh Metallov "Giprosvetmetobrobtka": See—  
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliyev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438, Cl. 72-10.000.
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Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.
- Goto, Atsushi: See—  
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295, Cl. 360-110.000.
- Goto, Kunio, to Victor Company of Japan, Limited. Pickup arm with servo-controlled stylus. 4,413,334, Cl. 369-126.000.
- Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Carbamate derivatives and insecticidal, miticidal or nematocidal compositions containing the same. 4,413,005, Cl. 424-285.000.
- Gotz, Gertrud: See—  
Coplan, Myron J.; and Gotz, Gertrud, 4,413,106, Cl. 525-534.000.
- Gramm, Jeffrey S., to Du Pont de Nemours, E. I., and Company. Process for preparing dialkyl propanediimide dihydrohalides. 4,412,957, Cl. 260-453.700.
- Grant, William O. Method and apparatus for remote indication of faults in coaxial cable R-F transmission systems. 4,413,229, Cl. 324-52.000.
- Grant, William P. Centrifugal spin air dryer. 4,412,390, Cl. 34-58.000.
- Gras, Rainer: See—  
Disteldorf, Josef; Gras, Rainer; and Schnurbusch, Horst, 4,413,079, Cl. 524-169.000.
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Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., 4,413,155, Cl. 585-417.000.
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- Green, Geoffrey W.; and Lettington, Alan H., to National Research Development Corporation. Coating infra red transparent semiconductor material. 4,412,903, Cl. 204-192.000.
- Green, George E.; Losert, Ewald; and Paul, John G., to Ciba-Geigy Corporation. Photopolymerization process employing compounds containing acryloyl group and anthryl group. 4,413,052, Cl. 430-327.000.
- Greenberg, Melvin B., to Glaeser, Arthur F. Coded control for vehicle engine ignition circuit. 4,413,261, Cl. 340-825.720.
- Greene, Thomas K. Garment hanging apparatus for passenger automobiles. 4,412,636, Cl. 224-313.000.
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Obermayer, Bertram; Greier, Josef; and Mandl, Walter, 4,412,513, Cl. 123-55.0VE.
- Grenda, Victor J.: See—  
Roberts, F. Edward; and Grenda, Victor J., 4,413,118, Cl. 536-7.100.
- Grieder, Conrad C.: See—  
Butte, Joseph A.; Foehn, Robert C.; and Grieder, Conrad C., 4,413,307, Cl. 361-378.000.
- Griffin & Company, Inc.: See—  
Wilding, Edwin; and DeVere, James W., 4,412,773, Cl. 414-403.000.
- Grob, Burkhardt. Method of manufacture of a support wing and flap. 4,412,666, Cl. 244-123.000.
- Grodinsky, Grigory I.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.
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- Grosshauser, Heinrich K., to Koenig & Bauer AG. Paper web guiding mechanism. 4,412,490, Cl. 101-219.000.
- Grove, Lawrence L.; and Benner, Donald G., to General Electric Company. Electric toaster control. 4,413,173, Cl. 219-412.000.
- Grove Valve and Regulator Company: See—  
Chow, Peter C. M., 4,412,554, Cl. 137-375.000.
- Gruppo Lepetit, S.p.A.: See—  
Winters, Giorgio, 4,412,953, Cl. 260-239.500.
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Waiteo, Keith R., 4,413,220, Cl. 320-15.000.
- GTE Automatic Electric Labs Inc.: See—  
Clements, John L.; and Magnusson, Stig E., 4,413,335, Cl. 370-16.000.
- Reimer, William A.; and Bertellotti, Ansano, 4,412,712, Cl. 339-17.00M.
- GTE Laboratories Incorporated: See—  
Byszewski, Wojciech W.; Budinger, A. Bowman; Proud, Joseph M.; and Riseberg, Leslie A., 4,413,204, Cl. 313-491.000.
- GTE Products Corporation: See—  
Avellino, Frank J.; and Hoffman, John E., 4,412,798, Cl. 425-137.000.
- Karlotski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., 4,413,206, Cl. 313-601.000.
- Roche, William J., 4,413,209, Cl. 315-101.000.
- Guazzo, Lucien, to Societe Anonyme dite: Les Cables de Lyon. Method of joining together optical fibre undersea cables. 4,412,878, Cl. 156-91.000.
- Guerrazzi, Vincent; and Vendramini, Valerio, to Seprosy Societe Europeenne pour la Transformation des Produits de Synthese. Vented synthetic-resin jug. 4,412,633, Cl. 222-468.000.
- Guerret, Patrick G.: See—  
Bourger, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001, Cl. 424-272.000.
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Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064, Cl. 518-715.000.
- Gulf & Western Industries, Inc.: See—  
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,412,843, Cl. 44-51.000.
- Guthrie, Roderick I. L.: See—  
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815, Cl. 432-206.000.
- Guttmann, Andrew T.: See—  
Dolhyj, Serge R.; Velenyi, Louis J.; and Guttmann, Andrew T., 4,412,847, Cl. 44-77.000.
- Gygax, Claude-Andre: See—  
Jeannot, Pierre; Froidevaux, Raymond; and Gygax, Claude-Andre, 4,412,751, Cl. 368-276.000.
- Gyomrey, Karl M., to Coles Cranes Limited. Telescoping strut crane. 4,412,622, Cl. 212-187.000.
- Haar, Wilhelm: See—  
Steinleitner, Gunther; and Haar, Wilhelm, 4,413,043, Cl. 429-104.000.
- Haas, Armand, to Societe Chimique des Charbonnages-CdF Chimie. Embossed films obtained from ethylene-propylene copolymers, and a process and apparatus for manufacturing the films. 4,413,109, Cl. 526-348.000.
- Haemonetics Corporation: See—  
Avery, Hollon B.; and Schoendorfer, Donald W., 4,412,831, Cl. 494-46.000.
- Hafner, Erich: See—  
Ney, Robert J.; and Hafner, Erich, 4,412,508, Cl. 118-726.000.
- Hafner, Udo, to Robert Bosch GmbH. Electromagnet. 4,413,244, Cl. 335-250.000.
- Haga, Mitsunobu; and Omori, Yasuzi, to Daicel Chemical Industries, Ltd. Coating composition for polycarbonate moldings containing partially hydrolyzed alkyltrialkoxysilane and polyvinylbutyral. 4,413,025, Cl. 427-387.000.
- Hagen, Gerry A.; and Donnelly, Edward N., to Badische Corporation. Device for introducing a traveling yarn into a yarn treatment chamber. 4,412,371, Cl. 28-272.000.
- Hagii, Hidehiko: See—  
Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, 4,413,148, Cl. 568-578.000.
- Hahn, Michael: See—  
Wackerle, Peter-Martin; and Hahn, Michael, 4,412,784, Cl. 416-230.000.
- Haker, Floyd H. Carousel card dispenser. 4,412,631, Cl. 221-66.000.
- Halcon SD Group, Inc.: See—  
Khoobiar, Sargis, 4,413,147, Cl. 568-476.000.
- Hall, Dale R.; and Bush, Charles N., to B. F. Goodrich Company, The. Process for making low density chlorinated polyvinyl chloride foam. 4,413,065, Cl. 521-82.000.
- Hall, Eric R. D., to Schaefer Marine, Inc. Rigging connection assembly. 4,412,499, Cl. 114-108.000.
- Hall, John B.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Intermediates used in the process for preparing 1(4-pentenyl)-3,3-dimethylcyclohexane. 4,413,139, Cl. 560-126.000.
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Brandell, John T., 4,412,584, Cl. 166-169.000.
- Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., 4,412,559, Cl. 138-89.000.

- Hamabe, Takafumi; and Moriwaki, Hiroshi, to Matsushita Electric Works, Ltd. Massaging apparatus. 4,412,534, Cl. 128-52.000.
- Hamaker, Raymond W.: See—  
De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,412,376, Cl. 29-576.00B.
- Hamana, Junji: See—  
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- Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Apparatus for forming an interpole crossover wire between stator coils. 4,412,564, Cl. 140-92.100.
- Hammond, Craig B., to Verbatim Corporation. Apparatus for burnishing. 4,412,400, Cl. 51-58.000.
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Wilson, Troy K.; and Handly, Robert J., 4,413,326, Cl. 364-748.000.
- Handwerker, Gary R., to Midwest Canvas Corp. Protective cover for pile of particulate material. 4,413,029, Cl. 428-61.000.
- Haney, Eugene A.; and Partus, Fred P., to Western Electric Company, Inc. Apparatus for supplying fluid to a rotating tube comprising end cap with purging fluid. 4,412,683, Cl. 277-3.000.
- Hans Sasserath & Co. KG: See—  
Ford, Thomas H.; and Sasserath, Arend, 4,412,648, Cl. 236-42.000.
- Hansen, Henning: See—  
Iversen, Kristian; and Hansen, Henning, 4,412,581, Cl. 165-29.000.
- Hanyu, Susumu: See—  
Kawanami, Shumpei; Watanabe, Yasuo; and Hanyu, Susumu, 4,412,442, Cl. 72-128.000.
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- Happel, Thomas A.: See—  
Lepley, Richard H.; and Happel, Thomas A., 4,412,762, Cl. 406-134.000.
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Tsuiji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,412,980, Cl. 423-446.000.
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Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, 4,412,424, Cl. 62-209.000.
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Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802, Cl. 425-392.000.
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Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,412,772, Cl. 414-331.000.
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- Harmon, Alvin E. Hunting stand. 4,412,398, Cl. 43-1.000.
- Hartl, Walter, to U.S. Philips Corporation. Flat rotary-anode X-ray tube. 4,413,356, Cl. 378-132.000.
- Hartley, Michael D.: See—  
Cohen, Sherman E.; Ramazzotti, Dario; and Hartley, Michael D., 4,413,255, Cl. 340-622.000.
- Hartmann, Erwin, to Optische Werke G. Rodenstock. Vision testing device. 4,412,729, Cl. 351-239.000.
- Hartmann, Ludwig; and Ruzek, Ivo, to Freudenberg, Carl. Non-woven fabric with wick action. 4,413,032, Cl. 428-288.000.
- Hartwig, Peter, to Carl Freudenberg, Firma. Method for the manufacture of solid electrolyte layers for galvanic cells. 4,412,901, Cl. 204-192.000.
- Hasegawa, Kunio; and Takizuka, Michinori, to Nippon Oil and Fats Co., Ltd. Nitramine composite propellant composition. 4,412,875, Cl. 149-19.900.
- Hashimoto, Yoshiro; and Horino, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Paper sheet bundling apparatus. 4,412,411, Cl. 53-587.000.
- Hassner, Martin: See—  
Adler, Roy L.; Hassner, Martin; and Moussouris, John P., 4,413,251, Cl. 340-347.00D.
- Hata, Setsuo: See—  
Watanabe, Kenkichi; and Hata, Setsuo, 4,412,550, Cl. 133-8.00A.
- Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., to Engelhard Corporation. Method for recovering platinum in a nitric acid plant. 4,412,859, Cl. 75-83.000.
- Hathaway, Richard A., to Ampex Corporation. Magnetic tape transport. 4,413,293, Cl. 360-85.000.
- Hattori, Masayuki: See—  
Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187, Cl. 250-491.100.
- Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, to Asahi Kasei Kogyo Kabushiki Kaisha. Isoprene-butadiene copolymer rubber having improved processing properties. 4,413,098, Cl. 525-314.000.
- Hauke, Dieter: See—  
Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, 4,412,658, Cl. 241-26.000.
- Hauni-Werke Korber & Co. KG: See—  
Hausler, Nikolaus; and Helms, Adolf, 4,412,505, Cl. 118-674.000.
- Hauske, James R., to Pfizer Inc. Semi-synthetic macrolides. 4,413,119, Cl. 536-7.200.
- Hausler, Nikolaus; and Helms, Adolf, to Hauni-Werke Korber & Co. KG. Apparatus for applying atomized liquid to a running layer of filamentary material or the like. 4,412,505, Cl. 118-674.000.
- Hawkeye Concrete Products Co.: See—  
Schmidgall, Ronald D., 4,412,817, Cl. 432-247.000.
- Hayakawa, Yoshikazu; and Ogawa, Naoki, to Nissan Motor Co., Ltd. Low noise level internal combustion engine. 4,412,514, Cl. 123-195.00R.
- Hayashi, Hideo: See—  
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, 4,413,067, Cl. 523-172.000.
- Hayashi, Yoshimasa, to Nissan Motor Company, Ltd. Low-noise level internal combustion engine. 4,412,516, Cl. 123-198.00E.
- Hearn, Daniel P., to Atlantic Richfield Company. Level detector. 4,413,182, Cl. 250-357.100.
- Hechenbleikner, Ingenuin: See—  
Valdiserri, Leo L.; and Hechenbleikner, Ingenuin, 4,413,077, Cl. 524-120.000.
- Heck, Ronald M.: See—  
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., 4,412,859, Cl. 75-83.000.
- Heft, Eldon B.: See—  
Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., 4,413,062, Cl. 501-123.000.
- Hegedus, Louis, to W. R. Grace & Co. Cross-flow monolith reactor. 4,413,041, Cl. 429-33.000.
- Heil, Robert H.: See—  
Benjamin, Fred; and Heil, Robert H., 4,413,221, Cl. 320-48.000.
- Hein, Lehmann AG: See—  
Schmidt, Heinrich, 4,412,865, Cl. 127-19.000.
- Hein, Richard A., to Centronics Data Computer Corp. Ink supply system for ink jet printing apparatus. 4,413,267, Cl. 346-75.000.
- Heitkamp, Herbert; and Hohn, Walter, to Gewerkschaft Eisenhütte Westfalen. Hydraulic control means. 4,412,758, Cl. 405-145.000.
- Helb, Horst-Dietrich: See—  
Assmann, Gerd; and Helb, Horst-Dietrich, 4,413,060, Cl. 436-47.000.
- Helm Instrument Company, Inc.: See—  
Wilhelm, Donald F.; and Moser, Robert L., 4,412,456, Cl. 73-862.650.
- Helms, Adolf: See—  
Hausler, Nikolaus; and Helms, Adolf, 4,412,505, Cl. 118-674.000.
- Henke, Otto K.: See—  
Hughes, Richard E., 4,412,568, Cl. 141-392.000.
- Henkel Corporation: See—  
Gladfelter, Elizabeth J.; and Rogier, Edgar R., 4,413,138, Cl. 549-551.000.
- Henkel Kommanditgesellschaft auf Aktien: See—  
Wiegner, Georg; and Reinwald, Elmar, 4,412,833, Cl. 604-14.000.
- Hennecke, Rudolf: See—  
Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, 4,412,757, Cl. 404-113.000.
- Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg. Process for bringing liquids into contact. 4,413,021, Cl. 427-236.000.
- Herbes, William F., to American Cyanamid Company. Alkylated meth-ylol melamine resin condensate compositions having low formaldehyde release. 4,413,100, Cl. 525-398.000.
- Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, to NCR Corporation. High speed low temperature diazo processor. 4,412,731, Cl. 354-299.000.
- Herder, Kornelis: See—  
Muis, Roelof; and Herder, Kornelis, 4,412,487, Cl. 101-41.000.
- Hergeth, Incorporated: See—  
Smith, George F., Jr., 4,412,410, Cl. 53-528.000.
- Hermes Precisa International S.A.: See—  
Gagnebin, Gustave, 4,412,704, Cl. 308-6.00R.
- Herrbach, Francois: See—  
Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Le-creff, Maurice, 4,413,241, Cl. 333-22.00R.
- Herrington, Kenneth M., to International Business Machines Corporation. Use of nodes to uniquely identify processes. 4,413,318, Cl. 364-200.000.
- Herrmann, John L., Jr.: See—  
Bell, Malcolm R.; and Herrmann, John L., Jr., 4,412,995, Cl. 424-251.000.
- Hertz, Carl H.; and Nilsson, Jan O. Optical scanner for color facsimile. 4,413,276, Cl. 358-75.000.
- Hess, Bernhard; Schulz-Walz, Hansjochen; von Harpe, Hannes; Peltzer, Bernd; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Mixtures of polyurethanes and unsaturated polyester resins. 4,413,072, Cl. 523-500.000.
- Hess, Ferdinand: See—  
Bartholomaeus, Reiner; Gibas, Christoph; Wolfges, Hans; Hess, Ferdinand; and Schiene, Karl, 4,413,245, Cl. 336-84.00M.
- Hessler, Edward J.: See—  
Walker, Jerry A.; and Hessler, Edward J., 4,412,955, Cl. 260-397.450.
- Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., to Ashland Oil, Inc. Endothermic removal of coke deposited on sorbent materials during carbo-metallic oil conversion. 4,412,914, Cl. 208-253.000.
- Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, to Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG. Method and a device for manufacturing partially oxidized lead dust. 4,412,658, Cl. 241-26.000.



- Hi-Stat Manufacturing Co., Inc.: See—  
Hire, Charles J., 4,413,247, Cl. 337-368.000.
- Higuchi, Saburo: See—  
Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986, Cl. 424-80.000.
- Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, to Nippon Steel Corporation. Steel sheet plated with layers of Ni-Sn and Pb-Sn alloy for automotive fuel tank, 4,413,039, Cl. 428-643.000.
- Hing, Peter. Method of producing discharge lamp arc tubes, 4,412,963, Cl. 264-61.000.
- Hinnenkamp, James A., to National Distillers and Chemical Corporation. Transition metal carbonyl complexes intercalated with lamellar materials and use of the intercalated complexes in the catalysis of organic reactions, 4,413,146, Cl. 568-451.000.
- Hirai, Minoru: See—  
Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937, Cl. 502-423.000.
- Hiraide, Shigeru: See—  
Okino, Haruka; Ogawa, Keitetsu; Takeda, Sunao; Mohri, Hiromichi; and Hiraide, Shigeru, 4,412,545, Cl. 128-691.000.
- Hirano, Hideo: See—  
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285, Cl. 358-260.000.
- Hirata, Tadashi; and Sakamoto, Katsuyoshi, to Amada Company, Ltd. Turret punch presses having tool holders rotatably mounted in the turrets, 4,412,469, Cl. 83-552.000.
- Hire, Charles J., to Hi-Stat Manufacturing Co., Inc. Thermally responsive electrical switch means and method of manufacture, 4,413,247, Cl. 337-368.000.
- Hirose, Inc.: See—  
Mecozzi, Walter P.; Mager, Gary C.; and Maliszewski, Stephen A., 4,412,582, Cl. 165-76.000.
- Hirota, Hajime; and Watanabe, Hiroshi, to Kao Soap Co., Ltd. Liquid detergent composition, 4,412,943, Cl. 252-546.000.
- Hirota, Kunio: See—  
Sugiyama, Akira; and Hirota, Kunio, 4,412,640, Cl. 227-85.000.
- Hitachi Ltd.: See—  
Abe, Masahiro; and Fujio, Masayuki, 4,412,781, Cl. 415-53.00R.
- Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285, Cl. 358-260.000.
- Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,413,283, Cl. 358-213.000.
- Fujie, Kunio; Uchida, Akinari; and Abe, Kazuhiko, 4,412,527, Cl. 126-400.000.
- Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, 4,413,284, Cl. 358-213.000.
- Koike, Keiichi; and Yanadori, Michio, 4,412,930, Cl. 252-70.000.
- Matsumoto, Toshio, 4,413,355, Cl. 378-127.000.
- Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900, Cl. 204-192.00P.
- Hitachi Plant Engineering and Construction Co., Ltd.: See—  
Koike, Keiichi; and Yanadori, Michio, 4,412,930, Cl. 252-70.000.
- Hitchcock, James: See—  
Kopp, Clinton V.; and Hitchcock, James, 4,412,553, Cl. 137-118.000.
- Hoch, Louis, to Becton Dickinson and Company. Multiple sample needle assembly, 4,412,548, Cl. 128-764.000.
- Hoch, Martin M.; and Stoltman, Donald, to General Motors Corporation. Diesel fuel distributor type injection pump, 4,412,519, Cl. 123-449.000.
- Hoechst Aktiengesellschaft: See—  
Brandt, Lothar; Arno; and Kleiner, Hans-Jerg, 4,413,121, Cl. 536-44.000.
- Fischer, Hartmut; and Skaletz, Detlef H., 4,413,149, Cl. 568-636.000.
- Hoergerle, Karl; and Ohnemus, Kurt, to Ciba-Geigy Corporation. 2-Alkyl-5-alkylsulfonyl-4,6-dihalopyrimidines and the production thereof, 4,413,124, Cl. 544-319.000.
- Hoeh, Poul E., to Country Baked Hams, Inc. Spiral meat slicer, 4,412,483, Cl. 99-538.000.
- Hofer, Alan; and Yama, Frank M. Miniature sounder with double tuned cavity, 4,413,253, Cl. 340-388.000.
- Hoffman, James F.: See—  
Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., 4,412,914, Cl. 208-253.000.
- Hoffman, John E.: See—  
Avellino, Frank J.; and Hoffman, John E., 4,412,798, Cl. 425-137.000.
- Hoffmann-La Roche Inc.: See—  
Zurfluh, Rene, 4,413,010, Cl. 424-300.000.
- Hohn, Walter: See—  
Heitkamp, Herbert; and Hohn, Walter, 4,412,758, Cl. 405-145.000.
- Hollenbach, David A. Two-piece mechanical flag, 4,412,646, Cl. 232-34.000.
- Holmes, Ann: See—  
Sircar, Ila; and Holmes, Ann, 4,413,011, Cl. 424-309.000.
- Holst, Arno: See—  
Brandt, Lothar; Holst, Arno; and Kleiner, Hans-Jerg, 4,413,121, Cl. 536-44.000.
- Holstedt, Richard A.; and Jessup, Peter, to Union Oil Company of California. Corrosion inhibitors for boron-containing lubricants, 4,412,928, Cl. 252-46.400.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Aiba, Yasuaki, 4,412,597, Cl. 180-228.000.
- Furukawa, Yoshimi; and Sano, Shoichi, 4,412,594, Cl. 180-140.000.
- Honda, Kiyokazu: See—  
Baba, Masaharu; and Honda, Kiyokazu, 4,412,716, Cl. 339-176.00L.
- Honda, Makoto: See—  
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098, Cl. 525-314.000.
- Honda, Ronald T.: See—  
Godwin, Paul K., Jr.; and Honda, Ronald T., 4,413,177, Cl. 250-203.00R.
- Hone, John W.; and Cadle, Terence M., to Brico Engineering Limited. Sintered metal articles and their manufacture, 4,412,873, Cl. 148-16.500.
- Honeywell Inc.: See—  
Wilson, Troy K.; and Handly, Robert J., 4,413,326, Cl. 364-748.000.
- Honeywell Information Systems Inc.: See—  
Schieve, Edmund H., 4,412,609, Cl. 198-341.000.
- Hopper, Willard C., Jr. Bicycle sealed bearing and method, 4,412,706, Cl. 308-192.000.
- Horgan, Paul M.: See—  
Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., 4,412,654, Cl. 239-171.000.
- Horimoto, Mitsuaki, to Minolta Camera Kabushiki Kaisha. Fish eye lens system, 4,412,726, Cl. 350-461.000.
- Horino, Shigeo: See—  
Hashimoto, Yoshiro; and Horino, Shigeo, 4,412,411, Cl. 53-587.000.
- Horiuchi, Hideo; and Yoshida, Kazutaka, to Fuji Photo Film Co., Ltd. Ink-jet color printing apparatus, 4,413,275, Cl. 358-75.000.
- Horn, Franziskus; and Fluck, Ekkehard, to Degesch. Process for preparing aluminum or magnesium phosphide, 4,412,979, Cl. 423-299.000.
- Horn, Stuart B.; McMillan, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., to United States of America, Army. Noncontact thermal interface, 4,412,427, Cl. 62-298.000.
- Hornby, Thomas W., to Northrop Corporation. Aircraft rocket and missile launcher, 4,412,475, Cl. 89-1.816.
- Horvath, Stanley K., to Ford Motor Company. Paint composition comprising hydroxy functional film former and improved stabilized flow control additive, 4,413,084, Cl. 524-315.000.
- Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Color synchronizing circuit, 4,413,274, Cl. 358-25.000.
- Hospital, Michel: See—  
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988, Cl. 424-177.000.
- Houghton, Russell J., to International Business Machines Corporation. Array word line driver system, 4,413,191, Cl. 307-254.000.
- Houghton, Timothy J.; Szwargulski, Carl J., Jr.; Bentrup, Jerry A.; and Smidt, Donald L., to Metal Container Corporation. Drawn and ironed can body, 4,412,627, Cl. 220-66.000.
- Howson, Barry R. Method of cleaning fibreglass, 4,412,932, Cl. 252-136.000.
- Hsieh, Shing-Chang R.: See—  
Torpie, John D.; Lozen, Robert F.; and Hsieh, Shing-Chang R., 4,413,287, Cl. 358-288.000.
- Hsiung, Thomas H.: See—  
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., 4,412,859, Cl. 75-83.000.
- Huffnagle, Clifton W.; Morningstar, LeRoy J.; and Tighe, Charles I., Jr., to AMP Incorporated. Apparatus for transposing a pair of parallel and adjacent conductors into a vertical relationship, 4,412,566, Cl. 140-147.000.
- Hughes, Richard E., to Henke, Otto K. Fill valve, 4,412,568, Cl. 141-392.000.
- Huizinga, Donald D.; Means, Donald R.; and Underhill, Edward W., to Bell Telephone Laboratories, Incorporated. Dial pulsing circuit, 4,413,159, Cl. 179-90.00K.
- Hummel, Klaus: See—  
Scherer, Arthur; Peteri, Dezsoe; and Hummel, Klaus, 4,412,998, Cl. 424-267.000.
- Hunt, James E. B.: See—  
Gelling, Paul J.; Hunt, James E. B.; and Marshman, John D., 4,413,113, Cl. 528-165.000.
- Hurst, Robert N., to RCA Corporation. Indicator control signal generator for video tape recorder, 4,413,288, Cl. 360-31.000.
- Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., to General Electric Company. Molding composition and product produced therefrom, 4,413,062, Cl. 501-123.000.
- Huskings, Chester W.; and Williams, Leroy J., to United States of America, Army. Silane ballistic modifier containing propellant, 4,412,874, Cl. 149-19.200.
- Huther, Werner, to MTU Motoren-Und Turbinen Union Munchen GmbH. Apparatus for injection molding of precision parts, 4,412,804, Cl. 425-546.000.
- Hylsa, S.A.: See—  
Viramontes-Brown, Ricardo; and Castanon, Jorge B., 4,412,858, Cl. 75-38.000.
- Ibaragi, Toshio: See—  
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098, Cl. 525-314.000.
- ICI Australia Limited: See—  
Gibson, David V.; Parr, Rodney W.; and Swallow, John E., 4,413,073, Cl. 523-511.000.

- Idemitsu Kosan Co., Ltd.: See—  
Kurashige, Tomozo; and Shimada, Hidetoshi, 4,412,864, Cl. 106-235.000.
- Iguchi, Masaaki: See—  
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, 4,412,886, Cl. 156-645.000.
- Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, to Diesel Kiki Company, Ltd. Air conditioning system for preventing fogging of vehicle windows, 4,412,424, Cl. 62-209.000.
- Iida, Sadahiko: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.
- Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, to Toho Belsco Co., Ltd. Method for manufacture of activated carbon fiber, 4,412,937, Cl. 502-423.000.
- Ikematu, Takeshi: See—  
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098, Cl. 525-314.000.
- Iker, Jean: See—  
Probst, Nicolas J.; Iker, Jean; and Autin, Jacques, 4,412,941, Cl. 252-511.000.
- IMI Kynoch Limited: See—  
Knights, Richard N.; and Whittall, Peter H. (said Peter H. Whittall assors. to), 4,412,492, Cl. 102-204.000.
- Inagaki, Yoshio; Okazaki, Masaki; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. Reagents for measuring lipase activity, 4,412,951, Cl. 260-202.000.
- Inai, Toshimi: See—  
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,412,882, Cl. 156-188.000.
- Ingersoll-Rand Company: See—  
Bowman, James L., 4,412,796, Cl. 418-201.000.
- Ingwall, Joanne S.: See—  
Fosell, Eric T.; and Ingwall, Joanne S., 4,413,233, Cl. 324-300.000.
- Inland Steel Company: See—  
Du Broff, William; Craig, George H.; and Veslocki, Timothy A., 4,412,841, Cl. 44-10.00C.
- Innovative Research Corporation: See—  
Smith, Jerry R., 4,412,437, Cl. 70-338.000.
- Inoue, Takayuki: See—  
Isaka, Tsutomu; Ishioka, Mitsugu; Shimada, Takeo; and Inoue, Takayuki, 4,413,066, Cl. 521-149.000.
- Instant Replay Systems: See—  
Murray, John M., 4,413,277, Cl. 358-93.000.
- Institut Francais du Pétrole: See—  
Audibert, Francois; Sugier, Andre; and Van Landeghem, Hugo, 4,413,063, Cl. 518-700.000.
- Ballerini, Daniel; Chaudé, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastelle, Jean-Paul, 4,412,925, Cl. 252-8.55D.
- Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, 4,413,133, Cl. 549-265.000.
- Institut Neftkhimicheskogo Sinteza Imeni A.V. Topchieva Akademii Nauk SSSR: See—  
Kolbanovskiy, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., 4,412,552, Cl. 137-14.000.
- Instrumentarium oy: See—  
Ahjopalo, Hannu T., 4,412,917, Cl. 210-104.000.
- Intel Corporation: See—  
Matthews, James A., 4,412,375, Cl. 29-571.000.
- Interlake, Inc.: See—  
Ducharme, Ronald L.; and Taylor, Robin, 4,413,219, Cl. 320-15.000.
- International Business Machines Corporation: See—  
Adler, Roy L.; Hassner, Martin; and Moussouris, John P., 4,413,251, Cl. 340-347.00D.
- Aviram, Ari; Kovac, Zalata; and Myers, Robert A., 4,413,266, Cl. 346-21.000.
- Chao, Hu H.; and Dennard, Robert H., 4,413,330, Cl. 365-205.000.
- De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,412,376, Cl. 29-576.00B.
- Herrington, Kenneth M., 4,413,318, Cl. 364-200.000.
- Houghton, Russell J., 4,413,191, Cl. 307-254.000.
- Kumar, Ananda H.; McMillan, Peter W.; and Tummala, Rao R., 4,413,061, Cl. 501-7.000.
- Pawletko, Joseph P.; and Pigos, Charles R., 4,413,269, Cl. 346-154.000.
- Thoma, Endre P., 4,413,329, Cl. 365-189.000.
- Videki, Edwin R., II, 4,413,328, Cl. 364-900.000.
- International Computers Limited: See—  
Johnson, Kenneth C., 4,413,227, Cl. 323-315.000.
- International Flavors & Fragrances Inc.: See—  
Hall, John B.; and Sprecker, Mark A., 4,413,139, Cl. 560-126.000.
- International Harvester Co.: See—  
Cellitti, Raymond A.; and Connelly, John J., 4,412,752, Cl. 374-43.000.
- Sorensen, Robert; Barrett, Edward A.; and Scarnato, Thomas J., 4,412,761, Cl. 406-98.000.
- INTERx Research Corporation: See—  
Sloan, Kenneth B.; and Little, Roy, 4,412,994, Cl. 424-248.530.
- Inverni Della Beffa S.p.A.: See—  
Lietti, Andrea; and Bonati, Attilio, 4,413,004, Cl. 424-283.000.
- Irwin, Thomas J. Two dimensional logical toy, 4,412,681, Cl. 273-153.00S.
- Isaka, Tsutomu; Ishioka, Mitsugu; Shimada, Takeo; and Inoue, Takayuki, to Mitsubishi Petrochemical Company, Ltd. Crosslinkable polyethylene resin compositions, 4,413,066, Cl. 521-149.000.
- Ise, Yukihiko: See—  
Yamashita, Ichiro; and Ise, Yukihiko, 4,412,454, Cl. 73-728.000.
- Ishida, Ryuichi: See—  
Kanno, Takeshi; Gaino, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, 4,413,006, Cl. 424-250.000.
- Ishii, Hitoshi: See—  
Miyata, Hideo; and Ishii, Hitoshi, 4,413,024, Cl. 427-370.000.
- Ishii, Katsumi; and Chikaraishi, Takayo, to Nissan Motor Company, Limited. Door handle device for an automotive vehicle, 4,412,696, Cl. 292-336.300.
- Ishii, Koji, to Ryobi Ltd. Automatic printing machine, 4,412,488, Cl. 101-142.000.
- Ishii, Shiro, to M-S Corporation. Divided cash drawer with slots and two trays, 4,412,709, Cl. 312-291.000.
- Ishii, Yutaka: See—  
Yasuda, Shuhei; Koyanagi, Katsubumi; Ishii, Yutaka; and Wada, Tomio, 4,413,256, Cl. 340-784.000.
- Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, to Canon Kabushiki Kaisha. Multi-layer electrophotographic photosensitive member comprises disazo charge generator layer, hydrazone transport layer, 4,413,045, Cl. 430-59.000.
- Ishioka, Mitsugu: See—  
Isaka, Tsutomu; Ishioka, Mitsugu; Shimada, Takeo; and Inoue, Takayuki, 4,413,066, Cl. 521-149.000.
- Ishizaki, Yasuo: See—  
Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, 4,412,945, Cl. 252-551.000.
- Isomura, Masayoshi: See—  
Okamoto, Kiyokazu; and Isomura, Masayoshi, 4,413,212, Cl. 318-317.000.
- Ito, Akio; Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, to Nihon Shinku Gijutsu Kabushiki Kaisha. Ferromagnetic high speed sputtering apparatus, 4,412,907, Cl. 204-298.000.
- Ito, Kunihiro: See—  
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, 4,412,886, Cl. 156-645.000.
- Ito, Takuzo; Suzuki, Tadashi; and Miyake, Tatsuro, to Mitsubishi Denki Kabushiki Kaisha. Hydraulic elevator, 4,412,600, Cl. 187-17.000.
- Itoh, Takeo: See—  
Kurachi, Hisao; Itoh, Takeo; and Onoda, Hiroshi, 4,412,755, Cl. 400-697.100.
- Ito, Mitiharu: See—  
Fukuda, Hirokazu; Shinohara, Koji; and Ito, Mitiharu, 4,413,343, Cl. 372-44.000.
- Ivanov, Konstantin; and Cascio, Jack, to Ethicon, Inc. Three panel needled suture holder, 4,412,614, Cl. 206-63.300.
- Iversen, Kristian; and Hansen, Henning, to Danfoss A/S. Heating installation comprising a boiler and a heat pump, 4,412,581, Cl. 165-29.000.
- Iwamoto, Ikuro: See—  
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuro; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340, Cl. 371-39.000.
- Iwanade, Hisao; and Negoro, Ikuro, to Asahi Kogyo Kogyo Kabushiki Kaisha. Position detecting device for a zoom lens of a copying machine, 4,412,737, Cl. 355-55.000.
- Iwasaki, Hidenori; Urata, Yukio; and Kasukawa, Shunichi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photosensitive polymer and photosensitive material for photomechanical process, 4,413,091, Cl. 525-61.000.
- Iwasaki, Keiji: See—  
Iwashita, Yuji; Ajisaka, Katsumi; and Iwasaki, Keiji, 4,412,989, Cl. 424-177.000.
- Iwase, Nobuo: See—  
Nagashima, Kenji; Matsumoto, Hiroshi; Tanaka, Masataka; Odaira, Hiroshi; and Iwase, Nobuo, 4,412,377, Cl. 29-577.00C.
- Iwashita, Yuji; Ajisaka, Katsumi; and Iwasaki, Keiji, to Ajinomoto Company Incorporated. Oxygen carrier, 4,412,989, Cl. 424-177.000.
- Iwata, Yasuhiro: See—  
Shibuya, Kunihiro; and Iwata, Yasuhiro, 4,412,734, Cl. 355-3.0SH.
- Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuhio; Kurata, Chikatoshi; and Fujii, Kenichi, to Kawasaki Jukogyo Kabushiki Kaisha. Pulverized coal burner, 4,412,810, Cl. 431-186.000.
- Izumi, Kazuo: See—  
Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937, Cl. 502-423.000.
- Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, to Hitachi, Ltd. Noise reducer for a solid state imager, 4,413,284, Cl. 358-213.000.
- Jabs, Gert: See—  
Wegner, Christian; Jabs, Gert; and Dahm, Manfred, 4,412,959, Cl. 264-4.100.
- Jackson, Ronald A., to Black & Decker Inc. Vise for workbench, 4,412,676, Cl. 269-101.000.
- Janich, Hans-Jurgen. Device for shutting off large pipes, 4,412,556, Cl. 137-614.110.
- Janssen, Alexander P. Disposable cooking bags, 4,412,482, Cl. 99-403.000.
- Janssen, Edward W., to Minnesota Mining & Manufacturing Company. Anaerobically-curing compositions, 4,413,108, Cl. 526-301.000.
- Japan Crown Cork Co., Ltd.: See—  
Murayama, Kashiwa, 4,412,797, Cl. 425-114.000.



Jarvik, Robert K., to United States Surgical Corporation. Repeating hemostatic clip applying instruments and multi-clip cartridges therefor. 4,412,539, Cl. 128-325.000.

Jason, Barry L., to Motorola, Inc. Low temperature coefficient logarithmic electronic gain controlled amplifier. 4,413,235, Cl. 330-254.000.

Jeannot, Pierre; Froidevaux, Raymond; and Gygax, Claude-Andre, to Omega SA. Jointed electronic watch. 4,412,751, Cl. 368-276.000.

Jeff Company, Inc.: See—  
Wenz, William, 4,412,778, Cl. 414-733.000.

Jeffers, Frederick J., to Eastman Kodak Company. Thin film magnetoresistive head. 4,413,296, Cl. 360-113.000.

Jendrzejek, Gary S.: See—  
LaBorde, Russell G.; and Jendrzejek, Gary S., 4,412,792, Cl. 417-454.000.

Jeneric Industries, Inc.: See—  
Prasad, Arun, 4,412,970, Cl. 420-463.000.

Jenkins, Merrill M. E., Sr.: See—  
Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., 4,412,610, Cl. 198-403.000.

Jerard, Robert B.: See—  
Beasette, Michael D.; and Jerard, Robert B., 4,412,962, Cl. 264-46.400.

Jessup, Peter: See—  
Holstedt, Richard A.; and Jessup, Peter, 4,412,928, Cl. 252-46.400.

Jidosha Kiki Co., Ltd.: See—  
Ohe, Takeshi; and Ohsaki, Hiroshi, 4,412,789, Cl. 417-288.000.

Johns, Robert H. Multiple frequency tuned circuit. 4,413,262, Cl. 343-722.000.

Johnson, Kenneth C., to International Computers Limited. Negative resistance element. 4,413,227, Cl. 323-315.000.

Johnson, Timothy L.: See—  
Callahan, Alfred S.; Rhodes, James S.; and Johnson, Timothy L., 4,412,547, Cl. 128-731.000.

Johnston, Barry W. Closed loop solar collector system with dual reservoirs and fluid bypass. 4,412,529, Cl. 126-419.000.

Johnston, Brian F.: See—  
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815, Cl. 432-206.000.

Jones, Cynthia G.: See—  
Abbott, Thomas I.; and Jones, Cynthia G., 4,413,053, Cl. 430-502.000.

Jones, Edward M., to Baldwin Piano & Organ Company. System for communicating data among microcomputers in an electronic musical instrument. 4,412,470, Cl. 84-1.010.

Jones, Stephen H., to Nordson Corporation. Method of heat control in a skin packaging machine. 4,413,172, Cl. 219-411.000.

Jones, William A.; and Young, Hugh M. Safety shift device for outboard motors. 4,412,826, Cl. 440-86.000.

Josephs, Richard M.; and Wang, Tsing-Chow, to Sperry Corporation. Three Josephson junction direct coupled isolation circuit. 4,413,196, Cl. 307-462.000.

Josephs, Richard M.; and Wang, Tsing-Chow, to Sperry Corporation. Four Josephson junction direct-coupled and gate circuit. 4,413,197, Cl. 307-462.000.

Juda, Walter; Allen, Robert J.; and Bar-Ilan, Amiram, to Prototech Company. Process for electrowinning of massive zinc with hydrogen anodes. 4,412,894, Cl. 204-119.000.

Julius Blum Gesellschaft m.b.H.: See—  
Rock, Erich; and Brustle, Klaus, 4,412,366, Cl. 16-236.000.

Jung, Michel: See—  
Bey, Philippe; and Jung, Michel, 4,413,141, Cl. 562-561.000.

Jurkowski, Walter J., to Pitney Bowes Inc. Tubular knife. 4,412,466, Cl. 83-200.000.

Kabanov, Pavel S.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexander I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201, Cl. 310-260.000.

Kabushiki Kaisha Kobe Sekio Sho: See—  
Nagai, Nobuyuki; Takahashi, Eiji; Matsumoto, Yoji; and Ohtsu, Hideaki, 4,412,453, Cl. 73-601.000.

Kabushiki Kaisha Kurio-Medikaru: See—  
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538, Cl. 128-303.100.

Kabushiki Kaisha Medos Kenkyusho: See—  
Chikashige, Kiyoshi, 4,412,531, Cl. 128-4.000.

Kabushiki Kaisha Toyota Jidoshokki: See—  
Kobayashi, Takeshi; and Suzuki, Hajime, 4,412,562, Cl. 139-54.000.

Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., to Gosudarstvennyy Proektnyy I Nauchno-Issledovatel'skiy Institut "Gipronikel". Method of smelting ferromanganese in ore-smelting electrical furnace under a layer of charge. 4,412,857, Cl. 75-11.000.

Kageyama, Takao; Suzuki, Yoshiaki; and Watanabe, Eiichi, to Nippon Electric Co., Ltd. Multivacuity klystron. 4,413,207, Cl. 315-5.520.

Kahara, Lasse S.: See—  
Uusitalo, Seppo J.; von Alfthan, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451, Cl. 73-432.0PS.

Kakishima, Todomu: See—  
Ohtani, Yoshio; Wakiya, Michio; and Kakishima, Todomu, 4,413,249, Cl. 340-52.00R.

Kakizaki, Tetsuji; and Mizutani, Toshikazu, to Mitsubishi Petrochemical Company Limited. Semiconducting resin compositions. 4,412,938, Cl. 252-511.000.

Kamada, Minoru: See—  
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039, Cl. 428-643.000.

Kamezaki, Yasushi: See—  
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047, Cl. 430-94.000.

Kamioka, Hajime: See—  
Takagi, Mikio; and Kamioka, Hajime, 4,412,388, Cl. 34-1.000.

Kaneko, Takushi: See—  
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,413,134, Cl. 549-332.000.

Kanemoto, Tetsuaki: See—  
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,413,102, Cl. 525-453.000.

Kanno, Takeshi; Gaiho, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, to Tanabe Seiyaku Co., Ltd. N-Aryl-N-phenoxy-alkyl-piperazine compounds useful in decreasing intracranial pressure. 4,413,006, Cl. 424-250.000.

Kao Soap Co., Ltd.: See—  
Hirota, Hajime; and Watanabe, Hiroshi, 4,412,943, Cl. 252-546.000.

Kapich, Davorin D., to GA Technologies Inc. System for producing process heat. 4,413,348, Cl. 376-367.000.

Karanatsios, Dimitrios, to Sandoz Ltd. 4,5,6,7-Tetrahalo-isoinodol-1-one derivatives. 4,413,131, Cl. 548-461.000.

Karlotski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., to GTE Products Corporation. Metal halide arc discharge lamp having electrolysis prevention means. 4,413,206, Cl. 313-601.000.

Karp, Joel A.: See—  
Sabo, Joseph D.; and Karp, Joel A., 4,413,327, Cl. 364-900.000.

Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., to Kaspar Wire Works, Inc. Coin dispensing machine for non-ferrous beverage cans. 4,412,608, Cl. 194-4.00D.

Kaspar, Don G.: See—  
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608, Cl. 194-4.00D.

Kaspar, Josephine A.: See—  
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608, Cl. 194-4.00D.

Kaspar Wire Works, Inc.: See—  
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608, Cl. 194-4.00D.

Kasukawa, Shunichi: See—  
Iwasaki, Hidenori; Urata, Yukio; and Kasukawa, Shunichi, 4,413,091, Cl. 525-61.000.

Katagiri, Kazuharu: See—  
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045, Cl. 430-59.000.

Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, to Canon Kabushiki Kaisha. Magnetic head. 4,413,295, Cl. 360-110.000.

Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, to Nippon Oil and Fats Co., Ltd. Process for producing dicumylperoxide. 4,413,148, Cl. 568-578.000.

Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, to Mita Industrial Co., Ltd. Cadmium photoconductor with (dialkylpyrophosphato) organic titanate additive. 4,413,047, Cl. 430-94.000.

Katoh, Yujiro: See—  
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902, Cl. 204-192.00E.

Katsuhiko, Nakamura: See—  
Katsuhisa, Kohyama; Katsuhiko, Nakamura; and Akira, Matsuno, 4,413,103, Cl. 525-469.000.

Katsuhisa, Kohyama; Katsuhiko, Nakamura; and Akira, Matsuno, to Mitsubishi Chemical Industries, Ltd. Halogen-containing polycarbonate resin and process for producing same. 4,413,103, Cl. 525-469.000.

Kau, Karl M.: See—  
Buddendeck, Gerald A.; and Kau, Karl M., 4,412,740, Cl. 355-14.0SH.

Kaufman, Benjamin J.; and Sweeney, William M., to Texaco Inc. Ethanol or gasohol fuel composition containing as inhibitor a reaction product of itaconic acid and mono-oleyl-1,3-diaminopropane. 4,412,845, Cl. 44-53.000.

Kavesh, Sheldon; and Prevorsek, Dusan C., to Allied Corporation. High tenacity, high modulus polyethylene and polypropylene fibers and intermediates therefore. 4,413,110, Cl. 526-348.100.

Kawakami, Yoshio: See—  
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295, Cl. 360-110.000.

Kawakubo, Takamasa, to Mitsubishi Pencil Co., Ltd. Carbon spring and process for preparing the same. 4,412,675, Cl. 267-167.000.

Kawanami, Shumpei; Watanabe, Yasuo; and Hanyo, Susumu, to Dai-ichi High Frequency Co., Ltd. Method for bending a metal pipe. 4,412,442, Cl. 72-128.000.

Kawasaki Jukogyo Kabushiki Kaisha: See—  
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuhio; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810, Cl. 431-186.000.

Kawasaki Kasei Chemicals Ltd.: See—  
Komatsu, Tatsuyoshi; and Usui, Kenji, 4,412,954, Cl. 260-369.000.

Kawasaki, Kiyoshi: See—  
Miyashita, Tsuneo; Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadaaki, 4,412,862, Cl. 75-130.500.

Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, to Yamanouchi Pharmaceutical Co. Ltd. Nifedipine-containing solid preparation composition. 4,412,986, Cl. 424-80.000.

Kawata, Mitsuyasu: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadaaki; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tateru; and Tanaka, Akira, 4,413,003, Cl. 424-285.000.

Kayser-Roth Hosiery, Inc.: See—  
Safrit, Sam C.; Cassidy, Edward L.; and Euliss, Melvin C., 4,412,433, Cl. 66-177.000.

Kearney, Michael M.: See—  
Schoenrock, Karlheinz W. R.; Kearney, Michael M.; and Rearick, D. Eugene, 4,412,866, Cl. 127-46.200.

Kearney-National Inc.: See—  
Westrom, Arthur C.; Livesay, Billy R.; and Larsen, James W., 4,413,246, Cl. 337-159.000.

Kekish, George T.: See—  
Collins, John H.; Lin, Mei-Jan L.; and Kekish, George T., 4,412,844, Cl. 44-51.000.

Kell, Michael J., to Cordis Dow Corp. Airless artificial kidney assembly. 4,412,916, Cl. 210-90.000.

Keller, J. Walter: See—  
Schalldach, Max; and Keller, J. Walter, 4,412,541, Cl. 128-419.0PG.

Keller, Richard L. Grain drying and storage structure. 4,412,392, Cl. 34-233.000.

Keller, Viktor R.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.

Kelsey-Hayes Co.: See—  
Prokop, B. Robert; and Trindle, Terry L., 4,412,690, Cl. 280-718.000.

Kendall, Robert M.: See—  
Schreiber, Richard J.; Kesselring, John P.; and Kendall, Robert M., 4,412,523, Cl. 126-92.00C.

Kenny, Andrew A., to Eaton Corporation. Idle speed control system. 4,412,518, Cl. 123-339.000.

Kesselring, John P.: See—  
Schreiber, Richard J.; Kesselring, John P.; and Kendall, Robert M., 4,412,523, Cl. 126-92.00C.

Ketel, William E., II, to Sun Electric Corporation. Method for detection of hydrocarbonaceous fuel in a fuel injection engine. 4,412,444, Cl. 73-23.000.

Kettinger, James G., to Phillips Petroleum Company. Specific gravity responsive control of BMCI in aromatic extract oils. 4,412,915, Cl. 208-311.000.

Kezerle, James A.: See—  
Sheppard, Douglas B.; Kezerle, James A.; and Sheffield, Ellis W., 4,412,808, Cl. 431-8.000.

Khan, Mohammed N., to Dowty Electronics Limited. Vacuum deposition apparatus. 4,412,905, Cl. 204-298.000.

Khmelkov, Stanislav F.; Ramazanov, Mnaidar R.; Soldatov, Mikhail P.; Beskaravainy, Vadim V.; Aranzovich, Viktor L.; and Soldaev, Lev K. Pigment for color-changing heat indicator. 4,412,936, Cl. 252-408.100.

Khoobiar, Sargis, to Halcon SD Group, Inc., The. Conversion of isobutane to methacrolein. 4,413,147, Cl. 568-476.000.

Khristoforov, Viktor P.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.

Kibby, Charles L.: See—  
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064, Cl. 518-715.000.

Kihira, Masafumi: See—  
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,412,564, Cl. 140-92.100.

Kimberly-Clark Corporation: See—  
Sigl, Wayne C., 4,412,881, Cl. 156-164.000.

Kimon, Peter M.; and Bertrand, Yves, to Exxon Research and Engineering Co. Personnel transfer apparatus and method. 4,412,598, Cl. 182-19.000.

Kimura, Kazuaki: See—  
Ohtomo, Fumio; and Kimura, Kazuaki, 4,412,745, Cl. 356-373.000.

Kimura, Muneaki: See—  
Yamashita, Kunihiko; and Kimura, Muneaki, 4,412,908, Cl. 208-8.00R.

Kingaley, Michael C. Method and apparatus for attaching sun visor to an automobile. 4,412,698, Cl. 296-97.00A.

Kinoshita, Toshio: See—  
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,412,564, Cl. 140-92.100.

Kinzel, Augustus B. Three wheeled vehicle. 4,412,595, Cl. 180-211.000.

Kirk, Norbert A. Blade housing for cast cutting tool. 4,412,381, Cl. 30-124.000.

Kish, Arthur S., to Murray Corporation. Hose cutoff device or tool. 4,412,380, Cl. 30-92.000.

Kitahara, Makoto: See—  
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045, Cl. 430-59.000.

Kitamoto, Tatsuji; and Shirahata, Ryuji, to Fuji Photo Film Co., Ltd. Magnetic recording medium manufacturing device. 4,412,507, Cl. 118-718.000.

Kiuru, Erkki S.: See—  
Uusitalo, Seppo J.; von Alfthan, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451, Cl. 73-432.0PS.

Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoeckigt, Dieter, to BASF Aktiengesellschaft. Color stabilized nonionic surfactants. 4,412,933, Cl. 252-174.190.

Klammers, Gerard, to Etablissements Eugene Scholtes. Electric cooking oven for domestic use. 4,413,171, Cl. 219-400.000.

Klayer, Charles W., to Cottell, Eric Charles. Coal beneficiation process. 4,412,842, Cl. 44-1.0SR.

Kleenair Products Co., Inc.: See—  
Oeck, Robert C., 4,412,889, Cl. 202-117.000.

Klein, Paul E.: See—  
Brummond, Gerald G.; Klein, Paul E.; and Anderson, Roland M., 4,412,820, Cl. 433-18.000.

Kleiner, Hans-Jerg: See—  
Brandt, Lothar; Holst, Arno; and Kleiner, Hans-Jerg, 4,413,121, Cl. 536-44.000.

Kleiner, Walter, to Staebli Ltd. Multiposition dobby. 4,412,563, Cl. 139-66.00R.

Klenzids Engineers Private Limited: See—  
Shahani, Chandru M., 4,412,849, Cl. 55-97.000.

Klessing, Klaus, to Fa. Wilmar Schwabe GmbH & Co. Optionally N-substituted aminodesoxy-1,4:3,6-dianhydrohexitol derivatives. 4,413,122, Cl. 544-153.000.

Kling, John E.; Camin, Larry R.; and Scott, Douglas W., to Baxter Travenol Laboratories, Inc. Peelable catheter introduction device. 4,412,832, Cl. 604-164.000.

Klockner-Humboldt-Deutz AG: See—  
Megerle, Friedrich, 4,412,583, Cl. 165-95.000.

Knights, Richard N.; and Whittall, Peter H., to IMI Kynoch Limited, by said Peter H. Whittall. Priming composition and techniques. 4,412,492, Cl. 102-204.000.

Knox, Wayne H.: See—  
Mourou, Gerard A.; and Knox, Wayne H., 4,413,178, Cl. 250-213.0VT.

Knuth, Detlef, to Licentia Patent-Verwaltungs-GmbH. Static frequency changer for feeding synchronous machines. 4,413,216, Cl. 318-721.000.

Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Idling speed control device of an internal combustion engine. 4,412,517, Cl. 123-339.000.

Kobayashi, Hirokazu, to Nippon Electric Co., Ltd. Ternary to binary pulse regenerator for a regenerative repeater. 4,413,347, Cl. 375-20.000.

Kobayashi, Hiroshi: See—  
Tanaka, Motoharu; Machida, Hazime; and Kobayashi, Hiroshi, 4,413,297, Cl. 360-119.000.

Kobayashi, Ikutaro: See—  
Matsuoka, Shoji; Kobayashi, Ikutaro; and Minowa, Junichiro, 4,413,179, Cl. 250-232.000.

Kobayashi, Keizou: See—  
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538, Cl. 128-303.100.

Kobayashi, Takeshi; and Suzuki, Hajime, to Kabushiki Kaisha Toyota Jidoshokki. Apparatus for forming selvages in weaving machines. 4,412,562, Cl. 139-54.000.

Kobylinski, T. P.: See—  
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064, Cl. 518-715.000.

Koch, Friedrich: See—  
Schilling, Wilfried; Lorenz, Siegfried; and Koch, Friedrich, 4,413,175, Cl. 377-25.000.

Kochs Adler AG: See—  
Scholl, Hans, 4,412,498, Cl. 112-313.000.

Kockler, Barry C.; Geiselman, Theodore S.; and Black, Gerda N., to Mead Corporation, The. Ink jet printer. 4,413,265, Cl. 346-1.100.

Koenig & Bauer AG: See—  
Grosshauser, Heinrich K., 4,412,490, Cl. 101-219.000.

Koenig, Raymond, to Dow Chemical Company, The. Stabilized thermosettable ethylenically unsaturated epoxy ester resin compositions. 4,413,105, Cl. 525-482.000.

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Sakane, Toshio; Madate, Haruhisa; and Kohayakawa, Yoshimi, 4,412,728, Cl. 351-206.000.

Kohl, Vance L., to McQuay Inc. Ice cube making. 4,412,429, Cl. 62-347.000.



- Kohler, Norbert: See—  
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- Koike, Keiichi; and Yanadori, Michio, to Hitachi, Ltd.; and Hitachi Plant Engineering and Construction Co., Ltd. Heat-storing composition, 4,412,930, Cl. 252-70.000.
- Kokado, Masayuki: See—  
Sumi, Hideji; and Kokado, Masayuki, 4,413,300, Cl. 361-98.000.
- Kolbanovsky, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., to Institut Neftekhimicheskogo Sintez Imeni A.V. Topchieva Akademii Nauk SSSR. Method of controlling inlet valves of compression reactor and device for effecting same, 4,412,552, Cl. 137-14.000.
- Kollmann, Horst, to Schelling & Co., Firma. Apparatus for centering alignment of planar workpieces, 4,412,769, Cl. 414-36.000.
- Komatsu, Tatsuyoshi; and Usui, Kenji, to Kawasaki Kasei Chemicals Ltd. Process for producing 1,4,4a,9a-tetrahydroanthraquinone compound, 4,412,954, Cl. 260-369.000.
- Kondo, Hiroshi; and Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor having an improved lubricant oil feeding arrangement, 4,412,787, Cl. 417-269.000.
- Kopp, Clinton V.; and Hitchcock, James, to Baxter Travenol Laboratories, Inc. Device to control the transmembrane pressure in a plasmapheresis system, 4,412,553, Cl. 137-118.000.
- Koppers Company, Inc.: See—  
Wallace, William E.; Sinha, Vijay K.; and Purarian, Faiz, 4,412,982, Cl. 423-644.000.
- Zavodsky, Tamas, 4,412,579, Cl. 164-413.000.
- Kornbaum, Simon; and Chenard, Jean-Yves, to Ato Chimie. Process for rendering polymers resistant to ionizing radiation, and compositions obtained thereby, 4,412,897, Cl. 204-159.200.
- Kosonen, Ahti; and Palmu, Mauri, to Outokumpu Oy. Method of manufacturing a thin copper plate with flow conduits, 4,412,373, Cl. 29-157.30V.
- Kosters, Larry J., to Roto Press Limited. Silo bag filling machine, 4,412,567, Cl. 141-114.000.
- Kottgen GmbH & Co. Kommanditgesellschaft: See—  
Gronau, Jürgen, 4,413,210, Cl. 318-16.000.
- Kovac, Zalata: See—  
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- Kovach, Stephen M.: See—  
Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., 4,412,914, Cl. 208-253.000.
- Kovacs, Jenoe: See—  
Reiter, Udo; Kovacs, Jenoe; and Schenck, Hans-Uwe, 4,413,117, Cl. 528-497.000.
- Kowalski, Gunter, to U.S. Philips Corporation. Computer tomography apparatus, 4,413,351, Cl. 378-19.000.
- Kowalski, Jeffrey M.: See—  
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- Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, to Agency of Industrial Science and Technology. The heat recovery method from gasified products of hydrocarbon, 4,412,848, Cl. 48-197.00R.
- Koyanagi, Katsubumi: See—  
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- Kraftwerk Union Aktiengesellschaft: See—  
Scholz, Manfred; and Fricker, Wolfgang-Peter, 4,412,408, Cl. 52-806.000.
- Kramer, Albert: See—  
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- Kramer, Gordon; Lara, Elias J.; and Wollmann, Andrew F., to Beckman Instruments, Inc. Conductive particle lead termination for an electro-optic display, 4,413,257, Cl. 340-815.010.
- Kramer, Louis T.; Butler, Franklin H.; and Callas, Donald C., to McDonnell Douglas Corporation. 3-Wheeled levered trailing beam landing gear, 4,412,665, Cl. 244-102.00R.
- Krasovsky, Yuri V.: See—  
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- Krautkremer, Franz, to Schottel-Werft, Josef Becker GmbH & Co. KG. Drive mechanism for ships or the like comprising a main propeller and an auxiliary mechanism, 4,412,500, Cl. 114-151.000.
- Krempel, Peter; Claassen, Peter; and List, Helmut, to List, Hans. Transducer with a flexible sensor element for measurement of mechanical values, 4,413,202, Cl. 310-338.000.
- Kreuzmann, Alvin B. Method for the recovery of uranium values from uranium tetrafluoride, 4,412,861, Cl. 75-84.10R.
- Krone GmbH: See—  
Forberg, Horst; Achtnig, Klaus-Peter; and Stoewe, Anneliese, 4,412,374, Cl. 29-566.400.
- Kroymann, Howard B.: See—  
Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Sofky, Edward H., 4,413,259, Cl. 340-825.060.
- Krueger, William R.: See—  
Cavil, David T.; and Krueger, William R., 4,413,215, Cl. 318-588.000.
- Kruehler, Wolfgang: See—  
Plaetner, Rolf; and Kruehler, Wolfgang, 4,412,935, Cl. 252-188.100.
- Kruger, Manfred, to Bosch-Siemens Hausgeräte GmbH. Method of automatically controlling the drying process in a laundry-drying system, and equipment for performing the method, 4,412,389, Cl. 34-46.000.
- Kruglewicz, Anne M.: See—  
Gavin, Francis M.; and Kruglewicz, Anne M., 4,413,089, Cl. 524-785.000.
- Krupka, Yaakov; Bachar, Avi; and Yerushalmi, Shmuel. Micropower system, 4,413,224, Cl. 323-222.000.
- Krutchin, Charles M.: See—  
DiBiasi, Daniel J.; and Krutchin, Charles M., 4,412,961, Cl. 264-40.100.
- Kubas, Robert J., to American Cyanamid Company. Microsurgical foam needle control package, 4,412,613, Cl. 206-63.300.
- Kubicek, Donald H., to Phillips Petroleum Company. Conversion of hydrogen sulfide to sulfur by direct oxidation, 4,412,981, Cl. 423-573.00R.
- Kubota Ltd.: See—  
Ohta, Ryozi; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802, Cl. 425-392.000.
- Kubota, Nobunori: See—  
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,412,413, Cl. 57-304.000.
- Kuhn, Edgar: See—  
Gansert, Willi; Munz, Ulrich; and Kuhn, Edgar, 4,413,222, Cl. 320-48.000.
- Kulik, Joseph S., Jr.: See—  
Karlotski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., 4,413,206, Cl. 313-601.000.
- Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C., to Baxter Travenol Laboratories, by said Ralph Kulin and Ronald C. Stauber. Antimicrobial ultraviolet irradiation of connector for continuous ambulatory peritoneal dialysis, 4,412,834, Cl. 604-29.000.
- Kulwiec, Leonard J.; and Kulwiec, Michael F. X. Removable partial dental prosthesis and method of forming and supporting the same, 4,412,824, Cl. 433-170.000.
- Kulwiec, Michael F. X.: See—  
Kulwiec, Leonard J.; and Kulwiec, Michael F. X., 4,412,824, Cl. 433-170.000.
- Kumar, Ananda H.; McMillan, Peter W.; and Tummala, Rao R., to International Business Machines Corporation. Glass-ceramic structures and sintered multilayer substrates thereof with circuit patterns of gold, silver or copper, 4,413,061, Cl. 501-7.000.
- Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, to Unrath, Ludwig; and Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co. Vibration machine for compacting materials, in particular an earth compacting machine, 4,412,757, Cl. 404-113.000.
- Kunkel, Heinrich: See—  
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,412,372, Cl. 29-149.50R.
- Kunz, Willy: See—  
Reichmuth, Arthur; and Kunz, Willy, 4,412,591, Cl. 177-1.000.
- Kurachi, Hisao; Itoh, Takeo; and Onoda, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Typewriter with an erasing apparatus, 4,412,755, Cl. 400-697.100.
- Kurakake, Mitsuo, to Fujitsu Fanuc Limited. Addressing system, 4,413,315, Cl. 364-200.000.
- Kurashige, Tomozo; and Shimada, Hidetoshi, to Idemitsu Kosan Co., Ltd. Asphalt compositions and a vibration-damping sheet formed by the same, 4,412,864, Cl. 106-235.000.
- Kurata, Chikatoshi: See—  
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810, Cl. 431-186.000.
- Kurata, Tonio; and Fujii, Hiroshi, to Neat Shujinki Kogyo Kabushiki Kaisha. Electric dust collector, 4,412,850, Cl. 55-130.000.
- Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
Mizuno, Toshiya; and Murayama, Naohiro, 4,413,095, Cl. 525-199.000.
- Shoji, Masuhiro; Sakagami, Teruo; and Murayama, Naohiro, 4,413,090, Cl. 525-59.000.
- Kurimoto Iron Works, Ltd.: See—  
Sakaguchi, Keizo; and Takeuchi, Shigeru, 4,412,561, Cl. 138-174.000.
- Kurtz, Robert J.; and LiCausi, Joseph, to BioResearch. Orthopedic foot splint, 4,412,536, Cl. 128-80.00A.
- Kurumada, Tomoyuki: See—  
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,413,076, Cl. 524-102.000.
- Kwasnik, Hans-Jürgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. G.m.b.H. Apparatus for overhauling and repairing doors of horizontal coke-oven batteries, 4,412,776, Cl. 414-684.300.
- Kyomen, Junsuke: See—  
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- Kyster, Erik: See—  
Thomsen, Svend E.; and Kyster, Erik, 4,412,415, Cl. 60-384.000.
- LaBorde, Russell G.; and Jendrzek, Gary S., to Oilgear Company, The. Intensifier pump with integrated check valve, 4,412,792, Cl. 417-454.000.
- La Conte, Ruth A. Tray for grooming instruments, 4,412,618, Cl. 206-581.000.
- Lacour, Alain P.: See—  
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001, Cl. 424-272.000.

- La Fever, William C. Spill resistant disposable paper drinking cup, 4,412,644, Cl. 229-1.50B.
- Laflamme, Daniel C., to D C L Microelectronics, Inc. Calculator for guitar chords, 4,412,473, Cl. 84-485.00R.
- Laine, Robert, to Agence Spatiale Europeene. Cryogenic apparatus suitable for operations in zero gravity, 4,412,851, Cl. 55-160.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
Nicolas, Jacques; Berger, Antoine; and Laminette, Christian, 4,412,974, Cl. 422-156.000.
- Lal, Mahendra, to Copeland Corporation. Refrigeration compressor apparatus and method of assembly, 4,412,791, Cl. 417-312.000.
- Lamanna, Richard A.: See—  
Anderson, Ronald W.; and Lamanna, Richard A., 4,413,015, Cl. 426-131.000.
- Lamb Technicon Corp.: See—  
Wright, Lawrence B., 4,412,465, Cl. 82-1.200.
- Lambert, Clifford L.: See—  
Nieh, Edward C. Y.; Naylor, Carter G.; and Lambert, Clifford L., 4,412,926, Cl. 252-8.55D.
- Laminette, Christian: See—  
Nicolas, Jacques; Berger, Antoine; and Laminette, Christian, 4,412,974, Cl. 422-156.000.
- Lampe, Guy W.: See—  
Mollitor, Edwin A.; Crowe, Norman P.; and Lampe, Guy W., 4,412,775, Cl. 414-626.000.
- Lampert, Heinz, to Lanker, Willy, a part interest. Measuring use of heat or the like at individual zones supplied from one source, 4,412,647, Cl. 236-36.000.
- Lamphere, Craig F.: See—  
Pecok, Roger L.; McCrea, Ray G., Jr.; and Lamphere, Craig F., 4,413,298, Cl. 360-133.000.
- Lancaster, David J.: See—  
Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., 4,413,303, Cl. 361-253.000.
- Landa, Benzion. Cable driven plotter, 4,412,383, Cl. 33-1.00M.
- Landa, Benzion, to Savin Corporation. Developing composition for a latent electrostatic image for transfer of the developed image across a gap to a carrier sheet, 4,413,048, Cl. 430-115.000.
- Landers, Don B.: See—  
Britton, Frederick G.; and Landers, Don B., 4,412,759, Cl. 405-225.000.
- Lane, George A.; and Rossow, Harold E., to Dow Chemical Company. The reversible phase change compositions of calcium chloride hexahydrate with a potassium salt, 4,412,931, Cl. 252-70.000.
- Langlois, Michel: See—  
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001, Cl. 424-272.000.
- Lanker, Willy: See—  
Lampert, Heinz, 4,412,647, Cl. 236-36.000.
- Laprad, Paul J.; and Wolanin, Gerald L., to Whirlpool Corporation. Gravity-operated latch for tilt-out console for dishwasher, 4,412,710, Cl. 312-311.000.
- Lara, Elias J.: See—  
Kramer, Gordon; Lara, Elias J.; and Wollmann, Andrew F., 4,413,257, Cl. 340-815.010.
- Larikka, Leo, to G. A. Serlachius Oy. Method for forming an enlarged flanged hole in a curved surface, 4,412,441, Cl. 72-71.000.
- Larsen, James W.: See—  
Westrom, Arthur C.; Livesay, Billy R.; and Larsen, James W., 4,413,246, Cl. 337-159.000.
- Laurel Bank Machine Co., Ltd.: See—  
Watanabe, Kenkichi; and Hata, Setsuo, 4,412,550, Cl. 133-8.00A.
- Laurent, Jacques: See—  
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988, Cl. 424-177.000.
- Lavagnino, Edward R.: See—  
Campbell, Jack B.; and Lavagnino, Edward R., 4,413,126, Cl. 546-52.000.
- Lavender, Michael R., to Gentex Corporation. Individually fitted helmet liner and method of making same, 4,412,358, Cl. 2-412.000.
- Layden, George K., to United Technologies Corporation. Method of producing fiber reinforced glass matrix composite articles of complex shape, 4,412,854, Cl. 65-18.100.
- Layfield, James D.: See—  
Todd, David B.; and Layfield, James D., 4,412,964, Cl. 264-143.000.
- Lebet, Jean-Pierre; and Berney, Michel, to Baumgartner Papiers, S.A. Production of cigarette filter units, 4,412,829, Cl. 493-48.000.
- LeBlanc, Richard E.: See—  
Porter, Ronald G.; LeBlanc, Richard E.; and Siemon, Rolf W., 4,413,250, Cl. 340-310.00A.
- Lebrun, Jean L., to Societe Fracaise d'Equipements pour la Navigation Aerienne S.F.E.N.A. Rapid detector of a wind gradient, 4,413,321, Cl. 364-428.000.
- Le Brun, Jean-Yves: See—  
Renoulin, Roger; and Le Brun, Jean-Yves, 4,413,338, Cl. 370-89.000.
- Le Coent, Jean-Louis: See—  
Demoures, Bernard; and Le Coent, Jean-Louis, 4,412,927, Cl. 252-33.300.
- Lecreff, Maurice: See—  
Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Lecreff, Maurice, 4,413,241, Cl. 333-22.00R.
- Lee, Byron D. Folding support frame for stroller or the like, 4,412,689, Cl. 280-648.000.
- Lee, Jerald D.; and Reilly, Charles D., to Du Pont de Nemours, E. I., and Company. Absolute spectrophotometer, 4,412,744, Cl. 356-319.000.
- Lee, Kyu-Wang: See—  
Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., 4,413,086, Cl. 524-386.000.
- Lee, Wooyoung: See—  
Garwood, William E.; and Lee, Wooyoung, 4,413,153, Cl. 585-304.000.
- LeFranc, Christiane; and Verdier, Francois. Telescoping grandstand arrangement, 4,412,403, Cl. 52-9.000.
- Le Fur, Daniel: See—  
Goldman, Alice; and Le Fur, Daniel, 4,412,960, Cl. 264-22.000.
- Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Apparatus for the installation of a jet engine in an aircraft compartment, 4,412,774, Cl. 414-589.000.
- Lemaitre, Maurice; Roussel, Robert; and Wirth, Rene, to Societe Chimique des Charbonnages. Process of preparation of graft copolymer of styrene and an EPDM rubber, 4,412,896, Cl. 204-159.200.
- Lemke, James U.; and French, William W., to Eastman Technology Inc. Method of manufacturing a multitrac magnetic head employing double helix structure, 4,412,379, Cl. 29-603.000.
- Lenko, Daniel S., to United States of America, Navy. Digital compass having a ratioimetric bearing processor, 4,412,387, Cl. 33-361.000.
- Lennon, Donald J.: See—  
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- Leonard, Frank W. Press construction, 4,412,486, Cl. 100-229.00R.
- Lepisto, J. George, to Champion International Corporation. Self-sealing bag sleeve, 4,412,645, Cl. 383-48.000.
- Lepley, Richard H.; and Happel, Thomas A., to Pfizer Inc. Pneumatic unloading of particulates, 4,412,762, Cl. 406-134.000.
- Lerner, Bernard; and Liebhart, Dana J., to Automated Packaging Systems, Inc. Labeling apparatus, 4,412,876, Cl. 156-64.000.
- Leroy, Claude, to Sorelec. Inflatable-structure apparatus for cooling a heat exchange fluid, 4,412,430, Cl. 62-467.00R.
- Lettington, Alan H.: See—  
Green, Geoffrey W.; and Lettington, Alan H., 4,412,903, Cl. 204-192.00C.
- Leung, Pak S.; and Cacciola, Anthony R., to Union Carbide Corporation. Dry, particulate, inorganic ultrafiltration membranes and the production thereof, 4,412,921, Cl. 210-500.200.
- Leveson, Richard C.; and Barker, Nicholas J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Selective photoionization gas chromatograph detector, 4,413,185, Cl. 250-423.00P.
- Levin, Harold. Method of and apparatus for providing a personal sanitary toilet seat cover, 4,412,360, Cl. 4-242.000.
- Lewis, Elyse B.; and Valdesirri, Leo L., to Borg-Warner Chemicals, Inc. Light-stable polyolefins, 4,413,078, Cl. 524-120.000.
- Libby, Charles J., to Automatrix Incorporated. Method and apparatus for image acquisition utilizing a hollow shaft motor and a concave, cylindrical reflector, 4,413,180, Cl. 250-236.000.
- Librairie Fernand Nathan: See—  
Duhamel, Claude-Alain, 4,412,489, Cl. 101-212.000.
- LiCausi, Joseph: See—  
Kurtz, Robert J.; and LiCausi, Joseph, 4,412,536, Cl. 128-80.00A.
- Licentia Patent-Verwaltungs-GmbH: See—  
Knuth, Detlef, 4,413,216, Cl. 318-721.000.
- Niemetz, Linhard, 4,413,192, Cl. 307-278.000.
- Liebhart, Dana J.: See—  
Lerner, Bernard; and Liebhart, Dana J., 4,412,876, Cl. 156-64.000.
- Lien, Suei-Yuen P., to Western Electric Co., Inc. Apparatus for the elimination of edge growth in liquid phase epitaxy, 4,412,502, Cl. 118-412.000.
- Lietti, Andrea; and Bonati, Attilio, to Inverni Della Beffa S.p.A. Pharmaceutical compositions, 4,413,004, Cl. 424-283.000.
- Lightfoot, Alan E.: See—  
Sadowski, Joseph P.; Lightfoot, Alan E.; and Kowalski, Jeffrey M., 4,412,812, Cl. 432-121.000.
- Lin, Mei-Jan L.: See—  
Collins, John H.; Lin, Mei-Jan L.; and Kekish, George T., 4,412,844, Cl. 44-51.000.
- Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Reum, Helmut, to Robert Bosch GmbH. Optical combustion sensor, particularly for use with internal combustion engines, 4,412,446, Cl. 73-35.000.
- Lindfors, Sven G.: See—  
Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., 4,413,022, Cl. 427-255.200.
- Linev, Valery D.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.
- Linn, James F. Quick-opening bearing block, 4,412,753, Cl. 384-437.000.
- Lion Corporation: See—  
Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, 4,412,945, Cl. 252-551.000.



- List, Hans: See—  
Krempel, Peter; Claassen, Peter; and List, Helmut, 4,413,202., Cl. 310-338.000.
- List, Helmut: See—  
Krempel, Peter; Claassen, Peter; and List, Helmut, 4,413,202., Cl. 310-338.000.
- Little, Roy: See—  
Sloan, Kenneth B.; and Little, Roy, 4,412,994., Cl. 424-248.530.
- Litton Systems, Inc.: See—  
Reeves, Albert H.; and Michalski, Joseph S., 4,413,242., Cl. 333-122.000.
- Liu, Kuo-ching: See—  
Cohen, Martin G.; and Liu, Kuo-ching, 4,413,342., Cl. 372-22.000.
- Liu, Thomas T.: See—  
Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, 4,412,731., Cl. 354-299.000.
- Livesay, Billy R.: See—  
Westrom, Arthur C.; Livesay, Billy R.; and Larsen, James W., 4,413,246., Cl. 337-159.000.
- Lloyd, Peter H., to National Research Development Corporation. Apparatus for use in investigating specimens. 4,412,742., Cl. 356-73.000.
- Loader, Mary A., to General Mills, Inc. Food product containing juice pulp and acidified milk components. 4,413,017., Cl. 426-616.000.
- Locatelli, Jean-Louis, to Rhone-Poulenc Industries. Imido thermosetting compositions storage-stabilized against recrystallization of bis-imides therefrom. 4,413,107., Cl. 526-262.000.
- Loffelman, Frank F.; and Brady, Thomas E., to American Cyanamid Company. Method of stabilizing a polymer from degradation by UV radiation. 4,413,093., Cl. 525-185.000.
- Loizeau, Pierre, to Societe Anonyme Francaise du Ferodo. Torsion damper device for automotive vehicle clutch friction disc. 4,412,606., Cl. 192-106.200.
- Lorenz, Siegfried: See—  
Schilling, Wilfried; Lorenz, Siegfried; and Koch, Friedrich, 4,413,175., Cl. 377-25.000.
- Losert, Ewald: See—  
Green, George E.; Losert, Ewald; and Paul, John G., 4,413,052., Cl. 430-327.000.
- Lotsch, Wolfgang: See—  
Dimroth, Peter; and Lotsch, Wolfgang, 4,412,949., Cl. 260-154.000.
- Louvet, Olivier F.: See—  
Dauphin, Jean-Louis; Louvet, Olivier F.; and Pitie, Jean-Marc, 4,413,337., Cl. 370-58.000.
- Lozen, Robert F.: See—  
Torpie, John D.; Lozen, Robert F.; and Hsieh, Shing-Chang R., 4,413,287., Cl. 358-288.000.
- Lu, Wen-Tong P., to Westinghouse Electric Corp. System using SO<sub>2</sub> as an anode depolarizer in a solid oxide electrolyte cell for H<sub>2</sub> production from steam. 4,412,895., Cl. 204-129.000.
- Lubrizol Corporation, The: See—  
Abbott, Franklin P., 4,412,846., Cl. 44-63.000.
- Lucas Industries Limited: See—  
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Carlo, Dennis J.; Nollstadt, Karl H.; Stoudt, Thomas H.; and Maigetter, Robert Z., 4,413,037., Cl. 435-101.000.
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- Manners, Vincent J., to Commonwealth of Australia. X-Ray diffraction camera. 4,413,354., Cl. 378-81.000.
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Tilbrook, Roger W.; and Markowski, Franz J., 4,412,969., Cl. 376-280.000.
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Reh Kemper, Steven F.; and Morrison, Howard J., 4,412,682., Cl. 273-1.0GG.
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Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, 4,412,658., Cl. 241-26.000.
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Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, 4,412,497., Cl. 112-96.000.
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Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.
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Biot, Maurice A.; Medlin, William L.; and Masse', Lucien, 4,412,452., Cl. 73-579.000.
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Obermann, George; and Mateja, Edward J., 4,413,164., Cl. 200-38.00R.
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Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986., Cl. 424-80.000.
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- Matsushita Electric Industrial Co., Ltd.: See—  
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,412,564., Cl. 140-92.100.
- Sakai, Hiroaki; and Okazaki, Tadanori, 4,412,823., Cl. 433-80.000.
- Yamashita, Ichiro; and Ise, Yukihiko, 4,412,454., Cl. 73-728.000.

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Hamabe, Takafumi; and Moriwaki, Hiroshi, 4,412,534., Cl. 128-52.000.
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Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Reum, Helmut, 4,412,446., Cl. 73-35.000.
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Piancatelli, Giovanni; Scettri, Arrigo; and Maurizio, D'Auria, 4,413,145., Cl. 568-345.000.
- Maydan, Dan: See—  
Wang, David N.; Egitto, Frank D.; and Maydan, Dan, 4,412,885., Cl. 156-643.000.
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Gontowski, Walter S., Jr.; and Mayrand, James F., 4,413,271., Cl. 357-40.000.
- McClellan, John M.: See—  
Colvin, Jack A.; and McClellan, John M., 4,412,457., Cl. 74-7.00A.
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Pecok, Roger L.; McCrea, Ray G., Jr.; and Lamphere, Craig F., 4,413,298., Cl. 360-133.000.
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- McDonnell Douglas Corporation: See—  
Kramer, Louis T.; Butler, Franklin H.; and Callas, Donald C., 4,412,665., Cl. 244-102.00R.
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Moote, Truman P.; Duntun, Myron L.; McGalliard, Russell L.; and Yarborough, Lyman, 4,412,913., Cl. 208-207.000.
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Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,412,843., Cl. 44-51.000.
- McGavin, Hubert P., to Singer Company, The. Drill adjusting tool. 4,412,462., Cl. 76-5.00R.
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Romeo, Donald E.; and McIver, George W., 4,413,239., Cl. 332-16.00T.
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Flynn, James H.; and McLemore, Donald E., 4,412,448., Cl. 73-81.000.
- McMahon, Walter C. Disposable irrigation gauge. 4,412,447., Cl. 73-73.000.
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Kumar, Ananda H.; McMillan, Peter W.; and Tummala, Rao R., 4,413,061., Cl. 501-7.000.
- McMillion, Lundy H.: See—  
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427., Cl. 62-298.000.
- McQuay Inc.: See—  
Kohl, Vance L., 4,412,429., Cl. 62-347.000.
- Mead Corporation, The: See—  
Kockler, Barry C.; Geiselman, Theodore S.; and Black, Gerda N., 4,413,265., Cl. 346-1.100.
- Means, Donald R.: See—  
Huizinga, Donald D.; Means, Donald R.; and Underhill, Edward W., 4,413,159., Cl. 179-90.00K.
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- Medlin, William L.: See—  
Biot, Maurice A.; Medlin, William L.; and Masse', Lucien, 4,412,452., Cl. 73-579.000.
- Medtronic, Inc.: See—  
Barthels, Richard N., 4,412,546., Cl. 128-709.000.
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- Melancon, Ronald D. Fish bait and method of manufacturing the same. 4,413,014., Cl. 426-1.000.
- Melfi, Anna J.: See—  
Melfi, Samuel T.; and Melfi, Nicholas J., 4,412,407., Cl. 52-699.000.
- Melfi, Nicholas J.: See—  
Melfi, Samuel T.; and Melfi, Nicholas J., 4,412,407., Cl. 52-699.000.
- Melfi, Samuel T.; and Melfi, Nicholas J., to Melfi, Samuel T.; Melfi, Anna J.; and Melfi, Nicholas J. Mounting arrangement for guard rail post. 4,412,407., Cl. 52-699.000.
- Mera, Hiroshi: See—  
Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, 4,413,114., Cl. 528-183.000.
- Merck & Co., Inc.: See—  
Carlo, Dennis J.; Nollstadt, Karl H.; Stoudt, Thomas H.; and Maigetter, Robert Z., 4,413,037., Cl. 435-101.000.
- Ormond, Robert E., 4,412,991., Cl. 424-180.000.
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- Roberts, F. Edward; and Grenda, Victor J., 4,413,118., Cl. 536-7.100.
- Merrill Torau de et Compagnie: See—  
Bey, Philippe; and Jung, Michel, 4,413,141., Cl. 562-561.000.
- Palfreyman, Michael G.; and McDonald, Ian A., 4,413,012., Cl. 424-319.000.
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Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, 4,412,998., Cl. 424-267.000.
- Messerschmitt-Boelkow-Blohm GmbH: See—  
Altmann, Konrad, 4,413,344., Cl. 372-90.000.
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- Wackerle, Peter-Martin; and Hahn, Michael, 4,412,784., Cl. 416-230.000.
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Houghton, Timothy J.; Szwargulski, Carl J., Jr.; Bentrup, Jerry A.; and Smidt, Donald L., 4,412,627., Cl. 220-66.000.
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Shallenberger, Fred T., Jr., 4,412,763., Cl. 408-224.000.
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Doliwa, Ernst J.; Reifferscheid, Karl J.; and Wolfgruber, Friedrich, 4,412,578., Cl. 164-349.000.
- Metallgesellschaft Aktiengesellschaft: See—  
Erl, Dietrich; and Ueberle, Dieter, 4,412,838., Cl. 23-302.00R.
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Reichmuth, Arthur; and Kunz, Willy, 4,412,591., Cl. 177-1.000.
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- Michalski, Joseph S.: See—  
Reeves, Albert H.; and Michalski, Joseph S., 4,413,242., Cl. 333-122.000.
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- Middleman, Lee M.; and Doljack, Frank, to Raychem Corporation. Circuit protection devices comprising PTC element. 4,413,301., Cl. 361-106.000.
- Midwest Canvas Corp.: See—  
Handwerker, Gary R., 4,413,029., Cl. 428-61.000.
- Mikshin, Viktor P.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mitisev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.
- Milferstaedt, Dieter: See—  
Maixner, Uwe; and Milferstaedt, Dieter, 4,413,302., Cl. 361-212.000.
- Miller, Anthony J.: See—  
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,413,260., Cl. 340-825.250.
- Miller, George A.; and Chan, Hak-Foon, to Rohm and Haas Company.  $\beta$ -Hydroxyarylethylimidazoles. 4,413,003., Cl. 424-273.00R.
- Miller, Mark C.: See—  
Gerlach, Robert L.; Seibel, David D.; and Miller, Mark C., 4,412,771., Cl. 414-217.000.
- Miller, Robert C., to Westinghouse Electric Corp. Electric energy meter having a mutual inductance current transducer. 4,413,230., Cl. 324-142.000.
- Minagawa, Shoichi: See—  
Sato, Yasuhiko; Sakai, Takamasa; and Minagawa, Shoichi, 4,412,906., Cl. 204-298.000.
- Mincher, Sally. Shirt. 4,412,357., Cl. 2-118.000.
- Minnesota Mining and Manufacturing Co.: See—  
Blake, Frederick D., 4,413,080., Cl. 524-187.000.
- Janssen, Edward W., 4,413,108., Cl. 526-301.000.
- Pecok, Roger L.; McCrea, Ray G., Jr.; and Lamphere, Craig F., 4,413,298., Cl. 360-133.000.
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Horimoto, Mitsuaki, 4,412,726., Cl. 350-461.000.
- Minowa, Junichiro: See—  
Matsuoka, Shoji; Kobayashi, Ikutaro; and Minowa, Junichiro, 4,413,179., Cl. 250-232.000.
- Mir, Leon, to Abcor, Inc. Positive-charged ultrafiltration membrane for the separation of cathodic/electrodeposition-paint compositions. 4,412,922., Cl. 210-638.000.
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Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047., Cl. 430-94.000.
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- Mitsubishi Chemical Industries, Ltd.: See—  
Katsuhisa, Kohyama; Katsuhiko, Nakamura; and Akira, Matsuno, 4,413,103., Cl. 525-469.000.
- Mitsubishi Denki Kabushiki Kaisha: See—  
Fujimoto, Takanori, 4,412,522., Cl. 123-602.000.



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- Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kiyosuke, 4,412,809, Cl. 431-76.000.
- Mitubishi Jukogyo Kabushiki Kaisha: See—  
Ohtawa, Kiyoshi; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,412,674, Cl. 266-91.000.
- Mitubishi Pencil Co., Ltd.: See—  
Kawakubo, Takamasa, 4,412,675, Cl. 267-167.000.
- Mitsubishi Petrochemical Company, Ltd.: See—  
Isaka, Tsutomu; Ishioka, Mitsugu; Shimada, Takeo; and Inoue, Takayuki, 4,413,066, Cl. 521-149.000.
- Kakizaki, Tetsuji; and Mizutani, Toshikazu, 4,412,938, Cl. 252-511.000.
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- Mitsuyasu, Masaki; Aoki, Keiji; and Nakatomi, Takayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection control apparatus, 4,412,520, Cl. 123-488.000.
- Mittsev, Sergei G.: See—  
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexander E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857, Cl. 75-11.000.
- Miyadera, Hiroshi: See—  
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848, Cl. 48-197.00R.
- Miyake, Tatsuro: See—  
Ito, Takuzo; Suzuki, Tadashi; and Miyake, Tatsuro, 4,412,600, Cl. 187-17.000.
- Miyamoto, Tomohiko: See—  
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848, Cl. 48-197.00R.
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- Miyata, Hideo; and Ishii, Hiroshi, to Fuji Kogyo Company, Limited. Method for chemical treatment of woods, 4,413,024, Cl. 427-370.000.
- Miyoshi, Mituji: See—  
Matsura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; Usui, Katumi; and Miyoshi, Mituji, 4,413,097, Cl. 525-240.000.
- Mizrahi, Moshe: See—  
Stier, Glenn R.; and Mizrahi, Moshe, 4,412,471, Cl. 84-1.030.
- Mizuno, Toshiya; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride resin-based shaped product, 4,413,095, Cl. 525-199.000.
- Mizutani, Toshikazu: See—  
Kakizaki, Tetsuji; and Mizutani, Toshikazu, 4,412,938, Cl. 252-511.000.
- Mobay Chemical Corporation: See—  
Markusch, Peter H.; and Potter, Terry A., 4,413,111, Cl. 528-59.000.
- Schmidt, Manfred; and Yeater, Robert P., 4,413,101, Cl. 525-440.000.
- Mobil Oil Corporation: See—  
Anderson, Ronald W.; and Lamanna, Richard A., 4,413,015, Cl. 426-131.000.
- Biot, Maurice A.; Medlin, William L.; and Masse, Lucien, 4,412,452, Cl. 73-579.000.
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- Modcom, Inc.: See—  
Brummond, Gerald G.; Klein, Paul E.; and Anderson, Roland M., 4,412,820, Cl. 433-18.000.
- Mohri, Hiromichi: See—  
Okino, Haruka; Ogawa, Keitoku; Takeda, Sunao; Mohri, Hiromichi; and Hiraide, Shigeru, 4,412,545, Cl. 128-691.000.
- Molitor, Edwin A.; Crowe, Norman P.; and Lampe, Guy W., to Multifold-International, Inc. Vacuum assisted machine for handling articles, 4,412,775, Cl. 414-626.000.
- Moncrief, Jack W.: See—  
Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C., 4,412,834, Cl. 604-29.000.
- Monroe, Kevin T., to AMP Incorporated. Coaxial connector plug, 4,412,717, Cl. 339-177.00R.
- Monsanto Company: See—  
Gaertner, Van R., 4,413,125, Cl. 546-22.000.
- Mount, Ramon A.; and Raffelson, Harold, 4,412,940, Cl. 502-209.000.
- Monsarrat, William G., to United Technologies Corporation. Full hoop bleed manifolds for longitudinally split compressor cases, 4,412,782, Cl. 415-175.000.
- Montedison S.p.A.: See—  
Di Battista, Piero, 4,413,075, Cl. 524-102.000.
- Mooij, Johannes W.: See—  
Ouwkerk, Johannes H. W.; Kramer, Albert; and Mooij, Johannes W., 4,412,479, Cl. 98-36.000.
- Moore, Bernard S.: See—  
Cue, Berkeley W., Jr.; and Moore, Bernard S., 4,412,958, Cl. 260-456.00R.
- Moore, Walter E.: See—  
Peters, LeRoy W.; and Moore, Walter E., 4,412,551, Cl. 134-104.000.
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- Mori, Sanae, to Daido Metal Co., Inc. Aluminum base bearing alloy, 4,412,972, Cl. 420-530.000.
- Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for producing composite pipes, 4,412,882, Cl. 156-188.000.
- Morimura, Syoji: See—  
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,413,076, Cl. 524-102.000.
- Morin, Armand. Forest residues sweeper, 4,412,660, Cl. 241-101.700.
- Morita, Shigeru; and Furuhashi, Masami, to Nippon Flute Co., Ltd. Adhesive coating machine, 4,412,506, Cl. 118-683.000.
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Hamabe, Takafumi; and Moriwaki, Hiroshi, 4,412,534, Cl. 128-52.000.
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- Morizot, Jean Paul, to Thomson-CSF. High gain crossed field amplifier tube and radio transmission system equipped with such a tube, 4,413,208, Cl. 315-39.300.
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- Morkosky, Charles E., II: See—  
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- Morningstar, Leroy J.; and Tighe, Charles, Jr. Latching connector assembly, 4,412,714, Cl. 339-91.00R.
- Morningstar, LeRoy J.: See—  
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Rehlemper, Steven F.; and Morrison, Howard J., 4,412,682, Cl. 273-1.0GG.
- Morrison, Rocky V., to Discovision Associates. Hot sprue assembly for an injection molding machine, 4,412,805, Cl. 425-549.000.
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Wilhelm, Donald F.; and Moser, Robert L., 4,412,456, Cl. 73-862.650.
- Moses, Kurt: See—  
Brandau, William E.; Swern, Frederic L.; and Moses, Kurt, 4,413,320, Cl. 364-428.000.
- Most, Allen F.: See—  
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- Mostek Corporation: See—  
Sadowski, Joseph P.; Lightfoot, Alan E.; and Kowalski, Jeffrey M., 4,412,812, Cl. 432-121.000.
- Motorola, Inc.: See—  
Birch, William A., 4,413,194, Cl. 307-456.000.
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- Bost, Jonathan R., 4,413,198, Cl. 310-324.000.
- Davies, Robert B., 4,413,226, Cl. 323-303.000.
- Dydyk, Michael, 4,413,243, Cl. 333-258.000.
- Jason, Barry L., 4,413,235, Cl. 330-254.000.
- Pace, W. David, 4,413,238, Cl. 331-111.000.
- Mount, Ramon A.; and Raffelson, Harold, to Monsanto Company. Method for preparing maleic anhydride catalyst, 4,412,940, Cl. 502-209.000.
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- Mowbray, Dorian F., to Lucas Industries Limited. Fuel injection nozzles, 4,412,657, Cl. 239-533.900.
- MTU Motoren-Und Turbinen Union Munchen GmbH: See—  
Huthner, Werner, 4,412,804, Cl. 425-546.000.
- Muis, Roelof; and Herder, Kornelis, to Wavin B.V. Apparatus for manufacturing a printed plastic article, 4,412,487, Cl. 101-41.000.
- Muller, Hans R., to Sundstrand Data Control, Inc. Digital symbol generator with symbol error checking, 4,413,323, Cl. 364-521.000.
- Muller, Klaus: See—  
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Reum, Helmut, 4,412,446, Cl. 73-35.000.
- Multifold-International, Inc.: See—  
Molitor, Edwin A.; Crowe, Norman P.; and Lampe, Guy W., 4,412,775, Cl. 414-626.000.

- Munz, Ulrich: See—  
Gansert, Willi; Munz, Ulrich; and Kuhn, Edgar, 4,413,222, Cl. 320-48.000.
- Murakami, Koichi: See—  
Tsukata, Masaharu; and Murakami, Koichi, 4,412,735, Cl. 355-14.00R.
- Murata Machinery, Ltd.: See—  
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,412,413, Cl. 57-304.000.
- Murata, Tadateru: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.
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- Shoji, Masuhiro; Sakagami, Teruo; and Murayama, Naohiro, 4,413,090, Cl. 525-59.000.
- Murdoch, Russell H.: See—  
McKee, William R.; Murdoch, Russell H.; and Schulte, Eric F., 4,413,020, Cl. 427-53.100.
- Muroran Institute for Technology, The President of: See—  
Yokouchi, Hirotaka, 4,412,746, Cl. 356-446.000.
- Murphy, James E.; and Reid, Kenneth H., to General Motors Corporation. Door mounted seat belt retractor, 4,412,691, Cl. 280-803.000.
- Murray Corporation: See—  
Kish, Arthur S., 4,412,380, Cl. 30-92.000.
- Murray, John M., to Instant Replay Systems. Instant replay productivity motivation system, 4,413,277, Cl. 358-93.000.
- Musiel, D. James; and Buhler, James E., to S. C. Johnson & Son, Inc. Apparatus for orienting heavy mold bases, 4,412,668, Cl. 248-346.000.
- Muzeroll, Martin E.: See—  
Karloski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., 4,413,206, Cl. 313-601.000.
- Myers, Robert A.: See—  
Aviram, Ari; Kovac, Zalata; and Myers, Robert A., 4,413,266, Cl. 346-21.000.
- Myers, Robert E.: See—  
Vassiliadis, Arthur; Brewer, Michael H.; and Myers, Robert E., 4,412,543, Cl. 128-633.000.
- Myers, William D. Posterior chamber lens implant, 4,412,359, Cl. 3-13.000.
- Mysels, Karol J.: See—  
Wrasidlo, Wolfgang J.; and Mysels, Karol J., 4,413,074, Cl. 524-43.000.
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- Nagahara, Shusaku: See—  
Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, 4,413,284, Cl. 358-213.000.
- Nagai, Nobuyuki; Takahashi, Eiji; Matsumoto, Yoji; and Ohtsu, Hideaki, to Kabushiki Kaisha Kobe Sekio Sho. Method for detecting brazing defects in plate-fin type heat exchangers, 4,412,453, Cl. 73-601.000.
- Nagashima, Kenji; Matsumoto, Hiroshi; Tanaka, Masataka; Oodaira, Hiroshi; and Iwase, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a hybrid integrated circuit device, 4,412,377, Cl. 29-577.00C.
- Naiman, Charles S.: See—  
Adlerstein, Joseph K.; Nitka, Heinz F.; Naiman, Charles S.; and Weiss, Aryeh, 4,413,280, Cl. 358-111.000.
- Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, to Elecompack Company, Ltd. Shiftable article storage device, 4,412,772, Cl. 414-331.000.
- Nakajima, Yukio, to Bridgestone Tire Company Limited. Pneumatic snow tire, 4,412,576, Cl. 152-209.00R.
- Nakamura, Kotaro: See—  
Mitsui, Akio; and Nakamura, Kotaro, 4,413,054, Cl. 430-555.000.
- Nakamura, Kyuzo: See—  
Ito, Akio; Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 4,412,907, Cl. 204-298.000.
- Nakano, Masao: See—  
Mochizuki, Hirohiko; Nakano, Masao; Baba, Fumio; Nakano, Tomio; and Takemae, Yoshihiro, 4,413,272, Cl. 357-65.000.
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- Nakatomi, Takayoshi: See—  
Mitsuyasu, Masaki; Aoki, Keiji; and Nakatomi, Takayoshi, 4,412,520, Cl. 123-488.000.
- Nakaya, Takao: See—  
Matsumoto, Toyosaku; and Nakaya, Takao, 4,413,161, Cl. 179-115.5PV.
- Nakazawa, Kazuharu. Addition agent for medicines or cosmetics, 4,412,987, Cl. 424-95.000.
- Nakazawa, Toru; and Fushida, Akira, to Mita Industrial Co., Ltd. Disazo photoconductor with nitrophthalic anhydride sensitizer, 4,413,046, Cl. 430-83.000.
- Nakazawa, Toru: See—  
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047, Cl. 430-94.000.
- Nalco Chemical Company: See—  
Bernot, Robert, 4,413,087, Cl. 524-389.000.
- Collins, John H.; Lin, Mei-Jan L.; and Kekish, George T., 4,412,844, Cl. 44-51.000.
- Phillips, Kenneth G.; and Premo, John G., 4,413,143, Cl. 564-128.000.
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Oota, Hiroyuki; and Narita, Ryuuho, 4,412,481, Cl. 99-280.000.
- Nasu, Kohji: See—  
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,413,102, Cl. 525-453.000.
- National Distillers and Chemical Corporation: See—  
Hinnenkamp, James A., 4,413,146, Cl. 568-451.000.
- National Research Development Corporation: See—  
Fray, Derek J.; Chilton, John P.; and Cooke, Arthur V., 4,412,893, Cl. 204-105.00R.
- Green, Geoffrey W.; and Lettington, Alan H., 4,412,903, Cl. 204-192.00C.
- Lloyd, Peter H., 4,412,742, Cl. 356-73.000.
- Naylor, Carter G.: See—  
Nieh, Edward C. Y.; Naylor, Carter G.; and Lambert, Clifford L., 4,412,926, Cl. 252-8.55D.
- NCR Corporation: See—  
Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, 4,412,731, Cl. 354-299.000.
- Neat Shujinki Kogyo Kabushiki Kaisha: See—  
Kurata, Tonio; and Fuji, Hiroshi, 4,412,850, Cl. 55-130.000.
- Neely, James E., Jr., to PPG Industries, Inc. Inorganic cement compositions having controlled thermal expansion coefficients, 4,412,863, Cl. 106-84.000.
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Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kiyosuke, 4,412,809, Cl. 431-76.000.
- Negoro, Ikuro: See—  
Iwanade, Hisao; and Negoro, Ikuro, 4,412,737, Cl. 355-55.000.
- Nehmsmann, Louis J.: See—  
Panzer, George W.; and Nehmsmann, Louis J., 4,412,944, Cl. 252-551.000.
- Nemeni, Tibor M.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexander I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201, Cl. 310-260.000.
- Nemoto, Shin: See—  
Tatsuaki, Masao; Nemoto, Shin; and Okuhara, Seiichi, 4,413,324, Cl. 364-557.000.
- Networks Electronics Corp.: See—  
Patrichi, Mihai D.; and Evanson, Delbert L., 4,412,420, Cl. 60-635.000.
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Donig, Gerhard; Schmidt, Walter; Schummer, Helmut; and Neulinger, Franz, 4,413,225, Cl. 323-246.000.
- Neurologics, Inc.: See—  
Callahan, Alfred S.; Rhodes, James S.; and Johnson, Timothy L., 4,412,547, Cl. 128-731.000.
- Newey Goodman Limited: See—  
Springer, Paul H., 4,412,368, Cl. 24-158.000.
- Ney, Robert J.; and Hafner, Erich, to United States of America, Army. Nozzle beam source for vapor deposition, 4,412,508, Cl. 118-726.000.
- Nicely, Thomas E.: See—  
Bakewell, Frank W.; Nicely, Thomas E.; and Stricker, C. Donald, 4,412,503, Cl. 118-420.000.
- Nickerson, L. Douglas. Wood splitter, 4,412,570, Cl. 144-193.00A.
- Nickles, R. Benton: See—  
Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., 4,412,559, Cl. 138-89.000.
- Nicolas, Jacques; Berger, Antoine; and Laminette, Christian, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude. Production of carbon black by an incomplete air-acetylene combustion reaction, 4,412,974, Cl. 422-156.000.
- Nieh, Edward C. Y.; Naylor, Carter G.; and Lambert, Clifford L., to Texaco Inc. Alkyl norbornyl ether sulfonates useful for solubilizing petroleum sulfonates in oil fluid brine solutions, 4,412,926, Cl. 252-8.55D.
- Niemetz, Linhard, to Licentia Patent-Verwaltungs-GmbH. Transistor firing circuit, 4,413,192, Cl. 307-278.000.
- Niepoky, James: See—  
Gaiser, William R.; and Niepoky, James, 4,412,806, Cl. 425-554.000.
- Nihon Kohden Corporation: See—  
Okino, Haruka; Ogawa, Keitoku; Takeda, Sunao; Mohri, Hiromichi; and Hiraide, Shigeru, 4,412,545, Cl. 128-691.000.
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Ito, Akio; Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 4,412,907, Cl. 204-298.000.
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- ment of coil ends in generator stator high-voltage winding. 4,413,201, Cl. 310-260.000.
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- Nilsson, Jan O.: See—  
Hertz, Carl H.; and Nilsson, Jan O., 4,413,276, Cl. 358-75.000.
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- Nippon Electric Co., Ltd.: See—  
Kageyama, Takao; Suzuki, Yoshiaki; and Watanabe, Eiichi, 4,413,207, Cl. 315-5.520.  
Kobayashi, Hirokazu, 4,413,347, Cl. 375-20.000.  
Okamoto, Kiyokazu; and Isomura, Masayoshi, 4,413,212, Cl. 318-317.000.
- Nippon Flute Co., Ltd.: See—  
Morita, Shigeru; and Furuhashi, Masami, 4,412,506, Cl. 118-683.000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Matsumoto, Toyosaku; and Nakaya, Takao, 4,413,161, Cl. 179-115.5PV.
- Nippon Kogaku K.K.: See—  
Saegusa, Takashi; and Fukuhara, Toru, 4,412,730, Cl. 354-31.000.
- Nippon Kokan Kabushiki Kaisha: See—  
Miyashita, Tsuneo; Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadaaki, 4,412,862, Cl. 75-130.500.
- Nippon Oil Company, Ltd.: See—  
Matsura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; Usui, Katumi; and Miyoshi, Mituji, 4,413,097, Cl. 325-240.000.  
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, 4,413,067, Cl. 523-172.000.
- Nippon Oil and Fats Co., Ltd.: See—  
Hasegawa, Kunio; and Takizuka, Michinori, 4,412,875, Cl. 149-19.900.
- Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, 4,413,148, Cl. 568-578.000.
- Nippon Soken, Inc.: See—  
Fukami, Akira; Noguchi, Hiroki; and Okamoto, Kunio, 4,412,425, Cl. 62-244.000.
- Nippon Steel Corporation: See—  
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039, Cl. 428-643.000.
- Nippon Telegraph & Telephone Public Corporation: See—  
Matsuo, Shoji; Kobayashi, Ikutaro; and Minowa, Junichiro, 4,413,179, Cl. 250-232.000.  
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902, Cl. 204-192.00E.
- Nippondenso Co., Ltd.: See—  
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,412,517, Cl. 123-339.000.  
Taira, Toshiyuki, 4,412,593, Cl. 180-68.00P.
- Nishikawa, Kinichi, to Yamaichi Electric Mfg. Co., Ltd. Socket having means of no-load engaging with and releasing from IC package. 4,412,713, Cl. 339-75.00M.
- Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying process. 4,413,044, Cl. 430-53.000.
- Nishio, Kohsaku, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray stereoscopic cinematography apparatus. 4,413,352, Cl. 378-42.000.
- Nissan Motor Co., Ltd.: See—  
Hayakawa, Yoshikazu; and Ogawa, Naoki, 4,412,514, Cl. 123-195.00R.  
Hayashi, Yoshimasa, 4,412,516, Cl. 123-198.00E.  
Ishii, Katsumi; and Chikaraishi, Takayo, 4,412,696, Cl. 292-336.300.
- Nitka, Heinz F.: See—  
Adlerstein, Joseph K.; Nitka, Heinz F.; Naiman, Charles S.; and Weiss, Aryeh, 4,413,280, Cl. 358-111.000.
- Noble, Allen T., to Noble Linear Irrigation, Inc. Land irrigation system and method. 4,412,655, Cl. 239-183.000.
- Noble Linear Irrigation, Inc.: See—  
Noble, Allen T., 4,412,655, Cl. 239-183.000.
- Noda, Koshi: See—  
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,412,413, Cl. 57-304.000.
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Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Junichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538, Cl. 128-303.100.
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Fukami, Akira; Noguchi, Hiroki; and Okamoto, Kunio, 4,412,425, Cl. 62-244.000.
- Nollstadt, Karl H.: See—  
Carlo, Dennis J.; Nollstadt, Karl H.; Stoudt, Thomas H.; and Maigetter, Robert Z., 4,413,057, Cl. 435-101.000.
- Noonan, Kevin W., to United States of America, National Aeronautics and Space Administration. Family of airfoil shapes for rotating blades. 4,412,664, Cl. 244-35.00R.
- Nordson Corporation: See—  
Cohen, Sherman E.; Ramazzotti, Dario; and Hartley, Michael D., 4,413,255, Cl. 340-622.000.  
Jones, Stephen H., 4,413,172, Cl. 219-411.000.
- Norlin Industries, Inc.: See—  
Stier, Glenn R.; and Mizrahi, Moshe, 4,412,471, Cl. 84-1.030.
- North American Philips Consumer Electronics Corp.: See—  
Speigel, Kenneth, 4,413,203, Cl. 313-446.000.
- Northcutt, Walter G.: See—  
Wallace, Steven A.; Creech, Edward T.; and Northcutt, Walter G., 4,412,860, Cl. 75-84.000.
- Northrop Corporation: See—  
Hornby, Thomas W., 4,412,475, Cl. 89-1.816.
- Notheaux, Andre R.: See—  
Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., 4,412,774, Cl. 414-589.000.
- Novick, Allen S.; Tomlinson, Jerry G.; and Troth, Dennis L., to General Motors Corporation. Heavy fuel combustor. 4,412,414, Cl. 60-39.230.
- N.V. Bekaert S.A.: See—  
Andre, Wieme, 4,412,687, Cl. 280-610.000.
- Nylund, Kenneth G. Partial flush apparatus utilizing pneumatic time delay mechanism. 4,412,362, Cl. 4-388.000.
- Nyman, Bjorn D.: See—  
Bergman, Hans I.; and Nyman, Bjorn D., 4,412,592, Cl. 180-14.00A.
- Nystrom, Lars H.: See—  
Stenberg, Kaj O.; and Nystrom, Lars H., 4,412,793, Cl. 417-477.000.
- Obermann, George; and Mateja, Edward J., to Singer Company, The. Timer with manual means for disabling a switch. 4,413,164, Cl. 200-38.00R.
- Obermayer, Bertram; Greier, Josef; and Mandl, Walter, to Simmering-Graz-Pauker AG; and AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH. Water-cooled internal combustion engine with direct fuel injection. 4,412,513, Cl. 123-55.0VE.
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Aichinger, Dietmar; Breuer, Hans-Werner; and Obrist, Albert, 4,412,409, Cl. 53-485.000.
- Ochialini, Carlo, to Sampulenti S.p.A. Apparatus for facilitating chamfering/deburring tool and gear meshing. 4,412,765, Cl. 409-6.000.
- Occidental Chemical Corporation: See—  
Witschard, Gilbert, 4,413,092, Cl. 525-71.000.
- Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., to Sony Corporation. Error correctable data transmission method. 4,413,340, Cl. 371-39.000.
- Oeck, Robert C., to Kleenair Products Co., Inc. Pyrolysis reaction apparatus. 4,412,889, Cl. 202-117.000.
- Officine Maccaniche Giovanni Cerutti S.p.A.: See—  
Caletti, Bruno, 4,412,639, Cl. 226-197.000.
- Officine Romanazzi S.p.A.: See—  
Peruzzi, Luigi, 4,412,699, Cl. 298-17.700.
- Ogata, Yoshihiro; Abe, Yoshihiro; and Takahashi, Harumi, to Ricoh Company, Ltd. Transfer medium separating device. 4,412,732, Cl. 355-3.0TR.
- Ogawa, Keitkitsu: See—  
Okino, Haruka; Ogawa, Keitkitsu; Takeda, Sunao; Mohri, Hiromichi; and Hiraide, Shigeru, 4,412,545, Cl. 128-691.000.
- Ogawa, Naoki: See—  
Hayakawa, Yoshikazu; and Ogawa, Naoki, 4,412,514, Cl. 123-195.00R.
- Ogletree, Robert H.: See—  
Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., 4,412,580, Cl. 164-433.000.
- Ohba, Shinya: See—  
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,413,283, Cl. 358-213.000.
- Ohe, Takeshi; and Ohsaki, Hiroshi, to Jidosha Kiki Co., Ltd. Oil pump unit. 4,412,789, Cl. 417-288.000.
- Ohmura, Tadayoshi: See—  
Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986, Cl. 424-80.000.
- Ohnemus, Kurt: See—  
Hoegerle, Karl; and Ohnemus, Kurt, 4,413,124, Cl. 544-319.000.
- Ohsaki, Hiroshi: See—  
Ohe, Takeshi; and Ohsaki, Hiroshi, 4,412,789, Cl. 417-288.000.
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Takahashi, Toshio; and Ohsawa, Mitsuo, 4,413,309, Cl. 361-406.000.
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Sakai, Hiroaki; and Okazaki, Tadanori, 4,412,823, Cl. 433-80.000.
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Tatsuwaki, Masao; Nemoto, Shin; and Okuhara, Seiichi, 4,413,324, Cl. 364-557.000.
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Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,412,975, Cl. 422-197.000.
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Jeannet, Pierre; Froidevaux, Raymond; and Gygax, Claude-Andre, 4,412,751, Cl. 368-276.000.
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Haga, Mitsunobu; and Omori, Yasuzi, 4,413,025, Cl. 427-387.000.
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- Onuki, Tadayoshi, to Fujitsu Fanuc Limited. Portable tape reader. 4,413,176, Cl. 235-445.000.
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- Ooms, Leo F. M., to U.S. Philips Corporation. Halogen incandescent lamp with internal current conductors of tungsten-rhenium alloy. 4,413,205, Cl. 313-579.000.
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Blum, Adolf; and Opitz, Hans D., 4,412,837, Cl. 8-449.000.
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Spellicy, Robert L., 4,412,445, Cl. 73-24.000.
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Hartmann, Erwin, 4,412,729, Cl. 351-239.000.
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Boston, William T., 4,413,286, Cl. 358-283.000.
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- Orenstein, Philip. Connection system for joining illuminated modules. 4,413,311, Cl. 362-219.000.
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Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., 4,413,155, Cl. 585-417.000.
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Demoures, Bernard; and Le Coent, Jean-Louis, 4,412,927, Cl. 252-33.300.
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Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187, Cl. 250-491.100.
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Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.
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Uchikuga, Saburo; Tashiro, Tomoyasu; and Osawa, Yasuko, 4,413,129, Cl. 548-342.000.
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- Oshima, Akio: See—  
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, 4,413,067, Cl. 523-172.000.
- Ostbergs Fabriks AB: See—  
Forslund, Erik T., 4,412,777, Cl. 414-694.000.
- Ota, Yoshifumi: See—  
Ito, Akio; Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 4,412,907, Cl. 204-298.000.
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Chemla, Daniel S.; Oudar, Jean-Louis; and Tsoucaris, Georges, 4,413,128, Cl. 546-312.000.
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Cavil, David T.; and Krueger, William R., 4,413,215, Cl. 318-588.000.
- Outokumpu Oy: See—  
Kosonen, Ahti; and Palmu, Mauri, 4,412,373, Cl. 29-157.30V.  
Uusitalo, Seppo J.; von Alfthan, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451, Cl. 73-432.0PS.
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Palka, James J., 4,412,708, Cl. 312-138.00R.
- Pace, W. David, to Motorola, Inc. Precision differential relaxation oscillator circuit. 4,413,238, Cl. 331-111.000.
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Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., 4,412,774, Cl. 414-589.000.
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Carnevale, Anthony; Paek, Un-Chul; and Peterson, George E., 4,412,722, Cl. 350-96.310.
- Pakkala, Arto J.: See—  
Suntola, Tuomo A.; Pakkala, Arto J.; and Lindfors, Sven G., 4,413,022, Cl. 427-255.200.
- Palfreyman, Michael G.; and McDonald, Ian A., to Merrell Torada et Compagnie. Method for treating depression. 4,413,012, Cl. 424-319.000.
- Palka, James J., to Pace Industries Inc. Cabinet door hinge construction. 4,412,708, Cl. 312-138.00R.
- Palmquist, Ronald W., to Corning Glass Works. Glass-melting furnace with batch electrodes. 4,413,346, Cl. 373-41.000.
- Palmu, Mauri: See—  
Kosonen, Ahti; and Palmu, Mauri, 4,412,373, Cl. 29-157.30V.
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Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064, Cl. 518-715.000.
- Panzer, George W.; and Nehmsmann, Louis J., to Alcolac, Inc. High foaming, low eye irritation cleaning compositions containing ethoxylated anionic (C13-C30) sulphates. 4,412,944, Cl. 252-551.000.
- Pardes, Greg: See—  
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,412,632, Cl. 222-148.000.
- Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., to Olin Corporation. Cast copper alloys. 4,412,871, Cl. 148-2.000.
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Gibson, David V.; Parr, Rodney W.; and Swalwell, John E., 4,413,073, Cl. 523-511.000.
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Haney, Eugene A.; and Partus, Fred P., 4,412,683, Cl. 277-3.000.
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Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., 4,412,610, Cl. 198-403.000.
- Patel, Kirit: See—  
Paul, Gunter; Patel, Kirit; and Schmitt, Gunter, 4,412,412, Cl. 57-280.000.



- Patrichi, Mihai D.; and Evanson, Delbert L., to Networks Electronics Corp. Explosive actuated pin puller. 4,412,420, Cl. 60-635.000.
- Paukku, Vaino A.: See—  
Uusitalo, Seppo J.; von Althaus, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451, Cl. 73-432.0PS.
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Green, George E.; Losert, Ewald; and Paul, John G., 4,413,052, Cl. 430-327.000.
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- Pellegrini, Bruno: See—  
Beretsky, Irwin; Arnold, David E.; and Pellegrini, Bruno, 4,412,544, Cl. 128-660.000.
- Pellicciari, Enzo E.: See—  
Giannella, Frank; and Pellicciari, Enzo E., 4,412,428, Cl. 62-308.000.
- Peltzer, Bernd: See—  
Hess, Bernhard; Schulz-Walz, Hansjochen; von Harpe, Hannes; Peltzer, Bernd; and Bottenbruch, Ludwig, 4,413,072, Cl. 523-500.000.
- Penzien, Klaus: See—  
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,412,942, Cl. 252-518.000.
- Periana-Pillai, Roy A.: See—  
Renga, James M.; and Periana-Pillai, Roy A., 4,413,137, Cl. 549-518.000.
- Perkin-Elmer Corporation, The: See—  
Gerlach, Robert L.; Seibel, David D.; and Miller, Mark C., 4,412,771, Cl. 414-217.000.
- Shafer, David R., 4,412,723, Cl. 350-171.000.
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White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815, Cl. 432-206.000.
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- Perry, John C. Positive displacement pump. 4,412,786, Cl. 417-241.000.
- Peruzzi, Luigi, to Officine Romanazzi S.p.A. Modular frame for tipping bodies of trucks adjustable in width. 4,412,699, Cl. 298-17.700.
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- Petters, Dezso: See—  
Scherm, Arthur; Petteri, Dezso; and Hummel, Klaus, 4,412,998, Cl. 424-267.000.
- Peters, LeRoy W.; and Moore, Walter E. Apparatus for cleaning hydraulic fluid system. 4,412,551, Cl. 134-104.000.
- Peterson, George E.: See—  
Carnevale, Anthony; Paek, Un-Chul; and Peterson, George E., 4,412,722, Cl. 350-96.310.
- Petroleo Brasileiro S.A. - Petrobras: See—  
Pedrosa Junior, Oswaldo A.; Castro Couto, Nilton; and Carvalho Figueiro, Raul C., 4,412,811, Cl. 431-202.000.
- Petrov, Alexandr K.: See—  
Markhasin, Alexandr B.; Belyaev, Gennady V.; Babushkin, Jury V.; and Petrov, Alexandr K., 4,413,341, Cl. 371-72.000.
- Petrzelka, Miloslav; and Taureg, Herbert, to Uni-Cardan AG. Universal joint. 4,412,827, Cl. 464-128.000.
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Gori, Reinhard, 4,413,279, Cl. 358-107.000.
- Pfister, Max, to CDM Connectors Development & Mfg. AG. Electric plug contact and method for its manufacture. 4,412,718, Cl. 339-256.00R.
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Cue, Berkeley W., Jr.; and Moore, Bernard S., 4,412,958, Cl. 260-456.00R.
- Hauske, James R., 4,413,119, Cl. 536-7.200.
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Fozzard, George B., 4,413,140, Cl. 560-248.000.
- Kettinger, James G., 4,412,915, Cl. 208-311.000.
- Kubicek, Donald H., 4,412,981, Cl. 423-573.00R.
- Mathis, Ronald D.; and Reed, Jerry O., 4,413,081, Cl. 524-202.000.
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- cyclopentene-5-oxy derivatives having insecticide activity. 4,413,145, Cl. 568-345.000.
- Piduch, Hans-Gunter: See—  
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,412,776, Cl. 414-684.300.
- Pigos, Charles R.: See—  
Pawletko, Joseph P.; and Pigos, Charles R., 4,413,269, Cl. 346-154.000.
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Skoch, Leroy V.; and Pike, Keith E., 4,413,016, Cl. 426-454.000.
- Pinneo, George G.; and Weaver, Jon N., to Sensormatic Electronics Corporation. Combined radio and magnetic energy responsive surveillance marker and system. 4,413,254, Cl. 340-572.000.
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Ohyaba, Takashi; and Suzuki, Yoichi, 4,413,160, Cl. 179-115.00V.
- Ueki, Yoshiharu; and Sakaguchi, Shouzaburo, 4,413,291, Cl. 360-71.000.
- Pitie, Jean-Marc: See—  
Dauphin, Jean-Louis; Louvet, Olivier F.; and Pitie, Jean-Marc, 4,413,337, Cl. 370-58.000.
- Pitney Bowes Inc.: See—  
Buan, Danilo P.; and Eckert, Alton B., Jr., 4,412,491, Cl. 101-363.000.
- Cruz-Urbe, Antonio S.; and Di Giulio, Peter C., 4,413,264, Cl. 346-1.100.
- Doutney, George J., 4,412,733, Cl. 355-3.0DD.
- Jurkowski, Walter J., 4,412,466, Cl. 83-200.000.
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- Polanek, Edward L.: See—  
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,413,260, Cl. 340-825.250.
- Polk Audio, Inc.: See—  
Lumsden, Stuart W.; and Polk, Matthew S., 4,413,162, Cl. 179-115.5VC.
- Polk, Matthew S.: See—  
Lumsden, Stuart W.; and Polk, Matthew S., 4,413,162, Cl. 179-115.5VC.
- Polysar International S.A.: See—  
Sinclair, Alvin R.; and Gleason, Edward H., 4,413,068, Cl. 523-201.000.
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Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C., 4,412,834, Cl. 604-29.000.
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- Potekhin, Konstantin F.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201, Cl. 310-260.000.
- Poth, Ulrich: See—  
Drexler, Hermann-Josef; and Poth, Ulrich, 4,413,036, Cl. 428-458.000.
- Potter, Terry A.: See—  
Markusich, Peter H.; and Potter, Terry A., 4,413,111, Cl. 528-59.000.
- Powell, Lawson W.: See—  
Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., 4,413,056, Cl. 435-43.000.
- Powers, Frank M.: See—  
Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., 4,412,580, Cl. 164-433.000.
- PPG Industries, Inc.: See—  
Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., 4,413,086, Cl. 524-386.000.
- Freiberg, James M., 4,412,739, Cl. 355-89.000.
- Neely, James E., Jr., 4,412,863, Cl. 106-84.000.
- Temple, Chester S., 4,413,085, Cl. 524-321.000.
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- Premo, John G.: See—  
Phillips, Kenneth G.; and Premo, John G., 4,413,143, Cl. 564-128.000.
- President and Fellows of Harvard College: See—  
Fossel, Eric T.; and Ingwall, Joanne S., 4,413,233, Cl. 324-300.000.
- Presley, Rex W., to Bendix Corporation, The. Ultra-high torque actuators. 4,412,794, Cl. 418-61.00R.
- Prevorsek, Dusan C.: See—  
Kavesh, Sheldon; and Prevorsek, Dusan C., 4,413,110, Cl. 526-348.100.
- Pribat, Didier: See—  
Val, Christian; and Pribat, Didier, 4,413,170, Cl. 219-216.000.
- Probst, Nicolas J.; Iker, Jean; and Autin, Jacques, to Phillips Petroleum Company. Recording disc compositions comprising polymers of monovinyl-substituted hydrocarbons, conductive carbon black and lubricants. 4,412,941, Cl. 252-511.000.

- Procter & Gamble Company, The: See—  
Chung, Stanley Y.; and Spadini, Gianfranco L., 4,412,934, Cl. 252-186.380.
- Van Laer, Albert, 4,412,619, Cl. 206-611.000.
- Profet, Gary A.: See—  
Bond, William C.; and Profet, Gary A., 4,413,350, Cl. 377-47.000.
- Prokop, B. Robert; and Trindle, Terry L., to Kelsey-Hayes Co. Suspension system. 4,412,690, Cl. 280-718.000.
- Prototech Company: See—  
Juda, Walter; Allen, Robert J.; and Bar-Ilan, Amiram, 4,412,894, Cl. 204-119.000.
- Proud, Joseph M.: See—  
Byszewski, Wojciech W.; Budinger, A. Bowman; Proud, Joseph M.; and Riseberg, Leslie A., 4,413,204, Cl. 313-491.000.
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Sowers, Edward E.; Goe, Gerald L.; and Prunier, Michael L., 4,413,099, Cl. 525-327.100.
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Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,412,975, Cl. 422-197.000.
- Purarian, Faiz: See—  
Wallace, William E.; Sinha, Vijay K.; and Purarian, Faiz, 4,412,982, Cl. 423-644.000.
- Purdue Research Foundation: See—  
Whistler, Roy L., 4,413,120, Cl. 536-18.600.
- Q Corporation: See—  
Smith, E. Quimby, Jr., 4,412,421, Cl. 60-643.000.
- Quaker Oats Company, The: See—  
Webster, Francis, 4,413,018, Cl. 426-618.000.
- Quantronix Corporation: See—  
Cohen, Martin G.; and Liu, Kuo-ching, 4,413,342, Cl. 372-22.000.
- Queen's University at Kingston: See—  
Cameron, John, 4,413,169, Cl. 219-73.100.
- Quick, Roy F., Jr.; and Spracklen, John E., to Burroughs Corporation. Interconnection for local area contention networks. 4,413,258, Cl. 340-825.500.
- Raffelson, Harold: See—  
Mount, Ramon A.; and Raffelson, Harold, 4,412,940, Cl. 502-209.000.
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Beatty, William T., 4,412,602, Cl. 188-53.000.
- RAJ Technology Partnership: See—  
Sandhu, Jaswinder S., 4,412,724, Cl. 350-341.000.
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Skoch, Leroy V.; and Pike, Keith E., 4,413,016, Cl. 426-454.000.
- Ramazanov, Mnaidar R.: See—  
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- Ratelband, John B. Fire-guard. 4,412,524, Cl. 126-121.000.
- Rattray, Tom: See—  
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Diaz, Stephen H., 4,413,028, Cl. 428-36.000.
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- Metal, Israel; and Berluti, Vincent, Jr., 4,413,183, Cl. 250-363.00S.
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- Wargo, Robert A., 4,413,282, Cl. 358-167.000.
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Schoenrock, Karlheinz W. R.; Kearney, Michael M.; and Rearick, D. Eugene, 4,412,866, Cl. 127-46.200.
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Mathis, Ronald D.; and Reed, Jerry O., 4,413,081, Cl. 524-202.000.
- Reed Rock Bit Company: See—  
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- Reeves, Albert H.; and Michalski, Joseph S., to Litton Systems, Inc. Hybrid tee waveguide assembly. 4,413,242, Cl. 333-122.000.
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- Reifferscheid, Karl J.: See—  
Doliva, Ernst J.; Reifferscheid, Karl J.; and Wolfsgruber, Friedrich, 4,412,578, Cl. 164-349.000.
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Sowers, Edward E.; Goe, Gerald L.; and Prunier, Michael L., 4,413,099, Cl. 525-327.100.
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- Reiner, Alberto, to Crinos Farmacologica Spa. Pyridoxine derivatives and related pharmaceutical compositions. 4,412,996, Cl. 424-256.000.
- Reinwald, Elmar: See—  
Wiegner, Georg; and Reinwald, Elmar, 4,412,833, Cl. 604-14.000.
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Chaille, Charles; and Reisinger, Konrad, 4,413,336, Cl. 370-48.000.
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- Reitz, Richard J.: See—  
Deem, Brian C.; and Reitz, Richard J., 4,412,605, Cl. 192-82.00T.
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Baumgarten, Arthur A., Jr., 4,413,213, Cl. 318-332.000.
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- Renga, James M.; and Periana-Pillai, Roy A., to Dow Chemical Company, The. Process for making vicinal epoxides. 4,413,137, Cl. 549-518.000.
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Hardtmann, Goetz E.; Repic, Oljan; and Vogt, Susi, 4,412,952, Cl. 260-239.30D.
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Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Reum, Helmut, 4,412,446, Cl. 73-35.000.
- Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, to Bayer Aktiengesellschaft. Process for the preparation of polyesters or alkyd resins, resins which may be obtained according to this process and the use thereof as lacquer binders. 4,413,116, Cl. 528-307.000.
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Callahan, Alfred S.; Rhodes, James S.; and Johnson, Timothy L., 4,412,547, Cl. 128-731.000.
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Ballerini, Daniel; Chaudé, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastelle, Jean-Paul, 4,412,925, Cl. 252-8.55D.
- Locatelli, Jean-Louis, 4,413,107, Cl. 526-262.000.
- Richardson, Larry S.: See—  
Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., 4,412,580, Cl. 164-433.000.
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Albrecht, Joachim; Duerig, Thomas; and Richter, Dag, 4,412,872, Cl. 148-11.50F.
- Rickett, David A. Automatic and continuous chemical feed system. 4,412,918, Cl. 210-169.000.
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- Sakamoto, Koji; and Tanzawa, Misao, 4,412,736, Cl. 355-15.000.
- Tanaka, Motoharu; Machida, Hazime; and Kobayashi, Hiroshi, 4,413,297, Cl. 360-119.000.
- Rieck, Lothar: See—  
Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641, Cl. 228-37.000.
- Rieter Machine Works Limited: See—  
Clement, Heinz; and Furrer, Christina, 4,412,367, Cl. 19-0.250.
- Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., to Digital Equipment Corporation. Multiple error detecting and correcting system employing Reed-Solomon codes. 4,413,339, Cl. 371-38.000.



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Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, 4,412,497, Cl. 112-96.000.
- Riseberg, Leslie A.: See—  
Byszewski, Wojciech W.; Budinger, A. Bowman; Proud, Joseph M.; and Riseberg, Leslie A., 4,413,204, Cl. 313-491.000.
- Rizzo, Victor L., to Upjohn Company, The. Sulfonamide compounds, compositions and methods for combatting insects. 4,413,013, Cl. 424-321.000.
- Robatel SLPI: See—  
Buffet, Denis, 4,412,707, Cl. 308-228.000.
- Robert Bosch GmbH: See—  
Gansert, Willi; Munz, Ulrich; and Kuhn, Edgar, 4,413,222, Cl. 320-48.000.  
Hafner, Udo, 4,413,244, Cl. 335-250.000.  
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Reum, Helmut, 4,412,446, Cl. 73-35.000.  
Sochor, Josef, 4,413,236, Cl. 331-25.000.  
Wischermann, Gerhard, 4,413,273, Cl. 358-22.000.
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Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., 4,413,056, Cl. 435-43.000.
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Tyler, Hugh J.; and Conway, William H., 4,413,252, Cl. 340-365.000.
- Robinson, Jeffrey I., to Texas Instruments Incorporated. Electrical inverters. 4,413,313, Cl. 363-80.000.
- Robson, Charles H. Apparatus for collecting and distributing pollen. 4,412,363, Cl. 64-00R.
- Roche, William J., to GTE Products Corporation. Series-connected discharge device ballast apparatus. 4,413,209, Cl. 315-101.000.
- Rock, Erich; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Adjustable hinge. 4,412,366, Cl. 16-236.000.
- Rockwell International Corporation: See—  
Dyke, Harry J., 4,413,240, Cl. 333-17.00R.
- Rogers Corporation: See—  
Bessette, Michael D.; and Jerard, Robert B., 4,412,962, Cl. 264-46.400.
- Rogers, Ralph W., Jr.: See—  
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,869, Cl. 148-2.000.  
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- Rogier, Edgar R.: See—  
Gladfelter, Elizabeth J.; and Rogier, Edgar R., 4,413,138, Cl. 549-551.000.
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Miller, George A.; and Chan, Hak-Foon, 4,413,003, Cl. 424-273.00R.
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- Roman, Walter G., to Westinghouse Electric Corp. Pumping apparatus. 4,412,785, Cl. 417-50.000.
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- Rossi, Anthony J., to General Electric Company. Apparatus and method for controlling a multi-turbine installation. 4,412,422, Cl. 60-706.000.
- Rossow, Harold E.: See—  
Lane, George A.; and Rossow, Harold E., 4,412,931, Cl. 252-70.000.
- Roto Press Limited: See—  
Kosters, Larry J., 4,412,567, Cl. 141-114.000.
- Roussel, Robert: See—  
Lemaitre, Maurice; Roussel, Robert; and Wirth, Rene, 4,412,896, Cl. 204-159.200.
- Roussel Uclaf: See—  
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988, Cl. 424-177.000.  
Zaliss, Rene; and Salles, Marie-France, 4,412,946, Cl. 260-112.00R.
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- Rowland-Hill, E. William, to Sperry Corporation. Combine harvester with improved cleaning. 4,412,549, Cl. 130-27.00T.
- Rumsey, Lynn D.: See—  
Beethem, William J.; and Rumsey, Lynn D., 4,412,484, Cl. 100-7.000.
- Ruppel, Wolfgang: See—  
Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641, Cl. 228-37.000.
- Rutecki, Daniel J. Spooled material dispenser/holder. 4,412,662, Cl. 242-125.300.
- Ruyter, Thomas J., to Ballast-Nedam Groep N.V.; and Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V. Balanced supplemental water bleed for suction dredgers. 4,412,790, Cl. 417-306.000.
- Ruzek, Ivo: See—  
Hartmann, Ludwig; and Ruzek, Ivo, 4,413,032, Cl. 428-288.000.
- Ryobi Ltd.: See—  
Ishii, Koji, 4,412,488, Cl. 101-142.000.
- S. C. Johnson & Son, Inc.: See—  
Musiel, D. James; and Buhler, James E., 4,412,668, Cl. 248-346.000.
- Saab-Scania Aktiebolag: See—  
Bergman, Hans I.; and Nyman, Bjorn D., 4,412,592, Cl. 180-14.00A.
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- Sachs, Hanns I.: See—  
Reiff, Helmut; and Sachs, Hanns I., 4,413,112, Cl. 528-73.000.
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- Saegusa, Takashi; and Fukuhara, Toru, to Nippon Kogaku K.K. Metering device. 4,412,730, Cl. 354-31.000.
- Safrit, Sam C.; Cassidy, Edward L.; and Euliss, Melvin C., to Kayser-Roth Hosiery, Inc. Pantyhose with integrally knit crotch area. 4,412,433, Cl. 66-177.000.
- Saito, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,413,333, Cl. 369-77.200.
- Saji, Hideo: See—  
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,412,517, Cl. 123-339.000.
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Shoji, Masuhiro; Sakagami, Teruo; and Murayama, Naohiro, 4,413,090, Cl. 525-59.000.
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- Sakaguchi, Masayuki: See—  
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802, Cl. 425-392.000.
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Ueki, Yoshiharu; and Sakaguchi, Shouzaburo, 4,413,291, Cl. 360-71.000.
- Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a ferroelectric substrate plate. 4,412,886, Cl. 156-645.000.
- Sakai, Akeo: See—  
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295, Cl. 360-110.000.
- Sakai, Hiroaki; and Okazaki, Tadanori, to Matsushita Electric Industrial Co., Ltd. Oral cavity cleaner. 4,412,823, Cl. 433-80.000.
- Sakai, Kiyoshi: See—  
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045, Cl. 430-59.000.
- Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, to Murata Machinery, Ltd. Air current rectifier plate on an air spinning device. 4,412,413, Cl. 57-304.000.
- Sakai, Takamasa: See—  
Sato, Yasuhiko; Sakai, Takamasa; and Minagawa, Shoichi, 4,412,906, Cl. 204-298.000.
- Sakamoto, Katsuyoshi: See—  
Hirata, Tadashi; and Sakamoto, Katsuyoshi, 4,412,469, Cl. 83-552.000.
- Sakamoto, Koji; and Tanzawa, Misao, to Ricoh Company, Ltd. Collection of suspended toner particles. 4,412,736, Cl. 355-15.000.
- Sakane, Toshio; Madate, Haruhisa; and Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Focusing apparatus for eye-fundus examining instrument. 4,412,728, Cl. 351-206.000.
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Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340, Cl. 371-39.000.
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Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,292, Cl. 360-72.200.  
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- Saleck, Wilhelm: See—  
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,413,055, Cl. 430-567.000.
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Zaliss, Rene; and Salles, Marie-France, 4,412,946, Cl. 260-112.00R.
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Rico, Tiziano, 4,412,883, Cl. 156-222.000.
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Occhialini, Carlo, 4,412,765, Cl. 409-6.000.
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Crawford, Roger; and Sanders, Duane, 4,412,659, Cl. 241-35.000.

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- Sandoz, Inc.: See—  
Hardtmann, Goetz E.; Repic, Oljan; and Vogt, Susi, 4,412,952, Cl. 260-239.30D.
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Karanatsios, Dimitrios, 4,413,131, Cl. 548-461.000.
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Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,413,076, Cl. 524-102.000.
- Sano, Shoichi: See—  
Furukawa, Yoshimi; and Sano, Shoichi, 4,412,594, Cl. 180-140.000.
- Santrade Ltd.: See—  
Schmid, Herbert; and Schmid, Ernst, 4,412,767, Cl. 409-234.000.
- Sanyo Electric Co., Ltd.: See—  
Hosoya, Nobukazu, 4,413,274, Cl. 358-25.000.
- Sargent & Greenleaf, Inc.: See—  
Bechtiger, Charles G., 4,412,436, Cl. 70-272.000.
- Sasaki, Hideyuki: See—  
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047, Cl. 430-94.000.
- Sasaki, Noriaki: See—  
Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, 4,413,114, Cl. 528-183.000.
- Sasaki, Sadaaki: See—  
Miyashita, Tsunao; Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadaaki, 4,412,862, Cl. 75-130.500.
- Sasano, Akira: See—  
Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900, Cl. 204-192.00P.
- Sasserath, Arend: See—  
Ford, Thomas H.; and Sasserath, Arend, 4,412,648, Cl. 236-42.000.
- Sato, Kazuhiro: See—  
Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, 4,413,284, Cl. 358-213.000.
- Sato, Shinsaku: See—  
Tsunoda, Sachio; and Sato, Shinsaku, 4,412,779, Cl. 415-1.000.
- Sato, Tomio; Okimoto, Kunio; and Yamakawa, Toshio, to Director-General of the Agency of Industrial Science and Technology. Method for bonding of a porous body and a fusion-made body. 4,412,643, Cl. 228-221.000.
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- Saunders, John B., Jr.: See—  
Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., 4,413,086, Cl. 524-386.000.
- Savin Corporation: See—  
Landa, Ben Zion, 4,413,048, Cl. 430-115.000.
- Sawada, Hiroomi: See—  
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538, Cl. 128-303.100.
- Sawada, Kengi: See—  
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538, Cl. 128-303.100.
- Sawyer, Geoffrey S.: See—  
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427, Cl. 62-298.000.
- Scarnato, Thomas J.: See—  
Sorensen, Robert; Barrett, Edward A.; and Scarnato, Thomas J., 4,412,761, Cl. 406-98.000.
- Scettri, Arrigo: See—  
Piancatelli, Giovanni; Scettri, Arrigo; and Maurizio, D'Auria, 4,413,145, Cl. 568-345.000.
- Schaefer Marine, Inc.: See—  
Hall, Eric R. D., 4,412,499, Cl. 114-108.000.
- Schafer, Wolfgang: See—  
Eiermann, Kurt; and Schafer, Wolfgang, 4,412,449, Cl. 73-204.000.
- Schaldach, Max; and Keller, J. Walter. Cardiac pacemaker. 4,412,541, Cl. 128-419.0PG.
- Schelling & Co., Firma: See—  
Kollmann, Horst, 4,412,769, Cl. 414-36.000.
- Schenck, Hans-Uwe: See—  
Reiter, Udo; Kovacs, Jenoe; and Schenck, Hans-Uwe, 4,413,117, Cl. 528-497.000.
- Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, to Merz & Company. Certain 4-(1-piperidino)-phenyl-nicotinates. 4,412,998, Cl. 424-267.000.
- Schetina, Otto: See—  
Zitz, Alfred; Droscher, Erich; and Schetina, Otto, 4,412,700, Cl. 299-1.000.
- Schiene, Karl: See—  
Bartholomaeus, Reiner; Gibas, Christoph; Wolfges, Hans; Hess, Ferdinand; and Schiene, Karl, 4,413,245, Cl. 336-84.00M.
- Schieve, Edmund H., to Honeywell Information Systems Inc. Transport system. 4,412,609, Cl. 198-341.000.
- Schilling, Wilfried; Lorenz, Sieberg; and Koch, Friedrich, to E.G.O. Regeltechnik GmbH. Heat level indication method and apparatus. 4,413,175, Cl. 377-25.000.
- Schipachev, Viktor S.: See—  
Kolbanovsky, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., 4,412,552, Cl. 137-14.000.
- Schlag, Johannes: See—  
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,412,942, Cl. 252-518.000.
- Schlegel Corporation: See—  
Weichman, Edward C., 4,413,033, Cl. 428-122.000.
- Schlumberger, Jules; and Aebli, Heinrich, to Gautschi Electro-Fours AG. Sliding shoe for a pusher furnace. 4,412,816, Cl. 432-239.000.
- Schmid, Ernst: See—  
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- Schmidgall, Ronald D., to Hawkeye Concrete Products Co. Canopy kiln system. 4,412,817, Cl. 432-247.000.
- Schmidt, Heinrich, to Hein, Lehmann AG. Device for separating a filler mass. 4,412,865, Cl. 127-19.000.
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- Schmitt, Wilhelm E., to Friedman, Jack S. Brush. 4,412,365, Cl. 15-184.000.
- Schmitz, Henry; Kaneko, Takashi; Essery, John M.; and Doyle, Terrence W., to Bristol-Myers Company. Triacylated derivative of scirpentriol. 4,413,134, Cl. 549-332.000.
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- Schoendorfer, Donald W.: See—  
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- Schulz, Friedemann J. Automatic control device. 4,413,190, Cl. 307-241.000.
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- Seibel, David D.: See—  
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- Seidaliyev, Fikrat S. O.: See—  
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliyev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438, Cl. 72-10.000.
- Seiguchi, Takashi: See—  
Yamaguchi, Hiroshi; Seiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kiyosuke, 4,412,809, Cl. 431-76.000.
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Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,412,882, Cl. 156-188.000.
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Pinneo, George G.; and Weaver, Jon N., 4,413,254, Cl. 340-572.000.
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- Shallenberger, Fred T., Jr., to Metal Cutting Tools, Inc. Drill with single cutter. 4,412,763, Cl. 408-224.000.
- Shanbrom, Edward. Depyrogenation process. 4,412,985, Cl. 424-78.000.
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McCrudden, Edward; and Shandala, Frank, 4,412,599, Cl. 182-201.000.
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Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,412,871, Cl. 148-2.000.
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- Shaw, David N.; and First, David J., to Durham-Bush, Inc. Control system for screw compressor. 4,412,788, Cl. 417-280.000.
- Sheffield, Ellis W.: See—  
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- Sherno, Stanley A., to Aperm of South Carolina. Method for weather-proofing substrates. 4,413,026, Cl. 427-407.100.
- Shibata, Akira, to Chugai Denki Kogyo K.K. Electrical contact materials of internally oxidized Ag-Sn-Bi alloy. 4,412,971, Cl. 420-501.000.
- Shibayama, Yuho: See—  
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- Shibuya, Kunihiko; and Iwata, Yasuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrophotographic copier with copy paper supply device. 4,412,734, Cl. 355-3.0SH.
- Shibuya, Tsunenori: See—  
Kondo, Hiroshi; and Shibuya, Tsunenori, 4,412,787, Cl. 417-269.000.
- Shima, Takaharu: See—  
Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187, Cl. 250-491.100.
- Shimada, Akira: See—  
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- Shimada, Hidetoshi: See—  
Kurashige, Tomozo; and Shimada, Hidetoshi, 4,412,864, Cl. 106-235.000.
- Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, to Teijin Limited. Aromatic copolyamide containing 3,4'-diphenylene moiety. 4,413,114, Cl. 528-183.000.
- Shimada, Takeo: See—  
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Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937, Cl. 502-423.000.
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Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,412,882, Cl. 156-188.000.
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Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900, Cl. 204-192.00P.
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- Shinada, Kazuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor device utilizing selective masking, etching and oxidation. 4,412,378, Cl. 29-578.000.
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- Shinohara, Koji: See—  
Fukuda, Hirokazu; Shinohara, Koji; and Ito, Mitiharu, 4,413,343, Cl. 372-44.000.
- Shintomi, Keiichi: See—  
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- Shipley, Randall S.; and Freyer, Larry E., to Dow Chemical Company. The. Reaction products of transition metal compounds and boron compounds and catalysts prepared therefrom. 4,412,939, Cl. 502-115.000.
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Kitamoto, Tatsuji; and Shirahata, Ryuji, 4,412,507, Cl. 118-718.000.
- Shoji, Masuhiro; Sakagami, Teruo; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cyanoethylated olefin-vinyl alcohol copolymer and dielectric material and adhesive comprising the same. 4,413,090, Cl. 525-59.000.
- Showalter, Thomas A., to Spectrum Design Co. Programmable electronic time and tide clock. 4,412,749, Cl. 368-19.000.
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- Siegel, Wolfgang: See—  
Wohnhas, Norbert; and Siegel, Wolfgang, 4,412,748, Cl. 366-341.000.
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Bonu, Bonu, 4,412,504, Cl. 118-664.000.  
Chaillie, Charles; and Reisinger, Konrad, 4,413,336, Cl. 370-48.000.  
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Saatz, Kuno, 4,412,721, Cl. 350-96.200.  
Schultz, Thomas, 4,413,165, Cl. 200-148.00H.  
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Porter, Ronald G.; LeBlanc, Richard E.; and Siemon, Rolf W., 4,413,250, Cl. 340-310.00A.
- Sifferman, Thomas R., to Conoco Inc. Methods of inhibiting the flow of water in subterranean formations. 4,412,586, Cl. 166-294.000.
- Sigl, Wayne C., to Kimberly-Clark Corporation. Method and apparatus for manufacturing elastic leg disposable diapers. 4,412,881, Cl. 156-164.000.
- Silbernagel, Hermann. Sign holder with reversible supporting brackets. 4,412,396, Cl. 40-607.000.
- Sillion, Bernard: See—  
Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, 4,413,133, Cl. 549-265.000.
- Silva, John C., Jr. Evaporative carburetor and engine. 4,412,521, Cl. 123-522.000.
- Silvia, Denis A., to United States of America, Navy. Explosive logic safing device. 4,412,493, Cl. 102-275.900.
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- Simonson, Jorgen R. Drawer slide system. 4,412,703, Cl. 308-3.600.
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Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., 4,413,314, Cl. 364-188.000.
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- Singer Company, The: See—  
Adams, Kenneth D., 4,413,310, Cl. 362-90.000.  
Brown, Jack, 4,413,214, Cl. 318-488.000.  
McGavin, Hubert P., 4,412,462, Cl. 76-5.00R.  
Obermann, George; and Mateja, Edward J., 4,413,164, Cl. 200-38.00R.
- Singh, Baldev, to Sterling Drug Inc. Preparation of 1,2-dihydro-6-(lower alkyl)-2-oxo-5-(pyridinyl)nicotinonitriles. 4,413,127, Cl. 546-249.000.
- Sinha, Vijay K.: See—  
Wallace, William E.; Sinha, Vijay K.; and Purarian, Faiz, 4,412,982, Cl. 423-644.000.
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Fischer, Hartmut; and Skaletz, Detlef H., 4,413,149, Cl. 568-636.000.
- SKF Kugellagerfabriken GmbH: See—  
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,412,372, Cl. 29-149.50R.
- Skinner, Dale D.: See—  
Rowe, Linwood M., Jr.; Skinner, Dale D.; and Thompson, John H., 4,413,331, Cl. 367-151.000.
- Skoch, Leroy V.; and Pike, Keith E., to Ralston Purina Company. Pellet die. 4,413,016, Cl. 426-454.000.
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Fundell, Bo W., 4,412,401, Cl. 51-103.00R.
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- Sloan, Kenneth B.; and Little, Roy, to INTERx Research Corporation. Mannich-base hydroxamic acid prodrugs, compositions and use. 4,412,994, Cl. 424-248.530.
- Slomma, Heinz-Georg: See—  
Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, 4,412,497, Cl. 112-96.000.
- Smidt, Donald L.: See—  
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- Smith, George F., Jr., to Hergeth, Incorporated. Horizontal baling apparatus and method. 4,412,410, Cl. 53-528.000.
- Smith, Jerry R., to Innovative Research Corporation. Rekeyable lock method and apparatus. 4,412,437, Cl. 70-338.000.
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White, George R., 4,413,130, Cl. 548-342.000.
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Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., 4,413,303, Cl. 361-253.000.
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Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., 4,413,322, Cl. 364-448.000.
- Sochor, Josef, to Robert Bosch GmbH. Circuit for deriving a timing signal from digital input signals. 4,413,236, Cl. 331-25.000.
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- Societe Anonyme dite: Alstom-Atlantique: See—  
Combes, Gilles, 4,412,555, Cl. 137-524.000.
- Societe Anonyme dite: Les Cables de Lyon: See—  
Guazzo, Lucien, 4,412,878, Cl. 156-91.000.
- Societe Anonyme Francaise du Ferodo: See—  
Loizeau, Pierre, 4,412,606, Cl. 192-106.200.
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Capitani, Enzo; and Teissie, Jean, 4,412,923, Cl. 210-661.000.
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Lemaitre, Maurice; Roussel, Robert; and Wirth, Rene, 4,412,896, Cl. 204-159.200.
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Haas, Armand, 4,413,109, Cl. 526-348.000.
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Barthelemy, Andre J., 4,412,460, Cl. 74-752.00E.
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Lebrun, Jean L., 4,413,321, Cl. 364-428.000.
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Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., 4,412,774, Cl. 414-589.000.
- Soeda, Takashi: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.
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Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986, Cl. 424-80.000.
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Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Softky, Edward H., 4,413,259, Cl. 340-825.060.
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Khmelkov, Stanislav F.; Ramazanov, Mnaidar R.; Soldatov, Mikhail P.; Beskaravainy, Vadim V.; Aranovich, Viktor L.; and Soldaev, Lev K., 4,412,936, Cl. 252-408.100.
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Baba, Yasuharu, 4,413,237, Cl. 331-108.00C.  
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Leroy, Claude, 4,412,430, Cl. 62-467.00R.
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- Southwire Company: See—  
Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., 4,412,580, Cl. 164-433.000.
- Sowers, Edward E.; Goe, Gerald L.; and Prunier, Michael L., to Reilly Tar & Chemical Corp. Polymer composition and process for preparing same. 4,413,099, Cl. 525-327.100.
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Chung, Stanley Y.; and Spadini, Gianfranco L., 4,412,934, Cl. 252-186.380.
- Sparks, Daniel R., to Becton Dickinson and Company. Space bar for low profile keyboards. 4,412,754, Cl. 400-496.000.
- Spectrum Design Co.: See—  
Showalter, Thomas A., 4,412,749, Cl. 368-19.000.
- Speigel, Kenneth, to North American Philips Consumer Electronics Corp. Cathode-G1 spacing material and method of application. 4,413,203, Cl. 313-446.000.
- Speirs, Graeme K. Clamps. 4,412,370, Cl. 24-268.000.
- Spellicy, Robert L., to OptiMetrics, Inc. Resonant spectrophone system noise elimination. 4,412,445, Cl. 73-24.000.
- Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. Sterile docking process, apparatus and system. 4,412,835, Cl. 604-29.000.
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Josephs, Richard M.; and Wang, Tsing-Chow, 4,413,196, Cl. 307-462.000.  
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- Rowland-Hill, E. William, 4,412,549, Cl. 130-27.00T.
- Swenson, Robert E., 4,413,317, Cl. 364-200.000.
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Quick, Roy F., Jr.; and Spracklen, John E., 4,413,258, Cl. 340-825.500.
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Gontowski, Walter S., Jr.; and Mayrand, James F., 4,413,271, Cl. 357-40.000.
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- Sprecker, Mark A.: See—  
Hall, John B.; and Sprecker, Mark A., 4,413,139, Cl. 560-126.000.
- Springer, Paul H., to Newey Goodman Limited. Safety-pins. 4,412,368, Cl. 24-158.000.
- SRI International: See—  
Weaver, Charles S.; and Chadwick, Joseph H., 4,413,289, Cl. 360-51.000.
- Sridhar, Bettadapur N. Nuclear reactor control apparatus. 4,412,968, Cl. 376-233.000.
- Staberoh, Uwe: See—  
Schreiner, Friedrich; and Staberoh, Uwe, 4,412,705, Cl. 308-178.000.
- Staerzl, Richard E., to Brunswick Corporation. Low fuel pressure monitor for internal combustion engine. 4,413,248, Cl. 340-52.00R.
- Staebli Ltd.: See—  
Kleiner, Walter, 4,412,563, Cl. 139-66.00R.
- Stafford, Richard W.: See—  
Schuder, Maurice E.; and Stafford, Richard W., 4,412,750, Cl. 368-98.000.



- Shake Technology Limited: See—  
Brown, Douglas B., 4,412,485, Cl. 100-117.000.
- Standard Oil Company, The: See—  
Dolhyj, Serge R.; Velenyi, Louis J.; and Guttman, Andrew T., 4,412,847, Cl. 44-77.000.
- Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., 4,413,155, Cl. 585-417.000.
- Standard Oil Company (Indiana): See—  
Moote, Truman P.; Dunton, Myron L.; McGalliard, Russell L.; and Yarborough, Lyman, 4,412,913, Cl. 208-207.000.
- Standard Products Company, The: See—  
Brenner, Walter, 4,413,019, Cl. 427-36.000.
- Stanley Works, The: See—  
Suska, Charles R., 4,412,711, Cl. 339-4.000.
- Stauber, Ronald C.: See—  
Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C., 4,412,834, Cl. 604-29.000.
- Stauffer Chemical Company: See—  
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956, Cl. 260-429.00R.
- Wong, Rayman Y., 4,412,997, Cl. 424-263.000.
- Stefancik, Nikolaus: See—  
Galow, Manfred; and Stefancik, Nikolaus, 4,412,770, Cl. 414-162.000.
- Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Method for the automatic or semiautomatic distance measurement and focusing of the image of an object onto a focal plane, 4,412,741, Cl. 356-1.000.
- Steinleitner, Gunther; and Haar, Wilhelm, to Brown, Boveri & Cie AG. Electrochemical storage cell, 4,413,043, Cl. 429-104.000.
- Stenberg, Kaj O.; and Nystrom, Lars H., to Cambro Lundia AB. Pump including locking means for a flexible tube, 4,412,793, Cl. 417-477.000.
- Stephens, Geoffrey B.: See—  
De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,412,376, Cl. 29-576.00B.
- Sterling Drug Inc.: See—  
Bell, Malcolm R.; and Herrmann, John L., Jr., 4,412,995, Cl. 424-251.000.
- Crounse, Nathan N., 4,412,950, Cl. 260-157.000.
- Singh, Baldev, 4,413,127, Cl. 546-249.000.
- Stern Electronics, Inc.: See—  
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,413,260, Cl. 340-825.250.
- Stier, Glenn R.; and Mizrachi, Moshe, to Norlin Industries, Inc. Synchronization system for an electronic musical instrument having plural automatic play features, 4,412,471, Cl. 84-1.030.
- Stoeckigt, Dieter: See—  
Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoeckigt, Dieter, 4,412,933, Cl. 252-174.190.
- Stoehr, Herbert M., to Artos Engineering Company. Roller forming machine with lengthwise adjustable heads, 4,412,443, Cl. 72-181.000.
- Stoewe, Anneliese: See—  
Forberg, Horst; Achtnig, Klaus-Peter; and Stoewe, Anneliese, 4,412,374, Cl. 29-566.400.
- Stokely-Van Camp, Inc.: See—  
Ertle, Raymond T., 4,412,978, Cl. 423-279.000.
- Stoltman, Donald: See—  
Hoch, Martin M.; and Stoltman, Donald, 4,412,519, Cl. 123-449.000.
- Stone, Louis P.: See—  
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,412,871, Cl. 148-2.000.
- Stonehill, Bernard C.: See—  
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815, Cl. 432-206.000.
- Stoudt, Thomas H.: See—  
Carlo, Dennis J.; Nollstadt, Karl H.; Stoudt, Thomas H.; and Maigetter, Robert Z., 4,413,057, Cl. 435-101.000.
- Strain, David H.; and Sutton, John H., III, to Beckman Instruments, Inc. Cover for centrifuge rotor, 4,412,830, Cl. 494-12.000.
- Strand, Rolf: See—  
Claesson, Kjell; Ronnerholm, Stig; and Strand, Rolf, 4,412,649, Cl. 236-46.00R.
- Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., to Halliburton Company. Dog locking sleeve, 4,412,559, Cl. 138-89.000.
- Stricker, C. Donald: See—  
Bakewell, Frank W.; Nicely, Thomas E.; and Stricker, C. Donald, 4,412,503, Cl. 118-420.000.
- Strickler, Rainer: See—  
Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoeckigt, Dieter, 4,412,933, Cl. 252-174.190.
- Strul, Bruno: See—  
Macovski, Albert; Strul, Bruno; and Alvarez, Robert E., 4,413,353, Cl. 378-062.000.
- Stumpf, Harry C.: See—  
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,869, Cl. 148-2.000.
- Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,870, Cl. 148-2.000.
- Sturdivant, Jack E. Dental mouth mirror, 4,412,821, Cl. 433-30.000.
- Sugier, Andre: See—  
Audibert, Francois; Sugier, Andre; and Van Landeghem, Hugo, 4,413,063, Cl. 518-700.000.
- Sugiyama, Akira; and Hirota, Kunio, to Brother Kogyo Kabushiki Kaisha. Apparatus for attaching a plurality of studs on flexible sheet material, 4,412,640, Cl. 227-85.000.
- Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus capable of performing automatic search reproduction, 4,413,292, Cl. 360-72.200.
- Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. State indicating device in a rotary recording medium reproducing apparatus, 4,413,299, Cl. 360-137.000.
- Sugiyama, Mituo: See—  
Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, 4,412,945, Cl. 252-551.000.
- Sullivan, Robert P.: See—  
Perry, Glenn M.; and Sullivan, Robert P., 4,412,510, Cl. 122-510.000.
- Sulzer Brothers Limited: See—  
Tiefenthaler, Edlbert, 4,412,671, Cl. 251-31.000.
- Sumi, Hideji; and Kokado, Masayuki, to Fujitsu Limited. Line driver circuit having a protective circuit against excess currents, 4,413,300, Cl. 361-98.000.
- Sumitomo Chemical Company, Limited: See—  
Omura, Takashi; Tezuka, Yasuo; and Sunami, Masaki, 4,412,948, Cl. 260-153.000.
- Sumitomo Electric Industries, Ltd.: See—  
Tsuiji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,412,980, Cl. 423-446.000.
- Sumitomo Kinzoku Kogyo Kabushiki Kaisha: See—  
Tatsuaki, Masao; Nemoto, Shin; and Okuhara, Seiichi, 4,413,324, Cl. 364-557.000.
- Sun Chemical Corporation: See—  
Lupoli, Peter J., 4,413,234, Cl. 324-435.000.
- Sun Electric Corporation: See—  
Ketel, William E., II, 4,412,444, Cl. 73-23.000.
- Sunami, Masaki: See—  
Omura, Takashi; Tezuka, Yasuo; and Sunami, Masaki, 4,412,948, Cl. 260-153.000.
- Sundstrand Data Control, Inc.: See—  
Muller, Hans R., 4,413,323, Cl. 364-521.000.
- Sunpower, Inc.: See—  
Beale, William T., 4,412,418, Cl. 60-520.000.
- Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., to Canon Kabushiki Kaisha. Method for performing growth of compound thin films, 4,413,022, Cl. 427-255.200.
- Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., to Standard Oil Co., The. Ammonoxidation of olefins with novel antimonate catalysts, 4,413,155, Cl. 585-417.000.
- Suska, Charles R., to Stanley Works, The. Two knuckle electrical hinge, 4,412,711, Cl. 339-4.000.
- Sutoh, Shinji: See—  
Iida, Katsumi; Sutoh, Shinji; and Hara, Toshizo, 4,412,424, Cl. 62-209.000.
- Sutton, John H., III: See—  
Strain, David H.; and Sutton, John H., III, 4,412,830, Cl. 494-12.000.
- Suzuki, Hajime: See—  
Kobayashi, Takeshi; and Suzuki, Hajime, 4,412,562, Cl. 139-54.000.
- Suzuki, Sadao: See—  
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,412,966, Cl. 264-521.000.
- Suzuki, Tadashi: See—  
Ito, Takuzo; Suzuki, Tadashi; and Miyake, Tatsuro, 4,412,600, Cl. 187-17.000.
- Suzuki, Yoichi: See—  
Ohya, Takashi; and Suzuki, Yoichi, 4,413,160, Cl. 179-115.00V.
- Suzuki, Yoshiaki: See—  
Kageyama, Takao; Suzuki, Yoshiaki; and Watanabe, Eiichi, 4,413,207, Cl. 315-5.520.
- Swalwell, John E.: See—  
Gibson, David V.; Parr, Rodney W.; and Swalwell, John E., 4,413,073, Cl. 523-511.000.
- Sweeney, William M.: See—  
Kaufman, Benjamin J.; and Sweeney, William M., 4,412,845, Cl. 44-53.000.
- Swenson, Robert E., to Sperry Corporation. Multiprocessor system with cache/disk subsystem with status routing for plural disk drives, 4,413,317, Cl. 364-200.000.
- Swern, Frederic L.: See—  
Brandau, William E.; Swern, Frederic L.; and Moses, Kurt, 4,413,320, Cl. 364-428.000.
- Szamek, Pierre E. Recreational skate, 4,412,685, Cl. 280-11.190.
- Szczepanski, Henry: See—  
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,412,856, Cl. 71-121.000.
- Szwargulski, Carl J., Jr.: See—  
Houghton, Timothy J.; Szwargulski, Carl J., Jr.; Bentrup, Jerry A.; and Smidt, Donald L., 4,412,627, Cl. 220-66.000.
- Szymaszek, Jan W.: See—  
Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., 4,413,062, Cl. 501-123.000.
- Tachihara, Satoru; and Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Rear stop diaphragm zoom lens, 4,412,725, Cl. 350-426.000.

- Tadauchi, Masaharu: See—  
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285, Cl. 358-260.000.
- Taguchi, Kenichi: See—  
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiko, 4,412,886, Cl. 156-645.000.
- Taira, Akio, to Olympus Optical Company Ltd. Optical system for tiltable lens barrel of a microscope, 4,412,727, Cl. 350-514.000.
- Taira, Toshiju, to Nippondenso Co., Ltd. Structure for supporting automobile horn, 4,412,593, Cl. 180-68.00P.
- Takada, Takuzo: See—  
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,412,966, Cl. 264-521.000.
- Takagi, Mikio; and Kamioka, Hajime, to Fujitsu Limited. Method for drying semiconductor substrates, 4,412,388, Cl. 34-1.000.
- Takahashi, Eiji: See—  
Nagai, Nobuyuki; Takahashi, Eiji; Matsumoto, Yoji; and Ohtsu, Hideaki, 4,412,453, Cl. 73-601.000.
- Takahashi, Harumi: See—  
Ogata, Yoshihiro; Abe, Yoshihiro; and Takahashi, Harumi, 4,412,732, Cl. 355-3.0TR.
- Takahashi, Hiroyoshi: See—  
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,412,674, Cl. 266-91.000.
- Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, to Lion Corporation. Aqueous high concentration slurry of alcohol ethoxylate, 4,412,945, Cl. 252-551.000.
- Takahashi, Sadao: See—  
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848, Cl. 48-197.00R.
- Takahashi, Toshio; and Ohswa, Mitsuo, to Sony Corporation. Printed circuit board, 4,413,309, Cl. 361-406.000.
- Takao, Hisashi: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.
- Takara Kogyo Co., Ltd.: See—  
Ueda, Yoshihiko, 4,412,919, Cl. 210-189.000.
- Takeda Chemical Industries, Ltd.: See—  
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,413,102, Cl. 525-453.000.
- Tanaka, Nobuyoshi, 4,412,624, Cl. 215-100.00A.
- Takeda, Sunao: See—  
Okino, Haruka; Ogawa, Keititsu; Takeda, Sunao; Mohri, Hiromichi; and Hirade, Shigeru, 4,412,545, Cl. 128-691.000.
- Takekoshi, Yasuaki: See—  
Hanyu, Yoshiyuki; and Takekoshi, Yasuaki, 4,412,669, Cl. 251-4.000.
- Takemae, Yoshihiro: See—  
Mochizuki, Hirohiko; Nakano, Masao; Baba, Fumio; Nakano, Tomio; and Takemae, Yoshihiro, 4,413,272, Cl. 357-65.000.
- Takemoto, Iwao: See—  
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,413,283, Cl. 358-213.000.
- Takenaka, Hisataka: See—  
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902, Cl. 204-192.00E.
- Takenouchi, Mutsuo: See—  
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,413,188, Cl. 250-578.000.
- Takeuchi, Shigeru: See—  
Sakaguchi, Keizo; and Takeuchi, Shigeru, 4,412,561, Cl. 138-174.000.
- Takizuka, Michinori: See—  
Hasegawa, Kunio; and Takizuka, Michinori, 4,412,875, Cl. 149-19.900.
- Talres Development (N.A.) N.V.: See—  
van der Loo, Henricus E.; and Wiener, Charles, 4,412,984, Cl. 424-58.000.
- Tanabe, Keiichi: See—  
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902, Cl. 204-192.00E.
- Tanabe Seiyaku Co., Ltd.: See—  
Kanno, Takeshi; Gano, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, 4,413,006, Cl. 424-250.000.
- Tanaka, Akira: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.
- Tanaka, Masataka: See—  
Nagashima, Kenji; Matsumoto, Hiroshi; Tanaka, Masataka; Odaira, Hiroshi; and Iwase, Nobuo, 4,412,377, Cl. 29-577.00C.
- Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, to Takeda Chemical Industries, Ltd. Composition for protecting cementware from frost-damage comprising urethane resin and organopolysiloxane, 4,413,102, Cl. 525-453.000.
- Tanaka, Motoharu; Machida, Hazime; and Kobayashi, Hiroshi, to Ricoh Company, Ltd. Magnetic recording and playback apparatus of perpendicular recording type, 4,413,297, Cl. 360-119.000.
- Tanaka, Nobuyoshi, to Takeda Chemical Industries, Ltd. Hanging member for hanging a container in an inverted position, 4,412,624, Cl. 215-100.00A.
- Tanaka, Shinichiro: See—  
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,412,517, Cl. 123-339.000.
- Tanaka, Shinji: See—  
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848, Cl. 48-197.00R.
- Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, to Hitachi, Ltd. Method of manufacturing photosensors, 4,412,900, Cl. 204-192.00P.
- Tanaka, Yuji: See—  
Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187, Cl. 250-491.100.
- Tanimura, Tomihisa: See—  
Abe, Akira; and Tanimura, Tomihisa, 4,412,399, Cl. 46-47.000.
- Tanno, Kiyohiko: See—  
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285, Cl. 358-260.000.
- Tano, Kazuhiro: See—  
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039, Cl. 428-643.000.
- Tanzawa, Misao: See—  
Sakamoto, Koji; and Tanzawa, Misao, 4,412,736, Cl. 355-15.000.
- Tappe, Horst; and Wille, Herbert, to Cassella Aktiengesellschaft. 4-Isopropyl-4'-nitrobenzophenone and a process for the preparation of 4'-nitrobenzophenones substituted in the 4-position, 4,413,144, Cl. 568-306.000.
- Tashiro, Tomoyasu: See—  
Uchikuga, Saburo; Tashiro, Tomoyasu; and Osawa, Yasuko, 4,413,129, Cl. 548-342.000.
- Tatsuaki, Masao; Nemoto, Shin; and Okuhara, Seiichi, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Temperature pattern measuring method and a device therefor, 4,413,324, Cl. 364-557.000.
- Taureg, Herbert: See—  
Petrzelka, Miloslav; and Taureg, Herbert, 4,412,827, Cl. 464-128.000.
- Tayeb, Abdul M.: See—  
Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Softky, Edward H., 4,413,259, Cl. 340-825.060.
- Taylor, David W., to Ergon, Inc. Coal treatment process, 4,412,839, Cl. 44-1.00B.
- Taylor, Noel R.; and Taylor, Paul A., to CMD Enterprise, Inc. Automatic load seeking control for a multitorque motor, 4,413,218, Cl. 318-771.000.
- Taylor, Paul A.: See—  
Taylor, Noel R.; and Taylor, Paul A., 4,413,218, Cl. 318-771.000.
- Taylor, Robin: See—  
Ducharme, Ronald L.; and Taylor, Robin, 4,413,219, Cl. 320-15.000.
- Tecor Electronics, Inc.: See—  
Crockett, Charles R., 4,413,193, Cl. 307-311.000.
- Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Apparatus for driving thread levers on embroidery machines, 4,412,497, Cl. 112-96.000.
- Teich, Wesley W., to Raytheon Company. Heating time coupling factor for microwave oven, 4,413,168, Cl. 219-10.55B.
- Teijin Limited: See—  
Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, 4,413,114, Cl. 528-183.000.
- Teissie, Jean: See—  
Capitani, Enzo; and Teissie, Jean, 4,412,923, Cl. 210-661.000.
- Teitscheid, Heinz-Horst: See—  
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,413,055, Cl. 430-567.000.
- Temple, Chester S., to PPG Industries, Inc. Storage stable polyolefin compatible non-crosslinking size for fiber glass strands, 4,413,085, Cl. 524-321.000.
- Teren, Dorothy R. Remotely controlled massaging apparatus, 4,412,535, Cl. 128-57.000.
- Terlizzi, Donald: See—  
Terlizzi, Nicholas, Jr.; and Terlizzi, Donald, 4,412,393, Cl. 36-113.000.
- Terlizzi, Nicholas, Jr.; and Terlizzi, Donald, to Ballet Makers, Inc. Ballet toe shoe and process of manufacture thereof, 4,412,393, Cl. 36-113.000.
- Tesch, Gunter; and Gieldanowski, Siegfried, to Breveteam S.A. Fiber aggregate, 4,413,030, Cl. 428-85.000.
- Texaco Inc.: See—  
Kaufman, Benjamin J.; and Sweeney, William M., 4,412,845, Cl. 44-53.000.
- Nieh, Edward C. Y.; Naylor, Carter G.; and Lambert, Clifford L., 4,412,926, Cl. 252-8.55D.
- Watts, Lewis W., Jr.; and Marquis, Edward T., 4,413,156, Cl. 585-254.000.
- Texas Instruments Incorporated: See—  
McKee, William R.; Murdock, Russell H.; and Schulte, Eric F., 4,413,020, Cl. 427-53.100.
- Robinson, Jeffrey I., 4,413,313, Cl. 363-80.000.
- Ting, Youn H., 4,413,174, Cl. 219-511.000.
- Tezuka, Yasuo: See—  
Omura, Takashi; Tezuka, Yasuo; and Sunami, Masaki, 4,412,948, Cl. 260-153.000.
- Thermo King Corporation: See—  
Barliss, John W., 4,412,783, Cl. 416-186.00A.
- Thermoguard Insulation Co.: See—  
Crawford, Roger; and Sanders, Duane, 4,412,659, Cl. 241-35.000.



- Thoma, Andre P., to International Business Machines Corporation. Dynamic memory cell. 4,413,329, Cl. 365-189.000.
- Thomas, Alan V., and Bone, Geoffrey E., to British Aerospace Public Limited Company. Fluid supply systems. 4,412,419, Cl. 60-634.000.
- Thomas, Lowell E., to Dynamics Research Corporation. Method for providing high resolution, highly defined, thick film patterns. 4,413,051, Cl. 430-312.000.
- Thompson, Donald R., and Vogliano, Robert H., to Goodyear Tire & Rubber Company, The. Method of making an air spring. 4,412,965, Cl. 264-257.000.
- Thompson, John H.: See—
- Rowe, Linwood M., Jr.; Skinner, Dale D.; and Thompson, John H., 4,413,331, Cl. 367-151.000.
- Thomsen, Svend E.; and Kyster, Erik, to Danfoss A/S. Hydrostatic steering gear. 4,412,415, Cl. 60-384.000.
- Thomson, Adam R., to Ewesplint Limited. Method for splinting animal teeth. 4,412,818, Cl. 433-1.000.
- Thomson-CSF: See—
- Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Le-creff, Maurice, 4,413,241, Cl. 333-22.00R.
- Morizot, Jean Paul, 4,413,208, Cl. 315-39.300.
- Val, Christian; and Pribat, Didier, 4,413,170, Cl. 219-216.000.
- Thonnart, Paul, to Ateliers de Constructions Electriques de Charleroi. Method for simultaneous teletext and analog signal transmission. 4,413,281, Cl. 358-147.000.
- Three Rivers Development Corporation: See—
- Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., 4,412,610, Cl. 198-403.000.
- Thubeauville, Heinz, to Dr. C. Otto & Comp. G.m.b.H. Coke oven battery for production of coke and gas. 4,412,890, Cl. 202-139.000.
- Tiefenthaler, Edelbert, to Sulzer Brothers Limited. Plate valve. 4,412,671, Cl. 251-31.000.
- Tiger, Howard L. Fresh air breathing mask with exterior heat exchanger. 4,412,537, Cl. 128-204.170.
- Tighe, Charles, Jr.: See—
- Morningstar, Leroy J.; and Tighe, Charles, Jr., 4,412,714, Cl. 339-91.00R.
- Tighe, Charles I., Jr.: See—
- Huffnagle, Clifton W.; Morningstar, LeRoy J.; and Tighe, Charles I., Jr., 4,412,566, Cl. 140-147.000.
- Tihon, Claude; and Curry, M. Elaine, to Bristol-Myers Company. Apparatus for preparing single cell suspension. 4,413,059, Cl. 435-286.000.
- Tilbrook, Roger W.; and Markowski, Franz J. Combination pipe rupture mitigator and in-vessel core catcher. 4,412,969, Cl. 376-280.000.
- Timofeev, Gennady A.: See—
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Thompson, Donald R.; and Vogliano, Robert H., 4,412,965, Cl. 264-257.000.

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Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,413,055, Cl. 430-567.000.

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Brown, Dale M.; and Vosburgh, Kirby G., 4,412,868, Cl. 148-1.500.

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Hegedus, Louis, 4,413,041, Cl. 429-33.000.

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Wohnhas, Norbert; and Siegel, Wolfgang, 4,412,748, Cl. 366-341.000.

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Kageyama, Takao; Suzuki, Yoshiaki; and Watanabe, Eiichi, 4,413,207, Cl. 315-5.520.

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Hirota, Hajime; and Watanabe, Hiroshi, 4,412,943, Cl. 252-546.000.

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Watanabe, Yasuo: See—  
Kawanami, Shumpei; Watanabe, Yasuo; and Hanyo, Susumu, 4,412,442, Cl. 72-128.000.

Watts, Lewis W., Jr.; and Marquis, Edward T., to Texaco Inc. Manufacture of synthetic lubricant additives from low molecular weight olefins using boron trifluoride catalysts. 4,413,156, Cl. 585-254.000.

Wavin B.V.: See—  
Muis, Roelof; and Herder, Kornelis, 4,412,487, Cl. 101-41.000.

Wawrzyniak, Walter W. Double ended tap. 4,412,764, Cl. 408-226.000.

Weaver, Charles S.; and Chadwick, Joseph H., to SRI International. Digital recording and playback method and apparatus. 4,413,289, Cl. 360-51.000.

Weaver, Jon N.: See—  
Pinneo, George G.; and Weaver, Jon N., 4,413,254, Cl. 340-572.000.

Webster, Francis, to Quaker Oats Company, The. Method for preparing whole grain oat product. 4,413,018, Cl. 426-618.000.

Webster, John E., Jr. Heating unit. 4,412,651, Cl. 237-1.00R.

Wegner, Christian; Jabs, Gert; and Dahm, Manfred, to Bayer Aktiengesellschaft. Process for the production of microcapsules. 4,412,959, Cl. 264-4.100.

Weichman, Edward C., to Schlegel Corporation. Wire carrier and edge protector trim strip formed therefrom. 4,413,033, Cl. 428-122.000.

Weil, Edward D.: See—  
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956, Cl. 260-429.00R.

Weinecke, Michael H.: See—  
Faulkner, Bobby P.; and Winecke, Michael H., 4,412,909, Cl. 208-11.00R.

Weiss, Aryeh: See—  
Adlerstein, Joseph K.; Nitka, Heinz F.; Naiman, Charles S.; and Weiss, Aryeh, 4,413,280, Cl. 358-111.000.

Welch, William G. Musical instrument capotasto. 4,412,472, Cl. 84-318.000.

Weng, Lih-Jyh: See—  
Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., 4,413,339, Cl. 371-38.000.

Wenz, William, to Jeff Company, Inc. Tong arm assembly. 4,412,778, Cl. 414-733.000.

Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co.: See—  
Eckstein, Rolf, 4,412,766, Cl. 409-233.000.

Wesselkamp, Ingrid: See—  
Gleichenhagen, Peter; and Wesselkamp, Ingrid, 4,413,082, Cl. 524-243.000.

West Company, Incorporated, The: See—  
Brignola, Dominic J., 4,412,836, Cl. 604-87.000.

Western Design Corporation: See—  
Golden, Michael D., 4,412,611, Cl. 198-450.000.

Western Electric: See—  
Carnevale, Anthony; Paek, Un-Chul; and Peterson, George E., 4,412,722, Cl. 350-96.310.

Western Electric Co., Inc.: See—  
Fisher, John R., Jr., 4,412,642, Cl. 228-173.00R.

Haney, Eugene A.; and Partus, Fred P., 4,412,683, Cl. 277-3.000.

Lien, Sui-Yuen P., 4,412,502, Cl. 118-412.000.

Partus, Fred P., 4,412,853, Cl. 65-3.120.

Zelins, Ronald P., 4,412,672, Cl. 254-134.30R.

Western Fuel Reducers, Inc.: See—  
Burke, Michael J.; and Fowler, Harry E., 4,412,558, Cl. 138-38.000.

Westinghouse Electric Corp.: See—  
Archer, David H.; and Ahmed, M. Mushtaq, 4,412,910, Cl. 208-11.00R.

Lu, Wen-Tong P., 4,412,895, Cl. 204-129.000.

Meyer, Jeffrey R., 4,413,166, Cl. 200-148.00B.

Miller, Robert C., 4,413,230, Cl. 324-142.000.

Roman, Walter G., 4,412,785, Cl. 417-50.000.

Rowe, Linwood M., Jr.; Skinner, Dale D.; and Thompson, John H., 4,413,331, Cl. 367-151.000.

Westrom, Arthur C.; Livesay, Billy R.; and Larsen, James W., to Kearney-National Inc. Metallic coating for a cadmium fuse. 4,413,246, Cl. 337-159.000.

Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsion, a photographic material and a process for the production of photographic images. 4,413,055, Cl. 430-567.000.

Wheelock, Kenneth S.: See—  
Schucker, Robert C.; and Wheelock, Kenneth S., 4,412,911, Cl. 208-121.000.

Whirlpool Corporation: See—  
Laprad, Paul J.; and Wolanin, Gerald L., 4,412,710, Cl. 312-311.000.

Whistler, Roy L., to Purdue Research Foundation. Process for producing acosamine, daunosamine, 1-thioacosamine and related compounds. 4,413,120, Cl. 536-18.600.

White, Donald A.: See—  
Michaelson, Robert C.; Austin, Richard G.; and White, Donald A., 4,413,151, Cl. 568-860.000.

White, Donald M., III, to Toro Company, The. Line feed mechanism for filament cutting. 4,412,382, Cl. 30-276.000.

White, George R., to Smith Kline & French Laboratories Limited. Sulphoxides. 4,413,130, Cl. 548-342.000.

White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., to Dofasco Inc. Loading system for an annealing furnace charge and components therefor. 4,412,815, Cl. 432-206.000.

White, James S.: See—  
Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., 4,412,610, Cl. 198-403.000.

Whitney, Floyd A., to Born Free Plastics, Inc. Thermoplastic drum apparatus. 4,412,628, Cl. 220-71.000.

Whittall, Peter H.: See—  
Knights, Richard N.; and Whittall, Peter H., 4,412,492, Cl. 102-204.000.

Wiegner, Georg; and Reinwald, Elmar, to Henkel Kommanditgesellschaft auf Aktien. Tampon applicator. 4,412,833, Cl. 604-14.000.

Wiener, Charles: See—  
van der Loo, Henricus E.; and Wiener, Charles, 4,412,984, Cl. 424-58.000.

Wierenga, Wendell, to Upjohn Company, The. Antibiotic CC-1065 indoline intermediates. 4,413,132, Cl. 548-491.000.

Wilding, Edwin; and DeVere, James W., to Griffin & Company, Inc. Control apparatus and method for dumping tobacco. 4,412,773, Cl. 414-403.000.

Wilhelm, Donald F.; and Moser, Robert L., to Helm Instrument Company, Inc. Load sensing probe. 4,412,456, Cl. 73-862.650.

Wille, Herbert: See—  
Tappe, Horst; and Wille, Herbert, 4,413,144, Cl. 568-306.000.

Williams, Donald E. Appliance for a book or the like. 4,412,692, Cl. 281-34.000.

Williams, Leroy J.: See—  
Huskins, Chester W.; and Williams, Leroy J., 4,412,874, Cl. 149-19.200.

Williams, Paul M., to Williams Sound Corporation. Multicompartment equipment case and cover. 4,412,616, Cl. 206-333.000.

Williams Sound Corporation: See—  
Williams, Paul M., 4,412,616, Cl. 206-333.000.

Wilson, Troy K.; and Handly, Robert J., to Honeywell Inc. Floating point division control. 4,413,326, Cl. 364-748.000.

Windsor, Harry M., to Automotive Products Limited. Rotary transmission electronic control system providing automatic changes of speed ratio. 4,412,461, Cl. 74-866.000.

Winter, Roland A. E.: See—  
Fu, Frank T.; and Winter, Roland A. E., 4,413,096, Cl. 525-204.000.

Winterberg, Friedwardt M. Multistage high voltage accelerator for intense charged particle beams. 4,412,967, Cl. 376-106.000.

Wintermantel, Erich. Process for producing hollow profiled structures, and structures produced thereby. 4,412,880, Cl. 156-156.000.

Winters, Giorgio, to Gruppo Lepetit, S.p.A. Process for preparing 16 $\alpha$ -hydroxy-17 $\alpha$ -aminopregnane derivatives. 4,412,953, Cl. 260-239.500.

Wirth, Rene: See—  
Lematre, Maurice; Roussel, Robert; and Wirth, Rene, 4,412,896, Cl. 204-159.200.

Wischermann, Gerhard, to Robert Bosch GmbH. System for mixing two color television signals. 4,413,273, Cl. 358-22.000.

Wise, Frederick M.; and DeWitt, Carl F., to Capitol Packaging Corporation. Spool fabricated from corrugated material. 4,412,661, Cl. 242-77.400.

Wistuba, Eckehardt, to BASF Aktiengesellschaft. Preparation of aqueous epoxy resin dispersions, and their use. 4,413,071, Cl. 523-411.000.

Witschard, Gilbert, to Occidental Chemical Corporation. Vinyl halide polymer blends of enhanced impact resistance. 4,413,092, Cl. 525-71.000.

Witte, Willi; and Boing, Wulf, to Dr. Boing GmbH & Co. Anlagen und Maschinen KG. Apparatus for the dyeing and fixing of knitted articles of clothing. 4,412,434, Cl. 68-3.00R.

Wohnhas, Norbert; and Siegel, Wolfgang, to Waeschle Maschinenfabrik GmbH. Gravity circulation mixer. 4,412,748, Cl. 366-341.000.

Wolanin, Gerald L.: See—  
Laprad, Paul J.; and Wolanin, Gerald L., 4,412,710, Cl. 312-311.000.

Wolffes, Hans: See—  
Bartholomaeus, Reiner; Gibas, Christoph; Wolffes, Hans; Hess, Ferdinand; and Schiene, Karl, 4,413,245, Cl. 336-84.00M.

Wolfsgruber, Friedrich: See—  
Doliwa, Ernst J.; Reifferscheid, Karl J.; and Wolfsgruber, Friedrich, 4,412,578, Cl. 164-349.000.

Wollmann, Andrew F.: See—  
Kramer, Gordon; Lara, Elias J.; and Wollmann, Andrew F., 4,413,257, Cl. 340-815.010.

Wong, Rayman Y., to Stauffer Chemical Company. Insect repellent compounds. 4,412,997, Cl. 424-263.000.

Woodman, Alan L.: See—  
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,413,260, Cl. 340-825.250.

Wootton, Gordon, to Beecham Group Limited. Bronchodilating hydnatoxin derivatives. 4,413,002, Cl. 424-273.00R.

Wrasidlo, Wolfgang J.; and Mysels, Karol J., to Brunswick Corporation. Hydrophilic surfaces and process for making the same. 4,413,074, Cl. 524-43.000.

Wright, Lawrence B., to Lamb Technicon Corp. Tool compensator. 4,412,465, Cl. 82-1.200.

Wulf, Karl A., to Alco Standard Corporation. Rotary hearth furnace and method of loading and unloading the furnace. 4,412,813, Cl. 432-11.000.

Xanar, Inc.: See—  
Vassiliadis, Arthur; Brewer, Michael H.; and Myers, Robert E., 4,412,543, Cl. 128-633.000.

Xerox Corporation: See—  
Buddendeck, Gerald A.; and Kau, Karl M., 4,412,740, Cl. 355-14.0SH.

Sprague, Robert A., 4,413,270, Cl. 346-160.000.

Torpie, John D.; Lozen, Robert F.; and Hsieh, Shing-Chang R., 4,413,287, Cl. 358-288.000.

Xyram Corporation: See—  
Adlerstein, Joseph K.; Nitka, Heinz F.; Naiman, Charles S.; and Weiss, Aryeh, 4,413,280, Cl. 358-111.000.

Yama, Frank M.: See—  
Hofer, Alan; and Yama, Frank M., 4,413,253, Cl. 340-388.000.

Yamada, Taiki: See—  
Ito, Akio; Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 4,412,907, Cl. 204-298.000.

Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kisuake, to Mitsubishi Denki Kabushiki Kaisha. Oxygen density detecting device in combustor. 4,412,809, Cl. 431-76.000.

Yamaguchi, Tsuneo: See—  
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,412,772, Cl. 414-331.000.

Yamaichi Electric Mfg. Co., Ltd.: See—  
Nishikawa, Kinichi, 4,412,713, Cl. 339-75.00M.

Yamakawa, Toshio: See—  
Sato, Tomio; Okimoto, Kunio; and Yamakawa, Toshio, 4,412,643, Cl. 228-221.000.

Yamamura, Michio: See—  
Kanno, Takeshi; Gano, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keichi, 4,413,006, Cl. 424-250.000.

Yamanouchi Pharmaceutical Co. Ltd.: See—  
Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986, Cl. 424-80.000.

Yamaoka, Noboru: See—  
Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; Usui, Katumi; and Miyoshi, Mituji, 4,413,097, Cl. 525-240.000.

Yamashita, Ichiro; and Ise, Yukihiko, to Matsushita Electric Industrial Co., Ltd. Pressure sensing unit for a pressure sensor. 4,412,454, Cl. 73-728.000.

Yamashita, Kunihiko; and Kimura, Muneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for thermal hydrocracking of coal. 4,412,908, Cl. 208-8.00R.

Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunchiro; Sawada, Hiroomi; and Kobayashi, Keizou, to Kabushiki Kaisha Kurio-Medikaru. Apparatus for refrigeration treatment. 4,412,538, Cl. 128-303.100.

Yanadori, Michio: See—  
Koike, Keiichi; and Yanadori, Michio, 4,412,930, Cl. 252-70.000.

Yanahashi, Shinichi: See—  
Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; Usui, Katumi; and Miyoshi, Mituji, 4,413,097, Cl. 525-240.000.

Yano, Katsuhiko: See—  
Kawata, Hirotsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986, Cl. 424-80.000.

Yarborough, Lyman: See—  
Moote, Truman P.; Duntun, Myron L.; McGalliard, Russell L.; and Yarborough, Lyman, 4,412,913, Cl. 208-207.000.

Yasuda, Shuhei; Koyanagi, Katsubumi; Ishii, Yutaka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Driving method for display panels. 4,413,256, Cl. 340-784.000.

Yasudomi, Norio: See—  
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005, Cl. 424-285.000.

Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., to University of California, The Regents of the. Laminar microjet atomizer and method of aerial spraying of liquids. 4,412,654, Cl. 239-171.000.

Yazu, Shuji: See—  
Tsuiji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,412,980, Cl. 423-446.000.

Yeater, Robert P.: See—  
Schmidt, Manfred; and Yeater, Robert P., 4,413,101, Cl. 525-440.000.

Yerushalmi, Shmuel: See—  
Krupka, Yaakov; Bachar, Avi; and Yerushalmi, Shmuel, 4,413,224, Cl. 323-222.000.

Yokouchi, Hirotaka, to Muroran Institute for Technology, The President of. Optical noncontacting detector. 4,412,746, Cl. 356-446.000.

Yoneda, Ryuichi: See—  
Ohta, Ryojo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802, Cl. 425-392.000.

York, Stuart A., to Continental Group, Inc., The. Offset flow injection nozzle. 4,412,807, Cl. 425-564.000.

Yoshida, Kazutaka: See—  
Horiuchi, Hideo; and Yoshida, Kazutaka, 4,413,275, Cl. 358-75.000.



- Yoshihara, Kenji: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,292, Cl. 360-72.200.  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,299, Cl. 360-137.000.
- Yoshii, Shizuka: See—  
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902, Cl. 204-192.00E.
- Yoshino Kogyosho Co., Ltd.: See—  
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,412,966, Cl. 264-521.000.
- Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, to Yoshino Kogyosho Co., Ltd. Neck orienting method of bottles of saturated polyester resins, 4,412,966, Cl. 264-521.000.
- Yoshioka, Takao: See—  
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,413,076, Cl. 524-102.000.
- Yoshizawa, Tadao: See—  
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802, Cl. 425-392.000.
- Young, Hugh M.: See—  
Jones, William A.; and Young, Hugh M., 4,412,826, Cl. 440-86.000.
- Young, Kevin L.; and Turner, Jesse H., to Essex Group, Inc. Snap acting heat motor operated gas valve, 4,412,650, Cl. 236-48.00A.
- Young, Sze-Teh: See—  
Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, 4,412,731, Cl. 354-299.000.
- Yuan, Shao W. Wiser cooling system, 4,412,426, Cl. 62-260.000.
- Yundt, George B.; and Curtiss, William P., to Charles Stark Draper Laboratory, Inc., The. Induction generator frequency control system, 4,413,223, Cl. 322-32.000.
- Yusa, Yasuhiro: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,292, Cl. 360-72.200.  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,299, Cl. 360-137.000.
- Zahnradfabrik Friedrichshafen Aktiengesellschaft: See—  
Schreiner, Friedrich; and Staberoh, Uwe, 4,412,705, Cl. 308-178.000.
- Zalasz, Rene; and Salles, Marie-France, to Roussel Uclaf. Immunostimulating glycoproteins, 4,412,946, Cl. 260-112.00R.
- Zander, Patricia J. Child-proof pill container for handicapped, 4,412,625, Cl. 215-223.000.
- Zavodsky, Tamas, to Koppers Company, Inc. Apparatus for handling a continuous casting machine starter bar, 4,412,579, Cl. 164-413.000.
- Zdeb, Brian D., to Baxter Travenol Laboratories, Inc. Injection site, 4,412,573, Cl. 604-415.000.
- Zelins, Ronald P., to Western Electric Company, Incorporated. Feeder guide, 4,412,672, Cl. 254-134.30R.
- Zitz, Alfred; Droscher, Erich; and Schetina, Otto, to Voest-Alpine Aktiengesellschaft. System for monitoring the movement of a cutting tool of a tunnel-driving machine relative to a desired profile, 4,412,700, Cl. 299-1.000.
- Zolotov, Lev A.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201, Cl. 310-260.000.
- Zorn, Thomas E. Floating arcade, 4,412,680, Cl. 273-85.00H.
- Zurfluh, Rene, to Hoffmann-La Roche Inc. Carbamic acid esters and use as pesticides, 4,413,010, Cl. 424-300.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Arvey Corporation: See—  
Gillie, Raymond A., Re. 31,435, Cl. 229-34.00R.
- Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., to U.S. Philips Corporation. Resistance material, Re. 31,437, Cl. 338-308.000.
- Capewell Manufacturing Company: See—  
Clark, Calvin M., Re. 31,433, Cl. 83-846.000.
- Clark, Calvin M., to Capewell Manufacturing Company. Variable tooth saw blade, Re. 31,433, Cl. 83-846.000.
- Electro Data Systems, Inc.: See—  
Reilly, David H., Re. 31,434, Cl. 222-25.000.
- Flow Technology, Inc.: See—  
Francisco, Edward E., Jr., Re. 31,432, Cl. 73-3.000.
- Francisco, Edward E., Jr., to Flow Technology, Inc. Apparatus and method for determining the characteristic of a flowmeter, Re. 31,432, Cl. 73-3.000.
- Gillie, Raymond A., to Arvey Corporation. Telescopic carton assembly, Re. 31,435, Cl. 229-34.00R.
- Mutsaers, Cornelis A. H. A.: See—  
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., Re. 31,437, Cl. 338-308.000.
- Phillips Petroleum Company: See—  
South, Aubrey, Jr., Re. 31,436, Cl. 523-514.000.
- Reilly, David H., to Electro Data Systems, Inc. Portable liquid metering device, Re. 31,434, Cl. 222-25.000.
- South, Aubrey, Jr., to Phillips Petroleum Company. Thermosetting polyester composition containing normally solid carboxy-containing diene polymer, Re. 31,436, Cl. 523-514.000.
- U.S. Philips Corporation: See—  
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., Re. 31,437, Cl. 338-308.000.
- van der Kruijs, Franciscus N. G. R.: See—  
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., Re. 31,437, Cl. 338-308.000.

## LIST OF DESIGN PATENTEEES

- Abel, Mary H.: See—  
Zimmerman, Valentine J.; Abel, Mary H.; and Rubbelke, Lloyd J., 271,228, Cl. D21-245.000.
- Accel Manufacturing Limited: See—  
Tang, Shun Yau, 271,240, Cl. D26-42.000.
- Allen, Jack. Toothpick dispenser, 271,172, 11-1-83, Cl. D7-75.000.
- Allibert S.A.: See—  
Vrignaud, Guy, 271,241, Cl. D26-85.000.
- American Sign & Indicator Corporation: See—  
Morrison, Donald, 271,219, Cl. D20-42.000.
- Amprim, Ralph J.; Chapman, Leif H.; and Ruzzin, Richard, to General Motors Corporation. Air spoiler, 271,191, 11-1-83, Cl. D12-181.000.
- Anderson Power Products, Inc.: See—  
Tetreault, Joseph E., 271,196, Cl. D13-24.000.
- Antonczyk, Andrew R. Display frame, 271,168, 11-1-83, Cl. D6-242.000.
- Aqua Gloves, Inc.: See—  
Francisco, Alicia C., 271,227, Cl. D21-238.000.
- Arken, Inc.: See—  
Farmer, Ian W., 271,218, Cl. D20-10.000.
- Avitar, Inc.: See—  
Iorio, Anthony J., 271,182, Cl. D10-40.000.
- Bauchwitz, William J.: See—  
Bee, James W. M.; and Bauchwitz, William J., 271,217, Cl. D19-91.000.
- Becking, Paul E. Audit tape scanner, 271,216, 11-1-83, Cl. D19-89.000.
- Bee, James W. M.; and Bauchwitz, William J., to Northern Telecom Inc. Combined copy stand and electronic interface device, 271,217, 11-1-83, Cl. D19-91.000.
- Bell, Melvin C.: See—  
Devey, William M., 271,206, Cl. D15-138.000.
- Bennato, Andre, to Sanistyl Creations-S.A.R.L. Glass holder, 271,234, 11-1-83, Cl. D6-93.000.
- Bettendorf Stanford Inc.: See—  
Lucido, John M., 271,177, Cl. D7-387.000.
- Bowen, Robert F.; and Martel, Thomas J., to Raytheon Company. Microwave corn popper with cover, 271,174, 11-1-83, Cl. D7-325.000.
- Braun Espanola, S.A.: See—  
Zimnowicz, Jose Z., 271,176, Cl. D7-379.000.
- Brown, Barry C.: See—  
Daggett, Donald G.; and Brown, Barry C., 271,208, Cl. D16-26.000.
- Bulgari, Marina, to Zoldia Anstalt. Necklace, 271,186, 11-1-83, Cl. D11-3.000.
- Bulgari, Marina, to Zoldia Anstalt. Necklace, 271,187, 11-1-83, Cl. D11-3.000.
- Burrows, Donald A. Animal figure, 271,225, 11-1-83, Cl. D21-159.000.
- Caulkett, Lawrence F. Table base, 271,167, 11-1-83, Cl. D6-196.000.
- Celle, Inc.: See—  
Runyon, Richard, 271,180, Cl. D9-370.000.  
Runyon, Richard, 271,181, Cl. D9-389.000.
- Chapman, Leif H.: See—  
Amprim, Ralph J.; Chapman, Leif H.; and Ruzzin, Richard, 271,191, Cl. D12-181.000.
- Cole, Kevin P. Live bait fishing rig, 271,232, 11-1-83, Cl. D22-27.000.
- Combi Co., Ltd.: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 271,224, Cl. D21-154.000.
- Compton, Edward M. Video cassette book cover storage receptacle package, 271,161, 11-1-83, Cl. D3-35.000.
- Conrad, Kenneth L.; and Sadow, Suzanne G. Wind sock, 271,183, 11-1-83, Cl. D10-59.000.
- Daggett, Donald G.; and Brown, Barry C., to Syncsound Pty. Limited; and Donald Daggett Pty. Limited. Film transport unit for a motion picture projector, 271,208, 11-1-83, Cl. D16-26.000.
- Daimler-Benz Aktiengesellschaft: See—  
Heinz, Werner; Jambor, Arno; and Schmidt, Adolf, 271,242, Cl. D26-122.000.
- Dermond, Andrew J. Measuring caliper, 271,185, 11-1-83, Cl. D10-73.000.
- Designs for Vision, Inc.: See—  
Feinbloom, Richard E., 271,209, Cl. D16-38.000.
- Devey, William M., to Bell, Melvin C. Detent coupled drill bit adapter, 271,206, 11-1-83, Cl. D15-138.000.
- Donald Daggett Pty. Limited: See—  
Daggett, Donald G.; and Brown, Barry C., 271,208, Cl. D16-26.000.
- Dostourian, Muratd. Flagstaff, 271,190, 11-1-83, Cl. D11-181.000.
- Dowling, Matthew M. Sweatshirt or similar article, 271,154, 11-1-83, Cl. D2-184.000.
- Durr-Dental GmbH & Co., KG: See—  
Schutt, Peter; Nitsche, Klaus; Grindler, Horst; Hofmann, Hans-Joachim; and Slany, Hans E., 271,203, Cl. D15-9.000.
- E. C. Carman Gauge Co., Inc.: See—  
Gentry, Jim A., 271,184, Cl. D10-73.000.
- E. E. Industries Inc.: See—  
Zimmerman, Valentine J.; Abel, Mary H.; and Rubbelke, Lloyd J., 271,228, Cl. D21-245.000.
- Emerson, James A.: See—  
Jones, James C.; and Emerson, James A., 271,197, Cl. D13-24.000.
- Endt, Evert, to Thomson-CSF. Computer disk drive, 271,202, 11-1-83, Cl. D14-109.000.
- Envoys U.S.A., Inc.: See—  
Gamm, Robert J., 271,157, Cl. D2-309.000.
- Evans, Bobby L. Sports equipment carrier, 271,162, 11-1-83, Cl. D3-36.000.
- Farmer, Ian W., to Arken, Inc. Display stand, 271,218, 11-1-83, Cl. D20-10.000.
- Farrar, Jack R.: See—  
Pachmayr, Frank A.; and Farrar, Jack R., 271,229, Cl. D22-1.000.
- Feinbloom, Richard E., to Designs for Vision, Inc. Optical coupler for a microscope or similar article, 271,209, 11-1-83, Cl. D16-38.000.
- Fisher, Morris F., to Futorian Corporation. Seat, 271,164, 11-1-83, Cl. D6-63.000.
- Fogarty, A. Edward; and Fogarty, Bonnie R. Water whistle, 271,221, 11-1-83, Cl. D21-64.000.
- Fogarty, Bonnie R.: See—  
Fogarty, A. Edward; and Fogarty, Bonnie R., 271,221, Cl. D21-64.000.



- Fox, Harry; and Law, Peter A. L., to Spectravideo International Limited. Video game joystick apparatus. 271,220, 11-1-83, Cl. D21-48.000.
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- Futurian Corporation: See—  
Fisher, Morris F., 271,164, Cl. D6-63.000.
- Gamm, Robert J., to Envoys U.S.A., Inc. Athletic shoe with pocket. 271,157, 11-1-83, Cl. D2-309.000.
- General Motors Corporation: See—  
Amprim, Ralph J.; Chapman, Leif H.; and Ruzzin, Richard, 271,191, Cl. D12-181.000.
- Gentry, Jim A., to E. C. Carman Gauge Co., Inc. Casing gauge. 271,184, 11-1-83, Cl. D10-73.000.
- Geraets, Josef F. G., to U.S. Philips Corporation. Pick-up cartridge. 271,199, 11-1-83, Cl. D14-28.000.
- Goldstein, Arthur. Tray. 271,170, 11-1-83, Cl. D7-19.000.
- Grindler, Horst: See—  
Schutt, Peter; Nitsche, Klaus; Grindler, Horst; Hofmann, Hans-Joachim; and Slany, Hans E., 271,203, Cl. D15-9.000.
- GTE Products Corporation: See—  
Nordberg, Svein T., 271,201, Cl. D14-85.000.
- Hanashima, Taira: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 271,224, Cl. D21-154.000.
- Heinz, Werner; Jambor, Arno; and Schmidt, Adolf, to Daimler-Benz Aktiengesellschaft. Foglight lens. 271,242, 11-1-83, Cl. D26-122.000.
- Hinkle, Philip B., to Locite Corporation. Combined adhesive container and dispenser. 271,215, 11-1-83, Cl. D19-66.000.
- Hofmann, Hans-Joachim: See—  
Schutt, Peter; Nitsche, Klaus; Grindler, Horst; Hofmann, Hans-Joachim; and Slany, Hans E., 271,203, Cl. D15-9.000.
- Hollenbeck, John C. Food container/holder. 271,169, 11-1-83, Cl. D7-16.000.
- Hoover, Charles C.: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193, Cl. D12-300.000.
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- Hopper, Thomas P. Running shoe heel. 271,158, 11-1-83, Cl. D2-17.000.
- Ingraham, Wade R. Rifle. 271,230, 11-1-83, Cl. D22-6.000.
- Iorio, Anthony J., to Avitar, Inc. Electronic timer. 271,182, 11-1-83, Cl. D10-40.000.
- Ishii, Yoshiyasu: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 271,224, Cl. D21-154.000.
- Itoh, Kunio, to Pentel Kabushiki Kaisha d.b.a. Pentel Co., Ltd. Pen or similar article. 271,212, 11-1-83, Cl. D19-48.000.
- Jambor, Arno: See—  
Heinz, Werner; Jambor, Arno; and Schmidt, Adolf, 271,242, Cl. D26-122.000.
- Jensen, Dale H.: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194, Cl. D12-300.000.
- Johnson, George F. Bicycle saddle cushion. 271,163, 11-1-83, Cl. D6-48.100.
- Jones, James C.; and Emerson, James A., to Robinson-Nugent, Inc. Combined integrated circuit package carrier and socket assembly. 271,197, 11-1-83, Cl. D13-24.000.
- Katada, Hiroyuki: See—  
Kawasaki, Kozo; and Katada, Hiroyuki, 271,200, Cl. D14-79.000.
- Kawasaki, Kozo; and Katada, Hiroyuki, to Sanyo Electric Co., Ltd. Projection television receiver. 271,200, 11-1-83, Cl. D14-79.000.
- Keshishian, Antoine H. Ice bucket. 271,173, 11-1-83, Cl. D7-78.000.
- Kirkade, Stuart L. Knife holder. 271,171, 11-1-83, Cl. D7-74.000.
- Lander, Lars B., to Molnycke AB. Soap dispenser. 271,165, 11-1-83, Cl. D6-95.000.
- Law, Peter A. L.: See—  
Fox, Harry; and Law, Peter A. L., 271,220, Cl. D21-48.000.
- Lee, Norman C., to Zarn, Inc. Trash can with lid. 271,247, 11-1-83, Cl. D34-07.000.
- Lemieux, David J.; and Rainin, Kenneth, to Rainin Instrument Co., Inc. Container and rack for pipette tips or similar article. 271,239, 11-1-83, Cl. D24-32.000.
- Locite Corporation: See—  
Hinkle, Philip B., 271,215, Cl. D19-66.000.
- Lowry, Philip L.: See—  
Matheson, James N.; and Lowry, Philip L., 271,246, Cl. D29-7.000.
- Lucido, John M., to Bettendorf Stanford Inc. Proofing tray. 271,177, 11-1-83, Cl. D7-387.000.
- Mansour, Mansour. Sandal or similar article. 271,155, 11-1-83, Cl. D2-270.000.
- Martel, Thomas J.: See—  
Bowen, Robert F.; and Martel, Thomas J., 271,174, Cl. D7-325.000.
- Martinez, Carlos M., to Monturas Y Fornituras, S.A. Spray. 271,243, 11-1-83, Cl. D28-91.100.
- Martinez, Carlos M., to Monturas Y Fornituras, S.A. Spray. 271,244, 11-1-83, Cl. D28-91.100.
- Martinez, Carlos M., to Monturas Y Fornituras, S.A. Spray. 271,245, 11-1-83, Cl. D28-91.100.
- Matheson, James N.; and Lowry, Philip L., to U.S.D. Corp. Combined respirator face piece and strap units. 271,246, 11-1-83, Cl. D29-7.000.
- Maza, Dale T.; Tomblin, Glen E.; and Ruckman, Harold E., to Rubbermaid Commercial Products Inc. Trash container. 271,248, 11-1-83, Cl. D34-8.000.
- McGraw, Leonard J.: See—  
Patriarca, William C.; and McGraw, Leonard J., 271,236, Cl. D23-19.000.
- Molnycke AB: See—  
Lander, Lars B., 271,165, Cl. D6-95.000.
- Monturas Y Fornituras, S.A.: See—  
Martinez, Carlos M., 271,243, Cl. D28-91.100.
- Martinez, Carlos M., 271,244, Cl. D28-91.100.
- Martinez, Carlos M., 271,245, Cl. D28-91.100.
- Moore, David D. Fishing lure. 271,233, 11-1-83, Cl. D22-27.000.
- Morabito, Anthony J. Table. 271,166, 11-1-83, Cl. D6-152.000.
- Morrison, Donald, to American Sign & Indicator Corporation. Disk for matrix display. 271,219, 11-1-83, Cl. D20-42.000.
- Muller-Feigelsstock, Roberto, to Pony International, Inc. Baseball shoe sole. 271,159, 11-1-83, Cl. D2-317.000.
- Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, to Combi Co., Ltd. Perforated animal figure toy. 271,224, 11-1-83, Cl. D21-154.000.
- Nitsche, Klaus: See—  
Schutt, Peter; Nitsche, Klaus; Grindler, Horst; Hofmann, Hans-Joachim; and Slany, Hans E., 271,203, Cl. D15-9.000.
- Nordberg, Svein T., to GTE Products Corporation. Remote control unit for cable television converter or similar article. 271,201, 11-1-83, Cl. D14-85.000.
- Northern Telecom Inc.: See—  
Bee, James W. M.; and Bauchwitz, William J., 271,217, Cl. D19-91.000.
- Nottingham, John R.; and Spirk, John W., Jr. Toy swivel crane or similar article. 271,223, 11-1-83, Cl. D21-132.000.
- Nurmi, Aulis U. Fish-breeding sea vessel. 271,195, 11-1-83, Cl. D12-316.000.
- Pachmayr, Frank A.; and Farrar, Jack R., to Pachmayr Gun Works, Inc. Gun grip. 271,229, 11-1-83, Cl. D22-1.000.
- Pachmayr Gun Works, Inc.: See—  
Pachmayr, Frank A.; and Farrar, Jack R., 271,229, Cl. D22-1.000.
- Palmer, Mrs. Robert G., representative: See—  
Palmer, Robert G., deceased; Palmer, Mrs. Robert G., representative; and Rose, Frank, 271,237, Cl. D23-90.100.
- Palmer, Robert G., deceased; by Palmer, Mrs. Robert G., representative; and Rose, Frank. Charcoal stack lighter. 271,237, 11-1-83, Cl. D23-90.100.
- PAT-N-MAC: See—  
Patriarca, William C.; and McGraw, Leonard J., 271,236, Cl. D23-19.000.
- Patriarca, William C.; and McGraw, Leonard J., to PAT-N-MAC. Semi-automatic bailer plug. 271,236, 11-1-83, Cl. D23-19.000.
- Pentel Kabushiki Kaisha d.b.a. Pentel Co., Ltd.: See—  
Itoh, Kunio, 271,212, Cl. D19-48.000.
- Peterson, Paul D. Planter. 271,189, 11-1-83, Cl. D11-154.000.
- Poley, Kenneth P.: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194, Cl. D12-300.000.
- Pony International, Inc.: See—  
Muller-Feigelsstock, Roberto, 271,159, Cl. D2-317.000.
- Quaker Oats Company, The: See—  
Riehm, Merry S., 271,222, Cl. D21-92.000.
- Raicevic, Nicolas P. Sun glasses. 271,211, 11-1-83, Cl. D16-112.000.
- Rainin Instrument Co., Inc.: See—  
Lemieux, David J.; and Rainin, Kenneth, 271,239, Cl. D24-32.000.
- Rainin, Kenneth: See—  
Lemieux, David J.; and Rainin, Kenneth, 271,239, Cl. D24-32.000.
- Raytheon Company: See—  
Bowen, Robert F.; and Martel, Thomas J., 271,174, Cl. D7-325.000.
- Rembrandt Jewelry Manufacturing Limited: See—  
Weeks, Peter G., 271,188, Cl. D11-79.000.
- Ricoh Company, Ltd.: See—  
Soda, Koichi, 271,207, Cl. D16-1.000.
- Riehm, Merry S., to Quaker Oats Company, The. Spinning toy. 271,222, 11-1-83, Cl. D21-92.000.
- Robinson-Nugent, Inc.: See—  
Jones, James C.; and Emerson, James A., 271,197, Cl. D13-24.000.
- Rose, Frank: See—  
Palmer, Robert G., deceased; Palmer, Mrs. Robert G., representative; and Rose, Frank, 271,237, Cl. D23-90.100.

- Rubbelke, Lloyd J.: See—  
Zimmerman, Valentine J.; Abel, Mary H.; and Rubbelke, Lloyd J., 271,228, Cl. D21-245.000.
- Rubbermaid Commercial Products Inc.: See—  
Maza, Dale T.; Tomblin, Glen E.; and Ruckman, Harold E., 271,248, Cl. D34-8.000.
- Ruckman, Harold E.: See—  
Maza, Dale T.; Tomblin, Glen E.; and Ruckman, Harold E., 271,248, Cl. D34-8.000.
- Runyon, Richard, to Celle, Inc. Jar for cosmetics. 271,180, 11-1-83, Cl. D9-370.000.
- Runyon, Richard, to Celle, Inc. Bottle. 271,181, 11-1-83, Cl. D9-389.000.
- Ruzzin, Richard: See—  
Amprim, Ralph J.; Chapman, Leif H.; and Ruzzin, Richard, 271,191, Cl. D12-181.000.
- Sadow, Suzanne G.: See—  
Conrad, Kenneth L.; and Sadow, Suzanne G., 271,183, Cl. D10-59.000.
- Salzmann, Ferdinand F.; and Swinehart, James P., to Wisco Industries, Inc. Pizza oven. 271,175, 11-1-83, Cl. D7-350.000.
- Sanistyl Creations-S.A.R.L.: See—  
Bennato, Andre, 271,234, Cl. D6-93.000.
- Sanyo Electric Co., Ltd.: See—  
Kawasaki, Kozo; and Katada, Hiroyuki, 271,200, Cl. D14-79.000.
- Sato, Hisao. Gummed stack of paper clips. 271,213, 11-1-83, Cl. D19-65.000.
- Sato, Hisao. Paper clip. 271,214, 11-1-83, Cl. D19-65.000.
- Satogosei Co., Ltd.: See—  
Suzuki, Tadashi, 271,178, Cl. D8-51.000.
- Schmidt, Adolf: See—  
Heinz, Werner; Jambor, Arno; and Schmidt, Adolf, 271,242, Cl. D26-122.000.
- Schutt, Peter; Nitsche, Klaus; Grindler, Horst; Hofmann, Hans-Joachim; and Slany, Hans E., to Durr-Dental GmbH & Co., KG. Air compressor with axially extending cooling fins. 271,203, 11-1-83, Cl. D15-9.000.
- Sherwin, Gerald A. Flashlight holder. 271,160, 11-1-83, Cl. D2-400.000.
- Shimizu, Tokuzo. Tape cassette. 271,198, 11-1-83, Cl. D14-11.000.
- Shull, Steven W., to Vivitar Corporation. Electronic flash adapter. 271,210, 11-1-83, Cl. D16-42.000.
- Slany, Hans E.: See—  
Schutt, Peter; Nitsche, Klaus; Grindler, Horst; Hofmann, Hans-Joachim; and Slany, Hans E., 271,203, Cl. D15-9.000.
- Slayman, Mitchell J. Grip indexer for sports rackets. 271,226, 11-1-83, Cl. D21-221.000.
- Smith, Elbert R. Combined touch up hair brush with hair spray dispenser. 271,179, 11-1-83, Cl. D9-338.000.
- Soda, Koichi, to Ricoh Company, Ltd. Camera. 271,207, 11-1-83, Cl. D16-1.000.
- Spectravideo International Limited: See—  
Fox, Harry; and Law, Peter A. L., 271,220, Cl. D21-48.000.
- Spirk, John W., Jr.: See—  
Nottingham, John R.; and Spirk, John W., Jr., 271,223, Cl. D21-132.000.
- Stout, Daniel M., to Whitmire Research Laboratories, Inc. Insect lure. 271,231, 11-1-83, Cl. D22-19.000.
- Suzuki, Tadashi, to Satogosei Co., Ltd. Locking piece fitter for labels, price tags and the like. 271,178, 11-1-83, Cl. D8-51.000.
- Swinehart, James P.: See—  
Salzmann, Ferdinand F.; and Swinehart, James P., 271,175, Cl. D7-350.000.
- Syncsound Pty. Limited: See—  
Daggett, Donald G.; and Brown, Barry C., 271,208, Cl. D16-26.000.
- Tang, Shun Yau, to Accel Manufacturing Limited. Combined flashlight and fluorescent lantern. 271,240, 11-1-83, Cl. D26-42.000.
- Tetreault, Joseph E., to Anderson Power Products, Inc. Electrical connector. 271,196, 11-1-83, Cl. D13-24.000.
- Thomson-CSF: See—  
Endt, Evert, 271,202, Cl. D14-109.000.
- Tomblin, Glen E.: See—  
Maza, Dale T.; Tomblin, Glen E.; and Ruckman, Harold E., 271,248, Cl. D34-8.000.
- U.S.D. Corp.: See—  
Matheson, James N.; and Lowry, Philip L., 271,246, Cl. D29-7.000.
- U.S. Philips Corporation: See—  
Geraets, Josef F. G., 271,199, Cl. D14-28.000.
- Valencia, Benjamin L. Passive heat exchanger. 271,238, 11-1-83, Cl. D23-136.000.
- Vivitar Corporation: See—  
Shull, Steven W., 271,210, Cl. D16-42.000.
- Vignaud, Guy, to Allibert S.A. Lighting fixture. 271,241, 11-1-83, Cl. D26-85.000.
- Ward, Raymond E. Water filter. 271,235, 11-1-83, Cl. D23-4.000.
- Watts, W. David. Abrasive blasting wheel liner. 271,204, 11-1-83, Cl. D15-126.000.
- Watts, W. David. Abrasive blasting wheel liner. 271,205, 11-1-83, Cl. D15-126.000.
- Weeks, Peter G., to Rembrandt Jewelry Manufacturing Limited. Pendant. 271,188, 11-1-83, Cl. D11-79.000.
- Whitmire Research Laboratories, Inc.: See—  
Stout, Daniel M., 271,231, Cl. D22-19.000.
- Williamson, Margaret. Pedicure sandal. 271,156, 11-1-83, Cl. D2-270.000.
- Wilson, Gary L.: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194, Cl. D12-300.000.
- Wisco Industries, Inc.: See—  
Salzmann, Ferdinand F.; and Swinehart, James P., 271,175, Cl. D7-350.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Incorporated. Boat. 271,192, 11-1-83, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Incorporated. Boat. 271,193, 11-1-83, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Incorporated. Boat. 271,194, 11-1-83, Cl. D12-300.000.
- Wood Manufacturing Company, Incorporated: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194, Cl. D12-300.000.
- Wood, Mickey C.: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193, Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194, Cl. D12-300.000.
- Zarn, Inc.: See—  
Lee, Norman C., 271,247, Cl. D34-07.000.
- Zimmerman, Valentine J.; Abel, Mary H.; and Rubbelke, Lloyd J., to E. Industries Inc. Playground climber. 271,228, 11-1-83, Cl. D21-245.000.
- Zimnowicz, Jose Z., to Braun Espanola, S.A. Hand held electric mixer. 271,176, 11-1-83, Cl. D7-379.000.
- Zoldia Anstalt: See—  
Bulgari, Marina, 271,186, Cl. D11-3.000.
- Bulgari, Marina, 271,187, Cl. D11-3.000.

## LIST OF PLANT PATENTEES

- Gesellschaftsvertrag über die Erfindergemeinschaft "OPTIMARA": See—  
Holtkamp, Reinhold, 5,129, Cl. 69.000.
- Holtkamp, Reinhold, to Gesellschaftsvertrag über die Erfindergemeinschaft "OPTIMARA". African violet plant. 5,129, 11-1-83, Cl. 69.000.
- Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 5,131, 11-1-83, Cl. 68.000.
- Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 5,132, 11-1-83, Cl. 68.000.
- Mikkelsens, Inc.: See—  
Mikkelsen, James C., 5,131, Cl. 68.000.
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- Weeks, O. L. Rose plant. 5,130, 11-1-83, Cl. 18.000.



# LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF  
NOVEMBER, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Baughner, Jeffrey S.; Oehlbeck, Douglas L.; and Brown, Barry M. Oehlbeck, Douglas L.: See—  
Process and apparatus for preparing silver halide emulsions. Baughner, Jeffrey S.; Oehlbeck, Douglas L.; and Brown, Barry M., T103,603., 11-1-83, Cl. 430-569,000.  
Brown, Barry M.: See—  
Baughner, Jeffrey S.; Oehlbeck, Douglas L.; and Brown, Barry M., T103,603., Cl. 430-569,000.  
Repetti, Ronald V. Process for preparation of microporous membranes of controlled flow characteristics. T103,601., 11-1-83, Cl. 264-41,000.  
Rettkowski, Gary H. Rotary-type cutter element with means for distributing wear. T103,602., 11-1-83, Cl. 299-10,000.

PI 42

# CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 1, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

118	CLASS 2	77	4,412,847	579	4,412,452	108	CLASS 114	66 R	4,412,563	227	4,412,596
412	4,412,357	CLASS 46	4,412,453	601	4,412,453	151	4,412,499	CLASS 140	4,412,564	228	4,412,597
	4,412,358	47	4,412,399	728	4,412,454	270	4,412,500	92.1	4,412,564	19	4,412,598
13	CLASS 3	CLASS 48	4,412,456	862.12	4,412,455		4,412,501	123	4,412,565	201	4,412,599
	4,412,359	197 R	4,412,848	862.65	4,412,456			147	4,412,566		
	CLASS 4	CLASS 51		CLASS 74		412	4,412,502	CLASS 141		CLASS 187	
242	4,412,360	58	4,412,400	7 A	4,412,457	420	4,412,503	114	4,412,567	17	4,412,600
286	4,412,361	103 R	4,412,401	512	4,412,458	664	4,412,504	392	4,412,568	27	4,412,601
388	4,412,362	439	4,412,402	711	4,412,459	674	4,412,505	CLASS 144		CLASS 188	
		CLASS 52		752 E	4,412,460	683	4,412,506	3 D	4,412,569	53	4,412,602
	CLASS 6	9	4,412,403	866	4,412,461	718	4,412,507	193 A	4,412,570	106 P	4,412,603
4 R	4,412,363	19	4,412,404	CLASS 75		726	4,412,508	219	4,412,571		
	CLASS 8	86	4,412,405	11	4,412,857			CLASS 145		CLASS 190	
449	4,412,837	208	4,412,406	38	4,412,858	17	4,412,509	2 R	4,412,572	1	4,412,604
	CLASS 12	699	4,412,407	83	4,412,859	510	4,412,510	CLASS 148		CLASS 192	
146 L	4,412,364	806	4,412,408	84	4,412,860			1.5	4,412,868	82 T	4,412,605
	CLASS 15	485	4,412,409	84.1 R	4,412,861	23	4,412,511	2	4,412,869	106.2	4,412,606
184	4,412,365	528	4,412,410	130.5	4,412,862	25 E	4,412,512	CLASS 149		CLASS 194	
	CLASS 16	587	4,412,411	CLASS 76		55 VE	4,412,513	11.5 F	4,412,870	1 D	4,412,607
236	4,412,366	97	4,412,849	5 R	4,412,462	198 E	4,412,514	16.5	4,412,871	4 D	4,412,608
0.25	4,412,367	130	4,412,850	36	4,412,463		4,412,515	CLASS 149		CLASS 198	
	CLASS 23	160	4,412,851	CLASS 81		339	4,412,516	19.2	4,412,874	341	4,412,609
302 R	4,412,838	280	4,412,412	3.1 R	4,412,464	449	4,412,517	19.9	4,412,875	403	4,412,610
	CLASS 24	304	4,412,413	CLASS 82		488	4,412,518	CLASS 152		450	4,412,611
158	4,412,368	CLASS 57		1.2	4,412,465	522	4,412,519	602	4,412,876	697	4,412,612
266	4,412,369	280	4,412,414	CLASS 83		602	4,412,520	151	4,412,877	CLASS 200	
268	4,412,370	304	4,412,415	200	4,412,466		4,412,521	209 R	4,412,878	38 R	4,413,164
	CLASS 28	39.23	4,412,416	346	4,412,467	92 C	4,412,522	CLASS 156		148 B	4,413,166
272	4,412,371	384	4,412,417	468	4,412,468	121	4,412,523	64	4,412,879	148 H	4,413,165
	CLASS 29	397	4,412,418	552	4,412,469	140	4,412,524	72	4,412,880	CLASS 202	
149.5 R	4,412,372	497	4,412,419	846	Re.31,433	365	4,412,525	91	4,412,881	117	4,412,889
157.3 V	4,412,373	520	4,412,420	CLASS 84		400	4,412,526	145	4,412,882	139	4,412,890
566.4	4,412,374	634	4,412,421	1.01	4,412,470	417	4,412,527	156	4,412,883	248	4,412,891
571	4,412,375	643	4,412,422	1.03	4,412,471	419	4,412,528	164	4,412,884	CLASS 204	
576 B	4,412,376	706	4,412,423	318	4,412,472	19	4,412,529	188	4,412,885	34	4,412,892
577 C	4,412,377	CLASS 62		485 R	4,412,473	46.2	4,412,865	222	4,412,886	103 R	4,412,893
578	4,412,378	6	4,412,424	CLASS 67		66	4,412,866	307.3	4,412,887	119	4,412,894
603	4,412,379	35	4,412,852	6	4,412,474		4,412,867	645	4,412,888	129	4,412,895
	CLASS 30	209	4,412,425	CLASS 89		1 R	4,412,530	CLASS 159		159.18	4,412,896
92	4,412,380	244	4,412,426	1.816	4,412,475	4	4,412,531	47.1	4,412,887	159.2	4,412,897
124	4,412,381	260	4,412,427	CLASS 92		20	4,412,532	CLASS 162		192 C	4,412,901
276	4,412,382	298	4,412,428	75	4,412,476	33	4,412,533	54	4,412,888	192 E	4,412,902
	CLASS 33	308	4,412,429	CLASS 98		57	4,412,534	CLASS 164		192 P	4,412,900
1 M	4,412,383	347	4,412,430	1	4,412,477	80 A	4,412,535	122.2	4,412,889	192 R	4,412,899
169 R	4,412,384	467 R	4,412,431	33 R	4,412,478	204.17	4,412,536	349	4,412,890	298	4,412,903
178 E	4,412,385	504	4,412,432	40 D	4,412,479	303.1	4,412,537	413	4,412,891	424	4,412,904
268	4,412,386	511	4,412,433	CLASS 99		325	4,412,538	433	4,412,892	CLASS 206	
361	4,412,387	CLASS 65		280	4,412,481	455	4,412,539	CLASS 165		63.3	4,412,613
	CLASS 34	3.12	4,412,853	403	4,412,482	633	4,412,540	29	4,412,581	319	4,412,615
1	4,412,388	18.1	4,412,854	538	4,412,483	660	4,412,541	76	4,412,582	333	4,412,616
46	4,412,389	CLASS 66		CLASS 100		691	4,412,542	95	4,412,583	339	4,412,617
58	4,412,390	177	4,412,433	7	4,412,484	709	4,412,543	CLASS 166		581	4,412,618
90	4,412,391	CLASS 68		117	4,412,485	731	4,412,544	169	4,412,584	611	4,412,619
233	4,412,392	22 R	4,412,435	229 R	4,412,486	764	4,412,545	248	4,412,585		
	CLASS 36	272	4,412,436	CLASS 101			4,412,546	294	4,412,586	CLASS 172	
113	4,412,393	338	4,412,437	41	4,412,487	27 T	4,412,547	39	4,412,587	CLASS 173	
	CLASS 37	118	4,412,855	142	4,412,488	8 A	4,412,550	68	4,412,588	39	4,412,908
57	4,412,394	121	4,412,856	212	4,412,489	CLASS 134		148	4,412,589	11 R	4,412,909
	CLASS 40	CLASS 72		219	4,412,490	104	4,412,551	CLASS 175		121	4,412,910
530	4,412,395	10	4,412,438	363	4,412,491	CLASS 136		229	4,412,590	206	4,412,912
607	4,412,396	41	4,412,439	CLASS 102		248	4,413,157	CLASS 177		207	4,412,913
	CLASS 42	46	4,412,440	204	4,412,492	14	4,412,552	1	4,412,591	253	4,412,914
1 LP	4,412,397	71	4,412,441	275.9	4,412,493	118	4,412,553	CLASS 179		311	4,412,915
	CLASS 43	128	4,412,442	491	4,412,494	375	4,412,554	90 BD	4,413,158	3.1	4,412,620
1	4,412,398	181	4,412,443	CLASS 106		524	4,412,555	90 K	4,413,159	CLASS 210	
	CLASS 44	3	Re.31,432	84	4,412,863	614.11	4,412,556	115 V	4,413,160	90	4,412,916
1 B	4,412,839	23	4,412,444	235	4,412,864	624.13	4,412,557	115.5 PV	4,413,161	104	4,412,917
1 SR	4,412,842	24	4,412,445	CLASS 109				115.5 VC	4,413,162	169	4,412,918
10 C	4,412,841	35	4,412,446	49.5	4,412,495	38	4,412,558	175.3 R	4,413,163	189	4,412,919
10 D	4,412,840	73	4,412,447	CLASS 110		89	4,412,559	CLASS 180		409	4,412,920
51	4,412,843	81	4,412,448	347	4,412,496	143	4,412,560	14 A	4,412,592	500.2	4,412,921
	4,412,844	204	4,412,449	CLASS 112		174	4,412,561	68 P	4,412,593	638	4,412,922
53	4,412,845	304 C	4,412,450	96	4,412,497	CLASS 139		140	4,412,594	661	4,412,923
63	4,412,846	432 PS	4,412,451	313	4,412,498	54	4,412,562	211	4,412,595	744	4,412,924

PI 43



## CLASSIFICATION OF PATENTS

CLASS 211	423 P	4,413,185	CLASS 298	17.7	4,412,699	CLASS 337	69	4,413,290	81	4,413,354
58	4,412,621	4,413,186	CLASS 299	1	4,412,700	CLASS 338	71	4,413,291	82	4,413,353
CLASS 212	578	4,413,187	CLASS 300	6 C	4,412,702	CLASS 339	72.2	4,413,292	127	4,413,355
187	4,412,622	4,413,188	CLASS 301	6 R	4,412,701	CLASS 340	85	4,413,293	132	4,413,356
CLASS 215	4	4,412,669	CLASS 302	31	4,413,189	CLASS 341	99	4,413,294	CLASS 383	
11 R	4,412,623	4,412,670	CLASS 303	241	4,413,190	CLASS 342	110	4,413,295	48	4,412,645
100 A	4,412,624	4,412,671	CLASS 304	254	4,413,191	CLASS 343	113	4,413,296	CLASS 384	
223	4,412,625		CLASS 305	278	4,413,192	CLASS 344	119	4,413,297	CLASS 400	
CLASS 219	8.55 D	4,412,925	CLASS 306	456	4,413,193	CLASS 345	133	4,413,298	CLASS 403	
10.55 B	4,413,168	4,412,926	CLASS 307	462	4,413,194	CLASS 346	137	4,413,299	CLASS 404	
10.55 E	4,413,167	4,412,927	CLASS 308	36	4,412,703	CLASS 347	98	4,413,300	CLASS 405	
73.1	4,413,169	4,412,928	CLASS 309	178	4,412,704	CLASS 348	106	4,413,301	CLASS 406	
400	4,413,170	4,412,929	CLASS 310	518	4,412,942	CLASS 349	219	4,413,311	CLASS 407	
411	4,413,171	4,412,930	CLASS 311	546	4,412,943	CLASS 350	269	4,413,312	CLASS 408	
412	4,413,172	4,412,931	CLASS 312	551	4,412,944	CLASS 351	80	4,413,313	CLASS 409	
511	4,413,174	4,412,932	CLASS 313	112 R	4,412,945	CLASS 352	188	4,413,314	CLASS 410	
CLASS 220	1.5	4,412,626	CLASS 314	123 R	4,412,947	CLASS 353	200	4,413,315	CLASS 411	
66	4,412,627	4,412,948	CLASS 315	133	4,412,948	CLASS 354	428	4,413,316	CLASS 412	
71	4,412,628	4,412,949	CLASS 316	154	4,412,949	CLASS 355	448	4,413,317	CLASS 413	
90.4	4,412,629	4,412,950	CLASS 317	157	4,412,950	CLASS 356	557	4,413,318	CLASS 414	
353	4,412,630	4,412,951	CLASS 318	202	4,412,951	CLASS 357	572	4,413,319	CLASS 415	
CLASS 221	56	4,412,631	CLASS 319	239.3 D	4,412,952	CLASS 358	748	4,413,320	CLASS 416	
CLASS 222	25	Re.31,434	CLASS 320	190	4,412,953	CLASS 359	900	4,413,321	CLASS 417	
188	4,412,632	4,412,672	CLASS 321	197	4,412,954	CLASS 360	186 A	4,412,749	CLASS 418	
488	4,412,633		CLASS 322	397.45	4,412,955	CLASS 361	230	4,412,750	CLASS 419	
519	4,412,634		CLASS 323	429 R	4,412,956	CLASS 362	276	4,412,751	CLASS 420	
CLASS 224	12.03 R	4,412,635	CLASS 324	453.7	4,412,957	CLASS 363	31	4,412,730	CLASS 421	
313	4,412,636	4,412,958	CLASS 325	456 R	4,412,958	CLASS 364	299	4,412,731	CLASS 422	
CLASS 226	172	4,412,637	CLASS 326	4.1	4,412,959	CLASS 365	341	4,412,747	CLASS 423	
190	4,412,638	4,412,959	CLASS 327	22	4,412,960	CLASS 366	426	4,412,748	CLASS 424	
197	4,412,639	4,412,960	CLASS 328	40.1	4,412,961	CLASS 367	461	4,412,749	CLASS 425	
CLASS 227	35	4,412,640	CLASS 329	1.5 B	4,412,644	CLASS 368	514	4,412,750	CLASS 426	
CLASS 228	173 R	4,412,641	CLASS 330	143	4,412,964	CLASS 369	206	4,412,728	CLASS 427	
211	4,412,642	4,412,643	CLASS 331	257	4,412,965	CLASS 370	239	4,412,729	CLASS 428	
CLASS 229	1.5 B	4,412,644	CLASS 332	521	4,412,966	CLASS 371	31	4,412,730	CLASS 429	
44 R	Re.31,435		CLASS 333	721	4,413,216	CLASS 372	299	4,412,731	CLASS 430	
CLASS 232	34	4,412,646	CLASS 334	729	4,413,217	CLASS 373	37	4,412,732	CLASS 431	
CLASS 235	445	4,413,176	CLASS 335	771	4,413,218	CLASS 374	99	4,412,747	CLASS 432	
CLASS 236	36	4,412,647	CLASS 336	16	4,413,219	CLASS 375	17	4,412,748	CLASS 433	
42	4,412,648	4,412,649	CLASS 337	257	4,413,220	CLASS 376	341	4,412,749	CLASS 434	
46 R	4,412,650		CLASS 338	317	4,413,221	CLASS 377	123	4,413,332	CLASS 435	
48 A	4,412,650		CLASS 339	332	4,413,222	CLASS 378	151	4,413,331	CLASS 436	
CLASS 237	1 R	4,412,651	CLASS 340	488	4,413,223	CLASS 379	186 A	4,412,783	CLASS 437	
6	4,412,652		CLASS 341	588	4,413,224	CLASS 380	230	4,412,784	CLASS 438	
CLASS 239	102	4,412,653	CLASS 342	721	4,413,225	CLASS 381	50	4,412,785	CLASS 439	
171	4,412,654	4,412,655	CLASS 343	729	4,413,226	CLASS 382	241	4,412,786	CLASS 440	
183	4,412,655	4,412,656	CLASS 344	771	4,413,227	CLASS 383	269	4,412,787	CLASS 441	
373	4,412,656	4,412,657	CLASS 345	15	4,412,736	CLASS 384	280	4,412,788	CLASS 442	
513.9	4,412,657		CLASS 346	76	4,412,738	CLASS 385	288	4,412,789	CLASS 443	
CLASS 241	26	4,412,658	CLASS 347	89	4,412,739	CLASS 386	306	4,412,790	CLASS 444	
35	4,412,659	4,412,660	CLASS 348	1	4,412,741	CLASS 387	312	4,412,791	CLASS 445	
101.7	4,412,660		CLASS 349	73	4,412,742	CLASS 388	344	4,412,792	CLASS 446	
CLASS 242	77.4	4,412,661	CLASS 350	142	4,412,743	CLASS 389	463	4,412,970	CLASS 447	
125.3	4,412,662	4,412,663	CLASS 351	220	4,412,744	CLASS 390	501	4,412,971	CLASS 448	
200	4,412,663	4,412,664	CLASS 352	236	4,412,745	CLASS 391	530	4,412,972	CLASS 449	
CLASS 244	35 R	4,412,664	CLASS 353	300	4,412,746	CLASS 392	72	4,412,973	CLASS 450	
102 R	4,412,665	4,412,666	CLASS 354	435	4,413,234	CLASS 393	156	4,412,974	CLASS 451	
123	4,412,666		CLASS 355	166	4,412,686	CLASS 394	197	4,412,975	CLASS 452	
CLASS 248	188.7	4,412,667	CLASS 356	610	4,412,687	CLASS 395	270	4,412,976	CLASS 453	
346	4,412,668	4,412,669	CLASS 357	642	4,412,688	CLASS 396	226	4,412,977	CLASS 454	
CLASS 250	203 R	4,413,177	CLASS 358	648	4,412,689	CLASS 397	279	4,412,978	CLASS 455	
213 VT	4,413,178	4,413,179	CLASS 359	718	4,412,690	CLASS 398	299	4,412,979	CLASS 456	
232	4,413,179	4,413,180	CLASS 360	803	4,412,691	CLASS 399	446	4,412,980	CLASS 457	
236	4,413,180	4,413,181	CLASS 361	108 C	4,413,236	CLASS 400	573 R	4,412,981	CLASS 458	
310	4,413,181	4,413,182	CLASS 362	111	4,413,238	CLASS 401	644	4,412,982	CLASS 459	
357.1	4,413,182	4,413,183	CLASS 363	16 T	4,413,239	CLASS 402	52	4,412,983	CLASS 460	
360 S	4,413,183	4,413,184	CLASS 364	17 R	4,413,240	CLASS 403	58	4,412,984	CLASS 461	
368	4,413,184		CLASS 365	22 R	4,413,241	CLASS 404	78	4,412,985	CLASS 462	
			CLASS 366	258	4,413,242	CLASS 405	80	4,412,986	CLASS 463	
			CLASS 367	250	4,413,244	CLASS 406	95	4,412,987	CLASS 464	
			CLASS 368	84 M	4,413,245	CLASS 407	177	4,412,988	CLASS 465	
			CLASS 369	31	4,413,288	CLASS 408	180	4,412,991	CLASS 466	
			CLASS 370	51	4,413,289	CLASS 409	226	4,412,992	CLASS 467	

## CLASSIFICATION OF PATENTS

243	4,412,993	325	4,413,023	CLASS 432	11	4,412,813	115	4,412,939	187	4,413,094	CLASS 548	
248.53	4,412,994	370	4,413,024	CLASS 433	121	4,412,812	209	4,412,940	199	4,413,095	342	4,413,129
250	4,413,006	387	4,413,025	CLASS 434	146	4,412,814	423	4,412,937	204	4,413,096	441	4,413,130
251	4,412,995	407.1	4,413,026	CLASS 435	206	4,412,815	700	4,413,063	240	4,413,097	461	4,413,131
256	4,412,996	31	4,413,027	CLASS 436	239	4,412,816	715	4,413,064	314	4,413,098	491	4,413,132
263	4,412,997	36	4,413,028	CLASS 437	247	4,412,817	700	4,413,064	327.1	4,413,099	CLASS 549	
267	4,412,998	61	4,413,029	CLASS 438	1	4,412,818	82	4,413,065	398	4,413,100	265	4,413,133
269	4,412,999	85	4,413,030	CLASS 439	18	4,412,820	149	4,413,066	440	4,413,101	332	4,413,134
272	4,413,001	122	4,413,031	CLASS 440	20	4,412,819	172	4,413,067	453	4,413,102	332	4,413,134
273 R	4,413,002	172	4,413,032	CLASS 441	30	4,412,821	201	4,413,068	469	4,413,103	495	4,413,135
283	4,413,003	212	4,413,033	CLASS 442	60	4,412,822	205	4,413,069	479	4,413,104	509	4,413,136
285	4,413,004	288	4,413,034	CLASS 443	80	4,412,823	223	4,413,070	482	4,413,105	518	4,413,137
298	4,413,005	458	4,413,035	CLASS 444	170	4,412,824	411	4,413,071	534	4,413,106	CLASS 550	
300	4,413,006	461	4,413,036	CLASS 445	229	4,412,825	500	4,413,072	561	4,413,107	126	4,413,139
309	4,413,011	643	4,413,038	CLASS 446	43	4,413,056	511	4,413,073	567	4,413,108	248	4,413,140
319	4,413,012	19	4,413,040	CLASS 447	101	4,413,057	514	4,413,074	59	4,413,111	CLASS 551	
321	4,413,013	33	4,413,041	CLASS 448	161	4,413,058	286	4,413,075	73	4,413,112	128	4,413,143
CLASS 425	114	4,412,797	4,413,042	CLASS 449	43	4,413,059	47	4,413,076	165	4,413,113	CLASS 552	
137	4,412,798	51	4,413,043	CLASS 450	102	4,413,077	86	4,412,826	183	4,413,114	306	4,413,144
150	4,412,799	104	4,413,043	CLASS 451	128	4,412,827	128	4,412,827	189	4,413,115	345	4,413,145
195	4,412,800	53	4,413,044	CLASS 452	203	4,413,050	81	4,412,828	307	4,413,116	451	4,413,146
338	4,412,801	59	4,413,045	CLASS 453	312	4,413,051	315	4,413,084	497	4,413,117	476	4,413,147
392	4,412,802	83	4,413,046	CLASS 454	327	4,413,052	386	4,413,085	169	4,413,079	538	4,413,148
456	4,412,803	94	4,413,047	CLASS 455	502	4,413,053	389	4,413,086	187	4,413,080	636	4,413,149
546	4,412,804	115	4,413,048	CLASS 456	555	4,413,054	714	4,413,087	202	4,413,081	697	4,413,150
549	4,412,805	126	4,413,049	CLASS 457	567	4,413,055	785	4,413,088	243	4,413,082	697	4,413,151
554	4,412,806	203	4,413,050	CLASS 458	1	4,413,014	454	4,413,016	299	4,413,083	863	4,413,152
564	4,412,807	233	4,413,051	CLASS 459	12	4,412,830	59	4,413,090	18.6	4,413,120	CLASS 553	
CLASS 426	1	4,413,014	4,413,052	CLASS 460	46	4,412,831	61	4,413,091	44	4,413,121	254	4,413,156
131	4,413,015	327	4,413,052	CLASS 461	7	4,413,061	71	4,413,092	153	4,413,122	304	4,413,153
454	4,413,016	502	4,413,053	CLASS 462	123	4,413,062	185	4,413,093	215	4,413,123	366	4,413,154
616	4,413,017	555	4,413,054	CLASS 463	12	4,412,830	59	4,413,090	319	4,413,124	417	4,413,155
618	4,413,018	567	4,413,055	CLASS 464	12	4,412,830	59	4,413,090	22	4,413,125	CLASS 554	
CLASS 427	36	4,413,019	4,412,808	CLASS 465	46	4,412,831	61	4,413,091	52	4,413,126	19	4,412,833
33.1	4,413,020	76	4,412,809	CLASS 466	7	4,413,061	71	4,413,092	249	4,413,127	87	4,412,834
236	4,413,021	186	4,412,810	CLASS 467	123	4,413,062	185	4,413,093	312	4,413,128	164	4,412,835
255.2	4,413,022	202	4,412,811	CLASS 468	123	4,413,062	185	4,413,093	312	4,413,129	105	4,412,836
				CLASS 469							417	4,412,837



# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,412,547	05 : 4,413,335	4,412,807	4,412,912	4,412,831	27 : 4,412,382
4,412,653	4,412,803	4,412,871	4,413,018	4,412,894	4,412,392
4,412,874	Re.31,435	4,412,958	4,413,029	4,412,922	4,412,398
4,412,546	4,412,361	4,412,962	4,413,087	4,412,929	4,412,429
4,412,609	4,412,375	4,413,173	4,413,115	4,413,049	4,412,530
4,412,689	4,412,379	4,413,264	4,413,143	4,413,051	4,412,616
4,413,194	4,412,421	4,413,271	4,413,150	4,413,106	4,412,771
4,412,400	4,412,447	4,413,350	4,413,152	4,413,167	4,413,017
4,412,420	4,412,483	4,412,835	4,413,164	4,413,168	4,413,080
4,412,611	4,412,523	4,412,957	4,413,240	4,413,174	4,413,108
4,412,692	4,412,543	4,413,094	4,413,260	4,413,180	4,413,138
4,412,703	4,412,551	4,412,529	4,413,306	4,413,204	4,413,232
4,412,709	4,412,554	4,413,157	4,412,414	4,413,209	4,413,298
4,412,731	4,412,568	Re.31,434	4,412,457	4,413,223	4,413,317
4,412,743	4,412,595	4,412,407	4,412,650	4,412,233	4,412,369
4,412,754	4,412,628	4,412,508	4,412,690	4,413,286	4,412,572
4,412,805	4,412,654	4,412,785	4,412,702	4,413,327	4,412,610
4,412,808	4,412,665	4,413,254	4,412,750	4,413,339	4,412,627
4,413,058	4,412,670	4,413,261	4,412,841	4,412,359	4,412,768
4,413,213	4,412,677	4,412,580	4,413,099	4,412,386	4,412,940
4,413,221	4,412,706	4,412,602	4,413,120	4,412,391	4,413,016
4,413,239	4,412,786	4,412,681	4,413,126	4,412,397	4,413,125
4,413,250	4,412,824	4,412,683	4,413,159	4,412,404	4,413,228
4,413,296	4,412,830	4,412,819	4,412,567	4,412,444	4,412,680
4,413,348	4,412,885	4,412,853	4,412,817	4,412,458	4,412,644
4,413,353	4,412,918	4,412,916	4,412,821	4,412,459	4,412,967
4,412,437	4,412,928	4,413,246	4,412,679	4,412,465	4,413,206
4,412,661	4,412,968	4,413,255	4,412,693	4,412,484	4,412,393
4,412,439	4,412,985	4,412,486	4,412,994	4,412,629	4,412,428
4,412,491	4,412,990	4,412,655	4,412,468	4,412,652	4,412,496
4,412,613	4,412,997	4,412,365	4,412,773	4,412,691	4,412,502
4,412,634	4,413,009	4,412,381	4,412,842	4,412,695	4,412,528
4,412,711	4,413,028	4,412,390	4,412,914	4,412,710	4,412,537
4,412,733	4,413,069	4,412,435	4,413,189	4,412,719	4,412,548
4,412,782	4,413,070	4,412,440	4,412,911	4,412,764	4,412,598
4,412,854	4,413,074	4,412,467	4,413,014	4,412,794	4,412,614
4,412,884	4,413,252	4,412,471	4,412,387	4,412,840	4,412,617
4,412,970	4,413,257	4,412,518	4,412,417	4,412,924	4,412,642
4,413,119	4,413,258	4,412,553	4,412,493	4,412,931	4,412,672
4,413,234	4,413,259	4,412,565	4,412,574	4,412,955	4,412,685
01 : 4,413,277	4,413,270	4,412,573	4,412,594	4,412,964	4,412,722
04 : Re.31,432	4,413,289	4,412,678	4,413,041	4,412,993	4,412,778
4,412,362	4,413,293	4,412,682	4,413,162	4,413,011	4,412,859
4,412,363	4,413,294	4,412,708	4,413,184	4,413,013	4,412,952
4,412,464	4,413,301	4,412,712	4,413,312	4,413,040	4,412,978
4,412,475	4,413,304	4,412,724	4,413,331	4,413,042	4,412,983
4,412,535	4,413,307	4,412,752	4,413,332	4,413,084	4,412,991
4,413,195	4,413,349	4,412,761	4,413,337	4,413,132	4,413,019
4,413,226	4,413,308	4,412,763	4,412,422	4,413,177	4,413,037
4,413,238	4,412,466	4,412,800	4,412,499	4,413,219	4,413,038
4,413,243	4,412,577	4,412,813	4,412,521	4,413,220	4,413,057
4,413,326	4,412,723	4,412,834	4,412,521	4,413,220	4,413,057
4,413,328	4,412,788	4,412,844	4,412,826	4,413,267	4,413,093

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,413,100	4,412,921	4,412,470	4,412,607	4,413,089	4,413,193
4,413,110	4,412,956	4,412,478	4,412,635	4,413,111	4,413,211
4,413,118	4,412,961	4,412,603	4,412,820	4,413,136	4,413,218
4,413,123	4,412,984	4,412,605	4,412,889	4,413,166	4,413,235
4,413,139	4,412,995	4,412,645	4,412,358	4,413,196	4,413,265
4,413,147	4,413,050	4,412,646	4,412,503	4,413,197	4,413,287
4,413,151	4,413,053	4,412,753	4,412,526	4,413,230	4,413,314
4,413,153	4,413,059	4,412,775	4,412,549	4,413,262	4,413,318
4,413,154	4,413,061	4,412,791	4,412,566	4,413,271	4,412,539
4,413,214	4,413,062	4,412,806	4,412,579	4,412,579	4,412,866
4,413,217	4,413,088	4,412,846	4,412,662	4,412,615	4,413,191
4,413,242	4,413,092	4,412,847	4,412,714	4,412,950	4,413,329
4,413,263	4,413,127	4,412,861	4,412,717	4,413,026	4,412,376
4,413,282	4,413,134	4,412,876	4,412,739	4,415,033	4,412,423
4,413,288	4,413,178	4,412,879	4,412,744	4,413,172	4,412,426
4,413,310	4,413,183	4,412,888	4,412,749	4,412,510	4,412,427
4,413,320	4,413,203	4,412,898	4,412,762	4,412,860	4,412,482
35 : 4,412,445	4,413,251	4,412,899	4,412,798	4,412,402	4,412,494
4,412,472	4,413,253	4,412,934	4,412,799	4,412,431	4,412,589
4,413,198	4,413,266	4,412,965	4,412,828	4,412,509	4,412,664
36 : 4,412,432	4,413,269	4,413,065	4,412,836	4,412,533	4,412,715
4,412,462	4,413,278	4,413,077	4,412,839	4,412,590	4,413,229
4,412,495	4,413,280	4,413,146	4,412,843	4,412,601	4,412,511
4,412,512	4,413,305	4,413,155	4,412,863	4,412,608	4,412,542
4,412,519	4,413,311	4,413,200	4,412,869	4,412,631	4,412,604
4,412,536	4,413,330	4,413,247	4,412,870	4,412,637	4,412,659
4,412,544	4,413,342	4,413,319	4,412,877	4,412,673	4,412,698
4,412,571	4,413,346	4,413,322	4,412,895	4,412,697	4,412,825
4,412,582	37 : 4,412,357	4,412,910	4,412,910	4,412,759	4,413,323
4,412,625	4,412,360	4,412,433	4,412,394	4,412,947	4,412,812
4,412,632	4,412,433	4,412,559	4,412,559	4,412,969	4,412,832
4,412,636	4,412,532	4,412,584	4,412,584	4,412,976	4,412,887
4,412,648	4,412,620	4,412,585	4,412,585	4,412,982	4,412,915
4,412,656	4,412,796	4,412,586	4,412,586	4,412,999	4,412,926
4,412,738	4,412,814	4,412,612	4,412,913	4,413,003	4,412,939
4,412,740	38 : 4,412,612	4,412,981	4,413,015	4,412,975	4,412,783
4,412,780	39 : 4,412,380	4,413,081	4,413,035	4,412,977	4,412,792
4,412,822	4,412,384	4,413,140	4,413,064	4,413,020	4,412,881
4,412,845	4,412,395	4,413,158	4,413,068	4,413,034	4,412,909
4,412,868	4,412,416	4,413,156	4,413,085	4,413,156	4,413,215
4,412,892	4,412,418	4,413,405	4,413,086	4,413,182	4,413,248
4,412,920	4,412,456	4,412,558			

## DESIGN PATENTS

6 : 271,216	271,180	09 : 271,158	271,196	271,222	271,201
9 : 271,215	271,181	12 : 271,164	271,239	271,247	271,230
01 : 271,179	271,189	271,221	271,191	39 : 271,160	51 : 271,161
04 : 271,235	271,206	271,227	271,232	271,223	271,173
05 : 271,192	271,210	13 : 271,204	271,157	40 : 271,184	271,236
271,193	271,211	271,205	271,231	42 : 271,155	271,248
271,194	271,217	17 : 271,168	271,238	271,185	53 : 271,183
271,156	271,226	33 : 271,159	271,159	271,237	271,219
271,166	271,229	36 : 271,163	271,163	44 : 271,182	54 : 271,162
271,167	271,246	18 : 271,197	271,209	47 : 271,172	55 : 271,175
271,169	08 : 271,171	25 : 271,174	271,220	48 : 271,177	271,228

## PLANT PATENTS

06 : 5,130	39 : 5,131	5,132			
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## DEFENSIVE PUBLICATIONS APPLICATIONS [Notice of Dec. 16, 1969, 869 O.G. 6877]

09 : T103,601	36 : T103,603	42 : T103,602			
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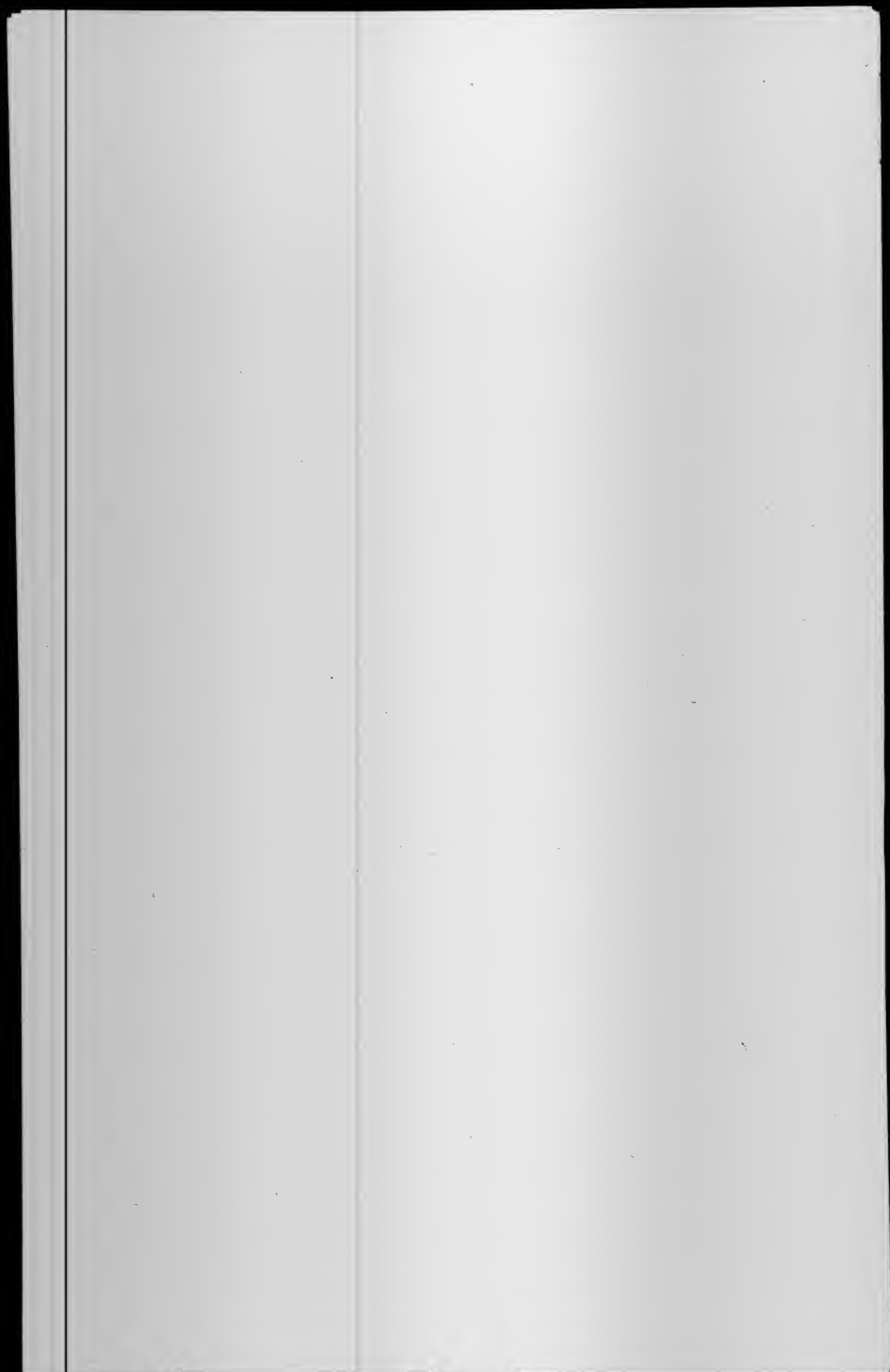
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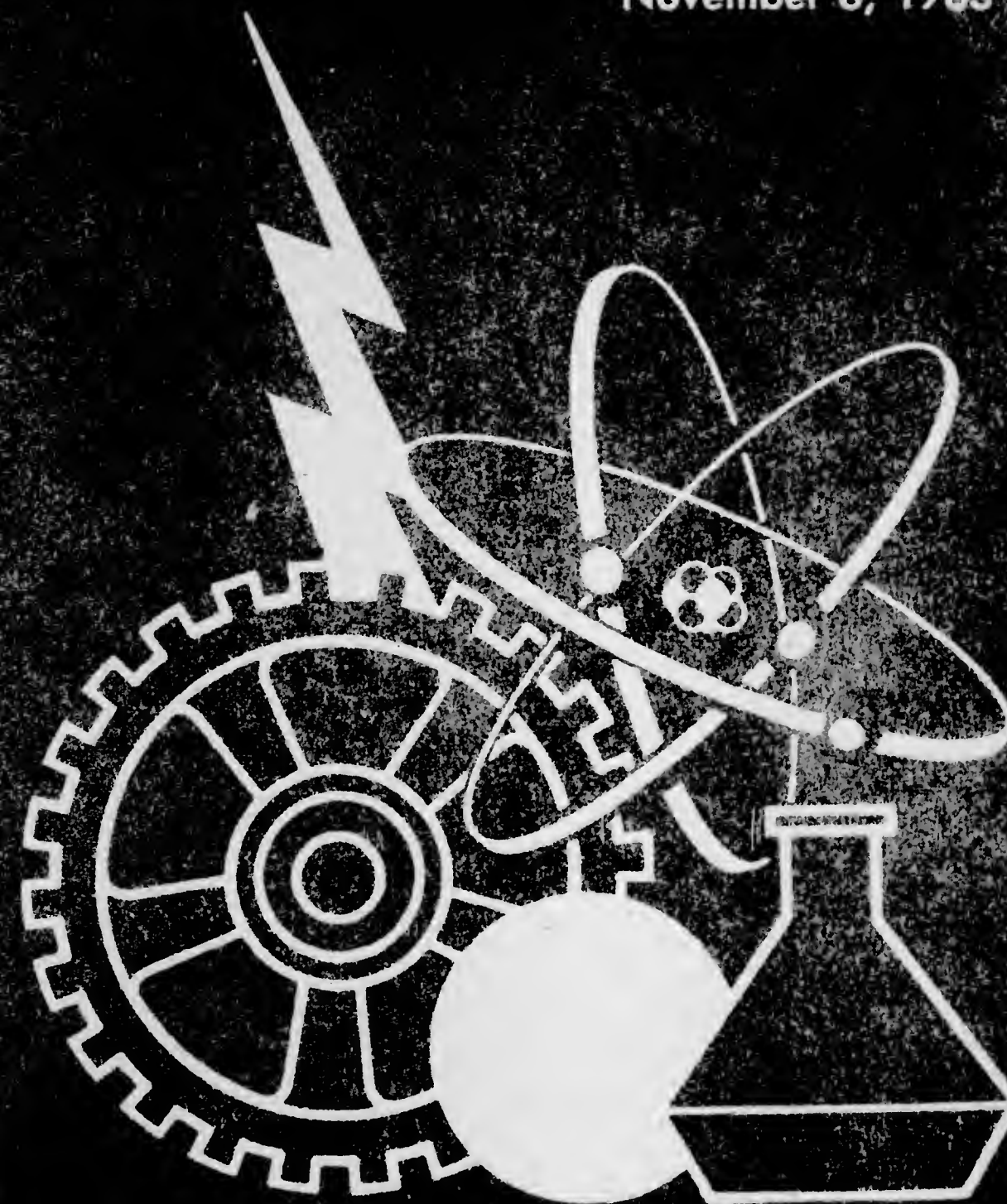
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November 8, 1983



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CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information . . . . .	1036 OG 8
Reissue Applications Filed . . . . .	1036 OG 8
Request for Reexamination Filed . . . . .	1036 OG 8
Recordation of Trade Names . . . . .	1036 OG 8
Adverse Decisions in Interference . . . . .	1036 OG 9
Patent Certificates of Correction . . . . .	1036 OG 10
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries . . . . .	1036 OG 11
Condition of Patent Applications . . . . .	1036 OG 12
Reissue Patents Granted (31,438) . . . . .	347
Plant Patents Granted (5,133) . . . . .	349
Patents Granted	
General and Mechanical (4,413,357) . . . . .	351
Chemical (4,413,997) . . . . .	571
Electrical (4,414,424) . . . . .	685
Design Patents Granted (271,249) . . . . .	777
Reexaminations . . . . .	799
Index of Patentees . . . . .	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees . . . . .	PI 49
Classification of	
Patents (Including Reissues and Reexaminations) . . . . .	PI 53
Designs and Plants . . . . .	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues) . . . . .	PI 57
Designs and Plants . . . . .	PI 58
Change of Address Form and Subscription Order Form . . . . .	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,022,529, Re. S.N. 524,696, Filed Aug. 19, 1983, Cl. 356/318, FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL, John U. White, Owner of Record: Inventor, Attorney or Agent: Lee C. Robinson, Jr., et al., Ex. Gp.: 257

4,024,065, Re. S.N. 505,755, Filed June 20, 1983, Cl. 210/315, FILTER FOR LIQUID MATERIAL, Howard William Morgan, Jr., Owner of Record: Filter Specialists, Inc., Michigan City, Ind., Attorney or Agent: James D. Hall, Ex. Gp.: 176

4,122,024, Re. S.N. 342,946, Filed Jan. 26, 1982, Cl. 430/111, CLASSIFIED TONER MATERIALS, Lewis D. Jones, et al., Owner of Record: Xerox Corp., Stamford, Conn., Attorney or Agent: J. E. Beck, et al., Ex. Gp.: 166

4,280,000, Re. S.N. 515,920, Filed July 20, 1983, Cl. 435/242, METHOD FOR OBTAINING MOLD SPORE MATERIAL, Peter P. Kozak, Jr., et al., Owner of Record: Leo H. Cummins & Sherwin A. Gillman,

Santa Ana, Calif., Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 172

4,321,978, Re. S.N. 444,862, Filed Nov. 26, 1982, Cl. 180/225, INTAKE SYSTEM FOR MOTORCYCLE ENGINES HAVING V-SHAPED CYLINDER ARRANGEMENT, Nobuyoshi Tominaga, et al., Owner of Record: Yamaha Hatsudoki, Kabushiki Kaisha, Iwata, Japan, Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 316

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,105,391, Reexam. No. 90/000,455, Requested: Oct. 7, 1983, Cl. 425/526, INJECTION BLOW MOLDING MACHINE, Katashi Aoki, Owner of Record: Nissei ASB Machine Co., Ltd., Tokyo, Japan, Attorney or Agent: L. A. Maxham, Ex. Gp.: 140, Requester: Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

4,157,276, Reexam. No. 90/000,451, Requested: Sept. 30, 1983, Cl. 162/348, PAPER MACHINE FABRIC IN AN ATLAS BINDING, Hermann Wandel, et al., Owner of Record: Herman Wagner, GmbH & Co. K.G., Reutlingen, Germany, Attorney or Agent: Ronald J. Baron, Ex. Gp.: 170, Requester: Owner

4,334,944, Reexam. No. 90/000,456, Requested: Oct. 7, 1983, Cl. 156/308.2, METHOD OF PREPARING POLYUREA FOAM MATERIALS, Hubert S. Creyf, Owner of Record: PRB N.V., Brussels, Belgium, Attorney or Agent: Buell, Blenko, et al., Ex. Gp.: 161, Requester: Upjohn Co., North Haven, Conn.

4,370,592, Reexam. No. 90/000,457, Requested: Oct. 7, 1983, Cl. 313/414, COLOR PICTURE TUBE HAVING AN IMPROVED INLINE ELECTRON GUN WITH AN EXPANDED FOCUS LENS, Richard H. Hughes, et al., Owner of Record: RCA Corp., New York, N.Y., Attorney or Agent: Eugene M. Whitacre, Ex. Gp.: 250, Requester: Owner

4,387,297, Reexam. No. 90/000,453, Requested: Oct. 4, 1983, Cl. 235/462, PORTABLE LASER SCANNING SYSTEM AND SCANNING METHODS, Jerome Swartz, et al., Owner of Record: Symbol Technologies, Inc., Hauppauge, N.Y., Attorney or Agent: Alan Israel, Ex. Gp.: 210, Requester: Owner

### DEPARTMENT OF THE TREASURY UNITED STATES CUSTOMS SERVICE

(T.D. 83-178)

#### RECORDATION OF TRADE NAME: "UNDERGROUND CAMERA, INC."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On May 6, 1983, a notice of application for the recordation under section 42 of the Act of July 5,

NOVEMBER 8, 1983

U.S. PATENT AND TRADEMARK OFFICE

1036 OG 9

1946, as amended (15 U.S.C. 1124), of the trade name "UNDERGROUND CAMERA, INC." was published in the Federal Register (48 FR 20531). The notice advised that before final action on the application, consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than July 5, 1983. No responses were received in opposition to the application.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "UNDERGROUND CAMERA, INC." is recorded as the trade name used by Underground Camera, Inc., a corporation organized under the laws of the State of Massachusetts, located at 369 Central St., Foxboro, Mass. 02035. The trade name is used in connection with photographic equipment, namely, cameras and lenses; photographic supplies, namely, photographic film and chemicals; and photographic accessories, namely camera supports and illuminators. The trade name is applied to the goods in the United States.

Date: Aug. 25, 1983

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,  
Director, Entry Procedures  
and Penalties Division.

Aug. 19, 1983.

### DEPARTMENT OF THE TREASURY UNITED STATES CUSTOMS SERVICE

(T.D. 83-176)

#### RECORDATION OF TRADE NAME: "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA"

Agency: U.S. Customs Service, Treasury

Action: Notice of Recordation

Summary: On May 11, 1983, a notice of application for the recordation under Section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA" was published in the Federal Register (48 FR 21231). The notice advised that before final action on the application, consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than July 11, 1983. No responses were received in opposition to the application.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA" is recorded as the trade name used by the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, an incorporated association, located at 901 Massachusetts Ave., NW., Washington, D.C. 20001. The trade name is used by the Association to identify its union activities, which include the formation of local labor unions in the plumbing and pipe fitting industry, as well as certifying (1) that pipe, fabricated pipe, welded pipe and fabricated welded pipe formations were made by members of the United Association's local unions and (2) that the services of fabricating and assembling such goods were performed by members of United Association's local unions. The Association's member unions and their members are authorized to use the trade name in the United States and Canada.

Date: Aug. 24, 1983

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,  
Director, Entry Procedures  
and Penalties Division.

Aug. 19, 1983.

### Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,913,129, Carl J. Snyder, Albert H. Maxwell, Jr. and William P. Doby, OUTAGE INDICATING APPARATUS FOR METER TELEMETRY SYSTEMS INCLUDING DATA RECORDERS, Interference No. 100,498, decided Apr. 29, 1983, claim 1.

Patent No. 3,913,828, Paul A. Roy, REINFORCING ULTRA-CENTRIFUGE ROTORS, Interference No. 100,429, decided Mar. 10, 1983, claims 1, 2, 4, 5 & 6.

Patent No. 3,921,207, William P. Doby and Albert H. Maxwell, Jr., OUTAGE INDICATING APPARATUS FOR METER TELEMETRY SYSTEMS INCLUDING DATA RECORDERS, Interference No. 100,497, decided Apr. 29, 1983, claim 1.

Patent No. 3,959,236, Jan Peska, Milan Benes and Jiri Stamberg, POLYMERS AND COPOLYMERS OF HYDROXYALKYL METHACRYLATE SULFO ESTERS AND THE METHOD FOR THEIR MANUFACTURING, Interference No. 99,511, decided Mar. 25, 1983, claims 1, 3, 6 & 7.

Patent No. 4,016,043, Antonius H.W.M. Schuurs, Bauke K. Van Weemen and Gerrit Wolters, ENZY-MATIC IMMUNOLOGICAL METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES, Interference No. 99,978, decided May 23, 1983, claim 2.

Patent No. 4,025,953, Sotirios Sideris, FREQUENCY SYNTHESIZER TUNING SYSTEM FOR TELEVISION RECEIVERS, Interference No. 100,161, decided June 23, 1982, claim 1.

Patent No. 4,065,534, Thomas A. Rechlicz and Bernard A. Maloney, METHOD OF PROVIDING A RESIN REINFORCED ASBESTOS DIAPHRAGM, Interference No. 100,351, decided May 26, 1983, claims 1, 3, 4 & 5.

Patent No. 4,175,464, Ralph Deutsch, MUSICAL TONE GENERATOR WITH TIME VARIANT OVERTONES, Interference No. 100,610, decided Apr. 8, 1983, claims 1-3, 5, 6, 15, 16 & 17.

Patent No. 4,203,992, Eric M. Gordon and William H. Koster,  $\beta$ -BROMOPENICILLANIC ACID SULFONE, Interference No. 100,912, decided June 3, 1983, claims 1 & 2.

Patent No. 4,221,914, Philippe Bey and Michel Jung, ALPHAHALOMETHYL DERIVATIVES OF HISTAMINE AND RELATED COMPOUNDS, Interference No. 100,906, decided Jan. 27, 1983, claim 8.

Patent No. 4,251,223, William I. White, SENSITIZERS FOR PEROXIDATIVE ACTIVITY TESTS, Interference No. 100,751, decided May 11, 1983, claims 1-4.

NANNIE B. HENRY,  
Deputy Clerk,  
Board of Patent Interferences.



## PATENT NOTICES

### Certificates of Correction for the Week of Nov. 8, 1983

D. 263,720	4,337,178	4,385,195	4,395,396
D. 270,334	4,341,780	4,385,915	4,395,460
Re. 31,247	4,350,793	4,386,135	4,395,566
Re. 31,319	4,358,390	4,386,466	4,396,221
Re. 31,336	4,358,545	4,386,860	4,396,671
3,655,201	4,358,561	4,387,851	4,397,502
4,051,123	4,368,496	4,388,382	4,397,579
4,217,159	4,369,432	4,389,036	4,397,622
4,224,150	4,369,511	4,389,335	4,397,711
4,249,024	4,370,211	4,389,707	4,398,250
4,251,432	4,373,392	4,389,952	4,398,580
4,266,478	4,374,798	4,390,593	4,398,646
4,283,675	4,376,647	4,390,798	4,399,139
4,290,244	4,378,210	4,391,278	4,399,439
4,300,380	4,378,755	4,391,357	4,400,377
4,301,068	4,379,087	4,391,617	4,400,533
4,304,485	4,380,077	4,392,376	4,400,795
4,307,818	4,380,394	4,392,591	4,400,875
4,308,114	4,380,533	4,393,082	4,400,964
4,316,061	4,381,171	4,393,107	4,401,110
4,321,134	4,382,085	4,393,249	4,401,538
4,322,974	4,382,141	4,394,211	4,401,616
4,324,247	4,382,981	4,394,616	4,402,198
4,327,074	4,384,159	4,394,983	4,402,330
4,331,931	4,384,224	4,395,031	4,402,879
4,336,019	4,384,378	4,395,215	4,405,669

1036 OG 10

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the

table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
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Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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\*Collection organized by subject matter.

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1036 OG 11



**PATENT EXAMINING CORPS**  
**RENE D. TEGMEYER, Assistant Commissioner**  
**WILLIAM FELDMAN, Deputy Assistant Commissioner**  
**CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983**

PATENT EXAMINING GROUPS		Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>		
<b>GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director</b> . . . . .	1-16-81	
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal- lurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.		
<b>GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director</b> . . . . .	11-20-81	
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.		
<b>HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director</b> . . . . .	3-1-82	
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthetics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.		
<b>COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director</b> . . . . .	3-09-82	
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.		
<b>SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—</b> <b>R. F. WHITE, Director</b> . . . . .	1-12-82	
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.		
<b>ELECTRICAL EXAMINING GROUPS</b>		
<b>INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director</b> . . . . .	5-22-81	
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.		
<b>SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director</b> . . . . .	3-30-81	
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.		
<b>INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director</b> . . . . .	1-05-81	
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.		
<b>RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—</b> <b>G. M. FORLENZA, Director</b> . . . . .	5-12-81	
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.		
<b>ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director</b> . . . . .	8-25-80	
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.		
<b>DESIGN, GROUP 290—KENNETH L. CAGE, Director</b> . . . . .	1-30-81	
Industrial Arts; Household, Personal and Fine Arts.		
<b>MECHANICAL EXAMINING GROUPS</b>		
<b>HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director</b> . . . . .	5-18-81	
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.		
<b>MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director</b> . . . . .	7-27-81	
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.		
<b>AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—</b> <b>R. E. AEGERTER, Director</b> . . . . .	8-27-82	
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.		
<b>HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director</b> . . . . .	11-17-80	
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.		
<b>GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—</b> <b>A. L. SMITH, Director</b> . . . . .	9-17-80	
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.		

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

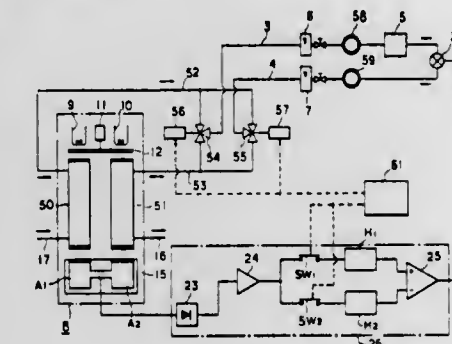
Patents	Numbers 3,243,822 to 3,248,737, inclusive
Plant Patents	Numbers 2,616 to 2,627 inclusive

## REISSUES

NOVEMBER 8, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,438  
**INFRARED RAY GAS ANALYZING APPARATUS**  
 Shinya Ueda, Kawasaki, Japan, assignor to Fuji Electric Co.,  
 Ltd., Kanagawa, Japan  
 Original No. 4,180,733, dated Dec. 25, 1979, Ser. No. 912,144,  
 Jun. 2, 1978. Application for reissue Jul. 31, 1981, Ser. No.  
 288,877  
 Claims priority, application Japan, Jun. 2, 1977, 52-70714[U]  
 Int. Cl.<sup>3</sup> G01N 21/26  
 U.S. Cl. 250—345 4 Claims



3. An analyzing-apparatus using infrared rays for measuring the density of an analysis gas in a sample gas comprising: a first cell irradiated by a first light beam of infrared rays; a second cell irradiated by a second light beam of infrared rays; means for receiving said first and second light beams passed through said first and second cells and providing an output signal in response thereto indicative of a density of the analysis gas contained in said sample gas being measured; and gas supply means for periodically supplying said sample gas containing said analysis gas to one of said first and second cells and a reference gas to the other of said first and second cells and, alternately, supplying said sample gas to said other of said first and second cells and said reference gas to said one of said first and second cells.



## PLANT PATENTS

GRANTED NOVEMBER 8, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,133

### ALSTROEMERIA NAMED STAKAROS

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij/M. C. van Staaveren, Aalsmeer, Netherlands

Filed Dec. 16, 1981, Ser. No. 331,149  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinctive alstroemeria plant, substantially as herein shown and described, characterized by the pink and yellow coloration of its large and profusely blooming flowers borne on strong, upstanding stems.

5,134

### IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,043  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of impatiens known by the cultivar name Twinkles, as described and illustrated, and particularly characterized by its sharp clear pink flower color in cool regimes and generally salmon pink flower color in mid-summer; variegated foliage; excellent self-branching and procumbent growth habits; high floriferousness, and quick flowering; fast growing and free breaking, providing full and large plant, and by its relatively small flowers.

5,135

### IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,057  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Flare, as described and illustrated, and particularly characterized by its compact, superior self-branching habit; bright dark red to a dull red flower color depending on light conditions; variegated to wholly green foliage depending on light conditions; superior floriferousness; excellent keeping qualities for house plant use, and by its adaptability to varying use environments.

5,136

### CORTADERIA 'MONVIN'

Gavin Espinosa, Azusa, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jan. 21, 1982, Ser. No. 341,550  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—89

1 Claim

1. A new and distinct *Cortaderia selloana* as substantially shown and described herein, that is a superior selection characterized by a unique leaf variegation pattern, a more dwarf-like plant and a female clone which can be relied upon to produce a more showy plume-like inflorescence.



## PATENTS

GRANTED NOV. 8, 1983

### ERRATA

For CLASS	See PATENT NO.
188-067 .....	4,413,387
361-014 .....	4,413,431
401-055 .....	4,413,435
072-071 .....	4,413,485
604-365 .....	4,413,623
198-344 .....	4,413,709
494-017 .....	4,413,771
494-017 .....	4,413,772
494-037 .....	4,413,773
420-578 .....	4,414,027
419-031 .....	4,414,028
423-367 .....	4,414,033
202-248 .....	4,414,072
204-299 .....	4,414,073
203-021 .....	4,414,074
502-169 .....	4,414,132
502-179 .....	4,414,133
502-204 .....	4,414,134
502-224 .....	4,414,135
502-225 .....	4,414,136
502-162 .....	4,414,137
502-073 .....	4,414,138
502-072 .....	4,414,139
502-303 .....	4,414,140
502-314 .....	4,414,141
422-133 .....	4,414,184
526-190 .....	4,414,381
524-494 .....	4,414,385
424-305 .....	4,414,407
381-022 .....	4,414,430
381-048 .....	4,414,431
219-121 .....	4,414,444
369-044 .....	4,414,655



# PATENTS

GRANTED NOVEMBER 8, 1983

## GENERAL AND MECHANICAL

4,413,357

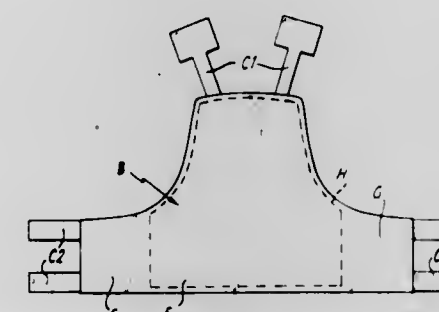
### PROTECTIVE SHIELDS

Michael Sacks, 43 Woodhall Ave., Whitefield, Manchester, England

Continuation-in-part of Ser. No. 91,958, Nov. 7, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 223,045 Int. Cl.<sup>3</sup> F41H 1/02

U.S. Cl. 2—2.5

10 Claims



1. A lightweight protective garment to be worn by a person to protect against injury by a bullet or other missile or moving object, said garment having front and back portions and means for interconnecting said portions at the sides and over the shoulders of said person so that the garment can be worn in the manner of a vest,

said front portion having supported thereon a ballistic pack arranged to extend over an area at the front of said person's body,

said ballistic pack comprising a sandwich of layers within an outer cover, said layers comprising: a penetration-resisting layer made up of a plurality of flexible sheets of a closely-woven fabric formed from aramid fibres of high tensile strength and high stretch resistance such as to be capable of resisting penetration by a bullet, and

a backing layer made up of one or more thin, flexible sheets of a semi-stiff impervious plastics material, said backing layer being formed separately to but being held in position relative to said sheet or sheets of said penetration-resisting layer on that side of said penetration-resisting layer which faces towards the person's body, whereby when struck with a bullet or missile or other moving object, said penetration-resisting layer acts to prevent or limit penetration whilst said backing layer acts to limit transmission of impact shock to the person's body.

4. A lightweight protective garment to be worn by a person to protect against injury by a bullet or other missile or moving object, said garment having front and back portions and means for interconnecting said portions at the sides and over the shoulders of said person so that the garment can be worn in the manner of a vest,

said front portion having supported thereon a ballistic pack arranged to extend over an area at the front of said person's body,

said ballistic pack comprising a sandwich of layers within an outer cover, said layers comprising: a penetration-resisting layer made up of a plurality of flexible sheets of a closely-woven fabric formed from aramid fibres of high tensile strength and high stretch resistance such as to be capable of resisting penetration by a bullet, and

an impact-absorbing backing layer, said backing layer being formed separately to, but being held in position relative to said sheet or sheets of said penetration-resisting layer on that side of said penetration-resisting layer which faces towards the person's body, whereby when struck with a bullet or missile or other moving object, said penetration-resisting layer acts to prevent or limit penetration whilst said backing layer acts to limit transmission of impact shock to the person's body

and said front portion also having supported thereon in front

of the said ballistic pack an auxiliary shield formed separately from said ballistic pack, said shield comprising a layer of a rigid brittle material having a high degree of hardness which is bonded to a supporting layer comprising one or more sheets of a closely-woven fabric made from aramid fibre of high tensile strength and high stretch resistance

10. A lightweight, armored vest for protecting the wearer against body penetration by a bullet and against blunt trauma from the impact of a bullet,

said vest having a front portion and a rear portion and connection means joining said portions into a vest covering the upper torso of the wearer,

each said portion being formed by an outer cover containing from eight to thirty superposed sheets of flexible, penetration-resistant fabric closely woven with about 31—31 (warp and weft) picks per inch (2.54 cms) from 1000—1500 denier aramid yarn, said sheets being attached to each other as a multi-layered sandwich to prevent bullet penetration,

and said cover containing at least one, thin flexible polycarbonate sheet, about 0.75 mm in thickness, co-extensive in area with the area of said multi-layered sandwich of aramid yarn sheets, as a backing layer for said penetration, resistant layers to absorb and spread shock impact and prevent blunt trauma, from a bullet.

4,413,358

### MOTORCYCLE SAFETY BELT

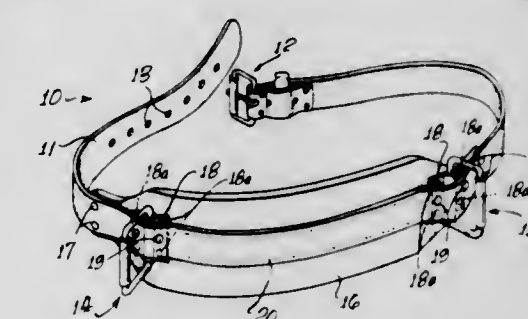
Albert Jimenez, 16225 Sierra Ridge Way, Hacienda Heights, Calif. 91745

Filed Mar. 23, 1981, Ser. No. 246,744

Int. Cl.<sup>3</sup> A41F 9/00

U.S. Cl. 2—321

4 Claims



1. A safety belt for use by the driver of a motorcycle which has a rider in addition to the driver to enable the rider on the motorcycle to more easily hold on to the driver, said belt comprising:

a belt member adapted to gird the driver's waist; buckle means affixed to the belt member to hold the belt member in a secure position around the driver; and

at least two generally rectangular, rigid handle means affixed to the belt member in a manner to prevent movement of the handle means along the belt member, the first of said handle means being affixed so that it is positioned on the side and near the rear of the driver on the right side and the second of said handle means being affixed so that it is positioned on the side and near the rear of the driver on the left side, each of said handle means being affixed to the belt member along one side of the generally rectangular, rigid handle means so that it is pivotable about the side which is affixed to the belt, whereby the rider may grasp the handles and easily and securely hold himself on the motorcycle.

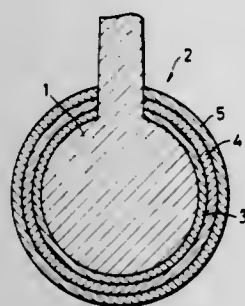


4,413,359

## IMPERMEABLE LAMINATE MEMBRANE

Tsichiro Akiyama, Tokyo, and Fumio Wada, Tsuruoka, both of Japan, assignors to Koken Co., Ltd., Tokyo, Japan  
 Filed Feb. 26, 1982, Ser. No. 352,528  
 Claims priority, application Japan, Mar. 4, 1981, 56-31008  
 Int. Cl.<sup>3</sup> A61F 1/00, 1/24

U.S. Cl. 3-1



1. An implantable impermeable laminate membrane bag for use in living organisms comprising a laminate of at least one membrane of a cured dimethylsiloxane polymer and at least one membrane of a vinylidene fluoride-hexafluoropropylene-based fluororubber.

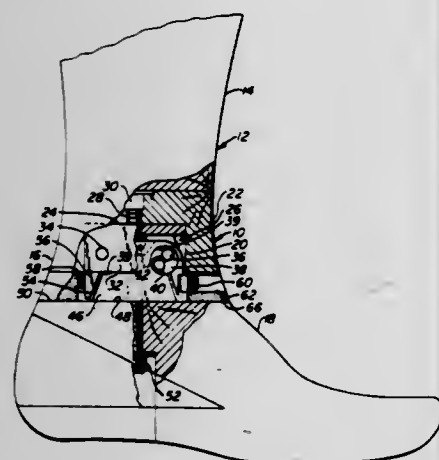
4,413,360

## ADJUSTABLE PROSTHETIC ANKLE ASSEMBLY

Steve R. Lamb, 2772 Sydney Way, Castro Valley, Calif. 94546, and Larry W. Lamoreux, 5470 Manilla Ave., Oakland, Calif. 94618

Filed Oct. 27, 1981, Ser. No. 315,423  
 Int. Cl.<sup>3</sup> A61F 1/04

U.S. Cl. 3-30



6. An ankle assembly for a leg prosthesis having a prosthetic shin member and a prosthetic foot member for adjustment of the foot flexion angle comprising an adjustment mechanism having:

- a shin connecting member having coupling means for connecting said shin connecting member to the shin member;
- a foot connecting member having coupling means for connecting said foot connecting member to the foot member;
- pivotal interconnecting means for pivotally interconnecting said shin connecting member to said foot connecting member said pivotal interconnecting means comprising a pair of spaced eccentric pivots; and
- locking means for locking said shin connecting member to said foot connecting member in a select pivotal orientation of said shin connecting member relative to said foot connecting member; wherein said locking means comprises a clamping assembly, said clamping assembly having a pair of collar clamps encompassing said eccentric pivots and having an adjustable tightening means operably connected to said collar clamps for clamping said collar

clamps around said eccentric pivots on select adjustment of said tightening means, wherein said shin connecting member is locked to said foot connecting member in a selected pivotal orientation.

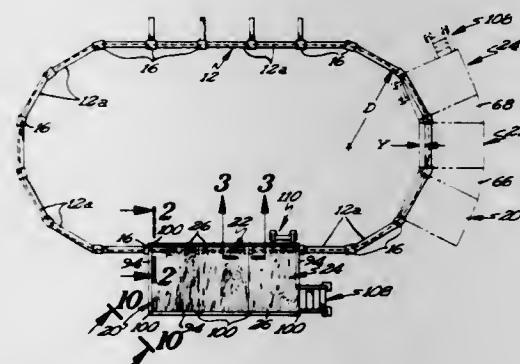
4,413,361

## DECK AND FENCE STRUCTURE FOR ABOVE GROUND SWIMMING POOLS

Donald A. Wolf, Deming, N. Mex.; Clarence G. Smith, Alta Loma, and Charles S. Johnson, Cedar Glen, both of Calif., assignors to Doughboy Recreational, Inc., Cucamonga, Calif.  
 Filed Nov. 10, 1980, Ser. No. 205,347  
 Int. Cl.<sup>3</sup> E04H 3/16, 3/18

U.S. Cl. 4-506

17 Claims



1. In combination with a portable swimming pool having upright side walls, an improved deck, and deck mounting structure comprising:

- a continuous, upright side wall structure defining a swimming pool enclosure;
- an elongated seat rest supported on top of said side wall structure along at least a portion of the length thereof, said seat rest including a top wall oriented generally horizontally;
- an elevated deck positioned outside of said side wall structure along a portion of the length thereof, said deck having an outer end remote from said side wall structure supported on upstanding, ground engaging members, and said deck having an inner end resting on top of said seat rest top wall and supported thereon;
- said seat rest is comprised of a plurality of elongated seat rest sections positioned in abutting, end to end relation along the top of said wall structure, and said deck is comprised of a plurality of deck sections, each of which rests at its inner end on top of one of said seat rest sections with its inner edge overhanging the inside edge of the respective seat rest section inwardly of the pool area defined by said side wall structure;
- each of said deck sections is comprised of a deck panel affixed to and supported on a rigid frame, each of said frames including at least one generally horizontally extending support beam; and
- means securing said deck to said seat rest top wall comprising an anchoring bracket secured to said support beam of at least one of said deck sections and removably attached to the seat rest section on which said one deck section rests.

4,413,362

## SITDOWN SHOWER FOR CHILDREN

Bernard V. Chianco; John B. Chianco, and David B. Chianco, all of 1040 NE. 16th Ter., Fort Lauderdale, Fla. 33304  
 Filed Dec. 9, 1981, Ser. No. 328,824  
 Int. Cl.<sup>3</sup> A47K 3/022

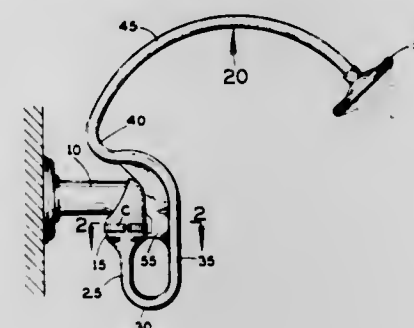
U.S. Cl. 4-567

3 Claims

1. For use in a bathtub having a water faucet which extends horizontally forward and then down to a water discharge opening, a shower assembly for releasable attachment to and

support by said water faucet, said shower assembly comprising:

- a hollow adapter with an open upper end which is slidably insertable on the faucet from below;
- means for releasably clamping said adapter on the faucet to receive water from said water discharge opening in the faucet;
- a rigid tube having one end attached integrally to the lower end of said adapter, said tube extending down from said



adapter and then curving upward and forward and passing up in front of said adapter to an opposite end spaced above and in front of said adapter;

- a shower head on said opposite end of said tube;
  - and a connector being integral with and extending between said adapter and said tube, forward of said adapter to said tube where the latter passes up in front of the adapter;
- the mounting of said adapter on the faucet constituting the sole means of support for said tube, shower head and connector.

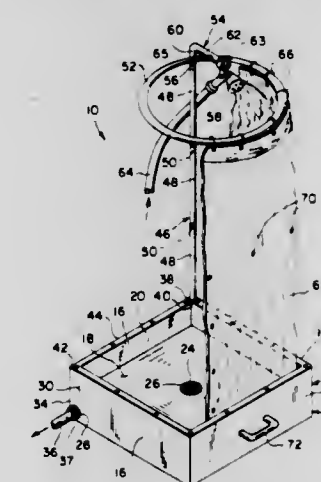
4,413,363

## PORTABLE SHOWER SYSTEM

Joseph Trolano, 80 Mahan St., West Babylon, N.Y. 11704  
 Filed Mar. 8, 1982, Ser. No. 356,185  
 Int. Cl.<sup>3</sup> A47K 3/22, 3/23

U.S. Cl. 4-599

3 Claims



1. A portable shower system, in combination, comprising:
- a base member having an inclined base wall four upright side walls, and a flat bottom partition wall spaced above said base wall and coextensive with said side walls, said side walls and said bottom partition wall defining a compartment, said side walls and said base wall defining an inclined cavity beneath said compartment, said side walls having an upright bore and a plurality of first fastening means spaced over the top surface of said side walls, said bottom partition wall having a first aperture connecting

said compartment and said cavity and a second aperture connecting the bottom of the inclination of said cavity with the outside of one of said side walls,

- a support rod removably mounted in said bore, said rod including a plurality of removably connected rod sections, a mounting ring,
- a shower head,
- a mounting means connected to said mounting ring and removably connected to the top of said support rod and said shower head, said mounting means being for positioning said ring and said shower head over said compartment,
- a flexible, waterproof curtain removably mounted to said ring and extending downward into said compartment, said curtain having a plurality of second fastening means formed about the mid section of the curtain commensurate with the four side walls, whereby said curtain mid section is capable of being removably connected to said first fastening means so as to form the cover of the compartment with the rest of the curtain being retained within the compartment beneath said mid section,
- a source inlet for pressurized water,
- a hose means for connecting said source inlet with said shower head, and
- said shower system having a dismantled position wherein said shower head, said mounting means with said mounting ring, said rod sections and said curtain are dismantled and positioned in said compartment, said shower curtain mid section being connected to said base member via said first and second fastening means.

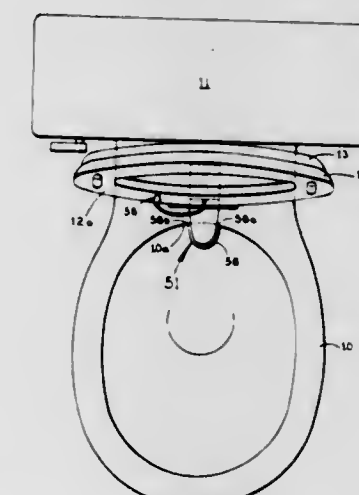
4,413,364

## TOILET LIGHT UNIT

Gerald W. Bittaker, and Evidio E. Martinez, both of Miami, Fla., assignors to Charlie I. Pearce, Miami Lakes, Fla.  
 Filed Feb. 10, 1982, Ser. No. 347,440  
 Int. Cl.<sup>3</sup> A47K 17/00

U.S. Cl. 4-661

21 Claims



1. A toilet light unit comprising:
- a housing having means thereon for mounting it on top of a toilet bowl at the back;
  - and a lamp socket mounted on said housing to extend down in front of the rear inner edge of the toilet bowl when said housing is mounted on top of the toilet bowl at the back;
  - said housing having a depending front end segment extending down in front and on opposite sides of said socket;
  - said housing having a bottom wall with an opening therein;
  - said socket having an electrical terminal at its upper end which projects up through said opening; and
  - an electrically conductive leaf spring mounted in cantilever fashion at its rear end on said bottom wall of the housing and having its front end overlying said opening and resiliently engaging said socket terminal.



4,413,365

## SAFETY LATCH FOR CRIB DROP SIDE

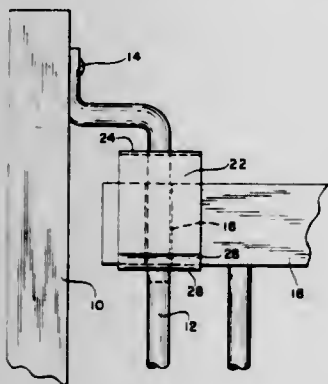
Donald R. Flye, Athol, and Richard T. Heininger, Gardner, both of Mass., assignors to Gem Industries, Inc., Gardner, Mass.

Filed Oct. 6, 1981, Ser. No. 308,984

Int. Cl.<sup>3</sup> A47D 7/02

U.S. Cl. 5—100

10 Claims



1. In a crib having a drop side, a drop side rod on which the drop side is slidable, and said drop side includes a top horizontal rail having an opening through which the drop side rod extends, and means forming a notch in said drop side rod, a clip generally embracing said top rail, said clip including two generally parallel flanges apertured to receive the drop side rod, an inset in said clip adjacent one of said flanges, and a spring located on the top rail and bearing on the other of said flanges, the one flange adjacent the inset having a portion thereof generally bearing on the rod, said spring tending to bias the clip causing said portion to enter the notch, the flanges on the clip being spaced apart a distance greater than the height of the top rail so that the top rail is capable of motion in said clip between flanges, and in one position it is engaged by said inset and in another position it is free of the inset, in which position the clip can be moved to remove the portion of said one flange from the notch whereby the drop side may be lowered.

4,413,366

## BED FRAME

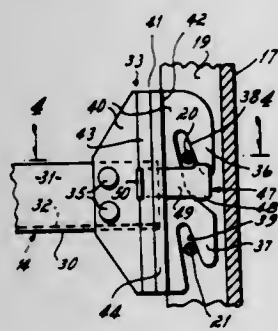
Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed May 26, 1981, Ser. No. 266,717

Int. Cl.<sup>3</sup> A47C 19/00

U.S. Cl. 5—201

3 Claims



1. A bed frame comprising a headboard, a footboard, and a pair of bed rails, said headboard and said footboard both having a pair of vertical slots for the reception of ends of said bed rails, and at least one pin extending across each said vertical slot, each of said bed rails comprising a longitudinally extending rail having a vertical section at each end of the rail, a bracket fixedly secured to the vertical section of each end of said rails, each of said brackets having at least one hook formed thereon, said hook being located in a vertical plane with extends

longitudinally of said rail, said hook being insertable into one of said vertical slots and over one of said pins contained within said slot,

a latch mounted for longitudinal sliding movement on each of said brackets, each of said latches being movable between a withdrawn position and an extended position, said latch in said extended position being adapted to cooperate with a hook of the bracket upon which said latch is mounted so as to lock a pin within said hook so as to prevent said bed rail from being disassembled from said headboard or footboard without said latch first being moved into said withdrawn position,

each of said brackets having an offset channel associated therewith, each of said channels extending in a vertical direction, and

a pair of horizontally aligned slots extending through each channel of each of said brackets, said latches being slideably mounted in said slots.

4,413,367

## CONFINING FRAME FOR WATER BED

Paul S. Miller, Collinsville, Ill., and Michael J. Rossi, 545 Buena Vista, Edwardsville, Ill. 62025, assignors to Michael J. Rossi, Belleville, Ill.

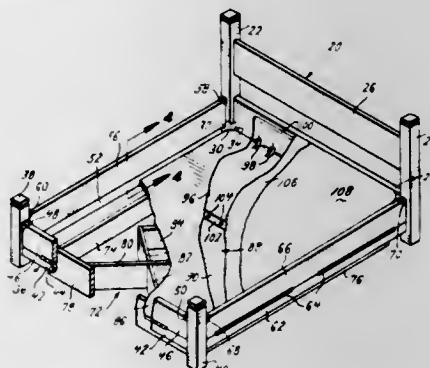
Continuation of Ser. No. 103,046, Dec. 13, 1979, abandoned.

This application Jun. 16, 1982, Ser. No. 389,095

Int. Cl.<sup>3</sup> A47C 27/08, 19/00

U.S. Cl. 5—411

10 Claims



1. A support for a waterbed mattress which comprises a generally horizontal platform, a confining side which is adjacent one side of said platform and which extends upwardly above the level of the upper surface of said platform, a second confining side which is adjacent the opposite side of said platform and which extends upwardly above the level of said upper surface of said platform, said platform and the first said confining side and said second confining side coacting to help define a space for a substantially dimensionally-stable, water-filled mattress which will rest upon said platform and which will have one side thereof and an opposite side thereof confined by said first said confining side and said second confining side, and one of said confining sides having at least a portion thereof which is mechanically independent of and is not secured to and which is selectively and bodily movable toward or away from the adjacent side of a substantially dimensionally-stable, water-filled mattress resting on said platform to support the adjacent side of such a substantially dimensionally-stable, water-filled mattress and also to apply frictional forces to the edges of a cover which is interposed between said one confining side and the adjacent side of such a substantially dimensionally-stable, water-filled mattress or to expose the adjacent side of such a substantially dimensionally-stable, water-filled mattress and thereby facilitate the positioning and smoothing of an edge of a cover for the adjacent side of such a substantially dimensionally-stable, water-filled mattress in smooth arrangement between the adjacent side of such a substantially dimensionally-stable, water-filled mattress and the inner face of said portion of said one of said confining sides.

4,413,368

## COMBINATION BEDSPREAD AND SLEEPING ENCLOSURE

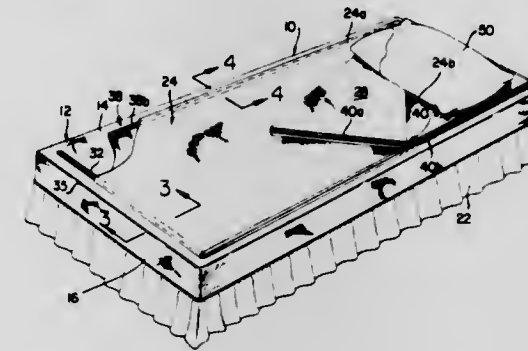
Nina Schuetz, 10108 Homeland Ave., Whittier, Calif. 90603

Filed Nov. 6, 1981, Ser. No. 318,830

Int. Cl.<sup>3</sup> A47G 9/00

U.S. Cl. 5—494

4 Claims



1. A combination bedspread and sleeping enclosure, comprising:

a bedspread adapted to be form-fitted over a mattress; a sleeping enclosure having an open head end, and a closed foot end, and longitudinal open sides, said enclosure being formed to be positioned on said bedspread;

said sleeping enclosure comprising a single, elongated, rectangular body cover adapted to be transversely folded into first and second half sections, whereby said closed foot end is defined along the transverse fold;

means interposed between said bedspread and said sleeping enclosure for removably securing said sleeping enclosure to said bedspread said removable securing means comprising a first securing fabric-strip member affixed transversely to said body cover adjacent said folded closed foot end; and a second securing fabric-strip member transversely affixed to said bedspread adjacent one end thereof; whereby said first and second securing strips are adapted to engage each other to fasten said sleeping enclosure to said bedspread; and

means formed along said longitudinal open sides of said sleeping enclosure for coupling the respective edges of said open sides to a closed position.

4,413,369

## AUTOMATIC DEVICE FOR LAP-JOINT ENGAGEMENT OF TWO BRIDGE ELEMENTS ON INTRADOS OR EXTRADOS AND BRIDGE ELEMENT COMPRISING IT

Michel E. Terrien, and Claude Bouvet, both of Angers, France, assignors to Etat Francals, Paris, France

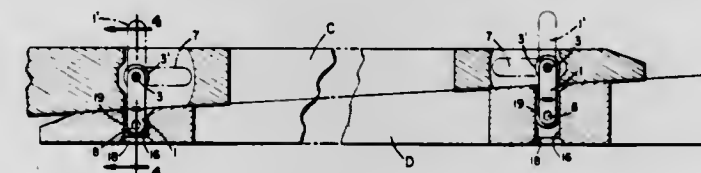
Filed Aug. 10, 1981, Ser. No. 291,453

Claims priority, application France, Oct. 21, 1980, 80.18256

Int. Cl.<sup>3</sup> E01D 15/14, 15/12

U.S. Cl. 14—27

6 Claims



1. A connecting device for permitting the lap joint connection of a first bridge element and a second bridge element, on intrados or extrados, wherein

the first bridge element includes a plurality of fingers, movable from a first position in which they are retracted into the plane of the first bridge element and toward two second positions in which the fingers protrude either on the intrados or on the extrados; and a shaft which is inte-

gral with said set of fingers and which is perpendicular to the longitudinal axis of the first bridge element; the second bridge element includes a plurality of passageways debouching on the intrados and extrados, said passageways being adapted to receive the fingers; a plurality of bolts which cooperate with said plurality of passageways to lock the fingers in an interlock position; and a motor which rotates said shaft so as to move the fingers from an unlocked position to the interlock position.

4,413,370

## UNITARY PIG FOR USE IN A PIPELINE

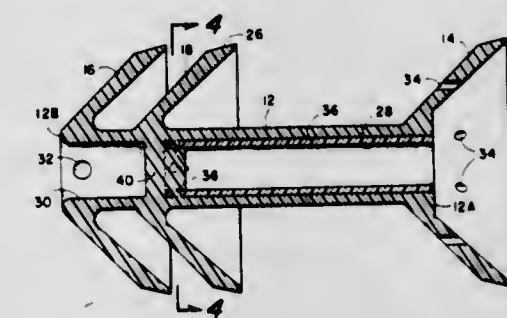
Larry D. Payne, Owasso; Hyun J. Cho, and Kishor N. Mehta, both of Tulsa, all of Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.

Filed Aug. 17, 1981, Ser. No. 293,084

Int. Cl.<sup>3</sup> B08B 9/04

U.S. Cl. 15—104.06 R

26 Claims



1. An improved pig for use in a pipeline comprising: an elongated cylindrical body of moldable semirigid material having a forward end and a rearward end; a plurality of cups integrally extending from said body, each cup extending rearwardly and outwardly to a peripheral pipe engaging surface, at least a major portion of said body having an axial opening therein; an elongated insert of stiff material received in said axial opening serving to increase the rigidity of said body, said elongated insert having at least one recess in the exterior surface whereby said body and integral cups are cast in place about said insert, material forming said body and cups entering said recess to lock said insert to said body.

4,413,371

## BLOWER ATTACHMENT FOR PORTABLE POWER UNIT

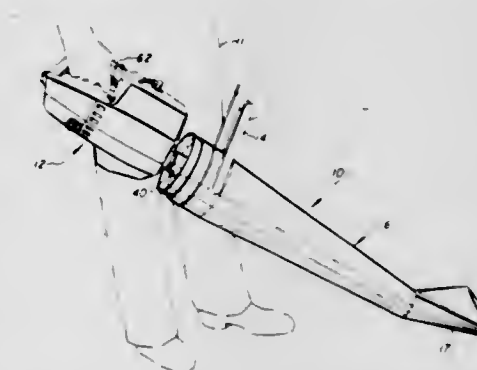
Lloyd H. Tuggle, Shreveport, and Ronald C. Loyd, Keithville, both of La., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 29, 1981, Ser. No. 278,694

Int. Cl.<sup>3</sup> A47L 5/14

U.S. Cl. 15—405

18 Claims



1. An air blower attachment for a portable power supply unit comprising: a housing including means forming an air inlet opening; an impeller rotatably mounted in said housing and including



shaft means operable to be drivably connected to power takeoff shaft means on said power supply unit; and means for coupling said air blower to said power supply unit comprising a boss on said power supply unit including a longitudinal bore, and a tubular sleeve secured to and extending from one end of said housing and adapted to be inserted in said bore in said boss in close fitting engagement with said boss, said impeller shaft means extending within said tubular sleeve into engagement with said power takeoff shaft means.

4,413,372

# SHOE ATTACHMENT FOR WET/DRY ELECTRIC VACUUM CLEANER

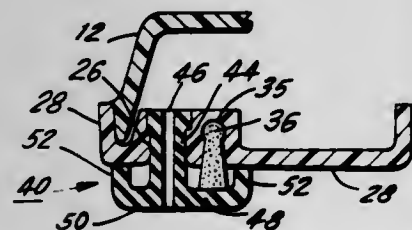
Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Nov. 12, 1981, Ser. No. 320,721

Int. Cl.<sup>3</sup> A47L 9/02

U.S. Cl. 15-414

12 Claims



1. A shoe attachment for the intake of a suction device, like a vacuum cleaner, or the like,

wherein the suction device includes an intake conduit, means for supplying suction force to the intake conduit, and the intake conduit having an end having an intake orifice into which material is sucked by the suction force; means communicating with the intake conduit for receiving material sucked into the intake orifice; the intake conduit being shaped for defining the intake orifice as a relatively narrow opening measured along one dimension of the intake orifice;

the shoe attachment for the intake comprising upstanding walls extending into the intake orifice, a plate extending beneath the end of the intake conduit at which the intake orifice is defined, the walls standing up from the plate, whereby the walls and the plate together close off flow through the intake orifice;

an inlet opening through the plate and defined by and extending between the walls of the shoe attachment and communicating into the intake conduit, wherein the inlet opening is narrower along the same one dimension than the intake orifice for increasing the air speed and/or the suction force at the inlet opening, as compared with the air speed and/or suction force that would be present at the intake orifice were the shoe attachment absent;

the shoe attachment is, at least at the plate thereof, comprised of a flexible and resilient material that is thick and flexible enough to deform to conform to irregularities in the surface over which the plate is moved as the intake conduit and inlet opening are moved across the surface to be suctioned.

## 4,413,373 PIVOT HINGE WITH REMOVABLE DOOR CLOSING DEVICE

Ryoichi Sasaki, Funabashi, Japan, assignor to Nippon Electric Industry Co., Ltd., Tokyo, Japan

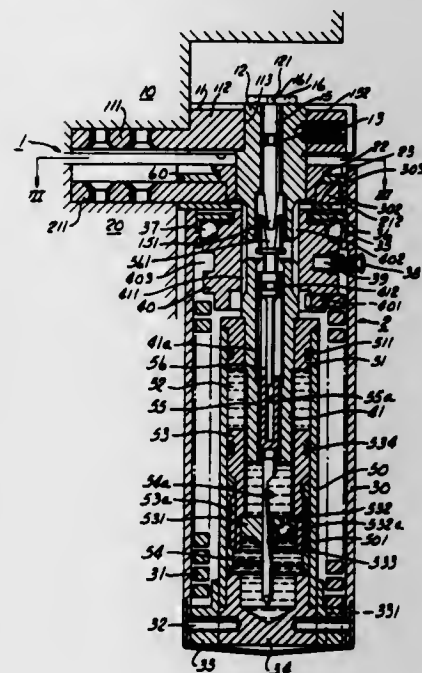
Filed Jun. 29, 1981, Ser. No. 278,463

Claims priority, application Japan, Jun. 28, 1980, 55-90022; Jun. 28, 1980, 55-90023; Jun. 28, 1980, 55-90024

Int. Cl.<sup>3</sup> E05F 3/08, 3/20

U.S. Cl. 16-54

9 Claims



1. In a pivot hinge for supporting a door at its top end and having a door closing device easily and removably assembled thereto, wherein said pivot hinge has a first plate member including a first leaf portion to be secured to the upper portion of a door frame and a first disk portion projecting horizontally from, and integral with, said first leaf portion, and a second plate member including a second leaf portion to be secured to the top end of the door and a second disk portion projecting horizontally from, and integral with, said second leaf portion, said first and second plate members being connected to one another by a pivot pin at said first and second disk portions, and said door closing device having an outer sleeve in which a door closing mechanism is contained, said door closing device comprises said outer sleeve, an inner member being mounted in said outer sleeve to be rotatable in relation to said outer sleeve and being removably connected to said pivot pin, and a coil spring member disposed within said outer sleeve with the lower end of said spring being connected to said outer sleeve and with the upper end being connected to said inner member so that said coil spring member may be twisted by rotation of said outer sleeve together with said second plate member in relation to said inner member to provide the door closing torque, the improvement comprising said second disk portion being formed with a plurality of first axial grooves in the outer surface thereof, said outer sleeve formed with a plurality of second axial grooves on the inner surface of its top end portion to provide axial ridges between adjacent said second axial grooves, said outer sleeve non-rotatably connected to said second disk portion by mating said first axial grooves with said axial ridges, a supporting disk member superposed onto the upper surface of said second disk portion and being rotatable about said pivot pin, said supporting disk member formed with a plurality of first cut-away portions at its peripheral edge portion for mating with said axial ridges and thereby providing radial projections, said outer sleeve formed with an annular groove intersecting each axial ridge in the inner surface of the top end portion thereof so that each said axial ridge has a radial recess to permit said supporting disk member to rotate in said outer sleeve, said outer sleeve retained to said second disk portion by engagement of said radial projections with said radial recesses.

4,413,374

# THREE PIECE KNOB ASSEMBLY INCLUDING A CAP

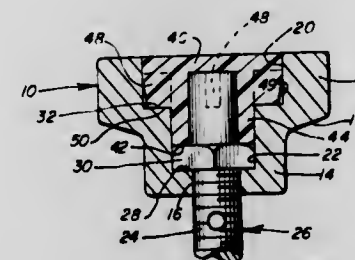
Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsch Company, Skokie, Ill.

Filed Jun. 12, 1981, Ser. No. 273,203

Int. Cl.<sup>3</sup> A47G 3/00

U.S. Cl. 16-121

5 Claims



1. A knob assembly comprising a knob having a top end and a bottom end, said knob defining an aperture including a first bore in said bottom end and including a second bore in said top end, said knob defining a seat around the upper end of said first bore and a shoulder around the lower end of said second bore; said knob having an intermediate interior surface with a non-circular configuration defining an intermediate portion of said aperture connecting said first and second bores, said knob intermediate interior surface terminating at one end along the inner periphery of said shoulder and at the other end along the outer periphery of said seat; nut means for mounting the knob assembly and having a configuration corresponding to, and disposed in, said intermediate aperture portion of said knob against said seat to prevent relative rotation between said knob and said nut means;

a cap having a cylindrical top end received in said second bore, said cap having a cylindrical bottom end with a bottom surface extending into said intermediate aperture portion for being positioned above said nut means in said intermediate aperture portion, said cap cylindrical bottom end having an outside diameter not exceeding the smallest cross-sectional dimension of said intermediate aperture portion, said cap top end defining a flange having an outside diameter about equal to that of said second bore, said cap further including a plurality of walls extending radially outwardly and depending from said cap flange, each said wall defining a bearing surface, said cap being disposed in said knob with said bottom surface of said cap bottom end engaging said nut means in said intermediate aperture portion and with said cap flange positioned in said second bore with said depending wall bearing surfaces supported on said shoulder; and

means for securing said cap to said knob whereby said cap positively holds said nut means in position within said knob.

4,413,375

# MEAT PROCESSING APPARATUS

John W. Cliff, Jr., Sioux City, Iowa, assignor to John Morrell & Co., Northfield, Ill.

Filed Aug. 17, 1981, Ser. No. 293,110

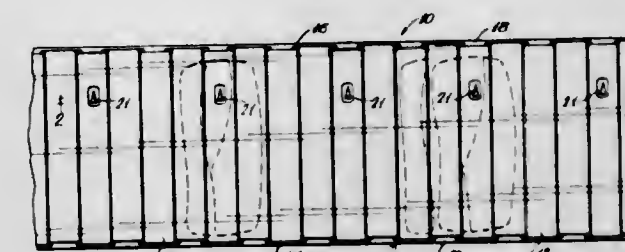
Int. Cl.<sup>3</sup> A22C 17/02

U.S. Cl. 17-1 R

10 Claims

1. Meat processing apparatus comprising, a device with a surface for supporting a body of meat during cutting thereof, and means for holding said meat securely on said surface including an opening in said surface, and a hook positioned within said opening, means mounting the hook for movement between a raised position above the opening for impaling of a body of meat thereon and a lowered position within the opening and not above the top of the surface, said opening having an area greater than said hook whereby the edge of the open-

ing is at a distance from the perimeter of the hook when the hook is in said lowered position to provide a space whereby a



portion of the meat is captured between the hook and the edge of said opening.

4,413,376

# SUPPORT SHACKLE AND PRODUCT DROP MECHANISM

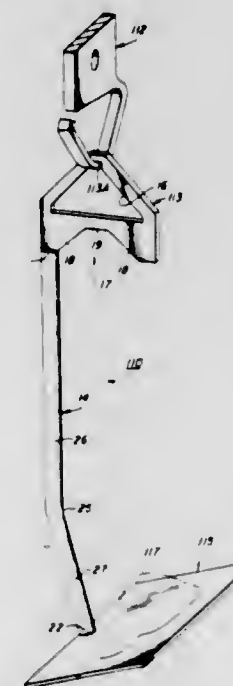
Richard D. Linville, P.O. Box 7, Pleasant Valley, Iowa 52767

Continuation of Ser. No. 227,140, Jan. 21, 1981, Pat. No. 4,372,009. This application Sep. 27, 1982, Ser. No. 424,322

Int. Cl.<sup>3</sup> A22C 21/00

U.S. Cl. 17-44.1

5 Claims



1. A shackle for hanging a product from a pendant depending from an overhead conveyor, comprising

hook means adapted to be attached to said pendant for pivotable movement about an axis parallel to the direction of travel of said conveyor,

an elongated rigid support member depending from said hook means to one side of said axis,

said support member having product support means disposed at its lower end and extending laterally therefrom directly below said axis for supporting said product with the center of gravity of said shackle and said product disposed directly below said axis and offset from said support member.

4,413,377

# SHRIMP STRIPPER

Edmund D. Betts, Libertyville, Ill., assignor to Gregor Jonsson Associates, Inc., Highland Park, Ill.

Filed Aug. 26, 1981, Ser. No. 296,528

Int. Cl.<sup>3</sup> A22C 29/02

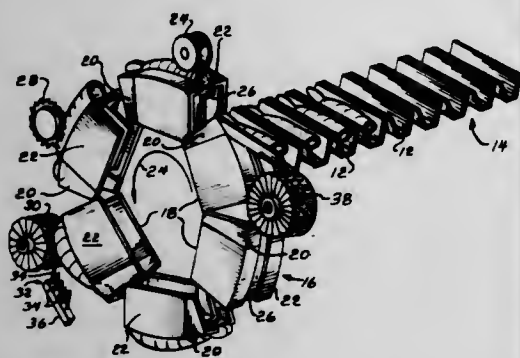
U.S. Cl. 17-73

21 Claims

1. A shrimp processing machine comprising: a plurality of processing stations including a meat separating station for separating the shrimp meat from the shrimp shells; and carrier means for transferring the shrimp through said processing



stations, said carrier means being arranged to transfer the shrimp along a descending path through said meat separating station, and said meat separating station including a plurality of spike members, each said spike member including an elongate shaft portion and a tip portion, said tip portions being disposed at an angle from said shaft portions and pointing in a direction



generally opposite to the direction of shrimp transfer by said carrier means, and said spike members being arranged for reciprocal movement to a protracted position into a shrimp for penetrating the shrimp and coacting with said carrier means for separating the shrimp meat from the shrimp shells and to a retracted position for movement out of the shrimp meat for releasing the separated shrimp meat.

4,413,378

#### METHOD AND DRAFTING ARRANGEMENT FOR SPINNING MACHINES FOR PROCESSING A FIBER SLIVER

Gerhard Mandl, Bruetten; Giancarlo Mondini; Viktor Pietrini, both of Winterthur; Kurt Weber, Elgg, and Rudolf Wildbolz, Winterthur, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

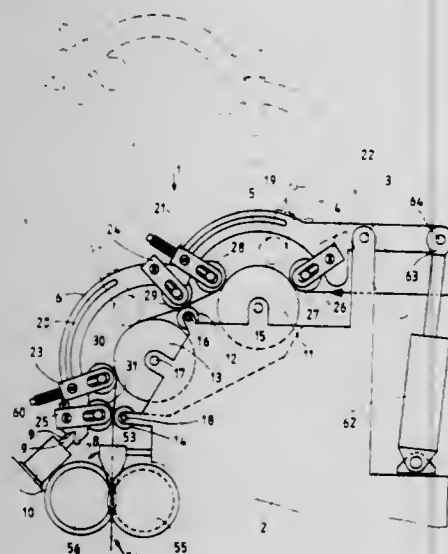
Filed Mar. 29, 1982, Ser. No. 362,873

Claims priority, application Switzerland, Apr. 6, 1981, 2309/81

Int. Cl.<sup>3</sup> D01H 5/70, 5/74

U.S. Cl. 19—258

22 Claims



1. In a method of processing a staple fiber sliver with a staple range between short to long staple fibers in a drafting arrangement for spinning machines, particularly for draw frames, wherein the staple fiber sliver is subjected to a high draft in drafting steps within drafting zones, the improvement which comprises:

positively deflecting the direction of movement of the fiber sliver per drafting step in front of and/or within the drafting zone, as the speed of the fiber sliver increases owing to thinning of the fiber sliver during the drafting process, in a manner such that the delivered fiber sliver, in relation to the inputted fiber sliver, is gradually subjected to a total positive deflection of substantially a 90° angle and that per

positive deflection the angular acceleration ( $r\omega^2$ ) does not exceed a value of 400 m/sec<sup>2</sup>.

4,413,379

#### ONE HAND OPERABLE WALL MOUNTED SPRING CLIPS

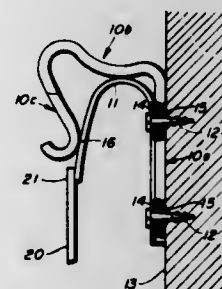
Alan G. Evans, Woodhaven Dr., Star Rte. 5, La Plata, Md. 20646

Filed Nov. 20, 1981, Ser. No. 323,314

Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 24—3 J

3 Claims



1. A clip for securing objects to a support surface, comprising:

a rigid means;

a spring means lying adjacent to said rigid means and having one leg biased toward one leg of said rigid means, said legs coacting with each other to form a length of a gripping jaw portion for holding an object placed therebetween, said leg of said spring means further being extended substantially beyond said leg of said rigid means and still further having a width substantially wider than said leg of said rigid means for the entire length of said jaw portion, whereby said leg of said spring means allows at least one finger of a user holding an object to slide continuously over the entire length of said leg of said spring means and simultaneously apply pressure to open said jaw portion and insert said object therebetween.

4,413,380

#### BINDING LOCKER

Tadashi Suzuki, Saitama, Japan, assignor to Satogosei Co., Ltd., Tokyo, Japan

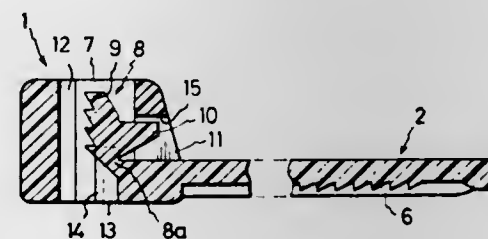
Filed Aug. 20, 1980, Ser. No. 179,810

Claims priority, application Japan, Jan. 8, 1980, 55-679

Int. Cl.<sup>3</sup> B65D 63/00

U.S. Cl. 24—16 PB

1 Claim



1. A binding locker for binding a plurality of objects together, said binding locker comprising:

(a) a band having a rack of engaging teeth formed on one surface thereof, said band having a leading end and a connecting end;

(b) a socket connected to said connecting end of said band and having a hole having an axis extending therethrough for receiving said leading end of said band, said socket further including an opening in communication with said hole and disposed at substantially right angles with said axis, said hole having a locking member projecting therein, said locking member having a plurality of locking

teeth for meshing with said engaging teeth when said band is inserted within said hole, whereby said leading end of said band and said socket are securely tied together to bind the plurality of objects;

(c) wherein said locking member has a projection disposed oppositely of said locking teeth and within said opening; and

(d) wherein said opening has an engaging surface and said locking member is secured to said socket in a manner to be movable as a force is exerted upon said band tending to withdraw it from said socket, whereby said projection is brought into contact with and is stopped by said engaging surface.

4,413,381

#### METHOD OF RETRIEVING AND SECURING ANCHORS, FISH TRAPS AND LOBSTER POTS

Robert J. Fidock, 49 Fourth St., Boolaroo, New South Wales, Australia

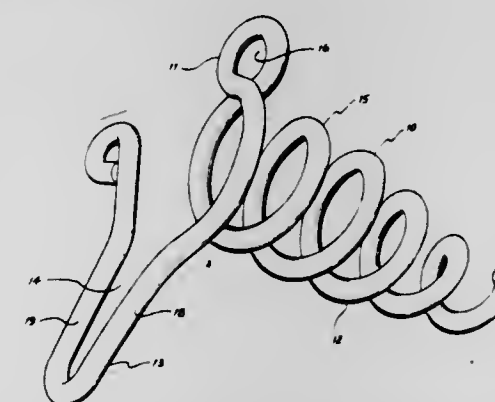
Filed Jul. 15, 1981, Ser. No. 283,670

Claims priority, application Australia, Oct. 30, 1980, PE6277

Int. Cl.<sup>3</sup> F16G 11/00

U.S. Cl. 24—131 C

5 Claims



1. A device to aid in the retrieval of anchors and like articles from the bottom of a body of water, comprising guide means having an aperture through which a rope or chain connected to the anchor or like article may pass freely and without obstruction, connection means adapted to allow the device to be connected to floatation means, and retaining means defining an upwardly opening generally V-shaped slot through which the rope or chain may run before passing through the guide means as the rope or chain is drawn in, the retaining means being so disposed relative to the guide means that in use a knot or other obstruction on the rope or individual links of a chain may ride upwardly through the V-shaped slot as the rope or chain is drawn in under tension but will engage behind the slot if the tension in the rope or chain is subsequently released, said V-shaped slot having a first portion adjacent its base in which the angle between the edges of the slot is less than in a second portion more remote from the base.

4,413,382

#### ROPE CLAMP

Goetz Siegmann, 3382 Rosenstra 4, Kressbron, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,283

Claims priority, application Switzerland, Jan. 29, 1980, 725/80

Int. Cl.<sup>3</sup> F16G 11/10

U.S. Cl. 24—132 R

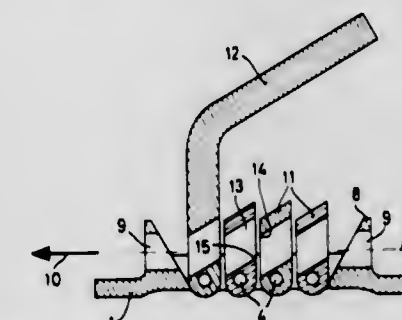
4 Claims

1. A clamp for securing and releasing a rope in a controlled fashion, the rope having an axis, the clamp comprising:

a base; and

a plurality of clamping members each having an opening therein through which the rope may pass, each said opening having an axis as well as a forward and a rear edge zone, each clamping member being attached proximate one end thereof to said base for pivotable movement independent of the pivotable movement of the other clamping

members in response to a force applied to one of said clamping members, the pivot axis of each clamping member being spaced from and parallel to the pivot axis of the other clamping members and lying in a common plane and also being transverse to and spaced from the axis of the rope, said clamping members having an open position in which each said clamping member lies in a plane at an oblique angle to the common axial plane containing the pivot axes of said clamping members for permitting the free passage of the rope through said openings;



wherein said openings are generally co-axial with one another and with the rope when said clamping members are in said open position; and

wherein said clamping members are relatively thick in relationship to their length, the thickness of said clamping members being measured generally along said axis of said opening therein, and the length thereof being measured generally along said oblique angle so that the rope is held in said clamp by coaction of the rear edge zone and forward edge zone of adjacent clamping members.

4,413,383

#### BUCKLES FOR HARNESES

David N. Spalding, Woking, England, assignor to Britax-Excel-sior Limited, Byfleet, England

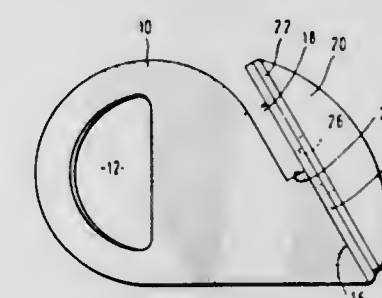
Filed Jul. 22, 1980, Ser. No. 171,216

Claims priority, application United Kingdom, Jul. 28, 1979, 7926379

Int. Cl.<sup>3</sup> A44B 11/00, 13/00

U.S. Cl. 24—164

1 Claim



1. A buckle for a safety harness formed of first and second interlocking parts, wherein the first and second parts are identical and each part comprises a plate having means for connection to a harness strap at one end, an upstanding portion at its other end folded at right angles along an oblique fold line, a slot dimensioned to receive the upstanding portion of the other part extending from the end of the fold line nearer to the harness aperture to the mid point of the fold line, a protuberance on the side of the upstanding end portion remote from the harness connection means to provide an abutment surface on the level of the plate on the inside of the fold line and a hole through said upstanding end portion with its axis aligned with the end of the slot at the midpoint of the fold line whereby, if the two parts are interengaged with each upstanding portion received in the oblique slot of the other part, tension applied to the harness apertures pulls the two parts so that the ends of their slots abut and the two holes in the upstanding end por-



tions are aligned with one another to permit an object to the inserted therethrough to lock the two parts in engagement with one another.

4,413,384

**LOCKING DEVICE FOR A SAFETY BELT**

Jakob Lassche, 45, Wiesenweg, 7230-Schramberg, Fed. Rep. of Germany

PCT No. PCT/NL80/00025, § 371 Date Apr. 2, 1981, § 102(e)

Date Mar. 18, 1981, PCT Pub. No. WO81/00383, PCT Pub.

Date Feb. 19, 1981

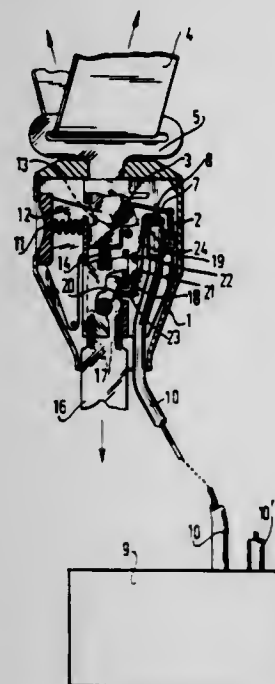
PCT Filed Jul. 29, 1980, Ser. No. 247,541

Claims priority, application Netherlands, Feb. 8, 1979, 7905948

Int. Cl.<sup>3</sup> A44B 19/00

U.S. Cl. 24—603

4 Claims



1. A locking device for a safety belt comprising a housing, a fastening member having a portion disposed in said housing for limited movement between retracted and extended positions with respect thereto, first spring means for urging said housing and fastening member to said retracted position, a lock bolt received in said housing for limited movement between locking and unlocking positions relative thereto, second spring means for urging said lock bolt toward said locking position, a key receivable in said housing and having a recess receiving said lock bolt in the locking position of the latter to prevent withdrawal of the key from said housing, means for effecting remote actuation of said lock bolt from said locking position toward said unlocking position whereby said key may be withdrawn from said housing, and blocking means operative when said fastening member and housing are in said extended position for blocking said means for effecting remote actuation and operative when said fastening member and housing are in said retracted position for unblocking said means for effecting remote actuation.

4,413,385

**INVERSE CLEVIS SAFETY BELT BUCKLE**

James A. Gavan, Centerline, and William E. Brennan, Troy, both of Mich., assignors to Irvin Industries, Inc., Madison Heights, Mich.

Filed Apr. 13, 1981, Ser. No. 253,200

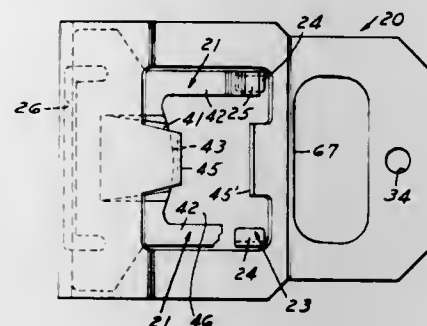
Int. Cl.<sup>3</sup> A44B 11/26

U.S. Cl. 24—230 A

14 Claims

1. A safety belt buckle characterized by a sheet metal loop formed clevis having apertured ends for attachment to a first belt end, a fully surrounded slot in the clevis loop end extremity, a connector having an apertured end for attachment to a second belt end and a tongue insertable through said slot into close proximity with one side of said clevis, said tongue

having an apertured end adapted for latch engagement, a latch having a reaction end extending beyond both extremities of said slot pivotally seated against slotted and unslotted portions of said loop end extremity within said clevis adjacent said slot having a latch projection engageable with said tongue aper-



4,413,386

**CONNECTING DEVICE FOR END OF ROPE OR BAR AND METHOD FOR PRODUCING THEREOF**

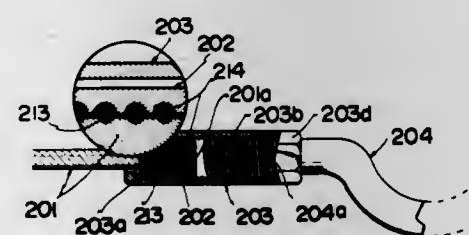
Soichiro Sato, 3728 Oaza Nishihonjoji, Sanjo-shi, Niigata-pref., Japan

Filed Jan. 12, 1982, Ser. No. 338,979

Int. Cl.<sup>3</sup> B66C 1/34; F16G 11/14

U.S. Cl. 24—230.5 R

6 Claims



1. A system for connecting a rope or bar to a threaded bolt, comprising:

a rope or bar member;  
a bolt member having a portion thereof externally threaded;  
a tubular coupling member having one end thereof internally threaded for engagement with said externally threaded portion of said bolt member, the other end of said coupling member being provided with a radially inwardly extending annular shoulder portion; and  
a sleeve member, having an outside diameter less than the inside diameter of said tubular coupling yet greater than the inside diameter of said annular shoulder portion, fixed onto said rope or bar member by means of a coil member, interposed between said rope or bar member and said sleeve member and embeddedly disposed within said rope or bar member and said sleeve member, and a malleable sleeve interposed between said coil member and said sleeve member, as well as within the interstices defined between successive spirals of said coil member so as to also be interposed between said rope or bar member and said sleeve member.

4,413,387

**DRILLING APPARATUS**

William Guier, 3100 E. 71st St., Tulsa, Okla. 74136

Filed May 22, 1981, Ser. No. 266,439

Int. Cl.<sup>3</sup> E12B 3/00

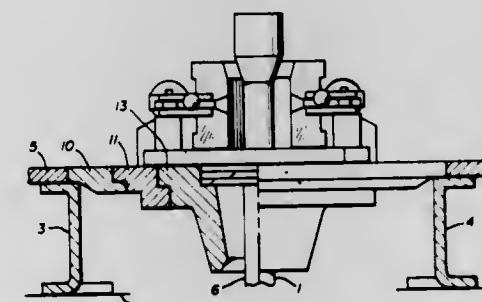
U.S. Cl. 188—67

1 Claim

1. A spider with which to grip and suspend a drill string

within a well bore at predetermined times within the drilling and tripping sequences, including,

a drilling floor extending horizontally and over the well bore having an aperture concentric with the well bore,  
a plurality of plate structures mounted over the floor aperture and having apertures of progressive sizes oriented concentric with the floor aperture and each other's apertures,  
tab structures mounted at the edges of the plates to support and register the plates to maintain the concentricity of the plate and floor apertures,



a pair of jaws mounted to pivot on one of the upper plates and sized and arranged to have two positions which permit drill pipe to freely pass into and out of the well bore and alternatively grip the drill pipe at predetermined longitudinal locations as required to suspend the pipe during drilling and tripping sequences,  
linkages connected between the pivoted jaws and the upper plate to actuate the jaws between their two positions,  
hydraulic piston-cylinder structures mounted on the upper plate with their pistons connected to the linkages, and means for applying hydraulic fluid to the cylinders to move the pistons in their actuation of the jaws.

4,413,388

**PIPE REPAIR CLAMP**

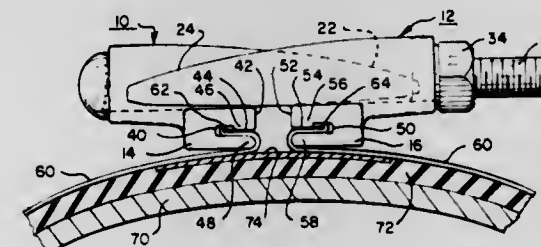
Fuad Akhtar-Khavari, and Bernard J. Lobin, both of Texarkana, Tex., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 4, 1981, Ser. No. 260,226

Int. Cl.<sup>3</sup> B65D 63/02; F16I 55/16

U.S. Cl. 24—279

4 Claims



1. A pipe clamp comprised of a pair of lugs each of which has a base with an inner edge, an axially extending recess in each base forming opposed jaws in each base and opening to respective inner edges of each base, said recess being comprised of a first portion of essentially rectangular cross section and remote from said inner edges, and a second portion extending from said first portion to the said inner edges, the radial dimension of said first portion being larger than the radial dimension of said second portion and extending radially outward beyond the radial dimension of said second portion, a band having surface and edge portions and extending between said lugs, an intermediate portion at said band is of a radial dimension snugly received in said second portion of each recess, enlarged portions on the ends of said band comprised of multiple layers of band having surface portions in substantial area contact with each other, formed by the end portions of the band being folded back on the band whereby the surfaces of layers which are in contact with each other are continuations

of each other, said enlarged portions and said band being axially insertable and snugly received in respectively the first and second portions of said recesses in each of said lugs.

4,413,389

**RELEASABLE BUCKLE STRUCTURE AND METHOD**

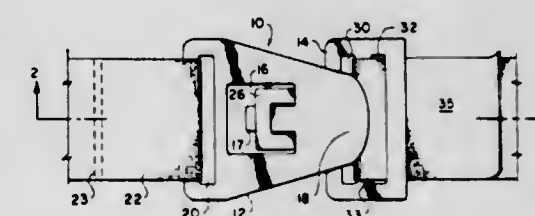
Greg E. Lowe, Ogden, Utah, assignor to Lowe Alpine Systems, Inc., Lafayette, Colo.

Filed Jan. 19, 1981, Ser. No. 225,826

Int. Cl.<sup>3</sup> A44B 11/28

U.S. Cl. 24—312

13 Claims



1. A releasable buckle structure comprising:  
an engaging member of a curved, planar configuration having attachment means defined at one end thereof and a release handle defined at the opposite end thereof, the engaging member further including a U shaped opening defined therein between the attachment means and the release handle portion, the U shaped opening defining an engaging projection centrally thereof,  
a receiving member of a planar configuration having attachment means defined at one end thereof and a U shaped portion at the opposite end thereof, the U shaped portion having a receiving opening defined centrally therein, the engaging projection of the engaging member being adapted to fit within the receiving opening of the receiving member with the side legs of the U shaped portion of the receiving member being adapted to fit within the side legs of the U shaped opening defined in the engaging member;  
whereby the engaging member and receiving member may be releasably secured together with the engaging projection of the engaging member fitting within the U shaped portion of the receiving member, the structure further being releasable by pulling upon the release handle thereby rotating the engaging member and causing the U shaped portion of the receiving member to ride along the engaging projection to ultimately provide release by disengaging the U shaped portion through the bottom of the U shaped opening.

4,413,390

**CASKET-PLACER AND CASKET-LOWERING APPARATUS**

Herbert R. Blaese, and Christopher R. Lorenc, both of Chicago, Ill., assignors to Wilbert, Inc., Forest Park, Ill.

Filed May 3, 1982, Ser. No. 374,100

Int. Cl.<sup>3</sup> A61G 19/00

U.S. Cl. 27—32

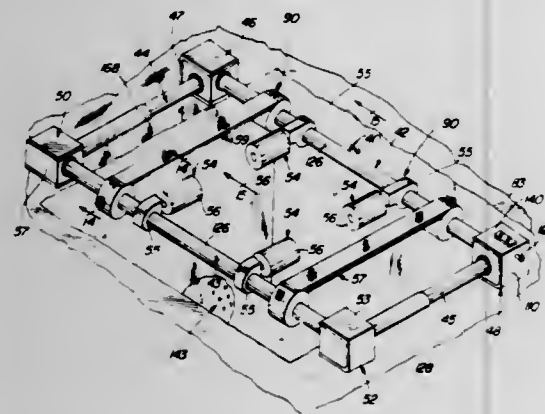
37 Claims

1. Apparatus for lowering a casket into a grave opening, or into the base of a burial vault in the grave opening, having four corner locations at the ground surface adjacent the said grave opening, comprising:

(a) a generally rectangular-shaped supporting frame adapted to be arranged over the said grave opening and including  
(1) a pair of generally parallel side rail members adapted to be arranged adjacent the sides of the said grave opening and including  
a. a first side rail member; and  
b. a second side rail member; and  
(2) a pair of generally parallel end rail members adapted to be arranged adjacent the ends of the said grave opening including



- a. a first end rail member; and  
b. a second end rail member;  
(b) a combination braking and power transmission head arranged at one corner of the said apparatus and at one of the said corner locations at the said ground surface of the said grave opening;  
(c) means operatively interconnecting one of the said end rail members with one of the said side rail members and with the said power transmission means for rotational movement together;  
(d) means operatively interconnecting the second one of said side rail members with the said power transmission means for rotational movement together;  
(e) casket-placer and casket-supporting means carried by the said side rail members and movably downwardly thereon into the grave opening under the rotational movement of



the said side rail members for supporting a casket in position on the said apparatus above the grave opening for a graveside service and for lowering the casket into the grave opening after conclusion of the graveside service; and

- (f) means including  
(1) electronically controlled braking means in the said braking and power transmission head under the control of the said casket-placer and casket-supporting means and operable by the weight of a casket resting on the said casket-placer and casket-supporting means and the rotational movement of the said side rail members and one of the said end rail members for controlling the speed of rotation of the said casket-placer and casket-supporting means and the speed of the lowering movement of the casket into the grave opening.

4,413,391

## RESIN CONTAINING TEXTILES

Armen Ranzilian, Colonie; Thomas H. Curry, Clifton Park, and Elizabeth Stracchino, Courtland, all of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,139

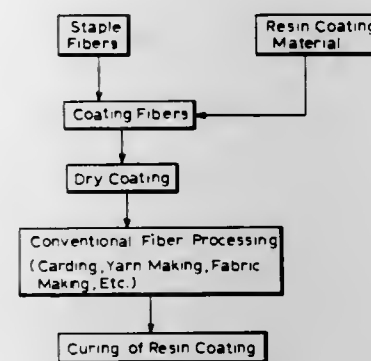
Int. Cl.<sup>3</sup> D65N 71/00

U.S. Cl. 28—166

2 Claims

1. A method of preparing textile fabrics from loose, staple textile fibers, which comprises;  
coating the fibers with a film of a synthetic, cross-linkable, polymeric resin, said resin being one which will, following application, dry to a tack-free state which will not adhere to itself;

drying the film so that it is tack-free and will not adhere to itself;



forming the coated fibers bearing dry film into a fabric form; and cross-linking the resin whereby the coated fibers in the fabric form remain unbonded to each other.

4,413,392

## METHOD OF MAKING TWO-STAGE CATALYTIC CONVERTER

Junji Otani, Oomiya; Yasuo Ikenoya, Kawagoe, and Kanau Iwashita, Sakado, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

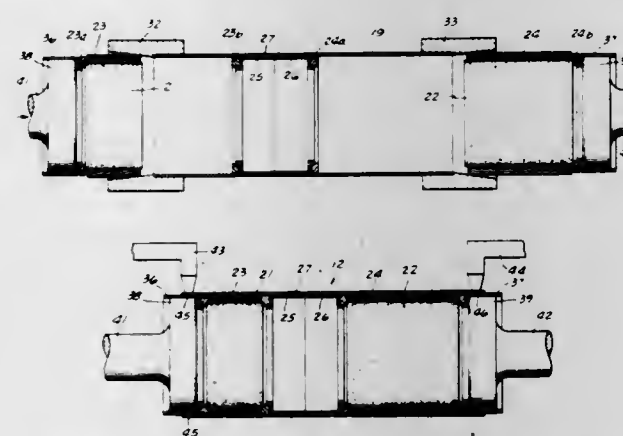
Filed Aug. 13, 1981, Ser. No. 292,618

Claims priority, application Japan, Aug. 22, 1980, 55-116230; Aug. 25, 1980, 55-116741

Int. Cl.<sup>3</sup> B23P 15/00; F01N 3/10

U.S. Cl. 29—157 R

3 Claims



1. A method of assembling a catalytic converter having a cylindrical casing, catalyst elements, peripheral cushions about the catalyst elements and flanged sleeves to locate the catalyst elements in the casing, comprising the steps of  
mounting tapered guide rings on opposite ends of the cylindrical casing;  
simultaneously pushing the catalyst elements with the peripheral cushions thereabout and the flanged sleeves, placed outwardly of the catalyst elements, into the opposite ends of the cylindrical casing by means of opposed flanged pusher bars, the tapered guide rings and the action of the flanged pusher bars squeezing the peripheral cushions into the casing and around the catalyst elements;  
removing the tapered guide rings; and  
spot welding the flanged sleeves to the casing using the flanged pusher bars as welding electrodes in combination with additional welding electrodes outside of the cylindrical casing.

4,413,393

## METHOD OF MANUFACTURING A VALVE ASSEMBLY

Petrus J. R. Schils, Breda, Netherlands, assignor to Keystone International, Inc., Houston, Tex.

Division of Ser. No. 887,513, Mar. 17, 1978, Pat. No. 4,275,867.

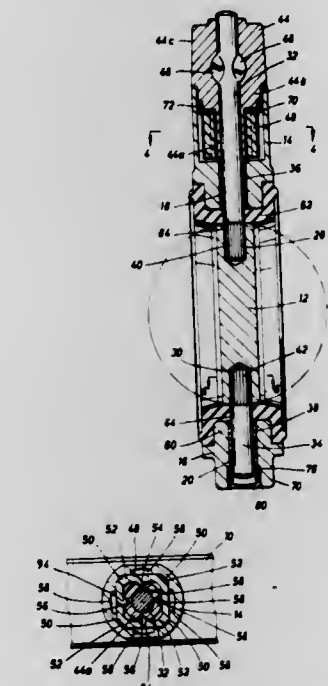
This application Jan. 22, 1981, Ser. No. 227,428

Claims priority, application Netherlands, Mar. 17, 1977, 7702881

Int. Cl.<sup>3</sup> B23P 15/00; F16K 31/00

U.S. Cl. 29—157.1 R

13 Claims



1. A method of making a disc-type valve assembly comprising:  
emplacing an integral positioning sleeve formed of resilient material generally coaxially within a radial passageway extending from a flowway in a tubular valve body, said sleeve and said valve body being formed with retainer formations wherein one of said sleeve and valve body is formed with radially projecting retainer formations and the other of said sleeve and valve body is formed with radially receiving retainer formations, said retainer formations being radially formed with respect to said sleeve, said sleeve being so emplaced as to interengage said retainer formations;  
emplacing a disc-like valve element in the flowway of said valve body;  
connecting a handle to a shaft member to form a rotating body; inserting one end of said shaft member through said positioning sleeve in said radial passageway of said valve body and into engagement with said valve element and thereby wedging said positioning sleeve radially with respect to itself in tight prestressed relation between said valve body and said rotating body such that said rotating body is rotatably mounted with respect to said valve body and interengaging detent formations formed on said sleeve and rotating body wherein one of said sleeve and rotating body is formed with radially projecting detent formations and the other of said sleeve and rotating body is formed with radially receiving detent formations, said detent formations being radially formed with respect to said sleeve and said rotating body.

4,413,394

## METHOD OF CONSTRUCTING A TUBE BUNDLE

William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 98,576, Nov. 28, 1979, Pat. No. 4,311,187.

This application May 18, 1981, Ser. No. 264,529

Int. Cl.<sup>3</sup> B23P 15/26

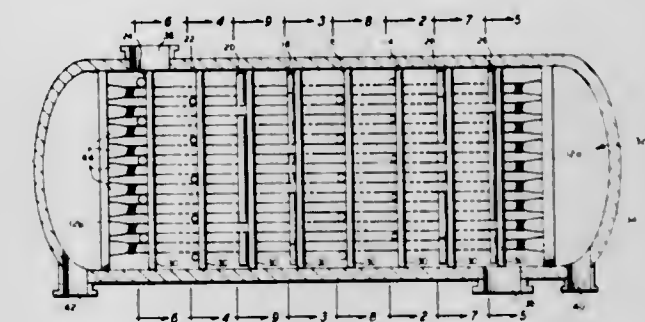
U.S. Cl. 29—157.3 B

4 Claims

1. A method of constructing a tube bundle comprising:  
(a) inserting a plurality of tubes into a ring having a plurality of first rods affixed thereto as parallel chords to form a plurality of parallel tube rows with the rows spaced from

one another and extending parallel to said plurality of first rods, said first rods having a diameter less than the spacing between adjacent tube rows in the first plurality of parallel tube rows; and

- (b) inserting a plurality of second rods parallel to said plurality of first rods between the parallel tube rows, said sec-



ond rods each having a diameter greater than the spacing between adjacent tube rows in the first plurality of parallel tube rows, the diameter of a first rod plus the diameter of a second rod being about twice the spacing between adjacent tube rows in the first plurality of parallel tube rows, to wedge each row of at least a portion of said plurality of parallel tube rows between a first rod and a second rod.

4,413,395

## METHOD FOR FIXING A TUBE BY EXPANSION

Andre Garnier, Berlaimont, France, assignor to Vallourec SA, Paris, France

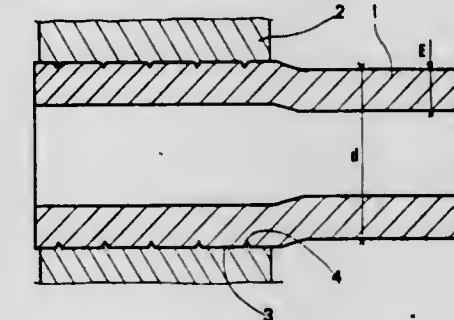
Filed Feb. 2, 1981, Ser. No. 230,531

Claims priority, application France, Feb. 15, 1980, 80 03348

Int. Cl.<sup>3</sup> B21D 39/06, 39/10; B23P 15/26; F16L 39/00

U.S. Cl. 29—157.3 C

4 Claims



1. A method for fixing a thin tube by expansion, the tube having an outside diameter from about 19 to 32 mm, comprising:  
(a) forming at least one bore in a metal plate to receive the tube, the inside surface of said bore having at least one annular projection with an axial length not greater than 1 mm when measured parallel to the axis of the bore, the annular projections being formed by displacing material on the bore surface before the end of the tube is set in position in the bore;  
(b) inserting the tube, which has a wall thickness from about 0.25 to 0.50 mm and said outside diameter being less than the inside diameter of the bore, into said bore; and  
(c) forcing the outer surface of the tube against the inside surface of the bore so that the annular projections are crushed on the inside surface of the bore to sealingly engage the outer surface of the tube.



# 4,413,396 MICROPROCESSOR CONTROL YIELD POINT TIGHTENING SYSTEM

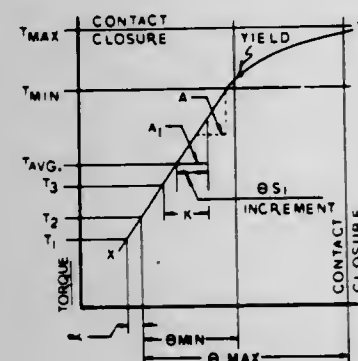
William K. Wallace, Barneveld; David A. Giardino, New York, and Joseph R. Groshans, Deerfield, all of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,424

Int. Cl.<sup>3</sup> B23P 19/06; G01L 5/24

U.S. Cl. 29—407

2 Claims



1. A method for tightening a fastener to yield point comprising the steps of:

- (1) rotating the fastener until a torque level  $T_3$  is reached, which is the beginning of a yield point sensing operation;
- (2) recording said torque level  $T_3$ ;
- (3) rotating the fastener through a predetermined angle  $\theta_{s1}$  to arrive at torque level  $T_4$ ;
- (4) recording said torque level  $T_4$ ;
- (5) calculating the averaging torque between  $T_3$  and  $T_4$ ;
- (6) determining the area under the torque-angle curve by summing measured torque values within the angular increment of  $\theta_{s1}$  less the product of average torque times  $\theta_{s1}$ ;
- (7) advancing predetermined angle  $\theta_{s1}$  one angular increment and repeating the procedure set forth in steps 4, 5 and 6, and calculating a quotient based on a last determined area to that of an initially determined area; and
- (8) continuing the procedure set forth in step 7, until the ratio of the last determined area decreases from unity to a predesignated value at which point the tightening operation is terminated to avoid fastener torquing beyond yield point.

4,413,397

## METAL DOOR AND LIGHT ASSEMBLY

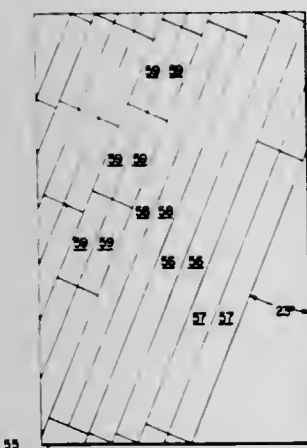
H. Smith McKann, Fredericksburg, Va., assignor to General Products Company, Inc., Fredericksburg, Va.

Division of Ser. No. 178,493, Aug. 15, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,351

Int. Cl.<sup>3</sup> B23P 17/00, 6/00

U.S. Cl. 29—416

2 Claims



1. A method of forming a door panel having an opening to receive a half-frame and muntins and of forming the half-frame and muntin members usable to retain a glass panel when assembled with a similar door panel and half-frame comprising the steps of:

- cutting a rectangular plate from the door panel to form an opening therein;
- bending the edges of the door panel around the opening thus formed to provide an L-shaped retaining ledge at each side of the opening;
- cutting the plate from the door panel along diagonal parallel lines to provide elongated strips of suitable width to provide a pair of horizontal frame members, a pair of vertical frame members, a pair of long muntins and six short muntins;
- cutting the strips transversely into proper lengths for the frame and muntin members; and
- bending the frame and muntin members into desired cross-sectional shapes whereby the door panel and frame and muntin members are provided with minimum material waste.

4,413,398

## SLIDE FASTENER CHAIN WITH LEG REMANENTS AT GAP AND METHOD AND APPARATUS OF MANUFACTURE

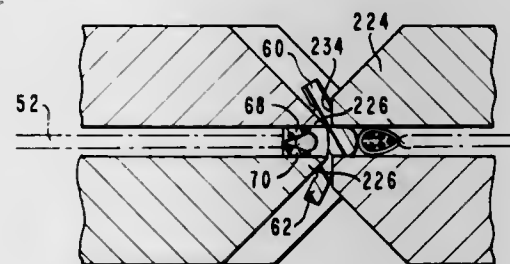
Harry M. Fisher, Whitestone, and Stuart N. Fisher, Floral Park, both of N.Y., assignors to Talon, Inc., Meadville, Pa.

Filed Sep. 21, 1981, Ser. No. 304,450

Int. Cl.<sup>3</sup> B21D 53/54; A41H 37/06

U.S. Cl. 29—410

10 Claims



1. A method of forming gaps in rows of coupling elements secured on respective inner edge portions of a pair of coplanar supporting tapes in a slide fastener chain, comprising the steps of positioning a section of the slide fastener chain relative to first and second spaced cutting disks such that coupling elements at one end of the section of slide fastener chain are positioned between peripheral portions of the cutting disks, rotating the cutting disks in opposite directions so as to engage cutting sections protruding radially from the periphery of the disks with coupling elements to sever portions of the engaged coupling elements and to pull the section of slide fastener chain between the disks, and removing the severed portions of coupling elements from the slide fastener chain to form a gap in the slide fastener chain.

4,413,399

## APPARATUS AND METHOD FOR PRECISELY POSITIONING AN OBJECT

David J. Crawford, Poughkeepsie, and Robert G. Meeker, La-Grangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,821

Int. Cl.<sup>3</sup> B21D 39/03; B23P 19/04

U.S. Cl. 29—428

12 Claims

1. Apparatus for moving an object a fixed distance from an unknown initial position, and apparatus comprising: a support member; a stop member fixed relative to said support member; first means mounted for movement relative to said support member for engaging the object to be moved to impart force thereto;

4,413,401

## METHOD FOR MAKING A SEMICONDUCTOR CAPACITOR

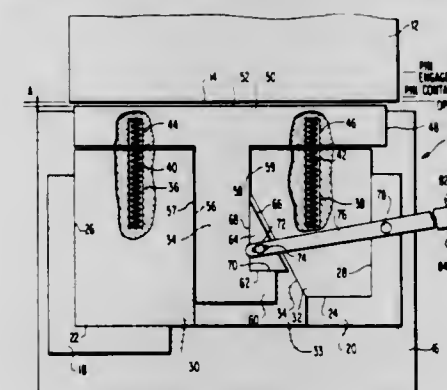
Thomas Klein; Andrew G. Varadi, and Charles E. Boettcher, all of Saratoga, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 59,637, Jul. 23, 1979, Pat. No. 4,290,186, which is a continuation of Ser. No. 788,872, Apr. 19, 1977, abandoned. This application Jul. 6, 1981, Ser. No. 280,984

Int. Cl.<sup>3</sup> B01J 17/00; H01L 21/265

U.S. Cl. 29—571

12 Claims



- ment of the object which exceeds the force imparted by said bias spring; and
- third means operatively associated with said first and second means for fixing the relative positions of said first and second means when said initial position is reached and then moving them together relative to said stop member through a fixed distance, whereby the object is moved said fixed distance from said initial position to a final position.

4,413,400

## APPARATUS AND PROCESS FOR NESTING DRUM BODIES

Norman L. Fischell, 8 Foothill Dr., Kinnelon, N.J. 07405

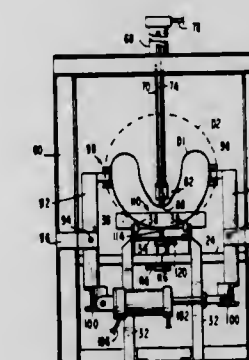
Division of Ser. No. 229,133, Jan. 21, 1981. This application

Dec. 9, 1982, Ser. No. 448,360

Int. Cl.<sup>3</sup> B21D 39/00

U.S. Cl. 29—515

5 Claims



1. A process for nesting a plurality of drum bodies to form a nested drum bodies assemblage which comprises:
  - (a) positioning a drum body in a deformation zone;
  - (b) exerting a linear deformation force upon said drum body and towards an axis of said drum body to form a deformed drum body;
  - (c) positioning another drum body about an end portion of said deformed drum body;
  - (d) removing said initial linear deformation force; and
  - (e) moving said another drum body to a point where said another drum body surrounds said deformed drum body.

1. A method for making a semiconductor capacitor device comprising the steps of:
  - forming a semiconductor region of one conductivity type within a higher resistivity semiconductor region of the same type conductivity;
  - forming a shallow semiconductor region of opposite conductivity type within said semiconductor region of one conductivity type located within said higher resistivity semiconductor region of the same one type conductivity;
  - forming an insulating layer on a surface of said semiconductor region of one conductivity type, said higher resistivity semiconductor region of the same one type conductivity and said shallow semiconductor region of opposite conductivity type;
  - forming an electrically conductive electrode on a surface portion of said insulating layer located over said shallow semiconductor region of opposite conductivity type, said electrode being contoured to have an area that covers a major portion of the area of said shallow semiconductor region of opposite conductivity type; and
  - depositing an electrical contact to make an electrical connection to said shallow semiconductor region of opposite conductivity type, said electrically conductive electrode being one plate of the semiconductor capacitor device, said insulating layer being the dielectric of the semiconductor capacitor device, and said semiconductor region of opposite conductivity type being the other plate of the semiconductor capacitor device.



4,413,402

**METHOD OF MANUFACTURING A BURIED CONTACT IN SEMICONDUCTOR DEVICE**

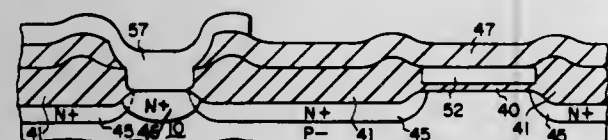
Darrell M. Erb, Los Altos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 22, 1981, Ser. No. 313,569

Int. Cl.<sup>3</sup> H01L 21/265

U.S. Cl. 29—571

10 Claims



1. A method of manufacturing a semiconductor structure comprising:
  - forming a first oxide layer over a silicon substrate;
  - forming at least one polysilicon gate electrode on said first oxide layer;
  - implanting dopant ions into said substrate using said gate electrode as a mask so that said dopant forms a source/drain region in said substrate with respect to said electrode to create a MOSFET structure;
  - thickening said first insulating layer not covered by said gate electrode by oxidation to a thickness so as to surround said gate electrode;
  - etching said gate electrode so as to expose said first insulating layer therebelow;
  - etching said exposed first insulating layer to expose said substrate;
  - introducing a second dopant into said exposed substrate to diffuse through said substrate to said source/drain region;
  - forming a conducting lead over said thickened first insulating layer to contact said exposed substrate, whereby a buried contact to said source/drain region is formed.

4,413,403

**METHOD OF PRODUCING SEMICONDUCTOR DEVICES**

Shoji Arizumi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 87,813, Oct. 24, 1979, abandoned. This

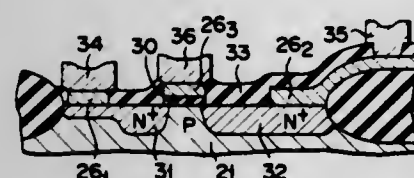
application Feb. 23, 1982, Ser. No. 351,407

Claims priority, application Japan, Oct. 31, 1978, 53-134246

Int. Cl.<sup>3</sup> H01L 21/22

U.S. Cl. 29—571

3 Claims



1. A method of producing a semiconductor device, comprising the steps of:
  - (1) forming a silicon oxide film on one main surface of a silicon semiconductor substrate of one conductivity type;
  - (2) selectively removing the silicon oxide film so as to provide openings partly exposing the surface of the substrate;
  - (3) forming a poly-Si film of the opposite conductivity type on the entire surface of the substrate by the chemical vapor deposition method;
  - (4) forming a silicon nitride film on the poly-Si film;
  - (5) selectively removing the silicon nitride film and the poly-Si film successively in a manner to form a pattern of the electrodes and wiring layers;
  - (6) removing the patterned silicon nitride film except the contact-forming portion in which a conductive layer is brought into contact with the underlying poly-Si film layer;

- (7) selectively removing the exposed portion of the silicon oxide film so as to provide openings through which an impurity is diffused into the substrate for forming source and drain regions, the unremoved portion of the silicon oxide film constituting a gate oxide film;
- (8) oxidizing the entire surface of the substrate so as to form a silicon oxide film covering the exposed portion of the substrate and the exposed portion of the poly-Si film;
- (9) removing the remaining silicon nitride film to form the contact-forming portion; and
- (10) forming the conductive layer in contact with the poly-Si film via the contact-forming portion.

4,413,404

**PROCESS FOR MANUFACTURING A TEAR STRIP PLANARIZATION RING FOR GANG BONDED SEMICONDUCTOR DEVICE INTERCONNECT TAPE**

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 139,934, Apr. 14, 1980, Pat. No. 4,312,926.

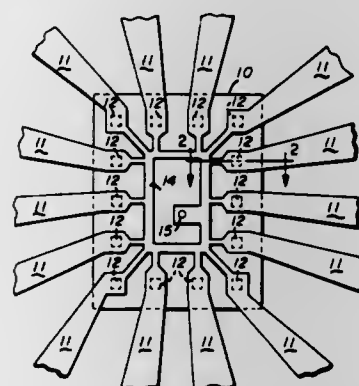
This application Aug. 10, 1981, Ser. No. 291,197

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> H01L 21/92, 21/96, 21/98

U.S. Cl. 29—590

5 Claims



1. A process for interconnecting an automatic assembly tape with a semiconductor device having a pattern of bonding pads thereon, said tape including a plurality of successive finger arrays each of which comprises a plurality of metal fingers extending inwardly to form an inner array that mates with said pattern of bonding pads, said process comprising the steps of:
  - forming a ring of metal integral with said fingers inside said inner array with each finger being connected to said ring;
  - forming a weakened region between each finger in said inner array and said ring;
  - bonding said fingers to said bonding pads at said inner region; and
  - removing said ring from said fingers thereby to leave said fingers attached to said semiconductor device.

4,413,405

**METHOD FOR FITTING MAGNETIC WEDGES**

Hiroshi Doke, Suzuka, Kazunobu Itomi, Yokohama, and Kenshi Ishihara, Mie, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 29, 1981, Ser. No. 316,530

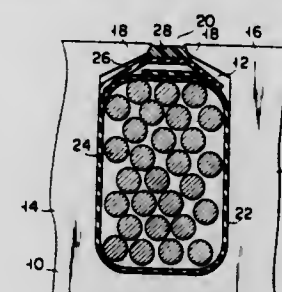
Int. Cl.<sup>3</sup> H02K 15/00

U.S. Cl. 29—596

1 Claim

1. A method for fitting magnetic wedges in stator slots in a stator core of an electric rotary machine, comprising steps of: energizing a winding on the stator core of the electric rotary machine to produce magnetic flux passing through slot openings; successively forcing the magnetic wedges in said slot openings while keeping said winding energized to maintain said magnetic wedges in predetermined positions in said slot openings by the agency of attraction of said magnetic flux; and

impregnating varnish into said stator core with said slot openings fitted with said magnetic wedges and with said winding



kept energized, thereby fixing said magnetic wedges to said predetermined positions in said slot openings.

4,413,406

**PROCESSING AMORPHOUS METAL INTO PACKETS BY BONDING WITH LOW MELTING POINT MATERIAL**

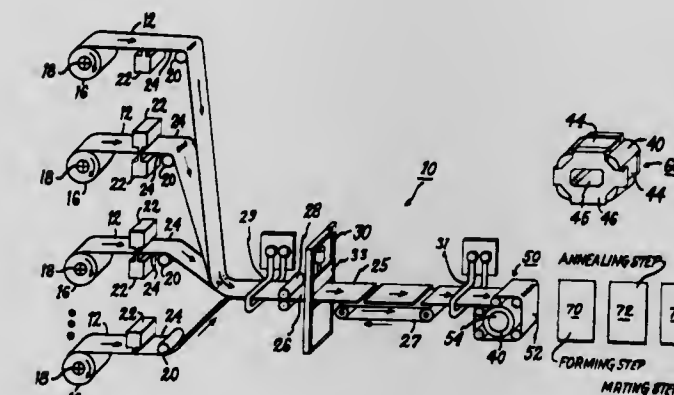
Moreland P. Bennett, Hickory, and Donald E. Ballard, Conover, both of N.C., assignors to General Electric Company, Philadelphia, Pa.

Filed Mar. 19, 1981, Ser. No. 245,402

Int. Cl.<sup>3</sup> H01F 3/04

U.S. Cl. 29—609

16 Claims



1. A method of forming an amorphous metal core for an electromagnetic device having relatively thick superimposed amorphous metal laminations comprised of a plurality of superimposed relatively thin amorphous metal sheets, said method comprising the steps of:
  - (a) providing a plurality of amorphous metal sheets of extended length and positioning said sheets adjacent each other so that immediately-adjacent sheets have confronting surfaces;
  - (b) applying to at least one confronting surface of each pair of immediately-adjacent sheets a deposit of metallic material having a melting temperature within the range of 50° to 350° C.;
  - (c) bringing together said plurality of amorphous metal sheets into a composite sheet having a thickness corresponding to the approximate thickness of one of said laminations;
  - (d) applying heat to said composite sheet so as to elevate its temperature to a value greater than the melting temperature of said deposit but less than the critical temperature of the amorphous metal sheets which would otherwise cause the amorphous metal to make a transition from its non-crystalline state to its crystalline state;
  - (e) allowing sufficient cooling of said composite sheet to cause the deposit to solidify and bond together the sheets of said composite sheet;
  - (f) cutting said composite sheet transversely of its length into packets of predetermined lengths corresponding to the desired lengths of said amorphous metal laminations; and
  - (g) arranging said packets into said superimposed laminations having a desired shape for said amorphous metal core.

4,413,407

**METHOD FOR FORMING AN ELECTRODE-CONTAINING DEVICE WITH CAPILLARY TRANSPORT BETWEEN ELECTRODES**

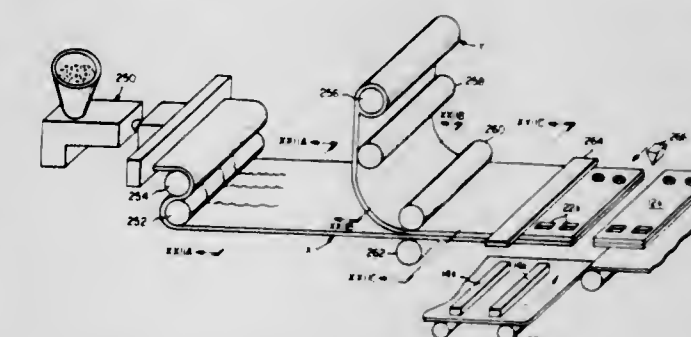
Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 128,413, Mar. 10, 1980, Pat. No. 4,302,313, and a continuation-in-part of Ser. No. 59,816, Jul. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 954,689, Oct. 25, 1978, Pat. No. 4,233,029. This application Nov. 9, 1981, Ser. No. 319,568

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—825

5 Claims



1. A method for making a device for the determination of activity of an ionic analyte of a liquid, said device including a pair of solid electrodes each constructed to generate therein an electrical potential that is proportional to the analyte activity present in a contacting quantity of said liquid, and flow control means for directing flow of respective quantities of two such liquids each to a different one of said electrodes and to a junction between said liquids, said control means including a member bridging and contacting said two electrodes; the method comprising the steps of

- (a) providing a first sheet of formable insulative material having a width and length;
- (b) forming in said sheet a plurality of adjacent channels extending generally the length of said sheet, a surface of one of said channels being configured to transport liquid;
- (c) superimposing above said formed sheet a second insulative sheet a surface portion of which is channeled to transport liquid and is opposite to and spaced away from said one surface a distance effective to induce capillary flow of the liquid between said portion and said one channel surface;
- (d) securing said second sheet to said first sheet to define a capillary liquid transport zone extending in the direction of the length of said first sheet; and, in any order,
- (e) forming apertures extending all the way through said secured first and second sheets;
- (f) severing individual units from said secured sheets; and
- (g) completing the manufacture of a plurality of said devices by attaching a pair of said electrodes to an exterior surface of said first sheet of each of said individual units, each of said electrodes being aligned with one of said apertures.

4,413,408

**METHOD FOR FABRICATING ELECTRODES**

Olen L. Riggs, Jr., Bethany, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Mar. 24, 1982, Ser. No. 361,582

Int. Cl.<sup>3</sup> H01R 43/00

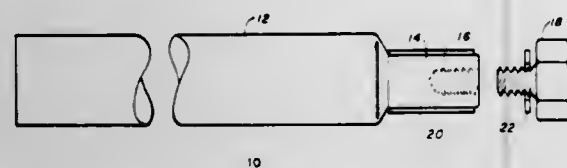
U.S. Cl. 29—825

3 Claims

1. In the process of fabricating electrodes for use in cathodic protection systems installed in corrosive atmospheres such as heat exchangers, such electrodes employing titanium and platinum, the improvements which comprise:
  - a. mill one end of a titanium rod;
  - b. drill and tap a hole in the inner portion of said milled end;



- c. slip fit a platinum cylinder about the milled end of said titanium rod and



- d. secure the platinum cylinder about the milled end of the titanium rod by inserting a titanium locking bolt into said drilled and tapped hole.

4,413,409

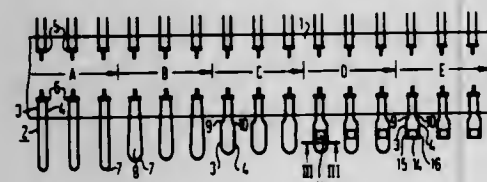
**METHOD FOR ATTACHING AND FASTENING PARALLEL CURRENT LEAD WIRES TO OPPOSITE LATERAL SURFACES OF ELECTRICAL COMPONENTS**  
Erich Haidinger, Deutschlandsberg, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,828  
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022590

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—856

3 Claims



1. Method for attaching and fastening parallel current lead wires to opposite lateral surfaces of an electrical component wherein current lead wires formed in one piece in the shape of a U are disposed in continuous sequence on a horizontally disposed bent-shaped conveyor-carrier of an automatically operating assembly system so that part of the two legs of the U-shaped structure and the part of the U-shaped structure connecting the legs protrude laterally beyond the edge of the conveyor-carrier, and an electrical component is clamped between the two legs and soldered thereto, which comprises sequentially the steps of:

- forming bends in the legs of U-shaped parallel current lead wires so as to adjust the mutual spacing of the legs in the part thereof projecting beyond the edge of the conveyor-carrier so that the spacing is smaller than is the length of the electrical component to be clamped between the legs, and the mutual spacing of the centers of the cross sections of the legs is greater than is the length of the electrical component;
- inserting the electrical component between the legs wherein said two legs each supports at least some vertically directed weight of said electrical component, in a direction perpendicular to the plane of the U-shaped structure and of the conveyor-carrier and spreading the legs apart due to the closer mutual spacing thereof than the length of the electrical component with resultant clamping of the electrical component between the legs;
- soldering the component to the legs;
- cutting off, in vicinity of the electrical component, the

- part of the U-shaped structure connecting the legs as well as the legs of the U-shaped structure, respectively, connected thereto, and
- (e) testing the component with the current lead wires soldered thereto.

4,413,410

**ELECTRIC SHAVER WITH ROTARY BLADE**

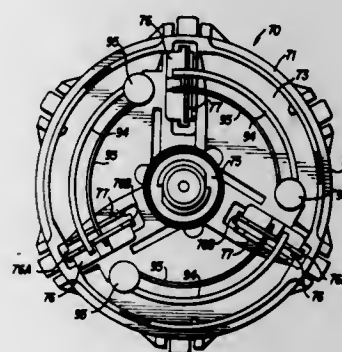
Kiyotaka Otsuka, and Masao Tanahashi, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan  
Filed Nov. 16, 1981, Ser. No. 321,749

Claims priority, application Japan, Nov. 29, 1980, 55-168833

Int. Cl.<sup>3</sup> B26B 19/14

U.S. Cl. 30—43.6

6 Claims



1. A shaving unit for a rotary type electric shaver, comprising an inner cutter and a shaving head mounted over said inner cutter;

said inner cutter including a rotatable base having an upper surface, a lower surface, and a peripheral edge joining said surfaces, said base having receiving slits disposed radially about the axis of rotation of said rotatable base;

said inner cutter also including a cutter blade inserted in each receiving slit, each cutter blade having a cutting edge and a leg portion, said leg portion extending away from said cutting edge and terminating in a distal edge, said distal edge having a receiving notch and a receiving hole, said receiving hole being located closer to the axis of rotation of said rotatable base than said receiving notch; said inner cutter also including a spring assembly for each said receiving slit, each spring assembly having at least first and second spring portions, one end of each spring portion being fixed to the lower surface of said rotatable base, the other end of said first spring portion engaging said receiving hole of said distal edge and exerting a downward force thereon, said second spring portion engaging said receiving notch and exerting an upward force thereon;

said shaving head including a thin, perforated comb having an upper surface and a lower surface;

said cutting edge of each cutter blade bearing against the lower surface of said comb; the thickness of said first spring portion being less than said second spring portion, the upward force of said second spring portion on said receiving notch thus being greater than the downward force of said first spring portion on said receiving hole;

whereby a uniform contact pressure between the cutting edge of each said cutter blade against the lower surface of said comb is maintained along the entire cutting edge when said blades are rotated with said rotatable base during operation of said shaver.

4,413,411

**RAZOR HANDLE**

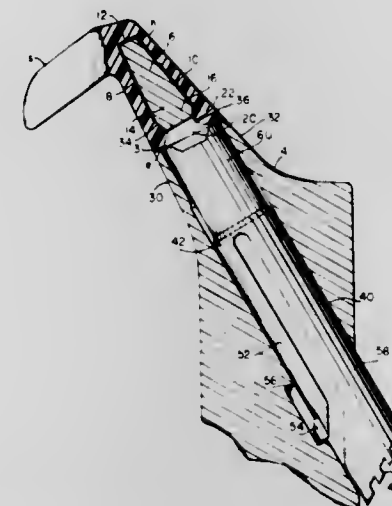
Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 352,146, Feb. 25, 1982. This application Mar. 19, 1982, Ser. No. 359,877

Int. Cl.<sup>3</sup> B26B 21/14

U.S. Cl. 30—85

2 Claims



1. A razor handle comprising an elongated grip portion, a neck portion extending from one end of said grip portion and disposed at an angle to said grip portion, and a protrusion extending from an end of said neck portion remote from said grip portion, a connecting web joining said protrusion to said end of said neck portion, said connecting web being of lesser thickness than said protrusion, whereby to provide recess means between said end of said neck portion and said protrusion, said protrusion being in substantial alignment with said neck portion, and plunger means disposed in said neck portion, a first end of said plunger means being accessible from said grip portion and a second end of said plunger means being proximate said remote end of said neck portion, said plunger means being movable.

4,413,412

**MOTOR-DRIVEN SCRAPING TOOL**

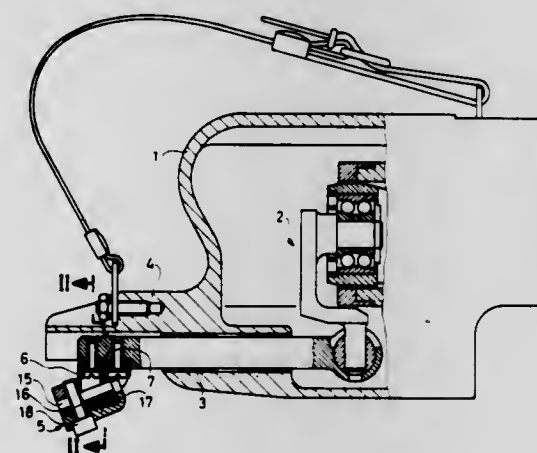
Ludwig Wetzel, Pforzheim, Fed. Rep. of Germany, assignor to Firma Schmid & Wezel, Maulbronn, Fed. Rep. of Germany  
Filed Aug. 3, 1981, Ser. No. 289,519

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029193

Int. Cl.<sup>3</sup> B23D 79/06

U.S. Cl. 30—169

13 Claims



1. A motor-driven scraping tool, comprising a housing; drive means; an elongated supporting element having an axis and displaceable in an axial direction by said drive means, said supporting element having a free end portion; a receiving head for receiving a scraping member and arranged on said free end

portion of said supporting element, said receiving head having two guiding faces for guiding said receiving head relative to said supporting member; and means for adjusting the play between said guiding faces of said receiving head and said supporting member, said adjusting means including at least one bendable tongue formed in said receiving head and forming one of said guiding faces, and at least one adjusting screw arranged to bend said one tongue relative to said supporting element.

4,413,413

**CUTTING TOOL FOR USE ON PRINTED CIRCUIT BOARD WIRING**

Samuel R. Romania, Phoenixville, and Frank L. Watson, Paoli, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 7, 1982, Ser. No. 366,354

Int. Cl.<sup>3</sup> B26B 27/00

U.S. Cl. 30—300

8 Claims



1. A tool for severing a printed lead from an electrically conductive pad surrounding a hole in a printed circuit board, comprising:

a substantially tubular body member having at one extremity thereof an annular cutting edge, said body member being tapered adjacent said last mentioned extremity, said body member comprising first and second contiguous bores of respective different diameters,

a spindle positioned within said body member along the central longitudinal axis thereof, said spindle having a guide pin section at one extremity thereof, said spindle having a plurality of contiguous coaxial cylindrical sections, at least a first and second spindle section having diameters capable of being accommodated respectively by said first and second bores, a third of said sections contiguous with said second section but of lesser diameter than the latter being said guide pin section,

said last mentioned section protruding beyond the outermost portions of said cutting edge and having a shoulder enclosed by the latter and displaced a predetermined longitudinal distance from said outermost portions thereof, said guide pin section being adapted to engage said hole to provide registration for said tool, the rotation of said body member effecting the severing of said printed lead by said cutting edge, said shoulder of said pin guide section being larger than said hole and controlling the depth of cut made by said cutting edge into the surface of said printed circuit board.



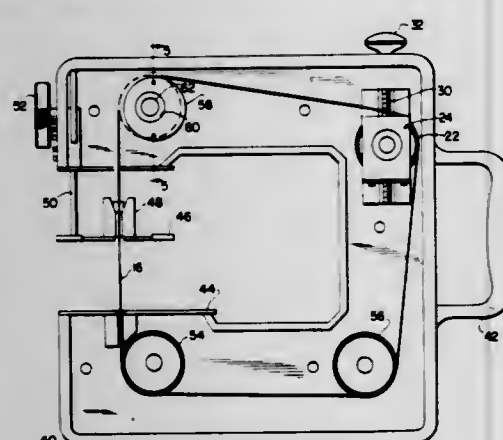
4,413,414

**HAND HELD PORTABLE BAND SAW**

Marion W. Strzalka, 230 E. Foxbury, Pomona, Calif. 91767  
Continuation-in-part of Ser. No. 172,658, Jul. 28, 1980,  
abandoned. This application May 17, 1982, Ser. No. 379,069  
Int. Cl.<sup>3</sup> B27B 13/08

U.S. Cl. 30—380

6 Claims



1. A band saw which comprises:  
a generally U-shaped housing having confronting spaced end portions,  
means for carrying an associated closed loop shaped saw blade, said carrying means being on said housing and supporting the blade with a blade portion extending between said housing end portions and with the blade supported for travel in a closed loop path, said means for carrying including a plurality of rollers, each roller being mounted on a respective shaft,  
means for driving the blade on said means for carrying,  
means for adjusting blade tension by varying the angular orientation of the axis of at least one of said rollers relative to a plane extending through the axial extent of the band saw blade, said means for varying comprising a rotatably mounted cylinder and a cylindrical recess in the cylinder, said recess being disposed in generally eccentric relationship to said cylinder, and  
said means for adjusting includes bearing means at axially spaced points on said shaft mounting said one roller, each bearing means comprising a ball bearing and an annular member disposed between said rotatably mounted member and an outer race of the ball bearing, the outer race and rotatably mounted member having mutually engaging arcuate surfaces to effect self-alignment of the bearing and accommodate variation in orientation of said axis of said one roller.

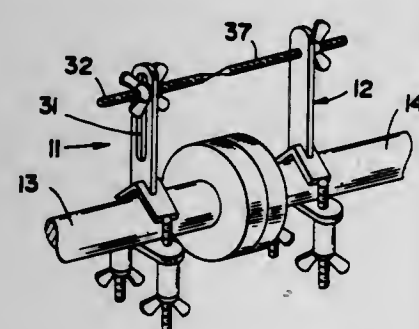
4,413,415

**SHAFT ALIGNMENT TOOL**

David T. Stovall, 265 Theobald La., Sacramento, Calif. 95811  
Filed Jan. 26, 1982, Ser. No. 342,796  
Int. Cl.<sup>3</sup> G01B 3/30

U.S. Cl. 33—181 R

1 Claim



1. An apparatus for aligning two rotatable shafts, comprising:  
a pair of jig assemblies, a pair of clamping means, each associated with one of said jig assemblies for releasably engag-

ing one of the shafts, each clamping means including a pair of leg members extending generally linearly from a common vertex, and adapted to impinge tangentially on one of the shafts disposed therebetween, a pair of bracket members, means for joining each of said bracket members to one of said clamping means in releasable and adjustable fashion, including a pair of threaded shafts extending from the distal ends of said leg members to the respective bracket member, a pair of arms, each extending outwardly from one of said common vertices of one of said clamping means, each arm including a slot extending longitudinally therein, a pair of indicator members, each comprising a rod-like member having an axis extending generally parallel to the respective shaft, each indicator member including a portion extending through one of said slots and secured therein in longitudinally translatable fashion, means for aligning said indicator members in axial registration, said last mentioned means including a tapered, pointed end formed integrally on each of said indicator members and disposed in confronting relationship to the other, like pointed end.

4,413,416

**MEASURING DEVICE**

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

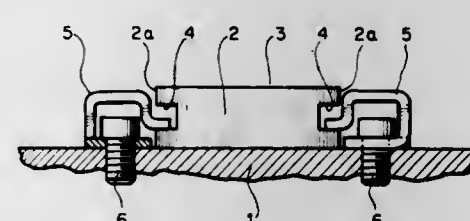
Filed Feb. 26, 1981, Ser. No. 238,638

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008384

Int. Cl.<sup>3</sup> G01B 11/02

U.S. Cl. 33—125 R

7 Claims



1. In a precision measuring device for measuring the position of a first component with respect to a second component, said measuring device comprising a bending resistant scale, the improvement comprising:  
means, included in the scale, for defining a plurality of recesses in the scale; and  
a plurality of resilient fastening elements for mounting the scale to a support surface defined by one of the first and second components, each of said fastening elements securely mounted to the support surface and positioned to engage a respective one of the recesses to apply a resilient mounting force to the scale acting substantially perpendicularly to the support surface, said mounting force of said fastening elements being sufficient to hold the scale in place, substantially without distorting the scale.

4,413,417

**ADJUSTABLE ANGLE PLATE**

Joseph R. Esposito, 304 Greenway Ave., Syracuse, N.Y. 13206

Filed Mar. 29, 1982, Ser. No. 363,157

Int. Cl.<sup>3</sup> G01B 5/24

U.S. Cl. 33—174 M

9 Claims

1. A toolmaker's square that includes a single piece body having a pair of cojoined legs, each leg having an accurately machined flat outer reference surface thereon with the surfaces meeting to form a corner having an inside angle that is slightly less than 90°, one of said legs forming the base of the square and containing a laterally extended slotted opening passing upwardly through the reference surface with the bottom of the opening being a flat tapered surface, a slide movably supported in the opening that has a tapered top surface that rides in contact against the tapered bottom surface of the opening to

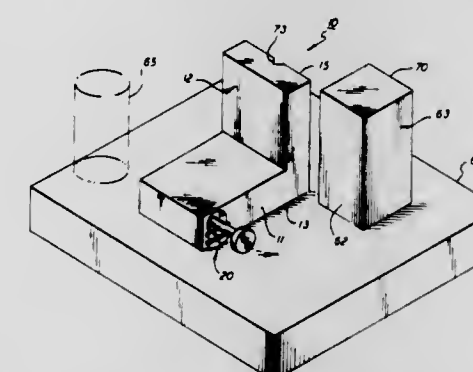
4,413,419

**METHOD AND APPARATUS FOR REMOTE MEASURING**

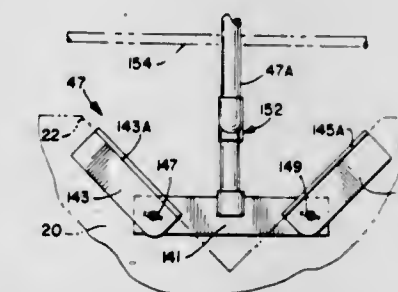
Nicholas A. Venuso, Hickory Hills, Ill., assignor to Metropolitan Sanitary District of Greater Chicago, Chicago, Ill.  
Division of Ser. No. 166,372, Jul. 7, 1980, Pat. No. 4,367,652.  
This application May 12, 1982, Ser. No. 377,503  
Int. Cl.<sup>3</sup> G01B 5/20

U.S. Cl. 33—174 G

4 Claims



lower section of the slide containing a rest surface upon which the square can be seated and a drive means threaded into the base leg that is operatively connected to the slide for moving the slide laterally in said opening.



1. A notch measuring device for measuring the angle of a V-shaped notch in a top edge of a weir positioned in a man-hole, handle means extending above the notch comprising:  
a cross arm;  
an elongated long rigid handle fixed to the cross arm;  
a pair of upstanding side arms pivotally attached at their bottom ends to the opposite ends of said cross arm for moving transversely into engagement with the weir at the notch to be measured, said side arms including respective flanges transversely bent relative thereto and extending backwardly therefrom for engaging the top edge portion of the weir defining the notch as said arms move into engagement with the weir to cause said arms to pivot relative to said cross arms to assume the angular relationship of the notch, said handle including an off-set portion adjacent to the cross arm to enable said arms to be slipped under the handle means extending above the notch.

4,413,418

**MEASURING APPARATUS**

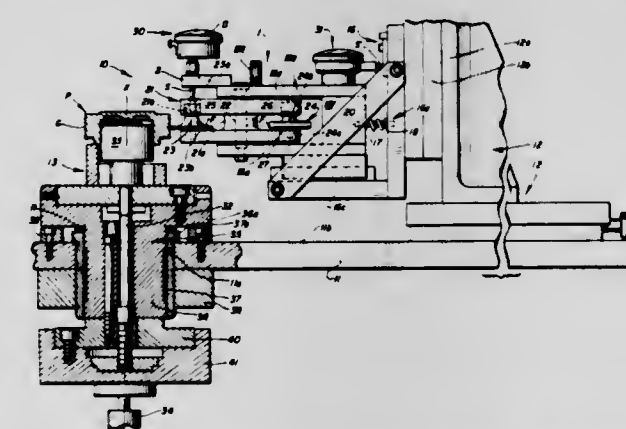
Wilbur F. Anderson, Nineveh, and Jon K. Griffith, Seymour, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 5, 1982, Ser. No. 365,403

Int. Cl.<sup>3</sup> G01B 5/00

U.S. Cl. 33—174 L

11 Claims



1. An apparatus for measuring the axial and radial runout of a groove formed in the periphery of a pulley, said apparatus comprising a base; a spindle mounted on said base and accommodating the pulley; a frame adjustably mounted on the base; a carriage mounted on said frame and adjustable independently thereof substantially axially and radially of the spindle axis; a carrier mounted on said carriage and adjustable independently thereof to a plurality of selected positions; a plurality of relatively spaced detector elements adjustably mounted on said carrier whereby a detector element is in close proximity to the pulley groove when said carrier is in each selected position; adjustable means coaxing with said carriage and frame for positioning the detector element at the selected position whereby a portion of the detector element is in aligned engagement with side surfaces defining the pulley groove; and gauge means for simultaneously measuring axial and radial deflection of the groove-engaging detector element upon rotation of the spindle.

1036 O.G.—15

4,413,420

**VEHICLE GEOMETRY CHECKING APPARATUS**

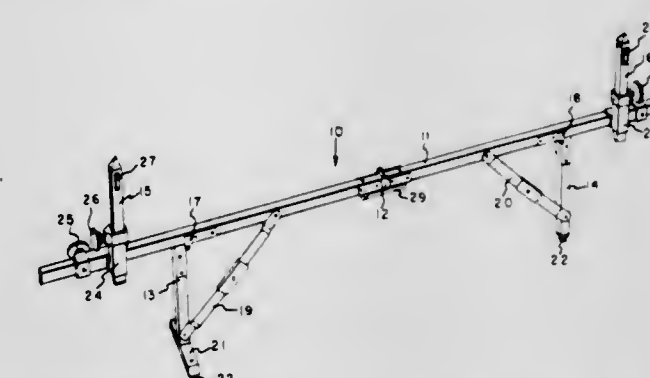
Ronald E. Hoffman, Uniontown, Ohio, and William K. Freed, Memphis, Tenn., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1982, Ser. No. 337,218

Int. Cl.<sup>3</sup> G01B 5/25, 5/255

U.S. Cl. 33—180 AT

6 Claims



1. A lightweight, collapsible apparatus for checking vehicle geometry comprising in combination:  
(a) a pointer bar assembly used as a trammel and for checking toe measurements, comprising a horizontal bar member hinged at the center of its length, a means for vertical support attached by hinges to said horizontal bar member, and a plurality of pointers attached by means for sliding to said horizontal bar member, said pointers being perpendicular to said horizontal bar member in a direction opposite said means for vertical support; and  
(b) an adjustable square bar assembly for providing a reference line perpendicular to a vehicle frame comprising a



straight bar member hinged at the center of its length, and a plurality of reference bars perpendicularly attached to said straight bar member so that T's are formed.

4,413,421

## PICTURE HANGING LOCATOR

Nicolay Siniuk, 235 Genevieve, Windsor, Ontario, Canada

Filed Apr. 15, 1982, Ser. No. 368,730

Int. Cl.<sup>3</sup> G01B 3/02

U.S. Cl. 33—180 R



1. A device for locating the hanging location of a frame picture upon a wall, comprising: of a rubber or plastic covered wire which is wound at its top into a short coil having an inside diameter to permit the insertion therein of an index finger and by means of which said device is held against the wall; the wire of said coil continuing downwardly and transversely to the longitudinal axis of said coil into a straight shank which abuts the wall when the device is held against it; the free end of said shank terminating in a hook, upon which the frame of said picture is freely suspended, so that after locating where the picture should be permanently hung, the picture is removed, exposing the hook, the bottom of which is marked upon the wall as the spot where the nail or hanger is attached to the wall.

4,413,422

## APPARATUS FOR DETECTING THE POSITION OF A MACHINE TOOL SPINDLE

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co. Ltd., Takaoka, Japan

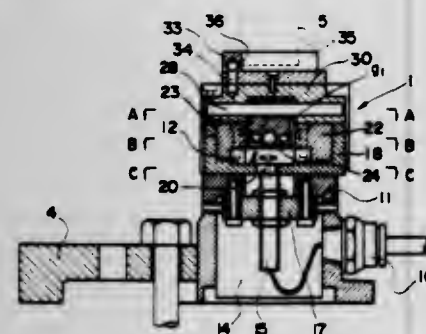
Filed Nov. 5, 1981, Ser. No. 318,364

Claims priority, application Japan, Nov. 10, 1980, 55-156987

Int. Cl.<sup>3</sup> G01B 7/00, 11/00

U.S. Cl. 33—185 R

5 Claims



1. An apparatus for detecting the position of a spindle of a machine tool comprising:

- a base;
- a proximity switch fixedly mounted on said base;
- a proximity member slidably mounted on said base and having a sensing hole formed therein adjacent to said proximity switch;
- a contactor coupled to said proximity member; and means effective when said contactor and said proximity member are displaced for returning said contactor and said proximity member to original positions thereof;

said base being adapted to be fixedly mounted on a table of said machine tool; and  
said contactor being formed with a right-angle x-direction and y-direction contact surface adapted for contact with measuring means mounted on the spindle of said machine tool.

4,413,423

## SUN TRACKING DEVICE

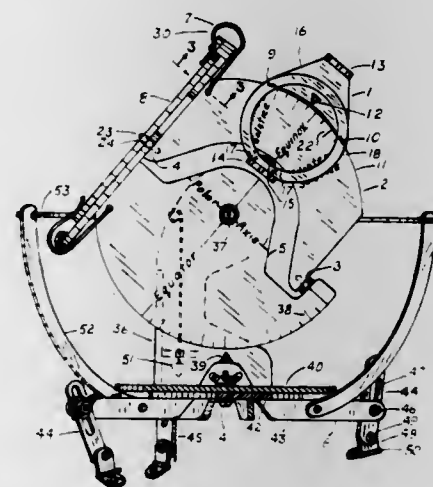
Ralph B. Galvin, 2350 E. 91st St., Indianapolis, Ind. 46240

Filed Aug. 20, 1981, Ser. No. 294,493

Int. Cl.<sup>3</sup> G01C 1/00

U.S. Cl. 33—268

10 Claims



1. A sun tracking device, comprising:
- a. a support means rotatable about a horizontal axis;
  - b. a circular segment mounted on said support means so as to rotate about a principal axis parallel to the face plane of the segment and perpendicular to the said horizontal axis;
  - c. a solar ray directed assembly straddling the said circular segment with means for rotating the assembly about an axis through the center of curvature of the circular rim of the segment and normal to the said face plane of the segment;
  - d. a solar ray incident member fixed to the outer end of the said solar ray directed assembly and extending laterally on both sides of the said face plane of the segment, said solar ray incident member characterized by a replica of the sun, a disc with apertures for receiving the sun's rays, and a lens for concentrating the sun's rays;
  - e. a time element mounted on the said support means, centered and rotatable on the said principal axis of the said circular segment, and having a generally circular rim form as characterized by a disc, a clock dial, and a toothed gear, and;
  - f. a holding means for adjustably positioning the said circular segment relative to the said time element.

4,413,424

## AZIMUTH DETERMINATING APPARATUS

Hiroaki Sasaki, Chiryu; Testuya Inoue, Kariya; Yoshiharu Mineo, Kariya; Sei Iguchi, Kariya; Kazuhide Makita, Nagoya; Hiroshi Arai, Toyota; Hajime Itoh, Aichi; Hisatoshi Ohta, Toyota; Masahiro Inazu, Toyota, and Akira Kawahashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 16, 1981, Ser. No. 312,075

Claims priority, application Japan, Oct. 20, 1980, 55-150199[U]

Int. Cl.<sup>3</sup> G01C 17/30; G01R 33/02

U.S. Cl. 33—361

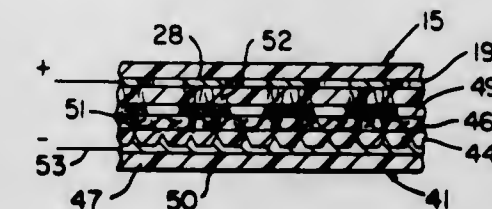
2 Claims

1. An azimuth determining apparatus including an azimuth sensor provided on a moving body for sensing a direction of said moving body relative to earth's magnetism to produce two

direction component signals crossed at the right angles and means for comparing the two direction component signals from said azimuth sensor with two reference signals, respectively, to display a moving direction of said body, the apparatus comprising:

- an adjusting circuit including a first inverting amplifier having a non-inverting input receiving a reference signal from first adjusting means and an inverting input receiving one of said detection signals from said azimuth sensor, and a second amplifier having a non-inverting input receiving a reference signal from inverting second adjusting means and an inverting input receiving the other detection signal from said azimuth sensor; and
- an indicating circuit including a first comparator having an inverting input receiving the output signal from said first inverting amplifier and a non-inverting input receiving a

thereby cause the particles of liquid of said wet web to be vaporized by said heated layer and be condensed back to particles of liquid by said cooled layer while said layers and said webs are moving together in a sandwiched relation, the



4,413,426

## METHOD AND APPARATUS FOR DRYING MOIST EXHAUST AIR FROM ONE OR MORE BULK MATERIAL DRYING HOPPERS

Roderich W. Gräff, 1311 Pine Valley Ct., Ann Arbor, Mich. 48104

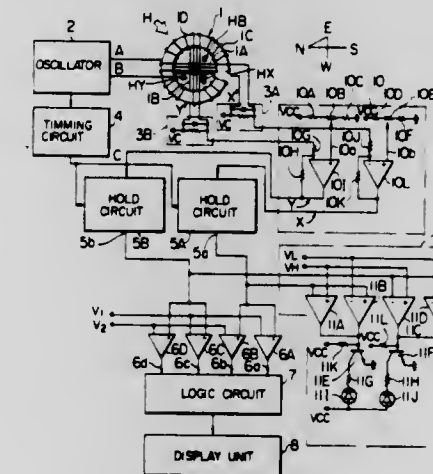
Filed Dec. 1, 1981, Ser. No. 326,223

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110873; Aug. 8, 1981, 3131471

Int. Cl.<sup>3</sup> F26B 3/14

U.S. Cl. 34—27

28 Claims



first predetermined reference signal, a second comparator having an inverting input receiving a second predetermined reference signal and a non-inverting input receiving the output signal from said first inverting amplifier, a third comparator having an inverting input receiving the output signal from said second inverting amplifier and a non-inverting input receiving said first predetermined reference signal, a fourth comparator having an inverting input receiving said second predetermined reference signal and a non-inverting input receiving the output signal from said second inverting amplifier, first light emitting means responsive to the output signals of said first and second comparators for indicating correct adjustment of said one direction component, and second light emitting means responsive to the output signals of said third and fourth comparators for indicating correct adjustment of said other direction component.

4,413,425

## METHOD FOR THERMAL/VACUUM DRYING A WET WEB OF MATERIAL

James T. Candor, 5440 Cynthia Ln., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 174,886, Aug. 4, 1980, Pat. No. 4,319,407, which is a division of Ser. No. 85,216, Oct. 16, 1979, Pat. No. 4,236,317, which is a continuation-in-part of Ser. No. 849,097, Nov. 7, 1977, Pat. No. 4,189,845, which is a

continuation-in-part of Ser. No. 809,945, Jun. 24, 1977, Pat. No. 4,135,307, which is a division of Ser. No. 695,092, Jun. 11, 1976, Pat. No. 4,050,162, which is a continuation-in-part of Ser. No. 541,218, Jan. 15, 1975, Pat. No. 3,977,937, which is a

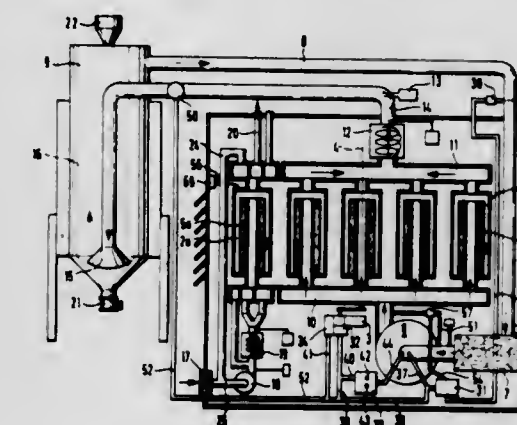
continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449. This application Dec. 14, 1981, Ser. No. 330,240

Int. Cl.<sup>3</sup> F26B 3/34; B01D 57/02

U.S. Cl. 34—1

5 Claims

1. In a method for thermal/vacuum drying a wet web of material, said method comprising the steps of sandwiching a part of said wet web with a porous web between a pair of moving heat conductive layers, heating the layer adjacent said wet web, and cooling the layer adjacent said porous web to



1. In a method of drying exhaust air from one or more bulk material drying hoppers, comprising the steps of conveying exhaust air from a bulk material drying hopper through at least one chamber filled with an absorbing medium and feeding the air back to the drying hopper in a closed circuit, the chamber being regenerated at intervals in a second air circuit, the improvement comprising the step of controlling the amount of the air throughput through the bulk material drying hopper as a function of the temperature of the exhaust air from the drying hopper.

4,413,427

## FUEL CONTROL SYSTEM FOR DRYER

Joseph A. Villalobos, Mahwah, and Triffin G. Psychojios, East Brunswick, both of N.J., assignors to AER Corporation, Ramsey, N.J.

Filed Jul. 29, 1981, Ser. No. 288,124

Int. Cl.<sup>3</sup> F26B 21/08

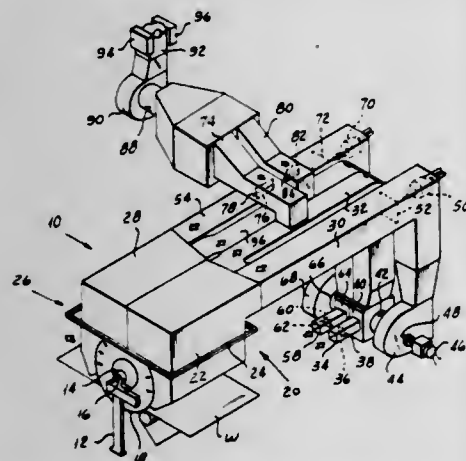
U.S. Cl. 34—46

1 Claim

1. In a dryer system, an exhaust duct and a plurality of dryer sections each comprising a fresh air supply and a recirculating air system and a burner for directly heating drying air and a removal duct through which moisture-laden air is carried away



from each of the sections at a temperature in excess of 250° F., said system including a bypass duct section, means connecting one end of said bypass duct section to said exhaust duct, means for selectively directing air from said section removal ducts into the other end of said bypass duct, a radiant energy source located outside said bypass duct section, means for directing radiation from said source into said bypass duct section to subject moisture-laden air therein to the action of said radiation



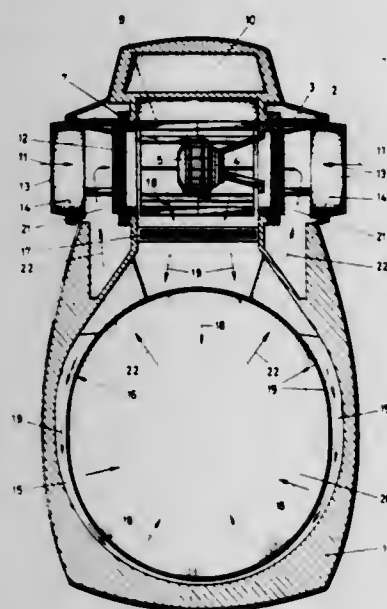
to produce resultant radiation, means located outside said bypass duct section for detecting said resultant radiation and means responsive to said detecting means for controlling the proportion of recirculated to fresh air in the removal duct connected to the other end of the bypass duct by regulating the fresh air introduced into each of the sections through said fresh air supply to thereby regulate the moisture content of the air in said last-named duct and in said dryer sections.

4,413,428

## HAIR DRYER CASING

Johannes P. Roos, Medemblik, Netherlands, assignor to Indola Cosmetics B.V., Rijswijk, Netherlands  
Filed Jan. 19, 1978, Ser. No. 871,085  
Claims priority, application Netherlands, Jan. 21, 1977, 7700652; Jan. 21, 1977, 7700654  
Int. Cl.<sup>3</sup> A45D 20/22

U.S. Cl. 34—100



1. A hair drying apparatus of the type comprising a double-walled casing having an outer wall and a perforated inner wall separated by an intermediate space from the outer wall and partly enclosing an inner space for receiving the head of a person whose hair is to be dried, a supporting member pivotally connected to said casing and means, including a motor-driven fan and air-heating means, for producing a flow of heated air into said intermediate space and through the perforations of said inner wall into said inner space where, in use, it will impinge on the hair to be dried, said supporting member comprising a bow-shaped member having tubular end parts

which are axially aligned with each other and disposed substantially perpendicularly to the parts of said casing adjoining said bow-shaped member, said bow-shaped member including pivot means for directly pivotally connecting the tubular end parts of said bow-shaped member to said casing so that said casing is pivotally adjustable about only one axis coincident with the center-line of the motor-driven fan, said motor-driven fan being fixed to said bow-shaped member so as to be supported thereby in a position between the tubular end parts, said motor-driven fan having a drum-shaped rotor which operates as a radial blower so as to draw air from the outside of the double-walled casing through the tubular end parts of the bow-shaped members, said tubular end parts being provided with filters which are positioned in the axial inner end of each of said tubular end parts for filtering the air drawn in through the same, and said inner space which is partly enclosed by said inner wall of said double-walled casing being connected through openings in the walls of the tubular end parts with those portions of the interiors of said tubular end parts which are located on that side of the respective filter which is remote from the fan, so that, in use, the fan will draw not only fresh air from outside the casing, but also recirculated air from said inner space for delivery through the filters into the intermediate space between the walls of the double-walled casing.

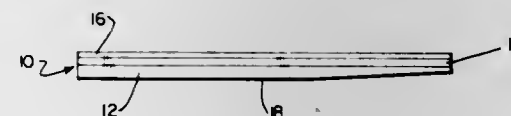
4,413,429

## MOLDED FOOT BED

Roy J. Power, Berwyn, Pa., assignor to Power-Soler, Inc., Westumpka, Ala.  
Filed Jun. 22, 1981, Ser. No. 275,662  
Int. Cl.<sup>3</sup> A43B 13/38

U.S. Cl. 36—44

8 Claims



1. A moldable foot bed for insertion and wearing in a shoe comprising a laminate having three layers; a bottom or base layer comprising a foam rubber having a density ranging from about 10 to about 25 pounds per cubic foot and being heat deformable at a molding temperature ranging from about 130° to about 170° F. to take a permanent compression set of at least about 50% under the weight of an adult human, the thickness of said base layer ranging generally between 3/16 inches and 3/8 inches; an intermediate layer of a foam rubber which is highly resistant to permanent deformation under pressure at temperatures below about 170° F., said intermediate layer displaying a resiliency as determined by the Bayshore Rebound method of at least about 50%, having a minimum elongation of about 200%, and having a thickness approximately half that of said base layer, and a top or face layer thinner than said intermediate layer and having a resilience and elasticity substantially less than said intermediate layer; said face layer displaying a maximum compression set of less than about 20% at said molding temperature.

4,413,430

## SKATE BOOT INSERT

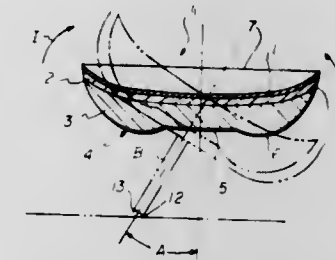
Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230  
Filed Oct. 30, 1981, Ser. No. 316,721  
Int. Cl.<sup>3</sup> A43B 13/38, 7/22, 5/04

U.S. Cl. 36—44

17 Claims

1. An insert adapted for insertion and wearing use within a boot or the like, comprising in combination;  
a blank having a top layer with its upper surface generally contoured to conform to the plantar surface of a person's foot,  
a lower layer having a bottom face provided with a recess

substantially extending rearwardly from the metatarsal to the calcaneal area of the foot, the metatarsal area itself of



uniform thickness along an entire metatarsal head area and transverse to said recess.

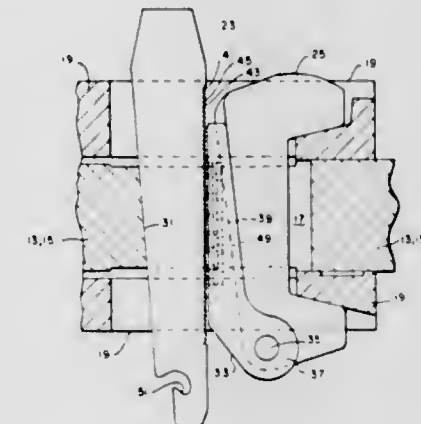
4,413,432

## WEDGE AND CLAMP LOCKING SYSTEM

Robert S. Blerwith, 145 Basinside Way, Alameda, Calif. 94501  
Filed Jul. 9, 1982, Ser. No. 396,763  
Int. Cl.<sup>3</sup> E02F 9/28

U.S. Cl. 37—142 A

5 Claims



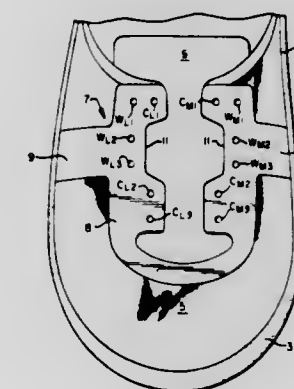
4,413,431

## ATHLETIC SHOE UPPER CONSTRUCTION

Peter R. Cavanagh, Pine Grove Mills, Pa., assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany  
Filed Jun. 11, 1982, Ser. No. 387,668  
Int. Cl.<sup>3</sup> A43B 5/00, 11/00

U.S. Cl. 36—114

8 Claims



1. An athletic shoe upper construction comprising a vamp with an elongated throat opening, and a one-piece reinforcement of non-stretchable material having a lacing hole reinforcing portion, a medial reinforcing portion, and a lateral reinforcing portion; wherein said lacing hole reinforcing portion is secured to said vamp adjacent to and surrounding said throat opening and is provided with a plurality of pairs of lacing holes, the holes of each pair of holes being located on opposite sides of said throat opening; wherein said medial reinforcing portion is an elongated strip extending from said lacing hole reinforcing portion to the featherline of said vamp in the mid-tarsal region of the medial side of said vamp, and is of a width and location with respect to the medial side lacing holes of an adjacent two of said pairs of lacing holes sufficient to span same; wherein said lateral reinforcing portion is an elongated strip extending from said lacing hole reinforcing portion to the featherline of said vamp in the mid-tarsal region of the lateral side of said vamp, and is of a width and location with respect to the lateral side lacing holes of said adjacent two pairs of lacing holes sufficient to span same; and wherein said pairs of lacing holes comprise widely-spaced pairs of holes and closely-spaced pairs of holes, the holes of the widely-spaced pairs of holes being located closer to said featherline than the holes of the closely-spaced pairs; and wherein the pairs of holes spanned by said medial and lateral reinforcing portions are widely-spaced pairs of holes.

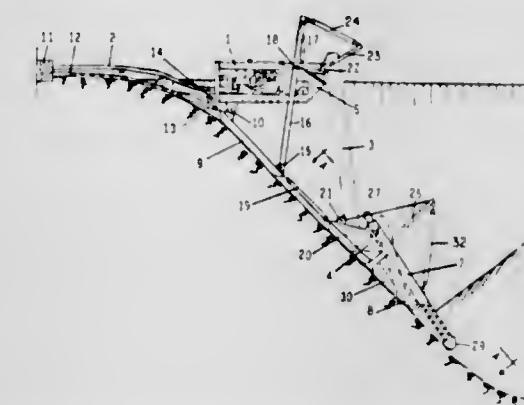
4,413,433

## APPARATUS FOR EXTRACTING MUDDY MATERIALS AND FEEDING THEM TO A TREATMENT STATION

Jean-Claude M. Duverne, 18, rue des Processions, F91310 Montlhéry, Linas, France  
Filed Dec. 4, 1981, Ser. No. 327,581  
Int. Cl.<sup>3</sup> E02F 3/06

U.S. Cl. 37—190

5 Claims



1. Apparatus for extracting and feeding muddy materials to a remote treatment station and operable progressively from firm ground toward basins or deep morasses with steep sloping



banks comprising at least one extraction and excavating screw, bucket means for receiving the materials extracted by said screw, elevator means for removing said extracted materials from said bucket means, pump means for receiving said materials from said elevator means and propelling it to toward said treatment station, wherein said pump means is supported on a foundation, said foundation supporting in a hinging manner at one end the corresponding end of said pump means and at the other end in a hinging manner a gantry, said gantry and said pump means being operably connected to maintain said pump means in a generally horizontal position, and said foundation being restrained from sliding by anchoring means secured in firm ground and comprising a cable, cable hoist and a control winch secured to said pump means.

4,413,434

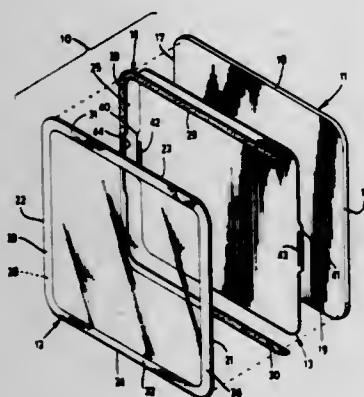
## SUBSURFACE SIGN ASSEMBLY

John G. Rupert, 795 Frederica St., Apt. No. 1, Atlanta, Ga. 30306, and Kenneth N. Jensen, 444 Sterling St., NE., Atlanta, Ga. 30307

Filed May 28, 1982, Ser. No. 382,963  
Int. Cl.<sup>3</sup> G09F 3/18

U.S. Cl. 40—10 R

10 Claims



1. A subsurface sign assembly comprising a back plate for mounting to a wall surface or the like, a transparent face plate, double face adhesive strip material contacting one surface of said back plate and the facing surface of said transparent face plate for mounting said face plate to said back plate and maintaining said face plate in spaced relationship with said back plate, said adhesive strip material being arranged between said back plate and said face plate to form a sign plate space between said back plate and said face plate, with said sign plate space open along at least one edge portion of said sign assembly, a sign plate bearing indicia on at least one surface thereof and positioned in said sign plate space with the surface bearing the indicia facing said transparent face plate, whereby said sign plate can be inserted between and withdrawn from between the back plate and the face plate through the open edge portion of the sign assembly, the surface of said face plate which faces said back plate including a layer of opaque material applied thereto at its perimeter which extends inwardly from the edges of said face plate and which overlies said adhesive strip and hides said adhesive strip from view through said face plate, and wherein the edge portions of said sign plate are juxtaposed the opaque material and the opaque material hides the edge portions of said sign plate from view through said face plate.

4,413,435

## PICTURE VIEWER

Max Baur, Kollbrunn, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Division of Ser. No. 943,471, Sep. 18, 1978, Pat. No. 4,241,529.

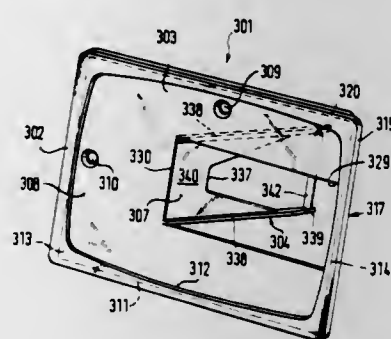
This application Dec. 29, 1980, Ser. No. 221,165

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742351; Oct. 7, 1977, 2745214; Dec. 16, 1977, 7738461[U]

Int. Cl.<sup>3</sup> A47G 1/06; G09F 1/12

U.S. Cl. 40—155

8 Claims



1. A picture carrier having a frame that defines a viewing aperture for the picture and means to support the front side of the picture adjacent the aperture, and having a rear wall that has a support face for the rear side of the picture, there being a gap formed between the rear wall and the frame joined therewith and extending at least partially around the frame, and a transport slider slidably mounted in a recess in the rear of said frame and having a retentive covering for engaging the picture in such a manner that the picture will be carried along with said transport slider, the slider yieldably mounting the retentive covering relative to the gap so that upon engagement through said recess of said transport slider, the retentive covering is brought into engagement with the rear side of the picture at an area of the picture against which the front side of the picture is supported for sliding the picture relative to said carrier frame.

4,413,436

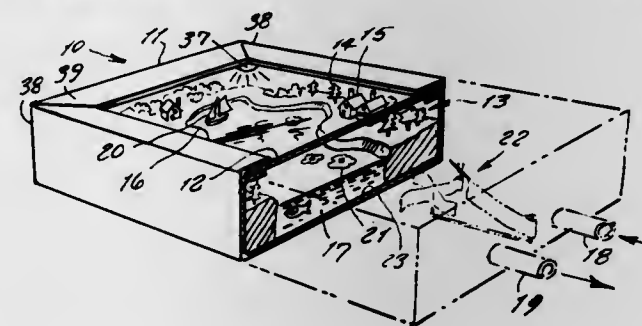
## AQUARIUM WITH SIMULATED STREAM FLOW

Michael L. Ward, c/o George Spector 3615 Woolworth Bldg. 233 Broadway, and George Spector, c/o Michael L. Ward 3615 Woolworth Bldg. 233 Broadway, both of New York, N.Y. 10007

Filed Jun. 1, 1982, Ser. No. 384,093  
Int. Cl.<sup>3</sup> G09F 1/12

U.S. Cl. 40—160

3 Claims



1. A display device, comprising in combination, a case, a transparent window on top of said case, and a display inside said case, said display including a miniature landscape together with a lake comprised of a depression with water therein, said water circulating through said case from an outside source via an inlet and said outlet, floating objects upon the surface of said water, an transparent barriers in said lake for controlling circulating of said water, said inlet and outlet located adjacent the bottom of said case in combination with means responsive to inlet flow providing variations in the flow pattern through the device.

4,413,437

## CARTRIDGE MAGAZINE

Robert A. Anderson, 19009 Laurel Park Rd., Sp. 75, Dominguez Hills, Calif. 90220

Filed Jun. 15, 1981, Ser. No. 273,869

Int. Cl.<sup>3</sup> F41C 25/02

U.S. Cl. 42—50

3 Claims



1. A cartridge magazine comprising: a substantially rectangular shaped casing having a removable base portion at the bottommost portion, a coiled spring located within said casing and supported at one end by said removable base portion, and a follower attached to the other end of said spring to prevent fore and aft motion of the follower, said spring formed to physically contact the follower in the fore and aft portions of the spring attachment point thereby preventing the follower from pivoting about the spring and allowing the full spring at all times to urge cartridges in an upward direction without jamming, said follower has a tongue portion with an opening located below the bottommost portion of the follower and the end of the spring is lower than the highest coiled loop and is adapted to be inserted in said opening thereby attaching said follower to said spring and preventing fore and aft motion of the follower.

4,413,438

## FLOATABLE FLY CASTING WEIGHT AND LEADER STORAGE DEVICE

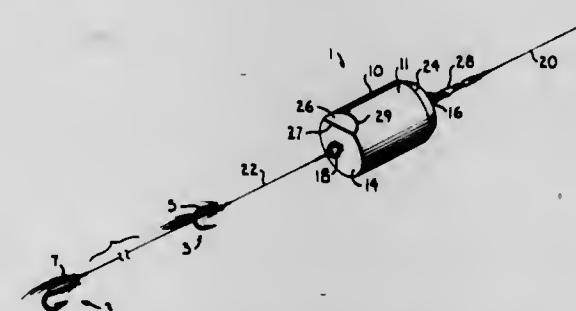
Hank Hayne, 634 N. Shore, Parkville, Mo. 64151

Filed May 4, 1981, Ser. No. 260,323

Int. Cl.<sup>3</sup> A01K 93/00

U.S. Cl. 43—43.11

10 Claims



9. A floatable fishing lure casting aid and leader storage device comprising:

- (a) an elongate cylindrical body member characterized by the ability to be floatable in water having first and second ends; each end comprising a substantially flat surface normal to a longitudinal axis of the body member; said body member having a cylindrical surface;
- (b) first and second eyelets extending outward and generally along said axis from said first and second end surfaces near a center thereof respectively, said second eyelet adapted to attach a leader to the device;
- (c) ripple reducing means provided with said first end and comprising a beveled surface extending between said body cylindrical surface and said first end surface and

totally therearound, and resulting from the revolution of a generally linear curve aligned at an outer angle to a longitudinal axis of said body member so as to define a substantially truncated cone; and

(d) leader wrapping means positioned adjacent said second end to facilitate the wrapping of an associated leader about said device; said leader wrapping means comprising a planar, outwardly facing surface positioned obliquely to said second end and intersecting said second end and said body cylindrical surface; the intersection of said leader wrapping means planar surface with said second end defining a generally linear edge which is positioned between a center of said second end and said body cylindrical surface; said edge being generally perpendicular with respect to said body member axis; said planar surface being generally semi-elliptical in shape.

4,413,439

## MOUSETRAP

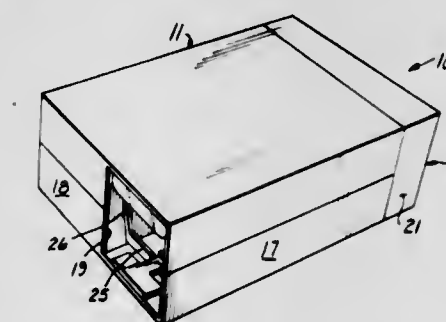
Donald C. Lindley, 3 Skipper, Irvine, Calif. 92714

Filed Feb. 12, 1982, Ser. No. 348,270

Int. Cl.<sup>3</sup> A01M 23/20

U.S. Cl. 43—61

28 Claims



1. A mousetrap comprising: a housing having a bottom, a top, and a peripheral sidewall forming an enclosure in which to trap a mouse; a partition inside of and extending partway across said enclosure to form an elongated, U-shaped chamber having a first and a second arm at opposite sides of a bend; an entry port through said sidewall opening into said first arm; a closure hinged to said housing for rotation around a hinge axis, said closure having its hinged edge near said entry port and having a first cocked position where it is raised to leave the entry port open to entry by a mouse, and a second closed position where it closes said entry port and frustrates the exit of a mouse from the enclosure, said closure substantially occluding said entry port in its second position; a trigger in said second arm so disposed and arranged as to be depressed by a mouse, said trigger being hinged to said housing and having a first cocked position where it is raised to await a mouse, and a second released position after a mouse has depressed it; and a latch system holding said closure and trigger in their respective first positions comprising a deflectable post supported by said housing and having a latching surface spaced from the point of attachment of said post to said housing, whereby said post inherently tends to assume a first condition wherein said latching surface is in a first position, and a second condition wherein said latching surface is in a second position, one of said latching surface positions being respective to a cocked condition of the mouse trap, a finger rotatable with said closure around its hinge axis and so disposed and arranged as to rest on said latching surface when said latching surface is in its first position, and to be free to rotate when said latching surface is in its second position, a cam rotatable with said trigger around the hinge axis of said trigger having a first position respective to a first position of said trigger and a second condition of said post when there is no mouse load on said trigger, thereby permitting said post to remain in its first position with the cam lightly abutting against it and the finger resting on said latching surface and thereby holding the closure and the trigger in their first position, a mouse load on said trigger moving the trigger to its second position, turning the cam to its second position to



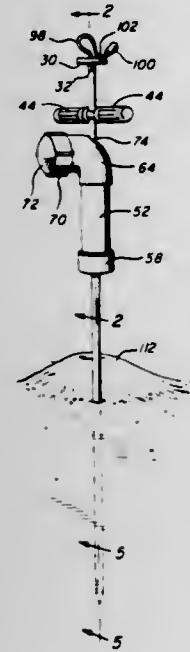
bend the post to its second condition, thereby moving the latching surface to its second position, releasing the finger from its first position to enable the closure to lower to its second position, to close the entry port and trap the mouse in the enclosure.

4,413,440

**GOPHER PROBE AND POISON DISPENSER**

Harley D. Schultz, Star Route #1, Box 293, Anza, Calif. 92306  
Filed Apr. 30, 1981, Ser. No. 259,060  
Int. Cl.<sup>3</sup> A01M 25/00

U.S. Cl. 43—124



1 Claim

said tubular shank is snugly received, said handle means including generally diametrically opposite outwardly projecting handle structures carried by said tubular shank a spaced distance above said elbow and below the upper end of said shank, a mount fixed on said tubular shank and snugly slidably received in said pipe section, fastener means secured through said pipe section and securing said mount in position within said pipe section, the upper end of said tubular shank including a generally circular and centrally apertured disc secured thereacross, said torsion rod projecting upwardly and being rotatably received through said centrally apertured disc and including a reversely curved terminus thereon terminating downwardly in an upwardly and downwardly curved portion whose terminal end includes a hand grip spaced outward of said disc, the upper end portion of said torsion rod being somewhat resilient, said disc including a generally radial groove formed in the upper surface thereof, said upwardly and outwardly curved portion comprising a detent snap receivable within said groove for frictionally retaining said torsion rod in adjusted angularly displace position.

4,413,441

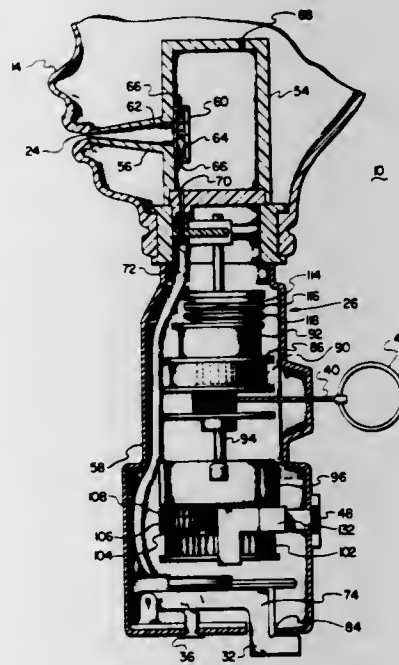
**MULTIPLE FUNCTION DOLL**

Gary L. Hunter, Fountain Valley; Gabriel Marason, Jr., Los Angeles, and Diana C. Troup, Cerritos, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 9, 1981, Ser. No. 319,493  
Int. Cl.<sup>3</sup> A63H 3/24, 13/02

U.S. Cl. 46—116

7 Claims



1. A ground probe and poison dispenser comprising an upstanding tubular shank including upper and lower end portions, said lower end portion including a tapered lower terminal end and a lateral opening formed therein closely spaced above said terminal end, a hollow poison reservoir carried by a midportion of said shank intermediate said upper and lower end portions, port means communicating the interior of said shank midportion with the interior of said reservoir for gravity flow of fluent poison material from said reservoir into said shank midportion and subsequent gravity flow of said poison material downward through said shank into the lower end portion thereof and toward said lateral opening, valve member means mounted in said shank for rotation about an axis extending longitudinally of said shank between closed and open positions relative to said opening closing and opening the latter, valve member control means rotatably supported from said upper end portion of said shank and operatively connected with said valve member through a torsion rod disposed within said shank and extending through the latter to said valve member for rotating the latter between said closed and open positions, said tubular shank including handle means adapted to be engaged by a user for applying downward and upward thrust on said shank independent of said valve member and valve member control means, said hollow poison reservoir including an upstanding cylindrical pipe section considerably larger in inside diameter than the outside diameter of said tubular shank, said tubular shank extending centrally longitudinally through said pipe section, an end cap secured over the lower end of said pipe section and having a central bore formed therethrough, said tubular shank being snugly received through said central bore and longitudinally positioned relative to said pipe section and end cap with said port means disposed closely above said central bore, a 90° tubular elbow including a first internally threaded end threaded over the upper end of said pipe section and including a second externally threaded end opening horizontally outwardly of one side of said pipe section, a closure cap removably threaded over said second end, said elbow including a smooth bore formed therethrough aligned with said central bore and through which the upper end portion of

1. A doll comprising a body; a controlled wetting mechanism positioned in the body including a reservoir for fluid, conduit means for conducting the fluid from the reservoir to an exit opening adjacent the bottom of the torso of the doll, valve means for starting and stopping the flow of the fluid out of the exit opening, and actuating means for automatically operating the valve whenever the doll is placed on a toy toilet; two arms, each pivotably mounted to the body and having a hand attached thereto; and a hand-clapping mechanism positioned in the body including a spring motor, an eccentric pulley driven by the motor, and means linking the pulley to the arms, whereby the arms are moved to simulate clapping by the operation of the motor.

4,413,442

**THREE DIMENSIONAL TRANSFORMABLE TOY**  
Andrea McSweeney, 100 Morningside Dr., New York, N.Y. 10027

Filed Dec. 15, 1981, Ser. No. 330,963

Int. Cl.<sup>3</sup> A63H 3/00

U.S. Cl. 46—151

8 Claims



1. A three-dimensional toy comprising:
  - (a) juxtaposed first and second surfaces, said first surface defining a complete outer surface of said toy in a first configuration, said second surface defining a complete outer surface of said toy in a second configuration, said juxtaposed first and second surfaces having means defining an opening therethrough;
  - (b) a plurality of figure-forming elements affixed to only said second surface such that in the second configuration said toy forms a fanciful figure, said figure forming elements being related to each other and having multiple surfaces which extend outwardly from the bulk of the toy such that the second surface of the toy is complex;
  - (c) said first surface being devoid of any figure forming elements such that the first surface is simple and smooth, said toy in said first configuration forming an egg from which said fanciful figure of the second configuration hatches; and
  - (d) said toy transformable from said first configuration to said second configuration, said transformation being performed by causing the bulk of said toy to pass through said means for defining an opening, said toy when in said first configuration being such that said first surface is on the outside of said toy and said second surface is completely hidden from view within said first surface, said second configuration being such that said first surface is located completely within said toy and said second surface is positioned outwardly from said first surface and exposed to view, said means for defining an opening being closed when said toy is in either said first or said second configuration, and being opened during said transformation, said figure-forming elements being exposable when said toy is being transformed from said first configuration to said second configuration and vice-versa such that said two surfaces and said two configurations are inter-related to one another, and said figure-forming elements changing in shape during said transformation, said transformable toy being approximately the same size in both said first and said second configurations.

4,413,443

**TOY VEHICLE DEVICE**

Ralph J. Kulesza, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 29, 1982, Ser. No. 343,879

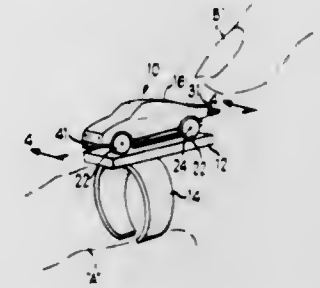
Int. Cl.<sup>3</sup> A63H 17/00

U.S. Cl. 46—206

11 Claims

1. A toy vehicle device comprising:
  - a vehicle housing including a pivotal housing portion;
  - means for propelling said vehicle housing;
  - means for supporting said housing and propelling means on

the human body, said supporting means including a finger ring; and



means for propelling said pivotal housing portion away from the remainder of said housing in response to impact of said housing with an obstacle.

4,413,444

**GUIDE RAIL FOR A SLIDING DOOR**

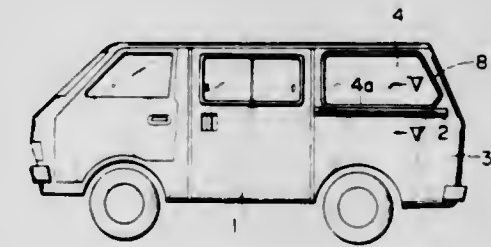
Takayo Chikaraishi, Kawasaki, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan  
Filed Jul. 16, 1981, Ser. No. 283,794

Claims priority, application Japan, Jul. 17, 1980, 55-97743; Jul. 17, 1980, 55-97744

Int. Cl.<sup>3</sup> E05D 13/02; B60J 5/06

U.S. Cl. 49—409

8 Claims



1. A guide rail structure for a sliding door on an automotive vehicle comprising a sliding means for supporting the sliding door; and a guide rail in which the sliding means is moved, secured onto a rear quarter panel of the vehicle body; the improvement comprising:
  - said guide rail located under, along and adjacent to the weather strip surrounding a rear side window; and
  - a lip integrally formed along the lower edge of the weather strip, arranged such that said lip seals the gap between the rear quarter panel and said guide rail.

4,413,445

**SPRING-STRETCH-REDUCING WINDOW SASH BALANCE**

Donald M. Trout, 19700 Woodward Ave., Detroit, Mich. 48203  
Continuation-in-part of Ser. No. 180,034, Aug. 21, 1980, abandoned. This application Apr. 28, 1982, Ser. No. 372,488

Int. Cl.<sup>3</sup> E05D 13/10

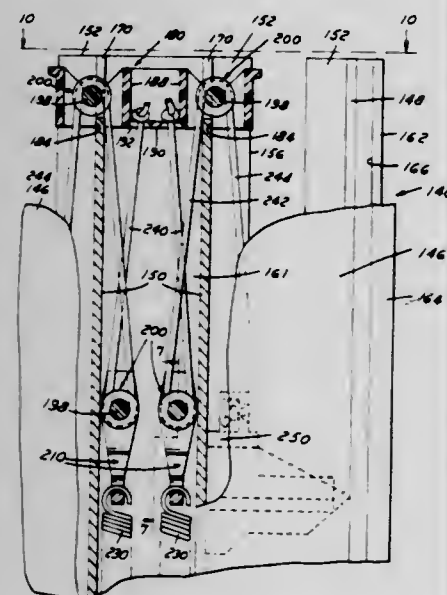
U.S. Cl. 49—445

4 Claims

1. A self-contained spring-stretch-reducing sash balance construction for double-hung, sliding sash windows to be mounted in and between laterally spaced opposite vertical sides of a sliding sash window frame, that improvement which comprises:
  - (a) a separately mountable, elongate slide housing for at least one side of the window having a back face portion to lie along the side of a window frame, said slide housing having a closed front center panel to be spaced outwardly from the back face to form a first, central, elongate, vertical chamber open at the back, and spaced, parallel, elongate sash guides spaced laterally to each side of said center panel, each sash guide being slotted lengthwise and spaced outwardly from the back face of the housing to provide a



- vertical reentrant retaining guide track chamber for a sash coupling element with common vertical walls between said central chamber and said guide track chambers,
- (b) a sash balance header element supported horizontally at the top and within the confines of said slide housing having spaced pulley chambers formed therein at the top of and open to said vertical chamber and said guide track chambers,
- (c) a stationary pulley rotatably supported in each said pulley chamber above said respective guide tracks in said slide housing,
- (d) elongate balancing springs disposed in parallel spaced relation in said central vertical chamber anchored at one end adjacent the bottom of said slide housing with movable ends extending up into said central vertical chamber,
- (e) a traveling pulley element affixed to the upper ends of each of said springs, and



- (f) a flexible cable on each side of said slide housing having a fixed end anchored centrally of said header above said central vertical chamber and a movable end connected to sash coupling elements in the respective vertical guide track chambers,
- each said cable having a first section in said central vertical chamber extending from said header to and around said traveling pulley and a second section in said vertical chamber extending from said first section beyond said traveling pulley into one of the spaced header vertical guide track chambers around a stationary pulley above said chambers, and a third section in a guide track chamber extending from said second section beyond said stationary pulley to a sash coupling in said respective guide track chambers.

4,413,446

## THRESHOLD ASSEMBLY

Sebastian Dittich, Clifton, N.J., assignor to Magnetic Weather Stripping Corp., Clifton, N.J.

Filed Aug. 19, 1981, Ser. No. 294,105

Int. Cl.<sup>3</sup> E06B 1/70

U.S. Cl. 49—470

17 Claims

1. An improved threshold assembly for mounting on a door and a door sill comprising:

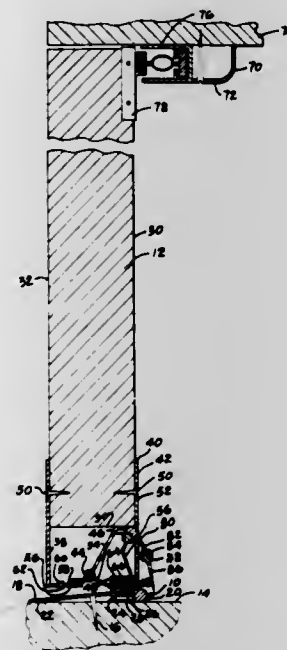
- a. a sill mounted portion comprising, in turn:
- (1) a threshold plate formed of non-magnetically attracted material, said plate having a substantially vertical end portion at one side thereof;
  - (2) a support depending from said threshold plate, said support and said end portion forming at least one internal channel therebetween;
  - (3) at least one first elongated magnet means for insertion in said channel having an area of first polarity on the

edge adjacent said end portion and an area of second polarity on the opposite edge thereof;

- (4) attachment means for attaching said threshold plate to said door sill;

- b. a door-mounted portion comprising, in turn:

- (1) a door cap attached to the lower edge of said door and extending downwardly therefrom toward said threshold plate;
- (2) magnet-holding means for supporting with the door in the closed position second elongated magnet means adjacent and above said first elongated magnet means, said magnet-holding means flexibly attached to said door cap;



- (3) second elongated magnet means mounted in said magnet-holding means having an area of second polarity on the edge adjacent said end portion and an area of first polarity on the opposite edge thereof;
  - (4) attachment means for attaching said door cap to the lower edge of said door;
- whereby, upon closing said door, at the nearly closed position the areas of like polarity of said first and said second magnet means repel and move said magnet-holding means away from said threshold plate and then at the closed position, the areas of unlike polarity of said first and said second magnet means attract to seal the door-mounted portion to the sill-mounted portion.

4,413,447

## GROOVE REFINISHING TOOL

Harvey J. Kellogg, Homosassa, Fla., and Robert O. Holm, Santa Fe, N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,806

Int. Cl.<sup>3</sup> B24B 23/00

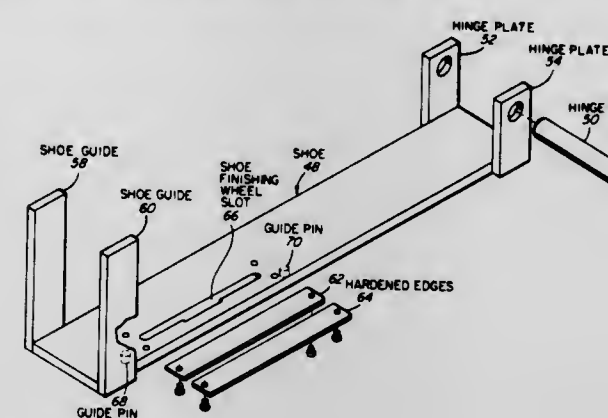
U.S. Cl. 51—170 PT

7 Claims

1. A device for refinishing a groove in a flat surface comprising:

- a main body having a main body finishing wheel slot formed therein;
- a rigid planar shoe having a shoe finishing wheel slot formed therein, said shoe pivotally mounted at one end to said main body;
- a finishing wheel motor attached to said main body;
- a finishing wheel attached by a collet and arbor to said finishing wheel motor such that said finishing wheel protrudes through said main body finishing wheel slot and said shoe finishing wheel slot for refinishing said groove;
- slot guide means attached to said shoe and extending down-

wardly from a lower surface thereof, said slot guide means being offset from said shoe finishing slot and extending into



said groove for guiding said device on said groove as said device is refinishing said groove.

4,413,448

## SELF-SEPARATING FINISHING MACHINE HAVING VARIABLE DEGREES OF ROTATION AND VIBRATION, AND METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

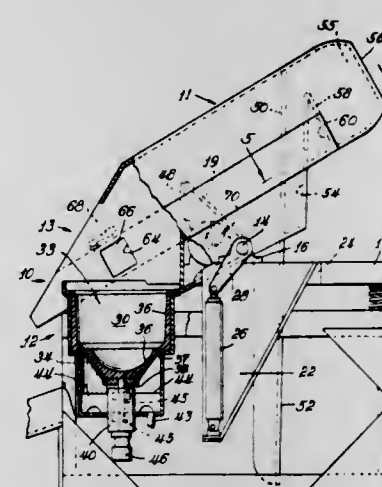
Division of Ser. No. 264,399, May 18, 1981, Pat. No. 4,380,137.

This application Sep. 20, 1982, Ser. No. 419,973

Int. Cl.<sup>3</sup> B24B 1/00

U.S. Cl. 51—313

2 Claims



1. The method of finishing parts with finishing media in a finishing machine comprising a housing which is rotatable about a substantially horizontal axis and which has a finishing chamber in said housing and a media storage chamber in said housing and a foraminous member disposed therebetween, and first, second, and third positions of rotation, which positions are different from each other, comprising the steps of finishing said parts in said finishing chamber when said housing is in a first and finishing position, rotating said housing to a second and media-separation position, imparting vibrations of preselected intensity to said foraminous member while said housing is in said media-separation position for separation of media from parts, rotating said housing to a third and parts-ejection position, and imparting vibrations of a preselected intensity to said foraminous member while said housing is in said third and parts-ejection position for ejection of said parts from said machine.

4,413,449

## MOTORIZED SYSTEM FOR CLEANING DRAIN TROUGHS

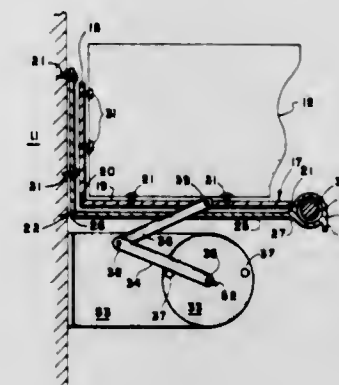
Lloyd H. Faye, 8821 Elm Rd., Richmond, Va. 23235

Filed Jan. 25, 1982, Ser. No. 342,246

Int. Cl.<sup>3</sup> E05D 5/06

U.S. Cl. 52—16

5 Claims



1. A motorized mounting bracket for a drain trough comprising:

- (a) a mounting bracket comprised of:

- (1) a harness member comprised of a flat rear panel and a flat bottom panel emanating from the lowermost extremity of said rear panel and terminating in a front extremity,
  - (2) a bracket member having a generally L-shaped configuration comprised of a flat vertical panel and a flat horizontal panel emerging from the lowermost extremity of said vertical panel and terminating in a forward extremity,
  - (3) said harness member being adapted to be positioned above said bracket member and closely adjacent thereto in nested configuration, and
  - (4) hinge means associated with the forward extremity of said bracket member and front extremity of said harness member, causing rotative interengagement of said members,
- (b) an electric motor and associated spindle, said motor adapted to be positioned below said mounting bracket,
- (c) drive means fixedly attached to said spindle and adapted to mechanically transmit rotative force,
- (d) driven means associated with said harness member and adapted to receive motivating force from said drive means, and
- (e) control means to constrain the motor to cause said harness member to rotate at least 180° about said hinge means and then return to its starting position.

4,413,450

## ROOF CURB ADAPTER

Gary M. Brower, 2311 East 28 St., Chattanooga, Tenn. 37407

Filed Jul. 13, 1981, Ser. No. 282,658

Int. Cl.<sup>3</sup> E04F 19/00; E04H 14/00

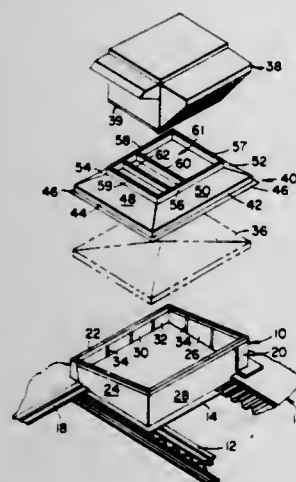
U.S. Cl. 52—27

8 Claims

1. An adapter for use in combination with a roof curb for supporting a roof-top environmental control unit on the roof of a building, said roof curb being fastened to the roof and having a substantially box-shaped open top configuration including upstanding walls interconnected together to form a substantially horizontally disposed top border defining the open top, said roof-top unit including a support pedestal through which environmentally conditioned and return air flows, said adapter adapted to be interposed between said curb and said unit and comprising a base positionable upon said top border of the roof curb and having downwardly extending wall portions enveloping said border, an open frame for ingress and egress of air disposed above said base and having upstanding wall means for forming an upper peripheral edge on which said roof-top unit support pedestal is disposed, inclined surfaces fixed to and



interconnecting said base with said upstanding wall means below said peripheral edge, said inclined surfaces being interconnected together to form a continuous surface, means for



securing the pedestal of said roof-top unit to said peripheral edge, and means for securing said downwardly extending wall portions to the border of said roof curb.

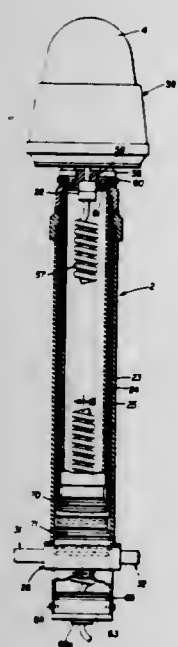
4,413,451

# PNEUMATICALLY ACTUATED TILTING TELESCOPING MAST CONSTRUCTION

Harry E. Featherstone, Wooster, and Alvin R. Steffen, Loudonville, both of Ohio, assignors to The Will-Burt Company, Orrville, Ohio

Filed May 5, 1982, Ser. No. 374,980  
Int. Cl.<sup>3</sup> E04F 19/00; E04H 14/00

U.S. Cl. 52-28



1. In a tilting, telescoping, tubular mast construction for mounting an electrical fixture on a vehicle and positioning the fixture at a desired location above the vehicle of the type in which a pneumatic control system is actuated to tilt the mast when retracted between horizontal and vertical positions and to move telescoping sections of the mast when in vertical position between retracted and extended positions; wherein the improvement comprises a seal unit for a slidable joint between any pair of adjacent telescoped mast sections, including first and second seal clamping rings, the first clamping ring being mounted on a lower open end of an inner mast section of each pair of adjacent mast sections, the second clamping ring being axially adjustably engaged to and within the first clamping ring, said first and second rings having axially spaced annular surfaces forming a circumferentially open groove at the lower axially open end of said inner mast section; a flexible seal ring in said groove U-shaped in cross section with U-legs annularly,

axially open at an end of said inner mast section; and an O-ring in said groove at the open "U" of said U-legs clamped axially between the first and second clamping rings to press the O-ring into the axially open "U" of the U-legs of the U-shaped seal ring to circumferentially press the seal ring against an inner surface of the other mast section of the pair of adjacent mast sections; whereby the seal units at the lower ends of the telescoped mast sections present circular, full, unobstructed openings for such mast sections providing an unobstructed passage from end to end of the mast at all times whether telescopically retracted or extended.

4,413,452

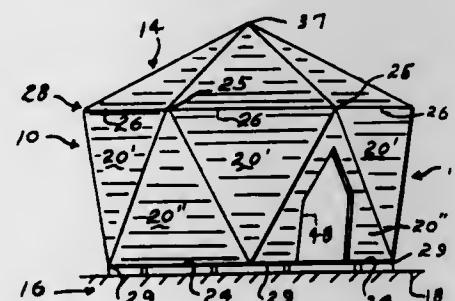
# BUILDING STRUCTURE

Don G. Wilkinson, 32 Palm Ave., Sarasota, Fla. 33577  
Continuation of Ser. No. 85,525, Oct. 17, 1979. This application  
Jul. 8, 1981, Ser. No. 281,456

Int. Cl.<sup>3</sup> E04B 1/32

U.S. Cl. 52-82

4 Claims



1. A building structure, comprising a plurality of identical triangular panels positioned and joined in an edge-to-edge array to define an essentially hexagonal geometric shape which functions as a roof and sidewalls, each of said triangular panels being formed from a rectangular panel having a two-to-one length to width dimensional ratio by diagonally cutting said rectangular panel to form two identical right triangular panel elements, each of said right triangular panel elements having a one-to-one base to perpendicular height dimensional ratio, and joining said right triangular panel elements along their respective perpendicular height dimensions.

4,413,453

# SWIMMING POOL CONSTRUCTION

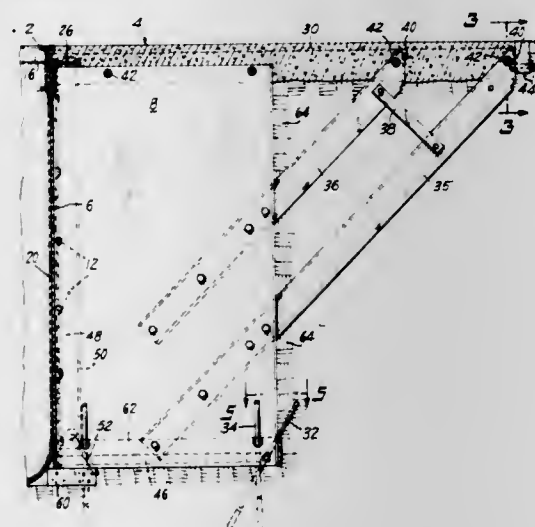
Donald H. Witte, Arlington, Tex., assignor to Carl R. Meyer and Carol S. Meyer, both of Port Isabel, Tex.

Filed Mar. 17, 1980, Ser. No. 131,222

Int. Cl.<sup>3</sup> E04H 3/16, 3/18

U.S. Cl. 52-127.1

11 Claims



1. In a swimming pool construction having an upstanding wall defined by a plurality of substantially identical modular

units, with each unit including a sheet of bendable material having an integral vertical flange at one end thereof extending perpendicular thereto and outwardly of the pool for a substantial distance, the improvement comprising an integral coping member of resilient material extending along the upper edge of the wall and including:

- (a) depending flanges extending continuously along and embracing the upper edge of the wall;
- (b) a substantially horizontal outwardly extending portion freely supported by the upper edge of each vertical flange and defining an upwardly facing channel; and
- (c) rigid reinforcing means disposed in the channel and extending throughout the length of the upper edge of the wall for determining and maintaining the desired shape of the upper edge of the wall.

4,413,455

# BASE SUPPORT INSTALLATION FOR TRIPOD-TYPE STRUCTURES

Walter L. Jenkins, 236 Lafayette Rd., Syracuse, N.Y. 13205

Filed Jun. 20, 1980, Ser. No. 161,250

Int. Cl.<sup>3</sup> E02D 27/00

U.S. Cl. 52-295

9 Claims



9. A support system for a tripod-type structure having an elongated, central axis for movement of such structure between erected and lowered positions wherein said central axis is substantially vertically and horizontally disposed, respectively, said support system comprising:

- (a) a fixed slab having an essentially planar, horizontal, upper surface;
- (b) a rigid, unitary, member connected by anchor means to said slab for pivotal movement with respect thereto about a horizontal axis, perpendicular to said tripod central axis;
- (c) three mounting brackets affixed to said unitary member at equally spaced positions thereon for respective connection to the three legs of said tripod-type structure;
- (d) two of said brackets being positioned on a line parallel to said horizontal axis, the third of said brackets and said horizontal axis being positioned on opposite sides of said line; and
- (e) means for releasably affixing said unitary member to said slab at a single point on the same side of said line as said third bracket for securing said unitary member in a first position wherein said tripod axis is vertically disposed and releasable to permit movement of said unitary member about said horizontal axis to a second position wherein said tripod axis is horizontally disposed, all three tripod legs remaining connected to said mounting brackets during movement of said unitary member between said first and second positions thereof with the tripod legs connected to said two brackets being placed in compression and the leg connected to said third bracket being placed in tension during such movement.

4,413,456

# MUD-SILL ANCHOR

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Mar. 25, 1982, Ser. No. 362,026

Int. Cl.<sup>3</sup> E02D 27/00

U.S. Cl. 52-295

7 Claims

1. A singleside sheetmetal mudsill anchor for anchoring a sill plate to a concrete slab foundation comprising:

- a concrete slab foundation having a generally horizontal top surface and a perimeter;
- a nailable form board member having an inner face temporarily placed in contact with a portion of said perimeter and an upper edge positioned parallel to said top surface of said concrete slab foundation;
- a wood mudsill having a top face and an edge positioned on said concrete slab perimeter when said concrete hardens;
- said anchor is formed from a single piece of sheetmetal and includes an embedded leg having a distal end embedded at an angle to said top surface of said slab and positioned downwardly within said slab foundation and inwardly from said slab perimeter and having an upper end

4,413,454

# PREFABRICATED FRAME AND A MULTI-STOREY BUILDING INCLUDING SAID FRAME

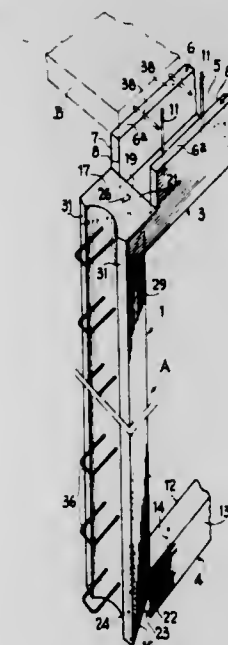
Alfred-Henri Milh, 21 Rue de Longchamp, 75016 Paris, France  
Filed Jun. 4, 1981, Ser. No. 270,396

Claims priority, application France, Jun. 5, 1980, 80 12524;  
Mar. 4, 1981, 81 04307

Int. Cl.<sup>3</sup> E04H 1/00

U.S. Cl. 52-236.6

15 Claims

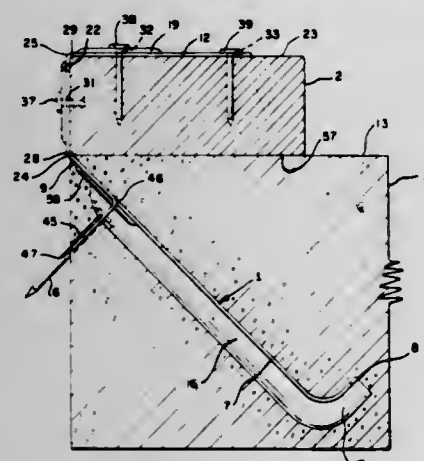


1. Prefabricated reinforced concrete frame for the construction of buildings, the frame having a contour edge defined by two uprights and two rails, each upright having an edge which comprises rigid elements anchored in the concrete and constituting projecting reinforcements which, in combination with corresponding reinforcements of at least another adjacent frame oriented at 90° or 180° to the frame, form at least a part of reinforcing ironwork of a reinforced concrete post for the assembly of two frames, the upper rail of the frame having a generally U-section defining two side walls and a bottom wall, in which U-section can be inserted with clearance the lower rail of another superjacent frame, said lower rail being formed by a solid beam, each upright having at both of the ends thereof planar and horizontal end faces, each of which end faces being set back relative to an edge of an adjacent one of said rails, which edge is part of said contour edge of the corresponding frame, the lower end face of the upright being adapted to bear, under the effect of the force of gravity, against the upper end face of the upright of another subjacent frame.



positioned adjacent the intersection of said inner face and upper edge of said form board;

(c) said anchor includes first and second laterally spaced and parallel mudsill attachment arms integrally connected to said upper end of said leg and each having a portion dimensioned for temporarily resting upon said upper edge of said form board and extending outwardly from said form board and said slab perimeter wherein the planes of said arms are temporarily on generally the same plane and



generally parallel to said top surface of said slab foundation;

(d) said first and second arms are laterally spaced a distance equal to the initial width of said anchor leg and have a length selected to span said mudsill edge and a substantial portion of said mudsill top face when bent over said mudsill member from the same side of said mudsill; and

(e) fastener means connecting said first and second arms to said top face of said mudsill member.

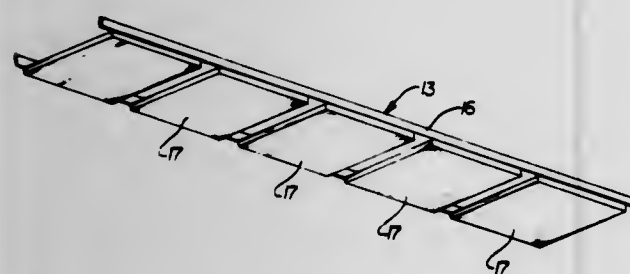
4,413,457

## CHECKERED WALL OR CEILING SYSTEM

Albert H. Lahm, and Paul D. LaLonde, both of Lorain, Ohio, assignors to Donn Incorporated, Westlake, Ohio  
Filed Feb. 5, 1981, Ser. No. 231,597  
Int. Cl.<sup>3</sup> B44F 7/00

U.S. Cl. 52—314

15 Claims



1. A wall, ceiling, and the like comprising a plurality of elongated members each formed from a single piece of sheet material, each member providing a pair of parallel support rails extending the length thereof and a plurality of spaced substantially rectangular pans, each pan including a rectangular planar base portion and sidewalls extending back from the plane of said base portion, one pair of opposed sidewalls connecting with said rails at a location spaced back from said base portion whereby said rails support said pans of a member in a predetermined spaced relationship in which said pans are aligned in one direction, and said members being positioned in substantially parallel spaced relationship, whereby said pans are aligned in another direction with associated pans of adjacent members, said support rails having a color substantially different from said pans which is selected to obscure the presence of said rails and to provide a system appearance of a pattern of separate

rectangular pans having a depth at least equal to the length of said one pair of opposed sidewalls suspended in space.

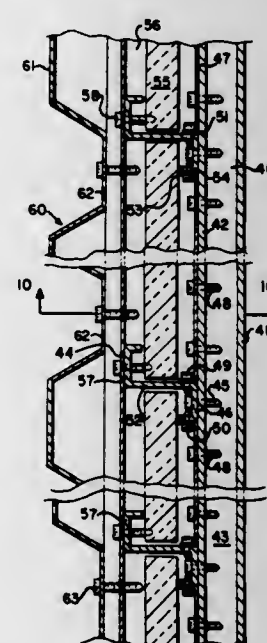
4,413,458

## BUILDING WALL LINER ASSEMBLY

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237  
Filed Aug. 5, 1981, Ser. No. 260,342  
Int. Cl.<sup>3</sup> E04C 3/00

U.S. Cl. 52—481

14 Claims



1. A building wall liner assembly secured to a building frame and formed from alternating structural liner panels and non-structural liner panels, comprising:

parallel, spaced apart sheet metal structural liner panels, each having a web and a first flange at one end extending normally from said web, a second flange at the other end extending normally from said web, a terminal lip on said second flange, the said second flange of each of said structural panels being connected to a building frame, said first flanges being in a common surface and said second flanges being in a common surface;

sheet metal non-structural liner panels having a metal thickness which is less than the metal thickness of said structural panels, each of said non-structural liner panels having a central surface and parallel marginal connecting elements along two opposed side edges thereof;

said non-structural liner panels being secured to said building frame between adjacent ones of said structural liner panels by means of connections between said central surface and said frame, said non-structural liner panels being further engaged along one of said side edges with a web of one said structural liner panel and being engaged along the other of said side edges to said terminal lip of the adjacent one of said structural liner panels;

whereby said second flanges and said central surfaces are in a common surface and comprise the liner wall surface of said building.

4,413,459

## LAMINATED WOODEN STRUCTURAL ASSEMBLY

Alan L. Lambuth, Boise, Id., assignor to Boise Cascade Corporation, Boise, Id.

Filed Mar. 16, 1981, Ser. No. 243,774

Int. Cl.<sup>3</sup> E04C 3/42, 3/14

U.S. Cl. 52—729

8 Claims

1. A laminated wooden structural assembly, comprising

(a) at least one multi-ply generally rectangular web member including a pair of spaced parallel outer layers, and at least one inner core layer bonded between said outer layers, each of said layers being formed of wood;

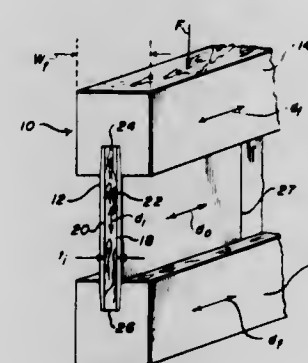
(b) at least one wooden flange member arranged adjacent

one longitudinal edge portion of said web member, the longitudinal axis of said flange member being parallel with said one longitudinal edge portion of said web member; and

(c) means rigidly connecting said web and flange members, said connecting means including

(1) a longitudinal slot contained in the surface of said flange member adjacent said web member;

(2) the longitudinal edge portion of said web member being inserted with a friction fit within said longitudinal slot; and



(3) adhesive means bonding together the mating surfaces of said longitudinal edge portion and said slot;

(d) the inner core and outer layers of said web member being arranged with their grain directions ( $d_i$ ,  $d_o$ ) extending toward and parallel with said flange member, respectively;

(e) said flange member being arranged with its grain direction ( $d_f$ ) extending longitudinally and parallel with the grain direction of said web outer layers;

(f) the thickness dimensions of said inner core layer and said flange member being in accordance with the expression:

$$\frac{t_i}{w_f} > \frac{FS}{CS}$$

where:

$t_i$  = total thickness of said inner core layers;  
 $w_f$  = width of said flange member;  
 $FS$  = fiber stress at the proportional limit, per unit area, in a compressive direction perpendicular to the grain of said flange member; and  
 $CS$  = maximum crushing strength, per unit area, in a compressive direction parallel to the grain of said inner core layer.

4,413,460

## METHOD OF ASSEMBLING A SPIRAL STAIR CASE

Horst Gerlach, Vorhölzerstrasse 17, 8000 München 71, Fed. Rep. of Germany  
PCT No. PCT/DE80/00022, § 371 Date Nov. 1, 1980, § 102(e)  
Date Oct. 27, 1980, PCT Pub. No. WO80/01819, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 29, 1980, Ser. No. 224,574

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907959

Int. Cl.<sup>3</sup> E04F 11/00

U.S. Cl. 52—741

8 Claims

1. A method of assembling a spiral staircase to accommodate differences in the height between a lower floor and an upper floor to be interconnected by said spiral staircase having central column means including first support means for securing a lower end of said column means to a lower floor and second support means for securing an upper end of said column means to an upper floor, and treads secured to said column means, comprising the following steps:

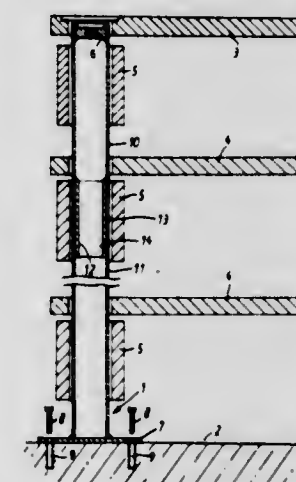
(a) providing tubular column means having a total standard length which is longer than said height between floors,

(b) providing means for telescoping said tubular column means,

(c) making at least one substantially radially extending hole through said telescoping means,

(d) cutting off a portion near a free end of said tubular column means so that the remainder of said tubular column means has an axial height corresponding to the height between a lower floor and an upper floor at a particular installation site,

(e) telescoping said tubular column means relative to said telescoping means and so that said axial height extends between the floors,



4,413,461

## APPARATUS FOR SHAPING FROZEN CONFECTIONS

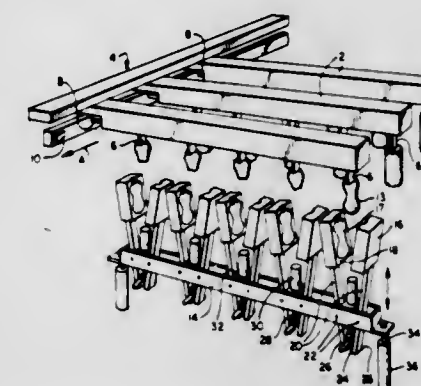
Ejvind Waldström, Hundelund, Denmark, assignor to O. G. Hoyer A/S, Højbjerg, Denmark

Filed Jul. 20, 1981, Ser. No. 284,790

Int. Cl.<sup>3</sup> B65B 5/04, 63/00

U.S. Cl. 53—122

14 Claims



1. An apparatus for producing ice cream lollies or similar frozen material articles of irregular shape, the apparatus comprising means for producing a prefrozen material body of regular shape, at least one pair of cooperative die tools, at least one of said die tools is provided with a generally concave shaped cavity, means for mounting said die tools so as to be pivotable between an open position and a closed together position, said die tools being disposed at a position above said means for mounting, means for pivotably moving said tools



between the open position in which a receiving space is defined between the tools, and the closed together position, means for supplying said prefrozen material body to said receiving space, whereby said frozen material body is deformable into the desired irregular shape by the tools being moved to said closed together position and thereafter retracted from each other to the open position.

4,413,462

# ACCUMULATOR AND STACKER FOR SANDWICHED BISCUITS AND THE LIKE

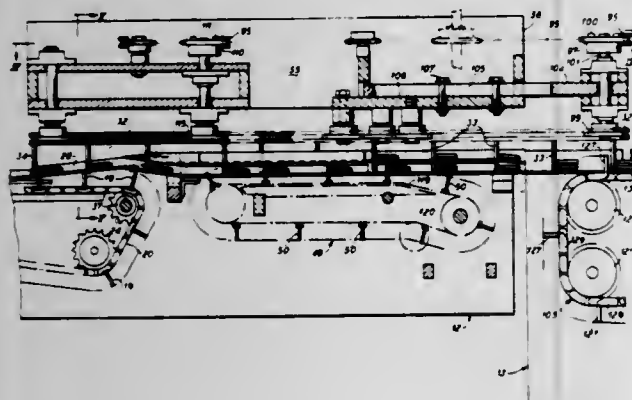
Edward Rose, Skokie, Ill., assignor to Peters Machinery Co., Subsidiary of Katy Industries, Chicago, Ill.

Filed May 12, 1981, Ser. No. 262,994

Int. Cl.<sup>3</sup> B65B 35/50, 35/44

U.S. Cl. 53—540

19 Claims



1. In a sandwiching machine and wrapping machine spaced in advance of the sandwiching machine a stacker cooperating with the sandwiching machine to stack sandwiches delivered therefrom and cooperating with the wrapping machine to effect the accumulation of stacked sandwiches into two, three, or four stacks in tandem arrangement relative to each other to thereafter be wrapped by the wrapping machine,

two side by side sandwiching carrying conveyor troughs extending from the sandwiching machine over the wrapper and carrying sandwiches for stacking and having flight receiving slots extending therealong, a first trough for one row of sandwiches declining to substantially the plane of the top of the wrapping machine and having a first conveyor extending therealong and a second trough for the other row of sandwiches having a second conveyor and extending parallel to the first trough for the one row of sandwiches and angularly toward the trough for the one row of sandwiches and therealong to intersect the line of travel of the one row of sandwiches, the sandwiches in each trough being carried by the flights of said second conveyor and carried therealong as the flights recede beneath the bottom of its trough and the flights depending from the intersecting trough carry the sandwiches in both troughs in aligned relation for stacking said second trough extending along a wrapper conveyor for a portion of the length thereof and constructed to enable the depending flights to pass outwardly out said second trough beyond a sidewall thereof to a return path of said flights, and disengage the sandwiches in a decelerating path as the flights move outwardly of the sidewall of said second trough, to avoid crumbling of the trailing edges of the sandwiches as said flights move out of engagement therewith.

## 4,413,463 ROLLER STRETCH PASS THROUGH STRETCHING APPARATUS AND PROCESS

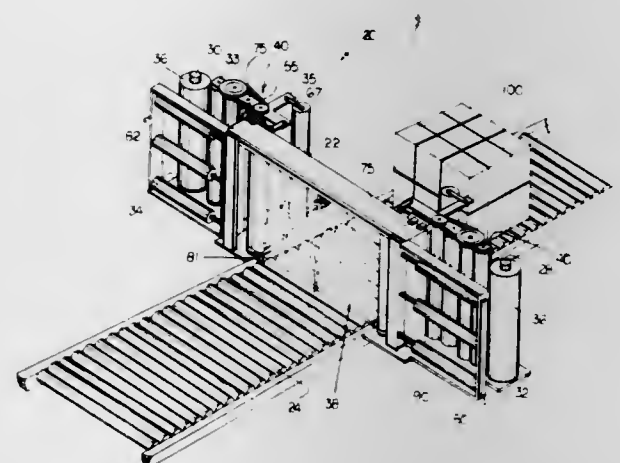
William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Oct. 23, 1980, Ser. No. 200,013

Int. Cl.<sup>3</sup> B65B 11/08, 13/04

U.S. Cl. 53—399

22 Claims



18. A process for wrapping a web of stretched film material around a load carried by a conveyor with a pass through film wrapping apparatus comprising the steps of:

- placing a composite film web comprising two film webs having their leading ends sealed together across the path of a transported load;
- transporting said load into said composite film web to engage said composite film web and carry said composite film web;
- simultaneously pre-stretching each of the two film webs independently before the webs engage the load substantially beyond the film web's yield point by passing each said film web through pre-stretch means each comprising an upstream roller and a downstream roller driven at different relatively constant speeds to exert a force on the film webs so that the upstream roller retards each said film web with respect to said downstream roller;
- relieving a portion of the force experienced by each of the film webs during pre-stretching after leaving said downstream rollers and while wrapping the film web around the load;
- stopping the movement of the load along the conveyor path after it has passed the wrapping apparatus with the rear of the load positioned downstream of a pair of opposed sealing jaws;
- moving said opposed sealing jaws inward toward each other against the film webs to superimpose the webs;
- sealing the webs together in at least two places to form a composite web; and
- cutting the webs between the spaced apart seals allowing a severed composite film web to hold the load under composite force.

4,413,464

## PROCESS OF PRODUCING A PACKAGE OR WRAPPING FOR STORING OR SHIPPING MATERIAL

Lars-Göran Larsson, Malmö, and Bertil S. O. Murne, Oxie, both of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmö, Sweden

Division of Ser. No. 681,231, Apr. 28, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,050

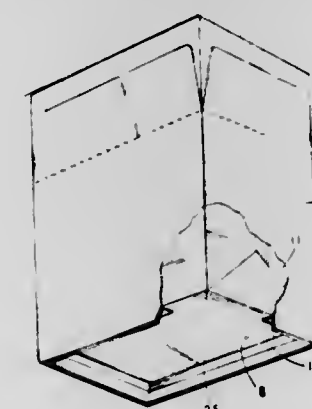
Int. Cl.<sup>3</sup> B65B 43/08, 61/18

U.S. Cl. 53—412

8 Claims

1. A method of forming a package filled with material comprising folding a continuous flat sheet of flexible material onto a mandrel to form an inner container having four side walls, an open top, and a closed bottom wall which define a parallelepiped shape, the material having overlapping edges extending along each of two of said four side walls opposite to one another, joining the overlapping edges along the entire longitudinal length of each of the side walls to form a longitudinal seam therealong with a flap extending from said bottom wall, each of the longitudinal seams extending continuously from the side wall along the respective flap, forming a transverse seam at each said flap at the juncture thereof with the respective side wall, folding said flaps around the transverse seams and into sealed engagement against the respective side walls, said bottom wall being constituted by the thickness of the sheet of material of the inner container and being free from flaps and folds to form a flat smooth surface, forming an outer container of stiffer material than the inner container with four side walls corresponding to said four side walls of said inner container and opposite open ends, and a circumferential flange positioned adjacent to and spaced from one end of the outer container, said circumferential flange extending inwardly from the inner surfaces of said four side walls of said outer container,

ped shape, the material having overlapping edges extending along each of two of said four side walls opposite to one another, joining the overlapping edges along the entire longitudinal length of each of the side walls to form a longitudinal seam therealong with a flap extending from said bottom wall, each of the longitudinal seams extending continuously from the side wall along the respective flap, forming a transverse seam at each said flap at the juncture thereof with the respective side wall, folding said flaps around the transverse seams and into sealed engagement against the respective side walls, said bottom wall being constituted by the thickness of the sheet of material of the inner container and being free from flaps and folds to form a flat smooth surface, forming an outer container of stiffer material than the inner container with four side walls corresponding to said four side walls of said inner container and opposite open ends, and a circumferential flange positioned adjacent to and spaced from one end of the outer container, said circumferential flange extending inwardly from the inner surfaces of said four side walls of said outer container,



inserting the inner container into the outer container through the other of the open ends so that the bottom wall of the inner container rests on said circumferential flange, securing the bottom wall of the inner container to the circumferential flange, the transverse seams at said flaps of the inner container stabilizing the folds between the flaps and the side walls of the inner container and also stabilizing the shape of the inner container in the region where the bottom wall is secured to the circumferential flange of the outer container, filling the inner container with the material to be stored therein, closing and sealing the open top of the inner container and the outer container at said other of the open ends, inverting the containers so that the bottom wall of the inner container faces upwardly and constitutes the end at which the material can be removed from the inner container by opening said bottom wall, and sealably and removably fitting a cover lid within the outer container to rest on the circumferential flange such that by removing said cover lid and cutting open said bottom wall of said inner container at the opening defined by said circumferential flange the filling material in said inner container may be discharged.

4,413,465

## STIRRUP ADJUSTING AND LOCKING DEVICE

Earl L. Blevins, and Joan V. Blevins, R.R. 2, both of Wheatland, Wyo. 82201

Filed Dec. 14, 1981, Ser. No. 330,486

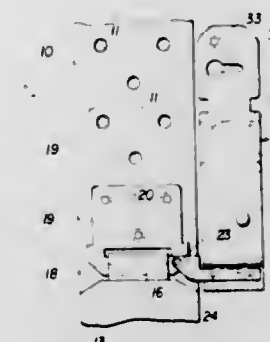
Int. Cl.<sup>3</sup> B68C 1/16; A44B 11/20

U.S. Cl. 54—46

7 Claims

1. In a saddle stirrup, a stirrup suspension strap including two length adjustable strap sections, one strap section having a plurality of adjusting and locking openings formed there-through, a flat adjusting and locking plate fastened to the other strap section and having spaced locking pins projecting from one side thereof for entry into selected openings of said one strap section, a U-formed locking buckle having an open end and a closed end pivotally attached to said locking plate and adapted to be swung across the latter and across said one strap section into straddling relationship therewith, a flexible strap

having a free end carried by the U-formed locking buckle and adapted to be extended around the open end of said buckle and around an adjacent edge of the said one strap section, a rigid



4,413,466

## CONTROL ASSEMBLY FOR BLADE CLUTCH UNIT

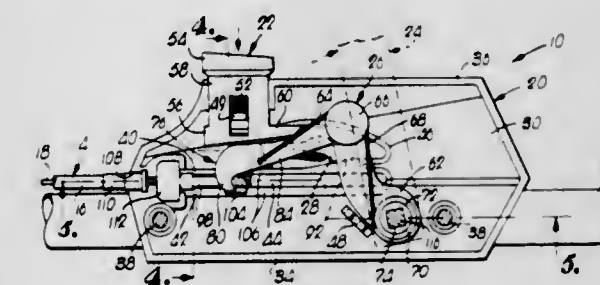
Anthony F. Beugelsdyk, Wichita; Terence J. Stuchlik, Emporia, and Bruce J. Kester, Wichita, all of Kans., assignors to Conchemco, Incorporated, Lenexa, Kans.

Filed Jan. 11, 1982, Ser. No. 338,480

Int. Cl.<sup>3</sup> A01D 75/20

U.S. Cl. 56—11.3

12 Claims



1. A power lawnmower control apparatus for connection to a disengageable clutch coupling the lawnmower motor and blade, said apparatus comprising:

- movable operating means;
- shiftable handle means;
- cable means for operative connection to said clutch including an end portion biased to a first position corresponding to the disengaged position of said clutch and shiftable to a second position corresponding to the engaged position of said clutch; and
- operating mechanism, including—
  - coupling means operatively connected to said handle means and shiftable to a position adjacent said cable end portion wherein said coupling means is engageable by said operating means upon movement thereof for coupling said coupling means with said cable end portion for thereafter causing movement of the cable end portion from said first to said second position thereof upon shifting of the handle means; and
  - means engageable with said coupling means for disengaging said coupling means from said cable end portion when said handle means is released and said cable end portion moves from said second toward said first position thereof.



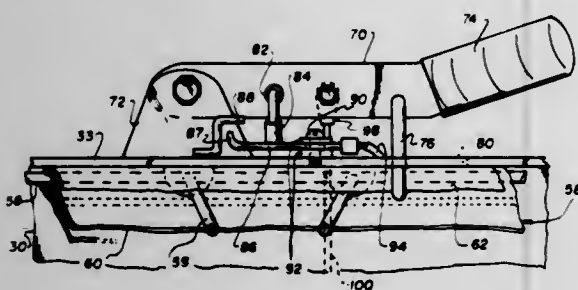
4,413,467

**DISPOSABLE BAG MOUNTING AND SHUTDOWN MECHANISM FOR ROTARY LAWN MOWER**

Harold M. Hockersmith, 9938 Donegal, Dallas, Tex. 75218  
 Division of Ser. No. 236,537, Feb. 20, 1981, Pat. No. 4,345,418.  
 This application Jun. 28, 1982, Ser. No. 393,126  
 Int. Cl.<sup>3</sup> A01D 75/20, 69/10

U.S. Cl. 56—11.3

8 Claims



1. In a rotary power lawnmower;  
 a housing, motor means mounted on said housing and including a power takeoff shaft drivably connected to rotary mower blade means, brake means operably connected to said blade means to arrest rotation of said blade means, said housing including a discharge chute for conveying grass cuttings entrained in a moving air stream generated by said blade means away from said housing, means on said housing for supporting grass collection bag means in flow receiving communication with said discharge chute for receiving said grass cuttings, and a movable locking member associated with said support means and adapted to be moved between locking and release positions for releasably retaining said bag means on said support means, and actuating means interconnecting said brake means and said locking member and responsive to the movement of said locking member to said release position to cause said brake means to brake the rotation of said blade means.

4,413,468

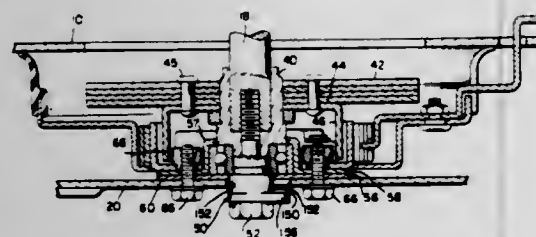
**LAWN MOWER BLADE RETAINER**

Harold M. Hockersmith, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Apr. 2, 1982, Ser. No. 364,992  
 Int. Cl.<sup>3</sup> A01D 55/18

U.S. Cl. 56—295

10 Claims



1. A safety mounting for a rotary lawn mower blade, comprising  
 a blade carrier mounted for rotation on the axis of a depending drive shaft, and plurality of eccentrically positioned blade bolts for securing a blade to the carrier,  
 a blade having bolt holes for the reception of said blade bolts and having a central opening which lies on the axis of the carrier when the blade is mounted on the carrier,  
 a blade retainer fixed on the drive shaft, having a cylindrical shank extending through said blade opening and a head below the blade,  
 said blade having bearing portions at the edge of said opening in bearing clearance relation with said retainer shank so as to hold the blade substantially concentric with the shank in the absence of blade bolts,  
 said blade opening and retainer head having complementary unsymmetrical shapes adapted to register with each other

in not more than a small limited number of relative orientations to permit axial movement of the blade off the retainer and to block such axial movement in all other orientations.

4,413,469

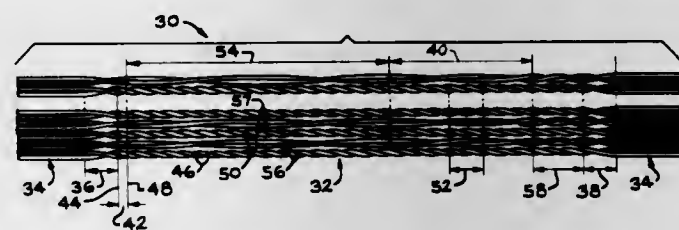
**METHOD OF MAKING LOW CROSSTALK RIBBON CABLE**

Patrick J. Paquin, Hamden, Conn., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 23, 1981, Ser. No. 246,800  
 Int. Cl.<sup>3</sup> H01B 13/04, 13/06

U.S. Cl. 57—293

19 Claims



1. A method of making multi-conductor cable having a plurality of longitudinally extending insulated conductor pairs with each of said insulated conductor pairs having twisted pair portions alternating in series with straight portions, comprising:  
 twisting a first plurality of first pairs of individually insulated moving conductors in a first direction;  
 twisting a second plurality of second pairs of individually insulated moving conductors in a second direction opposite to said first direction;  
 passing said first plurality of pairs of individually insulated moving conductors through a plurality of first twister tubes intermittently rotatably operated in said first direction;  
 passing said second plurality of pairs of individually insulated moving conductors through a plurality of second twister tubes intermittently rotatably operated in said second direction;  
 in a first cycle, operating said first twister tubes and said second twister tubes to twist said first plurality of pairs of individually insulated moving conductors and said second plurality of pairs of individually insulated moving conductors into parallel twisted pair portions alternately laterally disposed and having respective first and second lengths of twist and respective first and second directions of twist, terminating the operation of said first and second twister tubes but not the forward movement of said conductors forming said twisted pair portions, and shortly after terminating the operation of said first and second twister tubes positively maintaining each of said moving, insulated conductors forming said twisted pair portions along straight, precisely laterally spaced, paths for a predetermined distance to thereby form said straight portions of said multi-conductor cable;  
 successively repeating said first cycle to form insulated conductor pairs having twisted pair portions alternating in series with said straight portions;  
 simultaneously with said first and successive cycles, bonding said twisted pair portions of said insulated moving conductors and said straight portions of said insulated moving conductors to at least one longitudinally extending plastic sheet while positively maintaining a first precise lateral spacing of said twisted portions during bonding, and positively maintaining a second precise lateral spacing of said straight portions alternating with said twisted portions during bonding; and  
 cooling the cable so formed.

4,413,470

**CATALYTIC COMBUSTION SYSTEM FOR A STATIONARY COMBUSTION TURBINE HAVING A TRANSITION DUCT MOUNTED CATALYTIC ELEMENT**

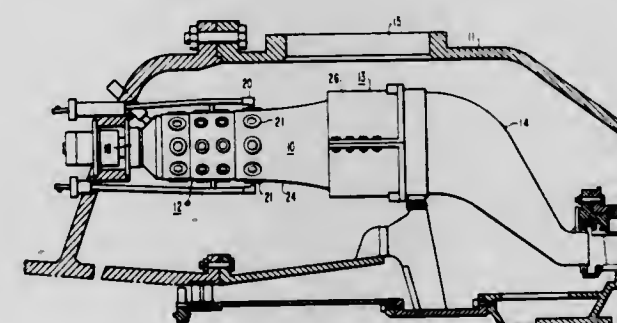
Paul E. Scheihing, Glen Mills, and James A. Laurelli, Springfield, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 5, 1981, Ser. No. 240,716

Int. Cl.<sup>3</sup> F02C 7/20

U.S. Cl. 60—39.32

11 Claims



1. A catalytic combustion system for a stationary combustion turbine having a casing comprising a supported combustor basket having means for burning primary fuel to provide a preheated gas, means for mixing secondary fuel and air with the preheated gas, a transition duct disposed downstream from said combustor basket, means for supporting said duct relative to the turbine casing, a catalytic unit, means for supporting said catalytic unit relative to an upstream portion of said transition duct to put the thrust load from said catalytic element on said duct supporting means, and means for coupling an outlet portion of said combustor basket to an inlet of said catalytic unit.

4,413,471

**AIR-FUEL RATIO CONTROL APPARATUS OF AN INTERNAL COMBUSTION ENGINE**

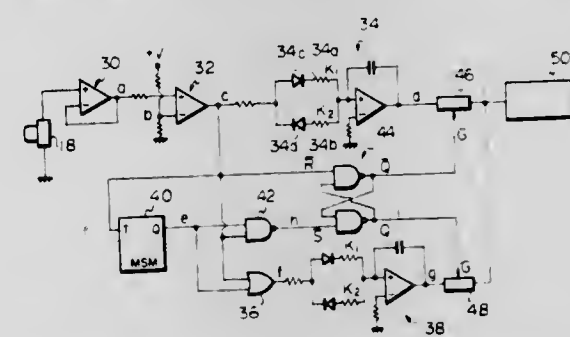
Kyo Hattori, Noriyoshi Shibata, both of Susono, and Isamu Hagino, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 2, 1981, Ser. No. 326,653

Claims priority, application Japan, Dec. 3, 1980, 55-169654  
 Int. Cl.<sup>3</sup> F01N 3/08

U.S. Cl. 60—276

4 Claims



1. An air-fuel ratio control apparatus of an internal combustion engine comprising:  
 means for detecting the concentration of a predetermined component in the exhaust gas to generate an electrical signal which indicates the detected concentration;  
 means for comparing the level of said generated electrical signal with a predetermined reference level to produce a discrimination signal having a first or second level which is different from each other;  
 first integration means for integrating, with respect to time, said discrimination signal to produce a first integration signal which is increased during the first level period of said discrimination signal and decreased during the second level period of said discrimination signal, the integration time constant for increasing the integration signal being

larger than the integration time constant for decreasing the integration signal;  
 second integration means for integrating, with respect to time, said discrimination signal to produce a second integration signal which is increased during the first level period of said discrimination signal and decreased during the second level period of said discrimination signal, the integration time constant for increasing the integration signal being larger than the integration time constant for decreasing the integration signal;  
 means for selecting said first integration signal or said second integration signal in response to said discrimination signal; and  
 means for adjusting the air-fuel ratio condition of the engine in response to said selected integration signal of said selection means.

4,413,472

**HIGH-PRESSURE PUMP WITH PRESSURE REGULATOR**

Armin Lang, Schwabisch, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

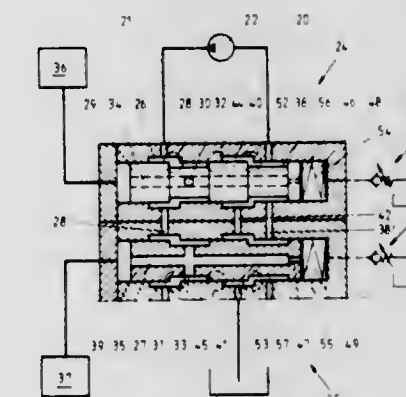
Filed Jul. 24, 1980, Ser. No. 172,032

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930107

Int. Cl.<sup>3</sup> F15B 13/02

U.S. Cl. 60—420

6 Claims



1. In combination with a fluid operated device, a fluid reservoir, a pump having suction and pressure lines, a fluid supply line connected to the fluid operated device, and a pressure regulator connected to the reservoir and located between said suction and pressure lines, including a control piston (7, 29, 39) having opposed end faces (10 and 12) and spring means (11-15, 48-54, 49-55) loading one of the end faces (10) for restricting flow through the suction line as a function of operating pressure of fluid in the supply line to which the other of the end faces (12) is exposed and blocking flow through the suction line at a predetermined level of the operating pressure in response to which the pressure line is connected to the reservoir, the improvement comprising restricted passage means (14, 46, 47) in the piston for conducting restricted flow of the fluid between the opposed end faces thereof, to automatically vary flow in the suction line, and pressure responsive pilot means (17, 50, 51, 64) operatively associated with said spring means for controlling the operating pressure through the pressure regulator.



4,413,473

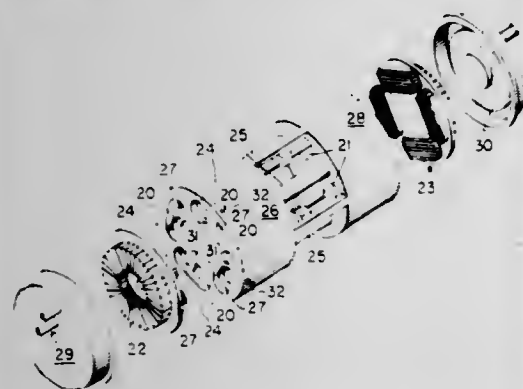
HEAT TRANSFER COMPONENTS FOR  
STIRLING-CYCLE, RECIPROCATING THERMAL  
MACHINES

William M. Moscrip, 309 Ellery Ct., Fredericksburg, Va. 22401  
PCT No. PCT/US82/00651, § 371 Date Jul. 28, 1982, § 102(e)  
Date Jul. 28, 1982, PCT Pub. No. WO82/04101, PCT Pub.  
Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 403,773  
Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—517

4 Claims



1. A Stirling-cycle, reciprocating, thermal machine having an expansion space, a compression space, a regenerator, a working fluid enclosed in said spaces and in ducts permitting oscillatory flow of said fluid between said spaces through said regenerator, a heater for transmitting heat from an external heat source to working fluid in the expansion space, a cooler for transmitting heat from working fluid in the compression space to an external heat sink, the heat transfer element of at least said heater being constructed of a material having high thermal conductivity and being affixed to said machine by joining structure having low thermal conductivity, said transfer element and said joining structure having substantially the same linear thermal expansion coefficients.

4,413,474

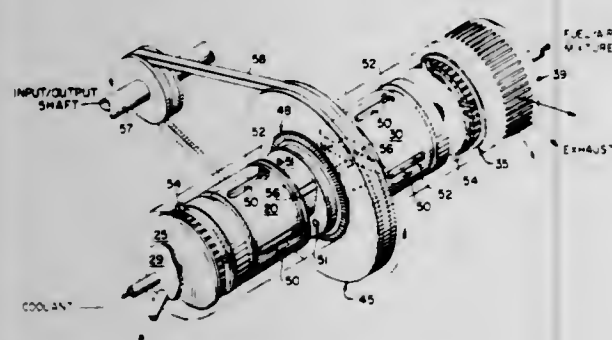
MECHANICAL ARRANGEMENTS FOR  
STIRLING-CYCLE, RECIPROCATING THERMAL  
MACHINES

William M. Moscrip, 309 Ellery Ct., Fredericksburg, Va. 22401  
PCT No. PCT/US82/00649, § 371 Date Jul. 29, 1982, § 102(e)  
Date Jul. 29, 1982, PCT Pub. No. WO82/04099, PCT Pub.  
Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 406,729  
Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—517

7 Claims



1. A reciprocating, single-acting, multiple-piston, Stirling-cycle thermal machine which includes a frame; at least one pair of stationary, coaxial, in-line, right-circular cylinders mounted in said frame, said cylinders being thermally isolated from each other, open at their adjacent ends and closed at their remote ends, one of said cylinders enclosing an expansion space of the machine and the other enclosing a compression space of the machine; an external heat source; an external heat sink; regenerators for each cylinder pair; a heater for each

expansion space comprising a heat exchanger element closing the remote end of the expansion space and serving to thermally conductively connect said source to the machine working fluid; a cooler for each compression space comprising a heat exchanger element closing the remote end of the compression space and serving to thermally conductively connect said sink to the machine working fluid; a piston arranged to reciprocate within each of said cylinders, locked against rotation relative thereto and sealing the open end thereof, the pistons of each coaxial pair of cylinders being mechanically linked; cam and cam follower means operatively connecting said pistons to a rotary drive mechanism turning about an axis coaxial with the principal machine axis of symmetry, the symmetry plane of said drive mechanism normal to its axis of rotation being coincident with the plane of symmetry of the reciprocating parts of the machine; the machine working fluid being contained in one or more isolated stages comprising an expansion space, a heater, a regenerator, a cooler, and a compression space connected in series by passages permitting oscillating flow between said spaces.

4,413,475

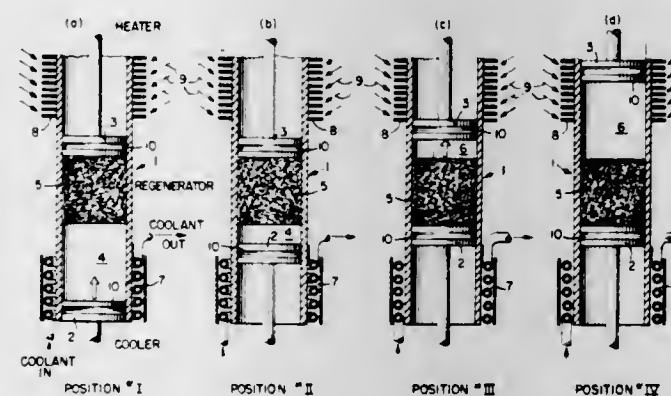
THERMODYNAMIC WORKING FLUIDS FOR  
STIRLING-CYCLE, RECIPROCATING THERMAL  
MACHINES

William M. Moscrip, 309 Ellery Ct., Fredericksburg, Va. 22401  
PCT No. PCT/US82/00648, § 371 Date Jul. 28, 1982, § 102(e)  
Date Jul. 28, 1982, PCT Pub. No. WO82/04098, PCT Pub.  
Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 403,770  
Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—521

4 Claims



1. A Stirling-cycle, reciprocating, thermal machine in which the internal working fluid is a gas that has a molecular weight substantially greater than that of air, is non-toxic, nonflammable, chemically and thermally stable, with a heat transfer coefficient substantially greater than that of hydrogen at machine operating temperatures and pressures and can be easily liquefied under pressure at room temperature, and comprising a control system including means for varying the main system mean operating pressure by rapid injection of working fluid from a reservoir into the working volume as a liquid to increase that pressure and by withdrawal of working fluid as a gas from that working volume and its condensation in the reservoir to reduce that pressure.

4,413,476

GEOGRAPHICALLY POSITIONED, ENVIRONMENTAL,  
SOLAR HUMIDIFICATION ENERGY CONVERSION

Gene S. Kira, 7986 Amargosa Dr., Carlsbad, Calif. 92008, and  
Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif.  
92067

Filed Dec. 23, 1980, Ser. No. 220,175  
Int. Cl.<sup>3</sup> F03G 7/02

U.S. Cl. 60—641.8

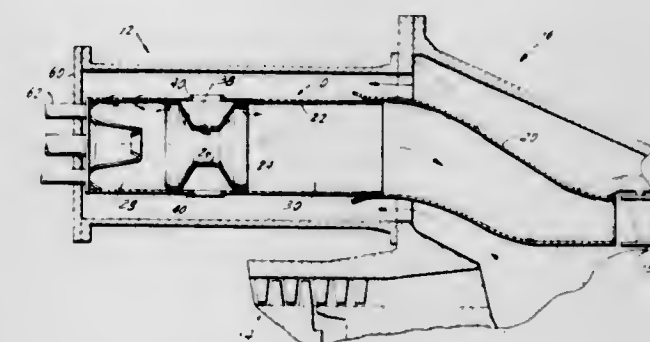
16 Claims

1. A method of geographically positioned, environmental

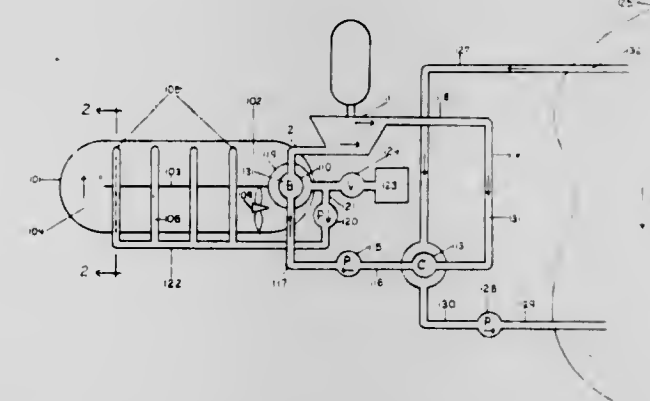
solar humidification energy conversion comprising the steps of:

- providing air in a solar collector;
- providing water in the solar collector;
- combining the provided air with the provided water in the solar collector to create humid air;
- heating the provided air, the provided water and/or the humid air by the solar collector to create warm humid air;
- transporting the warm humid air to a boiler of a closed cycle power system;
- providing a working fluid in the boiler of the power system;
- heating the working fluid in the boiler with the transported warm humid air whereby the working fluid is pressurized and the warm humid air is cooled, whereby some water vapor condenses;
- converting the energy of the pressurized working fluid by passing the fluid through a turbine to produce a useful form of energy, thereby expanding the working fluid;
- transporting the expanded working fluid to a condenser of the closed cycle power system;

a plurality of upstream fingers defined by a plurality of slots in an upstream end of said throat insert; means for connecting each of said upstream fingers to said outer shell; and



a plurality of downstream fingers on a downstream end of said throat insert, said downstream fingers including means for coupling said downstream end to said outer shell.



4,413,478

AIR CONDITIONING SYSTEM AND METHOD  
Alden I. McFarlan, 691 Dorian Rd., Westfield, N.J. 07090  
Continuation-in-part of Ser. No. 301,655, Sep. 14, 1981. This  
application Jan. 18, 1982, Ser. No. 340,328  
Int. Cl.<sup>3</sup> F25D 17/02

U.S. Cl. 62—98

15 Claims

- introducing waste water from an environment body of water;
- transporting the waste water to the condenser of the power system;
- cooling the transported expanded working fluid in the condenser with the transported waste water, whereby the working fluid condenses, thereby heating the waste water;
- recycling the cooled working fluid to provide said working fluid in the boiler of the power system; wherein step (b) comprises the step of:
- distributing the provided water through a network of conduits to an array of emitters and wherein step (c) comprises the steps of:
- emitting the distributed water by the emitters whereby the emitted water travels down some absorbent filaments, where each filament is suspended in the air from the emitter to which it is connected
- absorbing the emitted water by the filaments
- evaporating the absorbed water from the filaments.

4,413,477

LINER ASSEMBLY FOR GAS TURBINE COMBUSTOR  
Gilbert J. Dean, Ballston Spa, and Loren H. White, Scotia, both  
of N.Y., assignors to General Electric Company, Schenectady,  
N.Y.

Filed Dec. 29, 1980, Ser. No. 220,272  
Int. Cl.<sup>3</sup> F02G 3/00

U.S. Cl. 60—757

15 Claims

1. A liner assembly for a combustor used in connection with a gas turbine, said liner assembly comprising:  
an outer structural shell;  
a separate throat insert flexibly coupled to and situated in said outer shell;  
said throat insert including a reduced throat section effective to divide said outer shell into an upstream chamber and a downstream chamber;

4. A method of air conditioning a plurality of spaces which comprises the steps of, producing three separate continuous streams respectfully of hot water and cold water and neutral water wherein the temperature of said neutral water is between the temperatures of said streams of hot water and cold water, delivering a heat-transfer stream of water to each of a plurality of air-treating units which are remote from each other and each of which cools or heats a stream of air which is delivered to an air-conditioned space, and wherein each of said heat-transfer streams is formed from a stream of said hot water or a stream of said cold water or a stream of said neutral water of a mixture of said neutral water with water from only one of said streams of hot water or cold water, controlling the formation of each of said heat-transfer streams in accordance with the air heating or air cooling required of the said heat-treating unit to which that said heat-transfer stream flows, and supplying neutral water to any of said air-treating units which is required to heat air when the dominant action of the other of said air-treating units is to cool air, and returning separate streams from said units receiving hot water and cold water.



4,413,479

**PROCESS FOR PRODUCING COLD AND/OR HEAT BY MEANS OF AN ABSORPTION CYCLE**

Alexandre Rojey, Garches, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

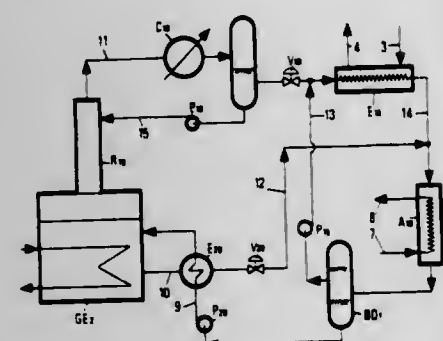
Filed Apr. 15, 1982, Ser. No. 368,591

Claims priority, application France, Apr. 15, 1981, 81 07751

Int. Cl.<sup>3</sup> F25B 15/00

U.S. Cl. 62—101

13 Claims



1. Process for producing cold and/or heat according to an absorption cycle operated with a working fluid (F), a solvent (S) for said working fluid and an auxiliary fluid (H), characterized by the steps of:

- contacting, in an absorption/condensation step, a liquid phase of solvent (S) with a gas phase comprising both the working fluid (F) and a fluid (H), so as to obtain a solution of the fluid (F) in the solvent (S) and a liquid phase of fluid (H), the liquid phase of fluid (H) being at least partly immiscible with the solution of the fluid (F) in the solvent (S) and the fluid (H) being a fluid which can vaporize in the conditions of step (e) and condense in the conditions of step (a), the absorption heat of the fluid (F) in the solvent (S) and the condensation heat of the fluid (H) being transferred to an external fluid,
- separating the solution of fluid (F) in the solvent (S) from the liquid phase of fluid (H),
- supplying the solution of fluid (F) in solvent (S), recovered from the step (b), to a desorption step and subjecting said solution to desorption conditions, the desorption heat being supplied by an external fluid, so as to form a liquid phase of decreased content of fluid (F) and a vapor phase of high content of fluid (F), and recycling said liquid phase of decreased content of fluid (F) to the absorption/condensation step (a) to form the liquid phase of solvent (S),
- condensing at least a portion of the vapor phase of high content of fluid (F), recovered from the desorption step (c), and delivering heat to an external fluid, to obtain a liquid condensation phase,
- admixing at least a portion of the liquid condensation phase, obtained in step (d), with at least a portion of the liquid phase of fluid (H) recovered from step (b), vaporizing at least a portion of the resultant mixture with heat supplied from an external fluid, the operating conditions being so selected as to allow vaporization of at least a portion of the fluid (F) and at least a portion of the fluid (H), and
- recycling the resultant gas phase to the step (a), the fluid (H) being so selected that the maximum variation of its vapor pressure be comprised between 40 and 80% of the minimum vapor pressure of the fluid (F), and the ratio of the molar feed rate of fluid (H) to the molar feed rate of fluid (F) representing at least 80% of the ratio of the vapor pressure of the fluid (H) at the end of the vaporization step (a) to the vapor pressure of the fluid (F) at the beginning of the vaporization step, both molar feed rates being determined at the beginning of the vaporization step.

(f) recycling the resultant gas phase to the step (a), the fluid (H) being so selected that the maximum variation of its vapor pressure be comprised between 40 and 80% of the minimum vapor pressure of the fluid (F), and the ratio of the molar feed rate of fluid (H) to the molar feed rate of fluid (F) representing at least 80% of the ratio of the vapor pressure of the fluid (H) at the end of the vaporization step (a) to the vapor pressure of the fluid (F) at the beginning of the vaporization step, both molar feed rates being determined at the beginning of the vaporization step.

4,413,480

**HYPERABSORPTION SPACE CONDITIONING PROCESS AND APPARATUS**

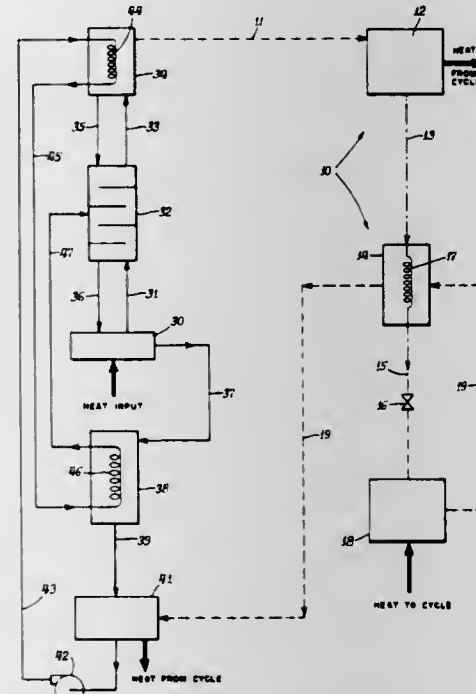
Robert A. Macriess, Deerfield, and Thomas S. Zawacki, Oak Park, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Apr. 5, 1982, Ser. No. 365,792

Int. Cl.<sup>3</sup> F25B 15/00, 17/08

U.S. Cl. 62—112

21 Claims



1. In a closed cycle space conditioning process of the type comprising the steps of sequentially absorbing a refrigerant vapor in a liquid in an absorber zone with removal of heat energy from the cycle, passing said absorbed refrigerant vapor in said liquid to a generator zone and heating said absorbed refrigerant vapor from liquid, passing said refrigerant vapor from liquid, passing said refrigerant vapor to a condenser zone condensing said refrigerant vapor to a refrigerant liquid with removal of heat energy from the cycle, passing said condensed refrigerant liquid through a pressure reduction zone vaporizing said condensed liquid, passing said refrigerant vapor to an evaporator zone and heating said refrigerant vapor by addition of heat energy to the cycle, and passing said heated refrigerant vapor to said absorber zone for repeat of the cycle, the improvement comprising:

sequentially in a closed cycle maintaining in said absorber a substantially saturated salt working solution of a salt having an exothermic heat of crystallization, passing said substantially saturated working solution to said generator, crystallizing said salt from said working solution to form a solid phase salt in said generator, and passing a slurry of said solid phase salt in a solution of said salt to said absorber wherein said solid phase salt is dissolved to form said substantially saturated salt working solution whereby the exothermic heat of said crystallization is utilized to aid said vaporization in said generator zone.

4,413,481

**PORTABLE BEVERAGE COOLER**

William S. Thomas, 160-19 Normal Rd., Jamaica, N.Y. 11432

Filed Jul. 19, 1982, Ser. No. 399,300

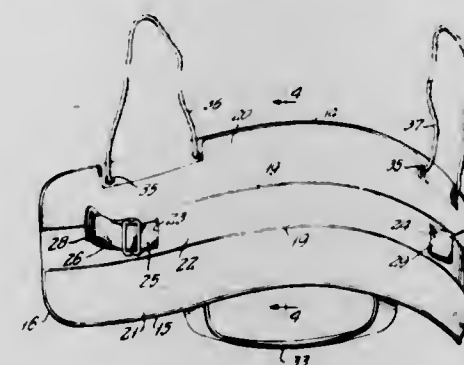
Int. Cl.<sup>3</sup> F25D 3/08

U.S. Cl. 62—371

3 Claims

1. An improved portable beverage cooler comprising: a flexible planar main body element including inner and outer walls of generally rectangular configuration, said walls being interconnected at the peripheral upper, lower, and end edges thereof, and along a pair of parallel longitudinally extending areas to define upper and lower pockets for the sealed reten-

tion of a cooling medium, and a medially disposed pocket, said medially disposed pocket having transversely extending slot openings in said outer wall leading thereto disposed medially of said end edges of said main body element; an elongated elastic member slidably disposed within said medially disposed pocket, and having first and second ends provided with mutu-



ally interconnecting means; and an elongated strap member having first and second ends interconnected to said main body element adjacent said lower edge thereof; whereby when said main body element is wrapped about a beverage container of predetermined diameter, said last mentioned strap is positioned beneath a lower wall of said container to prevent relative slipping between said main body element and said container.

4,413,482

**CAM-SUPPORT FOR A KNITTING MACHINE**

Gerard Stelger, Montreux, Switzerland, assignor to Atelier de Construction Stelger S.A., Switzerland

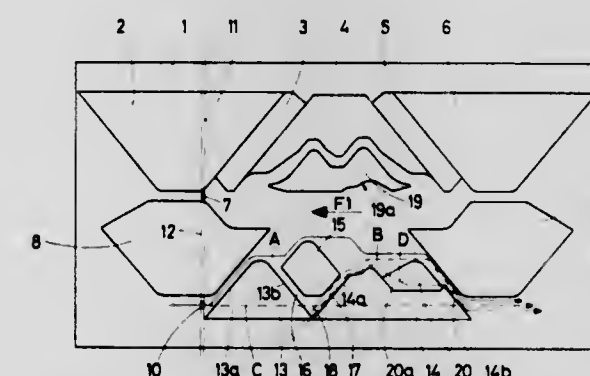
Filed Jun. 5, 1981, Ser. No. 270,966

Claims priority, application Switzerland, Jun. 16, 1980, 4608/80

Int. Cl.<sup>3</sup> D04B 7/00

U.S. Cl. 66—78

1 Claim



1. A cam support for a knitting machine for the entrainment of push-rods, respectively of the needles, according to the so-called "three way" technique, comprising several lifting cams intended to entrain the abutment surfaces of the push-rods, respectively of the needles, at several different selection points, so that the needles operate either in a knit, tuck or miss position, characterised by the fact that it comprises at least one arrangement of lifting cams comprising two lifting cams arranged immediately one after the other and each comprising two opposed ramps and a third lifting cam disposed between the adjacent ramps of the of the two first cams, an empty space being provided below this third cam, said space being connected to two channels limited on one side by the adjacent ramps of the first two cams, so that a push-rod, respectively of a needle, selected before the arrival of an outer end of said first cams, is entrained by one of the said first cams, in the direction of movement of the cam-support and by the third cam and operates in the knit position, whereas a push-rod, respectively of a needle, selected when said empty space arrives approxi-

mately opposite said push-rod, respectively of a needle, is not entrained by the third cam and operates in the tuck position.

4,413,483

**CONTROL MECHANISM FOR CIRCULAR KNITTING MACHINE**

William C. Smith, and Gerald A. G. Seekings, both of Leicester, England, assignors to Bentley Engineering Company Limited, Leicester, England

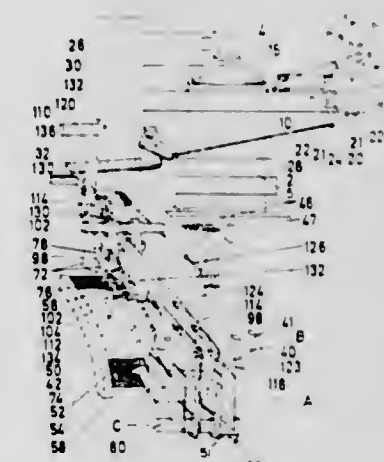
Filed Sep. 30, 1980, Ser. No. 192,637

Claims priority, application United Kingdom, Oct. 1, 1979, 7933905

Int. Cl.<sup>3</sup> D04B 15/38, 15/66

U.S. Cl. 66—125 R

7 Claims



1. Circular knitting machine having a needle cylinder, a cam system surrounding the cylinder, needles in the cylinder operable by the cam system, yarn feeders for supplying yarn to the needles for knitting, a cam drum, cams on the cam drum, a cam drum racking mechanism, a control means for selectively activating the cam drum racking mechanism with predetermined interruptions,

wherein said control means includes a timing drum, control elements mounted on said timing drum for controlling activation of the cam drum racking mechanism, a rack-wheel rotatable with the timing drum, a racking lever, a pivot mounting the racking lever at a position intermediate its ends a small increment racking means pivotably mounted on the lever for engaging the rackwheel on one side of the pivot mounting at a small radius to thereby rack the timing drum at increments smaller than the increments with which the cam drum racking mechanism racks the cam drum, a larger increment racker pivotably mounted on the lever for engaging the rackwheel on the other side of the pivot mounting at a larger radius than the small increment racking means to thereby rack the timing drum at increments larger than the increments with which the cam drum racking mechanism racks the cam drum, a manually operable control member to activate the large increment racker, to cause the yarn feeders to cease supplying yarn to the needles for knitting and to override the control means so that the cam drum racking mechanism operates without interruption to enable the cam drum and timing drum to be zeroed.

4,413,484

**BASKET GOAL NET**

Hiroyuki Ogura, Kyoto, and Toyoyuki Kuroda, Kuwana, both of Japan, assignors to Raschel Co., Ltd., Japan

Filed Jul. 16, 1981, Ser. No. 284,093

Claims priority, application Japan, Jul. 28, 1980, 55-107431[U]; Jul. 28, 1980, 55-107432[U]; Nov. 19, 1980, 55-163493; Mar. 19, 1981, 56-039885

Int. Cl.<sup>3</sup> D04B 23/08

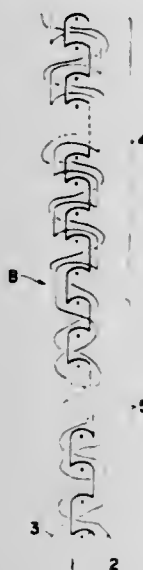
U.S. Cl. 66—193

8 Claims

1. A basket goal net having an open upper end adapted to be



connected to a goal ring and an open lower end of a smaller opening characterized in that the net is formed from a plurality of netting cords of synthetic fiber, each of the netting cords comprising at least one main yarn having loops formed over the entire length thereof by warp knitting and at least one inlay



yarn having loops formed simultaneously with the loops of the main yarn by warp knitting in the upper half of the netting cord to give that portion of the netting cord a greater thickness and stiffness than the remaining portion of the netting cord, each two adjacent netting cords being joined together at a plurality of locations by warp knitting.

4,413,485

## FLANGE FORMING DRILL MEANS

Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Mantta, Finland

PCT No. PCT/FI81/00007, § 371 Date Sep. 24, 1981, § 102(e) Date Sep. 24, 1981, PCT Pub. No. WO81/02119, PCT Pub. Date Aug. 6, 1981

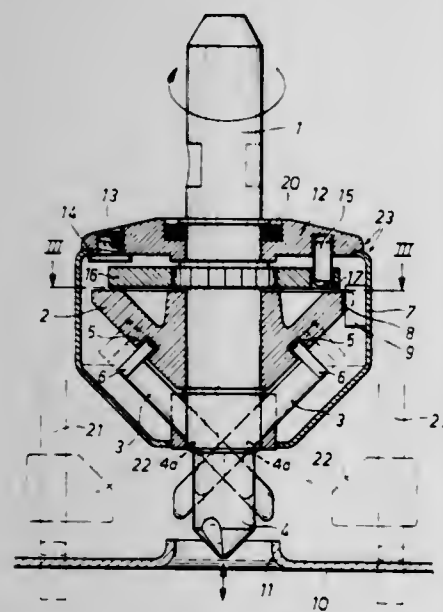
PCT Filed Jan. 29, 1981, Ser. No. 305,650

Claims priority, application Finland, Jan. 30, 1980, 800279

Int. Cl.<sup>3</sup> B21D 51/40

U.S. Cl. 72-71

9 Claims



1. Flange forming drill means for drilling a hole through the side of a pipe or the like and forming a hole encircling flange comprising:

a drill rod mountable on a rotating power source and having a drill bit adjacent a lower end portion, a plurality of retractable, flange forming members mounted on said lower end portion for forming a flange around the edge of a drilled hole after drilling has been completed, said flange forming members mounted for movement between a retracted position wherein lower ends are contained within an

outer surface of said drill bit while said hole is being drilled and an extended position projecting downwardly and outwardly of said surface,

an adjustment element mounted on said drill rod and engaging said flange forming members for moving the same between said extended and retracted positions upon relative rotation between said element and said drill rod,

protective shield means around said adjustment element and said flange forming members mounted in non-rotating engagement with said adjustment element for rotating said element on said drill rod, and

locking means secured to rotate with said drill rod and removably lockable with respect to said adjustment element in a plurality of relative angular positions around the drilling axis of said bit for selectively securing said flange forming members in said retracted and extended positions.

4,413,486

## ROTATING CYLINDER EXTERNAL COMBUSTION ENGINE

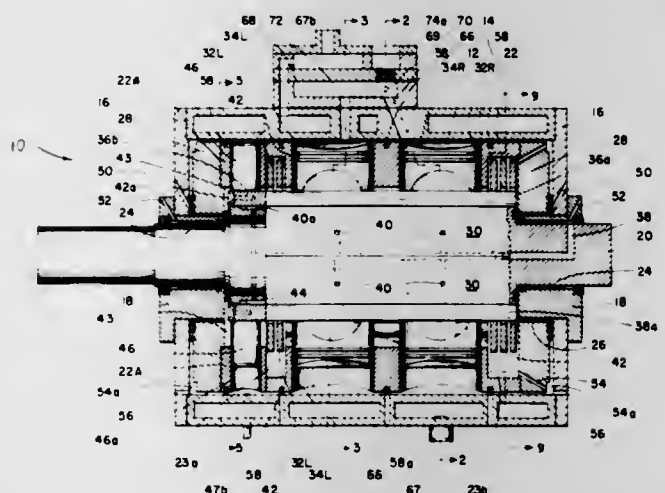
Everett F. Irwin, 430 Orangewood Dr., Dunedin, Fla. 33528

Filed Mar. 15, 1982, Ser. No. 358,190

Int. Cl.<sup>3</sup> F02G 3/02

U.S. Cl. 60-39.63

22 Claims



1. A rotating cylinder continuous external combustion engine, comprising, in combination, a non-rotatable cylindrically-shaped housing, said housing having fluid flow passage means and fluid intake and discharge ports formed therein, a co-axially disposed engine block rotatably mounted within said housing, a synchronously rotatable shaft mounted within said engine block, the rotational axis of the shaft being parallel to the axis of the housing but offset therefrom in fixed spaced relationship therewith, a plurality of angularly spaced piston chambers formed in said engine block in radially disposed relation to the axis of the housing, a plurality of pistons, each slideably mounted in a different one of said piston chambers, said shaft having longitudinally spaced portions journaled within transversely disposed opposite ends of said housing and said rotatable engine block, said fluid intake and discharge ports being alternately openable and closeable attendant rotation of said engine block, said pistons operatively engaged by said shaft so that the eccentric mounting of the shaft determines the length of the piston strokes, the improvement wherein:

(a) said rotary block is provided with at least two banks of an even-numbered plurality of at least two diametrically opposed piston chambers in each bank;  
(b) said eccentrically disposed rotary shaft having a medial portion provided with an even number of at least two opposed parallel planar faces;  
(c) each bank having plural fluid-displacement pistons

which correspond in number to and are respectively operatively disposed within said piston chambers, said pistons having radially innermost ends operably reciprocally engageable with said shaft's corresponding planar faces during rotation thereof;

(d) means disposed interiorly of and apart from said rotary block for operatively interconnecting each pair of diametrically opposed pistons to provide more positive synchronous reciprocative fluid-displacement movement thereto responsive to driven rotation of said shaft, which block and shaft-engengageable pistons collectively effect said fluid displacement; and

(e) said diametrically opposed pistons being fixedly mounted upon respectively opposed base plates, each of said base plates having at least a bottom planar surface for the complementary reciprocating engagement by a corresponding planar face of said shaft during rotational operation of said device.

for receiving a padlock shackle comprising a U-shaped portion,

said shackle engaging portion having an elongated member extending therefrom adapted to extend through the openings in at least two prongs of the plug, said elongated member and said plug being positioned on opposite sides of the shackle with at least one of said prongs extending through said U-shaped portion of said shackle.

4,413,489

## FURNITURE LOCK

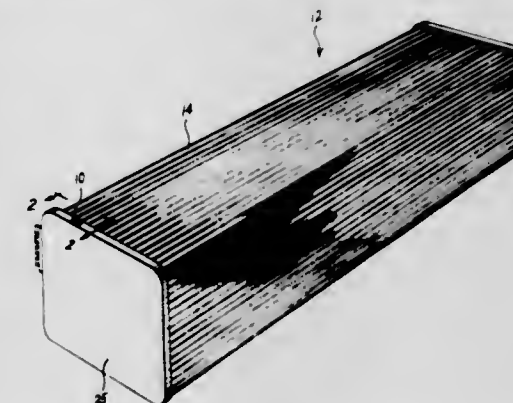
Norman E. Hogue, Niles, Mich., assignor to Packard Industries, Inc., Niles, Mich.

Filed Sep. 18, 1981, Ser. No. 303,211

Int. Cl.<sup>3</sup> E05B 65/08, 65/44; E05C 1/02

U.S. Cl. 70-81

3 Claims

4,413,487  
HAND-OPERATED KNITTING MACHINE, METHOD OF CASTING ON AND KNIT ARTICLE OBTAINABLE ON THE MACHINE

Yoshimasa Yamaguchi, Kodaira, Japan, assignor to Silver Seiko Ltd., Tokyo, Japan

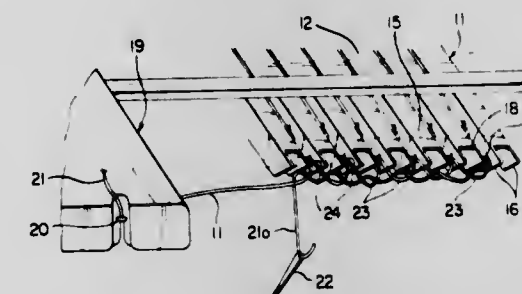
Filed Jul. 26, 1982, Ser. No. 401,606

Claims priority, application Japan, Jul. 29, 1981, 56-117822

Int. Cl.<sup>3</sup> D04B 7/00

U.S. Cl. 66-60 H

4 Claims



1. A hand-operated knitting machine having a needle bed containing a plurality of knitting needles mounted for individual back and forth movement therein, said needle bed having a plurality of sinker elements secured to an edge thereof and disposed in alternate relationship with said knitting needles, each of said sinker elements being bifurcated at a free end thereof to form a vertically extending, endwise open slot or recess which is sufficient to allow a needle element to pass therethrough.

4,413,488

## ELECTRICAL APPLIANCE LOCK

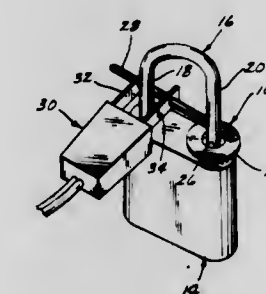
Herbert A. Harrison, Jr., Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 22, 1980, Ser. No. 219,371

Int. Cl.<sup>3</sup> E05B 65/00

U.S. Cl. 70-57

5 Claims



1. A locking device for an electrical appliance plug, comprising, a shackle engaging portion having an opening formed therein

4,413,490  
FRONT ENTRY LOCKING RING ASSEMBLY

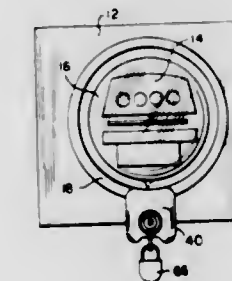
Anker J. Nielsen, Jr., Holden, Mass., assignor to Omco Inc., Holden, Mass.

Filed Mar. 1, 1982, Ser. No. 353,591

Int. Cl.<sup>3</sup> B65D 55/14

U.S. Cl. 70-164

10 Claims



1. A front entry meter locking ring assembly for locking electric meters and the like comprising:

(a) a split locking ring having a U-shaped cross-section, said locking ring having a circular portion adapted to clamp the glass bowl flange to the meter receptacle flange;  
(b) said locking ring having two substantially parallel downturned legs, said legs being substantially equal in length for ease of being manually squeezed together during initial positioning and fastening of said locking ring over the



flanges of the glass bowl and the meter receptacle, said downturned legs having U-shaped cross-sections and having opposed and aligned apertures through which is mounted a take-up fastener for drawing said two legs towards each other;

(c) a lock receptacle affixed to the interior of one of said legs, said lock receptacle having a hollow cylindrical body which has an axis which is parallel to the axis of said circular portion of said locking ring, said lock receptacle cylindrical body having a round front opening and having interior locking ball retaining means for permitting the insertion of an unlocked barrel lock and for preventing the withdrawal of a locked barrel lock;

(d) a removable substantially unbreakable housing for enclosing and securely shielding said locking ring legs and their associated elements against unauthorized entry, said housing adapted to be moved into its locking position by being fitted over said locking ring legs and positioned closely adjacent to the lower circumference of said locking ring circular portion, said housing when in its locking position having a round front aperture in axial alignment with said lock receptacle round front opening, said housing front aperture being sized and shaped to accept with a relatively close fit the full insertion of a barrel lock, the rear face of the inserted barrel lock being relatively flush with the outer rim of said housing front aperture thereby substantially preventing malicious deformation of said housing over the rear face of a locked barrel lock, said housing also having a bottom aperture; and

(e) an elongated sealing tab extending substantially vertically through said housing bottom aperture when said housing is in its locking position, retaining means for fixing said sealing tab against downward movement relative to said locking ring, and a tell-tale seal affixed to said sealing tab below said housing bottom aperture, said tell-tale seal sized and shaped sufficiently large to prevent undetectable passage of said housing bottom aperture over it.

4,413,491

#### ANTI-THEFT DEVICE FOR THE STEERING COLUMN OF AN AUTOMOBILE

Andre Thirion, Dijon, France, assignor to Antivols Simplex, Apollinaire, France

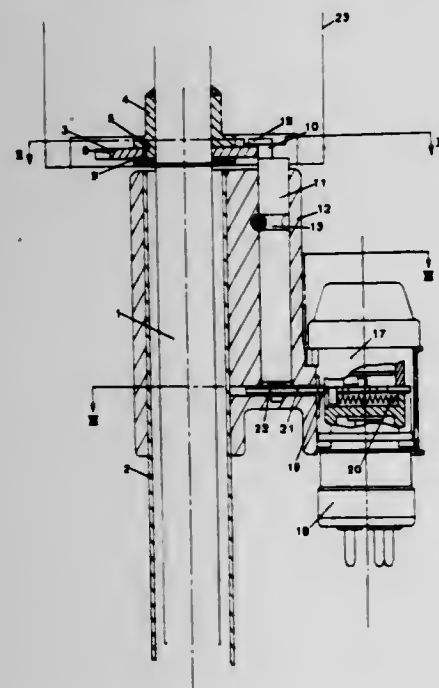
Filed May 12, 1981, Ser. No. 262,907

Claims priority, application France, Jun. 6, 1980, 80 12562

Int. Cl.<sup>3</sup> B60R 25/02; G05G 5/06

U.S. Cl. 70—252

3 Claims



1. An anti-theft device for locking the steering shaft of a vehicle against rotation wherein the steering shaft extends colinearly through a hollow steering column and is mounted

for relative rotation with respect thereto comprising, a crown gear mounted on said steering shaft by a mounting means so that it is rotatable with said steering shaft with respect to said steering column and rotatable with respect to said steering shaft through a predetermined arc, said crown gear comprising radially projecting teeth and concave sections between said teeth each having at least a partly circular profile, means to resiliently urge said crown gear into a median position within said predetermined arc, a locking element support member rigidly attached to said steering column, an elongated cylindrical locking spindle rotatably mounted in said support member with its longitudinal axis of rotation extending substantially parallel to said steering shaft, a control element operably engaging said spindle to impart and control the rotation thereof, a lock mounted on said support member operably engaging said control means to control the operation thereof, and a locking element on said spindle adjacent said crown-gear comprising a locking finger in the form of a segment of a cylinder rotatable with said spindle having a radially outer part circular face of substantially the same radius as said partly circular profile of said concave sections of said crown gear, said outer face being positioned with respect to said crown gear so that when said lock is in the unlocked position, said face and segment are entirely removed from engagement with said concave sections and teeth to allow rotation of said crown gear and when said lock is in the locked position, said face of said segment engages said partly circular profile of one of said concave sections to thereby prevent rotation of said crown gear and steering shaft.

4,413,492

#### DEADBOLT LOCK PROTECTOR

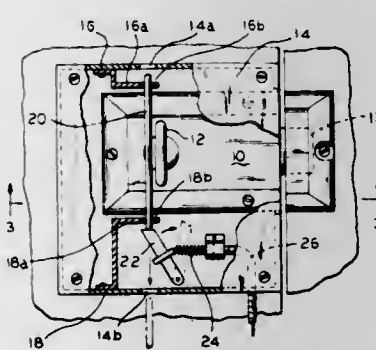
R. L. Strange, 944 London St., Menasha, Wis. 54952

Filed Oct. 1, 1981, Ser. No. 307,755

Int. Cl.<sup>3</sup> E05B 13/00

U.S. Cl. 70—416

8 Claims



1. A deadbolt lock protector, for protecting a conventional, single cylinder deadbolt lock having a thumbblatch which is in the vertical position when locked and a spring-loaded wedge-type bolt, allowing the door on which the lock is mounted to be closed when the bolt is in its protruding position, comprising:

an enclosure, of sufficient size to cover the lock completely, affixed to the door covering the lock;

means for preventing the thumbblatch from turning from its locked position, even when a key is inserted from the outside;

said preventing means including a pin secured vertically alongside the thumbblatch to prevent it from turning, brackets secured inside said enclosure to hold said pin from moving horizontally, and a support member also inside said enclosure to hold said pin from moving vertically; and means for releasing said preventing means, so that the thumbblatch may then be turned from its locked position.

4,413,493

#### FRANGIBLE LOCK APPARATUS

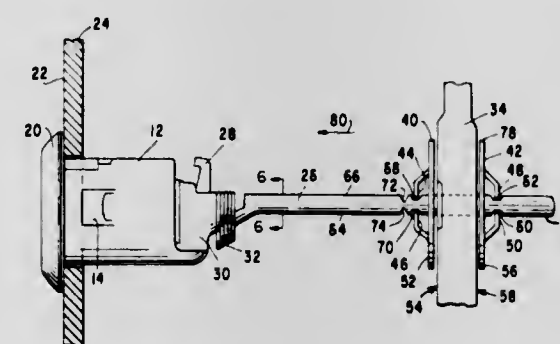
Edward Meinsen, 1126 E. 43rd St., and James Ferretti, 1895 Albany Ave., both of Brooklyn, N.Y. 11210

Filed Jan. 5, 1981, Ser. No. 222,350

Int. Cl.<sup>3</sup> E05B 15/16, 63/00

U.S. Cl. 70—422

6 Claims



1. A frangible lock apparatus comprising a tumbler, a housing, said tumbler journaled for rotation within said housing, a non-circular shaft, one end of said non-circular shaft coupled for rotation with said tumbler, a locking mechanism, said locking mechanism having an opening for receiving a portion of said non-circular shaft therein, a pair of pan-shaped washers, said locking mechanism having opposed lateral surfaces, each of said pair of pan-shaped washers having a brim portion and a pair of opposed jaw-like tines, said jaw-like tines having free ends, said free ends of said jaw-like tines disposed in opposed spaced apart relationship, said non-circular shaft having a first pair of notches and a second pair of notches and a third pair of notches, one of said pair of pan-shaped washers being disposed having said brim portion thereof adjacent to one of said opposed surfaces, the other of said pair of said pan-shaped washers having said brim portion thereof disposed adjacent the other of said pair of pan-shaped washers engaging said first pair of notches, said free ends of said other pan-shaped washers engaging said second pair of notches, said third pair of notches being disposed at a location immediately adjacent to said second pair of notches and disposed intermediate said locking mechanism and said housing, wherein said non-circular shaft is breakable in the region of said third pair of notches, upon the application of force exerted in tension upon said non-circular shaft.

4,413,494

#### PINCH ROLL SYSTEM FOR VERTICAL LAYING HEADS

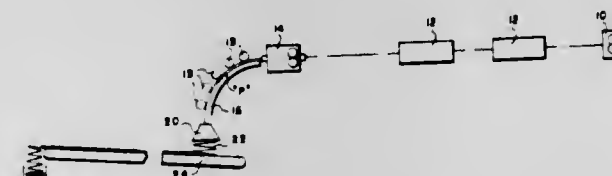
Martin Gilvar, Oakham, and Phillips Wykes, Worcester, both of Mass., assignors to Morgan Construction Company, Mass.

Filed Feb. 13, 1981, Ser. No. 234,115

Int. Cl.<sup>3</sup> B21D 7/08

U.S. Cl. 72—167

10 Claims



1. In a rolling mill wherein hot rolled rod is directed along a downwardly curved path into a vertical laying head which forms the rod into a series of rings, a method of propelling the rod along said path and through the laying head comprising: directing the rod between a pair of driven pinch rolls located in advance of said path, said pinch rolls having means associated therewith for accommodating roll parting adjustments, exerting an initial closing force on said pinch rolls to establish an initial parting prior to entry of a rod front end therebetween, said initial parting being sized to produce at least some rod deformation while providing a driving relationship between said pinch rolls and said rod, said initial closing force being greater than the momentary surge in separating force accompanying impact of a rod front end with said pinch rolls; maintaining said initial closing force and said initial parting until the rod front end has passed along said path through the laying head, and thereafter releasing said initial closing force to allow said rod to force said pinch rolls apart to a secondary parting at which said rod deformation is eliminated while said driving relationship continues to be maintained.

4,413,495

#### METHOD FOR THE STIFFENING AND STRAIGHTENING OF STARTING SHEETS

Eino J. Peuhkurinen, Kokkola; Erkki J. Linnanketo, Pori; Kari M. U. Färm, Vantaa; Tuomo V. J. Kivistö, Espoo; Tauno T. Koho, Helsinki; Seppo T. Kinnunen, and Martti P. Taskinen, both of Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

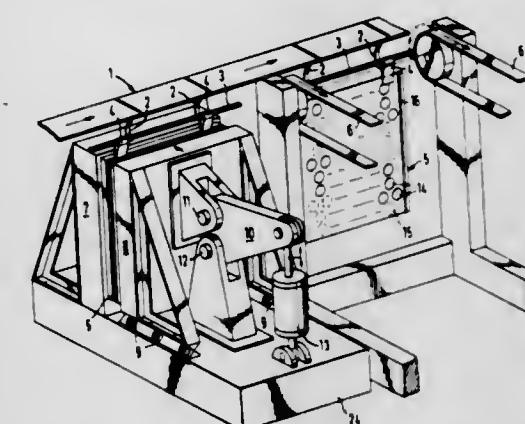
Filed Mar. 2, 1981, Ser. No. 239,677

Claims priority, application Finland, Mar. 3, 1980, 800647

Int. Cl.<sup>3</sup> B21D 13/02, 13/04, 31/06, 43/00

U.S. Cl. 72—196

6 Claims



1. A method for producing a stiffened and straightened starting sheet of the type having a major planar surface area, a sheet thickness of approximately 0.4 to 1.2 mm and a stiffening pattern projecting at maximum approximately 2.5 mm from the plane defined by said planar surface area and provided with suspension lugs attached to one sheet edge, comprising first attaching said suspension lugs to the sheet, then suspending the sheet from said lugs in a vertical orientation and continuing to suspend the sheet from said lugs while rolling or pressing the sheet to produce said stiffening pattern therein and to simultaneously align said plane with said lugs to assure that the sheet produced will hang straight down from said lugs.

4,413,496

#### METHOD OF MAKING FLANGED TRACK TRACTOR ROLLER FOR OFF-HIGHWAY EQUIPMENT

Donald J. Diemer, 4355 Brendan Ln., North Olmsted, Ohio 44070, and Ralph D. Dello, R.D. 1 Susan Trace, New Wilmington, Pa. 16142

Continuation-in-part of Ser. No. 2,851, Jan. 12, 1979, Pat. No. 4,294,101. This application Oct. 13, 1981, Ser. No. 311,003

Int. Cl.<sup>3</sup> D21D 22/00; B21K 1/28

U.S. Cl. 72—356

13 Claims

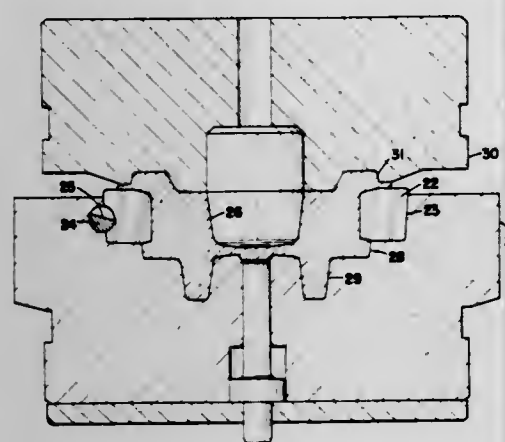
1. A closed die forging apparatus to produce a forged roller or its equivalent, comprising:

A. a bottom die cavity consisting of a generally circular first cavity;

B. a step in said cavity for a smaller diameter cavity immediately below said first cavity;



- C. a split ring in said first cavity projecting inwardly and forming a cavity of lesser diameter than said step cavity;  
 D. a top die cavity consisting of a generally circular second cavity of a diameter approximating that of said step cavity but of lesser diameter than said first cavity; and  
 E. said top die cavity having a plunger which extends into



said bottom die cavity and forms a central cavity and said bottom die having a portion centrally thereof which projects near the plunger, whereby the closing of said top and bottom die cavities produces a roller or its equivalent and includes at least two flanges, one of which is formed by the step cavity and the other of which is formed by the top die closing of said bottom die near said split rings.

4,413,497

#### METHOD OF FORMING DOMED END FOR CONTAINER

Charles S. Kubis, Weston, Conn., and John Walter, Evergreen Park, Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Sep. 21, 1981, Ser. No. 304,121  
 Int. Cl.<sup>3</sup> B21D 22/00

U.S. Cl. 72-356

10 Claims



1. A method of forming a domed end for a container body, said method comprising the steps of initially shaping a flat blank to a generally cup-shaped blank having at its open end a radially outwardly directed surrounding flange with a free and final peripheral edge, utilizing said flange as a support for the end during subsequent forming operations, and then reshaping said flange for securing of said domed end to the container body.

4,413,498

#### ROTARY TRANSFER PRESS

Hiroshi Inaoka; Michio Sakiyama, both of Nara, and Masahiro Yamamoto, Sakai, all of Japan, assignors to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Feb. 9, 1982, Ser. No. 347,101

Claims priority, application Japan, Feb. 24, 1981, 56-24601; Jul. 20, 1981, 56-108455[U]; Sep. 25, 1981, 56-142971[U]

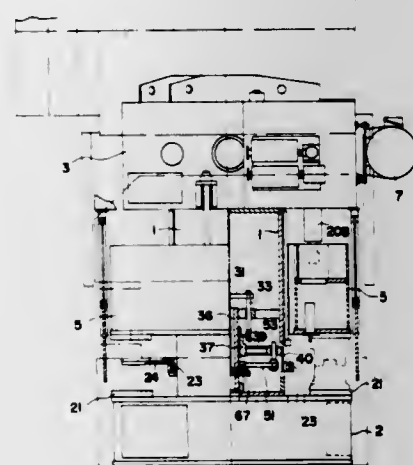
Int. Cl.<sup>3</sup> B21J 11/00

U.S. Cl. 72-405

7 Claims

1. A rotary transfer press comprising a bed; an upright extending upward from the bed, a crown mounted on the upright

and providing a plurality of stations between the crown and the bed in an annular arrangement; a slide upwardly and downwardly movably guided on said upright; a feed bar having clamping means corresponding in number to the number of the stations and provided around the upright for transferring workpieces from station to station in succession; slide drive means disposed in the crown and connected to said slide for moving the slide upward and downward and comprising a main shaft coupled to a main electric motor to rotate at a



reduced speed, a plurality of eccentric rings coupled to the main shaft to rotate at a reduced speed and connecting rods connecting the eccentric rings to the slide; feed bar lifting drive means having a lift cam coupled to the slide drive means and actuated by the lift cam for moving the feed bar upward and downward; feed bar feeding-driving means having a feed cam coupled to the slide drive means and actuated by the feed cam; and clamp drive means having a clamp cam coupled to the slide drive means and actuated by the clamp cam for operating the clamping means.

4,413,499

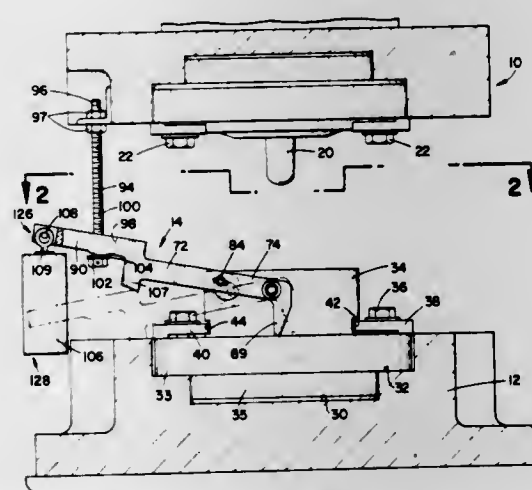
ROLLING KEY LOCK FOR FORGING DIE AND PRESS  
 Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070, and Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142

Filed Oct. 13, 1981, Ser. No. 311,004

Int. Cl.<sup>3</sup> B21J 13/00

U.S. Cl. 72-446

12 Claims



1. A forging press including a die lock comprising: a forging base including a die socket, said socket having an inner sidewall slot; a ram including a plunger; a die received in said die socket and including a mating slot disposed for mating alignment with said sidewall slot; a rolling key received in said sidewall slot and said mating

slot comprising an elongated bar including an intermediate undercut portion, and a connecting member eccentrically secured to one terminal end of said bar; and a lever, one end portion of said lever operatively engaging said connecting member for rotation of said rolling key upon selective operation of said lever, and a second end portion of said lever operatively engaging said ram for operation of said lever upon selective advancement and retraction of said ram.

4,413,500

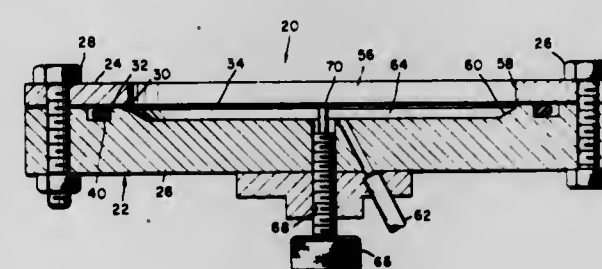
TOOL FOR FORMING PRECISELY CURVED SURFACES  
 Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 106,985, Dec. 26, 1979. This application Sep. 13, 1982, Ser. No. 417,756

Int. Cl.<sup>3</sup> B21B 25/00

U.S. Cl. 72-465

5 Claims



1. A tool useful in the method of forming precisely curved surfaces comprising:

- a holder having a central space and a pair of first and second clamping surfaces placed about the space for retaining therebetween a blank at its periphery and for freely supporting the blank in the space;
- a recess in at least one of said surfaces having a given depth and width and positioned equally around the space;
- at least one O-ring having a thickness greater than the recess depth and smaller than the recess width and residing in the recess against a wall thereof closest to the central space of said holder so that, when said clamping surfaces are moved together with said blank positioned therebetween, said O-ring is compressed and forced to move outwardly from the central space within said recess and to frictionally drag said blank at its periphery also outwardly from the central space for stretching said blank.

4,413,501

APPARATUS FOR PRESSURE TESTING TUBING  
 Peter Schröck, Im Vogelsang 5, D-6000 Frankfurt am Main, Fed. Rep. of Germany 90

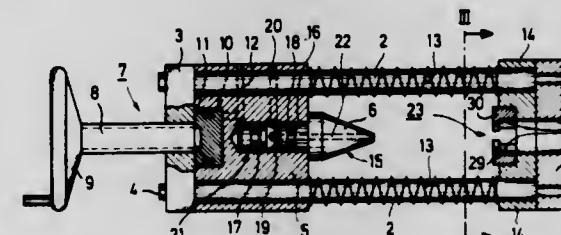
Filed Aug. 31, 1981, Ser. No. 298,046

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009168

Int. Cl.<sup>3</sup> G01M 3/04

U.S. Cl. 73-49.6

10 Claims



1. Apparatus capable of use in pressure testing flexible tubing ending with a metal connector, comprising: a first and a second support member; means mounting the first support member for movement towards and away from the second support member; a spigot on the first member and having a conical face for

coaxial insertion into the end of the metal connector when the first support member is moved toward the second support member; mechanical means for so moving the first support member; pressure drive means disposed in the first support member and connected between the spigot and the mechanical means for moving the spigot away from the mechanical means and into sealing engagement with the end of the metal connector; a duct through the spigot for introducing pressure-testing fluid into the flexible tubing; and holding means on the second support member for holding the metal connector with the end thereof facing the spigot, the holding means comprising two clamp members each pivotally mounted on the second support member for closing movement about the metal connector.

4,413,502

#### GAS DETECTING SENSOR

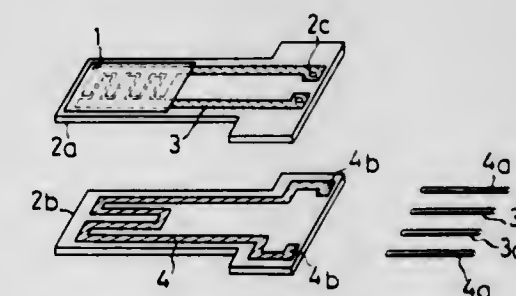
Minoru Ohta; Yutaka Hattori, both of Okazaki; Tomio Kawakami, Nishio, and Michitoshi Onoda, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan  
 Filed Feb. 26, 1982, Ser. No. 352,562

Claims priority, application Japan, Apr. 27, 1981, 56-63625; Nov. 30, 1981, 56-192476

Int. Cl.<sup>3</sup> G01N 27/12

U.S. Cl. 73-23

12 Claims



1. A gas detecting sensor for detecting the partial pressure of oxygen gas contained within exhaust gases discharged from an engine, comprising:

- a sensing element having such an electrical characteristic that the electrical resistance thereof changes in response to the partial pressure of oxygen gas;
- said sensing element being formed of alloy ceramic material composed of 20 to 60 mol percent of cobalt monoxide, 20 to 60 mol percent of magnesium monoxide and 10 to 30 mol percent of nickel monoxide;
- a base member formed of ceramic material for supporting said sensing element;
- said base member being mounted to an exhaust passage of said engine so as to be exposed to said exhaust gases; and
- an electric current conducting means for supplying an electric current to said sensing element;
- one end of said electric current conducting means being electrically connected to said sensing element.

4,413,503

#### METHOD OF DETECTING LEAKS IN A LARGE STORAGE TANK

Edgar S. Olivieri, Summit Hills, P.R., assignor to Texaco Puerto Rico Inc., San Juan, P.R.

Filed Apr. 5, 1982, Ser. No. 365,752

Int. Cl.<sup>3</sup> G01M 3/20

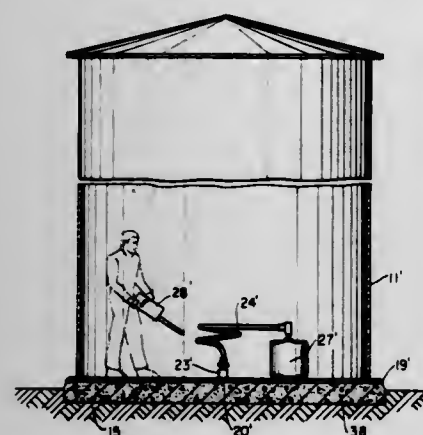
U.S. Cl. 73-40.7

8 Claims

8. Method of detecting leaks in bottom plate of a large storage tank having said bottom plate resting on a foundation, comprising the steps of applying an asphalt seal to the periphery of said bottom plate at said foundation against gas leakage from under said bottom plate at the edges thereof,



installing a gas-tight union on the inside of said bottom plate, drilling a hole through said bottom plate inside said union, coupling a pressurized tank of fluorinated hydrocarbon to said union for feeding said fluorinated hydrocarbon in gaseous



form through said hole to the underside of said bottom plate, and scanning the upper side of said bottom plate by manually moving a halogen detector over said bottom plate inside said large storage tank.

4,413,504

## LIQUID-PHASE CHROMATOGRAPHY DETECTOR

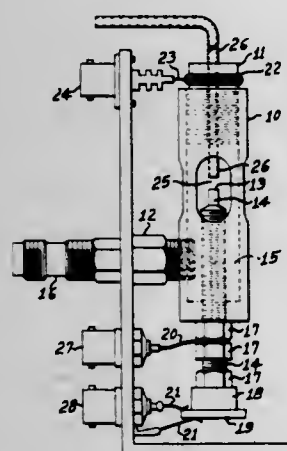
Edward G. Voigtman; James D. Winefordner, and Arthur R. Jurgensen, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 27, 1982, Ser. No. 382,633

Int. Cl.<sup>3</sup> G01N 31/06

U.S. Cl. 73-61.1 C

19 Claims



1. A liquid-phase chromatography detector comprising a flow cell having an inlet tubular conduit for receiving a liquid chromatographic effluent and discharging it as a flowing columnar stream onto a vertically adjustable receiving surface spaced apart from and located vertically below and in close proximity to the discharge end of said conduit; a receiver adapted to receive liquid overflowing from said receiving surface; means for continuously removing liquid from said receiver; means for focussing fluorescence-producing light pulses on said flowing columnar stream as it passes from said conduit to said receiving surface and means to detect the produced fluorescence; means for focussing light pulses on said flowing columnar stream as it passes from said conduit to said receiving surface so as to produce acoustic waves in said stream and piezoelectric transducer means to detect those waves; and means to produce ionization of said liquid effluent passing through said flow cell so as to produce photocurrents therein and electrical means to detect said photocurrents.

4,413,505  
ELECTROCHEMICAL FLOW CELL, PARTICULARLY  
USE WITH LIQUID CHROMATOGRAPHY

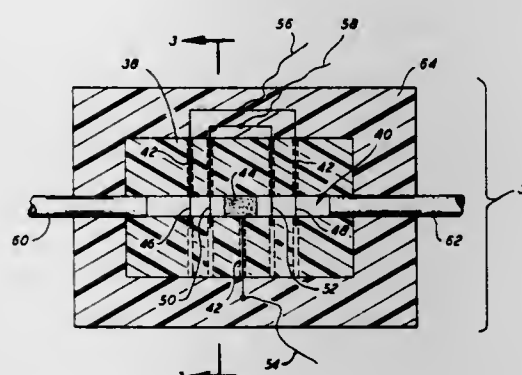
Wayne R. Matson, Ayer, Mass., assignor to Environmental Sciences Associates, Inc., Bedford, Mass.

Filed Mar. 9, 1981, Ser. No. 241,945

Int. Cl.<sup>3</sup> G01N 27/30

U.S. Cl. 73-61.1 C

20 Claims



1. An electrochemical flow cell for treating a sample solution, said cell comprising:  
a holder assembly defining a flow path and having an inlet for directing a stream of said solution into said cell, and an outlet for directing treated solution from said cell;  
a plurality of electrode elements arranged in said holder, said electrode elements being operatively disposed, electrically insulated from one another, within said flow path, said plurality including at least one active testing electrode, at least one reference electrode and at least one counter electrode;  
said flow cell being encapsulated within a higher impact, chemically resistant, electrically insulating material, with said flow path extending through said encapsulation; and, a pair of high pressure resistant fittings communicating with said flow path.

4,413,506

## HORIZONTAL FILM BALANCE HAVING WIDE RANGE AND HIGH SENSITIVITY

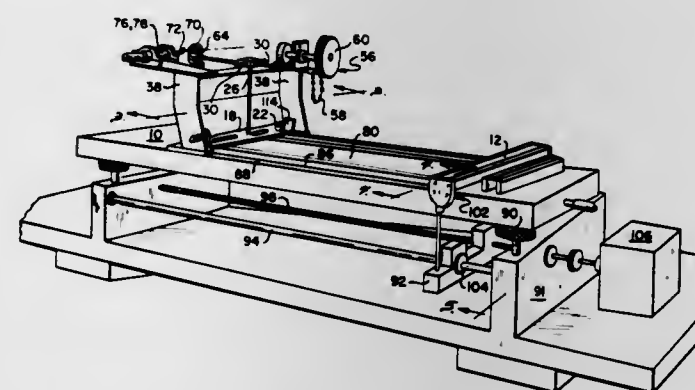
Bernard M. Abraham, Oak Park; Kenjiro Miyano, Downers Grove, and John B. Ketterson, Evanston, all of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 5, 1981, Ser. No. 240,647

Int. Cl.<sup>3</sup> G01N 13/02

U.S. Cl. 73-64.4

10 Claims



1. In a horizontal film balance having a receptacle for a liquid substrate upon which a thin film is suspended, a balance instrument comprising:  
a float disposed to contact the liquid substrate and the thin film;  
means for applying a force to said float through the thin film;

bearing means for mounting said float for movement in response to forces being applied to said float;  
a horizontal arm having at least one end portion attached to said bearing means for movement in response to movement of said float;  
feedback positioning means for maintaining the end portion of said horizontal arm in a fixed vertical position, said feedback positioning means including force restoring means which balance forces applied to said float; and means for measuring the restoring force.

4,413,507

## METHOD AND ARRANGEMENT FOR DETERMINING TOOL WEAR

Jeffrey-Michael Drew; Max-Gerhard Seitz, both of Munich; Hans-Peter Kehr, Unterhaching, and Gottfried Eichelbroenner, Berlin, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

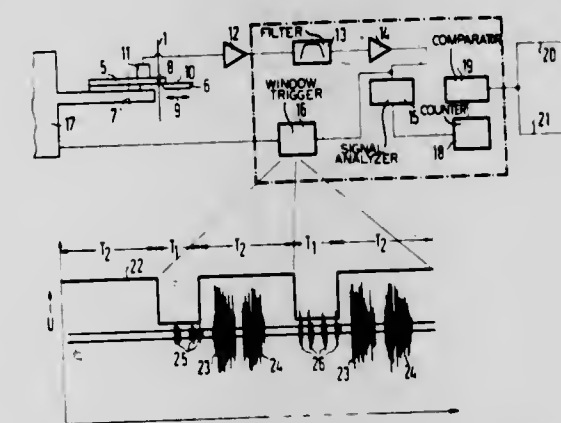
Filed Aug. 7, 1981, Ser. No. 291,093

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029957

Int. Cl.<sup>3</sup> G10N 19/00

U.S. Cl. 73-104

7 Claims



1. A tool wear monitoring device for monitoring wear of a cutting tool, comprising:  
a sound pick-up means coupled to the cutting tool for creating output signals responsive to cutting noises associated with the cutting tool during operation;  
window trigger means connected to control the output signals for excluding friction noises associated with the cutting tool while permitting the cutting noises to pass through;  
signal analyzer means connected to receive the output signals as controlled by the window trigger means for evaluating a magnitude of the cutting noises in comparison to a predetermined threshold level beyond which the cutting tool is considered to be blunt; and  
the window trigger means selecting the cutting noises for passage therethrough by sensing a physical movement of at least a portion of the cutting tool.

4,413,508

## ADJUSTING SYSTEM FOR CRANK ANGLE SENSOR

Yoshihisa Kawamura, and Seishi Yasuhara, both of Yokosuka, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Sep. 8, 1981, Ser. No. 300,101

Claims priority, application Japan, Sep. 9, 1980, 55-125160

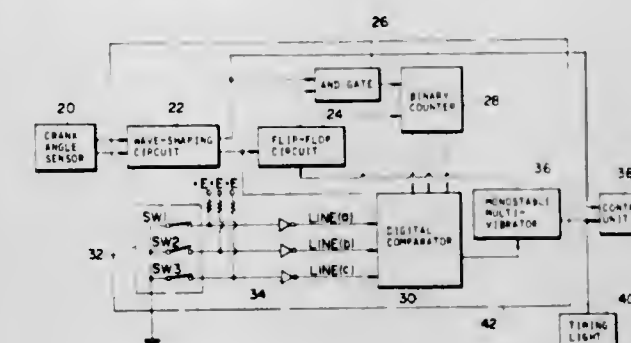
Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73-116

19 Claims

1. An adjusting system for internal combustion engines comprising:  
first means associated with an engine crankshaft for producing first and second pulse signals, said first signal being indicative of a predetermined crankshaft position for each engine

cylinder and said second signal being indicative of rotation of the engine crankshaft through a predetermined unit angle; second means applied with said first and second signals from said first means for adjusting said first signal to provide a third pulse signal; and



third means for measuring the difference between an actual value and a target value with respect to a desired timing, said actual value of the desired timing being variable corresponding to a change in a pulse phase of said third signal; said adjustment of the first signal being done to eliminate said difference between the actual and target values.

4,413,509

## COMBUSTION PROCESS PARAMETER SENSOR

Winfried Moser, Markgröningen; Klaus Müller, Tamm, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

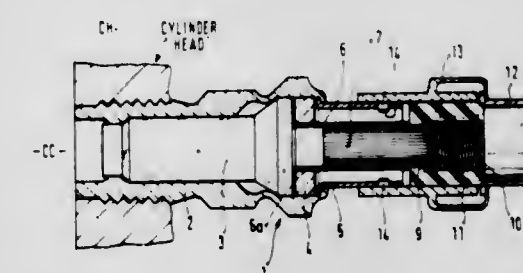
Filed Oct. 20, 1981, Ser. No. 313,359

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045721

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73-117.3

7 Claims



1. Combustion process parameter sensor to determine, simultaneously, pressure and optical physical effects of combustion processes within the combustion space of a combustion chamber (CC) of an internal combustion engine (CH) having a housing (1, 2), and, within the housing, the combination of a light guide means (3, 7) extending through the housing to transmit light from the interior of the combustion chamber during operation of the engine, with a pressure sensing means (4) located in the housing and exposed to the combustion chamber to measure pressures occurring in the chamber as the light guide means transmits light signals from the interior of the combustion chamber and to permit simultaneous evaluation of pressure and light phenomena during combustion within the combustion chamber.



4,413,510

## COATING ADHESION TESTING

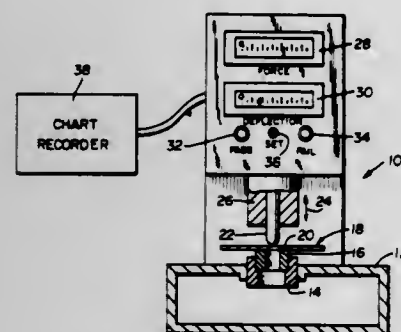
Joseph H. McCusker, Princeton; Barry J. Thaler, Plainsboro, and Wei H. Tsien, Cherry Hill, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 323,057

Int. Cl.<sup>3</sup> G01N 19/04

U.S. Cl. 73—150 A

3 Claims



1. A method of testing the adhesion of a coating to a substrate comprising the steps of: supporting the substrate against motion in a given direction, biasing a force applying member against the coating, increasing the force, measuring the force and the deflection caused by the force-applying member, and terminating the test when the rate of deflection as a function of increasing force decreases.

4,413,511

## SYSTEM FOR MEASURING CUTTINGS AND MUD CARRYOVER DURING THE DRILLING OF A SUBTERRANEAN WELL

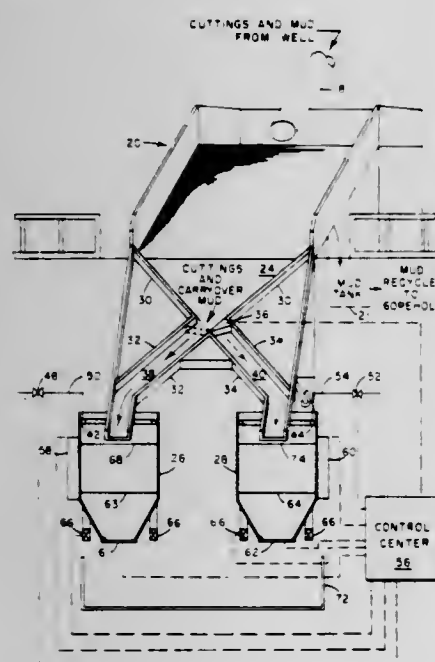
John K. Godbey, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,516

Int. Cl.<sup>3</sup> E21B 49/08

U.S. Cl. 73—155

8 Claims



1. A method for continuously determining the amount of solid cuttings in a drilling mud discharged from a well drilling operation and the amount of mud carried over with the solid cuttings during separation of the cuttings from the drilling mud, comprising the steps of:

- measuring the density of the solid cuttings in said drilling mud;
- measuring the density of said drilling mud;
- passing the drilling mud discharged from the well

through a shale shaker to remove the solid cuttings and mud carried over with the cuttings from the drilling mud; (d) returning the drilling mud devoid of cuttings separated by the shale shaker to the well drilling operation; (e) withdrawing said solid cuttings and carryover mud separated by the shale shaker and constantly measuring the weight and volume of said cuttings and carryover mud; (f) constantly determining the volume fraction of said cuttings  $\phi_c$  in accordance with the formula:

$$\phi_c = \frac{W_i/V_i - \rho_m}{\rho_c - \rho_m}$$

where:

$W_i$  is the total weight of a fixed volume of solid cuttings and carryover mud,  
 $V_i$  is the total volume of solid cuttings and carryover mud,  
 $\rho_m$  is the density of drilling mud, and  
 $\rho_c$  is the density of cuttings; and  
 (g) constantly determining the volume fraction of said carryover mud  $\phi_m$  in accordance with the formula:

$$\phi_m = 1 - \phi_c$$

where:  $\phi_c$  = volume fraction of solid cuttings determined in step (f).

4,413,512

## METHOD OF LOCATING POTENTIAL LOW WATER CUT HYDROCARBON RESERVOIRS

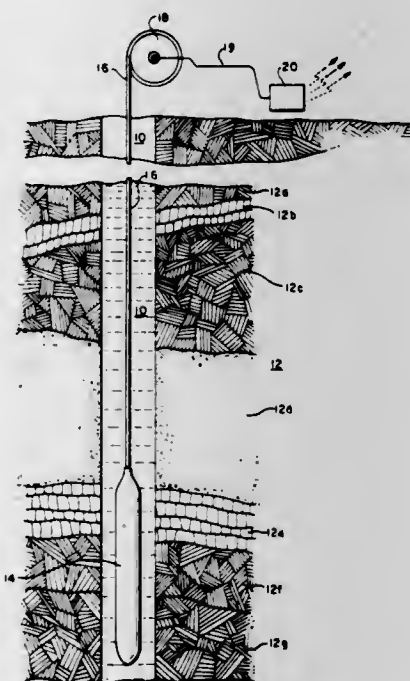
Joseph Zemanek, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,743

Int. Cl.<sup>3</sup> E21B 49/00

U.S. Cl. 73—152

9 Claims



1. A method for identifying potential low water cut hydrocarbon reservoirs in a geological formation having significant water saturation comprising the steps of:

- traversing a length of a borehole through said formation with a logging tool;
- generating with said logging tool during said traversing step a first set of signals representing the formation water saturation;
- determining from said first set of signals, the water saturation of the formation along said length;
- sampling the formation rock at a level at which water saturation is significant;
- measuring the surface area of the sampled formation rock by nuclear magnetic resonance;

determining the irreducible water saturation at said level of the formation from the measured surface area of the sampled formation rock; and  
 plotting the irreducible water saturation and the log determined water saturation of the formation at said level to produce a log which can be compared to identify a level at which said irreducible water saturation approximates or exceeds the corresponding log determined water saturation as a potential region where hydrocarbons may be produced without significant attendant water production.

4,413,513

## MACHINE FOR TESTING CHAIN AND SPROCKET TYPE DRIVE SYSTEMS

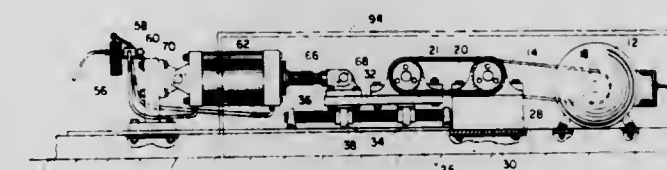
Michael O. Ross, 14111 Laterna La., Houston, Tex. 77083, and Kurt M. Marshak, 9701 Courtleigh Cir., Austin, Tex. 78759

Filed Jun. 1, 1981, Ser. No. 268,759

Int. Cl.<sup>3</sup> G01M 13/02

U.S. Cl. 73—162

10 Claims



1. An apparatus for measuring and testing chain wear elongation and determining power capacity of a chain-sprocket drive system and other transmission systems, the apparatus comprising a base frame which can indirectly support chains and sprockets under test; a driving sprocket shaft; a moveable sprocket shaft means; a cylinder mounted substantially parallel to the chains to apply load to said chain sprocket drive system; means for attaching said cylinder to the base frame; a linear bearing plate attached to said cylinder through which load is applicable to two test chains and four sprockets under test in one instance; a motor mounted on said base frame, having a rotatable shaft; means for coupling said rotatable motor shaft to a driving sprocket shaft for developing a torque on said driving sprocket shaft means urging the same to rotate relative to said base frame and can hence apply power to overcome friction in the chain-sprocket drive system under test; said torque being transmittable via the chains and sprockets between said driving sprocket shaft and a moveable sprocket shaft means which permits rotation of said movable shaft to occur without rotation of said base frame; speed sensing means for sensing the rotational speed of sprockets; and counting system means for counting rotation of the said movable shaft located on said linear bearing plate and an elongation sensing switch to stop drive system operation of said drive system if chain elongation exceeds a fixed amount; a clevis and chain load measuring system comprised of strain gages which form a Wheatstone bridge and measure strain in said clevis through which load is applied to the chains; and a noncontact temperature measuring system to determine the temperature of chains and sprockets during operation; and a lubrication system comprised of a gravity feed and brush for wiping lubricant on the test chains and an environmental and safety cover for protecting the operation as well as for enclosing the chain drive system.

4,413,514

## AIR FLOW SENSOR

William W. Bowman, Dallas, Tex., assignor to Hoffman Controls Corporation, Dallas, Tex.

Filed May 22, 1981, Ser. No. 266,487

Int. Cl.<sup>3</sup> G01F 1/68

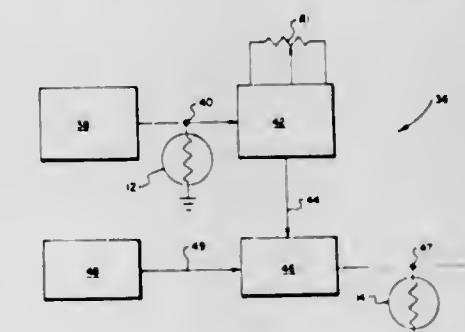
U.S. Cl. 73—204

8 Claims

1. Apparatus for positioning within a slowly moving fluid medium for sensing fluid flow velocity therethrough, comprising:

- a tubular housing having intake and outlet ends;

- turbulence reducing means within said housing for reducing fluid flow turbulence to an acceptable level;
- a first thermistor disposed outside of said tubular housing;
- a first current supply for supplying constant current to said first thermistor to develop a voltage across said first thermistor which is proportional to the ambient temperature of the fluid medium outside said housing;
- a second thermistor disposed within said tubular housing;



- a second current supply responsive to the voltage across said first thermistor for supplying current to said second thermistor, which current is proportional to the ambient temperature of the fluid medium outside said housing, whereby the voltage across said second thermistor is a function only of the temperature change of said second thermistor, independent of changes in the ambient temperature of the fluid outside said housing.

4,413,515

## BARBECUE FUEL LEVEL GAUGE

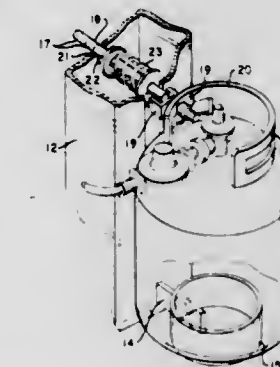
Leonard L. Quinn, Barrie, Canada, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 14, 1981, Ser. No. 293,037

Int. Cl.<sup>3</sup> G01F 23/20

U.S. Cl. 73—296

4 Claims



1. A fuel level gauge for a barbecue fuel tank including, in combination with a pedestal of a barbecue:

- support means adjacent to a lower end of said pedestal for engaging under a bottom edge portion of the barbecue fuel tank such that the tank tends to tilt away from the pedestal;
- a gauge comprising an elongated member located transversely relative to said pedestal, said elongated member having an end which engages a top portion of said fuel tank, said elongated member being slidably affixed to said pedestal adjacent to the top portion of said fuel tank to permit movement of said elongated member along a direction of its length transversely relative to said pedestal; and,
- spring means opposing the tendency of said tank to tilt away from said pedestal so that the degree of tilt is a function of the weight of the tank and therefore the amount of fuel in the tank, the transverse position of said gauge relative to said pedestal thereby serving as a measure of the fuel level in said tank.



4,413,516

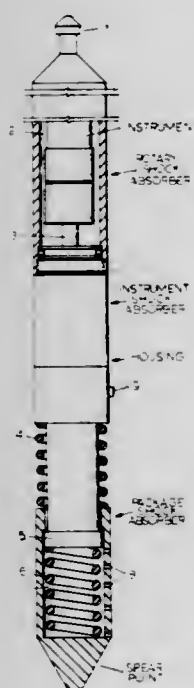
## OIL WELL SERVICE TOOL

Robert E. Croom, Jr., Lafayette, and John D. Jeter, St. Martinville, both of La., assignors to Oil-Well Drilling Control, Inc., Broussard, La.

Filed Mar. 19, 1982, Ser. No. 360,108  
Int. Cl.<sup>3</sup> G01D 11/24

U.S. Cl. 73—431

10 Claims



1. In a well bore survey instrument package to be lowered into and retrieved from a pipe bore situated in an earth bore hole, shock damping apparatus to reduce shock to an instrument contained within the package comprising:

- an elongated generally cylindrical housing having an upper and a lower end, a sealed enclosure, and a generally central longitudinal axis;
- well bore survey instrument situated in said enclosure, mounted for axial movement from a first upper position to a second lower position along said central axis;
- fluid filled dashpot cylinder interposed between said housing and said instrument, situated for telescoping movement along said central axis from said first position to said second position in sympathy with axial movement of said instrument;
- means to force fluid movement from at least part of said dashpot cylinder in response to telescoping movement;
- variable area flow restriction means to regulate flow of fluid from said dashpot cylinder in response to telescope position of said dashpot;
- means responsive to the telescope position of said dashpot to vary the area of said flow restriction;
- variable volume container means in communication with said dashpot to receive, contain, and return fluid moving from and back to said dashpot; and
- bias means to return said instrument and said dashpot to the first upper position;

whereby the change in velocity of an instrument may be controlled to distribute acceleration forces evenly over the acceleration run to minimize peak acceleration forces imposed upon the instrument.

4,413,517

## APPARATUS AND METHOD FOR DETERMINING THICKNESS

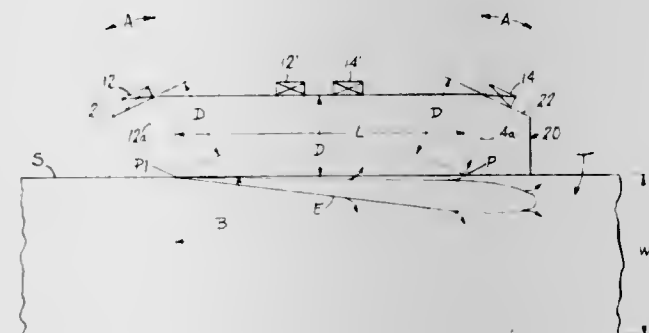
Robert A. Soden, Trenton, N.J., assignor to Sonic Instruments, Inc., Trenton, N.J.

Continuation of Ser. No. 61,610, Jul. 30, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,601

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—597

8 Claims



1. A method of measuring the thickness of a test piece with sonic energy, comprising the steps of:

- (A) providing a member of different material than said test piece, said member having:
  - (i) spaced apart angular surfaces approaching an angle complementary to the first critical angle of refraction of said test piece, each said angular surface adapted to receive a transducer,
  - (ii) an upper surface disposed between said angular surfaces and
  - (iii) a bottom surface;
- (B) acoustically coupling said member to the surface of said test piece;
- (C) positioning a first transducer upon one of said test piece angular surfaces such that the critical angle of refraction of said test piece is approached;
- (D) positioning a second transducer upon the other of said test piece angular surfaces at the same critical angle from said test piece surface so that the axes of said first and second transducers intersect said test piece surface to define a known dimension along said test piece surface;
- (E) exciting said first transducer to provide a sonic subsurface wave in said test piece substantially parallel to said test piece surface;
- (F) measuring the time of transmission of said sonic wave between said first and said second transducers;
- (G) calculating the velocity of said sonic wave in said test piece;
- (H) positioning a third transducer on said member upper surface, the distance between said member upper surface and said member bottom surface being equal to the distance of said first transducer, measured along the axis of said first transducer, to the intersection of said first transducer axis with said member bottom surface;
- (I) exciting said third transducer to transmit an ultrasonic pulse in said member and said test piece;
- (J) detecting an echo pulse from the bottom side of said test piece; and
- (K) measuring the thickness of said test piece by determining the round trip transit time of a sonic pulse and echo in said test piece.

4,413,518

## APPARATUS AND METHOD FOR MEASURING THE EXTENSION OF BOLTS UNDER STRESS

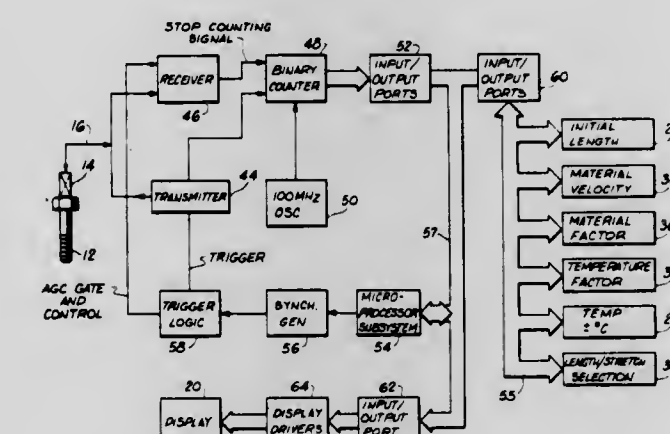
Robert L. Jones, La Habra, Calif., assignor to NDT Instruments, Inc., Huntington Beach, Calif.

Filed Jul. 20, 1981, Ser. No. 284,761

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—615

51 Claims



- 1. A bolt length measurement apparatus comprising:
  - an acoustic energy pulse transmitter,
  - an acoustic energy pulse receiver,
  - a transducer connected to said transmitter and to said receiver for imparting a transmitted acoustic energy pulse into a bolt and for responding to a reflected echo acoustic energy pulse from a bolt,
  - a high frequency oscillator for generating a plurality of timing pulses of a constant repetition period,
  - a counter for counting and registering said timing pulses,
  - gating means having an input connected to said oscillator, an output connected to said counter, and a gate control terminal connected to said transmitter and receiver for starting said counter in response to a transmitted pulse and stopping said counter in response to a received echo pulse,
  - calculating means connected to said counter for receiving a registered count indicative of the number of timing pulses counted by said counter between said occurrence of each transmitted pulse and each subsequent received echo pulse,
  - input factor means connected to said calculating means and providing means for inputting at least one factor into said calculating means,
  - said calculating means being capable of utilizing said registered timing pulse count and said input factor for generating a signal representative of a length parameter of a bolt,
  - display means connected to said calculating means for displaying said length parameter,
  - means for receiving a selected plurality of said pulse counts serially generated by said counter in response to a corresponding plurality of transmitted acoustic energy pulses and received echo pulses,
  - means for determining whether each of said received pulse counts differs from each pulse count received immediately prior thereto by more than a predetermined difference count,
  - means for rejecting said selected plurality of pulse counts and restarting said selected plurality if said predetermined difference count is exceeded, and
  - means for generating said length parameter representative signal based on an average of said plurality of pulse counts when said predetermined difference count is not exceeded for said selected plurality of pulse counts.

4,413,519

## TURBINE BLADE VIBRATION DETECTION APPARATUS

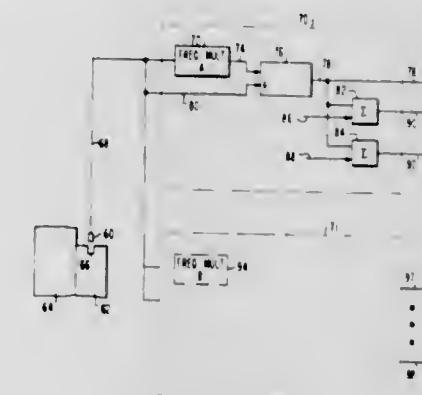
Ronald L. Bannister, Westtown, and John M. Beatty, Aston, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 287,843

Int. Cl.<sup>3</sup> G01H 3/04

U.S. Cl. 73—660

11 Claims



- 1. Vibration detection apparatus for detecting vibration of turbine blades in a turbine system having a plurality of adjacent turbine blade rows, rotatable about a central axis, comprising:
  - (a) a plurality of radar sensors mounted on said turbine system;
  - (b) each said radar sensor being operable to transmit a relatively narrow beam radar signal toward a predetermined blade row and to receive a reflected radar signal therefrom to derive an output radar signal indicative of relative blade movement toward and/or away from said radar sensor;
  - (c) means coupled to said turbine system to provide an output reference signal for each X degrees of rotation of said blade rows about said central axis relative to a reference position, where  $X \leq 360^\circ$ ;
  - (d) means responsive to said output reference signals for providing, for each blade row having one or more said radar sensors, a running count indicative of the number of turbine blades which have traversed said reference position;
  - (e) first gating means for gating said running counts;
  - (f) second gating means for gating said radar output signals;
  - (g) signal processing means operable to provide enabling signals, at predetermined times, to said first and second gating means and being operably connected to receive said signals so gated; and
  - (h) said signal processing means being further operable to analyze said gated radar output signals to provide an indication signal if said analyzed signal is out of predetermined limits.

4,413,520

## ULTRASONIC IMAGING APPARATUS

Kelichi Murakami, Kawasaki; Shinichi Amemiya; Junji Miyazaki, both of Yokohama; Tadabiko Yanashima, Fujisawa; Atsuo Iida, Yokohama; Takaki Shimura, Machida; Hirohide Miwa, and Norio Midorikawa, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 16, 1981, Ser. No. 274,160

Claims priority, application Japan, Jun. 16, 1980, 56-21655

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—609

13 Claims

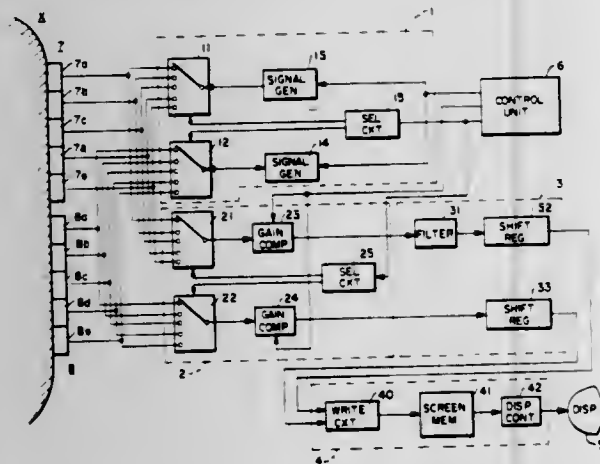
13. An ultrasonic imaging apparatus for imaging the internal structure of an object by transmitting ultrasonic waves to the object and receiving acoustic waves from the object, comprising:

- first means for generating first and second transducer control signals;
- a first transducer unit, operatively connected to said first means, for transmitting ultrasonic waves at a first frequency in dependence upon said first transducer control signal and for receiving acoustic waves, said first trans-



ducer unit having a first frequency characteristic and functioning as a frequency filter on the basis of the first frequency characteristic;

a second transducer unit, operatively connected to said first means, for transmitting ultrasonic waves at a second frequency in dependence upon said second transducer control signal and for receiving acoustic waves, said second transducer unit having a second frequency characteristic different from the first frequency characteristic, said second transducer unit functioning as a frequency filter on the basis of the second frequency characteristic;



second means, operatively connected to said first and second transducer units, for receiving the acoustic waves received by said first and second transducer units and for generating first and second detection signals, respectively; an electric filter, connected to said second means, for receiving and filtering at least one of said first and second detection signals; and

third means, operatively connected to said second means and said electric filter, for displaying the internal structure of the object.

4,413,521

#### APPARATUS FOR EXAMINING AN OBJECT BY MEANS OF ULTRASONIC WAVES

Martinus J. C. Van Kemenade, Santa Ana, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

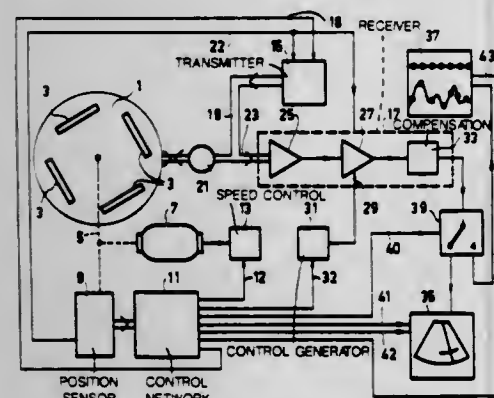
Filed Apr. 22, 1982, Ser. No. 370,780

Claims priority, application Netherlands, Apr. 29, 1981, 8102104

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—626

5 Claims



1. Apparatus for examining an object with ultrasonic waves comprising:

- a rotatable shaft;
- a cylindrical carrier supported on the shaft for rotation therewith;
- a group of n transducers, which function to emit and receive ultrasound energy, regularly distributed around the periphery of the carrier;

drive motor means which function to rotate the shaft; angle sensing means which function to determine the angular position of the carrier;

a transmitter;

a receiver;

connecting means which function to successively connect the transmitter and receiver to respective transducers;

first display means which function to display an image in the B-mode by displaying an image of a scanned region of the object in the form of a sector of the circle wherein the image consists of a sequence of m picture lines which together span the sector of the circle and the direction of each picture line corresponds to the angular position of the transducer which is connected to receiver during receipt of information which is displayed on that picture line;

second display means which function to display an image in the M-mode by displaying a succession of images formed from a single selected picture line at a plurality of successive instances in time wherein the successive images of the selected picture line are displayed parallel to one another with a constant interline spacing;

switching means which function to selectively connect the receiver to the first display means and/or to the second display means; and

control means which function to actuate the transmitter for the transmission of ultrasound energy each time the carrier reaches one of a plurality of predetermined angular positions and to control the switching means so that it connects the receiver to the second display means at each angular position of the carrier in which a respective one of the transducers is aligned in a direction which corresponds to the selected picture line;

wherein, as an improvement, the control means functions to actuate the transmitter in a cyclic manner so that each of the n transducers supplies data for the formation of a corresponding group of m/n picture lines so that during one revolution of the carrier the entire group of transducers supplies data for m picture lines, to interrupt the cycle for an interrupt period during which a respective operative transducer occupies a position in which it would otherwise supply data for any one of the n-1 picture lines which immediately follow the selected picture line in the sequence of lines, and to actuate the transmitter at every instant at which any of the transducers occupies a position in which it can supply data for the selected picture line.

4,413,522

#### RIDE QUALITY METER

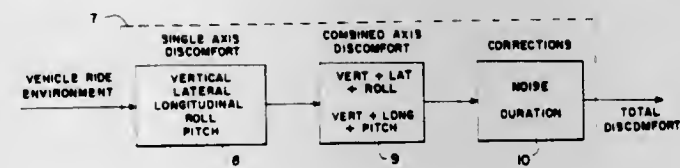
Jack D. Leatherwood; Thomas K. Dempsey, both of Hampton; Sherman A. Clevenson, Newport News, and David G. Stephens, Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 22, 1981, Ser. No. 267,179

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—646

8 Claims



1. A meter for measuring the ride quality of a passenger vehicle comprising:  
means on said vehicle for producing an electrical signal proportional to the noise level on said vehicle;  
means on said vehicle for producing several electrical signals proportional to vibrations on said vehicle; and

means for combining said electrical signal proportional to noise and said several electrical signals proportional to vibrations to obtain a total discomfort value indicative of the ride quality of said passenger vehicle.

4,413,523

#### SYSTEM FOR DAMPENING PULSATIONS OR OSCILLATIONS IN A FORCE-BALANCE INSTRUMENT

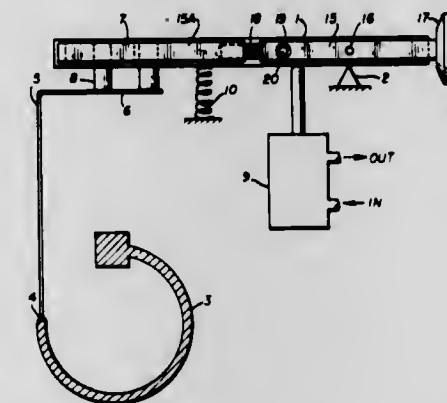
Kenneth W. Claxton, and Lewis K. Harris, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 23, 1982, Ser. No. 371,084

Int. Cl.<sup>3</sup> G01L 7/04

U.S. Cl. 73—701

7 Claims



1. A force-balance system responsive to a variable to establish a fluid pressure output signal representative of the variable, including,

- a first elongated beam member,
- a fulcrum structure for the first beam member,
- a structure for exerting a first continuous force on the first beam member in the direction to rotate the beam clockwise about the fulcrum structure,
- a pilot valve connected to the first beam member with which to establish a fluid pressure output over a predetermined range,
- a primary element responsive to a variable condition by establishing a mechanical movement over a predetermined range,
- a variable length spring connected between the first beam member and primary element arranged to exert a force upon the first beam member counter-clockwise about the fulcrum structure,
- a compensation beam with its pivot point mounted on the first beam member in an arrangement whereby the compensation beam responds to undesirable oscillations initiated in the first beam member,
- and means for connecting the compensation beam to the first beam member so that the response of the compensation beam absorbs the energy of the first beam member to dampen its oscillations.

4,413,524

#### PULSATION THROTTLING DEVICE FOR A PRESSURE GAUGE

William S. Kosh, Shelton, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 26, 1982, Ser. No. 362,321

Int. Cl.<sup>3</sup> G01L 7/00

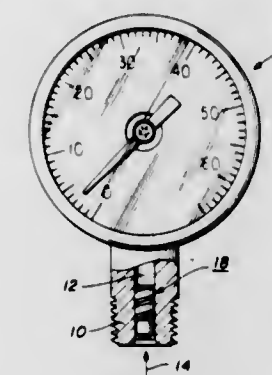
U.S. Cl. 73—707

6 Claims

1. A pulsation throttling device for a pressure gauge comprising:

- (a) an elongated cylindrical plug adapted for a snug fit in a bore communicating with the inlet to the sensing mechanism of a pressure gauge;
- (b) said plug including two axially contiguous portions including an upstream portion cooperating with the bore surface thereat to define an annular flow clearance therebetween, and a downstream portion cooperating with the bore surface thereat to define a selective flowpath there-

between effective to dampen pulsation in the flow being conducted in said bore; and



(c) said annular flow clearance of said upstream portion having a radial dimension equal to or less than the minimum clearance afforded by the flow path of said downstream portion.

4,413,525

#### BOURDON TUBE CONSTRUCTION

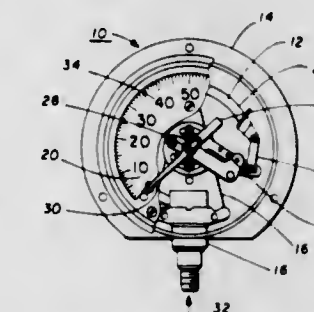
Jack Conti, Norwalk, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 8, 1980, Ser. No. 184,864

Int. Cl.<sup>3</sup> G01L 7/04

U.S. Cl. 73—741

18 Claims



1. The method of fabricating a Bourdon tube comprising the steps of:

- (a) forming a predetermined length of tubing of selected cross section from strip metal longitudinally welded seal tight at an edge gap located on the tubing cross section corresponding to a predetermined near minimal operational stress area for a contemplated in-service Bourdon tube;
- (b) shaping said tubing into a desired Bourdon tube configuration for said contemplated in-service while substantially maintaining the location relation of said seal to said stress area; and
- (c) sealing one end of said tubing to comprise the displacement end of the Bourdon tube.

4,413,526

#### DEVICE FOR ACCURATELY MEASURING FLUID PRESSURE WITH DISPLAY OF THE MEASURED PRESSURE

Pierre Delajoud, Neuilly-sur-Seine, France, assignor to Desranges & Huot, Aubervilliers, France

Filed Apr. 27, 1981, Ser. No. 257,610

Claims priority, application France, Apr. 30, 1980, 80 09889

Int. Cl.<sup>3</sup> G01L 7/16, 9/10

U.S. Cl. 73—745

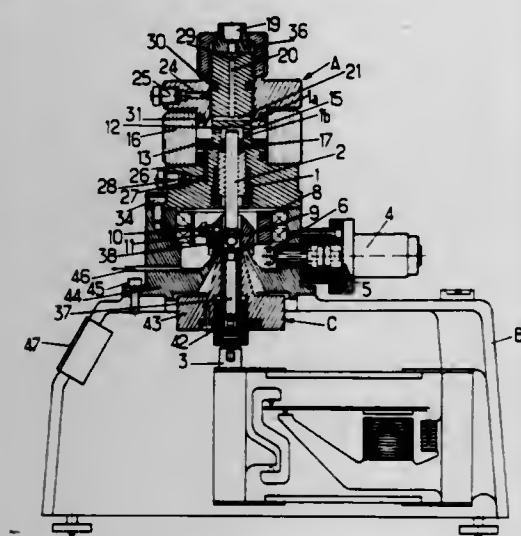
13 Claims

1. A device for the very accurate measurement of a fluid pressure and the display of the measured pressure, comprising in combination:

- a very accurate electromagnetic weighing apparatus with a vertical shaft having a top extremity and with display



means for displaying the weight applied to said top extremity of said shaft;  
 a removable measuring unit including a vertical cylinder and a vertical piston adapted to slide and to rotate in said cylinder with viscous friction, said piston having a top extremity and a bottom extremity;  
 means for receiving said measuring unit;



conduit means for applying to said top extremity of said piston the pressure to be measured;  
 driving means for rotating said piston in said cylinder; and  
 force transmitting means connecting said bottom extremity of said piston to said top extremity of said shaft and transmitting to said top extremity of said shaft the force to which is submitted said bottom extremity of said piston.

4,413,527

## SEMICONDUCTOR PRESSURE SENSOR

Junji Sugiura, Toyota; Hiroshi Okada, Hekinan; Michitaka Hayashi; Toru Yamazaki, both of Kariya, and Hiroshi Sugimoto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

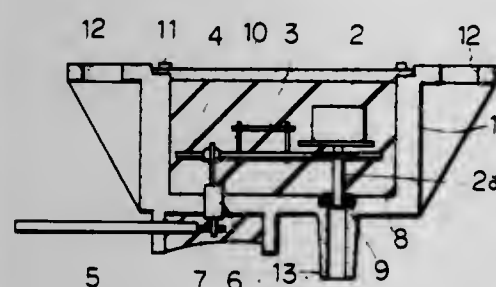
Filed Apr. 6, 1982, Ser. No. 366,087

Claims priority, application Japan, Apr. 14, 1981, 67-55835

Int. Cl.<sup>3</sup> G01L 9/08

U.S. Cl. 73-754

5 Claims



1. A semiconductor sensor unit comprising:  
 a casing including a pressure introduction pipe and an electrically conductive member;  
 a pressure sensor unit enclosed by said electrically conductive member in said casing for detecting a pressure introduced through said pressure introduction pipe;  
 a circuit unit enclosed by said electrically conductive member in said casing for amplifying an output signal delivered from said pressure sensor unit; and,  
 at least one through-type capacitor mounted on said casing and electrically connected to said electrically conductive member, the arrangement being that a signal from said circuit unit is delivered out of said casing through said through-type capacitor.

4,413,528  
MINIATURE PRESSURE TRANSDUCER

Bertil Hök, Västerås, and Gösta Säll, Norsborg, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

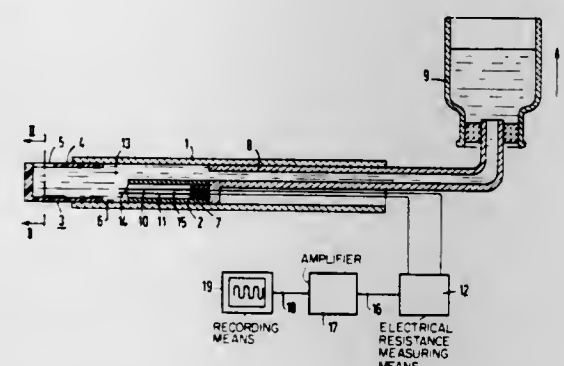
Filed Apr. 15, 1981, Ser. No. 254,408

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019464

Int. Cl.<sup>3</sup> G01L 9/02

U.S. Cl. 73-753

5 Claims



1. A miniature pressure transducer for generating an electrical signal which corresponds to a hydrostatic pressure to be measured in a liquid vessel, comprising an outer tube, a measuring cell disposed in the outer tube, said measuring cell having means for generating an electrical magnitude corresponding to the pressure to be measured, fluid chamber defining means comprising said outer tube defining a chamber in fluid communication with said measuring cell so that the pressure of said chamber is sensed by said measuring cell, a liquid line for the passage of liquid into the chamber, and fluid coupling means for coupling the chamber to liquid whose pressure is to be measured, in a liquid vessel external to said outer tube, wherein the improvement comprises said fluid coupling means being a one-way valve (3) disposed between the chamber (13) and the exterior of said outer tube such that the liquid can only flow in the direction from the chamber (13) into the liquid vessel, said one-way valve (3) consisting of one piece with a sealing and with a spring-back part (4, 5) consisting of a flexible material.

4,413,529

## ADJUSTABLY KEYED PRESSURE GAUGE CONSTRUCTION

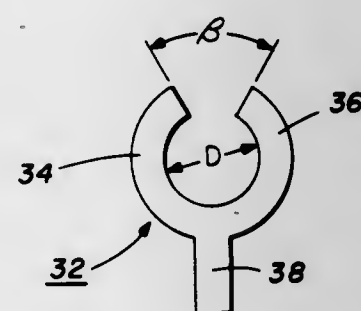
Robert D. Bissell, Orange, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 17, 1981, Ser. No. 303,247

Int. Cl.<sup>3</sup> G01L 19/00, 7/04

U.S. Cl. 73-756

6 Claims



1. In a pressure gauge including a casing, a Bourdon tube rotationally secured relative to said casing, a pointer operably connected to said Bourdon tube, a dial plate arcuately displaceable for zero calibration setting relative to said pointer and a reference indicia on said dial plate, key means supported on said gauge and adjustably set at a predetermined angular dis-

placement from said reference indicia on the post-calibration setting of said dial plate.

the present fraction ratio signal the bandwidth frequencies of the filtered and the Doppler shift signals, which bandwidth

4,413,530

## DEVICE FOR MEASURING AND MONITORING GAS FLOWRATES

Laurent J. Guadagnin, and Claude R. Grosslond, both of Annecy, France, assignors to Cricket Sarl, France  
 PCT No. PCT/FR80/00094, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO80/02874, PCT Pub. Date Dec. 24, 1980

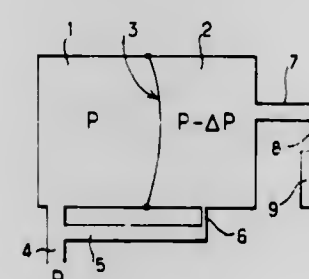
PCT Filed Jun. 13, 1980, Ser. No. 237,164

Claims priority, application France, Jun. 15, 1979, 79 15438

Int. Cl.<sup>3</sup> G01F 1/38

U.S. Cl. 73-861.47

4 Claims



1. Apparatus for measuring the flowrate of a fluid through a system whose through flowrate is to be measured, comprising:  
 a first chamber in fluid communication and substantial pressure equilibrium with a substantially constant pressure source;  
 a second chamber in fluid communication with said constant pressure source through a flow restrictor having a through flowrate substantially equal to the through flowrate of the system to be measured;  
 a valve having an upstream port and a downstream port, said upstream port being in fluid communication with said second chamber and said downstream port being adapted to receive and connect with the system to be measured, said valve being selectively actuatable between a first state wherein fluid communication between said second chamber and the system to be measured is blocked and a second state wherein fluid communication between said second chamber and the system to be measured is established;  
 means for actuating said valve from said first state to said second state upon connection of the system to be measured to said valve and for actuating said valve from said second state to said first state upon disconnection of the system to be measured from said valve; and  
 pressure difference measuring means for measuring the pressure difference between said first and second chambers.

4,413,531

## DOPPLER FLOWMETER

Henry H. B. Karplus, Hinsdale, and Apostolos C. Raptis, Downers Grove, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

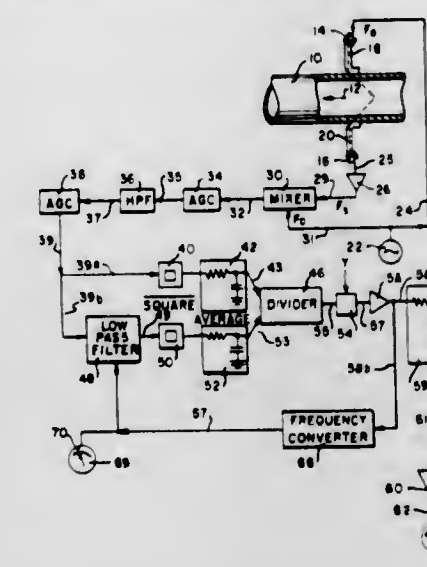
Filed Nov. 13, 1981, Ser. No. 321,345

Int. Cl.<sup>3</sup> G01F 1/66

U.S. Cl. 73-861.25

8 Claims

1. A method of determining the velocity of a slurry flowing in a pipe, comprising the steps of radiating a fixed-frequency ultrasonic signal obliquely into the pipe toward its center and receiving off the flowing slurry a scattered signal that is varied according to the slurry flow and combining the fixed-frequency and scattered signals to give a Doppler shift signal, filtering the Doppler shift signal off the high frequency end and comparing the filtered signal against the Doppler shift signal to obtain a fractional ratio signal, comparing the fractional ratio signal against a preset fractional ratio signal and minimizing the divergence of the fractional ratio signals in a feedback loop, and determining from the feedback loop and



frequencies are proportional to and can be used to determine the velocity of the slurry flow.

4,413,532

## ORIFICE METER WITH ISOLATION VALVE ON THE CARRIER

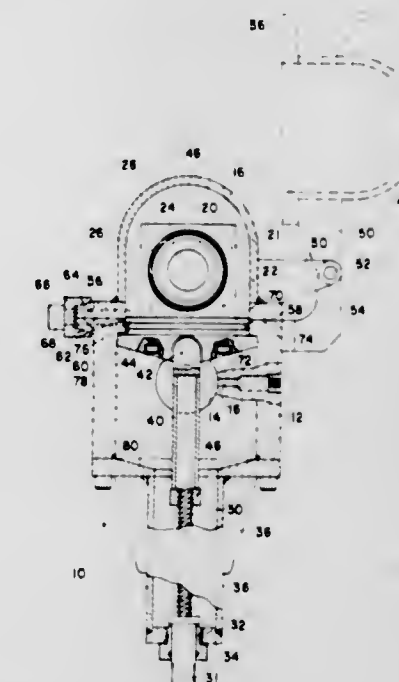
Davis A. Van Scoy, Simonton, Tex., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Mar. 29, 1982, Ser. No. 362,885

Int. Cl.<sup>3</sup> G01F 1/42

U.S. Cl. 73-861.61

3 Claims



1. An orifice meter comprising:  
 a housing with a lower working chamber and a service chamber;  
 said lower chamber including:  
 a pair of planar, parallel walls with aligned flow passages therethrough;  
 a gate-like carrier for an orifice disc movable between said chambers;  
 seal rings on opposite sides of said carrier operative to seal around said flow passages when said carrier is in said working chamber;  
 a restricted passageway between said chambers;  
 a valve closure member of a size and shape to fit snugly in said passageway carried on the lower end of said carrier; and



a resilient seal around said closure member.

4,413,533

**SAMPLING DEVICE FOR ISOKINETIC SAMPLING**  
Hans A. Diesel, Annandale, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 29, 1981, Ser. No. 316,294

Int. Cl.<sup>3</sup> G01N 1/20

U.S. Cl. 73—863.31

15 Claims



1. A sampling device for isokinetic sampling of a flowable substance passing through a conduit comprising a plurality of tubes fixedly located relative to each other, each tube including an inlet end having an inlet opening, a discharge end having a discharge opening, an adjustable metering valve means for regulating the flow rate through each tube and an operating valve for permitting and preventing flow through each tube, the volume contained in each tube between the inlet opening and the valve being substantially equal to the corresponding volume of each of the other tubes, the inlet openings of the tubes being spaced apart substantially in a common plane and facing in the same direction, and the sampling device being so constructed and arranged for a part thereof including said inlet openings to be received in leak-proof fashion through an orifice in the wall of the conduit, operating plate means connected to each said operating valve for opening and closing all said operating valves simultaneously when each said separate metering valve means has been set to substantially equalize the flow rate through each tube, and a plurality of individual containers located adjacent each said tube discharge end to receive a plurality of individual samples therein upon opening of each said operating valve means.

4,413,534

**SAMPLE TRANSPORT MECHANISM**

Toma Tomoff, Überlingen; Hans G. Mohr, Uhldingen, and Volker Kempf, Überlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,809

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030396

Int. Cl.<sup>3</sup> G01F 35/06

U.S. Cl. 73—864.21

11 Claims

1. Mechanism for automatically supplying sample from sample vessels to a measuring loop of a liquid chromatograph; said mechanism comprising:

a stationary holder arranged to retain said sample vessels in rows parallel, whereby each sample vessel can be characterized by a row and a column number;

a dosing tube, said tube having a front end and a rear end;

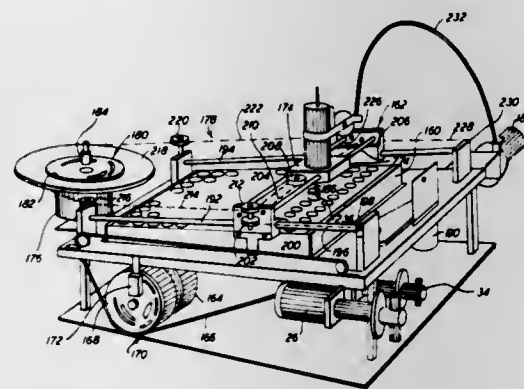
said dosing tube being vertically movable by a third servomotor;

a changing-over valve having a plurality of ports; a measuring loop, said measuring loop being connected to a first port and a second port of said changing-over valve; a solvent pump outlet, said solvent pump outlet connecting to a third port of said changing-over valve, means for positioning said dosing tube between a first position whereat said front end thereof is in one of said sample vessels and said rear end thereof communicates with a dosing pump whereby sample fluid can be sucked into said dosing tube, and a second position whereat said front end thereof communicates with said first port of said changing-over valve and whereat said dosing pump discharges said sample from said dosing tube into said measuring loop;

a control unit for controlling and synchronizing said changing-over valve with said dosing tube position whereby when said dosing tube is in said first position thereof said solvent pump communicates with said column and when said dosing tube is in said second position thereof said solvent pump communicates with said column via said measuring loop;

a cradle extending parallel to said rows is movably guided above said holder in a direction perpendicular to said rows by a first servomotor via a rope transmission, wherein the position of said first servomotor being controlled by a first coding device;

a carriage movably guided on said cradle along said rows,



said carriage being adjustable by a second servomotor via a rope transmission, said second servomotor being controlled by a second coding device, said cradle and said carriage being movable into a position beside said holder, whereat said dosing tube is located above the sample discharge station; said second servomotor being stationary with respect to the apparatus on one side of the holder, said cradle being guided on two parallel sliding bars; and said rope transmission assigned to the second servomotor comprises a rope, which:

is retained stationary with respect to the apparatus with one end on the side remote from the servomotor and extends along one sliding bar;

is deviated around a first deviating roller provided on one side of said cradle and being guided along the guide means of said carriage to a second deviating roller provided thereon;

is deviated through 180° by said second deviating roller and guided to a third deviating roller provided on said cradle and being coaxial to said first deviating roller;

is deviated thereby and guided further along one sliding bar; winds around a pulley located on said second servomotor; then extends along the other sliding bar;

is deviated around a fourth deviating roller provided on the other side of said cradle and guided along said guide means of said carriage to a fifth deviating roller provided thereon;

is deviated through 180° by said fifth deviating roller end

guided to a sixth deviating roller provided on said cradle and coaxial to said fifth deviating roller, is deviated thereby and guided further along the other sliding bar and also being stationary with respect to the apparatus with the other end on the side remote from the servomotor.

4,413,535

**POWER TRANSMISSION APPARATUS**

Howard F. Hobbs, Rugby, England, assignor to Variable Kinetic Drives Limited, Northamptonshire, England

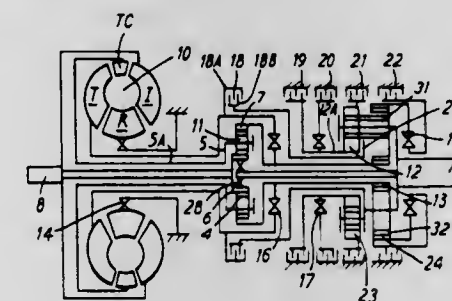
Filed Jun. 17, 1980, Ser. No. 160,169

Claims priority, application United Kingdom, Jun. 26, 1979, 7922130

Int. Cl.<sup>3</sup> F16H 47/08

U.S. Cl. 74—688

7 Claims



1. A power transmission apparatus comprising a torque converter having an input shaft (8), an impeller connected to the input shaft, an output turbine, a first uni-directional detent (14), a reactor connected to a fixed part on which to react by means of said first uni-directional detent which is arranged to prevent rotation of the reactor in a reverse direction, and a circulatory turbine, a first gearing (11) connecting the circulatory turbine to the input shaft (8), a second gearing (12, 13, 27, 31, 32) connecting the first gearing to an output shaft (9), a second uni-directional detent (17) and a brake (20) arranged to act between part of the second gearing and a stationary part, the apparatus having a ring gear (23) and a holding device (21, or 21A) acting on said ring gear (23), both being included in the second gearing, whereby when the ring gear is held stationary by said holding device, the output shaft is driven in reverse.

4,413,536

**AUTOMATIC TRANSAXLE CONTROL SYSTEM**

Douglas A. Whitney, Livonia, and Sergio Kavalhuna, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 11, 1980, Ser. No. 176,948

Int. Cl.<sup>3</sup> B60K 41/10

U.S. Cl. 74—869

7 Claims

1. A control system for an automatic transmission for delivering torque from a driving member to a driven member comprising:

planetary gear elements connecting said driving and driven members;

fluid pressure operated clutch means for connecting two gear elements together to establish a high speed ratio;

fluid pressure operated brake means for anchoring one of said gear elements to establish an underdrive speed ratio, said brake means comprising a fluid pressure piston in a cylinder with a brake apply pressure chamber on one side of said piston and a brake release pressure chamber on the other side of said piston;

a pressure source;

conduit structure connecting said pressure source and said clutch means and connecting said pressure source and said pressure chambers;

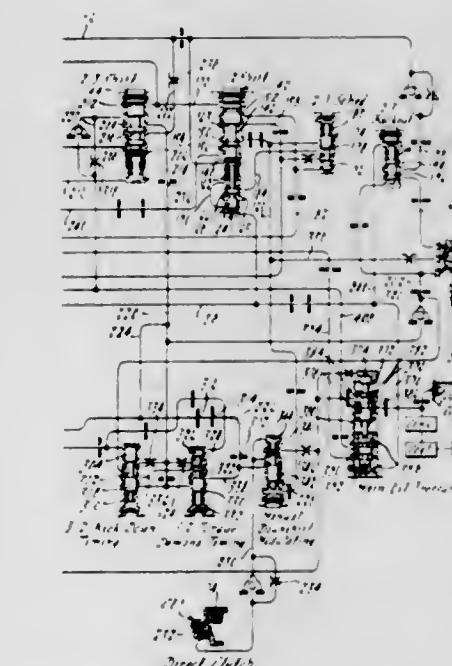
shift valve means in said conduit structure for controlling pressure distribution to said clutch and brake means

whereby ratio changes may be accomplished between said high speed ratio and said underdrive ratio;

governor valve means for developing a pressure signal proportional to driven speed of said driven member, throttle valve means for developing a pressure signal proportional to the torque on said driving member;

said governor valve means and said throttle valve means being connected to said shift valve means for imposing thereon opposed activating forces;

said transmission assuming a high speed ratio condition when said clutch means and said release pressure chamber are pressurized simultaneously and assuming an underdrive condition when said clutch means and said pressure release chamber are exhausted;



separate exhaust pressure flow paths for said clutch means and said release pressure chamber including a common flow path portion, said shift valve means being disposed in and forming a part of said common flow path portion;

a downshift kick-down timing valve means and a downshift torque demand timing valve means in the exhaust flow path for said pressure release chamber, each timing valve means being responsive to said speed pressure signal;

the exhaust flow path extending from said release pressure chamber having parallel branches, said downshift kick-down timing valve means being on the exhaust flow upstream side of said downshift torque demand timing valve means;



a plurality of orifices in said exhaust flow paths, a first of said orifices being in the exhaust flow path for both the said clutch means and said release pressure chamber and a second of said orifices being in the flow path for said pressure release chamber only;

said timing valve means each responding to said speed pressure signal to provide a flow path through a first set of said orifices at speeds of said driven member less than a predetermined valve and through a second set of said orifices at speeds of said driven member greater than said predetermined value.

4,413,537

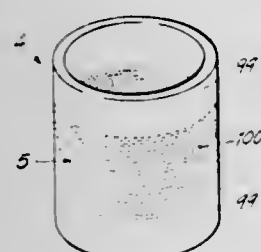
# METHOD OF MAKING A TUBULAR CYLINDER FOR EXTRUDING A PRODUCT

Robert R. Fischer, Michigan City, and Joe R. Urschel, Valparaiso, both of Ind., assignors to Urschel Laboratories, Incorporated, Valparaiso, Ind.

Division of Ser. No. 286,373, Jul. 24, 1981. This application Sep. 21, 1982, Ser. No. 420,738  
Int. Cl.<sup>3</sup> B21K 21/00

U.S. Cl. 76—101 R

13 Claims



1. A method of constructing a cylinder comprising providing a support, assembling an appreciable number of notched circular layers of metal about said support, compressing said layers, brazing said layers and support while the layers are compressed to provide a unitary tubular cylinder, and cutting away a cylindrical portion of said cylinder whereby said notches provide a multitude of circumferentially and longitudinally spaced substantially radially extending passages extending through the wall of the cylinder.

4,413,538

# UNIVERSAL SERVICE TOOL

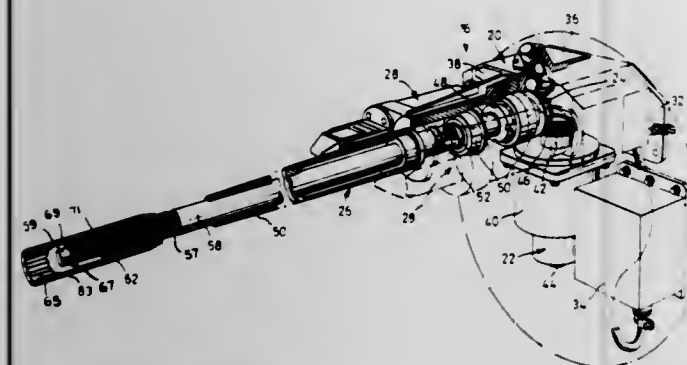
Robert D. Norman, Bramalea, Canada, assignor to Spar Aerospace Limited, Toronto, Canada

Filed Mar. 17, 1981, Ser. No. 244,670

Int. Cl.<sup>3</sup> B25B 17/00

U.S. Cl. 81—57.13

12 Claims



1. A tool comprising:  
(a) a housing;  
(b) power transmission means mounted on said housing for connection with a power source;  
(c) a powered shaft supported by said housing to extend therefrom along a first axis, said shaft being operably connected

to said power transmission means to be driven through it in use;

(d) workpiece engaging means mounted on said housing laterally outwardly from said shaft, said workpiece engaging means being secured to said housing to prevent rotation about said powered shaft and adapted to engage a workpiece in use such that the workpiece may be restrained against longitudinal and rotational movement with respect to said housing when worked by operation of the powered shaft;

(e) said workpiece engaging means comprising a pair of latch assemblies projecting from said housing, one on either side of said powered shaft to engage a workpiece at opposite sides of said powered shaft;

(f) each of said latch assemblies comprising:  
(i) latch support means on said housing,  
(ii) a latching shoulder projecting laterally at first end of said support means,  
(iii) a latch actuator rod having a first end and a second end, said latch actuator rod being slightly mounted in said support means to reciprocate longitudinally between an extended position and the retracted position, said first end of said actuator rod projecting forwardly from said first end of said support means,  
(iv) a latching head mounted at said first end of said actuator rod, said latching head having an inner end disposed toward said shoulder,  
(v) a pair of latch arms each having an upper arm portion and a forearm portion, the proximal end of each upper arm portion being pivotally connected to the inner end of the head, one at each side thereof, the distal end of each upper arm portion being pivotally connected to the proximal end of the forearm portion, the distal end of each forearm portion being pivotally mounted on the housing adjacent the latch actuator rod, said arms articulating in response to movement of said head such that when said head is in said extended position, the arms are extended and arranged in-line with the head and when the head is in the retracted position, the arms are bent such that the forearm portions project laterally to overlie said shoulders to clamp a workpiece therebetween,  
(vi) latch drive means operable to drive said actuator rod relative to said support means between said extended position and said retracted position to move said head to effect movement of said link arms as aforesaid.

4,413,539

# NUMERICALLY CONTROLLED LATHE

Shinichi Ishizuka, and Kenji Sugimoto, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

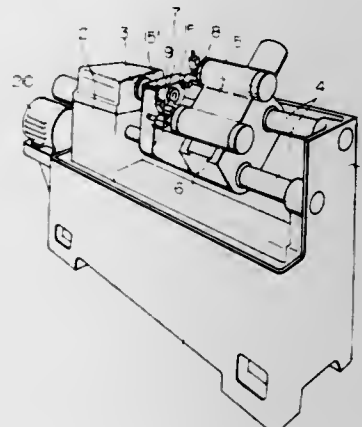
Filed Oct. 29, 1980, Ser. No. 201,847

Claims priority, application Japan, Oct. 31, 1979, 54-140821; Oct. 31, 1979, 54-140822; Feb. 26, 1980, 55-22982; Feb. 26, 1980, 55-22983; Feb. 26, 1980, 55-22984; Mar. 21, 1980, 55-35962; Mar. 21, 1980, 55-35963; Mar. 22, 1980, 55-36444

Int. Cl.<sup>3</sup> B23B 3/18, 29/32

U.S. Cl. 82—2 R

7 Claims



1. A numerically controlled lathe, comprising:

a stationary headstock;  
a spindle supported in said headstock for rotational movement;  
first guideway means located in front of said headstock, extending horizontally and parallel to the axis of said spindle;  
a saddle horizontally movable on said first guideway means relative to said spindle, said saddle including second guideway means extending perpendicular to said first guideway means;  
a cross slide slidably supported by said second guideway means and movable in a direction perpendicular to said first guideway means;  
first and second tool posts supported by said cross slide and located in opposing relationship with respect to the axis of said spindle, said first and second tool posts including turret heads, respectively, each carrying a plurality of tool receivers;  
turret indexing means allowing indexing of one of said turret heads while a tool of the tool receiver of the other one of turret heads is in a cutting position relative to the axis of said spindle;  
a guide bush;  
a guide bush supporting member located between said spindle and said first and second tool posts and connected to said saddle for horizontal movement therewith, said supporting member supporting said guide bush in concentric relation with the axis of said spindle; and  
detecting means for detecting when a tool of the tool receiver of the other one of said turret heads is in said cutting position relative to the axis of said spindle;  
said turret head of said first tool post and said tool receiver of said second tool post including axes extending parallel to the axis of said spindle and being located between said guide bush supporting member and adjacent ends of said first and second tool posts in an area away from said second guideway means;  
each of said turret heads having a plurality of tool mounting faces circumferentially spaced apart about the axis of said turret head, with the number of the tool mounting faces being of n number of an odd number; and  
said turret indexing means comprising cylinder means, piston means movable in said cylinder means to (n+1)/2-number of stopping positions to effect indexing of each of said turret heads at a plurality of indexing positions, stopper means mounted to said cylinder means to cause said piston means to stop at said stopping positions, and adjusting means cooperating with said stopper means to effect adjustment of said stopper positions relative to said indexing positions, gear means provided between each of said turret heads and said cylinder means to permit the engagement therebetween, and means for shifting said gear means into and out of engagement.

4,413,540

# FOAM PEELING PROCESS AND APPARATUS

Russell W. Burge, Covina, Calif., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1981, Ser. No. 332,284

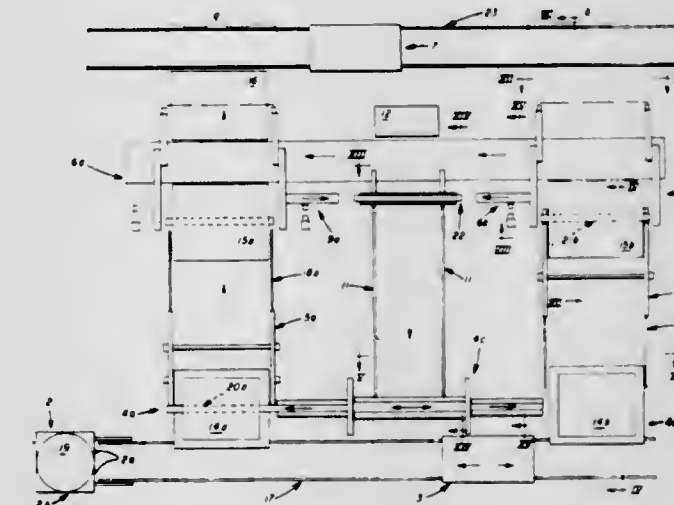
Int. Cl.<sup>3</sup> B23Q 37/00

U.S. Cl. 82—47

14 Claims

1. A process for producing a continuous sheet of foam material in roll form comprising:  
(A) transporting a cylindrical foam body to a first station,  
(B) at said first station, inserting a supporting rod through the longitudinal axis thereof,  
(C) transporting a cylindrical foam body from said first station to a second station,  
(D) at said second station,  
(i) rotating a cylindrical foam body about its longitudinal axis by rotating a supporting rod located therein,  
(ii) bringing a downwardly moving cutting element from

a first position into contact with the rotating foam body to thereby produce a continuous sheet of foam material,  
(iii) winding said continuous sheet upon a mandrel,  
(iv) stopping the downward moving of said cutting element once the cutting element has progressed a predetermined distance through said rotating foam body,  
(v) discharging the fully wound roll from said second station,  
(vi) discharging the remainder of said foam body from said second station, and  
(vii) returning said cutting element to said first position,  
(E) transporting said remainder of said foam body to a third station,



(F) at said third station, removing said remainder from its supporting rod, and  
(G) transporting said supporting rod from said third station to said first station, wherein  
(i) the transporting step (A) does not occur until completion of the operation of step (B) and occurs substantially simultaneously with the transporting step (C),  
(ii) the transporting step (C) does not occur until completion of the operation of step (D), and  
(iii) the transporting step (E) does not occur until completion of the operation of step (D) (i) through (vi).

4,413,541

# RAPID CHANGEOVER PRINTER

Frank M. Biggar, III, Lakeview, N.Y., assignor to Elizabeth Short Biggar, Silver Creek, N.Y.

Continuation of Ser. No. 123,171, Mar. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,799, Mar. 15, 1979, abandoned. This application May 18, 1982, Ser. No. 379,484

Int. Cl.<sup>3</sup> B26D 7/26

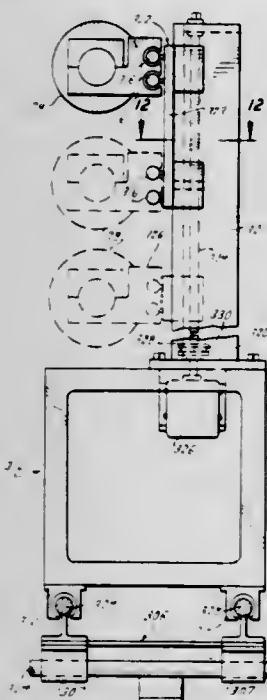
U.S. Cl. 83—346

14 Claims

1. In a station of a compound printer for processing a continuous web, the station having a frame and at least one cylinder mounted within said frame; means for rapid changeover of said cylinder, said rapid changeover means comprising:  
bearing means mounting said cylinder within said frame for sliding transverse movement of said bearing means and cylinder in a direction parallel to the cylinder axis along a first track means,  
a cart having a main frame,  
bearing means supporting a replacement cylinder within said cart main frame for sliding transverse movement of said replacement cylinder in a direction parallel to the replacement cylinder axis along a second track means,  
said cart having a third track means for slidably receiving said station cylinder,  
means for positioning said cart adjacent said station with said second track means parallel to said first track means and with said first and third track means in transverse alignment for the transverse sliding movement of said cylinder



and its bearings from said first track means of said station and onto said third track means of said cart, and means for positioning said second track means in transverse



alignment with said first track means for transverse sliding movement of said replacement cylinder and its bearings from said second track means of said cart onto said first track means of said station.

4,413,542

## MAT CUTTER AND GUIDE SYSTEM

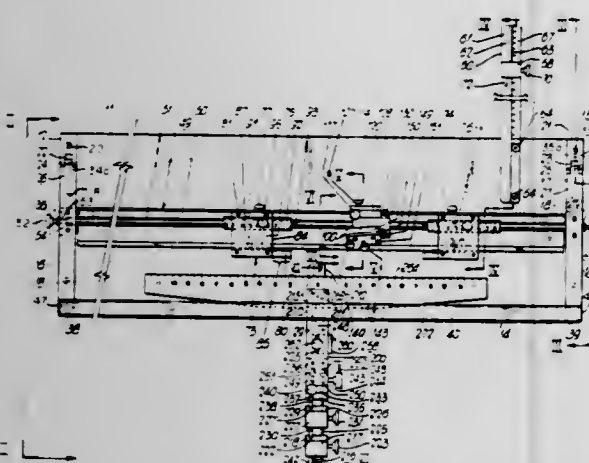
Delmar Rempel, 1421 Egbert Ave., Saskatoon, Saskatchewan, Canada (S7N 2L8)

Filed Apr. 30, 1980, Ser. No. 145,340

Int. Cl.<sup>3</sup> B26D 7/02, 7/26, 5/10

U.S. Cl. 83—455

28 Claims



1. A mat cutter for picture frame mats comprising:

- a rectangular cutter base having a planar mat-supporting surface;
- a clamping frame including a pair of spaced-apart, parallel, transverse, lateral hinge bars, each being secured by an associated hinge means adjacent its respective rear end, a longitudinally extending handle interconnecting the respective forward ends of the transverse, lateral hinge bars, and a longitudinally extending intermediately transversely positioned cutter head guide bar assembly disposed between said hinge bars, said cutter head guide bar assembly including a guide plate having a lower surface which, in use, lies flush with said picture frame mat resting on said mat-supporting surface and a guide rod secured to its upper surface, said guide rod being journaled for selective restrictive rotation in, and with respect to, said transverse, lateral hinge bars, at a point intermediate the for-

ward end and the rearward end of said transverse, lateral hinge bars, each said hinge means having a first stop member cooperating with an associated said hinge bar to limit rotation of said cutter head guide bar assembly and said clamping frame to an upright position at a selected angle within the range of from about 92°–96° to the plane of said cutter base, and each said hinge means having a second stop member cooperating with an associated said hinge bar to limit rotation of said cutter head guide bar assembly and said clamping frame to a lowered position at which the bottom surface of said guide plate is flush with, but is not resting with any significant weight upon, said picture frame mat which is resting on said mat-supporting surface, said clamping frame being selectively deformable by exerting downward pressure on said cutter head guide assembly, thereby to urge said guide plate into gripping engagement with said picture frame mat;

- a cutter head slidably mounted along said guide rod by means of a replaceable bearing block, said cutter head including spaced-apart longitudinal edges, one of said edges forming an acute angle to the plane of said base and the other forming approximately a right angle to the plane of said base, said cutter head including a pair of cutting blades pivotally carried thereby, one blade being disposed for guidance by, and cooperation with, each longitudinal edge of said cutter head; and
- a pair of longitudinally spaced-apart, longitudinally slidably, adjustably, movable, fixable, but detachable stop means, each being mounted on said guide rod to limit to-and-fro slidable movement of said cutter head along said guide rod.

4,413,543

## SYNCHRO START DEVICE FOR ELECTRONIC MUSICAL INSTRUMENTS

Akio Iba, Tokorozawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

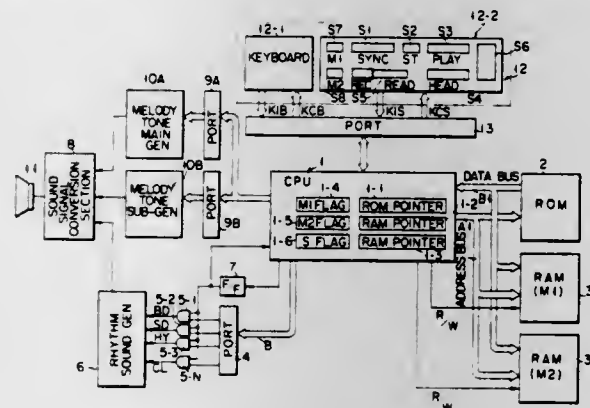
Filed Dec. 18, 1981, Ser. No. 331,972

Claims priority, application Japan, Dec. 25, 1980, 55-185268

Int. Cl.<sup>3</sup> G10H 1/42, 7/00

U.S. Cl. 84—1.03

13 Claims



1. A synchro start device for an electronic musical instrument comprising:

- memory means including a plurality of memory areas, each memory area being capable of storing musical tone codes representing musical tones sequentially, each memory area having a plurality of memory locations;
- setting means for setting a specific memory area of the plurality of memory areas as a main memory area;
- inputting means for inputting a synchro start code at a specified location in said main memory area;
- first means for reading out musical tone codes and a synchro start code from said main memory area;
- second means for starting to read out musical tone codes sequentially from a memory area other than said main memory area when said synchro start code is read out from said main memory area by said first means; and

automatic playing means for performing an automatic play of the electronic musical instrument in accordance with said musical tone codes read out by said first and second means.

4,413,544

## SINGLE CHANNEL STRING ENSEMBLE SOUND SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

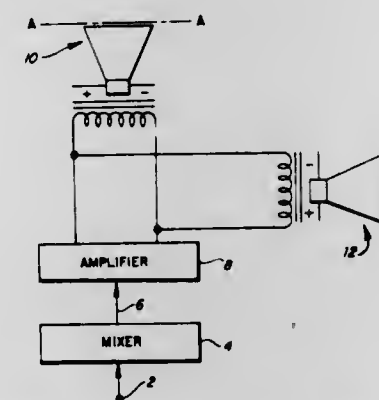
Donald R. Sauvey, Palatine, Ill., assignor to The Marmon Group, Inc., Chicago, Ill.

Filed Jan. 18, 1982, Ser. No. 340,579

Int. Cl.<sup>3</sup> G10H 1/02

U.S. Cl. 84—1.24

3 Claims



1. A single channel sound system for use in an electronic organ having a keyboard and a signal means responsive to the depression of keys on said keyboard for generating electric signals representing the waveforms produced by a string instrument, said single channel sound system being responsive to said electric signals for generating string ensemble tones for a listening audience and comprising:

- a mixer circuit for receiving said electric signals representing the waveforms produced by string instruments and dividing said signals into at least two separate signals, phase shifting at least one of said separate signals with respect to the other separate signal and combining said separate phase shifted signal and said other separate signal into a phase shifted output signal;
- an amplifier connected in circuit to said mixer circuit for receiving said phase shifted output signal and providing an amplified phase shifted output signal;
- a first transducer driven by said amplified phase shifted output signal and physically oriented in a plane to directly radiate sound waves toward the listening audience;
- a second transducer driven by said amplified phase shifted output signal substantially 180° out of phase electronically from said first transducer and physically oriented in a plane to radiate sound waves by reflection toward the listening audience;
- said plane of said second transducer is substantially perpendicular to said plane of said first transducer for providing sound waveforms from said first transducer and said second transducer which, in addition to being 180° out of phase, acoustically cancel and reinforce each other providing both direct and reflected sound waveforms to the listening audience which simulate the actual waveforms produced by a string ensemble.

4,413,545

## MUSIC DATA READING TYPE ELECTRONIC MUSICAL INSTRUMENT

Eisaku Okamoto, and Kohtaro Mizuno, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

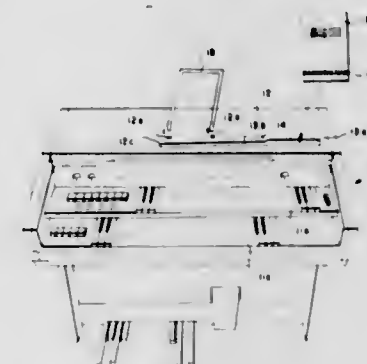
Filed Jul. 28, 1981, Ser. No. 287,560

Claims priority, application Japan, Jul. 30, 1980, 55-108084[U]

Int. Cl.<sup>3</sup> G10H 3/03

U.S. Cl. 84—1.28

6 Claims



1. An electronic musical instrument comprising:

- a keyboard;
- a musical instrument body incorporating said keyboard, said musical instrument body having in an upper surface thereof behind said keyboard a first groove portion for supporting a music sheet during play of music on said music sheet and for holding said music sheet in a position to show a musical representation of musical notes on said music sheet to a player, a second groove portion and a third groove portion and all of which are upwardly opened to accept a lower portion of said music sheet and are arranged continuous to form a music sheet passage extending substantially parallel to a longitudinal direction of said keyboard, said music sheet having at said lower portion a data recording portion carrying music data corresponding to said musical notes;
- a reading device disposed at said second groove portion for reading said music data from the data recording portion as the sheet is moved through said music sheet passage from the third groove portion through the second groove portion to the first groove portion; and
- memory means for storing the music data read out by the reading device.

4,413,546

## DRUM MAGAZINE FOR CARBINES OR THE LIKE

William J. Taylor, Jr., 828 Sycamore Dr., Decatur, Ga. 30030

Filed Dec. 17, 1980, Ser. No. 217,236

Int. Cl.<sup>3</sup> F41C 25/10

U.S. Cl. 89—33 D

5 Claims

- Drum magazine apparatus for successively feeding a plurality of cartridges to a firearm, comprising:
  - means defining a housing;
  - means within said housing to define a channel for receiving a plurality of cartridges in serial relation relative to a feeding end of said channel;
  - extension means associated with said housing and defining a cartridge feeding channel in communication with said feeding end of said cartridge receiving channel;
  - means within said housing operative to urge said plural cartridges in a forward direction along said cartridge receiving channel toward said cartridge feeding channel;
  - loading means selectively operative from outside said housing to move said cartridge urging means in a backward direction sufficiently to admit one cartridge at said feeding end, so as to permit loading a cartridge into the open end of said cartridge receiving channel through said cartridge feeding channel;



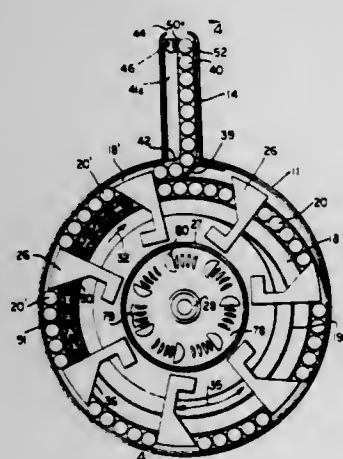
said cartridge receiving path being an arcuate path within said housing;

said cartridge urging means comprising a rotor having a plurality of arms extending outwardly from the rotor in angularly spaced apart relation and disposed across said cartridge receiving channel, so that said arms define a number of cartridge receiving spaces along the cartridge receiving channel;

each said cartridge receiving space being sufficient to accommodate several individual cartridges in side-by-side relation, and each cartridge space being separated from an adjacent cartridge space by an arm;

means operative to urge said rotor in said forward direction along the cartridge receiving channel, so that said cartridge spaces and the individual cartridges received therein are moved along the cartridge receiving channel toward said feeding end as cartridges are fed from said extension means;

a plurality of detents associated with said rotor;



an operating means operable from outside said housing to engage a detent and move said rotor back sufficiently to receive a cartridge;

said detents comprising plural groups of first detents, each such detent group corresponding to one of said cartridge receiving spaces defined between two adjacent rotor arms;

each said group of first detents having a plurality of first detents corresponding in number to the number, minus one, of cartridges accommodated by the corresponding cartridge receiving space and being operative to move said rotor back a first distance when engaged by said operating means;

each group of first detents being separated from an adjacent group of detents by a second detent, each of said second detents corresponding to one of said rotor arms; and said second detents operative to move said rotor back a second distance greater than said first distance whenever one of said rotor arms is aligned with said feeding end of said cartridge receiving channel.

4,413,547

#### SERVO-CONTROL DEVICE FOR AIRCRAFT FLIGHT CONTROL

Gerard L. Devaud, Paris, France, assignor to Societe d'Applications des Machines Motrices, Issy-les-Moulineaux, France  
Filed Jan. 21, 1981, Ser. No. 227,118

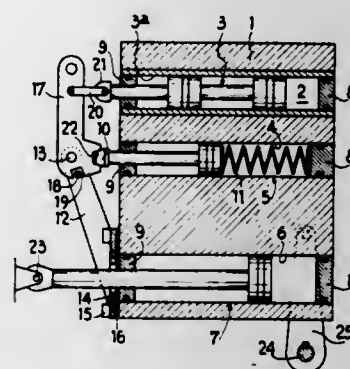
Claims priority, application France, Jan. 25, 1980, 80 01591  
Int. Cl.<sup>3</sup> F01B 15/00; F15B 9/10

U.S. Cl. 91—216 R

4 Claims

1. A flight control apparatus for an aircraft comprising: a directional valve having a body and a spool mounted in a longitudinal passageway in the body for axial, bidirectional movement relative to a neutral position of the spool, fixedly mounted guide means cooperative with the body for guiding the body which is movable relative to said guide means, a support mounted on the valve body and stationary with respect

thereto, a pivot pin carried by the support, said pivot pin being stationary with respect to the valve body, a control lever pivotally mounted on the pin for limited angular displacement about an axis defined thereby, said axis being stationary with respect to the valve body, means connecting the spool to the



lever, and a shim forming a spacer member interposed between the support and the valve body for adjustably fixing the stationary position of the support with respect to the body to thereby enable the facile adjustment of the neutral position of the spool.

4,413,548

#### HYDRAULIC MOTOR WITH ADJUSTABLE FLOW VOLUME

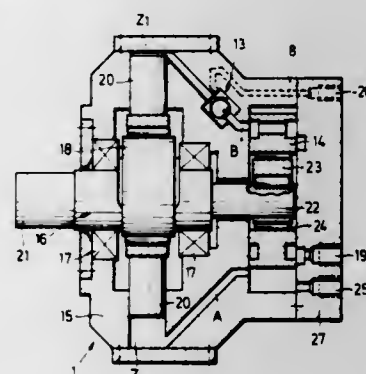
Jurgen Klie; Walter Lubos, both of Sprockhoevel, and Wilhelm Flieter, Hattingen, all of Fed. Rep. of Germany, assignors to G. Diesterloh GmbH, Sprockhoevel, Fed. Rep. of Germany  
Filed Mar. 15, 1982, Ser. No. 357,877

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109706

Int. Cl.<sup>3</sup> F01B 1/06; F04B 21/02

U.S. Cl. 91—491

9 Claims



1. An adjustable, axial or radial piston type hydraulic motor having at least two cylinders and pistons cooperating with a rotary crankshaft or with a reaction guiding member, a fluid flow distributor, intake and return pressure conduits provided between the distributor and the cylinders, comprising at least one pressure-actuated control valve arranged in one of said pressure conduits, said control valve being a check valve spring-biased into its closing position by a relatively weak biasing means, said check valve being formed with a first surface portion exposed in its opening direction to pressure fluid from said cylinder, a second surface portion exposable to pressure fluid either in opening direction or in closing direction depending on the relative position of said distributor to the pressure conduit for the check valve, and a third surface portion exposable to working fluid in opening direction; said second surface portion being at least as large as said first surface portion and larger than said third surface portion, and the combined areas of said first and third surface portions being larger than the area of said second surface portion.

4,413,549

#### LIMIT SWITCH ACTUATOR FOR FLUID CYLINDERS

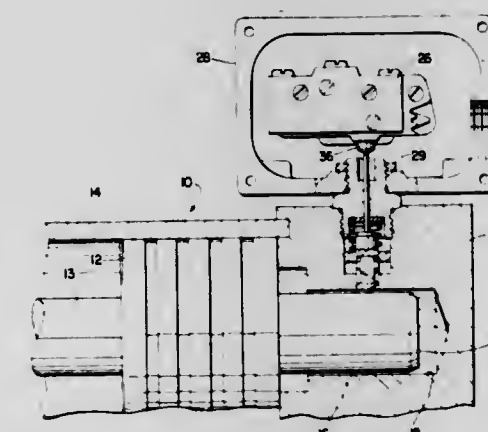
Raymond J. Knable, Elmhurst, Ill., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jun. 18, 1981, Ser. No. 274,940

Int. Cl.<sup>3</sup> F01B 31/12

U.S. Cl. 92—5 R

4 Claims



4,413,550

#### VENTILATION SYSTEM FOR THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE

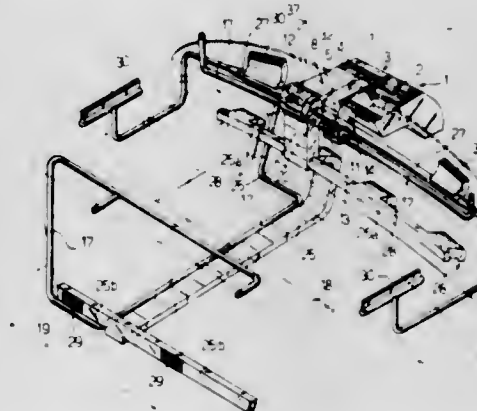
Renzo Piano, Paris, France, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 13, 1981, Ser. No. 263,066

Claims priority, application Italy, May 20, 1980, 67793 A/80  
Int. Cl.<sup>3</sup> B60H 1/24

U.S. Cl. 98—2

8 Claims



1. A ventilation system for the passenger compartment of a motor vehicle comprising:

a first conduit system in the vehicle for supplying a first series of substantially pulsating air flows into the high portion of the passenger compartment inner space where the heads of the passengers are normally situated, and means in the first conduit system which cyclically interrupts the pulsating air flows for a predetermined period of time; and

a second conduit system in the vehicle for supplying a second series of substantially continuous air flows into the low region of the passenger compartment inner space.

4,413,551

#### VENTILATOR GRILL

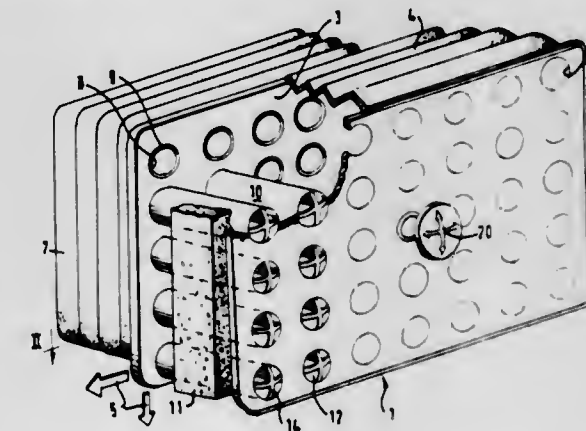
Alan S. Jackson, Benfleet, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1981, Ser. No. 317,352

Int. Cl.<sup>3</sup> F24F 13/08

U.S. Cl. 98—40 V

13 Claims



1. A ventilator grill comprising a front plate defining an array of apertures characterized by a back plate disposed in a parallel relationship with the front plate, and also defining an array of apertures, a plurality of adjacent aligned tubes, each end of which registers with a respective aperture in each of the plates to conduct air therebetween, and means for moving one of the plates relative to the other while retaining their parallel disposition, the ends of each tube being pivotable relative to the aperture with which it registers in free sliding engagement with the peripheral surface thereof.



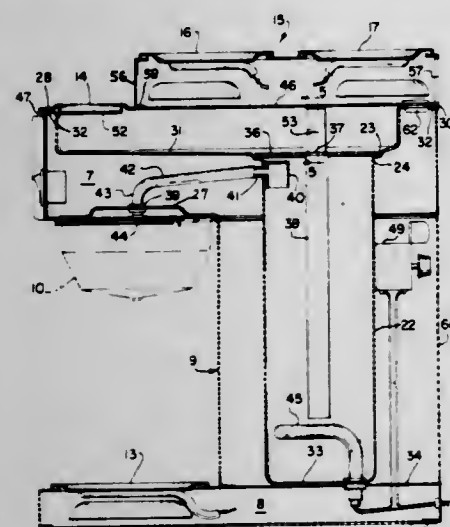
4,413,552

## COFFEE MAKING MACHINE

Donald L. Daugherty, Sherman, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.  
Filed Dec. 28, 1981, Ser. No. 334,579  
Int. Cl.<sup>3</sup> A47J 31/00

U.S. Cl. 99—295

6 Claims



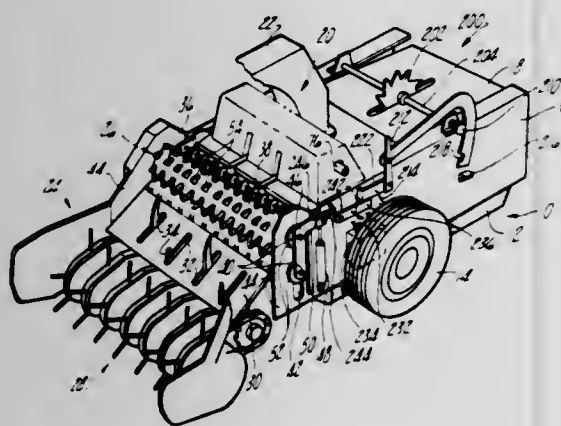
1. In a cold water, pour-in beverage brewer, comprising: a generally C-shaped body providing upper and lower leg portions interconnected by an upright leg portion; means for supporting a removable brewer funnel underneath the upper leg portion; heater means on the lower leg portion for heating and supporting a beaker under said brewer funnel; a shallow cold water basin housed within said upper leg portion; and a deep hot water tank housed mainly within said upright leg portion; the improvement wherein said cold water basin and said hot water tank are integral and constitute an inverted L-shaped receptacle, the bottom of said cold water basin having an opening that mates with the opening at the top of said hot water tank, a plate closing off said mating openings, said plate having a drain opening therein, and a cold water tube depending from the underside of said plate with the upper end thereof in communication with said drain opening.

4,413,553  
BALER

Alexander Crawford, Mississauga, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Canada  
Filed Aug. 24, 1981, Ser. No. 295,881  
Int. Cl.<sup>3</sup> B65B 13/24

U.S. Cl. 100—4

5 Claims



1. A baler comprising:  
a bale chamber having an inlet end;  
feeding means including a pair of feed rollers capable of feeding crop material into the bale chamber;  
reciprocating means including a hydraulic cylinder capable of reciprocating the pair of feed rollers between first and

second positions across the inlet end of the bale chamber; bale tying means carried by the bale chamber, the bale tying means including a knotter, a pickup needle capable of bringing twine to the knotter, and a knotter shaft interconnected with the knotter and needle;

actuating means capable of actuating the bale tying means including a bale length metering mechanism, a sprocket constantly driven by a hydraulic motor, and a single revolution clutch interconnecting the sprocket with the knotter shaft, the bale length metering mechanism being interconnected with said single revolution clutch and capable of initiating operation of the clutch to cause rotation of the knotter shaft when the proper bale length has been achieved; and

coordinating means capable of preventing operation of the clutch except when the pair of rollers have been reciprocated to said first position.

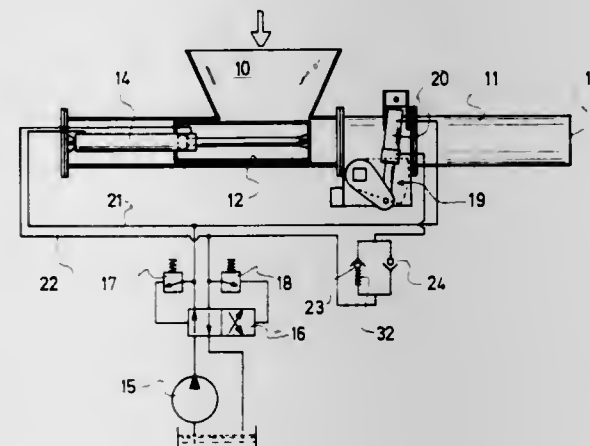
4,413,554

## REFUSE COMPACTING DEVICE

Carl-Otto Wallander, Västra Frölunda, Sweden, assignor to Hydropress Wallander & Co. AB, Mölndal, Sweden  
Filed Apr. 29, 1982, Ser. No. 373,058  
Int. Cl.<sup>3</sup> B30B 15/16

U.S. Cl. 100—43

3 Claims



1. A device for compacting refuse material and of the type comprising a piston reciprocable within a tube and being driven by a first double-acting hydraulic ram having a first end connected to a source of pressure fluid ensuring a power stroke, and a second end connected to a return flow conduit, the improvement of

at least one throttling plate member swingable about an axis located perpendicularly to said tube so as to be introduced edgewise thereinto,

a further hydraulic ram for swinging said at least one plate between a first position which leaves the cross section of said tube substantially unrestricted and a second position obtainable during a power stroke of said further ram, where said plate imparts a considerable restriction of said cross section,

said further hydraulic ram having a power stroke end and a return flow end,

a first conduit for connecting the power stroke end of said further ram with the return flow end of said first ram,

a second conduit for connecting the return flow end of said further ram with the power stroke end of said first ram, and

two oppositely directed non-return valves fitted in parallel in said first conduit.

4,413,555

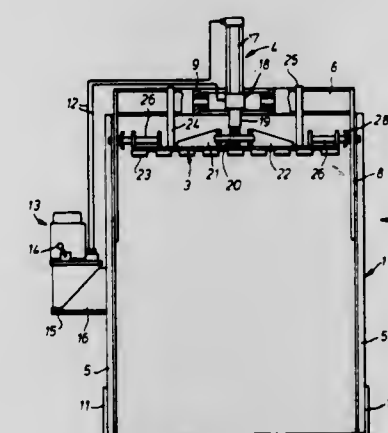
## PRESS FOR THE COMPRESSION OF LOADS

Dennis P. Swinney, Morpeth, England, assignor to Swinney Engineering Limited, Northumberland, England and Lanso Products Limited, Ramsey, Isle of Man  
Filed Jun. 18, 1981, Ser. No. 274,806  
Claims priority, application United Kingdom, Jun. 19, 1980, 8020008

Int. Cl.<sup>3</sup> B30B 15/04

U.S. Cl. 100—214

5 Claims



1. A press for the compression of a load comprising a frame (1) defining a compression area, a pressure member (3) movable relative to the load for compressing the load located within the compression area, means mounting said pressure member (3) to be able during compression to tilt about a first horizontal axis and to tilt about a second horizontal axis substantially perpendicular to said first horizontal axis so as to adopt different angular positions relative to the load whereby irregularity in the shape of the load may be accommodated, and guide means (26, 27, 28) for guiding the pressure member (3) during said movement, said guide means (26, 27) including, at each of two opposed sides of the pressure member, a projection portion (26) and a portion (27) receiving said projection portion, one of said portions being elongate and provided on the frame (1), and the other of said portions being on the pressure member (3).

4,413,556

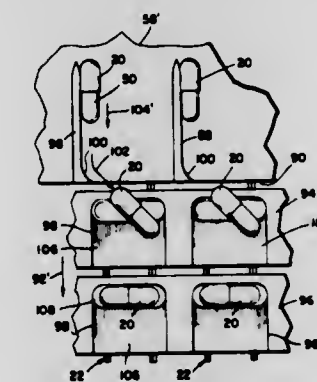
## MATERIAL ORIENTATION APPARATUS AND METHOD

Michael Ackley, 1273 N. Church St., Moorestown, N.J. 08057  
Continuation of Ser. No. 954,243, Oct. 24, 1978, Pat. No. 4,266,477. This application May 11, 1981, Ser. No. 262,612  
The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B41F 17/36; B65G 47/24

U.S. Cl. 101—40

8 Claims



1. Apparatus for transporting and orienting pharmaceutical capsules comprising:  
a rotatable drum having a plurality of spaced apart pockets each having a longitudinal portion adapted for carrying said

capsules in an orientation substantially parallel to the direction of rotation of said drum;

a back guide positioned adjacent said rotatable drum and extending over a selected arc length of said drum for retaining said capsules in said pockets and for releasing said capsules at a delivery point, said back guide having an arcuate side wall at said delivery point adapted to engage said capsules for shifting said capsules to an orientation at an angle to said direction of rotation of said drum at which said capsules are released by said back guide; and transporting means positioned at said delivery point for receiving said released capsules.

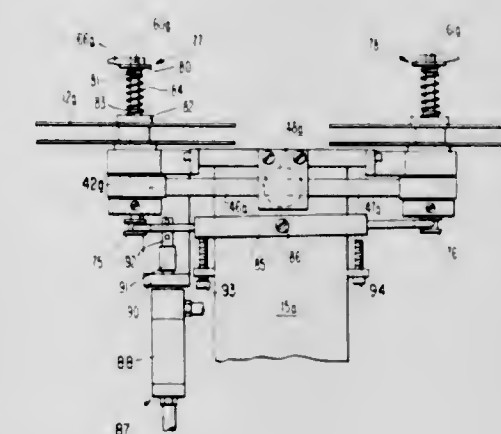
4,413,557

## RIBBON TYPE DATING EQUIPMENT

Charles E. Wade, Jr., 81 Myrtle Dr., Manahawkin, N.J. 08050, and Fred J. Rapp, 877 Main St., West Creek, N.J. 08092  
Filed Mar. 28, 1980, Ser. No. 135,210  
Int. Cl.<sup>3</sup> B41F 17/24

U.S. Cl. 101—44

10 Claims



1. In a ribbon dater:  
frame means;  
a pair of spaced apart drivers respectively rotatably mounted on said frame, each driver having an axially extending square hole, the holes being the same size;  
means for incrementally rotating said drivers by the same amount simultaneously in opposite directions;  
a pair of ribbon reels carrying a printing ribbon, each reel having an axially extending square hole of the same size as said driver holes, the reels being respectively removably disposed on said drivers with said square holes in axial alignment and the reels being adapted to be disposed on either driver;  
a pair of elongated drive shafts, each having a square portion and a stem portion, the stem portion being of smaller cross section than the square portion and the square portion being the same size as said driver holes, the shafts being respectively disposed in said aligned holes;  
positioning means operable to axially position each drive shaft to a reel-idle position or to a reel-drive position, in the reel-idle position the square portion of the drive shaft being disposed in the square hole of the driver for rotation therewith but spaced from the square hole in the reel whereby rotary motion of the driver and the drive shaft is not transmitted to the reel and in the reel-drive position the square portion of the drive shaft being disposed in the hole of the driver for rotation therewith and also disposed in the square hole of the reel whereby rotary motion of the driver and the drive shaft is transmitted to the reel;  
printing means on said frame, said ribbon extending thru said printing means and the ribbon being moved thru the printing means by rotation of a drive shaft when in said reel-drive position; and  
said positioning means providing for one drive shaft to be in the reel-drive position while the other drive shaft is in the reel-idle position for running said ribbon thru said printing means in one direction and for the reel-idle and reel-drive



positions of the respective drive shafts to be changed for re-running the ribbon thru said printing means in the reverse direction to thereby re-use the face of the ribbon effecting said printing.

4,413,558

# LINE PRINTER AND TYPE CARRIER FOR USE THEREIN

Hiroyoshi Monma; Masao Miyasaka, and Kazuyuki Kubo, all of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

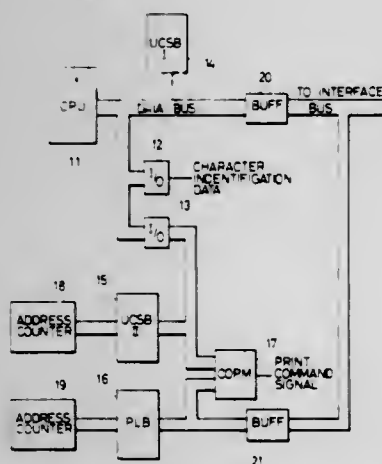
Filed Oct. 6, 1981, Ser. No. 309,134

Claims priority, application Japan, Oct. 7, 1980, 55-140833; Feb. 20, 1981, 56-24566

Int. Cl.<sup>3</sup> B41J 1/20

U.S. Cl. 101-93.14

11 Claims



1. A line printer of the type capable of using a plurality of different type carriers each having a different array of N characters, and also having a memory for storing data for use in a printing operation, said data corresponding to the particular type carrier being used, for use in a printing system wherein a computer system transfers to said line printer a first data array corresponding to one of a plurality of different type carriers having an array of M characters, where M and N are unequal positive integers, said line printer comprising:

first memory means for receiving and storing said first data array from said computer system corresponding to an M-character type carrier; and means for converting said first data array to a second data array corresponding to an N-character type carrier useable by said line printer and for storing said second data array for use in a printing operation.

4,413,559

# MULTI-SPEED DRIVE FOR SCREEN PRINTING PRESSES

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Continuation of Ser. No. 850,256, Nov. 11, 1977, abandoned.

This application Jul. 30, 1982, Ser. No. 403,856

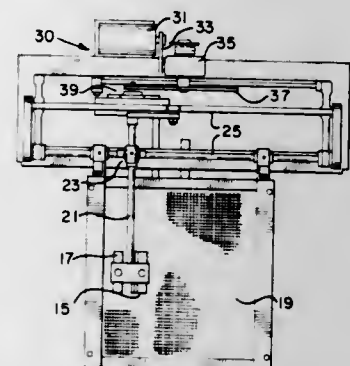
Int. Cl.<sup>3</sup> B41F 15/14, 15/44

U.S. Cl. 101-123

9 Claims

1. A screen printing press including a screen, an assembly arm positioned for reciprocating lateral movement above said screen during a print mode and a flood mode, a squeegee and a flood bar mounted adjacent one another on said assembly arm, said flood bar being functionally operative to provide a flood stroke during the flood mode as it is moved by said assembly arm in a lateral first direction across said screen and being functionally inoperative as it is moved in the opposite lateral direction across said screen, said squeegee being functionally operative to provide a print stroke during the print mode as it is moved in the opposite direction and being functionally inoperative as it is moved in the first direction, an electrically powered drive means including a direct current motor for driving said assembly arm, and said squeegee and

flood bar, cam means driven by said electrically powered drive means having characteristics associated with the flood stroke and printing stroke, limit switch means operable by said cam means with movement of said assembly arm at the end of its travel in each of the first and opposite directions to cause a change in motor speed, first electrical current control means selectively associated with said limit switch means and said



direct current motor for controlling the speed of said drive means during the flood stroke, and second electrical current control means selectively associated with said limit switch means and said direct current motor for controlling the speed of said drive means during the print stroke independently of the control provided by said first electrical current control means.

4,413,560

# FLEXOGRAPHIC PRINTING PRESS

Dieter Rogge, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

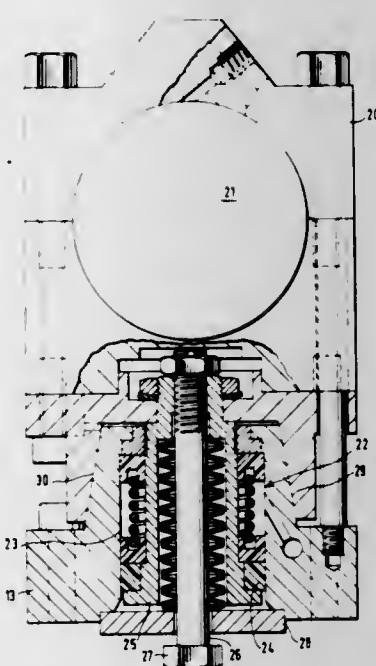
Filed Oct. 10, 1980, Ser. No. 195,762

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941521

Int. Cl.<sup>3</sup> B41F 13/24, 31/00

U.S. Cl. 101-247

2 Claims



1. In a flexographic printing press including an impression cylinder carrying a gear, a plate cylinder having a shaft carrying a gear, bearing means for supporting said plate cylinder shaft, a bearing block for supporting said bearing means for radial movement towards and away from said impression cylinder, an ink roller for applying ink to said plate cylinder and carrying a gear, an ink roller block for supporting said ink roller for radial movement towards and away from said impression cylinder, and means for moving said bearing block and said ink roller block into limit positions in dependence on the diameter of the plate cylinder so as to position the plate

cylinder and the ink roller in limit positions for performing a printing operation, the gears of said impression cylinder, said plate cylinder, and said ink roller being in full meshing engagement with each other during the printing operation, the improvement comprising:

means for moving said plate cylinder tangentially to said impression cylinder between the printing position and an inoperative position, said moving means acting on said bearing means so as to move said bearing means with respect to said bearing block; and

means for limiting the amount of movement of said bearing means by said moving means so that the gear carried by said plate cylinder shaft is in partial meshing engagement with the gear carried by said impression cylinder and the gear carried by said ink roller when said plate cylinder is in the inoperative position;

said gear of said plate cylinder being releasably securable on its shaft in a normal functioning position and being axially movable on said plate cylinder shaft so that when said plate cylinder is in its inoperative position said plate cylinder gear is movable from a position spaced from its normal functioning position into its normal functioning position in which the plate cylinder gear is in partial meshing engagement with the impression cylinder gear and the ink roller gear, said plate cylinder gear being movable into full meshing engagement by movement of said bearing means by side moving means to move the plate cylinder into the printing position.

4,413,561

# INK FOUNTAIN DEVICES FOR PRINTING PRESS

Hideaki Toyoda, Tokyo, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

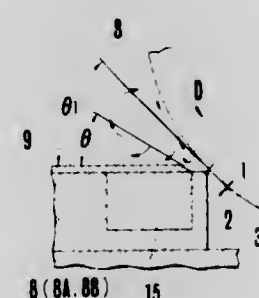
Filed Mar. 2, 1982, Ser. No. 353,985

Claims priority, application Japan, Mar. 10, 1981, 56-34302

Int. Cl.<sup>3</sup> B41F 31/04, 31/06

U.S. Cl. 101-365

2 Claims



1. An ink fountain device for a printing press comprising: an ink fountain roller; an ink fountain frame inclined toward said ink fountain roller; a plurality of divided blade sections juxtaposed on said ink fountain frame, with their adjacent sides in close contact; a covering plate covering entire surfaces of said divided blade sections, said covering plate being made of magnetic material and being removably mounted on said divided blade sections; a plurality of permanent magnets embedded in said divided blade sections for attracting said covering plate to said divided blade sections; an inner end of said covering plate being spaced a predetermined distance from a periphery of said ink fountain roller and slanted downwardly; and an angle between the slanted surface and upper surfaces of said covering plate being smaller than an angle between a tangent passing through a point on the periphery of said ink fountain roller confronting inner ends of said divided blade sections and the upper surfaces thereof.

# CHAIN-TYPE TRANSPORT APPARATUS, FOR USE WITH PRINTING MACHINES

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

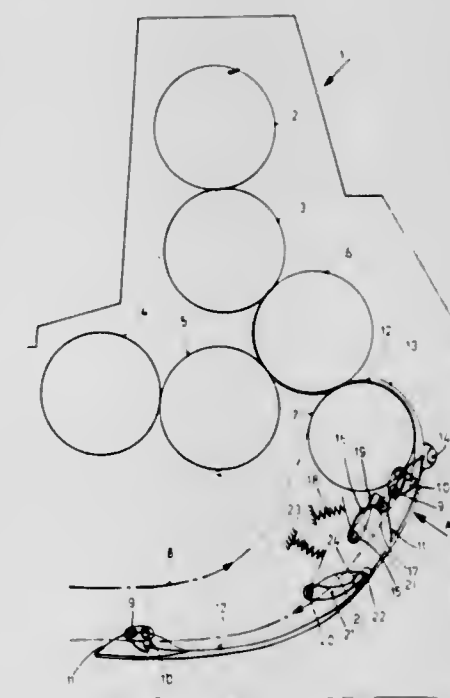
Filed Mar. 22, 1982, Ser. No. 360,066

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114581

Int. Cl.<sup>3</sup> B41F 1/30; B65H 29/04

U.S. Cl. 101-408

10 Claims



1. Sheet transport apparatus for a sheet-fed rotary printing machine having a drum, or cylinder (7) from which a sheet (12) is to be transported, and defining a sheet delivery zone (A) adjacent thereto;

two endless transport chains (8) located at axial ends of the drum or cylinder; cross struts (9) connecting the chains, located at spaced intervals thereon;

sheet grippers (10) located on the cross strut to grip the leading edge of the sheet (12) to be transported; and comprising in accordance with the invention means to prevent creasing, rolling-over or other uncontrolled movement of the trailing end of the sheet being transported comprising

movable sheet guide elements (19, 22, 30, 34) located at least in said sheet delivery zone (A) and extending at least in part transversely to the movement of the sheet as it is being transported;

and movement control means (11, 16, 17; 25, 26, 27, 28) connected to and controlling movement of said movable sheet guide elements, in synchronism with rotation of the drum, or cylinder (7) between an inoperative position when the grippers (10) on the chain pass beneath said sheet guide elements and an operative position thereafter in which said sheet guide elements move to operative engagement with the portion of the sheet behind the leading end thereof gripped by said grippers, to control the position of said portion of the sheet on the chain conveyor.



4,413,563

## ELECTRONIC FUSE FOR PROJECTILES

Roger Beuchat, Gland, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

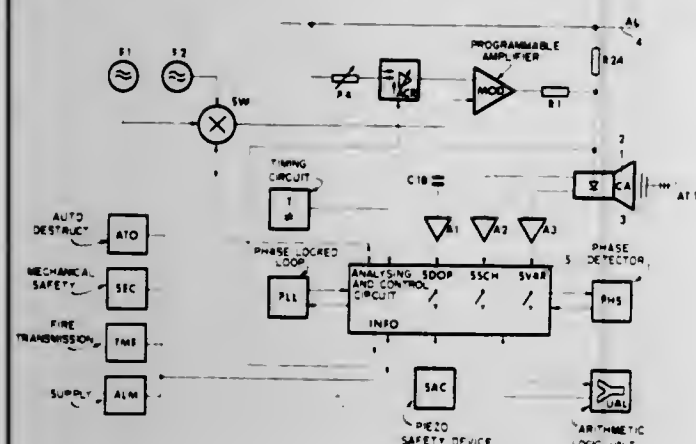
Filed May 27, 1981, Ser. No. 267,551

Claims priority, application Switzerland, Jun. 2, 1980, 4253/80

Int. Cl.<sup>3</sup> F42C 13/04

U.S. Cl. 102—214

5 Claims



1. An electronic fuse for a projectile, having an emitter for producing a radar signal which is emitted in the form of a beam directed towards the front of the projectile on which the fuse is mounted, comprising: means for detecting a Doppler effect upon the radar signal; means for modulating the emitter of the radar signal by at least one frequency different from that of the emitted signal; means for sending at least one modulating pulse, which means for sending are rendered active by the appearance of the Doppler effect; means for analysing the modulated signal; firing means which are rendered active when the analysis of the modulated signal complies with predetermined conditions.

4,413,564

## SLUG FOR A SHOTGUN SHELL

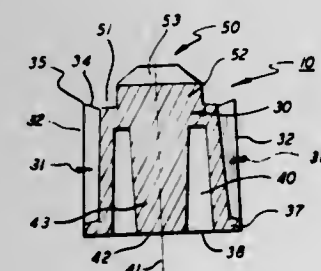
Worthy H. Brown, R.D. 7, Box 60, Fulton, N.Y. 13069

Filed May 1, 1981, Ser. No. 259,591

Int. Cl.<sup>3</sup> F42B 13/24

U.S. Cl. 102—501

4 Claims



1. A slug cast from a single piece of metal for use in a smooth bore shotgun, said slug comprising a truncated conical body having a flat circular front face and a parallel disposed flat rear face, the diameter of the front face being slightly less than the diameter of the rear face, a series of circumferentially spaced, straight, fluted, rectangular shaped vanes projecting outwardly from the side wall of the body with the vanes being separated by channels, each vane extending obliquely between the front face and the rear face of the body with the top surfaces of the vanes describing a truncated cone, the pitch of the truncated cone of the vanes being steeper than the pitch of the truncated cone of said truncated conical body whereby the height of the vanes decreases from the front face to the rear face of the slug, said vanes move in interfering contact against the bore of the shotgun to impart a rotational motion to the slug as it moves therethrough, each vane further having a front tip that extends outwardly from the front face of said body and which terminates in a chisel point edge, a blunt nose projecting forwardly from the front face of said body a greater distance than the chisel point edges on said vanes whereby the nose strikes a target before said chisel point edges, an annular ring at the rear face of the body that has an outer diameter substantially equal to the outside diameter of the cylinder described by the vanes whereby the ring closes each channel between the vanes, and said body containing a blind hole passing inwardly from the rear face to a depth that is greater than one-half the axial length of the body whereby the slug has a nose heavy configuration.

tional motion to the slug as it moves therethrough, each vane further having a front tip that extends outwardly from the front face of said body and which terminates in a chisel point edge, a blunt nose projecting forwardly from the front face of said body a greater distance than the chisel point edges on said vanes whereby the nose strikes a target before said chisel point edges, an annular ring at the rear face of the body that has an outer diameter substantially equal to the outside diameter of the cylinder described by the vanes whereby the ring closes each channel between the vanes, and said body containing a blind hole passing inwardly from the rear face to a depth that is greater than one-half the axial length of the body whereby the slug has a nose heavy configuration.

4,413,565

## PROJECTILE WITH A TUBULAR-SHAPED PROJECTILE BODY

Philippe Matthey, Arogno, Switzerland; Robert Salmon, St. Genis, France, and Niklaus Bühlmann, Thalwil, Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

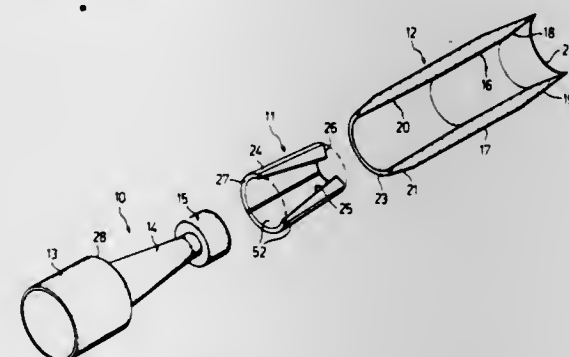
Filed Apr. 29, 1982, Ser. No. 373,122

Claims priority, application Switzerland, May 21, 1981, 3307/81

Int. Cl.<sup>3</sup> F42B 13/16, 11/00

U.S. Cl. 102—503

12 Claims



1. A projectile comprising: a substantially tubular-shaped projectile body; said tubular-shaped projectile body having a rear end provided at an inner surface thereof with a substantially conical-shaped rearwardly widening inner wall defining a conical-shaped portion of the projectile body; a sabot base portion positioned to cooperate with the rear end of said projectile body; said projectile body bearing upon said sabot base portion during firing of said projectile; said sabot base portion detaching from the projectile body upon exit of the projectile out of a firing weapon; said sabot base portion containing a rearwardly widening substantially conical-shaped portion which extends into the rear end of said conical-shaped portion of the projectile body; a substantially ring-shaped wedge member formed of at least two wedge parts arranged between said conical-shaped rearwardly widening inner wall of the projectile body and said rearwardly widening conical-shaped portion of the sabot base portion; and said at least two-part ring-shaped wedge member being of conical configuration at an outer surface and at an inner surface thereof.

4,413,566

## NON-ABLATIVE PROJECTILE HEAT SENSITIVE NOSE

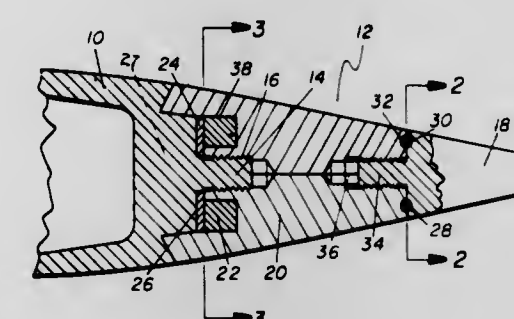
Alfred A. Loeb, Dover, and Robert G. Salamon, Boonton, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1981, Ser. No. 288,827

Int. Cl.<sup>3</sup> F42B 9/20, 11/00

U.S. Cl. 102—517

5 Claims



1. A heat sensitive nose cap assembly for limiting the range of a fin-stabilized, hypervelocity, anti-armor training projectile which has passed a target which comprises:

a projectile body having a centrally positioned boss located on a front end and an axially aligned screw member integrally connected to said boss; first thermal conductive means releaseably connected to said screw member of said projectile for maintaining an ogive geometry for said projectile during flight toward said target and for transferring aerodynamically generated heat which includes: a pair of rear ogive members, having a centrally disposed forward threaded cavity therein, a centrally disposed rear threaded cavity, a semi-annular shaped groove operatively disposed in a front end of said rear ogive members, and a rear locking ring groove positioned in an aft end of said rear ogive members; a second thermal conductive means fixedly connected to said first thermal conductive means for preventing premature break-up of said projectile which includes: a conically shaped forward ogive member threadably attached to said rear ogive members, said forward ogive member having a semi-annular shaped groove operatively disposed opposite to the semi-annular grooves of said rear ogive members; a forward locking ring positioned in said semi-annular grooves of said rear and forward ogive members; and a threaded axially aligned rear end for fixedly engaging the centrally disposed forward threaded cavity of said rear ogive members, said forward ogive preventing the premature opening of said pair of rear ogive members during projectile setback; a zinc alloy locking ring internally positioned in said projectile and operatively disposed in said rear locking ring groove under compressive radial stress approximately equal to the yield stress of said zinc alloy locking ring, for releaseably holding said first thermal conductive means attached to said projectile body for a specified period of time after launch of said projectile, said first thermal conductive means heating said zinc alloy locking ring and thereby changing the yield strength of said locking ring in response to the aerothermodynamic heating of said rear and forward ogive members, and breaking in response to the centrifugal forces generated by said fin stabilized projectile; and an insulator means, operatively disposed intermediate said projectile boss and said zinc alloy locking ring for thermally isolating said zinc alloy locking ring from said projectile boss.

4,413,567

## FIN-STABILIZED MORTAR GRENADE

Amos Frostig, Haifa, Israel, assignor to Etablissement Salgad, Vaduz, Liechtenstein

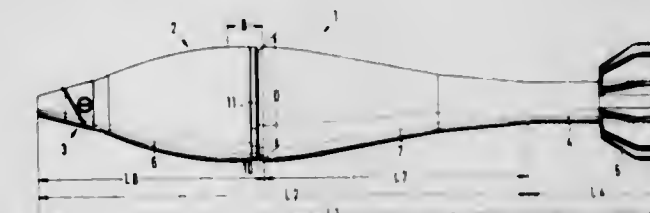
Filed Sep. 8, 1980, Ser. No. 185,041

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936408

Int. Cl.<sup>3</sup> F42B 31/00

U.S. Cl. 102—525

5 Claims



1. A fin-stabilized mortar grenade comprising: (a) an ogival body and a tail section having fin controlling surfaces, (b) said body including a caliber diameter zone having at least one annular groove located therein, (c) a spreadable sealing ring disposed within said annular groove, (d) said sealing ring having an outside surface facing outwardly from said body, an inside surface facing the bottom of the annular groove and an edge bevel side surface extending outwardly a predetermined depth from said inside facing surface and disposed on the side of the sealing ring between the outside and inside surfaces and facing the rear of the shell body, (e) said sealing ring includes a separation plane passing obliquely therethrough, (f) said separation plane being at an angle of about 3° to 6° with respect to a principal plane of the ring which is perpendicular to the longitudinal axis of the ring, (g) the sealing ring includes a further edge bevel side surface located between the outside and inside surfaces at the side thereof facing toward the forward portion of said shell body, and (h) the inside surface of the ring and the bottom of the annular groove are both cylindrical, (i) said sealing ring includes cross slots peripherally spaced along the inner side of the sealing ring, (j) said cross slots having a depth corresponding to the extent of the ring thickness equal to the predetermined depth of said edge bevel surfaces, and (k) said cross slots being effective to facilitate flow of propellant gases from the rear facing side to the forward facing side of the body portion.

4,413,568

## METHOD OF AUTOMATICALLY OPERATING A SEMI-CONTINUOUS PASSENGER TRANSPORT SYSTEM USING PASSIVE VEHICLES, AND MEANS FOR IMPLEMENTING SAME

Jean Huon de Kermadec, Versailles, France, assignor to Soule Fer et Froid S.A., Bagnères de Bigorre, France

PCT No. PCT/FR80/00052, § 371 Date Nov. 26, 1980, § 102(e) Date Nov. 26, 1980, PCT Pub. No. WO80/02128, PCT Pub. Date Oct. 16, 1980

PCT Filed Apr. 3, 1980, Ser. No. 224,560

Claims priority, application France, Apr. 4, 1979, 79 08510

Int. Cl.<sup>3</sup> B61B 13/12

U.S. Cl. 104—20

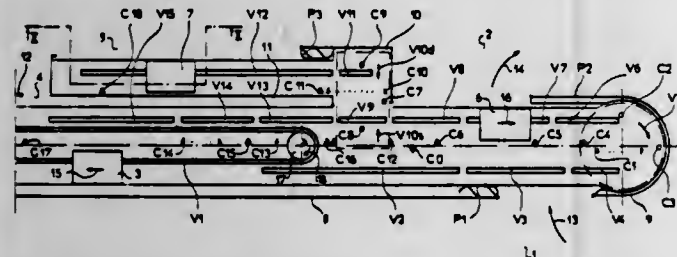
22 Claims

1. An automatic method of operating a semi-continuous passenger transport system having successive movable tracks for driving non-motorized vehicles along a closed path between at least two stations, said tracks including cruising speed tracks located between said stations, slow speed tracks at embarkation and disembarkation platforms located at each of said



stations, and transition tracks for accelerating and decelerating said vehicles at the ends of said platforms; said transport system further including structural means for limiting access of passengers to one of said vehicles located at one of said stations, said method comprising the steps of:

- (1) detecting the presence of an object by actuation of said structural means, the presence of said object being defined as a fault condition;



- (2) signaling said fault condition;
- (3) stopping the track on which said one vehicle in said station is situated and stopping all other tracks in said station without stopping said cruising speed tracks; and
- (4) cancelling steps (2) and (3) after said fault condition has been removed to progressively return said system to normal operation.

4,413,569

## STEERING RAILROAD TRUCK

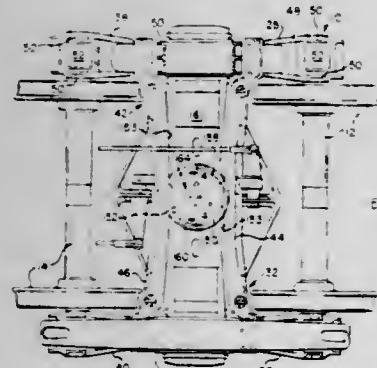
Harry W. Mulcahy, Griffith, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation of Ser. No. 53,934, Jul. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 903,952, May 8, 1978, abandoned. This application May 7, 1981, Ser. No. 261,421

Int. Cl.<sup>3</sup> B61B 5/38, 5/44; B61H 13/00

U.S. Cl. 105-168

7 Claims



1. A railroad car truck for carrying a body of a railroad car, said truck assembled from a pair of spaced side frames, a bolster transversely positioned between said side frames with end portions of said bolster resiliently carried in windows centrally located in said side frames respectively, a pair of steering arms located on each side of said bolster and between said side frames, each said steering arm having side portions positioned within pedestal jaws formed at ends of said side frames, said steering arms joined at a point proximate a center of said bolster to in part regulate movement of said arms by a connection including a bracket formed on each said steering arm and positioned in a side by side relationship with multi-directional pivot means interconnected therewith, and a pair of wheelsets each having axle ends journaled in bearings located within said steering arm side portions to form a respective unit comprising said wheelset and said steering arm, an improvement in said truck comprising,

an adapter carried one each on an upper portion of each said bearing and having a frustum-like shaped boss formed on an upper side of said adapter,

an outwardly extending part forming part of said steering arm side portion, said extending part having a horizontal member with a reverse frustum-like shaped recess on a bottom side of said horizontal member to receive said

adapter boss and form a compressive joint therebetween, and a recessed receiving area in a top side of said horizontal member,

an elastomeric device having a lower portion disposed with a snug fit in said horizontal member receiving area, and a recessed covering area formed in a roof of said side frame pedestal jaw for disposition with a snug fit of an upper portion of said elastomeric device, said elastomeric device spacing said steering arm-wheelset unit from said side frame to allow movement therebetween,

wherein steering forces generated between said wheelsets and trackage over which said truck may travel result in movement of each said steering arm-wheelset unit, said movements being regulated by said elastomeric device and said connection between said steering arms.

4,413,570

## TABLE EASILY ASSEMBLED FROM STANDARDIZED PARTS AND CORNER CLAMPING ASSEMBLY USABLE THEREWITH

Paul Haigh, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,206

Int. Cl.<sup>3</sup> A47B 3/06

U.S. Cl. 108-153

20 Claims



1. An assembly for clamping a plurality of members securely together at a common corner, including an inner bracket having a plurality of arms each adapted to underlie an end portion of a respective member, means including first holding elements engaging respective arms for holding said members securely to said inner bracket, and an outer bracket adapted to fit over facing end surfaces of said members while being held securely thereover by a second holding element extending from said inner bracket generally in a direction centrally through the intersection of the longitudinal axes of said arms.

4,413,571

## SOLID FUEL HOT WATER HEATER

Richard C. Hill, and Mark R. Daniele, both of Orono, Me., assignors to The Board of Trustees of the University of Maine, Bangor, Me.

Filed Jun. 29, 1981, Ser. No. 278,355

Int. Cl.<sup>3</sup> F23G 5/00; F22B 5/02

U.S. Cl. 110-234

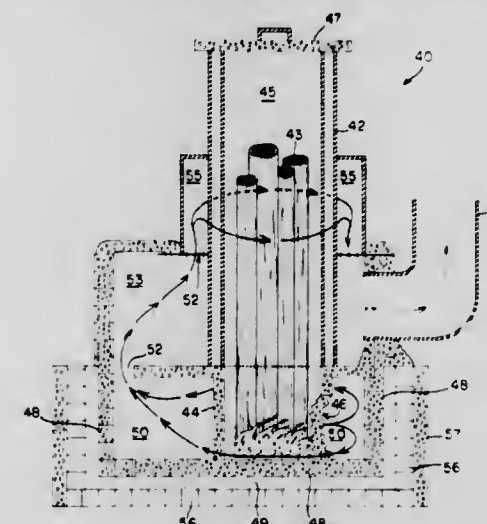
20 Claims

1. A solid fuel hot water heater comprising:

primary combustion chamber means comprising a refractory material base portion including walls and a draft outlet, said base portion forming the locus of solid fuel combustion, said refractory material base portion comprising a "U" shaped or arcuate wall portion open on one side for drafting flue gases away from the locus of combustion, and water jacket means defining an upright portion over the refractory material base portion for receiving a charge of solid fuel in a generally vertical stack, said water jacket means including coupling means for coupling to a source

of water for at least convection circulation for confining the locus of solid fuel combustion to the base portion of the combustion chamber means;

flue gas delay channel means coupled with the combustion chamber base portion draft outlet, said delay channel means defining pathways around the outer periphery of the walls of the refractory material base portion, said delay channel means defined by refractory material and providing delayed propagation in a high temperature environment sufficient to afford substantially complete secondary burning of the gaseous products of combustion;



heat exchange channel means defining pathways around the outer periphery of the water jacket means in heat exchange relationship with said water jacket means for transfer of heat from the end products of combustion to the circulating water, said heat exchange channel means coupled to said flue gas delay channel means;

means for coupling a draft through the combustion chamber means, delay channel means and heat exchange means including draft outlet means from said heat exchange channel means;

and means for admitting combustion air into said combustion chamber means.

4,413,572

## ADJUSTABLE SUPPORT ASSEMBLY FOR OPEN HEARTH FURNACE

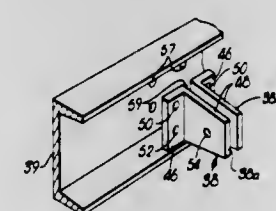
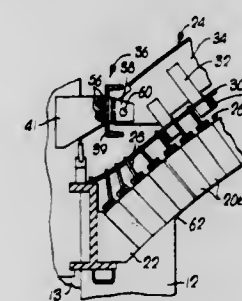
John J. Musser, Kansas City, Mo., assignor to George P. Reintjes Company, Inc., Kansas City, Mo.

Filed Mar. 7, 1983, Ser. No. 472,729

Int. Cl.<sup>3</sup> F23M 5/06

U.S. Cl. 110-331

3 Claims



1. In combination with a furnace chamber having spaced sidewalls, a roof for said chamber comprising:

a plurality of refractory blocks, each block having a lower-

most, chamber directed face and a longitudinal length generally perpendicular to said face, said faces collectively comprising an arcuate top wall to said chamber and defining an arch that intersects said sidewalls at a boundary line;

a plurality of spaced beams arranged in pairs, each pair spanning between said sidewalls and each beam adapted at its outer end for pivotal coupling to one of said sidewalls, the inner ends of each pair of beams being pivotally interconnected;

support means of a given length depending from said beams and being operably coupled to said blocks for supporting said blocks;

a plurality of reversible brackets pivotally mounting said outer ends of said beams to respective sidewalls of said furnace, each bracket including

a sidewall-connecting portion having first and second, spaced apart, sidewall connection points defining a vertically oriented line and a centerpoint therebetween, an arch-supporting portion having a beam connection point,

means for connecting said sidewall connection points to one of said sidewalls at first and second sidewall junction points and means for pivotally connecting the outer end of one of said beams to said beam connection point,

said beam connection point being vertically offset from said centerpoint, whereby said beam connection point is oriented in a first position when said first sidewall connection point is aligned with said first junction point and said second sidewall connection point is aligned with said second junction point, and said beam connection point is oriented in a second position vertically offset from said first position when said first connection point is aligned with said second junction point and said second connection point is aligned with said first junction point, thereby shifting the elevation of said outer end of said one of said beams to accommodate installation of said refractory blocks having varied longitudinal lengths without shifting the vertical orientation of said boundary line.

4,413,573

## PROCESS FOR COMBUSTING CARBONACEOUS SOLIDS CONTAINING NITROGEN

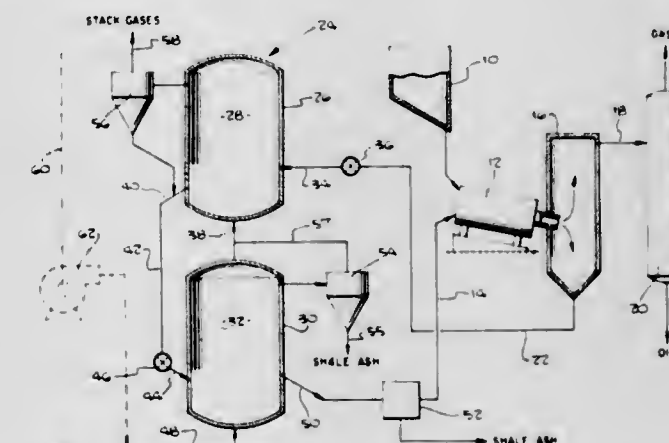
Robert N. Hall, Boulder; Franklin B. Carlson, Broomfield, both of Colo., and William J. Thomson, Moscow, Id., assignors to Tosco Corporation, Los Angeles, Calif.

Filed Jun. 21, 1982, Ser. No. 390,756

Int. Cl.<sup>3</sup> F23D 1/00

U.S. Cl. 110-347

23 Claims



1. A process for staged combustion of solids containing combustible carbonaceous material and nitrogen comprising the steps of:

passing said solids to a first combustion zone;

adding sufficient oxygen containing gas to said solids in said first combustion zone to partially combust said carbonaceous



ceous material to produce partially combusted solids and flue gas;  
 separating said partially combusted solids from said flue gas;  
 passing said partially combusted solids to a second combustion zone;  
 adding sufficient oxygen containing gas to said partially combusted solids in said second combustion zone to combust substantially all of said carbonaceous material to produce combusted solids and flue gas containing oxygen and nitrogen oxides;  
 separating said combusted solids from said flue gas;  
 passing said second combustion zone flue gas to said first combustion zone to provide said oxygen containing gas to said first combustion zone, wherein the carbonaceous material in said first combustion zone is partially combusted and the amount of nitrogen oxides in said flue gas is reduced by the interaction of the nitrogen oxides with said solids in said first combustion zone.

4,413,574

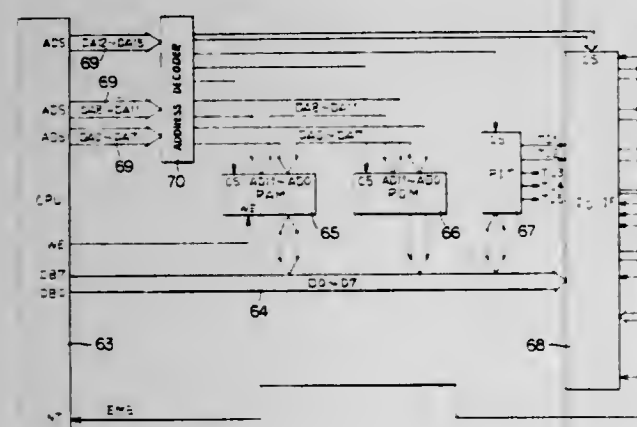
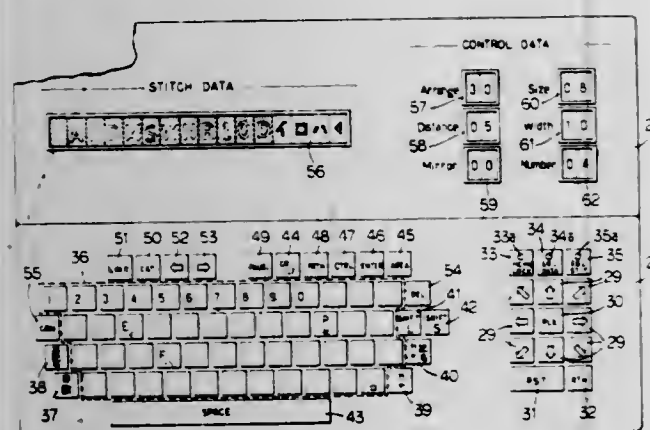
## STITCH PATTERN SEWING MACHINE

Kunio Hirota, and Masao Shimomura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan  
 Filed Feb. 24, 1981, Ser. No. 237,421  
 Claims priority, application Japan, Mar. 5, 1980, 55-28394;  
 Mar. 19, 1980, 55-37269

Int. Cl.<sup>3</sup> D05B 21/00

U.S. Cl. 112-121.12

14 Claims



1. An automatic sewing machine comprising:  
 means for forming stitches on a workpiece, including a reciprocating needle and a looper cooperating with said needle;  
 a workholder for holding said workpiece during sewing operation;  
 drive means connected to at least one of said workholder and said stitch forming means, and operative to vary the relative position between said workholder and said needle;  
 first memory means for storing plural blocks of unit pattern information each of which corresponds to respective predetermined plural unit stitch patterns, each of said plural blocks of unit pattern information consisting of a

plurality of position data related to the relative position between said workholder and said needle;  
 first manually operable means for generating selection commands to select at least two desired blocks of unit pattern information from said first memory means;  
 second memory means for storing said selection commands generated by said first manually operable means in the order of the selection operation conducted through said first manually operable means;  
 second manually operable means to generate a command signal representative of the size of each of the individual unit stitch patterns selected by said selection commands; and  
 control means for modifying the position data of the selected unit pattern information according to the command signal generated by said second manually operable means and supplying the modified position data to said drive means in timed relation with the reciprocation of said needle.

4,413,575

## DEVICE FOR TRIMMING AN EDGE OF A TUBULAR TEXTILE ARTICLE

Vinicio Gazzarrini, Florence, Italy, assignor to Solis S.r.l., Florence, Italy

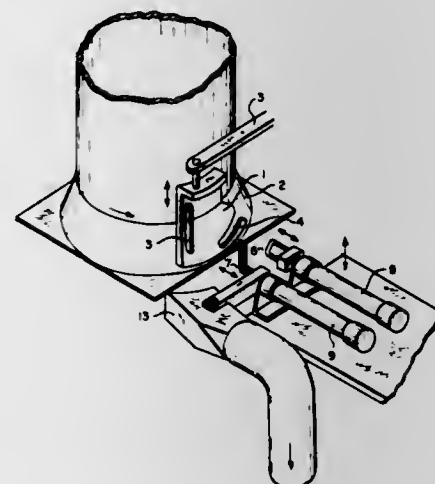
Filed Dec. 22, 1980, Ser. No. 218,911

Claims priority, application Italy, Dec. 24, 1979, 9634 A/79

Int. Cl.<sup>3</sup> D05B 21/00; B26D 7/10

U.S. Cl. 112-129

17 Claims



1. Device for trimming the unsewn edge of a tubular article, such as a pantyhose, prior to the sewing of a gusset thereon, comprising  
 an article support having a truncated cone shape for stretching the unsewn edge of the article, said support being rotatable in a horizontal direction;  
 a mask in the form of a shell concentric to a portion of said support fastened independently of said support but spaced a short distance therefrom for underlying the article when the article is in a position stretched over said support and for holding raised a piece of fabric which is to be trimmed from said annular support during the horizontal rotation of said support, said support having a first slot and a second slot;  
 two electric resistances, each separately introducible into said first and said second slots, one of said resistances cooperating with said first slot to achieve with the simultaneous horizontal rotation of said support the circumferential trimming of the fabric stretched thereon, and said other resistance cooperating with said second slot to achieve with said support in its stationary condition an opening in ribbon form of the annular piece of fabric detached by the aforesaid trimming; and  
 a suction mouth for the removal of the piece of fabric formed into a ribbon.

4,413,576

## BUTTONHOLE DEVICE FOR A ZIG-ZAG SEWING MACHINE

Kazufumi Taguchi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

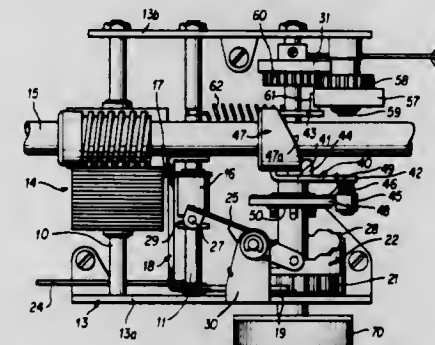
Filed Apr. 1, 1981, Ser. No. 250,080

Claims priority, application Japan, Apr. 3, 1980, 55-43741

Int. Cl.<sup>3</sup> D05B 3/06

U.S. Cl. 112-158 B

7 Claims



1. A buttonhole device for a zig-zag sewing machine comprising:  
 a main shaft;  
 a rotary shaft operatively associated with said main shaft;  
 means operatively connected to said rotary shaft for controlling lateral needle oscillation, needle position or base line and work feeding so as to produce various stitch patterns, and which is positionable at a plurality of positions wherein said plurality of positions further comprise a first position, a second position, a third position and a fourth position respectively corresponding to a first bar tack, a first side stitch, a second bar tack, and a second side stitch of a buttonhole, a disc cam having formed thereon at a peripheral portion thereof a first and second recessed portion and which is fixedly mounted on said rotary shaft, a single ratchet wheel rotatably mounted on the rotary shaft adjacent said disc cam and having a plurality of teeth formed thereon, a pawl means reciprocally moved by said main shaft for advancing said ratchet wheel by engaging one of said plurality of teeth of said ratchet wheel to thereby automatically rotate said rotary shaft from said first position to said second position, and for engaging with said second recessed portion of said disc cam to thereby automatically rotate said rotary shaft from said third position to said fourth position, and control means mounted on said rotary shaft for preventing said pawl from engaging with said plurality of teeth of said ratchet wheel while said rotary shaft is positioned at said third position subsequent to being manually rotated from said second position.

4,413,577

## PATTERN FEED BALANCING ARRANGEMENT IN AN ELECTRONICALLY CONTROLLED SEWING MACHINE

Phillip F. Minalga, Piscataway, and John W. Wurst, Chester Township, Somerset County, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Nov. 8, 1982, Ser. No. 439,695

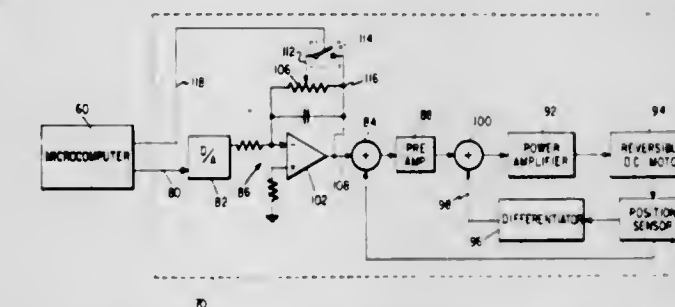
Int. Cl.<sup>3</sup> D05B 3/02

U.S. Cl. 112-158 E

5 Claims

1. In an electronically controlled sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, said stitch forming instrumentalities including a feed regulating mechanism positionable for two directions of feed; means for storing pattern stitch feed and bight information; means operating in timed relation with said sewing machine for extracting said pattern stitch information from said storing means; separate feed and bight actuating means responsive to said extracted pattern stitch information for influencing the feed and bight motions, respectively, of said stitch forming instrumentalities to produce a pattern of stitches

corresponding to said extracted pattern stitch information; and an operator actuatable and influenceable feed override means for selectively attenuating the response of said feed actuating means to the extracted feed information;  
 an arrangement for utilizing said feed override means to effect a feed balancing function for a pattern having both directions of feed comprising:



means responsive to operator actuation of said feed override means for operating on the extracted feed information for only one of said feed directions to increase the feed motion for said one feed direction; and  
 means responsive to operator actuation of said feed override means for making effective operator influence of said feed override means for only said one feed direction.

4,413,578

## CAMMING ARRANGEMENT FOR THREAD HANDLING DEVICE

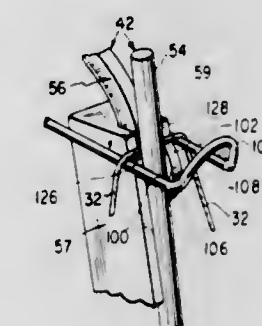
Donald Rodda, Butler, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 24, 1982, Ser. No. 422,770

Int. Cl.<sup>3</sup> D05B 49/00

U.S. Cl. 112-254

7 Claims



1. In a sewing machine wherein a sewing needle and looper cooperate in the formation of lockstitches in a fabric, the combination comprising: a thread source; thread tensioning means to which thread extends from the thread source; a thread handling device into which thread extends from the tensioning device and beyond which the thread extends to the needle, the thread handling device including an elongate rigid member and a fiber supporting strip from which resilient fibers project outwardly toward said rigid member to contact the thread in the thread handling member; a takeup for setting stitches and pulling thread through the tensioning device from the supply, the takeup being movable upwardly with thread to a stitch setting position at one end of its operating range whereat the thread is disposed for temporary retention by said thread handling device, and movable downwardly free of the thread to the other end of said operating range to enable thread to move in the thread handling device away from the temporary retention position to a position of reengagement with the takeup at said other end of its operating range and during such movement shorten the path for thread between the tensioning device and needle to supply a quantity of thread for use by the needle and looper; and a pair of cams in the thread path which bracket the thread handling device and have edges engageable outwardly from the fibrous strip with downwardly moving thread, one of the cams being contoured to cause the



thread to move downwardly thereon in advance of the other and to prevent the downwardly moving thread from becoming slack.

4,413,579

## BOBBIN CASE RETAINING MEANS

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

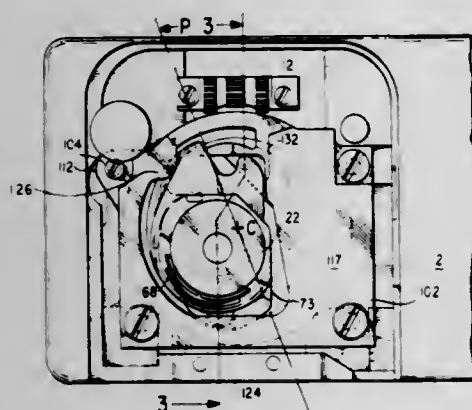
Filed Jun. 19, 1981, Ser. No. 275,168

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> D05B 57/14, 57/26

U.S. Cl. 112—184

5 Claims



1. A sewing machine having a work supporting bed, a loop taker arranged for rotation about a vertical axis, said loop taker having a rim including a thread seizing beak formed therein, a bobbin case within said loop taker, a bracket removably attached to said bed and with said loop taker providing the sole support for constraining said bobbin case rotationally, radially, and vertically said bracket loosely connect to said bobbin case to permit the passage of thread between said bobbin case and said bracket during the formation of lockstitches, said bobbin case being vertically supported only at a first location on said bracket and at a second location on said rim of said loop taker, said second location having less than 180° of angular displacement, said bracket being of unitary integral construction having a vertical wall adjacent said first location on said bracket for loosely abutting said bobbin case, said bracket overlaying a portion of said bobbin case in third and fourth spaced apart locations, said second, third, and fourth locations being positioned on one side of a plane containing said vertical axis of said loop taker and said first location being positioned on the other side of said plane whereby said bobbin case is retained in operational engagement with said rim and removal of said bobbin case is prevented without removal of said bracket:

4,413,580

## METHOD FOR FORMING FABRIC TUBES

James D. Moyer, and Robert S. Hoffert, both of Winchester, Va., assignors to Midwestco, Inc., Niles, Ill.

Division of Ser. No. 86,141, Oct. 18, 1979. This application May 29, 1981, Ser. No. 268,634

Int. Cl.<sup>3</sup> D05B 97/00

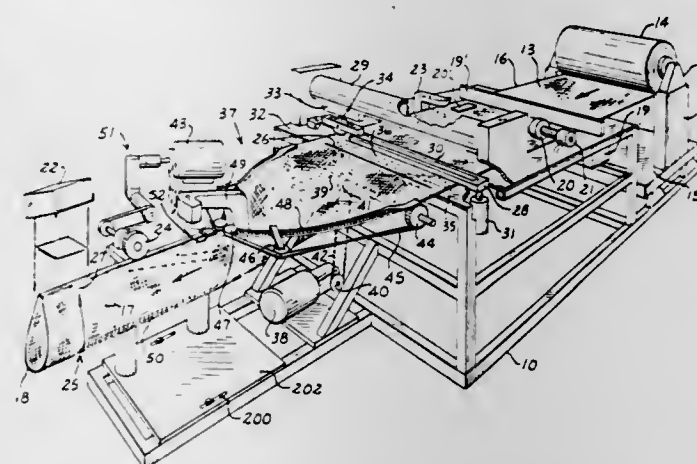
U.S. Cl. 112—262.2

12 Claims

1. A method of forming a tubular fabric bag with ends square to the length of the bag comprising:  
feeding a flat sheet of fabric material along a predetermined path of travel;  
stopping the feeding of said sheet and cutting said sheet across a substantial portion of its width along a line that is spaced inwardly of each edge of the sheet;  
resuming feeding of the sheet along said path, then folding the edges of the sheet into a seam with the cut line precisely aligned on opposite sides of the seam so that the bag after its seam is sewn can be separated by snipping through the seam as well as any uncut material adjacent

the seam to provide a bag with precisely square ends, and sewing the seam.

7. A method of automatically forming a fabric filter bag tube comprising:  
feeding a flat sheet of fabric material along a predetermined path;



frictionally gripping the sheet adjacent each side edge; bringing said edges together while the sheet is moving; overlapping said edges; and stitching through said overlapped edges to form a sewn seam.

4,413,581

## OPTICAL SWITCHING ARRANGEMENT FOR A SEWING MACHINE

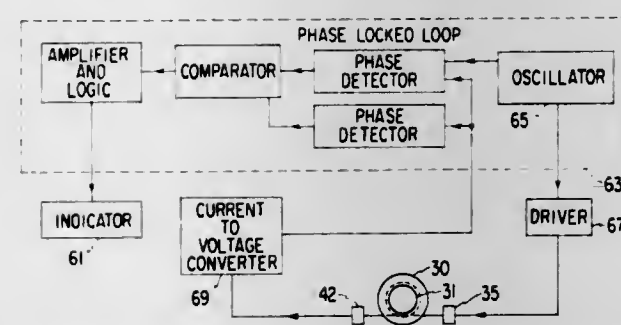
William W. Logan, Glen Ridge, N.J., assignor to The Singer Co., Stamford, Conn.

Continuation-in-part of Ser. No. 364,129, Mar. 31, 1982, abandoned. This application Apr. 7, 1983, Ser. No. 482,743

Int. Cl.<sup>3</sup> B65H 63/02; D05B 51/00, 3/06

U.S. Cl. 112—278

10 Claims



1. A sewing machine having a frame including a bed, said bed having a cavity for receiving a loop taker, a loop taker rotatably supported in said cavity, a bobbin case supported in said loop taker against rotation therewith, said bobbin case freely supporting a lower thread carrying bobbin therein, and means for sensing the thread carrying condition of said bobbin, said sensing means including a light source and a light detector, wherein the improvement comprises:

means for providing a modulation signal;  
means utilizing said modulation signal for driving said light source; and  
means utilizing said modulation signal for examining the output of said light detector.

4,413,582

## WORKPIECE FEEDING DEVICE FOR A SEWING MACHINE

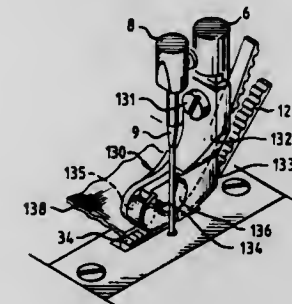
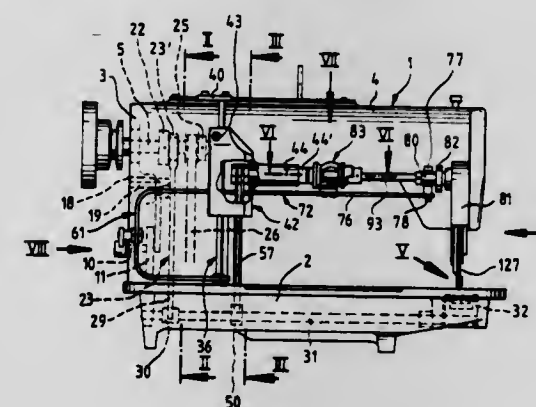
Günter Landwehr, and Horst Thiele, both of Bielefeld, Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Division of Ser. No. 77,143, Sep. 19, 1979, Pat. No. 4,271,776. This application Oct. 1, 1980, Ser. No. 192,912

Int. Cl.<sup>3</sup> D05B 27/06

U.S. Cl. 112—311

2 Claims



1. In a sewing machine having a workpiece supporting base plate, a standard and an overhanging arm carrying a presser bar, a movable needle and a longitudinally extending arm shaft for driving said needle, a workpiece feeding device having a mechanism synchronously driven relative to said needle and including an adjustable eccentric, means for adjusting said eccentric, a rock shaft pivoted in said base plate, a crank fastened to said rock shaft and a pitman, the upper end of which cooperating with said eccentric and the lower end of said pitman linked to said crank; a lower feeding means including a lower feeding element arranged to engage in a steady contact the lower surface of a workpiece, means for driving said lower feeding element comprising an intermediate shaft journaled in said base plate, means drivingly connecting said rock shaft with said intermediate shaft including at least one one-way coupling, an output shaft journaled in said base plate and drivingly connected to said upper feeding element, and a lower device having a clutch coupling and a reversing gear alternately connecting said intermediate shaft with said output shaft, and control means including a feed reversing regulator and connecting elements shiftably connecting said feed reversing regulator with said clutch coupling and said reversing gear; and an upper feeding means including an upper feeding element arranged to cooperate with said lower feeding element in the area of said needle in a steady contact with the upper surface of said workpiece, a bracket secured to said presser bar carrying said upper feeding element, and means for driving said upper feeding element comprising a housing clamped to a vertical bar fastened to said standard, a first shaft pivoted in said housing, coupling means including at least one one-way coupling arranged on said first shaft, a driving connection between said rock shaft and said coupling means, a second shaft pivoted on said overhanging arm and drivingly connected to said upper feeding element, and a device having said clutch coupling and said reversing gear alternately connecting said first shaft with said second shaft by means of shifting

4,413,583

## PLASTIC LIFEBOATS

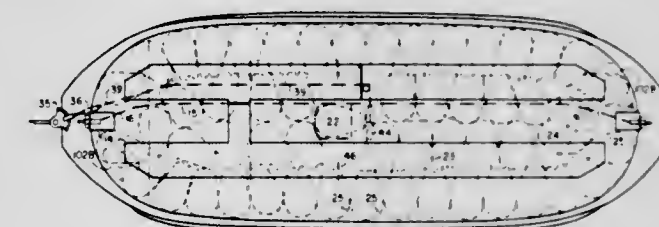
William E. Elling, Metuchen, N.J., and by Hanny M. Elling, executrix, St. Louis, Mo., assignors to Hanny M. Elling, St. Louis, Mo.

Filed Dec. 18, 1979, Ser. No. 104,798

Int. Cl.<sup>3</sup> B63B 43/02; B63C 9/02

U.S. Cl. 114—350

10 Claims



1. A fiberglass-reinforced plastic (F-RP) lifeboat with a totally rigid and watertight cover, without thwarts or other athwartship bracing above the floor level, except a single thwart towards amidship adjacent to each end-hoisting bulkhead at seat level, with a longitudinally level seat along each gunwale and with a level, continuous double width, longitudinal center seat, being slightly raised above the side seats, thus creating an aisle on each side allowing free walking without hindrance for the entire inside length; and said watertight cover being made in five sections; (a) one symmetrical and slightly cambered center section; (b) two symmetrical side sections; (c) two symmetrical end hoods, each with a hook well; and zigzag formed flanges between the sections remaining perforce flush one to the other on the underside, acting as cover stiffeners and offering a firm handhold for gunwale and deck walkers; and a triple flanged joint between gunwale top, inner hull flange and said symmetrical side section for the watertight connection of the rigid cover to the basic lifeboat hull; and part of said triple flanged joint being the gunwale top connection between outer hull and inner hull at top, forming a gutter-like depression for its entire length, with an overboard drain at midship on each side; and a hook release swing area with a watertight hinged observation window in said hook well; a small service hatch in each end hood or starboard aft and on port side forward, the end hoods therefore remaining alike and symmetrical; one elongated, transport observation dome at midship center on cover top, fitted with two hand wipers being operated from the inside; on each side of center line top a sprinkler water pipe with cocks at the pilot seat; right and left slanted cover stanchions, under the longitudinal zigzag stiffener on each side; pre-installed davit cable gripefitting anchor bolt nuts on the underside of the inner hull flange for later insertion of fitting; a vertical and level rudder installation to suit quadrant gear tiller pinion shaft, pointing to port side, away from the hoist hook and passing through a watertight bushing in said cover-end hood with a cable drum at its end leading over fairlead sheaves to a cable drum at the lower end of a vertical steering column being a sleeve on stanchion under the roof which has the pilot's steering stick at its upper end; a support girder under the inner hull strength floor stringer, being substantially connected by bolted structure and by steel clips, welded to a back bone bilge pipe, and resting on the plastic keel; universal ball joints, intraconnected within a tubular rod for the simultaneous release of hoist hooks at each end of the lifeboat; each joint comprising a metal sphere or ball, with two cross center holes to suit three pins, the ball diameter to suit the inside diameter of the tubular rod without tolerance; the rod ends resembling ears with pin holes in their center; a bow pull propeller, having a horizontal shaft, three blades with disk stumps held loosely in a three piece hub shell; and the disk of each said blade resting on one of the hexagon sides of a center piece, said center piece having been bored to suit the



shaft and two threaded rings holding the three-piece threaded shell together; a deflated rubber side tube stowed under a protective, portable rigid cover on each side of the boat, ready to be inflated at a moment's notice by pulling a dowel release cable and by opening a pressure air valve, both from the pilot station, resulting in the automatic abandonment of said protective covers by having same pushed out of the way when the air pressure is filling the tubes; a heavy steel flywheel, comprising two rings, one on top of the other, with a base plate between the rings, a vertical shaft extending from a keel pipe to the center seat above, with a hub and two levels of drive pins, said pins being engaged by the teeth of two saber blades on each level, said blades reciprocating back and forth, activated by sixteen pull lines from seated occupants; said saber blades being interconnected within two endless cable rings; said top ring on the base plate having on its periphery an endless tooth rack for pinion power take-offs; engaging and disengaging of such power take-offs being controlled by the pilot and including the following pinion drives: diesel engine starting, centrifugal water pump, light bulbs, air pump, radio receiving, radio transmitting, power take-off drives through worm gears for the pull propeller and the pressure water pump from the vertical shaft of the flywheel; furthermore, on the end of said vertical shaft, a hand safety crank for quick emergency use and a hand brake to stop the wheel; tubes installed for passing air or wires through side air tank spaces to be foam-filled later; in addition to a regular lap seat belt, two sandal foot straps on the floor and two hand hold straps on a seat stringer.

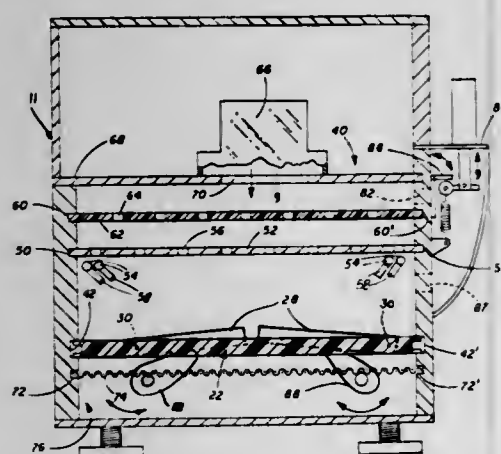
4,413,584

**BIOLOGICAL SLIDE STAINING APPARATUS**

Joseph P. DiMaggio, Jr., Bergenfield; Henry Eng, Clifton; Donald A. Ball, Warren, and Kenneth J. Walenciak, Wayne, all of N.J., assignors to A.J.P. Scientific, Inc., Clifton, N.J. Continuation-in-part of Ser. No. 897,884, Apr. 19, 1978, Pat. No. 4,274,359. This application Jan. 2, 1981, Ser. No. 269,079 Int. Cl.<sup>3</sup> B05C 11/12, 13/02

U.S. Cl. 118—56

9 Claims



1. In an apparatus for staining biological slides comprising, a support housing, a slide conveyor assembly mounted within said support housing, a slide tray for holding a plurality of slides removably insertable into said support housing, a stain dispensing assembly disposed within said housing with a plurality of dispensers located to be above said slide support tray when said slide support tray is fully inserted into said support housing, and a stain removal assembly located within said support housing and adjacent said dispensers, said stain removal assembly including a fluid drain component and a fluid evaporation component; the improvement wherein said slide support tray consists essentially of: at least two slide shelves mounted along parallel, laterally opposed pivot axes enabling said slide shelves to rotate

away from each other in the same plane, said pivot axes so positioned when said slide support tray is fully inserted in said support housing that said slide shelves are adapted to cooperate with said stain removal assembly to tilt upward in a plane transverse to the plane in which said slide support tray resides within said support housing.

4,413,585

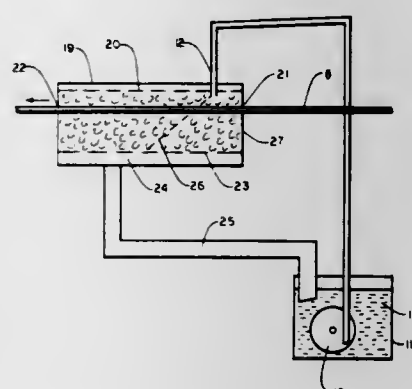
**PROCESS AND ARRANGEMENT FOR APPLYING AND DRYING LIQUID LUBRICANT**

Harri Weinhold, Kreischa; Heinz-Rüdiger Vogel; Bernhard Kurze, both of Dresden; Joachim Schlegel, Freiberg; Dieter Rauschenbach, Dresden; Roland Hering; Peter Werner, both of Mittweida, and Heinz Wunsch, Lauenhain, all of German Democratic Rep., assignors to Veb Schwermaschinenbau Kombinat "Ernst Thälmann" Magdeburg, Magdeburg, German Democratic Rep.

Filed Jul. 17, 1980, Ser. No. 169,931  
Int. Cl.<sup>3</sup> B05C 3/12

U.S. Cl. 118—61

12 Claims



1. An arrangement for applying and drying a liquid lubricant on a metallic material to be mechanically worked, particularly a lubricant including an organic solvent and a solid or semi-solid lubricating substance, the arrangement comprising a closed coating container arranged to accommodate a lubricant, said coating container forming a part of a closed lubricant circuit and having inlet and outlet openings so that a metallic material passes through said coating container via said openings and the lubricant coats the metallic material whereupon the latter exits from the coating container through one of said openings, said coating container having a sieve located in the interior of the same and a granular material arranged above said sieve and in the region of said inlet and outlet openings, so that a lubricant collecting zone is formed below said sieve, and coating container also having a lubricant supply opening which opens into said granular material above said sieve, and a lubricant discharge opening which leads from said lubricant collecting zone below said sieve; means for removing the superfluous portion of lubricant which exits via said one opening without contacting the superfluous portion of lubricant with outside air; a drying channel located downstream of said removing means and said coating container and arranged to pass the lubricant coated metallic material therethrough; means for urging air through the interior of said drying channel and connected with the latter; and means for disturbing the air in said drying channel.

4. An arrangement as defined in claim 1; and further comprising solvent recuperating means connected with said drying channel.

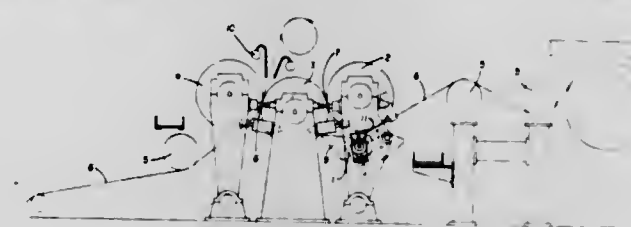
4,413,586

**SIZE PRESS**

Albert Wöhrle, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Volth GmbH, Heidenheim, Fed. Rep. of Germany  
Filed May 20, 1982, Ser. No. 380,246  
Int. Cl.<sup>3</sup> B05C 1/08, 3/12

U.S. Cl. 118—206

5 Claims



1. A size press for depositing a bath of size on a moving paper web, comprising: a first roller being rotatably mounted therein, a trough member adapted to contain a first sump of liquid and having at least a portion of said first roller disposed therein, a second roller being rotatably mounted therein and arranged substantially parallel to said first roller, said first and second rollers being spaced apart to form there between a first gap, said first roller being adapted to apply a predetermined amount of liquid to one side of the paper web at said first gap, a third roller being rotatably mounted therein and arranged substantially parallel to said second roller, said second and third rollers being slightly spaced apart to form there between a second gap at a first predetermined distance from said first gap to allow liquid applied to the one side of the paper web to penetrate therein, said second roller and said third roller being adapted to squeeze excess liquid from the paper web at said second gap, and a fourth roller being rotatably mounted therein and arranged substantially parallel to said first, second and third rollers, said fourth roller being adjacent to and spaced from said third roller to form a third gap therebetween at a second predetermined distance from said second gap to allow the paper web to reach a state of high absorbability, said fourth roller being further arranged relative to said third roller to provide a space adapted for receiving a second sump of a second liquid between respective outer surfaces of said third and fourth rollers, whereby the opposite side of the paper web has the second liquid applied thereto and the excess liquid squeezed therefrom when moved through said third gap, said first gap and said third gap being adapted to continuously support therebetween the paper web.

4,413,587

**CAN OR TUBE ADHESIVE APPLICATOR**

Ronald Cook, Marquand, Mo., assignor to Tools & Machinery Builders, Inc., Arcadia, Mo.

Filed Sep. 14, 1981, Ser. No. 302,067  
Int. Cl.<sup>3</sup> B05C 1/02, 7/06

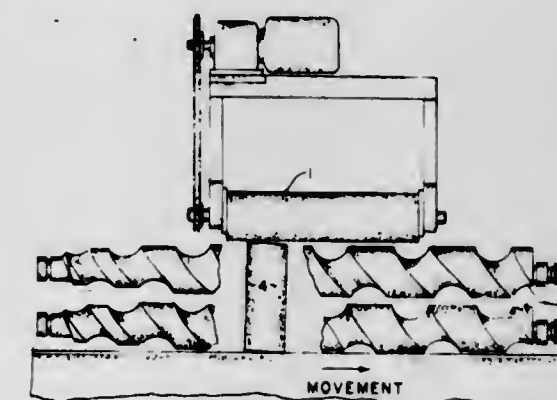
U.S. Cl. 118—210

6 Claims

1. An apparatus for applying substantially uniform amounts of adhesive or sealant material to container members, said apparatus comprising: (i) container means; (ii) means communicating with said container means to apply a controlled quantity of adhesive from said container means to an adhesive applicator; (iii) means to position and rotate said adhesive applicator; (iv) two (2) spiral timing screws, one mounted above the other in a generally parallel orientation and each having a spiral groove sufficient to grip a container member; (v) said spiral timing screws being adjustably positioned to both accept container members at regular intervals and to move said containers past and the top of said container members in contact with said adhesive applicator in order

to apply one or more beads of adhesive to said container member;

- (vi) means connected to said timing screws to control the rate of rotation thereof, means to adjust to a desired differential the number of degrees of relative rotation of one timing screw to the other for a given rate of rotation, so that said container member being advanced into the grooves of said timing screws may be tilted through a range of angles by said timing screws;



- (vii) positioning means to position the center line of said container member relative to the center line of the adhesive applicator as said container member is advanced past said adhesive applicator; and (viii) means spaced from said timing screws and below the adhesive applicator to receive the container member therebetween and to rotate said container member while said container member is being advanced by said timing screws past the adhesive applicator.

4,413,588

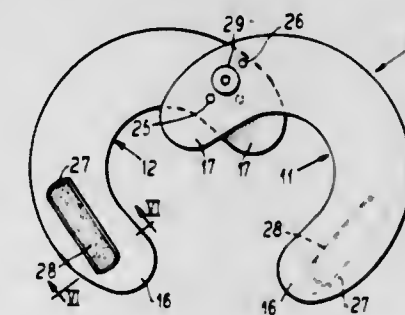
**ANIMAL RESTRAINT COLLAR**

Donald W. Lindholm, 15368 Betty Ann Ln., Oak Forest, Ill. 60452

Filed Jun. 17, 1982, Ser. No. 389,382  
Int. Cl.<sup>3</sup> A01K 15/04, 27/00

U.S. Cl. 119—106

12 Claims



1. An annular radial animal restraint collar adjustable to snugly fit a wide size range of animal necks to be held on the neck between the animal's head and shoulders and project radially for restraining the animal against digging under or squeezing through fences which comprises a pair of rigid flat U-shaped mats each having a bight portion and a pair of legs extending from the bight portion having curved outer peripheries, one leg of each mat having a plurality of holes spaced along the length thereof, the other leg of each mat having a strip of fibers secured thereon with the fibers of the strips interlocking when the strips are pressed together, the legs containing the holes being overlapped with a selected hole of one leg aligned with a selected hole of the other leg, a removable pivot pin seated in the aligned holes accommodating swinging of the mats from a closed position with fiber strips overlapped in selected positions to an open position with the strip carrying legs spaced apart opening a gap facilitating easy application and removal of the collar from the animal's neck,



the selected alignment of the holes, and the selected overlapping of the fiber strips varying the closed size of the collar without projecting the curved outer peripheries of the legs substantially beyond the outer peripheries of the bight portions.

4,413,589

## COLLAPSIBLE ANIMAL LEASH

Theodore J. Bielen, Jr., and Denise M. Bielen, both of 1024 Amato Ave., Berkeley, Calif. 94705

Filed Apr. 30, 1982, Ser. No. 373,358

Int. Cl.<sup>3</sup> A01K 27/00

U.S. Cl. 119—109

6 Claims



1. A collapsible animal leash for attachment to an animal collar comprising:

- a. an endless loop member;
- b. means for releasibly holding a majority portion of the endless loop member to itself and fully collapsing said majority portion of said endless loop member, said fully collapsed majority portion of said endless loop member being free of exposed loops;
- c. handle means formed from a majority portion of the endless loop member not capable of being held to itself by said means for releasibly holding a portion of said endless loop member;
- d. means for connecting said endless loop member to the animal collar; said handle means being capable of serving as a proximal portion of said endless loop member in relation to the animal collar when said endless loop member is in a collapsed configuration, said handle means further being capable of serving as the distal portion of said endless loop member in relation to the animal collar when said endless loop member is in an uncollapsed configuration without disconnection of said endless loop member from the animal collar.

4,413,590

## BOILER FOR A HEATING SYSTEM

Andre Landreau, Fontenay-le-Comte, France, assignor to Jean Mingret, Bressuire, France

Filed Nov. 21, 1980, Ser. No. 209,062

Claims priority, application France, Nov. 23, 1980, 79 28884

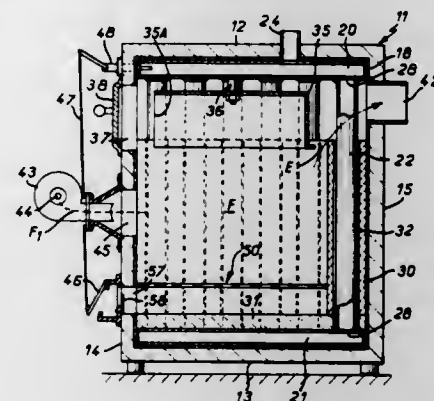
Int. Cl.<sup>3</sup> F22B 5/02

U.S. Cl. 122—18

14 Claims

1. A selectively solid or liquid fuel boiler for a central heating system, said boiler comprising a combustion chamber, means for selectively supplying liquid or solid fuel and combustion supporting gas to said combustion chamber, a heat exchanger for connection to a heating fluid circuit, said heat exchanger including upper and lower headers and a plurality of straight, parallel spaced-apart tubular elements interconnecting said headers for the flow of heating fluid therebetween, said tubular elements being disposed along the back and lateral

sides of said combustion chamber, said tubular elements being embedded in refractory material along the major part of their length from their lower ends upward, said refractory material being positioned for direct contact with a burning solid fuel for maximum solid fuel efficiency, interstitial spaces being formed



between said tubular elements and the surrounding refractory material to permit uninhibited expansion of said tubular elements with exposed upper parts of said tubular elements being positioned for direct contact with flue gases produced in said combustion chamber for maximum heat transfer efficiency with a liquid fuel.

4,413,591

## SUPERHEATER HANGER DESIGN

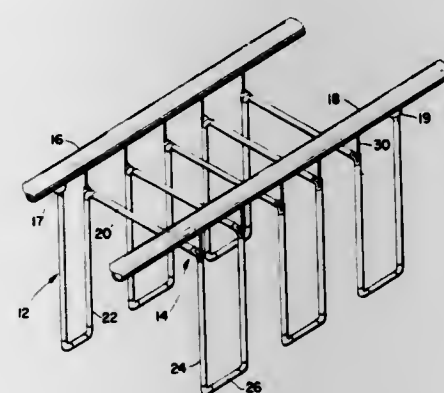
Gary E. McCordle, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Feb. 26, 1982, Ser. No. 352,705

Int. Cl.<sup>3</sup> F22B 15/00, 25/00, 37/10

U.S. Cl. 122—235 R

4 Claims



1. In a boiler having disposed therewithin a superheater unit which comprises a spaced succession of upright U-shaped piping elements in the longitudinal direction and a spaced succession of inverted U-shaped piping elements in the transverse direction, each of said inverted elements comprising a straight horizontal crossover piping length between vertical portions of a pair of said upright elements and all said inverted and upright elements being connected to provide flow connection from an inlet to an outlet, an improved support means for suspending said superheater unit from support surfaces disposed outside of said boiler and for preventing said piping elements from exceeding their bending moment and becoming distorted because of thermal expansion and contraction caused by thermal changes taking place in said boiler during superheating of a fluid passing through said superheater unit from said inlet to said outlet, said support means comprising:

- a. a plurality of lower pivot means, one said pivot means being attached to each end of each said crossover piping length;
- B. a plurality of slide brackets, each said slide bracket being attached to said support surfaces and in approximately vertical alignment with one said lower support means; and
- C. a plurality of hanger rods, each being pivotally mounted

on one said lower pivot means at its lower end and being pivotally and slideably attached within one said slide bracket at its upper end,

whereby said hanger rods are spaced along two spaced-apart rows and said superheater unit is provided with completely balanced and independent support at a plurality of points which are in both longitudinal and transverse arrays.

4,413,592

## WATER DAMAGE PREVENTER PAN

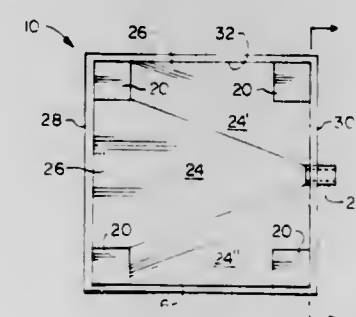
George D. Jones, 4926 Harford Rd., Baltimore, Md. 21214

Filed Sep. 29, 1982, Ser. No. 428,134

Int. Cl.<sup>3</sup> F22B 37/24

U.S. Cl. 122—510

8 Claims



1. In a system of a pan with bottom, a rim and a drain for catching spillage from an appliance and draining same away, the improvement comprising: said bottom sloping to said drain from all points, and a plurality of blocks around the perimeter of the pan within said rim, said plurality of blocks having co-planar tops.

4,413,593

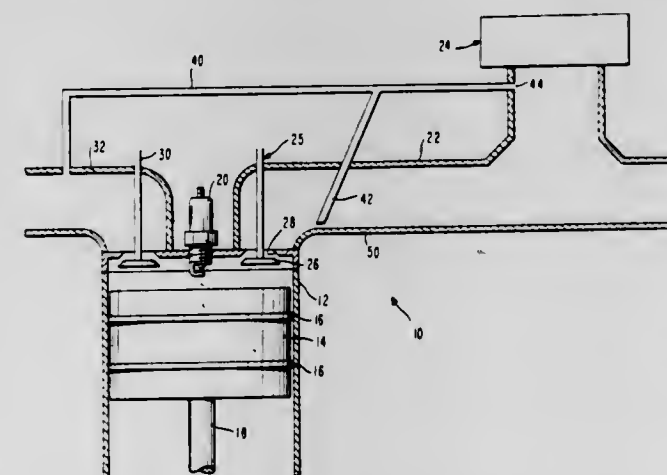
COMBUSTION CONTROL BY PRESTRATIFICATION  
Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc.

Continuation-in-part of Ser. No. 163,898, Jun. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 140,932, Apr. 16, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,237

Int. Cl.<sup>3</sup> F02B 17/00; F02M 25/06; F02B 27/08

U.S. Cl. 123—1 A

14 Claims



14. A prestratified charge for a working cylinder of a turbo-charged internal combustion engine operating on the Otto cycle, said charge enabling the engine to operate with a fuel having a permissible compression ratio less than the compression ratio of the engine, the charge comprising:

- a first substantially undiluted portion having a pressure  $P_0$  at a given power level of the engine,
- a second diluted portion differing in composition from said first portion by the addition of a diluent gas supplied to increase the manifold pressure to  $P_0^*$ , said second portion forming a region of diluent charge to produce a prestratification of the charge, the pressure of said diluted portion

being increased by the addition of diluent gas by the ratio  $P_0^*/P_0$  defined as

$$\frac{P_0^*}{P_0} = \frac{\eta_{PCR}}{\eta^*(A/F)_{PCR}}$$

$$\left[ \frac{CR^*(q/C_v T_0)}{(PCR) \frac{q}{C_v T_0} \frac{(A/F+1)_{PCR}}{(A/F+1)_{PCR}} + (PCR)\gamma - (CR)\gamma} - 1 \right]$$

where  $CR^*$  is the prestratification controlled compression ratio for the fuel,  $\eta_{PCR}$  is the engine efficiency without prestratification;  $PCR$  is the permissible compression ratio without prestratification,  $A/F$  the air fuel ratio without prestratification,  $C_v$  the heat capacity of the combustion mixture at constant volume;  $q$  the heating value of the fuel;  $T_0$  the cylinder inlet or manifold temperature;  $\eta^*$  is the engine efficiency with prestratification; and  $\gamma$  is the ratio of specific heat at constant pressure to the specific heat at constant volume, and wherein the ratio  $P_0^*/P_0$  is caused to be substantially larger than 1.1, whereby the engine will operate on said charge without knock.

4,413,594

## METHOD AND APPARATUS FOR STARTING AN ALCOHOL ENGINE

Toshio Hirota, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

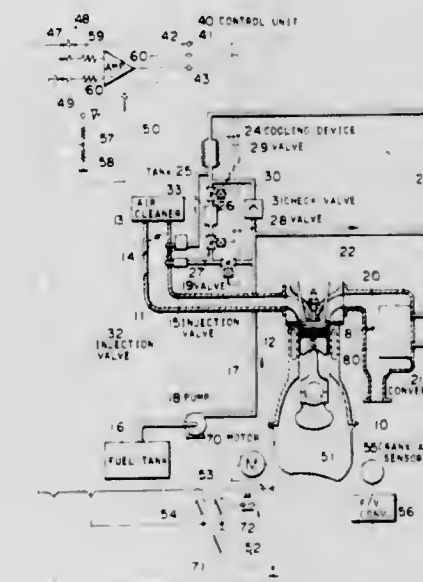
Filed Jan. 18, 1982, Ser. No. 340,276

Claims priority, application Japan, Mar. 19, 1981, 56-38734

Int. Cl.<sup>3</sup> F02B 43/08; F02M 13/06

U.S. Cl. 123—3

15 Claims



1. An apparatus for starting an alcohol engine equipped with a starting motor, comprising:

- (a) a converter supplied with alcohol for converting it into a high-temperature gaseous mixture containing a relatively highly volatile substance;
- (b) a cooling device connected to the converter for receiving the high-temperature gaseous mixture and cooling it to produce a liquid condensate including the relatively highly volatile substance;
- (c) a passageway connecting the cooling device to the engine for supplying the liquid condensate to the engine as fuel;
- (d) a valve disposed in the passageway for selectively interrupting and effecting the supply of the liquid condensate to the engine;
- (e) means for sensing whether the starting motor is in operation or at rest; and
- (f) means responsive to the sensed conditions of the starting



motor for opening the valve to effect the supply of the liquid condensate to the engine when the starting motor is in operation and closing the valve to interrupt the supply of the liquid condensate to the engine when the starting motor is at rest.

4,413,595

# **DIESEL LOCOMOTIVE FUEL SAVINGS AND PROTECTION SYSTEM**

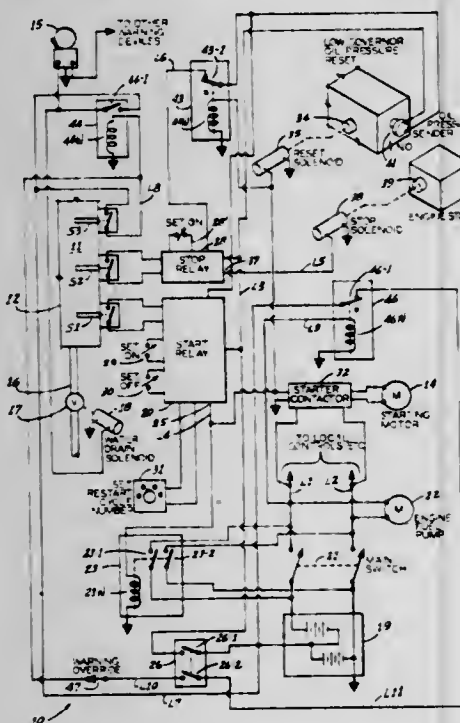
John E. Potts, Jr., 4547 Beacon Ct., Decatur, Ill. 62521

Filed May 17, 1982, Ser. No. 378,527

Int. Cl.<sup>3</sup> F02N 17/02; F02B 77/08

U.S. Cl. 123—142.5 R

10 Claims



1. A system for automatically protecting, and saving fuel consumed by, an out-of-service diesel engine of a locomotive having a liquid cooling system for said engine and a battery for electrical power supply, said battery being normally electrically disconnected while said engine is out of service, said system comprising

temperature sensing means for sensing the temperature of cooling liquid in said cooling system and for providing a first switching function when the sensed temperature falls to a first preselected value above the freezing point of said cooling liquid, a second switching function when the sensed temperature climbs to a second preselected value higher than said first value, and a third switching function if the sensed temperature falls to a third preselected value lower than said first valve but closer to said freezing point; first circuit means responsive to said first switching function for electrically reconnecting said battery and for energizing a starter for said engine to initiate operation of said engine for producing increase of said temperature; second circuit means responsive to said second switching function for energizing a stopping mechanism for said engine to terminate operation thereof; an audible warning device; and protection circuit means responsive to said third switching function for initiating operation of said warning device; whereby operation of said engine normally will be automatically effected intermittently to maintain said temperature between said first and second values but said warning device will be operated if operation of said engine is not automatically initiated.

## **4,413,596 ENGINE COOLING SYSTEM WITH OPTIONALLY COMMUNICABLE HEAD COOLING CIRCUIT AND BLOCK COOLING CIRCUIT, AND METHOD OF OPERATING THE SAME**

Tsutomu Hirayama, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

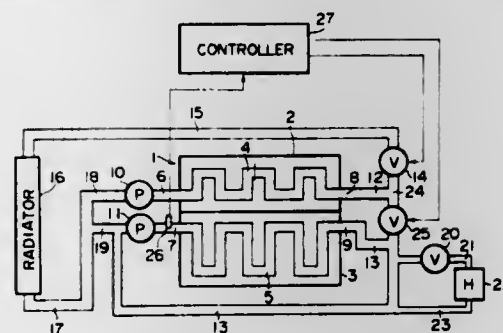
Continuation-in-part of Ser. No. 264,866, May 18, 1981, Pat. No. 4,369,738. This application Aug. 26, 1982, Ser. No. 411,804

Claims priority, application Japan, May 21, 1980, 55-68036

Int. Cl.<sup>3</sup> F01P 3/02, 7/16

U.S. Cl. 123—41.1

26 Claims



1. For an internal combustion engine comprising:

- (a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;
- (b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and
- (c) a radiator formed with an inlet and an outlet; a cooling system, comprising:
  - (d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;
  - (e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;
  - (f) a block input fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block inlet to said block cooling jacket, and for generating a sensed block input temperature signal representative of said temperature;
  - (g) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;
  - (h) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;
  - (i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, said downstream part of said block recirculation conduit system being thereby communicated also to said cylinder head inlet of said head cooling jacket;
  - (j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;
  - (k) a flow mixing conduit which communicates a part of said main recirculation conduit system with a part of said block recirculation conduit system;
  - (l) a second control valve for controlling flow of cooling fluid through said flow mixing conduit according to a block flow regulation signal; and
  - (m) a controller, which receives said sensed block input temperature signal from said block input fluid temperature

sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve;

- (n) whereby said controller can vary the amount of cooling operation provided for said internal combustion engine, by varying the opening amount of said first control valve, thus varying the amount of cooling fluid passing through said radiator; and can also vary the amount of mixing between the cooling circuit for said cylinder head and the cooling circuit for said cylinder block, by varying the opening amount of said second control valve, thus varying the amount of cooling fluid passing through said flow mixing conduit.
17. A method for operating a cooling system of an internal combustion engine having:
- (a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;
  - (b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and
  - (c) a radiator formed with an inlet and an outlet; said cooling system, comprising:
    - (d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;
    - (e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;
    - (f) a block input fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block inlet to said block cooling jacket, and for generating a sensed block input temperature signal representative of said temperature;
    - (g) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;
    - (h) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;
    - (i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, said downstream part of said block recirculation conduit system being thereby communicated also to said cylinder head inlet of said head cooling jacket;
    - (j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;
    - (k) a flow mixing conduit which communicates a part of said main recirculation conduit system with a part of said block recirculation conduit system;
    - (l) a second control valve for controlling flow of cooling fluid through said flow mixing conduit according to a block flow regulation signal; and
    - (m) a controller, which receives said sensed block input temperature signal from said block input fluid temperature sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve;
    - (n) whereby said controller can vary the amount of cooling operation provided for said internal combustion engine, by varying the opening amount of said first control valve, thus varying the amount of cooling fluid passing through said radiator; and can also vary the amount of mixing between the cooling circuit for said cylinder head and the

cooling circuit for said cylinder block, by varying the opening amount of said second control valve, thus varying the amount of cooling fluid passing through said flow mixing conduit;

said cooling system being filled with cooling fluid; said method comprising the processes, simultaneously performed, of:

- (o) operating said first pump and said second pump; and
- (p) depending upon said sensed block output temperature signal from said block output fluid temperature sensor, performing either one or the other but not both of the following two processes (q) and (r):
  - (q) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of less than a certain first predetermined temperature value, then simultaneously:
    - (q1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as substantially to interrupt flow of cooling fluid through said radiator; and
    - (q2) controlling said second control valve, by said block flow regulation signal, so as to allow a flow of cooling fluid through said flow mixing conduit;
  - (r) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of greater than said first predetermined temperature value, then simultaneously:
    - (r1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as to allow cooling fluid to flow through said radiator; and
    - (r2) controlling said second control valve, by said block flow regulation signal, so as to allow a controlled flow of cooling fluid through said flow mixing conduit;
- (s) whereby, during the warming up process of said internal combustion engine, before the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket has attained said first predetermined temperature, the cooling systems for said cylinder head and for said cylinder block are substantially communicated, and no substantial cooling is provided for either by said radiator, so that the heat which is supplied to the cooling fluid within the head cooling jacket is communicated to the cooling fluid within the block cooling jacket, and both the cylinder head and the cylinder block are quickly warmed up together; but, after said cooling fluid which passes out through said cylinder block outlet of said block cooling jacket has attained said first predetermined temperature, then according to process (r1) substantial cooling is provided for the cooling fluid in said head cooling jacket, while according to process (r2) the amount of cooling provided for the cooling fluid in said block cooling jacket is regulated; whereby, after said internal combustion engine has been warmed up, said cylinder block may be kept substantially warmer than said cylinder head.

4,413,597

## **OIL COOLED INTERNAL COMBUSTION ENGINE**

John H. Stang, and Steven N. Cusick, both of Columbus, Ind.,

assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 13, 1980, Ser. No. 149,332

Int. Cl.<sup>3</sup> F01P 3/02

U.S. Cl. 123—41.42

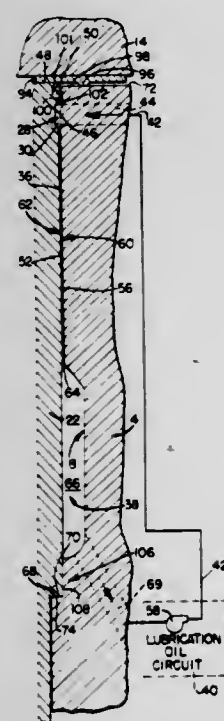
12 Claims

2. An oil cooled cylinder liner for use in an internal combustion engine containing a cylinder bore extending inwardly from a surface for engaging an engine head toward a crankshaft to which is connected a piston for reciprocating travel within the cylinder bore and having a radially oriented liner support surface positioned inwardly from the head engaging surface and further having a lubrication oil circuit including an



oil inlet for supplying oil to an exterior surface of the cylinder liner at a point axially adjacent the head engaging surface and still further having a cylindrical outside flow control surface formed on the interior of the cylinder bore having a fixed radius starting adjacent the oil inlet and extending inwardly, said cylinder liner comprising:

a) a generally hollow cylindrical body having an interior cylindrical surface for guiding the piston during reciprocating movement and having an exterior surface one portion of which includes an oil flow passage forming means for cooperating with the outside flow control surface when the cylinder liner is mounted within the cylinder bore for forming a circumferential flow passage through which a very thin film of lubrication oil of uniform radial thickness may pass under laminar flow conditions having no circumferential component and having a linear component in a direction parallel to the central axis of said hollow cylindrical body and extending inwardly from the oil inlet when the liner is mounted within the cylinder bore, said oil flow passage forming means including an inside flow control surface having a fixed radius along its entire



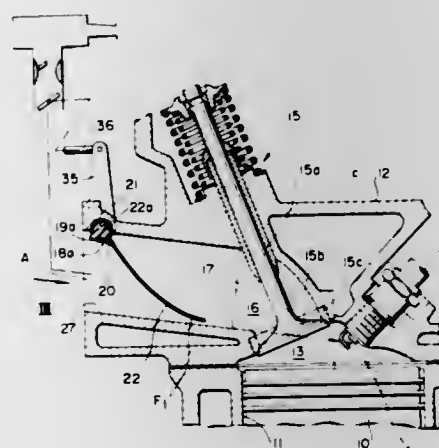
length which is 0.006 to 0.016 inches less than the radius of the outside flow control surface; and

(b) liner positioning means for positioning said inside flow control surface concentrically within the outside flow control surface when said hollow cylindrical body is positioned within the cylinder bore to form the oil flow passage between said inside flow control surface and the outside flow control surface with a constant radial dimension between 0.006 and 0.016 inches throughout the axial and circumferential extent of the oil flow passage, said liner positioning means including:

- (1) outer locating means adjacent the outer end of said hollow cylindrical body for forming a precise radial fit with the outermost portion of the cylinder bore, said outer locating means including a radial flange positioned outwardly from said inside flow control surface, and
- (2) inner locating means positioned inwardly from said inside flow control surface for forming a precise radial fit with a corresponding portion of the cylinder bore when the cylinder liner is mounted within the cylinder bore.

**4,413,598**  
**INTAKE CONTROL DEVICE FOR AUTOMOTIVE**  
**INTERNAL COMBUSTION ENGINE**  
Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

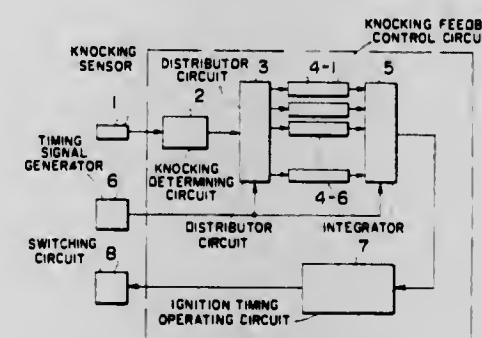
Filed Feb. 11, 1981, Ser. No. 233,652  
Claims priority, application Japan, Feb. 12, 1980, 55-14801  
Int. Cl.<sup>3</sup> F02B 31/00  
U.S. Cl. 123—306 7 Claims



2. An internal combustion engine comprising:
  - a cylinder having a longitudinal axis and a piston slidably movable within said cylinder to define a variable volume combustion chamber;
  - an induction passage leading from said combustion chamber to the ambient atmosphere, said induction passage being oriented with respect to said cylinder so as to introduce a fluid charge transmitted therethrough into said combustion chamber tangentially with respect to the cylinder wall so that the charge enters said combustion chamber and swirls about said cylinder axis;
  - a single throttle valve disposed within the induction passage for controlling the flow of fluid therethrough;
  - an intake valve having a stem for controlling fluid communication between the induction passage and said combustion chamber;
  - a partition disposed in said induction passage for dividing said passage into first and second substantially rectangular cross-section sub-passages, said partition being oriented so that a surface thereof defining part of said first sub-passage is longitudinally aligned with a surface of said intake valve stem so that fluid flowing through said first sub-passage is prevented from impinging upon said valve stem;
  - a first substantially rectangular guide vane disposed in said first sub-passage;
  - a second substantially rectangular guide vane disposed in said second sub-passage;
  - said first and second guide vanes defining first and second variable cross section openings in said first and second sub-passages respectively, said first and second variable cross section openings each having an essentially rectangular cross section being elongate in a direction parallel with a plane normal to said cylinder axis so that the flow component in said plane normal to said cylinder axis is maximized; and
  - control means interconnecting said throttle valve with said first and second vanes, said control means including a common shaft carrying said first and second vanes and a lost motion arrangement enabling said second vane to remain closed until said first vane has opened by a predetermined amount whereafter said first and second vanes are moved synchronously.

**4,413,599**  
**IGNITION TIMING CONTROL SYSTEM IN A SPARK**  
**IGNITION TYPE INTERNAL COMBUSTION ENGINE**  
Takashi Shigematsu; Tomoyuki Watanabe, and Daisaku Sawada, all of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 7, 1981, Ser. No. 223,082  
Claims priority, application Japan, Jan. 7, 1980, 55-000398  
Int. Cl.<sup>3</sup> F02P 5/14  
U.S. Cl. 123—425 6 Claims



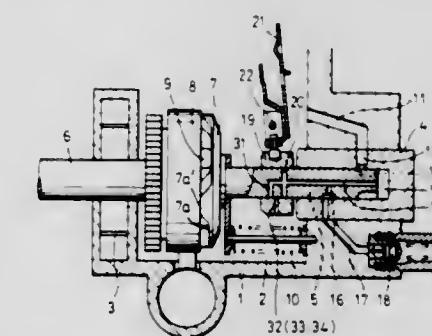
1. An ignition timing control system in a spark ignition type internal combustion engine having multiple cylinders, comprising:

- at least one knocking detecting means for detecting engine vibrations and emitting a vibration signal;
- a knocking determining means for comparing the level of said vibration signal with a reference level and emitting a knocking signal when the level of said vibration signal exceeds said reference level;
- a timing signal generating means for emitting a timing signal having one pulse at each predetermined crank angle;
- a knocking feedback control means in which knocking feedback control circuits equal in number to cylinders of the engine are arranged in parallel to one another, for operating a correction ignition advance angle in response to said knocking signal and emitting a correction ignition signal;
- a distributor means for selecting one knocking feedback control circuit of said knocking feedback control means in accordance with the number of pulses of said timing signal and supplying said knocking signal to the knocking feedback control circuit thus selected, said distributor means comprising a counter provided with output terminals equal in number to the cylinders of the engine and supplied to an input terminal thereof with said timing signal for successively emitting control signals from the output terminals between two pulses of said timing signal, analog switches having respective input and output terminals equal in number to the cylinders of the engine and connected in parallel to said knocking determining means in such a manner that said knocking signal is supplied to the respective input terminals with said analog switches adapted to be successively turned on by said control signals, and delaying circuits equal in number to the cylinders of the engine and connected to the output terminals of said analog switches, respectively, for delaying the knocking signal, which has passed through said analog switch, for a predetermined period of time and supplying said knocking signal to each of said knocking feedback control circuits;
- an integrator means for selecting one knocking feedback control circuit of said knocking feedback control means in accordance with the number of pulses of said timing signal and allowing said correction ignition signal of the knocking feedback control circuit thus selected to pass there-through;
- an ignition timing operating means for operating an actual ignition timing in accordance with said correction ignition signal thus passed through said integrator means and a basic ignition timing; and
- a switching means for controlling an ignition timing in re-

sponse to an output signal from said ignition timing operating means.

**4,413,600**  
**DISTRIBUTOR TYPE FUEL INJECTION PUMP**  
**ADAPTED FOR PARTIAL CYLINDER OPERATION OF**  
**AN INTERNAL COMBUSTION ENGINE**  
Hajime Yanagawa, and Yoshio Suzuki, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,682  
Claims priority, application Japan, Apr. 18, 1981, 56-55934[U]  
Int. Cl.<sup>3</sup> F02M 59/24; F02D 13/06  
U.S. Cl. 123—449 5 Claims



1. In a distributor type fuel injection pump for combination with an internal combustion engine having a plurality of cylinders, said pump including: a plunger having an outer peripheral surface; a plunger housing having an inner peripheral surface along which said plunger is received therein and defining therein a pump working chamber in cooperation with a head portion of said plunger; means for causing simultaneous reciprocating and rotative motion of said plunger; a low pressure space in which a portion of said plunger is located; a first port formed in said plunger in communication with said pump working chamber and opening in a portion of said outer peripheral surface of said plunger located in said low pressure space; a second port formed in said plunger in communication with said pump working chamber and opening in another portion of said outer peripheral surface of said plunger located within said plunger housing; a plurality of outlet pressure channels corresponding in number to said cylinders of said engine and connected to respective injection nozzles, said second port being disposed for successive engagement with said outlet pressure channels during said simultaneous reciprocating and rotary motion of said plunger; and a fuel injection quantity setting member having an inner peripheral surface slidably fitted on said portion of said outer peripheral surface of said plunger located in said low pressure space for engagement with said first port, and controllable in axial position relative to said plunger; whereby pressure feeding of fuel caused by movement of said plunger through a delivery stroke thereof is terminated upon disengagement of said first port from said fuel injection quantity setting member; the improvement comprising: a third port formed in said plunger in communication with said pump working chamber, said third port opening in a portion of said outer peripheral surface of said plunger which is in permanent slidable engagement with said fuel injection quantity setting member; and a plurality of fourth ports formed in said fuel injection quantity setting member in circumferentially spaced relation and smaller in number to said outlet pressure channels, said fourth ports each communicating at one end with said low pressure space and opening at the other end in said inner peripheral surface of said fuel injection quantity setting member at a predetermined axial location thereof; wherein said third port and said fourth ports are arranged relative to each other such that each time said second port engages a predetermined one of said outlet pressure channels, said third port engages a corresponding one of said fourth







4,413,607

**PROPANE CARBURETION SYSTEM**

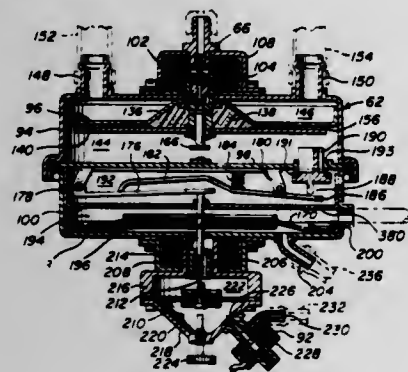
William H. Batchelor, 703 S. 11th, Lantana, Fla. 33460, and Douglas R. Batchelor, 4020 Buffalo Rd., Buchanan, Mich. 49107

Continuation-in-part of Ser. No. 177,790, Aug. 13, 1980, Pat. No. 4,369,751. This application Mar. 25, 1981, Ser. No. 247,598

Int. Cl.<sup>3</sup> F02B 43/00; F02M 29/00

U.S. Cl. 123—590

22 Claims



1. A mixer for first and second gases, said mixer including a substantially longitudinally straight venturi duct portion including opposite axial end large cross sectional area inlet and outlet end portions for intaking and discharging one of said gases passing through said venturi duct portion and a smaller cross sectional area midportion including means defining at least a substantially peripherally continuous slot extending about midportion and spaced intermediate said inlet and outlet end portions, and gas supply means for supplying said second gas to said slot for passage therethrough into the interior of said venturi duct portion downstream from the inlet end portion thereof.

4,413,608

**ELECTRONIC IGNITION WITH ADVANCE**

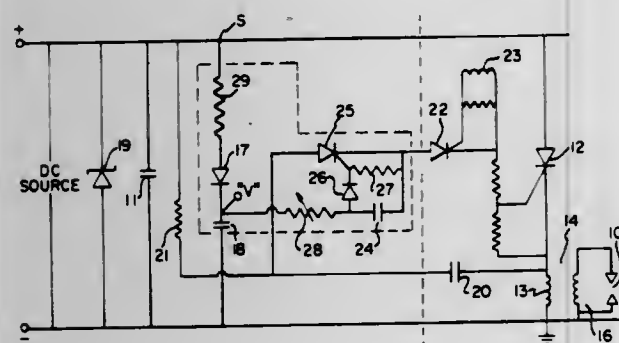
Bruce R. Beechly, Youngstown, Ohio, assignor to The Economy Engine Company, Youngstown, Ohio

Filed Nov. 27, 1981, Ser. No. 325,317

Int. Cl.<sup>3</sup> F02P 3/06, 500

U.S. Cl. 123—599

14 Claims



1. A trigger circuit comprising: first, second, and third triggerable switches each being rendered conductive when a signal at its control terminal reaches the threshold level; said first switch being connected to accept a timing pulse signal; said first and second switches being connected in series with each other and a control terminal of the third switch to activate the third switch when both the first and second switches have become conductive; a delay circuit means in series with the first switch and in parallel with the gate and one other terminal of the second switch resulting in a time delay after the first switch is activated by the timing pulse signal before the second switch is activated thus triggering the third switch.

4,413,609

**PORTABLE HIBACHI-TYPE CHARCOAL GRILL WITH KINDLING STRUCTURE**

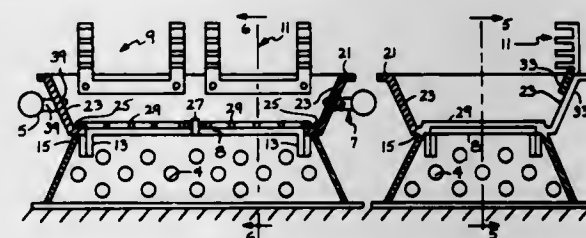
Reynold D. Tisdale, 2 Atlantic Ave., Hampton Beach, N.H. 03842

Filed Feb. 15, 1978, Ser. No. 878,164

Int. Cl.<sup>3</sup> A47J 37/00

U.S. Cl. 126—25 R

8 Claims



1. A portable Hibachi-type charcoal burning food grill in combination with a structure for kindling the charcoal therein comprising,

- (a) an upstanding, shallow dish-like casting which is a container for charcoal having outwardly sloping sides from the bottom to the top thereof, at least one large opening through the bottom and legs extending downward from said bottom for supporting said container on a flat surface with the open bottom thereof spaced above the flat surface;
- (b) a grate in the container at the bottom thereof covering the bottom opening which together with the sloping sides contains the charcoal;
- (c) a kindling structure having closed sides and readily separable from the dish container below the dish container for supporting the container and which defines an enclosure below the container of relatively larger volume than the shallow container for containing burning kindling material;
- (d) the top of the kindling structure snugly fitting the bottom of the container around the grate and around the container legs;
- (e) the top and bottom of the kindling structure being open so that the structure forms an upstanding combustion chamber and funnel to the grate and
- (f) a multitude of air passages through the sides of the kindling structure providing air flow to kindling materials therein;
- (g) whereby kindling material placed in the structure and ignited, burns rapidly to ignite charcoal placed in the container on the grate.

4,413,610

**VENTILATED GAS RANGE WITH MODULAR COOKING UNITS**

Lee J. Berlik, Cleveland, Tenn., assignor to Raytheon Company, Lexington, Mass.

Filed May 4, 1981, Ser. No. 260,655

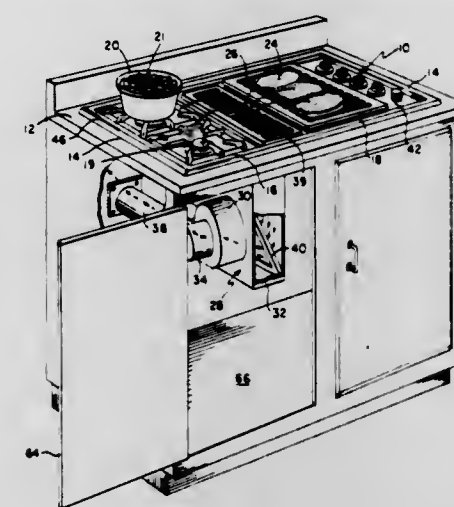
Int. Cl.<sup>3</sup> F24L 3/00

U.S. Cl. 126—39 K

19 Claims

1. A gas surface range comprising: a compartment having an orifice hood and a connector rigidly secured therein; a modular gas burner cartridge removably positioned in said compartment, said cartridge comprising a pan having a burner and igniter rigidly mounted therein; said burner being coupled to said orifice hood; said igniter being slidably engaged to said connector; an air duct adjacent to the surface of said range and extending downwardly; means for providing a down draft through said air duct to ventilate the surface area of said range, said down draft being exhausted through an opening near the bottom of said duct;

means for providing a flow of gaseous fuel to said orifice hood in response to an operator actuatable control; and



means for providing a high voltage potential to said connector for activating said igniter.

4,413,611

**MODULAR GAS RANGE COMPARTMENT**

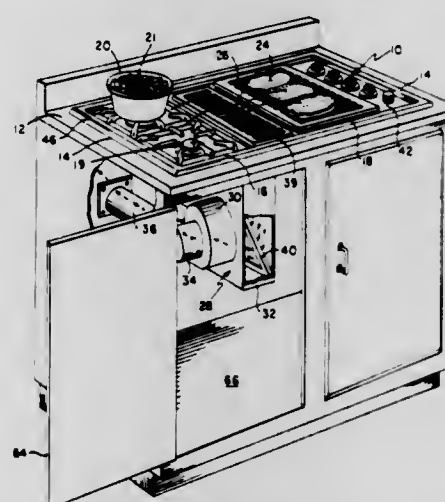
Lee J. Berlik, Cleveland; S. Thomas Barnes, and David E. Levi, both of Chattanooga, all of Tenn., assignors to Raytheon Company, Lexington, Mass.

Filed May 4, 1981, Ser. No. 260,656

Int. Cl.<sup>3</sup> F24C 3/00

U.S. Cl. 126—39 E

9 Claims



1. An apparatus including a compartment adapted for receiving a detachable modular gas cartridge having a pilotless igniter and burner, comprising:

- an open top burner box;
- a partition rigidly mounted in said burner box substantially dividing said box into first and second compartments;
- at least one orifice hood rigidly connected to said partition and having its orifice directed into said first compartment;
- a gas pipe connected to said orifice hood and routed through said second compartment for supplying gaseous fuel;
- a connector rigidly connected to said partition and having a plurality of receptacles each having a terminal secured therein, said receptacles extending into said first compartment;
- an operator actuatable source of high voltage;
- a wire routed through said second compartment coupling said source of high voltage to the terminal of said one of said receptacles;
- a cover over said second compartment for enclosing said second compartment; and
- said first compartment being open on top and adapted for receiving an interchangeable modular gas cartridge having a pilotless igniter and burner attached thereto wherein

said connector is aligned for detachably coupling with said pilotless igniter for providing said high voltage to said pilotless igniter and said orifice hood is aligned for providing said burner with gas.

4,413,612

**RED-HOT TYPE OIL BURNER**

Kazuharu Nakamura; Motoki Matsumoto; Yoshimasa Taubol; Akinobu Kondo, and Yoshitaka Kataoka, all of Nagoya, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

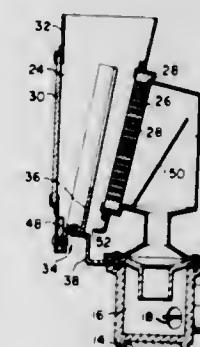
Filed Apr. 16, 1981, Ser. No. 255,001

Claims priority, application Japan, Oct. 17, 1980, 55-148571[U]; Nov. 17, 1980, 55-164352[U]; Dec. 27, 1980, 55-190188[U]; Feb. 3, 1981, 56-14479[U]

Int. Cl.<sup>3</sup> F24C 3/02

U.S. Cl. 126—92 C

17 Claims



1. A red-hot type oil burner, comprising: a hollow vaporization means, including a heating element, for vaporizing fuel oil supplied thereto; mixing means, disposed above and communicated with said vaporization means, for uniformly mixing vaporized fuel oil and air supplied thereto from said vaporization means to provide a combustible mixture; a combustion chamber disposed adjacent to said mixing means, said combustion chamber comprising a wall including a perforated ceramic plate means for allowing passage of said combustible mixture from said mixing means to said combustion chamber; and a heat absorption member of heat conductive material, said heat absorption member having one end extended to said combustion chamber and another end, said other end having an open portion through which said vaporization means extends, said open portion being fittedly attached and thermally connected to said vaporization means, said heat absorption member thereby comprising means for evenly conducting a part of the combustion heat to said vaporization means whereby normal combustion is stabilized in said combustion chamber.

4,413,613

**SLEEVE DAMPER APPARATUS**

David A. Dunlap, Warrenville, Ill., assignor to Jefco Laboratories, Inc., Chicago, Ill.

Filed Jul. 17, 1981, Ser. No. 284,495

Int. Cl.<sup>3</sup> F23L 3/00

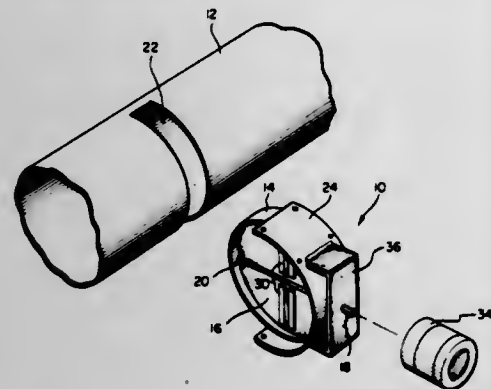
U.S. Cl. 126—292

7 Claims

1. A damper device for insertion into a transverse slot provided in an elongated duct transverse to the duct longitudinal axis without cutting completely through said duct, said damper device comprising: a sleeve having an outer surface conforming to the cross-section of said duct and to the transverse slot in the duct and adapted for insertion through said transverse slot provided in said duct so as to nest within the un-cut portion of said duct; a damper plate rotatably mounted within said sleeve, including a damper drive shaft extending through said sleeve for



rotating said damper plate from at least one exterior side of said duct;  
a cover plate having an aperture for passage of said damper drive shaft therethrough;



said cover plate having a width slightly larger than said transverse slot and adapted to extend over said transverse slot and onto said duct immediately adjacent said transverse slot to reseal said duct; and  
means for rigidly mounting said cover plate to said duct.

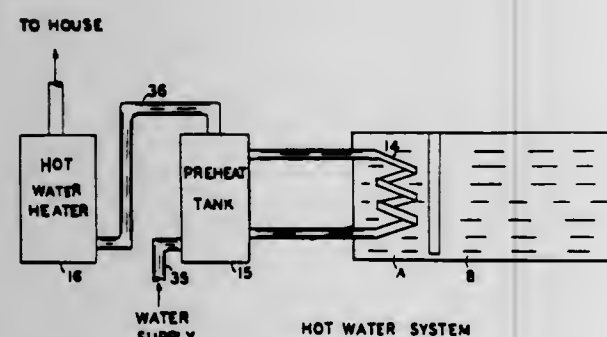
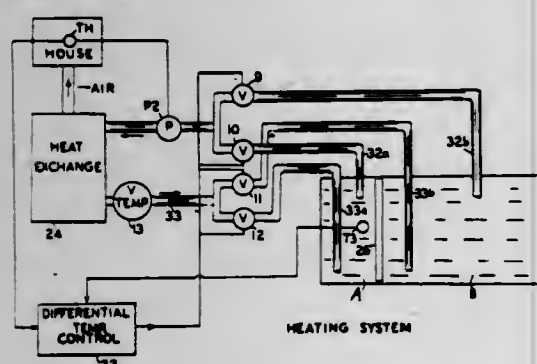
4,413,614

## SOLAR HEATING SYSTEM

Floyd A. Lyon, Brookville; William H. Yale, and Donald Lyon, both of Locust Valley, all of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.  
Division of Ser. No. 142,337, Apr. 21, 1980, Pat. No. 4,313,419.  
This application Oct. 9, 1981, Ser. No. 310,216  
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-421

1 Claim



1. Solar heating collection system comprising:  
a solar collector,  
double storage means comprising first and second storage means connected to the collector and the building heating means,  
the first storage means of a first fixed size having a capacity for approximately one days operation,  
the second storage means of a second fixed size having a capacity for several days operation,  
and means connected to control operation of the storage means so that the storage means which is coolest is heated first, and means to control operation of the storage means so that the first storage means is used first and when the first storage means is depleted of usable heat then the second storage means is used, the system

having means to heat domestic hot water from the first storage means, means to control collector heat flowing into the first storage means until the correct temperature is obtained, and means operating thereafter to transfer the collector heat into the second storage device.

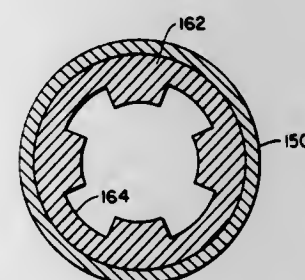
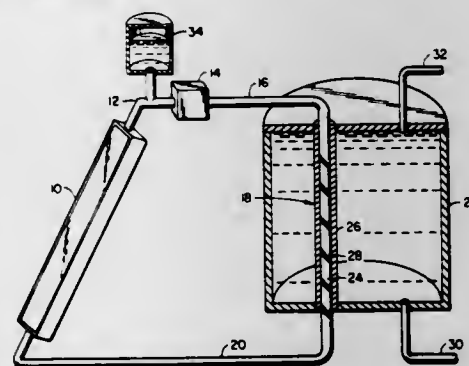
4,413,615

## PASSIVE SOLAR ENERGY WATER PREHEAT SYSTEM USING NON-FREEZING HEAT TRANSPORT MEDIUMS

Harry W. Sigworth, Jr., Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
Filed May 26, 1981, Ser. No. 267,193  
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-434

9 Claims



1. A solar energy system for preheating water to a hot water heater, which comprises:  
a metal absorber inclined to the horizontal having flow passages therethrough for the thermosiphoning circulation of heat transport fluid at a positive pressure of less than five atmospheres, said fluid being in a normally liquid state over the temperature range, -40° C. to 204° C.;  
a conduit loop for the removal of hot transport fluid from the top of the absorber and the return of cool transport fluid to the bottom of the absorber;  
expansion chamber means disposed in said conduit for preventing excessive pressure increases in the thermosiphon loop as a result of thermal expansion of the heat transport fluid;  
a valve disposed in said conduit having a housing with a lower fluid port for normally receiving fluid from the top of said absorber and an upper fluid port; a valve seat interposed in said housing between said ports;  
a valve member movably disposed in said housing above the valve seat, which has a density greater than the fluid at or below the specified normal operating temperature and a density less than the fluid above the specified normal operating temperature, which valve member will sealingly engage the valve seat to prevent the downward flow of fluid if the operating temperature is at or below the specified normal operating temperature, but which will disengage from the valve seat to permit the upward flow of fluid, and which will also disengage from the valve seat to permit the downward flow of fluid if the operating temperature is above the specified normal operating temperature; and  
double wall exchanger means in said conduit for transferring heat from said hot transport fluid to a second fluid; and said valve being disposed in the conduit between the expansion chamber means and the double wall heat exchanger.

3. A solar energy system for preheating water to a hot water heater, which comprises:

- a metal absorber inclined to the horizontal having flow passages therethrough for the thermosiphoning circulation of heat transport fluid at a positive pressure of less than five atmospheres, said fluid being in a normally fluid state over the temperature range, -40° C. to 204° C.;
- a conduit loop for the removal of hot transport fluid from the top of the absorber and the return of cool transport fluid to the bottom of the absorber;
- expansion chamber means disposed in said conduit for preventing excessive pressure increases in the thermosiphon loop as a result of normal expansion of the heat transport fluid;
- a valve disposed in said conduit having a housing with an upper fluid port for receiving effluent fluid from the top of said absorber and a lower fluid port; a primary valve seat interposed in said housing between said ports; a secondary valve seat interposed in said housing between said ports below said primary valve seat; a valve member movably disposed in said housing between said primary and said secondary valve seats which has a density less than the fluid at or below the specified normal operating temperature and a density greater than the fluid above the specified normal operating temperature, which valve member will sealingly engage the primary valve seat to prevent the upward flow of fluid if the operating temperature is at or below the specified normal operating temperature, which will disengage from the primary valve seat to permit the downward flow of fluid but which will engage the secondary valve seat to prevent said downward flow of fluid if the operating temperature is above the specified normal operating temperature; and
- double wall heat exchanger means in said conduit for transferring heat from said hot transport fluid to water at line pressure.

a metallic adhesive material having a coefficient of thermal expansion similar to that of said sealant which bonds said heat-collecting metallic pipe to said sealant.

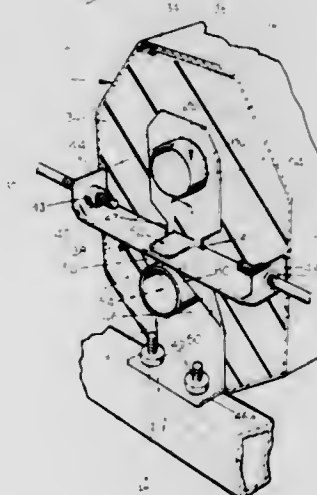
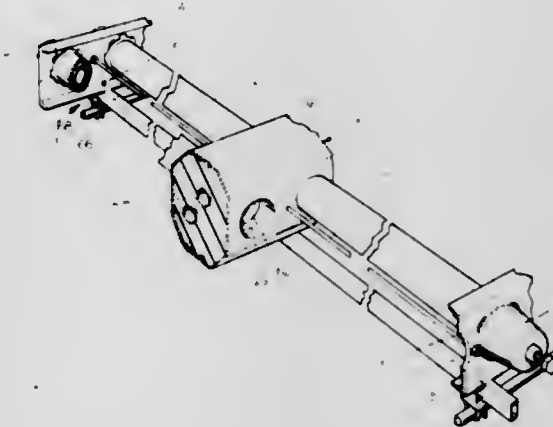
4,413,617

## SOLAR COLLECTOR MODULE

Glenn H. Dunlap, Maumee, and Wayne J. Zitkus, Toledo, both of Ohio, assignors to Sunmaster Corporation, Corning, N.Y.  
Filed Mar. 29, 1982, Ser. No. 362,586  
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-443

4 Claims



4,413,616

## SOLAR HEAT COLLECTOR ASSEMBLY

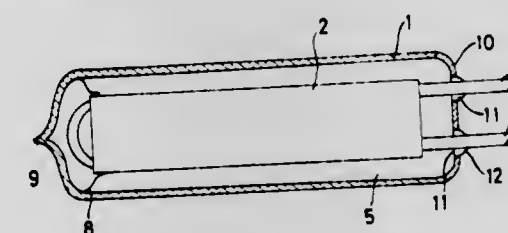
Toshiya Tonomura, Nara; Koichi Takeishi, Sakai; Mitsuhiro Shimada, and Atsuyuki Katto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
Filed Dec. 3, 1980, Ser. No. 212,443

Claims priority, application Japan, Dec. 3, 1979, 54-167869[U]

Int. Cl.<sup>3</sup> F23J 3/02

U.S. Cl. 126-443

3 Claims



1. A solar heat collector assembly comprising:  
a cylindrical transparent glass tube having an open end portion;  
a bowl-shaped sealant material bonded to said open end portion of said tube which hermetically seals said open end of said cylindrical transparent tube in a vacuum state, said sealant comprising a material which is the same as said transparent tube material including a heavy metal which raises the softening temperature of said sealant higher than the softening temperature of said tube, said sealant having a coefficient of thermal expansion similar to that of said tube material;  
a heat-collecting metallic pipe for transporting a heat-collecting vehicle secured in said transparent tube, said pipe having an end portion which projects outside said open end portion of said transparent tube through said sealant; and

1. A frame for mounting solar collector tubes in a parallel array, the solar collector tubes having fluid inlet and outlet openings in only one end, comprising at least two elongated, parallel girder elements rigidly connected at their one ends by a rigid transverse tube support member, said girder elements being parallel to the desired alignment of the solar collector tubes, a manifold disposed transversely to said longitudinal girder elements, vertical brackets in said manifold secured to said girder elements, inlet and outlet fluid conduits supported by said vertical brackets, means in said manifold for respectively sealingly mounting the open ends of the solar collector tubes in fluid communication with said inlet and outlet conduits, means in said tube support member for supporting the other ends of the solar collector tubes, and a frame rigidifying tie rod disposed in parallel relationship to each girder element, means for securing one end of each said tie rod to said tube support member, means for securing the other end of each tie rod to said vertical bracket, at least one of said securing means being threadably adjustable, thereby permitting a selected degree of tensile stress to be imposed on said tie rods to rigidify the frame during handling and installation.



4,413,618

## SOLAR COLLECTOR

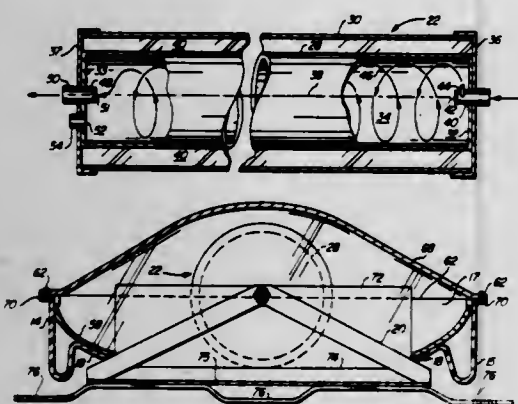
Elvin C. Pitts, Irvine; Walter G. Burns, and Harvey R. Anderson, both of Concord, all of Calif., assignors to King Energy Systems, Inc., Irvine and Servamatic Solar Systems, Inc., Concord, both of, Calif.

Filed Nov. 4, 1981, Ser. No. 318,174

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—450

16 Claims



1. A Solar collector comprising: a collector frame having a longitudinal axis; reflective means forming a curved reflecting surface for reflecting solar radiation, said reflective means being mounted on the collector frame so that the reflecting surface is substantially symmetric with respect to the longitudinal axis of the frame;
- a collector assembly including a right circular cylindrical collector tube having an inner surface, said collector tube having a pair of ends and a longitudinal axis, said collector tube having inlet means and outlet means mounted in opposite ends thereof for introducing into and removing a liquid from the tube, said inlet means directing liquid flowing into the collector tube into a substantially helical path, a right circular cylindrical energy conservator tube made of material which is substantially transparent to the visible spectrum of solar radiation and having an internal diameter greater than the external diameter of the collector tube, and cap means for mounting the conservator tube so that it is substantially concentric with the collector tube; and means for mounting the collector assembly on the collector frame so that the longitudinal axis of the collector frame substantially coincides with the axis of the collector tube.

4,413,619

## PORTABLE CERVICAL COLLAR

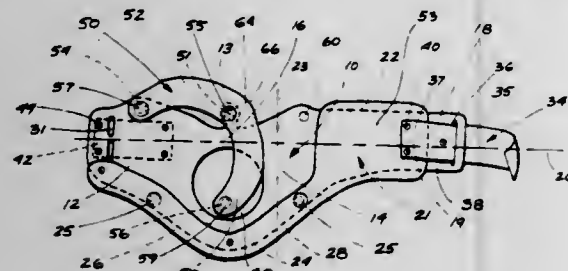
Geoffrey C. Garth, 334 Colorado Pl., Long Beach, Calif. 90814

Filed Oct. 16, 1981, Ser. No. 311,959

Int. Cl.<sup>3</sup> A61F 5/08

U.S. Cl. 128—76 R

10 Claims



1. A cervical collar formed entirely of a stiff, flexible flat plastic sheet band having an asymmetrical configuration comprising:
  - (a) an elongated neck encircling band formed of said stiff, flexible sheet material having front, side and back portions;
  - (b) a chin support brace, also formed entirely of stiff flexible

- plastic sheet material having a generally C-shape including fastening means located on each end of said brace;
- (c) said chin support brace fastening means being engageable with cooperative attachment means located at least on opposite sides of said neck encircling band such that when said band is formed into said collar at least one of said fastening means is allowed to align with a respective attachment means thus bowing said brace thereby enabling said brace to obtain an upwardly inclined, conically convex chin rest supported along its' entire length by the upper edge of the front portion of said band and projecting forwardly therefrom;
  - (d) collar retention means carried at each end of said band and mutually cooperative to retain said band in its collar configuration.

4,413,620

## ABDOMINAL RESTRAINT SYSTEM

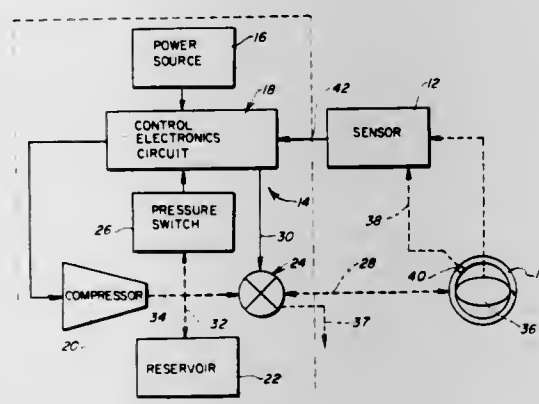
Samuel M. Tucker, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Sep. 21, 1981, Ser. No. 304,519

Int. Cl.<sup>3</sup> A61F 5/37

U.S. Cl. 128—134

21 Claims



1. An abdominal restraint system, comprising: means for providing a controlled amount of restraint against movement to a part of the trunk of a patient's body;
- means for connection with the patient to detect the onset of a cough or the like by the patient; and means responsive to said detecting means for controlling the restraint providing means to increase the amount of restraint during the cough or the like.

4,413,621

## FILM DRESSING

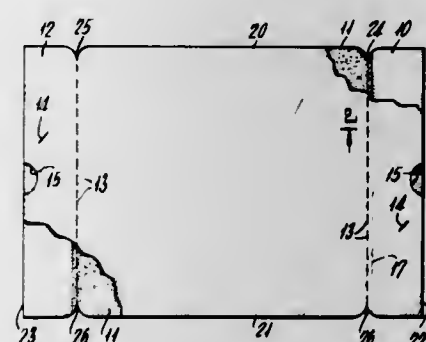
Robert W. McCracken, Westfield, and James P. Dellas, East Brunswick, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Dec. 11, 1981, Ser. No. 329,970

Int. Cl.<sup>3</sup> A61F 13/02

U.S. Cl. 128—156

4 Claims



1. An adhesive dressing comprising a transparent polymeric film from 0.6 to 10 mils thick having a moisture vapor transmis-

sion rate of at least 15 grams per 100 square inches per 24 hours and being impervious to liquid water, said film having a top edge, a bottom edge and two opposed side edges, a skin-adhering adhesive coating on one side of said film extending from said top edge to said bottom edge and between lines spaced inwardly from said opposed side edges to provide a pair of adhesive-free handling tabs on the side edges of said dressing, a perforation line parallel to each of said side edges and extending through said adhesive coating and said film and a release sheet covering said adhesive coating.

4,413,622

## OXYGEN MANIFOLD SYSTEM

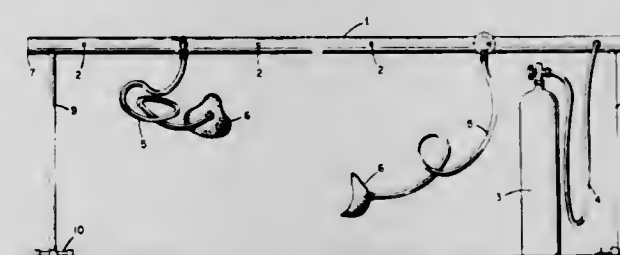
Stephen D. Austin, Sandwich, Mass., assignor to AMM Incorporated, Sandwich, Mass.

Filed Dec. 22, 1981, Ser. No. 333,373

Int. Cl.<sup>3</sup> A62B 7/00

U.S. Cl. 128—205.25

12 Claims



1. A portable medical oxygen delivery system comprising at least one tube having spaced holes along one side of it adapted for the connection of valves thereto; valves connected to said holes; two legs, one extending from the bottom of said tube near each end thereof; the ends of said tube being permanently capped to form an airtight member; one or more of said valves being connectable to one or more portable supplies of oxygen, and at least one of the remaining valves being connected through elongated flexible members to medical oxygen applicators.

4,413,623

## LAMINATED STRUCTURES HAVING GATHERED AND UNGATHERED MARGINAL PORTIONS AND METHOD OF MANUFACTURING THE SAME

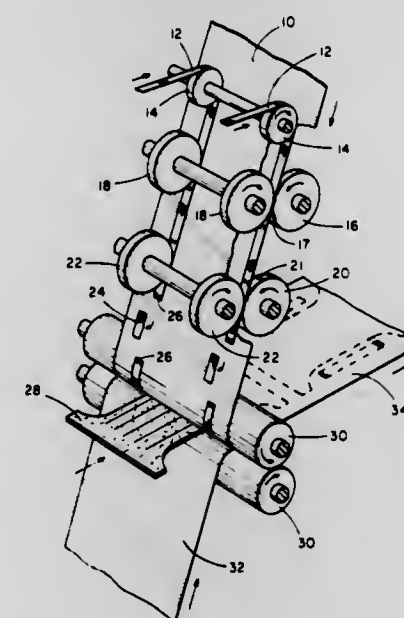
Heinz A. Pieniak, Chicago, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Feb. 17, 1981, Ser. No. 235,187

Int. Cl.<sup>3</sup> A61F 13/16

U.S. Cl. 604—365

15 Claims



1. A method for making an elastic structure which can be

separated into a series of individual elastic structures comprising:

- (a) feeding a web substrate having in the feed direction alternate first portions to be gathered and second portions to remain ungathered;
- (b) feeding an elastic member in a stretched condition immediately adjacent to one side of said web substrate;
- (c) adhering said elastic member intermittently to said substrate along at least one longitudinal line at the terminating portions of each first portion to be gathered;
- (d) severing said elastic member at points adjacent to the adhered portions thereof so as to remove the unadhered portion of the elastic member adjacent to each second portion of the web substrate; and
- (e) removing the unadhered elastic member portion from the individual elastic structures.

4,413,624

## SCROTUM INSULATOR

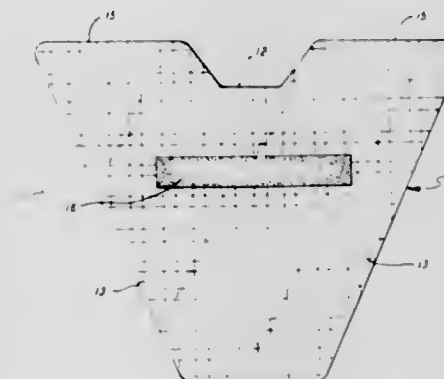
Paul Snow, 203 Loudon Rd., Apt. 1-24, Concord, N.H. 03301

Filed Jun. 8, 1981, Ser. No. 271,780

Int. Cl.<sup>3</sup> A61F 7/00; A61N 00/00

U.S. Cl. 128—399

6 Claims



1. As a scrotum insulator, (a) a sheet of flexible insulating material in symmetric trapezoidal form, the base of which is in the range of six to seven inches wide, the top of which is in the range of one and one-half to two and a half inches wide and the height of which is in the range of four and a half to five and a half inches, said base having a centrally located cutout adapted to accommodate the penis, and wherein said sheet is a moisture impervious plastic film having on one side a thin, infrared-reflective metal layer; (b) fastener means attached to the outer face thereof and adapted to secure said insulator to the under-shorts of the user.

4,413,625

## BRASSIERE CONSTRUCTION

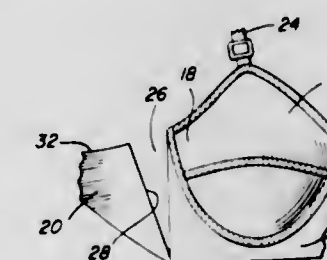
Marvin P. Footer, 2713 Unicorn Ln., NW., Washington, D.C. 20015

Filed Jan. 26, 1982, Ser. No. 342,888

Int. Cl.<sup>3</sup> A41C 3/00, 1/00

U.S. Cl. 128—425

6 Claims



1. In a brassiere construction comprising a pair of breast cups, interconnected by a front body portion, a support band connected to the outer edge portions of the breast cups and



body portion, shoulder straps attached to the upper edge portion of each breast cup and the rear portion of the support band, that improvement comprising the upper edge portion of the support band being shorter than the lower edge portion in a manner that lateral upward and lateral radially inward forces will be exerted on the outer edge portion of the breast cup to pull the outer edge portion of the breast cup radially inwardly toward the chest cavity and upwardly and laterally outwardly thereby providing better fit and more effective support for the outer portion of the breast where the outer tissues thereof connect with the chest area of the wearer.

4,413,626

## FOUNDATION GARMENT

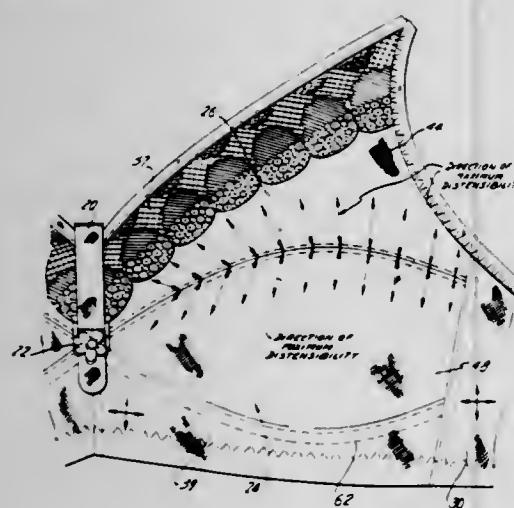
Ursula Capasso, Hollis, N.Y., assignor to Exquisite Form Industries, Inc., Pelham Manor, N.Y.

Filed May 22, 1981, Ser. No. 266,168

Int. Cl.<sup>3</sup> A41C 3/00

U.S. Cl. 128—498

7 Claims



1. In a brassiere having bust covering and supporting sections and body encircling sections extending from each side of the bust covering section, and means for adjusting the cup size of the bust covering sections, the improvement comprising: the cup portions each including a lower panel of a material that is distensible substantially in one direction only, the cup portions each including an upper panel of a material that is distensible substantially in one direction only; the said upper and lower panels being in engagement with one another along an arcuate line of engagement therebetween, and the alignment of the direction of distensibility of each of said upper and lower panels changing with respect to one another along the said line of engagement; a body panel of material that is distensible at least around the body of the user; a means for adjustably gathering and urging downwardly the inner edges of the upper portion of said cup portions; and wherein the alignment of the directions of distensibility of each of said respective upper and lower panels is 180 degrees at one point along the line of engagement therebetween.

4,413,627

## POLAROGRAPHIC CATHETER PROBE

Johannes G. Schindler, Marburg an der Lahn, Fed. Rep. of Germany, assignor to Dr. E. Fresenius Chemisch-pharmazeutische Industrie KG Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,599

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943457

Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128—635

13 Claims



1. A polarographic catheter-shaped probe for intravenously determining data of fluids, comprising: a cathode; an anode; an electrolyte disposed between said anode and said cathode; a longitudinally extending flexible catheter sheath having opposed ends, said cathode disposed at one end of said sheath to define a cathode tip, said flexible sheath concentrically surrounding said cathode and said electrolyte and provided with an ion-impermeable but gas-permeable membrane at said cathode tip to seal said electrolyte between said flexible sheath and said cathode, said sheath defining a distal end opposite said cathode tip; said anode disposed adjacent said distal end of said catheter sheath with the electrolyte extending from said cathode tip to said distal end between said sheath and said cathode; and a terminal jack located adjacent the distal end of said sheath and electrically coupled to said anode and cathode, said jack adapted for connecting said anode and cathode to measuring instruments.

4,413,628

## PH MONITOR ELECTRODE ELECTROLYTE CARTRIDGE

Walter G. Tamulis, 239B Twin Lakes Rd., North Branford, Conn. 06471

Filed Nov. 19, 1980, Ser. No. 208,143

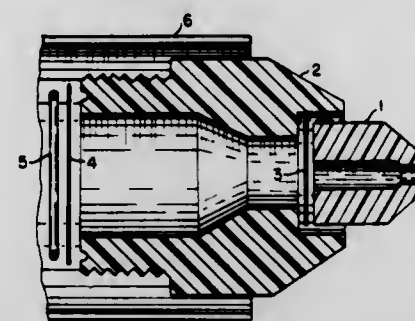
Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128—635

4 Claims

1. A disposable probe tip attachable to an electrode cell to make up a probe assembly used to make a continuous determination of ion concentrations in living tissues wherein the electrode cell has a thin protruding tube and having an ion sensitive membrane on the tip of the tube, the tube having a conductor around the outside thereof but not extending to the membrane, wherein said disposable probe tip comprises: a housing having a hollow chamber therein and having a first and a second opening communicating with said hollow chamber, an electrolyte solution within the chamber of said housing, first means sealing said first opening,

second means sealing said second opening and cooperating with said first sealing means to seal said electrolyte within said chamber, a tip piece with a passage therethrough having a diameter only slightly larger than the diameter of said tube, said tip piece being attached to said housing so as to hold said first



sealing means up against said first opening and so that said first and said second openings are coaxial with the axis of said tip piece passage, the tip of said tube first penetrating said second sealing means, then passing through said electrolyte solution, penetrating said first sealing means and then passing through said passage and exiting therefrom as said disposable probe tip is attached to said electrode cell.

4,413,629

## PORTABLE ULTRASONIC DOPPLER SYSTEM

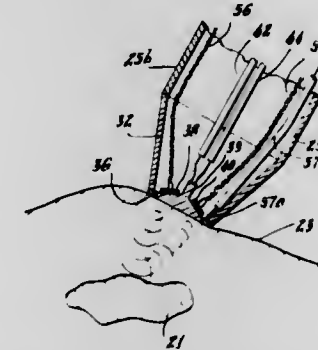
Benton A. Durley, III, Fox Lake, Ill., assignor to Cryomedics, Inc., Bridgeport, Conn.

Filed Apr. 22, 1982, Ser. No. 370,858

Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—660

20 Claims



1. A portable ultrasonic doppler system for sensing movement comprising: a handheld unit including a housing with a head end, a transmitting element mounted in said head end, means for energizing said transmitting element to emit ultrasonic energy, a receiving element mounted adjacent said transmitting element in said head end and responsive to ultrasonic energy emitted from said transmitting element and reflected to the receiving element by an object spaced therefrom, means for detecting the response of said receiving element to the reflected ultrasonic energy, radio-frequency transmitter means coupled to said detecting means for transmitting a radio-frequency signal modulated in accordance with the response of said receiving element, and an electrically conductive surface connected to the output of said radio-frequency transmitter means and situated externally of said handheld unit at said head end; and a radio-frequency receiver unit adapted to receive the radio-frequency signal transmitted from said handheld unit and including audio output means for producing an audible signal in accordance with the response of said receiving element; said head end adapted to be placed on the body of a living being in which movement is to be sensed with said trans-

mitting element positioned to emit ultrasonic energy toward a moving object within said body, said receiving element positioned to receive ultrasonic energy reflecting off of said moving object, and said electrically conductive surface in contact with said body, whereby said body serves as the antenna for transmitting said radio-frequency signal to said radio-frequency receiver unit.

4,413,630

## SECTOR SCANNER DISPLAY AND RECORDING SYSTEM FOR ULTRASONIC DIAGNOSIS

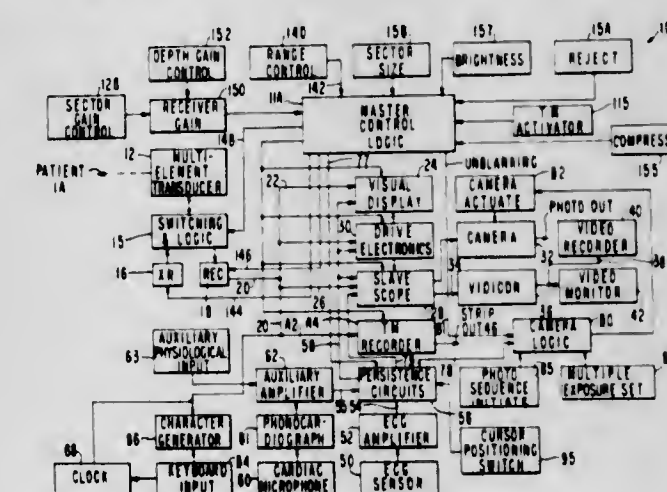
Weston A. Anderson; Lloyd D. Clark, both of Palo Alto, and William L. Beaver, Los Altos Hills, all of Calif., assignors to Diasonics Cardio/Imaging, Inc., Salt Lake City, Utah

Division of Ser. No. 914,323, Jun. 12, 1978, Pat. No. 4,274,422, which is a continuation of Ser. No. 673,500, Apr. 5, 1976, abandoned. This application Mar. 2, 1981, Ser. No. 239,251

Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—661

17 Claims



1. An ultrasonic system of the type utilized in patient cardio and cardiovascular diagnosis comprising: first means including a multi-element transducer for generating and displaying a fan shaped two-dimensional real-time operator-viewable image of a patient region being examined from ultrasonic energy directed into said patient by said transducer and reflected out of said region into said transducer, whereby said two dimensional real-time image is generated by said first means; ECG recording means operatively associated with said first means, and adapted for connection to said patient being examined, for generating an ECG output from said patient; means for displaying in real time said ECG output simultaneously with said fan shaped two-dimensional operator viewable image of said patient region being examined on an operator viewable display; and means responsive to said means for generating said image, for effecting simultaneously with said fan shaped real time two-dimensional image and said ECG output, a TM recording corresponding to a preselected region of said fan shaped real time two-dimensional image viewable during patient examination.

4,413,631

## SPHYGMOMANOMETER CONSTRUCTION

Harold G. Lacks, 200 E. 64th St., New York, N.Y. 10021

Filed Dec. 24, 1981, Ser. No. 334,081

Int. Cl.<sup>3</sup> A61B 5/02

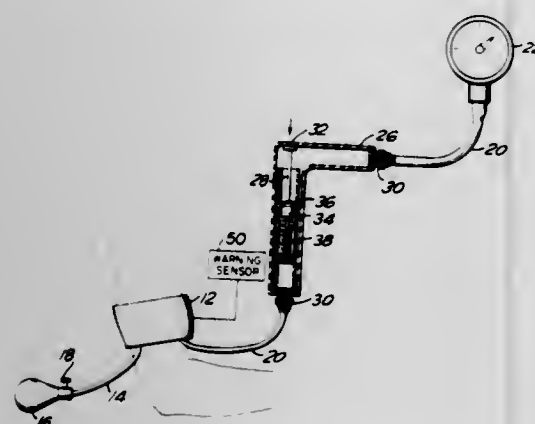
U.S. Cl. 128—677

8 Claims

1. A sphygmomanometer construction comprising in combination: an inflatable cuff adapted to securely encircle a human limb; a pump means connected to said inflatable cuff via a suitable conduit to affect the inflation thereof;



a manually operated pressure release means connected to said pump means; and  
a single pressure gauge for reading systolic and diastolic pressures interconnected to said inflatable cuff via a second suitable conduit having serially interposed in the interconnecting conduit between said pressure gauge and



the point of interconnection with said inflatable cuff a normally closed, manually operated valve for momentarily opening and closing the second conduit thereby affecting the pressurization and subsequent isolation of said pressure gauge, in order to sense and maintain the pressure in said inflatable cuff at the moment of opening and shutting of said valve.

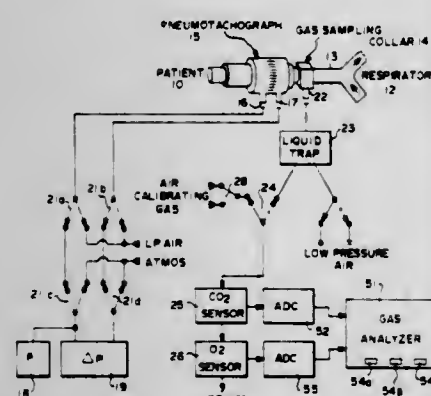
#### 4,413,632 PULMONARY MONITOR

Joseph E. Schlessinger, Berkeley, and Richard G. Hamilton, San Francisco, both of Calif., assignors to Critikon, Inc., Tampa, Fla.

Filed Oct. 9, 1979, Ser. No. 82,898  
Int. Cl.<sup>3</sup> A61B 5/08

U.S. Cl. 128—716

6 Claims



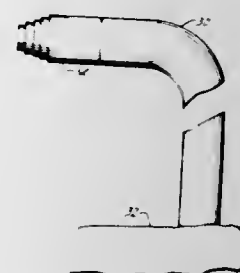
1. In a system having a conduit carrying respiratory gases, a pulmonary monitor for the measurement, analysis and display of respiratory data characterizing a patient comprising:
  - (a) first sensing means for measuring respiratory flow in said conduit;
  - (b) second sensing means for measuring O<sub>2</sub> and CO<sub>2</sub> concentration in said conduit;
  - (c) an analyzer unit including means responsive to said first and second sensing means for calculating respiratory parameters, and said analyzer unit further comprising:
    - (1) first selecting means for choosing a mode of operation, each mode having a set of control functions;
    - (2) second selecting means enabled upon selection of a mode, for selecting a control function for said selected mode of operation; and
    - (3) manually engaged means for energizing said calculating means for processing said first and second respiratory data into calculated respiratory parameters in response to said first and second selection means.

#### 4,413,633 METHOD AND APPARATUS FOR MONITORING BODY CONDITIONS

Roman L. Yanda, 462 Daniels Dr., Beverly Hills, Calif. 90212  
Filed Jun. 1, 1981, Ser. No. 269,259  
Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128—736

8 Claims



1. Body monitoring apparatus for use with a urinary catheter tube having an outlet opening and a drainage tube having a male connector engageable with the outlet opening of the catheter tube, the apparatus comprising:
  - a tubular body member having at one end a male connector engageable with the outlet opening of the catheter tube, at the other end an outlet opening engageable with the male connector of the drainage tube, and an exit from the body member between the connector and the outlet opening;
  - a temperature sensing transducer producing an electrical output, the transducer being located outside the body member;
  - a flexible transmission line extending from the transducer through the body member from the male connector thereof through the exit to a point outside the body member to transmit the electrical output outside the body member; and
  - means for sealing the exit.

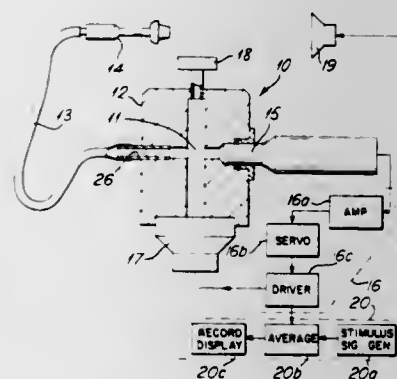
#### 4,413,634 LOW VOLUME CHANGE DETECTION

Robert J. Marchbanks, Wallingford, England, assignor to National Research Development Corporation, London, England  
Filed Apr. 30, 1981, Ser. No. 259,240

Claims priority, application United Kingdom, May 1, 1980, 8014390

Int. Cl.<sup>3</sup> A61B 5/10, 5/12  
U.S. Cl. 128—746

8 Claims



1. Volume change detection apparatus comprising means defining a cavity, said cavity having means for communicating with a variable volume to be measured, a D.C. microphone connected with said cavity for response to fluid pressure changes therein due to variations in the variable volume, an adjustable diaphragm operably connected with said cavity, a servo-control means operably connected between said microphone and said diaphragm to adjust the latter in response to the

output from the former to maintain the pressure in said cavity constant, and output means connected to said servo-control to present a signal representing the diaphragm adjustment.

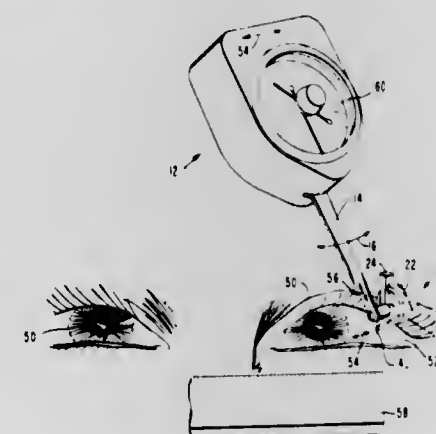
#### 4,413,635 OPHTHALMIC CLIP

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 7, 1980, Ser. No. 137,682  
Int. Cl.<sup>3</sup> A61B 5/10

U.S. Cl. 128—782

14 Claims



1. Apparatus useful in the correction of strabismus comprising a clip including means attachable to the sclera of an eye without damage thereto for movement of the eye in a desired direction, a force measuring device, and means coupling said device to said clip for enabling said clip to move the eye in only the desired direction and for enabling said device to measure accurately any resistance exerted by anything associated with the eye against the movement.

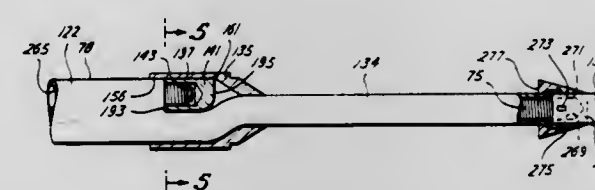
#### 4,413,636 CATHETER

Martin R. Jasso, Houston, Tex., assignor to Phillip R. Beutel, Colorado Springs, Colo.

Continuation of Ser. No. 95,342, Nov. 19, 1979, abandoned. This application Mar. 25, 1982, Ser. No. 361,802

Int. Cl.<sup>3</sup> D61N 1/04  
U.S. Cl. 128—786

8 Claims



1. An electrode assembly for a catheter having a cathode tip, a first conductor and a second conductor, comprising: an anode ring having a longitudinal axis, a proximal end and a distal end, and including an outer portion and an inner portion connected to said outer portion, said outer portion including a ring body and said inner portion including an anode insert telescopically received in and frictionally retained in said ring body, one terminal end of such first conductor being disposed entirely within said anode insert, said anode insert including coupling means for mechanically coupling said anode insert of said inner portion to such one terminal end of such first conductor and passing means for passing such second conductor through said anode ring from said proximal end of said anode ring to said distal end of said anode ring, one terminal end of such second conductor being connected to such cathode tip, such cathode tip being spaced distally of said anode ring, said anode insert of said inner portion including a solid member having a proximal end and a distal end, said coupling means including a blind passage extending from said proximal end of said member

through a part of the length of said member, such one terminal end of such first conductor being disposed in said blind passage, there being a pair of elongate trapezoidal crimps impressed into said member on opposite sides of said blind passage against such one terminal end of such first conductor, said passing means including a channel extending through said solid member from said proximal end of said member to said distal end of said member, such second conductor being carried within said channel.

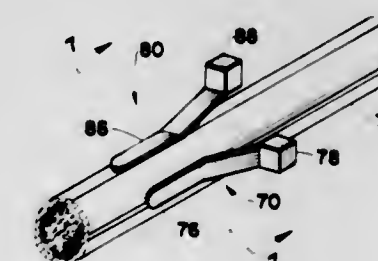
#### 4,413,637 DYNAMIC CIRCUMFERENCE GAGE

Christopher Irving, Richmond, Va., assignor to Philip Morris Inc., New York, N.Y.

Continuation-in-part of Ser. No. 226,569, Jan. 19, 1981, abandoned. This application Nov. 6, 1981, Ser. No. 319,009  
Int. Cl.<sup>3</sup> A24C 5/18

U.S. Cl. 131—84 R

5 Claims



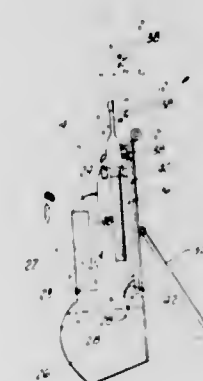
2. A cigarette making apparatus having a garniture for imparting curvature to a garniture tape and thereby to cigarette paper and tobacco disposed on said tape, and short tongue means engageable with said tobacco and cooperative with said garniture for imparting generally cylindrical shape to said tobacco to form a cigarette rod, a folder means for joining a free end of said cigarette paper to said tobacco rod, improvements therein comprising a first and second dynamic circumference gage, said second dynamic circumference gage located at a position approximately 90° around the circumference of said cigarette from said first dynamic circumference gage, said gages comprised of a guide block means, a spring means, and strain gage means mounted on said spring such that said strain gage means exhibits stress changes proportional to changes in said spring flexure due to changes in circumference of said cigarette rod.

#### 4,413,638 SAFETY CIGARETTE BOTTLE

Be V. Le, 912 S. Ter., Wichita, Kans. 67218  
Filed Mar. 19, 1982, Ser. No. 359,690  
Int. Cl.<sup>3</sup> A24F 13/16, 13/22, 13/12, 13/14

U.S. Cl. 131—174

7 Claims

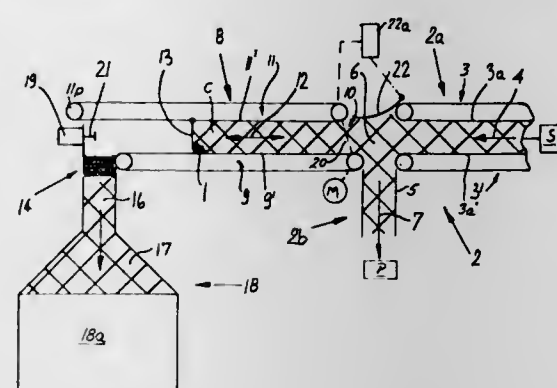


1. A safety cigarette bottle for smoking a cigarette or the like, the bottle comprising: a cigarette holder adapted for holding a cigarette, the holder



pivotaly attached to a slide member, the slide member slidably mounted in a cigarette chamber;  
a mouth piece with flexible smoking tube connected to the cigarette holder for drawing smoke from the cigarette;  
a cigarette lighter hingably mounted in a lighter chamber, the lighter chamber attached to the front of the cigarette chamber, and  
an ash tray chamber communicably connected to the bottom of the cigarette chamber, the ash tray chamber releasably attached to the bottom of the cigarette chamber for removing the ashes from the cigarette.

**4,413,640**  
**APPARATUS FOR TRANSPORTING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY**  
Günter Wahle, Reinbek, and Willy Rudazinat, Dassendorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany  
Filed Jun. 9, 1981, Ser. No. 271,970  
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021696  
Int. Cl.<sup>3</sup> A24C 5/32, 5/33; A20C 5/35  
U.S. Cl. 131—281 **35 Claims**



1. Apparatus for transport and temporary storage of rod-shaped articles which are supplied by at least one first variable-output machine and are normally processed by at least one second variable-output machine, comprising a reservoir including wall means defining a chamber having spaced apart first and second openings, said wall means comprising a partition disposed in said chamber and movable between plural first positions intermediate said openings and at least one second position in which said openings communicate with each other; conveyor means defining an elongated path communicating with said first opening and having first and second portions respectively located upstream and downstream of said first opening, said conveyor means including first and second sections respectively arranged to advance rod-shaped articles sideways at first and second variable rates along said first and second portions of said path, said first and second rates being respectively functions of the output and requirements of said first and second machines; and means for moving said partition between said first positions to thereby permit entry of articles into and effect evacuation of articles from said chamber via said first opening when the difference between said first and second rates is within a given range such that said partition assumes one of said first positions, as well as to permit evacuation of articles from said path by way of said first opening, said chamber and said second opening when the difference between said rates is outside of said given range so that the partition assumes said second position.

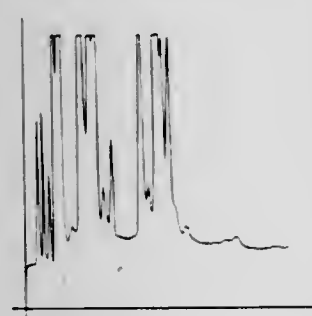
**4,413,641**  
**CIGARETTE MOUTHPIECE**  
R. William Dwyer, Jr., and Mable L. Fleming, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.  
Continuation-in-part of Ser. No. 73,394, Sep. 7, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,842  
Int. Cl.<sup>3</sup> A24D 3/00  
U.S. Cl. 131—361 **8 Claims**



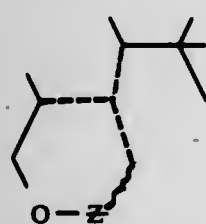
1. A filter-tipped cigarette having a cylindrical mouthpiece, said mouthpiece comprising an inlet end attached to the exit

**4,413,639**  
**USE OF PRINS AND DERIVATIVES THEREOF IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF A SMOKING TOBACCO COMPOSITION OR SMOKING TOBACCO ARTICLE COMPONENT**  
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.  
Division of Ser. No. 267,850, May 28, 1981, Pat. No. 4,359,412.  
This application Jun. 24, 1982, Ser. No. 391,596  
Int. Cl.<sup>3</sup> A24B 3/12, 15/32, 15/36  
U.S. Cl. 131—276 **1 Claim**

GLC PROFILE FOR EXAMPLE I



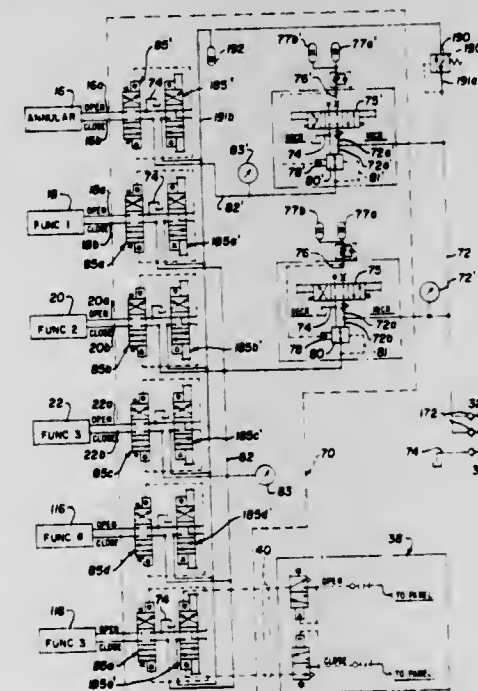
1. A process of augmenting or enhancing the aroma or taste of a smoking tobacco composition or smoking tobacco article comprising the step of adding to a smoking tobacco composition or at least a portion of a smoking tobacco article, an aroma or taste augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond; wherein the wavy line is a carbon-carbon single bond or no bond at all; wherein Z represents hydrogen, —CH<sub>2</sub>—, or C<sub>2</sub>—C<sub>4</sub> acyl; with the proviso that when the wavy line is no bond at all, Z represents hydrogen or C<sub>2</sub>—C<sub>4</sub> acyl and when the wavy line is a carbon-carbon single bond, then Z represents —CH<sub>2</sub>—.

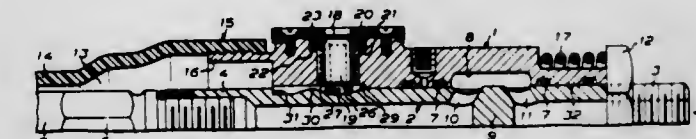
end of the filter, an outlet end opposite said inlet end from which smoke may leave the cigarette by way of at least one orifice therein, said orifice being an annular opening of smaller area in transverse section than the filter and being centered on the longitudinal axis of the filter, and at least one channel connecting said inlet end of the mouthpiece to said orifice, said channel being non-occluded, being of the same area at the inlet end as the filter, and being of the same area at the outlet end as the orifice, said channel continuously decreasing in transverse sectional area from the inlet end to a point between the inlet end and the outlet end and being from said point to the outlet end a substantially cone-shaped passage defined by a cone-shaped baffle with apex at said point, said filter being cylindrical.

**4,413,642**  
**BLOWOUT PREVENTER CONTROL SYSTEM**  
Gary D. Smith, and Richard D. Relyea, both of Spring, Tex., assignors to Ross Hill Controls Corporation, Houston, Tex.  
Filed Oct. 17, 1977, Ser. No. 843,010  
Int. Cl.<sup>3</sup> F16K 31/12  
U.S. Cl. 137—14 **2 Claims**



1. A method of regulating pressure of fluid in a regulated pressure line in a blowout preventer control system to which fluid at a higher pressure is supplied from a source of pressurized fluid, the method comprising the steps of: charging a closed system to a set-point pressure at which pressure in the regulated pressure line is to be maintained, said closed system including a pair of accumulators precharged to different pressures, connecting the pair of accumulators through a valve to the source of pressurized fluid, delivering pressurized fluid through the valve into the accumulators to establish the set-point pressure; delivering pressurized fluid to the valve through a first line, diverting flow of fluid from the first line to a second line if the flow rate of fluid in the first line exceeds a predetermined flow rate; sensing the difference between the set-point pressure in the closed system and pressure in the regulated pressure line by applying the set-point pressure of the closed system to a first valve actuator and by applying the regulated pressure of the regulated pressure line to a second valve actuator; and mounting the first and second valve actuators with a regulator valve such that when the pressure in the regulated pressure line is less than the set-point pressure, the regulator valve is actuated to deliver pressurized fluid from the source of pressurized fluid into the regulated pressure line, and such that when the pressure in the regulated pressure line is greater than the set-point pressure, the regulator valve is actuated to remove fluid from the regulated pressure line.

**4,413,643**  
**HOSE-BREAK VALVE**  
Thore K. E. Wiklund, Piteå, Sweden, assignor to Regioninvest i Norr AB, Luleå, Sweden  
PCT No. PCT/SE80/00185, § 371 Date Apr. 22, 1981, § 102(e)  
Date Apr. 22, 1981, PCT Pub. No. WO82/00185, PCT Pub. Date Jan. 21, 1982  
PCT Filed Jul. 4, 1980, Ser. No. 261,227  
Int. Cl.<sup>3</sup> F16K 13/04  
U.S. Cl. 137—68 R **9 Claims**



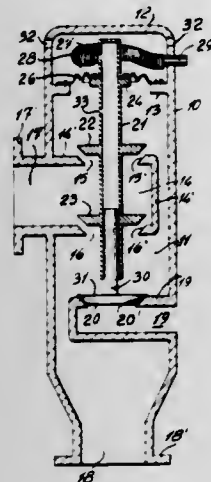
1. A hose-break valve for pressure hoses or conduits with a surrounding protective hose or conduit and a pressure medium in a space between the pressure and protective hoses or conduits, comprising,  
a valve housing,  
said valve having a flow passage for communicating with a pressure hose or conduit, and a chamber communicating with the space between the pressure and protective hoses or conduits,  
a sliding gate which is movable along said valve housing between an open position and a closed position, said sliding gate when in its open position permitting throughflow through the flow passage and when in its closed position preventing throughflow through the flow passage,  
a yieldable loading device for actuating the sliding gate toward its closed position to close the flow passage when the pressure of said pressure medium in said chamber falls short of a lower limit value,  
actuating means responsive to and actuated by the pressure of said pressure medium in said chamber for actuating the sliding gate toward its open position against the action of the yieldable loading device, said actuating means being independent of and unresponsive to the pressure in said flow passage,  
a pressure relieving device operable to relieve the pressure in the chamber when such pressure exceeds an upper limit value, said yieldable loading device being operable when said pressure is relieved to move the sliding gate to its closed position.

**4,413,644**  
**AUTOMATIC VACUUM BLEED VALVE FOR USE ON PAPER MAKING MACHINES**  
Derrick R. Woodward, Pointe Claire, Canada, assignor to Jwi Ltd., Kanata, Canada  
Filed Sep. 10, 1981, Ser. No. 300,951  
Int. Cl.<sup>3</sup> G05D 16/06  
U.S. Cl. 137—103 **10 Claims**

1. An automatic adjustable vacuum bleed valve comprising a valve body defining a first chamber connected to a vacuum operated device, an opening in said body communicating said first chamber to atmosphere, a second chamber within said body and connectible to a vacuum source, said second chamber being defined by a chamber housing extending within said body, a hollow cylindrical valve stem passing through said chamber housing and having a stem valve secured thereto for seating in a port in a wall of said chamber housing, a further valve positioned concentrically with said valve stem for seating in said opening in said body, said further valve having a stem slidably engaged in a lower end of said valve stem, an upper end of said cylindrical valve stem being flexibly connected to said valve body by a flexible impervious diaphragm having opposed surfaces, one of said surfaces being exposed to atmosphere and the other of said surfaces being exposed to said



first chamber, means for introducing a controlling flow of fluid into said cylindrical valve stem, and a restricting orifice in said



valve stem to restrict the flow of fluid and thereby provide pressure control in said cylindrical valve stem to regulate the vacuum in said first chamber.

4,413,645

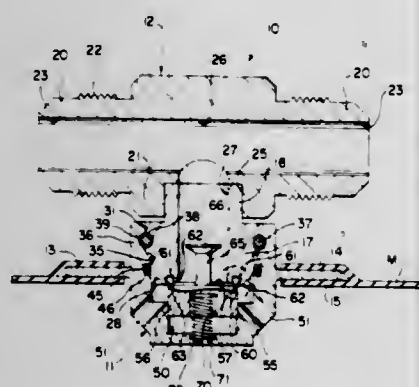
## FLUID SWIVEL VALVE DEVICE

Peter P. Seabase, Cuyahoga Falls, and Rickard N. Crewes, Uniontown, both of Ohio, assignors to National Machine Company, Inc., Stow, Ohio

Filed Dec. 24, 1980, Ser. No. 219,917  
Int. Cl.<sup>3</sup> F16K 15/20

U.S. Cl. 137—223

7 Claims



1. In a swivel valve assembly for an inflatable member permitting passage of a high pressure and velocity input of fluid from a pressurized source and providing sealing closure upon pressure equalization, the valve assembly comprising, body means having connecting means for sealing engagement with the inflatable member, cylindrical bore means in said body means communicating with the pressurized source of fluid, cylindrical recess means of greater diameter than and communicating with said bore means, passage means in said body means communicating with the inflatable member and connecting with said cylindrical recess means, and poppet means movable within said bore means and said cylindrical recess means, having a seating surface extending radially outwardly of said bore means to engage a sealing member in said body means for precluding fluid flow upon pressure equalization, and having a disk positioned in said cylindrical bore means for providing preselected throttling of the high velocity input of fluid before passing said sealing member.

4,413,646

## STREAMLINE COAL SLURRY LETDOWN VALVE

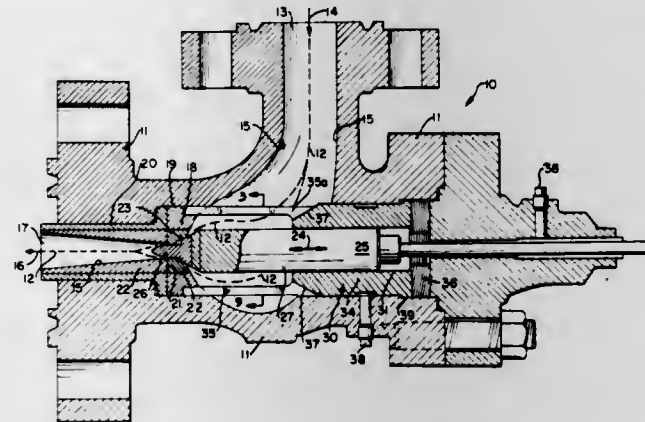
Robert J. Platt, Dover, and Edward A. Shadbolt, Basking Ridge, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 259,489, May 1, 1981. This application May 14, 1981, Ser. No. 263,750

Int. Cl.<sup>3</sup> F16K 1/12, 47/04

U.S. Cl. 137—240

9 Claims



1. A high pressure coal slurry letdown valve, comprising: means defining a high pressure cylindrical flange valve inlet and a low pressure cylindrical flange valve outlet, said outlet including a stepped cylindrical bore including an internal recess for slidably receiving and locating a valve seat means and wherein the central axis of said inlet and said outlet are disposed at generally right angles to one another; means defining a streamlined arcuate coal slurry flow path disposed between said inlet and said outlet; two-piece valve seat means defining a valve throat, said seat means including a first member having a downstream divergent flow path and adapted to slidably seat within said bore against said internal recess and having a flat upstream end surface transverse to said flow path, and a second member separate from said first member slidably fitted in said bore in abutting end contact with the flat end portion of said first member defining a convergent upstream portion of said seat means; a biased cage including at least two pillars fixedly disposed within said flow path opposite said inlet, said cage having at least two truncated conical surface portions between said pillars adjacent said valve inlet to provide streamlined surfaces generally conforming to the streamlined arcuate flow path means between said inlet and said outlet, said cage having an end portion in contact with said seat means second member to hold said seat means in said recess; and a plug movably disposed within and slidably supported by said biased cage for controlling flow of coal slurry through said valve throat.

4,413,647

## LEAK DETECTION ARRANGEMENT FOR VALVE HAVING SEALING MEANS

Bruce L. De Lorenzo, and Daniel J. McCarthy, both of P.O. Box 72, Clifton, N.J. 07015

Continuation of Ser. No. 309,903, Nov. 27, 1972, abandoned, and Ser. No. 624,199, Oct. 20, 1975, Pat. No. 4,052,997, and Ser. No. 839,096, Oct. 3, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,722

Int. Cl.<sup>3</sup> F16L 55/07

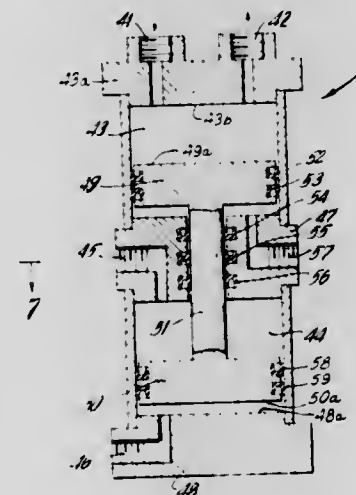
U.S. Cl. 137—312

3 Claims

1. Valve construction comprising actuating means and a chambered valve body including a first chamber in the valve body having a fluid inlet passage and a fluid discharge passage, a valve wall portion between the inlet and discharge passages of the first chamber,

a first plunger movable toward and away from the valve wall portion of the first chamber, an end wall portion for the first chamber on the side of the first plunger remote from the valve wall portion, a second chamber having opposed fluid inlet and discharge passages and an end wall remote from the first chamber provided with a centrally imperforate wall portion, a second plunger freely disposed in relation to the end wall provided with the centrally imperforate wall portion and operatively arranged for movement between the opposed passages of the second chamber, first sealing means mounted between the first plunger and

second effective control surface area is applied to said first effective control surface area of the valve piston thereby to control the variable metering orifice, flow sensing means between the inlet port and the outlet port for generating a flow-dependent feedback signal,



the first chamber for preventing the flow of fluid from the first chamber into the second chamber, second sealing means spaced from the first sealing means for preventing the flow of any fluid leaking past the first sealing means from flowing into the second chamber, and a separate leak detection passage extending from the interior of the first chamber outwardly to the exterior thereof and located in the end wall portion of the first chamber and between the first and second sealing means and directly openly communicating with the first chamber for the flow of any fluid leaking past the first sealing means to a visible location outside of the valve body to indicate that the first sealing means requires replacement.

4,413,648

## HYDRAULIC VALVES

Ronald B. Walters, Wembley, and Anthony G. Hammond, Guildford, both of England, assignors to Sperry Limited, Cobham, England

Filed Jul. 24, 1980, Ser. No. 171,894

Claims priority, application United Kingdom, Jul. 26, 1979, 7926162

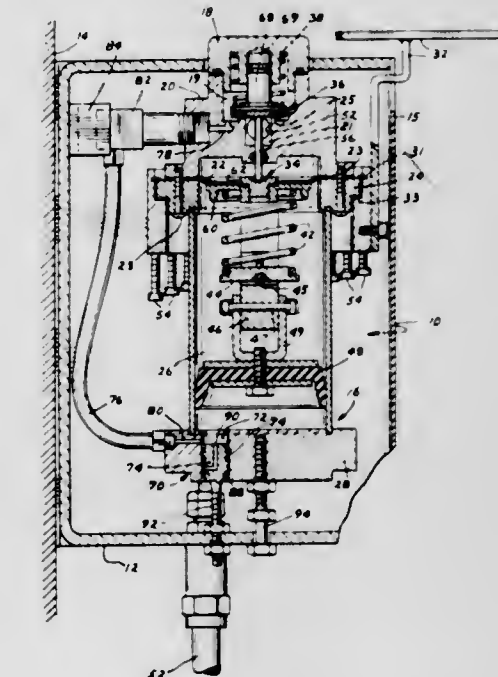
Int. Cl.<sup>3</sup> F16K 31/122, 31/02

U.S. Cl. 137—486

4 Claims

1. A hydraulic control valve comprising a main valve having a main valve inlet port and a main valve outlet port and incorporating a fluid pressure actuated valve piston located in a matching valve cavity and having first and second ends, said valve piston cooperating with said main valve outlet port for forming a variable metering orifice to control flow from said inlet port to said outlet port, said valve piston having at least one end-to-end fluid duct such that both ends of the valve piston are exposed to the pressure at the inlet to the metering orifice, said valve piston ends having equal areas, said valve piston comprising a collar defining a first effective control surface area and a second effective control surface area equal to the first effective control surface area, a pilot stage including a pilot valve and variable flow setting means acting on said pilot valve, fluid control means through which a controlled proportion of fluid pressure acting in operation of the valve on said

2. A multi-value air pressure regulator including: a main body member providing an unregulated first pressure cavity, a regulated second pressure cavity and a valve seat between those cavities; a diaphragm in sealing relation to said second cavity and spaced from said valve seat; a first conduit open from a source of air at a maximum pressure to said first cavity;



4,413,649

## AIR PRESSURE REGULATOR

Charles R. Rodd; Doris M. E. Rodd, both of Rte. 3, Box 59, and Richard L. Scheuerman, 317 E. Chestnut, all of Redwood Falls, Minn. 56283

Filed Mar. 29, 1982, Ser. No. 363,017

Int. Cl.<sup>3</sup> F16K 31/12

U.S. Cl. 137—505.39

19 Claims



a second conduit open from the second cavity to a location for use of air at a regulated pressure not greater than said maximum pressure;

a regulator valve operably associated with said diaphragm to move into sealing relation with respect to said valve seat responsive to movement of said diaphragm in a first direction away from said second cavity and to move into clearing relation to said valve seat responsive to movement of said diaphragm in a second direction toward said second cavity;

a pressure regulation spring having a first end in force-transmitting relation to said diaphragm in position to tend to move said diaphragm toward said second cavity;

a spring harness on a second end of said pressure regulation spring;

spring drive means operative on said spring harness to force said pressure regulation spring to tend to move said diaphragm in said second direction;

control means operative selectively to enable and to disable said spring drive means;

a bar operably connected with said spring harness to move in a first direction responsive to movement of the spring harness in a first direction and to move in a second direction responsive to movement of the harness in a second direction under the influence of said spring drive means;

a plurality of bar movement stop means movably mounted with respect to said main body member and positionable to interrupt the movement of the bar in its second direction;

said stop means being serially movable to selectively position any one of said stop means in operative interferring alignment with said bar; and

each of said stop means being of configuration, when in operative alignment with said bar, to interrupt the bar movement, when said drive means is enabled, at a different operative distance from the valve seat from that of other stop means when so aligned so that the minimum pressure in the second cavity at which the regulator valve first comes into sealing contact with the valve seat can be different for every stop means so aligned.

#### 4,413,650 HYDRAULIC SPOOL VALVES WITH CONTROLLED BY-PASS

Walter Kropp, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Holriegelskreuth, Fed. Rep. of Germany

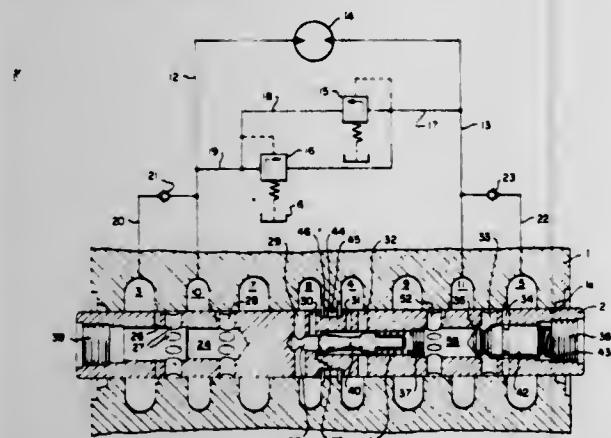
Filed Apr. 24, 1981, Ser. No. 257,148

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016533

Int. Cl.<sup>3</sup> F15B 13/04

U.S. Cl. 137—596.13

3 Claims



1. A valve for controlling the flow of fluid between a pump, a consumer of hydraulic energy and a reservoir comprising a housing having a bore, a spool slidable in said bore, said spool having a fluid by-pass including at least one restrictor passage therein, a plurality of spaced chambers in said housing surrounding the bore and spool, connections from two of said chambers to opposite sides of consumer of hydraulic energy, a

connection from at least a third and fourth one of said plurality of chambers to a pump and a connection from at least a fifth one of said plurality of chambers to a reservoir, said chambers and spool being arranged so that in a first position said two chambers having a connection to the energy consumer are selectively closed and the pump is directly connected to the reservoir through said third and fifth chambers, through said fluid by-pass in the spool, and in a second position of the spool the said fourth chamber connected to the pump is connected to one of said two chambers connected to the energy consumer and in an intermediate position between said first and second position the said third chamber is connected to said reservoir through said at least one restrictor in the spool and through the fifth chamber, said fluid by-pass having an adjustable pressure control valve controlling the flow therethrough and through the restrictor passage.

#### 4,413,651 DIAPHRAGM VALVE AND METHOD

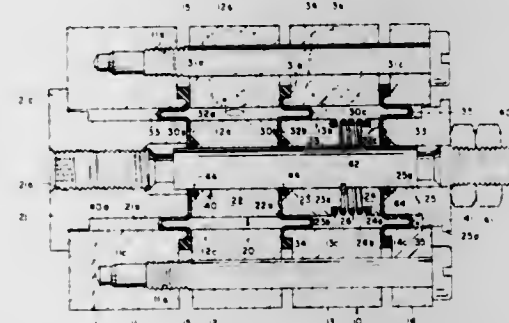
Kip B. Goans, Harvey, La., assignor to Baker Cac, Inc., Belle Chasse, La.

Filed Aug. 24, 1981, Ser. No. 295,205

Int. Cl.<sup>3</sup> F16K 11/02

U.S. Cl. 137—625.25

16 Claims



1. A fluid pressure valve, comprising: a hollow body; an actuator mounted in the bore of said hollow body for limited axial reciprocating movement relative thereto; an annular chamber defined between the exterior surface of said actuator and the bore of said hollow body; an annular flexible diaphragm; means on said hollow body for sealingly anchoring the outer periphery of said annular diaphragm; means on said actuator for sealingly anchoring the inner periphery of said annular diaphragm, thereby dividing said annular chamber; means for creating a fluid pressure said annular chamber; said diaphragm having an annular re-entrant portion disposed between and concurrently contacting said bore of the hollow body and the exterior surface of said actuator in sealing relation by the pressure force of said fluid pressure differential, said re-entrant portion having at least one aperture therein, each said aperture in said diaphragm being surrounded by an annular ridge of elastomeric material bonded to said diaphragm; said aperture being disposed between said hollow body bore and said actuator relative to said hollow body and being sealingly engaged with one of said hollow body bore and said actuator exterior surface in another axial position of said actuator relative to said hollow body.

#### 4,413,652 GAS-LIQUID ACCUMULATOR

Murry Allewitz, Houston, Tex., assignor to Oil Air Industries, Inc., Houston, Tex.

Filed Mar. 30, 1981, Ser. No. 248,143

Int. Cl.<sup>3</sup> F16L 55/04

U.S. Cl. 138—31

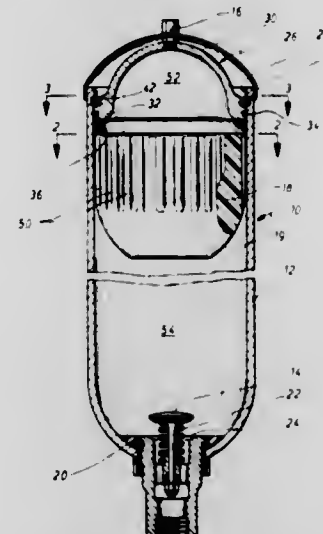
7 Claims

5. In a gas-liquid accumulator having a housing, a spring loaded liquid inlet-outlet valve connected to the bottom of the housing, and a gas charging and release valve for charging and releasing gas from the housing, the improvement in a separator

in the housing for separating the gas and liquid and actuating the liquid valve comprising,

a solid cylindrical buoyant float having a tapered bottom, and

a plurality of axially extending recesses around its outer periphery for preventing the float from sticking on the interior of the housing.



7. In a gas-liquid accumulator having a housing, a spring loaded liquid inlet-outlet valve connected to the bottom of the housing, a gas charging and release valve for charging and releasing gas from the housing, a separator in the housing for separating the gas and liquid and actuating the liquid valve, the improvement in the liquid inlet-outlet valve comprising, said valve being a poppet valve in which the valve element is enclosed by a resilient coating, and an annular resilient ring bonded to the coating and positioned to seat on the valve seat.

#### 4,413,653 INFLATION ANCHOR

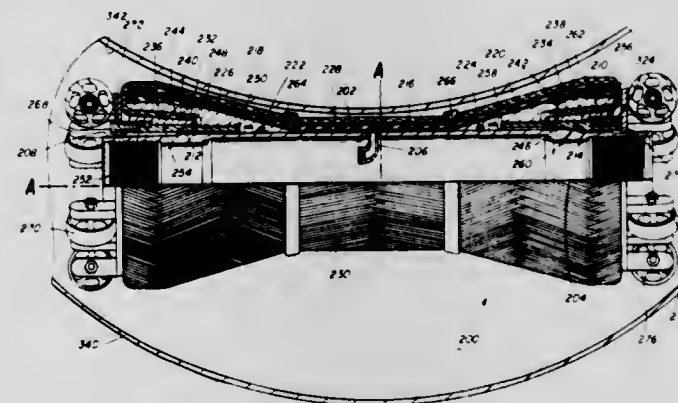
Ernest E. Carter, Jr., Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 8, 1981, Ser. No. 309,621

Int. Cl.<sup>3</sup> F16L 55/12

U.S. Cl. 138—89

14 Claims



1. An inflation anchor adapted for use in a conduit, comprising:

a substantially cylindrical mandrel;

an anchor assembly comprising an anchor and a wedge mounted at each end of said mandrel;

an inflatable elastomeric bladder surrounding said mandrel and each of said anchor assemblies; and

an expandable fabric of substantially tubular configuration surrounding said bladder, said anchor assemblies and said mandrel, each end of said fabric being wrapped around the longitudinally outermost extremity of each anchor, and tucked against an interior surface thereof, being clamped against said anchor by said wedge.

#### 4,413,654 CLEAN OUT DEVICE

Guenter Jahn, Winnipeg, Canada, assignor to Orifice Industries Ltd., Winnipeg, Canada

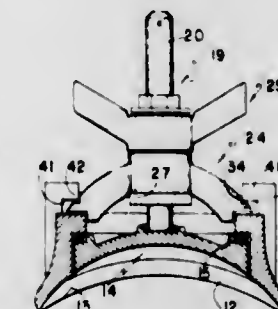
Filed Jan. 22, 1982, Ser. No. 341,907

Claims priority, application United Kingdom, Jan. 22, 1981, 8101992

Int. Cl.<sup>3</sup> F16L 55/10

U.S. Cl. 138—92

38 Claims



1. A clean out device for use within the wall of pipes, conduits, clean out elbows, tanks, chutes and the like comprising in combination a centrally apertured frame, the peripheral wall of the frame defining the central aperture therein, a detachable cover plate selectively and sealably engageable around the underside part of the wall defining the aperture, for selectively closing said aperture, and a clamping assembly secured to said cover and extending substantially perpendicular from the outer surface thereof, and means on the upper side of said frame cooperating with said clamping assembly to hold said cover in the closed, sealed relationship with said frame, said clamping assembly also including means cooperating with said frame, to move said cover out of sealing engagement with said frame, said clamping assembly including a screw threaded stem secured to and extending upwardly from said cover plate, a cylindrical element screw threadably engaging upon said stem, a clamping member freely engaging the lower part of said cylindrical element and cooperating with said frame, means retaining said clamping member upon said cylindrical element, an actuating member engaging said cylindrical element above said clamping member, said actuating member being operatively secured to said cylindrical element to rotate said cylindrical element upon said stem, and means retaining said actuating member upon said cylindrical element.

#### 4,413,655 PIPE REPAIR BYPASS SYSTEM

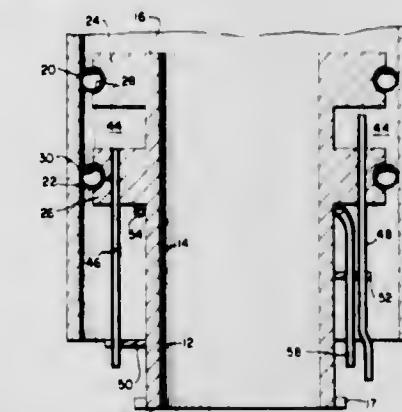
George T. Brown, Box 412, 255 Edge Ave., Valparaiso, Fla. 32580

Filed Apr. 14, 1981, Ser. No. 253,906

Int. Cl.<sup>3</sup> F16L 55/12, 55/18

U.S. Cl. 138—97

8 Claims



1. A pipe repair bypass device, comprising a tubular housing having a central passageway extending therethrough along a longitudinal axis and opening on opposite ends of said housing; coupling means, mounted on one end of said housing, for attaching a conduit to said housing in fluid communication with said passageway;



seal means comprising two, annular, expandable seals, mounted on an exterior surface of said housing upstream of the area to be repaired and spaced along said longitudinal axis, for forming a seal between said housing and a pipe in which said housing is mounted, said seal means defining an interstage volume therebetween which is sealed upon expansion of said seal means against the pipe; means for expanding said seal means in a direction substantially perpendicular to said longitudinal axis; and purge gas means, located between said seal means and said coupling means, for supplying gas to the pipe interior outside of said housing and downstream of said interstage volume, said seal means being completely located upstream of said purge gas means; whereby, the device safely relieves the pressure on said seal means by conveying the fluid in the pipe through the conduit, and said purge gas means produces turbulent flow of purge gas.

4,413,656

## WRAP-AROUND DEVICE

Kenneth B. Pithouse, Wiltshire, England, assignor to Raychem Limited, London, England

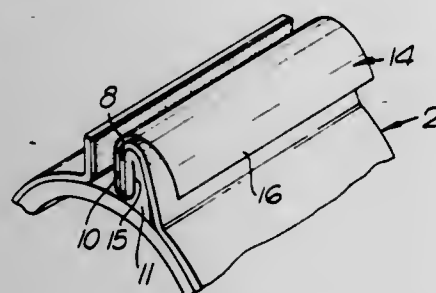
Filed Aug. 26, 1981, Ser. No. 296,278

Claims priority, application United Kingdom, Sep. 13, 1980, 8029661

Int. Cl.<sup>3</sup> F16L 57/00

U.S. Cl. 138—110

12 Claims



1. A wraparound device for enclosing at least part of an elongate substrate, comprising:

a dimensionally-recoverable cover having an adhesive closure arrangement comprising two closure portions which can be brought into abutment to form an adhesive bond, wherein the adhesive bond is formed by a heat-curable adhesive and after the bond is formed, changes in configuration to form a lap joint by recovery of the cover about the substrate; and

an element of higher thermal conductivity than that of the cover, the element being so arranged that, when the closure portions have been brought together the element extends from an external surface of either of the closure portions so as to be capable of conducting heat to the heat-curable adhesive.

4,413,657

## EXHAUST PIPE WITH VIBRATION DAMPING

Takesada Sasaki, Machida; Hiroshi Endo, Zama; Yoshimasa Zama, Sagami; Masahiko Shiraiishi, Nakatsu; Yosinari Miura, Nakatsu, and Masayuki Yamaguchi, Nakatsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,398

Claims priority, application Japan, Sep. 9, 1980, 55-125010

Int. Cl.<sup>3</sup> F16L 9/14

U.S. Cl. 138—149

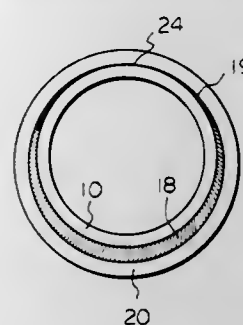
4 Claims

1. An exhaust pipe for discharging hot gas from an internal combustion engine comprising:

an inner tube and an outer tube, the inner surface of the outer tube and the outer surface of the inner tube defining an annular region therebetween;

a heat-resistant intermediate layer filled between said inner tube and said outer tube over the entire distance of said annular region as seen in the longitudinal direction of said

inner and outer tubes and having a thickness of from about 0.1 to 0.5 mm, said heat-resistant intermediate layer comprising a continuous length of heat-resistant material, said length



of said heat resistant material being from about 40% to 70% of the circumference of the annular region; and a gap left in the annular clearance where said heat-resistant material is not filled.

4,413,658

## WARP AND WEFT WEAVING MACHINE

Valentin S. Vilargunte, Paseo Ramon Vall, 49-51, Navas, Spain

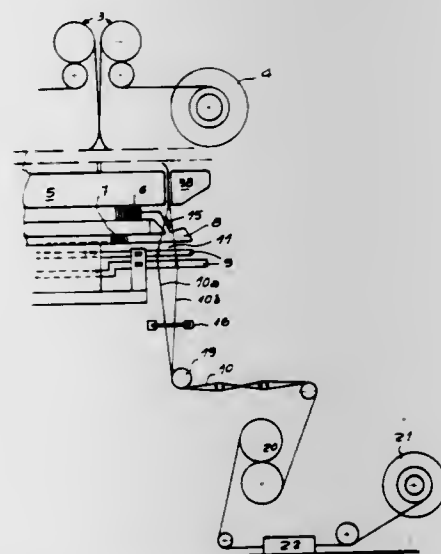
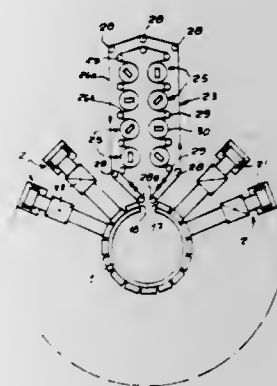
Filed Aug. 24, 1981, Ser. No. 295,330

Claims priority, application Spain, Aug. 25, 1980, 494,902

Int. Cl.<sup>3</sup> D03D 47/26, 37/00, 47/24

U.S. Cl. 139—436

13 Claims



1. A warp and weft weaving machine which comprises: means for providing a warp of parallel threads; means for holding the formed woven fabric; and at least one continuous row of heddles disposed between these two means and actuable in turn from an inlet end of the row to an outlet end thereof to form a continuous shed which moves between said two ends; weft-inserting means; a continuous row of drive plates, which plates are adapted to form, across the shed, a supporting guide for the weft-inserting means; at least one undulating unit for moving the weft-inserting means across the continuous shed in synchronism therewith from inlet end to outlet end so as to tension the weft threads, which are con-

nected to the warp threads by inversion of the relative positions of tenters forming the shed; at least one inserting-means loading station adapted to load onto each said inserting means a measured length of weft thread corresponding to the consumption of thread for forming a weft pass; and means for moving the weft-inserting means between the outlet end of the shed and its inlet end, said means extending along a path in which is located said at least one loading station, said means for moving said weft-inserting means including means for positively supporting said weft-inserting means along said path between the outlet and inlet ends of the shed and for positively supporting said weft-inserting means as the latter are transferred from said outlet end of said shed to said moving means and from said moving means into said inlet end of said shed.

4,413,659

## APPARATUS FOR FEEDING SPIRAL WIRE SPRINGS FROM COILING MACHINES TO A SPRING CORE ASSEMBLY MACHINE

Ernst Züngerle, St. Gallen, Switzerland, assignor to Spühl AG, St. Gallen, Switzerland

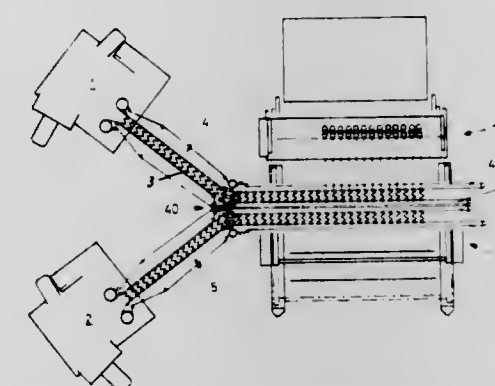
Filed Dec. 28, 1981, Ser. No. 335,030

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101014

Int. Cl.<sup>3</sup> B21F 27/00

U.S. Cl. 140—3 CA

4 Claims



1. An apparatus for supplying spiral wire springs (3) from a spring coiling machine to a spring core assembly machine (7), the spring coiling machine feeding an endless conveyor belt pair which supports end rings of the springs; said conveyor belt pair supplying springs in a row to a transfer system which removes a row of springs at a time from the conveyor belt pair and delivers said row into the spring core assembly machine by means of a plurality of gripping arms (20), wherein the transfer system is movable towards and away from the spring core assembly machine, characterized by:

- two spring coiling machines (1, 2) each supplying an associated endless conveyor belt pair (4, 5),
- the two conveyor belt pairs being arranged in parallel to each other in the area of the transfer system (6), and
- the transfer system including a plurality of gripping arms (20) and being periodically driven such that said gripping arms alternately remove a row of springs first from one and then from the other conveyor belt pair (4, 5).

4,413,660

## APPARATUS FOR TWIST-TYING CEILING HANGERS FROM JOISTS

James R. Conrad, 1631 Grandview, Glendale, Calif. 91201

Filed Sep. 21, 1981, Ser. No. 304,245

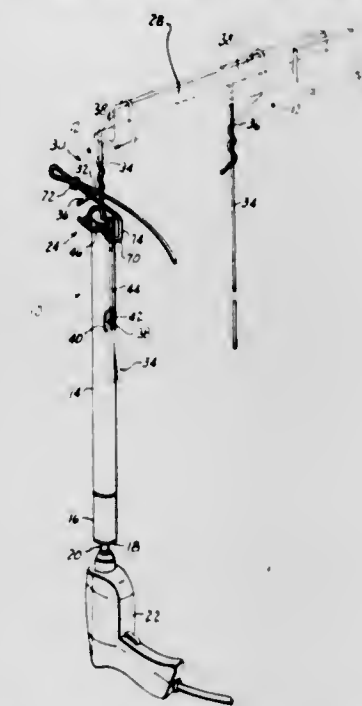
Int. Cl.<sup>3</sup> B21F 15/04

U.S. Cl. 140—119

18 Claims

1. Apparatus for the rapid twist-tying of a wire ceiling hanger onto a ceiling joist, said wire hanger comprising easily bendable wire of U-shape with a relatively longer leg and a relatively shorter leg having their respective axis in a common plane and radially spaced for straddling said joist, said apparatus comprising an axially rotatable handle slidably engaging

said joist-straddling wire hanger by the longer of its legs and radially inward of said hanger shorter leg, and a fork pivotally mounted on the handle having a tang and a pair of non-coplanar arms the radially outer of said arms extending downward and outward from the radially inner of said arms whereby said



fork is adapted to differentially engage and capture said shorter hanger leg for helical movement around and toward said hanger longer leg responsive to simultaneous rotation and axial displacement of said handle relative to said joist whereby said hanger shorter leg is wrapped around said hanger longer leg freely of said handle.

4,413,661

## BOOM MOUNT

Jacques Marchildon, Amos, Canada, assignor to Harricana Metal Inc., Amos, Canada

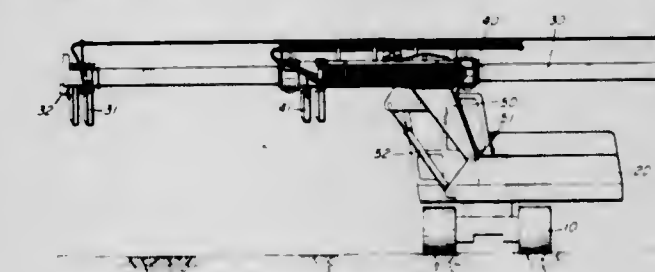
Filed Jun. 30, 1981, Ser. No. 278,987

Claims priority, application Canada, Apr. 7, 1981, 374888

Int. Cl.<sup>3</sup> A01G 23/08

U.S. Cl. 144—2 Z

6 Claims



1. A tree processor comprising a mobile vehicle, a horizontally disposed extendible and retractable boom, a stripper delimeter and tree gripping means mounted on the harvester and movable toward and away from one another during extension and retraction of the boom for removing limbs from trees during movement of the boom; and means mounting said boom on said vehicle, said means comprising a lever pivotally attached at first and second spaced apart positions respectively to said vehicle and to a fixed section of the boom about first and second parallel pivot axis so that the boom can be raised and lowered to respective operative and transport positions while the boom remains horizontal; lock means associated with said second pivotal connection preventing pivotal movement of the boom on the lever when said boom is in its raised operative position, said boom being in a vertical plane laterally off-set with respect to the position of said first pivot on said vehicle in a direction parallel to the pivot axis thereof; and power means for pivoting said lever about said first pivot axis.



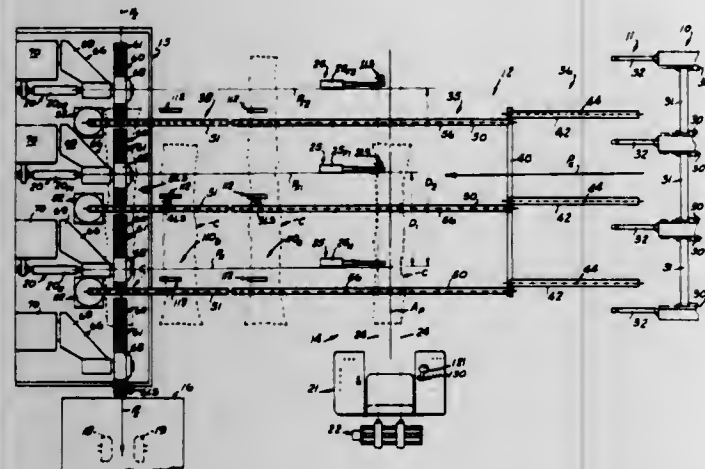
4,413,662

## EDGING SYSTEM

James L. Gregoire, Decatur; Robert D. Wismer, Roswell, and Robert L. Brouer, Conyers, all of Ga., assignors to Forest Industries Machine Corp., Conyers, Ga.  
Filed Jun. 8, 1981, Ser. No. 271,601  
Int. Cl.<sup>3</sup> B27B 1/00

U.S. Cl. 144—356

9 Claims



1. A method of orienting a cant on the infeed unit of an edger comprising the steps of:
  - moving the cant to a positioning station remote to the infeed unit;
  - arresting the movement of the cant in the positioning station;
  - superimposing on the cant a plurality of parallel, spaced apart, guide light beams corresponding to the paths along which the edger will trim the cant to form dimensioned lumber;
  - shifting the cant with respect to the guide light beams with a pair of spaced apart, manually controlled positioning mechanisms until the guide light beams lie inside the longitudinally extending waness on opposite sides of the cant to orient the cant;
  - sensing the position of each of the positioning mechanisms when the cant is oriented;
  - storing the sensed position of each of the positioning mechanisms;
  - moving the cant into the infeed unit;
  - engaging the cant with a pair of spaced apart infeed stops at spaced apart positions corresponding to the positions at which the positioning mechanisms engaged the cant;
  - positioning each of the infeed stops according to the stored sensed position of the corresponding positioning mechanism to locate the cant on the infeed unit so that the infeed unit will feed the cant into the edger to cause the edger to trim the cant along the paths of the guide light beams at the positioning station when the cant was oriented.

4,413,663

## PNEUMATIC TIRE

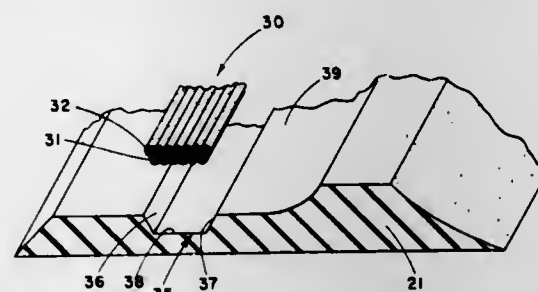
Gordon A. Sullenger, 3068 Kent Rd., 502C, Stow, Ohio 44224  
Filed Nov. 27, 1981, Ser. No. 325,131  
Int. Cl.<sup>3</sup> B60C 13/00

U.S. Cl. 152—353 R

7 Claims

1. A pneumatic tire casing comprising a tread portion for receiving a tread, beam means for mounting on a rim, a pair of sidewalls, one of said sidewalls extending between one axial extremity of said tread portion and said means for mounting on a rim and the other of said sidewalls extending between the other axial extremity of said tread portion and said means for mounting on a rim, a circumferential slot in at least one of said sidewalls, and inlay ring means integrally bonded in each said circumferential slot in said sidewalls during vulcanization of said sidewalls, said inlay ring means constituted of rubber having reinforcing cord means providing stabilization and

reinforcement for said sidewall, said reinforcing cord means being constituted of a continuous spiral of reinforcing cord, at



least one inlay ring means in the tire casing constituting a decorative member.

4,413,664

## CORD-LOCKING DEVICE

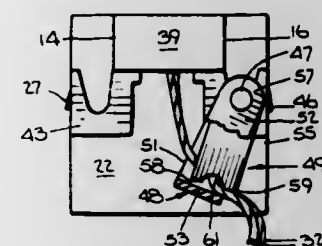
Johannis Isha, Utrecht, Netherlands, assignor to Verosol B.V., Enschede, Netherlands

Filed Jul. 9, 1981, Ser. No. 281,850

Int. Cl.<sup>3</sup> E06B 9/38

U.S. Cl. 160—176 C

10 Claims



1. A cord-locking device for cord operated window blinds adapted for use as an end cap of the upper rail supporting the blind, comprising:
  - a channel member generally U-shaped in cross section having two sides, a bottom, an open top and first and second ends and being elongated in a horizontal direction between the first and second ends;
  - an opening through the bottom of the U-shaped channel member adjacent the first end to permit the cord to pass therethrough, the direction of the cord being substantially vertical below said opening, the direction of said cord above said opening being horizontal along the direction of the open top of said channel, said cord disposed in the open top of said channel and exiting from said second end and being operative to lift or lower the window blind;
  - a U-shaped axle support integral with the channel member, said axle support having an open top, the open top extending in the longitudinal direction of the U-shaped channel member alongside the U-shaped channel member;

4,413,666

## EXPENDABLE DIE CASTING SAND CORE

Enno H. Page, San Lorenzo, Calif., assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 80,833, Oct. 1, 1979, abandoned. This application Aug. 6, 1981, Ser. No. 290,447  
Int. Cl.<sup>3</sup> B22C 3/00, 1/22, 9/10

U.S. Cl. 164—72

13 Claims

1. A method for forming a die casting having an undercut region comprising:
  - (A) forming a die casting having a casting surface that includes at least one expendable sand core that forms said undercut region, said sand core consisting essentially of:
    - (a) sand, and
    - (b) binding agent comprising from about 0.25 weight percent to about 5 weight percent of said sand, said binding agent consisting essentially of an acid curable resin and an oxidizing agent, said oxidizing agent comprising from about 20 weight percent to about 70 weight percent of said resin,
    - (c) curing said core with sulphur dioxide, and
    - (d) coating said cured core with a coating material consisting essentially of:
      - (1) from about 4 weight percent to about 30 weight percent suspending agent,
      - (2) from about 60 weight percent to about 95 weight percent particulate refractory material comprising calcium aluminate particles having an average particle size of 20 to 25 microns and having no particle size greater than 40 to about 70 microns
      - (3) 0 to 35 weight percent liquid vehicle, and
      - (4) from about 1 weight percent to about 10 weight percent organic binding agent selected from the group consisting of thermoplastic resins, vinyl toluene/butadiene copolymer, styrene/butadiene copolymer, vinyl toluene/acrylate copolymer, styrene/acetylene copolymer, or acrylate homopolymers;
  - (B) injecting molten metal into said die casting die,
  - (C) permitting said injected molten metal to solidify to form said die casting having said undercut region, and
  - (D) removing said die casting from said die and separating said expendable core from said undercut region within said die casting.

4,413,665

## DEVICE FOR PREVENTING OVERWINDING OF A ROLLER BLIND

Sean Corcoran, 34, Clarinda Park West, Dun Laoghaire, County Dublin, Ireland

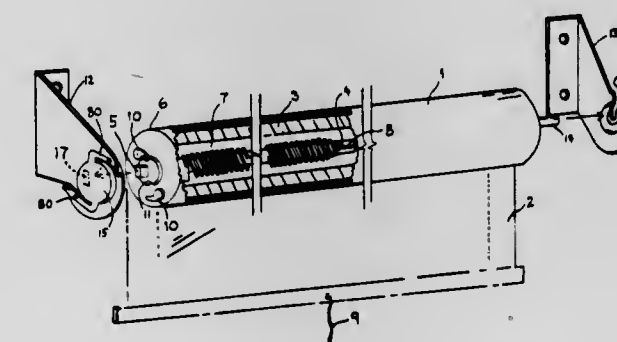
Filed Nov. 21, 1980, Ser. No. 209,211

Claims priority, application Ireland, Dec. 7, 1979, 2370/79

Int. Cl.<sup>3</sup> A47G 5/02; A47H 1/00

U.S. Cl. 160—315

10 Claims



1. In or for a roller blind having an axially elongate cylindrical roller, a spindle axially disposed within a housing at one end of the roller and terminating in a flat pin which extends beyond the end of the roller, a torsion spring disposed around the spindle and means for tensioning the torsion spring such that on unwinding it may rotate the roller in a shade winding direction, the improvement comprising the provision of a slip coupling which normally acts to resist unwinding of the torsion spring when the tension in the torsion spring is at or below a predetermined tension but which when the torsion spring is overstressed is adapted to slip to permit unwinding of the torsion spring until the tension in the torsion spring is again at or below said predetermined tension.

4,413,667

SUPERVISING THE INCLINATION OF MOLD SIDES  
Hans Schrewe, Düsseldorf; Lothar Parschat, Essen; Klaus Franken, Krefeld, and Peter Geisblüsch, Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

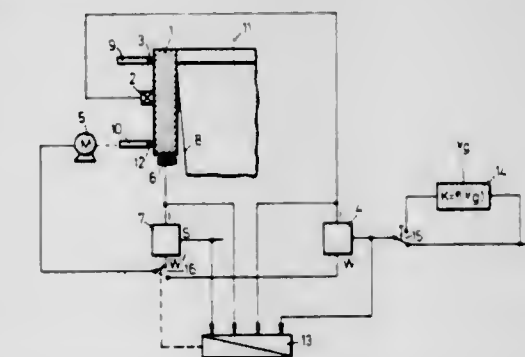
Filed Mar. 10, 1982, Ser. No. 356,302

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3110012

Int. Cl.<sup>3</sup> B22D 11/16, 11/04, 11/10

U.S. Cl. 164—154

6 Claims



1. An apparatus for adjusting the inclination of a small side of a mold for continuous casting of slab ingots having a rectangular cross section, comprising:
  - first transducer means operatively coupled to the small mold



side for detecting an inclination thereof in relation to a direction of casting and providing an output representative thereof;

second transducer means operatively coupled to the small mold side at an end thereof for determining a gap between a casting emerging from the mold and the small mold side and producing an output representative thereof;

adjusting means coupled to the small mold side for positioning and inclining the small mold side in response to control signals received;

first controller means connected to the first transducer means for receiving the output thereof and further connected for receiving a first reference signal indicative of a desired inclination for the small mold side and providing a correction signal in response to the output of the first transducer means and the first reference signal;

second controller means connected to the second transducer means for receiving the output thereof and further connected for receiving a second reference signal indicative of a desired gap between the emerging casting and the small mold side, and providing a correction signal in response to the output of the second transducer means and the second reference signal;

selector means operatively associated with said first and second controller means for applying one or the other of the corrective signals as control signals to the adjusting means.

4,413,668

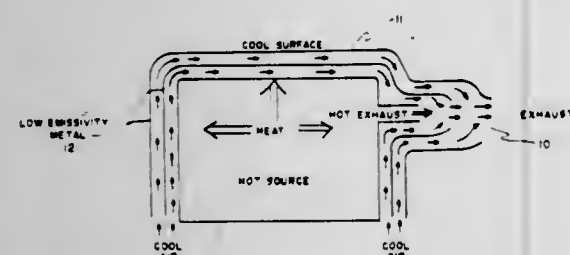
## THERMAL SIGNATURE SUPPRESSION

Edward F. Allard, 8904 LaGrange St., Lorton, Va. 22079  
Filed Mar. 7, 1980, Ser. No. 128,031

Int. Cl.<sup>3</sup> F24H 3/00

U.S. Cl. 165—1

2 Claims



1. A technique for reducing the thermal signature of an object having a temperature greater than its environment by: enclosing the object in a multi-layered enclosure wherein the various layers of material are separated by a space through which cool outside air is caused to flow;

causing air cooler than the object to flow between the layers of the multi-layered enclosure to absorb heat from the surfaces of the various layers of material over which the air flows;

exhausting the heat laden air to the outside environment to effect a reduction in the temperature gradient between the object being cooled and the outside environment; and

providing additional cooling by utilizing the air flow through the air entrainment means for cooling the object whose thermal signature is being reduced, whereby a significant portion of the heat emanating from the object may be effectively exhausted to the outside environment.

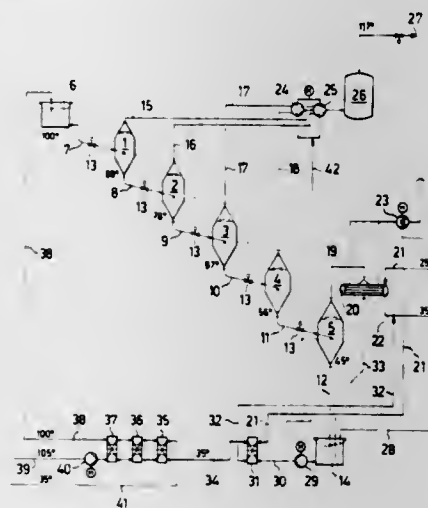
4,413,669  
METHOD OF HEAT EXTRACTION FROM AN AQUEOUS CARRIER MEDIUM

Harald Hantelmann, Ravensburg, Fed. Rep. of Germany, assignor to Escher Wyss Limited, Zurich, Switzerland  
Filed Apr. 30, 1981, Ser. No. 258,929

Claims priority, application Switzerland, May 20, 1980, 3918/80; Fed. Rep. of Germany, May 30, 1980, 3020504  
Int. Cl.<sup>3</sup> F28C 3/08

U.S. Cl. 165—1

4 Claims



1. A method of cooling and thereby utilizing the inherent heat of a hot industrial refuse comprising a salts laden or otherwise contaminated aqueous medium which is at a temperature below its normal boiling point and which, as a result, becomes better disposable as far as the environment is concerned, the method comprising the steps of passing the hot contaminated refuse in indirect heat transfer relation with clean boiler feed water which is at a lower temperature in a heat absorption zone to thereby heat the feed water and cool the contaminated refuse without comingling the two media; chilling the heated feed water by passing it through an expansion zone separate from the heat absorption zone and comprising a plurality of serially arranged expansion stages, whereby pure water vapor is produced from the feed water in each stage and a chilled feed water portion occurs at the last stage; passing said chilled feed water portion back to the heat absorption zone to thereby utilize that portion to cool additional hot refuse; and effecting expansion in said stages by separately withdrawing the vapors of the individual stages and subjecting the main portion of those vapors in parallel to thermo compression to produce therefrom pure consumable steam at a temperature higher than the temperature of the hot contaminated refuse which is being cooled.

4,413,670

PROCESS FOR THE ENERGY-SAVING RECOVERY OF USEFUL OR AVAILABLE HEAT FROM THE ENVIRONMENT OR FROM WASTE HEAT

Alfred E. Ritter, Mülheim, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mülheim, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 268,970

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020565

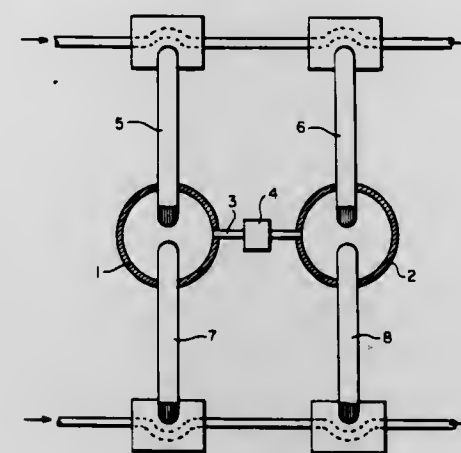
Int. Cl.<sup>3</sup> F28D 21/00

U.S. Cl. 165—1

12 Claims

1. A process for the energy-saving recovery of useful heat from the environment or from waste heat with the use of a reversible chemical reaction of the formation and decomposition of metal hydrides, comprising the steps of: providing two vessels interconnected by lines and which are filled with about equal parts of a metal hydride and the hydride forming metal or the hydride forming alloy, alternately and successively charging and discharging the vessels with hydrogen by pres-

sure variation and exchanging the heat of compression and the hydride formation, removing the useful heat and replacing consumed heat of expansion and hydrogen evolution of the



hydride by heat exchange with the environment or by waste heat, wherein the heat exchange removing useful heat and the heat exchange with the environment or waste heat is conducted by heat pipes which transfer heat only in one direction.

4,413,671

## SWITCHABLE ON-OFF HEAT PIPE

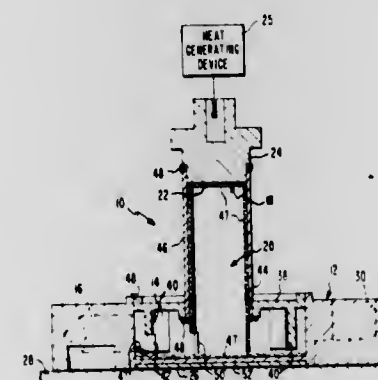
Algerd Bastiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed May 3, 1982, Ser. No. 374,570

Int. Cl.<sup>3</sup> F28D 15/00; F28F 13/00

U.S. Cl. 165—1

13 Claims



13. A method for respectively preventing and allowing heat transfer between a source of heat and a heat sink below and above a predetermined temperature in a heat pipe having an evaporator at the heat source, a condenser at the heat sink and a working fluid and an inert gas sealed in the heat pipe, comprising the steps of thermally insulating the heat source from the heat sink, providing a reservoir for the inert gas and maintaining the reservoir at a temperature less than that of the condenser.

4,413,672

CENTRAL DESK AIR CONDITIONING CONTROL SYSTEM

Donald L. Sidebottom, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 5, 1982, Ser. No. 365,764

Int. Cl.<sup>3</sup> F24F 3/00; G05D 23/00

U.S. Cl. 165—22

12 Claims

1. An air conditioning system including a plurality of air conditioning units and a central control system, said air conditioning system comprising:

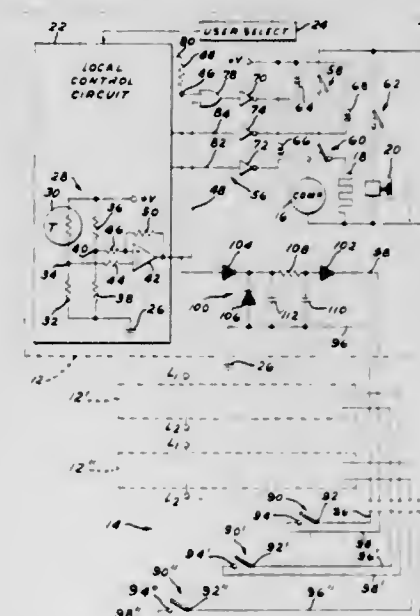
a) at least one major energy-consuming load included in each of said air conditioning units;

b) relatively local control circuitry respectively connected to each of said air conditioning units for directing the respec-

tive major energy-consuming load to cycle on and off as required to maintain a desired temperature in a space conditioned by the respective units;

circuitry included within each of said air conditioning units defining a reference potential, and a terminal at the reference terminal;

a) controlled power switching circuit for the respective major energy-consuming load included within each of said air conditioning units, each of said controlled power switching circuits having both a normal mode in which said major energy-consuming load operates in response to said local control circuitry to maintain the desired temperature and a low-energy mode in which operation of said major energy-consuming load is disabled, and each of said controlled power switching circuits having a control input effective when connected to the reference potential to select one of said modes and effective when not con-



ected to the reference potential to select the other of said modes;

a) relatively remote control switch for each of said air conditioning units, each of said relatively remote control switches having two terminals connected via conductors respectively to said reference terminal and to said control input in the corresponding air conditioning unit such that said one of said modes is selected when said remote control switch is closed without affecting said relatively local control circuitry; and

a) protective network included in each of said air conditioning units interposed between said conductors and said reference terminal and said control input, said protective network including elements arranged to prevent damage to said local control circuitry, said reference circuitry, or to said power switching circuit in the event voltage of either polarity is inadvertently applied to said conductors.

4,413,673

DEVICES FOR SUPPLYING TUBE EXCHANGERS WITH CLEANING BODIES AND FOR RECOVERING THESE BODIES

Herve C. de Maigret, 310 Stenton Ave., Plymouth Meeting, Pa. 19462

Filed Oct. 18, 1982, Ser. No. 434,727

Int. Cl.<sup>3</sup> F28G 1/12

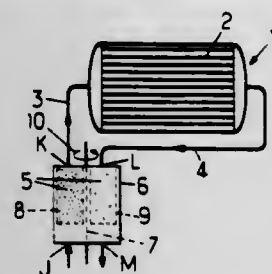
U.S. Cl. 165—95

9 Claims

1. A device for cleaning the tubes (2) of a heat exchanger (1) through which flows a fluid (F) coming from an upstream duct (3) and discharged into a downstream duct (4), comprising a plurality of cleaning bodies (5) adapted to be immersed in the circulating fluid and carried along thereby into the tubes for the purpose of cleaning these latter, and means for injecting said cleaning bodies into the upstream duct and for collecting



these bodies from the downstream duct while separating them at that time from the carrier fluid, characterized in that the injection and collection means comprise: a sealed box (6) provided with four apertures (J,K,L,M) connected externally so that two of them (J,K) define axially a section of the upstream duct (3) and the other two (L,M) define axially a section of the downstream duct (4); a rotary support (7) mounted in this box and forming therewith two diametrically opposite compartments A and B which define the two above duct sections for one of the angular positions of this rotary support; means for



providing the sealing between these two compartments; two identical baskets (8,9) for collecting the cleaning bodies, in which baskets the lateral wall and/or the bottom are chosen so as to let the fluid, but not the cleaning bodies, pass there-through, these baskets being mounted on the rotary support, in respectively the two compartments, so as to be open solely in the direction of the exchanger for the above angular position of said support; and means (10) for rotating this support through 180° about its axis (X) so as to switch over the two compartments as well as their baskets.

4,413,674

## TRANSFORMER COOLING STRUCTURE

Randall N. Avery; Charles A. Clayton; Levon R. Floyd; Douglas B. Mackintosh, all of South Boston; Willie A. Powell, Alton, and Michael W. Atkins, Danville, all of Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

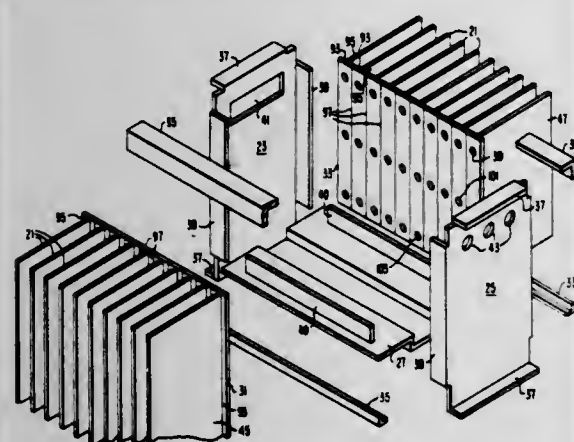
Continuation of Ser. No. 211,147, Nov. 28, 1980, abandoned.

This application Mar. 4, 1983, Ser. No. 472,327

Int. Cl.<sup>3</sup> F28D 15/00; H01F 27/14

U.S. Cl. 165—104.33

11 Claims



1. A tank for electrical apparatus submerged in a cooling fluid for transferring heat from said apparatus to walls of the tank for dissipation therefrom, comprising wall means forming a fluid-containing casing, at least a portion of the wall means having inlet and outlet means for said fluid, a cooling panel extending outwardly from said wall means for dissipating heat to an ambient atmosphere, the cooling panel comprising a pair of oppositely disposed sides having facing peripheral edge portions and end portions that are secured together in a fluid-tight seal, the sides being sheet-like members formed to include aligned corrugated surfaces forming spaced fluid-conducting headers and fluid conduits, one of the sides of the oppositely disposed sides having a first outturned flange along the panel edge opposite the peripheral edge portion, the other of said

sides having a second outturned flange extending in a direction opposite the first flange, the first and second flanges solely comprising said wall means of the tank with the cooling panel being the sole reinforcement of the wall means against internal pressures within the tank, one header extending from the outlet means and the other header extending from the inlet means, the fluid conduits extending between the spaced headers, whereby volume of cooling fluid space is minimized, and each cooling panel having a portion extending above the outlet means so as to accommodate any expansion of cooling fluid where excess heating occurs.

4,413,675

## COOLING SYSTEM PROTECTIVE DEVICE

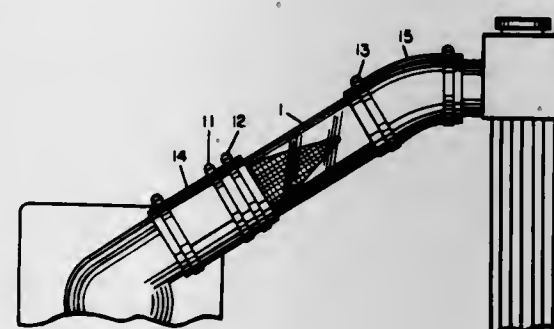
Lloyd D. Gano, 1205 Sandalwood La., Los Altos, Calif. 94022

Filed Aug. 10, 1981, Ser. No. 291,580

Int. Cl.<sup>3</sup> F28F 19/00

U.S. Cl. 165—119

9 Claims



1. In a cooling system in which a continuous stream of coolant fluid normally flows in a given path from an engine to a radiator, a filter assembly comprising: first means including a first particle filtering screen extending across the flow path of said stream of fluid so as to prevent large particles, that is, particles of a predetermined size or larger, within said stream from passing through said screen and reaching said radiator from said engine; and second means including a second particle filtering screen extending across said flow path upstream of and spaced from said first screen for preventing said large particles from passing therethrough, said second screen including a through-hole which is sufficiently large to allow said large particles to pass therethrough but smaller in area than the cross-section of said stream, said through-hole being positioned within said stream to allow said large particles to pass into the space between said first and second screens during the normal direction of flow of said stream while preventing said large particles, once they are within said space, from readily passing back out said through-hole in the event said stream is caused to flow in the opposite direction.

4,413,676

## OIL WELL MONITORING DEVICE

Kendall G. Kervin, Scio, N.Y., assignor to Well Research, Inc., Scio, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,408

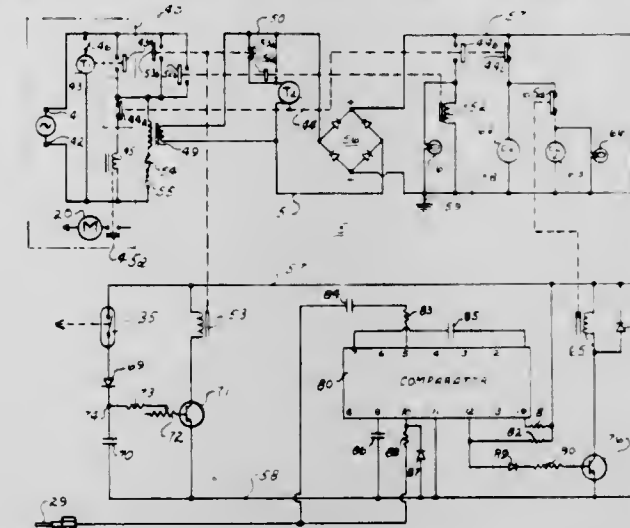
Int. Cl.<sup>3</sup> E21B 43/00; F04B 49/00

U.S. Cl. 166—53

20 Claims

1. An oil well monitoring device for an oil well having a motor-driven pump controlled by a first control switch, comprising, in combination: a housing adapted to be connected in the fluid flow exit from the pumped well; a fluid flow switch in said housing adapted to be actuated upon fluid flow from said well; a resistance probe in said housing to sense the resistance of the pumped fluid relative to the housing wall; and an electrical circuit for said motor; said electrical circuit including first means connected to said

fluid flow switch for determining the existence of fluid flow from the well, said first means including hold-in contact means connected across the first control switch to maintain pump actuation despite first control switch opening, a total flow indicator controlled by said first means,



second means including said resistance probe for determining the difference between oil flow and water flow and controlling an flow indicator, third means including a time switch to terminate pump motor energization upon an absence of fluid flow from the well despite the closed first control switch, and fourth means to maintain said third means energized despite de-energization of said pump motor.

4,413,677

## DUAL STRING WELL PACKER

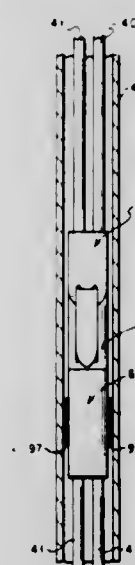
Donald H. Perkins, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 27, 1982, Ser. No. 372,138

Int. Cl.<sup>3</sup> E21B 29/00, 23/08

U.S. Cl. 166—55.1

16 Claims



1. A well packer comprising: a. a pair of parallel mandrel means, each having a passage-way extending therethrough; b. upper and lower body means carried on the exterior of the mandrel means and slidable longitudinally with respect to each other over the mandrel means; c. anchoring means carried by each body means and radially expandable relative to each body means between a retracted position and an expanded position whereby each anchoring means is engageable with the interior of a casing string to prevent longitudinal movement of its associated body means relative to the casing string;

d. packing means carried on the exterior of the mandrel means between the upper and lower body means; e. piston means, carried by said mandrel means, for moving the body means longitudinally toward each other in response to fluid pressure in one of the passageways; f. the longitudinal movement of the body means causing compression of the packing means and radial expansion thereof to form a fluid barrier between the exterior of the mandrel means and the interior of the casing string; g. the same longitudinal movement causing radial expansion of the anchoring means; h. means for locking the lower body means to the mandrel means after completion of the longitudinal movement whereby the packing means are maintained compressed and the anchoring means are maintained radially expanded; i. each anchoring means comprising a plurality of slip elements; j. each body means further comprising a slip carrier and a slip expander which are movable longitudinally towards each other to radially expand the associated slip elements; k. means for releasing the mandrel means from the locking means of the lower body means; and l. means for moving the slip expander of the upper body means longitudinally away from its associated slip carrier to allow retraction of the slip elements carried by the upper body means after the locking means for the lower body means has been released.

4,413,678

## ALARM MEANS FOR USE WITH APPARATUS PROTECTING A DEVICE SITUATED IN A BOREHOLE

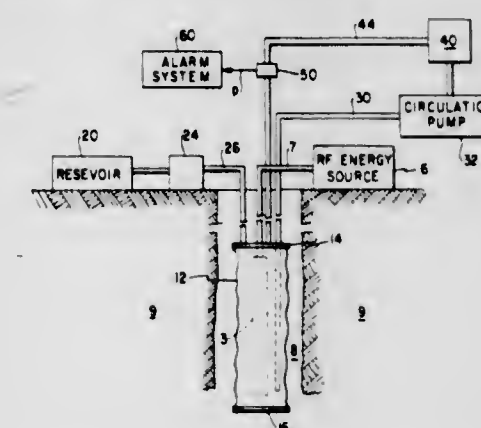
Ronald G. Gillespie, Old Tappan, N.J., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,699

Int. Cl.<sup>3</sup> E21B 33/12

U.S. Cl. 166—57

7 Claims



1. An improvement to an apparatus for the in-situ recovery of hydrocarbons from an oil shale deposit wherein an RF antenna is entered into a borehole traversing the oil shale deposit and is energized so as to heat the oil shale deposit, comprising: inflatable, non-conductive means encompassing said RF antenna for protecting the antenna, means for inflating said inflatable means with a fluid so as to prevent portions of the heated oil shale deposit from contacting said RF antenna, means for sensing the pressure of the fluid and providing a corresponding pressure signal, and means for providing an alarm in accordance with the pressure signal when the pressure of the fluid has decreased; said alarm means includes sample and hold means which periodically sample and hold the pressure signal, means connected to the sample and hold means for comparing the current cycle pressure with the previous cycle



pressure and providing a comparison signal in accordance therewith, and means connected to the comparison means for providing an alarm when the pressure of the current cycle is less than the pressure of the next previous cycle.

4,413,679

**WELLBORE CATHODIC PROTECTION**

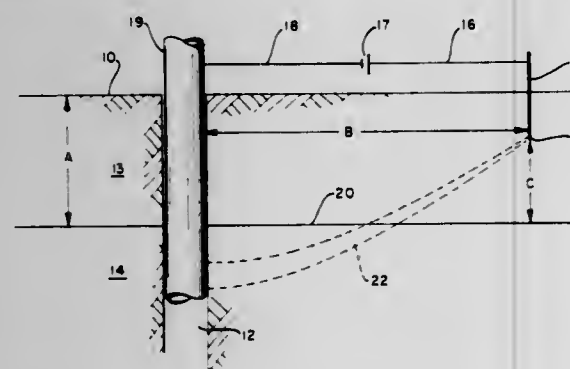
Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 7, 1982, Ser. No. 375,842

Int. Cl.<sup>3</sup> E21B 41/02, 36/04

U.S. Cl. 166—248

3 Claims



1. In a method for the cathodic protection of metal conduit in a wellbore, said wellbore being in part in permafrost which has an electrical resistance greater than that of unfrozen earth, wherein said cathodic protection involves impressing a predetermined electrical current by way of a variable voltage in the earth between said conduit and an anode, said anode being set into the earth a finite distance which is less than the depth of the permafrost, said anode being spaced away from said wellbore, the improvement comprising placing said anode a distance away from said wellbore which is greater than the distance between the bottom of said anode and the bottom of said permafrost, and increasing the impressed voltage sufficiently to match the increased resistivity of the permafrost to thereby maintain said predetermined current between said wellbore and anode, whereby at least part of said current between said wellbore and anode passes downwardly through said permafrost into unfrozen earth below the permafrost.

4,413,680

**PERMEABILITY REDUCTION IN SUBTERRANEAN RESERVOIRS**

Burton B. Sandiford, Placentia; Hoai T. Dovan, Fullerton, and Richard D. Hutchins, Placentia, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 332,940

Int. Cl.<sup>3</sup> E21B 43/22, 33/138

U.S. Cl. 166—270

25 Claims

1. A method for reducing the permeability of the higher permeability zones of a subterranean reservoir having heterogeneous permeability penetrated by at least one well comprising injecting through a well and into said reservoir about 2 to 800 barrels per vertical foot of reservoir to be treated of an aqueous solution or dispersion of (1) a water-soluble or water-dispersible polymer selected from the group consisting of acrylic acid-acrylamide copolymers, polyacrylamides, partially hydrolyzed polyacrylamides, polyalkyleneoxides, carboxyalkylcelluloses, hydroxyethylcelluloses and heteropolysaccharides obtained by the fermentation of starch-derived sugar, (2) a cross-linking agent for the polymer comprising a water-soluble salt of a polyvalent cation which reacts in solution to form a colloidal hydroxide selected from the group consisting of an alkali metal or ammonium aluminate or tungstate, and (3) an amount of a water-soluble alkaline material selected from the group consisting of alkali metal and ammonium hydroxides, alkali metal silicates, and alkali metal phosphates sufficient to raise the pH of the overall aqueous

solution or dispersion to about 10 or above, passing the said aqueous solution or dispersion through the reservoir until the pH has fallen to about 9 or below, and shutting in the well until the reservoir permeability has been reduced.

4,413,681

**METHOD OF CEMENTING A WELL BORE USING A FLUID LOSS ADDITIVE**

Lee F. McKenzie, Arlington, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 14, 1982, Ser. No. 388,334

Int. Cl.<sup>3</sup> E21B 33/138, 33/14

U.S. Cl. 166—293

4 Claims

1. A method of cementing a well bore, comprising the steps of:

mixing together a hydraulic cement, water in an amount to produce a pumpable slurry, and a fluid loss additive comprising the reaction product of a polyamine compound selected from the group consisting of polyalkylenepolyamines, polyalkylenimines, and mixtures thereof, and a high molecular weight sulfonated polymer, said sulfonated polymer having a molecular weight in the range of 500,000 to 8,000,000; pumping said cement slurry to the desired location in said well bore; and allowing said cement slurry to harden to a solid mass.

4,413,682

**METHOD AND APPARATUS FOR INSTALLING A CEMENTING FLOAT SHOE ON THE BOTTOM OF A WELL CASING**

Rudy B. Callihan, San Antonio, and Clyde Wainwright, McQueeney, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 7, 1982, Ser. No. 385,614

Int. Cl.<sup>3</sup> E21B 33/14, 34/08

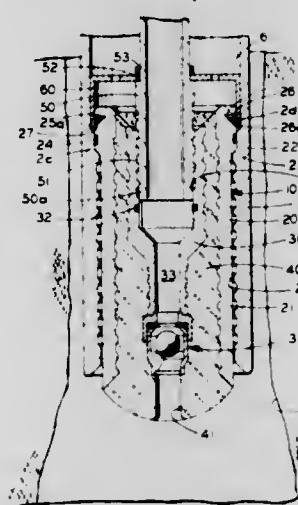
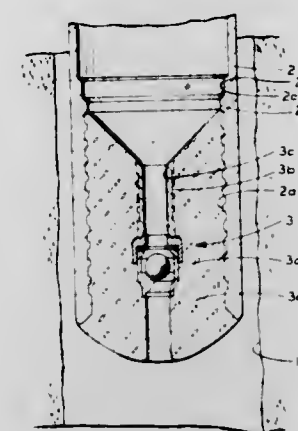
U.S. Cl. 166—382

8 Claims

7. The method of installing a cementing float shoe in the bottom of a well casing comprising the steps of:

(1) providing in the bore of the well casing immediately above the desired location of the cementing float shoe a cylindrical seal bore surface and an upwardly facing locating shoulder; (2) running in the well on a workstring a cementing float shoe having a downwardly facing external abutment surface adjacent an external annular seal, and radially expandable slips disposed above the external annular seal; (3) engaging the external annular seal with the cylindrical seal bore surface and engaging the downwardly facing

external abutment surface on the cementing float shoe with the upwardly facing locating shoulder;



(4) expanding the radially expandable slips into engagement with the adjacent inner wall of the casing by manipulation of the workstring; (5) detaching the workstring from the cementing float shoe.

4,413,683

**FIREPROOF ENCLOSURE FOR VALVE ACTUATOR**

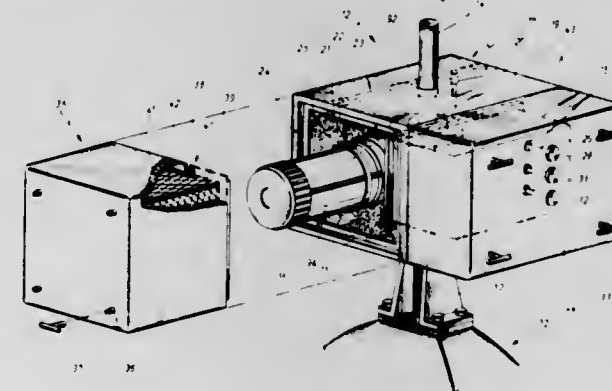
R. G. Hune, Sugarland, Tex., assignor to Thermal Designs, Inc., Houston, Tex.

Filed Oct. 20, 1980, Ser. No. 198,452

Int. Cl.<sup>3</sup> A62C 7/00

U.S. Cl. 169—48

16 Claims



1. A fireproof enclosure for protecting a valve actuator, said fireproof enclosure comprising a plurality of units, one of said units being a center unit adapted for mounting upon a valve actuator and each other unit being an extension unit adapted for mounting upon the center unit to form a tight seal therewith, each unit having a substantially box-shaped frame with expanded metal sides, there being no expanded metal side where an extension unit is mounted upon the center unit, wherein the tight seal between the center unit and each extension

unit is formed by a stepped flange capable of precluding a flame path into said fireproof enclosure and wherein the box-shaped frame of each unit, exclusive of each stepped flange, is substantially completely encased in a homogeneous body of refractory material formed by vacuum molding from a slurry of refractory material into a mold surrounding the exterior of the substantially box-shaped frame of each unit and curing the refractory material deposited thereby.

4,413,684

**LASER-CONTROLLED GROUND LEVELING DEVICE WITH OVERFILL SENSOR AND WHEEL RISE LIMITING DEVICE**

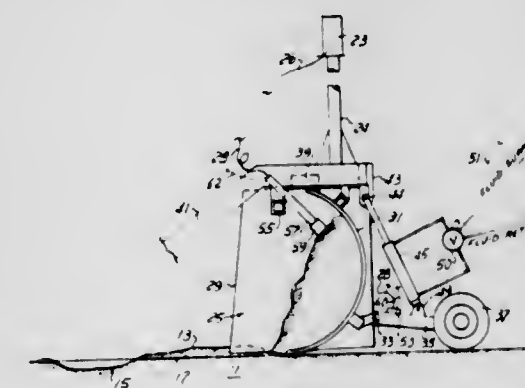
Timothy V. Duncklee, 3124 Collee Ct., Naples, Fla. 33942

Filed Jul. 27, 1981, Ser. No. 287,525

Int. Cl.<sup>3</sup> E02F 3/76; A01B 63/112

U.S. Cl. 172—4.5

4 Claims



1. In an earth leveling laser beam control system comprising earth scraping and storing means controllably displaceable over rough terrain for leveling said terrain, level defining laser beam transmitting means, laser beam receiving means mounted on said earth scraping and storing means, indicating means associated with said laser beam receiving means for indicating alignment of said earth scraping and storing means with said laser beam, and control means for lowering and raising said earth scraping and storing means for leveling said rough terrain to a pre-determined grade level as defined by said laser beam, the improvement comprising overflow sensor means in said scraping and storing means for detecting an excess of scraped earth in said scraping and storing means, means actuated by said overflow sensor means for dumping earth from said scraping and storing means upon receiving an appropriate signal from said overflow sensor means for preventing overflowing of said scraping and storing means, means actuated by said indicating means for preventing said control means from lowering said earth scraping and storing means while said indicating means is on, ground engaging wheels, pivotable support means interconnecting said ground supported wheels and said earth scraping and storing means, and control means mounted on said pivotable support means for maintaining said pivotal support means below a pre-determined angle for limiting the rise of said ground engaging wheels above the ground.

4,413,685

**PLANTER IMPLEMENT WITH ADJUSTING POSITION-DISPLAY APPARATUS AND SYSTEM THEREOF**

Philip E. Gremelspacher, and Cornelius J. Gremelspacher, both of Rte. No. 1, Walton, Ind. 46994

Continuation-in-part of Ser. No. 102,635, Dec. 11, 1979, abandoned, which is a continuation of Ser. No. 831,558, Sep. 8, 1977, abandoned. This application Mar. 21, 1980, Ser. No. 131,944

Int. Cl.<sup>3</sup> A01B 63/111

U.S. Cl. 172—316

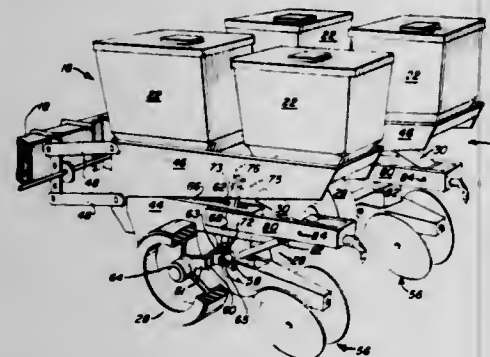
29 Claims

7. In combination with a planter implement having a lift/-



lower system for moving said implement between a raised position for transport and a lowered position for planting and being designed for control from a remote operator's position, said planter implement having a plurality of planting units each including planting components and a ground engaging gauge element for support of the respective planting unit on the ground while in said planting position and each adjustable as to the depth setting of the respective planting components relative to the respective gauge element, the improvement comprising:

each of said planting units including power means for adjusting the relative positional setting between the planting



components of the respective unit and the respective gauge element to determine the planting depth setting of each respective planting unit;  
means for actuating each of said power means independently of the actuation of each other such power means to adjust the depth setting of such planting components of the respective planting unit independently of the depth setting of each other such planting unit; and  
control means mounted at the operator's position and adjustable by the operator to provide an operator-selected depth setting control signal to said actuating means, whereby each of said power means is independently controlled to maintain the depth setting selected by the operator.

4,413,686

# WEDGE ARRANGEMENT FOR LOCKING TOGETHER HAMMERHEAD AND ANVIL

Erik Sundberg, Hofors, Sweden, assignor to Waller Innovation AB, Hofors, Sweden

Continuation of Ser. No. 198,998, Oct. 21, 1980, abandoned.

This application Apr. 8, 1983, Ser. No. 483,413

Claims priority, application Sweden, Feb. 5, 1980, 8000908

Int. Cl.<sup>3</sup> B25D 17/08

U.S. Cl. 173-131

4 Claims



1. A hammerhead (1) and anvil (4) locking arrangement, comprising:  
(a) a resiliently deformable locking wedge (14) having converging, opposite, planar side surfaces (16, 17),  
(b) means defining a first planar locking surface (7) on an anvil,  
(c) means defining a second planar locking surface (9) on a hammerhead,  
(d) said first and second locking surfaces converging at an

angle equal to an angle of convergence of said wedge, defining between them a wedge receiving groove, and being inclined to a vertical plane, and

(e) an insertion draw head (18) defined on a leading, relatively narrow end (20) of said wedge for tensioning said wedge to draw it firmly into the groove in mating engagement with the locking surfaces and to simultaneously longitudinally extend and laterally contract the wedge, and for releasing said tension to longitudinally contract and laterally expand the wedge to firmly lock it in said groove.

4,413,687

# HYDRAULICALLY OPERATED IMPACT DEVICE

Ake T. Eklöf, Skärholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

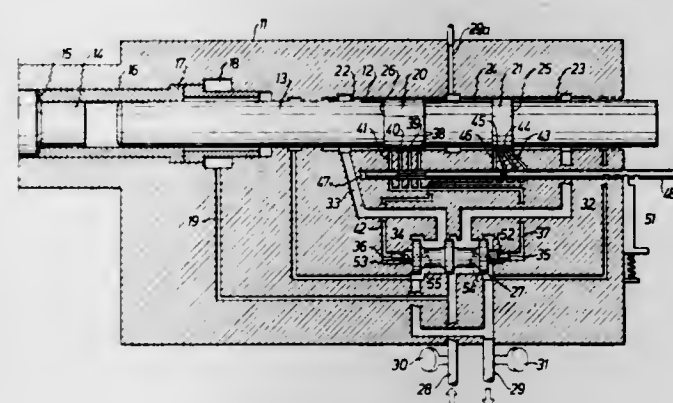
Filed Feb. 13, 1981, Ser. No. 234,444

Claims priority, application Sweden, Feb. 20, 1980, 8001325

Int. Cl.<sup>3</sup> B25D 9/18

U.S. Cl. 173-134

14 Claims



1. In a hydraulically operated impact device, for example a rock drill, comprising a housing (11); a cylinder (12) in said housing; an anvil means (14); a hammer piston (13) which is reciprocally mounted in said cylinder and arranged to impact upon said anvil means; and first and second port means (38-41; 43-46) in said cylinder cooperating with said hammer piston for controlling the reciprocation of said hammer piston, said first port means being arranged for initiating the work stroke when said hammer piston reaches a predetermined variable rear position during its return stroke and said second port means being arranged for initiating the return stroke when said hammer piston reaches a variable forward position during its work stroke,

the improvement comprising:

first means for selectively varying the working fluid flow through said first port means so as to provide for stroke length selection, the second means for selectively varying the working fluid flow through said second port means, said first and second means being operatively coupled together for selectively varying said working fluid flow through said first and second port means in a predetermined bound relationship.

4,413,688

# DIVERTER VALVE

Joe M. Seabourn, 301 Birch St., Apt. 248, Lafayette, La. 70506

Filed Jun. 5, 1981, Ser. No. 271,002

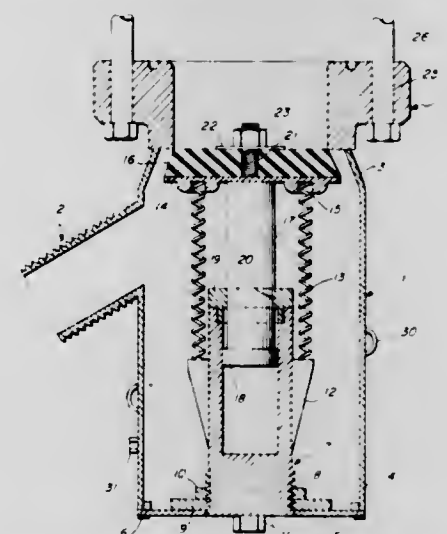
Int. Cl.<sup>3</sup> E21B 21/10

U.S. Cl. 175-38

3 Claims

1. A diverter valve for preventing blow-outs, during the early stages of drilling, which can be caused by sudden pressure surges encountered by the drilling bit in drilling an oil well, by rapid release of said pressure surges prior to forced movement of unwanted fluid up outside the casing comprising, in combination, a housing having an inlet aperture and an exhaust aperture the exterior whereof is free from any obstruction to the movement of fluidized solid materials therethrough, a rubber gasket adapted to close said inlet aperture,

a spring mounted within said housing so as to engage said gasket and press it against said inlet aperture so as to close it, said exhaust aperture being located in the vicinity of the annulus formed when said rubber gasket is moved away from said inlet aperture in such a direction as to compress said spring, the size of said exhaust aperture being sufficiently great and location of said exhaust aperture being sufficiently close to said inlet aperture so as freely to release drilling mud and other fluidized solid materials from said annulus,



and means for adjusting the compression of said spring so as to compensate for the normal pressure of drilling mud at said inlet aperture during the drilling operation, said adjusted compression being insufficient to compensate for the pressure of drilling mud at said inlet aperture upon arrival at said inlet aperture of any pressure wave caused by excess pressure encountered at the bottom of the well during the drilling operation.

4,413,689

# PLURAL-PART EARTH BIT, AND AN IMPROVED BIT HEAD THEREFOR

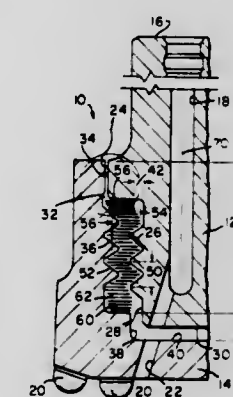
Robert W. Hughes, and James F. Cantrel, both of Easton, Pa., assignors to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Jun. 1, 1982, Ser. No. 383,976

Int. Cl.<sup>3</sup> E21B 10/00

U.S. Cl. 175-409

33 Claims



1. An improved bit head, for a plural-part earth bit, said head having a central axis, and an axially-extended cavity formed therein; said cavity defining a first wall, substantially smoothly threaded and of a given pitch diameter, which circumscribes said axis, wherein the improvement comprises:

means lining said first wall defining a second, threaded wall which circumscribes said axis, said defined second wall having a thread with a pitch diameter which is less than said given diameter; wherein said lining means comprises means which, along a given radial plane drawn outwardly from said axis, defines a plurality of lamina; each lamina of said plurality, along said given plane, termi-

nates radially inwardly in an individual, rigid, surface of a given axial dimension;  
the median of any one of said individual surfaces, of a plurality of said surfaces, measured along said given radial plane, is disposed at a given radial distance from said axis; and  
the median of another such surface immediately adjacent to said any one individual surface, measured along said plane, is disposed at a radial distance from said axis other than said given distance.

4,413,690

# WEIGHING CUP

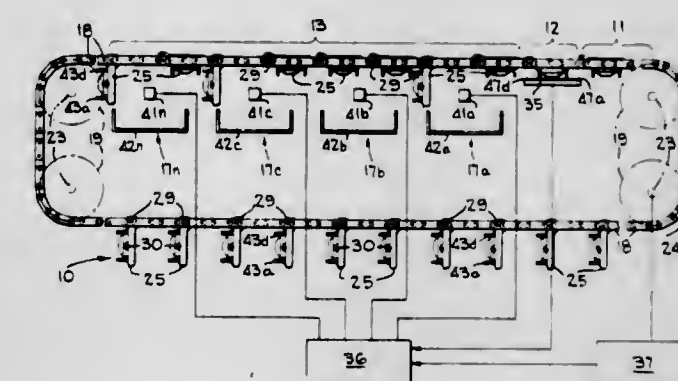
Shepard J. Peterson, Anaheim, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 12, 1982, Ser. No. 357,460

Int. Cl.<sup>3</sup> B07C 5/28

U.S. Cl. 177-54

13 Claims



1. Apparatus for weighing articles held in spaced article receiving cups arranged in single file on a conveyor, each of the articles being weighed as the corresponding cup moves through a weighing zone, said apparatus providing accurate weighing of each article irrespective of the orientation of the article in the cup, said apparatus comprising:

at least one front weighing peg mounted to a front portion of said receiving cup;  
a pair of rear weighing pegs mounted to a rear portion of said receiving cup;  
a weighing cell which provides an output signal proportional to a weight supported by said weighing cell;  
at least one front weigh bar mounted to said weighing cell to support said front weighing peg as said cup moves through said weighing zone;  
a pair of rear weigh bars mounted on said weighing cell to support said rear weighing pegs as said cup moves through said weighing zone; and  
wherein said front and said rear weigh bars are positioned so said front peg is supported by said front weigh bar at the same time that said rear pegs are supported by said rear weigh bars.

4,413,691

# SHEAVE BLOCK WEIGHING ASSEMBLY

Donald C. Wetzel, Berea, Ohio, assignor to Quest Corporation, Macedonia, Ohio

Filed Oct. 23, 1981, Ser. No. 314,361

Int. Cl.<sup>3</sup> G01G 19/14, 3/14; B66C 1/40

U.S. Cl. 177-147

7 Claims

1. A sheave basket weighing system for a material handling apparatus comprising:

a sheave basket having sheaves and supported by lifting ropes, the sheave basket also having generally horizontally extending ledges;  
three bending beam load cells fixed on the ledges of the sheave basket to provide a three-point support system, all



three of the load cells being immovable with respect to the sheave basket, and



a ladle hanger assembly having generally horizontally extending surfaces which are supported on top of the load cells.

4,413,692

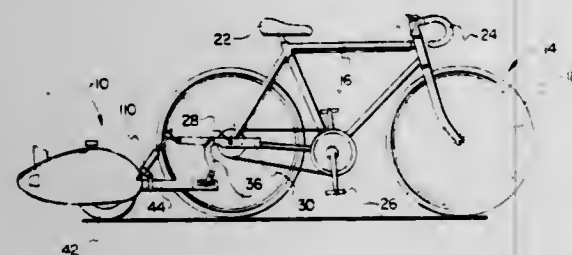
# POWER ASSISTING DEVICE FOR A MANUALLY OPERABLE VEHICLE

Dale L. Clift, 13530 Herron St., Sylmar, Calif. 91342  
Filed Oct. 13, 1981, Ser. No. 310,798

Int. Cl.<sup>3</sup> B62M 7/14

U.S. Cl. 180—11

6 Claims



1. In combination with a vehicle having a plurality of wheels, a frame connecting said wheels, said wheels comprising a leading wheel and a trailing wheel, a power assisting assembly for said vehicle comprising:

- a motor;
- a mounting frame, said motor being mounted on said mounting frame;
- a driving wheel rotatably driven through a driving belt assembly by said motor, said driving wheel being longitudinally spaced rearwardly of said trailing wheel, said driving wheel being mounted by a suspension system on said mounting frame; and tensioner means mounted on said mounting frame for continuously maintaining taut said driving belt assembly.

4,413,693

# MOBILE CHAIR

Sherwin L. Derby, 904 Susan Ct., O'Fallon, Ill. 62269  
Filed Mar. 27, 1981, Ser. No. 248,405

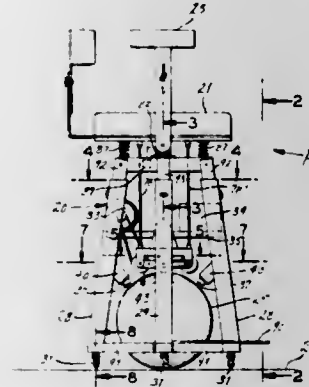
Int. Cl.<sup>3</sup> B60K 7/00

U.S. Cl. 180—74

11 Claims

1. A compact mobile self-propelled chair including a frame carrying a passenger seat and a prime mover and characterized by a spherical body for carrying at least in part the weight of said chair and passenger and providing frictional rolling engagement with a support surface, means for captively mounting said spherical body for rotation relative to said frame about a plurality of axial orientations, drive means for interconnecting said spherical body and said prime mover for driving rotation of said spherical body, and control means responsive to postural shifting by said passenger for controlling the axial orientation during rotation of said spherical body for thereby determining the direction of movement of said chair, said spherical body being substantially centered beneath the combined weight of said chair and passenger for primarily carrying

said combined weight, and auxiliary support means providing rolling engagement with said support surface around said spherical body for providing stabilizing auxiliary support of said combined weight, said prime mover comprising a first electric motor and first switch means operatively associated with said seat for selectively controlling the provision of said electric power to said electric motor, said source of power comprising a battery carried by said chair, said first switch



means being operative in response to postural shifting by said passenger in a desired direction of translational movement to supply electric power from said battery to said motor, said control means comprising means carried by said frame for providing selective frictional engagement of said chair with said support surface upon postural shifting by said passenger in a desired direction of turning movement for causing rotation of said spherical body about an axis producing turning of said chair.

4,413,694

# LOCK ASSEMBLY FOR A TILTABLE TRUCK CAB

Joseph Slocombe, Chelmsford, and Michael A. Parry, Billerica, both of England, assignors to Ford Motor Company, Dearborn, Mich.

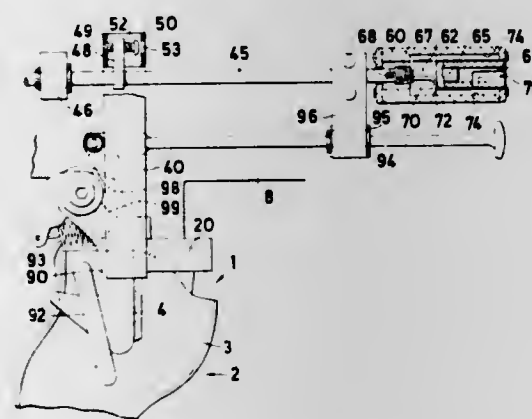
Filed Jun. 4, 1980, Ser. No. 156,230

Claims priority, application United Kingdom, Jun. 14, 1979, 7920801

Int. Cl.<sup>3</sup> B62D 27/06, 33/06

U.S. Cl. 180—89,14

2 Claims



1. A lock assembly for retaining a tiltable cab structure in a normal operating position relative to the body structure of a truck and comprising two transversely spaced latches, each including a keeper attached to one of the structures, a latch member attached to the other structure and mounted for movement into and out of a closed position to effect latching engagement with the keeper, and an operating lever movable between an unlocking position in which the latch member is disengageable with the keeper and a locking position in which the latch member is retained in engagement with the keeper, and a releasing linkage interconnecting the operating levers for simultaneously moving the operating levers from the lock-

ing and unlocking positions, the operating lever and the latch member of each latch including mutually engaging cam surfaces which allow movement of the operating lever into the locking position only when the latch member is in the closed position.

4,413,695

# VEHICLE WITH TILTABLE CAB

Joseph Slocombe, Chelmsford, and Michael A. Parry, Billerica, both of England, assignors to Ford Motor Company, Dearborn, Mich.

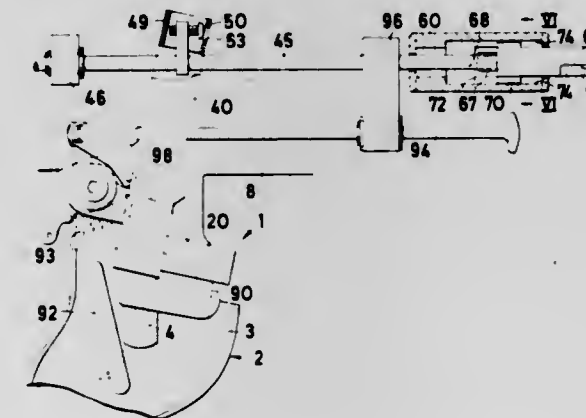
Filed Jun. 4, 1980, Ser. No. 156,231

Claims priority, application United Kingdom, Jun. 14, 1979, 7920800

Int. Cl.<sup>3</sup> B62D 33/06

U.S. Cl. 180—89,14

17 Claims



1. A motor vehicle comprising a body structure, a cab mounted on the body structure for movement about a pivot axis between a normal operating position and a tilted position, and a support radially spaced from the pivot axis for supporting the cab structure on the body structure in the normal operating position of the cab, at least one of the supports comprising a keeper attached to one of the structures and a latch member attached to the other structure and mounted for movement into and out of latching engagement with the keeper when the cab is in its normal operating position, characterized in that further support is provided for the cab spaced from the first mentioned support in the direction of the pivot axis, and comprising a keeper attached to one of the structures and having a bracket mounted on the said one structure, and a striker pin resiliently mounted in the bracket, and a latch member attached to the other structure and mounted for movement into and out of latching engagement with the keeper when the cab is in its normal operating position.

4,413,696

# LATCH MECHANISM FOR A TILTABLE CAB

Joseph Slocombe, Chelmsford, and Michael A. Parry, Billerica, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 4, 1980, Ser. No. 156,239

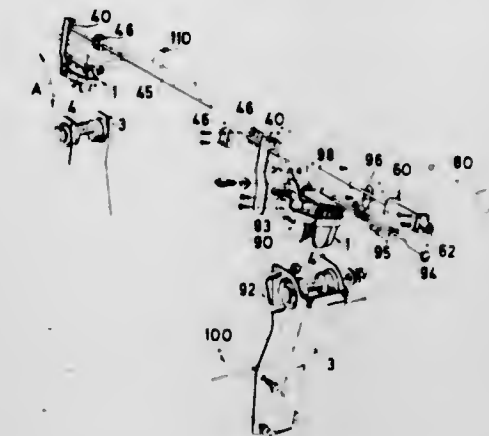
Claims priority, application United Kingdom, Jun. 14, 1979, 7920799

Int. Cl.<sup>3</sup> B62D 33/06

U.S. Cl. 180—89,14

12 Claims

1. A lock for retaining a tiltable cab structure in a normal operating position relative to the body structure of a vehicle and comprising a latch which includes a keeper attached to one of the structures, and a latch member attached to the other structure and mounted for latching engagement with the keeper, and a releasing linkage for locking the latch member in engagement with the keeper, characterized in that the releasing linkage includes an actuating member and an operating rod connected to the actuating member and mounted for sliding movement therewith in a housing between a first position in which the latch member is locked in engagement with the keeper and a second position in which the latch member is



4,413,697

# AIR CUSHION VEHICLE

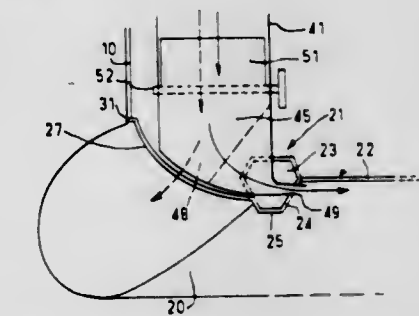
Claude Duneau, 64 Levee des Tulleries, 41000 Blois, France  
PCT No. PCT/FR81/00025, § 371 Date Oct. 30, 1981, § 102(e)  
Date Oct. 30, 1981, PCT Pub. No. WO81/02552, PCT Pub.  
Date Sep. 17, 1981

PCT Filed Mar. 3, 1981, Ser. No. 317,892

Claims priority, application France, Mar. 3, 1980, 80 040702  
Int. Cl.<sup>3</sup> B60V 1/04, 1/15

U.S. Cl. 180—120

8 Claims



1. Air cushion vehicle intended to move on ground or on water, equipped with a central platform surrounded by a belt to which an inflatable skirt is fixed as well as with lifting means for establishing an air cushion under said platform, and propulsion means; wherein said belt surrounding the platform provides under said platform a first face directed obliquely toward the vertical central axis of the platform and downward, and a second horizontal face extending toward the outside of the platform to form a support pad; with at least one nozzle connected to the lifting means, opening under the platform into said first oblique face of the belt for the creation of the air cushion, said belt being equipped on its outer periphery with a shaped piece for fixing the skirt.

5. Vehicle according to claim 1, wherein the lifting means include a propeller, a duct having an inlet positioned under and directly behind the propeller and equipped with a first distribution flap pivotally mounted around a horizontal shaft from a closed position of said inlet to various positions of admission and channeling of the air flow created by the propeller toward the duct, with said duct being divided in two sections by a vertical partition positioned directly behind a second pivotally mounted flap for dividing the admitted air as needed in the duct toward each of said two sections, the first one of said two sections ending by a nozzle opening into the skirt through the shaped piece and the second one of said two sections, after having matched the outline of said shaped piece, ending through a nozzle which opens under the platform, through the first oblique face of the belt.











4,413,709

## CONSTANT-SPEED CONVEYOR APPARATUS

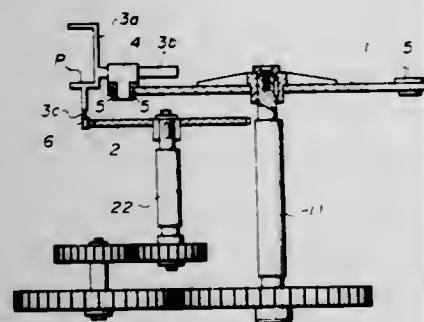
Ozawa Kazumi, Koga, and No Shinichiro, Hooya, both of Japan, assignors to Kabushiki Kaisha Yakult Honsba, Tokyo, Japan  
PCT No. PCT/JP80/00194, § 371 Date Apr. 13, 1981, § 102(e)  
Date Apr. 13, 1981, PCT Pub. No. WO81/00553, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 22, 1980, Ser. No. 253,757

Claims priority, application Japan, Aug. 24, 1979, 54-107177  
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> B65G 17/16

U.S. Cl. 198—344

3 Claims



1. An apparatus for conveying articles along a conveying locus or path of a predetermined path comprising:  
a rotary disk having a plurality of bearings mounted on the outer periphery thereof and having a first rotating shaft for rotating said disk;  
a plurality of article support means each including an arm, a frame for holding said article and a connecting member;  
a freely rotatable shaft mounted on each one of said bearings, said arm of said article support means being arranged to be slidably fitted into each respective rotatable shaft;  
a conveyor means arranged to be moved along a predetermined locus controlled by inner and outer guides;  
said connecting member being connected to said conveyor;  
a sprocket means having a second rotating shaft and adapted to drive said conveyor; and  
said first rotating shaft of said rotary disk being arranged to rotate in synchronism with said second rotating shaft of said sprocket means.

4,413,710

## RETRACTABLE PANTOGRAPH FOR DOWNWARD WITHDRAWAL IN THE EVENT OF AN ABNORMAL FRONTAL LOAD

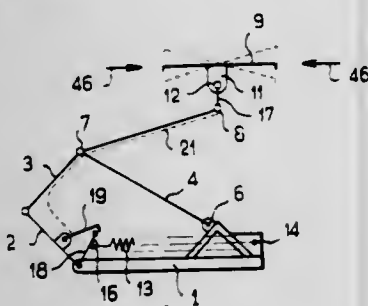
Andre Milleville, Ezanville, France, assignor to Faiveley S.A., Saint Ouen, France

Filed Jun. 10, 1981, Ser. No. 272,343

Claims priority, application France, Jun. 18, 1980, 80 13487  
Int. Cl.<sup>3</sup> B60L 5/12

U.S. Cl. 191—70

7 Claims



1. A retractable pantograph for automatic downward withdrawal in the event of an abnormal frontal load, comprising a frame, a lifting structure pivotally attached to the frame, a lifting spring connected to the lifting structure for urging a top region of the lifting structure away from the frame, means for

connecting a current-collector bow to the top region of the lifting structure, said connecting means including means for permitting displacement of the bow independently of the movable structure, means for neutralizing the lifting spring, additional transmission means for coupling the bow-displacement means to said means for neutralizing the lifting spring, and a load limiter which inhibits the bow-displacement means at point below a predetermined threshold value of the load applied to the bow and which trips said bow with respect to said lifting structure above said threshold value.

4,413,711

## EXTENDED TRAVEL DAMPER IN A LOCK-UP CLUTCH FOR A TORQUE CONVERTER

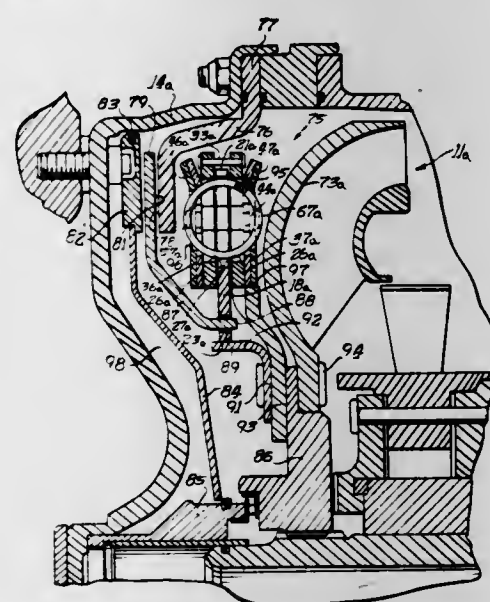
Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,778

Int. Cl.<sup>3</sup> F16H 45/02; F16D 3/14

U.S. Cl. 192—3.28

14 Claims



1. A torsional vibration damper assembly for a lock-up clutch in a torque converter wherein said damper assembly is located adjacent the periphery of the turbine within the torque converter housing, said vibration damper assembly comprising an annular hub plate having a plurality of circumferentially equally spaced radially extending arms, a torque input member operatively connected to said hub plate, a pair of annular retainer plates axially spaced apart to receive said hub plate therebetween, a first floating equalizer formed of a pair of annular plates axially spaced apart and secured together to receive said retainer plates therebetween, a second floating equalizer formed of a pair of annular plates axially spaced apart and secured together to receive said first equalizer therebetween, said retainer plates having a plurality of elongated arcuate windows therein separated by radial spokes, three spring sets received in each window, and a pair of spring separators received in each window to separate said three spring sets, each of said pair of separators being operatively connected to the alternate floating equalizers, and means operatively connecting said retainer plates to the turbine.

4,413,712

## DEVICE FOR LOCKING AN ELEMENT IN A STATIONARY POSITION FOR AN AUTOMOBILE VEHICLE

Jackie Richard, Bezons, France, assignor to Regie Nationale des Usines Renault, France

Filed Feb. 10, 1981, Ser. No. 233,528

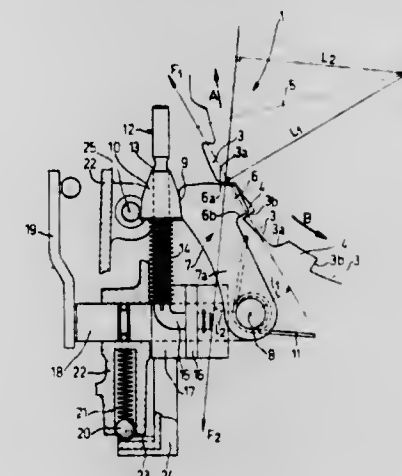
Claims priority, application France, Feb. 12, 1980, 80 03077  
Int. Cl.<sup>3</sup> B60K 67/00

U.S. Cl. 192—4 A

6 Claims

1. A device for locking the driving wheels of an automobile

in a stationary position comprising a rotary mechanical element adapted to be coupled with the driving wheels of a vehicle for locking those driving wheels when said rotary mechanical element is locked, said rotary mechanical element having a plurality of peripheral notches; and a locking device including a locking finger member and means for pivotably mounting said locking finger member for pivoting between an engaged position, in which said locking finger member engages one of the peripheral notches of said rotary mechanical element to lock said rotary mechanical element, and a disengaged position, in which said locking finger member is withdrawn from the notches of said rotary mechanical element; said locking finger member, when in the engaged position with said rotary



mechanical element coupled to the driving wheels of a vehicle, being urged toward the disengaged position by rotational torque resulting from the weight of the vehicle; in the engaged position said locking finger member and one of the notches of said rotary mechanical element contacting each other on inclined contact surfaces; said contact surfaces being asymmetric with respect to a radius of said rotary mechanical element such that the inclinations of said contact surfaces result in the torque exerted by rotation of said rotary mechanical element and transmitted by said contact surfaces, to urge said locking finger member toward the disengaged position, being substantially the same for each rotational direction of said rotary mechanical element.

4,413,713

## TORQUE TRANSMITTING AND BLOCKING DEVICE

Joe E. West, 141 N. Oak Trail, Coppell, Tex. 75019

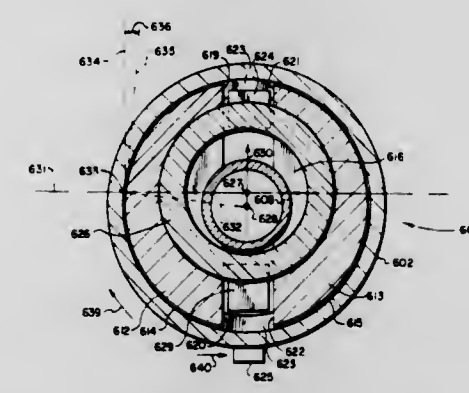
Continuation-in-part of Ser. No. 841,809, Oct. 13, 1977, Pat. No.

4,236,618. This application Nov. 21, 1980, Ser. No. 209,011

Int. Cl.<sup>3</sup> F16D 67/00

U.S. Cl. 192—8 R

22 Claims



1. Apparatus for selectively transmitting torque from a torque input means to a torque output means, and for blocking transmission of torque from said output means to said input means, comprising:  
a drum having a cylindrical inner surface;  
a pair of shoes positioned within said drum, each of said

shoes having an arcuate surface bearing against the inner surface of said drum;  
a spanner ring extending between said shoes and engaging their inner surfaces at least at points lying on the same side of the axis of said drum, said spanner ring being so positioned with respect to the drum axis that a perpendicular struck from its effective centerline at the intersection of the centerline with the inner drum surface forms an angle with a drum inner surface tangent struck from the same point which is in the lock angle range for the materials employed to form the drum and shoe surfaces;  
said shoes being displaceable toward each other at their ends lying on the side of the drum axis opposite their points of engagement with said spanner ring;  
said shoes having among them at least two force transmitting surfaces oriented generally radially of said drum;  
force transmitting means engagable with each of said surfaces;  
one of said force transmitting surfaces being oriented such that a force applied generally orthogonally therethrough by said force transmitting means sets both of said shoes in jamming relationship with the inner surfaces of said drum; and  
the other of said force transmitting surfaces being oriented such that a force applied generally orthogonally therethrough by said force transmitting means slidably rotates said shoes within said drum without jamming thereagainst.

4,413,714

## CLUTCH CONTROL SYSTEM

Harry M. Windsor, Harbury, England, assignor to Automotive Products Limited, Leamington Spa, England

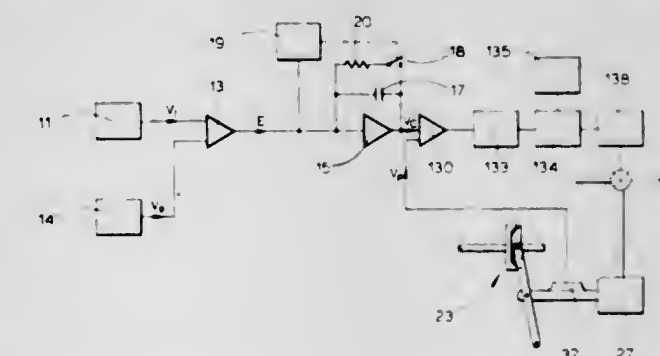
Filed Jun. 30, 1981, Ser. No. 279,084

Claims priority, application United Kingdom, Jul. 8, 1980, 8022347

Int. Cl.<sup>3</sup> B60K 41/02

U.S. Cl. 192—0.033

5 Claims



1. A vehicle transmission clutch electronic control system comprising:  
an engine speed sensor;  
means for producing an electrical engine speed signal representative of engine speed and derived from the sensor;  
generator means for producing an electrical reference signal;  
comparator means arranged to receive and compare said engine speed and reference signals and produces a consequent error signal;  
an integrator which receives the error signal and has a capacitor with a switch means for causing the error signal to bypass said capacitor, or not, depending upon the state of the switch means, the state of said switch means being dependent upon the value of said error signal so that the integrator has two response modes to the error signal for consequent production of a command signal;  
a clutch actuator that operates the clutch, and a control means responsive to the command signal and controlling the actuator.



4,413,715

**SELF-ENERGIZED SYNCHRONIZER**

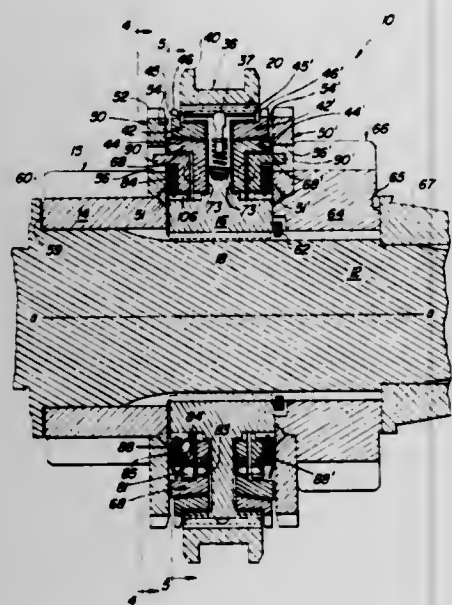
Richard A. Michael, Waterloo; Dalsang K. Chaudhari, Cedar Falls, and Gordon L. Marquart, Jesup, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 13, 1981, Ser. No. 321,139

Int. Cl.<sup>3</sup> F16D 23/06

U.S. Cl. 192—53 F

21 Claims



1. In a self-energized synchronizer for synchronizing first and second members rotatable about a common axis, said synchronizer including: a body member fixed to said first member for rotation therewith having a toothed outer circumference, a shifter collar having a toothed inner surface engaging said toothed outer circumference of said body member and movable axially thereon, a blocking ring positioned adjacent to said body member and movable axially thereto having a toothed outer surface, a friction surface, and abutment means for limiting relative rotation between said body member and said blocking ring, a drive collar secured to said second member for rotation therewith having a toothed outer surface, the improvement comprising:

- (a) self-energized means rotatable with said drive collar and frictionally engageable by said friction surface of said blocking ring for transferring frictional torque between said first and second members and responsive to such torque transfer to expand; and
- (b) a frictional member carried on said body member and acting between said drive collar and said self-energized means for resisting relative rotation between said first and second rotatable members upon expansion of said self-energized means.

4,413,716

**FRICTION CLUTCHES**

Thomas B. Newsome, and Garry Fulford, both of Sheffield, England, assignors to Laycock Engineering Limited, Sheffield, United Kingdom

Filed Jan. 29, 1981, Ser. No. 229,762

Claims priority, application United Kingdom, Feb. 19, 1980, 8005519

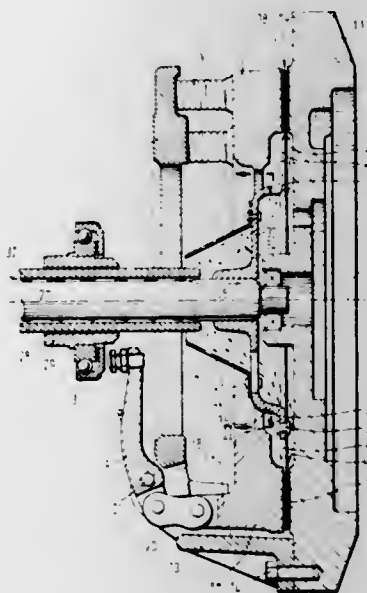
Int. Cl.<sup>3</sup> F16D 13/72, 13/74

U.S. Cl. 192—70.12

3 Claims

1. A friction clutch comprising a rotary driving member; a friction face on the rotary driving member; a pressure member which is rotatable with the driving member and can be urged towards the driving member; a friction face on the pressure member; a driven member disposed between the driving and pressure members; friction faces on the driven member for engagement with the friction faces of the driving and pressure members so that the latter members can drive the driven member frictionally through a first interface defined by the friction face of the driving member and one friction face of the driven member and a second interface defined by the friction face of

the pressure member and the other friction face of the driven member; fluid supply means for supplying fluid to the friction faces of the driven member for cooling and lubrication of the faces, fluid from said supply means being flung outward in use by centrifugal force to the friction faces; characterized by the provision of means for dividing the fluid in controlled proportions between the two interfaces, said means comprising a generally bell shaped distribution member connected to said



driven member for rotation therewith; a first passage leading outward to one interface; a second passage leading outward to the other interface; and apertures in the distribution member adjacent its connection with said driven member, said apertures facing generally radially outwardly and leading to said first passage so that some of said fluid passes through them into said first passage, the remainder of said fluid entering said second passage from the end of said distribution member.

4,413,717

**ELECTROMAGNETIC CLUTCH AND METHOD OF MANUFACTURE**

Hisanobu Kanamaru, Katsuta; Hideo Tatsumi, Mito; Kosaku Sayo, Katsuta, and Moisei Okabe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 20,316, Mar. 14, 1979, Pat. No. 4,305,198.

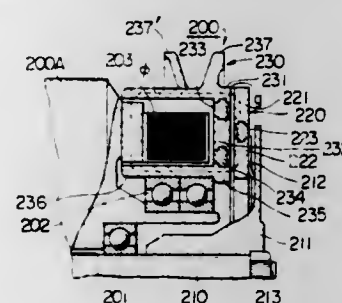
This application Jun. 29, 1981, Ser. No. 278,728

Claims priority, application Japan, Mar. 27, 1978, 53-34193

Int. Cl.<sup>3</sup> F16D 27/10, 27/14

U.S. Cl. 192—84 C

5 Claims



1. An improved electromagnetic torque transmission clutch including first and second rotatable members disposed in substantially coaxial relationship, said first rotatable member being drivingly connected to a driven member and including a section made of a magnetizable material, said second rotatable member including a section made of a magnetizable material and provided with means for drivingly connecting said second rotatable member to a driving means, and one of said rotatable members being axially movable into face-to-face contact with the other of said rotatable members; means including said sections of said first and second rotatable members for forming

4,413,719

**METHOD AND APPARATUS FOR ENTRAPMENT PREVENTION AND LATERAL GUIDANCE IN PASSENGER CONVEYOR SYSTEMS**

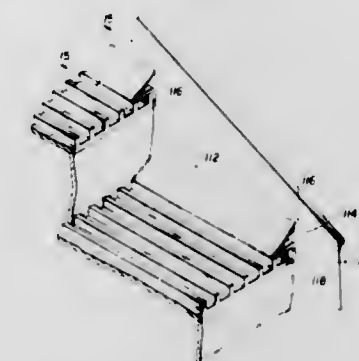
Carl J. White, 5000 SW. 80th St., Miami, Fla. 33143

Filed May 28, 1981, Ser. No. 268,022

Int. Cl.<sup>3</sup> B66B 9/12

U.S. Cl. 198—333

27 Claims



a magnetic circuit; and an electromagnetic coil means for generating a magnetic flux passing through said magnetic circuit; wherein at least one of said first and second rotatable members comprises substantially concentric and radially spaced annular members both made of a magnetizable material, said annular members having radially opposed connecting surfaces formed therein with radially opposed annular grooves therein, each of said grooves being defined by a bottom and axially spaced side walls that are each inclined at an angle relative to a plane that is perpendicular to a rotation axis of said transmission clutch and an annular bond member of a non-magnetizable metal swaged into the annular space between said concentric magnetizable members and into said annular grooves to mechanically connect them together and magnetically disconnect them from each other whereby said concentric magnetizable members are restrained not only in the radial direction but also in the axial direction, said bond member being formed with an annular recess in that side which is directed to and engaged by the other of the first and second rotatable members.

4,413,718

**METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A COIN IN A PASSAGEWAY**

Robert Dean, Slough, England, assignor to Mars, Inc., McLean, Va.

PCT No. PCT/GB80/00054, § 371 Date Nov. 26, 1980, § 102(e)

Date Oct. 29, 1980, PCT Pub. No. WO80/02081, PCT Pub.

Date Oct. 2, 1980

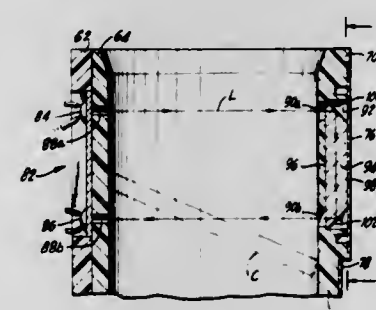
PCT Filed Mar. 26, 1980, Ser. No. 212,714

Claims priority, application United Kingdom, Mar. 26, 1979, 7910550

Int. Cl.<sup>3</sup> G07D 9/00

U.S. Cl. 194—1 K

14 Claims



10. A method of detection of a coin in a predetermined plane substantially transverse to the coin path of a coin which moves freely through a nearly vertical coin passageway of a coin mechanism, the method comprising the steps of:

- directing a light beam in a first line from a first point in the predetermined plane located on one side of the coin passageway to a second point in the predetermined plane located on the other side of the coin passageway, reflecting the light beam from the second point to a third point in the predetermined plane located on the same side of the coin passageway as the second point, reflecting the light beam in a second line from the third point to a fourth point in the predetermined plane located on the same side of the coin passageway as the first point, and detecting the interruption of the light beam, the first line and the second line being spaced from one another and from the nearest of the sides of the coin passageway by distances which are less than the size of the smallest coin which is to be detected whereby the beam of light is always interrupted by the passage of the smallest coin.

4,413,720

**ARTICLE HANDLING APPARATUS**

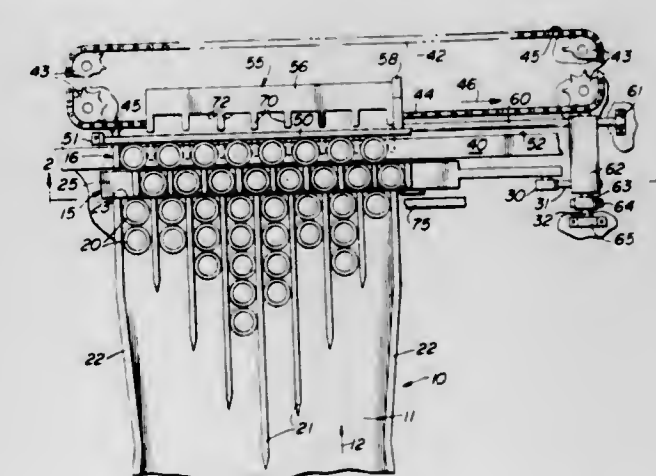
Frederick W. Pfeiffer, 27 Cherry Ave., Maple Shade, N.J. 08052

Filed Sep. 4, 1981, Ser. No. 299,300

Int. Cl.<sup>3</sup> B65G 47/00

U.S. Cl. 198—345

7 Claims



1. Article handling apparatus comprising a generally horizontal feed conveyor, a plurality of longitudinal guides along and subdividing said feed conveyor into channels for passing



aligned rows of articles and terminating at a station, a gate extending transversely of said feed conveyor at said station and generally coplanar with said feed conveyor to receive and support a transverse row of articles from said station, a removal conveyor extending along said gate generally coplanar therewith for receiving and removing a transverse row of articles, and means for shifting said gate upwardly while supporting a transverse row of articles to block the next upstream transverse row of articles at said station for operating on said blocked articles.

4,413,721

**SORTING CONVEYOR FOR INDIVIDUAL OBJECTS**  
Willy Bollier, Goldau, Switzerland, assignor to Daverio A.G., Zurich, Switzerland

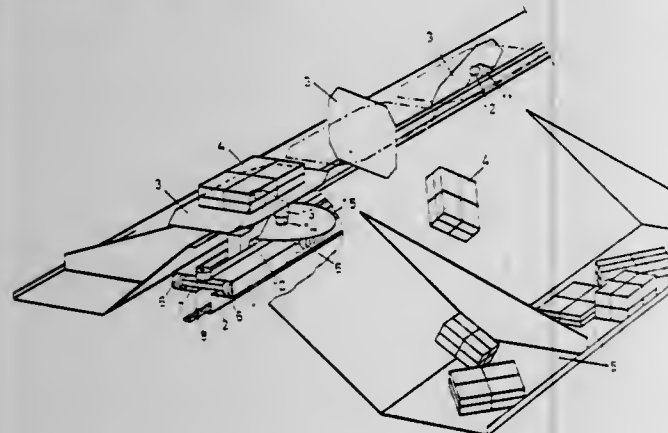
PCT No. PCT/CH80/00140, § 371 Date Jul. 31, 1981, § 102(e)  
Date Jul. 31, 1981, PCT Pub. No. WO81/01999, PCT Pub.  
Date Jul. 23, 1981

PCT Filed Nov. 17, 1980, Ser. No. 287,742

Claims priority, application Switzerland, Jan. 4, 1980, 38/80  
Int. Cl.<sup>3</sup> B65G 47/46

U.S. Cl. 198—365

2 Claims



1. Sorting conveyor for individual objects having a plurality of carts circulating along an endless track, each cart carrying a load bearing tray for the conveyed objects, said tray being tiltable from the horizontal position in both directions into an inclined position at predetermined discharge locations by guidance means arranged along the track, said conveyor being characterized in that each said load bearing tray is supported from below by a support shaft which extends diagonally to the load bearing tray surface, said support shaft being rotatably journaled within a bearing fixedly attached to said cart, in that a drive disc mounted on a vertical shaft is rotatably journaled upon the cart, said vertical shaft being in drive connection with said support shaft of the load bearing tray by means of a universal joint, and in that said guidance means at said discharge locations are so constructed as to be capable of rotating said drive disc, thereby to tilt said load bearing tray.

4,413,722

**ARTICLE ORIENTATION DEVICE**

Donald Frisbie, R.R. 1, Northfield, Minn. 55057; Larry D. Frisbie, Briceyn, Minn. 56014, and Joel J. Olson, 2836 Blackstone, St. Louis Park, Minn. 55416

Filed Aug. 19, 1981, Ser. No. 294,330  
Int. Cl.<sup>3</sup> B65G 47/24

U.S. Cl. 198—392

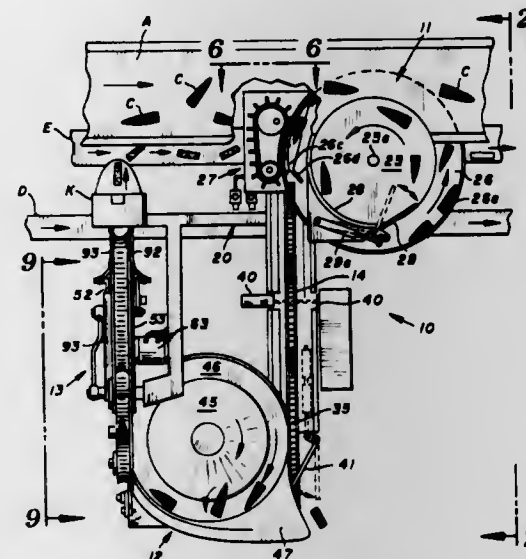
17 Claims

1. An article orientation device particularly for delivering tapered articles such as ears of corn from a conveyor transporting the ears in random fashion to a kernel cutting device with the ears being arranged in a determined orientation, said device including:

- a pick-off section for receiving and gathering ears of corn from the conveyor;
- a first conveyor means receiving ears from said pick-off section;
- a sensing station arranged in position adjacent said first

conveyor means to determine the orientation of the ears carried by said conveyor means;

- an orientation section arranged and constructed to receive ears of corn from said first conveyor means and to selectively rotate the ears in end-to-end relation in response to a signal from said sensing station;



4,413,723

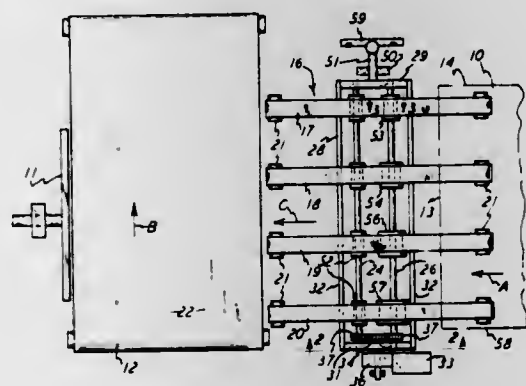
**METHOD AND APPARATUS FOR CONVEYING A SHEET**

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Dec. 7, 1981, Ser. No. 328,209  
Int. Cl.<sup>3</sup> B65G 47/24

U.S. Cl. 198—415

3 Claims



1. Apparatus for conveying a sheet in a turning action, comprising a set of movably mounted belts extending in one direction and parallel to each other, a driving member disposed adjacent said belts, two shafts rotatably and displaceably disposed in driven rotatable relation to said driving member and extending adjacent said belts and transverse to the direction of the extent of said belts, a set of driving pulleys on each of said shafts for rotation therewith and with one pulley of each of said set being aligned with a respective one of each of said belts, all of said pulleys in said set on one of said shafts being of the same diameter, for driving all of said belts at the same speed when in contact with said belts when said one shaft is displaced into driving relation with said belts, and all of said pulleys in said set on the other of said shafts being of diameters different

from each other, for driving all of said belts at speeds different from each other when in contact with said belts when said other shaft is displaced into driving relation with said belts.

4,413,724

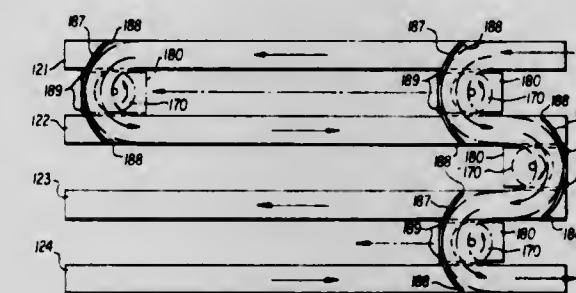
**HORIZONTAL ACCUMULATOR**

Theodore F. Fellner, Neenah, Wis., assignor to Mapatent, N.V., Netherlands

Filed May 18, 1981, Ser. No. 264,845  
Int. Cl.<sup>3</sup> B65G 15/26

U.S. Cl. 198—594

4 Claims



1. A power driven conveyor system for transporting and accumulating a plurality of items along a path of movement from a source to a destination, comprising:

- a plurality of horizontally oriented, parallel conveyor belt means for accumulating the plurality of items along the path, said conveyor belt means being arranged so that each of said conveyor belt means moves in a direction opposite to that of an adjacent conveyor belt means;
- a plurality of pulley wheel means for moving the plurality of items along the path of movement from each of the conveyor belt means to the adjacent conveyor belt means, each of said plurality of pulley wheel means being arranged between adjacent conveyor belt means; and
- a plurality of slide assembly means, each arranged between the adjacent conveyor belt means, for carrying the plurality of pulley wheel means and for extending the length of the path of movement of the plurality of items.

4,413,725

**POTTED PLANT PACKAGE**

Edward D. Bruno, 1880 S. Monaco Pkwy., Denver, Colo. 80202, and Gary C. Bruno, 3132 S. Norfolk St., Aurora, Colo. 80002  
Continuation of Ser. No. 280,212, Jul. 6, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,205

Int. Cl.<sup>3</sup> B65D 85/50, 85/52

U.S. Cl. 206—45.33

2 Claims



1. A package for a pot containing a plant comprising, in combination, an initially flat decorative sheet, said sheet being of such a flexibility and pliability that it will wrap and form around said pot but will not stay around said pot without additional support, a flexible tubular sleeve made of collapsible material openable into said sleeve, said sleeve being positionable around the pot to snugly encircle said sheet and pot and being the sole means of holding the sheet in position around the pot, portions of said sheet extending upwardly from said sleeve to form a decorative background for the plant, and a message card positioned between said transparent sleeve and said deco-

orative sheet to be held in slideable and retractable position by said sleeve, whereby an attractive plant package is provided, wherein said sleeve has an upper portion for protecting the potted plant such as during shipment and which is removable from the pot in situ and a lower portion which remains around the pot to hold the sheet and card in position, and a ribbon mounted on said card, said card being positionable with the card and ribbon straddling said sleeve, and with the ribbon facing outwardly.

4,413,726

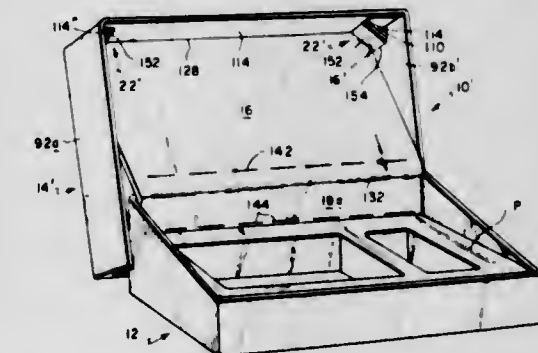
**DISPLAY BOX**

Thomas L. Davidson, Montville, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Jan. 18, 1982, Ser. No. 340,258  
Int. Cl.<sup>3</sup> B65D 5/66

U.S. Cl. 206—45.13

16 Claims



1. A display box formed from a single material blank, said box comprising

- A. a generally rectangular bottom section having bottom, front, rear and side walls and a top opening;
- B. a cover
  - (1) having top, front, rear and side walls and a bottom opening; and
  - (2) sized slightly larger than the bottom section;
- C. a hinge connecting the rear walls of the bottom section and cover so that the cover can swing between
  - (1) a closed position wherein it engages over and closes the bottom section; and
  - (2) an open position wherein it extends upwardly rearwardly forming an obtuse angle with the bottom section;
- D. a display panel;
  - (1) positioned in said cover;
  - (2) extending into the bottom section;
  - (3) having one end hinged at the junction of the cover top and front walls; and
  - (4) having an opposite end portion secured against the bottom section rear wall;
- E. a first hinge line extending across the display panel and which is opposite and substantially parallel to the upper edge of the bottom section rear wall when the cover is in its open position;
- F. a second hinge line extending across the display panel and spaced substantially parallel to the first hinge line so that
  - (1) when the cover is in its closed position, the panel lies more or less against the inside of the cover top wall; and
  - (2) when the cover is in its open position, the panel opposite end portion is swung out of the cover so that the panel is substantially flat and angled upwardly so that it helps to establish the open position of the cover and is readily visible to an observer; and
- G. means for establishing the closed position of the cover, said establishing means comprising a panel
  - (1) integral with the display panel;
  - (2) adhered to the inside of the cover front wall; and
  - (3) having a height less than the height of the cover front wall so as to form a stopper edge which engages the top



edge of the bottom section front wall when the cover is in its closed position.

4,413,727

**FOLDER RETAINER FOR SURGICAL SUTURES**

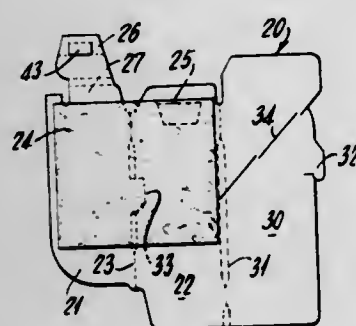
Robert J. Cerwin, Pittstown, and Marvin Alpern, Glen Ridge, both of N.J., assignors to Ethicon Inc., Somerville, N.J.

Filed Mar. 18, 1982, Ser. No. 359,403

Int. Cl.<sup>3</sup> A61B 17/06

U.S. Cl. 206—63.3

10 Claims



1. A folded retainer for surgical sutures comprising:
  - (a) first and second suture retaining panels foldably connected along one major edge thereof;
  - (b) a foam member adhesively secured on facing surfaces of said first and second panels;
  - (c) one of said first and second panels including a window exposing said adhesive securing the foam to said panel; and
  - (d) a third panel foldably connected to an edge of the panel not having the window, said third panel being foldable about said edge so as to contact the adhesive exposed in said window.

4,413,728

**ARTICLE CARRIER**

Prentice J. Wood, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

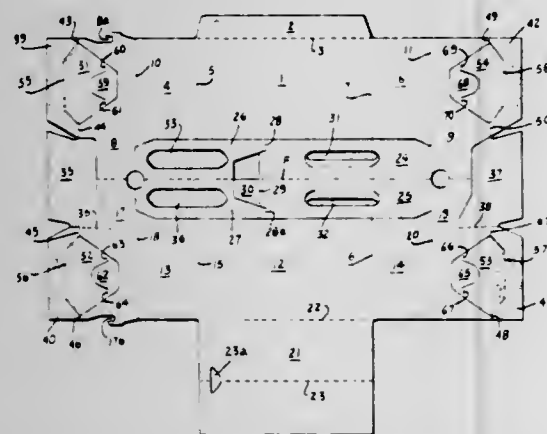
Filed Jul. 8, 1982, Ser. No. 396,345

The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> B65D 6/48, 75/00

U.S. Cl. 206—187

10 Claims



1. An article carrier comprising a bottom wall, a pair of side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined respectively to the end edges of said side walls and extending inwardly therefrom, medial partition structure foldably joined to the inner edges of said end wall panels and extending medially inward of the carrier, handle structure secured to said medial partition structure and extending upwardly therefrom, a first pair of transverse partition panels foldably joined to the medial partition structure on each side of the carrier, a second pair of transverse partition panels foldably joined respectively to said first pair of trans-

verse partition panels on each side of the carrier and disposed in overlapping relation therewith, an anchoring tab foldably joined to each of said second pair of transverse partition panels and secured to the inner surface of the associated side wall to form a plurality of article receiving cells on each side of the carrier and characterized in that the distance between said medial partition structure and the adjoining fold line between each of said first and second transverse partition panels is approximately one-fourth the width of each of said end wall panels and in that said second transverse partition panels are struck in part from the associated ones of said first transverse partition panels and of said medial partition structure and wherein the parts of said second transverse partition panels which are struck from said first transverse partition panels respectively constitute approximately one-third of the horizontal dimensions of said second transverse partition panels.

4,413,729

**ARTICLE CARRIER**

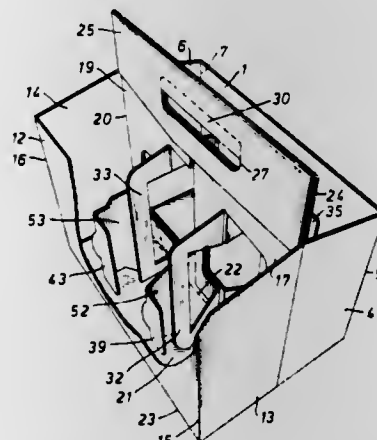
Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 127,988, Mar. 7, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,744

Int. Cl.<sup>3</sup> B65D 75/00

U.S. Cl. 206—188

4 Claims



1. A blank for a cellular article carrier comprising a pair of side wall forming panels, end wall panels hinged to opposed end edges of said side wall forming panels, medial panels foldably joined to each of said end wall panels along the edges thereof remote from said side walls, each of said medial panels having struck therefrom a transverse partition forming structure comprising a main transverse partition panel hinged to that medial panel, a supplementary transverse partition panel hinged to said main transverse partition panel and arranged to be folded into overlapping relationship with at least a portion of said main transverse partition panel, and an anchoring tab hinged to said supplementary transverse partition panel, characterized in that said supplementary transverse partition panels and anchoring tabs associated with each of said medial panels are all arranged so as to extend in the same direction toward one and the same end of said blank before being folded and that all of said supplementary transverse partition panels are hinged to said main transverse partition panels so as to be rotated and folded in one and the same direction when the carton is formed.

4,413,730

**CARTON-SLIDE CHART**

Henry C. Morse, 345 Fullerton Pkwy., Chicago, Ill. 60614

Filed Apr. 14, 1982, Ser. No. 368,467

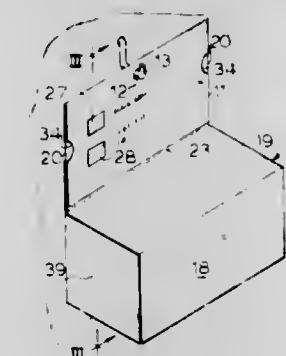
Int. Cl.<sup>3</sup> B65D 69/00

U.S. Cl. 206—232

11 Claims

1. A carton and billboard type of slide chart comprising a one piece relatively stiff cardboard strip having opposite parallel end edges,

said strip being divided into a plurality of longitudinally aligned sections, said sections including four carton forming panel sections intermediate said end edges, two adjacent slide envelope panel sections adjacent one end adapted to be folded over each other and secured at the open end of the folded section, a two sided glue flap and slide panel section at the other end, said two sided glue flap being adjacent a carton forming panel section and positioned intermediate said slide panel section and said carton forming section, and said slide panel section adapted to be folded and interposed between the folded envelope panel sections so that the envelope panel sections and slide panel section form a slide chart, a transverse slit defining an outer margin of said glue flap, said slit stopping short of one end of said glue flap to form a retainer tab retaining the outer of said sections to said glue flap, to extent between said two end sections and accom-



modate the gluing of said end sections thereto to form a slide, the slit and retainer tab defining a margin of a slide card adapted to be positioned between said first mentioned folded end sections and form a slide card movable along the edge of said glue flap upon the breaking of said tab, the end section of said slide card visible when the carton is in a normal position having indicia thereon cooperating with windows in said slide and indicia on said slide adjacent said windows to give interesting information, which may be educational or refer to the contents of the carton or trivia interesting to the age of the person using the contents of the carton, upon breaking of said tab and moving said slide card along said slide, and four intermediate sections bent at right angles with respect to each other to form a rectangular carton with the glue flap extending vertically of the rear wall portion of the carton between said first mentioned two end sections to glue said end sections in the form of a slide.

4,413,731

**PACKAGING ARRANGEMENT FOR CUTTING TOOLS SUCH AS DRILLS**

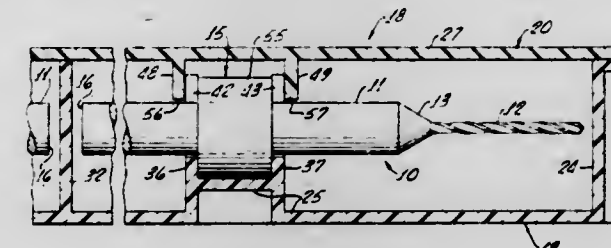
Allen T. Weideman, North Hollywood, Calif., assignor to Tulon, Inc., Gardena, Calif.

Filed Jul. 7, 1982, Ser. No. 396,109

Int. Cl.<sup>3</sup> B65D 85/28

U.S. Cl. 206—379

12 Claims



1. In combination with a cutting tool having a shank for insertion into the collet of a machine and a portion having a cutting means thereon projecting from one end of said shank, a packaging arrangement for said cutting tool comprising

a plastic collar received on said shank and frictionally retained thereon between the ends thereof;  
a first member defining opposed parallel walls having free outer edges and a bottom wall, each of said parallel walls having a slot therein extending inwardly from said free outer edge thereof;  
said slots being aligned and being wider than the diameter of said shank;  
said shank extending through said slots, and  
said collar being positioned intermediate said walls and gripped thereby so as to suspend tool above said bottom wall by said collar,  
and a second member having means for retaining said shank so received in said slots.

4,413,732

**CASSETTE AND ADAPTER COMBINATION**

Friedrich Louzil, Vienna, Austria, assignor to U.S. Phillips Corporation, New York, N.Y.

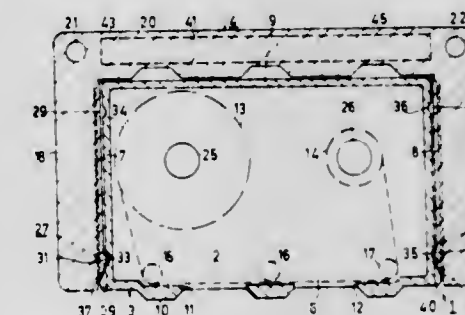
Filed Aug. 30, 1979, Ser. No. 71,224

Claims priority, application Austria, Sep. 4, 1978, 6386/78

Int. Cl.<sup>3</sup> B65D 85/672

U.S. Cl. 206—387

13 Claims



1. In combination, a cassette for a record carrier in the form of a tape, comprising a cassette housing having two cover walls, two side walls and a front wall having at least one opening, the record carrier tape passing along and being accessible through said opening,

a U-shaped bracket comprising two limbs and one cross piece interconnecting said two limbs, arranged to be detachably connected to the cassette housing by engagement of said two limbs with the two side walls of the cassette housing, and

retaining means acting between the cassette housing and the bracket for retaining the cassette housing and the bracket to each other,

characterized in that the cassette housing and the bracket are arranged to be connectable to each other in a first position relative to each other, in which the front wall of the cassette housing is remote from the bracket cross piece, the cassette-bracket combination thereby being positionable in an apparatus by locating with respect to the bracket, at the same time that the front wall opening is accessible for scanning of the tape; as well as in a second relative position in which the cassette housing front wall faces the bracket cross piece such that the bracket cross piece protects said front wall, and

said retaining means comprise at least one double-acting latching device having primary and secondary latching elements arranged on the cassette housing and on the bracket, engageable with each other.



4,413,733

## PIPE NESTING DEVICE

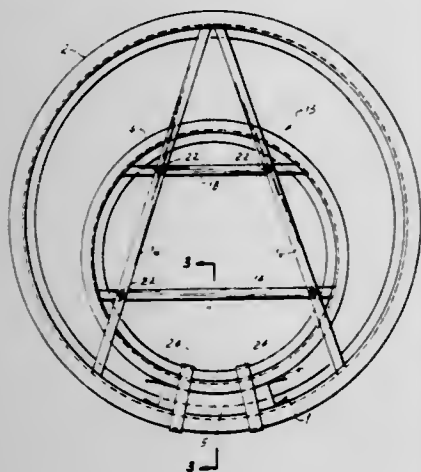
J. James Dunn, Brookwood, and Robert M. Graham, Birmingham, both of Ala., assignors to U.S. Pipe and Foundry Company, Birmingham, Ala.

Filed May 3, 1982, Ser. No. 374,573

Int. Cl.<sup>3</sup> B65D 85/20; F16L 3/22

U.S. Cl. 206—446

7 Claims



6. A nest of push-on bell and plain end pipes having a retainer groove in the bell of each pipe comprising:

- a first and second pipe,
- said first pipe being placed inside said second pipe with said bell of said first pipe being displaced substantially axially from said bell of said second pipe,
- a first structural member extending across a chord of said bell of said second pipe and having each end of said first structural member extending into said retainer groove of said second pipe,
- a second structural member coplanar with said first structural member, said second structural member extending across a diametrically opposite chord of said bell of said second pipe and having each end of said second structural member extending into said retainer groove of said second pipe,
- a third structural member extending across said first and second structural members and across a chord of the bell of the first pipe and having each end of said third structural member extending into said retainer groove of said first pipe,
- a fourth structural member coplanar with said third structural member, said fourth structural member extending across said first and second structural member and across a diametrically opposite chord of said bell of said first pipe and having each end of said fourth structural member extending into said retainer groove of said first pipe, and
- said first structural member being bolted to said third and fourth structural members and said second structural member being bolted to said third and fourth structural members.

4,413,734

## MULTIPLE COMPONENT FILM PACKAGE

Elliott H. Newcombe, Jr., Charlotte, N.C., assignor to Atlantic Coast Carton Company, Charlotte, N.C.

Filed Aug. 11, 1982, Ser. No. 407,259

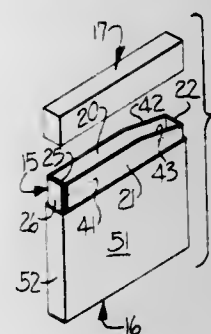
Int. Cl.<sup>3</sup> B65D 5/56, 5/32

U.S. Cl. 206—455

8 Claims

1. A protective storage and dispensing box for flexible sheets of light-sensitive material, such as X-ray film sheets, said box including an inner box component with an open upper end and a closed lower end, an outer box component closely surrounding and engaging said inner box component, said outer box component including an open upper end terminating below the level of the open upper end of said inner box component and a closed lower end, and a cap-type cover including a lower edge adapted to cooperate with the open upper end of said outer box

component, said cover surrounding and closing the open upper end portion of said inner box component, said inner box component including rectangular front and rear spaced-apart panels with opposed sides and upper and lower edges, a first side panel including opposed sides joined along fold lines to corresponding sides of said front and rear panels, a second side panel including first and second overlapped panel components, a bottom including first and second overlapped bottom panels joined along fold lines to said front and rear panels, downwardly sloping portions on said upper edges of said front and rear panels of said inner box component, said first side panel of said inner box component including an upper edge positioned at the juncture of said downwardly sloping portions of said upper edges of said front and rear panels of said inner box component, said downwardly sloping portions and said upper edge of said first side panel of said inner box component providing exposure of the corresponding upper corner of the film sheets to thereby aid in the removal of the film sheets from said box, and lines of perforations formed in said front and rear



panels of said inner box and spaced below said upper edge of said front and rear panels and at the same level as the upper edge of said first side panel so that the upper portions of said front and rear panels of said inner box may be easily removed to provide access to the entire width of the upper portions of the film sheets packaged in said box, said outer box component including rectangular front and rear spaced-apart panels with opposed sides and upper and lower edges, a first side panel including opposed sides joined along fold lines to corresponding opposed sides of said front and rear panels, a second side panel including first and second overlapped panel components, and a bottom including first and second overlapped bottom panels joined along fold lines to said front and rear panels, said bottom panels of said inner and outer box components being overlapped in the same manner so that said bottom panels are alternately joined by fold lines to said front and rear panels to provide a sinuous path for any light entering the box through the bottom to thereby aid in excluding light from the interior of said box.

4,413,735

## EDGE PROTECTOR AND METHOD OF MAKING EDGE PROTECTORS

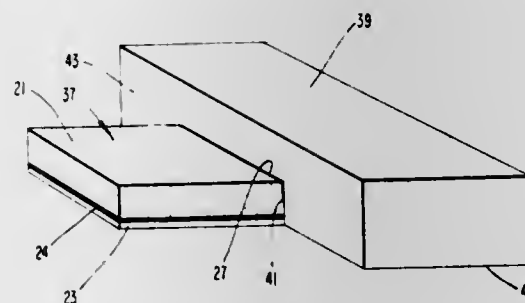
Thomas J. Little, Kings Hill Rd., Etna, N.H. 03750

Filed Apr. 21, 1981, Ser. No. 256,137

Int. Cl.<sup>3</sup> B65D 81/02, 85/30

U.S. Cl. 206—523

13 Claims



1. A protector for an edge of an article comprising: a first part having a scoring line, said scoring line extending

from a first edge to a second edge of the first part and from a first side surface of the part closely adjacent to a second side surface; pliable film means on the second side surface of said first part for permitting flexing of said first part along said scoring line; a second part having a recess in a first side surface which encases a portion of the first part extending from the scoring line; and means for securing the portion of the first part within the recess in the second part.

4,413,736

## JEWELRY BOX

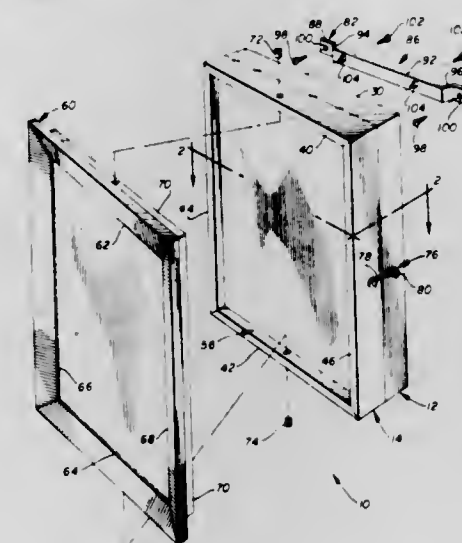
Jerre L. Nibling, P.O. Box 277, Lavon, Tex. 75066

Filed Mar. 29, 1982, Ser. No. 363,057

Int. Cl.<sup>3</sup> A47F 5/08; A47B 67/02; B65D 25/10, 5/52

U.S. Cl. 206—566

16 Claims



1. A jewelry box, comprising: container means adapted to enclose jewelry; cover means for preventing access into said container means; means for connecting said cover means to said container means; frame means for providing a supporting border to a representation made on a surface and for permitting a visual observation of the representation; and attaching means for detachably connecting said frame means to said cover means to permit replacement of the representation.

4,413,737

## SHIPPING PALLET AND A PACKAGE FORMED THEREFROM

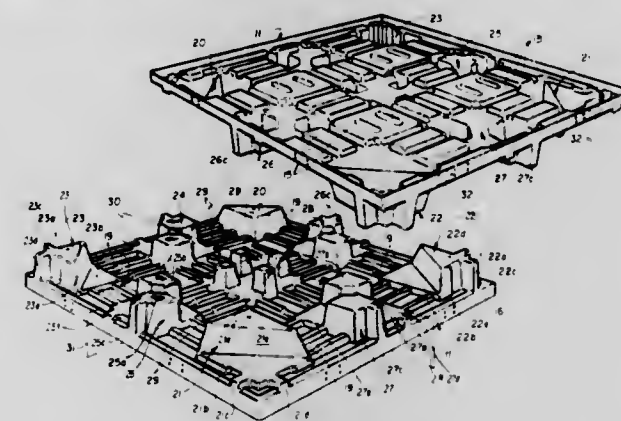
Joseph H. Wind, Taylors, S.C., assignor to Bigelow-Sanford, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 229,195, Jan. 28, 1981, abandoned. This application Aug. 24, 1981, Ser. No. 295,524

Int. Cl.<sup>3</sup> B65D 19/00, 19/38, 21/02

U.S. Cl. 206—599

27 Claims



1. A shipping pallet of the type formed of a single sheet of material and constructed for use with another substantially identical pallet so as to serve as a bottom or top wall of a

shipping container for transporting and storing a load, said shipping pallet having a generally planar base and a plurality of foot means projecting from the base, said foot means including corner foot means positioned in respective corner areas of the pallet, central foot means positioned centrally of the pallet, and intermediate foot means positioned between adjacent corner foot means, and wherein each of the foot means comprises at least one projecting member and a platform member adjacent each projecting member, and said projecting members and said platform members being so constructed and arranged relative to each other that the pallet when in use in a predetermined position of orientation, and at least another position of orientation 180° out-of-phase therefrom, may be stacked in mating relation to a substantially identical inverted pallet and with the projecting members abutting the platform members of the inverted pallet and serving to provide a lateral anti-shift interengagement between the adjacent pallets in a plurality of directions.

4,413,738

## APPARATUS AND METHOD FOR CONTROLLING THE INSPECTION OF FINISHED PRODUCTS

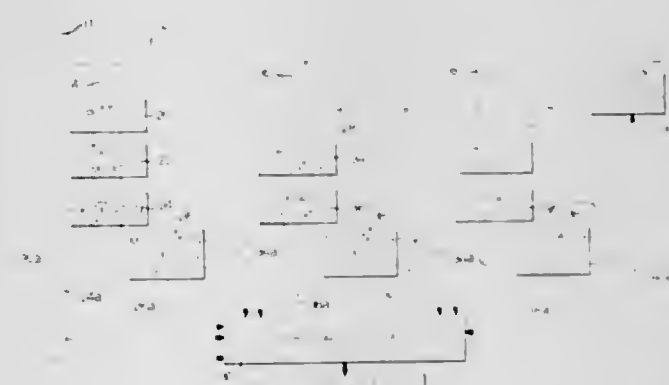
Ernest H. Pemberton, Toledo, Ohio; Darius O. Riggs, Ottawa Lake, Mich.; Douglas J. Mansor; James R. Sager, both of Sylvania, Ohio, and John W. Juvinal, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 11, 1981, Ser. No. 242,808

Int. Cl.<sup>3</sup> B07C 5/34; G06F 15/46

U.S. Cl. 209—523

18 Claims



3. In a glassware production line including a forming machine wherein bottles are formed in molds which apply an identifying code unique to each mold to every formed bottle and means for inspecting the bottles for defects, a finished product controller for monitoring the performance of the glassware forming machine and bottle inspection means, comprising:

- a primary inspection loop including first means for inspecting a portion of the bottles for defects and first means for reading the mold identifying code on those bottles; means responsive to said first means for inspecting and said first means for reading for correlating the detected defects in said primary inspection line bottles to the mold producing them;
- a secondary inspection loop including second means for inspecting others of the bottles for defects;
- a second means for reading the mold identifying codes on all the bottles received from said primary and secondary inspection loops; and
- means responsive to said means for correlating, said second means for inspecting and said second means for reading for determining if bottles formed in defective molds are being identified by said second means for reading.







4,413,745

## TRAY CADDY FOR WAITRESSES

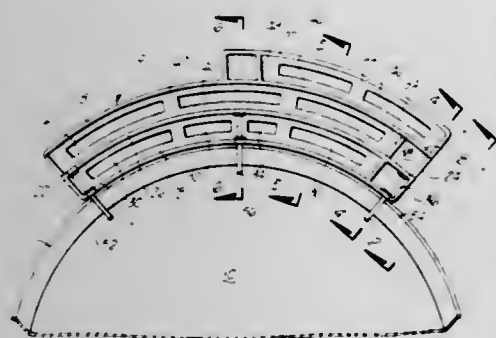
Ray D. Stroud, Oklahoma City, Okla., assignor to Continental Plastics, Oklahoma City, Okla.

Filed May 6, 1981, Ser. No. 261,148

Int. Cl.<sup>3</sup> A47G 23/06; B65D 21/02, 1/36

U.S. Cl. 220—23.4

16 Claims



1. A waitress' tray caddy adapted for attachment to a serving tray comprising:

an inner wall having an upper edge and a lower edge and adapted to register with the outer peripheral portion of a serving tray;

an outer wall having an upper edge and a lower edge and spaced from the inner wall;

an intermediate wall between said inner and outer walls and having an upper edge and a lower edge;

bottom wall means extending between and interconnecting the lower edges of the inner wall and the outer wall, said bottom wall means comprising:

a first horizontally extending bottom wall extending from the lower edge of said inner wall to the lower edge of said intermediate wall; and

a second horizontally extending bottom wall extending from a location spaced upwardly from the lower edge of the intermediate wall to the lower edge of said outer wall;

end walls extending between the inner wall and the outer wall;

partition means between the inner wall and the outer wall and above the bottom wall means and dividing the space between the inner and outer walls into a plurality of vertically tiered chambers for receiving, and making horizontally accessible, a plurality of articles to be served from the tray caddy;

retainer clip means snap-attachable to the inner wall and to the first horizontally extending bottom wall and including a portion extending beneath said first horizontally extending bottom wall for supporting the caddy upon a surface upon which a serving tray carrying the caddy is rested; and

nose means projecting from the inner wall and cooperating with said retainer clip means for retaining the caddy attached in a cantilevered fashion to the outer peripheral portion of a serving tray.

4,413,746

## PRESSURIZED-FLUID CARTRIDGE AND SAFETY CLOSURE THEREFOR

Yoshihide Matsutani, Fujisawa, Japan, assignor to Miyata Industry Co., Ltd., Chigasaki, Japan

Filed Feb. 10, 1982, Ser. No. 347,725

Claims priority, application Japan, Apr. 10, 1981, 56-52022[U]

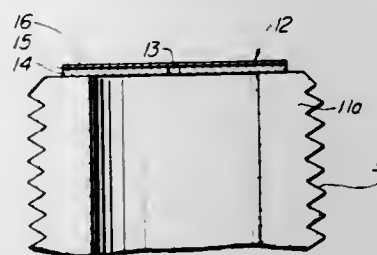
Int. Cl.<sup>3</sup> B65D 90/34

U.S. Cl. 220—89 A

15 Claims

1. A safety closure used to close the mouth of a metallic container of cartridge type for storing a fluid under pressure, said closure being formed by a laminated structure comprising a first layer of a first metal adapted to be welded to said container around said mouth, a second solid layer coextensive with

said first layer of a second metal having a corrosion-resistant property, said first layer having a thickness greater than that of said second layer and provided with at least one pressure relief through-hole formed therein, and means disposed between said first and second layers and coextensive with said first layer for



sealingly securing said layers together so that said pressure relief through-hole is closed by said second layer and said sealingly securing means, the portion of said second layer facing said pressure relief through-hole being rupturable when the pressure in said container is raised to an unduly high level.

4,413,747

## FLOATING LID FOR A LIQUID STORAGE TANK

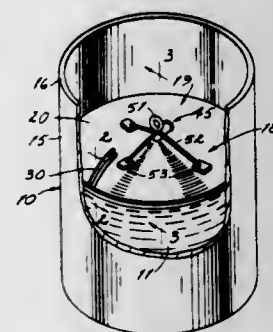
Tyrus N. Tenold; Michael D. Cossette; James P. Kuntz, and Jack D. Gordon, all of Spokane, Wash., assignors to Spokane Industries, Inc., Spokane, Wash.

Filed Jun. 14, 1982, Ser. No. 387,796

Int. Cl.<sup>3</sup> B65D 88/48, 88/34

U.S. Cl. 220—225

2 Claims



1. A flotation lid for a cylindrical liquid storage tank having upright side walls, comprising:

a circular top plate having an integral peripheral wall extending axially to a downwardly facing edge surface;

a circular bottom plate having an integral peripheral wall extending axially toward the top plate to an upwardly facing edge surface;

an annular rim affixed to the edge surfaces of the circular top and bottom plates forming a sealed cavity defined with the top plate, the rim, and the bottom plate, of sufficient buoyance to float the lid on the liquid surface;

a circular serrated edge on the annular rim adapted to selectively engage the upright side walls of the tank to seal the tank interior below the bottom plate to minimize exposure of the liquid surface; and

vent means extending between the top and bottom plates for selectively venting gases from below the bottom plate;

the top plate including an upwardly facing surface and the bottom plate including a downwardly facing surface and wherein the serrated edge is situated axially between the upward and downwardly facing surfaces; the bottom plate being arched upwardly and being held in its upwardly arched configuration by a tension member from the top plate.

4,413,748

## PINCH CAP

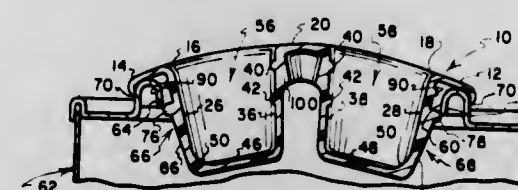
Milton Kessler, Youngstown, and Myron E. Ullman, Canfield, both of Ohio, assignors to Kessler Products Co., Inc., Youngstown, Ohio

Filed Jul. 22, 1982, Ser. No. 400,633

Int. Cl.<sup>3</sup> B65D 43/04

U.S. Cl. 220—281

30 Claims



1. A pinch cap for insertion into a container opening to releasably close the opening, comprising:

(a) a top wall with edge portions which form a rim having a size which is greater than that of a container opening that is to be closed by the cap, the rim being configured to overlie container portions which surround the container opening;

(b) side wall portions which depend from the top wall at locations inset from the rim, the side wall portions having shapes which conform substantially to the shape of at least parts of the container opening, and being configured to permit the side wall portions to be inserted into the container opening;

(c) locking means carried on the side wall portions and projecting outwardly therefrom for engaging the container as the cap is inserted into the container opening, and for deforming the normal configuration of the cap sufficiently to permit at least selected portions of the locking means to be inserted through the container opening as the cap is inserted, the selected portions being configured to underlie and engage such container portions as define the container opening for retaining the cap in a position closing the container opening;

(d) the cap being formed as a one-piece, resiliently deformable structure molded from resilient plastics material which has a memory that tends to return the cap to its normal molded configuration if the cap has been deformed, and having a pair of spaced portions which are movable relatively toward and away from each other during cap deformation; and

(e) formation means including a pair of finger-receiving wells which open upwardly through the top wall at spaced locations, with each of the wells being connected to a separate one of the spaced, relatively movable portions for providing access thereto to enable the spaced, relatively movable portions to be gripped and pinched together to deform the normal configuration of the cap sufficiently to release the selected portions of the locking means from engagement with the container to permit the cap to be removed from the container opening.

4,413,749

NEWSPAPER DISPENSING APPARATUS AND METHOD  
Robert L. Glaser, Chicago, Ill., assignor to Single Vend, Inc., Chicago, Ill.

Filed Jun. 5, 1981, Ser. No. 270,930

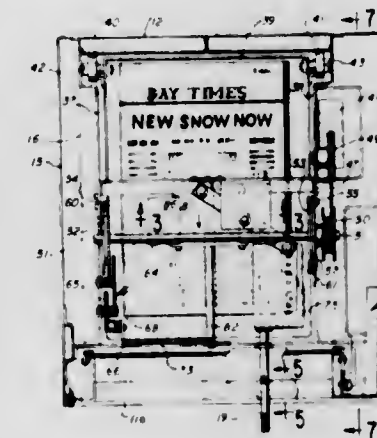
Int. Cl.<sup>3</sup> B65H 3/22

U.S. Cl. 221—1

10 Claims

9. A method of dispensing a single generally flat article, such as a newspaper, from within an enclosure having front, rear and lateral walls which comprises; forming a stack of said articles on a supporting elevator platform mounted within said enclosure; arranging said articles in said stack with any folded edge parallel with the lateral walls of said enclosure, positioning said stack directly below an article engaging means adapted to engage the uppermost article in said stack, moving

said elevator platform to bring the uppermost article in said stack into engagement with said article engaging means, braking the movement of said elevator platform in response to a predetermined pressure being applied to said article engaging means by said uppermost article in said stack, and moving said article engaging means forwardly while in engagement with said uppermost article to dispense a portion of said uppermost



article outwardly from within said enclosure, whereby the pressure between said article engaging means and said uppermost article in said stack is directly controlled to prevent applying an excessive amount of pressure on said article engaging means; thereby avoiding having more than one article dispensed from said enclosure with each forward movement of said article engaging means.

4,413,750

## CHIP DISPENSER

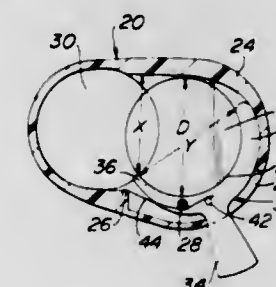
John J. Morrone, and Mary J. Morrone, both of 114 Payson Ave., Audubon, N.J. 08106

Filed Jun. 29, 1981, Ser. No. 278,521

Int. Cl.<sup>3</sup> B65G 59/06

U.S. Cl. 221—263

7 Claims



1. A hand held chip dispenser comprising:

a body,

a chamber within the body, the chamber having a lower wall and a side wall formed by a ledge extending upwardly from the lower wall,

a bore passing downwardly through the body, a bore inlet being formed in the lower wall of the chamber, a bore outlet being formed at the bottom of the body,

a cowl connected to the body adjacent to the ledge, a wall of the cowl being generally parallel to the lower wall of the chamber and forming an upper wall of the chamber, the cowl having a generally vertical opening extending there-through and being offset with respect to the bore inlet,

a chip supply means associated with the cowl whereby a chip adapted to be dispensed passes through the cowl, and a single crescent-shaped dispensing member having first and second horns pivotably disposed within the chamber,

the dispensing member being biased by a biasing means to a ready position in which the distance between the tip of the first horn of the dispensing member and an opposed side wall of the chamber is less than the diameter of a chip



adapted to be dispensed so as to prevent the chip from being dispensed,  
the dispensing member having an actuating means for pivoting the dispensing member to a dispensing position wherein the distance between the tip of the first horn and the opposed side wall is greater than the diameter of the chip and the chip is moved to a position over the bore inlet by the second horn.

4,413,751

# METHOD FOR DISPENSING A PRESELECTED AMOUNT OF LIQUID

Saeko Tokorozawa, Kanagawa, Japan, assignor to Pilot Man-Hitsu Kabushiki Kaisha, Tokyo, Japan

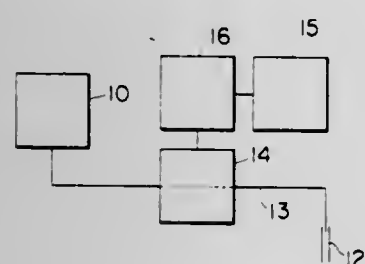
Filed Jul. 19, 1978, Ser. No. 926,057

Claims priority, application Japan, Jul. 19, 1977, 52-86191

Int. Cl.<sup>3</sup> F04B 43/12

U.S. Cl. 222—1

10 Claims



1. A method of dispensing a preselected amount of a liquid drop-by-drop from a reservoir, said liquid being pumped intermittently to a discharge pipe by the successive peristaltically squeezing and releasing of an elastic tube carrying said liquid and connected to said discharge pipe, said discharge pipe having a discharge port with a face, said face being perpendicular to the longitudinal axis of said discharge pipe, the outer diameter of said discharge pipe at said discharge port being less than or equal to twice the inner diameter of said discharge pipe at said discharge port, said preselected amount of said liquid dispensed in a drop-by-drop fashion from said discharge port satisfying the following conditions:

- (1)  $V = Q \times M \times C$
- (2)  $50 \text{ mg} \leq Q$
- (3)  $0.5 \text{ seconds} \leq M$
- (4)  $3/\text{seconds} \leq C$
- (5)  $1.5 \leq M \times C$

wherein:

V is the weight of the produced liquid drop,  
Q is the amount of liquid pumped per each pump,  
M is the time interval between successive drops, and  
C is the cycle of the pump.

4,413,752

# APPARATUS FOR DISPENSING A CARBONATED BEVERAGE

John R. McMillin, Maplewood, Minn., and Peter Strandwitz, Neenah, Wis., assignors to The Cornelius Company, Anoka, Minn.

Division of Ser. No. 1,027, Jan. 4, 1979, Pat. No. 4,305,527, which is a division of Ser. No. 806,136, Jun. 13, 1977, Pat. No. 4,143,793. This application Oct. 20, 1980, Ser. No. 227,857

Int. Cl.<sup>3</sup> B67D 5/54

U.S. Cl. 222—56

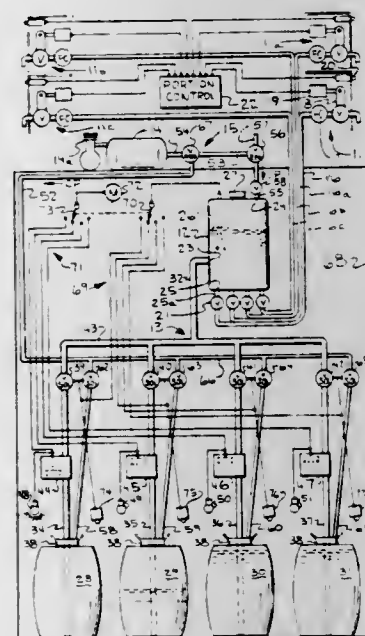
4 Claims

1. Apparatus for dispensing a carbonated beverage, comprising:

- (a) a plurality of beverage dispensing valves;
- (b) a beverage reservoir fluidly connected to each dispensing valve;
- (c) a beverage supply conduit having
  - (1) a downstream end fluidly connected to said reservoir,
  - (2) an upstream end having thereon means for fluidly

connecting the beverage conduit to a supply vessel having carbonated beverage therein, and

- (3) a normally closed beverage supply valve between the upstream and downstream ends for normally precluding flow of carbonated beverages through the conduit;
- (d) a supply vessel propellant gas conduit having
  - (1) an upstream end adapted to be fluidly connected to a supply of pressurized propellant gas,
  - (2) a downstream end having thereon means for fluidly connecting said gas conduit to said supply vessel, and
  - (3) means for regulating propellant gas pressure at the downstream end of said gas conduit at a predetermined level of pressure;
- (e) a reservoir propellant gas conduit having
  - (1) an upstream end adapted to be fluidly connected to a source of pressurized propellant gas,



- (2) a downstream end fluidly connected to said reservoir, and
- (3) means for regulating the pressure of propellant gas within the reservoir at a level of pressure at least equal to the carbonation saturation pressure of beverage within the supply vessel and less than the predetermined level of pressure at the downstream end of said supply vessel gas conduit;
- (f) means for sensing the quantity of carbonated beverage within the reservoir; and
- (g) means operatively connected said sensing means to said beverage supply valve for opening said beverage supply valve upon the sensing of less than a predetermined quantity of carbonated beverage within the reservoir by said sensing means.

4,413,753

# DISPENSER FOR CYANOACRYLATE ADHESIVES

Hugh J. Stock, Saratoga, Calif., assignor to Pacer Technology and Resources, Inc., Campbell, Calif.

Continuation of Ser. No. 150,151, May 15, 1980, abandoned.

This application Feb. 5, 1982, Ser. No. 346,117

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> B01L 3/00; B65D 1/08, 17/24

U.S. Cl. 222—149

4 Claims

1. A dispensing tip internally attachable to the mouth of a necked container of liquid adhesive for dispensing the adhesive, said dispensing tip comprising in combination:

- (a) an hollow boss for sealingly engaging the interior cylindrical surface of the neck of the container, said boss including a disc section extending across the mouth of the container for supportingly contacting the extremity of the neck;

- (b) a conical tip extending from said boss for dispensing the adhesive;
- (c) a diametrically oriented ridge extending from said disc section on opposed sides of said conical tip for providing an engageable element by apparatus used to install and hermetically seal said dispensing tip with the container;
- (d) a passageway extending from said hollow boss through said conical tip for discharging the adhesive to be dispensed;
- (e) a stopper detachably attached to the end of said conical tip for hermetically sealing said passageway prior to detachment of said stopper from said tip, said stopper including a disc extending radially at the extremity of said conical tip, an inverted conical shroud extending from the axial center of said disc, said conical shroud including a



cavity having an interior conical surface for receiving said conical tip and a plug enclosed within said cavity for engaging said passageway on mounting of said stopper upon said conical tip to force flow of any residual adhesive within said passageway into the container, and a pair of flanges disposed upon opposed sides of said shroud and joined with said disc for providing an enlarged surface area to grip said stopper and which grip in constrained against sliding by said disc;

- (f) a break away junction between said tip and said stopper for detaching said stopper from said tip, said junction including an annular indentation about said tip and circumscribing said passageway; and
- (g) a length of said passageway extending beyond said junction and into said disc for assuring formation of a discharge outlet on detachment of said stopper from said tip.

4,413,754

# DISPENSER OF SMALL QUANTITIES OF LIQUIDS

Frank Landwehr, Hochdorf, and Heinz Wanner, Biberach, both of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,206

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 8107209[U]

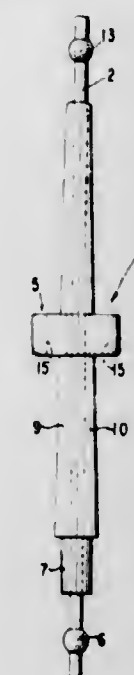
Int. Cl.<sup>3</sup> B65D 37/00

U.S. Cl. 222—209

5 Claims

1. An apparatus for dispensing small quantities of fluid which comprises a hinged clamping member with a bellows means attachment for receiving a primary packing means in the form of an elongated cylindrical tube containing fluid and having sealed ends, said bellows means attachment having a cylindrical shaft, wherein the hinged clamping member consists of two half-shells which enclose an inner space; the two half-shells are enclosed by a retaining and supporting member; the retaining and supporting member consists of symmetrical halves which are connected to each other by a hinge; the inner diameter of the inner space corresponds to the outer diameter of the tube; the two halves of the retaining and supporting member have, adjacent to the hinge, recesses with stops and, on the side opposite the hinge, a locking or snap-fit means; the hinged half-shells comprise, at one end, a shaft whose outer diameter corresponds to the inner diameter of said cylindrical shaft of said bellows means attachment; the bellows means attachment is provided with an opening which permits the

bellows means attachment to be pushed onto the shaft; and the retaining and supporting device comprises, on its outer periph-



4,413,755

# METERED AEROSOL VALVE FOR USE IN INVERTED POSITION

Michel Brunet, Sainte Colombe La Commanderie, France, assignor to Etablissements Valois, Le Neubourg, France

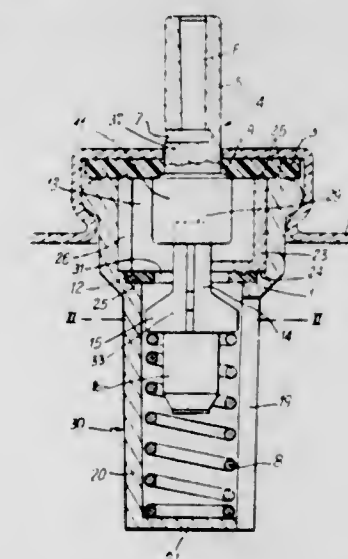
Filed Mar. 30, 1982, Ser. No. 363,748

Claims priority, application France, Mar. 30, 1981, 81 06272

Int. Cl.<sup>3</sup> B65D 83/00

U.S. Cl. 222—402.2

5 Claims



1. A valve for being mounted in the opening of a pressurized container, for being filled up with a liquid material to be atomized, containing a propellant miscible gas solved under pressure in said liquid material, and for expelling precise metered amounts of material when the container is maintained in inverted position with the opening downwards, comprising a valve body (1) of tubular form, said body forming at its upper part, when the container is in upright resting non inverted position, a metering chamber (13) adjacent to the container opening, limited by a generally cylindrical wall (23,26), two radial walls formed by a first upper annular gasket (3) with a central opening and a second lower annular gasket (12) with a central opening (31), and a valve stem (4) extending through gasket openings and including an upper extension (5) extending out of the valve, said stem comprising between gasket (3) and



gasket (12) a bulge (11) provided for closing opening (31) by downward movements, said stem (4) extending downwards by comprising a slender part (14) passing through opening (31) when the valve is at rest, and a guiding shank (16), the upper outer part (5) of stem (4) comprising an axial canal (6) externally communicating through a passage (7) located outside of the valve when said valve is at rest and inside of the valve when the stem is displaced downwardly, said valve body forming at its lower part a tubular housing (30) with a bottom (21) for receiving a return spring finding its upper abutment against a shoulder (15) of the stem and its lower abutment against bottom (21), wherein the slender part (14) of stem (4) is formed with ribs (17), and housing (30) is formed with a longitudinal opening (19), the number of openings (19) being different from the number of ribs (17).

4,413,756

**AEROSOL INSECT EXTERMINATOR DEVICE**

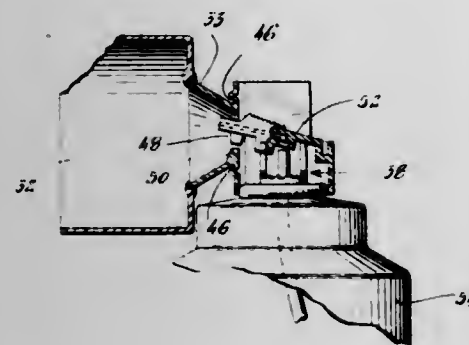
Joseph F. Kirley, 138 Crescent Rd., Concord, Mass. 01742

Filed Dec. 20, 1978, Ser. No. 971,394

Int. Cl.<sup>3</sup> B65D 83/14; B05B 9/03

U.S. Cl. 222—402.11

4 Claims



1. In an insect exterminating device, an aerosol can having a liquid propellant, a rotatable valve assembly having a valve lever connected to a valve supply tube, the latter having its free end submerged in said liquid propellant, the invention comprising: a discharge orifice for said liquid propellant having an enlarged part at the forward end thereof provided with a flat edge that can be placed against a flat surface such as a wall to form an enclosure trapping an insect therein, means for venting said enlarged part, a mounting fixture inserted on the top of said can having said valve lever movably secured thereto, a connecting member connecting said enclosure to said mounting fixture, said connecting member having a flexible part, said valve lever and connecting member respectively provided with aligned abutments in the inactive condition of said device so that the valve lever cannot be depressed to discharge a quantity of liquid propellant, and when said enclosure is pressed firmly against a flat surface said flexible part is caused to flex whereby said enclosure is forced inwardly, and said abutments are caused to be moved out of alignment thereby permitting the valve lever to be depressed to release a quantity of liquid propellant through said orifice which upon sudden expansion forms a cold gas that freezes said insect within said enclosure.

4,413,757

**DISPENSER FOR REPELLING ANIMALS**

Harold A. Adler, 1457 Eastwind Cir., Westlake Village, Calif. 91361

Filed Mar. 9, 1981, Ser. No. 242,039

Int. Cl.<sup>3</sup> B65D 1/32

U.S. Cl. 222—105

1 Claim

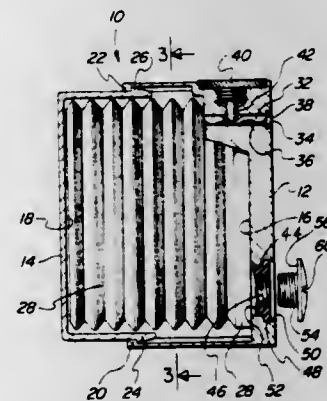
1. A hand held dispenser for a pungent liquid to repel animals comprising:

- a first housing section having a first internal chamber;
- a second housing section having a second internal chamber and an end wall, said first and said second housing sections being telescopically connected together so said first and

second internal chambers cooperate together to form a single enlarged chamber, said second housing section being telescopically movable with respect to said first housing section by squeezing said end wall toward said first housing section so as to forcefully rapidly and sharply reduce the volume of said single enlarged chamber;

an outlet valve assembly attached to said first housing section, said outlet valve assembly to be capable of dispensing a directed stream of liquid;

a bladder adapted to contain an animal-repelling pungent liquid, said bladder being located within and substantially filling said single enlarged chamber, said bladder having a liquid inlet and a liquid outlet, said liquid outlet connecting with said outlet valve assembly, whereby upon moving of said second housing section relative to said first housing section decreasing the volume of said single enlarged chamber the said bladder is compressed causing discharge of liquid from said bladder through said outlet valve assembly, said bladder having a bottom end directly bearing against said end wall and being completely corrugated on its sides so that, when collapsed by said squeezing action, said bladder is substantially emptied of said liquid by a continual progressive squeezing operation in the liquid discharging direction;



said first housing section having a front end wall, said front end wall having an outlet opening extending completely therethrough so as to communicate with said first internal chamber, said bladder being integrally provided with an outlet tube located in and completely filling said outlet opening and having an outer end captured by said front end wall, said outlet valve assembly comprising a manually operable knob rotatably mounted on said first housing section and having an end portion protruding laterally into said outlet opening and bearing against said outlet tube for manually selectively closing said tube by lateral restriction thereof and adjustably opening said tube for selective discharge of said fluid;

said front end wall having an inlet opening extending completely therethrough so as to communicate with said first internal chamber, said bladder being integrally provided with a flexible walled inlet conduit located in and completely filling said inlet opening and having an outer end captured by said front end wall, a plug removably insertable into said conduit and oversize with respect to said conduit so as to tightly press said flexibly walled conduit against said first housing section to seal said bladder against fluid leakage.

4,413,758

**COMPLETE AIR-FLOW DISPENSERS**

Armon J. Walters, 39 Haverhill Rd., Trumbull, Conn. 06611

Filed May 22, 1981, Ser. No. 266,235

Int. Cl.<sup>3</sup> B65G 69/06

U.S. Cl. 222—195

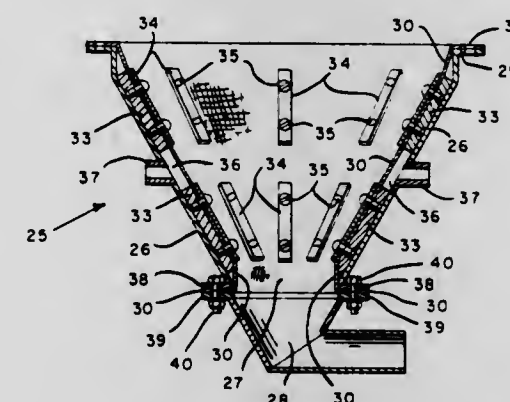
8 Claims

1. An air-flow container assembly adapted to receive a supply of solid, particulate material and to dispense said material through an opening in the base thereof under the influence of

pressurized fluidizing air introduced to said container, said assembly comprising an upper air-flow product compartment and a lower air-flow base which is releasably attached to said product compartment, said base comprising a porous floor for said product compartment comprising an air space covered by a layer of air-permeable fabric, and means for receiving a supply of pressurized fluidizing air into said air space and for directing said air up through said air-permeable floor to fluidize product in contact with said floor, said product compartment having a rigid outer wall, a porous inner wall comprising a layer of air-permeable fabric supported by said outer wall closely spaced therefrom to provide a narrow interconnected air space therebetween which substantially completely sur-

rounds said product compartment, and means for receiving a supply of pressurized fluidizing air through said rigid outer wall and into said narrow interconnected air space to cause said fluidizing air to surround said product compartment and pass through said air-permeable inner wall from all sides to fluidize product in contact with said inner wall and cause said fluidized product to flow down to said air-flow base, said base and said product compartment each comprising means for releasably attaching said elements to each other and for confining therebetween adjacent extremities of the layers of the fabrics which form the porous floor of said base and the porous wall of said product compartment to isolate the air spaces underlying said porous floor and said porous wall.

actuating surface which is provided on said headpiece, the headpiece being collapsible in bellows-like manner, pressing said headpiece increasing pressure on said pasty composition thereby forcing it through said nozzle, the improvement comprising a rod passes through the piston and is operatively coupled with the headpiece via a free path, means comprising another catch for coupling said rod in force-locked manner to the piston, said means operates in a direction opposite the first-mentioned catch.



4,413,760

**DISPENSING DEVICE HAVING RATCHET MEMBER**

John S. Paton, Belth, Scotland, assignor to Greater Glasgow Health Board, Glasgow, Scotland

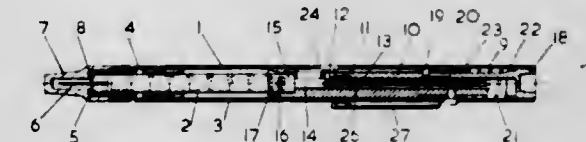
Filed Mar. 31, 1981, Ser. No. 249,448

Claims priority, application United Kingdom, Apr. 8, 1980, 8011572

Int. Cl.<sup>3</sup> B67D 5/42

U.S. Cl. 222—309

8 Claims



rounds said product compartment, and means for receiving a supply of pressurized fluidizing air through said rigid outer wall and into said narrow interconnected air space to cause said fluidizing air to surround said product compartment and pass through said air-permeable inner wall from all sides to fluidize product in contact with said inner wall and cause said fluidized product to flow down to said air-flow base, said base and said product compartment each comprising means for releasably attaching said elements to each other and for confining therebetween adjacent extremities of the layers of the fabrics which form the porous floor of said base and the porous wall of said product compartment to isolate the air spaces underlying said porous floor and said porous wall.

4,413,759

**DISPENSER FOR PASTY COMPOSITIONS**

Herbert Mettenbrink, Lohne, Fed. Rep. of Germany, assignor to Bramlage GmbH, Lohne/Oldenburg, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,701

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045048

Int. Cl.<sup>3</sup> B05B 11/04; A47K 5/12

U.S. Cl. 222—213

9 Claims



1. In a dispenser for pasty composition, having a nozzle opening, a catch, a dispenser housing, and a piston which is arranged for displacement in the dispenser housing, travels in a direction towards said nozzle opening upon emptying of the dispenser, and is blocked in the opposite direction by said catch, a headpiece of said dispenser housing, and a push-button

1. A dispensing device suitable for use in dispensing a predetermined quantity of material from a container comprising a tubular body member having one end, said one end having an outlet, and a plunger slidably movable in said body member towards said outlet, said dispensing device comprising:

an elongate body having a first end portion and defining a chamber for receiving a said container with said outlet of said container held in said first end portion of the elongate body;

a first drive member slidably mounted on said body; an unidirectional drive transmission means disposed for driving engagement with said first drive member, at least in use of the device;

a second drive member having a free end, said free end being drivingly engageable with said plunger of the container, in use of the device, so that said second drive member and said plunger can be driven by the first drive member via said unidirectional drive transmission means, in use of the device for dispensing, only in a direction towards the container outlet and the first end portion of the elongated body whilst permitting return movement of the first drive member;

said unidirectional drive transmission means comprising a plurality of ratchet teeth on one of said first and second drive members and a pawl means on the other disposed for unidirectional driving engagement with said ratchet teeth; said device including a resilient biasing means disposed in said elongate body for biasing said first drive member in a direction for providing return movement of said first drive member;

wherein one of said elongate body and first drive member is provided with a stop means and the other with axially spaced apart first and second abutment means, said abutment means being disposed on either side of said stop means for co-operation therewith so as to define a maximal displacement of the first drive member thereby to determine a maximal dispensing dose for a single stroke of the first drive member.

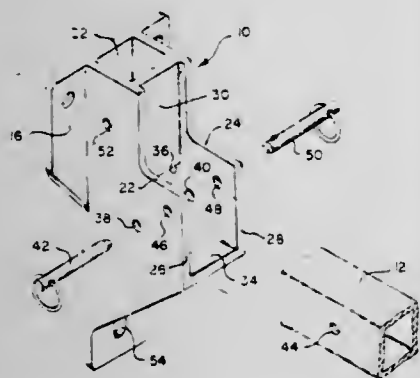


4,413,761

**SUPPORT APPARATUS FOR MOTOR VEHICLE BUMPER RACK MEMBERS**

Norman Angel, 2321 Carolton Rd., Maitland, Fla. 32751  
Continuation-in-part of Ser. No. 298,340, Aug. 31, 1981,  
abandoned. This application Jun. 9, 1982, Ser. No. 386,601  
Int. Cl.<sup>3</sup> B65R 9/06; A47F 5/00; B60R 19/02  
U.S. Cl. 224—42.45 R

9 Claims



1. A support apparatus for motor vehicle bumper rack members comprising:

- a vertical back plate member for joining to the bumper;
- a pair of parallel spaced apart side members perpendicularly joined to the back plate, each having a front edge;
- a partition member means perpendicularly joining the side members, spaced in parallel from the back plate and having a bottom edge and forming a socket area with the back plate and the side members to receive and position a bumper rack member in a vertical position; and
- a strut member joining the side members near the front edge of the side members, the strut member is positioned below the bottom edge of the partition member means a distance to permit a bumper rack member to be inserted between the bottom edge of the partition member means and the strut member, each side member having aligned first holes between the bottom edge of the partition member means and the strut member to receive a pin which passes through a rack member to prevent horizontal movement of the rack member and to serve as a pivot point for movement of the rack member from a horizontal position to a vertical position and each side member having aligned second holes slightly above the bottom edge of the partition member means to receive a pin across a top surface of a horizontal rack member to prevent vertical movement of the rack member when it is in a horizontal position and to maintain the rack member when it is placed in a vertical position.

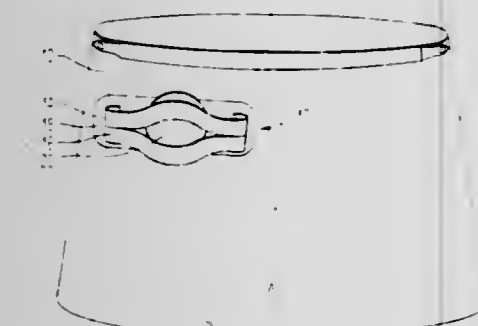
4,413,762

**GAME BALL HOLDER**

Edward Carini, 20 Stewart Pl., Mount Kisco, N.Y. 10549  
Filed Oct. 22, 1981, Ser. No. 313,803  
Int. Cl.<sup>3</sup> A45F 5/00

U.S. Cl. 224—250

10 Claims



1. A ball holder adapted for use on a garment comprising two elongate strips of elastic material, each having two ends

and two lateral edges, said strips being arranged side by side with one lateral edge of one strip adjacent to one lateral edge of the other, the adjacent lateral edges being joined together along a prescribed length from each end and unjoined for a prescribed length midway between said ends, the ends of said strips being adapted for attachment to a garment.

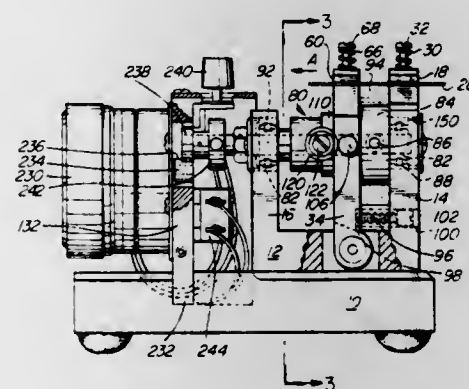
4,413,763

**METHOD AND APPARATUS FOR BREAKING AN OPTICAL FIBER**

Helmut H. Lukas, Carleton Place, Canada, assignor to Northern Telecom Limited, Montreal, Canada  
Filed Jul. 13, 1981, Ser. No. 282,819  
Int. Cl.<sup>3</sup> C03B 37/16

U.S. Cl. 225—2

27 Claims



1. A method of breaking an optical fiber, including the steps of scoring the fiber transversely to its length to produce a score, and tensioning the fiber longitudinally to cause a crack to propagate from the score completely across the fiber, wherein a level of tension sufficient to cause the crack to propagate across the fiber is applied to the fiber after, but not during, the scoring step, and during the scoring step the fiber is subjected to a controlled tension insufficient to sever the fiber when scored, the first and second-mentioned tension being produced substantially without bending of the fiber by stretching it between spaced locating means and urging said locating means apart.

4,413,764

**GUIDE FOR TRACTOR FEED FOR PAPER WEBS IN OFFICE MACHINE**

Wendelin Weber, Siegen, and Manfred Rosenthal, Kirchen, both of Fed. Rep. of Germany, assignors to U. S. Philips Corporation, New York, N.Y.  
Filed Sep. 14, 1981, Ser. No. 301,568  
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036642

Int. Cl.<sup>3</sup> B65H 17/34; G03B 1/30

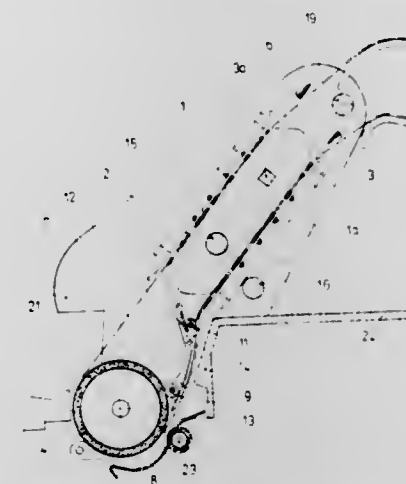
U.S. Cl. 226—170

10 Claims

1. A tractor feed device for paper webs, comprising two associated shafts, two tractors each journaled on said shafts and arranged to be driven by at least a first one of said shafts; each tractor comprising an endless transport chain having pins and arranged to pass about said shafts so as to define two longitudinal sides, and a pair of deflectable retaining flaps on the longitudinal sides of the tractor; said device further comprising a pivotable guide piece arranged adjacent an end face of a tractor, said device being adapted to feed a paper web along one longitudinal side of the tractors over said guide to a printing backing around which the web is guided, the web then being discharged along the other longitudinal side of the tractors,

characterized in that said guide piece is arranged to extend from the tractor to the vicinity of a zone in which the paper web first contacts the printing backing, in that at least one said guide piece is pivoted to a respective tractor in a hinged manner, and said guide piece has a surface

which contacts a paper web being so fed and which lies at a location within a loop formed by the paper web substan-



tially in a plane tangential to the printing backing at the zone of first contact between the paper web and the printing backing.

4,413,765

**METHOD AND APPARATUS FOR IN SITU REPAIR OF A WORN PIPE SECTION**

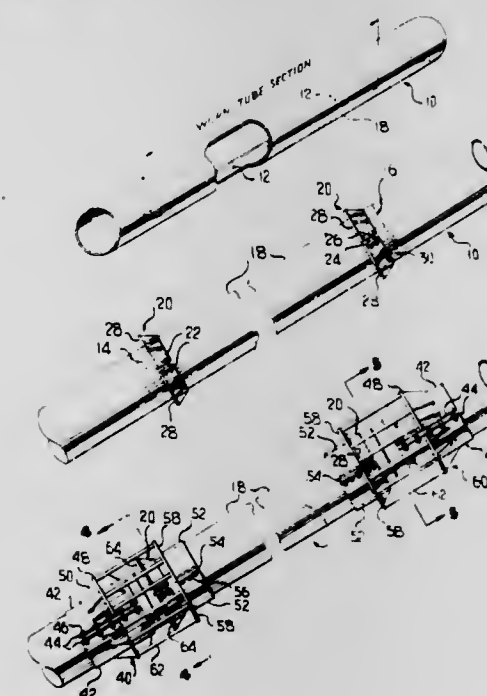
Fred L. Tracy, P.O. Box 111, 40th Ave. & County 4, Roll, Ariz. 85347

Filed Feb. 23, 1981, Ser. No. 237,526

Int. Cl.<sup>3</sup> B23K 37/04

U.S. Cl. 228—119

20 Claims



1. The method of repairing in situ a pipe section which has been unduly worn along a portion of its inner circumference by friction of material fed therethrough, comprising the steps of:

- (1) marking the ends of said worn pipe section,
- (2) clamping the worn pipe section coaxially aligned and longitudinally in place with respect to the remainder of the pipe, and while retaining the pipe section clamped as per step (2) performing the further steps of
- (3) cutting said pipe at the marked ends to free the worn pipe section from the remainder of the pipe,
- (4) rotating the freed pipe section a sufficient degree to displace the worn surface portion from substantial further contact with material to be fed through the pipe, and
- (5) reconnecting the rotated pipe section to the remainder of the pipe.

13. Clamp apparatus for in situ repair of a section of pipe unduly worn in its side wall by freeing said worn section, rotating it axially, and re-connecting said worn section to the

non-worn section, said apparatus comprising first and second elongated clamp means adapted to be mounted at spaced apart locations on the exterior of said pipe adjacent to the opposite ends of said worn section, each of said clamp means comprising attachment means for mounting said clamp means on said pipe, and bearing means spaced from said attachment means for supporting said worn pipe section aligned with said non-worn section and permitting rotation of said worn section with respect to said non-worn section after it is freed from the non-worn section of said pipe, wherein said bearing means comprises an element which encircles said worn section and provides a bearing surface to allow said worn section freedom to rotate with respect to said bearing means when said element is closed to its fullest extent around said worn section.

4,413,766

**METHOD OF FORMING A CONDUCTOR PATTERN INCLUDING FINE CONDUCTOR RUNS ON A CERAMIC SUBSTRATE**

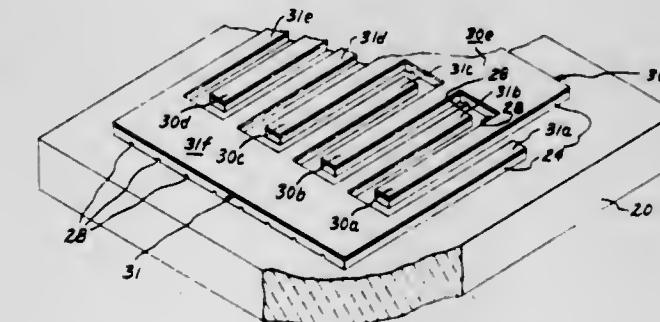
Harold F. Webster, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,992

Int. Cl.<sup>3</sup> H05K 3/06

U.S. Cl. 228—123

17 Claims



1. A method of forming a conductor pattern including fine conductor runs on a ceramic substrate, comprising:

- (a) forming a plurality of grooves in a first side of a metallic sheet, said grooves not crossing portions of said metallic sheet which are to be formed into said fine conductor runs;
- (b) direct bonding using an eutectic composition said first side of said metallic sheet onto said ceramic substrate; and
- (c) selectively removing metal from a second side of said metallic sheet to form said conductor pattern.

4,413,767

**METHOD OF ATTACHING A HANDLE TO A COOKING VESSEL**

David L. Hellinger, Fort Wayne, Ind., assignor to Lincoln Manufacturing Co., Inc., Fort Wayne, Ind.

Filed May 7, 1981, Ser. No. 261,594

Int. Cl.<sup>3</sup> A47J 35/10, 45/07; B23K 31/02

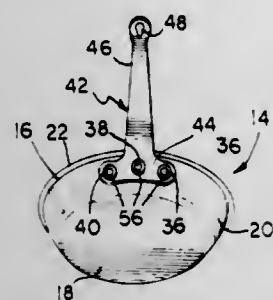
U.S. Cl. 228—136

7 Claims

1. A method for attaching a handle to a cooking vessel such as a pot or pan including a receptacle at least a portion of which has a curved outer surface, the method comprising: securing at least two elongated studs to the curved outer surface of the receptacle wherein the studs extend radially outward from the receptacle outer surface and the studs diverge outwardly from the receptacle outer surface, providing a handle with a mounting portion having two openings therein, the openings being larger than the diameters of the studs and being sufficiently large that the handle can be slipped directly over the diverging studs, subsequent to securing the studs to the receptacle outer surface, placing the handle openings over the studs so that



the studs enter and extend through respective said handle openings, inserting a washer into each of the openings and over the respective stud wherein each said washer is disposed



between the stud and the respective opening and the washers substantially prevent movement between the handle and the studs, and subsequently securing together the handle, washers and the respective studs.

4,413,768

## METHOD OF MAKING A MULTI-BORE ELEMENT

Wolfgang Niwiera; Franz-Josef Holtorf, and Hans H. Biederer, all of Osnabrück, Fed. Rep. of Germany, assignors to Kabel- und Metallwerke, Guthehoffnungshütte AG, Hanover, Fed. Rep. of Germany

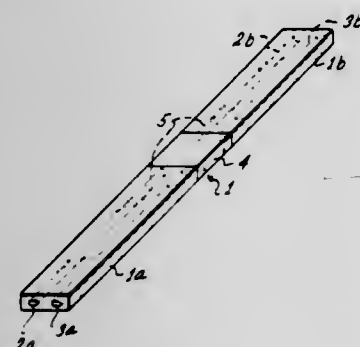
Filed Nov. 30, 1981, Ser. No. 325,745

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3110434

Int. Cl.<sup>3</sup> B23K 31/02

U.S. Cl. 228—173 A

11 Claims



1. A method of making a copper or copper alloy section having a plurality of blind bores, comprising the steps of providing two solid blanks; piercing each blank to obtain therein a plurality of through-bores; plugging one end of each bore by means of a tight-fitting plug; resistance-welding the plug ends of the two blanks directly to each other or to a solid blank; and sizing the bores to the extent that they are not plugged.

4,413,769

## CARTON WITH INTERNAL PARTITION

Louis C. Michetti, Santa Clara, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 7, 1982, Ser. No. 415,147

Int. Cl.<sup>3</sup> B65D 5/48

U.S. Cl. 229—27

11 Claims

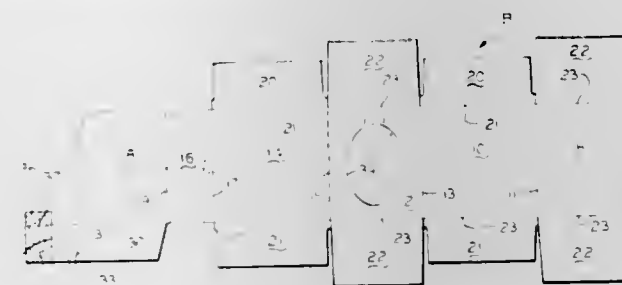
1. A collapsible folding carton with an integral, internal partition, said carton being formed from a unitary blank of foldable paperboard and comprising:

- (a) pairs of opposed top and bottom wall panels and side wall panels foldably joined to each other to form a tubular structure open at the ends;
- (b) end walls, for closing each end of said tubular structure, each including opposed pairs of closure flaps foldably

joined to end edges of said top and bottom wall panels and said side wall panels and adapted to be secured to each other in overlapped relation;

(c) an integral partition panel positioned within said tubular structure intermediate said side wall panels and parallel thereto;

(d) said partition panel:



- (i) having a lower edge foldably joined to said bottom wall panel;
- (ii) having one end edge, which is generally normal to said lower edge, foldably joined to one of said end walls;
- (iii) having its other edges free from attachment to said carton.

4,413,770

## RURAL MAILBOX

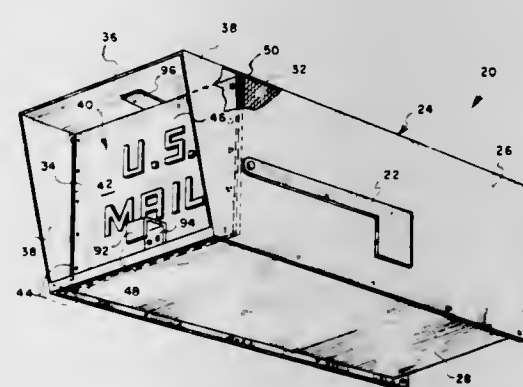
Beatrice E. Nye, R.F.D. #1, Fitchville, Conn. 06334

Filed Mar. 4, 1981, Ser. No. 240,562

Int. Cl.<sup>3</sup> B65D 91/00; E06B 7/16

U.S. Cl. 232—17

10 Claims



1. A mailbox comprising:

- a body including a plurality of sidewalls having inner surfaces defining an interior compartment for receiving and containing mail and an opening into the interior compartment;
- a door for gaining access to the interior compartment of said body including a central member, a peripheral outer edge defining the limits of said central member, and upper and lower ends;
- pivot means mounting said door adjacent said upper end within the opening for swinging movement between a closed position lying substantially in a vertical plane and open positions, one whereby said door is swung forwardly about its upper end out of said compartment and another whereby said door is swung rearwardly about its upper end into said compartment;
- said outer edge of said door being proximate to and enveloped by said inner surfaces when said door assumes the closed position and conforming generally to the opening into the interior compartment; and
- sealant means fixed to said door continuously along said outer edge of said door for engaging said inner surfaces when said door is in the closed position.

4,413,771  
METHOD AND APPARATUS FOR CENTRIFUGAL SEPARATION

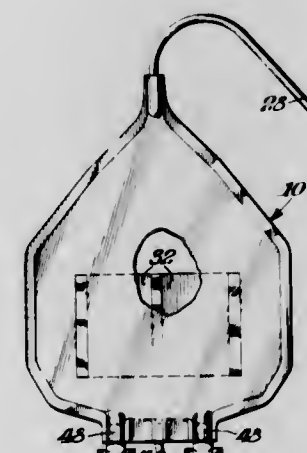
Vernon C. Rohde, Newtown, and William A. Romanaukas, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 10, 1979, Ser. No. 74,098

Int. Cl.<sup>3</sup> B04B 5/02, 11/00

U.S. Cl. 494—17

11 Claims



1. In a sealed, flexible thermoplastic blood centrifugation container having side wall sections with laminate edge seals and a longitudinal axis, two different portions of said edge seals being generally parallel to said longitudinal axis, and a first tubular conduit means sealed between said wall sections, communicating with the interior of said container and intersecting said longitudinal axis, the improvement wherein:

said container includes a septum, defined by a first sheet of a flexible thermoplastic, having ends joined to opposite said side wall sections along laminate seals which are generally parallel to said longitudinal axis, said septum being positioned longitudinally only in the mid portion of said container in the region of said different portions with the top of said septum extending to a point just above the separation line that occurs when blood is separated into plasma on the one hand and packed cells and a buffy coat on the other.

4,413,772

## APPARATUS FOR CENTRIFUGAL SEPARATION

Vernon C. Rohde, Newtown, and William A. Romanaukas, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 74,098, Sep. 10, 1979, Pat. No. 4,413,771.

This application Sep. 29, 1980, Ser. No. 192,081

Int. Cl.<sup>3</sup> B04B 5/02, 11/00

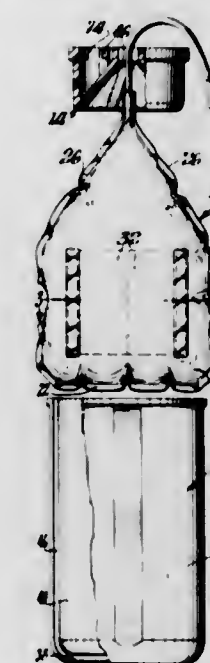
U.S. Cl. 494—17

4 Claims

1. Apparatus for separating particulate material from a fluid phase comprising:

- a sealed, flexible plastic fluid storage container having a longitudinal axis and a first tubular conduit means sealed to said container, communicating with the interior of said container and intersecting said longitudinal axis, the portion of said container contiguous the conduit being generally conical,
- a hollow cylindrical centrifuging receptacle, adapted for use in a swinging bucket type centrifuge, having a longitudinal axis, being closed at one end, and adapted to receive said container, with the receptacle and container axes coincident,
- an adapter configured to fit over said conduit means and slide within said receptacle to engage the said container, said adapter being in the shape of an annulus having a V-shaped cross-section and an outside diameter sufficiently less than the inside diameter of the receptacle to allow the container to drape over the V-shaped cross-section, and an inner surface which is conical in shape such

that, when the adapter and receptacle are under axial centrifugal force, the adapter maintains the conical por-



tion of said container contiguous the conduit under tension and free of wrinkles by virtue of its being draped over the V-shaped cross-section of the adapter.

4,413,773

## METHOD AND APPARATUS FOR CENTRIFUGAL SEPARATION

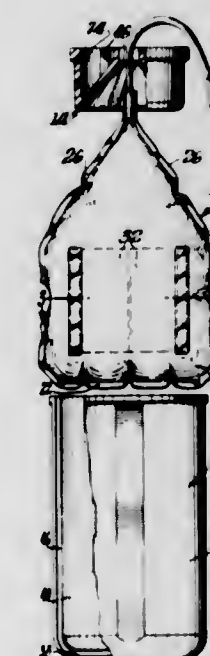
Vernon C. Rohde, Newtown, and William A. Romanaukas, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 74,098, Sep. 10, 1979. This application Sep. 29, 1980, Ser. No. 192,082

Int. Cl.<sup>3</sup> B04B 5/02, 11/00

U.S. Cl. 494—37

6 Claims



1. A method of separating and maintaining separated particulate material from a fluid phase using a storage container having flexible walls and top, middle and bottom portions with an outlet line at the top portion, by filling said container with said fluid phase, sealing said container, centrifuging said container in the bucket of a swinging bucket centrifuge top portion up, comprising the steps of: applying force to the top portion of said container by positioning a collar in the shape of an annulus having a V-shaped



cross section over said top portion and said outlet line, whereby centrifugal force on said collar causes the top portion of said container to drape tautly about said collar's V-shaped cross section and remove wrinkles therefrom.

4,413,774

**DIRECT DRIVE AIR REGISTER DAMPER**

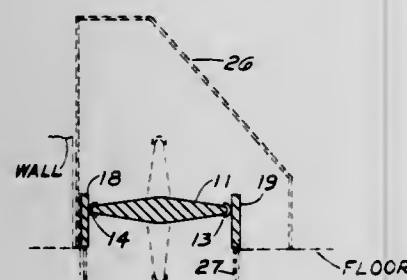
Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

Filed Mar. 5, 1982, Ser. No. 354,040

Int. Cl.<sup>3</sup> F24F 13/10

U.S. Cl. 236—9 A

9 Claims



6. Automatic rotatable damper means controlling the temperature within individual environments in a multiple room dwelling having a central heating/cooling system including a heating/cooling device and ducts, said damper means comprising in combination:

- (a) closure means,
 

said closure means comprising a damper housing having longitudinal front and rear panels separated by and connecting to end panels, said end panels being comprised of angular plates normal to said front and rear panels and having fixity with said longitudinal panels, said angular plates supporting a damper blade rotatably mounted within a space internal to said connecting panels; said end panels providing support for said damper housing on means external to said damper housing;
- (b) rotatable means having compressible means,
 

said rotatable means comprising a damper blade having containment means longitudinal to said damper blade and compressible sealing means attaching to longitudinal edges of said damper blade; said damper blade and compressible means in combination pivotally supported in said space of said closure means providing open and closed conditions within said closure means thereby controlling temperature in said environment;
- (c) motor means,
 

said motor means having an electrical motor being energized by circuit control means and providing rotary motion to a shaft attaching to said motor means, said shaft rotatably engaging said damper blade through said containment means formed along a longitudinal axis of said damper blade; said shaft having rotatable engagement with a cam; said cam operating a switch having double throw means, said switch incrementing degrees of rotation of said damper blade;
- (d) circuit control means,
 

circuit control means having components electrically interconnected including a temperature switch having light means and a first and a second switch position, relay means including a relay coil having first and second contacts, and a time delay relay, said relay means statically positioning said motor means and said rotatable means within said closure means in accordance with a preset condition externally established for said heating/cooling device; said circuit control means electrically connecting said temperature switch to said components of said circuit control means jointly operating said motor means and rotating said damper blade and creating an open or closed position in said damper

housing controlling the flow of a heating/cooling medium and said environmental temperature thereby.

4,413,775

**WATER HEATER CONTROL SYSTEM**

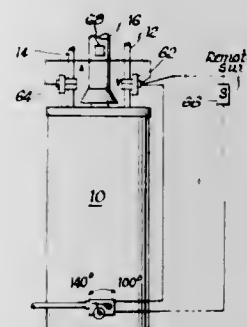
Kenneth W. Scott, 601 9th St., Coronado, Calif. 92118

Filed Jul. 12, 1982, Ser. No. 397,628

Int. Cl.<sup>3</sup> F23N 1/08; F24H 1/00

U.S. Cl. 236—20 R

9 Claims



1. A control for a thermostat for a water heater or the like having an incoming fresh water line, an outgoing hot water line, a heating means and a thermostatic control for said heating means, said control comprising:
  - (a) a first temperature sensor switch mounted on said incoming line set to close and remain closed at or below a temperature higher than incoming water temperature but lower than the temperature of standing water in said line;
  - (b) a second temperature sensor switch mounted on said hot water line which is closed at and below a pre-determined temperature which is in the range of desirable temperatures for hot water;
  - (c) means for alternately setting said thermostat at a low setting and a high setting and a circuit actuating said means to set said thermostat at said high setting in general when both of said switches are closed, and otherwise said thermostat is set at the low setting;
  - (d) retarder means for reducing the number of burns of said heating means caused by short sporadic bursts of hot water demand causing the frequent opening and closing of said first switch;
  - (e) a remote switch for said contact capable of overriding said circuit to establish said thermostat selectably at said high and low positions; and
  - (f) a timer for said remote switch operative to switch said remote switch from the high position to the "auto" position after the lapse of a pre-set time.

4,413,776

**RESET CONTROLLER WITH IMPROVED AIR FLOW SPAN ADJUSTMENT**

George C. Boyer, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Dec. 14, 1981, Ser. No. 330,705

Int. Cl.<sup>3</sup> F24F 13/10

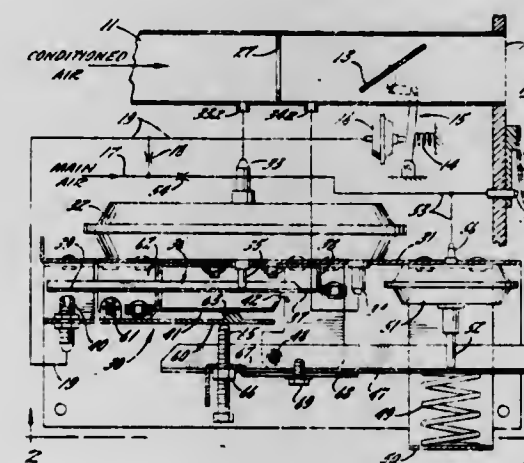
U.S. Cl. 236—49

1 Claim

1. A pneumatic controller of the reset type for providing a pneumatic control signal, said controller comprising a pneumatic control signal bleed nozzle, a flapper associated with said nozzle, a pressure differential-to-mechanical force transducer for applying a force tending to move said flapper in one direction relative to said nozzle, a bias member having a free end portion for applying a force tending to move said flapper in the opposite direction relative to said nozzle, the position of said flapper relative to said nozzle being determined by a balance of the opposed forces applied to said flapper, said pneumatic control signal varying as a function of the position of said flapper, a first pneumatic reset actuator for producing a first reset force as a function of a variable sensed condition to alter the force applied by said bias member to said flapper, a first pivotally mounted lever acted upon by said first reset force,

first bias means for applying force to said first lever in opposition to said first reset force whereby the angular position of said first lever is established by a balance of the latter two forces, a second pneumatic reset actuator for producing a second reset force as a function of a variable signal to re-act the force applied by said bias member to said flapper, a second pivotally mounted lever acted upon by said second reset force, and second bias means for applying force to said second lever in opposition to said second reset force whereby the angular position of said second lever is established by a balance of the latter two forces, the improvement in said pneumatic controller comprising, a third pivotally mounted lever, means on said first lever and engageable with said third lever to cause said

straight leg, a second portion in the form of a reverse bend, a third portion beside the first portion, a fourth portion in the form of a reverse bend and then a fifth portion which terminates at said other end of the rod and is beside the first portion, the configuration being such that when the clip is in a defined position in which the first portion is horizontal and the lowest points at opposite ends of the first portion lie in the same horizontal plane as one another and the lowest points on the third and fifth portions lie in the same horizontal plane as one another, a section of the fourth portion lies vertically above and cross-wise over the axis of the first portion and when the clip is viewed from above the third and fifth portions appear to be on opposite sides of the first portion, the clip further comprising, on the underside of its third portion when the clip is in the defined position, a step having a rising face which faces away from said one end of the rod.



third lever to swing in a direction opposite to the direction of swinging of said first lever, said last-mentioned means being selectively adjustable lengthwise of said first lever and also being adjustable transversely of said first lever and toward and away from said third lever, means on said second lever and engageable with said third lever to cause said third lever to swing in a direction opposite to the direction of swinging of said second lever, said last-mentioned means being selectively adjustable lengthwise of said second lever and also being adjustable transversely of said second lever and toward and away from said third lever, and means located between said third lever and said bias member for causing the force applied to said flapper by said bias member to change in response to a change in the position of said third lever.

4,413,777

**RAIL CLIP AND AN ASSEMBLY ON A RAILWAY TRACK WHICH INCLUDES THE CLIP**

Trevor P. Brown, Orpington, England, assignor to Pandrol Limited, London, England

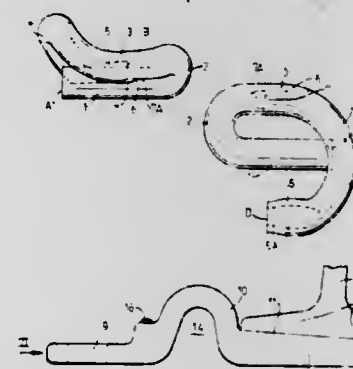
Filed Sep. 8, 1981, Ser. No. 299,953

Claims priority, application United Kingdom; Sep. 29, 1980, 8031392

Int. Cl.<sup>3</sup> E01B 9/48

U.S. Cl. 238—349

9 Claims



1. A rail clip, for holding down a railway rail, comprising a rod of resilient metal, at least 8 mm. thick, which has been bent so that it comprises, proceeding from one end of the rod to the other end, a first portion which constitutes a substantially

**4,413,778  
ANTIQUE LAWN PUMP MOBILE**

William S. Middlemiss, 332 - 7th SE., Swift Current, Canada (S9H 3P8)

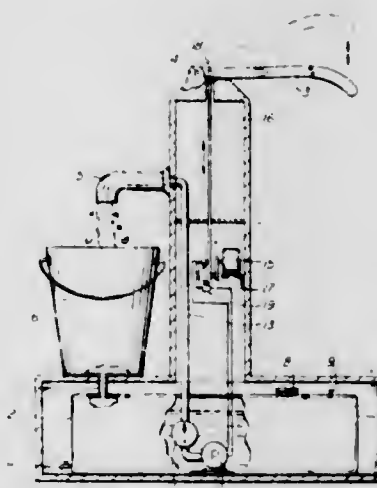
Filed May 17, 1982, Ser. No. 378,609

Claims priority, application Canada, Jun. 25, 1981, 380635

Int. Cl.<sup>3</sup> B05B 17/08

U.S. Cl. 239—17

10 Claims



1. A self contained fountain arrangement comprising:
  - (a) pump stand means including liquid reservoir means;
  - (b) elongate hollow pump body means mounted at one end thereof substantially perpendicularly on said stand means;
  - (c) pump handle means pivotally mounted, intermediate the ends thereof, on said pump body adjacent the free end thereof for oscillating movement in a plane parallel the longitudinal axis of said pump body;
  - (d) spout means projecting from said pump body means and spaced from said stand means;
  - (e) submersible pump means in said reservoir means to pump liquid to said spout means;
  - (f) motor means in said pump body operatively associated with said handle means so as to effect said oscillating movement; and
  - (g) means, associated with said handle means, to cyclically actuate and deactuate said pump means whereby liquid in said reservoir is pumped intermittently to said spout means in timed relation to said oscillating movement of said handle means.



4,413,779

## VAPOR DISPERSING DEVICE

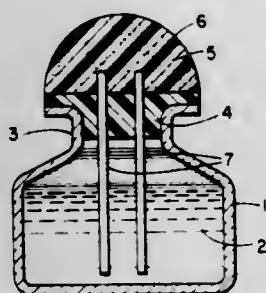
Thomas F. Santini, New York, N.Y., assignor to De Laire, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 246,089, Mar. 23, 1981, abandoned. This application Apr. 30, 1981, Ser. No. 259,068

Int. Cl.<sup>3</sup> A61L 9/04, 9/12

U.S. Cl. 239—45

7 Claims



1. A vapor dispersing device comprising a porous element having an open cell surface, and means for supplying to said surface an air treating liquid which has volatile and non-volatile components, said non-volatile component having a predetermined occluding rate on said open cell surface when said liquid evaporates therefrom, said open cell surface being initially impregnated, prior to supply of said liquid thereto, with an occluding agent which has a desired evaporation rate having a desired relation to said predetermined occluding rate, thereby to provide a desired evaporation rate of said liquid from said surface over an extended period of time.

4,413,780

## FUEL INJECTION NOZZLES

Robert T. J. Skinner, High Wycombe, and John W. Clegg, North Harrow, both of England, assignors to Lucas Industries Limited, Birmingham, England

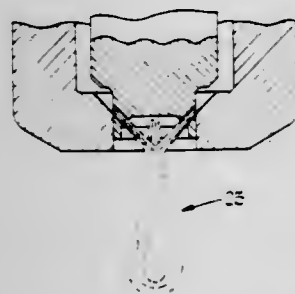
Filed Oct. 5, 1981, Ser. No. 308,597

Claims priority, application United Kingdom, Nov. 19, 1980, 8037091

Int. Cl.<sup>3</sup> F02M 61/08

U.S. Cl. 239—533.4

10 Claims



1. A fuel injection nozzle for use with an internal combustion engine comprising a body having a fuel inlet which in use, is connected to a high pressure source of fuel, a resiliently loaded valve member slidable within the body, said valve member defining a surface against which the fuel under pressure can act to lift the valve member to an open position against the resilient loading to allow fuel flow to an outlet orifice, a bore extending through the body and connected with said inlet, the bore defining a reduced valve guide portion at its outer end, said valve member being located within said bore and having an outer end portion guided for movement by said valve guide portion, the valve member being loaded by said resilient means in an outward direction and said orifice being formed in the outer end portion of the valve member characterized in that the orifice comprises a single drilling the downstream end of which opens onto the exterior surface of said outer end portion of the valve member, the upstream end of the drilling being positioned to be covered by said valve guide portion of the bore in the closed position of the valve member, said upstream

end of the drilling being progressively uncovered to the bore to permit flow of fuel through the orifice as the valve member moves to the open position.

4,413,781

## FUEL INJECTION NOZZLE

Masatoshi Iwata, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

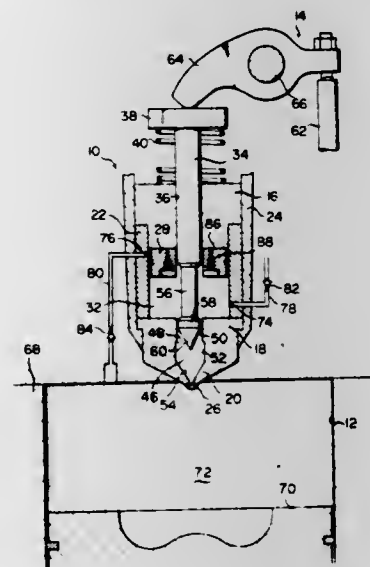
Filed Dec. 21, 1981, Ser. No. 332,736

Claims priority, application Japan, Dec. 22, 1980, 55-183182[U]; Dec. 22, 1980, 55-183183[U]

Int. Cl.<sup>3</sup> F02M 67/04

U.S. Cl. 239—91

13 Claims



1. A fuel injection nozzle for the delivery of fuel, premixed with air, to the combustion chamber of a cylinder in an internal combustion engine, comprising:

- (a) a nozzle body having formed therein an axial passage and at least one spray hole for communicating the axial passage with the combustion chamber of the engine cylinder;
- (b) a piston slidably mounted in said nozzle body for reciprocating movement between a first and a second position and defining in combination therewith a first and a second chamber therein;
- (c) said nozzle body having formed therein a fuel inlet port and an air inlet port, the fuel inlet port being open to the second chamber when said piston is in the first position and being closed when said piston is in the second position, the air inlet port being open to the first chamber when said piston is in the second position and being closed when said piston is in the first position;
- (d) a valve member fixedly secured to said piston and therefore reciprocable in the axial passage of said nozzle body between the first and second positions for opening and closing the spray hole, the communication between the second chamber and the axial passage being blocked when said valve member is between the first position and a third position which is intermediate the first and second positions and being established when said valve member is between the second and third positions;
- (e) conduit means for communicating the air inlet port with the combustion chamber; and
- (f) means mounted in said piston for allowing the air flow from the first chamber to the second chamber but blocking the flow in the opposite direction.

4,413,782

## JET EXCITATION BY AN OSCILLATING VANE

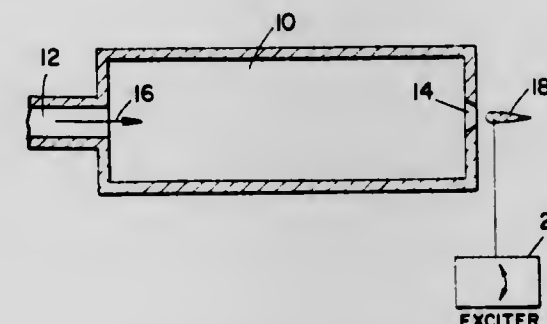
Maximilian F. Platzer, Pebble Beach, Calif., and John M. Simons, Indooroopilly, Australia, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 18, 1980, Ser. No. 217,871

Int. Cl.<sup>3</sup> B05B 3/14

U.S. Cl. 239—102

6 Claims



1. A device for enhancing mixing and entrainment of the central jet exhaust from a chamber with a medium surrounding said chamber comprising:

- (a) a nozzle through which a turbulent jet stream flows;
- (b) a vane having a leading and a trailing edge and situated just downstream from said nozzle in or near the core of said jet stream, said vane having winglike shape and spanning said nozzle, said vane having said leading edge blunter than said trailing edge; and
- (c) means connected to said vane for causing said vane to oscillate about an axis through its span in pitch at a selectively variable amplitude and frequency about a zero angle of attack relative to said jet stream.

4,413,783

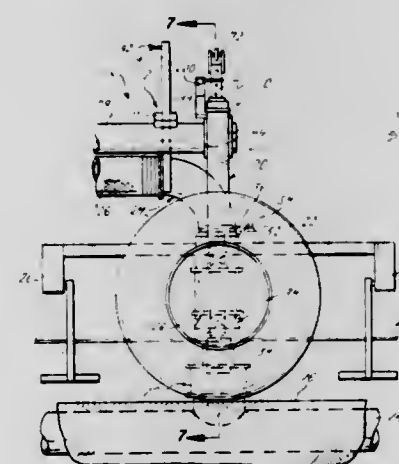
## COUPLER FOR AN IRRIGATION SYSTEM

Carl R. Ostrom, Omaha, and Dennis R. Theilen, Fremont, both of Nebr., assignors to Valmont Industries, Inc., Valley, Nebr. Continuation-in-part of Ser. No. 161,678, Jun. 23, 1980. This application Jul. 2, 1981, Ser. No. 279,771

Int. Cl.<sup>3</sup> B05B 3/00

U.S. Cl. 239—183

34 Claims



1. In an irrigation system having a liquid delivery apparatus for delivering liquid under pressure from a pressurized pipe line extending along the field to be irrigated to the irrigation system for dispensing the liquid onto the field, the pipe line having a series of connectors spaced along its length with valve means associated therewith, a coupler for connection with said connectors and for operating said valve means to deliver liquid from the pipe line to the irrigation system, said coupler comprising: a frame, a first member movable relative to said frame for connection and disconnection of said coupler with a connector, valve operating means for operating said valve means between open and closed positions upon connection and disconnection of said coupler with said connector, a second member for engagement with said connector upon connection therewith, said first member extending relative said second member upon operation of said valve means between open and closed positions.

4,413,784

## CONSTANT-OUTPUT ATOMIZER

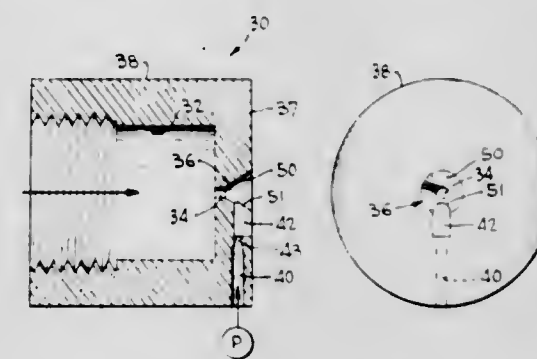
Jack Y. Dea, Reno, Nev., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 2, 1981, Ser. No. 308,203

Int. Cl.<sup>3</sup> B05B 7/08

U.S. Cl. 239—426

6 Claims



1. An improved constant-output atomizer comprising:

- a body containing an air supply conduit;
- an expansion nozzle formed in the wall of one end of said body, said expansion nozzle having a longitudinal axis, said nozzle comprising an exit orifice connected to said air supply conduit and a frustoconical diffuser section connecting said exit orifice to the outside surface of said end of said body, said frustoconical diffuser section widening from a narrow upstream end to a widened downstream end, said upstream end being contiguous with said exit orifice and of the same size as said exit orifice to form a smooth, continuous transition from said exit orifice to said frustoconical diffuser section;
- a transverse groove cut in the surface of said end of said body, one end of said groove connecting with and extending into the side of said frustoconical diffuser section;
- a liquid conduit formed in the wall of said one end of said body;
- a metering pump connected to one end of said liquid conduit for moving liquid to said atomizer at a precise and constant rate;
- an orifice for liquid connected to the opposite end of said liquid conduit, said liquid orifice connecting said liquid conduit to said transverse groove;
- whereby liquid expelled from said orifice for liquid travels in a stream down the length of said transverse groove into said diffuser section where it combines with air expelled from said exit orifice and is atomized to produce a constant output.

4,413,785

## VARIABLE PRESSURE FLUID CLEANING WAND

Carroll D. Engelbert, P.O. Box 1943, Walla Walla, Wash. 98362; Larry M. Muller, Nampa, and Dan E. Muller, Melba, both of Id., assignors to Carroll D. Engelbert, Walla Walla, Wash.

Filed Sep. 14, 1981, Ser. No. 302,226

Int. Cl.<sup>3</sup> B05B 9/00

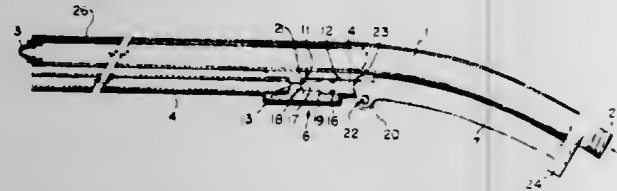
U.S. Cl. 239—443

8 Claims

- 5. A wand for delivery of pressure fluid comprising: first high pressure conduit means adapted to be connected at an inlet end to a pressure fluid source, having an outlet end with means for delivering a high pressure fluid stream, and having a curved end portion adjacent its inlet end, second low pressure conduit means arranged in parallel flow



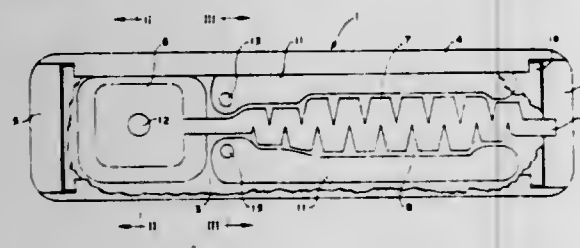
relation with said first conduit means, said high and low pressure conduit means being in close proximity, valve body means having a longitudinal through bore in axial alignment with and connected to an inlet end of said second conduit means, fluid passage means in said valve body connecting said bore and said first conduit means and extending at right angles thereto, a valve plunger extending axially in said bore and mounted for reciprocating movement therein, first seal means acting between said valve plunger and said bore upstream from said fluid passage means, said plunger extending externally of said valve body and being movable between a first open position to permit flow of pressure fluid from said fluid passage means through said bore and into said second conduit means and a second closed position wherein the end of said valve plunger is located downstream of said fluid passage means.



second seal means acting between said valve plunger and the walls of said bore downstream from said fluid passage means when the end of said plunger is located downstream of said fluid passage in said second position, and selectively operable contact means operatively associated with said first conduit means and said valve body and pivotally mounted for movement toward and away from said first conduit means, said contact means including a handle portion extending close to, adjacent and in conforming curvature with said high pressure conduit means, said high pressure conduit means and said handle portion comprising an operating hand grip for said wand and being arranged to contact the external end of said valve plunger when moved toward said first conduit means for moving said valve plunger toward said second position and permitting return of said valve plunger toward said first position when released.

#### 4,413,786 EMITTER UNIT

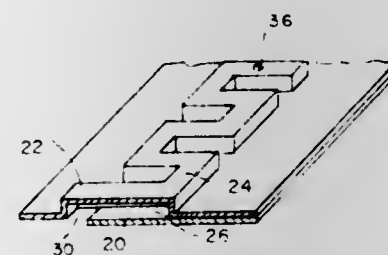
Raphael Mehoudar, Tel-Aviv, Israel, assignor to Hydro-Plan Engineering Ltd., Tel-Aviv, Israel  
Filed Nov. 21, 1980, Ser. No. 209,306  
Claims priority, application Israel, Nov. 21, 1979, 58773  
Int. Cl.<sup>3</sup> B05B 15/00  
U.S. Cl. 239—542



1. An emitter unit comprising a housing having defined therein an inlet and an outlet; a substantially planar inner wall portion having defined therein a groove, a recessed cavity communicating with one end of the groove and being of extended dimensions as compared with the width of the groove, a second and opposite end of the groove communicating with the inlet, an outlet bore in a base portion of the cavity communicating with said outlet and having a rim area substantially less than that of the cavity and at least one subsidiary recess; a resiliently flexible membrane juxtaposed with respect to the

inner wall portion with one face thereof defining with the groove a flow restricting flowpath, with said cavity an outlet control chamber, and with the recess, at least one retaining cell, coupling means for coupling the cell with reduced pressure zones; the arrangement being such that, with the inlet coupled to a water supply, said membrane is exposed to the supply pressure and the membrane is displaceable towards and away from the base portion of the cavity in accordance with pressure variations so as to stabilize the output rate of the emitter unit with respect to the variations and a pressure differential is set up across said membrane in the vicinity of said cell(s) and chamber so as to ensure that said membrane is maintained in contact with said inner wall portion in the region of said groove.

4,413,787  
APPARATUS FOR DRIP IRRIGATION  
Gideon Gilead, 5 Nicaragua St., P.O.B. 26025, and Aviram Gilad, P.O. Box 26025, both of Jerusalem, Israel  
Filed May 11, 1981, Ser. No. 262,509  
Claims priority, application Israel, May 14, 1980, 60071  
Int. Cl.<sup>3</sup> B05B 15/00  
U.S. Cl. 239—542 24 Claims

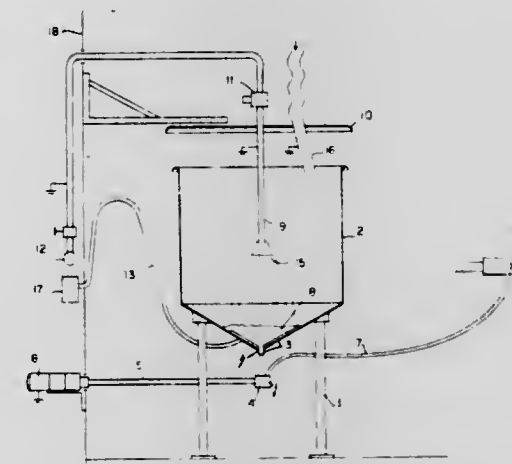


1. Drip irrigation apparatus comprising:  
at least one foil element including at least one first surface having a raised pattern formed thereon and defining a portion of a pressure reducing pathway; and  
at least one second surface joined to said at least one first surface and defining therewith said pressure reducing pathway;  
said at least one second surface being disposed in non-coextensive overlapping relationship with respect to said at least one first surface thereby having at least one portion of said raised pattern exposed so as to define at least one water pathway between the interior and exterior of said pressure reducing pathway.

4,413,788  
DEVICE FOR THE FEEDING OF ENAMEL TO AN ELECTROSTATIC PAINT EMITTER  
Gerd Schaefer, Heusenstamm; Winfried Ott, Rodgau, and Gunther Fleig, Hanau, all of Fed. Rep. of Germany, assignors to Ransburg GmbH, Heusenstamm, Fed. Rep. of Germany  
Filed Sep. 18, 1980, Ser. No. 188,514  
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937890  
Int. Cl.<sup>3</sup> B05B 5/02  
U.S. Cl. 239—703 9 Claims

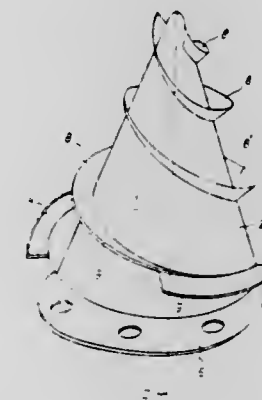
1. A device for feeding an electrically conductive coating material from a supply system to a coating material dispensing device wherein a high electrostatic potential is maintained between the supply system and the device, comprising an intermediate storage container fillable in controlled manner from the supply system to a maximum fill level and connected to the coating material dispensing device by a coating material conduit maintained at substantially the electrostatic potential of the coating material dispensing device, a device provided in the intermediate storage container for breaking up the supply of coating material into the intermediate storage container into electrically separated individual particles, and means for coupling the breakup device to a source of coating material, the

breakup device being arranged above the fill level such that, between the breakup device and the interior of the intermediate storage container, a minimum spacing is maintained so that no electrostatic discharge occurs, the intermediate storage container being dimensioned so that the coating material flow discharging from a delivery tube into the interior of the intermediate storage container flows freely in the form of an uncon-



strained column or large drops if no potential difference exists between the intermediate storage container and the delivery tube, but is broken up into individual drops which proceed somewhat along the electric flux lines established with the container as a potential difference is established, and while such potential difference exists, between the intermediate storage container and the delivery tube.

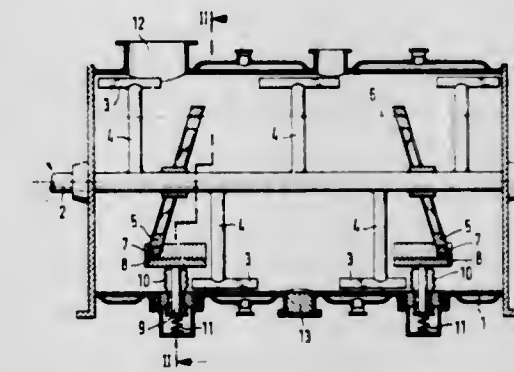
4,413,789  
ROTOR FOR A PULPER  
Reimund Rienecker, Heidenheim-Mergelstetten, and Walter Stricker, Aalen, both of Fed. Rep. of Germany, assignors to J. M. Volth GmbH, Fed. Rep. of Germany  
Filed Jul. 17, 1981, Ser. No. 284,407  
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027044  
Int. Cl.<sup>3</sup> B02C 23/36  
U.S. Cl. 241—46.17 15 Claims



1. A rotor for a pulper for forming a pulp suspension, wherein the rotor is mounted in the wall of a pulping container, the rotor comprising:  
a generally conically shaped rotor body extending from a wider bottom to a narrower tip;  
a helically wound conveyor element defined on and winding up along the rotor body from the bottom to the tip, the conveyor element being generally flat and including a surface extending out from the rotor body to a peripheral edge of the conveying element;  
an additional vane located in the vicinity of the bottom of the rotor and extending generally radially outward from the peripheral edge of the conveyor element, and extending a short distance along the length of the conveyor element from the end of the conveyor element at the bottom of the

rotor; the additional vane being oriented to extend generally close to perpendicular to the axis of the rotor.

4,413,790  
MIXER FOR BULK MATERIALS, ESPECIALLY FOR FIBROUS SUSPENSIONS  
Eberhard Lipp, Straubenhardt, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany  
Filed Oct. 1, 1981, Ser. No. 307,424  
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037332  
Int. Cl.<sup>3</sup> B02C 15/00  
U.S. Cl. 241—101 B 12 Claims



1. A mixer for bulk material, especially for fibrous suspensions, such as cellulose derivations, comprising a horizontally disposed trough-drum-shaped housing, an axially disposed shaft mounted for rotation within said housing, radially disposed support brackets and mixing blades mounted on said shaft for rotation therewith, at least one milling rim disposed for rotation with said shaft in spaced axial position with respect to said support brackets and mixing blades, said milling rim being mounted in a slanting plane with respect to the longitudinal axis of said shaft to carry out a tumbling motion by rotation, said milling rim being formed of a disk attached to said shaft, a milling stator adjustably mounted in said housing for milling engagement with a peripheral surface of said milling rim, said milling stator having a cylinder-part surface cooperating with a peripheral surface of said disk, and a support for engaging said cylinder-part surface of said milling stator, the support being adjustable from the outside of said housing, said cylinder-part surface being arranged in said housing such that at least one side of each of the mixing blades can be conducted beneath it.

4,413,791  
GLASS FIBER STRAND WINDING APPARATUS  
Yutaka Kawaguchi; Michio Sato, and Shin Kasai, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan  
Filed Apr. 19, 1982, Ser. No. 369,978  
Claims priority, application Japan, Apr. 22, 1981, 56/60774  
Int. Cl.<sup>3</sup> B65H 54/02, 67/04, 75/28  
U.S. Cl. 242—18 G 5 Claims

1. A glass fiber strand winding apparatus having a rotatable turret and at least two winding collets mounted at one end thereof on said turret, each said collet being provided at the other end with a waste strand winding portion, wherein said waste strand winding portion is formed with a frusto-conical strand guide surface disposed coaxially with said collet and having the smaller-diameter end thereof on the side remote from said turret, an annular strand stopping wall radially outwardly extending from the smaller-diameter end of said guide surface, a plurality of parallel grooves formed on at least one crescent-shaped wall surface area extending radially inwardly from a portion of the outer periphery at the smaller-diameter end of said guide surface, the grooves extending at a right



angle to the diameter of said guide surface, and a crescent-shaped flat portion extending from a portion of the outer periphery of said stopping wall in confronting spaced relationship with said crescent-shaped wall surface area.



riphery of said stopping wall in confronting spaced relationship with said crescent-shaped wall surface area.

4,413,792

# APPARATUS FOR AUTOMATIC TRAVERSE WINDING OF TAPES ON A CYLINDRICAL CORE

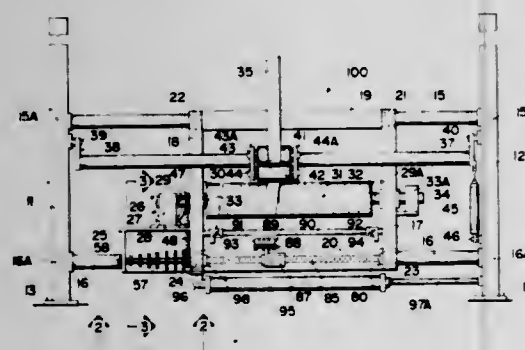
Lawrence O'Connor, P.O. Box 489, Lot 6, Clearwater Bay, Keewatin, Ontario, Canada POX 1C0

Continuation-in-part of Ser. No. 71,989, Sep. 4, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,201

Int. Cl.<sup>3</sup> B65H 17/02, 54/28

U.S. Cl. 242—67.1 R

17 Claims



1. Apparatus for traverse winding of flat tape on a cylindrical core comprising a supporting framework, a traverse carriage mounted for side to side reciprocation upon said supporting framework, means to detachably mount the cylindrical core on said carriage, means for applying a predetermined rotational force to the core to rotate the core and wind the tape thereon under a predetermined tension, means for applying a motive force to said carriage to cause reciprocatory movement thereof and means for controlling the speed of reciprocatory movement of the carriage said speed controlling means being separate from and independent of said motive force applying means and including lead screw means journaled on said carriage, means for rotating the lead screw means in dependence upon the rotation of the core and nut means operatively carried on said lead screw means and attached to said framework whereby the lead screw means acts to control the speed of reciprocatory movement substantially without the application of force thereto.

4,413,793

# CASSETTE TAPE MACHINE

Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 335,035

Claims priority, application Japan, Dec. 26, 1980, 55-186650[U]; Dec. 29, 1980, 55-187922[U]

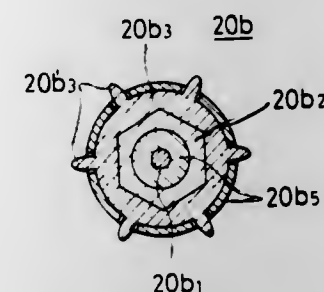
Int. Cl.<sup>3</sup> G11B 15/32

U.S. Cl. 242—68

2 Claims

1. In a cassette tape machine having a rotatable reel shaft

unit with at least one engagement projection on its outer periphery having a contact surface for engaging a reel in a cassette tape whereby said reel rotates said shaft unit in a supply direction, the improvement characterized in that said shaft unit



includes a hub of a viscous elastic material having a plurality of viscous elastic engagement projections, and a plastic member covering said hub and having a slit therein for exposing said engagement projection to said reel.

4,413,794

# LOCKING DEVICE REACTING TO INERTIA FORCES FOR RETRACTORS

Per O. Weman, Heverlee, Belgium, assignor to N.V. Klippan S.A., Heverlee-Leuven, Belgium

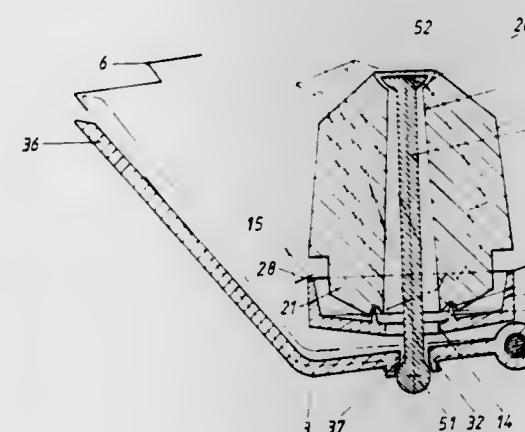
Filed Nov. 30, 1981, Ser. No. 325,882

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049255

Int. Cl.<sup>3</sup> B65H 75/48

U.S. Cl. 242—107.4 A

3 Claims



1. For use with a safety belt retractor having a housing and a ratchet wheel, a locking mechanism which is responsive to the attitude and to the acceleration of a vehicle comprising a support having an inner upstanding annular flange and an outer upstanding annular flange, a pawl disposed below said support, pivotally connected to the housing and movable into engagement with the ratchet wheel, an inertia body disposed above said support and including an annular groove and an annular shoulder, said inertia body being carried by said support so that said inner flange engages said groove, and a rod connected to said pawl and said inertia body so that tilting movement of said inertia body about said inner flange causes a pivotal movement of said pawl, said tilting movement of said inertia body being limited by contact of said shoulder with said outer flange.

4,413,795

# FLUIDIC THRUSTER CONTROL AND METHOD

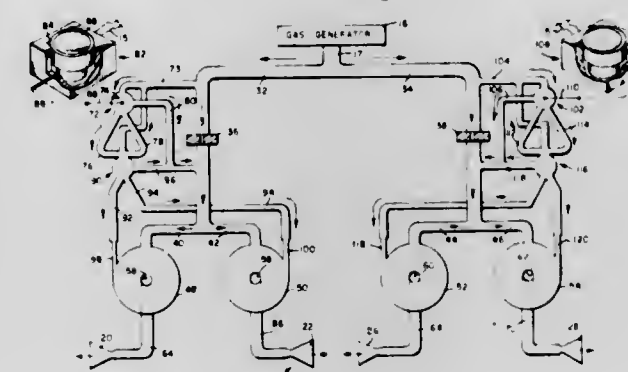
William F. Ryan, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 5, 1980, Ser. No. 184,604

Int. Cl.<sup>3</sup> F42B 15/02

U.S. Cl. 244—3.22

17 Claims



2. A fluidic system for proportionally controlling warm gas flow through a pair of thrust nozzles, comprising: passage means for delivering gas flow from a source to said first and second thrust nozzles in parallel flow arrangement; a pair of fluidic vortex valves each having control ports for receiving proportional fluid signals and being operable to proportionally vary the rates of flow of warm gas through each of said thrust nozzles in relation to said fluid signals whereby the total flow through both of said nozzles remains substantially constant; a flow restrictor interposed in said passage means upstream of said pair of vortex valves for producing a pressure differential across said flow restrictor; a fluidic jet interaction device having an input port and vent port respectively communicating with said passage means upstream and downstream of said flow restrictor whereby said pressure differential is impressed across said device to maintain subsonic conditions therein, said device having a pair of output ports operably communicating with said control ports of said pair of vortex valves; and control means for proportionally varying flow from said input port between said pair of output ports to develop said proportional fluid signals therein.

4,413,796

# AIRFOIL SHAPE FOR AIRCRAFT

Jean Bousquet, Blagnac, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

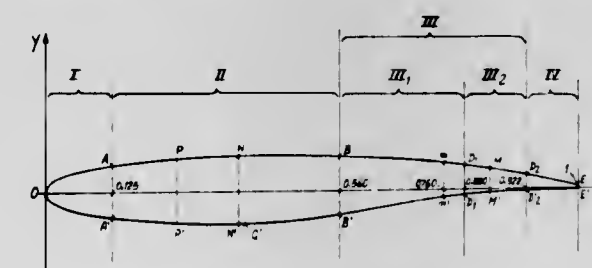
Continuation of Ser. No. 11,156, Feb. 12, 1979, abandoned. This application Aug. 14, 1981, Ser. No. 292,837

Claims priority, application France, May 29, 1978, 78 15926

Int. Cl.<sup>3</sup> B64C 3/26

U.S. Cl. 244—35 R

18 Claims



1. An airfoil for flight at high subsonic speeds, comprising a thick leading edge, a trailing edge, a convex upper surface, and a lower surface which is convex towards the leading edge and concave towards the trailing edge, wherein said upper surface comprises a point of maximum convex curvature within a first zone extending from 65% to 90% of the chord of the airfoil from said leading edge, the thickness of the airfoil at said point of maximum convex curvature being about three-tenths of the

maximum thickness thereof, and wherein the lower surface comprises a point of maximum concave curvature in an intermediate zone extending from 70% to 93% of the chord of the airfoil from the leading edge, and, at said point of maximum concave curvature, the thickness of the airfoil is about half the maximum thickness thereof;

said lower surface, in a zone adjacent its trailing edge, being represented by the formula

$$Y = e_{max}(-0.538X^{3/2} + 2.186X^4 - 1.648)$$

wherein  $e_{max}$  represents the maximum thickness of the airfoil and  $X$  has the values  $0.846 < x < 1$ , when related to a coordinate system having an origin  $O$  and rectangular axes  $OX, OY$  on which are respectively plotted reduced abscissae  $X$  and ordinates  $Y$  defining the airfoil, the origin  $O$  being located at the leading edge and the axis  $OX$  coinciding with the chord of the airfoil.

4,413,797

# CLAMPING RING

Dorotheus Donkervoort, Vlaardingen, Netherlands, assignor to Eerste Nederlandse Fabriek van Manometers B.V., Netherlands

Filed Mar. 16, 1981, Ser. No. 244,114

Claims priority, application Netherlands, Jun. 3, 1980, 8003238

Int. Cl.<sup>3</sup> G12B 9/00

U.S. Cl. 248—27.1

6 Claims



1. An attachment means for an article recessed in a wall element, in particular an article projecting through a panel opening, said attachment means being adapted to fix the article in a stationary axial position relative to the panel by engagement on an article portion projecting from the other side of the panel, in coaction with stopping devices operative on the panel, characterized in that the attachment means comprises an undivided clamping ring which fits with clearance about the article portion projecting through the panel, circumferentially spaced clamping elements thereon adjustable axially relative to the ring and operative at the inner edge of the ring, and adjusting elements for defining the axial position of the clamping ring relative to the rear wall of the panel, said clamping ring comprising ring zones situated circumferentially between the clamping elements having a smaller bending stiffness than at the clamping elements.



4,413,798

**AUTOMOTIVE VEHICLE PARTS AND FITTING STRUCTURE THEREFOR**

Takeo Tamura, Yokohama, and Mamoru Imai, Fujisawa, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

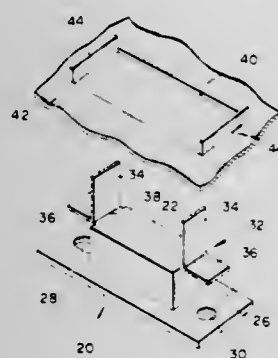
Filed Dec. 11, 1981, Ser. No. 329,876

Claims priority, application Japan, Dec. 18, 1980, 55-182326[U]

Int. Cl.<sup>3</sup> G12B 9/00

U.S. Cl. 248—27.1

12 Claims



1. An automotive vehicle part to be installed onto a vehicle panel for mounting vehicle equipment such as a room lamp, comprising:
  - a container having an open-ended chamber for receiving said vehicle equipment;
  - a flange laterally extending from the periphery of said container and having an opening for receiving a fastener for fixing the flange onto said vehicle panel, said flange constituting a part body in conjunction with said container; and
  - a fastener cover opposite said fastener for covering at least the end of the fastener, said fastener cover including a flexible hinge, first and second plane sections connected at a right angle, and rotatable about a hinge axis of said hinge between a first position in which said first section is positioned perpendicularly with respect to said panel and said second section is parallel to the flange, and a second position in which said second section is parallel to the flange and extends over said fastener and said first section is aligned perpendicular to said flange.

4,413,799

**DEVICE FOR FASTENING ELONGATED SYNTHETIC RESIN PROFILES**

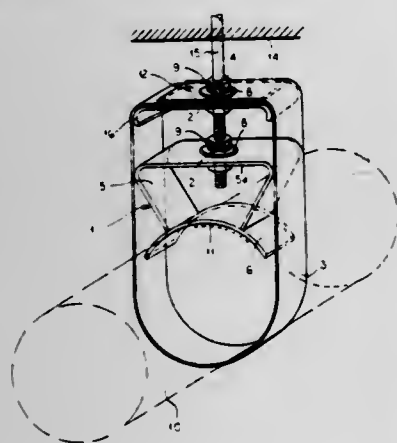
Fredy Gabriel, Reussbühl, Switzerland, assignor to Stapro AG, Lucerne, Switzerland

Filed Jul. 9, 1981, Ser. No. 281,645

Int. Cl.<sup>3</sup> F16L 3/16

U.S. Cl. 248—59

13 Claims



1. A device for mounting an elongated member upon a structure which comprises:
  - a threaded rod affixed to said structure;

a support bar adjustably mounted on and fixed to said rod; a strap having its opposite ends connected to said support bar and reaching around one side of said member; and a shoe adjustably mounted on said rod independently of said bar and reaching toward the opposite side of said member and juxtaposed with said opposite side whereby said member is retained between said shoe and said strap with at least limited freedom of longitudinal sliding displacement and transverse expansibility, said shoe having at least a pair of angularly adjoining portions one of which is adjustably fixed to said rod while another bears upon said member via a foot.

4,413,800

**TRASH BAG CADDY**

Arthur F. Kelson, 11701 Foster Rd., Los Alamitos, Calif. 90720

Filed May 19, 1982, Ser. No. 379,646

Int. Cl.<sup>3</sup> B65B 67/04

U.S. Cl. 248—99

7 Claims



1. A trash bag caddy comprising the combination of:
  - a trash bag composed of a pliable, resilient material having a tubular body closed at one end and open at its other end; said bag having an edge marginal region at said open end defining an entrance leading into the interior of said bag;
  - a circular rigid ring disposed at said open end of said bag and said bag edge marginal region being folded over said ring so that said ring rigidizes said bag entrance;
  - a vertical supporting structure for said trash bag;
  - snap-lock socket means releasably interconnecting said supporting structure with said ring for releasably holding said bag therefrom in a fully supported manner;
  - said vertical supporting structure includes a pair of U-shaped leg members having central sections cross over upon themselves at a right angle;
  - said supporting structure further includes upright leg sections at each end of each of said central sections;
  - said socket means releasably engaging with the terminating ends of each of said upright leg sections; and
  - a retaining socket means releasably engaged with said central sections at their cross-over point.

4,413,801

**LADDER RACK**

Paul B. Lancaster, 8451 Elliot Ave. South, Bloomington, Minn. 55420, and Gordon A. Huisentruit, 3120 Pilot Knob Rd., Eagan, Minn. 55122

Filed Mar. 13, 1981, Ser. No. 243,456

Int. Cl.<sup>3</sup> A47F 5/00

U.S. Cl. 248—316 A

8 Claims

1. A ladder rack comprising:
  - (a) an elongated based member having end edges which is pivotably attached about an axis parallel to said edge at one end thereof to a mounting bracket;
  - (b) a first hook member secured to said base member near one end thereof,

- (c) a second hook member carried on the opposite end of said base member, said second hook member including a



moveable seat which is normally biased toward said first hook member.

4,413,802

**DEVICE FOR HOLDING AN OBJECT ON A SMOOTH SHELF SURFACE**

Avraham Fishman, Kiosbachstrasse 110, CH-8032 Zurich, Switzerland

PCT No. PCT/CH79/00152, § 371 Date Aug. 1, 1980, § 102(e) Date Jul. 21, 1980, PCT Pub. No. WO80/01192, PCT Pub. Date Jun. 12, 1980

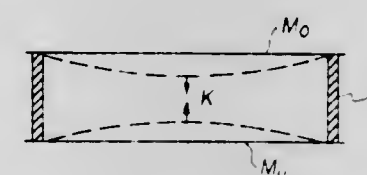
PCT Filed Nov. 29, 1979, Ser. No. 197,347

Claims priority, application Switzerland, Dec. 1, 1978, 12302/78

Int. Cl.<sup>3</sup> A45D 42/14

U.S. Cl. 248—362

8 Claims



1. A device for resting on and holding an object on a smooth surface by a suction gripping effect, comprising:
  - (a) two resilient membranes made of nonslipping elastic material disposed in superposed parallel spaced relation;
  - (b) supporting ring means consisting of a continuous ring disposed along the periphery of each of the resilient membranes and extending therebetween for maintaining the membranes in parallel spaced relation and for permitting relative rotational movement of the membranes with respect to each other;
  - (c) elongated center connecting means connected between the central sections of the membranes and having two interconnected relatively movable connecting elements which are axially and rotationally movable with respect to each other for permitting relative rotational movement between the membranes;
  - (d) at least one of the said means having elements for providing axial displacement such that the axial extent of the ring means is relatively greater than that of the center means so as to bring about a collapse of the two membrane central sections toward one another when the membranes are relatively rotated; and
  - (e) at least one of the means also having stop means thereon for limiting relative rotation between the membranes to a predetermined angular rotation whereby when an object having a flat bottom larger than the diameter of the top membrane is placed thereon and rotated, the membranes collapse to a desired point producing sufficient suction

between the object and the supporting surface to firmly hold the items in a fixed position on the supporting surface.

4,413,803

**PIVOTING LICENSE PLATE BRACKET**

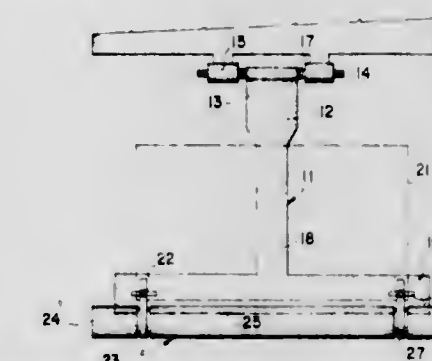
William Ross, P.O. Box 51, Vermillion Bay, Canada P0V 2V0

Filed Jun. 4, 1981, Ser. No. 270,586

Int. Cl.<sup>3</sup> A47F 7/14

U.S. Cl. 248—475 B

12 Claims



1. A license plate holder for trailers and the like which include plate holder support means thereon; said license plate holder comprising in combination a license plate bracket, means for pivotally supporting the license plate bracket from the support means for fore and aft swinging movement relative to the trailer and means on the underside edge of said license plate bracket to protect said lower edge upon engagement of same means on said underside edge with the ground surface, said means on said underside edge including at least one roller journaled for rotation to adjacent the lower side of said bracket with the underside of said roller being below the lower edge of said bracket and means to secure said roller to said bracket for free rotation relative to said bracket.

4,413,804

**PISTON VALVE AND FUEL TANK ASSEMBLY**

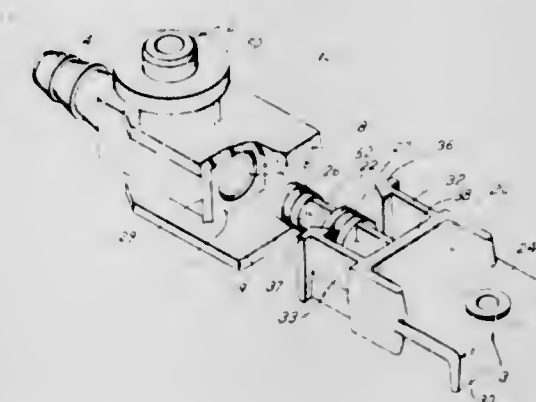
Charles A. Lanlus, Prairie du Sac; Harold D. Hulterstrum, and Gerald A. Rau, both of Baraboo, all of Wis., assignors to Flambeau Product Corporation, Baraboo, Wis.

Filed Jul. 15, 1981, Ser. No. 283,570

Int. Cl.<sup>3</sup> F16K 51/00

U.S. Cl. 251—144

14 Claims



1. A piston valve comprising, in combination:
  - a housing having a rear face, an intake port, an exhaust port, at least one stop mounted on said housing, and a flow channel extending through the interior thereof from said intake port to said exhaust port, said flow channel defining an intake channel adjacent to said intake port and an exhaust channel adjacent to said exhaust port and in fluid communication with said intake channel, said housing further defining a piston channel having a first end and a second end, said first end adjacent to and in fluid commu-



nication with said flow channel and said second end extending through said housing forming an opening in said rear face thereof;

a piston having a butt, a bedplate at one end of said butt, a shaft extending perpendicularly from said bedplate and having a diameter less than that of said piston channel, and arms extending from said bedplate and laterally disposed on either side of said shaft, at least one of said arms having a latch on the end thereof, said piston being slidably engaged within said housing and extending therefrom through said opening in said rear face thereof, said shaft being disposed near the first end of said piston channel for sliding into said flow channel when the valve is in the off position, and said butt being disposed near the second end of said piston channel near said opening and extending therefrom, said latch on said arm and said stop on said housing defining means to limit the outward movement of said piston relative to said housing, when said latch engages said stop, and wherein the length of said shaft corresponding to the length of said arms defining means for maintaining said piston channel sealing means in sealing engagement within said piston channel when said piston has been outwardly slid to the point where said latch engages said stop;

flow channel sealing means for sealing said flow channel when said piston is slid into said flow channel when the valve is in the off position; and  
piston channel sealing means for sealing said piston channel.

4,413,805

## VALVE DETENT

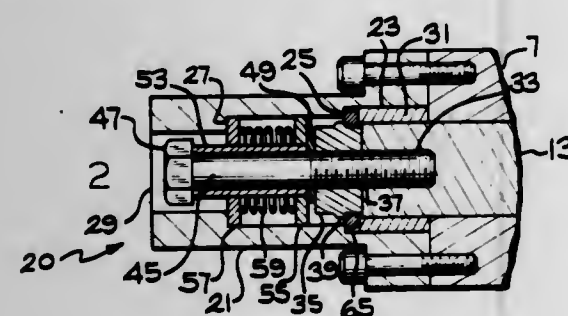
Robert H. Green, 17518 Euler Rd., Bowling Green, Ohio 43402, and James D. Simon, 10410 S. Dixie Hwy., Portage, Ohio 43451

Filed Jun. 18, 1981, Ser. No. 274,749

Int. Cl.<sup>3</sup> F15B 13/01

U.S. Cl. 251—297

12 Claims



1. A detent for maintaining a valve body of a valve in a preselected position comprising:

- an outer housing for said valve;
- a valve body slideably positioned in said outer housing;
- a raised diameter section located on and extending around the outer periphery of said valve body;
- a resilient ring shaped detent member positioned around substantially the entire outer periphery of said valve body, said ring having a first end and a second end, said first and second ends being disposed to facilitate expansion of said ring to engage said raised diameter section on said valve body, said detent member having a diameter greater than the diameter of said valve body and less than the diameter of said raised diameter section, said entire detent member being spaced apart from said valve body to allow said valve body to freely slide in said outer housing when said valve body is in a position other than said preselected position, said detent member positioned to resiliently engage substantially the entire outer periphery of said raised diameter section when said valve body is in said preselected position whereby the engagement of said raised diameter section by said detent member maintains said valve body in said preselected position.

4,413,806

## SHUT-OFF VALVE ASSEMBLY

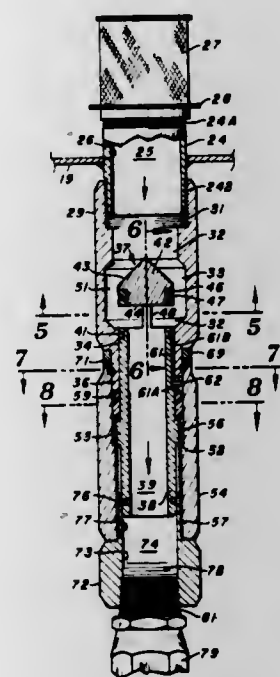
Glenys Anderson, 4820 Yorktown Lane North, Minneapolis, Minn. 55442

Filed Jul. 29, 1981, Ser. No. 288,063

Int. Cl.<sup>3</sup> F61K 31/44

U.S. Cl. 251—340

31 Claims



1. A shut-off valve assembly comprising: a body having a chamber, a first portion having a fluid inlet passage open to the chamber, and a second portion having an inside wall providing a fluid outlet opening to the chamber, valving means movably mounted on said inside wall for selectively opening and closing said fluid outlet, said valving means including a tubular member movably mounted on said inside wall, said tubular member having a fluid outlet passage open to the chamber when the valving means is in the open position, and head means connected to said tubular member and movable with said tubular member to an open position in said chamber and to a closed position in engagement with said inside wall to block the flow of fluid through said fluid outlet passage, means mounted on said second portion of the body operable to move the valving means to its open and closed positions, and annular elastic means engageable with said body and tubular member operable to hold the tubular member in the open position, said tubular body having an outwardly directed rim, and said annular elastic means being engageable with said rim and second portion of the body when the tubular member is in the open position.

4,413,807

## RAIL GAUGING SHOE

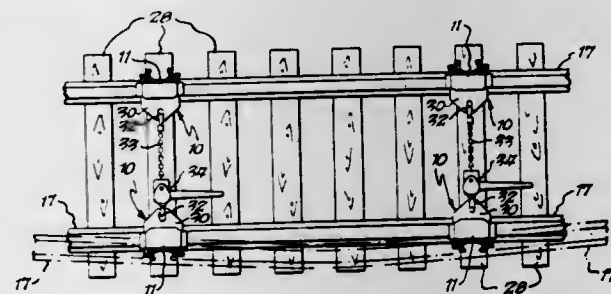
Edwin R. Winter, Rte. 75 and Shirley Rd., North Collins, N.Y. 14111

Filed Sep. 28, 1981, Ser. No. 305,936

Int. Cl.<sup>3</sup> B25B 1/20

U.S. Cl. 254—43

10 Claims



1. A rail gauging shoe for mounting on a deformed rail of a pair of railroad tracks to pull it back into proper gauged position.

tion relative to the other rail of said pair of railroad tracks and which can remain in position to permit train wheels to pass along the deformed rail and over the rail gauging shoe comprising a body portion, an elongated flat top portion on said body portion for placement in contiguous abutting relationship to the top of said deformed rail, an elongated first side portion extending transversely to said top portion for placement in contiguous relationship to the side of said deformed rail facing said other rail of said pair of railroad tracks, first chamfered portions at the ends of said first side portion, a second side portion extending transversely to said top portion on the opposite side thereof from said first side portion, first attachment means on said second side portion for securing said body portion to said rail with said first side portion in abutting relationship to said rail, and second attachment means on said first side portion for attachment to a pulling device.

4,413,808

## PORTABLE POWER DRIVEN WIRE PULLER

Louis J. Finkle, 9300 Palm St., Bellflower, Calif.

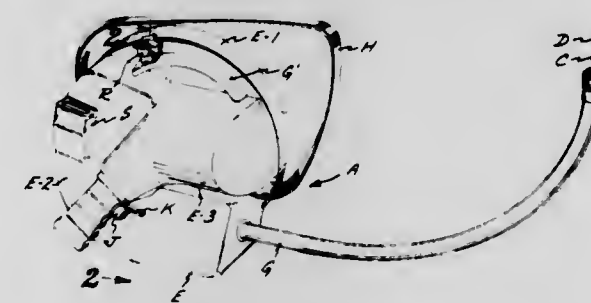
Continuation of Ser. No. 148,740, May 12, 1980, abandoned.

This application Dec. 10, 1980, Ser. No. 215,045

Int. Cl.<sup>3</sup> B65H 57/28

U.S. Cl. 254—134.3 FT

8 Claims



1. In combination with an elongate stiff, resilient steel tape having means on a first end thereof to which a length of wire may be secured to be pulled through a conduit, a portable power driven wire pulling device that may be used by an operator to push said tape through a conduit to have an end of said wire secured thereto and then retract said tape substantially into said device to pull said wire through said conduit, said wire pulling device including:

- a. a housing;
- b. a free floating tape storage cage rotatably supported in said housing and having a portion of said tape coiled therein;
- c. a reversible drive motor operatively associated with said housing;
- d. at least one pair of rotatably gripping members in said housing that pressure contact opposite sides of said tape;
- e. first and second gear trains in said housing in driving connection with said motor for selectively driving said gripping members in first or second directions; and
- f. first means that automatically impart rotation to said pair of gripping members through said first gear train when said motor rotates in a first direction to withdraw said tape from said free floating cage and push said tape into said conduit, and said first means when said motor operates in said second direction imparting rotation to said pair of gripping members through said second gear train in a second direction to draw said tape and wire from said conduit and direct said tape into said free floating cage to assume a coiled configuration therein.

4,413,809

## ANTI-FLASHBACK CUTTING TORCH

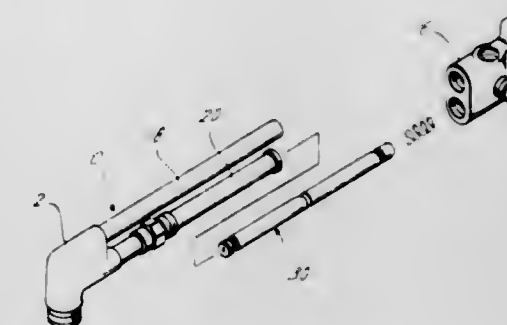
Robert A. Fischer, 1903 Ave. C., Katy, Tex. 77449

Filed Sep. 24, 1982, Ser. No. 423,363

Int. Cl.<sup>3</sup> B23K 7/00

U.S. Cl. 266—48

2 Claims



1. In a cutting torch having a torch head, a body having a fuel inlet and oxygen inlet, control means connected to the body for controlling the flow of fuel and oxygen, a preheat tube assembly and a cutting oxygen tube assembly connected between the body and the head, the improvement in the preheat tube assembly for preventing flashback comprising, an inner tubular member positioned in the preheat tube assembly, said member being threadably connected at one end to the head, the outer surface of the tubular member spaced from the inner surface of the preheat tube forming a fuel passageway in communication with the fuel, said means at each end of the tubular member blocking said passageway ends, said tubular member having a straight through bore with the body end of the bore being in communication with the oxygen, said member having one or more holes extending from the passageway to the bore intermediate the ends of the member for aspirating fuel from the passageway into the bore as oxygen flows through the bore to the head.

4,413,810

## ASCERTAINING THE LEVEL OF THE SLAG-LIQUID-METAL INTERFACE IN METALLURGICAL VESSELS

Werner Tenberg, Ratingen, and Ludwig Pichert, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

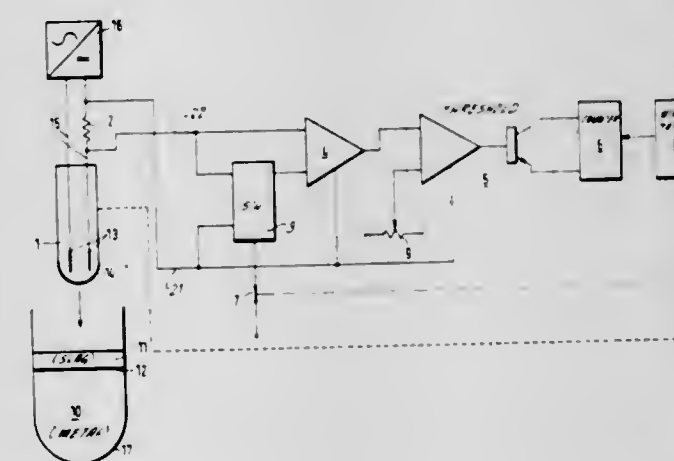
Filed Aug. 16, 1982, Ser. No. 408,510

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3133182

Int. Cl.<sup>3</sup> C21C 5/30

U.S. Cl. 266—94

3 Claims



1. Apparatus for ascertaining the surface level of the liquid



metal in a metallurgical vessel and interfacing with a slag layer. the apparatus including a two-electrode probe interconnected externally in an electric circuit that includes a voltage source, there being means for lowering the probe, including the two electrodes, into the vessel and raising and lifting the probe again, the improvement comprising:

circuit means connected to the probe to derive therefrom a voltage being representative of any current flow between the electrodes;

an analog storage device having an input connected to receive said voltage and having an output tracking the input, and including switch means for selectively enabling and interrupting the tracking;

means responsive to lifting of the probe and connected for causing said interrupting so that the output of the analog storage device equals a value of the input prior to the interrupting, representing a current flow between the electrodes as interconnected by the liquid metal in the vessel;

a differential amplifier having an input connected to receive said voltage as provided by the circuit means and having a second input connected to receive said output of said analog storage device;

a threshold circuit connected to receive an output of the amplifier and having an adjustable circuit for adjustment of a threshold level; and

a counter connected and operated for counting path increments for, thereby, tracking the lowering and/or lifting of the probe, further being connected for changing as between counting and not counting in response to the output of the threshold circuit then indicating that the output of the differential amplifier has exceeded the threshold level as adjusted in the threshold circuit.

4,413,811

## WATER-COOLED, LININGLESS CUPOLA

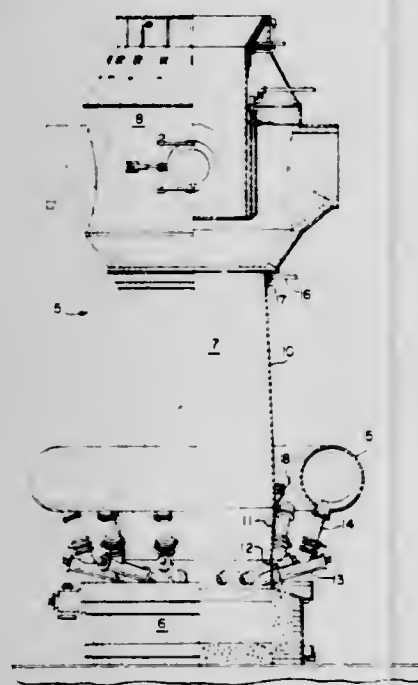
William A. VanDril, Frankfort, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed Jun. 17, 1982, Ser. No. 389,422

Int. Cl.<sup>3</sup> F27B 1/24

U.S. Cl. 266—190

5 Claims



1. In a water-cooled, liningless cupola having a water-cooled liningless body section which extends downwardly from the bottom of the cupola gas take-off section to the top of the cupola well section, with the lower portion of said body section including the high heat area above the tuyeres tapering inwardly toward the bottom of the body section with respect to its vertical axis, the improvement which comprises having said inward taper terminate a short distance above the cupola

tuyeres with the remaining bottom end portion of said body section being cylindrical or outwardly tapered.

4,413,812

## APPARATUS FOR DISCHARGING HOT FLOWABLE SOLIDS, PARTICULARLY SPONGE IRON, FROM A SHAFT FURNACE

Wilfried Pirkibauer, Linz, and Martin Nagl, Rutzenmoos, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

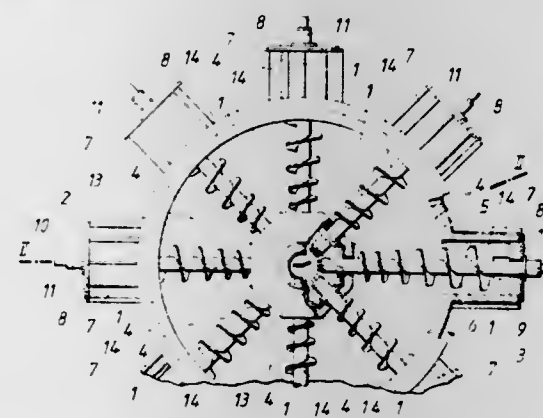
Filed Dec. 20, 1982, Ser. No. 451,043

Claims priority, application Austria, Jan. 11, 1982, 50/82

Int. Cl.<sup>3</sup> F27B 1/20

U.S. Cl. 266—195

10 Claims



1. In apparatus for discharging hot flowable solids from a shaft furnace, comprising

a centrally disposed hollow body,

a plurality of conical conveyor screws arranged to form a star-shaped array and having an inner end each, which is rotatably mounted in said hollow body, and

a bottom structure comprising a plurality of conveyor troughs, each of which contains one of said conveyor screws,

the improvement residing in that

said bottom structure comprises said hollow body and an annular mounting flange,

each of said conveyor troughs has a largest depth which is at least as large as the largest diameter of the associated conveyor screw,

each of said conveyor troughs has an outer end wall formed with an opening, through which the associated conveyor screw extends, and

each of said outer end walls carries a gas-tight discharge housing, which is provided with a discharge fitting and contains the outer end of the associated conveyor screw.

4,413,813

## DISPOSABLE BED FILTER APPARATUS

Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 200,342, Oct. 24, 1980, Pat. No. 4,330,327.

This application Jan. 25, 1982, Ser. No. 342,433

Int. Cl.<sup>3</sup> C21C 7/04; B01D 23/20, 23/24

U.S. Cl. 266—216

22 Claims

1. A filter apparatus for removing impurities from a molten metal comprising:

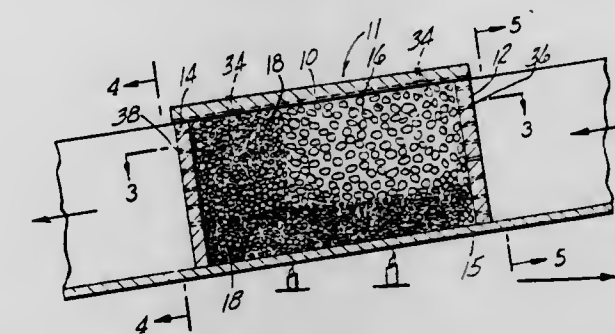
a trough for conveying a flow of said molten metal in a desired direction, said trough being sump-free;

a bed filter for removing the impurities in the molten metal located within the confines of said sump-free trough;

said bed filter comprising layers of different sized bed media overlapped longitudinally in the direction of said molten metal flow and having a cross-sectional area substantially transverse to said molten metal flow direction;

said layers being overlapped longitudinally for substantially preventing channelling in said bed filter and for increasing

molten metal flow through substantially all of said cross-sectional area; and  
perforated means for assisting in substantially preventing



said channelling in said bed filter and for increasing said flow through substantially all of said cross-sectional area, said perforated means being located adjacent an exit portion of said bed filter.

4,413,814

## INITIATING CONE

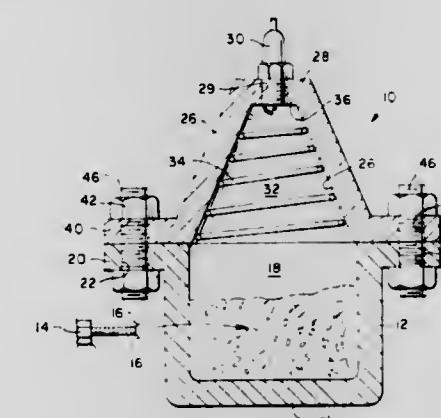
George S. Lobastov, 495 - 45th Ave., San Francisco, Calif. 94121

Filed Apr. 10, 1981, Ser. No. 252,998

Int. Cl.<sup>3</sup> B23K 7/00; B24C 1/00; C21D 1/82

U.S. Cl. 266—251

5 Claims



1. A detonation device for removing burrs from metallic articles comprising:

a receptacle having an open upper end and a hollow interior for receiving the metallic articles;

a combustion chamber casing, connectable to the open upper end of said receptacle in sealing engagement therewith, said casing having a hollow cavity in communication with the interior of said receptacle, said cavity having a generally frusto-conical configuration with the interior surface of said cavity being formed with a spiral pattern; and

ignition means mounted adjacent the upper end of said cavity for igniting a combustible material introduced into said cavity, whereby in operation, the configuration of the inner surface of said cavity functions to enhance detonation of said combustible material to aid in the removal of burrs from the metallic articles held in the receptacle.

4,413,815

## DEVICE FOR BLOWING SWIRLING GAS INTO A METAL REFINERY CONVERTER

Roger Duhomez, and Guy Quenton, both of Dunkerque, France, assignors to Compagnie Francaise des Aciers Speciaux, Paris, France

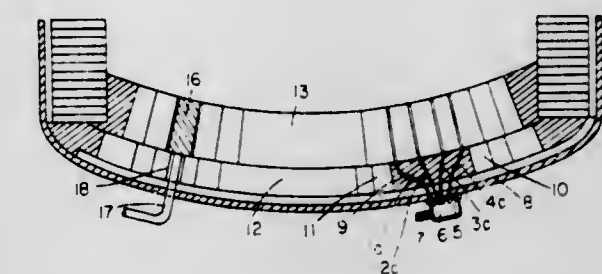
Filed Apr. 21, 1982, Ser. No. 370,652

Claims priority, application France, Apr. 24, 1981, 81 08188

Int. Cl.<sup>3</sup> C21B 7/16

U.S. Cl. 266—265

7 Claims



1. A device for blowing swirling gas through the compact refractory coating of the bottom wall of a converter for refining liquid metals and having a compact refractory coating, consisting of a set of single tube tuyeres, located throughout the entire thickness of said compact refractory coating and wearing away with said coating, the tube constituting each of the said tuyeres being flattened along the whole consumable length (1b) of said tuyere, the width of the internal cross-section for the passage of the gas in the flattened tube (1b) being, at most, equal to 1.0 mm, the head (1a) of each of said tubes, generally cylindrical, passing through a steel plate (5), to which it is brazed, and said steel plate (5) constituting one of the walls of a distribution chamber (6) between said swirling gas tuyeres, supplied with said gas through a duct (7), said chamber (6) being fixed by means of said plate (5) to the exterior surface of the sheathing (8) of said converter.

4,413,816

## GAS-BLAST PIPE FOR FEEDING REACTION AGENTS INTO METALLURGICAL MELTS

Simo A. I. Mäkipirtti, Nakkila; Mauri J. Peuralinna, Harjavalta; Valto J. Mäkitalo, Pori; Launo L. Lilja, Pori, and Helge J. Krogerus, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jul. 22, 1981, Ser. No. 286,039

Claims priority, application France, Aug. 4, 1980, 80 2438

Int. Cl.<sup>3</sup> C21B 7/16

U.S. Cl. 266—270

5 Claims



1. A device for blowing a gas continuously into a metallurgical melt, comprising: a blast pipe which has at one end an inlet



adapted to be connected to a source for the gas and at the opposite end an outlet adapted to be immersed below the melt surface in order to blow the gas into the melt; a cooling device attached to and surrounding the blast pipe, the cooling device comprising substantially smaller-diameter cooling pipes parallel to the blast pipe, the cooling pipes having inlets and outlets being adapted to be connected to a source of a gas-liquid mixture which vaporizes rapidly in the cooling device said inlets and outlets being at that end which is near the blast-pipe inlet; a thermally insulating mantle of ceramic material attached to and surrounding at least the lower part of the cooling device said mantle being further surrounded by a sleeve of graphite or silicon carbide or both, which sleeve is at least so thick that it protects the ceramic material from thermal shock when the device is lowered into the melt, so that the ceramic material reaches the temperature of the melt more slowly than the sleeve does and sinters before the sleeve wears out; and attached to the outlet of the blast pipe a Laval nozzle which is at an angle to the blast pipe and extends through the mantle and its sleeve.

4,413,817

# PLUG DEVICE FOR THE PENETRATION OF A PLUNGER ROD INTO A CYLINDER OF GAS SPRING OF THE LIKE

Rene Bich, Maisons-Laffitte, France, assignor to Societe J. G. Allinquant, Gentilly, France

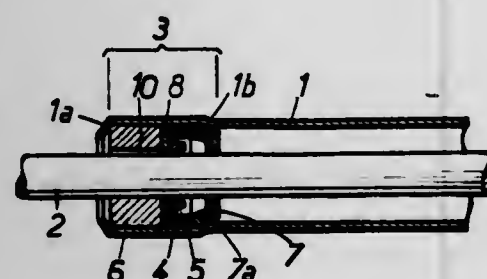
Filed Jan. 17, 1980, Ser. No. 113,036

Claims priority, application France, Jan. 17, 1979, 79 01107

Int. Cl.<sup>3</sup> F16F 9/36

U.S. Cl. 267—64.11

4 Claims



1. Pneumatic spring apparatus having a cylinder, a trio plug device forming a closure at an end of said cylinder, and a reciprocable plunger rod slidably fitted through said plug device for operation in said cylinder, said trio plug device consisting of three elements in axial succession: a first annular holder member located at the outer side of said trio plug device including means of such design as to be rigid enough for mechanical guidance of said plunger rod in its reciprocation while being yieldable enough for allowing a degree of swivelling upon exertion of radial stresses on said rod, an intermediate annular gastight seal of resilient material having a central axially extending lip surrounding said rod and in direct sliding frictional engagement therewith, and a second annular holder member located at the inner side of said trio plug device including further means for oil retention to lubricate said seal lip, said seal being tightly sandwiched between said first and second holder members.

4,413,818

# COMBINATION VISE

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Aug. 24, 1981, Ser. No. 295,732

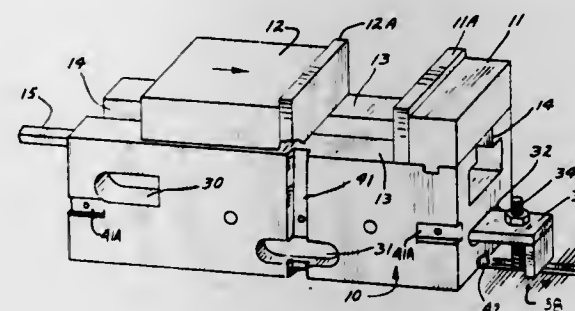
Int. Cl.<sup>3</sup> B23Q 1/04

U.S. Cl. 269—81

3 Claims

1. A vise body having a pair of sidewalls, a pair of end walls joining said sidewalls, and a bottom wall joining the end and sidewalls, the exterior surface of the bottom wall forming a first plane support of the vise body on a table, guide means on

said vise body on an upper side thereof opposite the bottom walls, a fixed jaw mounted on the upper wall adjacent said guideway, a movable jaw mounted on said guideway for movement toward and away from said fixed jaw, said fixed and movable jaws having longitudinal jaw axes extending transverse to the direction of movement of the movable jaw and generally parallel to the first plane, the side and bottom walls having generally flat exterior surfaces, the sidewalls defining plane at right angles to the bottom wall and parallel to each other, the fixed and movable jaws being of size to be entirely between the planes of the sidewalls, each of said sidewalls, end



walls and bottom walls having groove means defined therein opening to the respective walls, and the groove means defining surfaces at right angles to the plane of the respective wall in which the respective groove means is formed to permit selectively placing the sidewalls and bottom wall onto a support table using the groove means surfaces for clamping, to thereby permit the vise body to be placed on a support table supported on either of said sidewalls with the longitudinal axes of said jaws extending perpendicular to such table, or supported on the bottom wall with the longitudinal axes of said jaws extending parallel to the table.

4,413,819

# VISE CLAMP AND SWIVEL BASE VISE USING SUCH CLAMP

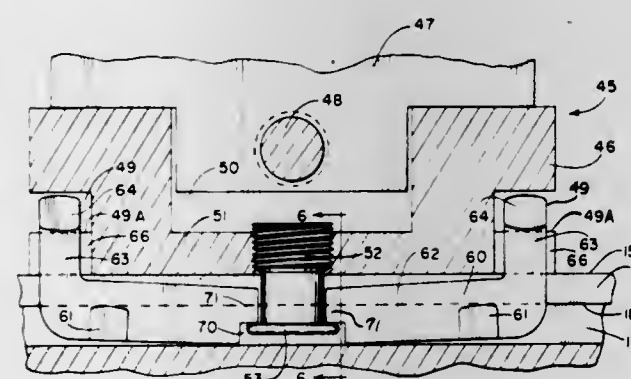
John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Apr. 9, 1981, Ser. No. 252,286

Int. Cl.<sup>3</sup> B23Q 3/02

U.S. Cl. 269—99

3 Claims



1. A combination vise body and clamp comprising a vise body having a base defining a support plane and having clamping slot portions defined therein by surfaces generally parallel to the supporting plane adjacent opposite sides of the base for use in clamping the vise body onto a tool table having a T-slot defined therein, a screw member threadably mounted in the base of the vise body which extends into a T-slot of a table with which the vise and clamp assembly is to be used when the vise is supported along the supporting plane, and at least one clamp adapted to be positioned in a T-slot of such a table and operatively coupled to the vise body, said clamp comprising an elongated clamp body, said clamp body having a narrow transverse dimension of size to pass through such T-slot, a pair of laterally extending pivot members on each side of said clamp

body establishing a pivot axis generally normal to the longitudinal axis of the clamp body, a head mounted at one end of said clamp body and when the clamp is positioned in such T-slot extending in direction outwardly from such table, said head having a shank and at least one protrusion extending outwardly from the shank to provide a surface that faces toward such table and which engages a surface defining one clamp slot portion of the vise base, the pivot members of the clamp being retained in the T-slot and with the head extending into one clamp slot portion on the vise base, and said clamp having means at the opposite end of the clamp body from the head engaged by said screw in the vise base, whereby said screw can be operated to lift the opposite end to thereby clamp the head onto a surface that defines a corresponding clamp slot portion.

4,413,820

# SHEET HANDLING APPARATUS AND METHOD

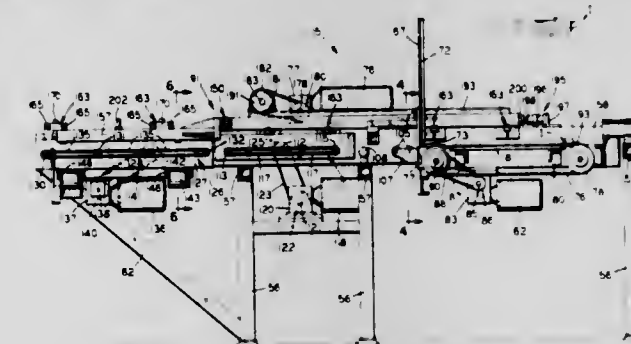
James A. Meeker, and Christopher J. Jackson, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 2, 1981, Ser. No. 317,315

Int. Cl.<sup>3</sup> B65H 5/02

U.S. Cl. 271—101

12 Claims



1. An apparatus for providing fragile sheet articles with interleaves comprising: a frame, means mounted on said frame for supporting a vertical stack of interleaves thereon, means for stripping the lowermost interleave from said stack and advancing said interleave longitudinally in a first horizontal path toward a forward location, a horizontally reciprocal shuttle having gripping means above said horizontal path, means at said location for raising said interleave from said first horizontal path into engagement with said gripping means, and means moving said shuttle longitudinally in a second horizontal path above said first horizontal path to position said interleave in vertical registry above the sheet article for subsequent deposit thereon.

4,413,821

# TREADMILL EXERCISER

Rocco Centafanti, 27 India St., Portland, Me. 04101

Filed Jul. 1, 1981, Ser. No. 279,320

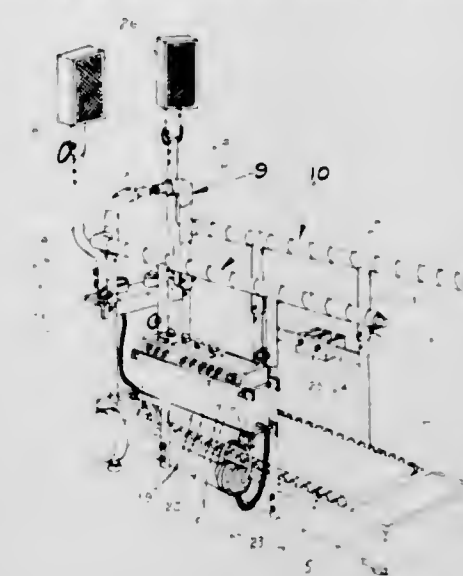
Int. Cl.<sup>3</sup> A63B 23/06

U.S. Cl. 272—69

4 Claims

1. A treadmill for use with accompanying dance or marching music, said treadmill including a base, an endless support for a person carried by said base and extending lengthwise thereof and movable by the feet of such a person, framework, and means connecting said framework to said base, said framework including a front, transverse section and side sections connected thereto and extending substantially the full length of said base, each section including a metal core and a resiliently yieldable encasement therefor providing for the full length thereof, a hand grip of substantial cross sectional area wherever grasped by said person as his positions change in response to the tempo and type of the music and a cushion if otherwise engaged, said connecting means including vertical posts secured to the base and depending tubular members attached to the framework and dimensioned slidably to receive within

them the upper end of the appropriate post, and means detachably connecting each member to the received post in a selected



4,413,822

# ELASTIC CORE COMPOSITE STRUCTURE AND METHOD OF MAKING SAME

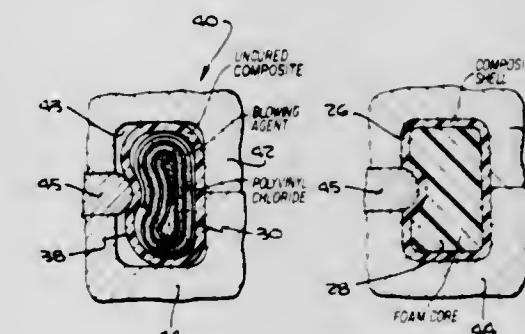
David Fernandez, and Helena J. Fernandez, both of Camarillo, Calif., assignors to American Sports Equipment, Camarillo, Calif.

Filed Jul. 31, 1981, Ser. No. 288,999

Int. Cl.<sup>3</sup> A63B 49/10

U.S. Cl. 273—73 C

9 Claims



6. In a method for producing a composite tubular frame structure comprising a rigid outer shell and a core wherein a core precursor is surrounded by an uncured composite shell and placed in a mold whereupon heating of said mold, said core precursor expands to provide internal pressure necessary to shape said composite shell by forcing said shell against said mold, said shell curing to form said rigid outer shell and said expanded core precursor forming said core, wherein the improvement comprises:

providing a core precursor made from a thin sheet of flexible polyvinyl chloride and a suitable blowing agent, wherein said core precursor is prepared by spirally wrapping one or more of said thin sheets of said polyvinyl chloride having said blowing agent on at least one surface thereof, said spirally wrapped sheets forming a multi-layered tubular core precursor having blowing agent dispersed between said layers.



4,413,823

## BALL PUZZLE

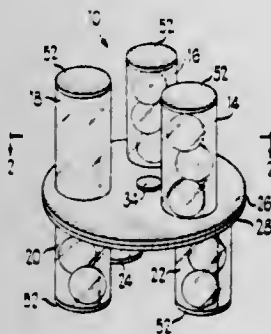
Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 3, 1980, Ser. No. 203,331

Int. Cl.<sup>3</sup> A63F 9/08

U.S. Cl. 273—153 S

14 Claims



1. A puzzle comprising: first and second base members rotatable coaxially relative to each other; an equal number of apertures in said first and second base members; an equal number of container means secured to said first and second base members, each said container means being in communication with one of said apertures; a predetermined number of playing objects positionable in said container means, said objects being divided into a plurality of said objects, whereby a player can solve the puzzle by moving the objects to position each group in one of the container means; and said apertures being defined in said first and second base members such that only one aperture in said first base member may be aligned with one aperture in said second base member at a time to allow one or more of said objects to move from one container means to another.

4,413,824

## REFLECTIVE GOLF BALL PUTTER ALIGNMENT DEVICE

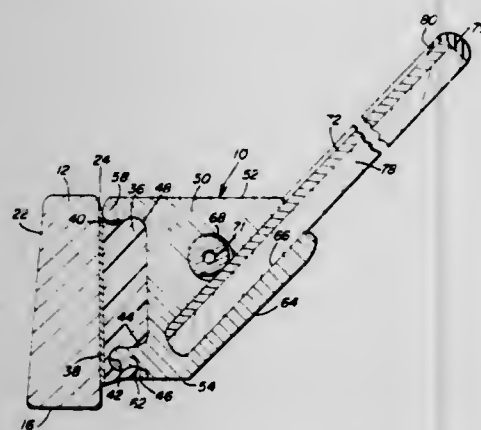
Melison J. King, 393 Park Ave., and John E. Wood, Jr., 135 Columbia St., both of Corning, N.Y. 14830

Filed Oct. 16, 1981, Ser. No. 312,883

Int. Cl.<sup>3</sup> A63B 69/36

U.S. Cl. 273—163 R

7 Claims



1. A golf ball putter alignment device comprising a reflective surface, means mounting the reflective surface from the rear face of a golf club putter head with the reflective surface extending upwardly and rearwardly therefrom in an inclined manner, said means comprising a bracket mount attached to the rear face of the putter head, a bracket attached to the bracket mount, said reflective surface being in the form of a mirror attached to the rear portion of the bracket thereby spacing the reflective surface from the rear surface of the

putter head to increase the distance between the reflective surface and a golf ball positioned in front of the striking face of the putter head for the purpose of optimizing the accuracy and sight perspective of the putter alignment device, said bracket mount including a body having a pair of groove means formed thereon, said bracket including a body having a pair of rib means formed thereon for interlocking detachable, non-adjustable engagement with the groove means to enable assembly and disassembly of the bracket mount and bracket according to a fixed relationship wherein the vertical center lines of the bracket and mount are parallel.

4,413,825

## GOLF CLUB

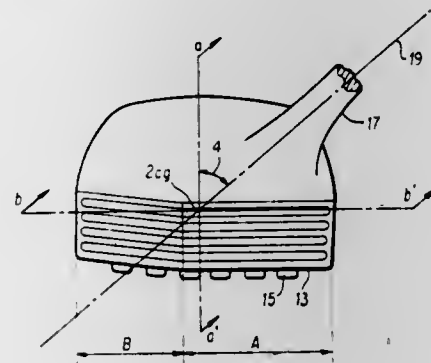
Howard A. Sasse, 27 Clyde Ave., Buffalo, N.Y. 14215

Continuation-in-part of Ser. No. 781,502, Mar. 25, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,217

Int. Cl.<sup>3</sup> A63B 53/04

U.S. Cl. 273—175

2 Claims



1. A wood-type golf club comprising a club head and a club shaft, said club head and shaft joined so that the center line of the shaft, when extended, intercepts a vertical plane within the confines of the club head which is perpendicular to the base of the club head and passes through the center of gravity of said club head, said club head having a striking face and a base portion, said striking face having a plurality of parallel corrugations thereon, ranging from 1/64 to 1/4 inch in depth, said corrugations positioned parallel to said base, one of said corrugations positioned at the bottom of the striking face, said striking face tapering outward from the top to the bottom of the face at an angle of from about 10° to about 15°, said club having a toe and heel portion, 25 to 50 percent of the surface of said striking face positioned nearest the toe portion tapered inward toward the back of the club head, at an angle between about 6° and about 12° to form two separate, substantially planar ball-striking surfaces on said striking face, the base portion of said club head consisting of a plurality of parallel runners thereon, said runners positioned parallel to the direction that the club would travel to strike a ball.

4,413,826

## GOLF TRAINING AID

Gardner H. Miller, Albuquerque, N. Mex., assignor to Trustroke International, Inc., Albuquerque, N. Mex.

Filed Jul. 14, 1982, Ser. No. 398,112

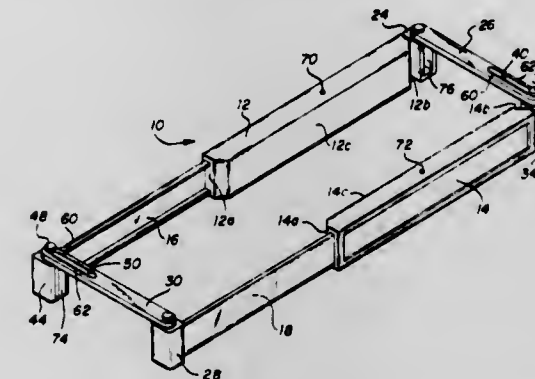
Int. Cl.<sup>3</sup> A63B 69/36

U.S. Cl. 273—186 C

5 Claims

1. A golf training aid comprising: first and second elongated telescopically extendable rail means each having first and second ends and being extendable to an operational position or retracted to a storage position; first elongated adjustable slide rail means having first and

second ends, said first end thereof being pivotally connected to said first end of said first elongated telescopically extendable rail means, said second end thereof being selectively pivotally connected to said first end of said second elongated telescopically extendable rail means in said operational position to thereby rigidly couple said first ends of said first and second elongated telescopically extendable rail means in said operational position; second elongated adjustable slide rail means having first and second ends, said first end thereof being pivotally connected to said second end of said first elongated telescopically extendable rail means, said second end thereof being selectively pivotally connected to said second end of said second elongated telescopically extendable rail means in said operational position to thereby rigidly couple said second ends of said first and second elongated telescopically extendable rail means in said operational position;



said first and second elongated adjustable slide rail means being disposed substantially perpendicular to said first and second elongated telescopically extendable rail means to thereby maintain said first and second elongated telescopically extendable rail means in a preselected spaced apart relationship throughout the entire length of said first and second elongated telescopically extendable rail means in said operational position; said first and second elongated adjustable slide rail means being disposed transversely to said first and second elongated telescopically extendable rail means in said storage position such that said first and second elongated telescopically extendable rail means contact each other to enable the golf training aid to collapse to a compact configuration; and means for rigidly locking together said elongated telescopically extendable rail means and said elongated adjustable slide rail means in said operational position and said storage position.

4,413,827

## SCALED-DOWN GOLF COURSE GAME

Erik O. Aberg, Pensacola, Fla.

Continuation of Ser. No. 955,218, Oct. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 947,572, Oct. 2, 1978, abandoned, which is a continuation of Ser. No. 869,161, Jan. 13, 1978, abandoned. This application Jul. 29, 1980, Ser. No. 173,366

Int. Cl.<sup>3</sup> A63B 69/36

U.S. Cl. 273—176 AB

5 Claims

1. A scaled-down golf game designed to be played with normal golf clubs, comprising: a plurality of golf holes having various par values, each hole including a first area designated as a driving tee, a second area provided as a putting surface and a fairway area located between the first and second areas, two types of balls, of normal golf ball size, one being a fairway ball which is designed to resist long flight when struck by a golf club and the other being a putting ball which is designed to have normal golf ball characteristics when chipped and putted, the driving characteristics of said balls being such that the fairway ball can be driven

about one-fourth the distance the putting ball can be driven with the same stroking force, the fairway area for each hole having a length which is scaled-down relative to the length of a fairway of a corresponding hole of a normal sized golf course by a factor which is the ratio of the distance the fairway ball can be driven relative to the distance said putting golf ball can be driven, whereby each of the holes of the scaled-down golf game has



a par value equal to the par value of the corresponding hole of the normal sized golf course, and an indication means provided at a designated distance from the periphery of the putting surface for indicating when the putting ball is to be substituted for the fairway ball, the indication means comprising a stripe located a designated distance from the periphery of the putting surface, whereby chipping may be performed using the putting ball designed to have normal golf ball characteristics when chipped.

4,413,828

## METHOD OF PLAYING A BOARD GAME UTILIZING CARDS

Anthony R. Gardner, 436 No. Highland Ave., NE, Atlanta, Ga. 30307

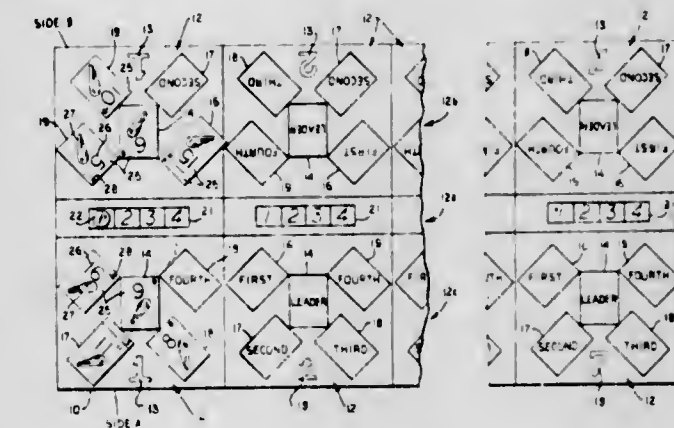
Division of Ser. No. 178,138, Aug. 14, 1980, Pat. No. 4,362,302.

This application Mar. 25, 1982, Ser. No. 361,500

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273—236

9 Claims



1. A method of playing a card game comprising the steps of: dealing a plurality of cards each bearing an indicium thereon to each of two opposing posts so as to designate a leader card and one or more cards in one or more of each of a plurality of supporting positions; conducting a first contest by comparing the leader card and any cards present in a first supporting position of one of said posts with the leader card and any cards present in a first supporting position of the other of said posts to determine a winning post and a losing post for said first contest; removing from said losing post said leader card and cards present in said first supporting position;



selecting a new leader card for said losing posts; conducting a second contest by comparing the leader cards and cards present in a second supporting position of said two posts to determine a winning post and a losing post for said second contest; and removing from said losing post said leader card and cards present in said second supporting position.

4,413,829

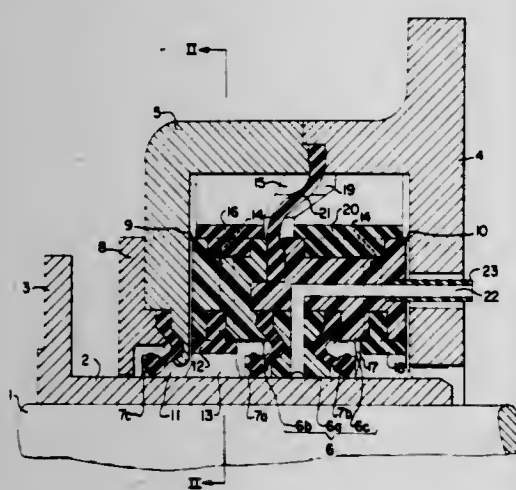
## SHAFT SEALING ASSEMBLY

Günter Pietsch, Hamburg, Fed. Rep. of Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Hamburg, Fed. Rep. of Germany  
Filed Feb. 18, 1982, Ser. No. 350,022  
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106318

Int. Cl.<sup>3</sup> F16C 33/74; F16J 15/40

U.S. Cl. 277—3

8 Claims



1. A shaft sealing assembly for sealing a shaft extension emerging from a housing which is at least partly cylindrical, the assembly comprising: at least one lip type sealing element disposed within said housing for making a seal on the shaft extension to be sealed, said sealing element being fastened to and supported by a mounting ring means of composite construction, said mounting ring means being disposed substantially coaxially with the shaft, said mounting ring means in turn being nonrotatably supported within said housing by an annular shaped resilient wall member, said annular shaped wall member being fastened along its outer periphery to an inside surface of said housing, whereby, by the flexing action of said wall member, said mounting ring in use is capable of radial displacements so as to accommodate any shaft-eccentricity and vibratory radial displacements of said shaft extension, wherein said mounting includes a plurality of ring elements fastened together and supporting two of said sealing elements which are axially spaced from each other and disposed on said shaft extension, the shaft assembly including: an additional lip type sealing element adapted to be disposed on said shaft extension and supported by an end portion of said housing, said assembly including a first annular shaped reservoir chamber defined partly by a surface of the shaft extension and partly by said at least one sealing element and said additional sealing element and partly by an inner surface of the mounting ring, said reservoir chamber adapted to contain a liquid lubricant; an outer annular chamber disposed radially outside of and substantially coaxial with said first annular chamber, the assembly including a first liquid passage in the form of a conduit interconnecting said first and outer annular chambers, the shaft sealing assembly including a first stationary deflector means supported by said mounting ring to extend towards the shaft, said deflector means being so shaped as to cause a whirl of said liquid lubricant and force the lubricant from said first annular shaped reservoir chamber to said outer annular chamber via said first liquid passage.

4,413,830

## SEAL ASSEMBLY FOR ROTATING SHAFTS

Günter Pietsch, Hamburg, Fed. Rep. of Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Fed. Rep. of Germany

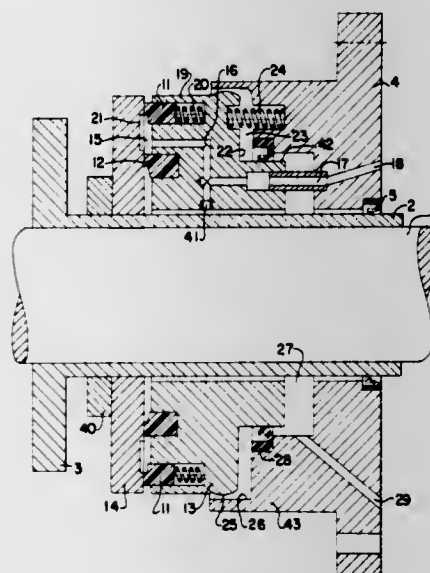
Filed Dec. 2, 1981, Ser. No. 326,812

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045855

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277—27

10 Claims



1. A seal assembly for rotating shafts, for use as a sea-water seal of an aft stern tube seal for ships, said assembly comprising two slide rings, namely, a first outer slide ring and a second inner slide ring radially spaced and concentrically arranged in substantially one plane; a receiving ring which surrounds the rotatable shaft and is axially movable, and in which said slide rings are mounted on one side, the rear side of said receiving ring being partially exposed to the surrounding sea-water; a counter-ring against which the slide rings are pressed, said slide rings, receiving ring and counter-ring forming a closed annular space for containing a pressurized liquid medium for lubricating said slide rings; the first, outer slide ring sealing the annular space against the surrounding sea-water, said outer slide ring being flexibly supported in the receiving ring and comprising a hydrostatic seal; a gap for lubrication which is influenced by the pressure of the liquid medium in said annular space; and the second, inner slide ring sealing said annular space against a drained void space at an inboard end of the sea-water seal, in operation said inner slide ring being made as a hydrodynamic seal and urged into contact with the counter-ring by the pressure of the sea-water which is acting against the rear side of the receiving ring, said outer slide ring being provided with a chamfered circumferential edge formed on its inner surface such that the chamfer is in contact with said annular space and also said counter-ring, whereby, said pressurized fluid in said annular space causes a slight opening of said chamfered circumferential edge so as to allow a slow escape of pressurized fluid from said annular space to the surrounding sea-water.

4,413,831

## FACE SEAL WITH ELASTOMERIC AXIAL THRUST MEMBER

Akira Washida, Tateishi, and Yuji Nakauchi, Sakura, both of Japan, assignors to Kabushiki Kaisha Arai Seisakusho, Tokyo, Japan

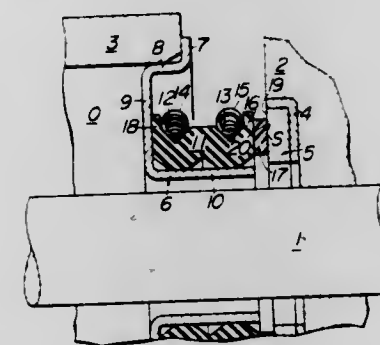
Filed Jan. 6, 1983, Ser. No. 455,907

Claims priority, application Japan, Jan. 9, 1982, 57-1960

Int. Cl.<sup>3</sup> F16J 15/38

U.S. Cl. 277—40

4 Claims



1. A shaft seal device essentially comprising: a rotary ring fluidly fitted onto a rotating member; a stationary ring fluidly fitted into a stationary member; a cylindrical seal ring member made of elastomeric material, said seal ring member being mounted around an inner sleeve portion of said stationary ring and having at least two annular grooves formed on the outer surface thereof, one of both the end faces of the seal ring member being brought into contact with the corresponding end face of the rotary ring, while the other one end face being brought into contact with a wall portion of the stationary ring; and ring-shaped resilient means fitted into said annular grooves on the seal ring so as to elongate the seal ring in the axial direction under the influence of contractive force caused by means of said resilient means whereby both the end faces of the seal ring member are placed in tight contact against the corresponding faces of the rotary and stationary rings.

4,413,832

## BODY SLED

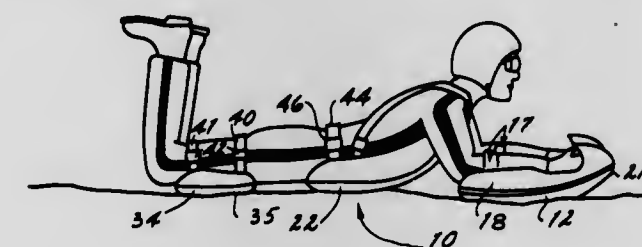
James E. Pendleton, 5705 SW 187th Pl., Aloha, Oreg. 97007

Filed Nov. 19, 1981, Ser. No. 322,743

Int. Cl.<sup>3</sup> B62B 13/02

U.S. Cl. 280—12 R

10 Claims



1. A body sled mountable to the forearms, chest and thighs of a rider's body, comprising: a pair of individual, unconnected forearm control runners, one for each forearm of the rider; means on each of the forearm control runners for releasably securing the forearm control runners respectively to the forearms of the rider; a chest plate separate and disconnected from the forearm control runners; means on the chest plate for releasably attaching the chest plate to the chest of the rider independently of the forearm control runners;

a pair of thigh runners separate and disconnected from one another and from the forearm control runners; and means on each of the thigh runners for releasably securing the thigh runners respectively to the thighs of the rider for independent movement with the rider's thighs in relation to the chest plate and forearm control runners; wherein the forearm control runners, chest plate, and thigh runners are positioned by the respective means on the rider's body to slide individually and independently over a surface such as snow or ice with the rider lying substantially in a prone position.

4,413,833

## TWO-WHEEL HAND TRUCK

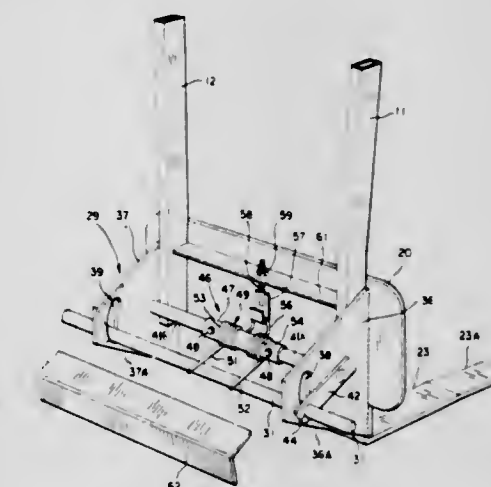
Wayne R. Tucker, P.O. Box 512, Volga, S. Dak. 57071

Filed Mar. 2, 1981, Ser. No. 239,525

Int. Cl.<sup>3</sup> B62B 1/02

U.S. Cl. 280—47.22

31 Claims



1. A hand truck comprising: a frame movable between a generally upright loading position and a rearwardly inclined transport position, said frame having side members, each side member having an upper end and a lower end, cross members secured to the side members between the upper and lower ends thereof, handle means attached to the upper ends of the side members, plate means attached to the lower ends of the side members, support means attached to the plate means for holding at least one object adjacent said plate means, wheel means to movably support the truck on a surface, axle means rotatably supporting the wheel means, mount means connecting the axle means to the plate means, said mount means including support members secured to the plate means and projected rearwardly therefrom, said support members having upwardly directed slots, said axle means extended through said slots whereby the axle means has limited generally vertical oscillating movement, shaft means rotatably mounted on the support members and extended generally parallel to the axle means, arm means secured to the shaft means and axle means whereby movement of the axle means in the slots rotates the shaft means, and biasing means mounted on the shaft means and engageable with the axle means operable to bias the axle means in a downward direction and hold the frame in its generally upright loading position.

4,413,834

## WOOD TOTER

Leonard C. Base, Rte. #3, Kingman, Kans. 67068

Division of Ser. No. 151,174, May 19, 1980, Pat. No. 4,343,483.

This application Nov. 30, 1981, Ser. No. 325,739

Int. Cl.<sup>3</sup> B62B 1/02

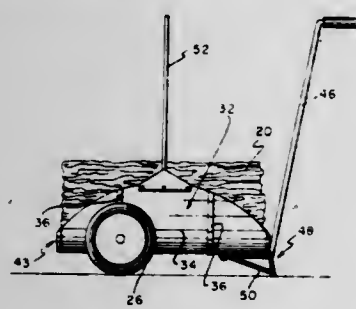
U.S. Cl. 280—47.26

1 Claim

1. A wheeled carrier for hauling logs or the like comprising: an elongated arcuate panel including a pair of open ends having sides essentially symmetrically tapering from a generally central apex position towards the ends;



an axis secured to said panel and having a structure defining an arcuate groove contouring the bottom of said panel wherein said panel lodges;  
 a pair of wheels supported by said axis and rotatably carried thereby, and  
 a handle bar connecting to and extending upwardly from said panel to facilitate the operation of the carrier when the same is gripped by a user, said axis is secured to said panel between said central position and one of the ends;  
 a log retention member transversing said panel from the generally central position of both sides;  
 said retention member comprises a rod configured to a U-shape and having its ends secured to the apices of both sides to retard the buckling of the sides when a large number of logs are loaded in the carrier;



a prop means secured to the bottom of said panel in proximity to the opposite end of said panel from where said axis is proximately secured;  
 said handle bar is secured on the bottom and at the opposite end of said panel from where said axis is proximately secured, said prop means being secured to said handle bar;  
 said carrier in operation having said handle bar gripped to lift said prop means off the ground in order to roll the wheels of said carrier to haul logs;  
 at least one band member traversing the outside of said panel and secured thereto to strengthen said panel and prevent the sides of same from buckling;  
 said panel and said axis each include a structure defining a plurality of apertures for receiving a fastening means to secure the panel to the axis.

4,413,835

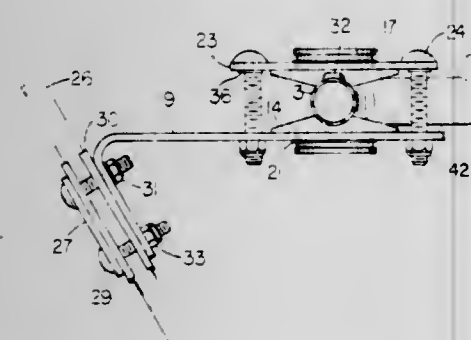
## HITCH FOR ONE-WHEEL CYCLE TRAILERS

Richard Hazelett, P.O. Box 60, Colchester, Vt. 05446  
 Filed Feb. 11, 1981, Ser. No. 233,681

Int. Cl.<sup>3</sup> B62D 63/08

U.S. Cl. 280-204

2 Claims



1. For use in conjunction with a one-wheel trailer having a normal upright position and adapted to be pulled by the frame

of a "cycle," such as a bicycle, motorcycle or moped, universal-joint hitch apparatus comprising:

a trailer frame for said one-wheel trailer having a transverse elongated frame member with a cylindrical rounded surface,  
 said elongated frame member extending horizontally transverse to the length of said one-wheel trailer when said trailer is in said normal upright position,  
 mounting means including attachment means for attaching said mounting means to the frame of the cycle for pulling the one-wheel trailer,  
 upper and lower wafer-like annular sector bearing elements positioned one above the other in spaced parallel relationship,  
 each of said sector bearing elements having a cylindrical concave bearing surface extending transversely horizontally across the respective element,  
 said upper sector bearing element being positioned above said elongated frame member with the concave bearing surface thereof engaged down against the cylindrical rounded surface of said elongated frame member,  
 said lower sector bearing element being positioned below said elongated frame member with the concave bearing surface thereof engaged up against the cylindrical rounded surface of said elongated frame member with said elongated frame member being journaled between the respective concave bearing surfaces of said upper and lower sector bearing elements for providing a transverse pivot axis,  
 said upper sector bearing element having an upwardly projecting centrally located trunnion with an upwardly facing thrust surface encircling said trunnion,  
 said lower sector bearing element having a downwardly projecting centrally located trunnion with a downwardly facing thrust surface encircling said latter trunnion,  
 said two trunnions being aligned for defining a vertical pivot axis,  
 said mounting means having a hole for receiving one of said trunnions and having a surface complementary with the thrust surface which encircles said one trunnion for engaging against said thrust surface,  
 a cap plate having a hole for receiving the other of said trunnions,  
 said cap plate having a surface complementary with the thrust surface which encircles said other trunnion for engaging against said latter thrust surface, and  
 clamping means urging said cap plate and said mounting means toward each other.

4,413,836

## TRACTOR-TRAILER COUPLING MEANS

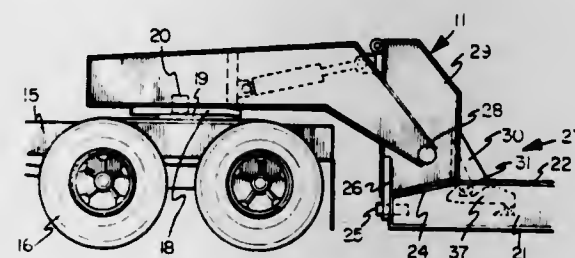
Russell L. Losh, Rensselaer, Ind., assignor to Talbert Manufacturing, Inc., Rensselaer, Ind.

Filed Jul. 31, 1981, Ser. No. 288,896

Int. Cl.<sup>3</sup> B62D 53/06

U.S. Cl. 280-423 B

6 Claims



4. A coupling assembly for connecting a tractor to a low-bed trailer, comprising:

a gooseneck on said tractor projecting rearwardly therefrom and mounted thereon for vertical and lateral movements;

a tail member attached to the rearward portion of said gooseneck, said tail member having secured thereto a bar; guide means secured to the front of said low-bed trailer for receiving said tail member, said guide means extending upwardly from the floor of said trailer, and said guide means including converging side walls secured to said trailer;  
 a latching bin situated at the uppermost portion of said trailer, laid bin having restriction walls coextensive with said converging side walls, and a back wall secured therebetween, and said bin having an aperture in the base thereof; and  
 hook means pivotally attached to said trailer and proximate said aperture, said hook means having a locking surface, means associated with an activating said hook, and means to urge said locking surface of said hook means upwardly to engage said bar of said tail member.

4,413,837

## DEVICE FOR ADJUSTING THE HEIGHT OF VEHICLES

Yasuyuki Hayashi, Fukuroi, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan

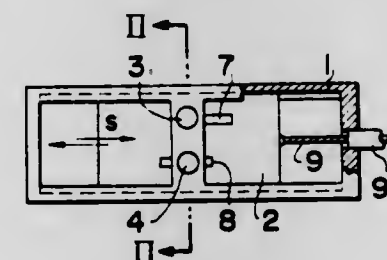
Filed Mar. 4, 1981, Ser. No. 240,455

Claims priority, application Japan, Jul. 24, 1980, 55-100481

Int. Cl.<sup>3</sup> B60G 11/26

U.S. Cl. 280-707

5 Claims



1. A device for adjusting the height of a vehicle, comprising:  
 a slidable pattern plate;  
 at least one each of a polarity-determination and allowable-displacement pattern on said slidable pattern plate, said pattern and pattern plate including through slots;  
 at least one each of a polarity-determination and allowable-displacement pattern on said slidable pattern plate;  
 means movable relative to said pattern plate in parallel relation in response to a change in the vehicle height for detecting said polarity-determination pattern in confronting relation;  
 means movable relative to said pattern plate in parallel relation in response to a change in the vehicle height for detecting said allowable-displacement pattern in confronting relation, said polarity-determination pattern having one end thereof normally positioned in confronting relation to said polarity-determination pattern detecting means and extending in a direction of movement of the pattern, and said allowable-displacement pattern having a center thereof normally positioned in confronting relation to said allowable-displacement pattern detecting means and extending in a direction of movement of the pattern;  
 and  
 an electrical circuit for producing a signal indicative of an increase or reduction in the vehicle height depending on whether or not said polarity-determination pattern detecting means produces an output signal when said allowable-displacement pattern detecting means produces no output signal.

4,413,838

## PASSENGER RESTRAINT SYSTEM

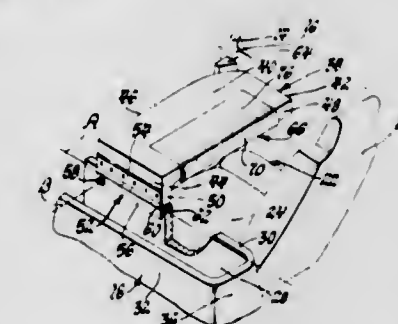
John H. Varterasian, Livonia, Mich.; Albert R. Plack, Middleburg Heights, Ohio, and Jackson W. Melichar, Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1981, Ser. No. 321,115

Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280-751

3 Claims



1. In combination with a vehicle having a front passenger seat comprising a seat cushion and a seat-back, said vehicle having a console along one side of said passenger seat; a passenger restraint table normally stored in a vertical position and adapted to be moved to a horizontal position above said seat cushion forwardly of said seat-back and extend across the torso of a passenger, said table in said horizontal position having a substantial dimension longitudinally of the vehicle; means connecting one end of said passenger restraint table to said console and permitting said passenger restraint table to be initially pivoted upwardly from said console about a first axis which extends transversely to the longitudinal axis of the vehicle followed by pivotal movement about a second axis which is substantially perpendicular to said first axis so as to allow said passenger restraint table to be moved from said vertical position to said horizontal position, a snubber secured to said vehicle for limiting forward movement of the other end of said passenger restraint table when said passenger restraint table is located in said horizontal position; and energy-absorbing means incorporated within said passenger restraint table and having substantial extent and absorbing capability in the longitudinal direction of the vehicle; said means and said snubber cooperating to maintain said passenger restraint table in a fixed position so as to cause said energy-absorbing means to cushion forward movement of said passenger in said front passenger seat when the torso of said passenger impacts against said passenger restraint table during sudden deceleration of said vehicle.

4,413,839

## MUD FLAP STABILIZER DEVICE

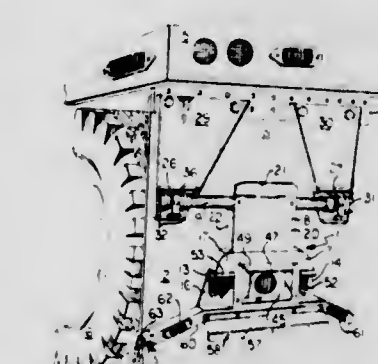
Thomas S. McCain, 9325 Georgia, Kansas City, Kans. 66109

Filed Sep. 14, 1981, Ser. No. 301,477

Int. Cl.<sup>3</sup> B62D 25/16

U.S. Cl. 280-154.5 R

4 Claims



1. A mud flap stabilizer device for use with an elongate,



generally rectangular mud flap formed of flexible material, and being swingably supported adjacent its upper end from a vehicle body rearwardly of an in close proximity to a vehicle wheel mounted tire; said stabilizer device comprising:

- (a) a stabilizer frame body;
- (b) a hanger member extending upwardly from said frame body;
- (c) a normally horizontally extending bar member having opposing ends, said hanger member secured to said bar member whereby said frame body depends therefrom;
- (d) swing mounting means for connecting said bar member opposite ends to said vehicle body rearwardly of said mud flap to position said frame body thereagainst;
- (e) rotation limiting means affixed to said bar member for controlling swinging movement of said frame body; and
- (f) illumination means connected to said frame body for visual enhancement thereof;
- (g) said frame body having spaced backing and front members providing an interior passage and closed by sidewalls;
- (h) said illumination means includes electrical lights having electrical wiring routed through said passage for protection of said wiring.

4,413,840

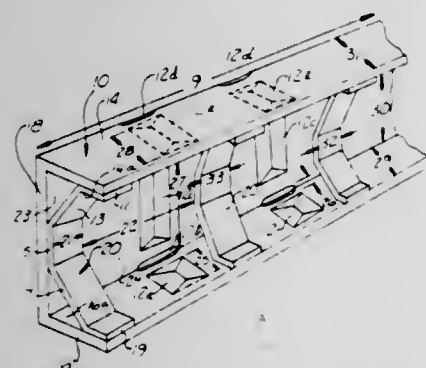
#### MECHANISM TO CONTROL AXIAL COLLAPSE OF AN OPEN CROSS-SECTION BEAM

Ramesh H. Shah, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1981, Ser. No. 301,791  
Int. Cl.<sup>3</sup> B62D 27/04

U.S. Cl. 280—784

14 Claims



1. A method of controlling the axial collapse of an open cross-sectioned beam having flanges constituting angulated walls of the beam, comprising:

- (a) attaching trusses at spaced intervals along said beam, said trusses extending laterally between angulated walls of
- (b) forming depressions in said flanges located at least intermediate said trusses, said trusses and depressions each having an axial dimension which is about 1/6-1/3 the spacing between said trusses; and
- (c) subjecting said beam to axial loading effective to collapse said flanges between said trusses, said flanges folding substantially only at said depressions.

4,413,841

#### SAFETY SEAT BELT ARRANGEMENT FOR AUTOMOTIVE SEAT OCCUPANT

Hideoaki Matsuo, Yokohama, and Yoshinobu Kondo, Kosai, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 26, 1981, Ser. No. 277,802  
Claims priority, application Japan, Jun. 27, 1980, 55-90974[U]  
Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280—802

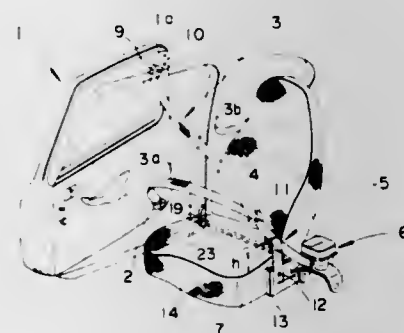
12 Claims

1. A safety seat belt arrangement for an automotive vehicle, comprising:

- (a) a first belt, having one end supported so as to be brought in contact with a shoulder portion of a seat occupant and

the other end supported so as to be brought in contact with the lap of the seat occupant;

- (b) a second belt, having one end secured to a first pivot ring having a hole through which said first belt is inserted and the other end held by a belt retractor located at the inboard side of the seat;
- (c) a projecting member engageable with a portion of the door and movable inwardly when the door is closed, and free to move outwardly when the door is open;
- (d) an elastic means for biasing said projecting member so as to urge said projecting member toward the outboard side of the seat;
- (e) an arm assembly rotatably supported on a frame member located on the inboard side of the seat, having a means for supporting said second belt at one end thereof and an axle at the other end thereof;



- (f) a stop, positioned between said elastic means and projecting member and fixed to the inboard side of said projecting member;
- (g) a wire for translating the movement of said stop to said engagement means, having one end fixed to said stop and the other end rotatably attached to said axle of said arm assembly;
- (h) a pulley for guiding said wire between said stop and axle of said arm assembly, being positioned at the rear inboard corner of the seat; and
- (i) a bracket attached to the rear of the seat for limiting the range of movement of said stop, the range of movement of said stop determining the range of rotation of said arm assembly, so that said second belt and, consequently, said first belt are moved away from the seat occupant, when said projecting member moves outwardly and the door is open.

4,413,842

#### WALKING ATTACHMENT FOR ROLLER SKATES

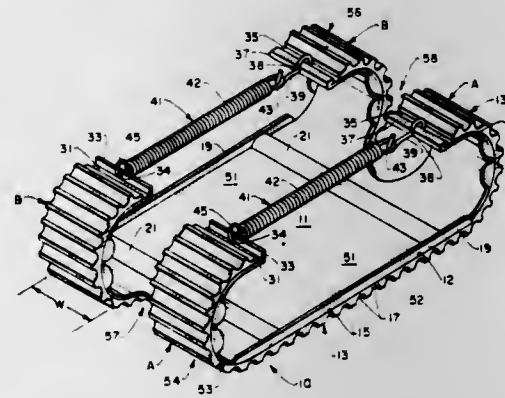
Isidoro Lored, 570 N. Main St., Manteca, Calif. 95336

Filed Jun. 22, 1981, Ser. No. 276,089

Int. Cl.<sup>3</sup> A63C 3/00

U.S. Cl. 280—825

4 Claims



- 1. An attachment to convert roller skates for walking comprising a sole plate having a top and bottom surface, said sole plate

having a rearward facing forward arcuate section connected to a central generally planar section in turn connected to a forward facing rear arcuate section sized in radius to correspond to the radius of the forward section, each arcuate section comprising a pair of spaced slightly flexible arc portions, at least the central section of said sole plate having an upstanding flange along each side thereof, a traction tread secured to the bottom surface of said sole plate, a pair of parallel forwardly and rearwardly adjustable wheel retainers mounted spaced from the arcuate sections and spaced from each, and adapted to prevent forward and rearward movement of skate trucks when said trucks are placed in the attachment, means disposed in said central section for adjustably mounting said wheel retainers, and releasable spring means for springingly connecting one arcuate section to the other arcuate section, mounted on the top of each such section.

4,413,843

#### MICROCAPSULES, METHOD FOR THEIR PRODUCTION AND PRESSURE SENSITIVE COPYING SHEET

Hiroshi Iwasaki, Kawanishi, and Shinsuke Irit, Nishinomiya, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,066

Claims priority, application Japan, Dec. 29, 1978, 53-165311  
Int. Cl.<sup>3</sup> B01J 13/02; B32B 27/42; B41L 1/36

U.S. Cl. 282—27.5

8 Claims

1. A method of making microcapsules comprising the steps of preparing an aminoaldehyde resin prepolymer of at least one amine and at least one aldehyde, and performing polycondensation of said aminoaldehyde resin prepolymer in an aqueous dispersion including particles of hydrophobic core material in the presence of anion-modified polyvinyl alcohol to form aminoaldehyde resin microcapsule walls around said particles of hydrophobic core material, said anion-modified polyvinyl alcohol being used in an amount between about 0.1 and about 20% by weight of the amount of said aqueous dispersion.

7. Microcapsules which are prepared by a method as claimed in claim 1.

8. Pressure sensitive copying sheet comprising a support having coated thereon a layer of microcapsules as claimed in claim 7.

4,413,844

#### SWIVEL CONNECTOR BETWEEN A FLOATING OR SEMI-SUBMERGED STRUCTURE AND A RISER OR FLOW LINE

Xuong N'Guyen Duc, Ruell Malmanson, and Rene Szabo, Le Pecq, both of France, assignors to Coflexip, Ruell Malmanson, France

Filed Feb. 25, 1981, Ser. No. 238,120

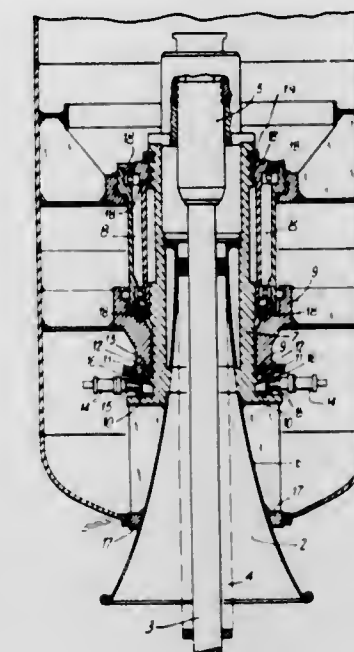
Claims priority, application France, Feb. 29, 1980, 80 04623  
Int. Cl.<sup>3</sup> F16L 55/00

U.S. Cl. 285—16

7 Claims

1. A swivel connection arrangement between a structure, floating or partly submerged in a body of water and a flow conduit for hydrocarbons comprising, a structure adapted to be supported in a body of water, a connection element including means for fixing the conduit to said element; bearing means supported on said structure, support means on said connection element for supporting said connection element on said bearing means, said bearing means supporting the connection element on the structure for rotation relative to the structure about an axis, whereby said connection element and the conduit

connected thereto can normally rotate relative to said structure, means for locking said connection element to said structure and moveable between



a first position in which said bearing means supports said connection element for rotation thereof relative to the structure, and

a second position in which said connecting element is locked to and supported by said structure independently of said bearing means.

4,413,845

#### PIPE COUPLINGS

Anthony J. Lawrence, Teddington, England, assignor to Tungum Hydraulics Limited, Cheltenham, England

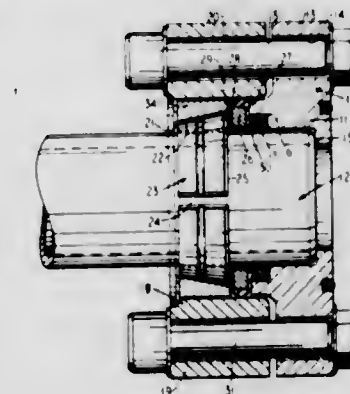
Filed Oct. 20, 1980, Ser. No. 199,016

Claims priority, application United Kingdom, Oct. 18, 1979, 7936130

Int. Cl.<sup>3</sup> F16L 55/00

U.S. Cl. 285—23

5 Claims



1. A pipe coupling comprising a first pipe-encircling member having a bore therein adapted to receive the pipe and having an outwardly extending projection, a recess coaxial with said bore and a sealing element disposed within the recess and of said first member to provide a seal between the member and a pipe, a second pipe-encircling member having an internal bore provided with an internal shoulder and an outwardly extending projection, a pipe-gripping collar within the bore in the second member and having an external frusto-conical surface so arranged that, upon axial movement of the second member towards the first member, the collar is contracted radially to grip the pipe, adjustable clamping means engageable with said projections on the first and second members to move the second member axially towards the first member without relative



rotation between the members, a slip ring located within the bore of the second member against the internal shoulder of said second member and having an internal frusto-conical surface which coacts with the external frusto-conical surface of the collar, a washer having one side in surface-to-surface engagement with an end surface of the collar and the other side in surface-to-surface engagement with the first pipe-encircling member, the washer having a metal body, a body of rubber encapsulating the metal body of the washer, a peripheral rubber flange integral with said encapsulating body of rubber for engagement with the bore in said second member to retain the collar and the slip ring within the bore of the second member, and a resilient rubber backing ring integral with said encapsulating body of rubber which extends into and cooperates, in use, with said recess and the sealing element to prevent extrusion of the material of the sealing element under high pressure conditions.

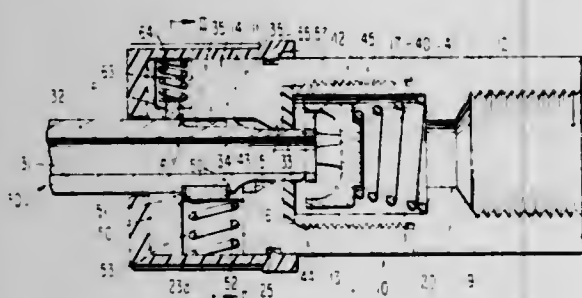
4,413,846

## HOSE COUPLING

Hans Oetiker, Oberdorfstrasse 21, Horgen, 810  
Filed Apr. 24, 1981, Ser. No. 257,321  
Int. Cl.<sup>3</sup> F16L 39/00, 37/00

U.S. Cl. 285—317

20 Claims



1. A locking arrangement for a coupling in which a male coupling member provided with an external annular groove is adapted to be inserted into a bore of a female coupling member whose bore is in direct communication with the outer surface of the female coupling member by way of a cutout whose imaginary chord-like inner end intersects said bore, and which includes latching means for holding the male coupling member in its connected position relative to the female member, when said cutout is in substantial axial alignment with said external annular groove by extending through said cutout into engagement with the shoulder surface formed by said annular groove, and actuating means on said female coupling member operable to engage with said latching means for withdrawing said latching means from said external annular groove to enable disengagement of said male coupling member from said female coupling member, characterized in that a safety locking means is provided in the female coupling member which prevents complete disengagement of the male coupling member from said female coupling member upon actuation of said actuating means until substantial decrease of pressure in a line connected to the female coupling member, said safety locking means including a locking member inserted into a slot provided in said female coupling member behind said cutout in the disengaging direction of said male member, said slot intersecting said bore, a spring in said female coupling member normally urging said safety locking member into its locking position, and further means operatively connecting said actuating means with said locking member in such a manner that said locking member is normally held out of intersecting said bore but upon actuation of said actuating means is released before complete release of said male coupling member by said latching means so that said male coupling member is pressed with its shoulder surface against said locking member by pressure existing in a line connected to said female coupling member to enable a decrease of said pressure.

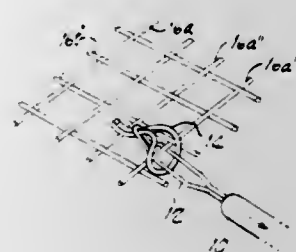
4,413,847

## HOOKING TOOL FOR HOBBY USERS

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011  
Filed Mar. 16, 1981, Ser. No. 244,287  
Int. Cl.<sup>3</sup> B65H 69/04

U.S. Cl. 289—17

13 Claims



1. A rug hooking tool having a handle and a closed, integral loop of firm material which extends forwardly from the handle and comprises a greater width portion which smoothly narrows forwardly to a lesser width tip, said loop being dimensioned to be inserted forwardly into canvas meshes between warp and weft runs such that a warp or weft run is over the loop and such that the tip and at least a part of the greater width portion of the loop are forwardly of said run while at least a major portion of the handle is rearwardly of the run, whereby when the loop is so inserted in the canvas, and there is a length of yarn with a central part thereof just rearwardly of the run and between the tool and the canvas and the free ends thereof extending away from the tool and/or canvas, said yarn length can be knotted to said run by pushing the free ends thereof forwardly over said run and downwardly into the loop and withdrawing the tool from the canvas by moving it rearwardly of said run, said loop being dimensioned in width to receive freely said free ends of the yarn length and said tip being dimensioned in width to receive said free ends relatively tightly in the course of said rearward movement of the tool.

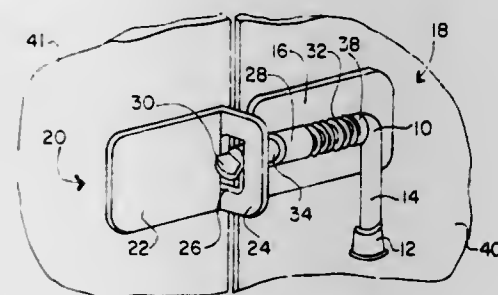
4,413,848

## LATCHING MECHANISM FOR PANELS

John Y. Leaver, Elkhart, Ind., and Harold D. Huggins, Quincy, Ill., assignors to The Knapheide Mfg. Co., Quincy, Ill.  
Filed Jan. 9, 1981, Ser. No. 223,626  
Int. Cl.<sup>3</sup> E05C 5/02

U.S. Cl. 292—59

1 Claim



1. In a latching device for attaching a first and a second member together comprising a rotatable latch rod slidably attached to said first member, said latch rod having an engaging end; and receiving means for engaging said engaging end attached to said second member, the improvement comprising: said latch rod being spring biased away from said receiving means, said engaging end having an edge defining a cam surface such that when said latch rod is engaging said receiving means and when said latch rod is rotated, said latch rod moves in a direction along its longitudinal axis; said device further comprising a plate attached to said first member and a hollow cylinder attached to said plate, said latch rod being received within said hollow cylinder and wherein said latch rod is L-shaped having a first and a

second leg, said first leg passing through said hollow cylinder, and said second leg comprising a handle; said device further comprising a ring fixedly attached to said first leg and a spring circumferentially surrounding a portion of said first leg and being located between said hollow cylinder and said ring, and wherein said receiving means has a slot therein which receives said engaging end and is an L-shaped plate having a first and a second flange, said first flange being attached to said second member, and said slot being located in said second flange; said device further comprising an insert for attaching to said receiving means, said insert comprising a flat member having a tongue and a head, said tongue having a width less than the width of said slot such that said tongue fits within said slot, and is attached to said first flange, said head having a second slot to receive said engaging end.

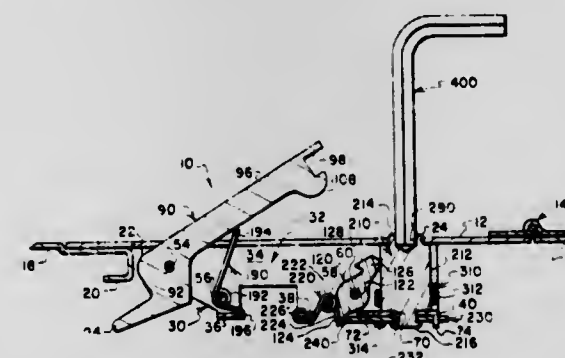
4,413,849

## TOOL-OPERATED FLUSH-MOUNTABLE LATCH

Edwin W. Davis, Medina, and Jack A. Braun, Cleveland, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio  
Continuation-in-part of Ser. No. 124,749, Feb. 26, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 215,567  
Int. Cl.<sup>3</sup> E05C 3/04

U.S. Cl. 292—229

16 Claims



1. A flush-mountable, tool-operable latch suitable for mounting on a door panel or the like to releasably retain the door panel in a closed position, comprising:

- a body having wall portions which define an elongate, forwardly-facing recess, and having mounting formation means on opposite sides of the recess for mounting the body on a door panel with the forwardly-facing recess aligned with an elongate opening formed through the door panel;
- an elongate latch lever pivotally connected to the body and having:
  - a strike-engaging formation which is movable between a latched position wherein it is engageable with a strike for retaining the door panel in a closed position, and an unlatched position wherein the strike-engaging formation is withdrawn to permit the door panel to move from its closed position to an open position; and
  - an elongate operating formation which is movable between a nested position relative to the forwardly-facing recess, and an extended position relative to the recess, the operating formation being configured to reside (1) in its nested position when the strike-engaging formation is in its latched position, and (2) in its extended position when the strike-engaging formation is in its unlatched position;
- a pawl pivotally connected to the body for movement between a retaining position wherein it engages the latch lever to releasably retain the latch lever with its formation in their nested, latched positions, and a releasing position wherein the pawl releases the latch lever thereby permitting the latch lever formations to be moved to their unlatched, extended positions;
- a tool-operable actuator connected to the body for movement between locked and unlocked positions, including:
  - tool-receiving means for receiving a specially config-

ured tool and being operable to move the actuator in response to movement of such received tool; and,  
(ii) a cam surface which operably connects with the pawl, which permits the pawl to assume its retaining position when the actuator is in its locked position, and which effects movement of the pawl to its releasing position when the actuator is moved to its unlocked position;  
(e) first biasing means for biasing the latch lever away from its latched, nested position, toward its unlatched, extended position; and,  
(f) second biasing means for biasing the pawl away from its releasing position toward its retaining position.

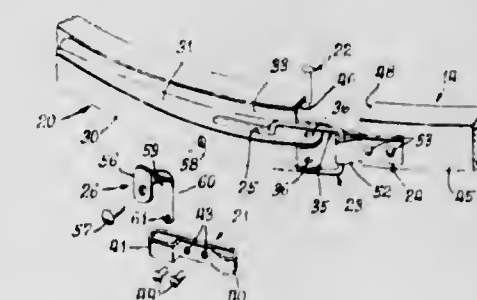
4,413,850

## DRUM LOCK MECHANISM

Allen D. Siblik, 2409 Valley Dr., Lindenhurst, Ill. 60046  
Filed Apr. 21, 1982, Ser. No. 370,179  
Int. Cl.<sup>3</sup> E05C 19/08

U.S. Cl. 292—256.69

3 Claims



1. For use with a split metal clamp ring adapted to secure a cover over the open end of a drum container, a lever operated mechanism for radially expanding and contracting the clamp ring, comprising: a second class lever having an elongated passageway intermediate its ends and extending laterally there-through, fulcrum means pivotally securing one end of said lever to one end of the clamp ring, articulated linkage means slidably connected to said lever via said elongated passageway therein, means pivotally anchoring said linkage means to the other end of the clamp ring whereby said linkage means bridges the split between the ends of the clamp ring so that pivotal movement of said lever serves to move said linkage means along said elongated passageway; movement of said lever to effect contraction of the clamp ring causing said linkage means to move toward said fulcrum means as the load on said lever increases to correspondingly increase the mechanical advantage of said second class lever, and latch means movable through said elongated passageway when said lever is moved to a position for closing the clamp ring; said latch means also interlocking with the clamp ring to prevent movement of said lever in a ring opening direction until released therefrom.

4,413,851

## RETAINER STRAP FOR GARBAGE CAN LID

Herbert W. Ritter, 13677 Torrey Pines Dr., Auburn, Calif. 95603

Filed May 26, 1981, Ser. No. 267,366

Int. Cl.<sup>3</sup> E05C 19/18

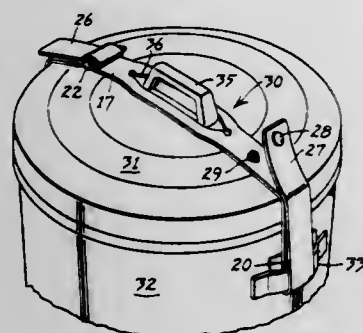
U.S. Cl. 292—259

4 Claims

1. A retainer device for detachably holding a lid having a top handle in closed position upon an open-top receptacle having a pair of opposed open-loop side handles, comprising:  
(a) an elongated flexible strap member having first and second end portions,  
(b) adjustable securing means on said strap member for holding said first end portion folded back upon itself in different positions to form an adjustable first loop adapted to extend through one of the open-loop side handles of the receptacle,



- c) a first fastener member fixed on said strap member adjacent the extremity of said second end portion,  
 d) a second fastener member manually detachably cooperative with said first fastener member and fixed on said strap member sufficiently spaced from said first fastener member so that the cooperative engagement of said first and second fastener members forms a second loop adapted to



extend through and be secured to the other open-loop side handle in operative position, when said strap member extends across the top of the lid in closed position.

- e) said first and second fastener members being manually detachable from each other to open said second loop in an inoperative position, and to permit said strap member to be removed from the corresponding open-loop side handle.

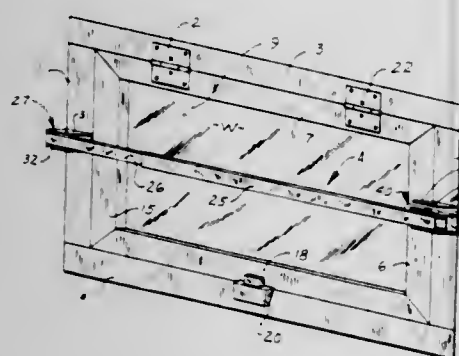
#### 4,413,852 WINDOW SECURITY DEVICE

Elvin W. Burnell, McClain Rd., R.D. 5, Ashland, Ohio 44805, and David Deschner, 563 Highland Ave., Mansfield, Ohio 44903

Filed Mar. 3, 1982, Ser. No. 354,509  
 Int. Cl.<sup>3</sup> E05C 9/18

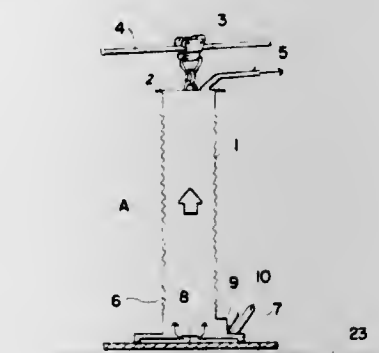
U.S. Cl. 292—259

7 Claims



1. A security device to prevent entry through windows and the like located in a wall structure, said device comprising:  
 a bar adapted to extend across said window and being pivotable about one end between an initial position extending outwardly from said wall structure and a security position extending generally parallel to said wall structure,  
 locking bracket means adapted for mounting on said wall structure adjacent said window,  
 lock means for releasably securing the other end of said bar to said locking bracket means,  
 pivot bracket means adapted for mounting on said wall structure on the other side of said window,  
 removable pivot pin means for pivotally connecting said one end of said bar to said pivot bracket means, and  
 means associated with said pivot bracket means for blocking removal of said pivot pin means when said bar is in its security position while permitting removal of said pivot pin means when said bar is in its initial position.

4,413,853  
**LIFTING MEANS FOR GOODS**  
 Sten Andersson, Torpadala, P.O. Box 1683, S-430-33 Fjärås, Sweden  
 PCT No. PCT/SE81/00030, § 371 Date Sep. 16, 1981, § 102(e) Date Sep. 16, 1981, PCT Pub. No. WO81/02289, PCT Pub. Date Aug. 20, 1981  
 PCT Filed Feb. 3, 1981, Ser. No. 306,611  
 Claims priority, application Sweden, Feb. 4, 1980, 8000861; Sep. 22, 1980, 8006607  
 Int. Cl.<sup>3</sup> B66C 1/02  
 U.S. Cl. 294—64 R 11 Claims



1. Lifting apparatus connectable to a fixed or movable anchoring point and having an object engaging portion capable of vertical movement in relation to the anchoring point, comprising:  
 a tubular container having a vertically oriented axis and closed upper and lower ends, said upper end being connectable to said anchoring point, said lower end comprising an annular seal for engaging a surface of an object to be lifted, for forming a substantially airtight seal against said surface, and for gripping said object when the interior of said container is evacuated and the vacuum within the container is communicated to a space encompassed by said seal;  
 at least a portion of the wall of said container being compressible or foldable in the axial direction to reduce the length of the container in the axial direction when the interior of the container is at least partially evacuated;  
 a vacuum port communicating with the interior of said container, said port being adapted for connection to a source of vacuum;  
 a vacuum break door in the wall of said container, said door when opened communicating with the interior of said container to the atmosphere to break the vacuum within the container and thereby release said object, said door having a hatch therein which, when opened, reduces the vacuum within said container to thereby allow the length of the container to increase; and  
 an actuating means for successively opening said hatch and door, said actuating means having (i) a first position wherein only the hatch is opened to gradually lower said seal and (ii) a second position wherein said door is opened to release said object.

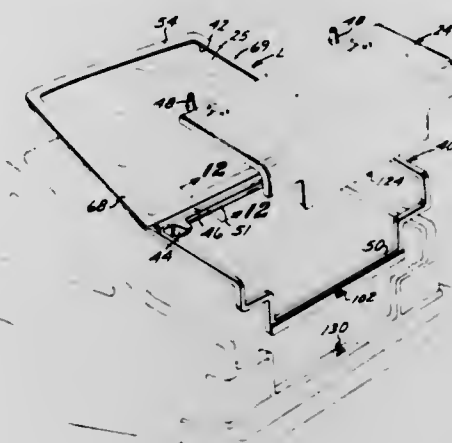
4,413,854  
**DUAL DECK CONSTRUCTION FOR A HATCHBACK TYPE AUTOMOBILE**  
 Gerald P. Hirshberg, Del Mar, Calif., assignor to Nissan Design International, Inc., La Jolla, Calif.  
 Filed Oct. 19, 1981, Ser. No. 312,548  
 Int. Cl.<sup>3</sup> B60J 5/10

U.S. Cl. 296—146

15 Claims

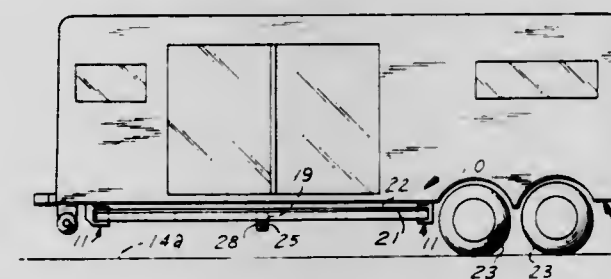
1. A dual deck construction for a hatchback type automobile, the body of such automobile having a trunk, said construction including:  
 an upwardly-facing trunk opening in the body of said automobile;

- a forward deck defining the front portion of the floor of said trunk;  
 a rear deck defining the rear portion of said trunk floor extending rearwardly from the rear of said forward deck and contiguous therewith;  
 a liftgate for covering said opening and having a front deck lid overlying at least the major portion of said forward deck, and a rear deck lid overlying said rear deck, said



- rear deck lid being hinged to said liftgate at the approximate juncture of said forward and rear decks;  
 hinge means connecting the front of said liftgate to the rear top portion of said automobile body along the front of said trunk opening; and  
 with the rear lid being openable independently of said front lid to afford access to said rear deck, and the entire liftgate being openable to afford simultaneous access to both the forward and rear decks.

4,413,855  
**SLIDING PATIO FOR TRAVEL TRAILERS AND MOBILE HOMES**  
 Francis Flanagan, Rte. 4, Box 57-F, Athens, Tex. 75751  
 Filed Jul. 15, 1981, Ser. No. 283,559  
 Int. Cl.<sup>3</sup> B60G 3/32  
 U.S. Cl. 296—162 8 Claims



1. A travel trailer or mobile home, having a patio that is slidable between a stored-away and utility positions, comprising, in combination, a chassis mounted at its rear upon wheels, a hitch at the front of said chassis for support from the rear of a towing vehicle, a trailer body upon said chassis, and a retractable patio assembly mounted on an underside of said chassis, said patio assembly comprising a pair of parallel, spaced-apart channels affixed to said chassis underside, grooves of said channels facing each other, so as to form guide rails, a frame slidably supported in said guide rails, and being sidewardly slidable partly outward from under said chassis, a plywood panel mounted upon said frame, a carpet mounted upon said panel, a hand rail hinged along edges of said frame, and being pivoted downwardly against the top of said carpet, when said frame is in slided position under said chassis, a protective cover affixed between said channels extending across the top of said downwardly pivoted hand rail, and preventing roadway mud from being splashed upon said carpet, a pair of locking pins removably secured in said channels and said frame for preventing accidental sliding of said frame from under said chassis

- during travel of said travel trailer or mobile home, a plurality of angled hand rail brackets being removably received in sleeves affixed to said frame, for rigidly holding said hand rail in vertically upright pivoted position, when said frame is in said outwardly slided position, for the safety of persons upon said patio, a pair of downwardly adjustable caster units removably attachable to outward corners of said frame, for support upon the ground when in said outwardly slided position, and a downwardly adjustable stabilizer secured under the center of said frame, for resting upon said ground when in said outwardly slided position.

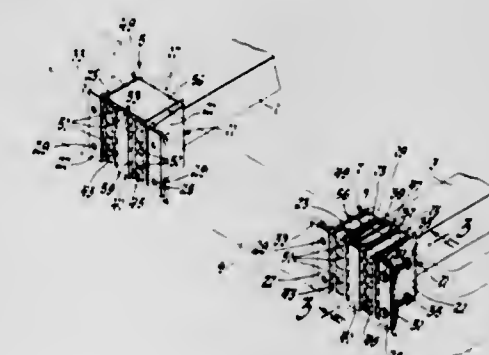
#### 4,413,856 HARDBAR ENERGY ABSORBING BUMPER SYSTEM FOR VEHICLES

David R. McMahan; Gary P. Zeller, both of Anderson; Ronald W. Slaughter, Pendleton; Martin D. Skirha, and Dean M. Bayer, both of Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 7, 1981, Ser. No. 290,827  
 Int. Cl.<sup>3</sup> B60R 19/04

U.S. Cl. 296—188

5 Claims



3. In a vehicle, an energy-absorbing unit for mounting a rigid, bumper assembly outwardly of and across one end of the vehicle to substantially rigid support structure of the vehicle comprising a resilient mounting bracket having at least one pair of laterally spaced side wall portions interconnected at one end by an end wall, at least one of said side wall portions having attachment means formed adjacent the other end thereof, first and second fastener means extending respectively through said end wall and said attachment means for connecting said mounting bracket to said bumper assembly and to said rigid support of said vehicle, and a discrete resilient energy absorbing medium separate from said bracket and interposed within the confines of said walls of said bracket for deflecting and absorbing impact energy from an impact load displacing said bumper assembly from a pre-impact position toward said support structure, and said mounting bracket having leg means for increasing the spring rate of the unit.

4,413,857  
**SEAT COVER**  
 Kazuo Hayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan  
 Filed Nov. 3, 1980, Ser. No. 203,463  
 Claims priority, application Japan, Nov. 6, 1979, 54-153946[U]

Int. Cl.<sup>3</sup> A47C 7/72

U.S. Cl. 297—180

4 Claims

1. In a seat cover to be mounted on a vehicle seat and used as a heater and as a ventilator, comprising:  
 a flat main body including a core which consists of resilient material and defines therein an air passage;  
 a motor-driven blower which discharges air from one side of the main body through the air passage in the core;  
 an electric heater which is disposed on the other side of the main body, the improvement which comprises:  
 said core including a flexible base plate formed with a num-



ber of holes and a plurality of relatively rigid, pin-shaped projections which project independently of each other from both sides of the base plate to define therebetween said air passage; said one side of the main body being



covered by a plastic sheet having holes and a cushion layer which provides sufficient air permeability to permit passage of air therethrough; said cushion layer being covered by a trimming sheet and a plastic sheet disposed on said other side of the base plate under said heater.

4,413,858

## DENTAL CHAIR

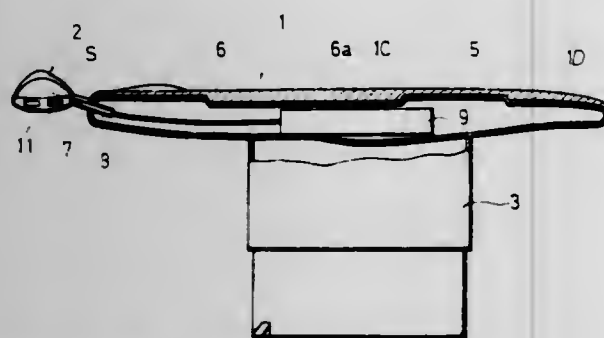
Raymond D. Beach, 8Ban-2Go, Wada-Cho, Atami-Shi, Shizuoka Prefecture, Japan 413

Filed Dec. 4, 1980, Ser. No. 213,021

Int. Cl.<sup>3</sup> A47C 7/62

U.S. Cl. 297—188

4 Claims



1. A dental chair comprising:

- an integral frame having a substantially flat horizontal upper surface and including four notched flat surface areas disposed longitudinally thereof, wherein a surface area disposed intermediate the ends of the frame and a surface area disposed at the rear portion of the frame are flattened below the remaining two flat surface areas of the frame;
- a cushioning material carried on the frame and including portions thereof being thicker at those surface areas flattened below the remaining surface area;
- a headrest supported at a front end of the chair;
- means positioned on at least one side of the headrest and supported for free insertion into and removable from the chair for holding at least one tube instrument;
- the front portion of the chair adjacent to the headrest being wider than the rear portion of the chair;
- the front portion of the chair having a peripheral edge curved into an arcuate configuration for conforming to the contour of the shoulders of the patient; and
- the rear portion of the chair having a peripheral edge curved into an arcuate configuration, with the latter being smaller than the arcuate configuration of the front portion of the chair.

4,413,859

## MINING OF SULPHUR WITH FOAM BARRIER

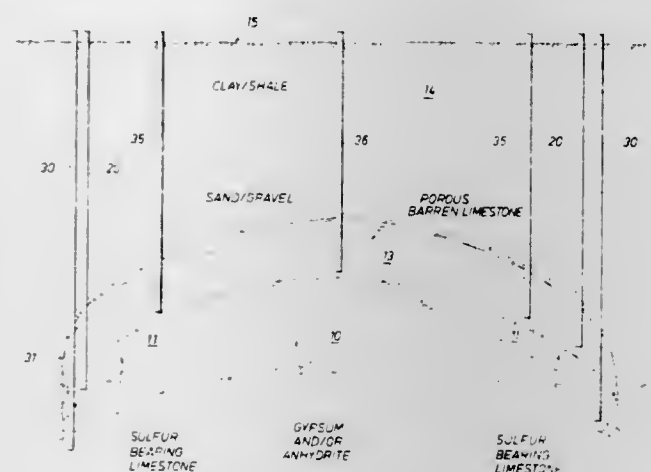
Stewart H. Folk, Houston, Tex., assignor to Stewart Folk & Company, Incorporated, Houston, Tex.

Filed Aug. 3, 1981, Ser. No. 289,783

Int. Cl.<sup>3</sup> E21C 41/14

U.S. Cl. 299—4

6 Claims



- The method of mining sulphur from subterranean formations containing sulphur-bearing zones below an adjacent porous zone comprising the steps of: developing, in the adjacent porous barren zone, a layer of pseudoplastic foam dispersion throughout the zone overlying the sulphur-bearing zones; heating the sulphur-bearing zone below the foam dispersion independently of the introduction of the foam dispersion; maintaining the heating in the sulphur-bearing zone a sufficient time to convert the elemental sulphur to a liquid; and removing the liquid sulphur from the sulphur-bearing zone to the earth's surface while maintaining the layer of foam dispersion above the sulphur-bearing zone.

4,413,860

## COMPOSITE DISC

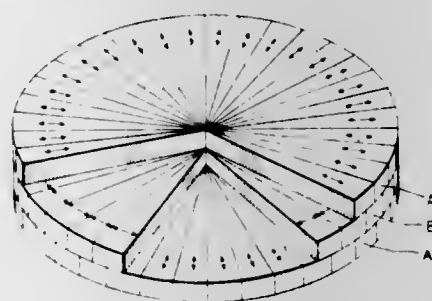
Roger Prescott, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,143

Int. Cl.<sup>3</sup> B32B 5/12; B60B 5/02

U.S. Cl. 301—63 PW

9 Claims



- A fiber reinforced composite disc comprised of a plurality of plies consisting of (A) and (B) wedge-shaped isosceles triangular segments cut from a parallel lay-up fiber-resin prepreg tape with the angle at the vertex of the two equal sides of no more than 60°, said vertex being coincident with the center of each of said plies of said disc, a line bisecting said vertex angle to the midpoint of the base of said isosceles triangular segment opposite said vertex being coincident with a radius of said disc, each of said (A) segments having fibers approximately parallel to said radius and normal to said base, each of said (B) segments having fibers approximately normal to said radius and approximately parallel to said base, each of said plies consisting of all said (A) or all of said (B) segments laid up with the sides of equal length abutting and coincident with radii of said disc, said bases forming a regular polygon defining a rim, said plies stacked with the centers in alignment and the edges defined by

said sides of equal length of said segments off-set between said plies.

4,413,861

## FLUID PRESSURE CONTROL VALVE UNIT OF THE INERTIA-CONTROLLED TYPE

Takashi Nagashima, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

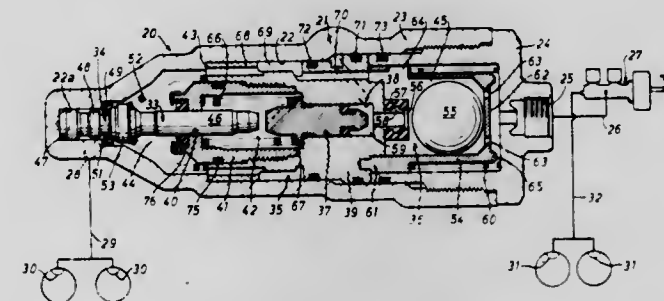
Filed May 19, 1982, Ser. No. 379,730

Claims priority, application Japan, May 25, 1981, 56-78852; Jul. 13, 1981, 56-103556[U]

Int. Cl.<sup>3</sup> B60T 8/14, 13/06

U.S. Cl. 303—6 C

6 Claims



- A fluid pressure control valve unit for incorporation between a master cylinder and a wheel brake cylinder in a vehicle braking system, comprising:
  - a housing adapted to be fixedly mounted at an inclined angle on a vehicle body structure, said housing being provided at opposite ends thereof with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinder and provided therein with a stepped bore in open communication with said outlet port at its small diameter portion;
  - a first partition member secured in position within said housing to provide first and second chambers respectively in open communication with said outlet port and said inlet port; said first partition member being formed at its peripheral portion with a communication passage for providing a fluid communication between said first and second chambers and being formed with an axial bore opening toward said second chamber;
  - a second partition member fixedly coupled in a fluid-tight manner with said first partition member to provide a space between said first and second partition members;
  - a stepped piston slidably disposed within said stepped bore of said housing in said first chamber and extending at one end thereof through said second partition member into said space;
  - valve means cooperable with said stepped piston for controlling intercommunication between said first chamber and said outlet port in dependence upon axial movement of said stepped piston;
  - a first spring for biasing said piston in the direction toward a position in which said valve means is opened to permit fluid flow between said first chamber and said outlet port;
  - a control plunger slidably disposed within said axial bore of said first partition member to provide a third chamber in open communication with said second chamber, said control plunger being arranged to be brought into abutment at its one end with the extending end of said piston; an inertia-controlled valve assembly including a valve seat provided on said first partition member to permit fluid flow into said third chamber from said second chamber, and an inertia-controlled valve element disposed within said second chamber for normally permitting fluid flow between said second and third chambers but adapted to cooperate with said valve seat to cut-off the fluid communication when said valve element is subjected to a deceleration in excess of a predetermined value; and
  - a second spring disposed within said space for biasing said control plunger toward said third chamber.

4,413,862

## TRACK RECOIL SYSTEM

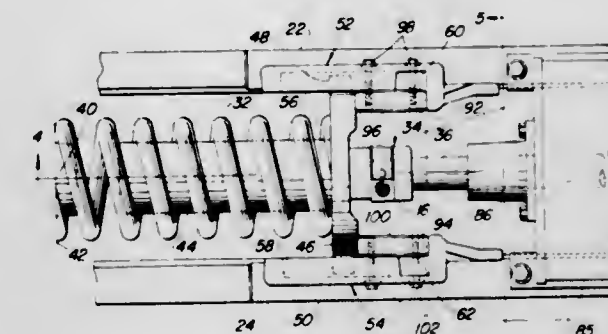
Danny L. Ragon, East Dubuque, Ill., assignor to Deere & Company, Moline, Ill.

Filed Nov. 17, 1980, Ser. No. 207,167

Int. Cl.<sup>3</sup> B62D 55/30

U.S. Cl. 305—10

3 Claims



- In combination with a track frame for a track-laying tractor, a recoil system for yieldably maintaining track tension comprising: said frame including a pair of transversely spaced track-adjuster guides defining horizontal channels opening toward each other and front and rear end walls closing opposite ends of each of said channels; said front walls projecting towards each other beyond said channels and each defining a rearwardly facing abutment surface; each track-adjuster guide being provided with an access opening leading vertically into the channel adjacent said front wall; a first stop fixed to the frame at a location spaced rearwardly from said track-adjuster guides; a coil compression spring having one end engaged with said stop and a second end located between said track-adjuster guides; an extensible and retractable hydraulic track adjuster having a flange engaged with said second end of the spring and said flange including a pair of oppositely projecting tabs respectively slidably received in said channels defined by said pair of track-adjuster guides; said tabs being dimensioned to pass through said access openings and being located so as to pass through said access openings only when said spring is in an unloaded state; and a pair of preload spacer blocks respectively releasably secured to said pair of track-adjuster guides in sandwiched relationship between said flange and said rearwardly facing abutment surfaces, whereby said spacer blocks establish a preselected preload in said spring and transfer all forces exerted thereon as a result of the action of the spring directly to said frame.

4,413,863

## HYDROSTATIC SUPPORT DEVICE

Jean Lombard, Boulogne sur Seine, France, assignor to Centre d'Etudes et de Recherches de la Machine-Outil (C.E.R.M.O.), France

Filed Jul. 30, 1981, Ser. No. 288,508

Claims priority, application France, Aug. 7, 1980, 80 17452 Int. Cl.<sup>3</sup> F16C 32/06, 39/06

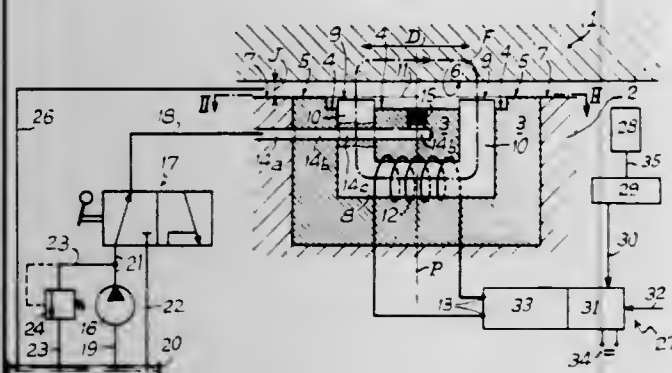
U.S. Cl. 308—5 R

6 Claims

- Hydrostatic support device for movably supporting one element above another element comprising: (a) at least one hydrostatic guide block mounted on one of said elements; (b) at least one magnet mounted on one of said elements such that the other element is traversed by the lines of magnetic forces thereby pulling the elements toward each other; and (c) demagnetizing means associated with the magnet, said demagnetizing means comprising an electromagnet electrically con-



connected to an A.C. power source, and located such that the poles of the electromagnet extend beyond each hydrostatic



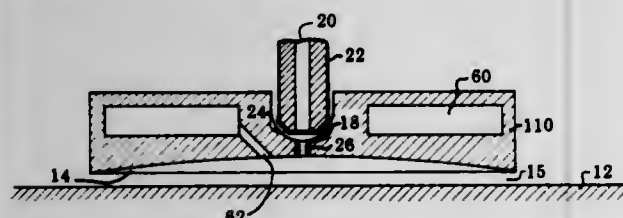
guide block and are offset with respect to the active face of said guide block.

#### 4,413,864 GAS BEARING

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.  
Filed Jul. 31, 1981, Ser. No. 288,680  
Int. Cl.<sup>3</sup> F16C 32/06

U.S. Cl. 308—5 R

18 Claims



1. A gas bearing for supporting a load in a high precision apparatus having a fixed bearing surface, the gas bearing comprising:

- a gas inlet;
- a body having a concave pocket formed in a surface thereof opposed to the fixed bearing surface, said body having a circular periphery and having first and second openings in the pocket;
- a first passage through a portion of the body connected to the gas inlet and the first opening;
- first restrictive means for restricting the flow of gas through the first passage;
- an enclosed chamber in the body, said chamber being associated solely with said pocket;
- a second passage through a portion of the body connected to the chamber and the second opening;
- second restrictive means for restricting the flow of gas through the second passage; and
- mechanical coupling means for coupling the body to the load.

#### 4,413,865

#### MARINE PROPULSION DEVICE INCLUDING BEARING HEAD RETENTION MEANS

Eugene R. Hackbarth, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 26, 1981, Ser. No. 267,260

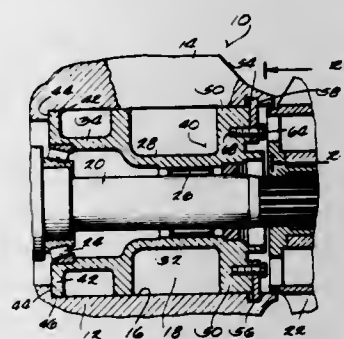
Int. Cl.<sup>3</sup> F16C 19/26

U.S. Cl. 308—207 R

11 Claims

1. A lower unit for a marine propulsion device comprising a drive shaft housing having a lower end, a gearcase housing connected to said lower end of said drive shaft housing and having an interior wall defining an elongated cavity having a longitudinal axis, said interior wall including a shoulder extending transversely to said longitudinal axis, a first surface portion located in longitudinally spaced relation to said shoulder

and transverse to said longitudinal axis of said elongated cavity, and a second surface portion located in longitudinally spaced relation to said shoulder and transverse to said longitudinal axis and spaced circumferentially from said first surface portion, a propeller shaft located in and extending axially through said gearcase housing cavity, a propeller supported on said propeller shaft, means for rotatably supporting said propeller shaft inside said gearcase housing and including a hollow bearing carrier member which is in encircling relation with said propeller shaft, said bearing carrier member being supported by said interior wall of said gearcase housing in abutting engagement with said shoulder and carrying a bearing rotatably engaging said propeller shaft, and means for anchoring said bearing carrier member to said gearcase housing and in



said butting engagement with said shoulder, said means for anchoring including a pair of anchoring members, one of said anchoring members being engageable with said first surface portion, and the other of said anchoring members being engageable with said second surface portion, and means on said bearing carrier member and on said one anchoring member for forcing said one anchoring member toward said bearing carrier member and causing engagement of said one anchoring member against said first surface portion and said abutting engagement of said carrier with said shoulder, and means on said bearing carrier member and on said other anchoring member for forcing said other anchoring member toward said bearing carrier member and causing engagement of said other anchoring member against said second surface portion and said abutting engagement of said carrier with said shoulder.

#### 4,413,866

#### BEARING ASSEMBLY WITH WEAR PADS

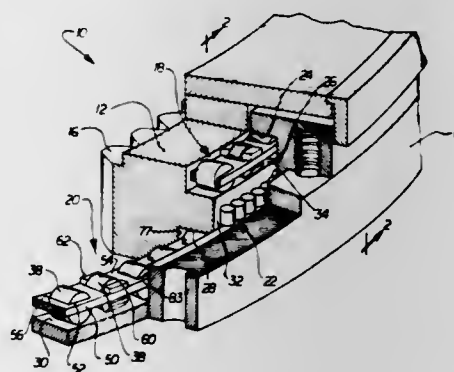
James W. Geisey, Kent, Ohio, assignor to Rotek Incorporated, Aurora, Ohio

Filed Jun. 8, 1982, Ser. No. 386,249

Int. Cl.<sup>3</sup> F16L 33/46

U.S. Cl. 308—217

15 Claims



1. A bearing assembly for use between first and second relatively movable parts having a first longitudinally extending raceway connected with the first part and a second longitudinally extending raceway connected with the second part, said bearing assembly comprising a plurality of rotatable bearing elements which are movable along the first and second raceways upon relative movement between the first and second

parts, said bearing elements having outer surfaces which are adapted to roll along central portions of the first and second raceways during relative movement between the first and second parts, longitudinally extending cage means for maintaining a desired spacing between said bearing elements as they move along the first and second raceways, said cage means includes first and second spaced apart and longitudinally extending side sections, connector sections extending between said first and second longitudinally extending side sections and cooperating with said side sections to at least partially define a plurality of openings in which said bearing elements are disposed, each of said first and second side sections having a first longitudinally extending side surface facing toward the first raceway, a second longitudinally extending side surface facing toward the second raceway, and inner side surfaces extending between said first and second longitudinally extending side surfaces and partially defining the openings in said cage means, and wear pad means for positioning said cage means in a desired position relative to the first and second raceways as said bearing elements move along the first and second raceways, said wear pad means including first surface means for slidably engaging one of the raceways at a location disposed to one side of the central portion of the one raceway and second surface means for slidably engaging the one raceway at a location disposed to a side of the central portion of the one raceway opposite from the one side, said first and second surface means being spaced apart by a distance which is at least substantially as great as the width of the central portion of the one raceway, said central portion of the one raceway being substantially free of sliding engagement with said wear pad means, said wear pad means includes a plurality of wear pad members each of which extends through one of the openings in said cage means, each of said wear pad members is releasably connected with said cage means, each of said wear pad members extends through one of the openings at a location between one of said rotatable bearing elements and an inner side surface of one of said longitudinally extending side sections, each of said wear pad members includes a first portion abutting said first longitudinally extending side surface of said cage means and a second portion abutting said second longitudinally extending side surface of said cage means, said second portion of said wear pad member slidably engaging a side portion of the second raceway at a location disposed to one side of the central portion of the second raceway.

#### 4,413,867

#### MULTI-UNIT STORAGE CABINET

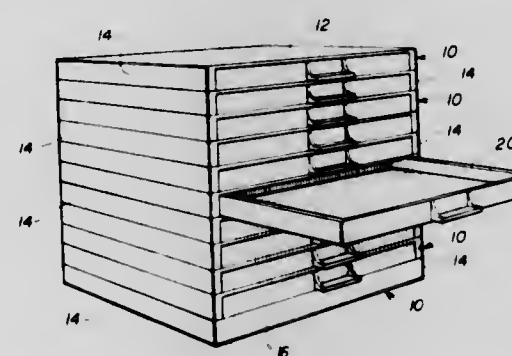
Dennis R. Mosebrook, Spring Grove, and Wayne C. Seeley, York, both of Pa., assignors to Dentaply Research & Development Corp., Milford, Del.

Filed Jun. 17, 1981, Ser. No. 274,689

Int. Cl.<sup>3</sup> F16B 12/00; A47F 5/00

U.S. Cl. 312—111

3 Claims



1. A storage cabinet comprising a plurality of identical shell-like sections molded from plastic material and characterized by each section having a substantially rectangular planar panel integral at three edges with opposite sidewalls and a rear wall of uniform height and connected at the ends to each other to form a continuous U-shaped configuration and a front opening similar in area to said rear wall, said sections being arranged in

a vertical stack with the planar panels uppermost and the openings disposed commonly in a vertical front plane except the lowermost section which has the rear wall in said vertical front plane to comprise a base section having the open face of the shell lowermost and the planar panel of the uppermost section comprising a top of the cabinet, holes in said sidewalls adapted to receive self-tapping screws of no greater length than the height of said sections and said screws extending substantially equally between immediately adjacent sections to secure the sections into a unitary assembly and leave substantially one-half of the depth of the holes in the uppermost section to receive additional screws, the inner surfaces of the planar panel of each section being provided with short molded reinforcing ribs extending thereacross of uniform depth and the edge of the planar panel adjacent said front opening having a narrow flange adjacent said front opening extending toward said opening and having a depth at least equal to the depth of the ribs, and similar drawers of complementary area and height to the spaces in each section slidably supported in all sections except the lowermost base section.

#### 4,413,868

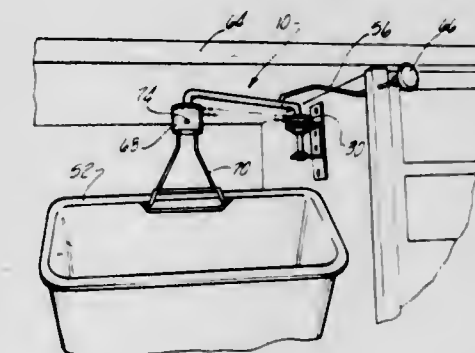
#### RETRACTABLE RECEPTACLE SUPPORT MECHANISM

Mitchell F. Gorkiewicz, 619 E. Sixth St., Royal Oak, Mich. 48067  
Continuation-in-part of Ser. No. 185,339, Sep. 8, 1980. This application Jan. 15, 1981, Ser. No. 225,431

Int. Cl.<sup>3</sup> A47B 81/00

U.S. Cl. 312—211

12 Claims



1. A device for moving a receptacle into and out of a housing, said device comprising:  
means for mounting the device to the housing;  
a receptacle support;  
a carrier arm rotatably connected at one end to said housing and rotatably connected at the other end to said support;  
an actuator rod connected to said arm and movable into and out of said housing so as to rotate said arm about said one end;  
means connected to said support for maintaining the orientation of said support relative to the housing at all rotational positions of said arm;  
whereby a receptacle may be moved into and out of said housing while being maintained in the same orientation relative to the housing regardless of the position of said arm; and  
wherein said maintaining means comprises a first sprocket affixed to said housing and connected to said one end of said arm so that said arm is rotatable in said first sprocket;  
a second sprocket connected to the other end of said arm and affixed to said support so that said second sprocket and said support affixed thereto are rotatable about said other end; and  
a chain mounted on and indexing on said sprockets, whereby said chain plays onto and off from the sprockets with movement of the actuator rod thereby maintaining the orientation of the receptacle.

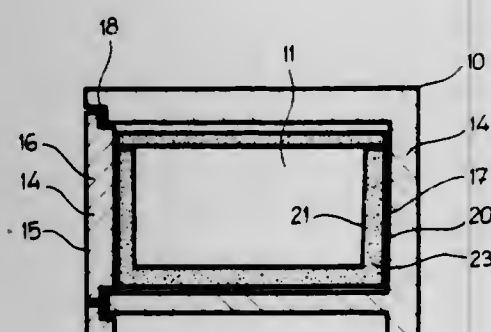


4,413,869

**HEAT RESISTANT CABINET AND METHOD OF MANUFACTURE**

Günther Pichler, Gernersheim; Friedrich Rothhaas, and Hans Hock, both of Bellheim, all of Fed. Rep. of Germany, assignors to Sistemco N.V., Willemstad, Netherlands Antilles. Continuation-in-part of Ser. No. 244,863, Mar. 18, 1981, abandoned. This application Mar. 26, 1981, Ser. No. 247,782. Claims priority, application Switzerland, Mar. 18, 1980, 2114/80.

Int. Cl.<sup>3</sup> A47B 81/00; C09K 5/06, 3/28; E05G 1/12  
U.S. Cl. 312—236 21 Claims



1. A heat resistant cabinet having at least one compartment for storing temperature-sensitive articles, said compartment being surrounded by a heat absorbing layer consisting essentially of a particulate or powdery mixture of a heat absorbing material having a large heat of fusion and at least about 10% by volume of a binder material, said binder material being a water absorbing inorganic material selected from the group consisting of plaster of paris, caustic lime, and cement which when the heat absorbing material becomes liquid, binds said liquid heat absorbing material to form therewith a doughy mass or a solid mass.

4,413,870

**PIVOTABLE SPARK PLUG CONNECTOR**

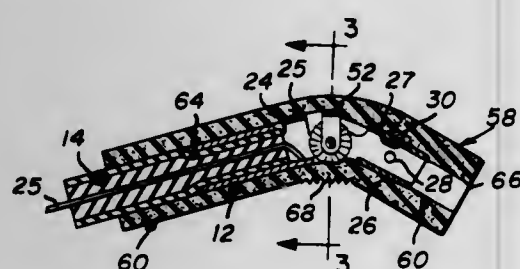
Justyn J. Labutski, III, 1557 Hearstone Dr., San Jose, Calif. 95122

Filed Jul. 30, 1981, Ser. No. 288,458

Int. Cl.<sup>3</sup> H01R 13/62

U.S. Cl. 339—6 R

10 Claims



1. A pivotable spark plug connector apparatus comprising, in combination:

- (a) wire clamp means for being mounted on ignition wire;
- (b) a spark plug terminal receptacle means for removably receiving a spark plug terminal; and
- (c) position-retaining means associated with the wire clamp means and the terminal receptacle means for pivotally connecting one to the other in a position-retaining manner, said position-retaining means including two identical pairs of disc portions, one of the pairs being the mirror image of the other of the pairs, with the pairs being disposed in spaced relation, and bias means arranged between the pairs of cooperating disc portions for exerting a force against each of the pairs.

4,413,871

**EARTH CONNECTION CONNECTOR HAVING PROVISION FOR AN ELECTRICAL COMPONENT**

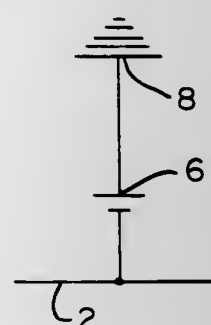
Robert C. Swengel, Jr., York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 10, 1981, Ser. No. 329,165

Int. Cl.<sup>3</sup> H01R 4/66

U.S. Cl. 339—14 R

7 Claims



1. An electrical connector for connecting a first lead extending from a component, such as a capacitor, to a through-conductor and for connecting a second lead extending from the component to a tap conductor, the connector being of the type comprising an insulating housing having a recess extending inwardly from one surface thereof, the recess being dimensioned to receive the component and first and second terminals, the first terminal having a wire-receiving slot therein for reception of the first component lead and the second terminal having a wire receiving slot for reception of the second component lead, the connector being characterized in that:

- a through conductor terminal is located beside the housing and proximate to the first terminal, the through conductor terminal having a wire-receiving slot for reception of the through conductor, the through conductor terminal and the first terminal being connected to each other by a connecting section which extends through a wall of the housing,
- the second terminal has a tap conductor terminal integral therewith, the tap conductor terminal being of the disconnect type and being dimensioned to receive a complementary disconnect type terminal upon movement of the complementary terminal into the recess,
- a sheet metal cover is provided for the recess, the cover having the complementary disconnect type terminal extending therefrom and located to mate with the tap conductor terminal when the cover is assembled to the housing in covering relationship to the recess, the sheet metal cover being the tap conductor whereby,
- upon placement of the component in the recess with the first and second leads received in the wire-receiving slots of the first and second terminals, and upon placement of the through conductor in the wire-receiving slot of the through conductor terminal, and upon assembly of the cover to the housing, the first lead of the component will be connected to the through conductor and the second lead of the component will be connected to the tap conductor.

4,413,872

**PRELOADED ELECTRICAL CONNECTOR**

William J. Rudy, Jr., Annville, Pa., and John A. Zimmerman, Jr., Cape Coral, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 11, 1981, Ser. No. 262,011

Int. Cl.<sup>3</sup> H01R 13/422

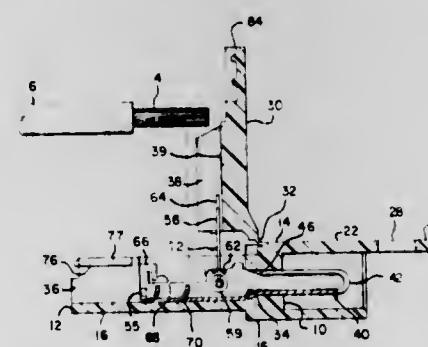
U.S. Cl. 339—59 M

15 Claims

1. A preloaded electrical connector of the type comprising an insulating housing having a mating face and a wire entry face, oppositely facing sidewalls and oppositely facing endwalls extending between said faces, at least one terminal receiving cavity extending through said housing from said wire entry face to said mating face, a terminal in said cavity, said

terminal having a wire connecting portion which is proximate to said wire entry face, one of said sidewalls having an integral housing flap which is hinged to said one sidewall at a location intermediate said faces, said housing flap being in an open position whereby a rearward portion of said cavity is exposed on one side thereof, said housing flap being movable to a closed position in which said cavity is closed on said one side, said connector being characterized in that:

said wire connecting portion of said terminal has a wire receiving portion and a wire clamping flap, said clamping flap being hinged to said terminal at an intermediate location thereon and being in an open position, said clamping flap extending beside said housing flap, said clamping flap being between said housing flap and the rearward end of said terminal,



said clamping flap being movable to a closed position with said housing flap when said housing flap is moved to said closed position whereby, upon positioning the end portion of a wire adjacent to and in alignment with said wire receiving portion of said terminal and moving said housing flap to said closed position, said clamping flap is moved to its closed position and said wire is clamped to said wire receiving portion of said terminal, said wire receiving portion of said terminal and said clamping flap having first interengaging means to hold said terminal flap in said closed position, said housing and said housing flap having second interengaging means thereon to hold said housing flap in said closed position.

4,413,873

**ELECTRICAL TAB RECEPTACLE**

Walter Karl, Lugarno, Australia, assignor to Utilux Pty. Ltd., Australia

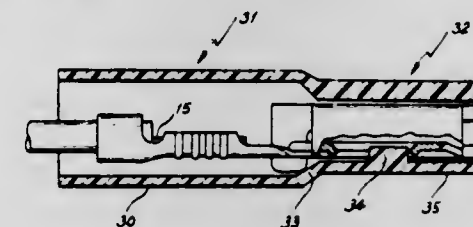
Filed Aug. 31, 1981, Ser. No. 298,341

Claims priority, application Australia, Sep. 17, 1980, PE 5606

Int. Cl.<sup>3</sup> H01R 11/22

U.S. Cl. 339—74 R

12 Claims



- 1. (a) An electrical tab receptacle integrally formed from a single piece of sheet metal and comprising a forward portion and a rearward portion,
- (b) the rearward portion being adapted to be connected to an electrical conductor and the forward portion having a generally channel-shaped receptacle portion for engaging in mating relationship with a complementary tab,
- (c) the receptacle portion having a base and upstanding side walls which are turned in so as to have free edge portions in spaced confronting relation with the base, the arrangement being such that the tab is adapted to be received

between said free edge portions and the base to form a connection, and characterised by

- (d) the tab receptacle further comprising a resiliently displaceable engagement member extending from a side of the receptacle portion and a portion of the engagement member extending between the turned in portions of the side walls in a direction towards the base to provide an engagement element for engaging in latching engagement with a corresponding portion of the complementary tab,
- (e) the engagement member having a release portion located outside the channel-shaped receptacle portion for receiving a displacement force to move the engagement element in a direction away from the base and towards the turned in portions of the side walls to permit disengagement of the engagement element from the complementary tab, and
- (f) the engagement element being biased to its latching position.

4,413,874

**MULTIPLE CONTACT TESTING DEVICE**

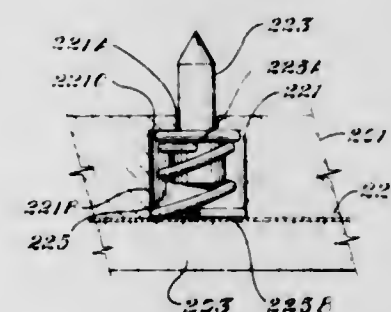
Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Feb. 27, 1981, Ser. No. 239,146

Int. Cl.<sup>3</sup> H01R 4/48

U.S. Cl. 339—151 B

5 Claims





end portion of said contact is spaced from said rear wall of its associated aperture,  
an electrically conductive coiled spring located in each enlarged portion of said apertures for urging said means of said rear end portion of its associated contact toward said shoulder and said forward end portion of its associated contact beyond said forward surface of said first plate, each coiled spring having a forward end surrounding and tightly engaging said rear end portion of its associated contact and a rear end seated against said rear wall of said enlarged portion of its associated aperture and tightly engaging said side wall means of said enlarged portion of its associated aperture.

4,413,875

## CONNECTOR RETAINING APPARATUS

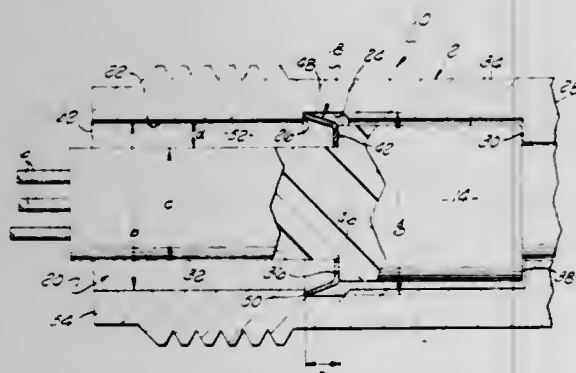
William R. Mattingly, Santa Ana, Calif., assignor to Matrix Science Corporation, Torrance, Calif.

Filed Sep. 23, 1981, Ser. No. 304,738

Int. Cl.<sup>3</sup> H01R 13/508

U.S. Cl. 339—217 R

14 Claims



1. A connector retaining apparatus for retaining an insulator insert in a shell comprising:
  - a connector shell comprising:
    - an exterior surface,
    - an annular flange extending radially outwardly from the exterior surface to define a rear facing shoulder at a junction between the annular flange and the exterior surface, and
    - a front facing front shoulder;
  - a connector shell having an interior surface defining a centrally disposed bore for receiving the insulator insert, the interior surface having at least one rear facing stop shoulder extending radially inwardly therefrom, the stop shoulder positioned for abutting the front shoulder of the insulator insert when the insulator insert is inserted into the bore of the connector shell, the interior surface further having an annular groove disposed therein at a location rearward of the stop shoulder, the rearward junction between the annular groove and the interior surface defining a front facing retaining shoulder, the retaining shoulder being located rearward of the rear facing shoulder of the insulator insert when the front shoulder of the insulator insert abuts against the stop shoulder of the connector shell; and
  - a retaining ring comprising:
    - a radial flange portion having an annular interior edge defining an orifice through the retaining ring, the radial flange portion abutting against the rear facing shoulder of the insulator insert, and
    - a frusto-conical portion extending rearwardly from the rear facing shoulder of the insulator insert and having a retention edge for abutting against the retaining shoulder of the connector shell whereby the insulator insert is prevented from rearward axial removal from the connector shell bore by the retaining ring between the retaining shoulder of the connector shell and the rear facing shoulder of the insulator insert, and the insulator insert is prevented from forward axial removal from the connector shell bore by the abutment of the front shoulder of the insulator insert against the front facing retaining shoulder of the connector shell.

der of the insulator insert against the stop shoulder of the connector shell.

4,413,876

## FAIL-SAFE ELECTRICAL CONNECTION TERMINAL AND TIGHTENING TOOL

Andre Borne, Villeurbanne; Joseph Vallod, Caluire et Cuire, and Rene Curvat, Rillieux La Pape, all of France, assignors to Societe Anonyme dite: Cgee Alsthom, Levallois-Perret, France

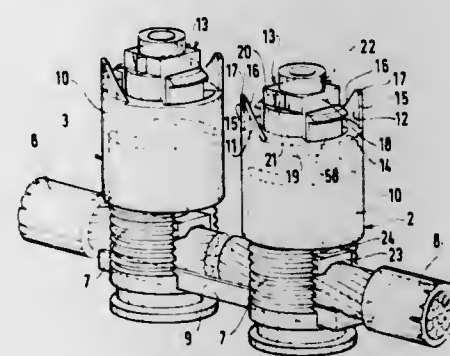
Filed Oct. 1, 1981, Ser. No. 307,552

Claims priority, application France, Oct. 2, 1980, 80 21114

Int. Cl.<sup>3</sup> H01R 4/30

U.S. Cl. 339—244 B

4 Claims



1. A fail-safe electrical connection terminal comprising: a slotted bolt for receiving an electrical conductor; a tapered cylindrical cap screwed onto the bolt to clamp the conductor therein, said cap being closed at one end by a plate having a central hole; a shoe for applying the clamping force to the conductor; a rod having one end integral with the shoe and being slidably mounted in said hole in the plate; and a compression spring interposed between the shoe and the plate of the cap, said shoe and spring being housed inside the cap; the improvement wherein the plate of the cap includes tightening means comprising two circumferentially spaced lugs projecting perpendicularly from the periphery of the plate, and a boss projecting from the center of the plate, said boss having two plane faces facing the spaces in between the lugs and having two hooks, one against each of said plane faces, the end of said central boss projecting axially beyond the ends of the hooks and being of polygonal shape with said two plane faces being capable of being received in a tool for tightening the cap.

4,413,877

## SELECTIVELY LIGHT-TRANSMITTING LAMINATED STRUCTURE

Kazutomi Suzuki; Hitoshi Mikoshiba, both of Hino, and Yuji Mitani, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 240,814, Mar. 5, 1981, abandoned. This application Nov. 1, 1982, Ser. No. 438,535

Claims priority, application Japan, Mar. 10, 1980, 55-24238; Jun. 2, 1980, 55-72679; Jun. 4, 1980, 55-74182; Jun. 4, 1980, 55-74183

Int. Cl.<sup>3</sup> G02B 5/24

U.S. Cl. 350—1.7

24 Claims

1. A selectively light-transmitting laminated structure having the following layers:
  - (1) a substrate layer (A) of a transparent sheet-like structure,
  - (2) a heat wave-reflective layer (D) of a silver-containing metal having a thickness of 50–300 Å,
  - (3) a single layer (C) deposited as elemental titanium (Ti) and having a thickness of 25 to 100 Å, or said layer (C) on each side of layer (D), said layers (C) having a minimum total thickness of 10 Å and a maximum total thickness of 100 Å,
  - (4) at least one transparent thin layer (B) having a thickness of 50–500 Å and a high refractive index, said layers being

in contact with each other in the order: (A)-(B)-(D)-(C), (A)-(B)-(D)-(C)-(B), (A)-(D)-(C)-(B), (A)-(B)-(C)-(D)-(C), (A)-(C)-(D)-(C)-(B) or (A)-(B)-(C)-(D)-(C)-(B) and (5) optionally, a transparent top layer (E).

4,413,878

## IMAGING SYSTEMS

Alan H. Lettington, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

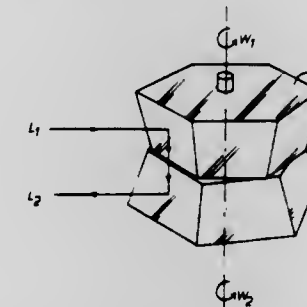
Filed Sep. 13, 1978, Ser. No. 942,737

Claims priority, application United Kingdom, Sep. 13, 1977, 38158

Int. Cl.<sup>3</sup> G02B 27/17

U.S. Cl. 350—6.7

3 Claims



1. An imaging system for collecting radiation from a scene and producing an image of the scene, said system including first and second scanning rotors mounted on a common rotational axis, said first scanning rotor having a set of  $n_1$  plane mirrors which extend around the first rotor axis, said second scanning rotor having a set of  $(n_1 + n_2)$  plane mirrors which extend around the second rotor axis (where  $n_1$  and  $n_2$  are integers), wherein adjacent mirrors in said first and second sets are inclined at different angles to the axes of said first and second rotors respectively, and wherein the rotors are arranged such that radiation from said scene is reflected from one of said sets to the other, and means for driving the first rotor at

$$\frac{(n_1 + n_2)}{n_1}$$

x speed of the second rotor.

4,413,879

## METHOD AND APPARATUS FOR SIDE LAUNCH EXCITATION OF SELECTED MODES IN GRADED-INDEX OPTICAL FIBERS

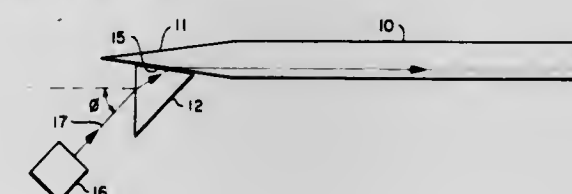
John W. Berthold, III, College Park, and Paul S. Szczepanek, Highland, both of Md., assignors to The United States of America as represented by the director of the National Security Agency, Washington, D.C.

Filed Oct. 15, 1979, Ser. No. 85,137

Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.19

7 Claims



1. An apparatus for exciting a selected mode in a graded-index optical fiber, comprising:
  - a graded-index multimode optical fiber which has been etched to a taper below the cladding layer;
  - a coupling medium having an index of refraction greater

1036 O.G.—20

than that of the fiber cladding and contacting the tapered portion of the fiber; and  
a source of light directed toward the coupling medium such that the light beam passes through the medium into the fiber.

4,413,880

## ADAPTABLE CONNECTOR FOR A FIBER OPTIC TESTING DEVICE

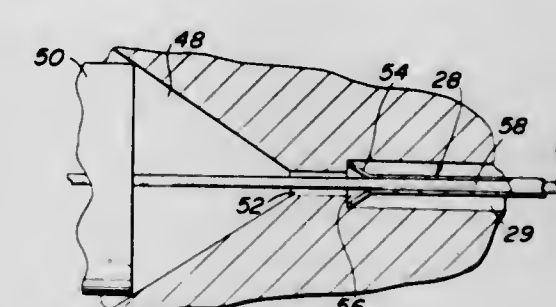
John W. Forrest, Acton, and Thomas DeFusco, Worcester, both of Mass., assignors to Bowmar/ALI, Inc., Acton, Mass.

Filed Jan. 2, 1981, Ser. No. 222,189

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20

2 Claims



1. An adaptable connector for connecting unterminated optical fiber cables to a test set or the like, comprising:
  - (a) an optical fiber adapter section having a cylindrical bore for receiving an unsheathed optical fiber of a fiber optic cable, the diameter of the bore being slightly larger than the outside diameter of the optical fiber whereby the fiber may be inserted in a sliding conformal fit in said bore;
  - (b) a cable adapter section having a cylindrical bore for receiving the fiber optic cable therein, said bore being coaxially aligned with the bore of the fiber adapter section, the cable adapter section having means to secure fiber optic cables of different diameters;
  - (c) a conical chamber disposed between the bore of the cable adapter section and the bore of the fiber adapter section, the axis of said conical section being coaxially aligned with the bores of the cable adapter section and the fiber adapter section, the base end of said conical chamber opening onto the bore of the cable adapter section and the apex end of said conical chamber opening onto the bore of the fiber adapter section, whereby the conical chamber guides the optical fiber into the bore of the fiber adapter section when the fiber optic cable is inserted into the connector;
  - (d) said optical fiber adapter section including a hollow metallic tube having one end thereof flared outward to form a second conical chamber to guide the optical fiber into the cylindrical bore of the optical fiber adapter section, said flared end also supporting the fiber adapter section in proper alignment within the conical chamber.

4,413,881

## OPTICAL FIBER HERMETIC SEAL

Tibor F. I. Kovacs, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 61,501, Jul. 26, 1979,

abandoned. This application Oct. 19, 1981, Ser. No. 312,834

Int. Cl.<sup>3</sup> G02B 7/26

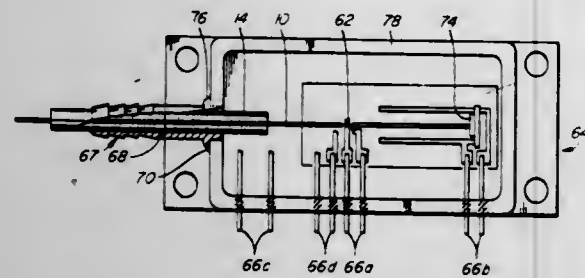
U.S. Cl. 350—96.20

17 Claims

1. An optical fiber hermetic seal comprising a mass of fusible alloy embracing a length of the fiber, the fusible alloy exerting pressure on the fiber at an interface between the alloy and the fiber, the alloy characterized by appreciable expansion during



solidification, the mass of fused alloy being generally cylindrical in shape, the fiber located on a central longitudinal axis of the mass of fused alloy, the switches formed on the inside surface of at least one of the plates, each switch having a



the cylindrical mass of alloy, and the mass of fused alloy being embraced by a hollow cylindrical tube.

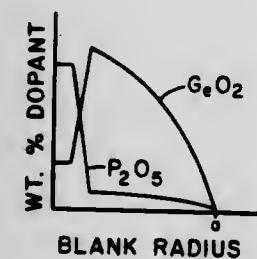
4,413,882

## LOW VISCOSITY CORE GLASS OPTICAL FIBER

Alan C. Bailey, Painted Post, and Alan J. Morrow, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.  
Division of Ser. No. 165,652, Jul. 3, 1980, Pat. No. 4,298,365.  
This application May 26, 1981, Ser. No. 266,745  
Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.30

8 Claims



1. An optical waveguide fiber comprising a glass core surrounded by a layer of cladding glass having a refractive index lower than that of said core, the viscosity  $V_1$  of the core glass being less than the viscosity  $V_2$  of the cladding glass, said fiber being characterized in that it further comprises an axial region of low viscosity glass within said core, the viscosity  $V_1$  being greater than the viscosity  $V_3$  of said axial region, said viscosities being determined at that temperature at which said cladding glass has a viscosity of  $10^{10}$  poise, there being an abrupt change in viscosity at the interface between said axial region and the remainder of said glass core.

4,413,883

## DISPLAYS CONTROLLED BY MIM SWITCHES OF SMALL CAPACITANCE

David R. Baraff, Ottawa; Nur M. Serinken, Kanata; Richard W. Streater, Nepean; Carla J. Miner, Nepean; Robert J. Boynton, Nepean; Blair K. MacLaurin, Nepean, and William D. Westwood, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

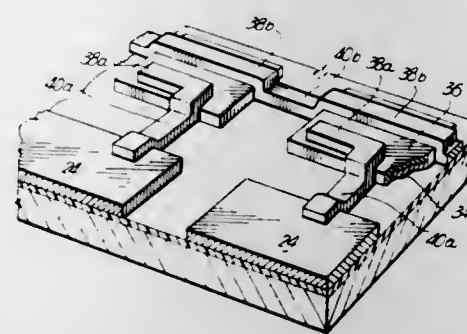
Continuation-in-part of Ser. No. 44,247, May 31, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,271  
Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350—334

24 Claims

1. A matrix multiplexed display comprising a pair of plates, at least one of the plates being transparent, the plates having sealed therebetween a layer of liquid characterized by electric field dependent optical transmissivity, a first plurality of electrodes on an inside surface of one plate and a second plurality of electrodes on an inside surface of the other plate, the display having a plurality of picture elements, each element defined by a pair of opposed electrodes on the inside surfaces of respective plates, means for applying a voltage between the opposed electrodes of each element, each picture element being series connected to a respective switch comprising a thin insulating film flanked by thin film conducting layers, the insulating film characterized by a gross change in resistivity at a predeter-

mined voltage thereacross, the switches formed on the inside surface of at least one of the plates, each switch having a



4,413,884

## CASTING A THERMOPLASTIC-ALKALI EARTH METAL SALT REFLECTOR TO A LIQUID CRYSTAL DISPLAY

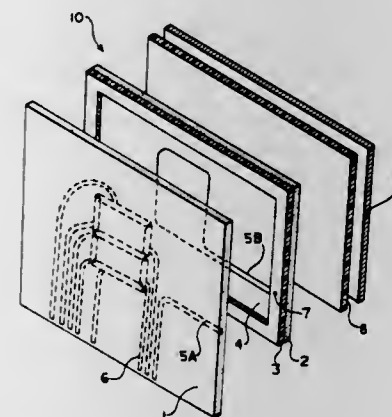
Joseph P. Ferrato, Stow, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 14, 1981, Ser. No. 301,553

Int. Cl.<sup>3</sup> G02F 1/13

U.S. Cl. 350—338

50 Claims



1. An electro-optical display comprising:
  - a front and back transparent plate disposed substantially parallel to each other;
  - an electro-optical material disposed between the plates, said electro-optical material having an ability to transmit light that depends on whether the electro-optical material is in an electrically energized or an electrically un-energized state;
  - a layer of transparent electrically conductive material disposed on at least a portion of the side of each of the plates facing toward the electro-optical material as a means of imposing a controlled electrical field thereacross and electrically energizing the electro-optical material;
  - a reflector layer coated on the side of the back plate facing away from the electro-optical material wherein said reflector layer is disposed adjacent to and adhered directly to the side of the back plate facing away from the electro-optical material, said reflector layer formed from a composition comprising a blend of from about 30% to about 99.9% by weight of at least one alkali earth metal salt with a mixture of at least one solvent and binder mixed in such amounts as to enable the composition to be cast as the reflector and upon evaporation of the solvent to bind the alkali earth metal salt sufficiently to provide said reflector layer with the ability to reflect light back towards the front plate that enters through the front plate and passes through the electro-optical material and the back plate and impinges upon the reflector while providing a high reflecting angle in conjunction with maintaining a high contrast ratio between the electrically energized state and

electrically un-energized state of the electro-optical material.

4,413,885

## ELECTRO-OPTICAL DISPLAY DEVICE

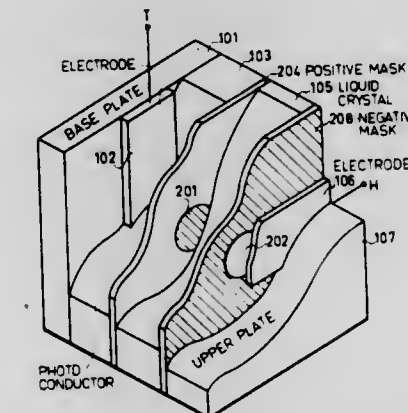
Michel Hareng; Jean-Pierre Huignard, and Serge Le Berre, all of Paris, France, assignors to Thomson-CSF, Paris, France  
Filed Feb. 11, 1980, Ser. No. 120,319

Claims priority, application France, Feb. 13, 1979, 79 03636

Int. Cl.<sup>3</sup> G02F 1/135, 1/03

U.S. Cl. 350—342

4 Claims



1. An electro-optical display device which comprises:
  - a layer of electro-optical material having a first and a second face;
  - at least a first electrode on the first face of said layer of electro-optical material;
  - a layer of photo-conducting material having a first face facing the second face of said electro-optical material layer and a second face;
  - at least a second electrode on the second face of said layer of photo-conducting material, defining with said first electrode at least one point of inscription and
  - means for causing to emerge through said second face of said layer of electro-optical material and at said point of inscription an incident light applied to said first face of said layer of electro-optical material when an electrical voltage greater than a given value is applied between said electrode; said light thus emerging at said point of inscription causing the resistivity of said photo-conducting material to drop at said point and thus increasing the effect of said electrical voltage on said layer of electro-optical material, wherein said electro-optical material presents a threshold of sensitivity of the electrical voltage, and the thickness of said layer of photo-conducting material allows an electrical voltage to be permanently applied between said two electrodes which is divided into a first fraction applied to said layer of photo-conducting material; said first fraction being less than said threshold of sensitivity, wherein there is further provided a first plurality of electrodes comprising said first electrode and a second plurality of electrodes comprising said second electrode; said two pluralities of electrodes defining a set of inscription points addressable in a matrix, wherein said electro-optical material is a liquid crystal presenting a twisted nematic structure; said means for causing the light to emerge comprising two polarizing films oriented in the said direction and situated respectively on each side of said liquid crystal layer, wherein a filter is further deposited on said second face of said layer of photo-conducting material to eliminate an external light capable of energizing said photo-conducting material through its second face, and a layer of fluorescent material deposited on said filter to emit under the action of said external light a light inactinic for said photo-conducting material and which passes through said filter to allow visualization by transmission of this inactinic light through the apparatus.

4,413,886

## OPTICAL SWITCH

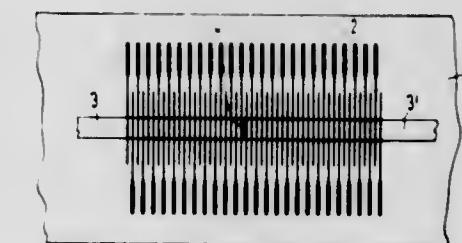
Joachim Lauckner, Korntal; Felix Lutz, Stuttgart; Gerhard Seibold, Remseck; Gerhard Wessel, Stuttgart, and Hans Volz, Schwieberdingen, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.  
Filed Jan. 26, 1981, Ser. No. 228,599

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3002956

Int. Cl.<sup>3</sup> G02F 1/05

U.S. Cl. 350—392

2 Claims



1. In an optical switch:
  - an elongated baseplate of transparent non-double-refracting material;
  - first and second rows of interdigitated electrode strips of electrically conducting material on one surface of said baseplate extending lengthwise of said baseplate, said baseplate having a middle part and side parts on each side of said middle part running lengthwise of said baseplate; said electrode strips being separate from and parallel to each other;
  - the strips of said first row extending over said middle part and one side part of said baseplate;
  - the strips of said second row extending over said middle part and the other side part of said baseplate;
  - each said electrode strip having an individual connection area on its respective side part of said baseplate; and
  - a strip of ferroelectric light permeable ceramic extending lengthwise of said baseplate, said ceramic strip being substantially narrower than said elongated baseplate so that said strip extends over only said middle part, said ceramic strip overlying and transversing said electrode strips and being secured to said middle part of the said baseplate.

4,413,887

## ZOOM LENS SYSTEM

Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

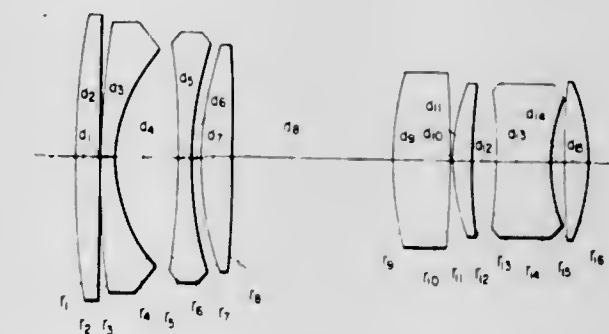
Filed Aug. 21, 1981, Ser. No. 294,824

Claims priority, application Japan, Aug. 29, 1980, 55-119566

Int. Cl.<sup>3</sup> G02B 15/16

U.S. Cl. 350—426

4 Claims



1. A zoom lens system comprising a front lens group consisting of a first positive lens component, a second negative meniscus lens component having a convex surface on the image side, a third negative lens component, and fourth positive lens compo-



nent, and a rear lens group consisting of a fifth positive lens component, a sixth positive lens component, a seventh negative lens component and an eighth positive lens component, said zoom lens system being adapted to perform zooming operation by varying the airspace reserved between said front and rear lens groups and to satisfy the following conditions (1) through (9):

$$1.8 < r_1/|f| < 3.5$$

(1)

$$6 < r_3/|f| < 9$$

(2)

$$0.03 < 1/n_1 - (1/n_2 + 1/n_3)/2$$

(3)

$$1.75 < n_7$$

(4)

$$50 < (v_2 + v_3)/2$$

(5)

$$0.18 < (d_3 + d_4 + d_5)/|f| < 0.3$$

(6)

$$1.68 < n_4$$

(7)

$$3 < |r_8|/|f|$$

(8)

$$0.35 < (d_9 + d_{13})/f_R < 0.5$$

(9)

wherein the reference symbol  $r_1$  represents radius of curvature on the object side surface of said first lens component, the reference symbol  $r_3$  represents radius of curvature on the object side surface of said second lens component, the reference symbols  $n_1$ ,  $n_2$ ,  $n_3$ , and  $n_7$  represent refractive indices of said first, second, third and seventh lens components respectively, the reference symbols  $v_2$  and  $v_3$  represent Abbe's numbers of said second and third lens components respectively, the reference symbols  $d_3$  and  $d_5$  represent thickness of said second and third lens component respectively, the reference symbol  $d_4$  represents the airspace reserved between said second and third lens components, the reference symbol  $n_4$  represents refractive index of said fourth lens component, the reference symbol  $r_8$  represents radius of curvature on the image side surface of said fourth lens component, the reference symbols  $d_9$  and  $d_{13}$  represent thicknesses of said fifth and seventh lens components respectively, the reference symbol  $f$  represents focal length of said front lens group, and the reference symbol  $f_R$  represents focal length of said rear lens group.

4,413,888

## COMPACT PHOTOGRAPHIC OBJECTIVE

Yasuhisa Sato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

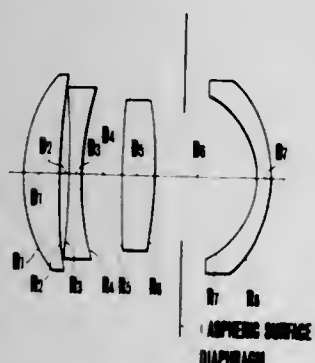
Filed Dec. 29, 1981, Ser. No. 335,468

Claims priority, application Japan, Jan. 13, 1981, 56-3590

Int. Cl.<sup>3</sup> G02B 9/34, 13/18

U.S. Cl. 350—432

2 Claims



1. A compact photographic objective comprising:
  - four lenses, from front to rear,
  - the first lens being a positive meniscus lens convex toward the front;
  - the second lens being a negative lens;
  - the third lens being a positive lens;

the fourth lens being a negative meniscus lens concave toward the front; and  
said lenses satisfying the following conditions:

$$-4 < f_4/f < -1.3$$

$$1.1 < \beta_4 < 1.4$$

$$0.2 < D_6/f < 0.3$$

$$-0.5 < \frac{R_6 + R_5}{R_6 - R_5} < 0$$

$$1.7 < N_3$$

- wherein  $f$  is the focal length of the entire lens system;
- $R_5$  and  $R_6$  are the radii of curvature of the first and second surfaces of the aforesaid third lens;
- $N_3$  is the refractive index of the glass from which the same lens is made up;
- $D_6$  is the air separation between the aforesaid third lens and the aforesaid fourth lens;
- $f_4$  is the focal length of the aforesaid fourth lens; and
- $\beta_4$  is the image magnification of the fourth lens.

4,413,889

## FOCUSING DEVICE FOR MICROSCOPES

Akio Taira, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

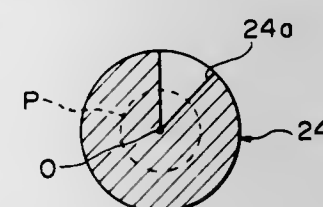
Filed Jul. 14, 1981, Ser. No. 283,198

Claims priority, application Japan, Jul. 17, 1980, 55-100814[U]

Int. Cl.<sup>3</sup> G02B 7/00

U.S. Cl. 350—501

6 Claims



1. A focusing device for microscopes comprising a light shielding plate arranged in the position of an exit pupil of an objective lens and rotatable concentrically with the optical axis of said objective lens and having therein an aperture extending from the center to the outer edge thereof, focusing being made by observing whether the image position of an object shifts or not when said light shielding plate is rotated.

4,413,890

## INSTRUMENT FOR OBJECT DETECTION OF OCULAR DISEASES

Michael Belkin, 12 Alexander Yanai St., Tel-Aviv, Israel, and David J. Lund, 60 McKeon Ct., Novato, Calif. 94947

Filed Mar. 20, 1981, Ser. No. 245,655

Int. Cl.<sup>3</sup> A61B 3/10

U.S. Cl. 351—221

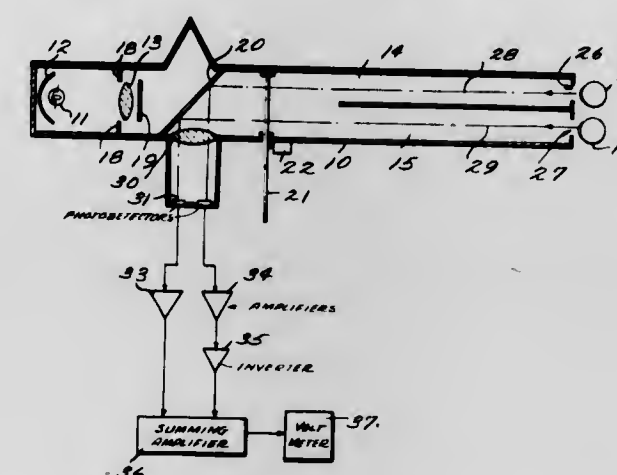
19 Claims

1. An apparatus for objectively detecting ocular disorders adapted to the expedient examination of uncooperative patients by simultaneously comparing the fundus reflex of each eye and indicating the deviation from normal thereof comprising:

means for collimating light into two predetermined paths for coaxial illumination of a person's right and left eye;  
conditioning means acting on the collimated light in said two predetermined paths for conditioning said collimated light to effect modulation thereof;  
aperture means disposed at one end of said two predetermined paths for permitting a person's eyes to be illuminated by said collimated light and for permitting retroreflection of said collimated light by said person's eyes; and

means responsive to the intensity of said retroflected collimated light for detecting the relative intensities of said retroflected collimated light, wherein said detecting means includes:

means for generating an electrical signal proportional to the



detected intensity of said retroflected collimated light discretely corresponding to the right and left eye, respectively; and

means connected to said generating means for measuring the difference between said electrical signals so that ocular disorders can be objectively detected.

4,413,891

## REFRACTOR OPTICAL SYSTEM

Edward B. Rybicki, Depew, N.Y., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

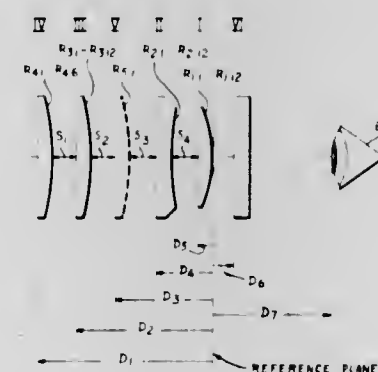
Continuation-in-part of Ser. 894,455, Apr. 7, 1978, Pat. No. 4,215,919. This application Mar. 27, 1980, Ser. No. 134,374

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> A61B 3/02

U.S. Cl. 351—235

3 Claims



1. A lens series for a refractor having a plurality of lenses positionable at each of more than two positions spaced along an optical axis and a reference plane at one of the positions which comprises, the plurality of lenses being positionable at the reference plane including a zero power lens having the same index of refraction, having the same thickness, having the same radius on one surface and the same distance to other lenses on the optical axis.

4,413,892

## MAGNETOSTRICTIVE POSITION SENSING DEVICE AND PHOTOGRAPHIC APPARATUS INCORPORATING SUCH DEVICE

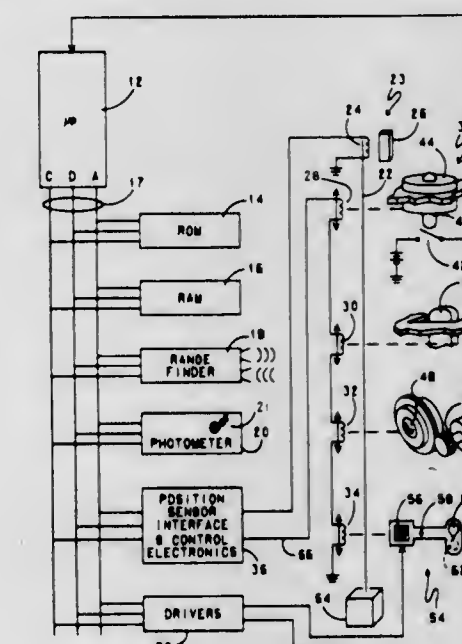
David N. Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,833

Int. Cl.<sup>3</sup> G03B 17/00; G01B 7/14

U.S. Cl. 354—21

7 Claims



1. A photographic camera, comprising:
  - a camera body;
  - a camera member such as a shutter/aperture blade, lens, cartridge notch sensor, or shutter release button mounted for movement with respect to said camera body; and
  - a position sensing device for sensing the position of said camera member, said position sensing device including:
    - a magnetostrictive element;
    - sender means located at a first position with respect to said element for launching an acoustic pulse therein;
    - sensor means located at a second position displaced along said element from said first position for sensing the acoustic pulse in said element, said sender means and said sensor means being coupled to said camera body and said movable camera member for relative movement along said magnetostrictive element in response to movement of said camera member; and
    - timer means coupled to said sender means and said sensor means for measuring the elapsed time between the launch and sensing of the acoustic pulse, the elapsed time representing the relative position of said moveable member with respect to the camera body.

4,413,893

## INTERCHANGEABLE LENS BARREL

Yasumasa Tomori, Sakado, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,696

Claims priority, application Japan, Jun. 11, 1980, 55-78858

Int. Cl.<sup>3</sup> G03B 3/10; G02B 7/04

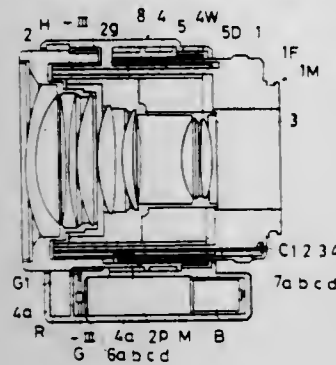
U.S. Cl. 354—195

8 Claims

1. An interchangeable lens barrel comprising a mount securing lens barrel having a mount which can be attached to a mount of a camera body with a control device, focussing lens means rotatably supported on the mount securing lens barrel and moving in directions of the optical axis when it rotates, a driving motor, a driving mechanism connected to the driving motor for rotating the focussing lens means, a device for detecting front and rear terminal positions of the focussing lens means in the axial direction which axially moves when it ro-



tees, and means on the mount of the mount securing lens barrel opposed to the mount of the camera body for transmit-



ting and receiving signals between the driving motor, the detecting device and the control device of the camera body.

4,413,894

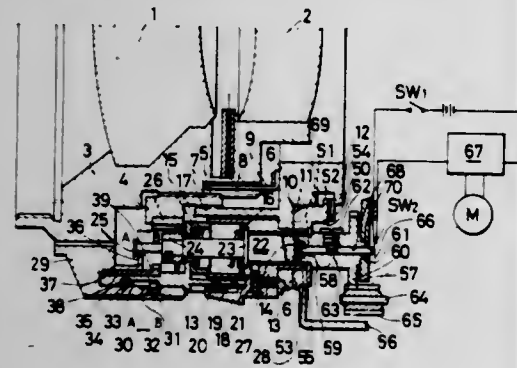
### INTERCHANGEABLE LENS AND CAMERA FOR USE THEREWITH

Yukio Miki, Sakai, and Takeshi Egawa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan  
Filed Jun. 25, 1982, Ser. No. 392,326

Claims priority, application Japan, Jul. 3, 1981, 56-104630; Jul. 9, 1981, 56-107360

Int. Cl.<sup>3</sup> G03B 3/00, 17/00; G02B 7/11  
U.S. Cl. 354—195

13 Claims



1. An interchangeable lens for mounting on a camera body equipped with a focusing device including a driving shaft for shifting at least one lens of an objective of the interchangeable lens automatically to the in-focus position, including:

- a lens shifting mechanism for shifting at least one lens along the optical axis;
- driven shaft carried to be shiftable parallel to the optical axis between an engaging position and a disengaging position so that it can be either engaged with or disengaged from the driving shaft of the camera body when the interchangeable lens is mounted on the camera body; said driven shaft being also arranged so that it is disengaged from the driving shaft of the camera body when the interchangeable lens is demounted from the camera body;
- driving force transmission mechanism for transmitting the torque produced by rotation of said driven shaft to said lens shifting mechanism;
- lens shifting member for focusing working in response to manual operation;
- clutch means for engaging said lens shifting member with and disengaging it from said lens shifting mechanism;
- change-over means for shifting said driven shaft to said engaging position in response to setting for automatic focusing with simultaneous disengaging of said clutch means and for shifting said driven shaft to said disengaging position in response to setting for manual focusing with simultaneous engaging of said clutch means.

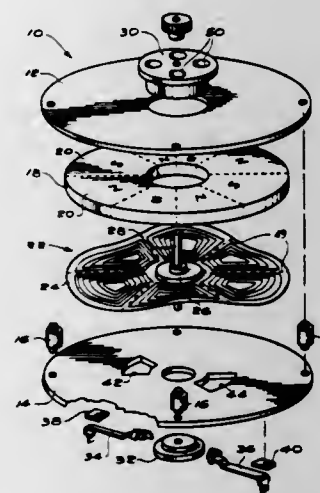
### 4,413,895 ELECTROMAGNETIC ACTUATOR HAVING A COMPLIANT ARMATURE

James K. Lee, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 360,494, Mar. 22, 1982, which is a continuation-in-part of Ser. No. 219,168, Dec. 22, 1980, Pat. No. 4,333,722. This application May 17, 1982, Ser. No. 379,372  
Int. Cl.<sup>3</sup> G03B 9/08; H02K 1/22

U.S. Cl. 354—234

24 Claims



1. An electromagnetic actuator of the type having means for forming a substantially planar magnetic gap and a flat armature positioned for movement in the magnetic gap, said actuator being characterized in that a portion of said armature is sufficiently compliant to contact and generally conform to the shape of said gap, and in that portions of said gap are substantially coextensive with said armature, for supporting said armature in a direction generally perpendicular to the path of said armature movement.

4,413,896

### PLANE FILM CASSETTE

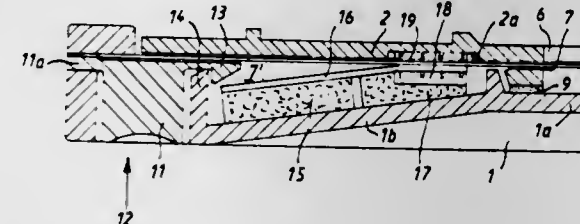
Walter Bauer, Munich, Fed. Rep. of Germany, assignor to AF-GA-Gevaert AG, Leverkusen, Fed. Rep. of Germany  
Filed May 10, 1982, Ser. No. 376,824

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3119987

Int. Cl.<sup>3</sup> G03B 17/26

U.S. Cl. 354—277

20 Claims



1. A plane film cassette for receiving at least one film, comprising a housing having two substantially flat walls, a slot provided between said walls and an illumination window provided in one of said walls; a light-protective plate insertable in a predetermined plane into said housing through said slot so as to close said window and to thereby light-tightly cover a film in the cassette; and light-tight means provided in said slot and including two light-tight elements at opposite sides of said slot, said light-tight elements being magnetically attractable toward one another and one of said light-tight elements being movable relative to the other of said light-tight elements toward said plane so that when said light-protective plate is in said slot said one light-tight elements abuts against said light-protective plate in a light-tight manner, whereas when said light-protective

tive plate is not in said slot said light-tight elements abut against one another in a light-tight manner.

4,413,897

### ELECTROSTATIC COPYING APPARATUS

Mitsuaki Kohyama, Higashikurume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

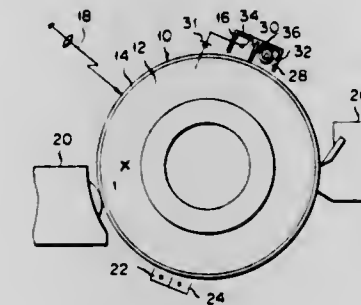
Filed Oct. 29, 1980, Ser. No. 202,174

Claims priority, application Japan, Oct. 31, 1979, 54-139763; Oct. 31, 1979, 54-139764

Int. Cl.<sup>3</sup> G03G 15/02

U.S. Cl. 355—3 CH

10 Claims



1. An electrostatic copying apparatus comprising:
  - a support member being formed of an electrically conductive material;
  - a photosensitive layer deposited on said support member, said photosensitive layer being formed of a photoconductive material which is photosensitive to light having wavelengths falling within a first predetermined range and is not photosensitive to light having wavelengths falling within a second predetermined range; and
  - means for removing charges trapped in the photosensitive layer, including means for irradiating said photosensitive layer with light having a wavelength in said second range for causing the release of charges trapped in said photosensitive layer and means for generating, simultaneously with the said second range wavelength irradiation, an electric field for expelling released charges from said photosensitive layer to said support member.

4,413,898

### PHOTOELECTROPHORETIC DUPLEX IMAGING APPARATUS AND METHOD

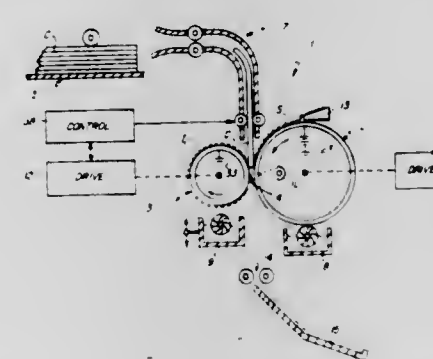
Raymond E. Anne, Caledonia, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1982, Ser. No. 379,380

Int. Cl.<sup>3</sup> G03G 15/24

U.S. Cl. 355—3 P

4 Claims



3. In apparatus for photoelectrophoretic imaging and which includes: (1) first and second electrodes which are movable along respective endless paths and cooperatively form an imaging nip, (2) means forming a migration inducing electrical field across said nip and (3) means for supplying photoelectrophoretic imaging suspension at said nip, the improvement comprising:

- (a) means for forming a first suspension image on said second electrode, by first-image light exposure of a layer of photoelectrophoretic imaging material at said nip, and for moving said first suspension image back through said nip;

- (b) means for feeding a copy sheet through said nip in timed relation with the movement of said first suspension image into said nip; and
- (c) means for forming a second image on one side of said copy sheet, by means of a second-image light exposure of a layer of photoelectrophoretic imaging material at said nip, while transferring said first formed image from said second electrode to the other side of said copy sheet.

4,413,899

### COPYING METHOD AND APPARATUS

Shuichi Karasawa, Kokubunji; Fuyuhiko Matsumoto, Wako; Shuichi Tsushima, Tokyo; Masatoshi Saitou; Tsutomu Ishida, both of Machida; Kunihiko Ikeda, Kodaira; Masao Yoshikawa, Machida, and Tsutomu Sato, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan

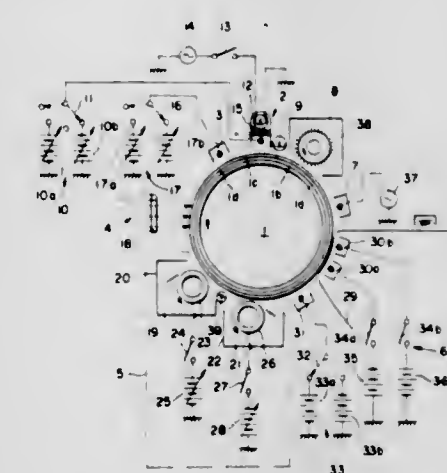
Filed Jan. 29, 1981, Ser. No. 229,730

Claims priority, application Japan, Jan. 30, 1980, 55-8705; Jan. 31, 1980, 55-9362; Jan. 31, 1980, 55-9363; Jan. 31, 1980, 55-9364; Jan. 31, 1980, 55-9365

Int. Cl.<sup>3</sup> G03G 15/01

U.S. Cl. 355—4

11 Claims



1. A two color copying apparatus comprising a single copying apparatus to produce copy sheet duplicates of an original of two colors and a white region with the copy sheet duplicates having two colors and a white region in the same areas corresponding to the areas of the original, the apparatus including a photoconductive material around which is arranged a charging unit, an exposure unit, a developing unit having two sections one of which is adapted to one color development and the other is for another color development, a transfer unit for transferring a toner image from said photoconductive material to copy sheet, and a cleaning unit, characterized in that switch means is provided for selecting a copy mode in which duplication is performed, the switch means including control means to actuate certain combinations of the aforementioned units and sections to obtain the two-color copying mode, in which both colors of the original are copied using two colors on the copy sheet, one color copying mode in which both colors of the original are copied using one color on the copying sheet or erasable mode in which one of the two colors of the original is not duplicated on the copy sheet while the other color is duplicated on the copy sheet.



4,413,900

## COPYING APPARATUS WITH SCANNING POSITION CONTROL

Shunichi Abe, and Mitsuo Akiyama, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

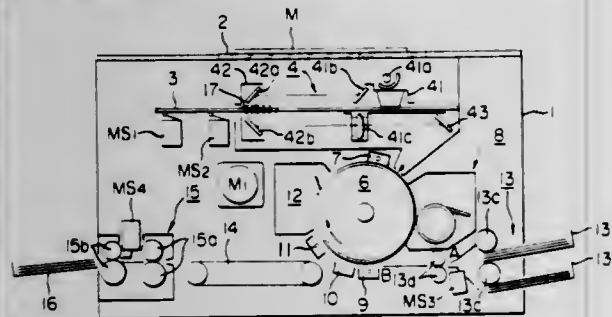
Filed Jul. 16, 1981, Ser. No. 284,118

Claims priority, application Japan, Aug. 19, 1980, 55-113642

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—8

3 Claims



1. In a copying apparatus in which an exposure scanning means is cyclically moved forward from an end position by a first driving means and then is moved backward toward its starting position by a second driving means, and resilient shock-absorbing means catches said scanning means on its return from its end position to its starting position, the combination of control means energizing said first driving means for a predetermined time period after said scanning means has been stopped in its backward movement by said shock-absorbing means at a predetermined distance removed from the initial starting position, and further means operative after a predetermined time for energizing said second driving means to return said scanning means to its initial starting position.

4,413,901

## RECIRCULATING AUTOMATIC DOCUMENT FEEDER

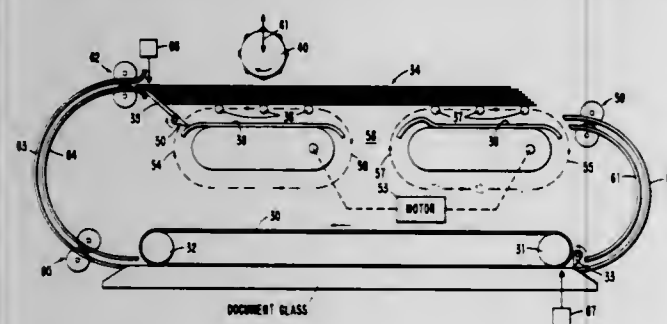
Ernest P. Kollar, Boulder County, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1979, Ser. No. 50,026

Int. Cl.<sup>3</sup> G03G 15/04; B65H 1/04, 31/00

U.S. Cl. 355—3 SH

11 Claims



1. A recirculating automatic document feed for use with a copier having a generally horizontal platen whereat a stationary original document is viewable for copying, comprising: a generally horizontal platform adapted to receive a stack of original documents to be copied; first document feed means adapted to cooperate with the top document of the stack and to feed said top document to position the document on said platen for copying; cyclically operable stack elevating means cooperating with said platform and constructed and arranged to elevate the original document stack a distance above said platform, thereby leaving said platform unobstructed to allow placement of a document onto said platform under the elevated stack; and second document feed means adapted to cooperate with a document on said platen and to feed such a copied docu-

ment to place the copied document on said platform under the elevated stack; said stack elevating means thereafter lowering the stack, and subsequently reelevating the stack, including the copied document.

4,413,902

## FOUR-BAR INTERPOSER MECHANISM FOR OFFSET PRINTING

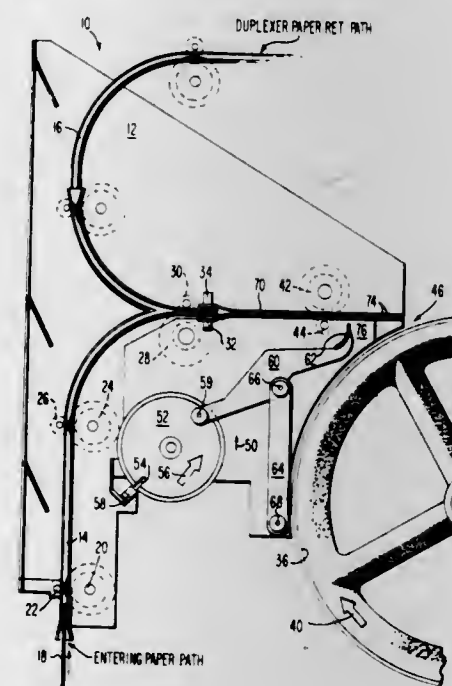
Emmett B. Peter, III, Orlando, and Wilson P. Rayfield, Longwood, both of Fla., assignors to Burroughs Corp., Orlando, Fla.

Continuation-in-part of Ser. No. 138,704, Apr. 9, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,243

Int. Cl.<sup>3</sup> G03B 27/48, 27/50; B65H 9/04

U.S. Cl. 355—48

2 Claims



1. Apparatus for timing, synchronizing and registering individual sheet items of fixed dimension, said items being arranged to move along a prescribed pathway for precise registration with respect to printing means movable at a fixed rate comprising,

an item interposer mechanism including an irregularly shaped member, the free end of which, includes means for momentarily interrupting the leading edge of a sheet item being fed to said printing means,

an elongated link rockably, fixedly pivoted at one end with the opposite end thereof pivotally, drivingly, connected to said interposer mechanism intermediate the ends thereof enabling the end of said interposer member to move in an oblate, substantially rectilinear path,

a rotatable member interconnected by said printing means and including means for periodically interrupting a light beam produced by light generating means operably associated with said rotatable member as said member is rotated, and

means interconnecting the opposite end of said interceptor linkage to said rotatable member so that upon rotation of said rotatable member said interposer linkage is moved along said oblate, substantially rectilinear path to intercept each sheet item so as to synchronize the forward movement of said sheet item with the rotative movement of said printing means effective to cause said item to locate itself along said printing means in front to back and edge to edge alignment without item overlap or interference between items.

4,413,903

## DOCUMENT ILLUMINATION SYSTEM

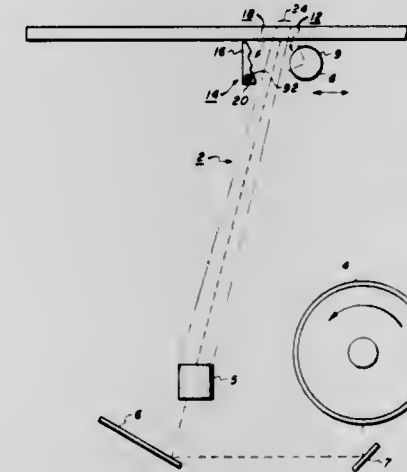
Stephen C. Corona, Rochester, and Charles J. Urso, Jr., Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1982, Ser. No. 357,967

Int. Cl.<sup>3</sup> G03B 27/74

U.S. Cl. 355—68

3 Claims



1. An illumination system for controlling the illumination of a document in an object plane, the system comprising: at least one linear illumination source disposed adjacent to said object plane, an elongated reflector assembly associated with the illumination source and positioned with respect to said source such that at least a portion of the emitted light from said source is directed toward, and is reflected from the facing portion of said assembly to said object plane, said reflector assembly comprising: a light transmitting interior member, a reflective coating on the surface of said member, said coating having a longitudinally extending aperture there-through along the surface of the assembly directly illuminated by said illumination source whereby a portion of said direct illumination enters into said member through said aperture, and at least one photosensor in operative association with said member to detect light entering the member through said aperture and propagating along the interior surface, said photosensor adapted to generate output illumination signals for use in controlling the light output of said illumination source.

4,413,904

## ELECTRO-OPTICAL RANGE FINDER USING THREE MODULATION FREQUENCIES

Toshio Hamada, and Fumio Ohtomo, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,256

Claims priority, application Japan, Mar. 10, 1980, 55-30123

Int. Cl.<sup>3</sup> G01C 3/08; G01S 13/08, 13/26

U.S. Cl. 356—5

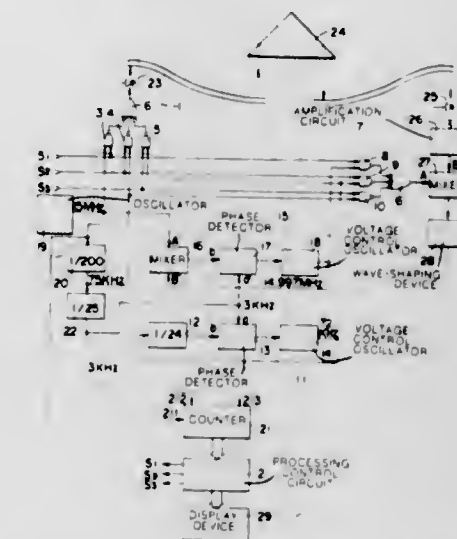
4 Claims

1. In an electro-optical range finder including:

projector means for radiating a ray of light having a given modulation frequency; light-receiving means for receiving the ray of light reflected by a reflector positioned at a measuring point and for converting it into an electric signal; a mixer for mixing the electric signal from said light-receiving means and a reference signal; and an arithmetic circuit for computing the distance between the measuring point and the range finder positioned at a setting point by the change in phases between the signal from said mixer and a divided signal of said modulation frequency;

the improvement wherein said projector means further in-

cludes means for selectively radiating the rays of light with first, second and third modulation frequencies which are different from each other, said first modulation fre-



quency having a value at least ten times higher than said second and third modulation frequencies, and said second and third modulation frequencies being approximations to each other within a maximum limit of  $\pm 20\%$ .

4,413,905

## LASER RANGE METER

Wolfgang Holzappel, Bruchkoebel, Fed. Rep. of Germany, assignor to Honeywell Inc., Minneapolis, Minn.

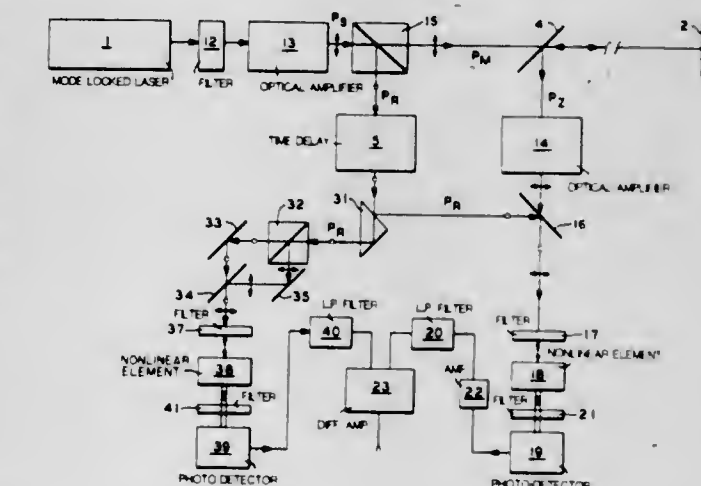
Filed Aug. 1, 1979, Ser. No. 62,848

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1978, 2834660

Int. Cl.<sup>3</sup> G01C 3/08

U.S. Cl. 356—5

15 Claims



1. An improved laser range meter of the type having a laser transmitter for radiating a series of pulses of known frequency toward a target, and a receiver for receiving primary measuring pulses returned from the target in response to the transmitted pulses and determining the round trip travel time of individual primary measuring pulses, the receiver including means for deriving reference pulses from the transmitted pulses, variable optical delay means for delaying the reference pulses, a measuring channel comprising a first nonlinear element which responds to the primary measuring and delayed reference pulses by emitting secondary radiation at double the known frequency, and a first radiation detector for producing an electrical signal indicative of the intensity of radiation emitted by said first nonlinear element, the range meter further having readout means connected to receive the electrical signal produced by said first radiation detector, wherein the improvement comprises:

a mode locked laser serving as the laser transmitter for



generating ultrashort high energy pulses of a pulse length which is at least two orders of magnitude shorter than the duration of secondary radiation emitted by said first nonlinear element, the intensity of said secondary radiation being representative of the time correlation of corresponding primary measuring pulses and delayed reference pulses; and

a reference channel in the receiver connected to receive delayed pulses derived from the transmitted pulses, said reference channel including a second nonlinear element for emitting radiation at double the known frequency in response to the delayed pulses and a second radiation detector for supplying an electrical signal indicative of the intensity of radiation emitted by said second nonlinear element to said readout means.

4,413,906

# PASSIVE OPTICAL RANGEFINDER/SEXTANT HAVING SEARCH CAPABILITY

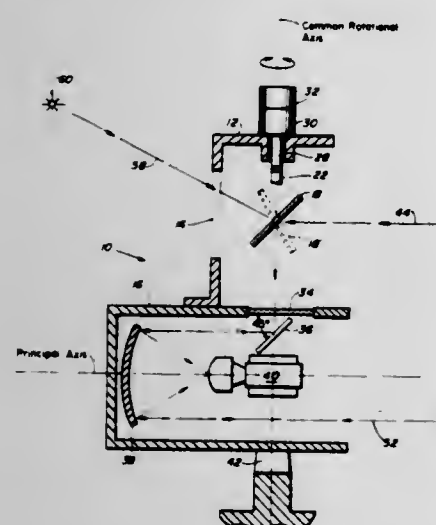
Sidney Feldman, Silver Spring, Md., and George G. Barton, Jr., Harker's Island, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1981, Ser. No. 277,376

Int. Cl.<sup>3</sup> G01B 11/26; G01C 1/00

U.S. Cl. 356—141

4 Claims



1. An improved rangefinder/sextant having a search capability and of the type having an optics housing including an optics housing yoke operatively attached to the bottom of said optics housing for moving thereof azimuthally and elevationally, a spherical mirror mounted towards the rear of said optics housing, an imaging camera disposed in said optics housing towards the front thereof on the principal optical axis of said spherical mirror, index mirrors and horizon mirrors symmetrically arranged in pairs on opposite sides of said optics housing and on opposite sides of the principal axis of said spherical mirror, and control means arranged such that rangefinder and sextant measurements can be made, wherein the improvement comprises:

a search mirror device operatively attached to the top of said optics housing and configured for continuous azimuthal and elevational motion independent of the azimuthal and elevational motion of said optics housing yoke to provide the search capability; and

a deflection mirror fixedly connected to said optics housing at an angle of 45 degrees as referred to the principal axis of said spherical mirror and mounted above said imaging camera on a rotational axis common to said search mirror device, said deflection mirror and said optics housing yoke such that light rays deflected from said search mirror device are directed via said spherical mirror to said imaging camera.

4,413,907

# REMOTE CONTROL SURVEYING

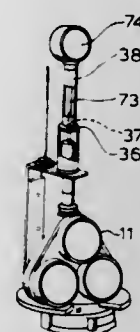
Vern E. Lane, Cheyenne, Wyo., assignor to Robert F. Delke, Cheyenne, Wyo.

Filed Nov. 7, 1980, Ser. No. 204,813

Int. Cl.<sup>3</sup> G01B 11/26; G01C 3/08

U.S. Cl. 356—141

9 Claims



1. The method of surveying which comprises selecting a pair of spaced base points, determining the distance between said base points, positioning remote control rotatable reflector units over said base points, said reflector units each having a stroboscopic light co-rotatable and co-directional therewith, establishing an electronic distance measurement survey station visible to said base points and spaced therefrom, selectively rotating said reflector units from said survey station, observing the brightness of each of said stroboscopic lights, ceasing rotating said reflector units when the observed brightness of each of said stroboscopic lights is at a maximum, determining the distances between each base point and the survey station, and calculating the location of the survey station relative to said base points.

4,413,908

# SCANNING INTERFEROMETER CONTROL SYSTEMS

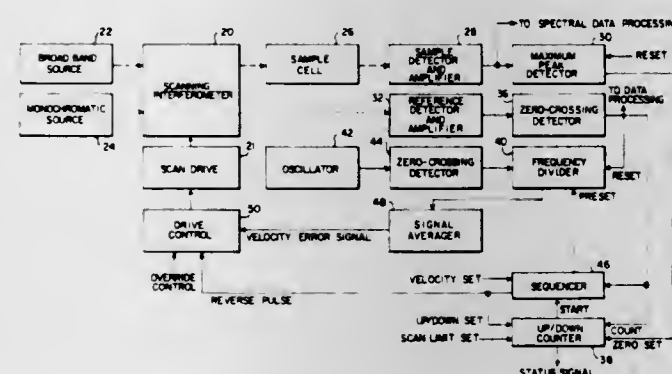
David E. Abrams, Winchester; Raul Curbelo, Lexington, and R. Brough Turner, Newton Corner, all of Mass., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Mar. 5, 1982, Ser. No. 354,934

Int. Cl.<sup>3</sup> G01B 9/02

U.S. Cl. 356—346

2 Claims



1. A system for controlling cyclic excursions of optical path length in a scanning interferometer including means for providing a beam of substantially monochromatic radiation traversing said interferometer, which beam is cyclically modulated by said excursions, said system comprising, in combination:

means for detecting said radiation and for generating a signal responsively to modulation of said beam; means for detecting predetermined like conditions of said signal in substantially each cycle of said modulation and for generating a pulse for each said condition detected; comparison means for comparing time intervals between successive said pulses with a temporal period selected from a pre-established ordered sequence of temporal peri-

ods, said comparison means being capable of providing an error signal dependent on the comparison of said intervals and said period by said comparison means;

scan drive means for controlling the velocity of said excursions responsively to said error signal, said scan drive means further including means for reversing the direction of motion of an excursion responsively to a command signal;

means for counting said pulses, said means for counting including means for reversing the direction of counting responsively to a trigger signal; and

sequencing means responsive to a predetermined count in said means for counting, so as to sequentially alter said temporal period in accordance with said ordered sequence of temporal periods, said sequencing means further providing said command signal and said trigger signal at predetermined periods in said sequence, whereby said excursions are controlled by detections of said modulation of said beam so as to reverse the direction of excursion motion within less than a half of cycle of said modulation.

4,413,910

# SYSTEM FOR DETECTING AND LOCATING SURFACE DISCONTINUITY BY A LIGHT BEAM

Jean Cornu, Nantes; Jean-Marie Detriche, Chambourcy; Bernard Tiret, Verdun; Gerard Jorge, Lunel; Richard Galera, Meylan; Dominique Biava, Clamart, and Paul Marchal, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

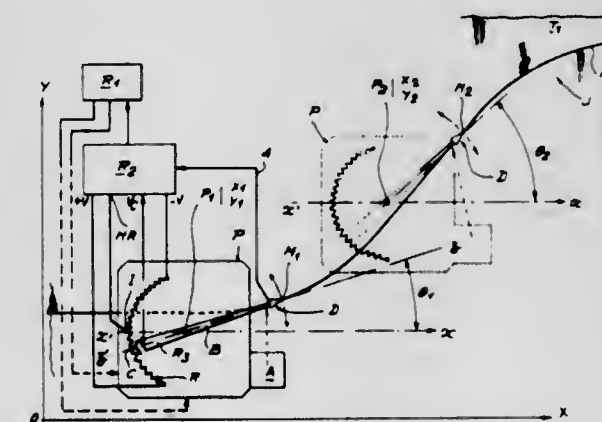
Filed Feb. 13, 1981, Ser. No. 234,361

Claims priority, application France, Feb. 12, 1980, 80 03068

Int. Cl.<sup>3</sup> G01B 11/24

U.S. Cl. 356—377

9 Claims



1. System for detecting and locating surface discontinuity by a light beam, comprising:

a detector comprising means for emitting a convergent incident beam of monochromatic light, in the direction of the discontinuity, means for receiving the light reflected on the surface and an optoelectronic transducer for the reflected light, associated with the receiving means;

means for displacing the detector so that the incident beam transversely scans the discontinuity and the vicinity thereof;

a carrier adapted to move the means for displacing the detector, along the discontinuity, this carrier being associated with means for locating its position with respect to a fixed system of coordinates;

locating means, connected to the receiving means of the detector, for locating the successive angular positions of this detector, with respect to a reference direction associated with the carrier, when this carrier occupies different positions along the discontinuity and when the incident beam passes over the discontinuity;

wherein the means for locating each angular position of the detector comprise means for determining the angular position of the detector with respect to said reference direction, each time the incident beam passes through a point located on the discontinuity;

wherein the means for determining the angular position of the detector each time the incident beam passes through a said point located on the discontinuity, comprise means for recording each pulse coming from the optoelectronic transducer and means for recording, for each of these pulses, the value of the angle between a detector position locating line and said reference direction, this detector position locating line passing through a determined point of the carrier and through a point of the detector, characteristic of the position of the detector;

wherein the means for recording each pulse comprise a circuit for shaping these pulses;

wherein the shaping circuit comprises a high gain amplifier, associated with an assembly for filtering the background noise accompanying these pulses; and

wherein the filtering assembly comprises at least one filter associated with means for comparing the output signal from this filter with a floating reference D.C. voltage corresponding to the means level of the signal leaving the filter.

4,413,909

# WAVEFRONT TILT MEASURING APPARATUS

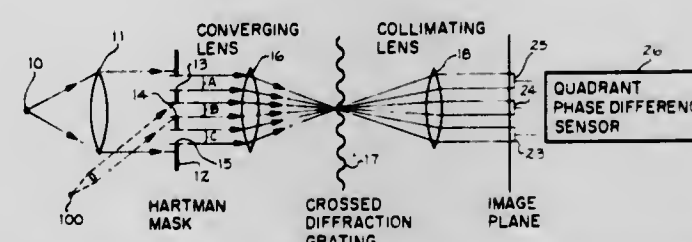
Richard H. Pohle, Monta Vista, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Jun. 1, 1981, Ser. No. 268,855

Int. Cl.<sup>3</sup> G01B 9/02

U.S. Cl. 356—354

30 Claims



1. A method for making tilt measurements of a first optical wavefront relative to a second optical wavefront, said first wavefront being defined by a first aperture and said second wavefront being defined by a second aperture, said method comprising the steps of:

(a) causing images of said first aperture formed by different orders of diffraction components of said first wavefront to interfere with each other, thereby producing first wavefront interference patterns;

(b) causing images of said second aperture formed by said different orders of diffraction components of said second wavefront to interfere with each other, thereby producing second wavefront interference patterns;

(c) causing periodic temporal fluctuations in intensity of said first wavefront interference patterns and of said second wavefront interference patterns; and

(d) determining a phase relationship between the intensity fluctuations of one of said first wavefront interference patterns and the intensity fluctuations of a corresponding one of said second wavefront interference patterns, said phase relationship being a quantitative measure of tilt of said first wavefront relative to said second wavefront.



4,413,911

## GAS ANALYZER WITH FLUID CURTAIN

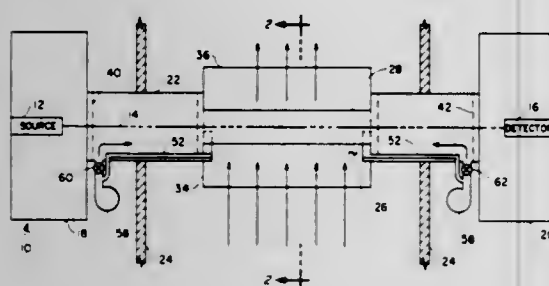
Richard G. Rice, Cupertino; Mathew G. Boissevain, Los Altos Hills, and Robert R. Dubin, San Jose, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Apr. 24, 1981, Ser. No. 257,063

Int. Cl.<sup>3</sup> G02B 7/00

U.S. Cl. 356-438

8 Claims



1. Apparatus for analyzing a first gas stream comprising:
  - (a) a source capable of emitting a beam of radiation;
  - (b) a detector located so that the beam passes through the first gas stream and impinges the detector;
  - (c) housing means enclosing at least part of the beam;
  - (d) means for filling the housing means with a second gas; and
  - (e) nozzle means coupled to said housing means for providing a curtain of fluid substantially between the second gas in said housing means and the first gas stream to substantially prevent the first gas stream from mixing with the second gas inside said housing means.

4,413,912

## APPARATUS FOR THE PRODUCTION OF A REACTION MIXTURE

Frank Redmer, Leverkusen, and Kurt Kripl, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

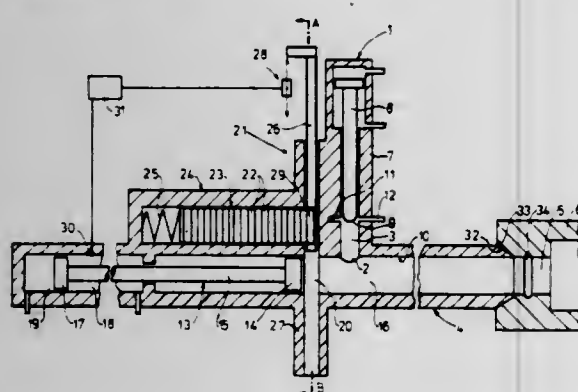
Filed Apr. 30, 1982, Ser. No. 373,587

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119662

Int. Cl.<sup>3</sup> B29B 1/06

U.S. Cl. 366-69

8 Claims



1. An apparatus for the production of a solid-forming or a foam-forming reaction mixture from at least two flowable components, the apparatus comprising a mixing head with a mixing chamber having an outlet opening, a filling tube, an ejection piston which is designed as a piston head having a forward and a rear position and a piston rod with a smaller diameter than that of the piston head and an introduction slit for the introduction of cleaning platelets, which platelets correspond to the size and shape of the filling tube and which are advanced through the filling tube by the ejection piston to clean residual mixture from the filling tube, wherein at the outlet opening of the mixing chamber is connected at an angle said filling tube in which the ejection piston is positioned, said introduction slit being provided in the filling tube between the

rear position of the ejection piston and the outlet opening of the mixing chamber, and wherein a delivery device for cleaning platelets is associated with the introduction slit.

4,413,913

## METHOD FOR PROCESSING PLASTIC AND POLYMERIC MATERIALS

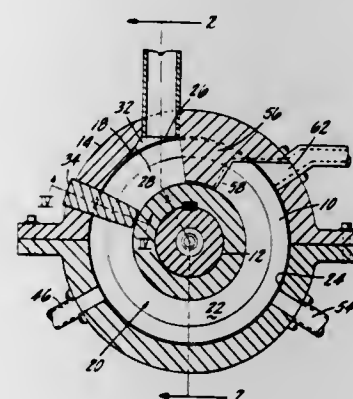
Peter Hold, Milford, Conn., and Zehev Tadmor, Teaneck, N.J., assignors to USM Corporation, Farmington, Conn.

Division of Ser. No. 190,465, Sep. 24, 1980, Pat. No. 4,329,065, which is a continuation of Ser. No. 971,331, Dec. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,184, Nov. 7, 1977, abandoned. This application Mar. 24, 1982, Ser. No. 361,397

Int. Cl.<sup>3</sup> B01F 5/12, 7/10; B29B 1/06, 3/02

U.S. Cl. 366-75

10 Claims



1. A method for processing liquid plastic or polymeric materials including the steps of:
  - a. providing a processing zone defined by an annular processing passage comprising a channel having opposed rotatable walls providing a polymer processing surface area for the zone, a coaxial stationary enclosure surface cooperatively arranged with the channel to retain material in the passage, a feed point and a discharge point associated with the stationary surface, a liquid material blocking and collecting end wall surface providing member positioned adjacent the discharge point which is spaced apart from the feed point a major portion of the circumferential distance about the passage, a blocking and spreader surface providing member spaced apart from the end wall surface providing member by a major portion of the circumferential distance about the passage and port means communicating with a selected portion of the passage between the blocking and spreader surface and the end wall surface;
  - b. rotating the opposed channel walls;
  - c. introducing the liquid material at the feed point;
  - d. blocking the advance of liquid material in the central portion of the channel at the blocking and spreader surface;
  - e. spreading blocked material on the opposed rotating walls as thin layers so that the spread thin layers can be carried past the blocking and spreader surface providing member toward the end wall surface and provide a free central space in advance of the blocking and spreader surface providing member in the direction of rotation of the walls;
  - f. adding material to or removing material from the thin layers through said port means;
  - g. blocking advance of said thin layers and collecting blocked thin layer material at said blocking and collecting end wall surface for controlled processing and/or discharge from said processing zone; and
  - h. discharging said material from said processing zone to another processing zone as defined in step a for further processing at least according to steps b, c, d, e, f and g.

4,413,914

## RECOVERY OF HEAVY HYDROCARBONS FROM OIL SLUDGE

Alistair D. McBride, Wishaw, Scotland, and Ian S. Ripley, Cleveland, England, assignors to Emultec Limited, Cleveland, England

Division of Ser. No. 228,274, Jan. 19, 1981, Pat. No. 4,364,776.

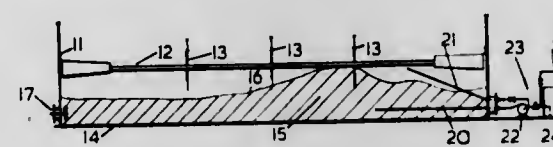
This application Sep. 28, 1982, Ser. No. 426,149

Claims priority, application United Kingdom, Jan. 19, 1980, 8001862

Int. Cl.<sup>3</sup> B01F 3/12

U.S. Cl. 366-137

2 Claims



1. Apparatus for effecting emulsification of a hydrocarbonaceous sludge body in a container, comprising a tank for storage of dispersant chemical, a pump having its inlet connected to a pipe for drawing off emulsified fluid from the surface of the sludge body in the container, a plurality of narrow bore lances for penetrating into the sludge body in the container and each lance connected to the pump outlet, means providing a supply of water, and valve means interconnecting the storage tank and the water supply means with the pump inlet whereby dispersant chemical and/or water can be pumped under pressure along the lances and drawn off emulsified fluid recirculated to the sludge body under pressure through said lances, wherein the draw-off pipe and each lance is a fluid-tight fit in a pertaining glanded nozzle, the nozzles being mounted on a carrier plate which is releasably securable over an opening in said container, and the draw-off pipe includes an elbow which is securable in the pertaining glanded nozzle in any one of a number of orientations so that the end of said pipe within the container can be selectively relocated as required to follow the changing level of the emulsified fluid in the container.

4,413,915

## WATCH HAVING AN ANALOG DISPLAY AND A DIGITAL DISPLAY

Rene Besson, Neuchatel, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches ETA 13, Switzerland

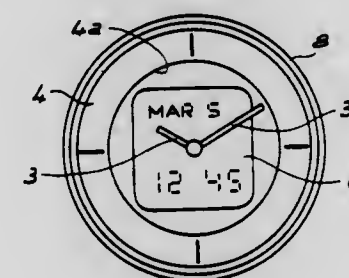
Filed Dec. 11, 1981, Ser. No. 329,652

Claims priority, application Switzerland, Dec. 16, 1980, 9258/80

Int. Cl.<sup>3</sup> G04B 25/00; G04C 19/00

U.S. Cl. 368-71

13 Claims



1. A watch comprising a casing, movable members for displaying time analogically, dial means for said movable members, and digital display means surrounded by said dial means and responding to a first external action by taking substantially the same colour as that of said dial means and also responding to a second external action by taking a colour different from that of said dial means.

4,413,916

## POWER METER FOR LASERS

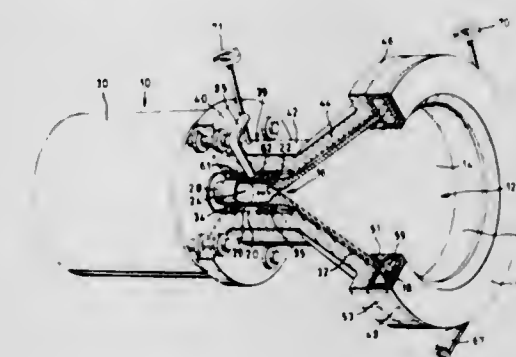
Herb J. J. Seguin, Edmonton, Canada, assignor to Majestic Contractors Limited, Edmonton, Canada

Filed Mar. 23, 1982, Ser. No. 360,836

Int. Cl.<sup>3</sup> G01J 5/02; G01K 17/00

U.S. Cl. 374-32

14 Claims



1. Apparatus for determining the power output of a laser for wavelengths which are substantially fully absorbed by water, comprising:
  - a rotary member defining a surface of revolution which widens away from an opening to a free edge, the opening being located substantially at the axis of said surface,
  - first means for rotating said member about said axis,
  - second means for bringing water to said surface through said opening,
  - third means for collecting water at said free edge,
  - fourth means for measuring the throughput of water through the apparatus,
  - and fifth means for measuring the water temperature differential arising due to absorbable radiation falling upon the water as it runs over said surface.

4,413,917

## RESISTANCE MEASURING SYSTEM

Neil A. Cooper, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

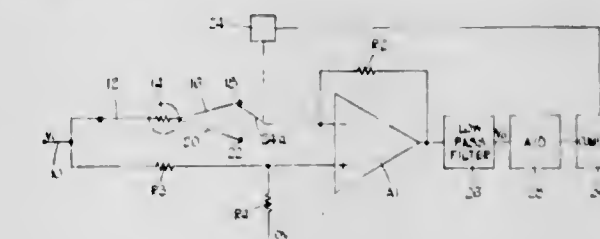
Filed Jun. 11, 1981, Ser. No. 272,743

Claims priority, application United Kingdom, Jun. 13, 1980, 8019475

Int. Cl.<sup>3</sup> G01K 7/20

U.S. Cl. 374-173

5 Claims



1. A resistance measuring system comprising a sensor the resistance of which varies, a first lead connected to one end of the sensor, a second lead connected to the other end of the sensor, a third lead of different resistance to the second lead connected to said other end, a circuit for measuring the resistance of the sensor, and switch means having a first state in which the sensor is connected to the measuring circuit through the first and second leads and a second state in which the sensor is connected to the measuring circuit through the first and third leads, the measuring circuit including means for producing a first voltage corresponding to the combined resistance of the sensor and the first and second leads when the switch means are in said first state and a second voltage corresponding to the combined resistance of the sensor and the first and third leads when the switch means are in the second state.



4,413,918

**THRUST BEARING FOR ROCK BITS**

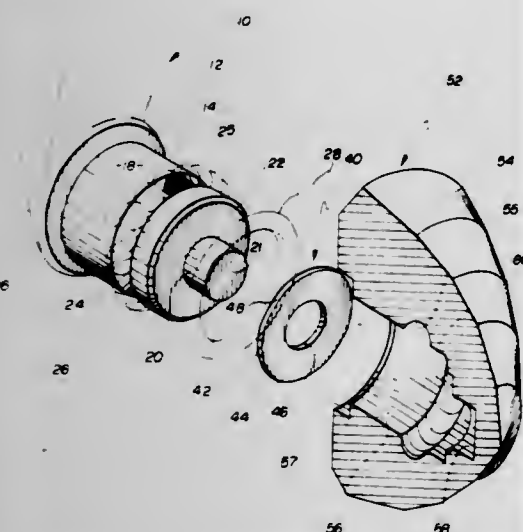
Robert D. Thomas, Arlington, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 19, 1982, Ser. No. 379,692

Int. Cl.<sup>3</sup> F16C 33/00, 17/04

U.S. Cl. 384-95

3 Claims



1. A rotary rock bit comprising:  
 a bit body having an upper end connectable to a drillstring;  
 at least one bearing journal extending from an opposite end of said body, said bearing journal defining at least one radially disposed bearing surface thereby;  
 a cutter cone rotatably positioned on said journal, said cutter cone defining at least one radially disposed bearing surface, said cone bearing surface being so configured to mate with said at least one radially disposed bearing surface formed by said bearing journal; and  
 at least one intermediate radially disposed thrust bearing positioned between said radially disposed bearing surfaces formed by said journal and said cone, said intermediate bearing is retained between said journal and bearing by intermediate bearing retention means, an outside peripheral edge formed by said intermediate radially disposed thrust bearing is noncircular, said noncircular bearing registers with a matching noncircular cavity formed in said cone, said noncircular cavity formed in said cone prevents rotation of said intermediate bearing when said cone is rotated on said journal.

4,413,919

**RIBBON LOADING SYSTEM FOR PRINTERS**

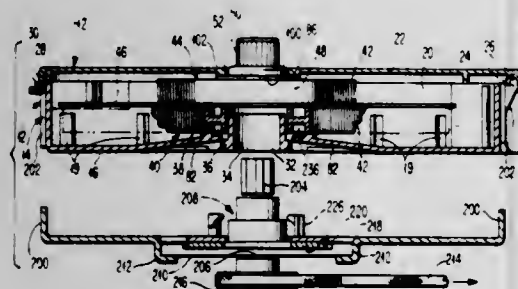
Steven L. Applegate, and James J. Molloy, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1981, Ser. No. 315,591

Int. Cl.<sup>3</sup> B41J 32/00, 33/12, 35/08, 33/52

U.S. Cl. 400-208

18 Claims



1. A cartridge for printer ribbon comprising:  
 first and second ribbon reels arranged to have a common rotational axis;  
 a container for said reels having a cover portion and a base portion including a generally flat floor that is opposite said cover portion, and a sidewall extending to receive said

cover section, said first reel being arranged toward said floor and said second reel being arranged toward said cover;

resilient means, arranged to project from said floor, for engaging said first reel and for urging said first reel toward said second reel and said cover; and  
 means defining at least one access aperture in said base portion to permit interaction with said resilient means from outside said container.

4,413,920

**PRINTING RIBBON CARTRIDGE WITH FLEXIBLE RIBBON GUIDES**

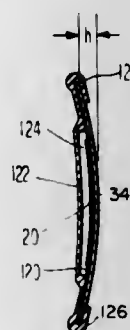
Dan W. Matthias, Downingtown, and Collier M. Miller, Rosemont, both of Pa., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 98,773, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 833,257, Sep. 14, 1977, abandoned. This application Oct. 9, 1981, Ser. No. 310,158

Int. Cl.<sup>3</sup> B41J 35/04

U.S. Cl. 400-248

28 Claims



1. A printer comprising means for supporting a print receiving medium, laterally movable character printing means juxtaposed to said supporting means for establishing a laterally movable print point, a ribbon comprising a printing medium for advancing past said movable print point in printing relationship with said print receiving medium and said character printing means, stationary ribbon storage means for storing said ribbon, means for moving said ribbon between said print point and said storage means, the improvement comprising means for maintaining a substantially constant path length from said ribbon storage means to said print point including flexible leader means and flexible cover means extending across said leader means so as to form a channel for said ribbon to move therethrough for supporting said ribbon, said means for maintaining a substantially constant path length maintaining curvature in a single direction as said movable print point moves, said flexible cover means being slidable with respect to said flexible leader means.

4,413,921

**COSMETIC PENCIL HAVING A SHARPENABLE POLYETHYLENE CASING**

Eustace Fotiu, Mahwah, N.J.; Marlene Tietjen, New York; Tibor Goldner, Fresh Meadows, both of N.Y., and Phillip Rosenblum, West Orange, N.J., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 939,887, Sep. 5, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 168,239

Int. Cl.<sup>3</sup> A45D 40/00, 40/20

U.S. Cl. 401-96

23 Claims

1. A cosmetic pencil capable of being sharpened in a conventional pencil sharpener, comprising a casing and a cosmetic composition core, wherein:

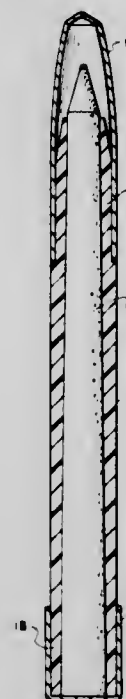
(a) said casing:

(i) comprises a homogeneous blend of materials, including major proportion of polyethylene whose density is in the range of between about 0.88 g/cc and 0.99 g/cc;

(ii) is made under conditions which are substantially free

of blowing agents for said polyethylene, thereby providing a non-porous casing;

(iii) is inert to ingredients in said cosmetic composition;  
 (iv) has a hardness in the range of between about 35-70 by the Shore Durometer according to the ASTM D-2240 method enabling said casing to be smoothly and evenly sharpened in a conventional pencil sharpener without significant resistance to the cutting edge of said sharpener;



(v) has a softening point above 60° C. enabling said casing to rigidly retain its shape when in contact with hot cosmetic compositions; and,  
 (vi) has a wall thickness sufficient to render said casing relatively inflexible at temperatures below 60° C.; and,  
 (b) said cosmetic core composition comprises a solid cosmetic product in contact with said casing.

4,413,922

**BRANCH-OFF SEAL**

Jean M. E. Nolf, Hamme-Mille, Belgium, assignor to N.V. Raychem S.A., Kessel-Lo, Belgium

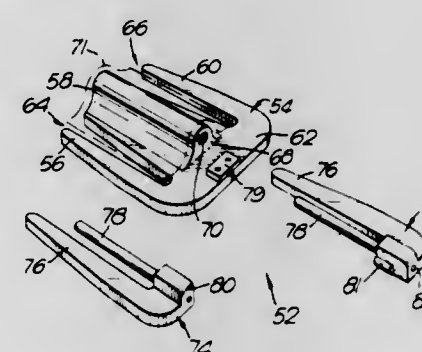
Filed May 21, 1981, Ser. No. 265,733

Claims priority, application United Kingdom, May 22, 1980, 8016951

Int. Cl.<sup>3</sup> F16B 2/12

U.S. Cl. 403-341

16 Claims



1. A clamping member for use in forming a branch-off seal between a recoverable sleeve and a plurality of substrates extending from an end thereof, the clamping member comprising:

at least two interengageable parts that extend generally parallel to each other, the parts being slidably interengageable and, when interengaged, providing at least five

legs extending generally parallel to each other from a head of the member,  
 the legs defining four generally parallel channels for receiving respective circumferentially-spaced portions of the sleeve with at least one of said legs extending into the sleeve to form therein at least four ducts for said substrates.

4,413,923

**SELF-CLEANING REFLECTIVE ROAD MARKER**

Bernard Wright, Burnside Cottage, Dalguise, Dunkeld, Perth, Scotland

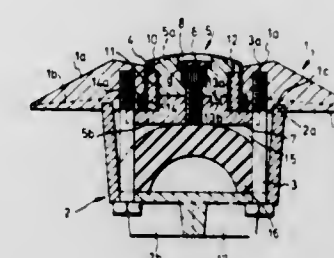
Filed May 11, 1981, Ser. No. 262,795

Claims priority, application United Kingdom, May 13, 1980, 8015815

Int. Cl.<sup>3</sup> E01F 9/00

U.S. Cl. 404-11

14 Claims



1. A self-cleaning reflective road marker comprising:  
 a housing having a generally cylindrical portion for insertion into a road surface and including a flanged portion, the flanged portion being connected to the generally cylindrical portion by connectors;  
 a stud comprising first and second stud portions connected together to secure a reflector on the stud wherein the second stud portion is generally circular and includes a plurality of equally spaced cut-outs for engaging said connectors whereby when the stud moves between said first and said second position, the movement of the stud is guided by the co-operation of the cut-outs and the connectors;  
 resilient means biasing the stud upwardly in the housing; and  
 reflector cleaning means located in the housing in a position to wipe the reflector when the latter is depressed against the bias of the resilient means;  
 the first and second stud portions being connected together by connector means engageable from above the road marker only to effect disconnection of said stud portions; the first stud portion upon such disconnection being removable upwardly from the road marker, whereby the reflector and the cleaning means may be removed and replaced without removal of the housing from the road surface.

4,413,924

**BLOCKS FOR CONSTRUCTING A BREAKWATER**

Takeshi Ijima, Fukuoka, Japan, assignor to Iida Kensetsu Co., Ltd., Fukuoka, Japan

Filed Jul. 20, 1981, Ser. No. 284,750

Claims priority, application Japan, Nov. 21, 1980, 55-164883

Int. Cl.<sup>3</sup> E02B 3/06; E04B 1/02; E04C 1/08

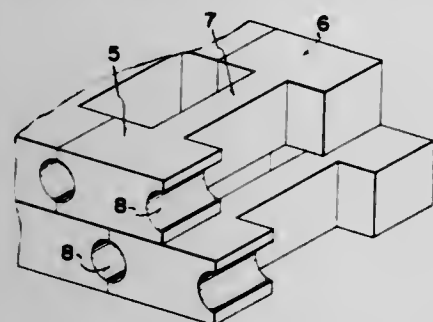
U.S. Cl. 405-31

6 Claims

1. Blocks for constructing a breakwater, each of said blocks having a front wall and a rear wall, said rear wall being in parallel and spaced-apart relationship relative to said front wall, at least one partition wall disposed perpendicular to said front and rear walls and integrally connecting said front and rear walls to form at least a half portion of a vertical open-ended chamber between said front and rear walls, at least a half portion of a horizontal hole formed in said front wall, each of



said blocks having at least a left and a right vertical open-ended hole formed in one of said front or rear walls, said blocks being disposed in generally horizontal rows with abutting joints with at least one row overlying another row and with the center-line of a block in said one row being generally vertically aligned with the abutting joint of two blocks in said other row, said blocks in said one row having their left and right open-ended holes each spaced from the respective block center-line a first distance, said blocks in said other row having their open-ended holes each spaced from the respective block center-line a second distance, said first distance being different from said second distance such that the left hole in one block in said one row is generally vertically aligned with the right



hole in a second block in said other row and the right hole in said one block in said one row is generally vertically aligned with the left hole in a third block in said other row in which said second and third blocks generally abut one another along an abutting plane which generally bisects said first block, whereby a plurality of rows of blocks may be stacked on one another to form said breakwater with the vertical abutting joints between the blocks in said one row being horizontally displaced relative to the vertical abutting joints of said blocks in said other row and with said vertical open-ended holes in overlying blocks being vertically aligned and thereby adapted to receive a material for providing vertical structural support to said breakwater.

4,413,925

## INDEPENDENTLY BALANCED SUPPORT PLATES

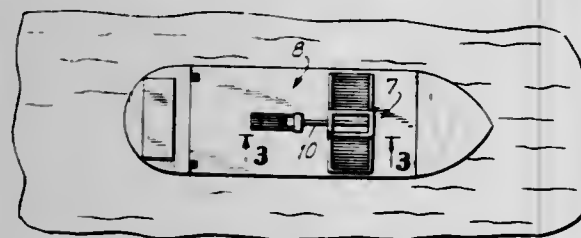
John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Dec. 28, 1979, Ser. No. 108,121

Int. Cl.<sup>3</sup> B63B 35/44; E02D 21/00

U.S. Cl. 405—195

11 Claims



1. Support means for supporting a relatively heavy weight having a horizontally extending, downwardly facing surface, the means comprising:

- (a) a primary support platform;
- (b) a plurality of load support members arranged around a central axis and each having an upwardly facing supporting surface;
- (c) balancing and connecting means pivotably connecting the load support members to the primary support platform about two transverse, horizontal axes, each load support member being independently pivotally supported about at least one such horizontal axis; and
- (d) drive means for reciprocally moving the load support member relative to the central axis, towards and away from a load supporting position;

whereby the weight is substantially proportionately supported by the support surfaces of the plurality of load support members when the load support members are balanced about the

transverse axes, such that net transverse stress is minimized on the weight being supported.

4,413,926

## SYSTEM AND METHOD FOR POSITIONING AN OFF-SHORE PLATFORM ON A SUPPORT

Jean-Louis Ninet, Nantes, France, assignor to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-ACB, Nantes, France

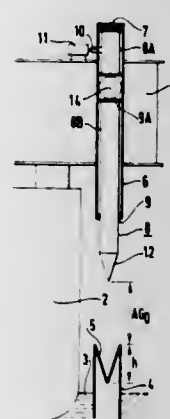
Filed Aug. 6, 1981, Ser. No. 290,537

Claims priority, application France, May 15, 1981, 81 09708

Int. Cl.<sup>3</sup> E02D 25/00

U.S. Cl. 405—204

6 Claims



1. System for positioning a barge-mounted off-shore platform on a support structure fixed to the sea bed, said fixed support structure including a plurality of upstanding piles with at least two of said piles having platform leg-receiving guide means at their upper ends, said platform including a plurality of legs for fixing to corresponding ones of said piles, at least two of said legs being hollow, plungers slideably mounted within said hollow legs for co-operating engagement with said platform leg-receiving guide means, a releasable fastening holding the plunger fixed at a raised position within said hollow leg for releasing said plunger on command for gravity drop into engagement with said platform leg-receiving guide means, means for effecting release simultaneously on a common command of the releasable fastenings of at least two of the plungers, abutment means fixedly mounted to said legs above said plungers for limiting upward movement of said plunger within said hollow leg, and wherein each plunger is constituted by upper and lower, axially separated rigid members freely slidable within said hollow leg with a block of shock-absorbing material sandwiched in between them, and wherein said lower rigid member terminates in a lower end configured to said platform leg-receiving guide means; whereby, upon release of said releasable fastening, said upper and lower rigid members with the block of shock-absorbing material sandwiched in between them move downwardly within said hollow leg until said lower rigid members abut said piles with the lower ends received within said guide means, and wherein as said platform continues to descend, said rigid members and said block of shock-absorbing material move upwardly within said hollow legs, until said upper rigid member abuts said abutment means, whereupon said lower rigid members continue to move relative to the hollow legs to the extent where said block of shock-absorbing material sandwiched in between said upper and lower rigid members, is fully compressed.

4,413,927

## ELEMENT FOR USE IN CONCRETE PILE CASTING TO ALIGN COUPLING MEMBERS ON END FITTINGS

Frank O. Silvester, Richtersgatan 12, S-412 60 Göteborg, Sweden

Filed May 20, 1982, Ser. No. 380,241

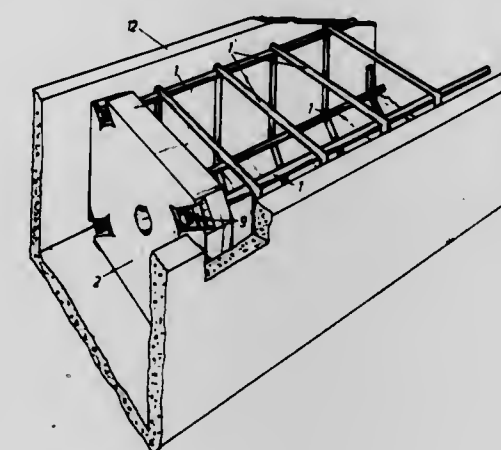
Int. Cl.<sup>3</sup> E02D 5/30, 5/34

U.S. Cl. 405—252

2 Claims

1. An element for use in concrete pile casting to align cou-

pling members on end fittings during the pile casting operation, comprising key grooves formed in said end fittings, locking keys designed, when two concrete pile sections are to be joined together in end-to-end position, to engage in said key grooves to interconnect the end fitting at one of the ends of one of said concrete pile sections with a matching end fitting arranged at the opposed end of the other one of said two concrete pile sections, a through-passage at the bottom of each one of said key grooves, a recessed seat in said through-passage, said seat arranged to accommodate therein one of said coupling mem-



bers, said coupling member resting freely in said seat, one such coupling member being coupled to each one of the reinforcement iron rods extending lengthwise through said concrete pile sections, the improvement comprising

a presser means, a support member placed in one of said key grooves formed in said end fittings, said presser means extending through said support member, said support member arranged to be pressed against the free end of said coupling member while the side faces of the associated one of said key grooves serve as back-up faces to said support member.

4,413,928

## REINFORCING AND CONFINING EARTH FORMATION

Michael C. Tucker, Halliburton Services, Athens Tower B, Suite 506, 610 Athens, Greece

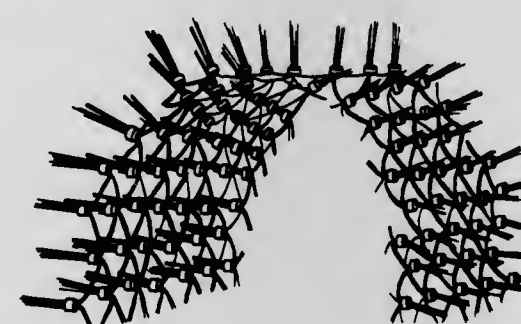
Filed Nov. 17, 1980, Ser. No. 207,554

Claims priority, application South Africa, Nov. 23, 1979, 79/6363

Int. Cl.<sup>3</sup> E21D 20/02

U.S. Cl. 405—260

17 Claims



1. A method of reinforcing and confining an earth formation by means of a plurality of restraining units, the units having retaining limbs for insertion into prepared holes in the formation and transverse portions for lying substantially against the formation, and means associated with said retaining limbs for inhibiting removal thereof from the holes, which method comprises forming an array of said holes in the formation with the spacing between said holes being substantially equal to the lengths of said transverse portions, inserting the retaining limbs into said holes with a plurality of said limbs in a majority of said holes, disposing the transverse portions of the units in contact with the surface of the formation, each of the trans-

verse portions extending to different other holes to form a mesh-like arrangement anchored at least partially by the retaining limbs.

4,413,929

## ROCK BOLT

Tomio Kigawa, Matsubara, and Kouetsu Fukui, Kawasaki, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 217,145, Dec. 16, 1980, abandoned.

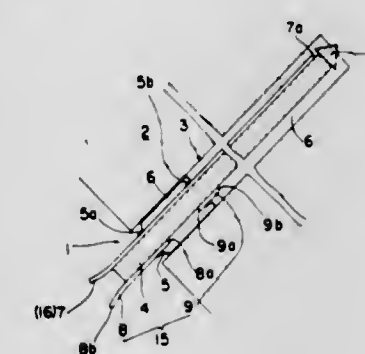
This application Mar. 1, 1983, Ser. No. 471,136

Claims priority, application Japan, Dec. 18, 1979, 54-165347

Int. Cl.<sup>3</sup> E02D 20/02

U.S. Cl. 405—260

10 Claims



1. A rock bolt for insertion into a hole comprising:

- a rock bolt body;
- inflatable bag means surrounding the outer periphery of said body adjacent one end thereof;
- retainer means for securely fixing said bag means to said body;
- injection tube means extending from adjacent said one end of said body through said bag means for communicating with the interior of said bag means for feeding packing material into said bag means to inflate said bag means and also for communicating with the space defined between the walls of said hole, said bolt body, and said bag means for feeding said material into said space after said bag means is inflated, said tube means comprising a tube having a cut-out portion in said bag means; and
- exhaust tube means extending through said bag means from adjacent said one end of exhausting air from said space as said material is fed into said space.

4,413,930

## METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Cresson, Pa.

Continuation-in-part of Ser. No. 209,134, Nov. 21, 1980. This application Feb. 27, 1981, Ser. No. 238,760

Int. Cl.<sup>3</sup> E21D 20/02

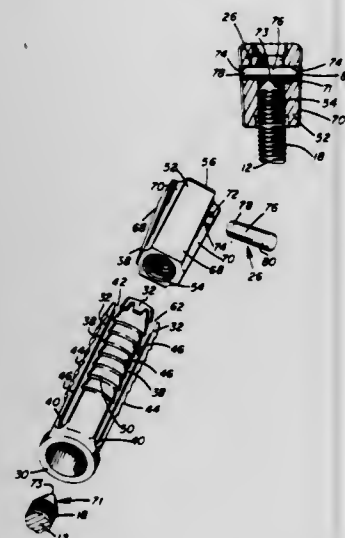
U.S. Cl. 405—261

15 Claims

1. Apparatus for supporting a rock formation comprising, an elongated rod positioned in a bore hole in the rock formation, said rod having a threaded portion with a tapered end portion extending from said threaded portion, a tensioning element having an internally threaded bore, said rod threaded portion engaging said tensioning element internally threaded bore, a stop means extending through said tensioning element for preventing relative rotation between said rod and said tensioning element upon application of a predetermined torque in a preselected direction to said rod to rotate together said tensioning element, stop means and rod, said rod tapered end portion abutting said stop means to obstruct movement of said rod tapered end portion be-



yond a preselected point in said tensioning element internally threaded bore,  
anchor means for anchoring said rod in the bore hole,  
said stop means being carried by said tensioning element in a position removed from contact with said anchor means, and



said stop means being displaced by said rod tapered end portion from a position preventing relative rotation between said rod and said tensioning element when said torque continuously applied to said rod in said preselected direction exceeds said predetermined torque to place said rod under tension in the bore hole.

4,413,931

#### METHOD FOR TREATING SUBTERRANEAN FORMATIONS

Roderick A. McDonald, Bothell, Wash., assignor to Univar Corporation, Seattle, Wash.

Filed Feb. 2, 1981, Ser. No. 230,618

Int. Cl.<sup>3</sup> E02D 3/12; C09K 17/00

U.S. Cl. 405—264 9 Claims

1. A method for treating a subterranean formation comprising the steps of:

placing in or adjacent said formation a particulate material coated with a two-step, curable, novolac resin comprising the reaction product of an aldehyde with a phenolic compound, and thereafter causing said resin to cure in said formation and thereby bonding said particulate material together, said resin having an insolubility parameter (p) greater than about 1.0.

4,413,932

#### PNEUMATIC CONVEYORS FOR FLOW OF GAS-BORNE PARTICULATE MATERIAL

Joseph Kobak, Wallsend, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Continuation-in-part of Ser. No. 221,790, Dec. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 58,262, Jul. 17, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,197

Claims priority, application Australia, Aug. 8, 1978, PD5419

Int. Cl.<sup>3</sup> B65G 53/16

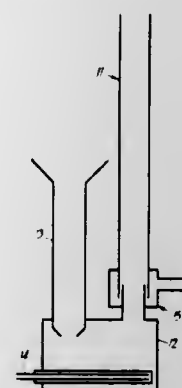
U.S. Cl. 406—138 18 Claims

1. A method of transporting particulate material, said method comprising:

(a) entraining said particulate material in a lean phase with a main flow of gas;  
(b) delivering said main flow of gas along an elongate duct at a low pressure via a duct inlet of said duct;

(c) introducing an auxiliary gas stream at a low pressure into said elongate duct adjacent to said duct inlet to define a low pressure non-boosting annular stream of auxiliary gas directed along at least part of a periphery of said duct;

said particulate material being transported along said duct entrained in lean phase by said main flow of gas;



said annular stream of auxiliary gas at least substantially preventing collection and recirculation of particulate material without boosting blow of said particulate material along said elongate duct.

4,413,933

#### PNEUMATIC SUCTION DEVICES

Theodor Hesse; Helmut Rieke, and Johannes Kleine-König, all of Melle, Fed. Rep. of Germany, assignors to Engelbrecht & Lemmerbrock GmbH & Co., Melle, Fed. Rep. of Germany

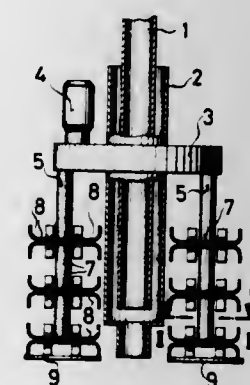
Filed Sep. 25, 1981, Ser. No. 305,393

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037461

Int. Cl.<sup>3</sup> B65G 53/42

U.S. Cl. 406—152

10 Claims



1. In a pneumatic suction device for removing slowly movable material from enclosed spaces, of the kind including a suction pipe secured to a pivotable arm, and having a suction aperture and a supply of air arranged to be fed to the suction aperture thereof, and provided with peripherally distributed driven tools for loosening the material, the improvement which comprises at least three axially parallel drivable spindles distributed around and above the suction aperture of said suction pipe, said spindles carrying, one above the other, tools for loosening the material sideways for conveying it to said suction aperture and said suction pipe, adjacent ones of said spindles being rotatable in opposite directions, but at least two adjacent spindles out of an odd number of said spindles being rotatable in the same direction.

4,413,934

#### MANIFOLD TO UNIFORMLY DISTRIBUTE A SOLID-LIQUID SLURRY

Kenneth C. Kern, Lake Hiawatha, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 20, 1981, Ser. No. 285,003

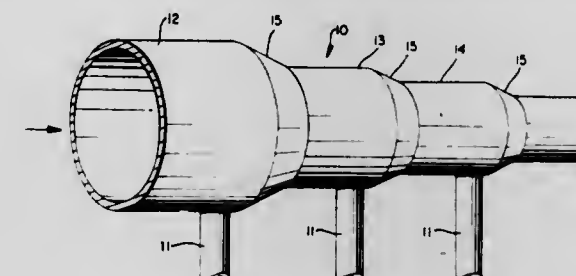
Int. Cl.<sup>3</sup> B65G 53/52

U.S. Cl. 406—155

2 Claims

1. A manifold for uniformly distributing a coal-liquid slurry

including coal particles of different size ranges mixed and suspended in said liquid, comprising, in combination, main conduit means conveying said coal-liquid slurry and including sections of progressively decreasing diameter, each said section being joined to its adjacent section by a converging truncated conical member means, and a plurality of downwardly oriented distributor conduits attached to the sections of said main conduit means immediately adjacent and upstream of



each of said conical member means, said distributor conduits intersecting said main conduit means and terminating in sharp edge terminal portions with said main conduit means to thereby create turbulence and a pressure drop in the main conduit means adjacent the end of each said distributor conduits whereby improved and substantially uniform coal particle size distribution will result in each of said distributor conduits.

4,413,935

#### FLOW SPLITTER FOR DIVIDING A STREAM OF PULVERULENT MATERIAL INTO MULTIPLE STREAMS

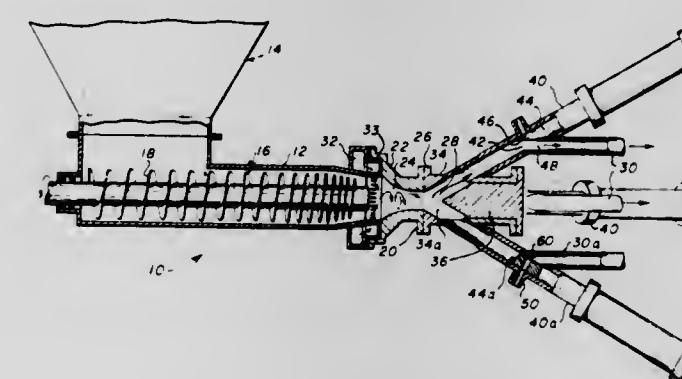
Donald A. Smith, Haddam, and Gary F. Lexa, Rocky Hill, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 29, 1981, Ser. No. 278,242

Int. Cl.<sup>3</sup> B65G 53/56

U.S. Cl. 406—181

7 Claims



1. A flow splitter for dividing a stream of pulverulent material into a multiplicity of substantially equal substreams, the flow splitter comprising:

- an inlet nozzle defining an open-ended mixing chamber for receiving a stream of pulverulent material and a stream of air for intermixing therein;
- a distributor housing defining a substantially cylindrical distribution chamber having an inlet for receiving the mixture of pulverulent material and air from the inlet nozzle and a plurality of outlet openings equally spaced about the periphery of and opening from the opposite end thereof;
- a plurality of outlet valve assemblies equal in number to the number of outlet openings in the distribution chamber, each outlet valve assembly defining a flow conduit having an inlet mated to an outlet opening in the distribution chamber and an outlet opening;
- a plurality of valve members, one per valve assembly, each valve member slidably disposed within the flow conduit of a valve assembly and retractably movable

therein from the inlet thereof when extended to a point downstream of the outlet thereof when retracted, the end face of each valve member contoured to conform with the inner surface of the cylindrical distribution chamber to which the valve assembly mates when the valve member is in its extended position;

e. purge means opening into the flow conduit of each valve assembly at a location opposite the outlet opening of the flow conduit; and

f. a hole extending transversely through each valve member so as to communicate the purge means with the outlet opening of the flow conduit when the valve member is in its extended position.

4,413,936

#### CONTROL DEVICE IN A MACHINE TOOL

Gerhard Kuhlmann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

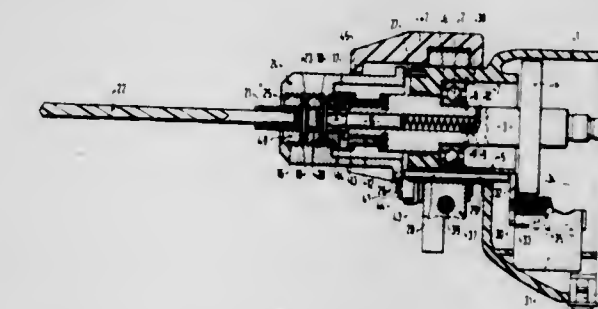
Filed Oct. 20, 1980, Ser. No. 199,106

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943508

Int. Cl.<sup>3</sup> B23B 45/00, 47/00

U.S. Cl. 408—8

23 Claims



1. In a machine tool, particularly for a hand tool machine, including a housing, drive means with a rotary spindle, and tool-receiving means, a control device comprising control means including a motor regulator and a hand switch bridged to said regulator and adapted to adjust the drive means to a predetermined rotation speed; a control element on said tool-receiving means, said control element being an elongated sleeve provided with outwardly radially extending flanges having a control face and arranged to be adjusted in an axial direction; and transmitting means operatively interconnected between said control element and said control means and operative for transmitting forces exerted on said tool-receiving means during operation to said control means, said transmitting means including a longitudinal pin slidably positioned within the housing and having a first end portion arranged to engage said control face so that the position of said pin defines the adjustment of said drive means to a predetermined rotation speed.

4,413,937

#### ELEMENTS FOR A TOOL SYSTEM

Gunter E. Gutsche, 5330 Forget, St-Louis Terrebonne, Quebec J0N 1N0, Canada

Filed Dec. 18, 1980, Ser. No. 217,798

Int. Cl.<sup>3</sup> B23B 45/00, 31/02

U.S. Cl. 408—239 A

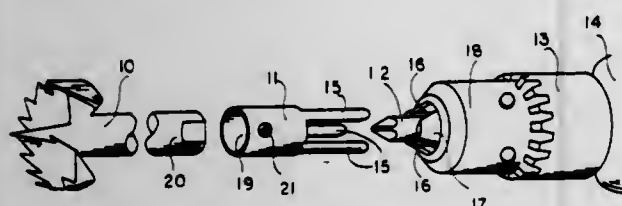
24 Claims

1. An element for a tool system having an axis of rotation and fitting a chuck, said chuck having convergeable gripping means and a first tool bit rigidly held therein said gripping means having walls defining at least two circumferentially spaced, axially extending recesses, said element comprising:

- at least one axially extending prong at one end and substantially parallel to and at a selected distance from said axis of rotation, said prong dimensioned and positioned to slidably fit over said first tool bit and to fit slidably into one of said recesses and rotationally about one of said walls,



said prong being slidably receivable into a space defined by a sector of 60° on said axis of rotation,  
 (b) centering means that are dimensioned to slidably fit and at least partially enclose the first tool bit and



(c) working means at the other end of said element for performing a work operation.

4,413,938

## SPINDLE MOTOR POWERED DRAWBAR

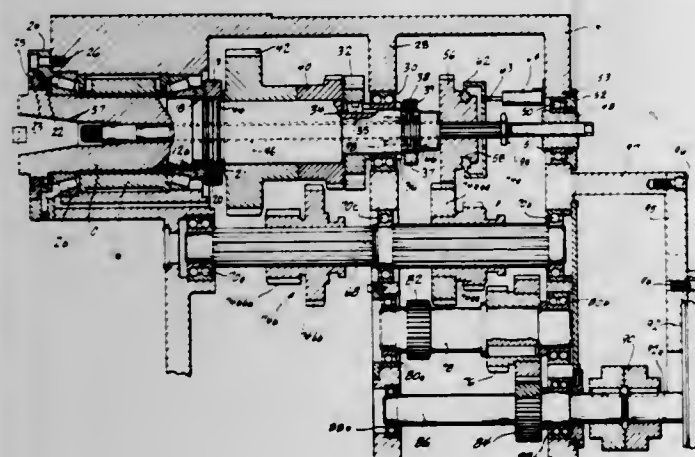
Steven R. Kuczynski, New Holstein, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 332,608

Int. Cl.<sup>3</sup> B23C 5/26

U.S. Cl. 409—233

7 Claims



1. In combination with a machine tool having a rotatably driven, tool receiving spindle, a drawbar coaxially disposed in said spindle for threaded engagement into or out of a toolholder disposed within said spindle so as to engage and disengage, respectively, said toolholder, a source of rotational energy, and a gear train for coupling said source of rotational energy to said spindle, a mechanism for rotatably driving said drawbar into or out of said toolholder from said source of rotational energy comprising:

gear means carried on that portion of said drawbar extending beyond said spindle for engaging said gear train;  
 means for biasing said gear means out of engagement with said gear train; and  
 shifter means for urging said gear means against said biasing means to bring said gear means into engagement with said gear train so that said drawbar can be rotatably driven through said gear means and said gear train from said source of rotational energy.

4,413,939

## BAR STOCK FEEDER

John M. Peris, Elmira, N.Y., assignor to Harding Brothers, Inc., Elmira, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,557

Int. Cl.<sup>3</sup> B65H 5/16

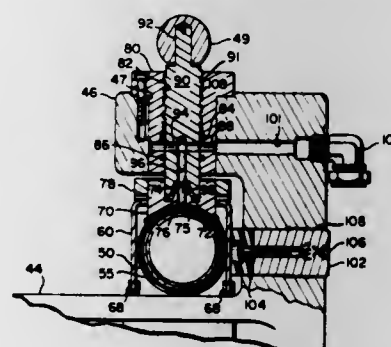
U.S. Cl. 414—17

15 Claims

1. A bar stock feeder assembly for use with a machine tool, comprising:

a. a bar stock feed tube assembly including an inner tube and a slightly larger outer concentric therewith,  
 b. a pneumatically operative plunger assembly disposed

within the inner tube for engaging bar stock and moving said bar stock toward the machine tool,  
 c. a support standard assembly for supporting the feed tube assembly horizontally and in alignment with the machine tool,  
 d. the support standard assembly including a lower support,  
 e. a vertical standard extending upwardly from the lower support and having a horizontally extending carrier member,  
 f. the carrier member having a horizontal feed tube supporting surface and an upright bar tube section which extends over and clear of the horizontal bar supporting surface,



g. the bar tube retaining section having an operable locking assembly and including an integral spiral threaded plunger which moves downwardly toward the horizontal feed tube supporting surface,  
 h. the bar stock feed tube assembly having an upwardly extending locking and feeder seat engaging means which is axially aligned with said spiral threaded plunger for engaging said spiral threaded plunger when the feed tube assembly is aligned with the machine tool, and which has a central receiving conduit, and  
 i. the spiral threaded plunger having a central supply conduit which is moved into direct communication with the feeder receiving conduit when the spiral threaded plunger is lowered into locking engagement with the feeder seat.

4,413,940

## ROLLED BALE HANDLER

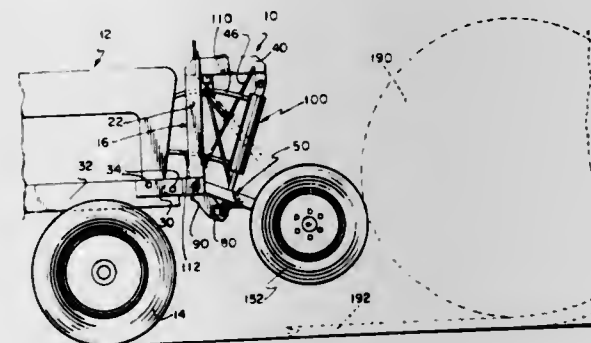
Jesse M. Southard, and John E. Diehl, both of Rte. #1, Hoyt, Kans. 66440

Filed Mar. 4, 1981, Ser. No. 240,278

Int. Cl.<sup>3</sup> A01D 87/12

U.S. Cl. 414—24.6

13 Claims



1. A bale roller attachment for tractors and the like, comprising an upstanding and transversely disposed rigid support frame provided with means adapted for securely mounting the same in fixed relation on the front end of a tractor, an auxiliary open and rigid frame having an overall generally rectangular and planar configuration, said auxiliary frame being disposed forwardly of the support frame and having one end pivotally mounted to a lower portion of the support frame for movement about a transverse and horizontal axis between an upwardly and forwardly inclined retracted position and a relatively

lower forwardly extending operative position, means operatively connecting the support and auxiliary frames at locations that are respectively remote from the axis for selectively supporting the auxiliary frame from the support frame in its retracted and operative positions, said auxiliary frame having an end remote from the axis that has as its transverse and forward extremities a pair of oppositely and transversely extending stub axles, with said stub axles being horizontal and aligned with each other in fixed parallelism to said axis, and a pair of wheels freely and independently journaled upon said stub axles, the arrangement being such that space forward of the auxiliary frame is substantially unobstructed between the wheels.

4,413,942

## LIFT-TYPE CAR PARK

Anton Roth, deceased, late of Hanau am Main, Fed. Rep. of Germany, and by Guenther Moeller, executor, Wuelfrath, Fed. Rep. of Germany, assignors to Mercator Gesellschaft für Entwicklung und Technik mbH, Dreieich, Fed. Rep. of Germany

Continuation of Ser. No. 133,411, Mar. 24, 1980, abandoned.

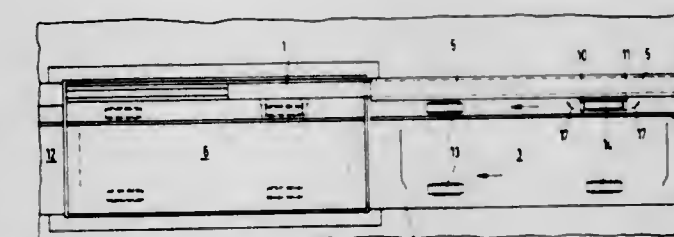
This application Sep. 30, 1982, Ser. No. 428,943

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911182

Int. Cl.<sup>3</sup> E04H 6/00

U.S. Cl. 414—253

4 Claims



4,413,941

## MACHINE TOOL SUPPORT TABLE AND FEEDING DEVICE

Horst Kollmann, Dornbirn, Austria, assignor to Firma Schelling & Co., Schwarzach, Austria

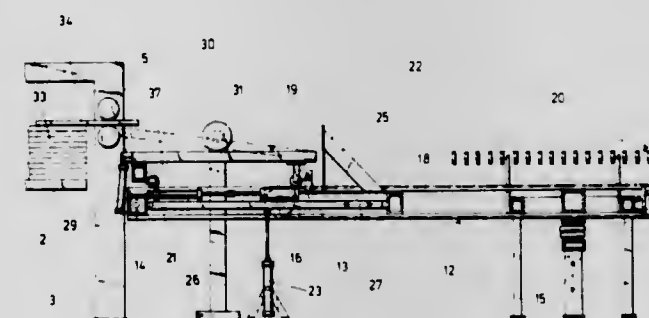
Filed Mar. 27, 1981, Ser. No. 248,478

Claims priority, application Austria, Mar. 31, 1980, 1715/80

Int. Cl.<sup>3</sup> B65H 31/30

U.S. Cl. 414—35

5 Claims



1. Apparatus for feeding planar workpieces in a machine tool assembly, particularly upon a worktable for a cutting saw, comprising: support table means including a plurality of rollers arranged in adjacent rows and defining a support plane for said workpieces; feeding means for feeding said planar workpieces into said apparatus; reciprocating carriage means having a grated support surface operably interposed between said feeding means and said support table means for delivering said planar workpieces to said support table means when said carriage means is moved in a feeding direction; tracks extending between said feeding means and said support table means movably mounting said carriage means thereon, said carriage means being arranged on said tracks to have said grated support surface vertically adjustable in height between a raised position located above said support plane and a lowered position located below said support plane; and alignment stop means arranged to be moved between said carriage means and said support table means when said carriage means is moved against said feeding direction and to be pivoted out of the path of said carriage means when said carriage means is moved in said feeding direction; said grated support surface of said carriage means being composed of a plurality of girders extending in the feeding direction of said carriage means and spaced apart from each other wherein at least a portion of said plurality of girders are adapted to be raised at their ends closest to said feeding means; said upwardly movable ends of said girders being connected with each other by a transverse girder supported by a lifting device which is fixedly mounted sidewise of said carriage means.

1. A lift type car park for removably storing a plurality of wheeled vehicles, said car park having:

an entrance; at least one transfer location at said entrance, said entrance transfer location including a floor for supporting wheeled vehicles; a plurality of parking spaces disposed on levels spaced vertically from said entrance transfer location floor;

at least one movable platform means which can be aligned with said floor and each of said levels for transporting motor vehicles from said entrance transfer location to said levels;

said entrance transfer location having a vehicle position and a passenger entry and exit position alongside said vehicle position to permit passengers to enter and exit a vehicle in said vehicle position;

a tunnel member mounted to and rising above said floor in said vehicle entry and exit position, said tunnel member having a slot shaped aperture disposed in a side of said tunnel facing said vehicle position and aligned with the horizontal direction of transport of said motor vehicle, said tunnel member having a substantially flat continuous upper surface above said aperture for supporting passengers entering and exiting a vehicle, said tunnel member having an entry opening facing said platform means;

telescopic means mounted on said platform, said telescopic means being movable from a retracted position in which said telescopic means is completely received on said platform to an extended position; said tunnel member being aligned with said telescopic means when said platform is aligned with said floor such that said telescopic means is received in said tunnel through said entry opening when in the extended position;

guiding and gripping means extendable through said slot shaped opening and connected to said telescopic means for removably engaging at least one wheel of said motor vehicle at a position above said floor and rolling said vehicle along said floor on its own wheels onto said platform when said telescopic means is moved from said extended position to said retracted position; and wheel guide means disposed adjacent tunnel member for guiding the wheel of said vehicle as it moves along said floor.



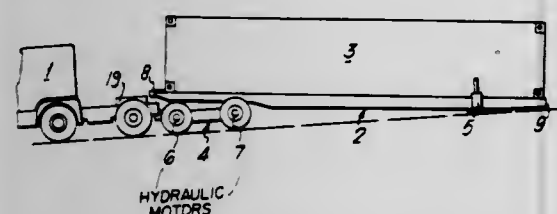
4,413,943

# METHOD AND APPARATUS FOR LOADING AND UNLOADING A LENGTHY OBJECT FROM A TRANSPORT VEHICLE

Leo L. Liljestrom, Renvallinkuja 4, 00840 Helsinki 84, Finland  
Continuation-in-part of Ser. No. 91,532, Nov. 5, 1979,  
abandoned. This application Jul. 9, 1981, Ser. No. 281,912  
Claims priority, application Finland, Nov. 8, 1978, 783399  
Int. Cl.<sup>3</sup> B60P 1/28

U.S. Cl. 414—475

5 Claims



1. A method of loading a lengthy object onto a transporting vehicle comprising a tractor and a trailer having adjustable support legs at its rear end, a bogie wheel assembly movable in the longitudinal direction of the trailer, and a winch for pulling the object onto the trailer, comprising the steps of:

supporting the rear end of the trailer by means of its support legs;

shifting the bogie wheel assembly to the front of the trailer; decoupling the tractor from the trailer as the bogie wheel assembly nears the front of the trailer; coupling the bogie wheel assembly to the tractor; moving the tractor forward from beneath the trailer; lowering the rear end of the trailer to the ground; and pulling the object onto the trailer by means of the winch.

3. Apparatus for facilitating the loading and unloading of a trailer of a tractor-trailer combination, comprising:

means to couple and decouple the tractor and trailer; adjustable support legs disposed at the rear end of the trailer; a bogie wheel assembly normally attached to the rear end of the trailer and movable to the front end of the trailer a distance sufficient to push the tractor from beneath the trailer so that the front end of the trailer is supported by the bogie wheel assembly alone;

means for moving the bogie wheel assembly along the trailer; and

means for coupling the bogie wheel assembly to the tractor when the bogie wheel assembly is moved to its forward position.

4,413,944

# TRACTOR FRONT LOADER WITH LOCKING STRUT

Anthony D. Coe, Manchester, England, assignor to David Brown Tractors Ltd., Huddersfield, England  
Filed Mar. 3, 1981, Ser. No. 240,058  
Claims priority, application United Kingdom, Mar. 14, 1980, 8008806

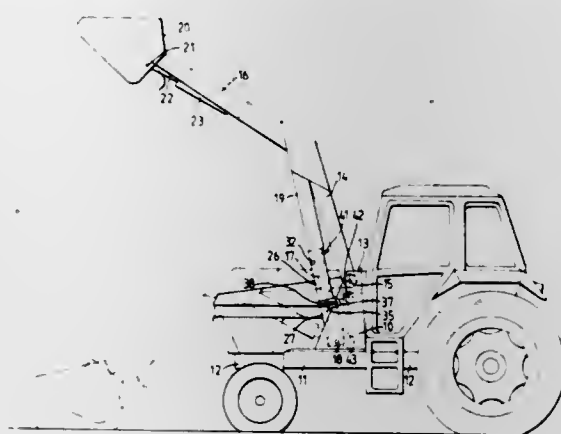
Int. Cl.<sup>3</sup> B66C 23/36

U.S. Cl. 414—685

4 Claims

1. A tractor front-end loader having support frame means comprising two channel structures adapted to be rigidly secured to opposite sides of the tractor, respective parallel interconnected booms pivotable on said structures between lowered and raised positions, respective hydraulic ram-and cylinder assemblies for pivoting said booms, and at least one telescopic locking strut comprising mutually slideable members which is housed partially within one of the channel structures and is pivotable thereon between a retracted inoperative position in which it is secured to said one structure and an extended operative position in which it locks said booms in raised position, wherein one of the mutually slideable members is pivotally mounted on said one structure by a part-circular surface formed at one end of said one member and extending through an arc of more than 180° which co-operates with a circular boss forming part of said one structure and provided with a flat

on its periphery, said boss housing a pivot pin which connects the ram of the associated ram-and-cylinder assembly to said one structure and the arrangement being such that the telescopic locking strut is removable from the loader by first



4,413,945

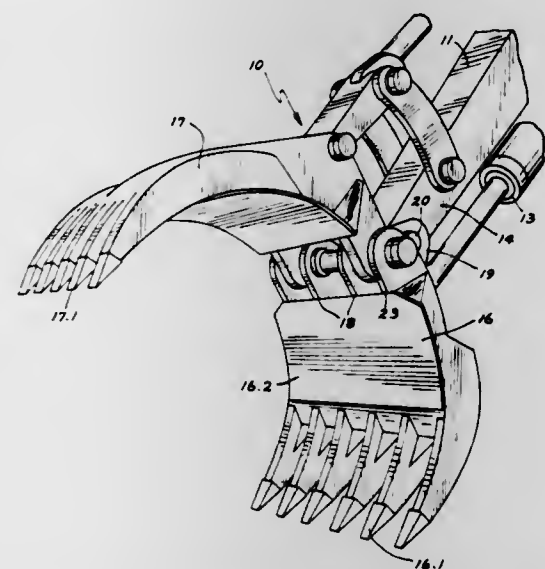
# GRAPPLE RAKE FOR BACKHOE

Roy E. LaBounty, 1607 - 8th Ave., Two Harbors, Minn. 55616  
Filed Sep. 28, 1981, Ser. No. 305,946

Int. Cl.<sup>3</sup> B66C 3/16

U.S. Cl. 414—739

5 Claims



1. A grapple rake for attachment onto the end of the dipper stick of a backhoe, comprising

a single generally upright back jaw to traverse the dipper stick and having upper and lower ends, lateral edges and front and back sides, the front side being concavely curved,

a swingable front jaw to traverse the end of the dipper stick and having inner and outer ends, lateral edges and front and back sides, the front side being concavely curved to cooperate with the back jaw,

attachment means of the upper end of the back jaw and on the inner end of the front jaw and including a swing shaft for swingably interconnecting the jaws together,

positioning means on the jaws and dipper stick for swinging both jaws relative to the dipper stick,

a pair of parallel mounting ears on the back jaw with apertured portions protruding rearwardly of the back side of the back jaw in a spaced relation to each other to receive the end of the dipper stick therebetween, and the apertured portions having a pivot pin in the apertures thereof and extending through the dipper stick to pivotally carry

the back jaw and permit the back to lie against the dipper stick while the front jaw is used for raking, the mounting ears having inner faces confronting each other at the end of the dipper stick therebetween and also having outer faces, and a pair of rigid depending ears on the inner end of the front jaw and respectively facing the outer faces of said adjacent mounting ears at opposite sides of the dipper stick, the swing shaft swingably connecting the depending ears with the mounting ears and being movable around the end of the dipper stick as the back jaw is swung, the front jaw thereby being adapted to swing through a full range of opening and closing regardless of whether the back jaw is oriented transversely of the dipper stick or is laid back along the dipper stick.

4,413,946

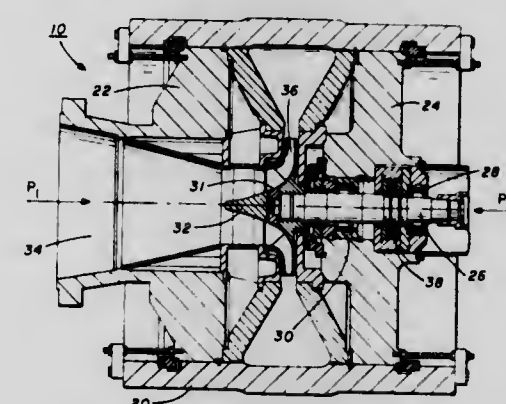
# VENTED COMPRESSOR INLET GUIDE

Dale F. Marshall, Allegany, and Ted C. Evans, Olean, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.  
Filed Aug. 20, 1981, Ser. No. 294,592

Int. Cl.<sup>3</sup> F04B 15/00

U.S. Cl. 415—28

7 Claims



1. In a centrifugal compressor having an overhung rotor including a shaft mounted for rotation, an impeller secured to said shaft for rotation therewith and a thrust bearing supporting said shaft against thrust loads imposed thereon, the improvement comprising apparatus for limiting the thrust load imposed against said rotor and comprising means in combination for controllably venting the low pressure side of the compressor exposed to said rotor and including:

(a) an aperture defined through a compressor wall from an inlet on the low pressure side of the compressor;

(b) labyrinth means for substantially sealing flow from said aperture to permit only a predetermined controlled leakage therepast;

(c) conduit means for communicating leakage from the outlet of said aperture to a relatively lower pressure receiving source; and

(d) presettable control means operative at a set point correlated to the allowable thrust load design capacity of said thrust bearing and responsive to values of pressure in said conduit means to open and close said conduit means to leakage flow at pressure above and below the set point, respectively.

4,413,947

# FAN ARRANGEMENT

Nakanobu Seki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 10, 1981, Ser. No. 300,743

Claims priority, application Japan, Oct. 24, 1980, 55-151891

Int. Cl.<sup>3</sup> F001 1/02; F01P 7/10

U.S. Cl. 415—182

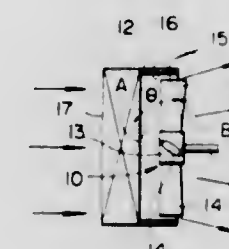
7 Claims

1. A fan arrangement comprising:

(a) a rotatable fan (10);

(b) a plurality of blades (14) formed on the fan, the blades extending radially and being spaced circumferentially, the blades also extending perpendicularly to the radial direc-

tion, a base angle  $\theta$  of each blade being set at a value of 55° to 75°, the base angle  $\theta$  being defined by the angle at which lines A and B intersect where the line A corresponds to the longest chord of the transverse section of each blade at its base and the line B is the line of intersection between the section plane for the blade and perpendicular plane with respect to the fan axis of rotation; and (c) a shroud (12) located on the periphery of the fan so as to cover a part of the fan in such a manner that the fan is



partially exposed at its downstream part and a clearance is formed between the shroud and the fan, the covering percentage of the shroud relative to the fan being set at a value of 50% to 90%, the covering percentage being defined as  $100 \cdot L_2 / L_1$ , where  $L_1$  is the axial width of the outer edge of each blade and  $L_2$  is the axial distance of the shroud from the downstream end thereof to a point in the same axial position as the upstream end of the outer edge of each blade, the optimum covering percentage depending on the base angle  $\theta$ .

4,413,948

# DOUBLE SHELL STEAM TURBINE HOUSING ASSEMBLY

Gerhard Purr, Mülheim-Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim-Ruhr, Fed. Rep. of Germany

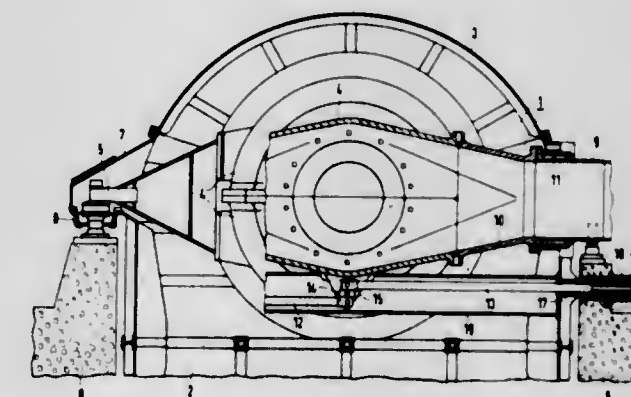
Filed Jul. 21, 1982, Ser. No. 400,582

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130376

Int. Cl.<sup>3</sup> F01D 25/26, 25/28

U.S. Cl. 415—219 R

6 Claims



1. Double shell steam turbine housing assembly having an inner housing and an outer housing separated from the inner housing, a base plate and lateral support arms supporting the inner housing on the base plate, comprising centering guide means for maintaining the inner housing in a central position, said centering guide means including a double-armed lever connected to the inner housing and a pair of elongated guide bars secured, respectively, at mutually opposite sides of the housing assembly to the base plate and articulately connected, respectively, to opposite ends of said double-armed lever, said guide bars extending through the outer housing.



4,413,949

## ROTOR BLADE FOR GAS TURBINE ENGINES

Alexander Scott, Bristol, England, assignor to Rolls Royce (1971) Limited, London, England

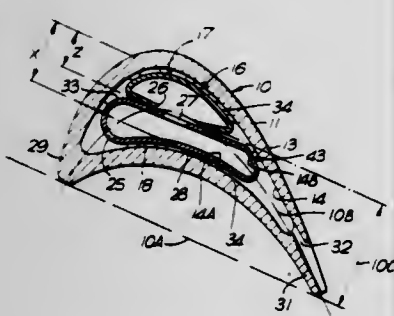
Filed Sep. 30, 1975, Ser. No. 618,688

Claims priority, application United Kingdom, Oct. 17, 1974, 44948/74

Int. Cl.<sup>3</sup> F01D 5/18

U.S. Cl. 416—96 A

7 Claims



1. Rotor blade for gas turbine engines comprising a hollow aerofoil (11), a first hollow insert (17) situated between opposite first and second interior surfaces (14A, 14B) of the aerofoil in an operative position in which the insert is in closer proximity with the second (14B) than the first (14A) surface, a root (12) having an opening (15) including opposite first and second surfaces (15A, 15B) which are spaced apart by a distance greater than the width of the first insert but less than the spacing between surfaces of said interior, the second surface (14B) of said interior defining a recess (14C) in respect of the second surface (15B) of the opening, a second hollow insert (18) situated in an operative position between the first insert (17) being insertable through the opening (15), the first insert being displaceable laterally into said recess to attain said operative position thereof and the second insert (18) being insertable after said lateral displacement of the first insert, and passage means (24) for introducing cooling air into the interior of the inserts.

4,413,950

## HALL SWITCH PUMP

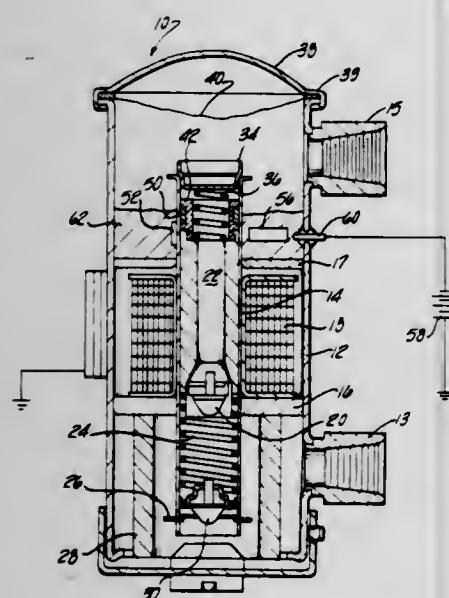
Michael V. Wiernicki, Trumansburg, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Sep. 25, 1980, Ser. No. 191,055

Int. Cl.<sup>3</sup> F04B 17/04; H02K 33/10

U.S. Cl. 417—53

16 Claims



1. A method for reciprocating a magnetically permeable piston member along a predetermined path in an electromagnetic device having a resilient member urging said magnetically permeable piston member in one direction along said predetermined path and a solenoid coil for pulling said magnetically permeable piston member in the opposite direction

against the force of said resilient member, said method comprising the steps of:

reciprocating a magnet attached to said magnetically permeable piston member along said predetermined path, the magnetic poles of said magnet being arranged parallel to the direction of motion of said magnetically permeable piston member along said predetermined path;

placing a hall effect switch sensitive to the direction of the magnetic field generated by said magnet intermediate the two extremes of the motion of said magnet as it is reciprocated with said magnetically permeable piston member to generate a differential signal having a magnitude and polarity indicative of the position of said magnetically permeable piston member along said path;

activating an electronic switch circuit to energize the solenoid coil in response to said differential signal having a magnitude and polarity indicative of said magnetically permeable piston member being pushed to a position near said one end of said predetermined reciprocation path of said magnet under the influence of said force generated by said resilient member, said step of activating said electronic switch means to energize the solenoid coil comprising the steps of detecting when said differential signal has a predetermined magnitude and a first polarity to generate a SET signal, switching a bi-stable means to a first state in response to said SET signal to generate a biased signal, connecting a transistor means in series with said solenoid coil to control the current flow therethrough, and forward biasing said transistor means to its conductive state with said biased signal to energize said coil; and

activating said same electronic switch circuit to de-energize said solenoid coil in response to said signal having a magnitude and polarity indicative of said magnetically permeable piston member being pulled to a position near said other end of said predetermined reciprocation path of said magnet under the influence of said force generated by said energized coil, said step of activating said electronic switch circuit to deenergize said solenoid coil comprising the steps of detecting when said differential signal has a second predetermined magnitude and a reversed polarity opposite said first polarity to generate a RESET signal, switching a bi-stable means to its second state in response to said RESET signal to terminate said biased signal, and backward biasing said transistor means with the termination of said biased signal to its nonconductive state to deenergize said solenoid coil;

wherein said hall effect device produces a first signal at a first output terminal and a second signal at a second output terminal and said differential signal is the difference between said first and second signals, said first step of detecting compares the magnitude of difference between said first and second signal having a predetermined polarity to generate said SET signal; said second step of detecting compares the magnitude of the difference between said first and second signal having an opposite polarity to generate said RESET signal.

4,413,951

## CAPACITY CONTROL ARRANGEMENT FOR FIXED SPEED COMPRESSOR

Clifford W. Allen, Jr., Lexington, Ky., assignor to Lexair, Inc., Lexington, Ky.

Filed Oct. 6, 1980, Ser. No. 194,021

Int. Cl.<sup>3</sup> F04B 49/02

U.S. Cl. 417—53

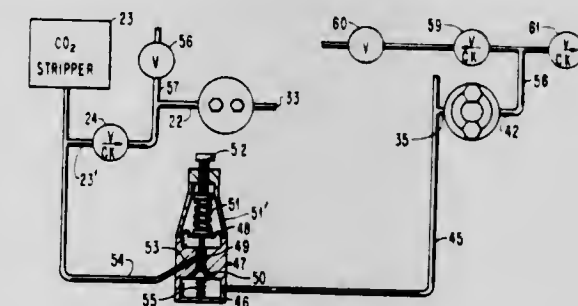
24 Claims

1. In combination:  
a compressor operating at a fixed speed;  
gas generating means producing a varying supply of gas;  
said compressor having its inlet communicating with said gas generating means to receive gas therefrom;  
said compressor including means to compress the gas entering said inlet of said compressor;

said compressor having an outlet to discharge the compressed gas;

first connecting means to provide communication between said outlet of said compressor and said inlet of said compressor exterior of said compressor, said first connecting means providing the sole communication between said outlet of said compressor and said inlet of said compressor;

valve means in said first connecting means to block said first connecting means when said gas generating means is supplying sufficient gas to maintain the pressure of the gas



at the inlet of said compressor above a predetermined pressure;

said first connecting means having causing means solely therein to cause movement of said valve means to a position in which said valve means does not block said first connecting means when the pressure at the inlet of said compressor drops below the predetermined pressure;

and said causing means including means responsive solely to the pressure of the gas supplied from said gas generating means to cause movement of said valve means to the position in which said valve means does not block said first connecting means.

4,413,952

## SMALL TEMPERATURE DIFFERENTIAL HEAT-POWERED COMPRESSOR

Francis L. Burnham, Orangeburg, S.C., assignor to Orangeburg Technologies, Inc., Orangeburg, S.C.

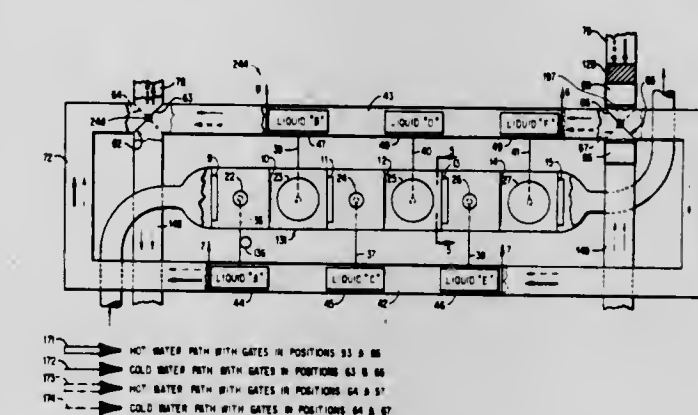
Continuation of Ser. No. 242,242, Mar. 10, 1981, Pat. No. 4,372,114. This application Jul. 15, 1982, Ser. No. 398,564

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> F04B 25/00

U.S. Cl. 417—253

7 Claims



1. A pump system for pumping a first fluid from a source to an output facility comprising:

a. a multiple-stage pump comprising:

(1) a plurality of pumping stages; and  
(2) a plurality of check valves, one of said plurality of check valves being located on the input and output of said multiple-stage pump and between each of said plurality of pumping stages;

b. each of said plurality of pumping stages comprising:

(1) a pressure chamber operable to hold said first fluid; and  
(2) a flexible member within said pressure chamber opera-

ble, when expanded, to exert pressure against said first fluid and to force said first fluid from said pressure chamber through the one of said plurality of check valves between said pressure chamber and the next pressure chamber of the next subsequent pumping stage of said plurality of pumping stages or said output, if said pressure chamber is within the last of said plurality of pumping stages, when said pressure within said pressure chamber exceeds the next pressure in said next pressure chamber or said output;

c. each of said flexible members, connected to a container which is one of a plurality of containers; and

d. a plurality of vaporizable fluids, one of said plurality of vaporizable fluids contained within each one of said plurality of containers,

whereby each said container holds one of said plurality of vaporizable fluids and when said container is subjected to a hot temperature, said one of said plurality of vaporizable fluids vaporizes causing said flexible member to expand and when said container is subjected to a cold temperature, said one of said plurality of vaporizable fluids condenses causing said flexible member to contract,

wherein each said one of said plurality of vaporizable fluids which vaporizes into said flexible member has a higher pressure, when heated to said hot temperature, than the cold pressure of the next said one of said plurality of vaporizable fluids which vaporizes into the next flexible member within said next pressure chamber or to said output, if said flexible member is within said last of said plurality of pumping stages,

wherein connected to said plurality of pumping stages are a first heat exchanger and a second heat exchanger which utilize a hot fluid to provide said hot temperature and a cold fluid to provide said cold temperature.

4,413,953

## TWO-STAGE HYDRAULIC PISTON PUMP

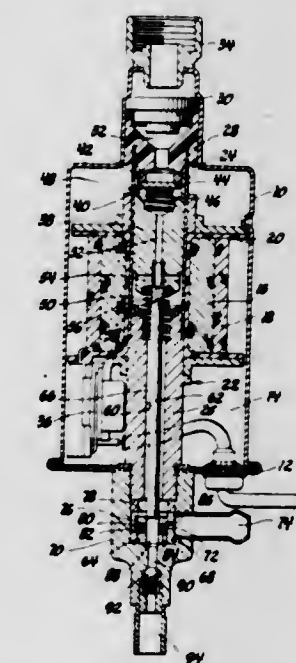
Douglas I. Fales, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 332,369

Int. Cl.<sup>3</sup> F04B 3/00, 17/04, 39/10

U.S. Cl. 417—262

4 Claims



1. A two-stage solenoid operated hydraulic pump comprising: a pump cylinder and housing assembly having a nonmagnetic pump cylinder portion; a solenoid coil surrounding a portion of said pump cylinder and housing assembly; spring means disposed in said pump cylinder; an armature piston slidably disposed in said nonmagnetic pump cylinder portion and cooperating therewith to form a first pump means operable to pump fluid through cooperation of said solenoid coil en-



zation and said spring means; an inlet valve for admitting fluid to said first pump means; a delivery passage for delivering fluid from said first pump means; second pump means including a piston secured to and reciprocable with said armature piston, a cylinder means for receiving a portion of said piston when said piston is reciprocated, said cylinder including an inlet passage in fluid communication with said delivery passage, an overflow passage for directing excess fluid delivered by said first pump means from said cylinder means and being disposed to be closed by said piston during the discharge stroke of said second pump means prior to said inlet passage being closed and outlet passage means for delivering fluid from said second pump means; and outlet valve means disposed in fluid communication with said outlet passage means for preventing discharged fluid from reentering said second pump means.

4,413,954

# SWASH-PLATE TYPE COMPRESSOR HAVING PUMPLESS LUBRICATING SYSTEM

Michio Okazaki, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

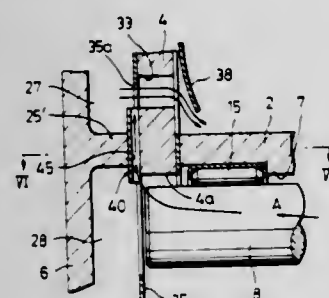
Filed Jul. 20, 1981, Ser. No. 284,694

Claims priority, application Japan, Jul. 31, 1980, 55-105267

Int. Cl.<sup>3</sup> F04B 1/16, 1/18

U.S. Cl. 417—269

6 Claims



## 1. A swash-plate type compressor which comprises:

- a cylinder block having an axial hole extending along an axis thereof, a plurality of cylinder bores axially extending there-through in circumferentially spaced arrangement, and a swash plate chamber defined therein at a substantially axial center thereof;
- a drive shaft inserted in said axial hole in said cylinder block;
- a plurality of pistons slidably mounted within said cylinder bores;
- a swash plate secured on said drive shaft at a boss thereof, said swash plate being arranged within said swash plate chamber;
- a pair of valve plates mounted at opposite ends of said cylinder block, said valve plates each having a central opening aligned with and communicating with said axial hole, a plurality of suction openings each opening in an associated one of said cylinder bores in said cylinder block, said drive shaft extending through said central opening in at least one of said valve plates;
- a pair of thrust bearings mounted at opposite ends of said boss of said swash plate for bearing thrust loads applied to said swash plate;
- a pair of radial bearings mounted in said axial hole in said cylinder block at locations close to opposite ends of said axial hole for supporting said drive shaft in radial directions; and
- a pair of passageways each including a communication passage, said communicating passage having one end opening in said central opening of an associated one of said valve plates and the other end opening in at least one of said suction openings of said associated one of said valve plates, said passageways each extending from said swash plate chamber to said at least one of said suction openings through said axial hole, said central opening and said communication passage; wherein said at least one of said suction openings has a diameter smaller than that of an associated one of said cylinder bores such that as refrigerant passes said at least one suction opening it has a flow velocity thereof increased to a value

enough to cause a considerable pressure drop in said communication passage during the suction stroke of an associated one of said pistons within said associated cylinder bore, whereby oily mist in said swash plate chamber is guided through said axial hole, said central opening, said communication passage and said at least one suction opening into said associated cylinder bore due to an increased pressure difference between the internal pressure of said swash plate chamber and pressure in said communication passage, which is caused by said pressure drop in said communication passage.

4,413,955

# SWASH PLATE COMPRESSOR

Kimio Kato; Hisao Kobayashi, both of Kariya; Takamitsu Mukai, Anjo; Hiroya Kono, Kariya, and Taku Yamamoto, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

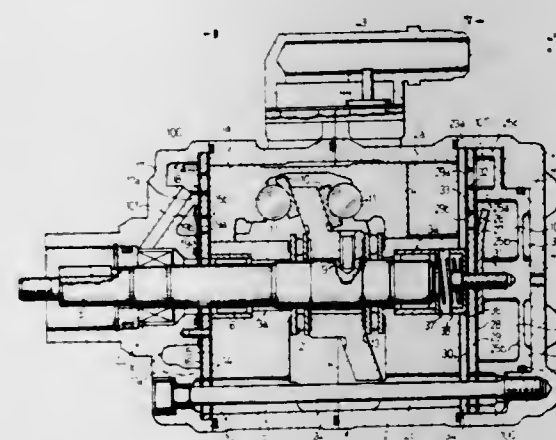
Filed Mar. 19, 1982, Ser. No. 359,951

Claims priority, application Japan, Mar. 28, 1981, 56-45864

Int. Cl.<sup>3</sup> F04B 49/02, 1/18

U.S. Cl. 417—270

5 Claims



- 1. A swash plate compressor comprising, in combination, a main body of the compressor consisting of mutually connected front and rear cylinder blocks,
- a front housing and a rear housing respectively mounted to front and rear end faces of the body member by the medium of front and rear valve plates in each of which suction ports and discharge ports are provided,
- a rotary shaft inserted into the center bore of the body member from the front housing side,
- a plurality of cylinder bores provided in said cylinder blocks for extending in the front and rear direction and parallel to and radially outwardly of said rotary shaft, a plurality of pistons mounted in each of said cylinder bores and reciprocable therein by means of a swash plate which is mounted on said rotary shaft for performing a unitary rotation therewith, and
- a suction flange and a discharge flange connected respectively to a suction passage and a discharge passage provided in the body member of the compressor, wherein the improvement comprises,
- an inner housing in the form of a bottomed cylinder mounted in the rear housing for movement axially of said rotary shaft in such a manner that the front end face of the inner housing acts for closing or exposing the rear face of the body member of the compressor through the medium of said rear valve seat,
- a discharge chamber delimited by a partition wall so as to lie centrally on the front surface of said inner housing, said discharge chamber communicating with said cylinder bores through discharge ports in said valve plate, said discharge chamber also communicating with said discharge passage,
- a suction chamber delimited on the front surface of the inner housing by said partition wall so as to lie radially outwardly of said discharge chamber, said suction chamber communi-

cating with said cylinder bores through suction ports in said valve seat, said suction chamber also communicating with said suction passage,

spring means arranged in said body member for normally urging said inner housing and said valve plate on the front surface thereof towards rear;

a pressure chamber defined between the rear surface of said inner housing and the inner surface of the rear housing, said pressure chamber being operative upon increase in the inside pressure to shift said inner housing and the rear valve plate towards front against the pressure of said spring means for abutting said rear valve plate against the rear end face of the body member of the compressor for stopping up said rear end face,

changeover valve means provided halfway in a conduit passage interconnecting said pressure chamber with a high pressure source or a low pressure source, and

check valve means provided halfway in said discharge passage for preventing reversed flow of the pressurized gas from said discharge flange into the discharge chamber of said inner housing in the absence of the compression operation in the rear cylinder block.

4,413,956

# WAVE PUMP APPARATUS

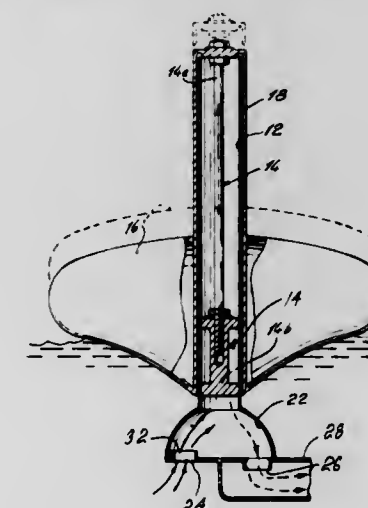
John L. Berg, P.O. Box 1282, Vallejo, Calif. 94590

Continuation-in-part of Ser. No. 81,013, Oct. 1, 1979, Pat. No. 4,302,161. This application Sep. 23, 1981, Ser. No. 304,648

Int. Cl.<sup>3</sup> F03B 13/12

U.S. Cl. 417—333

3 Claims



- 1. A wave pump apparatus comprising a super-structure type frame, floats mounted on the frame below the super-structure and adapted to float the frame, the floats including at least a pair thereof which are spaced apart one from the other a distance approximating the average wave length of a particular wave pattern of a body of water, a plurality of wave pumps provided below the super-structure, each wave pump including a cylinder, a piston movable in the cylinder, a float on the exterior of the cylinder directly connected to the piston, chamber means communicating with the cylinder, a generator provided on the super-structure and communicating with the wave pumps, and each wave pump adapted to supply water under pressure to the generator for turning the generator.

4,413,957

# PORTABLE, HAND HELD, HIGH PRESSURE PUMP

David H. Sanders, P.O. Box 502, Hamlin, Tex. 79520

Filed Mar. 22, 1978, Ser. No. 888,846

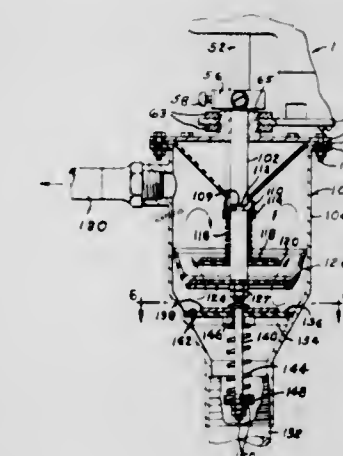
Int. Cl.<sup>3</sup> F04B 35/04, 21/04, 39/14

U.S. Cl. 417—415

2 Claims

- 1. A high speed, hand carried, motor operated pump, which pump comprises:
- a. a pump cylinder housing,

- (i) a plunger mounted within said pump cylinder housing for reciprocation therein,
- (ii) an elastomer cup mounted on said plunger,
- (iii) a perforate plate on said cup,
- (iv) said plunger being connected in reciprocating relation with the motor,
- b. a reservoir,
- (i) a valved inlet opening in said pump cylinder housing,
- (ii) said inlet valve being interposed between said inlet opening and said elastomer cup so as to control the flow of fluid into said cylinder housing,
- c. an abutment formed on said plunger to form a valve seat,



- d. an elastomer valve operatively positioned for opening and closing the perforations of said plate,
- (i) a stem passing through said elastomer valve,
- (ii) a spring surrounding said stem and being biased between said stem and said valve seat so as to cause the elastomer valve to sit on the valve seat, when in one position,
- (iii) an elastomer seal interposed between the upper face of said cylinder housing and said elastomer cup,
- (iv) said elastomer seal being secured to said plunger intermediate said elastomer cup and the head of said cylinder housing.

4,413,958

# APPARATUS FOR INSTALLATION IN WELLS

Alan D. Webb, Hinchley Wood, England, assignor to The British Petroleum Company Limited, London, England

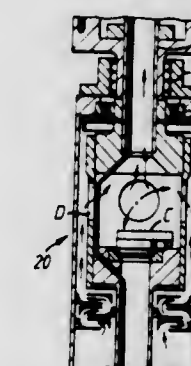
Filed Jul. 16, 1980, Ser. No. 169,381

Claims priority, application United Kingdom, Jul. 18, 1979, 7925088

Int. Cl.<sup>3</sup> F04B 17/00

U.S. Cl. 417—424

8 Claims



- 1. An electric pump suitable for location in a well to lift fluids in the well, the pump having an electric motor comprising a rotor and a stator, the stator being fixed and internal with respect to the rotor and having a central aperture extending axially therethrough of a dimension sufficient to permit wire line operations to be conducted through the aperture in the well below the pump, the rotor having a plurality of fluid impellers attached thereto, the pump further comprising a



non-return valve located in said aperture and biased in the open position when the pump is inoperative but closable by the wash of well fluids when the pump is working.

4,413,959

# SCROLL MACHINE WITH FLEX MEMBER PIVOTED SWING LINK

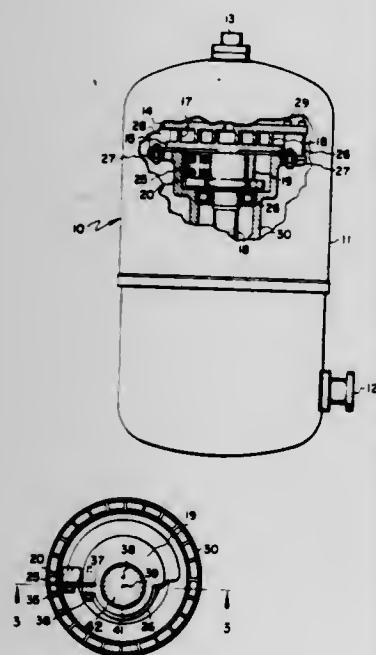
Arthur L. Butterworth, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Oct. 19, 1981, Ser. No. 312,556

Int. Cl.<sup>3</sup> F01C 1/02, 17/06

U.S. Cl. 418—14

12 Claims



1. A scroll type positive fluid displacement apparatus comprising
  - a. two generally parallel plates, the facing surface of each having an involute wrap element attached thereon in fixed angular, intermeshed relationship with each other, contacting surfaces of said plates and wrap elements defining pockets of fluid;
  - b. a drive shaft rotatably driven about its longitudinal axis, said drive shaft at one end thereof, having a crank post offset from the longitudinal axis of the drive shaft;
  - c. swing link means for coupling the drive shaft in radial compliance to one of the two parallel plates so that rotation of the drive shaft causes the involute wraps associated with said one of the plates to orbit within the involute wrap of the other plate, thereby causing pockets of fluid to move between an inlet and an outlet; and
  - d. a flex member of resilient material connecting the crank post of the drive shaft with an adjacent parallel surface of the swing link means and operative to transmit rotational driving force from the drive shaft to the swing link, said flex member being rigid in tension, but flexible in bending, so that by its spring force it biases the involute wrap elements slightly apart when the drive shaft is not rotating, to reduce the driving torque required upon start-up of the scroll apparatus.

4,413,960

# POSITIONABLE CONTROL DEVICE FOR A VARIABLE DELIVERY PUMP

Victor J. Specht, 197 S. Saginaw St., Pontiac, Mich. 48058

Filed Apr. 2, 1981, Ser. No. 250,341

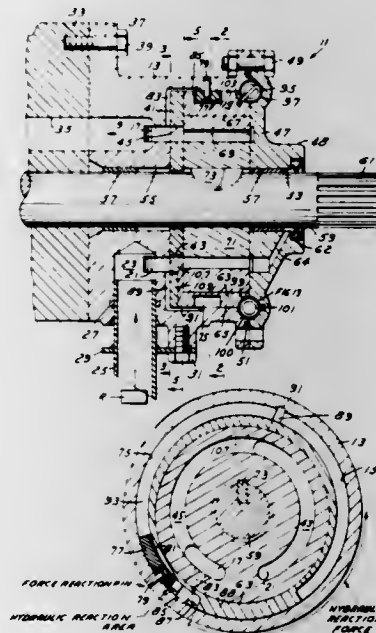
Int. Cl.<sup>3</sup> F04C 2/10, 15/04

U.S. Cl. 418—19

16 Claims

1. In a fluid rotary power transmission having a housing with a cylindrical bore, a fluid intake and a fluid outlet communicating with said bore through a port plate having a fixed cross-

over land and a movable crossover land separating said fluid intake from said fluid outlet;  
a positionable control device comprising a cylindrical body having an outer diameter rotatably and adjustably nested in said bore;  
and having an inner diameter eccentric to said outer diameter;  
a fluid power mechanism including an outer controlled member rotatably nested within said body and a power driven inner control member rotatably nested within said con-



trolled member and eccentric thereto, and drivably engaging the controlled member to provide a fluid pumping action between said intake and outlet;  
the eccentric position between said controlled and control members being variable for selectively increasing and decreasing the volume outlet of fluid;  
selective rotation of said positionable control device within said housing and relative to said controlled and control members correspondingly modifying and changing said eccentric position, relative to said fixed crossover land.

4,413,961

# MOTION CONVERSION DEVICE AND ROTARY DISPLACEMENT DEVICE

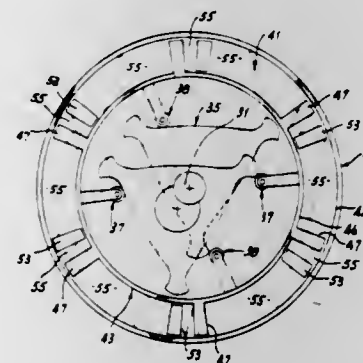
Peter J. Griffin, 13/40 Bayswater Rd., Kings Cross, New South Wales, Australia

Filed Jul. 8, 1981, Ser. No. 281,417

Int. Cl.<sup>3</sup> F04C 2/00; F16H 35/02

U.S. Cl. 418—38

20 Claims



1. A motion conversion device comprising a cam mounted for rotation about an axis eccentric to a central axis, said eccentric axis being rotatable about said central axis, the cam having N lobes the outermost points of which are equally spaced around and equidistant from the eccentric axis, N being an odd integer other than 1, means for effecting relative rotation between the central axis and the cam on rotation of the eccentric axis about the central axis or rotation of the cam about its eccentric axis whereby the cam is arranged to rotate about its

eccentric axis at an angular velocity of  $2/(N+1)$  times the angular velocity of the eccentric axis about the central axis, a pair of cam followers rotatable about an axis substantially coincident with the central axis, the cam followers being in contact with the cam on opposed sides of the central axis and equidistant from the central axis, the cam being formed such that on rotation of the eccentric axis about the central axis at a substantially constant velocity the cam followers undergo  $2N$  cycles of acceleration from a dwell condition and deceleration to a dwell condition for each revolution of the cam followers.

4,413,962

# TORQUE-AMPLIFYING SERVO-MECHANISM WITH COMPACT STRUCTURE FOR POWER STEERING SYSTEMS

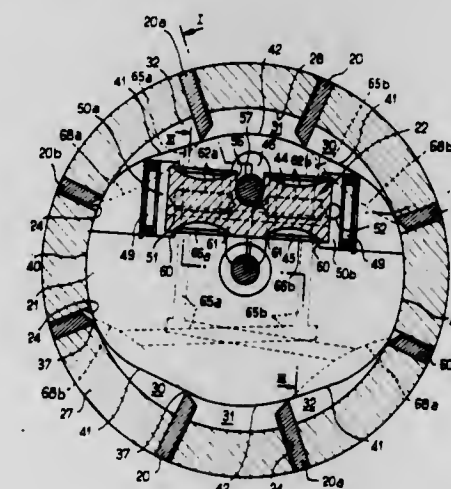
Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme DBA, Paris, France

Filed Sep. 17, 1981, Ser. No. 303,309

Int. Cl.<sup>3</sup> F04G 15/04, 29/10

U.S. Cl. 418—186

5 Claims



1. A hydraulic servomechanism of the type comprising a common casing enclosing a fluid distributor and a hydraulic motor having movable vanes and a rotary piston with a non-circular contour rotatably mounted in a cylindrical cavity into which said vanes project, these being held in contact with the lateral surface of said piston in order to define together with said lateral surface and said casing pressure chambers which communicate with said distributor, which further comprises fluid connecting means for connecting it to a fluid source and to a reservoir, an input shaft being coupled to said distributor and an output shaft being linked to said rotary piston, an elastic coupling means being arranged between said input shaft and said output shaft in order to define, in a rest position, a neutral relative angular position between said shafts, characterized in that said distributor comprises a valve spool slidably mounted in a transverse bore formed in said rotating piston and being adapted to become displaced in said bore under the control of said input shaft, the valve spool includes at least two recesses at its outer surface, each defining, together with shoulders in said bore, two fluid flow paths of variable section communicating respectively with said fluid source and said reservoir, conduits are formed in said rotary piston for providing fluid communication between each one of said recesses and selected regions of said lateral surface of said rotary piston, for supplying fluid to said pressure chambers, an operating pin is eccentric and rigidly fixed to said input shaft and movable in a cavity of said rotary piston, said operating pin is in engagement with said spool for operating it, the axial ends of said spool are adjacent two opposing chambers, respectively, in communication with said fluid source, said cavity communicating with said reservoir and said recesses of said spool are formed longitudinally, respectively between each chamber and said cavity in order to define together with said shoulders said fluid flow paths of variable sections.

4,413,963

# SELF-CONTROLLABLE CAPACITY COMPRESSOR

Teruo Maruyama, Neyagawa; Shinya Yamauchi, Katano, and Yoshikazu Abe, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

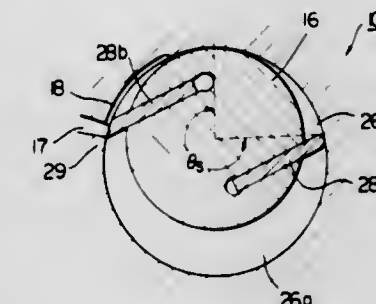
Filed Jan. 22, 1982, Ser. No. 341,608

Claims priority, application Japan, Jan. 29, 1981, 56-12427

Int. Cl.<sup>3</sup> F04C 29/08

U.S. Cl. 418—259

3 Claims



1. In a compressor including a rotor having vanes slidably fitted thereto, a cylinder for receiving said rotor and vanes, side plates rigid on both sides of said cylinder and enclosing a space of each vane chamber defined by said vanes, rotor and cylinder at the sides thereof, and inlet and outlet ports each serving as a passage to communicate said vane chamber with the exterior, wherein said cylinder is oriented to have its top portion where a distance between the outer periphery of said rotor and the inner periphery of said cylinder becomes minimum, the improvement characterized in that said inlet port is positioned so as to make  $a(\theta)$  almost constant, or meet  $a(\theta) = a$ , in a range of  $\frac{1}{2}\theta_s < \theta \leq \theta_s$  and parameters of said compressor are determined to meet the following relation;

$$0.025 < \theta_s/V_0 < 0.080$$

where,

$\theta$ (radian): angle from the top portion of the cylinder to the leading end of the vane, which is held in contact with the inner periphery of the cylinder, around the center of revolution of the rotor,

$\theta_s$ (radian): angle  $\theta$  at the completion of a suction stroke,  $V_0$ (cc): volume of the vane chamber when  $\theta$  undergoes  $\theta_s$ , and

$a(\theta)$ (cm<sup>2</sup>): effective area of suction passage from an evaporator to the vane chamber.

4,413,964

# APPARATUS FOR THE CONTINUOUS FORMATION OF BI-AXIALLY ORIENTED THERMOPLASTIC MATERIALS

Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

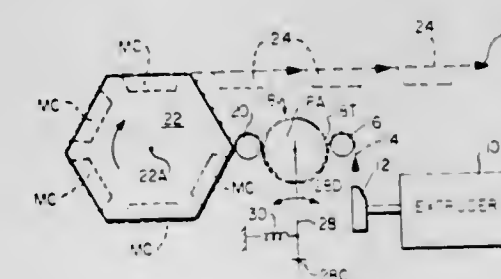
Division of Ser. No. 886,160, Mar. 13, 1978, Pat. No. 4,250,129.

This application May 29, 1980, Ser. No. 154,369

Int. Cl.<sup>3</sup> B29D 7/02

U.S. Cl. 425—66

30 Claims



1. An apparatus for continuously manufacturing oriented



thermoplastic molded articles from granulated and comminuted polystyrene material comprising:

extruder means for assimilating raw thermoplastic material and extruding it into a strip;

charging means for providing granulated and comminuted thermoplastic material to said extruder means;

regulating means controlling the temperature of said extruded strip to a desired optimum orientation temperature;

orientation means including input and output roller means for longitudinally advancing said strip and divergent rotary blade means intermediate said input and output roller means for imparting transverse stretch to said strip;

said input and output roller means and said divergent blade means having selected differential peripheral speeds therebetween to longitudinally stretch said strip to thereby biaxially orient said strip in conjunction with said divergent blade means;

polygonal rotary mold means having a mold cavity in each peripheral segment thereof;

said periphery of said mold means being juxtaposed with said output roller means;

said output roller means being constrained to closely follow said periphery of said mold means;

means continuously constraining said strip into the shape of said mold cavities while fixing said strip in its biaxially oriented state;

means continuously stripping the now fixed molded products and selvage from said mold means and separating said products from said selvage; and

means continuously comminuting and recycling said selvage into said extruder means through said charging means, wherein the orientation means, divergent rotating blade means and polygonal rotary mold cooperate so that the stress placed in the polystyrene material by said biaxial orientation is substantially maintained from the initiation of said orientation to the forming of the molded articles therein.

4,413,965

**PELLETIZING DEVICE FOR PLASTIC MATERIAL**  
Tomoo Kinoshita, and Minoru Hinuma, both of Tokyo, Japan, assignors to Nihon Reppomachine Kogyo Kabushiki Kaisha, Tokyo, Japan

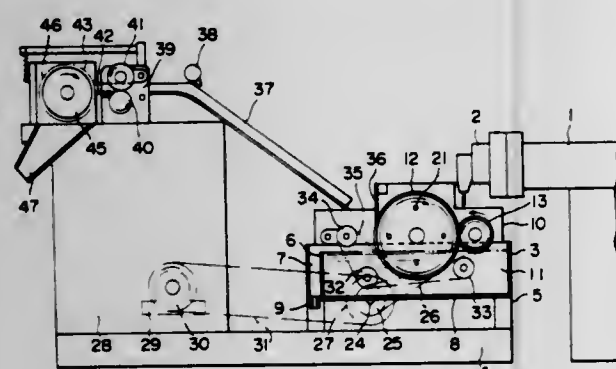
Filed May 27, 1982, Ser. No. 382,610

Claims priority, application Japan, May 8, 1981, 56-68294

Int. Cl.<sup>3</sup> B29C 25/00

U.S. Cl. 425-71

1 Claim



1. A pelletizing device for plastic material comprising:

a T-die for extruding said plastic material into a sheet;

a cooling water tank disposed beneath said T-die;

a cooling roll having a plurality of first annular projections and first annular grooves formed in a surface portion of said roll for forming a corresponding profile of second projections and second grooves in said sheet of said plastic material, said cooling roll being partially submerged in said cooling water tank;

a pinch roll disposed adjacent to and coacting with said cooling roll to form said sheet;

a guide belt containing a lower surface portion of said cool-

ing roll for transferring said sheet of said plastic material from said T-die, between said T-die, between said cooling roll and said pinch roll and away from said cooling roll;

a guide flume having an entrance and an exit and being disposed adjacent to an upper surface portion of said guide belt such that said entrance receives said sheet material from said cooling roll;

a fixed knife blade disposed above said exit of said guide flume and having a plurality of third grooves formed therein such that second projections formed in said sheet of said plastic material in said guide flume are positioned so as to correspond to said third grooves; and

a rotary knife having a plurality of blades connected thereto at predetermined intervals and wherein said rotary knife is juxtaposed with said fixed knife blade,

whereby the coaction of said fixed knife blade and said rotary knife breaks said sheet along said grooves to form strips, and cuts said strips.

4,413,966

**FLUID-RELEASE MOLD AND THE METHOD OF MANUFACTURING THE SAME**

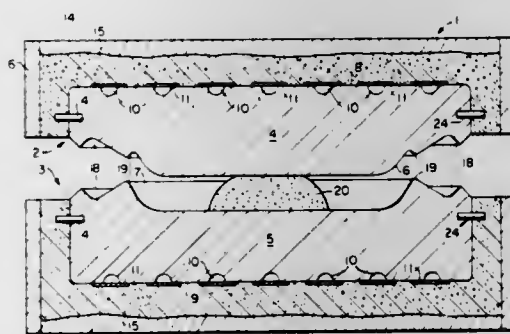
Walter H. Mills, and Joseph T. Bilbrey, Sr., both of Springfield, Ohio, assignors to Wallace Murray Corporation, New York, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,673

Int. Cl.<sup>3</sup> B28B 21/36, 1/00, 1/26; B29C 1/02

U.S. Cl. 425-84

25 Claims



1. A fluid-release mold comprising:

a preformed, porous mold body having a mold face formed on a first exterior surface and a second surface;

at least one narrow groove formed in said second surface;

tape covering said groove and attached to said second surface to form a conduit between the surface of said groove and the surface of said tape facing said groove for directing pressurized release fluid to said mold; and

a fluid-impermeable backing material disposed over said second surface of said mold body to direct the egress of fluid from said conduit through said mold body in a direction away from said second surface.

13. A method of manufacturing a fluid-release mold comprising the steps of:

providing a preformed, porous mold body having a first exterior surface and a second surface;

forming a groove in said second surface;

covering said groove with a cover material to form a conduit between the surface of said groove and said cover material for directing release fluid to said mold body; and

covering said mold body with a fluid-impermeable backing material whereby egress of fluid from said conduit is prevented except through the mold body in a direction away from said second surface.

4,413,967

**APPARATUS FOR PRODUCING UNIFORM DENSITY AND WEIGHT BRIQUETTES**

Stephen W. Barry, Geneva, Ind., assignor to CTS Corporation, Elkhart, Ind.

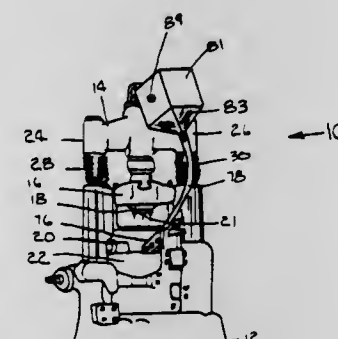
Division of Ser. No. 156,387, Jun. 4, 1980, Pat. No. 4,376,085.

This application Sep. 7, 1982, Ser. No. 415,358

Int. Cl.<sup>3</sup> B28B 17/00

U.S. Cl. 425-149

8 Claims



1. An apparatus for controlling compacting force during compacting cycles to effect substantially constant density, size and weight briquettes from loose particles, comprising a variable size mold cavity, means for receiving a quantity of loose particles and adapted to be superimposed over the mold cavity prior to its expansion to an initial charge size whereby the loose particles are drawn into the expanding mold cavity to effect a void-free charge condition thereof, means for compacting the loose particles into a briquette, means for thereafter ejecting the briquette, and a closed-loop feedback control network for effecting the substantially constant density, size and weight briquettes and comprising means for detecting the peak compacting force during the compacting cycle to determine a peak compacting force value effected during the compacting cycle and during succeeding compacting cycles, means for comparing the peak compacting force value with a predetermined standard compacting force value corresponding to a standard density, size and weight briquette, means for detecting the deviation of the peak compacting force value from the predetermined compacting force value, and means for adjusting said variable size mold cavity in accordance with the deviation of the peak compacting force value from the predetermined standard compacting force value to effect selectively either an enlargement or a reduction in cavity size to effect successive compacting cycles each producing substantially the predetermined standard compacting force value productive of the substantially constant density, size and weight briquettes.

4,413,968

**EXTRUSION DIE METERING DEVICE**

William R. Bliss, Wilmington, Del., assignor to Thiokol Corporation, Chicago, Ill.

Filed Mar. 11, 1982, Ser. No. 357,224

Int. Cl.<sup>3</sup> B29F 3/06

U.S. Cl. 425-198

23 Claims

1. An extrusion die for producing elongated products having longitudinally co-extending perforations, said perforations arranged in predetermined, varying patterns comprising

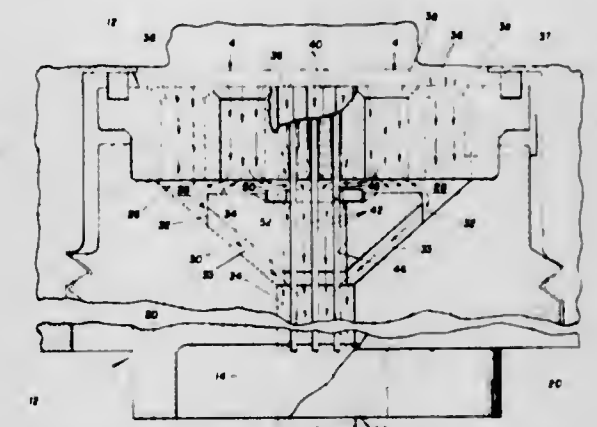
(a) a body having a central bore and an open chamber communicating with said bore;

(b) cover means for said chamber having at least one aperture for passage of extrusion product into said chamber;

(c) means in said body for regulating the flow of said product in said chamber including means for diverting a portion of said product and defining a passageway for said diverted portion to flow to said bore and means defining a passageway for the remaining product in said chamber to flow to said bore, said diverted flow passageway being relatively more circuitous than said remaining product passageway;

(d) means in said body for forming said perforations in said patterns in said product; and

(e) a selected one of a variety of means positionable in cooperating relationship with said regulating means for meter-



ing the flow of said product in said body for effecting an adjustment in the distribution of product in said chamber and thereby forcing a positional adjustment of said perforation forming means in said bore to provide a selected one of said predetermined, varying perforation patterns.

4,413,969

**METHOD AND APPARATUS FOR RE-CYCLING PLASTICS WASTE**

William J. McDonald, Helen's Bay, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

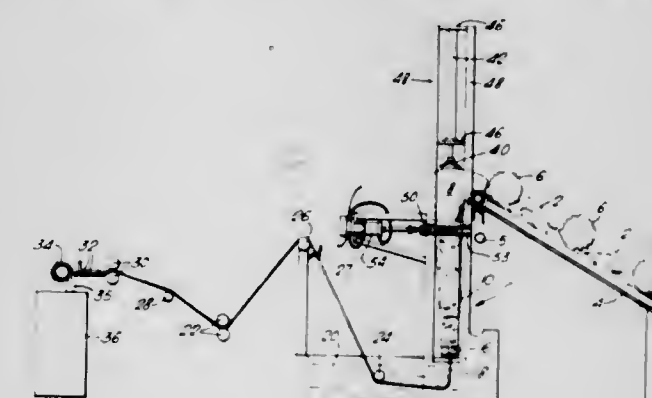
Filed Dec. 10, 1981, Ser. No. 329,332

Claims priority, application United Kingdom, Dec. 16, 1980, 8040298

Int. Cl.<sup>3</sup> B29F 3/08; C08J 11/00

U.S. Cl. 425-217

6 Claims



1. Apparatus for re-claiming resilient thermoplastics material comprising an extruder having an inlet, a plunger, a heater to melt said thermoplastics material and an outlet, means for reciprocating said plunger in relation to said inlet to said extruder whereby to compress thermoplastic material into said extruder, a feeding device for said thermoplastic material, means for intermittently operating said feeding device in synchronism with said plunger to feed material to said inlet to said extruder prior to each compressive stroke of said plunger, a restraining member comprising an assembly of spaced tines for holding said resilient material in said inlet of said extruder in a compressed condition and means for operating said restraining member in synchronism with said plunger, whereby said member is moved to its restraining position at approximately the end of each compressive stroke of said plunger and is withdrawn again before the end of the next compressive stroke of said plunger.

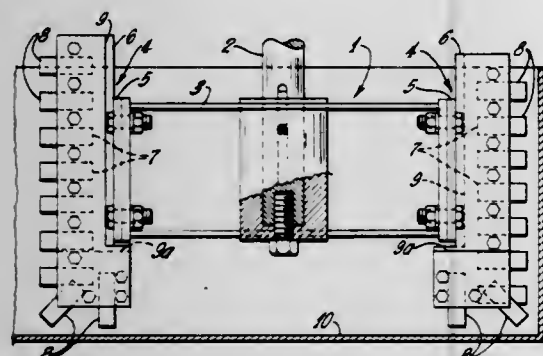


# 4,413,970 ROTARY SCRAPERS

Stephen Seng, Frazeeburg, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio  
Filed Feb. 27, 1981, Ser. No. 238,884  
Int. Cl. B22F 3/00

U.S. Cl. 425-222

3 Claims



1. In a pelletizer for converting particulate material into pellets, having a need to remove build-up of said material from the inside walls of said pelletizer, the improvement comprising:

- (a) a rotatable scraper support;
- (b) a blade carrier affixed to said support, said carrier being adapted with a plurality of ports for the positioning of a plurality of scraper blades therein, at least one of said scraper blades extending horizontally from one of said ports and at least one of said scraper blades extending angularly from another of said ports.

# 4,413,971

## RUBBER RECOVERY APPARATUS

James S. Nettleton, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

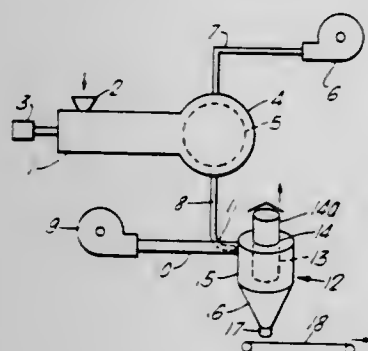
Filed May 11, 1982, Ser. No. 377,265

Claims priority, application Canada, Jun. 22, 1981, 380339

Int. Cl. A01J 21/02

U.S. Cl. 425-311

8 Claims



1. An improved apparatus for the recovery of dry polymer in porous crumb form which comprises in combination:

- (a) an extrusion device which terminates in a die means, said die means comprising a pair of generally cylindrical concentric plates each having a plurality of spaced apart extrusion orifices through which polymer is extruded, the downstream-most plate being rotatably mounted with respect to the upstream-most plate, said upstream-most plate presenting a concave surface in the downstream direction, said downstream-most plate being co-axial with and in mating nesting engagement with a generally concave surface of said upstream-most plate;
- (b) cutter means having a generally cylindrical body mounted for rotation about its longitudinal axis and being co-axial with and closely spaced from and within said pair of concentric plates, said cutter means being equipped with a plurality of spaced apart blades which project radially from and extend in a helical manner longitudinally along said body, said blades having at their free ends

a cutting edge which is closed spaced adjacent to the downstream side of said downstream-most plate,

- (c) first gas compressing means capable of supplying compressed gas at a pressure of from about 7 to about 15 psig and at a linear velocity of from about 75 to about 150 feet per second to said concentric plates to cause gas to flow over said plates and longitudinally over said cutter means in a downstream direction whereby pellets of polymer formed therein are flushed in a downstream direction,
- (d) first pipe means for transferring said pellets of polymer in said compressed gas away from said cutter means,
- (e) second gas compressing means capable of supplying compressed gas at a pressure of from about 0.07 to about 0.35 psig and at a linear velocity of from about 100 to about 150 feet per second,
- (f) second pipe means having a cross-sectional area of from about 4 to about 8 times the cross-sectional area of said first pipe means and connected at one end to said second gas compressing means,
- (g) said first pipe means being joined into said second pipe means and terminating within said second pipe means in a downstream direction thereof, both said first and said second pipe means terminating at a point closely adjacent to and downstream of the junction thereof and forming the entry to a cyclone separator, said entry being tangential to the circumference of the upper portion of the cylindrical section of said cyclone separator,
- (h) said cyclone separator comprising an upper cylindrical section and attached thereto a lower inverted truncated conical section, said upper cylindrical section having on its topmost closed end a re-entrant exit port for gas and said lower inverted truncated conical section having at its lowest end a lower exit port for porous polymer crumb, and
- (i) conveying means for conveying said porous polymer crumb from said lower exit port of said cyclone separator, optionally to further vapor removal/cooling means, to weighing and packaging means.

# 4,413,972

## DEVICE FOR USE IN MAKING DOUGHNUTS

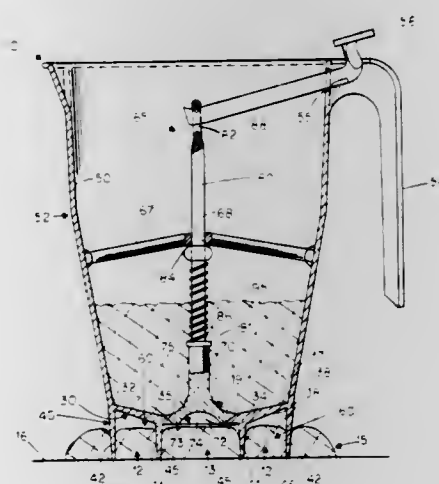
Richard L. Lawson, 3272 N. Greenwood, Sanger, Calif. 93657

Filed Jan. 22, 1982, Ser. No. 341,690

Int. Cl. A21C 5/00, 11/12

U.S. Cl. 425-290

8 Claims



1. A device for use in making doughnuts and the like from a flowable dough disposed on a substantially horizontal upwardly disposed surface comprising a container for such dough having a bottom wall defining an opening centrally thereof; valve means for selectively opening and closing the opening to regulate a gravitational flow of dough therethrough to form a layer of such dough on said surface; a first blade-like ring extended downwardly from the wall in circumscribing relation to the opening; and a second blade-like ring extended

downwardly from the wall in circumscribing spaced relation to the first ring, so that pressing the rings into such layer cuts a doughnut therefrom between the rings, said valve means being such as to seat against an upper surface of said bottom wall and leaving unobstructed the space inside said first ring.

# 4,413,973

## EXTRUSION DIE

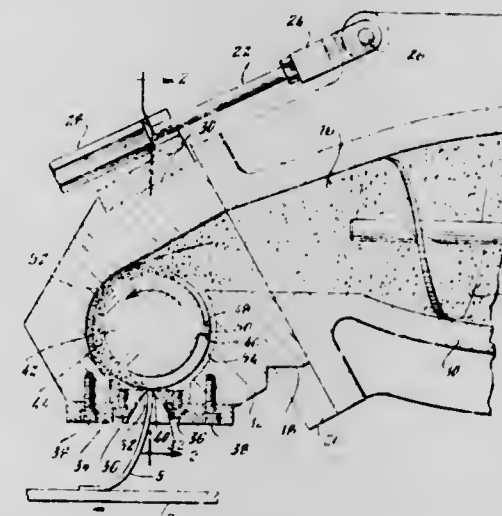
Alan R. Peters, Stratford, Conn., assignor to Automation International Corp., Norwalk, Conn.

Filed Jun. 24, 1981, Ser. No. 275,219

Int. Cl. B29F 3/04; B29D 7/02

U.S. Cl. 425-461

20 Claims



1. Apparatus for extruding material comprising a die having an elongated aperture, a roll juxtaposed to said aperture in closely spaced-apart relationship thereto with the axis of said roll substantially parallel to the long axis of said aperture, said roll having at least one depression in the surface thereof, at least one edge of which is a generally axially oriented leading edge and forms an abrupt ridge with respect to the surface of said roll, the depth of said depression with respect to the circumference of said roll being greater at each point along said leading edge than at the circumferentially corresponding point on the opposite trailing edge of said depression, means for applying pressure to extrudable material to cause it to move past said roll and through said aperture, and means to rotate said roll in the direction such that as said depression moves past said aperture, said leading edge passes said aperture before said trailing edge.

# 4,413,974

## APPARATUS FOR MAKING A MULTI-LAYERED BLOWN PLASTIC CONTAINER

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 303,759, Sep. 21, 1981, Pat. No. 4,364,896.

This application May 21, 1982, Ser. No. 380,580

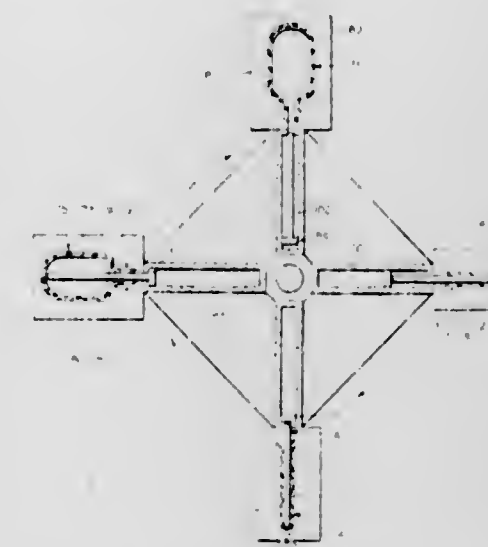
Int. Cl. B29C 17/07; B29D 9/00

U.S. Cl. 425-523

2 Claims

1. An apparatus for blow molding an oriented multi-layered hollow plastic container comprising:
- A. a first station having pin means including a core pin and having injection molding means for forming a first thermoplastic parison about the core pin,
  - B. a second station including the pin means in which the core pin serves as a stretch pin for stretching the first parison axially and a second injection molding means for injection molding a second thermoplastic parison around the first stretched parison on the stretch pin to provide a two-layer parison,
  - C. a third station including means for blow molding the two-layer parison at its orientation temperature to form a

blown container, the pin means being a blow pin at the third station; and  
D. a fourth station including means for ejecting the finished blown container.



# 4,413,975

## COMBINATION CONTROL WITH HIGH/LOW PILOT GAS FLOW

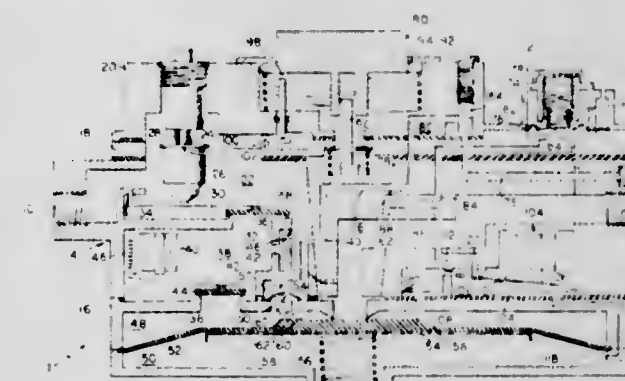
Jesse H. Turner, Auburn, and Eimer E. Wallace, Fort Wayne, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 9, 1982, Ser. No. 366,957

Int. Cl. F23Q 9/08

U.S. Cl. 431-56

4 Claims



1. In a combination control including a housing having a gas inlet, a main burner gas outlet, a pilot burner gas outlet, a first flow passage including first and second serially connected chambers interconnecting said gas inlet to said main burner gas outlet, and a second flow passage interconnecting said first chamber to said pilot burner gas outlet; a thermostatically controlled redundant valve in said first flow passage between said first and second chambers; a differential pressure operated main valve in said first flow passage between said second chamber and said main burner gas outlet; and adjustable flow restrictor means in said second flow passage for adjusting a high pilot supply of gas therethrough to produce a pilot burner flame of a selected large ignition size for ignition purposes; the improvement comprising: parallel first and second inlet branch passageways in said second flow passage upstream of said pilot flow adjustment means; said first inlet branch passageway communicating with said first chamber and including flow restriction means for supplying a restricted low pilot supply of gas to said pilot burner gas outlet to produce a pilot burner flame of a small standby size when said redundant valve is closed; said second inlet branch passageway communicating



with said second chamber and bypassing said first inlet branch passageway for supplying an increased high pilot supply of gas to said pilot burner gas outlet to produce a pilot burner flame of a large ignition size when said redundant valve is open; and check valve means in said second inlet branch passageway for blocking gas flow from said first inlet branch passageway to said second chamber through said second inlet branch passageway when said redundant valve is closed.

4,413,976

## IGNITER FOR A GAS BURNER

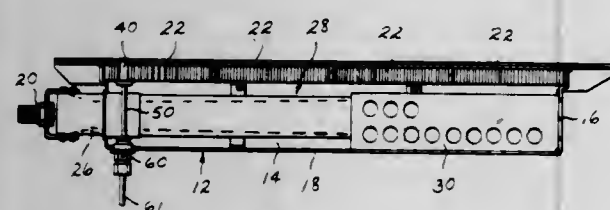
Richard M. Scherer, Niles, Mich., assignor to Southbend Escan Corporation, South Bend, Ind.

Filed May 15, 1981, Ser. No. 264,111

Int. Cl.<sup>3</sup> F23D 13/12

U.S. Cl. 431-278

2 Claims



1. A gas burner including tile having inner and outer surfaces with multiple openings extending through the tile from the inner to the outer surfaces thereof, a housing associated with said tile and defining a chamber with said tile inner surface forming one wall of said housing chamber, means for introducing gas into said housing chamber, means for igniting said gas to produce radiant heat at said tile outer surface, the improvement wherein said gas igniting means includes a nozzle secured within one of said openings, tube means adapted for connection at one end to a gas source extending within said housing chamber and seated at its other end in said nozzle for supplying gas to a pilot flame at said tile outer surface, said tube means as it extends into said housing chamber including heat expandable bellows parts to accommodate heat expansion of the tube means within said housing chamber during burner usage for the purpose of maintaining the seat of said tube means other end in said nozzle, whereby gas introduced into said housing chamber will be ignited at said tile outer surface.

4,413,977

## APPARATUS FOR TAKING MATERIAL TO BE TREATED INTO AND OUT OF HIGH PRESSURE TANK

Motobaru Takano, Machida, and Minoru Hoshino, Kawaguchi, both of Japan, assignors to Q.P. Corporation, Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,693

Claims priority, application Japan, Jan. 9, 1981, 56-1892; May 13, 1981, 56-71885

Int. Cl.<sup>3</sup> F27D 19/00; A45B 9/00

U.S. Cl. 432-56

4 Claims

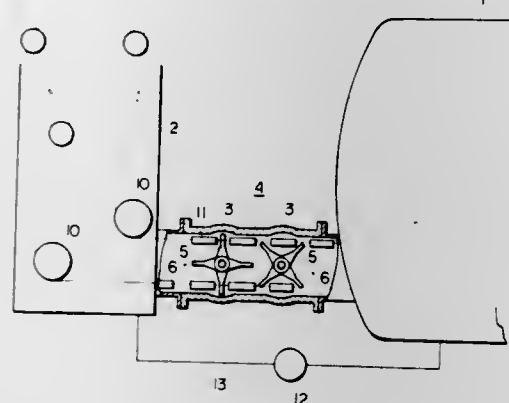
1. An apparatus for taking a material to be treated into and out of a treating high pressure tank, comprising:

all means defining a conveyor passage connecting an end of a high-pressure treating tank containing a treating liquid and a portion of water tank below the water level in said water tank, said conveyor passage being composed of a plurality of cylindrical casings arranged in a side-by-side relation with the axes of said casings extending widthwise of said passage;

a rotary closure member having two or more blades accommodated rotatably within each casing coaxial therewith, the length of each blade measured from the axis being generally equal to the radius of the casing such that each blade make a sliding contact with the inner surface of the associated casing, said rotary closure members being adapted to rotate in the same direction, the blades of adjacent rotary closure members being arranged at a phase difference of  $180/n^\circ$  ( $n$  being number of blades of

each rotary closure member) so that said conveyor passage is always closed by some of said blades of rotary closure members;

a pair of conveyor chains carrying a plurality of treating vessels at a constant pitch and disposed along both side surfaces of said conveyor passages to run through said



high pressure tank and said water tank in timed relation to the rotation of said rotary closure members so that said vessels pass between said rotating blades in each casing and between adjacent casings; and means mounted in said water tank to return leaked treating liquid from said water tank to said high pressure tank.

4,413,978

## ORTHODONTIC RETAINER

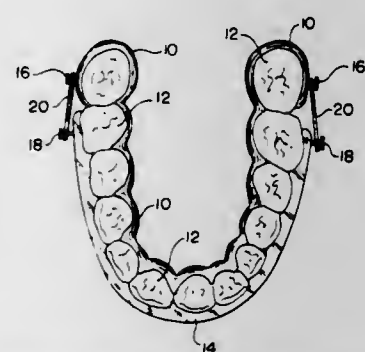
Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Filed May 17, 1982, Ser. No. 379,051

Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433-6

3 Claims



1. A retainer assembly for use in conjunction with the teeth of an arch of a patient, said assembly comprising: a first metallic arcuate band configured to conform with the lingual surface of the teeth of the arch extending around the lingual side of the arch to be cemented to the lingual side of the arch so as to hold the teeth in particular post-orthodontic treatment positions; a second transparent removable plastic arcuate band separate from the first band and configured to conform with the labial surfaces of the teeth of the arch and extending around the labial side of the arch also serving to hold the teeth of the arch in their post-orthodontic treatment positions, posts mounted at the respective ends of each of said first and second arcuate bands; and elastic ligatures extending around respective pairs of said posts resiliently to secure said arcuate bands to one another.

4,413,979

## PREFORM FOR MOLDING CUSTOM DENTAL IMPRESSION TRAYS

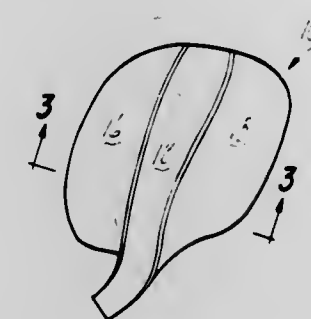
Stephen J. Ginsburg, Ann Arbor, and Frederick E. Draheim, Milford, both of Mich., assignors to Black Knight Investments Limited, Georgetown, Cayman Islands

Filed Apr. 19, 1979, Ser. No. 31,665

Int. Cl.<sup>3</sup> A61C 9/00

U.S. Cl. 433-41

10 Claims



1. A dental tray for use in taking a dental impression comprising a thin planar sheet, said sheet being constructed of a material which is rigid at mouth temperature but which is pliant when heated to a predetermined temperature, and a handle protruding outwardly from one end of the sheet, wherein said dental tray is of a one-piece construction and includes a first elongated side and a second opposing, elongated side, said first and second sides extending asymmetrically from said handle, whereby said tray is reversible and can be used in taking a dental impression on all four quadrants of a human dentition.

4,413,980

## FLEXIBLE GRID COUPLING

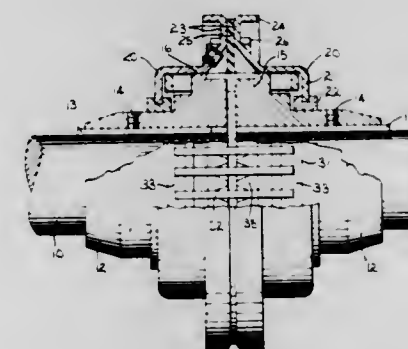
Richard G. Walloch, Muskego, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Feb. 24, 1981, Ser. No. 237,843

Int. Cl.<sup>3</sup> F16D 3/50, 3/56

U.S. Cl. 464-82

4 Claims



1. In a flexible coupling including a pair of hubs each having a plurality of axially extending teeth whose adjacent side faces define slots therebetween, and a grid joining the hubs, the improvement wherein:

the grid includes a plurality of straight metal rungs received in the slots and spanning the space between the hubs, the ends of said rungs extending axially beyond the teeth of the pair of hubs, and elastomer members joining together the ends of the rungs to form a unitary structure with said rungs.

4,413,981  
SHEAVE

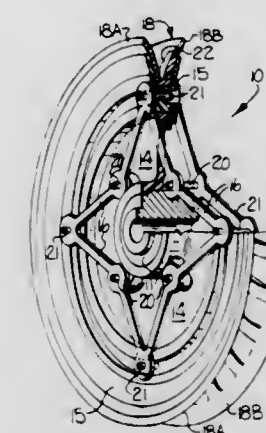
Eugene F. White, and Frances H. White, both of Rte. 4, Box 118, both of Monroe, N.C. 28110

Filed Jun. 12, 1981, Ser. No. 273,248

Int. Cl.<sup>3</sup> F16H 55/36, 7/22, 55/40, 55/44

U.S. Cl. 474-94

8 Claims



4. A strand engaging sheave comprising a hub, an annular body formed of a soft elastomer and defining a sheave axis, said body having outwardly diverging sidewall portions defining between opposing inner surfaces a circumferential strand receiving groove of predetermined radial depth and having a plurality of strand gripping abutments projecting inwardly into said groove from opposing sidewall surfaces, each said abutment having a predetermined circumferential dimension, adjacent ones of said abutments projecting inwardly from alternate ones of said opposing sidewall surfaces and being spaced circumferentially one from another at a predetermined circumferential distance, each said abutment having a predetermined radial dimension less than said radial depth and an arced, planar abutment surface facing an opposing sidewall surface which abutment surface is arcuate about a center spaced further said opposing sidewall surface than from the sidewall surface from which said abutment projects and defines a planar radial wall lying on a plane including said sheave axis, said abutment surfaces of adjacent abutments defining a tortuous cusp-like strand engaging zone for positively gripping a strand received within said groove, said sheave further comprising a plurality of resilient spoke members extending generally tangentially of said hub for compression and tension loading upon gripping engagement of said body with a strand.

4,413,982

## BELT TENSIONER, PART THEREFOR AND METHODS OF MAKING THE SAME

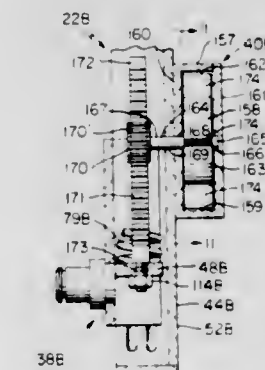
Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Sep. 11, 1981, Ser. No. 301,351

Int. Cl.<sup>3</sup> F16H 7/12

U.S. Cl. 474-138

6 Claims



1. In a tensioner for a power transmission belt that is adapted



to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, the improvement wherein said mechanical spring means comprises a pair of springs disposed in substantially parallel spaced relation and said fluid dampening means has at least a part thereof disposed between said springs and in substantially parallel relation therewith, said fluid dampening means comprising a rotary dampening means.

4,413,983

# APPARATUS FOR ASSEMBLING RING-TYPE CLOSURES

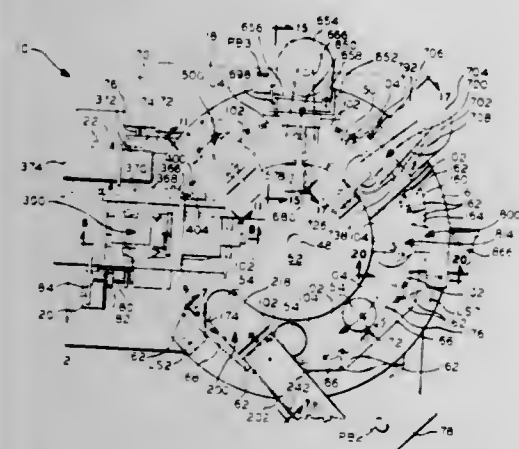
Jerry W. Young, Weston; William R. Eddy, and Raymond C. Taylor, both of Kansas City, all of Mo., assignors to Sealright Co., Inc., Kansas City, Mo.

Continuation of Ser. No. 55,234, Jul. 6, 1979, abandoned. This application Apr. 1, 1981, Ser. No. 311,353

Int. Cl.<sup>3</sup> B31B 17/02

U.S. Cl. 493—30

46 Claims



1. Apparatus for assembling closures, each including a generally cylindrical ring, having a generally cylindrical outer surface and generally circular open ends, and a generally circular disc, said apparatus comprising:

a plate having an upper surface and a lower surface and a plurality of ring receiving means on said upper surface each adapted for receiving one of said generally cylindrical rings thereon;

plate drive means operatively related to said plate for rotating said plate about an axis of rotation,

ring feed means positioned adjacent said plate for positioning one of said rings on a first one of said ring receiving means;

disc feed means positioned adjacent said plate for positioning one of said generally circular discs within one of said open ends of one of said generally cylindrical rings on a second one of said ring receiving means;

adhesive dispensing means positioned adjacent said plate for dispensing a quantity of adhesive at at least one location within one of said open ends of one of said rings on a third one of said ring receiving means;

lubricant dispensing means positioned adjacent said plate for dispensing a quantity of lubricant on at least one of said rings;

curling means positioned adjacent said plate for mutually curling one of said open circular ends of one of said rings and a respective one of said discs positioned therewithin into mutual engagement on a fourth one of said ring receiving means so as to thereby close one circular end of said ring and form a ring-type closure;

receiving means so as to thereby close one circular end of said ring and form a ring-type closure;

grooving means positioned adjacent said plate for forming a generally circumferential groove in the generally cylindrical outer surface of a generally cylindrical ring of a ring-type closure on a fifth one of said ring receiving means; and

ejecting means positioned adjacent said plate for ejecting a ring-type closure from a sixth one of said ring receiving means.

4,413,984

# METHOD AND APPARATUS FOR MAKING WINDOW ENVELOPES

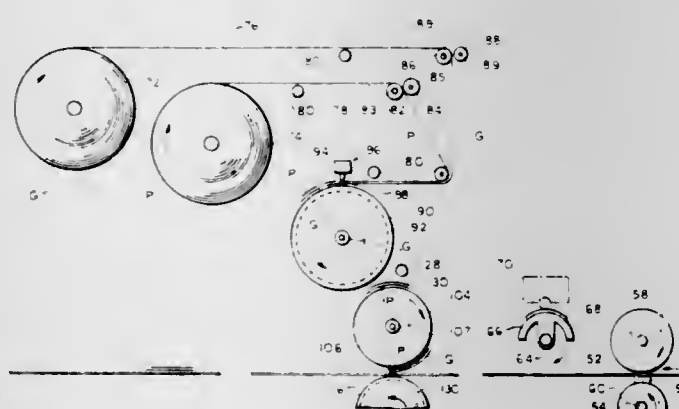
Seymour S. Alter, Great Neck, N.Y., assignor to New York Envelope Corp., Long Island City, N.Y.

Filed May 1, 1981, Ser. No. 259,676

Int. Cl.<sup>3</sup> B31B 1/82

U.S. Cl. 493—222

14 Claims



1. A method for manufacturing a window envelope comprising the steps of:

providing an envelope blank having an opening cut therein; providing a first rotatable cylinder having suction means capable of holding a sheet of material at its surface;

providing a second rotatable cylinder having suction means capable of holding a sheet of material at its surface, said second cylinder having a surface portion in proximity to said first cylinder;

feeding at least two overlapped sheets to said first cylinder, at least one of said sheets being able to transmit light;

rotating said first cylinder while said suction means holds said overlapped sheets to the surface thereof;

de-actuating said suction means of said first cylinder when said sheets are rotated to a point where they are in proximity to said second cylinder, said suction means of said second cylinder causing said sheets to be transferred thereto;

rotating said second cylinder so that said sheets are positioned in proximity to the envelope blank; and

transferring said sheets to said envelope blank from said second cylinder such that the light transmitting sheet directly overlies said opening and said other sheet is positioned behind said light transmitting sheet.

4,413,985

# HYDROCEPHALIC ANTENATAL VENT FOR INTRAUTERINE TREATMENT (HAVIT)

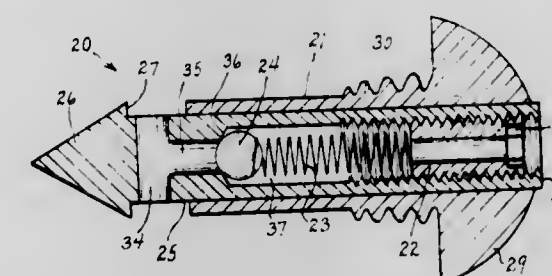
Edward Wellner, Fairfax, Va.; Maria Michejda, Rockville, and Gary D. Hodgen, Potomac, both of Md., assignors to The United States of America as represented by the Dept. of Health & Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 298,773, Sep. 2, 1981, abandoned. This application Nov. 30, 1981, Ser. No. 325,730

Int. Cl.<sup>3</sup> A61M 27/00

U.S. Cl. 604—9

15 Claims



15. A drainage valve for in utero relief of pressure from hydrocephalic fluid in the cranial cavity of a fetus, comprising: a hollow valve element including means, at one end, for penetrating said cranial cavity in utero, said valve element having an intake port adjacent said penetrating means and containing means for blocking flow of said fluid into said intake port and means for biasing said blocking means into blocking position;

and means, adjustably positioned on said valve element, for securing said valve element in an implanted position at said cranial cavity;

wherein when pressure in said cranial cavity exceeds a predetermined amount, the force of said cavity pressure overcomes the force of the biasing means, said blocking means is moved to an unblocking position and said fluid flows into said intake port, through said valve element and out of the cranial cavity into the uterus.

4,413,986

# TAMPON ASSEMBLY WITH MEANS FOR STERILE INSERTION

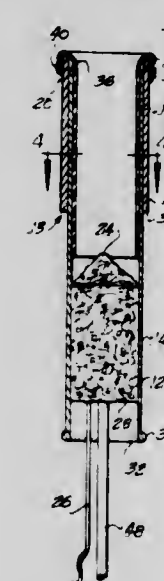
Henry R. Jacobs, 525 Grove St., Evanston, Ill. 60201

Filed Nov. 10, 1980, Ser. No. 205,678

Int. Cl.<sup>3</sup> A61F 15/00

U.S. Cl. 604—14

8 Claims



1. A vaginal tampon assembly comprising: a tampon of absorbent material for insertion into the vagina and having withdrawal means, a semirigid first tube containing said tampon,

ejector means to push said tampon from said first tube into the vagina,

a semirigid second tube having an inside diameter substantially the same as the outside diameter of said first tube, said second tube disposed in telescoping relationship around said first tube, said second tube having means for preventing its insertion into the vagina when placed against the introitus of the vagina,

a flexible sheath having an outer end secured to the inner end of said second tube and folded into the inner end of said first tube, whereby said tampon may be inserted into the vagina in a sterile manner by placing said inner end of said second tube against the introitus, plunging said first tube inward of said second tube to extend an inner portion thereof into the vagina while extending said flexible sheath therearound, and actuating said ejector means to push said tampon from the inner end of said first tube.

4,413,987

# WOUND IRRIGATION SYSTEM

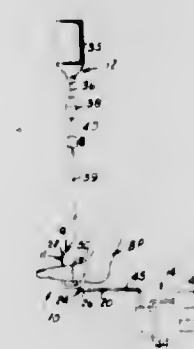
Nathan H. Schwartz, P.O. Box 1643, Smyrna, Ga. 30081

Filed Feb. 2, 1982, Ser. No. 345,003

Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604—28

6 Claims



1. A method of irrigating a wound in a body part with a treatment liquid comprising the steps of:

placing a piece of tubing having a perforated section therein in the body part so that the perforated section is generally straight and located in the vicinity of the wound in the body part to be irrigated and opposite ends of the tubing extend exteriorly of the body part;

connecting one end of the tubing to a source of the treatment liquid;

connecting the opposite end of the piece of tubing to a vacuum pump,

operating the source of treatment liquid so that the treatment liquid continuously passes along the tubing toward the perforated section so that some of the treatment liquid passes into the wound through the perforated section; and operating the vacuum pump to impose a vacuum in the tubing and withdraw liquid from the wound through the perforated section while at the same time withdrawing treatment fluid past the perforated section without passing into the wound to keep the passage through the tubing from becoming blocked.

4,413,988

# SHORT-TUBING SET GRAVITY POWERED PERITONEAL CYCLER

Alan E. Handt, 705 Pineview, Zionsville, Ind. 46077, and Stephen R. Ash, 2500 N. 400 East, Lafayette, Ind. 47905

Filed Apr. 28, 1982, Ser. No. 372,457

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—29

16 Claims

13. A short tube set gravity powered peritoneal cyclor operation with full bags of fluid comprising:

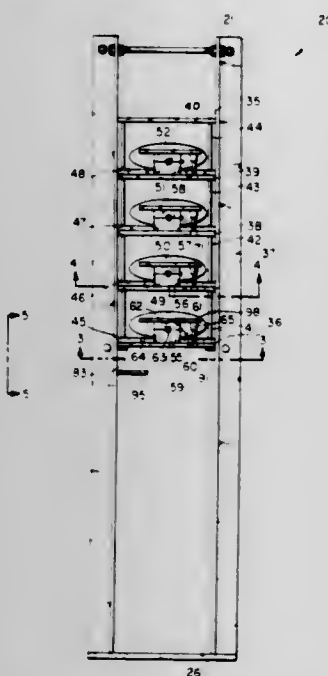
main frame means;

a plurality of trays each sized to support a full bag of fluid;



vertical frame means slidably mounted in said main frame means and having mounting planes each receiving one of said trays and spacing said trays apart a distance at least equal to a full bag thickness;

a movable holder on said main frame means to alternately



hold a particular tray as said vertical frame means moves downwardly decreasing said distance between said particular tray and the tray thereabove and then holding said vertical frame means as said particular tray falls away from said vertical frame means until said distance is once again attained.

4,413,989

## EXPANDABLE OCCLUSION APPARATUS

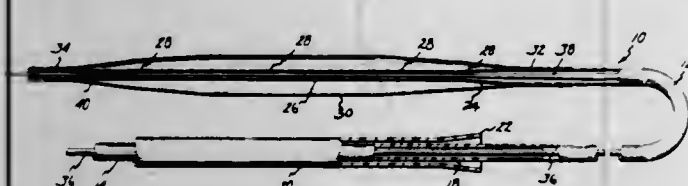
Gilmore T. Schjeldahl, Minnetonka, Minn., and B. Sharma, Springfield, Ill., assignors to Angiomedics Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 185,273, Sep. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,353, Jun. 11, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,466

Int. Cl.<sup>3</sup> A61M 25/00

U.S. Cl. 604—96

33 Claims



1. A catheter attachment for facilitating coronary transluminal angioplasty/coronary perfusion procedures, comprising:

(a) an elongated outer tubular member having at least one perforation proximate the distal end thereof;

(b) a generally non-elastic, hollow, expander member surrounding said outer tubular member proximate said distal end and sealingly connected to said outer tubular member at longitudinally spaced apart locations on either side of said perforation; and

(c) an elongated inner tubular member of a predetermined diameter less than the inner diameter of said outer tubular member and disposed within the lumen of said outer tubular member and extending from the proximal end thereof beyond the distal end thereof, the arrangement being such that a fluid introduced at said proximal end of said outer tubular member perfuses between said outer and inner tubular members, through said perforation to fill the volume of said

expander member and out the distal end of said outer tubular member.

4,413,990

## AIR BYPASS VALVE ASSEMBLY FOR A MEDICAL FLUID ADMINISTRATION SET

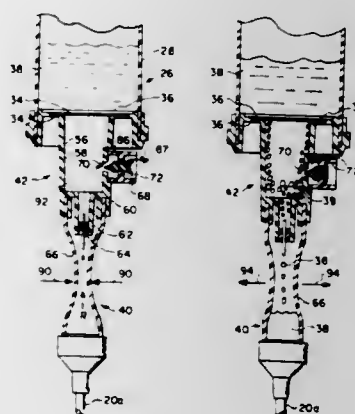
Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 31, 1981, Ser. No. 298,234

Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604—122

8 Claims



1. In a medical fluid administration set including a fluid pathway, a compressible drip chamber in the pathway and a membrane valve in the pathway preventing air from passing downstream through the membrane valve in the pathway, the improvement comprising:

air-venting bypass valve means mounted in the pathway intermediate the membrane valve and the drip chamber; said bypass valve means operable in an unstressed, first mode wherein the pathway is closed at said bypass valve means to the atmosphere external to the pathway, and an air-expulsing, second mode upon compression of the drip chamber, wherein said bypass valve means automatically opens, permitting air in the drip chamber to exit the administration set through said bypass valve means; said bypass valve means gradually returning to said unstressed, first mode in response to the decreasing force of the existing air, said bypass valve means relieving pressure upon the membrane valve by the air entrapped in the drip chamber during the compression thereof, said bypass valve means returning from said air-expulsing, second mode to said unstressed, first mode before the air pressure in the drip chamber drops to atmospheric pressure, thereby preventing an influx of air into the pathway through said bypass valve means.

4,413,991

## DUAL DOSE AMPULE

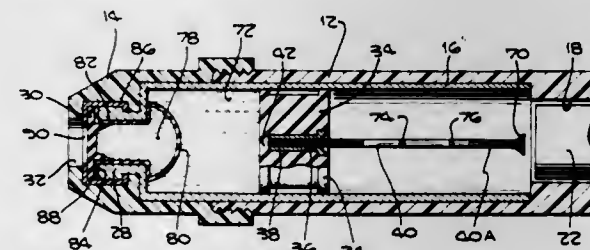
John B. Schmitz, 800 Fairview Ave., Arcadia, Calif. 91006, and William L. Schmitz, 43901 Citrus View Dr., Hemet, Calif. 92343

Filed Mar. 18, 1982, Ser. No. 359,222

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—191

6 Claims



1. A dual dose liquid medicament device comprising:

a tubular chamber having rearward and forward ends, a hypodermic needle supported in said chamber for forward movement therein between a rearward limit and a forward limit with the forward end of the needle extending from said chamber, said hypodermic needle having a lumen with a forward outlet and with rearward inlet means, a pair of separate liquid medicament compartments in said chamber, means for flowing liquid medicaments from both compartments to said lumen inlet means, a wall in said chamber pierceable by the hypodermic needle and dividing a portion of said chamber into said separate liquid medicament compartments, said compartments being in tandem axially of said chamber, and both compartments having pierceable walls other than said wall dividing a portion of said chamber in the said separate liquid medicament compartments, and said hypodermic needle in its rearward limit of movement, having its forward end located rearwardly of both said compartments.

4,413,992

## CANNULA SUPPORT ASSEMBLY AND ITS METHOD OF MANUFACTURE

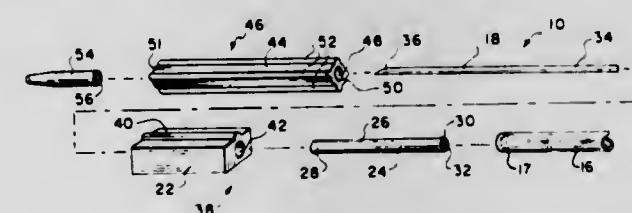
Emil H. Solka, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1981, Ser. No. 326,739

Int. Cl.<sup>3</sup> A61M 5/14

U.S. Cl. 604—263

7 Claims



1. An assembly attachable as a prefabricated unit to a fluid conduit and comprising

a cannula having an operative end,

a first separately fabricated component part comprising a first generally tubular member having an essentially uniform cross-sectional shape and a bore extending between opposite sides thereof,

a second separately fabricated component part comprising a second generally tubular member having an essentially uniform cross-sectional shape and including a main body portion inserted within said first tubular member bore to join said first and second parts together, said second tubular member further including first and second opposite end portions each outwardly exposed beyond respective opposite sides of said first tubular member when said main body portion is inserted in said first member bore and a bore which extends between said opposite end portions and into which said cannula is inserted with said operative end thereof supported in an outwardly exposed position beyond said first outwardly exposed opposite end portion of said second tubular member,

a third separately fabricated component part comprising a third generally tubular member having an essentially uniform cross-sectional shape and including an open interior having oppositely spaced end and an interior diameter which exceeds the exterior diameter of said operative cannula end, one of said ends being removably engaged about said first outwardly exposed opposite end portion of said second member to thereby join said second and third component parts together and to enclose said operative end of said cannula within said open interior,

a fourth separately fabricated component part comprising a fourth member inserted within the other one of said ends of said third tubular member to thereby join said third and

fourth component parts together and to seal said other end of said open interior, and said opposite end portion of said second member remaining outwardly exposed for attachment to the fluid conduit after said cannula and said first, second, third, and fourth component parts have been joined together to thereby enable the attachment of said assembly as a prefabricated unit to the fluid conduit.

4,413,993

## INFILTRATION-PROOF INTRAVENOUS NEEDLE

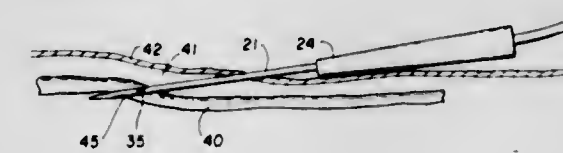
Yolan R. Guttman, P.O. Box 304, Radio City Station, Bronx, N.Y. 10019

Continuation-in-part of Ser. No. 236,105, Feb. 19, 1981, abandoned, which is a continuation of Ser. No. 172,238, Jul. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 896,340, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 697,043, Jun. 17, 1976, abandoned, which is a continuation of Ser. No. 602,733, Aug. 7, 1975, abandoned, which is a continuation of Ser. No. 384,081, Jul. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 156,017, Jun. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 830,211, Apr. 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 393,688, Sep. 1, 1964, abandoned, which is a continuation-in-part of Ser. No. 313,362, Oct. 2, 1963, abandoned. This application Oct. 26, 1981, Ser. No. 314,686

Int. Cl.<sup>3</sup> A61M 5/32

U.S. Cl. 604—274

3 Claims



1. An intravenous needle for insertion into a vein to supply fluid thereto, said needle preventing infiltration of fluids into tissues surrounding said vein, said intravenous needle comprising a round elongated hollow needle shaft tapering to a completely round elongated tip terminating in a sharp point which exhibits a solid, imperforate circumferential surface, said point retaining a round cross section throughout, said point lying on the axis of the needle shaft and an opening of said needle shaft at a measured distance spaced from said point, said distance being sufficient to permit said opening to remain within the lumen of said vein even when the point of such an inserted needle penetrates the wall of the vein from inside out.

4,413,994

## INTESTINAL IRRIGATOR FOR USE WITH ARTIFICIAL ANUS

Hiromi Sarashina, Sakura, Japan, assignor to Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,741

Claims priority, application Japan, Mar. 18, 1981, 56-38004[U]

Int. Cl.<sup>3</sup> A61F 5/44

U.S. Cl. 604—327

5 Claims

1. An intestinal irrigator adapted for use with an artificial anus which irrigator comprises:

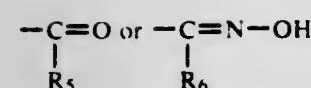
(a) a body including a hollow portion having open front and rear ends, said hollow portion having a bag-mounting portion;

(b) a suction portion mounted around said hollow portion, said suction portion having an open front end, said open front end of said suction portion lying flush with said open front end of said hollow portion; and said suction portion having a suction port connectable to a suction source; and

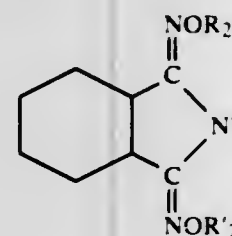
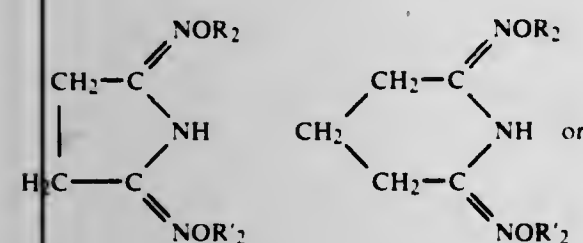




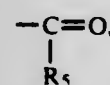




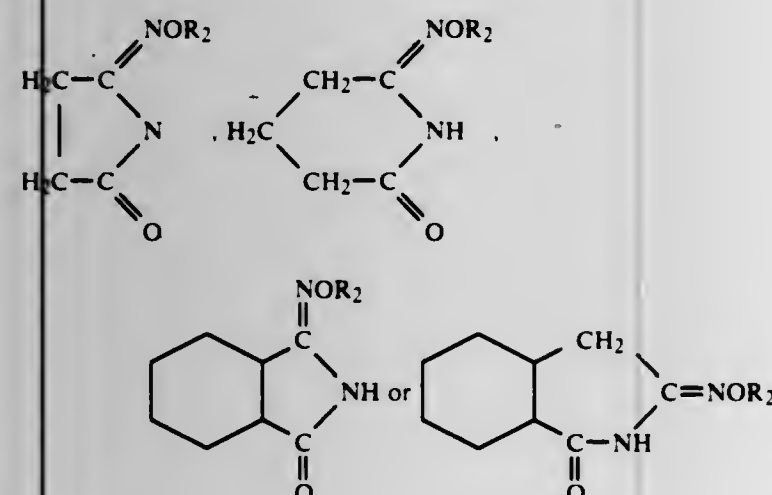
and the other, H, wherein R<sub>5</sub> or R<sub>6</sub> are alkyls of 2 to 5 carbon atoms optionally substituted by R<sub>1</sub>, or a phenyl optionally substituted by R<sub>1</sub>, or R<sub>6</sub> and R<sub>1</sub> together form structures of the formula



wherein R<sub>2</sub> is as defined and wherein R<sub>2</sub>' is either R<sub>2</sub> or H, or wherein R<sub>2</sub> is H and R<sub>4</sub> is



and R<sub>5</sub> and R<sub>1</sub> together form structures of the formula:



wherein R<sub>2</sub> is as defined.

4,414,000

# PROCESS FOR THE CONTINUOUS OR SEMICONTINUOUS DYEING OF VOLUMINOUS CELLULOSE FABRICS WITH AZO DEVELOPING DYE STUFFS USING ACRYLAMIDE POLYMERS

Hans-Ulrich von der Eltz, Frankfurt am Main; Peter Heinisch, Kelkheim, and Hans J. Ballmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 288,015, Jul. 29, 1981. This application Jun. 16, 1982, Ser. No. 388,932

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028845

Int. Cl.<sup>3</sup> D06P 1/12, 3/68

U.S. Cl. 8—555

8 Claims

1. In a process for the even dyeing of a voluminous woven fabric consisting of or containing preponderantly cellulose fibers, with at least one water-insoluble azo dyestuff produced

on the fiber according to a continuous or semicontinuous method, in which the impregnation is performed by pre-padding the fabric web with a coupling component under alkaline conditions, and subsequently the development of the dyestuff is effected, wet-in-wet, by slop-padding the textile goods with a diazo component in the presence of an acid and/or an acid-forming substance, the improvement which comprises incorporating into the acidic developing liquor containing the diazo component capable of being coupled combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures of the foregoing, said polymeric component being incorporated in an amount of from 30 to 60 g/l in the form of a 2 to 8% (by weight) aqueous formulation, and of from 2 to 20 g/l of an anionic or nonionic wetting agent.

4,414,001

# METHOD FOR THERMALLY DECOMPOSING AND GASIFYING COMBUSTIBLE MATERIAL IN A SINGLE FLUIDIZED REACTOR

Daizo Kunii, No. 25-16, Nakamachi 1, Meguro-ku, Tokyo, Japan

Division of Ser. No. 109,294, Jan. 3, 1980, Pat. No. 4,337,066.

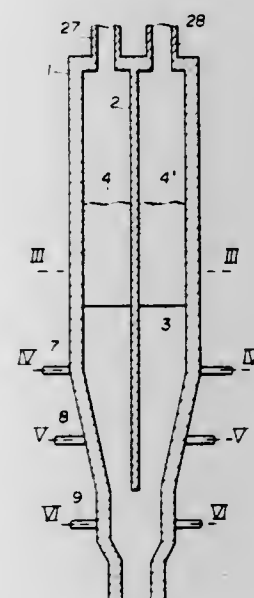
This application Jan. 21, 1982, Ser. No. 341,492

Claims priority, application Japan, Jul. 11, 1979, 54-87584

Int. Cl.<sup>3</sup> C10J 3/54

U.S. Cl. 48—197 R

7 Claims



1. A method for thermally decomposing and gasifying either liquid or solid combustible raw material in a single reactor in the form of cylindrical tower filled with solid powdered working medium in active fluidization, said reactor being provided with two vertical partitions, a first partition is extended downwards from the upper portion of the reactor so that the upper portion of the reactor tower is divided into two space sections, while the second partition is vertically extended at the lower and middle portions of the reactor substantially at a right angle to said first partition, said second partition extending lower than said first partition and into the lower portion of the reactor at a location above the bottom so that the reactor is divided into four space sections at the middle portion of the reactor, and at the lower portion of the reactor, the reactor is divided into two sections, wherein thermal decomposing and gasifying are performed by way of supplying the combustible raw material into a downwardly travelling working medium and at the same time supplying steam thereinto for generating and maintaining the active fluidization of the working medium in a thermal decomposition and gasification section, while burning and heating are performed by way of supplying air or a mixture gas of oxygen and steam into the upwardly travelling working medium accompanied by carbon or carbonaceous material produced during the preceding thermal decomposing and

gasifying process to burn said carbon or carbonaceous material in a combustion and heating section, said circulating working medium being adapted to displace upwards via the lower end of the first partition, wherein said method comprises the following steps of:

supplying combustible material into the middle or upper portion of the thermal decomposition and gasification section of the fluidized bed to disperse and mix the combustible material with the working medium so that the combustible material is thermally decomposed and gasified at a predetermined range of temperature so as to produce combustible gas, displacing downwards the mixture of the working medium and the residual material of carbon or carbonaceous material produced during said thermal decomposition and gasification through one of two space sections of the fluidized thermal decomposition and gasification section divided by means of the second partition, said downwards displacing being effected substantially by the gravity force of said mixture, transferring the mixture into the lower part of the fluidized combustion and heating section from the lower part of the thermal decomposition and gasification section via the lower end of the first partition, further displacing upwards the mixture through one of two space sections of the fluidized combustion and heating section in a active fluidization state by way of supplying steam therein at the lower portion of said space section, supplying air or mixture gas of oxygen and steam in both space sections at the middle portion of the combustion and heating section so that the carbon or carbonaceous material is burnt or partially oxidized therein in active fluidization so as to heat the working medium at the predetermined range of temperature, removing the so produced combustion gas or combustible gas out of the reactor, displacing downwards the working medium through the other of the two space sections of the fluidized combustion and heating section divided by means of the second partition, said downward displacing being effected substantially by the gravity of the working medium, transferring the working medium into the lower part of the fluidized thermal decomposition and gasification section from the lower part of the combustion and heating section via the lower end of the first partition, further displacing upwards the working medium through the other of the two space segments of the fluidized thermal decomposition and gasification section in a active fluidization state divided by means of the second partition by way of supplying steam therein at the lower portion of said space section, and fluidizing the working medium by way of supplying steam at the middle portion in both space sections of the thermal decomposition and gasification section of the fluidized bed.

4,414,002

# METHOD FOR GASIFICATION OF LARGE-SIZED VEGETABLE MATERIALS USING A FIXED BED GASOGENE

Jean Lucas, Paris; Jean-Francois Molle, Chaisy le Roy; Etienne Gille, Longjumeau, and Patrick Creze, Bois Guillaume, all of France, assignors to Centre National d'Etudes et d'Experimentation de Machinisme Agricole, Antony, France

Division of Ser. No. 90,911, Nov. 5, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,369

Claims priority, application France, Nov. 6, 1978, 78 31356

Int. Cl.<sup>3</sup> C10J 3/14

U.S. Cl. 48—209

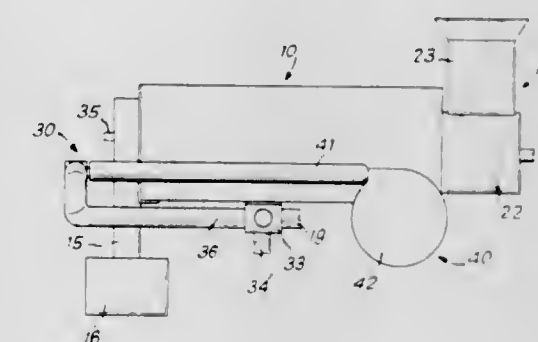
3 Claims

1. A method for the gasification of relatively large-sized vegetable materials, said method comprising the steps of: moving said materials in a fixed treatment chamber extending substantially horizontally and having opposite rear and forward ends, said materials being moved from said

rear end towards said forward end through substantially the whole transverse section of said chamber and being subjected successively to drying, pyrolysis and gasification in successive areas of said chamber;

generating hot gases in a zone free of materials to be treated and located in said chamber in front of the natural talus created by the front of the whole bulk of materials which occupy substantially the whole transverse section of said chamber;

extracting gases from said chamber by aspiration at a location adjacent to the rear end thereof whereby a forced stream of hot gases is produced rearwardly through the whole bulk of materials contained in said chamber and over the whole transverse section thereof;



recycling said extracted gases into said zone in front of said natural talus and adding a comburent gas to said recycled gas whereby heat for generating said hot gases is produced by combustion, said hot gases being diluted in said zone before entering said natural talus, and said tars produced from the pyrolysis and carried away by said extracted gases being eliminated by said combustion in said zone;

adjusting said aspiration so that the temperature of said extracted gases is at least 500° C. after having passed through the materials contained in said chamber; and taking out from said chamber and at a location in front of said pyrolysis area product, gas having passed through said material in said gasification area, whereby said product gas is free from tars.

4,414,003

# PROCESS AND APPARATUS FOR THE RECOVERY OF SOLVENTS

Bernd Blaudszun, Steinkirchen, Fed. Rep. of Germany, assignor to Lohmann GmbH & Co., KG, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,236

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042081; Nov. 7, 1980, 3042082

Int. Cl.<sup>3</sup> B01D 53/04

U.S. Cl. 55—18

27 Claims

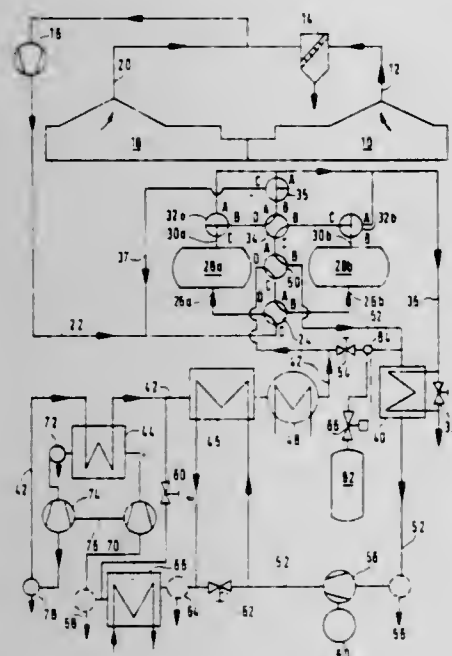
1. A process for recovering solvents which are adsorbed by an adsorbent from exhaust air containing solvent vapors, said process including the steps of passing a hot stream of inert gas as the desorption medium from an inert gas circuit through the adsorbent, cooling the stream of inert gas to condense the solvent vapors picked up by the stream of inert gas, separating the solvent condensate, and re-using the reheated stream of inert gas, low in solvent vapors, as the desorption medium, the improvement comprising:

the steps of compressing the inert gas stream laden with the solvent vapors and cooling the inert gas stream laden with solvent vapors in an expansion turbine while delivering work from the expansion chamber, wherein both steps condense the solvent vapors.

17. Apparatus for the recovery of solvents containing at least one adsorbent vessel with inlet and outlet ducts for alternately transmitting a cold stream of exhaust air laden with solvent vapors and a stream of inert gas lean in solvent vapors,



at least one cooling means connected to the outlet duct of the inert gas stream which was laden in the adsorbent vessel with solvent vapors, at least one solvent separator following the cooling means, and at least one heating means following the last solvent separator and connected to the inlet duct to the



adsorbent vessel for heating the cooled stream of inert gas lean in solvent vapors, the improvement comprising:  
an expansion turbine in the outlet duct of the inert gas stream laden with solvent vapors, said expansion turbine preceded by at least one compressor.

4,414,004

#### REMOVAL OF CONDENSABLE ALIPHATIC HYDROCARBONS AND ACIDIC GASES FROM NATURAL GAS

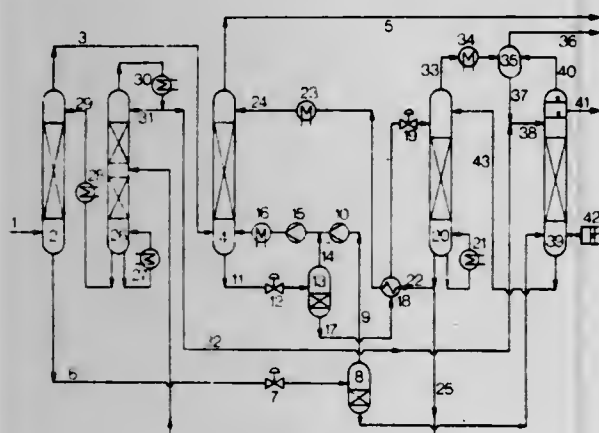
Edkhardt Wagner, Ludwigshafen; Ulrich Wagner, Limburgerhof; Klaus Volkamer, Frankenthal, and Wolfgang Vodrazka, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,721

Int. Cl.<sup>3</sup> B01D 53/14

U.S. Cl. 55-48

9 Claims



1. A process for removing condensable aliphatic hydrocarbons and acidic gases such as  $H_2S$ ,  $CO_2$  and  $COS$  from natural gas containing these, which comprises:

- initially treating the natural gas with polyethylene glycol dialkyl ethers, as the solvent, in a first absorption stage to effect absorption of the condensable aliphatic hydrocarbons,
- then treating the natural gas drawn off from the first absorption stage with polyethylene glycol dialkyl ethers, as the solvent, under superatmospheric pressure in a sec-

ond absorption stage, the acidic gases completely or partly being absorbed,

- treating the solvent charged with condensable aliphatic hydrocarbons which is obtained from the first stage with water in an extraction stage to form a hydrocarbon phase containing the condensable aliphatic hydrocarbons and an aqueous dialkyl ether phase, and separating the hydrocarbon phase from the aqueous dialkyl ether phase,
- regenerating the solvent charged with acidic gases which is obtained from the second absorption stage by expansion and/or stripping in a regeneration stage and
- recycling the regenerated solvent to the absorption.

4,414,005

#### METHOD OF ENCAPSULATING MATERIALS IN A ZEOLITE IN A STABLE MANNER

Paul J. De Bievre, Kasterlee; Etienne F. Vansant, Zoersel, and Guido J. Peeters, Berchem, all of Belgium, assignors to European Atomic Energy Community (Euratom), Luxembourg, Luxembourg

Filed Oct. 6, 1981, Ser. No. 309,222

Claims priority, application Netherlands, Oct. 13, 1980, 8005645

Int. Cl.<sup>3</sup> B01D 53/04

U.S. Cl. 55-75

4 Claims

3. A method of separating mixtures, which comprises contacting pore-containing zeolites with a mixture of components, selectively adsorbing at least one component of the mixture in the pores of the zeolite, separating the zeolite from the non-adsorbed component and desorbing the adsorbed substances, said zeolite having been treated with a modifying agent selected from the group consisting of silanes, halosilanes, alkylsilanes, boranes, haloboranes and alkylboranes, germanes, halogermanes and alkylgermanes to reduce the pore size to a desired dimension.

4,414,006

#### AIR SEPARATION FOR AN OIL PUMP

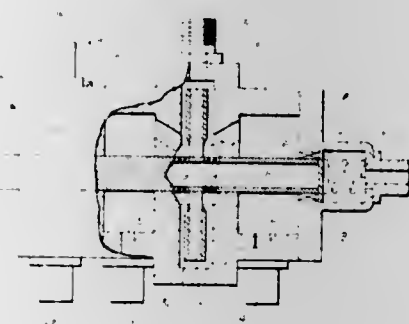
Gary D. Armstrong, 2552 Albatross Way, Sacramento, Calif. 95815

Filed Feb. 10, 1982, Ser. No. 347,628

Int. Cl.<sup>3</sup> B01D 19/00

U.S. Cl. 55-190

3 Claims



1. A device for separating air from oil or the like comprising in combination:

- an oil/air inlet means,
  - means for directing the oil/air to said device,
  - separating means for moving the oil substantially radially outwardly while directing the air substantially radially inwardly,
  - an oil outlet for emitting the oil,
  - and venting means for emitting the air,
- wherein said separating means includes an impeller disc mounting on a driven shaft,
- wherein said driven shaft is provided with plural apertures for air migration, said shaft including a hollow core,
- wherein said core communicates with said venting means for

air discharge, said venting means including an air pressure sensitive diaphragm proximate to a shaft end, wherein said diaphragm is responsive to biasing means for back pressure, wherein said directing means include oil/air intake chamber which store a quantum of the air/oil received from said air/oil inlet means, wherein said air/oil intake chamber communicates with said impeller via a radially inwardly sloped intake port including a pair of said intake chambers, ports, and inlet means on opposed face of said impeller which is housed in an associated impeller chamber.

4,414,007

#### PROCESS FOR SEPARATION OF GAS MIXTURE

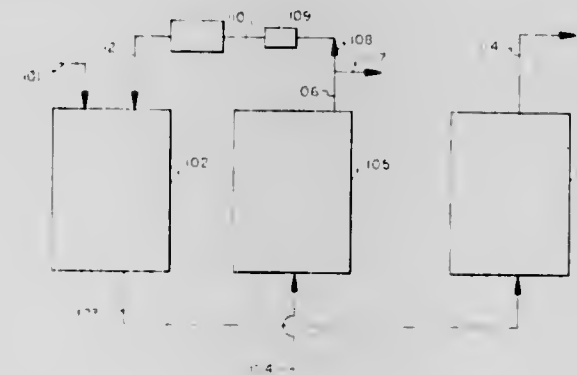
Bernard A. Bucchianeri, Monongahela, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1981, Ser. No. 298,052

Int. Cl.<sup>3</sup> F25J 3/02

U.S. Cl. 62-12

26 Claims



1. In a process for the purification of the low boiling constituents of a compressed gas mixture comprising gases from a coal conversion process by cooling to low temperatures in cyclical alternated regenerators to condense high-boiling constituents of said gas mixture comprising (1) passing said gas mixture through a first regenerator from the warm end to the cold end of the same to cool said gas mixture and to condense said high-boiling constituents of said gas mixture thereby producing a purified gas stream; (2) passing large quantities of a scavenging gas which is at a lower pressure than said gas mixture in said first regenerator through a second regenerator from the cold end to the warm end of the same to clean said second regenerator and to re-evaporate said high boiling constituents, and (3) passing at least part of said purified gas stream through a third regenerator from the cold end to the warm end of same to re-cool said third regenerator, the improvement comprising compressing and recycling at least part of said scavenging gas which has passed through said second regenerator through said first regenerator from the warm end to the cold end and repeating the process as defined above and wherein said scavenging gas which has passed through said second regenerator is very dilute in said high-boiling constituents.

4,414,008

#### PROCESS FOR PRODUCING OPTICAL FIBER PREFORM

Takao Eda, Ibaraki; Tetsuo Miyajiri, Kanagawa; Hiroshi Yokota, Kanagawa, and Toru Kuwahara, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Inds., Ltd., Osaka, both of Japan

Filed Dec. 11, 1981, Ser. No. 329,919

Claims priority, application Japan, Dec. 12, 1980, 55-174729

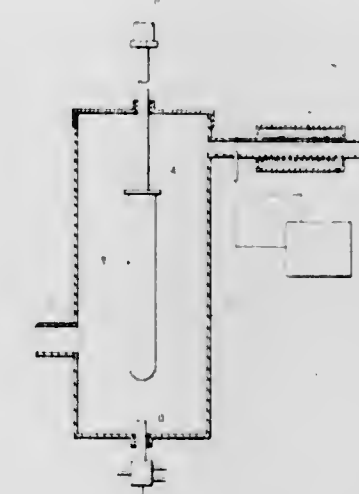
Int. Cl.<sup>3</sup> C03B 19/00, 37/07

U.S. Cl. 65-3.12

2 Claims

1. A process for producing a porous optical fiber preform by hydrolyzing a gaseous glass forming material with a flame

from an oxyhydrogen burner and depositing the resulting soot in a rod form in a muffle furnace, wherein the muffle furnace is supplied with a preheated gas other than that from the oxyhydrogen burner, said preheated gas being air supplied at a



constant temperature at a level slightly lower than the temperature of the gas within the muffle furnace.

2. A processing according to claim 1, wherein said preheated air has a temperature less than 50° C. lower than the average temperature of the gas within the muffle furnace.

4,414,009

#### METHOD OF MAKING AN IMAGE INTENSIFIER FACEPLATE

Walter P. Slegmund, Woodstock, Conn., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

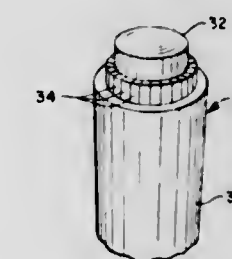
Division of Ser. No. 178,317, Aug. 15, 1980, Pat. No. 4,393,322.

This application Jun. 11, 1982, Ser. No. 387,340

Int. Cl.<sup>3</sup> C03B 23/207

U.S. Cl. 65-4.3

4 Claims



1. The method of making faceplates for image intensifiers comprising the steps of:

- grinding and polishing the side of a glass rod;
- assembling against said rod a closely related succession of relatively thin pieces of light-absorbing glass;
- fitting a tube of supporting glass over said assembly of pieces and rod;
- heating and stretching the resulting faceplate preform into a boule;
- annealing and transaxially slicing flat plates from said boule;
- and
- machining said flat plates to configurations desired of said faceplates.



4,414,010

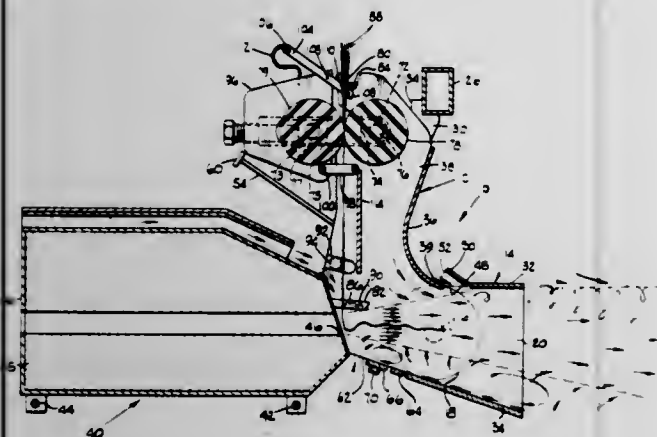
**APPARATUS FOR ATTENUATING MINERAL FIBERS**  
John F. Chin, Toledo; Joseph A. Rhodes, Sylvania, both of Ohio,  
and James E. Kusterer, Sedalia, Colo., assignors to Manville  
Service Corporation, Denver, Colo.

Filed Jun. 21, 1982, Ser. No. 390,567

Int. Cl.<sup>3</sup> C03B 37/065

U.S. Cl. 65—16

10 Claims



1. An attenuation shroud in combination with a fiber attenuating burner, said burner having a degree of play in its mounting to accommodate positioning with respect to upstream elements, said play varying the alignment of said burner's outlet orifice, said attenuation shroud being characterized by a first upstream portion stationarily mounted adjacent said attenuating burner for receiving and directing a flow of hot gases from said outlet orifice, a second downstream portion hingedly mounted to said first portion for pivotal movement about a generally horizontal axis, control means to enable said second portion to be pivotally adjusted relative to said first portion to accommodate alignment variations of the attenuating burner's outlet orifice.

4,414,011

**METHOD OF SECURING FIBER REINFORCED GLASS MATRIX COMPOSITE MATERIAL TO STRUCTURAL MEMBERS**

George K. Layden, Wethersfield, and Karl M. Prew, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1982, Ser. No. 381,802

Int. Cl.<sup>3</sup> C03C 25/00

U.S. Cl. 65—18.1

10 Claims



1. A method of securing fiber reinforced glass matrix composite material to a structural member comprising molding and machining a high temperature stable fiber reinforced glass matrix composite material into rivet or bolt form, forming substantially concentric holes in the composite material and structural member at the point of attachment, securing the composite material to the structural member by inserting the rivet or bolt through such holes and closing the open end of the rivet or bolt by heat deforming or nut means respectively, so as to produce a composite material-structural member which remains secure under extreme temperature fluctuations.

4,414,012

**FABRICATION METHODS OF DOPED SILICA GLASS AND OPTICAL FIBER PREFORM BY USING THE DOPED SILICA GLASS**

Shoichi Suto; Hiroyuki Suda; Fumiaki Hanawa; Motohiro Nakahara, all of Mito, and Nobuo Inagaki, Katsuta, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

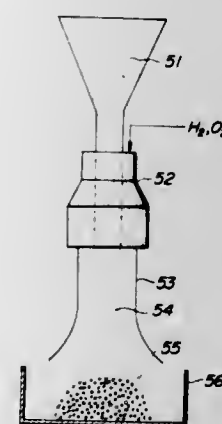
Filed Sep. 8, 1981, Ser. No. 300,296

Claims priority, application Japan, Sep. 11, 1980, 55/126556; Sep. 16, 1980, 55/127102; Nov. 4, 1980, 55/154960; Nov. 4, 1980, 55/154961; Nov. 26, 1980, 55/166262; Apr. 13, 1981, 56/54332; Apr. 13, 1981, 56/54334

Int. Cl.<sup>3</sup> C03B 19/06, 20/00

U.S. Cl. 65—18.2

17 Claims



1. A method of manufacturing doped silica glass, comprising the steps of:

providing either silica glass fine particles or quartz powder produced by subjecting an easily oxidizable silicon compound to thermal oxidation or flame hydrolysis; dissolving a dopant oxide into said silica glass fine particles or said quartz powder by means of oxidation of a gas for forming doped silica glass on the surfaces of said silica glass fine particles or said quartz powder to form doped silica glass fine particles or doped quartz powder; and sintering to vitrify said doped silica glass fine particles or said doped quartz powder to form doped silica glass.

17. A method of manufacturing doped silica glass, comprising the steps of:

exposing quartz powder to a gas for forming doped silica glass containing  $\text{SiCl}_4$ , a gaseous additive for producing a dopant which is capable of forming a solid solution with  $\text{SiO}_2$  by reacting with  $\text{H}_2\text{O}$ , and water vapor to form a  $\text{SiO}_2$ -dopant solid solution, and

vitrifying the resulting  $\text{SiO}_2$ -dopant solid solution.

4,414,013

**METHOD OF MAKING BLACK GLASS BY UTILIZING INCINERATED WASTE GLASS**

David A. Connell, 747 Dividing Rd., Severna Park, Md. 21146

Filed Apr. 26, 1982, Ser. No. 372,025

Int. Cl.<sup>3</sup> C03B 5/08

U.S. Cl. 65—28

18 Claims

1. A process for producing black glass comprising:  
(a) reclaiming glass material including ferrous oxide and ferric oxide from incinerated municipal waste,  
(b) melting said glass material in the range from about 1300° C. to about 1500° C. to convert at least a portion of the iron oxides therein to  $\text{Fe}_3\text{O}_4$ , thereby causing black coloration of the glass material and stratifying the mixture wherein one of the layers comprises a substantially homogeneous black glass,  
(c) cooling the molten glass to obtain a middle layer of substantially homogeneous black glass and a top and bottom layer of non-homogeneous material, the top layer being of extraneous and undissolved matter and the bottom layer being of concentrated metals,

(d) removing the non-homogeneous material from the substantially homogeneous black glass layer.

4,414,014

**METHOD OF PRODUCING A BUBBLE-FREE VITREOUS MATERIAL**

Rolf Bruning; Poul-Erik Breidenbach, both of Bruchköbel; Norbert Cibis, Frankfurt am Main; Fritz Aldinger, Rodenbach, and Waltraud Werdecker, Hanau, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau am Main, Fed. Rep. of Germany

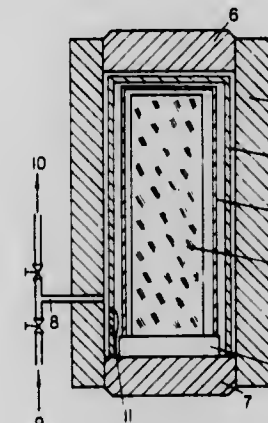
Filed Oct. 19, 1981, Ser. No. 312,469

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3039749

Int. Cl.<sup>3</sup> C03B 20/00, 32/00; C03C 15/02

U.S. Cl. 65—31

12 Claims



1. A method for the production of a shaped article of a bubble free vitreous material, and in particular bubble free vitreous silica, formed a shaped article of bubbles-containing vitreous material, and in particular vitreous silica, which comprises heating said material in the form of a shaped article while said shaped article is disposed on a support in a furnace and while heating said shaped article applying an omnidirectional gas pressure thereagainst which pressure is applied by a gas which is insoluble in said material, said gas being at an omnidirectional pressure of 100 to 3,000 bars, said material being heated to a temperature which reduces the viscosity of said material to a value between  $10^{13.5}$  and  $10^8$  Pa.sec, said material in the form of a shaped article being heated at said temperature and pressure for a period of not less than 10 minutes and thereafter cooling said material to room temperature over a period of less than 10 hours.

4,414,015

**PROCESS AND APPARATUS FOR FORMING A METAL OR METAL COMPOUND COATING**

Robert Van Laethem, Loverval, and Robert Terneu, Charleroi, both of Belgium, assignors to BFG Glassgroup, Paris, France

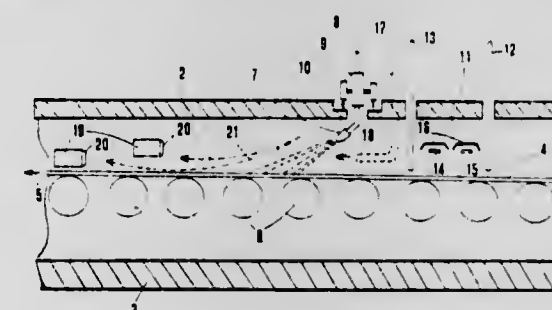
Filed Jun. 18, 1981, Ser. No. 275,048

Claims priority, application United Kingdom, Jun. 20, 1980, 8020166

Int. Cl.<sup>3</sup> C03B 29/04

U.S. Cl. 65—60.3

24 Claims



1. A process for forming a metal or metal compound coating

on a face of a freshly formed ribbon of hot glass during its travel from a flat glass forming installation, by contacting such face at a coating station with a fluid medium or fluid media comprising a substance or substances from which said coating metal or metal compound is formed on said face, characterised in that preparatory to being coated, the glass (4, 23) is thermally conditioned at a thermal conditioning station between the flat glass forming installation and the coating station, so as to eliminate or reduce temperature gradients across the ribbon width to be coated.

14. Apparatus suitable for use in coating a freshly formed ribbon of hot glass during its travel from a flat glass forming installation, said apparatus comprising means (7-10, 29, 30) for delivering (a) fluid coating medium or media into contact with the glass (4, 23) at a coating station, characterised in that there is means (14-16, 36) whereby the temperature of one or more portions of the ribbon width can be conditioned selectively or differentially at a thermal conditioning station constituted as a heating station incorporating heating means and located between the flat glass forming installation and said coating station, so as to eliminate or reduce temperature gradients across the ribbon width to be coated, and regulating means for varying the selective or differential heat supply distribution at said heating station.

4,414,016

**APPARATUS FOR THE PELLETIZATION OF HEAT-LIQUIFIABLE SOLID MATERIALS**

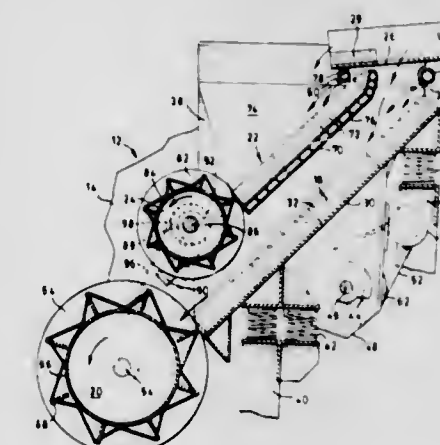
Michael Orlander, Dundas; Robert P. Cotsworth, and Peter A. MacKenzie, both of Hamilton, all of Canada, assignors to National Slag Limited, Hamilton, Canada

Filed May 13, 1982, Ser. No. 377,871

Int. Cl.<sup>3</sup> C03B 19/04

U.S. Cl. 65—141

8 Claims



1. Apparatus for the pelletization of molten heat-liquifiable solid material comprising:  
an apparatus frame;  
feed means providing a primary discharge means for molten material fed thereto up to a predetermined flow rate, and a secondary discharge means for excess molten material when the flow rate of the material fed thereto is greater than said predetermined flow rate,  
first and second feed plates mounted by the frame one above the other to receive respectively material from the primary and secondary discharge means and providing respective first and second feed surfaces over which the received molten material flows under gravity,  
first and second radially-vaned projecting rotors mounted by the frame for rotation about respective horizontal axes and on to the respective peripheries of which the molten material is fed respectively from the first and second feed surfaces for projection into the air for cooling and pelletization thereof, and  
motor means for rotating the two rotors about their respective axes in the respective required directions.



4,414,017

## HERBICIDAL 3-BUTYROLACTONES

David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

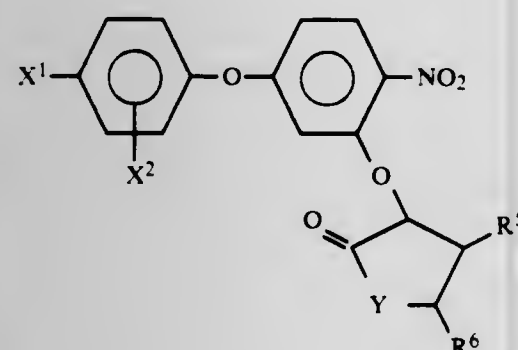
Filed May 27, 1980, Ser. No. 153,476

Int. Cl.<sup>3</sup> A01N 43/08, 43/10; C07D 333/32, 307/32

U.S. Cl. 71-88

13 Claims

1. A compound having the formula:



wherein

X<sup>1</sup> is halo or trihalomethyl;X<sup>2</sup> is hydrogen or halo; Y is oxygen or sulfur andR<sup>5</sup> and R<sup>6</sup> are independently hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms or phenyl.

4,414,018

## HERBICIDES

Roberto Colle, Franco Gozzo, and Ciro Prezioso, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 159,957, Jun. 16, 1980, abandoned.

This application Mar. 9, 1982, Ser. No. 356,422

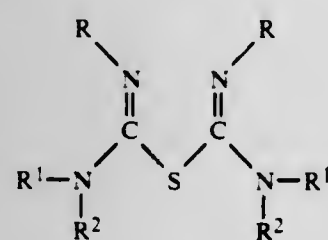
Claims priority, application Italy, Jun. 15, 1979, 23621 A/79

Int. Cl.<sup>3</sup> A01N 33/02; C07C 119/00

U.S. Cl. 71-88

5 Claims

1. Compounds of the formula:

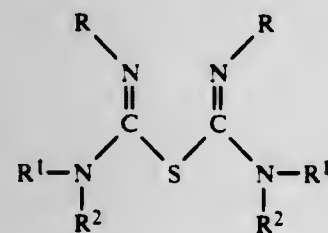


wherein

R is phenyl substituted by one or more halogen atoms, one or more alkyl or haloalkyl groups with from 1 to 3 carbon atoms;

R<sup>1</sup> and R<sup>2</sup> are the same or different and each represents an alkyl C<sub>1</sub>-C<sub>3</sub>, an alkoxy C<sub>1</sub>-C<sub>3</sub>, or R<sup>1</sup> or R<sup>2</sup> together with the nitrogen atom to which they are bonded form a piperidino or morpholino radical.

5. A method of fighting infestations of monocotyledons and dicotyledons, characterized in that one or more compounds, either as such or in the form of suitable compositions, are spread on the soil prior to or after the emergence of the plants from the soil, said compounds having the formula:



wherein

R is phenyl optionally substituted by one or more halogen

atoms, one or more alkyl or haloalkyl groups with from 1 to 3 carbon atoms;

R<sup>1</sup> and R<sup>2</sup> are the same or different and each represents an alkyl C<sub>1</sub>-C<sub>3</sub>, an alkoxy C<sub>1</sub>-C<sub>3</sub>, or R<sup>1</sup> or R<sup>2</sup> together with the nitrogen atom to which they are bonded form a piperidino or morpholino radical.

4,414,019

## 2-BENZYL 1,3-DITHIOLANES AS HERBICIDAL ANTIDOTES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

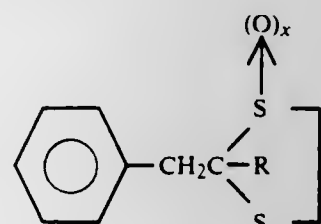
Filed Feb. 22, 1982, Ser. No. 351,047

Int. Cl.<sup>3</sup> E05B 65/00

U.S. Cl. 71-91

20 Claims

1. The method of protecting a crop from injury due to at least one thiolcarbamate herbicide, comprising preplant incorporation in the soil in which said crop is to be planted, a non-phytotoxic antidotally effective amount of a compound corresponding to the formula



wherein R is hydrogen or lower alkyl having 1-3 carbon atoms, and x is 0 or 1.

4,414,020

## COMPOSITION AND PROCESS FOR PROMOTING THE GROWTH OF CROP PLANTS

Karl H. Heier, Frankfurt am Main; Hans J. Nestler, Königstein; Hermann Bieringer, Eppstein, and Klaus Bauer, Rodgau, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 2, 1981, Ser. No. 222,077

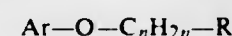
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1980, 3000076

Int. Cl.<sup>3</sup> A01N 37/36, 33/02

U.S. Cl. 71-108

8 Claims

1. A herbicidal composition for promoting the safening of cereal crop plants comprising an effective amount of phenoxy alkanic acid herbicide and an antidotally effective amount of an antidote of the formula

or a metal salt or acid addition product thereof, in which Ar is phenyl mono-, di- or trisubstituted with chlorine or bromine; n is 1, 2 or 3 and R is C(NH<sub>2</sub>)NOH and wherein said herbicidal composition comprises from about 2 to about 80 percent by weight of antidote and herbicide, the ratio of antidote to herbicide being in the range of 0.125 to 7 parts antidote per part herbicide.

4,414,021

## PROCESS FOR THE SYNTHESIS OF IRON POWDER

William W. Welbon, Belleair, Fla., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 6, 1982, Ser. No. 375,519

Int. Cl.<sup>3</sup> C21B 15/00

U.S. Cl. 75-0.5 AA

7 Claims

1. A process for preparing metallic iron powder having a spongelike structure, a total iron content of 97% minimum, a metallic iron (Fe<sup>0</sup>) content of 89% minimum, an oxygen content of 2.3% maximum, a Green strength of 4000-6000 psi, and a Fischer subsize size of 1.5-3.5, with a minimum of 70% of a

4,414,023

## IRON-CHROMIUM-ALUMINUM ALLOY AND ARTICLE AND METHOD THEREFOR

George Aggen, and Paul R. Borneman, both of Sarver, Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1982, Ser. No. 367,710

Int. Cl.<sup>3</sup> C22C 38/06

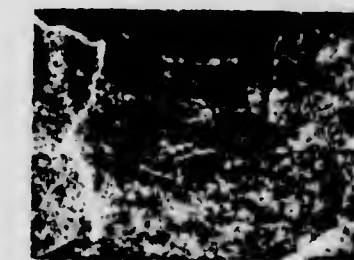
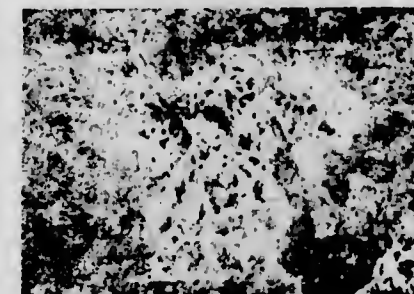
U.S. Cl. 75-124

23 Claims

size of -325 mesh and a maximum of 1.0% of a size of +100 mesh.

comprising,

heating to boiling for 1-3 hours, an aqueous solution comprising 0.4-2 M of a solubilized ferric salt, 10-40 g/l of formic acid or sulfuric acid and 60-120 g/l of urea, thereby obtaining a precipitate, separating the precipitate, drying it, and

reducing the dried precipitate by treating it with hydrogen gas at 650°-900° C. for 4-2 hours, thereby producing iron (Fe<sup>0</sup>) powder having a total iron content of 97% minimum, a metallic iron (Fe<sup>0</sup>) content of 89% minimum, an oxygen content of 2.3% maximum, a Green strength of 4000-6000 psi, and a Fischer subsize size of 1.5-3.5, with a minimum of 70% of a size of -325 mesh and a maximum of 1.0% of a size of +100 mesh.

4,414,022

## METHOD AND APPARATUS FOR SMELTING SULFIDIC ORE CONCENTRATES

Gerhard Melcher, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

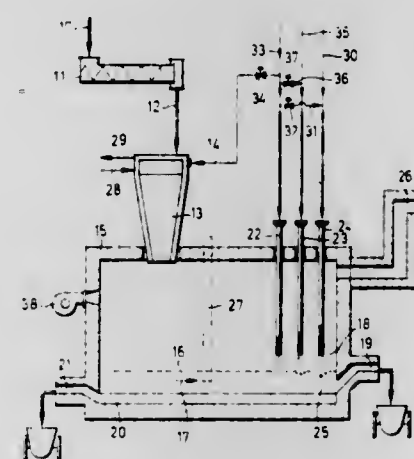
Filed Jan. 18, 1982, Ser. No. 340,300

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101369

Int. Cl.<sup>3</sup> C22B 5/16

U.S. Cl. 75-26

7 Claims



1. In a method of smelting a sulfidic ore concentrate or the like in which said concentrate is melted in an oxidizing atmosphere, the melt is after-treated with reducing gases from a plurality of lances which blow said reducing gases onto said melt in the form of concentrated streams of high kinetic energy, to produce a metal-rich phase and a slag phase, the improvement which comprises:

oxidizing said concentrate sufficiently to form an enriched metal matte containing more than 75% by weight metal at a rate of more than 500 metric tons/day, said oxidizing being carried out in a smelting cyclone having a melt outlet temperature of at least 1600° C., circulating feed water through said smelting cyclone to generate steam, and recovering the steam thus produced.

4,414,025

## PROCESS FOR ADDITION OF SILICON TO IRON

Chi-Ming Yang, Kaohsiung, Taiwan, assignor to China Steel Corporation, Kaohsiung, Taiwan

Filed Jul. 20, 1982, Ser. No. 400,183

Int. Cl.<sup>3</sup> C22C 33/00

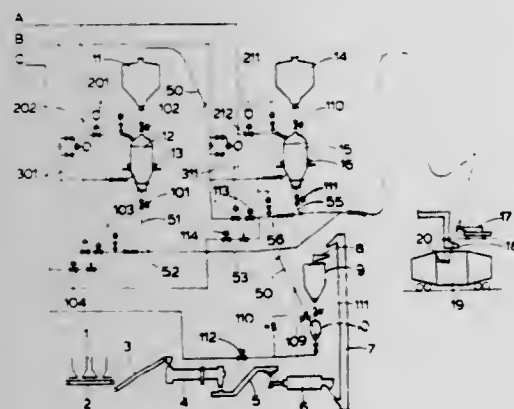
U.S. Cl. 75-129

10 Claims

1. A process for the addition of ferro-silicon to molten iron



to increase the silicon content which comprises conveying pulverized ferro-silicon powder from a container which is at a preset pressure  $P_1$  to a conveyor line in which line gas flow is controlled by at least two valves set to open at predetermined



gas pressures to establish gas pressure  $P_2$  in said line and further conveying said ferro-silicon through an adjustable lance into the molten iron, the rate of injection of the ferro-silicon being controlled by the difference in pressures  $P_1$  and  $P_2$  by a differential pressure recording controller.

#### 4,414,026 METHOD FOR THE PRODUCTION OF FERROCHROMIUM

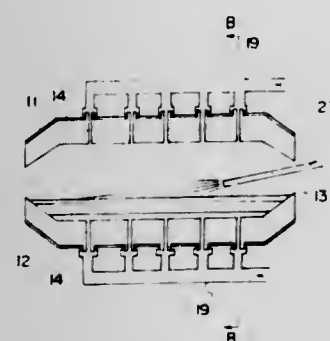
Tsutomu Fukushima, Kiyoshi Kawasaki, and Sadayuki Sasaki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,049

Claims priority, application Japan, Jul. 30, 1981, 56-118500; Jul. 31, 1981, 56-119291

Int. Cl.<sup>3</sup> C22C 33/00

U.S. Cl. 75—130.5



1. A method for producing ferrochromium comprising the steps of:

- charging materials comprising chromium ores, fluxes and carbonaceous reducing agents into a rotary furnace or a shaft furnace;
- preheating said materials under conditions selected from reducing and non-reducing conditions;
- introducing said preheated materials into a rotary furnace being at an angle of from horizontal to tilted up to a maximum of 35° with respect to the axis of said rotary furnace; and
- blowing a gas selected from air, oxygen and mixtures thereof into said rotary furnace through a plurality of small openings in the shell and refractory lining of the rotary furnace, thereby subjecting the material to a smelting reduction thereby producing a molten metal and slag, wherein during the smelting reduction process, a layer of carbonaceous agents at least 50 mm thick is maintained on said materials.

#### 4,414,027 METHOD FOR OBTAINING IRON-BASED ALLOYS ALLOWING IN PARTICULAR THEIR MECHANICAL PROPERTIES TO BE IMPROVED BY THE USE OF LANTHANUM, AND IRON-BASED ALLOYS OBTAINED BY THE SAID METHOD

Mario Gorgerino, Meyzieu, and Daniel Videau, Le Touvet, both of France, assignors to Compagnie Universelle d'Acetylene et d'Electrometallurgie, France

Division of Ser. No. 26,778, Apr. 3, 1979, Pat. No. 4,290,805.

This application Apr. 27, 1981, Ser. No. 257,859

Claims priority, application France, Apr. 6, 1978, 78 10254

Int. Cl.<sup>3</sup> C22C 33/08

U.S. Cl. 420—578

2 Claims

1. Alloy for the addition to iron-based alloys to provide such alloys which are substantially devoid of pinholes and cavities in spheroidal graphite cast-irons, and of carbides in flaky grey-iron and having improved castability, rollability, anisotropy and mechanical properties, said alloy having the following composition in percent by weight:

Si=60-90

Ca=0.01-4

Al=0.1-4

La=0.01-5

Fe=the balance.

#### 4,414,028 METHOD OF AND APPARATUS FOR SINTERING A MASS OF PARTICLES WITH A POWDERY MOLD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Apr. 8, 1980, Ser. No. 138,448

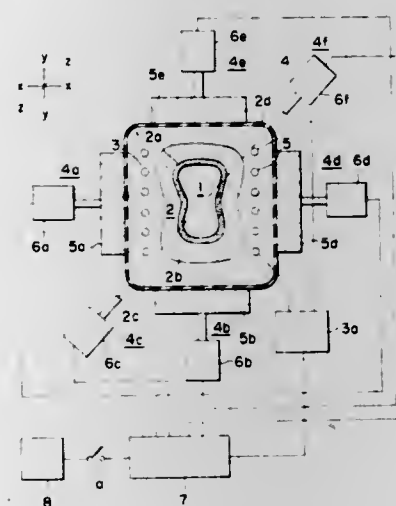
Claims priority, application Japan, Apr. 11, 1979, 54-43851; Apr. 16, 1979, 54-47012; Apr. 19, 1979, 54-48824; Aug. 31, 1979, 54-111428

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B22F 3/16, 3/14; B30B 7/04

U.S. Cl. 419—31

13 Claims



1. A method of sintering a sinterable mass of particles, comprising the steps of:

- (a) imbedding the sinterable mass in a porous mass of particulate heat-resistant material, said porous mass constituting a force-transmitting medium for transferring pressures uniformly to said sinterable mass;
- (b) disposing said porous mass in pressure-reception relationship in a multi-axial compression system capable of applying plural independent axial pressures externally to said porous mass along a plurality of axes intersecting generally at a point in said sinterable mass, each axis lying generally orthogonal to the adjacent axes;
- (c) applying thermal energy sufficient for sintering said sinterable mass;
- (d) in a first stage of sintering, applying said independent

- pressures, set at a first magnitude, simultaneously along said axes to multi-directionally compress said sinterable mass through the medium of said porous mass.
- (e) in a second stage of sintering, applying said independent pressures set at a second magnitude, which is greater than said first magnitude, successively and cyclically along said axes, and
- (f) in a third and final stage of sintering, applying said independent pressures set at a third magnitude, which is greater than said second magnitude, simultaneously along said axes.

#### 4,414,029 POWDER MIXTURES FOR WEAR RESISTANT FACINGS AND PRODUCTS PRODUCED THEREFROM

Harold C. Newman, Fallon, Nev., and William M. Stoll, Ligonier, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed May 20, 1981, Ser. No. 265,534

Int. Cl.<sup>3</sup> C22C 29/00

U.S. Cl. 75—252

6 Claims

1. A mixture of hardfacing powders comprising: macrocrystalline WC particles; 0.05 to 0.5 weight percent niobium metal powder; and 0.05 to 1.0 weight percent molybdenum metal powders.

#### 4,414,030 FIBER-REINFORCED CEMENT, AND PROCESS

Jose M. Restrepo, Calle 85 No. 14-70, Of. 301-, Bogota, Colombia

Filed Nov. 25, 1981, Ser. No. 325,035

Int. Cl.<sup>3</sup> C04B 31/34

U.S. Cl. 106—90

12 Claims

1. A cement mortar consisting essentially of: water, particulate mortar components of cement and sand, and separate reinforcing filaments consisting essentially of filaments obtained from polyolefin film, said separate microfibrillated filaments consisting in sections shredded from non-twisted fibrillated ribbons having a length of up to 50 mm long, with said fibrillated ribbons having been split apart from said polyolefin film and subjected to microfibrillation by stirring particulate mortar components and said reinforcing filaments to effect stretching the fibrillated film fibrils to breakage so generating smaller splinters which are the microfibrils, wherein said separate reinforcing filaments have filamentary structure comprising hooked microfibrils laterally branching from points along the length of said separate filaments, and wherein separate reinforcing plastic filaments are evenly distributed throughout the body of said cement mortar in a randomly oriented fashion along all of its spatial directions.

#### 4,414,031 FIBER-CONTAINING PRODUCTS MADE WITH HYDRAULIC BINDER AGENTS

Josef Studinka, Zürich, and Peter E. Meier, Wädenswil, both of Switzerland, assignors to Ametex AG, Niederurnen, Switzerland

Filed Mar. 19, 1982, Ser. No. 359,943

Claims priority, application Switzerland, Mar. 20, 1981, 1919/81

Int. Cl.<sup>3</sup> C04B 31/34

U.S. Cl. 106—90

21 Claims

1. Solid, fiber-containing products manufactured with hydraulic binder agents, characterized in that they contain fibers of polymerized acrylic nitrile as reinforcement fibers having a molar concentration of acrylic nitrile units of from 98 to 100%, which maintain their strength characteristics during and after the setting process.

#### 4,414,032 ANTI-FLOODING AGENT FOR PAINTS AND PLASTERS

Walter Schratzenholz, Mainz-Gonsenheim; Eckhard Hilgenfeldt, and Volker Knittel, both of Wiesbaden-Schierstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 906,588, May 16, 1978, abandoned.

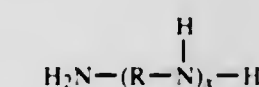
This application Jul. 30, 1979, Ser. No. 62,080

Int. Cl.<sup>3</sup> C08K 5/08, 5/17; C08I 1/26

U.S. Cl. 106—186

4 Claims

1. In a process for preventing the flooding of color pigments in aqueous plastic dispersion paints, plastic-based plasters, and distemper paints containing cellulose ethers, in which an agent is added to said paint or plaster, while it is still in the white state or after it has been colored by the addition of said colored pigments, said agent being based on a block polymer in which a di- or polyamine is present as the initial molecule on which alkylene oxide units are added, the improvement comprising adding a block polymer obtained from one mole of a di- or polyamine of the general formula



wherein R is an alkylene group with 2 to 6 carbon atoms, and x is a whole number from 1 to 4, by reaction with about 5 to 50 moles of ethylene oxide, followed by reaction with about 5 to 100 moles of propylene oxide.

#### 4,414,033 PROCESS FOR PREPARING FERRIFERROCYANIDE PIGMENTS

Arvind S. Patil, Wyoming; John H. Bantjes, and John T. Ouderkirk, both of Holland, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 6, 1981, Ser. No. 318,752

Int. Cl.<sup>3</sup> C08K 3/00; C09D 11/00; C09C 1/26

U.S. Cl. 423—367

7 Claims

1. A process for preparing a ferriferrocyanide pigment in the absence of ammonium sulfate comprising (a) forming a reaction mixture containing a ferrous salt and an alkali metal ferrocyanide in an aqueous solution in a mole ratio of ferrous salt to alkali metal ferrocyanide of from 1:0.9 to 1:1.5; (b) adding an alkaline compound to the solution in an amount sufficient to raise the pH to at least 9; (c) oxidizing the basic solution by aeration; (d) heating the solution to from 10° C. to 90° C.; and (e) recovering the pigment.

#### 4,414,034 NOVEL ADDITIVE BLENDS FOR CEMENTITIOUS MATERIALS

Stanley A. Lipowski, Livingston, N.J., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jul. 19, 1982, Ser. No. 399,758

Int. Cl.<sup>3</sup> C04B 7/35

U.S. Cl. 106—90

12 Claims

1. An additive for cementitious materials comprising: (a) at least one salt of naphthalene or lower alkyl substituted naphthalene sulfonic acid formaldehyde condensate and (b) at least one water-soluble resin selected from the group consisting of resorcinol-formaldehyde and catechol-formaldehyde resins.



4,414,035

## METHOD FOR THE REMOVAL OF ASPHALTIC DEPOSITS

Michael E. Newberry, Chesterfield, and Kenneth M. Barker, Crestwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 21, 1979, Ser. No. 40,628

Int. Cl.<sup>3</sup> B08B 3/08

U.S. Cl. 134—3

14 Claims

1. A process for removing organic deposits containing asphaltic constituents from surfaces which comprises contacting said organic deposits with a solvent mixture containing
  - (1) an aromatic solvent, and
  - (2) a hydrocarbon-substituted-alkarylsulfonic acid.

4,414,036

## SANITIZER SYSTEM AND SANITIZING METHOD FOR CARBONATED BEVERAGE CONTAINER FILLER MACHINE

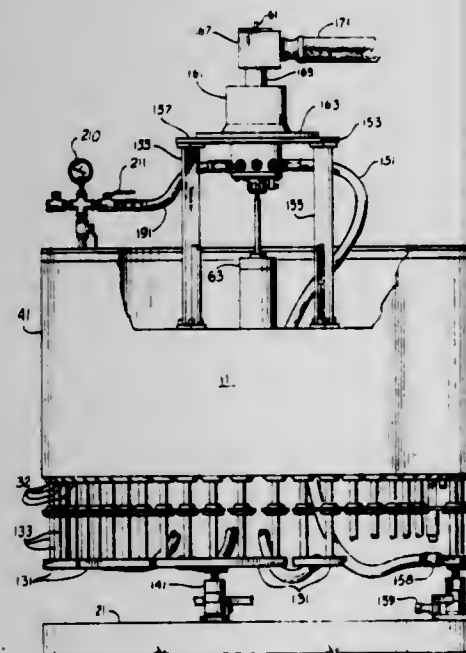
Frank E. Anderson, 1717 Queensbury Way, and Robert A. Martin, Rte. #5, Box 406, both of Fort Smith, Ark. 72901

Filed Sep. 18, 1981, Ser. No. 303,354

Int. Cl.<sup>3</sup> B08B 9/00

U.S. Cl. 134—23

13 Claims



1. A sanitizer system for a beverage container filler machine having a rotating bowl and associated circular array of filler valves, a reservoir and a rotating conveyor comprising a plurality of collector manifolds, each having an outlet opening and at least three upwardly extending tubes with lips at the top thereof adapted to seal against seals of filler machine valves, said tubes being in an arcuate arrangement with a radius corresponding to that of a filler machine valve array,

means for holding each said manifold in a raised position on said rotating conveyor to cause all of its tubes to seat and seal against corresponding valves of said bottle filling machine and to receive liquid flow from said valves when open,

a plurality of flexible hoses, each connectable at one end to one of the outlet openings of said manifolds, a stationary return pipe connected to said reservoir, a rotating collector located above said bowl and having a plurality of inlets with said hoses connected thereto and a rotatable, liquid-tight connection with said return pipe, whereby a liquid return path is provided from said manifolds through said rotatable liquid-tight connection to said stationary return pipe and to a reservoir.

6. A method of sanitizing a bottle filler machine having a reservoir, a rotating conveyor and a rotating bowl with a circular array of filler valves comprising the steps of placing a plurality of collector manifolds on said conveyor,

each manifold having upwardly extending tubes with lips at the top thereof vertically aligned with seals of filler machine valves,

supporting said manifolds in a raised position on said conveyor in a position to receive liquid flow from all said valves when open,

connecting a plurality of flexible hoses, one on each of said manifolds, said hoses being connected at the other end to a rotating collector located above said bowl having a rotatable, liquid-tight connection with a stationary return pipe,

opening said valves, causing introduction of hot washing liquid from said reservoir into said bowl to flow by gravity through said valves, producing a pressure head in said manifolds sufficient to cause said valves and bowl to be flooded, and recirculating said washing liquid through said manifolds, said hoses, said collector, said return pipe and said bowl.

4,414,037

## STEAM JET CLEANING AND STERILIZING SYSTEM

Max Friedheim, 8652 LeBerthon St., Sunland, Calif. 91046

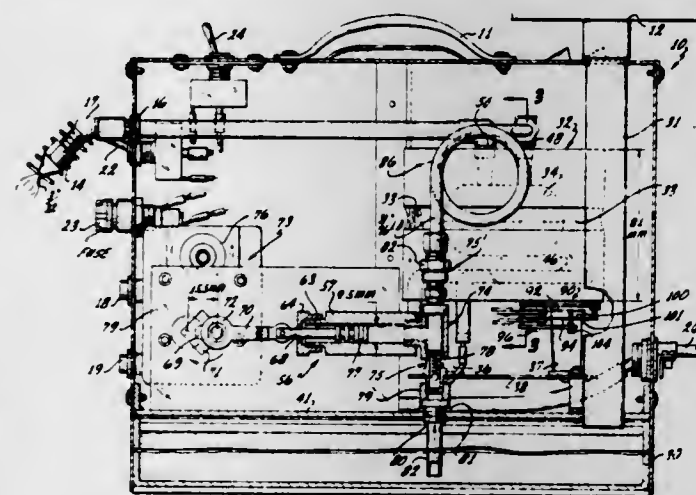
Continuation-in-part of Ser. No. 144,654, Apr. 28, 1980,

abandoned. This application Jan. 4, 1982, Ser. No. 336,777

Int. Cl.<sup>3</sup> B08B 3/02

U.S. Cl. 134—35

10 Claims



6. A method of cleaning and sterilizing, including pumping from a source of vaporizable liquid medium including water and/or mixtures of water and chemicals into a boiler, applying heat to the boiler and maintaining its temperature at a superheating value, metering the flow of liquid from a pump means into the boiler at a predetermined controlled rate relative to the temperature in the boiler, providing non-uniform internal boiler surfaces, discharging dry vapor from the boiler through jet nozzle means connected to it, at a pressure within a predetermined relatively high range, predetermining the size of the orifice in the jet nozzle means to limit discharge of vapor from the boiler, preventing flow of pressure from the boiler back to the pump means whereby pressure and temperature are held within the boiler so that liquid entering the boiler is flashed into steam and the boiler is maintained operating in a dry condition and discharging dry vapor within said pressure range for a predetermined number of seconds.

4,414,038

## LASER BEAM SURFACE TREATMENT PROCESS FOR MATERIALS OF LARGE REFLECTIVITY

Friedrich Dausinger, Stuttgart; Werner Müller, Schwieberdingen, both of Fed. Rep. of Germany, and Peter Arnold, Westendstrasse 11, 8000 München 2, Fed. Rep. of Germany, assignors to Peter Arnold, Munich, Fed. Rep. of Germany

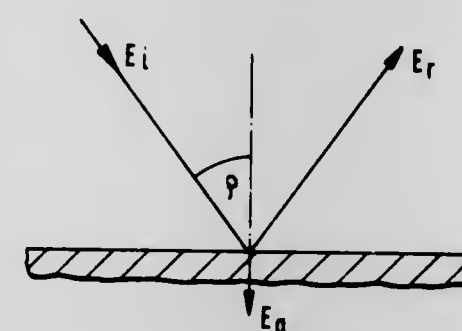
Filed Jul. 7, 1982, Ser. No. 396,138

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126953

Int. Cl.<sup>3</sup> B23K 26/00

U.S. Cl. 148—4

2 Claims



1. A process of surface heat treatment of work pieces by means of a laser beam, comprising the steps of: directing said laser beam to impinge on the surface to be treated at an angle of incidence greater than 45°, said angle of incidence being defined as the angle between the axis of said laser beam and the perpendicular to said surface where it is intersected by the center of said laser beam, and polarizing said laser beam linearly in a direction substantially parallel to the plane of incidence of the laser beam, thereby maximizing the portion of the laser beam energy absorbed by the work piece.

4,414,039

## METHOD OF ACTIVATING TITANIUM SURFACES

Martin Thoma, Munich, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union München GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,585

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133189

Int. Cl.<sup>3</sup> C23F 7/24

U.S. Cl. 148—6.2

11 Claims

1. A method of activating a titanium surface for subsequent cladding with a metallic coating comprising wet blasting a titanium surface with finely granular  $Al_2O_3$ , contacting the thus wet-blasted surface with a fluoride-containing solution for a period of a few minutes at room temperature, and activating said surface with a solution consisting essentially of chromic acid, hydrofluoric acid and hexafluorosilicic acid in following molar ratios of the constituent elements:



at a temperature of 35° to 100° C. for 15 to 50 minutes.

4,414,040

## PASSIVATION OF MERCURY CADMIUM TELLURIDE SEMICONDUCTOR SURFACES BY OZONE OXIDATION

Robert E. Kvaas, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 20, 1981, Ser. No. 294,670

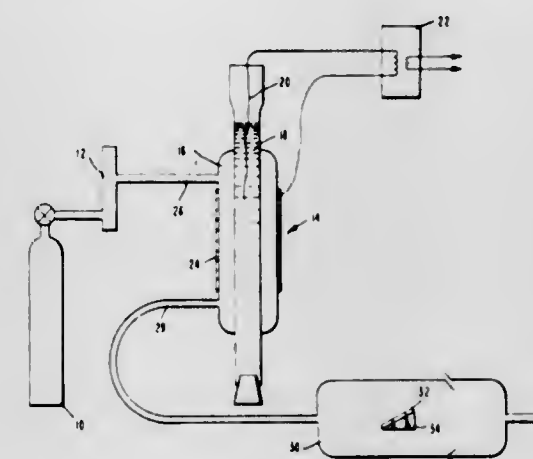
Int. Cl.<sup>3</sup> C23C 11/00

U.S. Cl. 148—6.3

7 Claims

1. A process for forming a native oxide on a semiconductor surface comprising  $Hg_{1-x}Cd_xTe$ , where x ranges from 0 to 1, which comprises exposing the semiconductor surface to a

substantially water-free mixture of ozone and oxygen containing at least about 0.3 vol/vol percent ozone, said process car-



ried out at a temperature within about  $\pm 10^\circ$  C. of ambient temperature.

4,414,041

## GUIDE SYSTEM FOR FLAME CUTTING OF PIPE

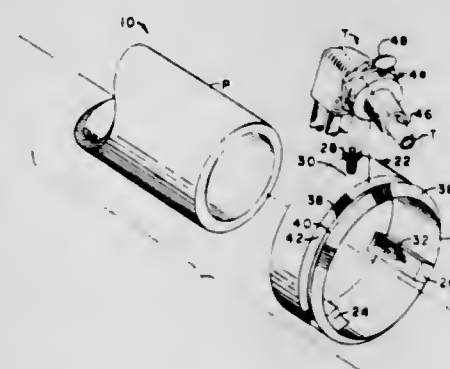
Richard W. Rusk, Rte. #1, Box 336, Simpson Dr., Waldorf, Md. 20601

Filed Jan. 22, 1982, Ser. No. 341,821

Int. Cl.<sup>3</sup> B23K 7/04

U.S. Cl. 148—9.6

9 Claims



1. In a system for precision angle-beveling of an end of a pipe using a manually held gas cutting torch of the type having a torch tip aligned with a cutting flame of the gas cutting torch and having: track means, means for holding said track means coaxially on a pipe to be bevelled by a said gas cutting torch and means for guiding a said gas cutting torch around said track means under manual manipulation of said gas cutting torch, the improvement comprising: the track means including a sleeve with an end thereof bevelled at the same angle as said angle to be bevelled on a pipe, and said guiding means including means for positioning a said gas torch cutting tip in alignment with said sleeve bevelled-end, by riding on said sleeve bevelled-end.

4,414,042

## METHOD OF MAKING HIGH STRENGTH STEEL TUBE

Heinz Gross, Dortmund; Friedrich Reith, Hamm; Friedhelm Retzlaff, Kamen-Methler, and Karl H. Schlusnus, Hamm, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 106,548

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900022

Int. Cl.<sup>3</sup> C21D 8/10

U.S. Cl. 148—12 R

1 Claim

1. A method of converting pre-rolled precipitation-hardenable fine-grain medium-carbon low alloy steel plates or strips into steel profiles having a yield strength of  $\geq 500$  N/mm<sup>2</sup>, a



tensile strength of  $\geq 600$  N/mm<sup>2</sup> and high toughness, comprising the first step of cooling the rolled steel plates or strips from a final rolling temperature above the A<sub>1</sub>-temperature level, down to a temperature of about 400° C. in an atmosphere which in part suppresses radiation and convection heat losses and thus reduces the cooling rate; the second step of thereafter cooling the steel plates or strips to room temperature; the third step of cold-processing the cooled steel plates or strips to form an open profile therefrom; the fourth step of subjecting the profile to annealing so as to dissolve coarse precipitants thereon; and the fifth step of cooling the profile to form finely dispersed precipitants therein; the first step of cooling comprising maintaining the steel plate in a furnace atmosphere during the cooling for overaging at high temperature; said third step comprising further the sixth step of converting the open profile into a tube by welding adjacent longitudinal edges of the profile together; said fourth step comprising further the seventh step of solution-annealing the profile above the A<sub>C3</sub>-temperature; the eighth step of subjecting the tube to diameter reduction by longitudinal stretching at an initial stretch-pass temperature corresponding to said solution-annealing temperature; said fifth step comprising further the ninth step of cooling the profile subsequent to said annealing, and tenth step of interrupting the cooling at a temperature of 600° C. and continuing the cooling in the 500°-600° C. temperature range at reduced cooling speed to achieve a yield strength of 648 N/mm<sup>2</sup>; the steel having a composition of:

0.28%	carbon
1.5%	manganese
0.32%	silicon
0.015%	sulfur
0.025%	phosphorous
0.03%	aluminum
0.12%	vanadium
0.015%	nitrogen
the balance being iron and impurities.	

4,414,043

#### CONTINUOUS DECARBURIZATION ANNEALING WITH RECYCLE TO CONVERT CARBON MONOXIDE

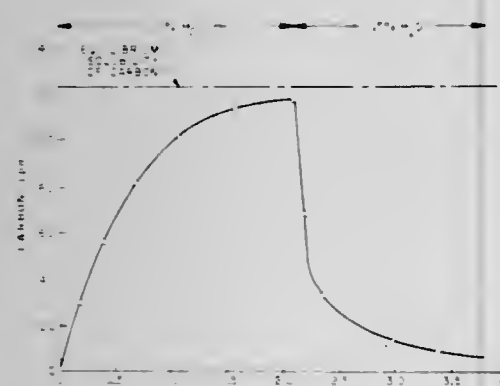
Frank N. Davis, and Harry H. Podgurski, both of Greensburg, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1982, Ser. No. 341,737

Int. Cl.<sup>3</sup> C21D 1/48

U.S. Cl. 148-16

7 Claims



1. In the continuous decarburization annealing of steel strip, wherein the strip is passed substantially horizontally through an elongated furnace and an annealing atmosphere containing H<sub>2</sub> and H<sub>2</sub>O is flowed in a direction counter to the strip motion resulting in a build-up in the CO content of the atmosphere in the area where the strip enters the furnace, the atmosphere in said build-up area also containing H<sub>2</sub>, N<sub>2</sub> and H<sub>2</sub>O at temperatures of 1200° to 1600° F., the method for preventing said CO from increasing to a level

at which the decarburization rate of the strip surface is materially decreased, comprising,

- at a first zone in the build-up area of the furnace, withdrawing an amount of said atmosphere;
  - reacting said withdrawn atmosphere with H<sub>2</sub> in contact with a methanation catalyst to convert a substantial portion of the CO content therein to CH<sub>4</sub> and H<sub>2</sub>O;
  - introducing the reaction product into said furnace at a zone thereof downstream, with respect to the strip travel, of the first zone,
- wherein the amount of atmosphere withdrawn in step (a) and the resulting reaction product introduced in step (c) are effective to decrease the CO content thereof to a level below which the decarburization rate is not materially decreased.

4,414,044

#### WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Fumio Takeuchi, and Masao Takahashi, both of Aichi, Japan, assignors to Nippon Oil and Fats, Co., Ltd., Tokyo, Japan  
Filed Apr. 27, 1982, Ser. No. 372,131

Claims priority, application Japan, May 11, 1981, 56-69282; May 12, 1981, 56-70181; May 12, 1981, 56-70182

Int. Cl.<sup>3</sup> C06B 45/00

U.S. Cl. 149-2

8 Claims

1. A water-in-oil emulsion explosive composition, comprising a disperse phase formed of an aqueous oxidizer solution consisting of (a) ammonium nitrate or a mixture of ammonium nitrate and sodium nitrate and (b) water; a continuous phase formed of a combustible material consisting of (c) fuel oil and/or wax; (d) at least one emulsifier selected from the group consisting of dipentaerythritol fatty acid ester, polyoxyalkylenedipentaerythritol fatty acid ester, sugar fatty acid ester and polyoxyalkylenesugar fatty acid ester; and (e) hollow microspheres or microbubbles.

4,414,045

#### HIGH SPEED ULTRASONIC BONDING

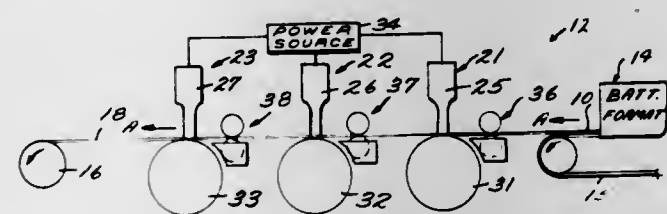
Kenneth Y. Wang, Greensboro, N.C.; Berlie R. Hill, Cana, Va., and Marvin J. Pinson, Jr., Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 22, 1982, Ser. No. 350,823

Int. Cl.<sup>3</sup> B29C 27/08; B32B 31/20

U.S. Cl. 156-73.2

20 Claims



1. A method of producing a non-woven fabric from a batt of random, loose, ultrasonically fusible fibers utilizing a plurality of ultrasonic welding machines spaced from each other in a batt feed direction, the fabric having a predetermined number of primary bonding points per unit area formed with the ultrasonic welding machines, said method comprising the steps of:

- feeding the batt of fibers in the feed direction into operative engagement, in turn, with each of the ultrasonic welding machines;
- supplying energy to each of the ultrasonic welding machines to effect formation of primary bonding points therewith; and
- effecting bonding of substantially less than all of said predetermined number of primary bonding points per unit with each of the ultrasonic welding machines but so that together the machines provide all of said predetermined number of bonding points.

10. Apparatus for effecting the formation of a non-woven fabric from a batt of random, loose, ultrasonically fusible fibers, comprising:

- a plurality of ultrasonic welding machines, each machine including at least one horn and an anvil roller;
- means for mounting said welding machines so that they are spaced from each other in a direction of batt feed so that the batt may pass between the horn and anvil of each;
- means for transporting the batt in the feed direction between the horns and anvil of each of said machines;
- means for supplying energy, to effect ultrasonic bonding, to each of said machines at the same time; and
- wherein each of said ultrasonic welding machines includes a plurality of horns, said horns of each machine being in-line with each other and spaced from each other in a dimension substantially transverse to said feed direction, and each horn of each machine is in cooperation with said anvil roller of said machine; and wherein the horns of at least one of said machines are staggered along said dimension substantially transverse to said feed direction with respect to the horns of at least one of the others of said machines, so that essentially every portion of the batt across the width thereof passes in operative association with at least one horn of at least one of said ultrasonic welding machines.

4,414,046

#### FRICTION WELDING

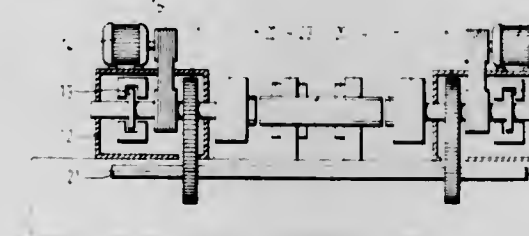
Bertram J. Palmer, Staffordshire, England, assignor to GKN Transmissions Limited, West Midlands, England  
Filed Feb. 22, 1982, Ser. No. 351,014

Claims priority, application United Kingdom, Feb. 26, 1981, 8106087

Int. Cl.<sup>3</sup> B23K 19/02; B29C 27/08

U.S. Cl. 156-73.5

4 Claims



2. A method of friction welding first and second components to respective ends of a third component, comprising holding said third component stationary, holding said first and second components at the ends of said third component, applying axial force thereto and rotating them in contact with said third component to produce welding conditions at the junctions therebetween, applying further axial force to said first and second components to produce welds with said third component, and braking said first and second components and releasing said third component substantially simultaneously with or immediately after commencement of application of said axial force, to permit said third component to rotate and be braked with said first and second components during production of said welds, with said third component being supported, during application of said welding force, solely by being held between said first and second components.

3. Apparatus for friction welding first and second components to respective ends of a third component, comprising releasable means for holding said third component stationary, means for holding said first and second components, means for driving said first and second components to rotate same, means for applying axially directed force to said first and second components while rotating to urge them into position with said third component and to apply a force thereto sufficient to cause welding of said components, means for braking said first and second components, and control means operable to cause release of said third component, by said holding means there-

for, substantially simultaneously with operation of said means for braking and first and second components.

4,414,047

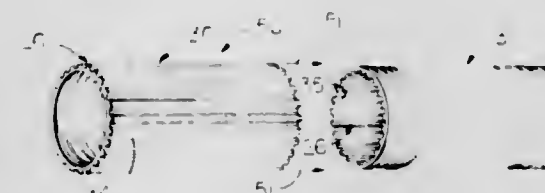
#### METHOD OF MAKING AN ENDLESS POWER TRANSMISSION BELT

Robert E. Wetzel, and Richard L. Marsh, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio  
Filed Jun. 11, 1981, Ser. No. 272,637

Int. Cl.<sup>3</sup> B29H 7/22; B32B 31/06

U.S. Cl. 156-138

14 Claims



1. In a method of making an endless polymeric power transmission belt having a set of driving teeth on each of a pair of opposite surfaces thereof, said method comprising the steps of, forming a first belt portion which has a set of teeth extending from an outside surface thereof which defines one of said pair of opposite surfaces, helically winding a first load-carrying cord to define a part of said first belt portion, forming a second belt portion which has a set of teeth extending from an outside surface thereof which defines the other of said pair of opposite surfaces, bonding said belt portions together to define a belt sleeve having said first load-carrying cord therebetween, and cutting said belt sleeve to define said belt from a portion thereof, the improvement in said method wherein said step of helically winding said first cord comprises winding said first cord on a right hand helix along substantially cylindrical means of a given diameter to define a precise pitch line for said first belt portion, said first cord being disposed substantially outwardly of the completed first belt portion, and comprising the further steps of helically winding a second load-carrying cord on a left hand helix along substantially cylindrical means of said given diameter to define a part of said second belt portion and a precise pitch line therefor, said second cord being disposed substantially outwardly of the completed second belt portion, inverting one of said portions, and disposing said inverted portion concentrically around the other belt portion prior to said bonding step with the first and second cords having helical turns thereof of substantially identical size and arrangement disposed in an alternating manner across the width of said belt, said belt being adapted to be operated to provide a precision driving action employing the driving teeth on either belt portion thereof due to each belt portion having said first and second load-carrying cords on a precise pitch line.

4,414,048

#### WEB SPLICING APPARATUS

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 7, 1981, Ser. No. 261,303

Int. Cl.<sup>3</sup> B31F 5/06; B65H 21/00

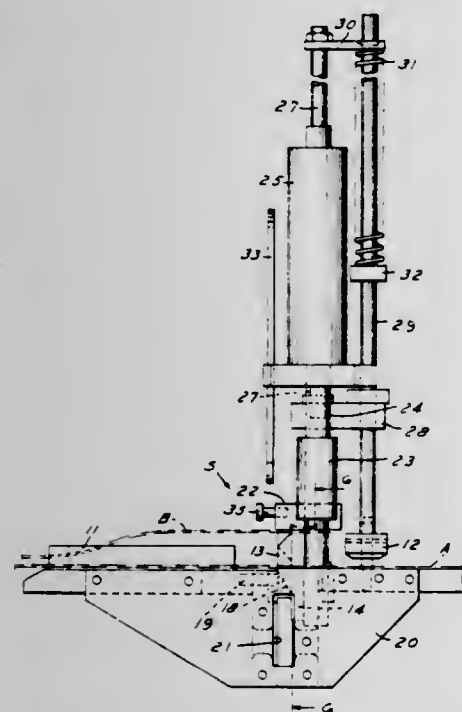
U.S. Cl. 156-159

8 Claims

1. An apparatus for splicing webs from separate web rolls comprising means defining a substantially horizontal splicing station across which a web from one roll is moved, a vertically movable brake movable downwardly for engaging the web to momentarily interrupt the web, a movable knife blade, means for guiding the movable knife blade for movement from a first position above the web to a second position below the web,



detent means for holding the movable knife blade in said first position above the web,  
 a fixed knife blade associated with said splicing station beneath the web,  
 a vertically movable bar above said movable knife for holding the taped end of a web from a second roll in position between the movable knife blade in its first position and said bar disposed above the web from the first roll, said bar operable for driving said movable knife downwardly to its second position below the web and carrying the tape and second web to the first web,  
 and drive means for moving said brake into engagement with said web and moving said bar to drive said movable knife blade, thereby severing the trailing end of the web from the first roll, and taping the leading end of the second roll to the severed end of the first roll in a butt splice thereof,  
 said apparatus including a transverse opening so that the movable knife blade may be manually removed while at its said second position after severing the web and inserted to its first position above the second web for a subsequent similar splicing of the second web to another roll.  
 4. An apparatus for splicing webs from two separate web rolls comprising  
 means defining a splicing station across which a web from one roll is moved,



a brake shiftable toward the moving web for engaging the web to momentarily interrupt its movement across the splicing station,  
 a movable knife blade,  
 guide means defining the path of movement for said knife blade from a first position on one side of the web to a second position on the other side of the web whereat said knife blade is free of said guide means,  
 yieldable means for holding said knife blade in said first position,  
 a fixed knife blade associated with said splicing station on other side of the web cooperating with the movable knife blade to sever the web,  
 bar means on the one side of the web at the splicing station adapted for holding the taped end of a web from a second roll in position, the movable knife blade in its first position holding said taped end against the bar means and adapted for movement toward said first web together by movement of said bar means in that direction,  
 and means for operating said bar means driving said movable knife blade from its first position to its second position to sever the trailing end of the web of the first roll, and concurrently therewith and, in succession with such severing action, tape the leading end of the web of the second

roll to the severed end of the first roll thereby providing a butt splice of the two ends,  
 said movable knife blade being free for removal from the guide path after being actuated to its said second position.

4,414,049

# METHOD OF MANUFACTURE OF AN ENERGY ABSORBING BEAM

Brian H. Jones, San Gabriel, Calif., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Sep. 25, 1981, Ser. No. 305,753

Int. Cl.<sup>3</sup> B65H 81/00

U.S. Cl. 156—166

2 Claims



1. In a method of forming a resin impregnated pre-form for the manufacture of a composite energy absorbing beam, the steps of:

- providing a fixture positioning first and second end bushings, said fixture including a plurality of pin means extending between said first and second end bushings defining a predetermined curve therebetween;
- selecting one of said pin means as an anchor pin;
- sequentially winding a tow of continuous resin impregnated fibers in a pattern about said pins commencing with said anchor pin and extending to a first next adjacent pin thereto wrapping said tow about said first next adjacent pin thereby reversing direction of said tow toward said anchor pin, winding said tow past and radially outward of said anchor pin to a second next adjacent pin wrapping said tow about said second next adjacent pin thereby reversing direction of said tow toward said anchor pin, winding said tow past and radially outward of said anchor pin and said first adjacent pin advancing to the next positioned pin wrapping said tow thereabout reversing direction of said tow toward said anchor pin, winding said tow past and radially outward of the prior wrapped pins to the next progressively positioned pin wrapping said tow thereabout reversing direction of said tow toward said anchor pin, continuing the winding pattern until all pins and the end bushings are wrapped by said tow.

4,414,050

# METHOD AND APPARATUS FOR JOINING VENEER STRIPS

Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer Brugg-Oehler AG, Switzerland

Filed May 11, 1982, Ser. No. 377,075

Claims priority, application Switzerland, May 21, 1981, 3313/81

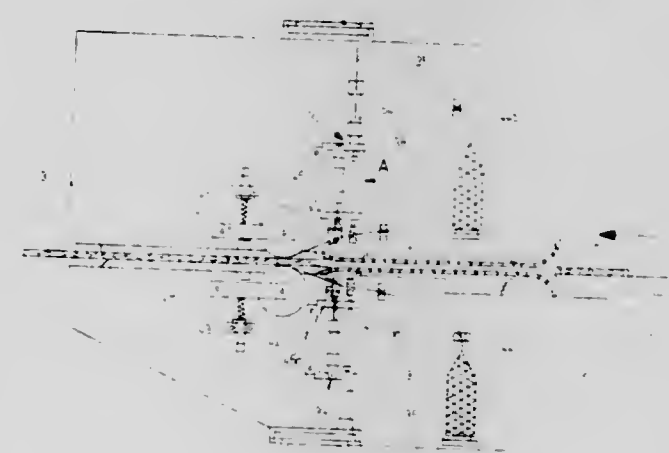
Int. Cl.<sup>3</sup> B27D 1/10, 3/04

U.S. Cl. 156—166

9 Claims

1. A method for joining a plurality of veneer strips into a panel so that abutting edges of the strips are generally parallel with the direction of the wood grain using adhesive strings, comprising the steps of  
 extending a portion of at least one adhesive string across one major surface of a first veneer strip in a direction perpendicular with the strip grain;  
 forming a loop at a side edge of the strip so that the string extends beyond the opposite surface of the first strip and back;  
 moving a second strip into contiguous abutting relationship with the first so that the loop is caught between the side edges;  
 bending the exposed portion of the loop onto the opposite

surface of one of the contiguous strips, and pressing the loop portion to adhere it to said opposite surface;  
 extending the adhesive string across the major surface of the second strip lying in the same plane as the one major surface of the first strip; and  
 repeating the steps of forming loops, moving additional strips into contiguous relationship, and bending exposed portions of the loops to form a panel in which each string extends across only one panel surface.  
 4. An apparatus for joining a plurality of veneer strips into a panel comprising  
 means for supporting and moving a plurality of veneer strips;  
 means for holding a supply coil of adhesive string;



means for extending a portion of said adhesive string from said coil across a major surface of a first veneer strip in a direction perpendicular with the grain thereof;  
 means for forming a loop at a side edge of said first strip so that the string extends beyond the opposite surface of said first strip and back;  
 means for moving a second strip so that its edge is in contiguous abutting relationship with said edge of said first strip so that the loop thus formed is caught between the strip edges; and  
 heated roller means for bending the exposed portion of the loop onto said opposite surface of one of said strips to adhere it to said surface, said means for extending being usable to place said string across the plane-parallel major surface of the second and subsequent strips between loops formed between contiguous edges thereof, in sequence.

4,414,051

# METHOD FOR SLITTING AND/OR SEALING PLASTIC FILM MATERIAL

Ajit Bose, Rexdale, Canada, assignor to Leco Inc., Rexdale, Canada

Filed Mar. 29, 1982, Ser. No. 363,074

Int. Cl.<sup>3</sup> B29C 17/00, 19/00

U.S. Cl. 156—198

4 Claims

1. A method for forming two or more smaller tubes of blown film from a larger single tube of blown tube of a greater diameter than the smaller tubes comprising the steps of extruding said larger tube by the blown-tube process, and, after said tube is formed collapsing said tube, and, but prior to winding up said collapsed tube into rolled tubing, severing and sealing said larger collapsed tube in the axial or lengthwise direction of movement of said tube by contacting said tube with a beam generated by a laser while controlling the temperature of the beam at the surface of the film to a point sufficient only to raise the enthalpy of the material of the tube to the transition point between the molten and solid states of said material, whereby said laser beam severs and seals said larger diameter tube into two or more smaller diameter tubes with axial or longitudinal seams of substantially similar thickness to the thickness of the layers of film comprising said blown tube and in which the real

strength of the seal is greater than a similar corresponding hot-knife seal.

4,414,052

# POSITIVE-TEMPERATURE-COEFFICIENT THERMISTOR HEATING DEVICE

Etsuro Habata, Ikoma; Nobumasa Ohshima, Hirakata, and Kenji Kanatani, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

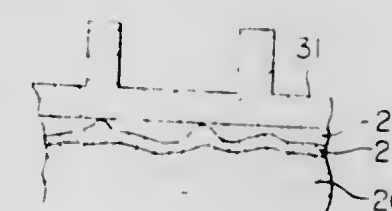
Filed Dec. 23, 1981, Ser. No. 333,917

Claims priority, application Japan, Dec. 26, 1980, 55-186490; Dec. 26, 1980, 55-186494

Int. Cl.<sup>3</sup> B32B 31/20; H01C 7/02; H05B 3/30

U.S. Cl. 156—273.7

3 Claims



2. A process for fabricating positive-temperature-coefficient thermistor heating devices characterized by

- preparing an adhesive which is electrically insulative and has a curing temperature equal to or in the proximity of a Curie point of a positive-temperature-coefficient thermistor element having electrodes formed over the opposite major surfaces thereof;
- applying layers of said adhesive over the surfaces of said electrodes, respectively, of said positive-temperature-coefficient thermistor element;
- placing heat radiating means, which are made of a metal thereof, over and pressing them against said electrodes of said positive-temperature-coefficient thermistor element with said layers of said adhesive therebetween in such a way that direct contacts without interposition of said adhesive can be at least partially established between said electrodes of said positive-temperature-coefficient thermistor element and said heat radiating means; and
- while maintaining the state as defined in said step (c), applying a voltage across said positive-temperature-coefficient thermistor element to thereby heat it to temperatures close to said Curie point thereof, thereby thermally curing said layers of said adhesive to bond between said positive-temperature-coefficient thermistor element and said heat radiating means, said heat radiating means functioning as current paths, respectively, to and out of said positive-temperature-coefficient thermistor element.

4,414,053

# POLYMER BLENDS AND EASY-PEEL FILMS PREPARED THEREFROM

Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 6, 1982, Ser. No. 447,230

Int. Cl.<sup>3</sup> C08L 33/04, 23/08

U.S. Cl. 156—308.2

8 Claims

1. A polymer composition consisting essentially of:  
 (a) 100 parts by weight of an ethylene copolymer, and  
 (b) About 1 to 5 parts by weight of a polymer of a higher alkyl ester of acrylic or methacrylic acid;  
 said ethylene copolymer having polymerized therein about 70-98 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid; said polymer of a higher alkyl ester of acrylic or methacrylic acid being a homopolymer of said ester or a copolymer of said ester with ethylene in which the copolymer contains at least 25 weight % of said ester; the alkyl group of said ester containing about 8 to about 24 carbon atoms.



4,414,054

## PORTABLE LABELING MACHINE

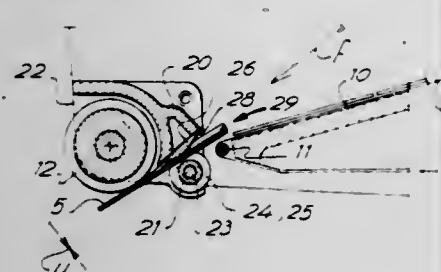
Werner Becker, Hirschhorn, and Heinz Kistner, Neckarsteinach, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,523

Claims priority, application Switzerland, Feb. 18, 1982, 1008/82

Int. Cl.<sup>3</sup> B65C 11/02

U.S. Cl. 156—384



1. A portable labeling machine comprising a housing (1) provided with a grasping handle (2), a control lever (3) located below the handle, a printing device (4) connected to the lever for printing, upon each pull on the lever, selected characters onto a label of a continuous strip (6) formed of a series of self-adhesive labels (5) borne by a common support strip (8), a device (7) for the step-by-step driving of the said continuous strip, which device is also connected to the control lever so as, upon each release of the latter, to cause the advance of said continuous strip by a step corresponding to the length of one label along an inner circuit comprising a hairpin curve which forms a separating edge (11), whereupon each printed label is separated, at least in part, from the support strip and placed below a pressure roller (12) borne by the housing, towards the outside of the latter, to permits its attachment by gluing pressure onto the article to be labeled, and in which there is provided a device for the cambering of said label, intended to maintain it so as to prevent the falling thereof after its separation from the support strip and before its pressure gluing, characterized by the fact that the label cambering device comprises three elements one of which is formed of the pressure roller (12) itself and the other two by two cambering guides (20, 21) extending transversely opposite each other, one above and one below the exit path of the printed label, which guides have complementary camber profiles and between them form the envelope of an imposed curvilinear passage (27) of a height (H) and width (L) which are greater than the thickness and width respectively of the labels, said passage having a flared entry (29) and being arranged between the pressure roller (12) and the separating edge (11) in order to camber the label parallel to the direction of its displacement and towards the side opposite the pressure roller, and by the fact that the generatrix (G) of contact of this pressure roller with the label is located at the highest at the level of a plane (T) tangent to the cambered portion (B) of the label.

4,414,055

## MACHINE FOR APPLYING BASE CUPS TO BOTTLES

William P. Young, Farmington, Mich., assignor to William P. Young Co., Farmington, Mich.

Division of Ser. No. 103,566, Dec. 14, 1979, Pat. No. 4,312,439. This application Jun. 13, 1980, Ser. No. 159,127

Int. Cl.<sup>3</sup> B29D 3/00

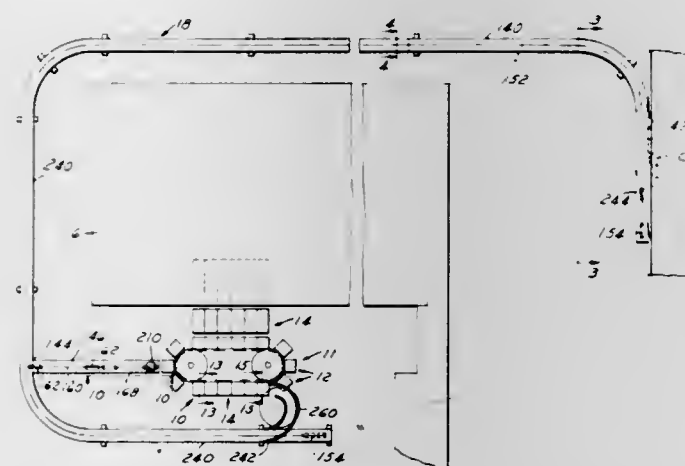
U.S. Cl. 156—423

9 Claims

1. A machine for applying base cups to bottles, comprising a conveyor movable along a predetermined path and having a series of support units each comprising a bottle holder having means for holding a bottle securely and firmly in an upright position and a base cup seat for holding a base cup upright supported beneath said bottle holder for movement toward and away from the bottom of a bottle held by said bottle holder, means for loading bottles upright on said respective

bottle holders, means for applying adhesive to the inside of said base cups, means for holding said base cups upright and with adhesive applied thereto on said respective base cup seats, and means downstream from said bottle and base cup loading means in the direction of conveyor movement for elevating said base cup seats to apply and adhere the base cups held thereby to the bottles while the bottles are held securely and firmly as aforesaid by the bottle holders thereabove.

5. A machine for applying base cups to bottles, comprising a conveyor movable along a predetermined path and having a series of support units each comprising a bottle holder for holding a bottle upright and a base cup seat for holding a base cup upright supported beneath said bottle holder for move-



ment toward and away from the bottom of a bottle held by said bottle holder, each bottle holder comprising means engageable with the body of a bottle and means engageable with the neck of a bottle, said neck engaging means comprising a member having an open slot of generally U-shape for closely receiving the neck of a bottle, said member being of a flexible, compressible material capable of holding the neck of a bottle with a friction grip, means for loading bottles upright on said respective bottle holders, means for loading base cups upright on said respective base cup seats, and means downstream from said bottle and base cup loading means in the direction of conveyor movement for elevating said base cup seats to apply the base cups held thereby to the bottles held by the bottle holders thereabove.

4,414,056

## METHOD AND APPARATUS FOR FOIL-CAPPING BOTTLES

Rainer Buchholz, Düsseldorf; Josef Tomashauer, Tönisvorst; Rudolf Zadow, Düsseldorf, and Hans-Werner Mohn, Kaarst, all of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,335

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046615; Feb. 11, 1981, 3104807

Int. Cl.<sup>3</sup> B65C 3/22

U.S. Cl. 156—476

29 Claims

1. In an apparatus for the foiling of bottles with a patch, having at least one point, comprising a turntable which has several controlled bottle turning means disposed at its periphery, at least one labeling station which transfers the foil patches to the bottles moved past it by the turntable and brought to a certain rotational position by the bottle turning means, elements for pressing down the foil patches transferred to the bottles, the elements being disposed along the transport path of the bottles, and a transfer wheel disposed after the turntable and provided with receiving places for the bottles, the transfer wheel having a clamping means for the bottles and means for turning and pressing down patch ends projecting above the tops of the bottles, the improvement which comprises clamping means holding the bottles against rotation on the entire transport by the transfer wheel, the turning and pressing means

4,414,058

## METHOD FOR PRODUCING DYNAMIC SEMICONDUCTOR MEMORY CELLS WITH RANDOM ACCESS (RAM) BY DOUBLE POLYSILICON GATE TECHNOLOGY

Wolfgang Mueller, Putzbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

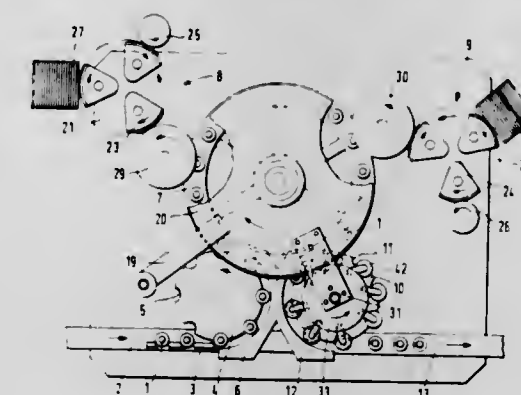
Filed Dec. 13, 1982, Ser. No. 449,145

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205858

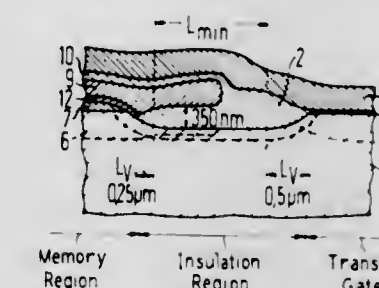
Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

12 Claims



ing receiving place, means for lowering each unit in its second position axially against the top of a bottle held in the receiving place, a fold-down device, and a smoothing and pressing element disposed behind the fold down device in the direction of pivoting from the first position to the second position and, when lowered, gripping the bottle top on all sides.



1. In a method for manufacturing dynamic semiconductor memory cells with random access in accordance with the double polysilicon gate technology having a first polysilicon level (9) applied insulated onto a semiconductor body (1) as a memory electrode for the memory regions generated in said semiconductor body and having a second polysilicon level (11) applied insulated from said first polysilicon level (9) as word lines, with which the insulation of adjacent, active regions occurs by thick oxide regions (2) generated according to known LOCOS technology and with which, for increasing cell capacity, a flat arsenic implantation region (7) and a deep boron implantation region (6) are generated in the memory region with the use of a photoresist mask (4), the improvement comprising:

positioning a photoresist mask edge (4a) in the center of the thick oxide regions (2) located between memory cells and thick oxide transistors; and reducing the thickness of the oxide in the memory regions, both axially and laterally, at the junctions between thick oxide regions (2) and thin oxide regions (2a) by etching.

4,414,059

## FAR UV PATTERNING OF RESIST MATERIALS

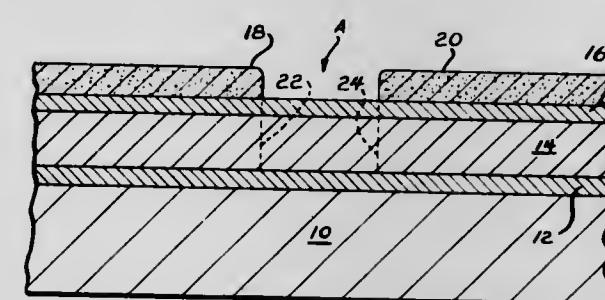
Samuel E. Blum, White Plains; Karen H. Brown, Yorktown Heights, and Rangaswamy Srinivasan, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,126

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06; B05D 3/06

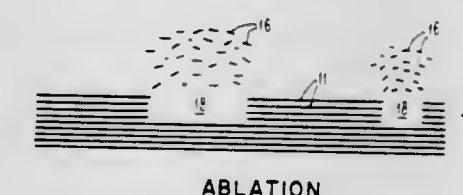
U.S. Cl. 156—659.1

17 Claims



1. A process for etching selected materials in a layered semiconductor product having a lower layer, an intermediate layer, and an upper silicide layer, the process comprising the steps of:

exposing the semiconductor product to a first gas consisting essentially of  $C_2ClF_5$  at reduced pressure for a time sufficient for said first gas to etch through the silicide layer; and exposing the semiconductor product to a second gas comprising  $Cl_2$  at reduced pressure for a time sufficient for said second gas to etch through the intermediate layer.



ABLATION

1. In a thin film fabrication process for producing a device or circuit, the steps as follows: providing a substrate including at least one layer therein, depositing a resist layer on said substrate, removing selected areas of said resist layer by irradiation of said selected areas with ultraviolet light of wavelengths less than 220 nm and having a sufficient power density to



produce ablative photodecomposition of said irradiated areas to expose portions of said substrate, and causing a change to said exposed portions of said substrate through said patterned resist layer.

4,414,060

# METHOD FOR SULFITE PULPING USING WATER-SOLUBLE MOLYBDENUM CONTAINING COMPOUNDS

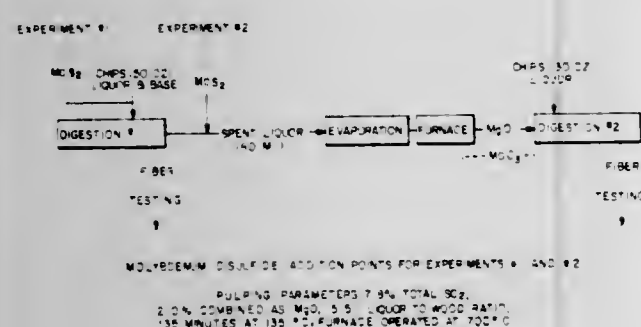
Dominic S. Rende, Woodridge, Ill., assignor to Nalco Chemical, Oak Brook, Ill.

Continuation-in-part of Ser. No. 216,749, Dec. 16, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 337,808. The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> D21C 3/04, 11/02

U.S. Cl. 162—36

3 Claims



1. An improved process for sulfite pulping of wood of the type which comprises sulfite pulping wood chips in the presence of a catalytic amount of a water-soluble molybdenum containing compound, the improvement which comprises adding to the spent liquor stream in the sulfite pulping process a catalytically effective amount of molybdenum disulfide, feeding the spent liquor stream into an evaporator and recovery furnace, heating the stream to evaporate excess liquid, and oxidizing said molybdenum sulfide to recover molybdenum oxides, and then returning these molybdenum oxides to a digester wherein the molybdenum oxides act as catalysts to accelerate the acid hydrolysis of wood lignins.

4,414,061

# TWIN WIRE PAPER FORMING APPARATUS

Alton D. Truffitt, Eltham, Australia, and David J. Bringman, Bolton, England, assignors to Australian Paper Manufacturers Limited, South Melbourne, Australia and Beloit Corporation, Beloit, Wis.

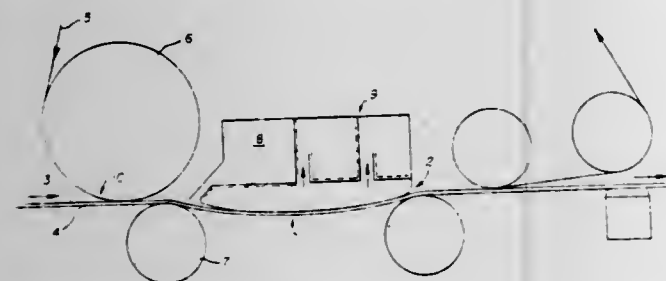
Continuation of Ser. No. 2,075, Jan. 8, 1979, abandoned, which is a continuation of Ser. No. 792,983, May 2, 1977, abandoned. This application Sep. 28, 1981, Ser. No. 305,868.

Claims priority, application Australia, Feb. 20, 1975, PC0668; United Kingdom, May 4, 1976, 18077/76

Int. Cl.<sup>3</sup> D21F 1/48

U.S. Cl. 162—295

4 Claims



1. Apparatus for forming a paper web from a dilute, aqueous slurry of fibers comprising, in combination: a looped upper forming wire; a looped lower forming wire; means for supporting the upper and lower forming wires in

opposed, substantially horizontal relationship for receiving an aqueous slurry of fibers to be dewatered therebetween; stationary dewatering device mounted within the looped upper forming wire and including

- (a) an autoslice mounted in water skimming relationship with the upper forming wire for urging the water into the autoslice for removal therefrom, said autoslice being capable of applying sub-atmospheric pressure to the water;
- (b) a suction box having a convexly curved pervious working surface with a radius between about 50 inches to about 400 inches and mounted within the looped upper forming wire positioned closely adjacent and downstream of the autoslice with the working surface bearing downwardly against the upper forming wire to cause the upper and lower forming wires to define a smooth upwardly concavely curved path over the working surface throughout at least a portion of their substantially horizontal path of travel, whereby a significant amount of water is removed upwardly from the aqueous slurry of fibers through the upper forming wire over the curved pervious working surface to form the paper web;

first and second means positioned within the lower forming wire substantially upstream and downstream, respectively, of the stationary dewatering device for creating negative pressure beneath the lower forming wire.

4,414,062

# HEADBOX OF A PAPER MACHINE

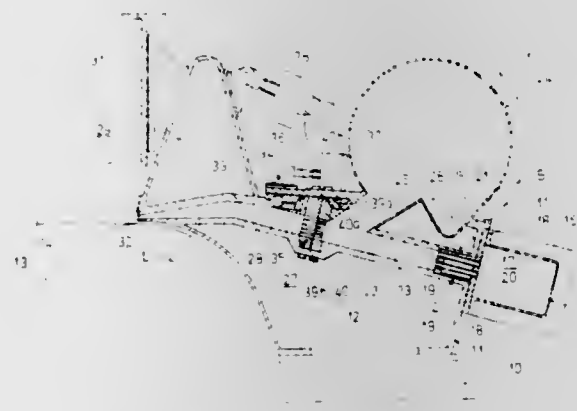
Alvi Kirjavainen, Jyväskylä, Finland, assignor to Valmet OY, Finland

Filed Nov. 18, 1981, Ser. No. 322,587

Int. Cl.<sup>3</sup> D21F 1/06

U.S. Cl. 162—336

8 Claims



1. In a headbox of a paper machine having a stock distribution header part: a distribution pipe assembly following and communicating with said stock distribution header part in the direction of the stock flow; and a stock suspension flow passage downstream of and following said distribution pipe assembly having upper and lower wall means and including means defining an equalizing passage communicating with and following said distribution pipe assembly in the flow path of the stock suspension with an air tank in direct communication with said equalizing passage for damping pressure pulsations occurring in the stock flow, a turbulence section downstream of and communicating with said equalizing passage, and a converging slice part communicating with and following said equalizing passage in the direction of stock flow, said converging slice part having a lower lip wall and an upper lip wall, and wherein at least said turbulence section is constituted by at least one exchangeable grating cassette component removably attached to the headbox, the improvement comprising:

said turbulence section includes two grating plates situated against each other extending transverse to the direction of stock flow, the first of the two plates having a plurality of first bores formed therethrough and the second of the two

plates having a corresponding plurality of second bores formed therethrough, each of said second bores being coaxial with a respective one of said first bores and having a larger diameter than that of said respective first bore to form a step therebetween, and wherein said grating plates constitute mechanical supporting and load-bearing means between said upper and lower wall means of said stock suspension flow passage for taking up forces acting on said upper and lower wall means of said stock suspension flow passage.

4,414,063

# REMOVING RESIDUAL ACRYLONITRILE IN AQUEOUS DISPERSIONS

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

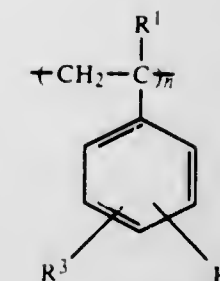
Filed Apr. 12, 1982, Ser. No. 367,755

Int. Cl.<sup>3</sup> B01D 3/36; C08F 6/10

U.S. Cl. 203—66

5 Claims

1. A process for the removal of residual acrylonitrile in acrylonitrile polymers in aqueous emulsion comprising adding at least about 1.5 parts by weight of methanol for each part by weight of acrylonitrile in said emulsion said methanol being in a form that will not break the emulsion and thereafter distilling off a methanol-acrylonitrile azeotrope until the concentration of acrylonitrile in the polymer and emulsion is less than about 10 ppm.



where R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may be the same or different and each represents hydrogen or a C<sub>1</sub>-C<sub>6</sub> lower alkyl group, and n is an integer from 50 to 30,000 with an organic solvent which will dissolve said polymer; and subjecting said polymer to an electrolytic reaction in the presence of an aqueous solution containing chlorine ions.

4,414,064

# METHOD FOR PREPARING LOW VOLTAGE HYDROGEN CATHODES

John Z. O. Stachurski, Amherst; Dirk Pouli, Williamsville; John A. Ripa, Lancaster, and Gerald F. Pokrzyk, Lewiston, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 104,235, Dec. 17, 1979, Pat. No. 4,354,915.

This application Nov. 19, 1980, Ser. No. 208,357

Int. Cl.<sup>3</sup> C25D 5/50; C25B 11/10; H01M 4/88; B05D 5/12

U.S. Cl. 204—37 R

16 Claims

1. A method for applying an activated cathode surface to a substrate to form a cathode useful in electrolytic processes, said method comprising the steps of:

- (a) electrodepositing a coating of a first metal selected from the group consisting of iron, cobalt, nickel, and mixtures thereof, a leachable second metal or metal oxide selected from the group consisting of molybdenum, manganese, titanium, tungsten, vanadium, indium, chromium, their oxides, and combinations thereof, and a nonleachable third metal selected from the group consisting of cadmium, mercury, lead, thallium, bismuth, and mixtures thereof, onto the substrate material from an aqueous plating solution until said coating covers at least a portion of said substrate material, and
- (b) removing at least a portion of the leachable second metal.

4,414,065

# METHOD FOR PREPARING A CHLORINATED VINYL AROMATIC POLYMER

Hiroyuki Watanabe, Shin-nanyo, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,945

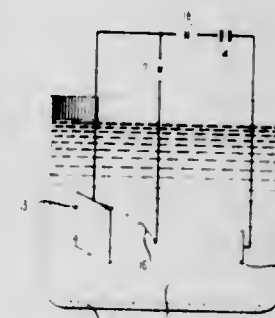
Claims priority, application Japan, Sep. 9, 1981, 56-140905

Int. Cl.<sup>3</sup> C25B 3/06

U.S. Cl. 204—81

17 Claims

1. A method for preparing a chlorinated vinyl aromatic polymer, which comprises: admixing a vinyl aromatic polymer represented by the formula:



1. A process for fabricating a device comprising at least one intrinsic or n-type compound semiconductor comprising the step of electrochemically photoetching at least part of the surface of the compound semiconductor to produce oxidized species by passing current through the compound semiconductor, an electrolytic solution with conductivity greater than 0.0001 mhos/cm and a cathode characterized in that the step further comprises

- a. applying a potential to the semiconducting compound which is between the maximum potential of the valence band of the semiconductor compound in the electrolytic solution and the minimum potential of the conduction band of the semiconductor compound in the electrolytic solution;
- b. illuminating the part of the surface of the compound semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band;
- c. including in the composition of the electrolytic solution species which remove the oxidized species from the surface of the compound semiconductor.



4,414,067

## VAPOR CONDENSATE RETURN MEANS IN A VAPOR GENERATING AND RECOVERY APPARATUS

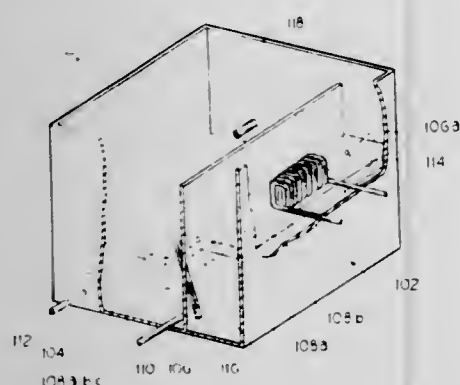
James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Continuation of Ser. No. 334,169, Dec. 24, 1981, Pat. No. 4,394,216. This application Apr. 28, 1983, Ser. No. 489,490

Int. Cl.<sup>3</sup> B01D 3/02, 11/02

U.S. Cl. 202—170

12 Claims



1. A vapor generating and recovery apparatus comprising: a housing having a vaporizing chamber and a condensing chamber therein separated by a first weir of preselected height; means to add heat to said vaporizing chamber and means to remove heat from said condensing chamber; and, means for minimizing the amount of additional fluids normally required for operation of said apparatus, by maintaining the composition of a solution comprising a first component and a second component immiscible with, and of higher density than said first component, including first means to transfer condensed second component from said condensing chamber to said vaporizing chamber, and second means to transfer condensed first component from said condensing chamber to said vaporizing chamber with sufficient force to provide mixing sufficient to cause substantial thermal equilibrium between said first and second components.

4,414,068

## SELF-CURABLE RESINOUS COMPOSITIONS USEFUL IN COATING APPLICATIONS

Steven E. Patricca, Pittsburgh, and Stephen L. Buchwalter, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

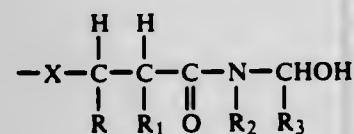
Division of Ser. No. 175,163, Aug. 4, 1980, Pat. No. 4,341,676. This application Mar. 11, 1982, Ser. No. 357,025

Int. Cl.<sup>3</sup> C25D 13/06

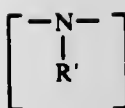
U.S. Cl. 204—181 C

15 Claims

1. In an improved process for cathodically electrocoating an electrically conductive surface serving as a cathode which comprises passing an electric current between said cathode and an anode which are immersed in an aqueous resinous dispersion containing an aqueous resinous composition wherein the improvement comprises a polymer characterized by a pendant group which is of the structure:



wherein X represents sulfur or an amino group



of which R' is hydrogen or an alkyl group containing from about 1 to 6 carbon atoms; and wherein R, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub>, each independently, is hydrogen or an alkyl group containing from about 1 to 6 carbon atoms; said composition also comprises a water-solubilizing group.

4,414,069

## NEGATIVE ION BEAM SELECTIVE ETCHING PROCESS

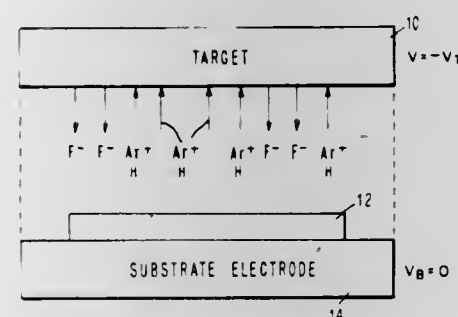
Jerome J. Cuomo, Lincolndale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,838

Int. Cl.<sup>3</sup> C23C 15/00; C23F 1/00

U.S. Cl. 204—192 E

27 Claims



1. In a negative ion etching process, wherein negative ions are sputtered from a target by a sputtering plasma and then are accelerated to a substrate to cause etching therefrom, the improvement wherein hydrogen or a species containing hydrogen is added to said sputtering plasma.

4,414,070

## ANODE POSITIONING SYSTEM

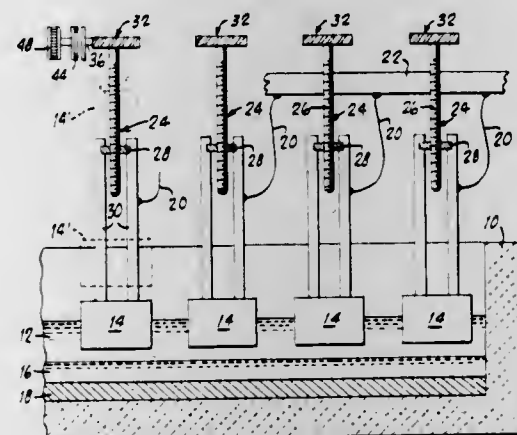
John S. Spence, Arvida, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Feb. 12, 1982, Ser. No. 348,170

Int. Cl.<sup>3</sup> C25D 17/00

U.S. Cl. 204—225

12 Claims



1. An anode positioning system for an electrolytic cell having multiple suspended anodes, comprising:
  - (a) a plurality of screw jacks each adapted to raise and lower one anode;
  - (b) a corresponding plurality of reduction gear means with outputs respectively connected to said screw jacks for individually driving said jacks;
  - (c) means including a motor for bidirectionally driving said plurality of reduction gear means; and
  - (d) means for transmitting drive from said driving means to

said plurality of reduction gear means including a corresponding plurality of slipping frictional clutches respectively interposed between said driving means and said plurality of reduction gear means such that each of said gear means has an individual frictional clutch associated therewith.

4,414,071

## ELECTRODE

Donald S. Cameron, Reading, and Susan J. Cooper, Finchampstead, both of England, assignors to Johnson, Matthey &amp; Co., Limited, London, England

Filed Apr. 15, 1981, Ser. No. 254,494

Claims priority, application United Kingdom, Apr. 22, 1980, 8013146

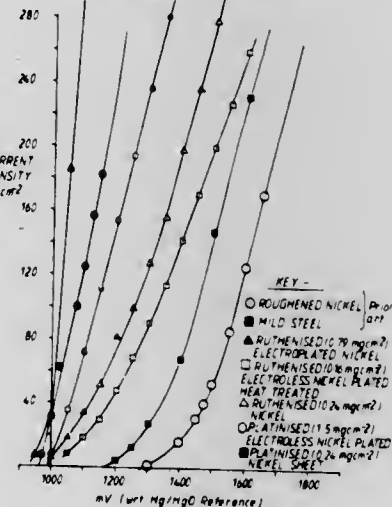
Int. Cl.<sup>3</sup> C25B 11/10, 1/34

U.S. Cl. 204—242

5 Claims

PRECIOUS METAL CATALYZED ANODE METAL ELECTRODE PERFORMANCE CHARACTERISTICS

CONDITIONS - 10% NaOH at 23°C



1. A cathode suitable for use in a chloralkali process, the cathode comprising an electrolytic deposit of platinum and ruthenium having a roughness factor of at least 100 cm<sup>2</sup>/cm<sup>2</sup> of geometric surface area, wherein the deposit is carried on an electrically conductive matrix and is selected from a group consisting of mixtures or alloys of platinum and ruthenium.
5. A chloralkali cell incorporating a cathode as claimed in claim 1.

4,414,072

## DOOR FOR COKING CHAMBER OF COKE-OVEN BATTERY

Dieter Breidenbach, Waltrop, and Wilhelm Mosebach, Kamen-Metteler, both of Fed. Rep. of Germany, assignors to WSW Stahl-und Wasserbau GmbH, Waltrop, Fed. Rep. of Germany Continuation-in-part of Ser. No. 303,609, Sep. 18, 1981, which is a division of Ser. No. 182,004, Aug. 27, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,317

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945017; Jan. 4, 1980, 3000161

Int. Cl.<sup>3</sup> C10B 25/06, 29/04

U.S. Cl. 202—248

6 Claims

1. A door for a coking chamber of a coke oven battery provided with a doorjamb at the narrow ends of the chamber between two major parallel chamber walls comprising:
  - a door frame sealingly engaging said doorjamb;
  - support means having an outer end thereof mounted on said doorframe and having an inner end thereof extending into an associated coking chamber fitted with said door;
  - a thermally conductive metal plate arranged and constructed to:
    - be mounted on said support means at the inner end thereof,
    - be spaced from said door frame to define therewith a vertical channel,
    - provide access to said channel by heated gases entering

said channel from a charge of coal in said coking chamber, permit said heated gases entering said channel to flow upwardly therein and transfer a considerable part of the heat of said gases through said metal plate to the coal



- charge in said chamber at the normally unheated end thereof adjacent said metal plate; and
- a heat insulating layer on said frame extending over substantially the full width and height thereof for minimizing the escape of heat from said gases to the exterior of said frame.

4,414,073

## SUPPORTING BODY CELL IN ELECTROPHORETIC APPARATUS

Toyotaro Iwata, Kobe; Kunio Nakajima, Miki, and Hiroyuki Otsuki, Kakogawa, all of Japan, assignors to Toa Medical Electronic Co., Ltd., Hyogo, Japan

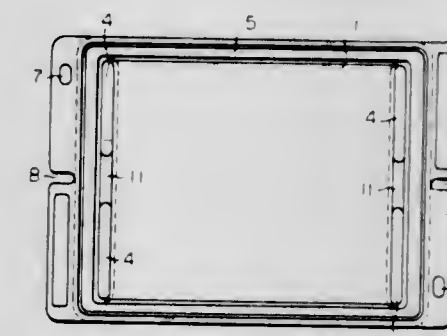
Filed Sep. 16, 1982, Ser. No. 419,034

Claims priority, application Japan, Sep. 18, 1981, 56-147164

Int. Cl.<sup>3</sup> G01N 27/28

U.S. Cl. 204—299 R

10 Claims



1. A cell for a supporting body in an electrophoretic apparatus, which cell comprises a tray having an upper side for accommodating a gel layer serving as the electrophoretic supporting body, a pair of legs, each of said legs extending laterally along an opposing side of said tray, each leg having a plurality of openings communicating between the upper side of the tray and a lower open end of the leg, and partitioning members, each partitioning member being disposed between adjacent ones of said openings to laterally partition the supporting body at the opposing sides.



# 4,414,074 PROCESS FOR THE PURIFICATION OF 4,4'-DIISOCYANATODIPHENYLMETHANE BY PLURAL DISTILLATIONS

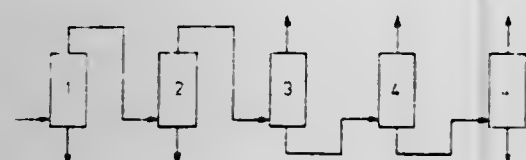
Günther Ellendt; Günter Glötschmann, both of Krefeld, and Max Scheidel, Willich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Oct. 25, 1982, Ser. No. 436,489

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3145910

Int. Cl.<sup>3</sup> B01D 3/10; C07C 119/00

U.S. Cl. 203—21

5 Claims



1 A process for the production of 4,4'-diisocyanatodiphenylmethane by the distillative separation of diisocyanatodiphenylmethane isomers from a polyisocyanate mixture of the diphenylmethane series obtained by phosgenating aniline/formaldehyde condensates, comprising separating said isomer from said mixture in a first distillation stage, further distilling the distillate resulting from said first stage in a second distillation stage, drawing off from 0.5 to 20%, by weight, of the quantity of product introduced into said second stage from the sump of said second stage, then subsequently separating 2,2'- and 2,4'-diisocyanatodiphenylmethane from the distillate obtained as the head product of said second stage in a third distillation stage, and finally working-up the sump product remaining from said third stage in order to obtain very pure 4,4'-diisocyanatodiphenylmethane, characterized in that

(a) the temperatures of the condenser outlets of the first, second and third distillation stages are adjusted to from 130° C. to 230° C., such that the temperatures are from 10° to 50° C. below the incoming vapor temperature which is predetermined in each case by the vacuum in the distillation column, and

(b) the sump remaining from said third stage is worked up in two distillation stages, such that in a first final stage, from 50 to 90%, by weight, of the sump remaining from said third stage is isolated as the head product in the form of pure 4,4'-diisocyanatodiphenylmethane, and in a second final stage, the sump of the first final stage is split into a further quantity of pure 4,4'-diisocyanatodiphenylmethane as the head product and into a distillation residue as the sump.

# 4,414,075 APPARATUS FOR AND A METHOD OF SELECTIVE PLATING OF COMPONENTS INCLUDING STRIP COMPONENTS

John M. Cockeram, 3 Church Rd., Spratton, Northampton, England

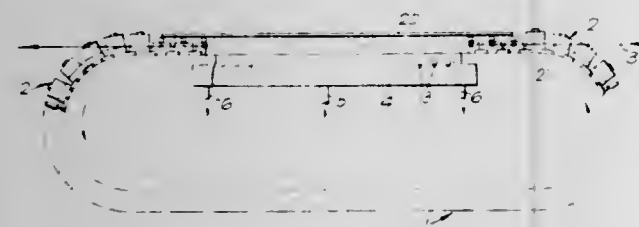
Filed Dec. 23, 1981, Ser. No. 333,692

Claims priority, application United Kingdom, Dec. 23, 1980, 8041267; Sep. 17, 1981, 8128196

Int. Cl.<sup>3</sup> C25D 5/02, 5/08, 17/00

U.S. Cl. 204—15

10 Claims



1. An apparatus for use in selective plating a component,

which apparatus comprises an electroplating zone, a series of movable selective plating heads in an endless chain configuration, wherein each plating head comprises an electrolyte opening, means for indexing the plating head to a component, means for engaging the component so as to expose an area to be selectively plated to electrolyte, means for releasably sealing the rear of the component in the region of the area to be plated, means for fastening the sealing means prior to the entry of the plating head into the electroplating zone and means for releasing the sealing means after the plating head leaves the electroplating zone, resilient or slidable couplings provided between the plating heads and means provided in the electroplating zone for supplying electrolyte to the area to be selectively plated.

4,414,076

# LOW RESISTANCE OHMIC CONTACT

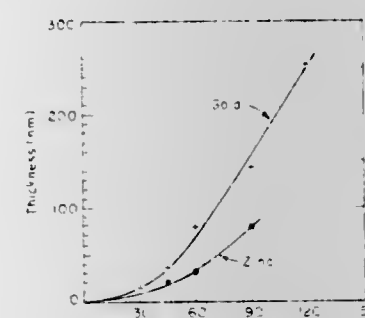
Kamal Tabatabaie-Alavi, Cambridge; Abu N. M. M. Choudhury, Belmont; Nancy J. (Slater) Gabriel, Cambridge, and Clifton G. Fonstad, Arlington, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1983, Ser. No. 471,098

Int. Cl.<sup>3</sup> C25D 5/02, 5/10, 5/18

U.S. Cl. 204—15

8 Claims



1. A method of fabricating low resistance ohmic contact on a p-type InP substrate using photoresist which comprises the steps of:

- plating a first film of gold on said substrate;
- plating a zinc film on said first layer of gold; and
- plating a second film of gold on said layer of zinc.

4,414,077

# METHOD FOR PRODUCTION OF COLORED ALUMINUM ARTICLE

Kohichi Yoshida, Shimizu; Teruo Miyashita; Yasuo Oka, both of Fuji, and Takashi Kajiya, Shizuoka, all of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,922

Claims priority, application Japan, Mar. 26, 1980, 55/37521

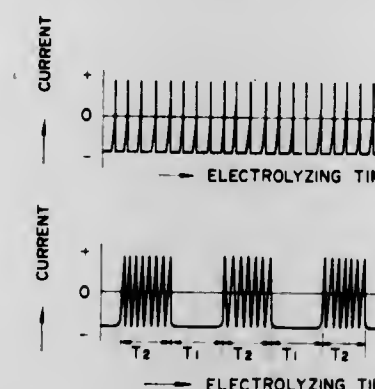
Int. Cl.<sup>3</sup> C25D 11/22

U.S. Cl. 204—35 N

18 Claims

1. An improved method for the electrolytic coloring of anodized aluminum by optical interference effects, which comprises subjecting an aluminum article carrying on its surface a porous anodic oxide film including a barrier layer in sequence to (1) an electrolytic treatment for enlarging the volume of the bottom of the pores in the film, (2) a preliminary electrolytic treatment in which said article is connected as an anode to a DC current to adjust the difference in thickness of said barrier layer to obtain more uniform current distribution at all parts of said article during subsequent coloring, and (3) an electrolytic coloring treatment in which the aluminum article is connected as a cathode in an electrolytic bath containing a soluble metal salt and subjected to electrolysis with a negative DC current having superimposed positive pulses to produce a metallic electrodeposition at the enlarged bottom of said pores, wherein the frequency of the pulses is in the range of 200 to

2600 pulses per minute and the ratio (Ta/Tc) between the periods of anodic and cathodic currents, respectively, during the coloring treatment does not exceed 0.3, said coloring treatment being controlled such that the upper surface of said



deposition is spaced from said barrier layer a distance in the order of the wave length of visible light, whereby the coloration of said article is determined by optical interference effects.

4,414,078

# METHOD FOR PRETREATMENT IN THE PRODUCTION OF TIN-FREE STEEL

Nobuyoshi Shimizu; Kinji Saijo; Kenji Hizuka, all of Kudamatsu; Tsuneo Inui, Tokuyama, and Yoshikazu Kondo, Kudamatsu, all of Japan, assignors to Toyo Kohan Company, Limited, Tokyo, Japan

Continuation of Ser. No. 141,210, Apr. 17, 1980, abandoned.

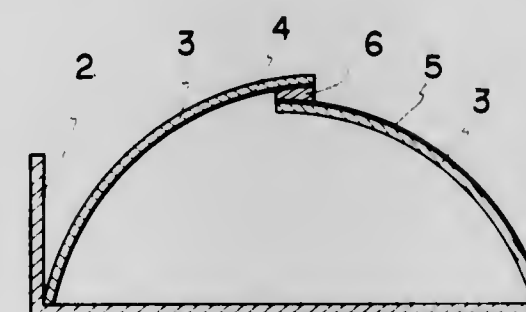
This application Mar. 12, 1982, Ser. No. 357,665

Claims priority, application Japan, Aug. 9, 1979, 54-100723

Int. Cl.<sup>3</sup> C25D 5/36

U.S. Cl. 204—34

9 Claims



1. A method for pretreating a steel substrate prior to formation of a tin-free steel which comprises pickling the steel substrate with sulfuric or hydrochloric acid to activate the surface of the steel substrate; subjecting the thus-pickled steel substrate to an anodic treatment or an anodic treatment after a cathodic treatment, said anodic treatment being conducted in an alkaline electrolyte containing a member selected from the group consisting of an alkali metal compound, an ammonium compound or mixtures thereof having a pH of above 8, and then subjecting the thus-pretreated steel substrate to an electrolytic chromic acid treatment to produce a tin-free steel by forming a lower layer of metallic chromium in the range of 50-150 mg/m<sup>2</sup> and an upper layer of hydrated chromium oxide in the range of 8-25 mg/m<sup>2</sup> as chromium.

1036 O.G.—22

4,414,079

# PROCESS FOR THE PREPARATION OF A 4-BUTANOLIDE COMPOUND

Kazunori Yamataka; Toshiro Isoya, and Nobuya Kitaguchi, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,604

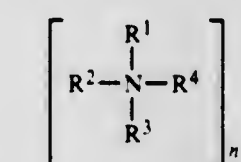
Claims priority, application Japan, Sep. 30, 1981, 56-155746

Int. Cl.<sup>3</sup> C25B 3/00

U.S. Cl. 204—75

20 Claims

1. A process for the preparation of a 4-butanolide compound which comprises subjecting a mixture of an acrylic ester and an aldehyde selected from the group consisting of aliphatic aldehydes having 1 to 13 carbon atoms, aromatic aldehydes and aralkyl aldehydes to electrolytic reduction, said mixture of the acrylic ester and the aldehyde being in the form of an aqueous emulsion comprising a water phase and an organic phase, in the presence of at least one phase-transfer catalyst selected from the group consisting of quaternary ammonium salts represented by the general formula:



wherein X stands for an acid radical, n stands for an integer corresponding to the valence of X, and R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> each independently stand for an alkyl group or an aralkyl group, provided that, when said aldehyde is an aliphatic aldehyde having 5 to 13 carbon atoms, an aromatic aldehyde or an aralkyl aldehyde, the total number of carbon atoms in R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> of the quaternary ammonium ion moiety is 12 to 30, said total number of carbon atoms is R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> being calculated by the equation n × (carbon number in R<sup>1</sup> + carbon number in R<sup>2</sup> + carbon number in R<sup>3</sup> + carbon number in R<sup>4</sup>)/n, and quaternary phosphonium salts in an electrolytic cell provided with at least one pair of anode and cathode, said cathode being made of lead or a lead alloy.

4,414,080

# PHOTOELECTROCHEMICAL ELECTRODES

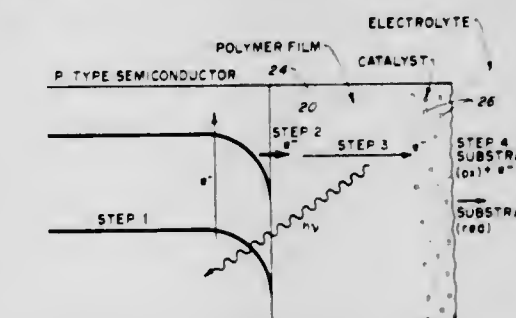
Roger M. Williams, and Alan Rembaum, both of Pasadena, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,306

Int. Cl.<sup>3</sup> C25B 1/02; H01M 6/36

U.S. Cl. 204—129

23 Claims



23. A method of photolysing water comprising placing an electrode comprising a solid semiconductor having a band gap below 2.0 eV coated with a film of polyquaternary, bipyridyl polymer containing cross-links between unsaturated groups on different chains and a dispersion of fine, hydrogen producing catalyst, and a counterelectrode in aqueous electrolyte; illuminating the coated electrode with solar energy; photolysing water to produce hydrogen gas; and collecting said gas.



4,414,081

## FAMILY OF COMPOUNDS CROSSLINKABLE BY PHOTON IRRADIATION

Armand Eranian; Jean-Claude Dubois; Maryse Gazard, and Françoise Barre, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 163,479, Jun. 27, 1980, abandoned, which is a division of Ser. No. 67,905, Aug. 20, 1979, Pat. No. 4,285,788, which is a division of Ser. No. 882,169, Feb. 28, 1978, Pat. No. 4,259,162. This application Nov. 6, 1981, Ser. No. 318,940

Claims priority, application France, Mar. 4, 1977, 77 06441

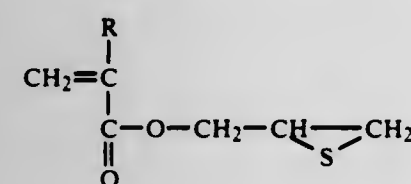
Int. Cl.<sup>3</sup> C08F 2/50

U.S. Cl. 204—159.18

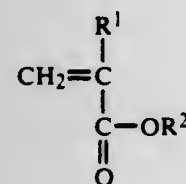
10 Claims

1. A copolymer composition crosslinkable by ionizing radiation into a 3-dimensional network, said composition comprising, as the cross-linkable monomers:

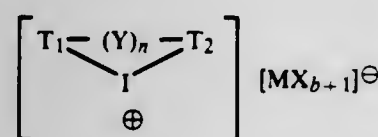
(i) from 40 to 80% by weight of 2,3 epithiopropyl alkyl acrylate monomer units of the formula:

wherein R is hydrogen or a C<sub>1</sub> to C<sub>4</sub> alkyl; and

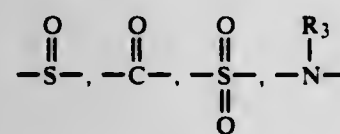
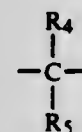
(ii) from 60 to 20% by weight of vinyl monomer units of the formula:

wherein R<sup>1</sup> is hydrogen or an alkyl group of the formula C<sub>n</sub>H<sub>2n+1</sub>, where n is an integer from 1 to 10 and R<sup>2</sup> is a C<sub>1</sub> to C<sub>5</sub> alkyl group, together with

(iii) an initiating amount of an aryl iodonium salt of the formula:



where n is 0 or 1,

T<sub>1</sub> and T<sub>2</sub>, which are the same or different, are aromatic groups consisting from 4 to 20 carbon atoms, Y is:where R<sub>3</sub> is hydrogen, alkyl or acyl, orwhere R<sub>4</sub> and R<sub>5</sub>, which may be the same or different, are hydrogen, a C<sub>1</sub> to C<sub>4</sub> alkyl or a C<sub>2</sub>-C<sub>4</sub> alkenyl, M is Fe, Sn, Sb, Bi, B, P or As, X is a halogen atom, and B is an integer from 1 to 5.

4,414,082

## PROCESS FOR CRACKING HYDROCARBONS

Michael P. Neary, 409 E. Coronado #2, Santa Fe, N. Mex. 87501, and Thomas A. Wilson, 14 Bayview Ct., Manhasset, N.Y. 11030

Continuation-in-part of Ser. No. 962,770, Nov. 21, 1978, abandoned, which is a division of Ser. No. 213,039, Dec. 4, 1980, Pat. No. 4,335,160. This application Nov. 16, 1981, Ser. No. 321,396

Int. Cl.<sup>3</sup> C07C 3/24

U.S. Cl. 204—162 R

1 Claim

1. The process for cracking hydrocarbons which comprises forming a metastable reagent gas, intermingling the same with hydrocarbon vapor, to cause the rupture of carbon-to-carbon bonds in the molecules of said hydrocarbon vapor to produce an improved hydrocarbon mixture.

4,414,083

## REMOVAL OF DIENE IMPURITIES FROM ALKENES OR ALKANES OVER ACTIVATED MAGNESIUM OXIDE UNDER ULTRAVIOLET RADIATION

Filippo Pennella, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1982, Ser. No. 343,047

Int. Cl.<sup>3</sup> C07C 3/24

U.S. Cl. 204—162 R

9 Claims

1. A process for reducing the amount of diene impurities in a gaseous stream of hydrocarbons comprising alkanes and/or alkenes having up to five carbon atoms and at least one diene impurity, which process comprises contacting said stream with an activated magnesium oxide catalyst at a temperature in the approximate range of about 20° C. to about 300° C., and under ultraviolet light radiation.

4,414,084

## PROCESS FOR CONVERSION OF CELLULOSE TO AMINO ACIDS BY RADIOFREQUENCY PLASMA OF NITROGEN AND HYDROGEN

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 18, 1982, Ser. No. 409,268

Int. Cl.<sup>3</sup> C07G 13/00

U.S. Cl. 204—165

7 Claims

1. A process for producing a mixture of amino acids from cellulose which process comprises:

- (a) positioning cellulose between or near electrodes in a radiofrequency plasma reaction chamber;
- (b) sealing and then reducing the pressure in said chamber;
- (c) bleeding a mixture containing a sufficient ratio of hydrogen and nitrogen through the chamber while maintaining the reduced pressure so that the hydrogen and nitrogen can react with the cellulose to form amino acids;
- (d) applying a radiofrequency electric current to the electrodes with sufficient power to create a colored plasma in the reaction chamber for a sufficient period of time to consume the cellulose thereby producing a mixture of amino acids from the cellulose.

4,414,085

## METHOD OF DEPOSITING A HIGH-EMISSIVITY LAYER

Charles E. Wickersham, Columbus, and Ellis L. Foster, Powell, both of Ohio, assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 8, 1981, Ser. No. 309,656

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 C

8 Claims

1. A method for depositing a carbon layer on a substrate comprising:

providing a chamber for RF reactive sputter deposition,

4,414,088

## CHLORATE CELL SYSTEM

Joseph B. Ford, Oakville, Canada, assignor to ERCO Industries Limited, Islington, Canada

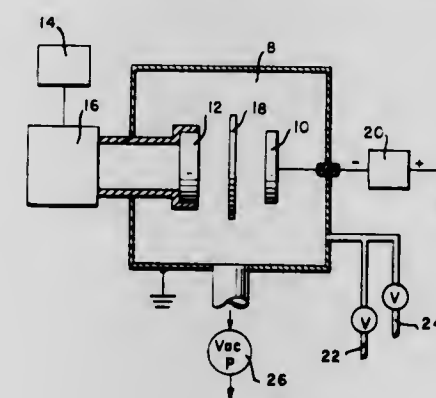
Filed Sep. 21, 1981, Ser. No. 304,108

Int. Cl.<sup>3</sup> C25B 15/08, 9/00, 11/10, 1/24

U.S. Cl. 204—237

4 Claims

providing within the chamber a substrate and a target comprised of a carbide compound, providing a noble gas and a hydrocarbon gas to the chamber, applying RF power to the target to sputter deposit the carbide compound onto the substrate and to decompose the hydrocarbon gas to hydrogen and carbon such that carbon deposits on the target and substrate whereby a layer



having a carbide/carbon composition gradient develops on the substrate, and maintaining the partial pressure of hydrocarbon gas sufficiently high so that the carbon accumulation rate on the target is greater than the sputter removal rate, whereby a continuous layer of carbon will form on the target and a layer of carbon will form over the carbide/carbon gradient on the substrate.

4,414,086

## MAGNETIC TARGETS FOR USE IN SPUTTER COATING APPARATUS

Lawrence T. Lamont, Jr., Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 5, 1982, Ser. No. 439,681

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 M

12 Claims

1. A magnetic sputter target for use in a magnetron sputter coating source having a magnetic field means for establishing magnetic fields above a sputter surface of a sputter target, said magnetic sputter target comprising a first magnetic member; and a second magnetic member spaced from said first magnetic member to form a gap containing no magnetic material between said magnetic members, whereby said magnetic members will cooperate with the magnetic field means in a magnetron sputter source to form a fringing magnetic field across said gap.

4,414,087

## MAGNETICALLY-ASSISTED SPUTTERING METHOD FOR PRODUCING VERTICAL RECORDING MEDIA

Benjamin B. Meckel, Del Mar, Calif.

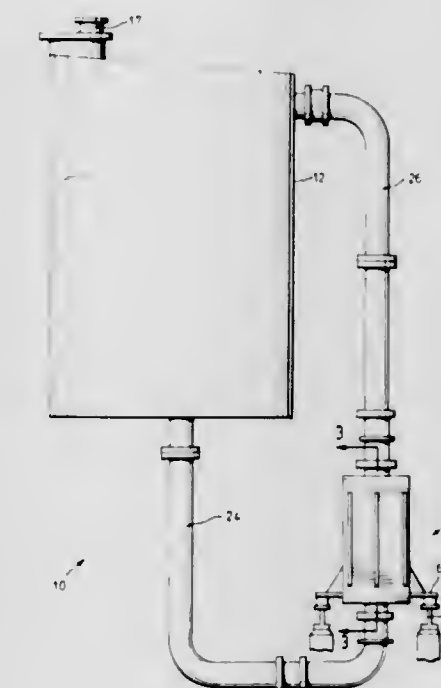
Filed Jan. 31, 1983, Ser. No. 462,564

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 M

5 Claims

1. A magnetically-assisted sputtering method for producing vertical recording media by sputtering a magnetic target onto a substrate to form a magnetic film exhibiting a high degree of uniaxial magnetic anisotropy along an axis substantially normal to the surface of said substrate, comprising the steps of heating a magnetic target to a temperature not less than about its Curie temperature to render said target non-magnetic while selectively cooling the portions of said target through which magnetic flux penetrates to a temperature below the Curie temperature of the target whereby to retain said portions in a magnetic state while sputtering said target, said target being formed from a cobalt-containing alloy having a Curie temperature of not greater than about 900° C., and sputtering said target while in a non-magnetic state to form said magnetic film.



1. An electrolysis unit for the production of sodium chlorate by electrolysis of sodium chloride solution, which comprises: a single reaction tank having a liquid feed inlet for receiving sodium chloride solution in said tank and a liquid product outlet for removing sodium chlorate product solution from said tank, a plurality of electrolysis cells connected in electrical series one with another in a bank wherein the cells are physically joined together in substantially fixed position relative to one another, each of said plurality of cells having a plurality of anode and cathode electrodes located therein and extending from respective spaced apart parallel anode and cathode backing plates in interleaved manner to define upwardly-directed parallel electrolysis channels therebetween extending between a lower inlet and an upper outlet, said cathode electrodes and cathode backing plates being constructed of mild steel, said anode electrodes being constructed of titanium having an electroconductive surface and said anode backing plate being constructed of titanium, said bank of cells having an anode backing plate located at one end and a cathode backing plate located at the other end, said bank of cells further having a cell divider plate located between each adjacent pair of cells in said bank to isolate the cells one from another, said cell divider plate consisting of the cathode backing plate of one cell and the anode backing plate of another cell intimately and integrally explosively bonded to opposite sides of a copper plate, said anode backing plate, cathode backing plate and copper plate being coextensive with each other, said cell divider plate being rigidly connected to but electrically insulated from structural parts of adjacent cells in said bank, a plurality of first liquid feed conduits corresponding in number with the number of said plurality of cells in said bank extending between respective liquid outlets of said reaction tank and respective ones of said liquid inlets to said cells, and a plurality of second liquid feed conduits corresponding in number with the number of said plurality of cells in said bank extending between respective liquid outlets of said cells and respective liquid inlets to said reaction tank.



4,414,089

**ELECTROLYSIS CELL FOR REDUCTION OF MOLTEN METAL HALIDE**

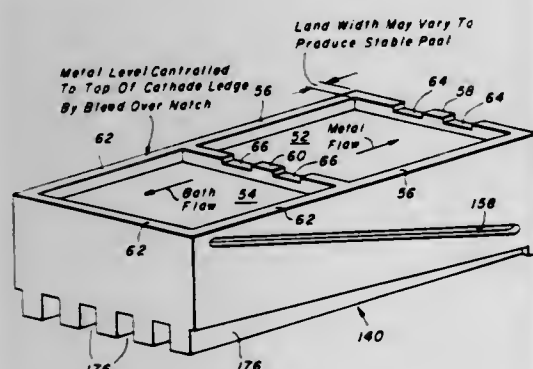
Matthew J. McMonigle, New Kensington, and Alfred F. LaCamera, Level Green, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 30, 1982, Ser. No. 404,347

Int. Cl.<sup>3</sup> C25C 3/08

U.S. Cl. 204—244

11 Claims



1. A cell for producing metal by electrolytic reduction of a metal halide in a molten salt bath comprising the metal halide dissolved in at least one molten salt of higher electrode-composition potential than the metal halide, said cell comprising:

- a plurality of electrodes, disposed horizontally and arranged in at least one vertical stack;
- each stack including a cathode, at least one intermediate bipolar electrode and an anode;
- the electrodes in each stack being adapted to be located beneath the upper level of the bath and arranged in a superimposed, spaced relationship defining inter-electrode spaces between each pair of adjacent electrodes;
- the upper face of each cathode and of each of the bipolar electrodes having at least one reservoir, bounded by a perimetric wall, for collecting metal producing during operation of the cell; and
- level maintaining means within said reservoir to maintain a pool of metal at a predetermined level adjacent the top of said perimetric wall whereby the cathode face of each electrode is protected by a layer of metal and the flow of excess metal from said reservoir is directable toward predetermined paths of metal flow within said cell and away from gas flow paths, said level maintaining means comprising one or more notches cut into the perimetric wall to such a depth that a pool of metal in the reservoir will be maintained at a level adjacent the top of the perimetric wall and metal produced in excess of that amount will drain through said one or more notches.

4,414,090

**SEPARATOR MEMBRANES FOR REDOX-TYPE ELECTROCHEMICAL CELLS**

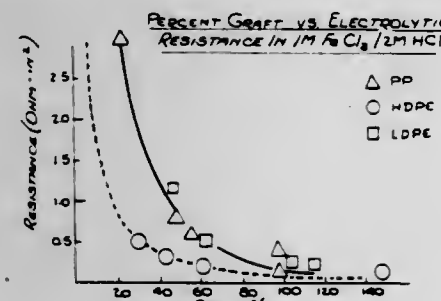
Vincent F. D'Agostino, Huntington, and Joseph Y. Lee, Lake Grove, both of N.Y., assignors to RAI Research Corporation, Hauppauge, N.Y.

Filed Oct. 1, 1981, Ser. No. 307,588

Int. Cl.<sup>3</sup> C25B 9/00, 13/08; H01M 14/00, 2/16

U.S. Cl. 204—252

11 Claims



1. In an improved redox electrochemical cell incorporating

two chemically-inert electrodes of opposite polarity, at least one aqueous acidic electrolyte, and a separator membrane between the adjacent electrodes, the improvement comprising a separator membrane formed from a polyolefin film grafted with a vinyl-substituted monomer via gamma irradiation.

4,414,091

**APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS**

Alexandr A. Axenko, ulitsa Bairova, 152, kv. 25; Miron M. Nazarian, ulitsa Bljukhera, 13, kv. 138; Vladimir A. Kolyada, ulitsa Petrozavodskaya, 91a, kv. 30; Arkady R. Mataev, ulitsa Timurovtsev, 19, kv. 130, and Ljudmila F. Shamsha, ulitsa Dinamovskaya, 3, kv. 23, all of, Kharkov, U.S.S.R.

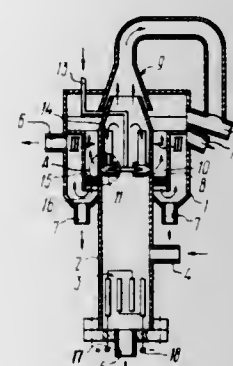
Continuation of Ser. No. 221,245, Dec. 30, 1980, abandoned.

This application Apr. 7, 1982, Ser. No. 366,444

Int. Cl.<sup>3</sup> C25B 9/00; C02F 1/46

U.S. Cl. 204—277

6 Claims



1. An apparatus for electrochemical purification of contaminated liquids comprising:

- a settling chamber having an outlet pipe for purified liquid and an outlet pipe for discharge of sludge;
- an electrocoagulation chamber communicating with said settling chamber at a level below the purified liquid outlet thereof, said electrocoagulation chamber having a system of soluble electrodes mounted therein, an inlet pipe for contaminated liquids disposed above said electrodes and an inlet pipe for electrolyte disposed below said inlet for contaminated liquids;
- and compressed air jet pump means for drawing froth from the upper portion of said electrocoagulation chamber into said settling chamber.

4,414,092

**SANDWICH-TYPE ELECTRODE**

Wen-Tong P. Lu, Upper St. Clair, and Earl R. Garcia, Ingram, both of Pa., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 15, 1982, Ser. No. 368,556

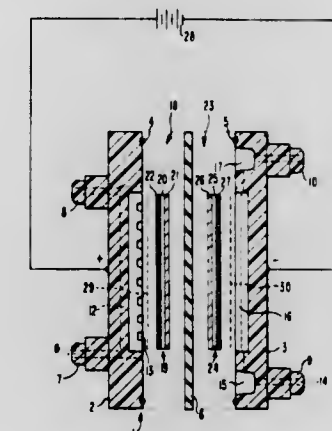
Int. Cl.<sup>3</sup> C25B 9/00, 11/12

U.S. Cl. 204—294

11 Claims

1. In a method of making an electrode wherein a suspension in a liquid is prepared of a powdered catalyst containing a noble metal, carbon powder, and a binder, the suspension is poured over a carbon substrate, dried, compressed, and sin-

tered to form a solid catalyst layer bonded to said carbon substrate, the improvement comprising placing carbon paper



on the surface of said solid catalyst layer prior to said compressing.

4,414,093

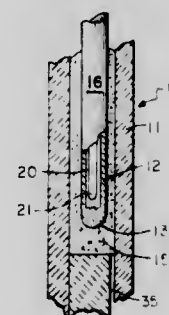
Laszlo Redey, Lisle, and Donald R. Vissers, Naperville, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Dec. 30, 1981, Ser. No. 335,997

Int. Cl.<sup>3</sup> G01N 27/30

U.S. Cl. 204—412

15 Claims



1. A multifunctional reference electrode, comprising a metal tube closed at one end, a means inside said metal tube near said closed end for measuring the temperature thereof, a housing surrounding said metal tube, an electrode terminal electrically connected to said metal tube extending outside of said housing, an electrolyte between said housing and the outer surface of said metal tube, and an ion diffusion barrier plug associated with said housing in contact with said electrolyte, whereby said multifunctional reference electrode provides a temperature dependent electrode potential at the surface of said metal tube where an electrochemical double layer exists between the metal tube outer surface and said electrolyte in combination with means for measuring the temperature of said metal tube.

8. A combination electrochemical cell and reference electrode comprising a plurality of working electrodes and a reference electrode and a first electrolyte in communication with said working and said reference electrodes, said reference electrode including a metal tube closed at one end said metal tube acting as internal contact for said reference electrode, means inside said metal tube electrically insulated therefrom for measuring the temperature thereof near said closed end, a housing surrounding said metal tube, a second electrolyte having a fixed anion activity between said housing and the outer surface of said metal tube providing a temperature dependent electrode potential at the surface of said metal tube when an electrochemical double layer exists between the metal tube outer surface and said second electrolyte, an ion diffusion barrier associated with said housing providing communication between ions of said first and second electrolytes, and means for measuring the temperature of said reference electrode and a working electrode adjacent thereto and the potential difference between said reference electrode and said working elec-

trodes, whereby the fixed anion activity and measured temperature of said reference electrode and the potential difference between said reference electrode and said working electrodes provides a value for the electrode potential at the working electrodes.

4,414,094

**SOLVENT REFINED COAL REACTOR QUENCH SYSTEM**

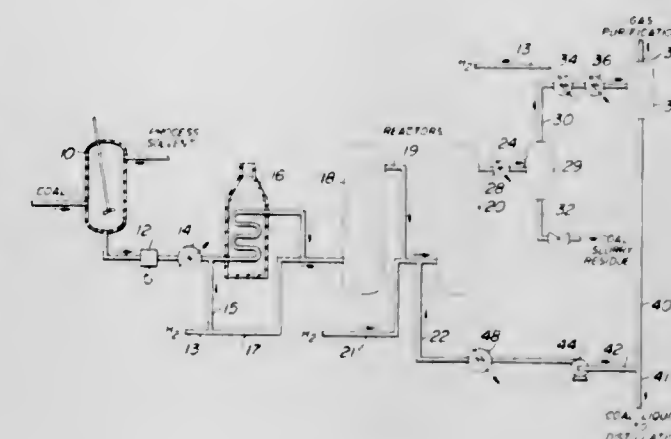
Robert M. Thorogood, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Mar. 14, 1983, Ser. No. 474,926

Int. Cl.<sup>3</sup> C10G 1/04

U.S. Cl. 208—8 LE

8 Claims



1. In a process for the solvent refining of coal wherein a slurry of finely ground coal in process solvent is passed through a preheater to a coal liquefaction stage in the presence of hydrogen rich gases at elevated temperatures and pressures, the improvement wherein said coal liquefaction stage comprises at least two reactors in series and operated at approximately the same temperature, the second and subsequent reactors being cooled by using a process-derived condensed product which is recycled thereto and provides cooling by evaporation.

4,414,095

**MESOPHASE PITCH USING STEAM CRACKER TAR (CF-6)**

Ghazi Dickakian, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 12, 1981, Ser. No. 273,200

Int. Cl.<sup>3</sup> C10C 1/20, 3/00; D01F 9/12; C01F 9/00

U.S. Cl. 208—44

10 Claims

1. A process for preparing a pitch suitable for carbon fiber manufacture comprising:

- providing a steam cracker tar or a vacuum stripped steam cracker tar;
- adding a polycondensed aromatic pitch oil boiling in an approximate range of 400° C. to 600° C. to said steam cracker tar or vacuum stripped steam cracker tar to provide a mixture; and
- heat soaking said mixture at temperatures in the range of from about 350° C. to about 430° C. whereby a pitch suitable for carbon artifact manufacture is obtained.







4,414,102

**PROCESS FOR REDUCING NITROGEN AND/OR OXYGEN HETEROATOM CONTENT OF A MINERAL OIL**

Lillian A. Rankel, Plainsboro, and Leslie R. Rudnick, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 15, 1981, Ser. No. 263,820  
Int. Cl.<sup>3</sup> C10G 45/00, 45/04, 45/60, 45/08

U.S. Cl. 208—211

18 Claims

1. A process for the transformation of nitrogen-containing or oxygen-containing components of a mineral oil to sulfur-containing components which comprises:

contacting a mineral oil comprising nitrogen-containing or oxygen-containing components with a gaseous mixture containing hydrogen and hydrogen sulfide which comprises between 10 and 90 mole percent hydrogen sulfide, and a fresh multimetal catalyst under process conditions effective to transform nitrogen-containing or oxygen-containing components to sulfur-containing components of said mineral oil, including a temperature of about 700° to about 875° F., said multimetal being a Group VB metal, a Group VIB metal, and a Group VIII metal or mixtures thereof.

4,414,103

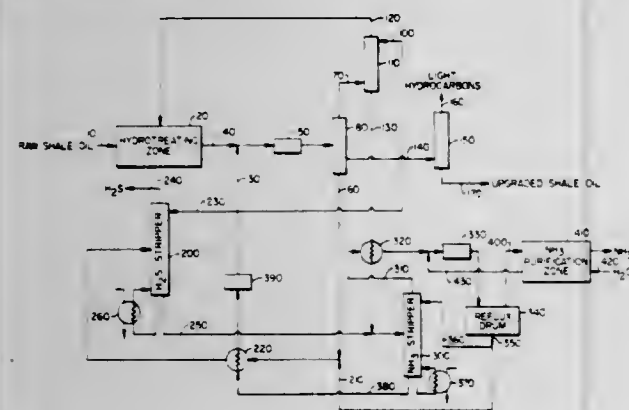
**SELECTIVE REMOVAL AND RECOVERY OF AMMONIA AND HYDROGEN SULFIDE**

Thomas R. Farrell, Hercules, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 9, 1982, Ser. No. 366,892  
Int. Cl.<sup>3</sup> C10G 45/02, 31/08; B01D 3/00

U.S. Cl. 208—212

1 Claim



1. A method of treating a hydrocarbon material containing at least 3 parts by weight nitrogen per 1 part sulfur comprising:

- hydrotreating said hydrocarbon material in the presence of hydrogen, wherein most of the nitrogen remaining in the hydrocarbon material is converted to ammonia, and wherein most of the sulfur remaining in the hydrocarbon material is converted to hydrogen sulfide;
- washing said hydrotreated hydrocarbon material with only enough water to absorb the bulk of the hydrogen sulfide but only a fraction of the ammonia; thereby forming a washed hydrotreated hydrocarbon material containing ammonia and hydrogen sulfide in a vapor phase, and a first sour water stream comprising water, ammonia and hydrogen sulfide;
- separating said washed hydrotreated hydrocarbon material from the first sour water stream, and separating a vapor phase from said washed hydrotreated hydrocarbon material in a high pressure separator;
- scrubbing said vapor phase with water to produce a second sour water stream containing ammonia with an ammonia to hydrogen sulfide ratio of at least 6:1;
- stripping said first sour water stream in a hydrogen sulfide stripper;
- withdrawing overhead vapor from said hydrogen sulfide

stripper, said vapor comprising hydrogen sulfide essentially free of ammonia;

- withdrawing bottoms liquid from said hydrogen sulfide stripper, said liquid comprising water, hydrogen sulfide and ammonia;
- adding said bottoms liquid to said second sour water stream;
- stripping said second sour water stream in an ammonia stripper;
- withdrawing overhead vapor from said ammonia stripper, said vapor comprising water, hydrogen sulfide, and ammonia;
- withdrawing bottoms liquid from said ammonia stripper, said liquid comprising stripped water;
- partially condensing said overhead vapor from said ammonia stripper to form an uncondensed portion comprising ammonia vapors substantially free of hydrogen sulfide and water, and a condensed portion comprising water, hydrogen sulfide and ammonia;
- returning a part of said condensed portion to said ammonia stripper; and
- recycling another part of said condensed portion to said hydrogen sulfide stripper.

4,414,104

**PROCESS FOR REMOVAL OF METALS FROM HYDROCARBON OILS**

Dennis D. Delaney, Placentia, and Donald M. Fenton, Anaheim, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed May 4, 1982, Ser. No. 374,717  
Int. Cl.<sup>3</sup> C10G 17/09

U.S. Cl. 208—251 R

14 Claims

1. A process for removing metals from a hydrocarbon oil comprising contacting a metals-containing hydrocarbon oil with a thiocyanate compound under reaction conditions including a temperature of about 250° C. to about 500° C. producing a metals-containing solid and a product hydrocarbon of reduced metals content in comparison to said oil, and separating said metals-containing solid from said product hydrocarbon.

4,414,105

**PROCESS FOR DEASPHALTING AN ASPHALTENE CONTAINING HYDROCARBON CHARGE**

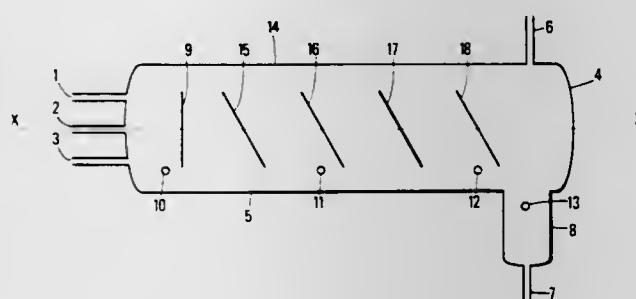
Alain Billon, Orlenas; Pierre Renard, St Nom la Breteche; Jean-Claude Simandoux, La Graviere, and Gerard Heinrich, Saint Germain en Laye, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 1, 1981, Ser. No. 298,431

Claims priority, application France, Sep. 1, 1980, 80 18900  
Int. Cl.<sup>3</sup> C10C 3/00

U.S. Cl. 208—309

8 Claims



1. A process for deasphalting an asphaltene containing hydrocarbon charge, characterized by the steps of:

- Introducing a mixture of the hydrocarbon charge with at least a first fraction of light paraffinic hydrocarbon solvent at a first end portion of a substantially horizontal elongated

zone whose base slopes downwardly in the elongated direction from the first end portion to a second end portion opposite the first end portion at an angle from 2° to 15° to a horizontal line,

- Flowing said mixture from the first end portion to the second end portion of the elongated zone,
- Introducing into said elongated zone at least one second fraction of light paraffinic hydrocarbon solvent at a temperature at least 20° C. lower than the temperature of introduction of said mixture, said introduction being effected at one or more points located in the lower half of the elongated zone, in a downward direction forming an average angle of 10° to 80° with the central axis in the elongated direction of said elongated zone, oriented in the direction of flow of the mixture, and
- separately withdrawing an upper phase of deasphalted oil and a lower asphalt phase and separating the light hydrocarbon from each of these phases.

4,414,106

**METHOD AND APPARATUS FOR IMPROVING SEDIMENTATION FIELD FLOW FRACTIONATION CHANNELS**

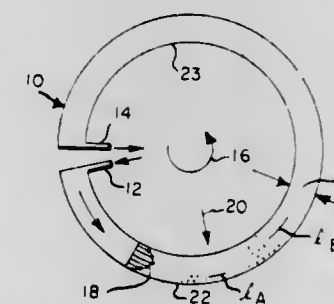
William A. Romanuskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

Continuation of Ser. No. 249,964, Apr. 1, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 352,077

Int. Cl.<sup>3</sup> B03B 5/00

U.S. Cl. 209—155

2 Claims



1. In an apparatus for separating particulates suspended in a fluid medium according to their effective masses, said apparatus having an annular cylindrical channel with a cylinder axis and radially inner and outer walls, said channel being comprised of an outer support ring forming said outer wall and an inner ring having an outer groove forming said inner wall, said inner ring forming a mating interface with said outer ring to define said channel there between, means for rotating said channel about said axis, means for passing said fluid medium circumferentially through said channel, and means for introducing said particulates into said medium for passage through said channel, the improvement of means to reduce leakage of said fluid medium at the mating interface between said rings by positioning a liquid layer having a density greater than the density of said fluid medium on said outer wall.

4,414,107

**FLOTATION REAGENT**

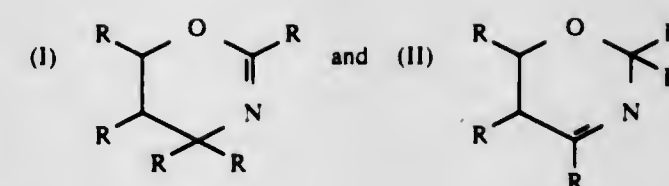
Robert M. Parlman; Clarence R. Bresson and Richard C. Doss, all of Bartleville, Okla., assignors to Phillips Petroleum Company, Bartleville, Okla.

Filed Jun. 29, 1982, Ser. No. 393,239  
Int. Cl.<sup>3</sup> B03D 1/14

U.S. Cl. 209—166

5 Claims

1. In an ore froth flotation wherein molybdenum values are recovered from an ore comprising the same in the froth, the improvement which comprises employing an effective amount of at least one oxazine compound, represented by the general formulas:

where R is selected from the group consisting of H, CH<sub>3</sub>, or CH<sub>3</sub>CH<sub>2</sub>, as a collection agent for molybdenum sulfide.

4,414,108

**APPARATUS AND METHOD FOR CONTINUOUS COUNTERCURRENT EXTRACTION AND PARTICLE SEPARATION**

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

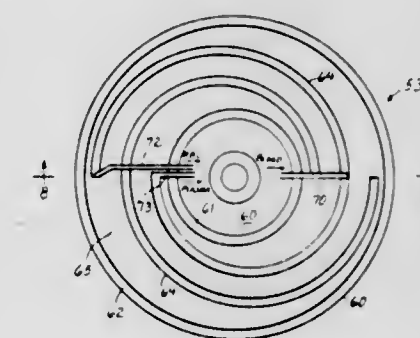
Division of Ser. No. 148,491, May 9, 1980, Pat. No. 4,324,661. This application Oct. 26, 1981, Ser. No. 315,271

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210—198.2

15 Claims



1. A flow-through countercurrent chromatographic coil planet centrifuge system comprising means defining an axially rotatable coiled column having a head end and a tail end, means to rotate said column around its own axis and simultaneously and in the same angular direction and at the same angular velocity revolve the rotating column around an axis parallel to and spaced from its own axis, first phase feed conduit means connected to said column at a coil element adjacent to said head end, second phase feed conduit means connected to said column at a coil element adjacent to said tail end, second phase collection conduit means connected to said column at a coil element adjacent to said head end, first phase collection conduit means connected to said column at a coil element adjacent to said tail end, and sample-admission conduit means connected to said column at a coil element located at an intermediate portion of said column, for separating the phases in accordance with their densities and for separating components of a sample admitted through said sample-admission conduit means in accordance with the partition coefficients of said components.

4,414,109

**MULTI-PORTED VALVE WITH SEALING NETWORK BETWEEN VALVE BODY AND ROTOR**

William B. Aurthur, Cucamonga, Calif., assignor to Purex Corporation, Lakewood, Calif.

Continuation of Ser. No. 191,704, Sep. 29, 1980, Pat. No. 4,328,833. This application Mar. 5, 1982, Ser. No. 355,118

Int. Cl.<sup>3</sup> B01D 29/38

U.S. Cl. 210—278

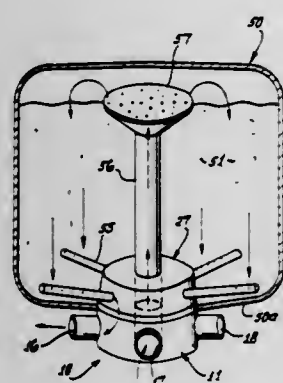
1 Claim

1. In a valve having a body containing three ports, and a rotor rotatable in the body, the rotor rotatable about an axis to bring two passages in the rotor selectively into and out of



registration with the body ports, the body ports opening at a cylindrical bore in the body, and the rotor passages communicating with said bore, the rotor passages spaced about said axis, the combination with said valve of:

- (a) axially spaced seal rings extending about said axis between the rotor and the body, the rings spaced at axially opposite sides of the passages and ports,
- (b) multiple seal strands extending between said rings and integral therewith, two strands spaced apart about said axis at angularly opposite sides of one of said rotor passages, and two strands spaced apart about said axis at angularly opposite sides of the second of said rotor passages,



- (c) said seal rings and seal strands being carried by the rotor which contains grooving corresponding in location with and receiving lengths of said seal rings and strands,
- (d) the rotor having wall structure and certain of said strands having attachment to the rotor via apertures in said wall structure,
- (e) and including a pool filter vessel attached to the valve, one passage in the rotor communicating with a first side of media in the vessel while the other passage in the rotor communicates with a second side of the media in one position of the valve rotor, and said one passage in the rotor communicating with said second side of the media while said other passage in the rotor communicates with said first side of the media in another position of the valve rotor.

4,414,110

#### SEALING FOR A HOLLOW FIBER SEPARATORY DEVICE

Zane H. Geel, Concord; Roger B. Hornby; Bennie J. Lipps, both of Walnut Creek; Charles E. Savage, and Pierre Vanat, both of Clayton, all of Calif., assignors to Cordis Dow Corp., Miami, Fla.

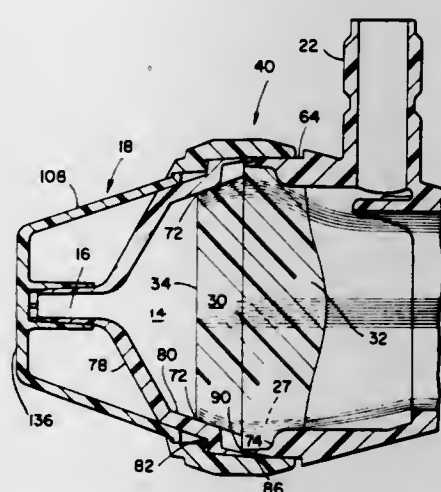
Continuation of Ser. No. 39,087, May 14, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 223,964  
Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—321.3

13 Claims

1. A separatory device for treating blood comprising a hollow shell elongated axially, said shell having a curvilinear central portion and openings in its opposite outer end portions, each end portion having a larger curvilinear cross section than said central portion, said shell having inlet and outlet ports located adjacent said end portions, a bundle of continuously hollow semipermeable fibers in said shell and extending through said end openings of said shell, said bundle terminating at each end thereof in a solidified castable resin tubesheet joining said fibers to each other, each said tubesheet having an axially extending inner portion sealingly interfitted with said shell within the opening in each outer end portion to thereby define a dialysate chamber between an inner end surface of each said inner portions, each said tubesheet including a frusto-conical portion integral with said inner portion and extending axially outwardly therefrom and terminating in an outer end planar surface exposing the open ends of said fibers therein, the frusto-conical portion of each tubesheet providing a peripheral surface tapering axially outwardly toward the associated end

planar surface, and blood chamber means comprising a separate header adjacent and associated with each tubesheet and forming a blood chamber communicating with the outer end planar surface of the adjacent tubesheet, means for effecting an axially elongated fluid seal between each header and adjacent tubesheet entirely around the periphery of each frusto-conical portion comprising an integral tapered portion of the adjacent header coextensive axially with a portion of said axially tapering peripheral surface of the associated frusto-conical portion in pressure sealing engagement therewith, blood chamber



sealing means on the peripheral surface of each outer end portion of said shell comprising a tapered portion of the shell extending toward the outer end of said shell in the direction from said central portion axially outwardly and radially inwardly, and means for effecting a gas seal between each header and each said tapered portion respectively of said shell outer end portion entirely around the latter comprising a skirt of each header at the inner end thereof extending around said tapered portion of the associated shell outer end portion in gas tight sealing engagement.

4,414,111

#### SHAPED COMPOSITE ADSORBENT AND A PROCESS FOR PREPARING THE SAME

Toshiyuki Iwaisako, and Akio Inoue, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan  
PCT No. PCT/JP81/00379, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/02006, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 15, 1981, Ser. No. 385,410

Claims priority, application Japan, Dec. 15, 1980, 55-175769

Int. Cl.<sup>3</sup> B05D 3/10, 5/00

U.S. Cl. 210—500.2

11 Claims



1. A shaped composite adsorbent made of a shaped porous material of a skin-core structure comprising a powdery ion-exchange type adsorbent and an acrylonitrile polymer containing 0.1 to 20% by weight of an ionic group and wherein said shaped porous material has a semi-permeable skin layer of 0.01 to 1 μm in thickness and a void volume rate of 50 to 90%.

4,414,112

#### OIL/WATER SEPARATOR

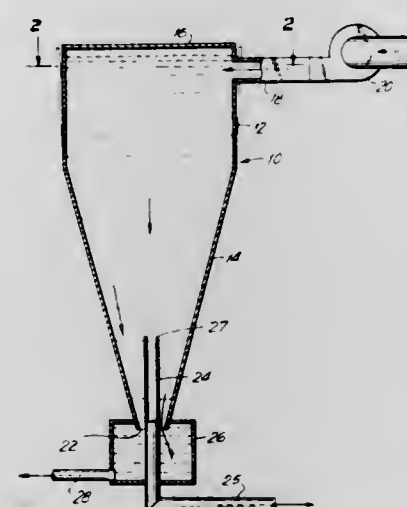
Robert E. Simpson, Dallas; Billy H. Amstead, Austin, and Charles R. Barden, Bastrop, all of Tex., assignors to Recovery Technology Associates, Daingerfield, Tex.

Filed Jan. 29, 1982, Ser. No. 343,995

Int. Cl.<sup>3</sup> B04C 5/00

U.S. Cl. 210—512.1

20 Claims



1. A separator comprising elements designed and positioned to separate a feed mixture consisting essentially of liquids of differing densities including a substantially cylindrical vortex generating chamber having a vertical axis, a liquid entry duct communicating at one end tangentially with said vortex generating chamber at a point near the upper edge of said vortex generating chamber, pump means having inlet and outlet ports, the outlet port of said pump means communicating with the other end of said liquid entry duct, a conical truncated accelerating chamber affixed at its larger end coaxially to the bottom of said vortex generating chamber and having its truncated apex comprising an orifice directed downwardly, a thin-walled vortex finding tube extending through said orifice and within said accelerating chamber substantially along the vertical axis of said accelerating chamber a distance into said accelerating chamber sufficient to provide separating efficiencies up to 94%, first liquid collecting means communicating with said orifice and second liquid collecting means communicating with said vortex finding tube.

4,414,113

#### LIQUID PURIFICATION USING REVERSE OSMOSIS HOLLOW FIBERS

Terrance LaTerra, Old Bridge, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,863

Int. Cl.<sup>3</sup> B01D 13/00, 31/00

U.S. Cl. 210—636

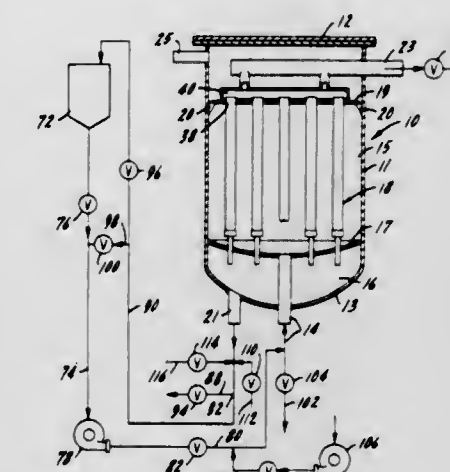
15 Claims

1. A method for removing dissolved solids and suspended particulate matter from a liquid to be treated, comprising the steps of:

- (a) passing a feedstream of liquid to be treated into a pressure vessel having a plurality of filter elements vertically positioned therein;
- (b) directing the liquid to be treated through an outer filter septum positioned around the filter elements for removal of suspended particulate matter in the liquid to be treated;
- (c) directing the liquid to be treated that passes through the filter septum through a layer of hollow RO fibers spirally wrapped around foraminous center cores of the filter elements such that the liquid to be treated flows in a direction from the outside of the filter elements towards the foraminous center cores, so as to cause substantially pure permeate liquid to permeate into the center bores of the hollow RO fibers and concentrate liquid to pass into the foraminous center cores;
- (d) collecting the permeate liquid from the center bores of

the hollow RO fibers in a common collector manifold and removing the collected permeate liquid from the pressure vessel;

- (e) collecting at least a portion of the concentrate liquid from the center cores in a common concentrate liquid collection compartment and removing the collected concentrate liquid from the pressure vessel;



- (f) periodically terminating passage of the liquid to be treated into the pressure vessel and directing backwash liquid into the concentrate liquid collection compartment and then across the layer of hollow RO fibers and the filter septum into the pressure vessel, so as to remove particulate matter that is trapped in the hollow RO fibers and the filter septum and;
- (g) removing the backwash liquid along with the suspended particulate matter from the pressure vessel.

4,414,114

#### DISCHARGE OF GASES FROM SUBMARINE DESALINATION PLANTS

Burkhard Drude; Thomas Peters, both of Erlangen, Fed. Rep. of Germany, and Eberhard Klapp, deceased, late of Erlangen, Fed. Rep. of Germany (by Ursula Klapp, executrix), assignors to Mannesmann Aktiengesellschaft, Dueseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 83,762, Oct. 11, 1979, abandoned. This application Apr. 4, 1980, Ser. No. 137,242

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844407

Int. Cl.<sup>3</sup> B01D 13/00

U.S. Cl. 210—652

7 Claims



1. Method of discharging gases from a deep-sea submarine desalination vessel which provides freshwater under high pressure, comprising the steps of intermittently discharging the gases from the vessel into a second vessel; using the pressurized freshwater for pressurizing the gas in the second vessel; and discharging the pressurized gas from the second vessel into the surrounding sea.



4,414,115

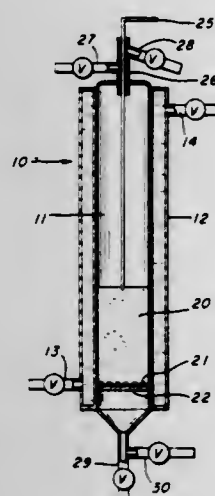
REMOVAL OF COPPER AND ZINC SPECIES FROM  
BAYER PROCESS LIQUOR BY FILTRATIONPaul J. The, Murrysville, Pa., assignor to Aluminum Company  
of America, Pittsburgh, Pa.

Filed Dec. 21, 1981, Ser. No. 332,442

Int. Cl.<sup>3</sup> C02F 1/52

U.S. Cl. 210—665

6 Claims



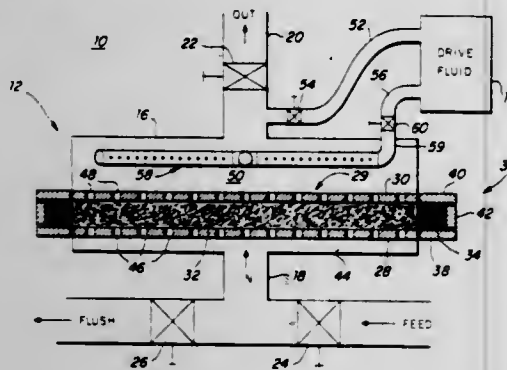
1. A process for decreasing the level of copper or zinc impurities in an alkali metal aluminate solution without increasing the sulfide content of the solution, said process comprising providing a filter bed comprising granular particles of a substance containing about 40 to 100% Fe<sub>2</sub>O<sub>3</sub> by weight, said particles having an average particle size of about 100 to 400 μm, coating said particles with zinc sulfide prior to filtering, by passing a zinc sulfide solution through the bed and then washing in order to avoid sulfide contamination of the aluminate solution, and filtering the aluminate solution through the filter bed.

4,414,116

SELF BACK-FLUSHING MAGNETIC SEPARATOR  
PROCESSJohn J. Nolan, W. Wareham, Mass., assignor to Allis-Chalmers  
Corporation, Milwaukee, Wis.Division of Ser. No. 39,671, May 16, 1979, abandoned, which is  
a continuation of Ser. No. 912,542, Jun. 5, 1978, abandoned. This  
application Apr. 16, 1980, Ser. No. 140,753Int. Cl.<sup>3</sup> B01D 35/06

U.S. Cl. 210—695

4 Claims



1. A self-flushing magnetic separator method comprising: feeding above ambient pressure and temperature a liquid medium to be separated to the upstream end of a ferromagnetic matrix; establishing a magnetic field in said matrix; collecting the separated liquid above ambient pressure and temperature at the downstream end of the matrix; accumulating at least one matrix volume of the separated liquid at above ambient pressure and temperature adjacent said downstream end of the matrix; stopping feeding to the upstream end of the matrix, trapping the accumulated separated liquid; removing said

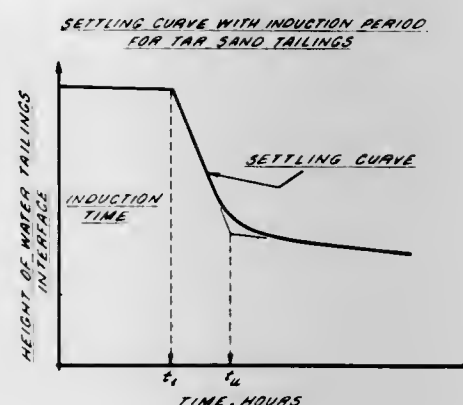
magnetic field; and venting the upstream end of the matrix to lower pressure to cause the accumulated liquid to boil and establish increased vapor volume to drive the boiling liquid through the matrix, and back-flush the matrix with the self-per-turbed boiling liquid; said feeding and collecting steps being at sufficiently high pressure and temperature above ambient to produce boiling of said trapped separated liquid when said upstream end of the matrix is vented to said lower pressure.

4,414,117

DECARBONATION OF TAILINGS SLUDGE TO  
IMPROVE SETTLINGRaymond N. Yong, and Amar J. Sethi, both of Beaconsfield,  
Canada, assignors to Suncor, Inc., Toronto, CanadaContinuation-in-part of Ser. No. 262,143, May 11, 1981,  
abandoned. This application Sep. 10, 1982, Ser. No. 416,729Int. Cl.<sup>3</sup> C02F 11/14

U.S. Cl. 210—710

12 Claims



1. A process for reducing the time for settlement during flocculation of a tailings sludge containing mineral solids obtained from recovery of bitumen from tar sands wherein said sludge, when treated with a starch flocculant, has an induction time before settlement begins, which comprises adding an additive to said sludge to remove essentially all of the carbonate and bicarbonate ions present in said sludge and then adding as said starch flocculant, an effective amount of a hydrolyzed wheat, corn or potato starch obtained by the aqueous hydrolysis of the starch in the presence of an insoluble metal salt formed in-situ, and settling the solids from the sludge.

10. The process of claim 1 wherein sand surcharging is used to effect a compaction of the sludge.

4,414,118

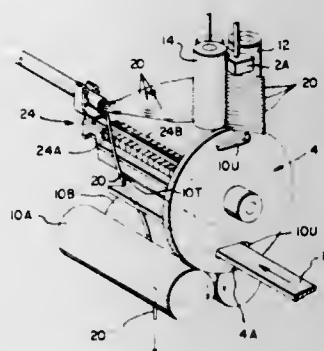
METHOD AND COMPOSITIONS FOR DISSOLVING  
SILICATES IN SUBTERRANEAN FORMATIONJoseph R. Murphey, Duncan, Okla., assignor to Halliburton  
Company, Duncan, Okla.

Filed Oct. 30, 1981, Ser. No. 316,692

Int. Cl.<sup>3</sup> E21B 43/27

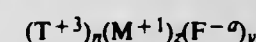
U.S. Cl. 252—8.55 C

18 Claims



1. A retarded aqueous acid composition for dissolving siliceous materials comprising:

- (a) a mineral acid other than hydrofluoric acid;  
(b) a compound having the formula



the hydrates of said compound and mixtures thereof wherein T is selected from the group consisting of cations of zirconium, chromium, and mixtures thereof; M is selected from the group consisting of hydrogen and ammonium; z is 0 to 4; and

$$3n+z=ay'$$

wherein said aqueous acid composition has a pH value no greater than 2 and the fluoride ion of said compound is present in said composition in an amount of at least 0.05 gram-moles of fluoride ion per liter of composition.

4,414,119

INJECTIVITY OF CRUDE OIL AND PETROLEUM  
SULFONATE SLUGS BY THE ADDITION OF AN  
ALKYLBENZENE SULFONATERoy B. Duke, Jr., Littleton, Colo., assignor to Marathon Oil  
Company, Findlay, Ohio

Filed Jan. 4, 1982, Ser. No. 336,731

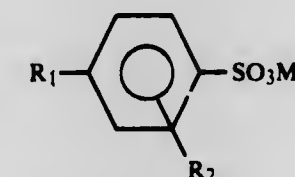
Int. Cl.<sup>3</sup> E21B 43/22

U.S. Cl. 252—8.55 D

5 Claims

1. A process for inhibiting the formation of insoluble precipitates in a crude oil sulfonation product wherein said crude oil sulfonation product is a component of a microemulsion that is to be injected into a subterranean, oil-bearing formation to recover oil therefrom, the process comprising the steps of:

- (a) mixing said crude oil sulfonation product, a hydrocarbon, water, and a cosurfactant to form said microemulsion;  
(b) filtering said microemulsion through a diatomaceous earth filter medium; and thereafter  
(c) adding an alkylbenzene sulfonate to said microemulsion at a concentration such that about 1 to about 40 weight percent of the resulting sulfonate groups in said microemulsion is attributable to said alkylbenzene sulfonate and the remaining weight percent of said sulfonate groups is attributable to said crude oil sulfonation product, and wherein said alkylbenzene sulfonate is defined by the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are alkyl groups containing about 10 to about 20 carbon atoms each and M is a monovalent cation; and

- (d) blending said microemulsion for a time sufficient to obtain uniform dispersion of said alkylbenzene sulfonate in said microemulsion, which substantially inhibits the formation of the insoluble precipitates therein.

4,414,120

## ENHANCED OIL RECOVERY

Thomas P. Malloy, Lake Zurich, and Raymond J. Swedo, Mt.  
Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 18, 1981, Ser. No. 274,914

Int. Cl.<sup>3</sup> E21B 43/22

U.S. Cl. 252—8.55 D

5 Claims

1. A process for the enhanced recovery of oil from a subterranean reservoir of oil which comprises the introduction of a three component aqueous surfactant slug into said subterra-

nean reservoir of oil to enhance the displacement of oil from said reservoir; the three components being:

- (i) from about 1% to about 10% of a sulfonate of an alkylated gas oil having a molecular weight of from about 300 to about 500, wherein said alkyl substituent contains from about 6 to about 18 carbon atoms, and wherein said gas oil has been obtained from the thermal cracking of coal, alkylation of said gas oil having been conducted in the presence of an alkylation catalyst;  
(ii) from about 1% to about 10% of a lower alkyl alcohol containing from about 3 to about 6 carbon atoms; and  
(iii) from about 0.1% to about 2% of a non-ionic surfactant which is an ethoxylated normal alcohol containing from about 12 to about 15 carbon atoms;  
wherein said three component aqueous surfactant is present in a sufficient amount to reduce the interfacial tension between the oil and water.

4,414,121

## AQUEOUS LUBRICATING COMPOSITIONS

Robert P. Aiello, Cypress, Tex., assignor to Shell Oil Company,  
Houston, Tex.

Filed Dec. 14, 1981, Ser. No. 330,415

Int. Cl.<sup>3</sup> C10M 1/06, 1/28

U.S. Cl. 252—49.5

9 Claims

1. An aqueous metal-working lubricant comprising a major amount of water and a minor amount of an emulsion-type soluble oil comprising a low viscosity index (LVI) lubricating oil; an emulsifier comprising sodium sulfonates; a soluble oil coemulsifier base comprising naphthenic acids, potassium hydroxide, antirust and antimicrobial agents; and an amount of block copolymers of ethylene oxide and propylene oxide or other alkylene oxides, generally known as polyalkylene glycols, having a molecular weight between about 800 and about 8,000, effective to improve the metal-working capability of said soluble oil.

4,414,122

OXIDIZED HYDROCARBON-SOLUBLE  
POLYAMINE-MOLYBDENUM COMPOSITIONSC. Thomas West, and Robert J. Basalay, both of Naperville, Ill.,  
assignors to Standard Oil Company (Indiana), Chicago, Ill.Division of Ser. No. 190,590, Sep. 25, 1980, Pat. No. 4,357,149.  
This application Sep. 14, 1981, Ser. No. 301,751Int. Cl.<sup>3</sup> C10M 1/32, 1/34

U.S. Cl. 252—49.7

6 Claims

1. An improved hydrocarbon-soluble molybdenum composition which comprises reaction product of a molybdenum compound which produces ammonium molybdate, molybdic acid, or molybdic oxide under reaction conditions and an oxidized hydrocarbon-soluble polyamine compound selected from the group consisting of oxidized polyamine Mannich products and oxidized substituted dicarboxylic acid compound-polyamine reaction products, wherein a hydrocarbon-soluble polyamine compound is reacted at a temperature of 38° C. to 427° C. and a subatmospheric, atmospheric, or superatmospheric pressure with an oxidizing agent comprising an oxygen-containing material to produce said oxidized hydrocarbon-soluble polyamine compound prior to reaction with the molybdenum compound, the reaction product of said molybdenum compound and said oxidized hydrocarbon-soluble polyamine compound having been prepared by contacting said molybdenum compound with said oxidized hydrocarbon-soluble polyamine compound at a ratio of about 0.5 to 10 moles of molybdenum compound per mole of amine in said oxidized hydrocarbon-soluble polyamine compound at a temperature within the range of about 50° C. to 300° C.

3. An improved hydrocarbon-soluble molybdenum composition which comprises an oxidized reaction product of a molybdenum compound which produces ammonium molybdate, molybdic acid, or molybdic oxide under reaction conditions and a hydrocarbon-soluble polyamine compound selected



from the group consisting of polyamine Mannich products and substituted dicarboxylic acid compound-polyamine reaction products, wherein a reaction product of the molybdenum compound and the hydrocarbon-soluble polyamine compound is reacted at a temperature of 38° C. to 427° C. and a subatmospheric, atmospheric, or superatmospheric pressure with an oxidizing agent comprising an oxygen-containing material to produce an oxidized hydrocarbon-soluble polyamine-molybdenum compound, the reaction product of said molybdenum compound and said hydrocarbon-soluble polyamine compound having been prepared by contacting said molybdenum compound with said hydrocarbon-soluble polyamine compound at a ratio of about 0.5 to 10 moles of molybdenum compound per mole of amine in said hydrocarbon-soluble polyamine compound.

4. A lubricant comprising a lubricating base oil and an effective friction-modifying amount of the hydrocarbon-soluble molybdenum composition of claim 1 or claim 3.

5. A gasoline containing sufficient hydrocarbon-soluble polyamine-molybdenum composition of claim 1 or claim 3 to supply about 0.1-10,000 parts of molybdenum per one million parts of gasoline.

4,414,123

#### MARINE DIESEL CYLINDER OILS CONTAINING POLYOXYETHYLENE SORBITOL LANOLIN FOR IMPROVED SPREADABILITY

Benjamin H. Zoleski, Beacon, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

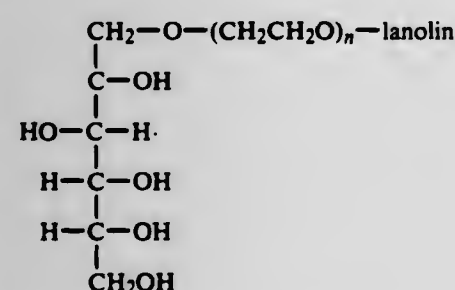
Filed Jun. 1, 1981, Ser. No. 268,955

Int. Cl.<sup>3</sup> C10M 1/20

U.S. Cl. 252-52 A

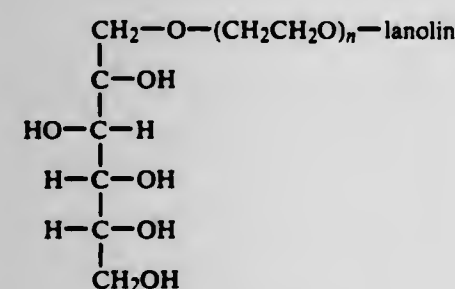
10 Claims

1. A process for improving the spreadability of a diesel engine cylinder lubricant having a total base number ranging from about 50 to 100 owing to the presence therein of alkaline detergents which comprises blending with said lubricant a spreadability improving amount of at least 0.5 weight percent thereof of at least one polyoxyethylene sorbitol lanolin of the formula:



wherein n is an integer ranging from 14 to 16.

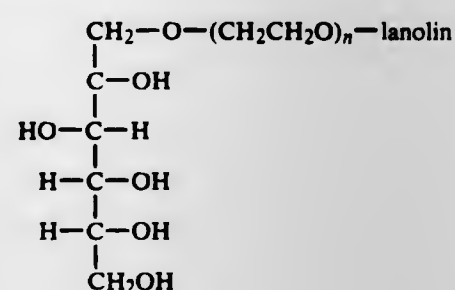
2. In a diesel engine cylinder lubricant comprising a major amount of an oil having an SAE viscosity of about 50 and a total base number ranging from about 50 to about 100 due to the presence of alkaline detergents, the improvement comprising in the presence therein of at least 0.5 weight percent thereof of a spreadability improving amount of at least one nonionic detergent polyoxyethylene sorbitol lanolin of the formula:



wherein n is an integer ranging from 14 to 16.

3. A process for lubricating the moving metal surfaces of a marine diesel engine cylinder which comprises causing a film

of a diesel oil having a total base number ranging from about 50 to about 100 due to the presence therein of alkaline detergents to spread on said surfaces by incorporating in said diesel oil a spreadability improving amount of at least one nonionic detergent polyoxyethylene sorbitol lanolin of the formula:



wherein n ranges from 14 to 16.

4,414,124

#### METHOD OF PRODUCING BARIUM-FERRITE SERIES POWDER

Hiroshi Endo, Masashi Awa, Shigeo Iiri, all of Yokohama; Toshibaiko Oguchi, Kawasaki; Isao Suzuki, Yokosuka; Naoyuki Hirate, and Masaru Hayashi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 3, 1981, Ser. No. 250,555

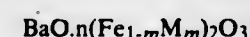
Claims priority, application Japan, May 8, 1980, 55-59943

Int. Cl.<sup>3</sup> C04B 35/26

U.S. Cl. 252-62.63

13 Claims

1. A method of producing barium-ferrite series microcrystalline powders having a general formula:



where M is at least one substituent component selected from the group consisting of Co, Ti, Ni, Mn, Cu, Zn, In, Ge and Nb, m is 0 to 0.2, and n is 5.4 to 6.0, comprising:

providing an alkaline aqueous solution having an alkalinity of at least 0.01 N and containing barium ions, iron (III) ions and, optionally ions of the substituent component M dissolved therein in amounts sufficient to provide a molar ratio of 1:2n(1-m):2nm in the crystalline powder of said formula by adding a first aqueous solution to a second aqueous solution of an alkali, said first aqueous solution being prepared in advance by dissolving the water-soluble compounds of barium, iron (III) and optionally substituent component M in water;

heating said alkaline aqueous solution at 150° to 300° C. at a constant volume, thereby precipitating a precursor of said crystalline powder, said precursor substantially bearing regular hexagonal plate-shaped crystal contour; and baking said precursor at 700° to 1,000° C. to completely crystallize the precursor, thereby obtaining the crystalline powder having a particle size of 0.5 μm or less.

4,414,125

#### ALKALI METAL OR AMINE SALTS OF A MIXTURE OF 2- AND 3-ALKYLADIPIC ACIDS AS CORROSION INHIBITORS

Hans S. H. Keil, deceased, late of Marl, Fed. Rep. of Germany (by Inge Keil, legal representative); Helmut Alfs, Marl, and Klaus Schulze, Haltern-Lippamsdorf, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,593

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948503

Int. Cl.<sup>3</sup> C23F 11/14, 11/12, 11/06

U.S. Cl. 252-75

11 Claims

1. A corrosion inhibited composition comprising

(a) water

(b) a glycol; a polyglycol; a polyglycol ether; a thickener for aqueous compositions; or a mineral oil and an emulsifier; and (c) an alkali metal salt or a water soluble aliphatic amine salt of a mixture of 2- and 3-C<sub>6-12</sub>-alkyladipic acids, the amount of this acid component being effective as a corrosion inhibitor, and the pH of the composition being 7-9.

4,414,126

#### AQUEOUS COMPOSITIONS CONTAINING CORROSION INHIBITORS FOR HIGH LEAD SOLDER

Joe C. Wilson, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

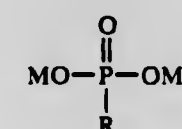
Filed Oct. 22, 1981, Ser. No. 313,687

Int. Cl.<sup>3</sup> C09K 5/00

U.S. Cl. 252-78.3

13 Claims

1. A corrosion resistant, alcohol-based antifreeze concentrate comprising a water-miscible alcohol and a corrosion inhibiting amount of a high lead solder corrosion inhibitor consisting essentially of a mixture of an alkali metal mercaptobenzothiazole and a phosphorus compound having the formula:



wherein R is a monovalent aliphatic group containing 1 to about 18 carbon atoms and M is a monovalent cation individually selected from the group consisting of hydrogen, an alkali metal, ammonium, alkylammonium, and alkylneammonium with the proviso that only one M can be hydrogen.

4,414,127

#### CONTACT LENS CLEANING SOLUTIONS

Cherng-Chyl Fu, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 6, 1981, Ser. No. 280,035

Int. Cl.<sup>3</sup> C11D 9/42; D06L 3/00; B08B 7/00

U.S. Cl. 252-95

29 Claims

15. An article of manufacture comprising two packages from which aliquots are combined to make a contact lens cleaning composition wherein

one package contains a granular or aqueous peroxide and the other contains an aqueous solution comprising a catalytic amount of water soluble transition metal catalyst in the form of an inorganic or organic salt; a surfactant which is (a) a monocarboxylated, dicarboxylated or sulfonated, fatty acid substituted imidazoline amphoteric surfactant, (b) a sulfonated amido-amine amphoteric surfactants or (c) a coco-hydrolyzed animal protein anionic surfactant.

4,414,128

#### LIQUID DETERGENT COMPOSITIONS

Pierre C. E. Goffinet, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 8, 1981, Ser. No. 271,165

Int. Cl.<sup>3</sup> C11D 3/44, 10/04, 17/08

U.S. Cl. 252-111

23 Claims

1. An aqueous liquid detergent composition comprising: (a) from 1% to 20% of surfactant selected from synthetic anionic, nonionic, amphoteric and zwitterionic surfactants and mixtures thereof, (b) from 0.5% to 10% of terpene selected from mono- and sesquiterpenes and mixtures thereof, the weight ratio of surfactant:terpene lying in the range from 5:1 to 1:3 and (c) from 0.5 to 10% of a polar solvent having a solubility in water at 25° C. in the range from 0.2% to 10%, said polar solvent being selected from the group consisting of benzyl alcohol, polyethoxylated phenols containing from 2 to 6

ethoxy groups, phenylethyl alcohol, mono C<sub>6-9</sub> alkyl ethers of ethylene glycol, di-C<sub>4-9</sub> alkyl ethers of ethylene glycol, and mixtures thereof.

16. A composition according to claim 1 comprising additionally from 0.005 to 2% of an alkali metal, ammonium or alkanolammonium soap of a C<sub>13</sub>-C<sub>24</sub> fatty acid.

4,414,129

#### FREE-FLOWING BUILDER BEADS AND DETERGENTS

David P. Joshi, Piscataway, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 275,023, Jun. 18, 1981, abandoned, which is a continuation of Ser. No. 177,784, Aug. 13, 1980, Pat. No. 4,310,431, which is a continuation-in-part of Ser. No. 661,471, Feb. 26, 1976, abandoned. This application Jun. 4, 1982, Ser. No. 384,951

Int. Cl.<sup>3</sup> C11D 3/075, 3/08, 11/02, 17/06

U.S. Cl. 252-135

13 Claims



1. A spray-dried base bead having detergent building properties comprising from about 45 to about 85 percent by weight of an alkali metal phosphate wherein from about 30 to about 60 percent of the phosphate is hydrated and the remainder is anhydrous, from about 5 to about 15 percent by weight of a sodium silicate having an Na<sub>2</sub>O:SiO<sub>2</sub> ratio of from about 1:1.6 to about 1:3.4 and from about 5 to about 15 percent water of hydration in the hydrated phosphate, the bead being essentially free of organic surfactant, organic detergent or soap when spray-dried; said bead having a structure of microcrystals and amorphous solid interconnected as an irregular network within the bead, the network defining interconnected, irregularly shaped passageways, said passageways comprising a reticular void space within the bead and interconnecting to discrete openings on the external surface of the bead; the bead having a specific gravity of from about 0.5 to about 0.8; and at least 90 percent of the beads having a particle size distributed between 20 mesh and 200 mesh U.S. sieve series; and when said beads are loaded with up to about 40 percent by weight nonionic organic surfactant, the resulting surfactant loaded beads have a flowability of at least about 70 percent that of clean dry sand.

4,414,130

#### READILY DISINTEGRABLE AGGLOMERATES OF INSOLUBLE DETERGENT BUILDERS AND DETERGENT COMPOSITIONS CONTAINING THEM

Bao-ding Cheng, Kendall Park, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 715,124, Aug. 17, 1976, abandoned. This application Nov. 21, 1980, Ser. No. 209,273

Int. Cl.<sup>3</sup> B01J 39/14; C02F 1/42; C11D 3/12, 17/06

U.S. Cl. 252-140

2 Claims

1. A readily disintegratable insoluble detergent builder particulate agglomerate comprising about 50% by weight of hydrated zeolite 4A having a particle diameter of about 0.01 to 10

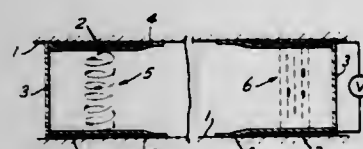


microns, to about 20% by weight of sodium silicate having a  $\text{Na}_2\text{O}:\text{SiO}_2$  ratio of about 1:2.4, about 10% by weight of sodium carboxymethylcellulose and about 20% by weight of corn starch, wherein the zeolite is combined with the sodium silicate, sodium carboxymethylcellulose and corn starch in the presence of about 15% by weight water.

2. A readily disintegratable insoluble detergent builder agglomerate comprising about 50% by weight initially anhydrous zeolite X, having a particle diameter in the range of from about 0.01 to 10 microns, about 25% by weight of a nonionic surfactant, said nonionic surfactant being an ethoxylation product of a 14 to 15 carbon atom chain fatty alcohol, having an average of 11 ethylene oxide units; and about 25% by weight of potato starch; wherein the zeolite is combined with the nonionic surfactant and potato starch in the presence of about 15% by weight water.

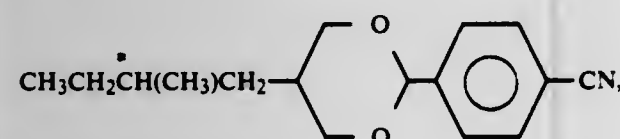
4,414,131

**GUEST-HOST LIQUID CRYSTALLINE COMPOSITION**  
Nicholas L. Sethofer, and Michael C. Harper, both of San Jose, Calif., assignors to Timex Corporation, Waterbury, Conn.  
Continuation of Ser. No. 319,349, Dec. 9, 1981, abandoned. This application Jan. 13, 1983, Ser. No. 457,781  
Int. Cl.<sup>3</sup> G02F 1/13; C09K 3/34  
U.S. Cl. 252—299.1



1. A guest/host nematic liquid crystalline composition having low optical birefringence and low threshold voltage comprising:

- (a) host nematic compounds: trans-alkyl pentylcyclohexyl dioxanes, trans-alkyl cyanophenyl dioxanes, trans-alkyl pentylcyclohexyl cyclohexyl dioxanes, trans-alkyl alkyl-cyclohexyl phenyl dioxanes and trans-cyanophenyl alkyl dioxanyl benzoates,  
(b) a chiral nematic compound having the formula:



(c) a guest pleochroic dye.

4,414,132

**OLEFIN POLYMERIZATION CATALYST COMPOSITIONS AND A PROCESS FOR THE POLYMERIZATION OF OLEFINS EMPLOYING SUCH COMPOSITIONS**

Brian L. Goodall; Adrianus A. van der Nat, and Willem Sijardijn, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.  
Continuation-in-part of Ser. No. 145,566, May 1, 1980. This application Oct. 30, 1981, Ser. No. 316,475  
Claims priority, application United Kingdom, May 17, 1979, 7917240

Int. Cl.<sup>3</sup> C08F 4/64

U.S. Cl. 502—169

31 Claims

1. An olefin polymerization catalyst composition comprising

an organoaluminum compound, a selectivity control agent and a solid component which has been obtained by halogenating a magnesium compound of the formula  $\text{MgR}'\text{R}''$  wherein  $\text{R}'$  is an alkoxide or aryloxy group and  $\text{R}''$  is an alkoxide or aryloxy group or halogen, with a halide of tetravalent titanium in the presence of a haloalkohydrocarbon and an electron donor, contacting the halogenated product with a tetravalent titanium halide, washing it to remove unreacted titanium compounds, and recovering the solid product.

4,414,133

**CATALYTIC COMPOSITION**

Masayuki Otake; Masakatsu Hatano, both of Yokohama; Toru Koyama, Machida; Masayoshi Murayama, Yokohama, and Kazunori Oshima, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan  
Filed Jan. 25, 1982, Ser. No. 342,238  
Claims priority, application Japan, Feb. 5, 1981, 56-16196  
Int. Cl.<sup>3</sup> B01J 27/14, 29/16, 29/00, 29/10  
U.S. Cl. 502—179

3 Claims

1. A catalytic composition represented by the formula:



in which A is iron and/or chromium, B is cerium and/or magnesium and C is potassium and/or lithium; and a, b, c, d, e, f, g, h, m and n stand for the numbers of atoms for molybdenum, tungsten, bismuth, lead, antimony, A, B, C, phosphorus and oxygen elements respectively, wherein, given that  $a+b=12$ ,

$$0 \leq b \leq 7, 0.4 \leq c \leq 7, 2 \leq d \leq 12,$$

$$0.1/22 \leq e/a \leq 25/22, 0.05/22 \leq f/a \leq 3/22,$$

$$0 \leq g/a \leq 2/22, 0 \leq h/a \leq 3/22,$$

$$0 \leq m/a \leq 7/22, \text{ and}$$

n is the numbers of oxygen necessary to satisfy the valences of atoms for the individual constituent elements other than oxygen.

4,414,134

**IMPREGNATING CATALYSTS**

Maria S. Friedrich, Lyndhurst; Dev D. Suresh, Macedonia, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio  
Filed Jan. 5, 1981, Ser. No. 222,820  
Int. Cl.<sup>3</sup> B01J 27/14, 21/02, 27/02, 29/16  
U.S. Cl. 502—204

8 Claims

1. A process for improving the catalytic performance of a substantially crystalline iron bismuth molybdate oxide complex interim catalyst to thereby produce a product catalyst of the formula:



wherein

- A is at least one element selected from the Group I, II and III elements;  
B is one or more Group VIII elements other than Fe;  
C is P, As, Sb, S, Te and/or Sn; and

wherein

- a is 0.1–12;  
b is 0.1–12;  
c is 0.1–12;  
d is greater than 0–12;  
e is 0.1–12;  
f is 0.1–12; and

x is a number determined by the valence requirements of the other elements present,

4,414,138

**FLUID CATALYTIC CRACKING CATALYST**

Randall H. Petty, Nederland, and Burton H. Bartley, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 180,357, Aug. 22, 1980, Pat. No. 4,344,926.

This application Jun. 2, 1982, Ser. No. 384,422

Int. Cl.<sup>3</sup> B01J 29/16, 21/04, 23/18

U.S. Cl. 502—73

11 Claims

1. A composition of matter as a component in catalytic cracking compositions which consists essentially of a composite of active alumina and 0.5 to 1 weight percent bismuth as bismuth oxide prepared by forming a cogel of active alumina and a soluble bismuth salt, drying said cogel and calcining the resulting composite at a temperature in the range of 1000° to 1200° F. for at least one hour.

4. A catalytic cracking catalyst composition comprising a major portion of a cracking catalyst composed of a crystalline zeolite in a supporting matrix in intimate admixture with a minor portion of a composite of bismuth oxide and active alumina, wherein said composite contains from 0.05 to 25 weight percent bismuth, calculated as the metal.

4,414,135

**SILVER-BASED CATALYST CONTAINING BROMINE AND/OR FLUORINE AS AN ANIONIC COMPONENT FOR THE PRODUCTION OF ETHYLENE OXIDE**

Naohiro Nojiri, and Yukio Sakai, both of Ami, Japan, assignors to Mitsubishi Petrochemical Co. Ltd., Tokyo, Japan  
Filed Feb. 18, 1982, Ser. No. 349,977

Claims priority, application Japan, Apr. 30, 1981, 56-65435  
Int. Cl.<sup>3</sup> B01J 27/08, 27/12

U.S. Cl. 502—224

8 Claims

1. A catalyst for the production of ethylene oxide by oxidation of ethylene, said catalyst comprising

- (A) silver,  
(B) (1) sodium in an amount of more than 1000 ppm (mg/kg of catalyst) based on the catalyst and (2) cesium as a cationic component, the amount of cesium being smaller than that of sodium and ranging from 10 ppm to 0.5% by weight based on the catalyst, and  
(C) at least one halogen element selected from bromine and fluorine as an anionic component, the amount of the halogen element being from 5 ppm to 0.1% by weight based on the catalyst.

4,414,136

**CATALYSTS FOR ETHYLENE OXYCHLORINATION**

Ronald J. Convers, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Apr. 2, 1982, Ser. No. 364,957

Int. Cl.<sup>3</sup> B01J 27/10

U.S. Cl. 502—225

5 Claims

1. A method for preparing ethylene oxychlorination catalysts comprising impregnating an alumina carrier with copper chloride or mixtures of copper chloride and Group I and Group II metal chlorides, wherein the alumina carrier has substantially no pores less than 150 Ångströms in diameter and a specific surface area of at least 30 square meters per gram.

4,414,137

**CATALYTICALLY ACTIVE AMORPHOUS SILICA**

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 9, 1982, Ser. No. 356,351

Int. Cl.<sup>3</sup> B01J 21/08, 27/14, 27/24

U.S. Cl. 502—162

25 Claims

1. A method for preparing an amorphous silica-containing product comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions, and an organic reactant selected from the group consisting of amines having a  $\text{pK}_a$  value above about 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing, and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

4,414,141

**HYDROTREATING CATALYST**

Harvey D. Schindler, Fairlawn, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 208,948, Nov. 21, 1980, abandoned.

This application Mar. 31, 1982, Ser. No. 363,914

Int. Cl.<sup>3</sup> B01J 21/04, 23/88

U.S. Cl. 502—314

9 Claims

1. A hydrotreating catalyst having an improved catalyst life, comprising:

a catalytically effective amount of nickel and molybdenum supported on an alumina support having a total porosity of



at least 0.5 cc/g and a pore size distribution of from 0.25 to 0.40 cc/g of pores with a diameter of less than 250 Å, 0.10 to 0.25 cc/g of pores with a diameter of from 250-500 Å, from 0.20 to 0.30 cc/g of pores with a diameter of from 500-1500 Å, from 0.05 to 0.15 cc/g of pores with a diameter of from 1500-4000 Å, and from 0.03 to 0.10 cc/g of pores with a diameter of greater than 4000 Å, said catalyst comprised of nickel and molybdenum supported on alumina having been prepared with calcining at a temperature of from 1150 F. to 1300 F.

4,414,142

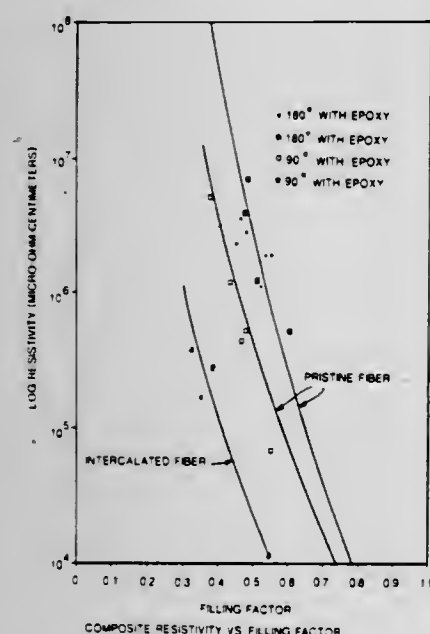
# ORGANIC MATRIX COMPOSITES REINFORCED WITH INTERCALATED GRAPHITE

F. Lincoln Vogel, R.D. 3, Whitehouse Station, N.J. 08889, and Claude Zeller, 97 Fan Hill Rd., Monroe, Conn. 06468

Continuation-in-part of Ser. No. 141,586, Apr. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 449,834, Aug. 23, 1974. This application Nov. 20, 1981, Ser. No. 323,560

Int. Cl.<sup>3</sup> H01B 1/04

U.S. Cl. 252-506



1. An electrically conductive composite comprising about 10 to about 65 volume percent relative to the volume of the composite, of an intercalated graphite compound in a remaining volume percent of an organic polymer matrix, wherein, the intercalated graphite compound is selected from:

- graphite intercalated with an inorganic or organic acid capable of high disassociation and capable of oxidizing carbon; or
  - graphite intercalated with a halide salt of a transition element, a Group III A element, or a Group IV A, V A or VI A metal or metalloid element, said salt being capable of coordinating with a halide anion to form an anionic complex; or
  - graphite intercalated with a Bronsted acid compound capable of donating a proton and making an acidic solution in water and a metal halide selected from boron trihalide, a tetrahalide of a Group IV element or a pentahalide of a Group V element;
- said intercalated graphite compound being in the form of flakes, fibers, filaments, a powder or crystals prior to its incorporation into the composite.

4,414,143

# CONDUCTOR COMPOSITIONS

John J. Felten, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 6, 1981, Ser. No. 260,608

Int. Cl.<sup>3</sup> H01B 1/02

U.S. Cl. 252-514

9 Claims

1. A palladium/silver metallization suitable for the manufacture of printed conductors which is an admixture of
  - A. 82-97% by weight of finely divided particles of metallic materials comprising by weight
    - (1) 40-70 parts silver metal;
    - (2) 1-25 parts palladium metal; and
    - (3) 1-25 parts of a base metal material selected from the group consisting of copper metal, copper oxide, cobalt oxide, nickel oxide and mixtures thereof; and
  - B. 3-18% by weight finely divided particles of inorganic binder dispersed in organic medium, in which admixture the weight ratio of silver to palladium is greater than 2.5, the weight ratio of base metal material to palladium is 0.05-1.5, the weight ratio of base metal material to inorganic binder is 0.1-1.75 and the sum of base metal material and inorganic binder is no more than 18 parts by weight.

4,414,144

# AQUEOUS SKIN CLEANER CONTAINING HYDROXYPROPYLATED GUAR GUM AND PARAFFIN SULFONATE/ALKYL SULFATE DETERGENT MIXTURE

Marvin Liebowitz, Edison, and Charles Buda, Middlesex, both of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,990

Int. Cl.<sup>3</sup> C11D 1/14, 3/22

U.S. Cl. 252-548

9 Claims

1. A liquid skin cleaner composition comprising an aqueous medium containing, approximately by weight
  - I. 0.05 to 1.0% of hydroxypropylated guar gum,
  - II. 10 to 20% of a mixture of
    - (A) A water soluble paraffin sulfonate salt and
    - (B) A water soluble C<sub>8-16</sub> alkyl sulfate salt, the ratio of A/B ranging from 3/1 to 1/3, and
  - III. At least 50% of water.

4,414,145

# PREPARATION AND USE OF A <sup>195</sup>M-AU-CONTAINING LIQUID

Karel J. Panek, Heiloo, Netherlands, assignor to Byk-Millinkrodt CIL B.V., Netherlands

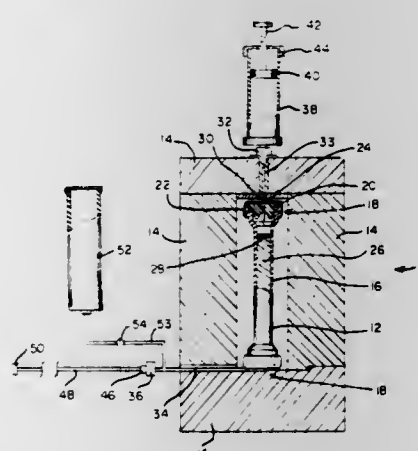
Filed Apr. 16, 1980, Ser. No. 140,781

Claims priority, application Netherlands, Apr. 17, 1979, 79/02970

Int. Cl.<sup>3</sup> G21G 4/08

U.S. Cl. 252-645

73 Claims



1. A method of preparing a non-toxic, pharmaceutically acceptable, <sup>195m</sup>Au-containing liquid capable of direct administration in a living being and substantially devoid of <sup>195m</sup>Hg

ions, wherein the <sup>195m</sup>Au is a daughter radioisotope of the <sup>195m</sup>Hg ion, comprising:

- (a) adsorbing <sup>195m</sup>Hg on a chemically and radiolytically stable adsorption agent comprising a mercury ion-binding material having a significantly higher affinity for mercury ions than for gold ions, and
- (b) eluting the daughter <sup>195m</sup>Au radioisotope with an eluant which selectively converts <sup>195m</sup>Au ions to an elutable form in the presence of the adsorbed parent <sup>195m</sup>Hg radioisotope, and which is non-toxic and pharmaceutically acceptable.

4,414,146

# METHOD OF POLYMERIZING ROSIN

Jerome R. Olechowski, Lawrenceville, and Nelson E. Lawson, Trenton, both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed May 5, 1982, Ser. No. 374,974

Int. Cl.<sup>3</sup> C09F 1/00; B01J 27/02

U.S. Cl. 260-97

19 Claims

1. The polymerization of a rosin in the presence of a catalytic proportion of an insoluble catalyst which comprises a polymer having pendant organosulfonic acid groups.

4,414,147

# METHODS OF DECREASING THE HYDROPHOBICITY OF FIBROBLAST AND OTHER INTERFERONS

Alexander M. Klibanov, Boston, and Robert S. Langer, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 17, 1981, Ser. No. 255,321

Int. Cl.<sup>3</sup> C07G 7/00

U.S. Cl. 260-112 R

3 Claims

1. A method of reducing the hydrophobicity of interferon, comprising contacting said interferon with an anhydride of a dicarboxylic acid under conditions that allow said interferon to become bonded to said anhydride.

4,414,148

# ANTI-CANCER DRUGS FOR THE TREATMENT OF MELANOMAS AND METHOD FOR PREPARING THEREOF

Franz K. Jansen, Castries, and Pierre Gros, Montpellier, both of France, assignors to Sanofi, Paris, France

Filed Apr. 14, 1982, Ser. No. 368,434

Claims priority, application France, Apr. 15, 1981, 81 07596

Int. Cl.<sup>3</sup> A61K 39/44; C07G 7/00

U.S. Cl. 260-112 B

4 Claims

1. Drugs useful in particular for the treatment of melanomas, wherein they contain an active substance which is a molecule in which the chain A of ricin is associated, by a covalent bond of disulfide type, with the human antimelanoma antibody, Anti p. 97.

4,414,149

# GLYCINE<sup>8</sup>-D-ARGININE<sup>24</sup> CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

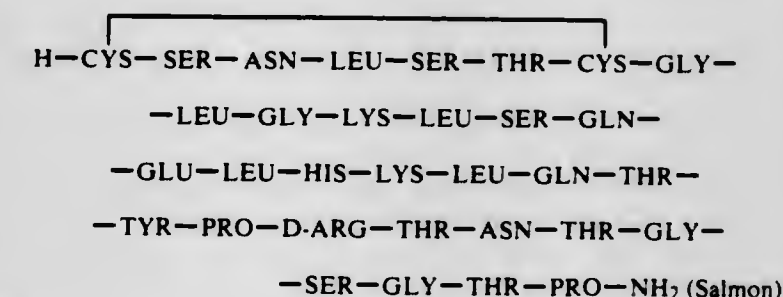
Filed Mar. 4, 1983, Ser. No. 471,982

Int. Cl.<sup>3</sup> C07C 103/52

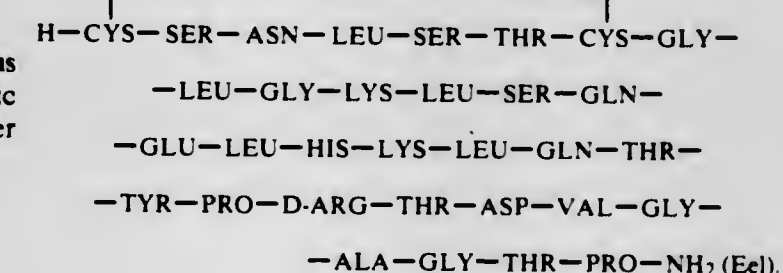
U.S. Cl. 260-112.5 T

4 Claims

1. Peptides having the structure:



or



4,414,150

# HYBRID HUMAN LEUKOCYTE INTERFERONS

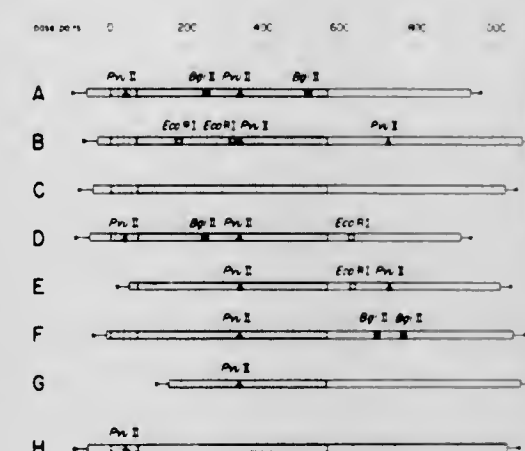
David V. Goeddel, Burlingame, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 205,579, Nov. 10, 1980. This application Feb. 23, 1981, Ser. No. 237,388

Int. Cl.<sup>3</sup> C07C 103/52; C07G 7/00; C12P 21/00, 21/06

U.S. Cl. 260-112.5 R

7 Claims



1. An antiviral composition of matter comprising a polypeptide of 165-166 amino acids, optionally having an additional methionine attached to the ordinarily first amino acid at the N-terminus, the amino acid sequence of said polypeptide comprising, in sequence, discrete sub-sequences corresponding in



amino acid identity and number to sub-sequences of different, naturally occurring leukocyte interferons, the amino acid sequence of said polypeptide differing from the amino acid sequence of naturally occurring leukocyte interferons.

4,414,151

**CHROMIFEROUS COMPLEX DYE STUFFS, A PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION**  
Antoine G. L. J. Breda, Craonne, and Jacques G. R. Roussel, Bosc Roger en Roumois, both of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jul. 13, 1981, Ser. No. 282,902

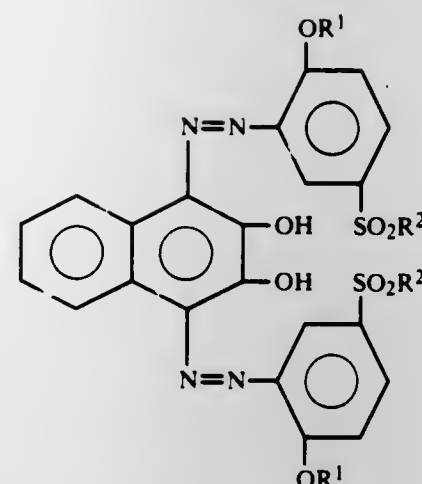
Claims priority, application France, Jul. 18, 1980, 8015879

Int. Cl.<sup>3</sup> C09B 45/00

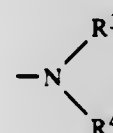
U.S. Cl. 260—145 B

14 Claims

1. The chromiferous complex dyestuffs which, in the acid form, correspond to the general formula



wherein R¹ is lower alkyl and R² is —F or



wherein R³ and R⁴ are hydrogen, lower alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted by lower alkyl and are the same or different.

4,414,153

**1,3-DITHIETANE-2-CARBOXYLIC ACID PENICILLIN AND CEPHALOSPORIN DERIVATIVES**

Masaru Iwanami, Yokohama; Tetsuya Maeda, Urawa; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Noriaki Nagano, Ageo; Atsuki Yamazaki, Ichikawa; Kazaharu Tamazawa, Saitama; Kiyoshi Murase, Urawa, and Tadao Shibamura, Asaka, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan

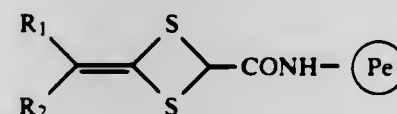
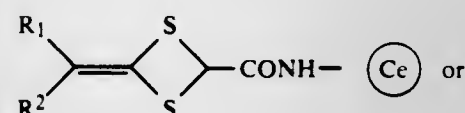
Continuation of Ser. No. 48,015, Jun. 13, 1979, abandoned, which is a division of Ser. No. 913,501, Jun. 7, 1978, Pat. No. 4,198,339. This application Sep. 23, 1981, Ser. No. 304,986  
Claims priority, application Japan, Jul. 28, 1977, 52-90772; Feb. 2, 1978, 53-10772; Feb. 22, 1978, 53-19512

Int. Cl.<sup>3</sup> C07D 499/76, 501/36

U.S. Cl. 260—239.1

1 Claim

1. 7-substituted cephalosporin or penicillin derivatives represented by the formula



wherein R¹ is a carboxyl group or the functional derivative residue thereof selected from the group consisting of carboxylic acid lower alkyl ester residue, carboxylic acid aralkyl ester residue, a carbamoyl group, N-monoalkylcarbamoyl group, N,N-dialkylcarbamoyl group, a carboazoyl group, and a cyano group; R² is a carboxyl group or the functional derivative residue thereof selected from the group consisting of carboxylic acid lower alkyl ester residue, carboxylic acid aralkyl ester residue, a carbamoyl group, N-monoalkylcarbamoyl group, N,N-dialkylcarbamoyl group, a carboazoyl group, and a cyano group, a hydrogen atom, a lower alkyl group, a lower hydroxyalkyl group, a lower alkoxyalkyl group, a lower carboxyalkyl group, a lower arylalkyl group, a lower alkoxy group, a lower alkanoyl group, R⁴S(O)ₙ group wherein R⁴ represents a lower

4,414,152

**BIS ARYL-AZO DERIVATIVES OF 2,3-NAPHTHALENEDIOL**

Domenic Santilli, Webster; Jeanne E. Kaeding, and Louis J. Rossi, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

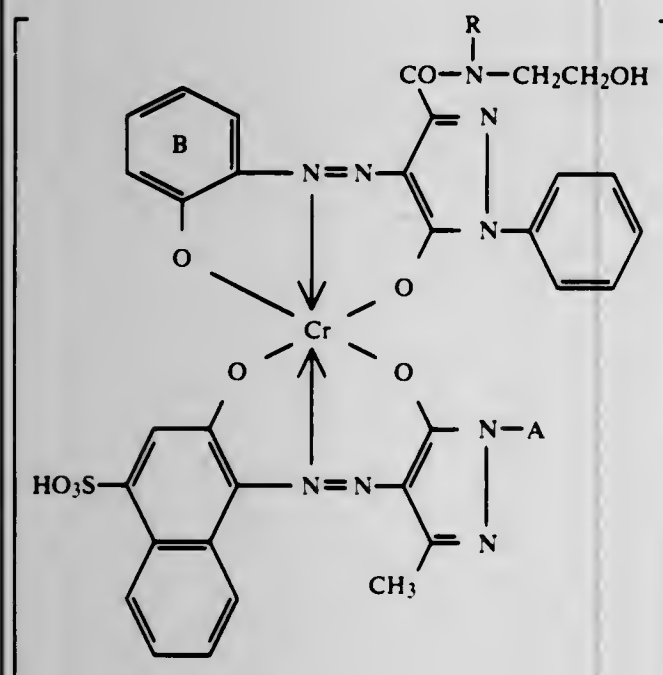
Filed May 18, 1981, Ser. No. 264,312

Int. Cl.<sup>3</sup> C09B 31/02, 31/068, 33/048; D06P 1/44

U.S. Cl. 260—185

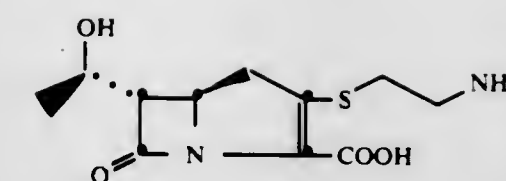
3 Claims

1. A compound of the formula

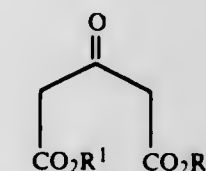


in which R represents a hydrogen atom or a β-hydroxyethyl group, A represents a hydrogen atom, a phenyl group or a phenyl group substituted by one or more halogen atoms or alkyl groups of low molecular weight, and the nucleus B may be substituted by one or more chlorine atoms.

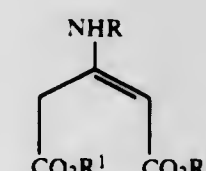
alkyl group and n represents 0, 1 or 2, and aryl group which may have a substituent selected from the group consisting of hydroxyl and alkoxy groups, an aryl group, a lower alkenyl group, a sulfamoyl group, or a heterocyclic residue which may have a substituent selected from the group consisting of a hydroxyl group, methyl group, and alkylthio group; and wherein (Ce) and (Pe) represent a cephalosporin nucleus and a penicillin nucleus, respectively.



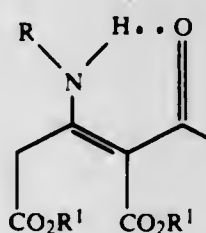
and its pharmaceutically acceptable salts and lower alkyl, aryl and aralkyl esters which comprises the steps of: treating:



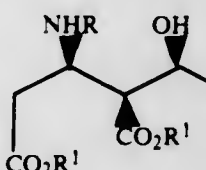
with NH₂R to form:



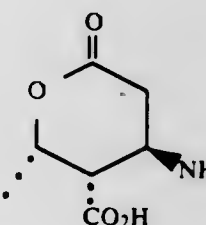
followed by acetylating to form:



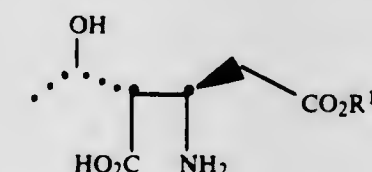
followed by reducing to form:



followed by cyclizing and deblocking to form:



followed by alcoholysis with R¹OH to form:



followed by cyclizing and deblocking to form:

4,414,154

**DIBENZO[a,d]CYCLOOCTEN-5,12-IMINES**

Paul S. Anderson, Lansdale; Marcia E. Christy, Perkasi; Ben E. Evans, Lansdale, and David C. Remy, North Wales, all of Pa., assignors to Merck & Co. Inc., Rahway, N.J.

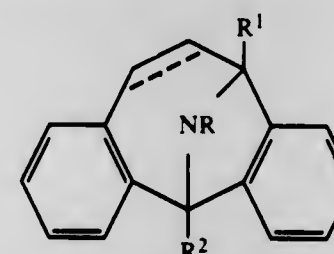
Division of Ser. No. 80,896, Oct. 1, 1979, Pat. No. 4,329,465, which is a continuation-in-part of Ser. No. 917,044, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,343, Sep. 19, 1977, abandoned. This application Oct. 22, 1981, Ser. No. 313,913

Int. Cl.<sup>3</sup> C07D 225/08

U.S. Cl. 260—245.7

5 Claims

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein, R is

- (1) hydrogen,
- (2) C₁-₃ alkyl,
- (3) C₂-₃ alkenyl,
- (4) phenyl-C₁-₃ alkyl,
- (5) C₃-₆ cycloalkyl,
- (6) C₃-₆ cycloalkyl-C₁-₃ alkyl, or
- (7) dimethylaminopropyl;

R¹ is

- (1) hydrogen,
- (2) C₁-₃ alkyl,
- (3) C₂-₃ alkenyl,
- (4) phenyl-C₁-₃ alkyl, or
- (5) C₃-₆ cycloalkyl;

R² is

- (1) hydrogen,
  - (2) C₁-₃ alkyl,
  - (3) C₂-₃ alkenyl,
  - (4) phenyl-C₁-₃ alkyl,
  - (5) C₁-₃ alkoxy, or
  - (6) dimethylaminopropyl; and
- the dotted line is a single or double bond.

4,414,155

**SYNTHESIS OF THIENAMYCIN VIA ESTERS OF (3SR, 4RS)-3-[(SR)-1-HYDROXYETHYL]-β,2-DIOXO-4-AZETIDINEBUTANOIC ACID**

Thomas M. H. Liu, Westfield; David G. Mellillo, Scotch Plains; Kenneth M. Ryan, Clark; Ichiro Shinkai, Westfield, and Meyer Slettinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 236,418, Feb. 20, 1981, abandoned, which is a division of Ser. No. 112,022, Jan. 14, 1980, Pat. No. 4,282,148. This application Mar. 29, 1982, Ser. No. 363,339

Int. Cl.<sup>3</sup> C07D 487/04

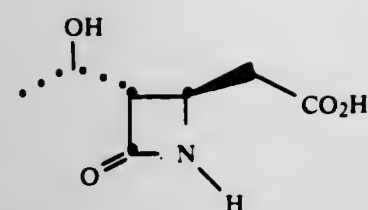
U.S. Cl. 260—245.2 T

2 Claims

1. A process for preparing:



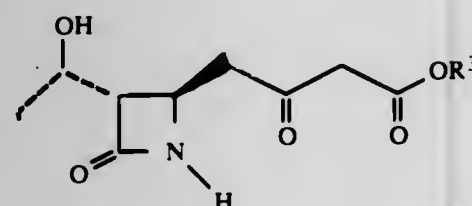




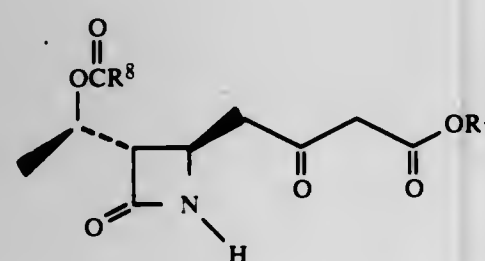
followed by treating with



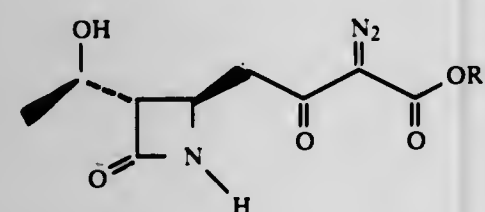
to form:



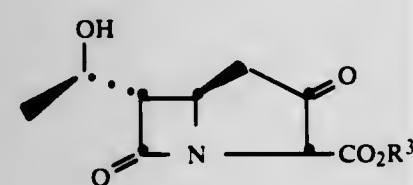
followed by reacting with a carboxylic acid  $R^8COOH$  in the presence of a triorganophosphine and an activating agent therefor to yield:



followed by deacylating and diazotization to provide:



followed by cyclizing to form:



followed by activating, treating with  $HSCH_2CH_2NHR^4$ , and deprotecting wherein  $R^1$ ,  $R$ ,  $R^3$  and



are removable protecting groups.

4,414,156

# PROCESS FOR PRODUCING 2-METHOXYBENZANTHRONES

Walter Scherrer, Basel, and Robert Portmann, Pratteln, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland  
Filed Oct. 9, 1981, Ser. No. 310,577

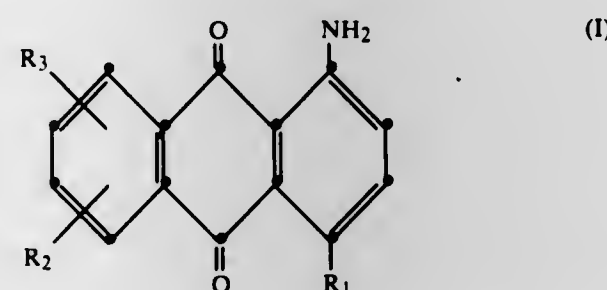
Claims priority, application Switzerland, Oct. 29, 1980, 8048/80

Int. Cl.<sup>3</sup> C07C 50/22

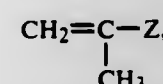
U.S. Cl. 260—352

11 Claims

1. A process for producing a 2-methoxybenzanthrone, starting with 1-aminoanthraquinone of the formula I



or the corresponding anthraquinone-1-diazonium salt, wherein  $R_1$ ,  $R_2$  and  $R_3$  independently of one another are each hydrogen or chlorine, or the hydroxyl, methoxy or benzamido group, in which process the starting compound is reacted to give the anthraquinone-1-diazonium salt, this in its turn is reacted in a Meerwein reaction with a propene derivative of the formula



wherein Z is an electron-attracting substituent, and the reaction product is then cyclised in an alkaline reaction mixture to obtain 2-hydroxybenzanthrone, the hydroxyl group of which is methylated, by reaction with the reaction medium, to yield 2-methoxybenzanthrone, the said process being characterised in that it is performed, without isolation of the intermediates, in a dimethylalkane phosphonate, of which the alkane radical has 1-4 C atoms.

4,414,157

# PROCESS FOR THE PURIFICATION OF CRUDE GLYCERIDE OIL COMPOSITIONS

Akio Iwama, and Yoshitaka Kazuse, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan  
Filed Dec. 30, 1981, Ser. No. 335,493

Claims priority, application Japan, Dec. 30, 1980, 55-186985

Int. Cl.<sup>3</sup> C09F 5/10; C11B 3/00

U.S. Cl. 260—428.5

12 Claims

1. A process for the purification of a crude glyceride oil composition which comprises diluting the crude glyceride oil composition containing a glyceride oil and phospholipid with an organic solvent, bringing the diluted crude glyceride oil composition under pressure into contact with an internal pressure capillary semipermeable membrane having an inner diameter of 0.1 to 2 mm to separate it into a semipermeable membrane permeable liquid and a semipermeable membrane impermeable liquid, bringing the thus-concentrated semipermeable membrane impermeable liquid under pressure into contact with an internal pressure type tubular semipermeable membrane having an inner diameter which is greater than that of the above capillary semipermeable membrane and which is 20 mm or less to separate it into a semipermeable membrane permeable liquid and a semipermeable membrane impermeable liquid, and removing the organic solvent from at least one of the total semipermeable membrane permeable liquid and the semipermeable membrane impermeable liquid to obtain a purified glyceride oil and/or a purified phospholipid.

4,414,158

# PHOSPHONOMETHYLGLYCYLHYDROXAMIC ACID AND NOVEL HERBICIDALLY ACTIVE SALTS THEREOF

Rudolph C. Thummel, Courgenay; Hanspeter Fischer, Bottmingen, and Ludwig Maier, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Filed Apr. 20, 1981, Ser. No. 255,411

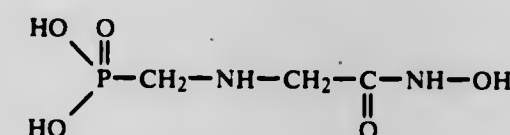
Claims priority, application Switzerland, Apr. 29, 1980, 3302/80

Int. Cl.<sup>3</sup> C07F 1/08, 9/38

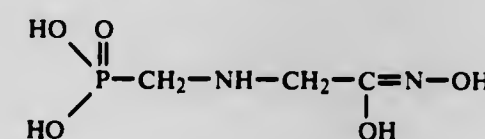
U.S. Cl. 260—438.1

8 Claims

1. An N-phosphonomethylglycylhydroxamic acid of the formula



and/or the tautomeric formula



in the form of the free acid, the mono-, di- or trisodium salt, the copper salt, the isopropylammonium salt, the tetrabutylammonium salt, the 4-pyrrolidinium-pyridinium salt, the 1-methyl-4,4'-bipyridinium salt, the dimethylbenzylammonium salt, the dimethyldodecylammonium salt, or of a hydrohalide.

4,414,159

# VINYL ETHER MONOMERS AND POLYMERS THEREFROM

Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

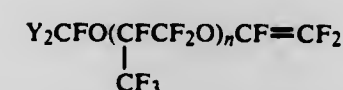
Division of Ser. No. 191,301, Sep. 26, 1980, Pat. No. 4,334,082. This application Dec. 14, 1981, Ser. No. 330,332

Int. Cl.<sup>3</sup> C07C 121/130

U.S. Cl. 260—465.6

9 Claims

1. A vinyl ether monomer of the formula:



wherein Y is selected from the group consisting of  $CF_2CN$ , of  $CF_2CO_2R$ ,  $CF_2CO_2H$ ,  $CF_2CO_2M$ ,  $CF_2CONH_2$  and  $CF_2CONR_2$ ; R is  $CH_3$  or  $C_2H_5$ ; n is an integer from 0 to 10; M is an alkali metal, ammonium or quaternary ammonium group.

4,414,160

# PROCESS FOR MAKING CARBOXYLIC ACID HALIDES

Heinz Erpenbach, Cologne; Klaus Gehrman; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,984

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035201

Int. Cl.<sup>3</sup> C07C 51/58

U.S. Cl. 260—544 A

5 Claims

1. In a process for making carboxylic acid halides by reacting an alkyl halide having from 1 to 6 carbon atoms or an aryl halide with carbon monoxide under practically anhydrous conditions at temperatures of 350 to 575 K. and under pressures of 1 to 300 bars in the presence of a catalyst system containing at least one of the noble metals selected from rhodium, palladium, iridium or their compounds, iodine and/or its

compounds, methyl trialkyl phosphonium iodide and/or methyl triaryl phosphonium iodide, the improvement which comprises admixing the reaction mixture with 0.02 to 0.75 mol of hydrogen per mol of carbon monoxide.

4,414,161

# PROCESS FOR PRODUCING LOW TEMPERATURE STABLE TERT-BUTYLPHENYL DIPHENYL PHOSPHATE

Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 1, 1981, Ser. No. 279,389

Int. Cl.<sup>3</sup> C07F 9/09

U.S. Cl. 260—975

13 Claims

1. A process of producing tert-butylphenyl diphenyl phosphate characterized by low temperature stability comprising the steps of: (a) alkylating a phenol with isobutylene to produce a predominately para-tert-butylphenol having a  $C_4/\phi$  ratio of from about 0.70 to 0.90 and (b) catalytically isomerizing the para-tert-butylphenol to produce a meta/para isomerized tert-butylphenol mixture having a meta/para ratio of from about 0.50 to about 0.70; then (c) realkylating the isomerized tert-butylphenol mixture at a temperature of from about 120° C. to about 190° C. to obtain a  $C_4/\phi$  ratio of from about 0.55 to about 0.85 and a meta/para ratio of from about 0.25 to about 0.50; and (d) phosphorylating the realkylated tert-butylphenol with a phosphorylating agent to produce a tert-butylphenyl diphenyl product characterized by a SUS viscosity of about 550 and low temperature stability.

4,414,162

# AIR VALVE TYPE TWIN COMPOUND CARBURETOR FOR ENGINES

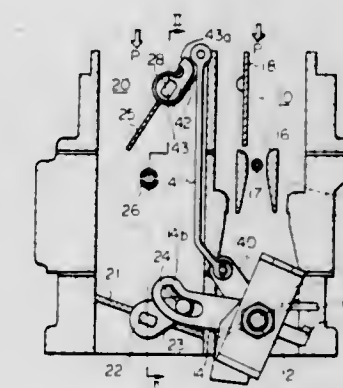
Akira Ii; Mitunori Sasano; Michio Morishita, all of Toyota; Mikio Kuno, Aichi, and Kunio Kadowaki, Obu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of Japan  
Filed Feb. 8, 1982, Ser. No. 346,992

Claims priority, application Japan, Oct. 30, 1981, 56-172947

Int. Cl.<sup>3</sup> F02M 13/04

U.S. Cl. 261—23 A

3 Claims



1. An air-valve type two-stage twin compound carburetor for an internal combustion engine, comprising: a carburetor body including a primary bore and a secondary bore; a primary throttle valve which is arranged in the primary bore so that it can be opened and closed; a secondary throttle valve which is arranged in the secondary bore so that it can be opened and closed cooperatively with the opening and closing of said primary throttle valve, after said primary throttle valve has been opened beyond a certain degree; an air valve which is arranged in the secondary bore upstream of a secondary fuel nozzle disposed upstream of said secondary throttle valve so that said air valve can be opened and closed; and means for regulating the opening degree of said air valve.



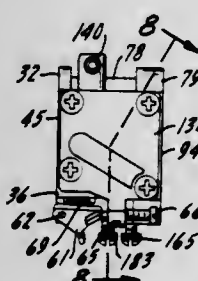
wherein said means comprises a first lever rotatably mounted on an air valve shaft to which said air valve is fixed, a second lever, capable of abutting on said first lever, being secured to said air valve shaft, a third lever fixed to a primary throttle shaft to which said primary throttle valve is fixed, and a connecting rod pivotally connected at one thereof to a free end of said third lever, and the other end of said connecting rod being pivotally connected to a free end of said first lever, so that the first lever is caused to abut on the second lever so as to open said air valve beyond a predetermined opening degree thereof, when said primary throttle valve is closed at a position close to the idling position thereof.

4,414,163

**FUEL FEED AND CHARGE FORMING APPARATUS**  
Rodney E. Barr, Cary, N.C., and Daniel L. Donovan, Decatur, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.  
Filed May 17, 1982, Ser. No. 378,584  
Int. Cl.<sup>3</sup> F02M 17/04

U.S. Cl. 261—69 A

19 Claims



1. A carburetor for an internal combustion engine including, in combination, a substantially cubically shaped body provided with a mixing passage having an air inlet region extending from a first planar surface and a mixture outlet region terminating at a second planar surface which serves for mounting the carburetor on the engine, a fuel chamber in the body, a flexible diaphragm forming a wall of the chamber, a fuel inlet passage in the body, a valve for the fuel inlet passage, control means for said fuel inlet valve including a lever actuated by movement of said diaphragm under the influence of reduced pressure in the mixing passage, a main orifice opening into the mixing passage, a throttle valve in the mixture outlet region of the mixing passage, an engine idling orifice opening into the mixing passage at the downstream side of the throttle valve, fuel channel means in said body for conveying liquid fuel from the fuel chamber to the orifices, a first pair of bosses, one extending transversely from each side of the body adjacent the air inlet region, a second pair of bosses, one boss of said second pair extending transversely from each side of the body adjacent the mixture outlet region, each boss of the second pair being in parallel alignment with a boss of the first pair, each of the bosses having a bore, the bores of the aligned pair of bosses being in spatial alignment, a pair of hollow cylindrical metal support members, one extending between each pair of spatially aligned boss bores and secured therebetween such that the ends of said support members extend only to the first and second planar surfaces, wherein said hollow cylindrical metal support members can receive a mounting bolt through its hollow center portion, thereby providing both a heat sink for cooling said carburetor and a load bearing member substantially impervious to thermal and mechanical creep, and to mechanical compression from bolt torque.

4,414,164  
**PROCESS AND APPARATUS FOR PRODUCING PREFORMS FOR OPTICAL FIBERS**

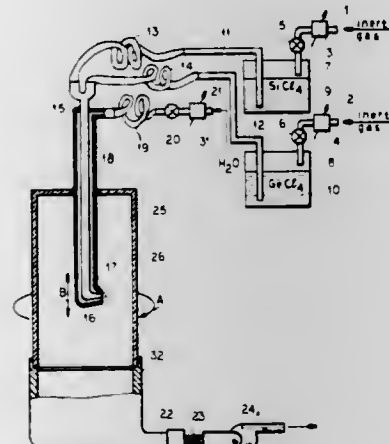
Giacomo Roba, Cogoletto, and Paolo Vergnano, Chieri, both of Italy, assignors to Caselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 9, 1980, Ser. No. 185,514

Claims priority, application Italy, Sep. 10, 1979, 68789 A/79  
Int. Cl.<sup>3</sup> B05B 13/02

U.S. Cl. 264—1.2

5 Claims



1. In a process for making a preform from which an optical fiber can be drawn, including the steps of (a) reacting a silicon halide with an oxidant in the presence of a doping agent, (b) depositing the resulting vitrifiable material on a cylindrical supporting surface to form a porous tubular structure having a selected refractive-index profile, (c) collapsing said tubular structure at high temperature into a solid rod, and (d) thermally vitrifying said rod.

the improvement wherein steps (a) and (b) are performed substantially at room temperature with said silicon halide and said doping agent present in liquid form, the two liquids being intermixed and jointly conducted to a spray nozzle confronting said supporting surface and being admixed in said spray nozzle with said oxidant for entrainment in a single spray onto said supporting surface in step (b) with relative rotation and axial reciprocation of the spray and said supporting surface to coat the latter in a multiplicity of helicoidal passes while progressively varying the relative feed rates of said liquids during at least some of said passes in accordance with the selected refractive-index profile.

4,414,165

**METHOD AND DEVICE FOR PRODUCING AN OPTICAL TRANSMISSION ELEMENT**

Ulrich Oestreich, Gernot Schoeber, both of Munich, and Gerd Witt, Neuried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,699

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111693

Int. Cl.<sup>3</sup> B29D 11/00

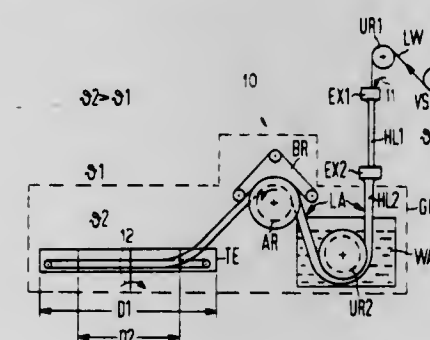
U.S. Cl. 264—1.5

22 Claims

1. A method for manufacturing an optical transmission element comprising a fiber-shaped optical waveguide loosely received in a tubular jacket of a greater internal diameter and containing a filling material so that the waveguide is freely moveable in the jacket to a certain extent, said method comprising providing the waveguide and means for forming a jacket at an elevated temperature, forming a vertically extending jacket by said means, simultaneously introducing the filling material and waveguide into the vertically extending jacket as it is being formed, cooling the formed jacket to a lower second temperature, coiling the jacket into a coil arrangement during

a portion of said step of cooling, said step of coiling including maintaining the waveguide on the smallest radius of curvature of the coiled tubular jacket by retarding the rate of introduction of the waveguide into the jacket at said means for forming said jacket, and subsequently cooling the coiled arrangement from the second temperature to the ambient temperature with the shrinkage of the jacket occurring during said second cooling step and the amount of retarding of the waveguide producing the desired relationship between the length of the jacket and the length of the waveguide therein.

18. A device for producing an optical transmission element having a fiber shaped optical waveguide loosely received in a tubular jacket containing a filling material and having an interior diameter greater than the diameter of the waveguide so



that the waveguide can freely move within the jacket to a limited extent, said device comprising means for forming a tubular jacket at an elevated temperature and extending in a vertical direction, means for introducing a waveguide into the tubular jacket as it is being formed, said means for introducing including a supply reel for the waveguide and means for retarding the rate of introduction of the waveguide into the tubular jacket; housing means for enclosing the tubular jacket after it is formed, said housing means being at a second temperature lower than the elevated temperature and above the ambient temperature, said housing means containing a trough of cooling medium for rapidly cooling the tubular jacket to said second temperature; and means for coiling the jacket into a coiled arrangement being disposed in said housing means.

4,414,166

**LASER JOINING OF THERMOPLASTIC AND THERMOSETTING MATERIALS**

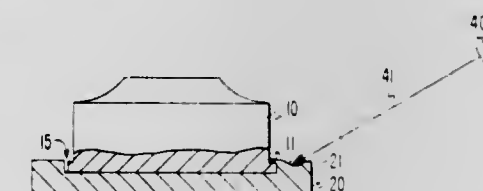
Paul M. Charlson, Longmont, Colo.; Clarence R. Schwieters, and Jun H. Souk, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,650

Int. Cl.<sup>3</sup> B29C 23/00, 27/00, 9/00

U.S. Cl. 264—25

6 Claims



1. A method for joining thermoplastic material to thermosetting material comprising the steps of: forming a projection locking surface on the thermosetting material, causing the thermoplastic material to melt and flow merely by projecting a laser beam to impinge upon the thermoplastic material at the area adjacent to said locking surface, the melted material flowing out of its own plane over said locking surface to form a joint at the interface between the thermosetting and thermoplastic materials.

4,414,167

**METHOD FOR MOLDING AN ARTICLE**

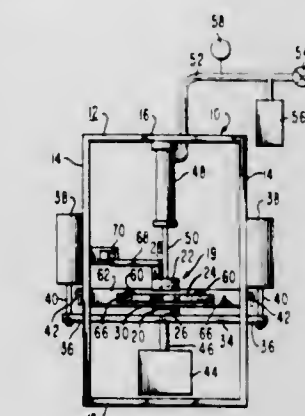
John J. Prusak, and Bupendra P. Patel, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 350,087

Int. Cl.<sup>3</sup> B29F 1/06

U.S. Cl. 264—40.5

2 Claims



1. A method of molding an article in a mold which includes at least two mold members having opposed recesses which are adapted to mate to form a mold cavity, a pneumatic cylinder for moving the mold members toward each other to a collapsed position in which the mold cavity is of a volume less than the desired volume of the article and away from each other to an expanded position in which the mold cavity is of the desired volume of the article, a pipe connecting the pneumatic cylinder to a source of air under pressure, valve means connected to said pipe for allowing air to flow from the source to the pneumatic cylinder but preventing the flow of air from the pneumatic cylinder to the source, and an enclosed air reservoir connected to the pipe between the pneumatic cylinder and the valve means, said method comprising

injecting a plastic mold material into the mold cavity with said mold cavity being in the collapsed position until the cavity is filled with said material, continuing to inject additional mold material into the cavity so that the mold material moves the mold members apart to the expanded position of the mold member against the pressure of the pneumatic cylinder which applies pressure on the mold material, and maintaining substantially uniform pressure on the mold material in the cavity while the mold members are being moved from the collapsed position to the expanded position solely by allowing the air in the pneumatic cylinder to expand into the enclosed air reservoir.

4,414,168

**PROCESS FOR MANUFACTURING A POROUS DIP TUBE**

Thomas E. Hankin, Morrisville, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Nov. 24, 1980, Ser. No. 209,515

Int. Cl.<sup>3</sup> B29D 27/00

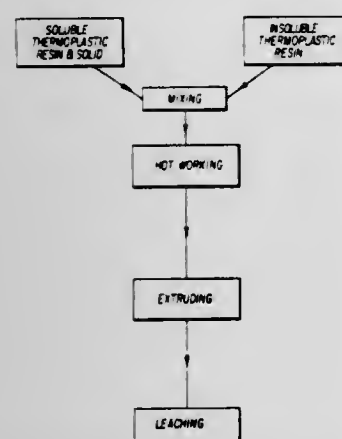
U.S. Cl. 264—49

2 Claims

1. A process for manufacturing a porous dip tube adapted to carry a first liquid longitudinally from an entry open end thereof to a discharge valve at the other end thereof under pressure derived from a second liquid floating on said first liquid and to permit transportation of a component of said second liquid laterally through the wall thereof comprising forming a hot-worked and plasticized viscous mass of a first polymer insoluble in said first and second liquids, a second polymer soluble in a solvent, said solvent being a non-solvent for said first polymer and fine particles of a solid, non-fusible at the hot-working temperature and said solid being soluble in said solvent, extruding said mass to tube form and thereafter



dissolving said soluble polymer and said solid in said solvent to thereby provide in the wall of said tube pores having an aver-



age cross-sectional dimension of about 1 to about 10 micrometers.

4,414,169

# **PRODUCTION OF POLYESTER FILAMENTS OF HIGH STRENGTH POSSESSING AN UNUSUALLY STABLE INTERNAL STRUCTURE EMPLOYING IMPROVED PROCESSING CONDITIONS**

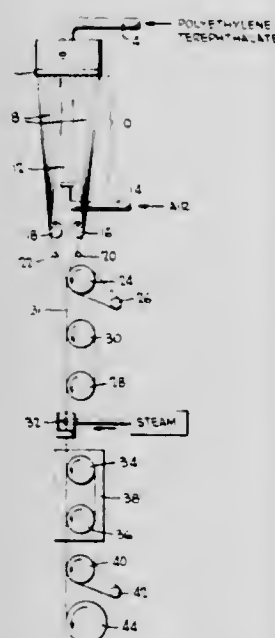
Edward B. McClary, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Feb. 26, 1979, Ser. No. 15,512

Int. Cl.<sup>3</sup> D01D 5/12

U.S. Cl. 264—210.7

21 Claims



1. In a process for the production of improved polyester filaments of high strength having an unusually stable internal structure which particularly are suited for use at elevated temperatures, comprising:

- extruding a molten melt-spinnable polyester which contains 85 to 100 mol percent polyethylene terephthalate and 0 to 15 mol percent of copolymerized ester units other than polyethylene terephthalate having an intrinsic viscosity of 0.5 to 2.0 deciliters per gram through a shaped extrusion orifice having a plurality of openings to form a molten filamentary material,
- passing the resulting molten filamentary material in the direction of its length through a solidification zone having an entrance end and an exit end wherein said molten filamentary material is uniformly quenched and transformed into a solid filamentary material,
- withdrawing said solid filamentary material from said solidification zone while under a substantial stress of 0.015

to 0.150 gram per denier measured immediately below the exit end of said solidification zone,

- continuously conveying said resulting as-spun filamentary material from the exit end of said solidification zone to a stress isolation device at a rate in excess of 500 meters per minute up to 3000 meters per minute with said filamentary material as it enters said stress isolation device exhibiting a relatively high birefringence of  $+9 \times 10^{-3}$  to  $+70 \times 10^{-3}$ ,
- continuously conveying said resulting filamentary material from said stress isolation device to a first draw zone,
- continuously drawing said resulting filamentary material at a draw ratio of 1.01:1 to 3.0:1 while present in said first draw zone, and
- subsequently thermally treating said previously drawn filamentary material while under a longitudinal tension and present at a temperature above that of said first draw zone to achieve at least 85 percent of the maximum draw ratio of said as-spun filamentary material and impart a tenacity of at least 7.5 grams per denier to the same, with at least the final portion of said thermal treatment being conducted at a temperature within the range from about 90° C. below the differential scanning calorimeter peak melting temperature of the same up to below the temperature of which filament coalescence occurs;

the improvement comprising providing said first draw zone in which step (f) is carried out, throughout at a temperature below the glass transition temperature of said as-spun filamentary material thereby facilitating a savings of energy when compared with polyethylene terephthalate drawing procedures of the prior art, and concomitantly enabling said drawing step (f) to be carried out in combination with the other process steps on a stable basis in the substantial absence of filament neck drawing.

4,414,170

# **METHOD OF PRODUCING VENTILATOR GRILLS**

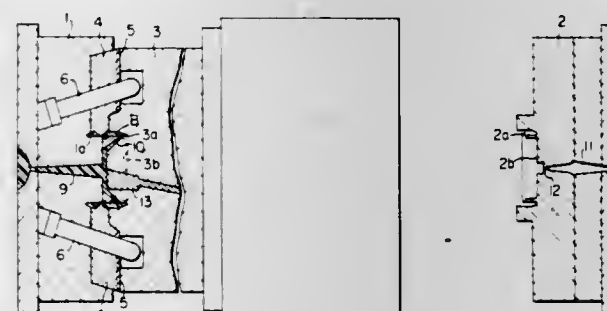
Yoshiaki Sano, Fuji, Japan, assignor to Nihon Plast Co., Ltd., Fuji and Yamato Plastics Machinery Co., Ltd., Tokyo, both of, Japan

Filed Apr. 6, 1982, Ser. No. 365,918

Int. Cl.<sup>3</sup> B29D 3/00; B29F 1/00

U.S. Cl. 264—242

2 Claims



1. A method of producing a ventilator grill of the type which comprises a grill frame and substantially parallel louver vanes pivotally mounted on said grill frame, said grill frame including a pair of opposite sides in which aligned pairs of axle holes are formed, said louver vanes having axles extending from the opposite ends of said vanes respectively and rotatably received in respective aligned pairs of axle holes, said grill frame being provided with at least two recesses formed in the outer surfaces of said pair of opposite sides of said frame and communicated with one of said aligned pairs of axle holes, the louver vane associated with said one aligned pair of axle holes having disc-like friction portions integrally connected to the outer ends of the axles of said one vane and received in said recesses rotatably but frictionally to provide a slight frictional resistance to angular movements of said louver vane relative to said grill frame, said method comprising the steps of: gathering together first and second mould halves and cores

in a first predetermined position in which they cooperate to define a first mould cavity for moulding said grill frame, said cores defining surfaces for moulding said axle holes and said recesses;

- injecting a first plastics material into said first mould cavity; allowing said first plastics material to solidify in said first mould cavity to form said grill frame having axle holes and recesses;
- removing said grill frame from said first mould half and from said cores while said grill frame is retained on said second mould half;
- gathering together said second mould half with said grill frame thereon and a third mould half in a second predetermined position in which the part of said grill frame moulded by said first mould half is received in said third mould half and in which said second and third mould halves and said grill frame cooperate to define a second mould cavity for moulding said louver vanes, said second mould cavity including spaces for moulding said axles and friction portions, said spaces being defined by said axle holes and recesses formed in said grill frame;
- injecting into said second mould cavity a second plastics material which is not weldable to said first plastics material and has a melting point lower than that of said first plastics material; and
- allowing said second plastics material to solidify in said second mould cavity to form said vanes, said axles and disk-like friction portions of said vanes being shrunk when solidified in said axle holes and recesses to allow said vanes to be angularly movable relative to said grill frame.

4,414,171

# **METHOD OF MAKING AN INJECTION MOLDED PROPELLER**

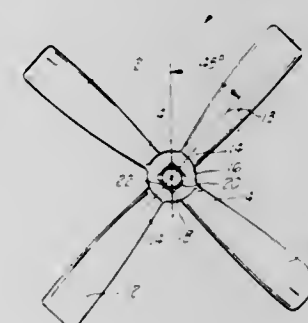
Brian J. Duffy, Derby; Eugene J. Gratz, Wichita; Steven E. Potter, Conway Springs, and Royal A. Power, Wichita, all of Kans., assignors to The Boeing Co., Seattle, Wash.

Filed Jan. 28, 1982, Ser. No. 343,536

Int. Cl.<sup>3</sup> B29C 27/00; B29D 3/00

U.S. Cl. 264—249

4 Claims



1. A method of attaching a propeller having a hub with a bore therethrough, the hub having a plurality of grooves spaced around the inner circumference of the hub and propeller blades extending outwardly from the outer circumference of the hub, the steps comprising: injection molding the propeller using a thermoplastic material in a mold die; forming grooves spaced around the circumference of the hub offset from the center line of the blade in the mold die; removing the propeller from the mold die; fitting a drive shaft into the propeller hub, the drive shaft having ribs disposed around the circumference of the shaft, the ribs indexed with the grooves in the hub when the shaft is inserted therein; and cooling the propeller hub on the drive shaft thereby providing a shrink fit and forming a high pressure bond therebetween, the grooves having a depth greater than the height of the ribs so that upon shrinking a space is left between the end of the ribs and the grooves.

4,414,172

# **PROCESS AND APPARATUS FOR SEALING A PLURALITY OF FILTER ELEMENTS**

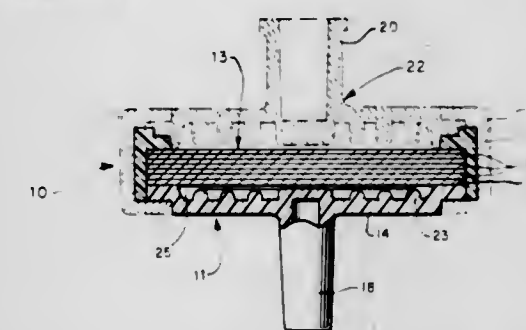
Hayden L. Leason, Palmas Del Mar, P.R., assignor to Filtrertek, Inc., Hebron, Ill.

Filed May 21, 1982, Ser. No. 380,565

Int. Cl.<sup>3</sup> B29C 6/04, 5/00; B29D 31/00

U.S. Cl. 264—255

14 Claims



1. A method for sealing a plurality of filter elements to a thermoplastic support having at least one aperture for the passage of a fluid, comprising the steps of: supporting the thermoplastic support on a lower mold half; aligning a plurality of filter elements over the aperture and the adjacent surface portions of the support, by utilizing a retractable locator projecting from the lower mold half; placing an upper mold half over the lower mold half, the upper mold half having portions which contact and apply pressure to the filter elements between the periphery of the filter elements and the portion of the elements above the aperture to hold the filter elements in position on the support, the upper mold half having portions which engage the retractable locator causing it to retract into said lower mold half as the upper mold half contacts the filter elements leaving an injection channel adjacent said elements;
- injection molding a thermoplastic material in said channel being formed by the upper mold half, the lower mold half, and the retractable locator, to form an integral seal between the support and the filter elements; and separating the mold halves and ejecting the support and its integral filter element.

4,414,173

# **IN-MOLD COATING**

David S. Cobbleddick, Kent; Donald F. Reichenbach, Massillon, and Henry Shanowski, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 316,592, Nov. 2, 1981, abandoned. This application Oct. 25, 1982, Ser. No. 435,026

Int. Cl.<sup>3</sup> B29H 9/02; C08L 75/00

U.S. Cl. 264—257

5 Claims

1. A method which comprises in-mold coating a molded thermoset polyester resin or thermoset vinyl ester resin glass fiber composition containing from about 10 to 75% by weight of glass fibers with a thermosetting in-mold coating composition under pressure, at a temperature and for a period of time sufficient to cure said in-mold coating composition to form an adherent thermoset coating on said molded thermoset resin glass fiber composition, said in-mold coating composition comprising:
  - 100 parts by weight of at least one polymerizable epoxy based oligomer having at least two acrylate groups and a weight average molecular weight of from about 500 to 1,500,
  - from about 80 to 160 parts by weight of at least one copolymerizable ethylenically unsaturated monomer,
  - from about 10 to 120 parts by weight of at least one copolymerizable monoethylenically unsaturated compound having a —CO— group and a —NH<sub>2</sub>, —NH— and/or —OH group,
  - from about 20 to 90 parts by weight of polyvinyl acetate,



- (e) from about 0.2 to 5 parts by weight of at least one zinc salt of a fatty acid having at least 10 carbon atoms,  
 (f) from about 0.01 to 1.0 part by weight of at least one accelerator for a peroxide inhibitor,  
 (g) from about 5 to 30 parts by weight of conductive carbon black,  
 (h) from about 50 to 155 parts by weight of a filler,  
 (i) from about 5 to 120 parts by weight of a copolymerizable or cocurable diacrylate compound having a weight average molecular weight of from about 250 to 5,000 and being selected from the group consisting of  
 (I) at least one polyoxyalkylene glycol oligomer having two acrylate groups and  
 (II) at least one polyurethane oligomer having two acrylate groups and mixtures of (I) and (II) and  
 at least one organic free radical peroxide initiator in an amount of up to about 5% by weight based on the weight of the polymerizable ethylenically unsaturated materials.

4,414,174

## REACTION INJECTION MOLDING COMPOSITIONS AND PROCESS

Daniel Klempner, Farmington Hills, and Kurt C. Frisch, Grosse Ile, both of Mich., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 29, 1982, Ser. No. 372,897

Int. Cl.<sup>3</sup> B29B 1/24; B29F 1/00; C08G 18/38

U.S. Cl. 264—328.6

6 Claims

1. A reaction injection molding composition comprising a polyisocyanate, a polymeric polyol, a short chain diol and a hydroxyalkylmelamine, the total hydroxyl content of the polymeric polyol, the short chain diol and the hydroxyalkylmelamine, being about equal to the stoichiometric requirements of said isocyanate, up to an isocyanate index of about 300, the polymeric polyol comprising the major weight proportion of the combination of polymeric polyol, short chain diol and hydroxyalkylmelamine and said hydroxyalkylmelamine comprising from about one fifth to about twice the weight content of short chain diol.

4,414,175

## METHOD FOR BLOWING ORIENTED CONTAINERS

Dewey Rainville, Westfield, N.J., assignor to Rainville Co., Inc., Middlesex, N.J.

Division of Ser. No. 194,853, Oct. 7, 1980, Pat. No. 4,364,721,

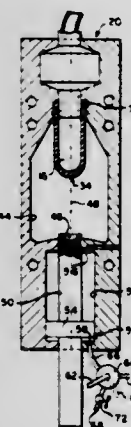
which is a continuation of Ser. No. 30,813, Apr. 17, 1979,

abandoned. This application Mar. 22, 1982, Ser. No. 360,427

Int. Cl.<sup>3</sup> B29C 17/07

U.S. Cl. 264—531

4 Claims



1. The method of making injection blow-molded plastic containers including applying a molten plastic parison to a core rod in an injection mold, moving the core rod with the plastic thereon from the injection mold to a blowing mold with the parison at a higher temperature than the orientation temperature of the plastic of the parison, the parison being held at the blowing end of the blowing mold and in axial offset from the opposite end of the blowing mold, providing at said opposite

end a reciprocating element with a container-bottom-defining surface having a localized parison-piercing formation, advancing said reciprocating element in substantially axial alignment with the core rod and to the point of pierced and bottom-supporting contact with the parison, blowing the parison, and retracting said element during the blowing while maintaining said pierced and bottom-supporting support, thereby holding the parison centered in the course of parison-expansion.

4,414,176

## FIRST WALL AND LIMITER SURFACES FOR PLASMA DEVICES

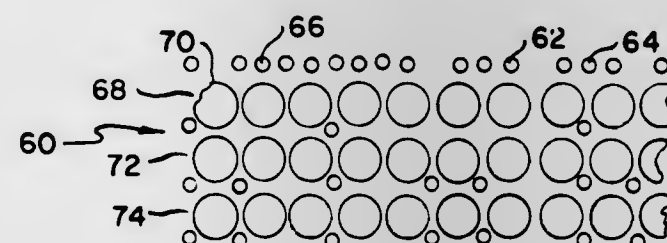
Alan R. Krauss, Plainfield, and Dieter M. Gruen, Downers Grove, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,235

Int. Cl.<sup>3</sup> G21B 1/00

U.S. Cl. 376—136

22 Claims



1. In a plasma device, a metallic member exhibiting reduced erosion when exposed to plasma at an elevated temperature, the member comprising: a metallic substrate composed of a first metal and a protective thin surface layer on the substrate, the surface layer comprising at least about 90 atomic percent of a second metal selected from the group consisting of alkali and alkaline earth metals, the first metal being more electronegative than the second metal, the surface layer being characterized by atoms of the second metal having ionic bonds to atoms of the first metal in the substrate and forming a higher ratio of secondary ions to neutrals than atoms of the second metal in bulk form when exposed to said plasma, and the binding energy between atoms of the first and second metal being below the binding energy between like atoms of the first metal and above the binding energy between like atoms of the second metal.

4,414,177

## LIQUID LEVEL, VOID FRACTION, AND SUPERHEATED STEAM SENSOR FOR NUCLEAR REACTOR CORES

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 27, 1981, Ser. No. 315,379

Int. Cl.<sup>3</sup> G21C 17/00

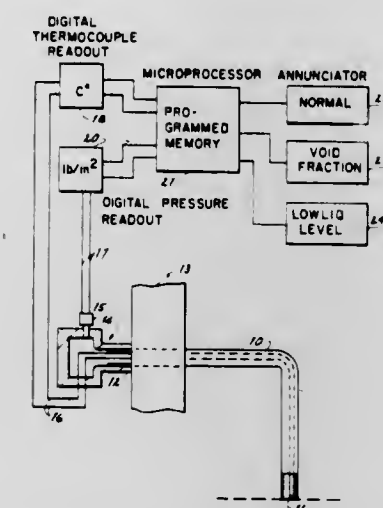
U.S. Cl. 376—247

5 Claims

1. A phase monitoring apparatus for coolant within a pressurized nuclear reactor vessel, comprising:  
 a length of small diameter tubing having an open end within the vessel at a preselected location, said length of tubing being extended to the exterior of the vessel;  
 temperature sensing means positioned at the open end of the length of tubing for measuring the temperature of coolant at said preselected location;  
 pressure sensing means exterior of the vessel and operably connected to the interior of the length of tubing for measuring the pressure of coolant at said preselected location;  
 and means operably connected to said pressure sensing means and to said temperature sensing means for comparing the

measured temperature to the known saturated temperature of the coolant at the pressure measured by said pressure

molten mixture to a temperature of at least about 420° C. for at least about 30 minutes, and cooling said mixture until it becomes a solid.



sensing means, whereby the phase condition of coolant at said preselected location can be determined.

4,414,178

## NICKEL-PALLADIUM-CHROMIUM-BORON BRAZING ALLOY

Murray S. Smith, Jr., Cincinnati; Mark S. Hilboldt, Fairfield, and Pracheeshwar S. Mathur, Montgomery, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 9, 1981, Ser. No. 310,339

Int. Cl.<sup>3</sup> C22C 19/04

U.S. Cl. 422—444

5 Claims

1. An improved brazing alloy consisting essentially of, by weight, about 28-32% Pd, about 6-13% Cr, about 1-3.5% B, balance being Ni and incidental impurities, the alloy further characterized by the substantial absence of Si and having a brazing temperature in the range of about 1800° F.-2000° F.

4,414,179

## PROCESS FOR MAKING PHOTORECEPTORS

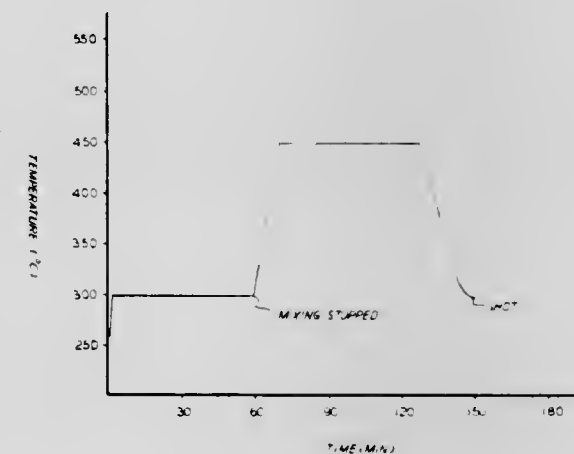
Susan L. Robinette, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1981, Ser. No. 326,997

Int. Cl.<sup>3</sup> C22C 1/02, 28/00

U.S. Cl. 420—579

10 Claims



1. A process for preparing a photoconductive insulating alloy comprising selenium, about 0.3 percent by weight to about 0.5 percent by weight arsenic, based on the total weight of said alloy, and about 50 ppm to about 150 ppm chlorine, based on the total weight of said alloy comprising heating a mixture comprising sufficient selenium, arsenic and chlorine to a temperature between about 290° C. and about 330° C. to form a molten mixture, agitating said molten mixture to blend said selenium, arsenic and chlorine, discontinuing or substantially discontinuing all agitation of said molten mixture, heating said

4,414,180

## METHOD FOR GENERATING CHLORINE DIOXIDE GAS

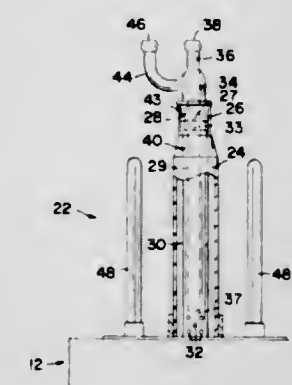
Robert P. Fisher, 4909 NW, 17th Pl., Gainesville, Fla. 32605

Filed Oct. 13, 1981, Ser. No. 310,459

Int. Cl.<sup>3</sup> B01J 19/12

U.S. Cl. 422—186

4 Claims



1. A chlorine dioxide generator for generating chlorine dioxide gas from a chlorite through the use of photochemical oxidation: said chlorine dioxide generator comprising a chlorine dioxide gas generating chamber operatively supported on a base including a transparent hollow reaction tube, a gas conduit member mounted on the upper portion and partially disposed within said transparent hollow reaction tube, a light source disposed adjacent said chlorine dioxide gas generating chamber and an opaque shield having a plurality of apertures formed in the lower portion thereof, disposed within said reaction tube, said gas conduit member including an innermost gas supply portion and an inner chlorine dioxide gas discharge portion, bounded externally by the opaque shield, wherein said light source radiates said chlorine dioxide gas generating chamber to photochemically oxidize the chlorite to produce chlorine dioxide in the aqueous phase which is swept into a gas phase by said innermost gas supply portion and discharged through said inner chlorine dioxide gas discharge portion.

4,414,181

## GAS GENERATOR OUTLET HAVING CONTROLLED TEMPERATURE TRANSITION

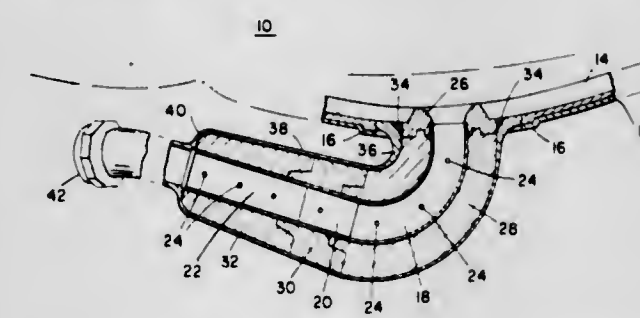
Edward J. Ford, Jr., Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1981, Ser. No. 317,712

Int. Cl.<sup>3</sup> B01J 19/02

U.S. Cl. 422—240

2 Claims



1. A combustion generator outlet for conducting high temperature gas from a gas generator to a manifold while maintaining a precise temperature gradient along both the radial and longitudinal axes of said outlet comprising:

(a) an external layer constructed of three separate metal alloys



of increasing thermal capability as said outlet is traversed from said gas generator to said manifold, said external layer constructed as a titanium elbow portion welded at one end to said gas generator to receive said gas and welded at the opposite end to one end of a reducer portion having increased thermal capability with respect to said elbow portion, said reducer portion having the opposite end welded to a tube end cup assembly having increased thermal capability with respect to said reducer;

- (b) an insulation layer of silica phenolic, said insulation layer formed as a cylindrical tube of interlocking segments machined to fit receivably together end-to-end, the thickness of said insulation layer having decreasing taper between said gas generator and said manifold;
- (c) an inner tubular liner of titanium-zirconium-molybdenum alloy encased by said insulation layer, said inner layer having an elbow shaped portion open at one end to receive said gas from said generator, a central portion threaded on the opposite end of said elbow portion and an end portion having one end threaded to said central portion and the opposite end welded to said tube and cup assembly of said external layer, said inner liner having a series of small regularly spaced holes along its length; and
- (d) a titanium-zirconium-molybdenum alloy coupling flange swaged onto one end portion of said outlet for connecting said outlet to said manifold.

4,414,182

## PROCESS FOR PRODUCING HYDROGEN

Hiroshi Okamoto, Ohme; Tetsuichi Kudo, and Go Kawamura, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 345,016

Claims priority, application Japan, Feb. 18, 1981, 56-21551

Int. Cl.<sup>3</sup> C01B 1/18

U.S. Cl. 423—652

4 Claims

1. A process for generating hydrogen from an alkaline aqueous solution of formaldehyde wherein the solution is contacted with at least one catalyst selected from the group consisting of molybdenum, tungsten, molybdenum carbides, tungsten carbides, tungsten molybdenum carbides, molybdenum nitrides, and tungsten borides to catalyze the generation of hydrogen from said solution.

4,414,183

PHENOLIC CHELATE RESIN, PROCESS FOR PRODUCING THE SAME, AND METHOD OF RECOVERING HEAVY METAL IONS WITH THE SAME  
Akio Sasaki, Jyoyo, and Yoshiaki Echigo, Uji, both of Japan, assignors to Unitika Ltd., Amagasaki, Japan  
Division of Ser. No. 246,770, Mar. 23, 1981. This application Jul. 20, 1982, Ser. No. 400,190

Claims priority, application Japan, Mar. 22, 1980, 55-36358

Int. Cl.<sup>3</sup> C22B 60/02; B01J 45/00

U.S. Cl. 423—7

5 Claims

1. A method of recovering a heavy metal ion from an aqueous solution by selective adsorption, comprising the steps of: containing the solution with a phenolic chelate resin having a chelate-forming group wherein hydrogen atoms in a primary or secondary alkylamino group introduced in a phenol nucleus are replaced by a methylenephosphonate group; and allowing for the formation of a chelate.

4,414,184

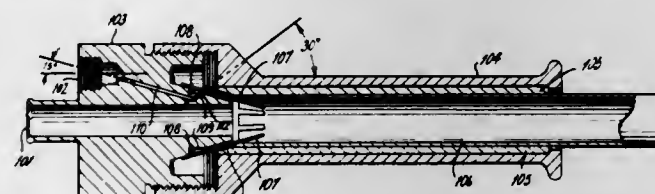
APPARATUS FOR MIXING CHEMICAL COMPONENTS  
Bruce H. W. Pinkston, Cleveland, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 237,242, Feb. 23, 1981, abandoned, which is a continuation of Ser. No. 115,623, Jan. 28, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,193

Int. Cl.<sup>3</sup> B01F 5/06

U.S. Cl. 422—133

2 Claims



1. An apparatus for producing a mixture of chemical components which comprises an elongated housing defining an elongated cylindrical tube extending therethrough, said housing having a main body portion with one end of said inlet tube extending upstream of said main body portion and forming a first inlet means for supplying at least one component into said tube whereby said components flow from said inlet means to the other end of said tube, said other end of said tube extending downstream of said main body and forming an outlet means with the outer surface thereof being conical in shape, said outer conical surface of said outlet means having an upstream annular groove therein and communicating with a plurality of longitudinal grooves extending along the length of said conical surface, second inlet means in said housing communicating with said annular groove via passage means in said housing for supplying at least one component either reactive with one or more components from said first inlet means, or catalyzing the reaction of two or more components from said first inlet means, discharge tube means connected to the downstream end of said main body, and conically shaped, directing and distributing means, located within said discharge tube means cooperating with said outer conical surface of said outlet means for directing the components from said grooves into the flow of components in said tube, said directing and distributing means extending into the flow path of said outlet means for mixing the components from said first and second inlet means.

4,414,185

## PROCESS FOR CALCIUM FLUORIDE PRODUCTION FROM INDUSTRIAL WASTE WATERS

Jonas P. Harrison, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 9, 1982, Ser. No. 406,420

Int. Cl.<sup>3</sup> C02B 1/20

U.S. Cl. 423—163

7 Claims

1. A process for the preparation of high purity calcium fluoride from industrial waste waters containing fluoride which comprises:

- contacting the industrial waste waters containing fluoride with aqueous potassium hydroxide to thereby obtain an aqueous solution of potassium fluoride and potassium hydroxide;
- contacting the solution of step (a) with finely divided high purity lime to thereby obtain a calcium fluoride precipitate in aqueous potassium hydroxide;
- settling the reaction product of step (b) into two phases comprising an aqueous potassium hydroxide supernatant and an aqueous slurry of calcium fluoride;
- recovering the aqueous potassium hydroxide supernatant;
- diluting the slurry of calcium fluoride with water;
- neutralizing the slurry of step (e) with carbon dioxide until the pH of the slurry is lowered to about 8 to 9; and
- filtering the slurry of step (f) to thereby provide the calcium fluoride product.

4,414,186

## METHOD AND APPARATUS FOR CALCINING LIMESTONE IN A SHAFT KILN

Martin Schmidt; Walter Köhler; Hans-Ulrich Loch, all of Bochum, and Albrecht Weber, Ratingen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

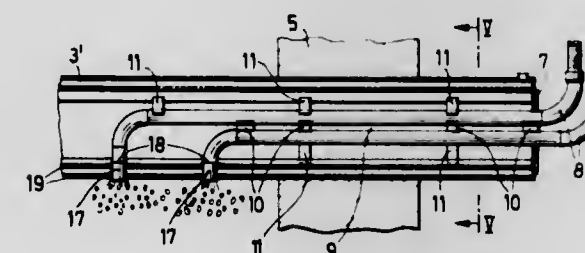
Filed Apr. 22, 1982, Ser. No. 370,833

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3116986

Int. Cl.<sup>3</sup> C01F 11/06; C01B 13/14; F27B 3/22

U.S. Cl. 423—175

9 Claims



1. An apparatus for calcining minerals such as limestone comprising in combination:

- a vertical shaft kiln with a calcining chamber therein;
- a plurality of horizontally extending hollow support means being double walled for the flow of coolant between the double walls and positioned at different levels in said calcining chamber, the inside space within the support being closed in an upward direction;
- fuel conduits each including a plurality of solid fuel pipes in parallel relationship extending from outside said kiln into said support means space within each of the support means;
- guide means extending longitudinally within said support means and parallel thereto supporting said conduits so that the fuel pipes can be slid therealong;
- spaced discharge openings from said pipes along said conduits; said conduit means being positionally adjustable along said guide means so that the location of said openings can be changed relative to the kiln with movement of said conduit means along said guide means for uniform distribution of fuel across the chamber;
- means for delivering granular fuel to said conduit for a soft burning process within the kiln;
- and means for circulating coolant between the double walls of said support means.

4,414,187

## PREPARATION OF METAL PHOSPHATES BY A REACTION USING BORON PHOSPHATE

Carlos E. Bamberger, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,801

Int. Cl.<sup>3</sup> C01B 25/26

U.S. Cl. 423—251

1 Claim

1. A method of preparing metal phosphate, comprising the steps of:

- preparing a mixture of boron phosphate and a first compound selected from the group consisting of  $\text{AlF}_3$ ,  $\text{NdF}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{Nd}_2\text{O}_3$ ,  $\text{Tb}_2\text{O}_3$ ,  $\text{AmO}_2$ ,  $\text{PuO}_2$ ,  $\text{UO}_2$ ,  $\text{NpO}_2$ ,  $\text{CeO}_2$ ,  $\text{Fe}_2\text{O}_3$ , and  $\text{Fe}_3\text{O}_4$ ; and
- heating said mixture to form a phosphate of the metal in said first compound and a second compound selected from the group consisting of a boron oxide and a boron salt.

4,414,188

## PRODUCTION OF ZIRCONIUM DIBORIDE POWDER IN A MOLTEN SALT BATH

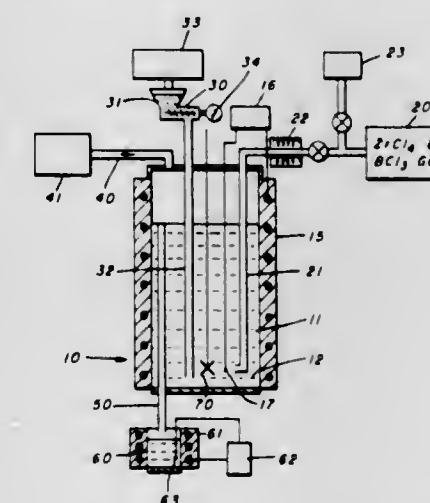
Aaron J. Becker, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 23, 1982, Ser. No. 371,234

Int. Cl.<sup>3</sup> C01B 35/04

U.S. Cl. 423—297

9 Claims



1. A process for production of  $\text{ZrB}_2$  powder, said process comprising the steps of

- providing a molten salt bath comprising  $\text{ZrCl}_4$  or  $\text{ZrCl}_2$  and at least one other salt selected from the group consisting of halides of K, Na, Li, Ca and Mg, and mixtures thereof;
- maintaining said bath at a temperature above its solidus temperature;
- feeding a boron halide and Al or Mg metal to the bath;
- reacting the  $\text{ZrCl}_4$  or  $\text{ZrCl}_2$  with the boron halide and Al or Mg in the bath to form  $\text{ZrB}_2$  powder; and
- separating the  $\text{ZrB}_2$  powder from the bath.

4,414,189

## MODIFICATION OF CATALYTIC ACTIVITY OF SYNTHETIC ZEOLITES

George T. Kokotallo, Woodbury; Albert C. Rohman, Jr., Gibbstown, and Stephen Sawruk, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,829

Int. Cl.<sup>3</sup> C01B 33/28; B01J 29/04, 29/28

U.S. Cl. 423—328

16 Claims

1. A method for altering catalytic activity of a synthetic crystalline zeolite characterized as having a crystal structure which provides constrained access to and egress from the intracrystalline free space by virtue of having a pore dimension greater than about 5 Angstroms and pore windows of about a size as would be provided by 10-membered rings of oxygen atoms which comprises the sequential steps of synthesizing said zeolite from a reaction mixture containing a source of bulky organic cations, contacting the synthesized zeolite with an aqueous hydrogen fluoride solution of from about 0.005 Normal to about 0.5 Normal at a temperature of from about ambient to about 100° C. and a pressure of from about atmospheric to about 40 psig for a contact time of from about 1 hour to about 10 hours, calcining the hydrogen fluoride solution contacted zeolite at a temperature of from about 200° C. to about 600° C., contacting the calcined zeolite with an ammonium exchange solution at a temperature of from about ambient to about 100° C., and calcining the ammonium exchange solution contacted zeolite at a temperature of from about 200° C. to about 600° C.



4,414,190

## METHOD OF PREPARING SILICON NITRIDE

Motoo Seimiya, Yokosukashi, and Katsutoshi Nishida, Yokohamashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
Continuation of Ser. No. 188,101, Sep. 17, 1980. This application Mar. 15, 1982, Ser. No. 358,433

Claims priority, application Japan, Nov. 22, 1979, 54-150739  
Int. Cl.<sup>3</sup> C01B 21/06

U.S. Cl. 423—344

11 Claims

1. In a method of producing silicon nitride of high  $\alpha$ -Si<sub>3</sub>N<sub>4</sub> content, which method consists essentially of heating silica in the presence of a carbon source and a nitrogen source, the improvement consisting in utilizing as said silica a wet process white carbon having a mean particle size between 0.015 and 0.035 micron, and having a surface area between 50 and 350 m<sup>2</sup>/g, said wet process white carbon having been produced by the process consisting essentially of dissociating an alkali metal silicate with an acid.

4,414,191

## PROCESS FOR THE PRODUCTION OF AMMONIA

Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

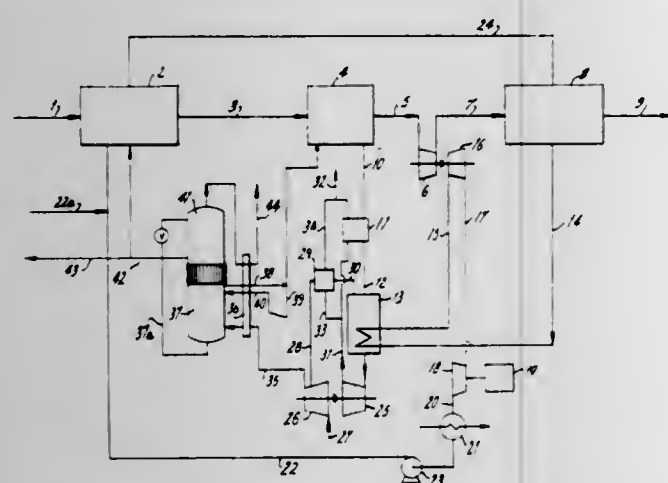
Filed Aug. 7, 1981, Ser. No. 290,926

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C01C 1/04

U.S. Cl. 423—359

31 Claims



1. An improved process for the production of ammonia comprising:

- passing a hydrogen-containing feed gas at an adsorption pressure of from about 300 to about 1,000 psia to a multiple bed pressure swing adsorption system capable of selectively adsorbing impurities from said hydrogen, each bed of said system undergoing the processing cycle of:
  - introduction of feed gas to the bed inlet end at said adsorption pressure, with adsorption of impurities therefrom and discharge of an unadsorbed, purified hydrogen stream from the discharge end thereof;
  - partial cocurrent depressurization of the bed with release of hydrogen-containing void space gas from the discharge end of the bed;
  - production of said released void space gas to the discharge end of an adsorption bed undergoing repressurization to equalize the pressure therebetween;
  - countercurrent depressurization of the bed with release of gas from the inlet end thereof for blowdown to its lower desorption pressure;
  - introduction of purge gas to the discharge end of the bed at its desorption pressure for the purging thereof, with the discharge of said purge gas from the inlet end of the bed; and
  - repressurization of the purged bed to said adsorption pressure; and

(vii) repetition of said cyclic steps (i)-(vi) with additional quantities of feed gas;

- passing nitrogen to the discharge end of each bed as said purging gas at an elevated purge pressure of from about 60 to about 100 psia, the unadsorbed, purified hydrogen stream, withdrawn from each bed at said adsorption pressure during the next succeeding adsorption step containing from about 16% to about 26% by volume nitrogen, said nitrogen comprising residual amounts of purge gas remaining in the bed upon completion of said purge; and
- synthesizing ammonia from said purified hydrogen-nitrogen gas discharged from said adsorption system, whereby the purified hydrogen-nitrogen gas discharged from said pressure swing adsorption system at said adsorption pressure can advantageously be employed for the synthesis of ammonia.

4,414,192

## METHOD OF PRODUCING A HIGHLY REACTIVE PITCH FRACTION AND ITS USAGE

Jürgen Palm, Oer-Erkenschwick; Herbert Glaser, Gladbeck; Gerd Collin, Duisburg; Rolf Marrett and Maximilian Zander, both of Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,636

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142826

Int. Cl.<sup>3</sup> C01B 31/02; C10C 3/02, 3/08; D01F 9/12

U.S. Cl. 423—445

4 Claims

1. A method of producing a highly reactive pitch fraction from a coal-tar pitch solution obtained through extraction, comprising treating a coal-tar pitch extract in a chloroform solution with 1-10% by weight of solid iodine at room temperature with agitation for 1-3 hours to obtain solid reaction products, separating said products and, in the presence of chloroform, decomposing said products with an aqueous ammonium solution and, following separation of the aqueous phase and removal by distillation of the solvent, recovering the highly reactive pitch fraction as a residue.

4,414,193

## PRODUCTION OF CHLORINE DIOXIDE ON A SMALL SCALE

Maurice C. J. Fredette, and Gerald Cowley, both of Mississauga, Canada, assignors to ERCO Industries Limited, Islington, Canada

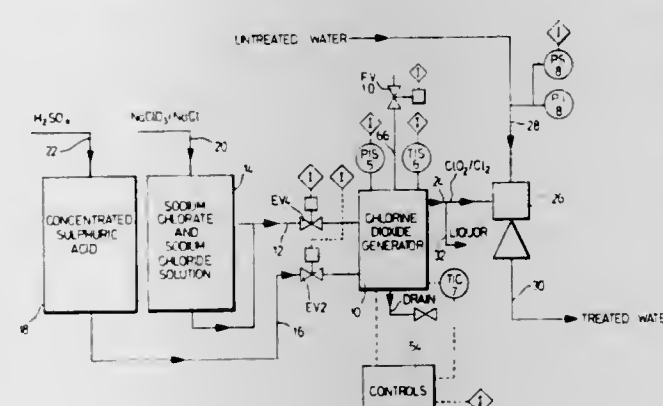
Filed Sep. 16, 1982, Ser. No. 418,732

Claims priority, application Canada, Sep. 9, 1982, 411094

Int. Cl.<sup>3</sup> C01B 11/02

U.S. Cl. 423—478

18 Claims





the acids, a polyamine, a thioalcohol, a polyhydric alcohol and a  $\beta$ -dicarbonyl compound, for a length of time sufficient to convert the amorphous ferric hydroxide into the acicular ferric oxide.

4,414,197

# METHOD FOR PREPARING PERMANENT SLIDES OF RARE SORTED CELLS

Richard A. Dussault, Seekonk, Mass., assignor to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Mar. 19, 1982, Ser. No. 360,119

Int. Cl.<sup>3</sup> G02B 21/34

U.S. Cl. 424—3

4 Claims

1. A method for preparing permanent slides of rare sorted cells present in a suspending solution comprising the steps of:

- providing a microscope slide;
- further providing means for retaining cells, said retainer means having at least one well;
- coating one side of both the microscope slide and the retainer means with an effective amount of serum albumin for substantially sealing capillary passages between the slide and retainer means;
- contacting together the coated sides of the microscope slide and retainer means to form a slide-retainer means sandwich;
- partially filling the well with an effective amount of serum albumin for retaining the cells in the well;
- depositing the sorted cells into the well;
- centrifuging the slide-retainer means sandwich whereby the cells are contacted with and retained by the serum albumin; and
- removing the retainer means and excess suspending solution.

4,414,198

# RAPIDLY DISINTEGRABLE TABLET COMPOSITION AND METHOD

Joseph Michaelson, 4767 Elmer Ave., North Hollywood, Calif. 91602

Filed Apr. 23, 1982, Ser. No. 371,517

Int. Cl.<sup>3</sup> A61K 9/26, 9/36, 9/62, 9/04

U.S. Cl. 424—44

19 Claims

1. Rapidly water-disintegrable tablet comprising an active ingredient, and distributed therewithin a small but effective amount of a tablet disintegrable system comprising an unreacted, intimate mixture of alginic acid and a water soluble carbonate radical precursor in proportions reactive to form metal alginic acid salt and carbonic acid when the tablet is placed in water, the bulk of said formed salt acting to swell the tablet and the carbonic acid acting to simultaneously release carbon dioxide within the swelling tablet whereby rapid disintegration of the tablet is effected, the alginic acid salt acting to body the resulting active ingredient solution.

4,414,199

# TOOTH PASTE

John R. Strobbridge, Comstock Park, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Jul. 15, 1982, Ser. No. 398,343

Int. Cl.<sup>3</sup> A61K 7/16, 7/18

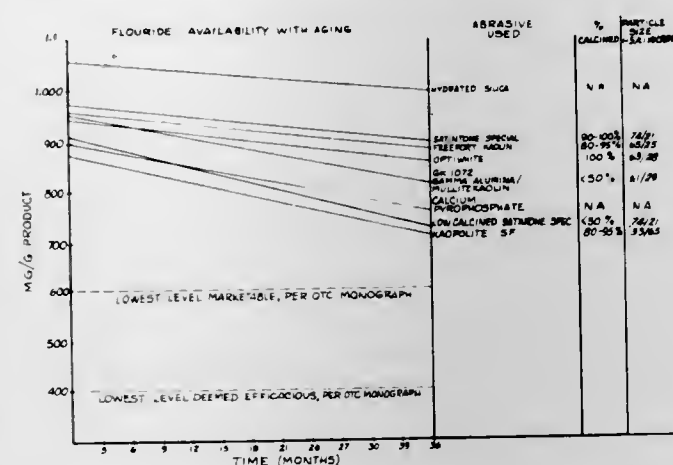
U.S. Cl. 424—52

20 Claims

1. In a toothpaste containing fluoride and calcined kaolin, the improvement comprising:

the calcined kaolin being at least 80% calcined to the mullite

crystal form, the majority of the particles being sufficiently fine to afford good polishing without excess abrasion, but no more than about 35% of the particles being less than 1 micron in diameter.



sion, but no more than about 35% of the particles being less than 1 micron in diameter.

4,414,200

# POWDER STICK COMPOSITION FOR TOPICAL APPLICATION

John H. Murphy, Matamoras, Pa.; Jon D. Packer, and Dennis R. Brown, both of Port Jervis, N.Y., assignors to Kolmar Laboratories, Inc., Port Jervis, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,969

Int. Cl.<sup>3</sup> A61K 7/02, 7/34

U.S. Cl. 424—63

12 Claims

1. A method of preparing a cosmetic powder product, comprising the steps of mixing at an elevated temperature a fatty alcohol containing 12 to 22 carbon atoms in the molecule, a finely divided filler, and a sufficient quantity of a liquid cyclic evaporable siloxane to form a liquid moldable slurry, introducing the slurry into a mold, solidifying the slurry to provide a solid molded product, evaporating the major portion of the siloxane from the molded product to provide a dried powder product, and thereafter packaging said product, said product having excellent pay off and high resistance to humidity absorption.

4,414,201

IMMUNOPOTENTIATOR CONTAINING ABRIN  
Hiroshi Shionoya, Tokorozawa; Haruyoshi Arai, Inuyama; Nozomu Koyanagi, Niiza, and Hitoshi Takeuchi, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 204,786, Nov. 7, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 384,324

Claims priority, application Japan, Nov. 9, 1979, 54-144326

Int. Cl.<sup>3</sup> A61K 37/00, 39/00

U.S. Cl. 424—88

1 Claim

1. A method for enhancing immune response to intra-cellular and extra-cellular parasitic bacteria in a human or animal subject in need of such treatment which comprises parenterally administering abrin to such human or animal subject in an amount of from at least about 3 ng per human or animal subject up to 1.5  $\mu$ g/kg of the body weight of the human or animal subject.

4,414,202

# COMPOSITION FOR TREATMENT OF WOUNDS

Anthony N. Silvestri, 930 Ashland Ave., River Forest, Ill. 60305

Continuation of Ser. No. 117,717, Feb. 19, 1980, abandoned.

This application Sep. 14, 1981, Ser. No. 301,472

Int. Cl.<sup>3</sup> A61K 31/70, 33/26

U.S. Cl. 424—147

6 Claims

1. A composition for application to skin wounds comprising, in effective amounts:

- a starch hydrolysate having a Dextrose Equivalent less than about 35; and

(b) at least one component selected from the group consisting of alphaketoglutaric acid and alphaketoglutarate salts.

4,414,203

# PERIODONTAL POWDER CONTAINING EXSICCATED POTASSIUM ALUM

Alberto M. Cabardo, Jr., 197 N. Washington St., Battle Creek, Mich. 49016

Division of Ser. No. 848,802, Nov. 7, 1977, Pat. No. 4,276,287, which is a continuation of Ser. No. 618,618, Apr. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 256,388, May 24, 1972, abandoned. This application Apr. 16, 1981, Ser. No. 255,031

Int. Cl.<sup>3</sup> A61K 33/06, 7/16, 33/00, 7/24

U.S. Cl. 424—154

18 Claims

1. A periodontal powder composition useful in periodontal treatment comprising a mixture of evenly exsiccated potassium alum and sodium bicarbonate in a ratio, by weight, of approximately 2:1 of said potassium alum to said sodium bicarbonate.

4,414,204

# ANTIBIOTIC PREPARATIONS HAVING INCREASED EFFECTIVENESS, PROCESSES FOR THEIR MANUFACTURE AND METHOD FOR INCREASING THE ANTIBIOTIC ACTION OF ANTIBIOTICS

Lajos Tarcsay, Grenzach-Wyhlen, Fed. Rep. of Germany; Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany, and Jaroslav Stanek, Birsfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 172,035, Jul. 24, 1980, abandoned. This application Jan. 21, 1981, Ser. No. 226,966

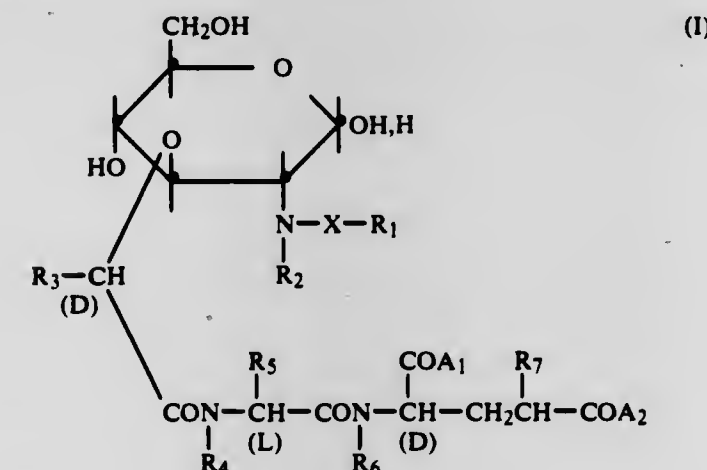
Claims priority, application Switzerland, Jul. 25, 1979, 6893/79

Int. Cl.<sup>3</sup> A61K 37/02, 31/71; C07C 103/52

U.S. Cl. 424—177

29 Claims

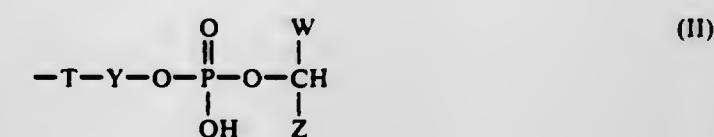
1. Pharmaceutical preparations with antibiotic activity comprising an antibiologically effective amount of a combination of at least one antibiotic and an amount effective to increase the activity of said antibiotic of at least one muramylpeptide of the formula (I)



wherein

- X represents carbonyl or carbonyloxy,  
R1 represents optionally substituted alkyl or aryl,  
R2, R4 and R6 represent hydrogen or lower alkyl,  
R3 represents hydrogen or lower alkyl,  
R5 represents hydrogen, lower alkyl, free or functionally modified hydroxy-lower alkyl, free or functionally modified mercapto-lower alkyl, optionally substituted amino-lower alkyl, cycloalkyl, cycloalkyl-lower alkyl, optionally substituted aryl or alkyl, nitrogen-containing heterocyclyl or heterocyclyl-lower alkyl, or  
R4 and R5 together represent also alkylene having 3 or 4 carbon atoms,

R7 represents hydrogen or optionally esterified or amidated carboxyl, and one of the radicals A1 and A2 represents a radical of the formula



wherein

T represents NH or O,  
Y represents an optionally substituted alkylene group that can also be interrupted by one or two oxycarbonyl and/or iminocarbonyl groups,  
W represents hydrogen, and  
Z represents a 1,2-dihydroxyethyl or 2-hydroxyethyl group in which at least one hydroxy group is esterified by an optionally unsaturated long-chain aliphatic carboxylic acid or etherified by an optionally unsaturated long-chain aliphatic alcohol, or each of W and Z represents a hydroxymethyl group esterified by an optionally unsaturated long-chain aliphatic carboxylic acid or etherified by an optionally unsaturated long-chain aliphatic alcohol, and the other of the radicals

A1 and A2 represents free or etherified hydroxy, free or alkylated amino, lower alkylamino or aminocarbonyl-lower alkylamino, and/or a pharmaceutically acceptable salt thereof together with a significant amount of a pharmaceutically acceptable carrier.

4,414,205

# CELL GROWTH INHIBITORY SUBSTANCES

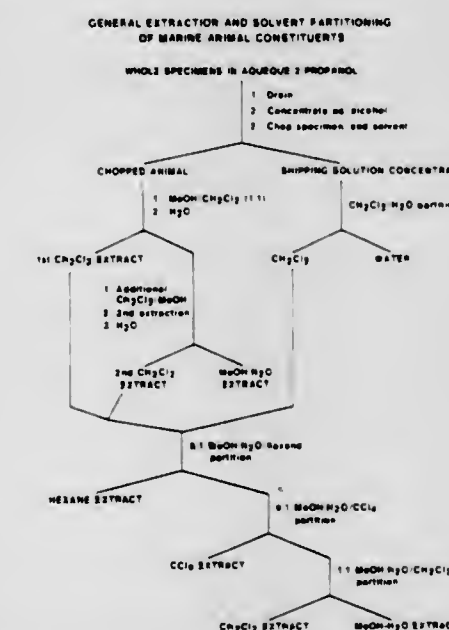
George R. Pettit, Paradise Valley, Ariz., assignor to University Patents, Inc., Tempe, Ariz.

Filed Aug. 28, 1981, Ser. No. 297,473

Int. Cl.<sup>3</sup> A61K 37/00, 35/56; C07G 7/00

U.S. Cl. 424—177

10 Claims



1. Cell growth inhibitory substance designated dolastatin 1 which has the following characteristics:  
Melting point—105°–111° C.;  
Thin layer chromatography (spots visualized by UV light or I2 vapor; I2 spots are yellow);

Solvent system	Rf
(AcOEt/EtOH 96:4)	0.41
(CHCl3/EtOH 95:5)	0.23



-continued

Solvent system	Rf
(CHCl <sub>3</sub> /MeOH/H <sub>2</sub> O 90:10:0.8)	0.46

## Ultraviolet spectrum

 $\lambda$ MeOH/max 218.8, 230(sh) and 243(sh)nM;

Mass spectrum (Field desorption)

MW=991 $\pm$ 1+ Ion  $\pm$  1: 1038 (M+2Na-H)<sup>+</sup> 1014 (M+Na)<sup>+</sup>, 807, 668, 551, 100+ Ion  $\pm$  2: 783, 680, 409, 381;

Proton magnetic resonance

"CDCl<sub>3</sub>" (0.8% solution in CDCl<sub>3</sub>)-60 MHz  $\delta$ : 0.90 (s), 0.99 (large peak), 1.05 (s), 1.10 (s), 1.18 (s), 1.26 (s), 1.80 (m), 2.06 (m), 2.17 (s), 2.28 (s, large peak), 2.44 (m), 3.03 (s), 3.16 (s), 3.34 (s, large peak), 3.38 (broad s), 3.90 (m), 4.12 (m), 4.80 (m), 5.57 (m), 6.91 (m), 7.22 (s, large peak), 7.26 (s), 7.73 (d, J=3.5 Hz);

"Acetone-d<sub>6</sub>" (0.8% solution in acetone d<sub>6</sub>)-60 MHz  $\delta$ : 0.82 (s), 0.94 (m, large peak), 1.15 (m), 1.23 (s), 1.70 (m), 2.28 (s, large peak), 2.48 (m), 3.10 (s), 3.22 (s), 3.30 (s), 3.34 (s), 3.45 (m), 3.58 (m), 3.92 (m), 4.15, 4.81 (m), 5.69 (t); CDCl<sub>3</sub>-90 MHz

$\delta$ : 0.89 (s), 0.96 (s), 0.99 (s), 1.06 (s), 1.10 (s), 1.18 (s), 1.26 (s, large peak), 1.42 (s), 1.66 (broad s, large), 1.98 (s), 2.06 (s), 2.30 (broad s, large), 2.42 (s), 3.03 (s), 3.16 (s), 3.33 (s, large peak), 3.38 (s), 3.72 (s), 3.90 (m), 4.12 (m), 4.80 (q, J=2.5 Hz and J=5.0 Hz), 5.30 (s), 5.57 (q, J=2.5 Hz and 7.5 Hz), 6.91 (m), 7.22 (s), 7.26 (s, large peak), 7.74 (d, J=3.5 Hz).

4. A process for treating an animal or human hosting a neoplastic disease which comprises the administration of an effective amount of dolastatin 1 to said host.

7. A process for preparing dolastatins active against P388 leukemia which comprises:

- extracting a ground preparation of the Indian Ocean sea hare *Dolabella* with ethanol to obtain an ethanolic extract;
- subjecting said ethanolic extract to solvent partitioning to obtain an extract showing activity against P388 leukemia;
- chromatographing said active extract and isolating the fractions active against P388 leukemia; and,
- rechromatographing said active fraction to obtain further fractions active against P388 leukemia.

4,414,206

## ANIMAL FEEDS

Maxwell Gordon, Dewitt, and George J. Christie, Skaneateles, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 156,787, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,011, Jul. 19, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,393

Int. Cl.<sup>3</sup> A61K 37/00

U.S. Cl. 424-177

2 Claims

1. A method for altering rumen digestion in ruminant animals having a developed rumen function so as to increase the production of propionates, decrease the production of acetates and suppress the production of methane, which method comprises the oral administration to ruminant animals in need thereof feed containing amphotycin at a concentration of from about 4 to 100 grams per ton of feed.

4,414,207  
RUTIN POLY(H)-SULFATE SALTS AND RELATED COMPOUNDS

Vijay G. Nair, New York, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

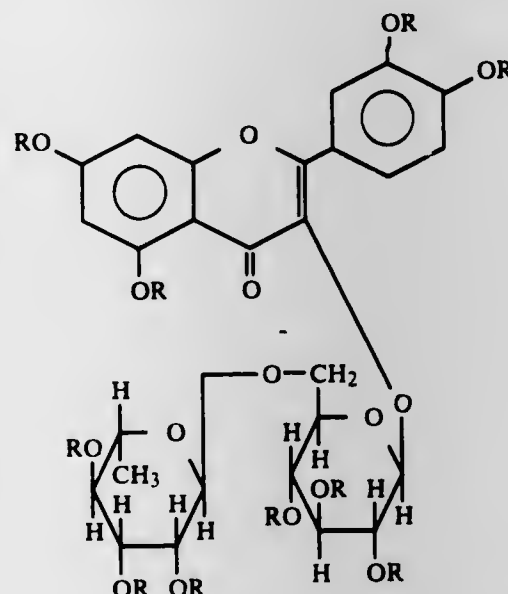
Division of Ser. No. 181,251, Aug. 25, 1980, Pat. No. 4,334,058, which is a continuation-in-part of Ser. No. 62,587, Jul. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,423, Dec. 4, 1978, abandoned. This application Feb. 22, 1982, Ser. No. 350,677

Int. Cl.<sup>3</sup> A61K 31/70

U.S. Cl. 424-180

15 Claims

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a rutin poly(H)-sulfate of the formula:



wherein each R is selected from the group consisting of hydrogen and —SO<sub>3</sub>A; wherein A is a pharmaceutically acceptable salt cation; with the proviso that at least six of the R groups are —SO<sub>3</sub>A.

4,414,208

O,S-DIALKYL-O-(4-FLUOROPHENYL)-(DI)THIOPHOSPHORIC ACID ESTERS, AND THE USE THEREOF FOR COMBATING PESTS

Hans-Peter Loeffler, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

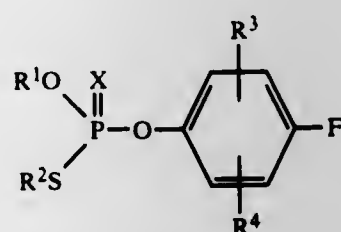
Continuation of Ser. No. 166,572, Jul. 7, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 337,076

Int. Cl.<sup>3</sup> C07F 9/165; A01N 57/14

U.S. Cl. 424-224

3 Claims

1. O,S-Dialkyl-O-(4-fluorophenyl)-(di)thiophosphoric acid esters of the formula



where R<sup>1</sup> is ethyl, R<sup>2</sup> is propyl or butyl, R<sup>3</sup> is hydrogen, or halogen, R<sup>4</sup> is hydrogen, halogen or methyl and X is oxygen or sulfur.

3. A process for combating insects and Arachnida pests, wherein O,S-dialkyl-O-(4-fluorophenyl)-(di)thiophosphoric acid esters of claim 1 are allowed to act on the pests of their habitat.

4,414,209

## MICRONIZED AEROSOL STEROIDS

Peter B. Cook, Standon, and John H. Hunt, Theydon Bois, both of England, assignors to Allen & Hanburys Limited, London, England

Division of Ser. No. 703,821, Jul. 9, 1976, Pat. No. 4,044,126, which is a continuation of Ser. No. 352,187, Apr. 18, 1973, abandoned. This application Jun. 13, 1977, Ser. No. 805,910

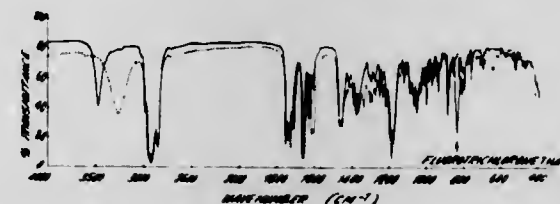
Claims priority, application United Kingdom, Apr. 20, 1972, 18421/72

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/56; C07J 7/00

U.S. Cl. 424-243

10 Claims



1. An antiinflammatory steroid in the form of a crystalline solvate with a halogenated hydrocarbon or said crystalline solvate from which part or all of the halogenated hydrocarbon has been removed, wherein said halogenated hydrocarbon is a chloro or chlorofluoro hydrocarbon having 1 or 2 carbon atoms; said steroid is beclomethasone dipropionate, betamethasone-21-acetate-17-isobutyrate or 21-chloro-21-desoxybetamethasone-17-propionate, said steroid being stabilized with respect to further crystal growth in a chloro or chlorofluoro hydrocarbon solvent having 1 or 2 carbon atoms and the particle size of substantially all of the steroid material being such as to permit inhalation into the human bronchial system.

4,414,210

## 2-HYDROXYARYLETHYLTRIAZOLE FUNGICIDES

George A. Miller, Maple Glen, and Hak-Foon Chan, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

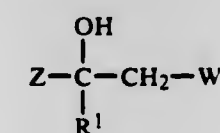
Continuation of Ser. No. 81,227, Oct. 2, 1979, abandoned, which is a division of Ser. No. 852,125, Nov. 16, 1977, abandoned. This application May 19, 1981, Ser. No. 264,999

Int. Cl.<sup>3</sup> A01N 43/64, 55/02; C07D 249/08; C07F 1/08

U.S. Cl. 424-245

12 Claims

1. A compound of the formula



wherein

Z is an unsubstituted phenyl or naphthyl group or a phenyl or naphthyl group substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, (C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkoxy, (C<sub>1</sub>-C<sub>4</sub>)alkylthio, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfinyl, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl and phenoxy, phenylthio, phenylsulfinyl or phenylsulfonyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl;

R<sup>1</sup> is cyano (C<sub>3</sub>-C<sub>12</sub>)alkyl, (C<sub>3</sub>-C<sub>8</sub>)cycloalkyl, (C<sub>2</sub>-C<sub>8</sub>)alkenyl, (C<sub>5</sub>-C<sub>8</sub>)cycloalkenyl, (C<sub>2</sub>-C<sub>8</sub>)alkynyl, unsubstituted phenyl or phenyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylsulfinyl and methylsulfonyl; or unsubstituted benzyl or phenethyl, or benzyl or phenethyl substituted with up to two substituents selected from the group consisting of halogen, nitro,

trihalomethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl, and methylsulfonyl; and  
W is a 1 or 4-(1,2,4-triazole);  
and the agronomically acceptable acid addition salts and metal said complexes thereof.

4,414,211

## HETEROCYCLIC DERIVATIVES OF GUANIDINE

Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

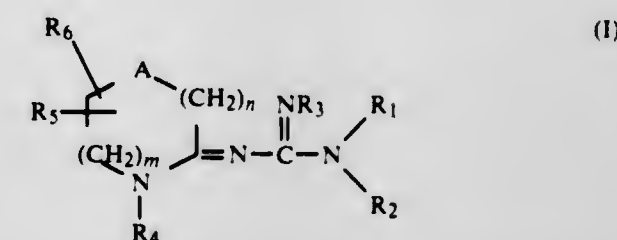
Continuation-in-part of Ser. No. 943,099, Sep. 18, 1978, abandoned. This application Mar. 14, 1980, Ser. No. 130,272

Int. Cl.<sup>3</sup> A61K 31/42, 31/425, 31/535, 31/54; C07D 263/16, 265/30, 277/18, 279/12

U.S. Cl. 424-246

33 Claims

1. A heterocyclic derivative of guanidine selected from the group consisting of a compound having the formula:



and the pharmaceutically acceptable acid addition salts thereof wherein:

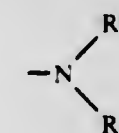
A is a member selected from the group consisting of O and S;

n is the integer 0, 1, 2, 3;

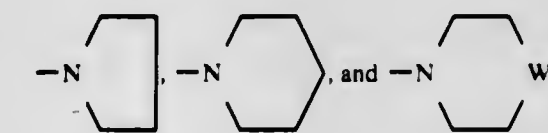
m is the integer 0, 1, 2, 3, provided that n+m=1, 2, or 3;

R<sub>1</sub> is a member selected from the group consisting of methyl and ethyl;

R<sub>2</sub> is a member selected from the group consisting of loweralkyl, cyclopentyl, cyclohexyl, and benzyl;



taken together represents a member selected from the group consisting of:



wherein W is a member selected from the group consisting of O, S, N-loweralkyl and N-aryl; and

R<sub>3</sub> is a member selected from the group consisting of: alkyl having from 4 to 10 carbons;

phenyl, methylenedioxyphenyl; phenyl substituted with from 1 to 3 substituents each selected from the group consisting of halo, loweralkyl and loweralkoxy; phenyl substituted with a member selected from the group consisting of hydroxy, benzyloxy, loweralkanoxyloxy, nitro; trifluoromethyl and methylthio;

naphthyl;

cyclopentyl; cyclohexyl;

exo-2-norbornyl; endo-2-norbornyl; 1-adamantyl;

arylalkyl in which the aryl function is phenyl and the alkyl function has from 1 to 4 carbons; and

diphenylalkyl in which the alkyl function has from 1 to 2 carbons;

R<sub>4</sub> is a member selected from the group methyl, ethyl, n-propyl, i-propyl, n-butyl and isobutyl;

R<sub>5</sub> is H or loweralkyl having from 1 to 4 carbons; and



R<sub>6</sub> is H or loweralkyl having from 1 to 4 carbons.

4,414,212

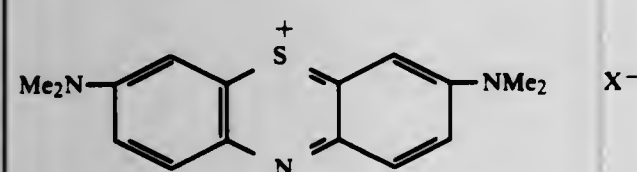
# METHOD OF TREATMENT OF PRE-MENSTRUAL SYNDROME

Graham J. Naylor, Lugate, Lucklawhill Balmiallo, St. Andrews, Fife, Scotland (KY16 OBQ), assignor to Graham J. Naylor and Pamela H. Naylor, both of Andrews, Scotland  
Filed Mar. 2, 1982, Ser. No. 354,065

Int. Cl.<sup>3</sup> A61K 31/54, 31/365, 31/195, 37/00

U.S. Cl. 424-247 10 Claims

1. A method of treatment of pre-menstrual syndrome in a female patient suffering from pre-menstrual syndrome, said method comprising the step of administering to said patient a therapeutically effective dosage of at least one compound selected from the group consisting of ascorbic acid, physiologically acceptable salts and esters thereof, EDTA, glutathione, physiologically acceptable salts and esters thereof, and a compound of Formula I



wherein X is a physiologically acceptable anion, and bioprecursors thereof.

4,414,213

# DIHYDROPYRIDYL CYCLIC IMIDATE ESTERS AND THEIR PHARMACEUTICAL USE

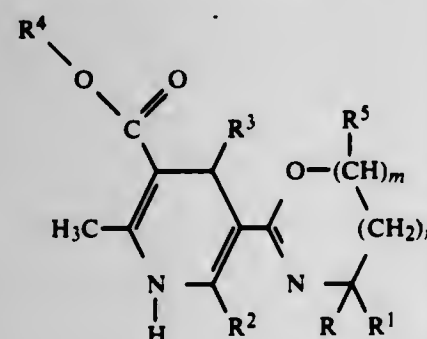
Graham S. Poindexter, and David L. Temple, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Mar. 22, 1982, Ser. No. 360,758

Int. Cl.<sup>3</sup> A61K 31/44; C07D 211/90, 263/14

U.S. Cl. 424-248.5 40 Claims

1. A compound having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

R and R<sup>1</sup> are independently selected from hydrogen, lower (C<sub>1</sub>-C<sub>4</sub>) alkyl or lower alkoxy-lower alkyl groups;

R<sup>2</sup> is lower alkyl, phenyl, or thienyl;

R<sup>3</sup> is cycloalkyl of 5 to 7 carbon atoms, bicycloalkenyl of 7 to 9 carbon atoms, furanyl, indolyl, pyridyl, thienyl, phenyl, naphthyl, or substituted phenyl with the substituents comprising acetamino, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, cyano, halogen, hydroxyl, nitro, trifluoromethyl, trifluoromethylsulfonyl, and methylsulfonyl;

R<sup>4</sup> is lower alkyl, lower alkoxy-lower alkyl, amino-lower alkyl, halo-lower alkyl, or di-lower alkylamino-lower alkyl;

R<sup>5</sup> is lower alkyl or aryl;

m is 0 or 1; and

n is 0, 1, or 2.

38. The method of exerting a vasodilating effect in a mammalian host which comprises administering to a mammal having a condition in which therapeutic benefit is derived from

vasodilation, a non-toxic effective vasodilating dose of a compound as claimed in claim 1.

4,414,214

# BENZODIOXOLE DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Ernst Habicht, Oberwil, and Paul Zbinden, Witterswil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,873

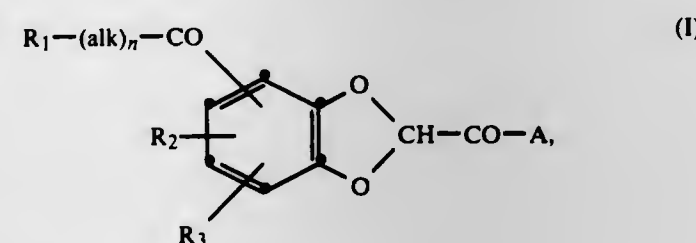
Claims priority, application Switzerland, Apr. 24, 1981, 2698/81

Int. Cl.<sup>3</sup> A61K 31/335; C07D 317/68

U.S. Cl. 424-248.51

22 Claims

1. A benzodioxole derivative of the formula I



in which

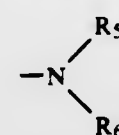
R<sub>1</sub> represents phenyl, thienyl or furyl, each of which is unsubstituted or substituted by lower alkyl, lower alkoxy or halogen,

alk represents an alkylene or alkylidene radical having a maximum of 5 carbon atoms,

n represents 0 or 1,

R<sub>2</sub> and R<sub>3</sub> each represents, independently of the other, hydrogen, lower alkyl, lower alkoxy or halogen, and

A represents the radical O-R<sub>4</sub>, wherein R<sub>4</sub> represents hydrogen or lower alkyl, or A represents the radical



in which either R<sub>5</sub> and R<sub>6</sub> each represents, independently of the other, hydrogen or lower alkyl, or R<sub>5</sub> and R<sub>6</sub> are bonded to one another and, together with the adjacent nitrogen atom, represent unsubstituted or lower alkyl-substituted tetra- to hexamethyleneimino or 4-morpholinyl, in the form of racemates or optical antipodes, and the salts of a compound of the formula I in which A represents OR<sub>4</sub> wherein R<sub>4</sub> represents hydrogen, with bases, and the acid addition salts of a compound of the formula I in which the radical R<sub>1</sub> has a basic character.

19. A method for treating oedema or hypertension in a mammal comprising administering to said mammal a therapeutically effective amount of a compound according to claim 1 or of a pharmaceutically acceptable salt of a compound according to claim 1 that is capable of salt formation.

4,414,215

# N-ACYL DERIVATIVES OF 6-ALKYLAMINO 5-CHLORO-3-NITROPYRAZINAMINES FOR RADIATION THERAPY

George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 295,445, Aug. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,092, Oct. 6, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,382

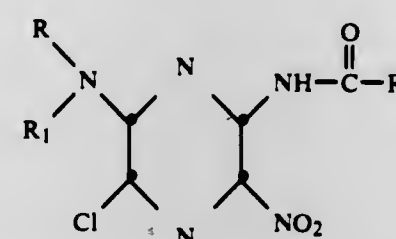
Int. Cl.<sup>3</sup> A61K 31/495; C07D 241/16, 241/20

U.S. Cl. 424-250

12 Claims

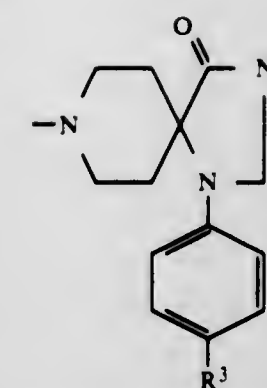
1. A pharmaceutical composition useful in enhancing the

therapeutic effect of radiation treatment comprising an effective amount of a radiation enhancing compound of the formula:



wherein R and R<sup>1</sup> are each hydrogen, C<sub>1</sub>-C<sub>6</sub> lower-alkyl and substituted lower alkyl having one or two amino C<sub>1</sub>-6 lower-alkylamino or dialkylamino, lower alkoxy, hydroxy or halo C<sub>1</sub>-C<sub>6</sub> lower alkenyl, and substituted lower alkenyl having one or two amino, C<sub>1</sub>-C<sub>6</sub> alkylamino or dialkylamino, lower alkoxy, or hydroxy groups or when taken together and linked through an additional nitrogen or oxygen constitute a 5-7 member saturated heterocyclic ring comprising a morpholine, a piperazine or an N-substituted piperazine wherein the N-substituent is either hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxyalkyl; and R<sup>2</sup> is a lower alkyl substituent; and a pharmaceutical carrier.

-continued



wherein Z is oxygen atom or sulfur atom, R<sup>3</sup> is hydrogen atom or halogen atom, R<sup>4</sup> is hydrogen atom, lower alkyl group or phenyl group which may be substituted by one to three substituents at any position(s) on the phenyl nucleus, each substituent being independently selected from halogen atom, lower alkyl group and lower alkoxy group, and R<sup>5</sup> is hydrogen atom or lower alkyl group.

10. A pharmaceutical composition comprising the compound of claim 1 in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

4,414,217

# 3,5-DI(T-BUTYL)-4-HYDROXYPHENYL SUBSTITUTED PYRIDINES

George G. I. Moore, Houlton, Wis., assignor to Riker Laboratories, Inc., St. Paul, Minn.

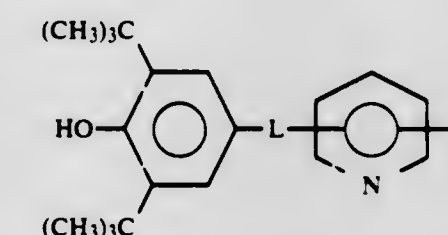
Filed Nov. 23, 1981, Ser. No. 324,062

Int. Cl.<sup>3</sup> A61K 31/44; C07D 213/04

U.S. Cl. 424-263

12 Claims

1. Compound of the formula



wherein L is a carbon-carbon bond or a carbonyl radical and R is hydrogen or methyl, or a quaternary ammonium salt thereof, with the proviso that when L is a carbonyl radical bonded to the 2-position of the pyridine ring and R is methyl, R is bonded to the 3- or 5-position of the pyridine ring.

4,414,218

# CYANO-(SUBSTITUTED AND UNSUBSTITUTED PYRIDINYL) METHYL AND ARYL ESTERS OF CARBOXYLIC ACID

Andrew T. Au, Needham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

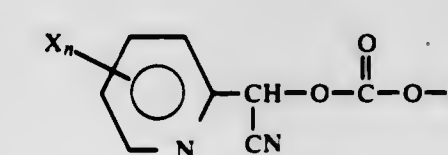
Filed Mar. 3, 1982, Ser. No. 354,481

Int. Cl.<sup>3</sup> C07D 213/55; A01N 43/40

U.S. Cl. 424-263

12 Claims

1. The pyridinyl cyano carbonates of the formula



wherein:

R is alkyl of up to 20 carbons, phenyl or phenylmethyl; X is hydrogen, halo, cyano, nitro, R or OR; and



n is 1, 2, 3 or 4, with a proviso that n is 1 or 2 when X is cyano, nitro R or OR.

3. A pesticidal composition comprising an inert horticultural carrier and as a pesticide, a compound of claim 1, the concentration of said pesticide being from 0.0001 to about 50 percent of the total weight of the composition.

4,414,219

## ANTIDEPRESSANT

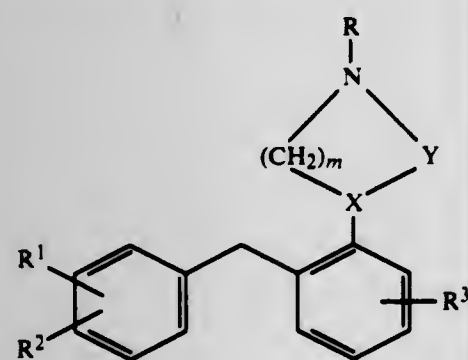
( $\alpha$ -PHENYL-2-TOLYL)AZACYCLOALKANOLS AND DERIVATIVES THEREOF

Lawrence L. Martin, Lebanon; Helen H. Ong, Whippany; Vernon B. Anderson, High Bridge, and Charles A. Crichlow, Piscataway, all of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

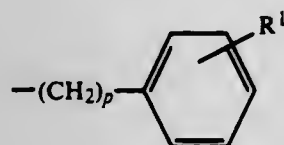
Division of Ser. No. 6,791, Jan. 25, 1979, Pat. No. 4,241,071, which is a continuation-in-part of Ser. No. 763,294, Jan. 27, 1977, abandoned. This application Aug. 1, 1980, Ser. No. 174,435

Int. Cl.<sup>3</sup> A61K 31/445, 31/40; C07D 211/52, 211/42  
U.S. Cl. 424-267 50 Claims

1. A compound of the formula



wherein X is COR<sup>5</sup>; Y is -(CH<sub>2</sub>)<sub>n</sub>-; R is hydrogen, loweralkyl, phenyl, loweralkyl of the formula



or cycloalkyl, loweralkyl in which the cycloalkyl portion contains from 3 to 6 carbon atoms; R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are the same or different and each can be hydrogen, halogen, alkoxy of from 1 to 2 carbon atoms, loweralkyl, hydroxy or trifluoromethyl; R<sup>5</sup> is hydrogen, loweralkyl, carboxylic acid loweralkyl, benzoyl or carboxylic acid lowercycloalkyl; m is the integer 1 or 2; n is the integer 1, 2 or 3; the sum of m and n is 3 or 4; p is the integer 1, 2, 3 or 4; or a pharmaceutically acceptable acid addition salt thereof.

47. A method of tranquilizing which comprises administering to a patient in need of tranquilization an effective tranquilizing amount of a compound defined in claim 1.

4,414,220

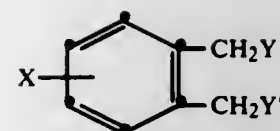
## ORGANIC DIAMINE THERAPEUTIC COMPOSITIONS

John L. Belletire, Madison, Wis., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 123,063, Feb. 20, 1980, Pat. No. 4,333,932, which is a division of Ser. No. 952,302, Oct. 18, 1978, Pat. No. 4,220,650. This application Mar. 1, 1982, Ser. No. 353,514

Int. Cl.<sup>3</sup> A61K 31/445; C07D 401/10  
U.S. Cl. 424-267 15 Claims

11. A method for lowering blood sugar in the treatment of a diabetic host, which comprises orally administering to said host an effective blood sugar lowering amount of a compound selected from the group consisting of organic diamine bases of the formula



and the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein

X is a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, cyano, lower alkyl and lower alkoxy and

Y and Y' are each a member selected from the group consisting of amino, lower N-monoalkylamino, lower N,N-dialkylamino, pyridylamino, pyrrolidino, piperidino, homopiperidino, morpholino, thiomorpholino, 2,3-dihydroisindolyl and 1,2,3,4-tetrahydroisquinolyl.

12. The method of claim 11 wherein X is nitro and Y and Y' are each piperidino.

4,414,221

## PESTICIDAL 1,2,4-TRIAZOLE COMPOUNDS

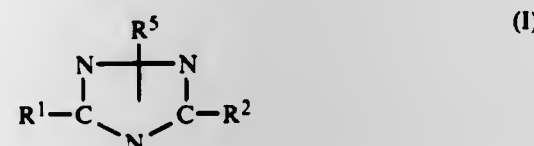
John H. Parsons, Saffron Walden, and Peter J. West, Cambridge, both of England, assignors to FBC Limited, Cambridge, England

Filed Mar. 20, 1981, Ser. No. 246,042

Claims priority, application United Kingdom, Mar. 22, 1980, 8009769

Int. Cl.<sup>3</sup> A01N 43/64, 43/82; C07D 249/08, 249/12  
U.S. Cl. 424-269 6 Claims

1. A method of combating acarids, insects or aphids, or their eggs or larvae, which comprises applying to a site infested or liable to infestation therewith, an effective amount of one or more compounds of the formula:



wherein

R<sup>1</sup> represents phenyl substituted in the 2-position by fluorine, chlorine, bromine or iodine;

R<sup>2</sup> represents cycloalkyl of 3 to 7 carbon atoms, alkoxy of 1 to 6 carbon atoms, or phenyl substituted in the 2-position by halogen or by alkyl of 1 to 6 carbon atoms; and

R<sup>5</sup> represents hydrogen, alkyl of 1 to 6 carbon atoms or alkenyl of 2 to 6 carbon atoms.

4,414,222

## ANTHELMINTHIC POUR-ON VETERINARY COMPOSITION

Peter J. Brooker, and John Goose, both of Saffron Walden, England, assignors to Bayer AG, Fed. Rep. of Germany

Division of Ser. No. 832,916, Sep. 13, 1977, Pat. No. 4,336,262, which is a division of Ser. No. 773,111, Feb. 28, 1977, Pat. No. 4,070,467, which is a continuation of Ser. No. 443,522, Feb. 19, 1974, abandoned. This application Dec. 4, 1981, Ser. No. 327,742

Claims priority, application United Kingdom, Feb. 23, 1973, 8972/73; Jan. 25, 1974, 3521/74

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/425 10 Claims

1. A pour on veterinary composition useful for the treatment of helminthic infestations in animals which comprises an anthelmintically effective amount of tetramisole, levamisole or a nontoxic acid addition salt thereof in combination with an alcohol, or an ester, as diluent suitable for pour-on therapy.

4,414,223

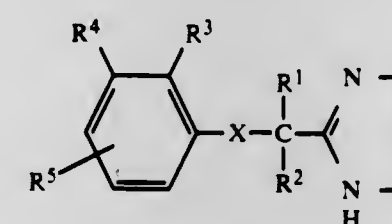
## PESTICIDAL ANILINOMETHYLIMIDAZOLINES

Frederick C. Copp, Beckenham; Peter T. Roberts, Berkhamsted; Alexander D. Frenkel, Aston Clinton, and David Collard, Beckenham, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 52,860, Jun. 28, 1979, abandoned, which is a division of Ser. No. 862,169, Dec. 19, 1977, abandoned. This application May 18, 1981, Ser. No. 264,305  
Claims priority, application United Kingdom, Dec. 20, 1976, 53059/76; Dec. 20, 1976, 53061/76; Dec. 20, 1976, 53062/76  
Int. Cl.<sup>3</sup> A01N 43/50

U.S. Cl. 424-273 R 5 Claims

1. A method for preventing pests of the Order Acarina from producing viable eggs which comprises applying to the pest or the pest's environment an effective amount of a compound of formula (I)



wherein

R<sup>1</sup> and R<sup>2</sup> are hydrogen;

X is NH

R<sup>3</sup> and R<sup>4</sup> are the same or different and are methyl or chloro; and R<sup>5</sup> is hydrogen or an acid addition salt thereof to inhibit the production of viable eggs by said pests.

4,414,224

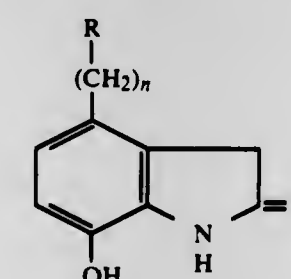
## PHARMACEUTICAL COMPOSITION AND METHODS FOR PRODUCING DOPAMINE AGONIST ACTIVITY

William F. Huffman, Malvern, and James W. Wilson, Wayne, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 180,551, Aug. 22, 1980, Pat. No. 4,314,944. This application Jan. 22, 1982, Ser. No. 341,972  
Int. Cl.<sup>3</sup> A61K 31/405

U.S. Cl. 424-274 10 Claims

7. The method of producing dopamine agonist activity in a subject in need thereof comprising administering orally or parenterally an effective therefor, nontoxic quantity of a compound of the structural formula:



in which R is amino, lower alkylamino, di-lower alkylamino, di-N-allylamino or N-allyl-N-lower alkyl amino and n is an integer of 1-3; or a pharmaceutically acceptable, acid addition salt thereof, combined with a pharmaceutical carrier in dosage unit form.

4,414,225

## AZEPINE DERIVATIVES AND THEIR

## ANTI-THROMBOTIC COMPOSITIONS AND METHODS

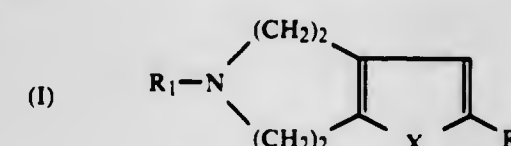
Robert Sauter, Laupheim; Gerhart Griss, Biberach; Wolfgang Grell, Biberach; Rudolf Hurnaus, Biberach; Bernhard Elsele, Biberach; Walter Haarmann, Biberach, and Eckhard Rupprecht, Aulendorf-Tannhausen, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,496  
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105858

Int. Cl.<sup>3</sup> A61K 31/40; C07D 495/04

U.S. Cl. 424-274 7 Claims

1. A compound of the formula



wherein

X is oxygen, sulfur, imino, methylimino, phenylimino or benzylimino;

R<sup>1</sup> is alkyl of 1 to 3 carbon atoms; unsubstituted mono- or di-substituted benzyl, where the substituents are chlorine or bromine; chloro-hydroxybenzyl; bromo-hydroxybenzyl; unsubstituted or mono-substituted benzoyl, where the substituent is chlorine or bromine; alkoxybenzyl of 2 to 4 carbon atoms; allyl; dodecyl, chloromethoxybenzyl; or benzyloxycarbonyl; and

R<sup>2</sup> is hydrogen, alkoxybenzyl of 2 to 4 carbon atoms or carboxyl;

a non-toxic, pharmacologically acceptable acid addition salt thereof; or, when R<sup>2</sup> is carboxyl, a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

7. The method of preventing or relieving thrombosis in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective anti-thrombotic amount of a compound of claim 1.

4,414,226

## 1,4-NAPHTHOQUINONE DERIVATIVES AND THEIR USE IN TREATING COCCIDIOSIS

Koichi Ikushima, Toyonaka; Hirokazu Tanaka, Takarazuka; Ohe Osamu, Osaka; Elko Kino, Hadano; Masanobu Kohsaka, Sakai; Hatauo Aoki, Ikeda; Akira Arakawa, Kusatsu, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00046, § 371 Date Oct. 30, 1981, § 102(e) Date Oct. 30, 1981, PCT Pub. No. WO81/02574, PCT Pub. Date Sep. 17, 1981

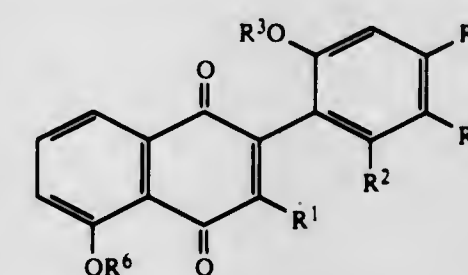
PCT Filed Mar. 6, 1981, Ser. No. 317,897

Claims priority, application Japan, Mar. 6, 1980, 55/29675

Int. Cl.<sup>3</sup> C07D 311/78; A61K 31/365

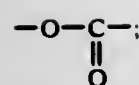
U.S. Cl. 424-279 6 Claims

1. A 1,4-naphthoquinone derivative of the formula:



wherein R<sup>1</sup> and R<sup>2</sup> taken together represent





R<sup>3</sup> is hydrogen or lower alkyl; R<sup>4</sup> is lower alkyl; R<sup>5</sup> is hydrogen or halogen; and R<sup>6</sup> is hydrogen, lower alkyl or lower alkanoyl.

4,414,227

# METHOD FOR REPELLING BIRDS, ESPECIALLY WOODPECKERS

Samuel J. Tomlinson, Sr.; Edward E. Dean, and Leon M. Adams, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation of Ser. No. 171,152, Jul. 22, 1980, abandoned. This application Apr. 2, 1982, Ser. No. 365,102  
Int. Cl.<sup>3</sup> A01N 35/00

U.S. Cl. 424—331

5 Claims

1. A method for repelling birds from a surface comprising selecting a surface from which it is desired to repel birds and applying to said surface a repelling amount of the compound of the formula



wherein R is a methyl, ethyl or propyl group.

4,414,228

# PROCESS FOR PREPARING DEEP-FROZEN YEAST BREAD DOUGH

Andre Nourigeon, Istres, France, assignor to Grandes Boulangeries Associees G.B.A., Paris, France  
Filed Dec. 30, 1981, Ser. No. 336,030

Claims priority, application France, Jan. 8, 1981, 8100215

Int. Cl.<sup>3</sup> A21D 8/02; C12N 1/06

U.S. Cl. 426—19

3 Claims

1. Process for preparing deep frozen yeast bread dough comprising the steps of:

- deep-freezing yeast at a temperature lower than  $-15^{\circ}\text{C}$ . for a sufficient period of time to stabilize the yeast;
- incorporating the deep frozen yeast into a dough containing flour, gluten, and malt, wherein said gluten is present in 0.5 to 1% of flour and said malt is present in 0.5 to 2% by weight of flour;
- mixing and kneading the dough under conditions whereby the dough does not exceed a temperature of  $20^{\circ}\text{C}$ ;
- cooling said dough to a temperature of at least  $-70^{\circ}\text{C}$ . at the heart of said dough.

4,414,229

# MARGARINE AND THE LIKE SPREAD WITH NATURAL BUTTER FLAVOR

Abraham I. Bakal, Parsippany, N.J., and Allen C. Bubler, Racine, Wis., assignors to Cumberland Packing Corp., Brooklyn, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,548

Int. Cl.<sup>3</sup> A23D 3/00; A23L 1/23

U.S. Cl. 426—98

11 Claims

1. Composition for providing natural butter flavor to a butter substitute spread, said composition comprising as a water soluble component starter distillate which is uniformly distributed through lipolyzed cream or lipolyzed butter oil as an oil soluble component in ratio of 2-20 parts of said oil soluble component per each part of said water soluble component.

## 4,414,230 PLASTIC CONTAINER IMPROVED IN BARRIER PROPERTIES AGAINST GASES AND WATER VAPOR

Makoto Hanabata, Takatsuki; Takashi Maruyama, Toyonaka, and Katsuji Ueno, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 238,132, Feb. 25, 1981,

abandoned. This application Oct. 19, 1981, Ser. No. 312,867

Claims priority, application Japan, Apr. 2, 1979, 54-40029

Int. Cl.<sup>3</sup> B65D 85/00; C08G 63/00

U.S. Cl. 426—106

9 Claims

1. A plastic container made from a thermoplastic resin composition comprising (A) an aromatic polyester carbonate composed of an aromatic dicarboxylic acid moiety, an aromatic dihydroxy compound moiety and a carbonate moiety and (B) at least one member selected from polyalkylene terephthalates and polyalkylene oxybenzoates, in a ratio of 100 parts by weight of (A) to 100 parts by weight or less of (B), said thermoplastic resin composition having improved barrier properties against gases and water vapor.

9. A plastic container made from a thermoplastic resin composition comprising (A) an aromatic polyester carbonate composed of an aromatic dicarboxylic acid moiety, an aromatic dihydroxy compound moiety and a carbonate moiety and (B) at least one member selected from polyalkylene terephthalates and polyalkylene oxybenzoates, in a ratio of 100 parts by weight of (A) to 100 parts by weight or less of (B), said thermoplastic resin composition having improved barrier properties against gases and water vapor, said container containing food or medicine.

4,414,231

## SPECIAL NATURAL WINES SIMULATIVE OF LIQUEURS

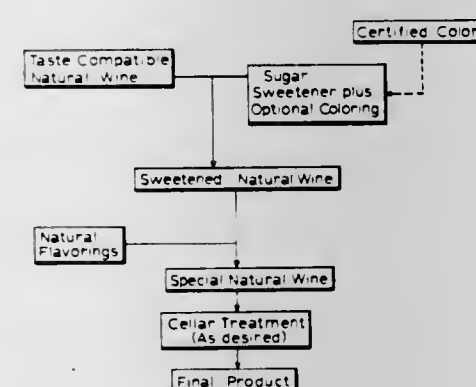
Vincent G. Ficca, Princeton Junction, N.J., assignor to Joseph E. Seagram & Sons, Inc., New York, N.Y.

Filed Apr. 20, 1981, Ser. No. 255,868

Int. Cl.<sup>3</sup> C12H 1/04; C12G 1/00

U.S. Cl. 426—271

5 Claims



1. A special natural wine, simulative of a distilled liqueur, which comprises;

- a natural wine comprising an anion-exchanged sherry wine of reduced nut-like flavor, having a total acid content of from 0.25 to 0.35 gm/100 ml. as tartaric acid, a pH of 3.8 to 4.5 and from 20 to 24 percent by volume of alcohol; wherein said flavor reduction is accomplished by treating the sherry wine with lactic acid precipitated casein;
- a sweetener selected from the group consisting of corn syrup, corn syrup derivative sweeteners, invert sugar syrup and a liquid sugar of not less than 60 brix by weight in an amount sufficient to result in sweetening of the natural wine; and
- a natural flavoring in an amount sufficient to result in a flavoring of the natural wine; said special natural wine having an alcohol content of from 15 to 21 percent by volume, a solids content of from about 20 to 45 brix by

weight dealcoholized, a total acid content of 0.05 to 1.0 gms/100 ml. as tartaric acid and a pH of 3.5 to 5.5.

4,414,232

## PROCESS FOR PREPARING COOKED BACON HAVING REDUCED LEVELS OF N-NITROSAMINES

Rhule B. Sleeth, Paradise Valley; Richard F. Theller, and Robert B. Rendek, both of Scottsdale, all of Ariz., assignors to Armour and Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 158,679, Jun. 12, 1980, Pat. No. 4,315,948. This application Dec. 28, 1981, Ser. No. 335,039

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A23B 4/00

U.S. Cl. 426—266

6 Claims

1. A process for preparing cured bacon which, when cooked for consumption, contains substantially reduced levels of N-nitrosamines, said process comprising the steps of nitrite-curing, heat processing and slicing bacon bellies and then applying to the external surfaces of the resulting slices, after completion of said nitrite-curing and before cooking, a liquid smoke in concentration to provide 20 to 160 ppm phenols and 10 to 800 ppm carbonyl compounds, based upon the weight of the sliced bacon, the ratio of carbonyls to phenols being within the range of 0.5-5 to 1.

4,414,233

## METHYLTHIOMETHYL ESTERS AS FLAVOR ADDITIVES

Steven van den Bosch, Woudenberg; Evert van't Land, Terschuur, and Jan Stoffelsma, Hoewelaken, all of Netherlands, assignors to Polak's Frutal Works, B.V., Amersfoort, Netherlands

Continuation-in-part of Ser. No. 231,184, Feb. 2, 1981, Pat. No. 4,332,829, which is a continuation-in-part of Ser. No. 52,154, Jun. 26, 1979, abandoned. This application Mar. 11, 1982, Ser. No. 357,012

Claims priority, application United Kingdom, Jul. 18, 1978, 30161/78

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A23L 1/226, 1/235

U.S. Cl. 426—535

33 Claims

1. A dairy flavoring composition or a dairy product flavor-enhancing composition containing at least one methylthiomethyl ester having the structural formula  $\text{R—COOCH}_2\text{—SCH}_3$  wherein R is selected from the class consisting of hydrogen, alkyl radicals with 1 to 9 carbon atoms, alkenyl radicals with 2 to 9 carbon atoms, and polyunsaturated alkyl radicals with 4 to 9 carbon atoms; and at least one other flavoring compound selected from the class consisting of 2-methylbutyric acid, vanillin, maltol, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, delta-decalactone, 2-heptanone, heliotropin, gamma-undecalactone, butyric acid, ethyl lactate, hexanoic acid, gamma-decalactone, gamma-dodecalactone, isovaleric acid, acetoin, octanoic acid and diacetyl.

17. A foodstuff to which has been added about 5 to 2000 parts per million, based on the total weight of said foodstuff, of at least one methylthiomethyl ester having the structural formula  $\text{R—COOCH}_2\text{SCH}_3$  wherein R is selected from the class consisting of hydrogen, alkyl radicals with 1 to 9 carbon atoms, alkenyl radicals with 2 to 9 carbon atoms and polyunsaturated alkyl radicals with 4 to 9 carbon atoms.

4,414,234

## NATURALLY COLORED OLEOMARGARINE

Baratham Sreenivasan, Paramus, and Kenneth S. Baker, Tena-fly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 107,745, Dec. 26, 1979, Pat. No. 4,304,792.

This application Jun. 15, 1981, Ser. No. 273,538

Int. Cl.<sup>3</sup> A23L 1/275

U.S. Cl. 426—540

2 Claims

1. A natural food colorant for use with margarine packaged in wrappers, said colorant having a yellow color substantially identical with the color of commercial margarines where said commercial margarines are colored with  $\beta$ -carotene, said colorant comprising a mixture of:

A. a first edible material of natural origin which in use amounts does not detract from normal margarine flavor and having a predominately yellowish hue due primarily to carotenoid pigments with a greenish cast due to  $\alpha$ -carotene, said first material being present in an amount sufficient to impart said yellowish hue with greenish cast to said margarine, and

B. a second edible material of natural origin which in use amounts does not detract from normal margarine flavor and having a predominately reddish hue, in an amount sufficient to negate the greenish cast of said first material and to produce said yellow color, said food colorant characterized by not substantially migrating from margarine containing said colorant to margarine wrappers in contact with said margarine.

4,414,235

## PROCESS FOR PREPARING INSTANT MACARONIS

Shukuko Takekoshi, No. 39-1, Mitsubishi Aza-Minamioke, Naruto-cho, Naruto-shi, Tokushima, Japan (772)

PCT No. PCT/JP80/00190, § 371 Date Apr. 22, 1981, § 102(e) Date Apr. 15, 1981

PCT Filed Aug. 21, 1980, Ser. No. 253,839

Claims priority, application Japan, Aug. 22, 1979, 54-108270

Int. Cl.<sup>3</sup> A23L 1/16

U.S. Cl. 426—557

5 Claims

1. A process for preparing instant macaronis which comprises adding an aqueous solution of a carbonate as a first kneading water, an egg white and a yam to a wheat flour, said carbonate, egg white and yam being present in the amount of 0.2 to 0.4% by weight based on the dry weight of said wheat flour; half-kneading the resulting mixture; aging the half-kneading mixture; adding an aqueous solution of an edible acid as a second kneading water to the aged mixture and kneading it, said acid being present in the amount of 0.2 to 0.4% by weight based on the dry weight of said wheat flour; molding the mixture into a desired shape; boiling the obtained alimentary paste in a 2 to 4% by weight aqueous solution of common salt; surface-treating the resulting boiled alimentary paste with a solution of about 2 to 4% by weight of glucose dissolved in an alcohol-water mixed solvent; and freeze-drying the surface-treated alimentary paste.

4,414,236

## EDIBLE EMULSIONS CONTAINING GELLING AGENTS

David P. J. Moran, Covington, and John J. Hepburn, Harpenden, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 95,122, Nov. 16, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,609

Claims priority, application United Kingdom, Nov. 16, 1978, 44799/78

Int. Cl.<sup>3</sup> A23D 3/00, 5/00

U.S. Cl. 426—573

6 Claims

1. Edible emulsions comprising a continuous fatty phase containing a plastic fat having a dilatation value at  $10^{\circ}\text{C}$ . of at least 150 and a dilatation value at  $35^{\circ}\text{C}$ . which does not exceed 50, and a dispersed aqueous phase in a weight ratio ranging



from 18–82 to 82–18, in which the aqueous phase is gelled with a gelling system of a softening point of at least 33° C., showing a sharp decrease in gel strength at a temperature ranging from 45° to 70° C., said gelled aqueous phase having a gel strength at a temperature below the softening point ranging from 0.1 to 30 N/cm<sup>2</sup> as measured by Instron apparatus using it in the linear compression test method.

4,414,237

# PROCESS FOR PREPARING A SAUCE CONTAINING BREAD CRUMBS AND PRODUCT THEREOF

David N. Evans, Dover; Gary W. Jarvis, Hartly; Wayne L. Steensen, Newark, and Manoj Kumar O. Shah, Dover, all of Del., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 220,565, Dec. 29, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 419,878

Int. Cl.<sup>3</sup> A23L 1/22

U.S. Cl. 426—589

8 Claims

1. A process for preparing a sauce having a pulpy texture wherein the improvement comprises:

- blending together sauce ingredients, wherein the sauce ingredients comprise bread crumbs, said bread crumbs consisting of from about 1 to about 10% of the sauce, based on the weight of the sauce, wherein said bread crumbs act as pulp-simulating particles, and said bread crumbs have a porous, elongated, and striated shape and structure, a particle size distribution such that the bread crumbs pass through a USS 16 mesh screen but are retained on a USS 60 mesh screen, and consist essentially of wheat flour, yeast and salt;
- cooking said sauce in a heat exchanger, wherein said ingredients are held in the heat exchanger for a period of time effective to cook said sauce;
- cooling said cooked sauce; and
- bottling the sauce.

4,414,238

# LIQUID ELEMENTAL DIET

Mary K. Schmidl, Emeryville, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 24, 1981, Ser. No. 334,278

Int. Cl.<sup>3</sup> A23D 5/00; A23J 3/00; A23L 1/00

U.S. Cl. 426—602

2 Claims

1. A ready-to-use aqueous elemental diet composition comprising, based on the total calories of the composition, a carbohydrate component ranging in amount from about 50 to 90%, an amino acid component ranging in amount from about 5 to 30%, and a lipid component ranging in amount from 10 to 50%, the composition being non-browning at 38° C., having a pH ranging from about 3.0 to about 4.4 and having the lipid component in the form of a stable emulsion consisting of lipids, an emulsifier selected from the group consisting of mono and diglycerides and a corn starch modified with succinate anhydride in quantities sufficient to maintain emulsion stability in the pH range of about 3.0 to 4.4.

4,414,239

# TOPPING COATING

Judith L. Oven, Banbury, England, assignor to General Foods Limited, Banbury, England

Filed Feb. 16, 1982, Ser. No. 348,909

Int. Cl.<sup>3</sup> A23G 3/00

U.S. Cl. 426—607

13 Claims

1. A dessert composition which is pourable at 19° C. but hardens to a smooth, brittle, edible coating when applied to a frozen dessert consisting essentially of from 50% to 65% by weight of a mixture of non-hydrogenated and non-fractionated vegetable oil having a solids index from 20% to 30% at 0° C. and not more than 4% at 19° C. wherein a major proportion of said mixture melts below 5° C. and a minor proportion melts

above 20° C.; from 10% to 35% by weight a finely-divided sugar; and from 5% to 20% by weight of a dried milk powder.

4,414,240

# PROCESS FOR LOWERING THE THERMOGELATION TEMPERATURE OF EGG ALBUMEN

Chang R. Lee, Yonkers, N.Y., assignor to Nutrisearch Company, Cincinnati, Ohio

Continuation of Ser. No. 95,685, Nov. 19, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 290,265

Int. Cl.<sup>3</sup> A23B 5/00; A23L 3/00

U.S. Cl. 426—614

6 Claims

1. A process for producing egg albumen having improved thermogelation properties consisting essentially

- heating an alkaline egg albumen solution to a temperature ranging from about 60° C. to the thermogelation temperature of the egg albumen, said solution having a pH ranging from about 8 to about 10 and a content of protein soluble within said pH range of less than about 20 percent,
- cooling the resulting heated solution to a temperature below at least 55° C. but not below 2° C. at a rate sufficient to avoid gelation of said solution and with sufficient agitation to insure uniform cooling throughout said solution, said cooling being initiated within less than 30 seconds after said solution has been heated to the temperature recited in step (1).

said solution during heating step (1) and cooling step (2) not being at a temperature greater than 55° C. for a period of time greater than 1 minute, and

- adjusting the pH of the solution to about 6 to about 8 simultaneously with or subsequent to cooling in step (2).

4,414,241

# METHOD FOR LUBRICATING BEARING AND GEAR SURFACES

Ferdinand Quella, Gauting, and Eugen Hohmann, Bensheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,863

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106184

Int. Cl.<sup>3</sup> B05D 1/36

U.S. Cl. 427—2

19 Claims

1. In a method of lubricating sliding/moving surfaces such as bearings, hand and angle pieces, high-speed turbine bearings and the like, the improvement comprising:

- applying a film of a poly (fluoroacrylic acid methyl ester) polymer out of a solution containing about 0.1 through 10% by weight of said polymer to the lubricating surface so as to attain a layer thickness of about 0.5 through 10  $\mu$ m of said polymer on said lubricating surface; and
- thereafter lubricating the resultant surfaces with a polar oil exhibiting high lubricity.

4,414,242

# PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE

Tadashi Nishimura, Hyogo, and Yoji Mashiko, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,095

Claims priority, application Japan, Nov. 26, 1981, 56-190228

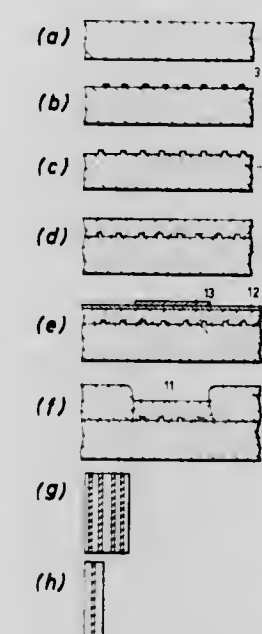
Int. Cl.<sup>3</sup> B05D 3/06; H01L 21/263

U.S. Cl. 427—43.1

8 Claims

1. A process for producing a semiconductor device, comprising: forming an island of a polycrystalline or amorphous

semiconductor layer on, and surrounding the same by, an insulator, locally heating said layer to fuse the same to form a



recrystallized structure and forming at least one ridge on the underlying insulator before the formation of said layer.

4,414,243

# METHOD FOR MAKING SURFACE ACOUSTIC WAVE DEVICES

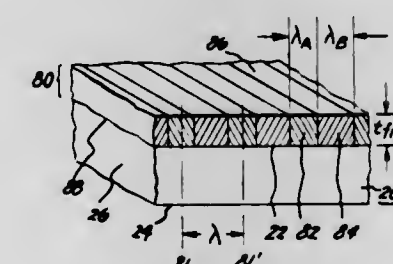
Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,778

Int. Cl.<sup>3</sup> B05D 5/12

U.S. Cl. 427—100

14 Claims



8. A method for making surface acoustic wave devices comprising the steps of:

- providing a body of piezoelectric material, said body having substantially parallel major surfaces and a peripheral edge area interconnecting said major surfaces;
- forming a thin film lamellar metallic eutectic on at least a portion of one of said major surfaces of said body;
- selectively removing one of the phases of said thin film lamellar metallic eutectic, forming thereby a first spaced array of substantially parallel metallic elements;
- forming a first interconnect to electrically connect said metallic elements of said first spaced array, forming thereby a first comb-like structure;
- applying a layer of an insulating material over the exposed surfaces of said first comb-like structure;
- selectively masking the top surface of said first interconnect;
- depositing a substantially continuous layer of a conducting material over the insulated first comb-like structure filling thereby the spaces between the insulated elements of said first spaced array;
- preferentially removing segments of the deposited conducting material from above the insulated metallic elements of said first spaced array to form a second spaced array of metallic elements substantially juxtaposed from said insulated metallic elements of said first spaced array;

- selectively masking the top surface of said first and second spaced arrays;

- forming a second interconnect to electrically connect said metallic elements of said second spaced array, forming thereby a second comb-like structure interdigitated with and electrically insulated from said first comb-like structure; and

- removing the masking material and metal deposited thereon from the top surface of said first interconnect and from the top surface of the first and second spaced arrays.

4,414,244

# SURFACE MODIFICATION TO WAVEGUIDES

John R. Timberlake, Allentown; David N. Ruzic, Kendall Park; Richard L. Moore, Princeton; Samuel A. Cohen, Pennington, and Dennis M. Manos, Lawrenceville, all of N.J., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 16, 1982, Ser. No. 388,873

Int. Cl.<sup>3</sup> B05D 7/22, 3/14, 3/02

U.S. Cl. 427—105

9 Claims

1. A method of treating the interior surfaces of a waveguide comprising the steps of:

- mechanically polishing the interior waveguide surfaces to remove surface protrusions;
- electropolishing the interior waveguide surfaces with an electrolyte to produce an electrochemically flat surface;
- ultrasonically cleaning the interior waveguide surfaces with a solvent to remove any residue;
- applying a 1 $\mu$ –5 $\mu$  thick film of an alkyd resin solution to the interior waveguide surfaces; and
- vacuum pyrolyzing said film to form a carbon coating.

4,414,245

# PROCESS FOR PRODUCING COBALT CONTAINING FERROMAGNETIC IRON OXIDES

Kokichi Miyazawa, Suzuka; Kazuo Nakata, Moriyama; Tsuneo Ishikawa, Moriyama; Ichiro Honma, Moriyama; Arata Koyama, Moriyama, and Masatoshi Amano, Moriyama, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jul. 23, 1982, Ser. No. 401,214

Claims priority, application Japan, Jul. 28, 1981, 56-117945; Oct. 7, 1981, 56-159620; Nov. 20, 1981, 56-186453; Dec. 15, 1981, 56-201958

Int. Cl.<sup>3</sup> C01G 49/06; B05D 5/12

U.S. Cl. 427—127

8 Claims

1. A process for producing a cobalt containing ferromagnetic iron oxide, which comprises treating magnetic iron oxide particles with a cobalt salt solution and an alkali or with a cobalt salt solution, a ferrous salt solution and an alkali to coat a cobalt compound or a cobalt compound and a ferrous compound on the surface of the particles the alkali being present at least in an amount equivalent to the cobalt salt or the cobalt and ferrous salts, the amount of cobalt coated being about 0.5–30% by weight based on the iron oxide, the amount of ferrous iron coated being about 1–30% by weight based on the iron oxide and said treating being effected in a non-oxidative atmosphere; separating the coated particles from the dispersion containing them and then heating the coated particles at a temperature of 60°–300° C. in an atmosphere in which the partial pressure of water vapor is at least 0.2 atm., said cobalt containing ferromagnetic iron oxide exhibiting a higher coercivity than a cobalt containing ferromagnetic iron oxide prepared as above absent said heating at a temperature of 60°–300° C. in an atmosphere in which the partial pressure of water vapor is at least 0.2 atm.



4,414,246

**METHOD FOR PROTECTING ENVIRONMENT FROM VOLATILE LIQUID CHLORIDE AS EXPOSED TO THE ATMOSPHERE**

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed May 3, 1982, Ser. No. 373,875

Claims priority, application Japan, May 13, 1981, 56-71797  
Int. Cl.<sup>3</sup> B05D 7/00

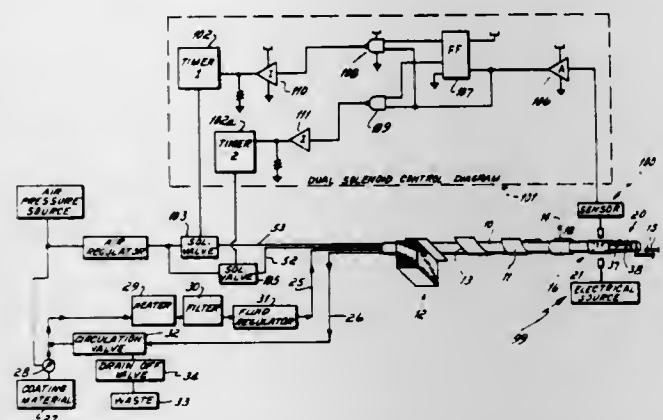
U.S. Cl. 427—222

8 Claims

1. A method for protecting the environment from volatile liquid metal chloride exposed to the atmosphere, which comprises:

- spreading foamy particulates of styrene resin over the chloride, and
- permitting a reaction to occur between the resin and chloride at the interface to form a filmy reaction product which covers the surface of the chloride to a substantial degree, thus blocking evaporation of the chloride to prevent it from spreading and contacting the humidity in the atmosphere.

applying coating material from a second spray coating means onto the inside of alternate can bodies following



those to which coating material was applied by said first spray coating means.

4,414,249

**METHOD FOR PRODUCING METALLIC ARTICLES HAVING DURABLE CERAMIC THERMAL BARRIER COATINGS**

Nicholas E. Ulion, Marlborough, and Duane L. Ruckle, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

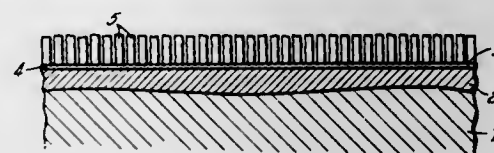
Division of Ser. No. 109,955, Jan. 7, 1980, Pat. No. 4,321,310.

This application Dec. 4, 1981, Ser. No. 327,377

Int. Cl.<sup>3</sup> C23C 11/00, 13/00

U.S. Cl. 427—248.1

12 Claims



1. A method for producing a metallic article having a durable ceramic thermal barrier coating said method consisting essentially of:

- a. providing a superalloy substrate with a clean surface
- b. applying a thin adherent layer of MCrAlY to the clean surface
- c. polishing the MCrAlY layer to a smoothness of less than about 25 microinches RMS
- d. applying a columnar ceramic coating to the polished MCrAlY layer by vapor deposition
- e. heat treating the columnar ceramic coated article in an oxygen containing atmosphere to develop an alumina layer between the MCrAlY and the columnar ceramic coating.

4,414,248

**METHOD FOR THE STRIPING OF THE INSIDE SEAM OF A CAN BODY MOVING AT A HIGH SPEED**

James A. Kolibas, Cleveland, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 245,939, Mar. 20, 1981, Pat. No. 4,353,326.

This application Jun. 7, 1982, Ser. No. 386,003

Int. Cl.<sup>3</sup> B05B 12/04, 12/02; B05D 7/22, 1/02

U.S. Cl. 427—236

3 Claims

1. A method of applying coating material onto the inside of consecutive can bodies moving along a can forming line comprising:

- applying coating material from a first spray coating means onto the inside of alternate can bodies moving past said first spray coating means along the can forming apparatus; and

**AMINE CONTAINING RESIN WITH OXALATE ESTERS FOR CASTING**

John R. Costanza, North Plainfield, and Louis E. Trapasso, Watchung, both of N.J., assignors to Celanese Corporation, New York, N.Y.

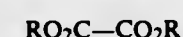
Filed Oct. 2, 1981, Ser. No. 308,064

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427—386

13 Claims

4. A method for protecting a surface with a crosslinked resinous coating which comprises admixing an oxalate ester with polyethyleneimine polyamine and casting the admixture on said surface at ambient temperatures; said oxalate ester corresponding to the formula:



wherein R is a lower alkyl group containing between one and about four carbon atoms.

4,414,251

**METHOD FOR MOISTURE-PROOFING REFRACTORY FIBER FOR USE IN FIRE-RESISTANT ENCLOSURES**

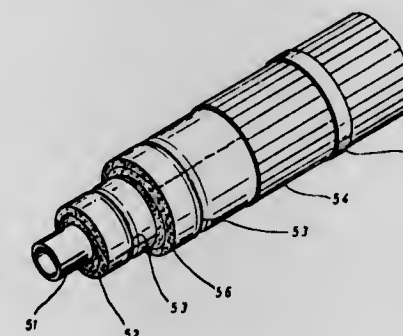
Thomas W. Palmer, 2907 Del Monte Ct., Missouri City, Tex. Division of Ser. No. 80,884, Oct. 1, 1979, Pat. No. 4,307,813.

This application Jul. 31, 1981, Ser. No. 288,879

Int. Cl.<sup>3</sup> B05D 1/36, 7/00; C08H 9/08; C08J 3/02

U.S. Cl. 427—407.1

1 Claim



1. A method for moisture-proofing refractory fiber material comprising emulsifying paraffin in water, applying the emulsion to the refractory fiber material, drying the refractory fiber material after the emulsion has been applied, and coating the refractory fiber material with at least one coat of vinyl mastic paint.

4,414,252

**SPRAY FORMING THIN FILMS**

Curtis M. Lampkin, El Paso, Tex., assignor to Photon Power, Inc., El Paso, Tex.

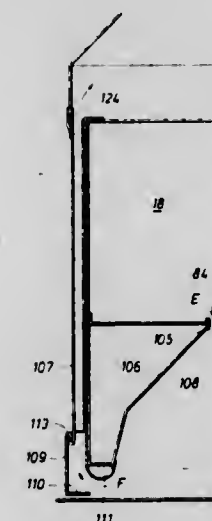
Continuation of Ser. No. 209,724, Nov. 24, 1980, abandoned.

This application May 24, 1982, Ser. No. 381,291

Int. Cl.<sup>3</sup> B05D 1/02; B05B 1/04

U.S. Cl. 427—424

25 Claims



23. A spray process for forming thin films of selected materials on a hot moving substrate, comprising: forming from an atomized liquid a selected spray configuration within a spray chamber; projecting said spray toward said hot substrate; introducing atmospheric flow about said spray in an amount effective to suppress convection currents above said hot substrate; removing a first portion of said atmospheric flow through an

intermediate slot within said spray chamber at an elevation remote from said substrate; and exhausting a second portion of said atmospheric flow from above said substrate.

4,414,253

**METHOD FOR APPLYING LIQUID PLASTICIZER TO FILAMENTARY FILTER MATERIAL**

Peter Grumer, Teape; Wolfgang Wiese, Hamwarde, and Günter Serrin, Buchholz, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber &amp; Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 269,976, Jun. 3, 1981, Pat. No. 4,368,688.

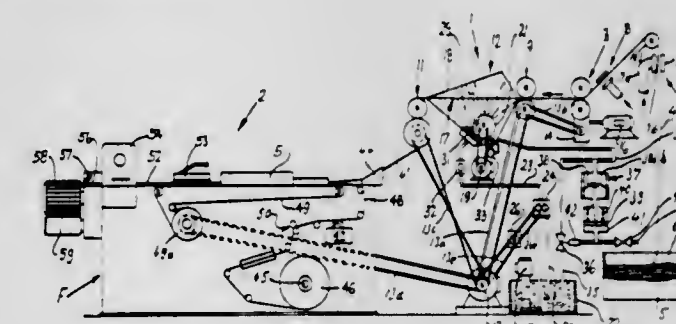
This application Sep. 28, 1982, Ser. No. 425,472

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023001

Int. Cl.<sup>3</sup> A24D 3/00

U.S. Cl. 427—424

7 Claims



1. A method of applying liquid plasticizer to a foraminous running tow of filamentary filter material, comprising the steps of establishing and maintaining a treating zone; conveying the tow into, through and from said zone at a variable speed; conveying into said zone atomized liquid plasticizer at a first rate such that successive increments of the tow which leave said zone entrain the admitted plasticizer as soon as said zone accumulates a quantity of residual plasticizer; interrupting at least one of said conveying steps; withdrawing at least some residual plasticizer from said zone on interruption of said one conveying step; resuming said one conveying step; conveying the plasticizer at a higher second rate on resumption of said one conveying step so as to restore said quantity of residual plasticizer; and thereupon again proceeding with conveying of plasticizer at said first rate.

4,414,254

**SELECTIVE LIGHT-TRANSMITTING LAMINATED STRUCTURE**

Kaoru Iwata; Toshio Nishihara, both of Hachioji; Michisuke Ohe; Yoichi Saito, both of Hino, and Akihito Horike, Mihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 23, 1981, Ser. No. 333,774

Claims priority, application Japan, Dec. 26, 1980, 55-183725; Dec. 29, 1980, 55-185293; Feb. 12, 1981, 56-17963

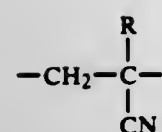
Int. Cl.<sup>3</sup> E06B 3/24; B32B 27/40

U.S. Cl. 428—34

17 Claims

1. In a selective light-transmitting laminated structure comprising (a) a laminate composed of a transparent substrate and formed on at least one surface of the substrate, a thin metallic layer having a thickness of 30-500 Å if required in combination with a thin film layer having a high refractive index, and (b) a protective layer coated on said laminate (a) and composed mainly of a polymer having structural units of the general formula





wherein R represents a hydrogen atom or a methyl group, as main structural units, the improvement wherein the corrosion resistance of said structure is improved by providing a urethan linkage in the interface between the laminate (a) and the protective layer (b).

4,414,255

## WATER ABSORBING SHEET ASSEMBLY

Mitsuru Tokuyama; Yoshimi Tsuchiya; Hikotaro Kawaguchi, all of Utsunomiya; Masayuki Sague, Ichikaimachi, and Kenji Ohki, Chiba, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

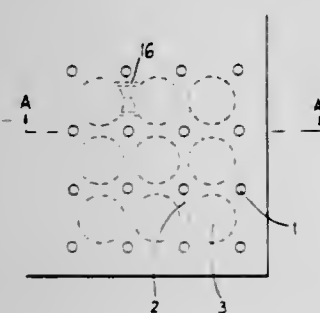
Filed Apr. 18, 1980, Ser. No. 141,742

Claims priority, application Japan, May 9, 1979, 54-56562

Int. Cl.<sup>3</sup> B32B 3/28, 29/00

U.S. Cl. 428—154

5 Claims



1. A laminated, water-absorbing, sheet assembly comprising two sheets and a layer of polymeric absorbent powder interposed between said two sheets, at least one of said sheets being a water-permeable, creped sheet, said sheet assembly being embossed in a pattern such that said sheet assembly consists essentially of first areas in which said sheets are deeply embossed and strongly press-bonded to each other, second areas in which said sheets are shallowly embossed and weakly press-bonded to each other and third areas in which said sheets are not embossed and not press-bonded to each other, said third areas being continuous to and communicating with each other, and the area ratio of press-bonded areas of said sheets to non-press-bonded areas of said sheets being in the range of from 1:0.05 to 1:4.

4,414,256

## CHEMICALLY WETTED FILM OF METAL PHASE ON GRAPHITE AND PROCESS FOR PREPARING SAME

Rexford D. Sherwood, Suffern, N.Y.; Rees T. K. Baker, Murray Hill, N.J.; Eric G. Derouane, Namur, Belgium, and Wim J. M. Pieters, Morristown, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 5, 1981, Ser. No. 222,644

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B01J 21/18

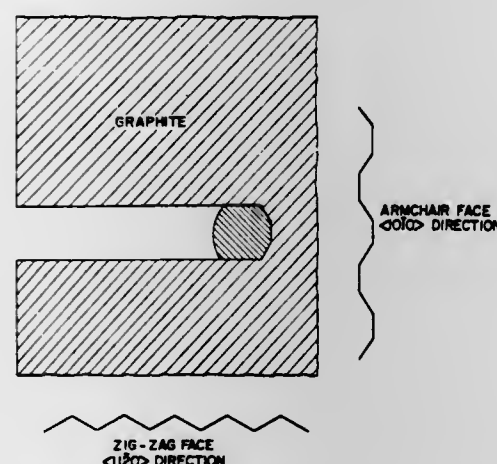
U.S. Cl. 428—163

8 Claims

1. A composition of matter comprising a film of chemically wetted metal phase on graphite wherein said metal is selected from the group consisting essentially of Ni, Co, Mo and mixtures thereof and wherein said film is formed by:

- contacting a composite of said metal and graphite with a net-reducing, hydrogen-containing atmosphere at a temperature of from about 800°-975° C. for a time sufficient for said metal to form a plurality of metal-containing channels in said graphite; and
- contacting said metal-containing, channeled composite

formed in (a) with a net-reducing, hydrogen-containing atmosphere at a temperature above about 975° C. for a time sufficient for said metal in said channels to spread out and chemically wet at least a portion of the surface of said channels as a thin film of said metal phase.



3. A composition of matter comprising a film of chemically wetted metal phase on graphite, said metal film being on the surface of channels formed in said graphite by the catalytic gasification thereof, wherein said channels are parallel to the a-face of the graphite and wherein said metal is selected from the group consisting essentially of nickel, cobalt, molybdenum, and mixtures thereof.

4,414,257

## ELEVATOR PANEL

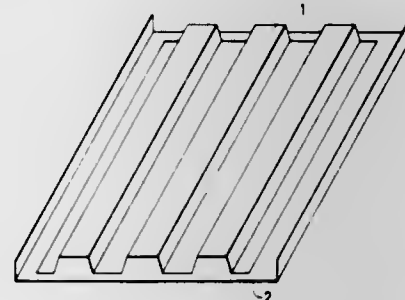
Kousuke Haraga, Hyogo, and Katsutoshi Hattori, Aichi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Denki Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,626

Int. Cl.<sup>3</sup> B32B 3/28

U.S. Cl. 428—182

4 Claims



1. A panel for an elevator comprising: a surface plate, and a corrugated reinforcing member having ridges facing said surface plate, said surface plate and said corrugated reinforcing member being joined to each other by a room temperature curing acrylate adhesive of a two-part non-solvent type applied in flat layers in an unmixed condition to entire crests of said ridges and surface portions of said surface plate facing said ridges.

4,414,258

## TURN-UP TAPE

James R. Corbin, Sr., P.O. Box 789, Millbrook, Ala. 36054

Filed Oct. 6, 1981, Ser. No. 309,063

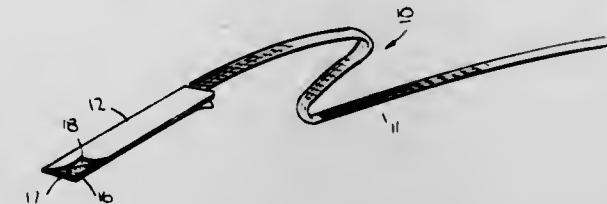
Int. Cl.<sup>3</sup> B32B 7/00

U.S. Cl. 428—193

10 Claims

1. A turn-up tape for severing a travelling web of paper comprising a repulpable paper ribbon having at least one cutting edge for severing a travelling web of paper; and

means secured to one end of said ribbon for attaching said ribbon end to a rotating reel spool, said means having at least



one adhesive layer and a release layer covering said adhesive layer.

4,414,259

## HEAT-SENSITIVE RECORD MATERIAL

Hiroshi Tsuchiya, Hino; Hitoshi Yamahira, Takatsuki, and Takeshi Murakami, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 151,759, May 20, 1980, abandoned.

This application Jun. 28, 1982, Ser. No. 392,809

Claims priority, application Japan, May 23, 1979, 54-64203

Int. Cl.<sup>3</sup> B32B 5/16

U.S. Cl. 428—207

6 Claims

1. In a heat-sensitive record material comprising a base sheet and a color developing layer formed on at least one surface of said base sheet, said color developing layer comprising color former and acceptor which is reactive with said color former to develop a color, the improvement in said color developing layer including oil absorptive pigment having an oil absorption larger than 80 ml/100 g and inorganic pigment having an average particle size within the range of 6 to 15 microns, said oil absorptive pigment being a member selected from the group consisting of diatomaceous earth, calcined diatomaceous earth, flux calcined diatomaceous earth, finely divided aluminium oxide anhydride, finely divided titanium oxide, magnesium carbonate, white carbon, finely divided silicon dioxide, magnesium aluminosilicate and mixtures of the foregoing, said inorganic pigment being a member selected from the group consisting of calcium carbonate, aluminium hydroxide, aluminum oxide, talc, calcined clay and mixtures of the foregoing, and said color developing layer having a surface roughness of an Ra smaller than 1.2 microns and a gloss smaller than 25%.

4,414,260

## STATIC DISSIPATIVE UPHOLSTERY FABRIC OR THE LIKE

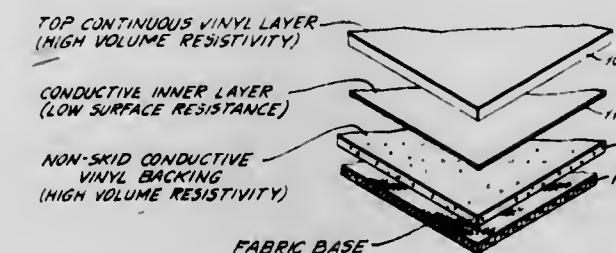
Ray M. Rzepecki, North Scituate, R.I., and Victor H. Welas, Bridgeport, Conn., assignors to Pervel Industries, Inc., Plainfield, Conn.

Continuation-in-part of Ser. No. 243,776, Mar. 16, 1981, Pat. No. 4,363,071. This application Aug. 19, 1982, Ser. No. 409,599. The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B32B 27/06, 27/18, 27/30

U.S. Cl. 428—212

8 Claims



1. As an article of manufacture, for lamination to a fabric base in the manufacture of static-dissipative upholstery material or the like, a multi-layer conductive web for dissipating a static electric charge impressed thereon, said web comprising an upper layer of thermoplastic polymeric material having a

volume resistivity of  $1 \times 10^7$  to  $1 \times 10^{12}$  ohm-cm, a continuous thin conductive film of thermoplastic polymeric material in direct physical and electrical connection with the underside of said upper layer and having a surface resistance in the order of  $10^2$  ohms per square, and a conductive underlying lower layer in electrical contact with the underside of said conductive film, said underlying layer being a layer of expanded thermoplastic polymeric material having a volume resistivity of  $1 \times 10^7$  to  $1 \times 10^{12}$  ohm-cm.

4,414,261

## ADHESIVE TAPE

Kazuhiko Nanbu, Nagahama, Japan, assignor to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 417,879

Claims priority, application Japan, Oct. 27, 1981, 56-171582

Int. Cl.<sup>3</sup> B32B 7/02; C09J 7/02

U.S. Cl. 428—213

13 Claims

1. An adhesive tape which comprises a base sheet and an adhesive layer coated on one side of the base sheet, characterized in that said base sheet comprises an intermediate layer made of a crystalline polypropylene containing from 25 to 35% by weight of a petroleum resin and outer layers made of a crystalline polypropylene laminated on both sides of the intermediate layer, said intermediate layer having a thickness within a range of from 60 to 90% of the total thickness of the base sheet and the layers of the base sheet being biaxially oriented so that the orientation in the longitudinal direction is greater than the orientation in the transverse direction.

6. The adhesive tape according to claim 1 wherein the base sheet has a thickness of from 30 to 40  $\mu$  and the adhesive layer has a thickness of from 15 to 25  $\mu$ .

4,414,262

## SHAPED BODY OF A SETTABLE MINERAL MATERIAL WITH REINFORCEMENT FIBERS EMBEDDED THEREIN

Ludwig Hartmann, Kaiserslautern, and Otto Ambros, Mannheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,311

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142598

Int. Cl.<sup>3</sup> D03D 13/00

U.S. Cl. 428—222

10 Claims

1. A shaped body comprising a nonwoven fabric of endless reinforcement fibers embedded in an alkaline settable mineral material the endless fibers having no preferred direction or orientation, and said fibers being comprised of a bundle of individual parallel fiber strands, wherein at least one fiber strand at the core of the bundle is protected against chemical interaction with said alkaline settable material by the outermost fiber strands of said bundle which are comprised of a polymeric material which is inert to the alkaline settable material.

4,414,263

## PRESS FELT

Joseph S. Miller, and Ronald L. Aylor, both of Atlanta, Ga., assignors to Atlanta Felt Company, Inc., Battletree, Ga.

Filed Jul. 9, 1982, Ser. No. 396,626

Int. Cl.<sup>3</sup> B32B 5/00

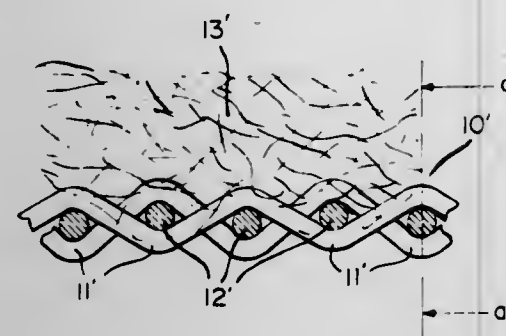
U.S. Cl. 428—234

6 Claims

1. A press felt being in the shape of an endless belt and having opposed side edges, said felt having a lateral direction extending between the side edges thereof and a longitudinal direction extending perpendicularly to said lateral direction, said felt comprising an open-mesh base fabric woven of a plurality of synthetic filaments extending in both the lateral and longitudinal directions, and at least one batt of stable fibers



needed thereto, characterized in that at least some of the filaments extending in the lateral direction are monofilaments



having a flattened cross-section, the long axis of which lies parallel to the plane of the fabric.

4,414,264

#### CHIP CARRIER SUBSTRATES OF HYBRID WOVEN GLASS CLOTHS

Larry D. Olson, Viroqua, Wis., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 334,500, Dec. 28, 1981, Pat. No. 4,372,347. This application Jan. 13, 1983, Ser. No. 457,778

Int. Cl.<sup>3</sup> B32B 5/16

U.S. Cl. 428—241

10 Claims

1. The application of a substrate for carrying a silicon chip (integrated circuits) which comprises a hybrid glass cloth woven from yarn comprising fiberglass and a second material which possesses a coefficient of thermal expansion of less than about  $5.0 \times 10^{-6}$  in/in/°C.

4,414,265

#### INSULATION BOARD

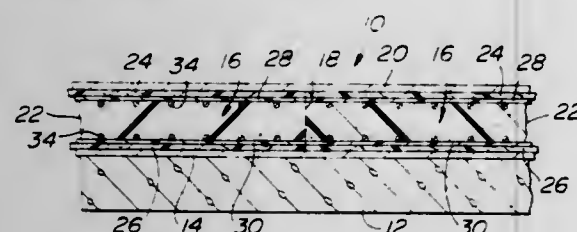
Dennis W. Rosato, Lawrenceville, and Neil K. Lister, Rahway, both of N.J., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 390,249, Jun. 21, 1982, Pat. No. 4,388,366. This application Mar. 10, 1983, Ser. No. 474,153

Int. Cl.<sup>3</sup> B32B 17/10, 5/18, 5/32

U.S. Cl. 428—285

12 Claims



1. An insulation board comprising a plastic foam layer covered by at least one facing panel, said panel comprising a facing sheet, said facing sheet comprising glass fibers which are randomly dispersed in uniform fashion throughout the sheet, said fibers being bonded together by a bonding agent, and said fibers and bonding agent being coated by a non-wicking agent to provide a porous but liquid-repellent structure, said panel also including a scrim, said scrim being positioned between the facing sheet and the foam layer, the scrim comprising a glass fiber mat wherein the fibers are randomly dispersed and bonded together by a bonding agent, and wherein a pattern of glass strands are bonded to at least one face of the mat.

#### 4,414,266 METHOD OF MANUFACTURE OF REINFORCED SHEET PLASTICS MATERIAL AND THE PRODUCTION OF MOULDED ARTICLES THEREFROM

Emmit W. Archer, Ann Arbor, Mich., and Derek F. Gentle, Danbury, England, assignors to Ford Motor Company, Dearborn, Mich.

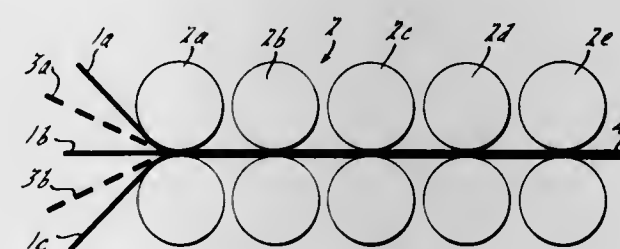
Filed Aug. 19, 1980, Ser. No. 179,618

Claims priority, application United Kingdom, Aug. 24, 1979, 7929582

Int. Cl.<sup>3</sup> B32B 27/36

U.S. Cl. 428—287

22 Claims



1. A method of manufacturing a reinforced sheet material which comprises holding superimposed layers of fibrous reinforcing material and molten polyethylene terephthalate, in contact under pressure, and cooling the superimposed layers to below the glass transition point of the polyethylene terephthalate, the cooling being effected at a rate sufficient to avoid crystallization of the polyethylene terephthalate.

4,414,267

#### METHOD FOR TREATING DISCONTINUOUS CELLULOSE FIBERS CHARACTERIZED BY SPECIFIC POLYMER-PLASTICIZER TO FIBER RATIOS, FIBERS THUS TREATED AND COMPOSITES MADE FROM THE TREATED FIBERS

Aubert Y. Coran, and Lloyd A. Goettler, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 8, 1981, Ser. No. 252,514

Int. Cl.<sup>3</sup> B32B 23/02, 23/08

U.S. Cl. 428—288

15 Claims

1. The process of treating discontinuous cellulose fibers by slurring said fibers in water, contacting said fibers with a mixture of (a) an aqueous suspension of a vinyl chloride polymer in which suspension the polymer has a particle diameter of 10μm or less and (b) a plasticizer for said polymer, causing the polymer and plasticizer to deposit on the fibers, and drying the treated fibers, wherein the polymer and plasticizer together are present in an amount of at least 25 parts per 100 parts of fiber by weight, and the weight ratio of plasticizer to polymer in the mixture is from 2.5:1 to 25:1.

13. Treated fibers produced by the process of claim 1.

14. A composite containing treated fibers of claim 13 dispersed in a matrix which comprises vinyl chloride polymer.

4,414,268

#### ABSORBENT MICROBICIDAL FABRIC AND PROCESS FOR MAKING SAME

A. Frank Baldwin, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 9, 1981, Ser. No. 310,414

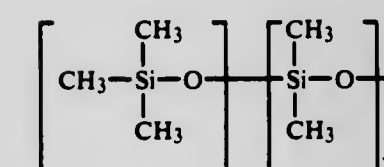
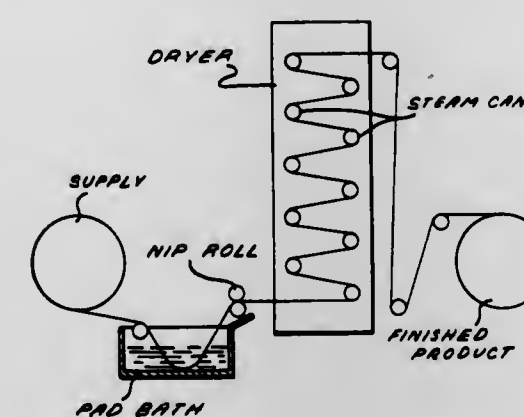
Int. Cl.<sup>3</sup> A61F 13/00

U.S. Cl. 428—289

3 Claims

1. An absorbent, bioactive, highly wettable non-woven cellulosic medical substrate having incorporated thereon a non-leachable, bioactive amount of 3-(trimethoxysilyl)-propyloctadecyl dimethyl ammonium chloride present in an amount from about 0.15% to about 1.05% on the basis of the

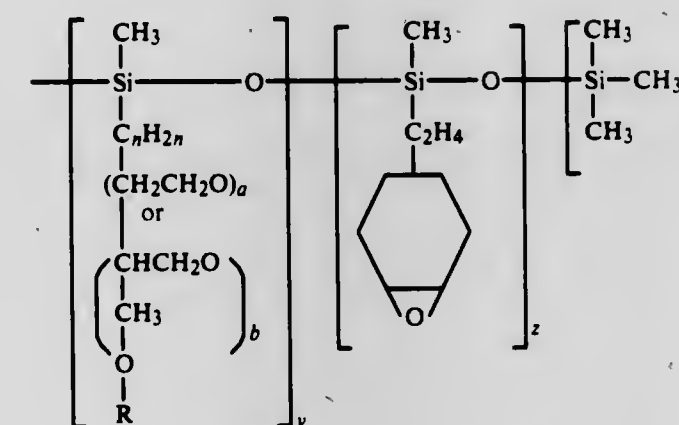
weight of the substrate; and, as a wettable hydrophilic coupling agent, an organosilicone terpolymer of the formula:



D'

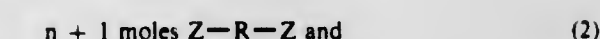
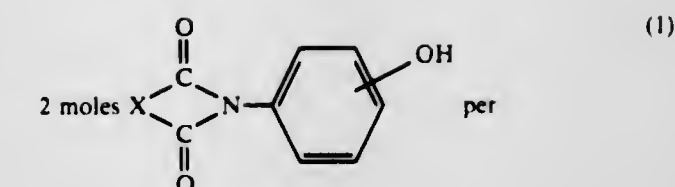
D''

M

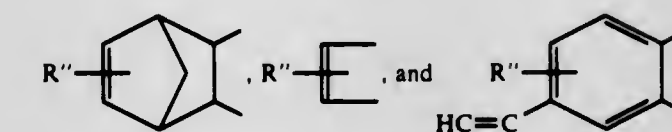


wherein R is hydrogen or methyl, the sum of a + b is in the range of 5 to 200, x is 10 to 50,000, y is 1 to x and z is 1 to 0.5x provided that the sum of y + z is  $\leq 0.75x$ ; said terpolymer is present in an amount of from about 0.25% to about 1.25% on the basis of the weight of the substrate,

wherein the bioactive material and the hydrophilic coupling agent are substantively attached to the fibers of the cellulosic substrate, such that the bioactive compound and the hydrophilic coupling agent are substantially non-leachable from the substrate.



wherein X is selected from the group consisting of



R'' is hydrogen or a lower alkyl, Z is selected from the group consisting of fluorine, chlorine, and bromine, R is an aromatic radical, R' is an aromatic radical, at least one of said aromatic radicals R and R' contains a diaryl radical wherein the aryl rings are connected by a sulfone linkage, and n is selected so that said polymer has a molecular weight between about 1,000 and about 40,000.

4,414,270

#### MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Toshimitsu Okutu; Goro Akashi; Tatsuji Kitamoto, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 2, 1982, Ser. No. 345,121

Claims priority, application Japan, Feb. 2, 1981, 56-14032

Int. Cl.<sup>3</sup> B32B 5/16

U.S. Cl. 428—325

6 Claims

1. A magnetic recording medium comprising a magnetic layer on one surface of a non-magnetic base and a back coating on the other surface thereof which is not thicker than 2μ and which comprises inorganic particles and binder, wherein the inorganic particles are selected from the group consisting of tungsten disulfide, molybdenum disulfide, boron nitride, SiO<sub>2</sub>, CaCO<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, MnO, ZnO, CaO, and SnO<sub>2</sub> and have an average size between 0.02 and 0.5μ and a Mohs hardness of 2.5 to 9.0, and the surface of the back coating has a center line average roughness (Ra) of 0.024μ or less and the surface of the magnetic layer has a center line average roughness (Ra) of 0.02μ or less.

4,414,271

#### MAGNETIC RECORDING MEDIUM AND METHOD OF PREPARATION THEREOF

Tatsuji Kitamoto; Ryuji Shirahata; Yasuyuki Yamada, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

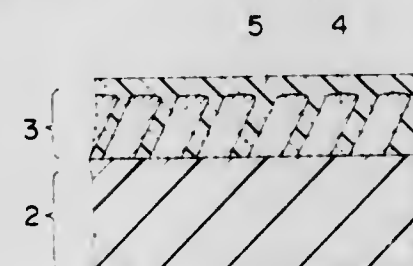
Filed Feb. 25, 1982, Ser. No. 352,220

Claims priority, application Japan, Feb. 27, 1981, 56-28196

Int. Cl.<sup>3</sup> B32B 5/16

U.S. Cl. 428—328

21 Claims



1. A magnetic recording medium comprising a substrate, a

4,414,269

#### SOLVENT RESISTANT POLYSULFONE AND POLYETHERSULFONE COMPOSITIONS

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to TRW, Inc., Redondo Beach, Calif. and The Boeing Company, Seattle, Wash.

Filed Jun. 16, 1981, Ser. No. 274,162

Int. Cl.<sup>3</sup> C08G 73/12

U.S. Cl. 428—290

10 Claims

1. A cross-linkable polysulfone or polyethersulfone polymer formed by reacting:



thin ferromagnetic metal film having spaced-apart columnar grain structures formed on said substrate, and a crosslinked organic polymer formed from a polymerizable organic compound and a curing agent at least in the spaces between said columnar grain structures and integrated with said thin ferromagnetic metal film.

4,414,272

# SHAPED POLYESTER COMPOSITE MATERIAL HAVING ACTIVATED SURFACE THEREOF AND PROCESS FOR PRODUCING THE SAME

Hirotsuke Watanabe, and Tadahiko Takata, both of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan  
Filed Sep. 16, 1981, Ser. No. 302,856

Claims priority, application Japan, Jul. 10, 1980, 55-93239; Sep. 22, 1980, 55-130619; Sep. 22, 1980, 55-130620; Oct. 31, 1980, 55-152215; Feb. 17, 1981, 56-20824; May 22, 1981, 56-76727; May 22, 1981, 56-76728; May 25, 1981, 56-78002; May 25, 1981, 56-78003; May 28, 1981, 56-79978

Int. Cl.<sup>3</sup> B32B 5/16, 27/36, 5/08

U.S. Cl. 428—331

32 Claims

1. A shaped polyester composite material having an activated surface thereof, comprising:  
a shaped substrate comprising a polymeric matrix consisting essentially of an aromatic linear polyester and fine solid particles each comprising mainly silicon dioxide and having an average size of 5 to 100 millimicrons said silicon dioxide fine particles being dispersed in at least a portion of said shaped substrate and the amount of said fine particles being in the range of 0.3% to 15% based on the weight of said polyester matrix in which said fine particles are dispersed; and  
a surface coating layer formed on the silicon dioxide fine particle-containing surface portion of said shaped substrate wherein said silicon dioxide fine particles are located and comprising from 0.5% to 10%, based on the weight of said shaped substrate, of a surface-activating material consisting of at least one member selected from the group consisting of silane coupling compounds and organic titanium compounds, and mixed with from 0.05% to 2%, based on the weight of said shaped substrate, of an additional material comprising at least one polyepoxide compound, said surface coating layer having been heat-treated together with said shaped substrate at a temperature of 50° C. or more but at least 10° C. below the melting point of said polyester matrix.

4,414,273

# THERMAL RECORDING MATERIALS

Minoru Wada; Yonosuke Takahashi, and Eiichi Hasegawa, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

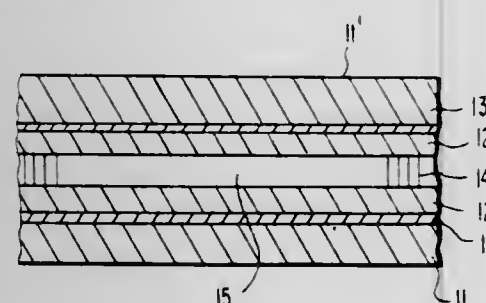
Filed May 20, 1982, Ser. No. 380,319

Claims priority, application Japan, May 20, 1981, 56-74819

Int. Cl.<sup>3</sup> B32B 15/04, 15/08

U.S. Cl. 428—336

17 Claims



1. In thermal recording materials comprising a thermal recording layer of high optical density provided on a base, the improvement wherein the recording layer comprises a mixture of a metal and a substance capable of increasing recording

sensitivity, said substance being present in an amount of 10 to 80% by volume and further wherein a stabilizing film composed of at least one metal selected from the group consisting of In, Al, Ag, Au, Rh, Pd, Ir and Pt is provided on at least one face of said recording layer, said film having a thickness of 22 to 100 Å and said stabilizing film preventing deterioration of said recording layer due to moisture or oxygen in the air.

4,414,274

# THIN FILM ELECTRICAL RESISTORS AND PROCESS OF PRODUCING THE SAME

Konrad Hieber, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

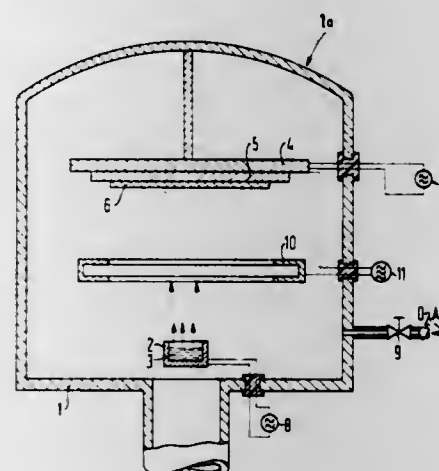
Continuation-in-part of Ser. No. 107,829, Dec. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 909,036, May 24, 1978, abandoned. This application Jun. 14, 1982, Ser. No. 388,180

Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724498

Int. Cl.<sup>3</sup> H01C 7/00

U.S. Cl. 428—336

3 Claims



1. An electrical layer resistor comprised of a substrate and layer of electrically conductive material positioned on a surface of said substrate, said conductive material comprising a substantially homogeneous amorphous chromium-silicon-oxygen alloy having an empirical formula:



wherein

x is a number in the range of 0.3 to 0.39,  
y is a number in the range of 0.4 to 0.52, and  
z is a number in the range of 0.1 to 0.30

with the proviso that the sum of x, y, and z is equal to one, said layer of conductive material having a thickness ranging between about 8 nm and 50 nm, said conductive material possessing a relative high degree of stability, a relatively low temperature coefficient of electrical resistance ranging between about 0 and -400 ppm/°K. and exhibiting a specific electrical resistance in the range of about 2000 to 16,000 μΩ-cm.

4,414,275

# UV CURABLE ADHESIVE TAPE

John Woods, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Tallaght, Ireland

Filed Jul. 13, 1981, Ser. No. 282,782

Int. Cl.<sup>3</sup> C09J 7/02; B32B 27/30

U.S. Cl. 428—352

34 Claims

1. A flexible tape comprising a thermoplastic support film etched on one side with a suitable etchant or etching method, said etched side being coated with a polyvinylformal pre-coat, and further coated with a photo-sensitive adhesive composition comprising,

- (i) at least one polymerizable acrylate ester monomer;  
(ii) a photo-initiator,  
(iii) optionally a film former;  
and the other side of said thermoplastic support film being coated with a release agent.

4,414,276

# NOVEL ASSEMBLY OF COMPOSITE FIBERS

Tsutomu Kiriya; Susumu Norota; Yasuhiko Segawa; Shingo Emi; Tadasi Imoto, and Toshinori Azumi, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan  
Filed Jul. 29, 1981, Ser. No. 288,202

Claims priority, application Japan, Jul. 29, 1980, 55-103067; Sep. 19, 1980, 55-129056; Oct. 23, 1980, 55-147547

Int. Cl.<sup>3</sup> D01D 3/00, 5/10, 5/20, 5/28; D02G 3/04

U.S. Cl. 428—374

20 Claims

1. An assembly of fibers composed of at least two dissimilar fiber-forming polymers, characterized by the fact that  
(1) it consists of numerous separated fibers,  
(2) at least 90% of said fibers have a noncircular cross-sectional shape,  
(3) the cross sections of at least 50% of said fibers differ from each other in at least one of shape and size, and  
(4) at least 50% of said fibers each have in their cross section taken at right angles to the fiber axis at least two side-by-side coalesced blocks of at least two dissimilar fiber-forming polymer phases with at least a part thereof being exposed to the peripheral surface of the fiber, at least one of the number, shape and size of the blocks varying from fiber to fiber.

4,414,277

# MIXTURES COMPRISING FLUORINATED PYROMELLITATE OLIGOMERS USEFUL AS SURFACTANTS AND PROCESSES FOR THE PRODUCTION AND USE THEREOF

Bryce C. Oxenrider, Florham Park, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 30, 1982, Ser. No. 412,620

Int. Cl.<sup>3</sup> B32B 27/34; B05D 3/02

U.S. Cl. 428—395

16 Claims

1. A process for the production of an organic mixture useful as a fiber surface modifying agent wherein said mixture comprises oligomeric compounds and wherein said process comprises:  
(a) reacting pyromellitic dianhydride with fluorinated alcohol at a mole ratio of about two moles of fluorinated alcohol per mole of pyromellitic dianhydride to produce a pyromellitate having two fluorinated ester moieties and two carboxylic acid moieties;  
(b) reacting said pyromellitate of step (a) with an excess of an oxirane compound selected from the group consisting of epichlorohydrin, epibromohydrin, and propylene oxide in the presence of additional pyromellitic dianhydride to produce said organic mixture comprising oligomeric compounds; wherein said oxirane compounds react with said carboxylic acid moieties to produce an ester having a primary or secondary alcohol, and wherein said alcohol reacts with said additional pyromellitic dianhydride to produce ester-linking moieties and carboxylic acid moieties capable of reacting with said oxirane compound to produce additional esters having primary or secondary alcohols.

4,414,278

# CROSSLINKED TRIACRYLATE POLYMER BEADS

Abraham B. Cohen, Springfield, N.J., and Christina N. Lazariadis, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 22, 1982, Ser. No. 370,992

Int. Cl.<sup>3</sup> B32B 5/16

U.S. Cl. 428—402

10 Claims

1. Discrete, substantially nonswellable, crosslinked polymeric beads having an average diameter size in the range of 0.7

to 20 μm, wherein at least 90% of the beads by population are below 20 μm, the beads being nonagglomerating in any solvent or solvents including a solvent or solvents for the monomer or monomers used in the preparation of the polymeric beads which are taken from the class consisting of homopolymers of tri- and tetraacrylate and tri- and tetramethacrylate monomers, copolymers of said tri- and tetraacrylate and tri- and tetramethacrylate monomers, copolymers of one of said tri- and tetraacrylate or said tri- and tetramethacrylate monomers and up to 25% by weight of at least one monomer having one terminal ethylenic group, copolymers of one of said tri- and tetraacrylate or said tri- and tetramethacrylate monomers and up to 50% by weight of at least one monomer having two terminal ethylenic groups or three terminal ethylenic groups different from said triacrylate or trimethacrylate monomers.

4,414,279

# BINDER COMPOSITIONS FOR POWDER COATINGS

Daniel Bernelin, Ris Orangis, and Jacques Meyer, Paris, both of France, assignors to Chloé Chimie, Puteaux, France

Division of Ser. No. 294,521, Aug. 20, 1981, Pat. No. 4,371,638, which is a continuation of Ser. No. 12,020, Feb. 14, 1979, abandoned. This application Sep. 23, 1982, Ser. No. 422,024

Claims priority, application France, Feb. 20, 1978, 78 04685

Int. Cl.<sup>3</sup> B32B 27/36, 27/38

U.S. Cl. 428—413

8 Claims

1. A process for producing a cross-linked coating having a non-gloss surface comprising applying to a substrate a powder coating composition comprising of a binder composition comprising at least two saturated cross-linking polyester resins and a cross-linking agent, said resins exhibiting different reactivities with respect to said cross-linking agent wherein the resin exhibiting the highest reactivity has a hydroxyl index between about 175 and 185 and the resin exhibiting the lowest reactivity has a hydroxyl index between about 40 and 60, and heating the thus applied coating to a temperature between about 160° and 220° C. for a period of time between about 5 to 40 minutes to effect cross-linking.

4,414,280

# MEMBRANES AND COMPOSITES FROM FLUOROPOLYMER SOLUTIONS

Raimund H. Silva; Paul R. Resnick, both of Wilmington, Del., and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 176,595, Aug. 8, 1980, Pat. No. 4,348,310, which is a continuation-in-part of Ser. No. 79,173, Sep. 26, 1979, abandoned. This application Dec. 3, 1981, Ser. No. 327,062

Int. Cl.<sup>3</sup> B32B 27/24

U.S. Cl. 428—422

4 Claims

3. An inert support material coated by fluoropolymer from a solution of fluoropolymer in halogenated solvent wherein: the fluoropolymer is present in an amount greater than 0.5 percent, by weight, of the solution at 25° C.; the solvent is a perhalogenated, saturated liquid having at least one alkyl segment, at least one alkyl ether segment, and at least one terminal polar group wherein the halogens in the liquid are selected from the group consisting of F, Cl, Br, and I, the alkyls have one to three carbon atoms, and the polar groups are either alkyl carboxyl ester or sulfonyl fluoride; and the fluoropolymer is a copolymer of tetrafluoroethylene and perfluorinated sulfonyl fluoride- or carboxyl-containing vinyl monomer having an equivalent weight of greater than 1000.



4,414,281

## GLASS-CERAMIC ARTICLES HAVING METALLIC SURFACES

Syed N. Hoda, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,000  
Int. Cl.<sup>3</sup> C03C 3/22

U.S. Cl. 428—433

2 Claims

1. A composite article composed of a substrate consisting of a glass-ceramic, wherein the predominant crystal phase is a synthetic fluor mica selected from the group of normal fluorophlogopite, alkali metal boron fluorophlogopite, and alkaline earth metal fluorophlogopite, which is mechanically machinable and an integral, electrically-conductive surface layer consisting of metallic copper and/or silver, said glass-ceramic consisting essentially, expressed in terms of weight percent on the oxide basis, of about 6-22% MgO, 10-18% MgF, an effective amount up to 6% Cu<sub>2</sub>O and/or Ag<sub>2</sub>O, 0-14% K<sub>2</sub>O, 0-16% BaO, 0-12% SrO, 0-10% CaO, 0-22% Al<sub>2</sub>O<sub>3</sub>, 0-18% B<sub>2</sub>O<sub>3</sub>, and 30-47% SiO<sub>2</sub>.

4,414,282

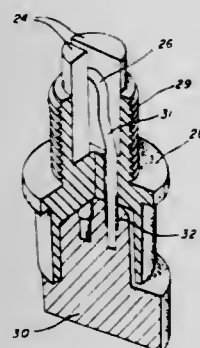
## GLASS CERAMIC SEALS TO INCONEL

Howard L. McCollister, Albuquerque, N. Mex., and Scott T. Reed, Albuquerque, N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 19, 1982, Ser. No. 369,965  
Int. Cl.<sup>3</sup> B32B 15/00

U.S. Cl. 428—433

22 Claims



1. A glass ceramic composition prepared by subjecting a glass composition comprising, by weight, 65-80% SiO<sub>2</sub>, 8-16% Li<sub>2</sub>O, 2-8% Al<sub>2</sub>O<sub>3</sub>, 1-8% K<sub>2</sub>O, 1-5% P<sub>2</sub>O<sub>5</sub> and 1.5-7% B<sub>2</sub>O<sub>3</sub>, to the following processing steps:

- heating the glass composition to a temperature sufficient to crystallize lithium metasilicate therein;
- holding the glass composition at a temperature and for a time period sufficient to dissolve the lithium metasilicate therein thereby creating cristobalite nuclei;
- cooling the glass composition and maintaining the composition at a temperature and for a time period sufficient to recrystallize lithium metasilicate therein; and
- thermally treating the glass composition at a temperature and for a time period sufficient to cause growth of cristobalite and further crystallization of lithium metasilicate producing a glass ceramic composition having a specific thermal expansion coefficient.

8. A process for forming a seal between a glass having a thermal expansion coefficient  $\alpha$  of  $120-160 \times 10^{-7}/^{\circ}\text{C}$ . and a nickel base alloy having substantially the same thermal expansion coefficient, comprising the steps of:

- applying a glass having a composition, by weight, of 65-80% SiO<sub>2</sub>, 8-16% Li<sub>2</sub>O, 2-8% Al<sub>2</sub>O<sub>3</sub>, 1-8% K<sub>2</sub>O, 1-5% P<sub>2</sub>O<sub>5</sub> and 1.5-7% B<sub>2</sub>O<sub>3</sub> to the nickel base alloy, and subjecting the glass to the following processing steps:
  - heating the glass composition to a temperature sufficient to crystallize lithium metasilicate therein;
  - holding the glass composition at a temperature and for a time period sufficient to dissolve the lithium metasilicate therein thereby creating cristobalite nuclei;
  - cooling the glass composition and maintaining the compo-

sition at a temperature and for a time period sufficient to recrystallize lithium metasilicate therein; and  
d. thermally treating the glass composition at a temperature and for a time period sufficient to cause growth of cristobalite and further crystallization of lithium metasilicate producing a glass ceramic composition having a specific thermal expansion coefficient.

11. A product produced by the process of claim 8.

4,414,283

## ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE ALLYL ALCOHOL COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 274,588, Jun. 17, 1981, Pat. No. 4,360,640.  
This application Sep. 29, 1982, Ser. No. 426,529  
Int. Cl.<sup>3</sup> B32B 15/08

U.S. Cl. 428—461

11 Claims

1. A coating composition comprising:

- a water-dispersible graft copolymer of an acrylic monomer or monomers and a random copolymer of a styrene and between about 20 weight percent and 30 weight percent of the random copolymer of allyl alcohol, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both, said graft copolymer being neutralized with ammonia, ammonium hydroxide, or a tertiary amine; and
- a cross-linking agent;

said composition being diluted with water to a solids content of between about 10 weight percent and about 40 weight percent.

4,414,284

## TWO LAYER SINTERED PISTON RING WITH A REST-CURVE LIKE BOUNDARY

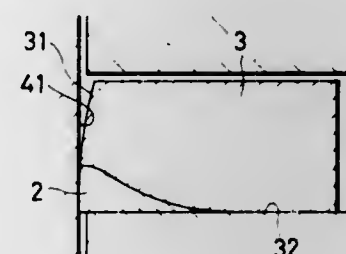
Tadashi Ebihara, Hatogaya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,570

Claims priority, application Japan, Feb. 26, 1981, 56-26118  
Int. Cl.<sup>3</sup> F16J 9/20; B22F 7/02; B32B 7/00

U.S. Cl. 428—550

4 Claims



1. A piston ring produced by a powder metallurgical method, comprising: first and second zones, said first zone being made of a first sintered alloy powder, said second zone being made of a second sintered alloy powder, said second zone having a nearly triangular shape in cross section, one edge of an outer peripheral surface of the piston ring being a vertex of the second triangular-shaped zone, a boundary between said first and second zones having a rest-curve like shape formed by relative movement between a core rod and a punch after said first sintered alloy powder is deposited on an upper surface of said core rod and punch but prior to said second sintered alloy powder being deposited on said first sintered alloy powder.

4,414,285

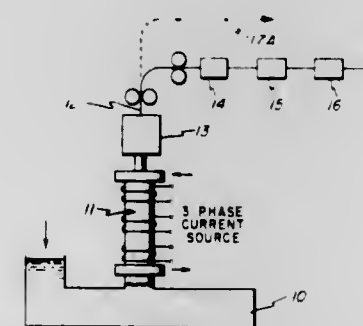
## CONTINUOUS METAL CASTING METHOD, APPARATUS AND PRODUCT

Hugh R. Lowry, Fairfield, Conn., and Robert T. Frost, Berwyn, Pa., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 430,830, Sep. 30, 1982, which is a continuation of Ser. No. 165,421, Jul. 2, 1980, abandoned. This application Dec. 30, 1982, Ser. No. 454,600  
Int. Cl.<sup>3</sup> B22D 27/02

U.S. Cl. 428—577

19 Claims



1. The method of producing a metal product of long length which comprises the steps of forming an elongated upwardly-traveling alternating electromagnetic field within the interior of a surrounding casting vessel, introducing liquid metal into the lower portion of the casting vessel and the field, establishing an alternating electromagnetic field acting on the liquid metal column to provide a levitation ratio between 75% and 200% of the weight per unit length of liquid metal and wherein the optimum fundamental frequency of the alternating electromagnetic field is given by the expression  $F = (36\rho/D^2)$  where  $F$  is the frequency in kilohertz,  $\rho$  is the resistivity of the liquid metal column in micro-ohm-centimeters, and  $D$  is the average diameter of the solidified metal product in millimeters to thereby reduce the hydrostatic head of the column and to maintain a predetermined dimensional relationship between the outer surface of the liquid metal column and the interior surrounding surfaces of said casting vessel, maintaining the electromagnetic field at the set value of levitation ratio so that the cross-sectional dimension of the liquid metal in the solidification zone is sufficiently large to preclude formation of a substantial gap between the outer surface of the column and the interior surrounding surfaces of the casting vessel thereby effecting optimized heat transfer conditions between the liquid metal column and the casting vessel for a given rate of production while simultaneously reducing frictional, adhesive and gravitational forces acting on the column to a minimum, moving the liquid metal column upwardly through the casting vessel, solidifying the metal while moving upwardly through said vessel and said field, and removing solidified metal product from the upper portion of said vessel.

4,414,286

## COMPOSITE THERMOSTAT METAL

Henry Ty, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

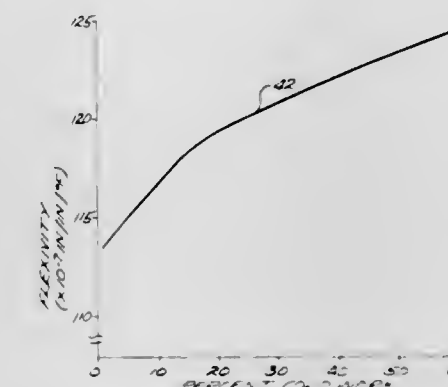
Continuation-in-part of Ser. No. 250,358, Apr. 2, 1981, abandoned. This application May 26, 1981, Ser. No. 267,144  
Int. Cl.<sup>3</sup> B32B 15/18

U.S. Cl. 428—616

13 Claims

1. A composite thermostat metal adapted to flex when heated comprising first metal layer means having a relatively high coefficient of thermal expansion in a selected temperature range disposed at the high expansion side of the thermostat metal, and second metal layer means having a relatively lower coefficient of thermal expansion in said selected temperature range metallurgically bonded to the first metal layer means to be disposed at the low expansion side of the thermostat metal, the second metal layer means including at least one layer component of an austenitic stainless steel material disposed on an

outer surface of the thermostat metal on the low expansion side thereof selected from the group consisting of austenitic stainless steels as set forth in Table III which are subject to significant austenite to martensite transformation during work hardening thereof, the stainless steel layer component having its



coefficient of thermal expansion in said selected temperature range substantially lowered at least as low as  $6.0 \times 10^{-6}$  in./in./°F. by work hardening thereof for cooperating in providing the thermostat metal with a suitably high flexivity of about  $55 \times 10^{-7}$  in./in./°F. or more in said selected temperature range.

4,414,287

## MAGNETIC RECORDING MEDIUM AND ITS MANUFACTURE

Eckhart Kneller, Herbede; Roland Koenig, Ludwigshafen; Eberhard Koester, Frankenthal; Werner Grau, Bobenheim-Roxheim, and Dieter Mayer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany  
Continuation of Ser. No. 228,718, Jan. 27, 1981, abandoned, which is a division of Ser. No. 126,895, Mar. 3, 1980, Pat. No. 4,287,225. This application Jun. 29, 1982, Ser. No. 393,498  
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909891Int. Cl.<sup>3</sup> B32B 15/10

U.S. Cl. 428—650

2 Claims

1. A magnetic recording medium comprising a non-magnetic base which is dimensionally stable at up to 300° C., and an 0.03 to 0.4  $\mu\text{m}$  thick, magnetically hard amorphous recording layer of an Sm-Co alloy, wherein the recording layer consists of an amorphous Sm-Co<sub>x</sub> alloy, where  $x$  is from 1 to 20, possesses uniaxial magnetic anisotropy in the plane of the layer and has a coercive force of from 10 to 100 kA/m and a squareness ratio of more than 0.9.

4,414,288

## MAGNETIC RECORDING MEDIUM

Hiroshi Kawahara; Hitoshi Azegami, and Eiji Horigome, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,653

Claims priority, application Japan, Apr. 14, 1981, 56-55099  
Int. Cl.<sup>3</sup> G11B 5/70

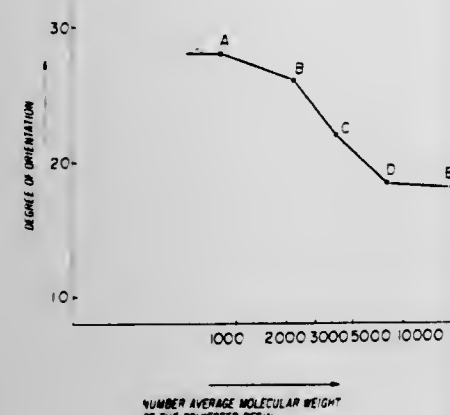
U.S. Cl. 428—694

4 Claims

1. A magnetic recording medium which comprises a substrate coated with a magnetic paint comprising a magnetic powder dispersed in a binder comprising a vinyl chloride-vinyl



acetate copolymer containing at least 10% of polyvinyl alcohol, a urethane resin and a polyester resin, wherein the poly-



ter resin has a number average molecular weight of 3,000 or less.

4,414,289

#### HIGH DENSITY MAGNETIC RECORDING MEDIUM

Fujio Shibata, Komoro; Kenji Hirabayashi, Mitsuka-Saku, and Chihoto Mikura, Kunitachi, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,413

Claims priority, application Japan, Mar. 23, 1981, 56-40465

Int. Cl.<sup>3</sup> G11B 5/70

U.S. Cl. 428—695

5 Claims

1. A magnetic recording medium carrying means for recording magnetic information comprised of a nonmagnetic base and a magnetic coating layer fixed on said base, said magnetic coating layer comprises ferromagnetic particles dispersed in a binder vehicle, characterized in that said magnetic coating layer contains a glyceride and a sorbitan ester of fatty acid.

4,414,290

#### MAGNETIC STRUCTURE SUITABLE FOR THE PROPAGATION OF SINGLE-WALLED MAGNETIC DOMAINS

Dirk J. Breed, and Antonius B. Voermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 130,889, Mar. 17, 1980, abandoned.

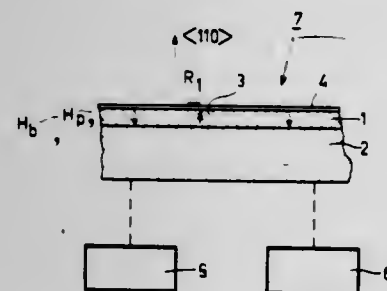
This application Mar. 15, 1982, Ser. No. 358,062

Claims priority, application Netherlands, Mar. 23, 1979, 7902293

Int. Cl.<sup>3</sup> G11C 11/02

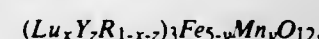
U.S. Cl. 428—700

7 Claims



1. A magnetic structure, in which single-walled magnetic domains can be propagated, comprising:  
a monocrystalline, nonmagnetic substrate having a surface extending substantially parallel to a (110) plane of the crystal; and  
a monocrystalline layer of a magnetic rare-earth iron garnet, having a partial substitution of  $Mn^{3+}$  ions at iron sites, said layer being substantially planar and having been grown under compression on the surface of the substrate,

said layer having an easy axis of magnetization substantially perpendicular to the plane of the layer and having a medium axis of magnetization in the plane of the layer; characterized in that:  
the substrate has a lattice constant between 12.23 and 12.38 Å; and  
the magnetic layer consists essentially of a material having the formula



where R is at least one rare earth ion which is larger than a Lu ion;  $0 < x < 1$ ,  $0 < z < 1$ , and  $y \geq 0.15$ .

4,414,291

#### METHOD FOR REDUCING ELECTROLYTE LOSS FROM AN ELECTROCHEMICAL CELL

Richard D. Breault, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

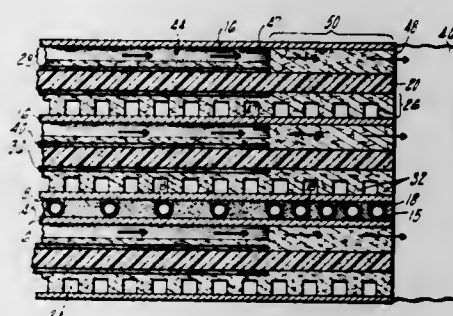
Division of Ser. No. 219,609, Dec. 24, 1980, Pat. No. 4,345,008.

This application May 25, 1982, Ser. No. 381,806

Int. Cl.<sup>3</sup> H01M 8/04

U.S. Cl. 429—14

4 Claims



1. In a stack of electrochemical cells, each cell having electrolyte adjacent a gas diffusion type porous electrode wherein during operation said electrolyte evaporates into a reactant gas stream flowing through said cell in operable relationship to said electrode and to said electrolyte, the process of reducing electrolyte loss from said cells as a result of said evaporation comprising the step of cooling said gas stream in a condensation zone within each cell adjacent the reactant gas outlet of each cell so as to condense at least some of the electrolyte vapor from the gas stream back into the respective electrode of each cell prior to said gas stream leaving the cell, wherein said condensed-out electrolyte is redistributed within the cell by diffusion or bulk flow within the electrode.

4,414,292

#### METAL HALOGEN BATTERY SYSTEM

Jozef Kiwalle, West Bloomfield; James H. Galloway, New Baltimore, both of Mich., and John W. Rowan, Stamford, Conn., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jan. 29, 1982, Ser. No. 343,904

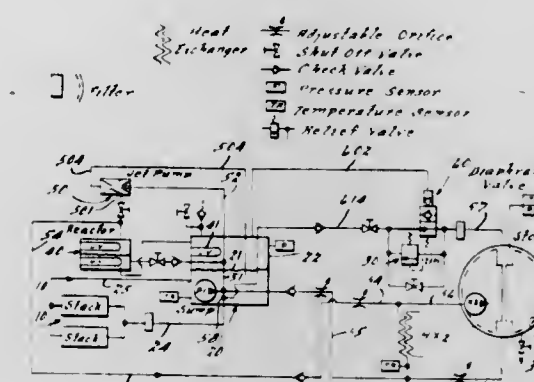
Int. Cl.<sup>3</sup> H01M 8/18

U.S. Cl. 429—19

10 Claims

1. A metal halogen battery construction, with the improved combination comprising,  
at least one cell having a positive electrode and a negative electrode for contact with aqueous electrolyte containing the material of said metal and halogen,  
sump means wherein the electrolyte is collected,  
store means wherein halogen hydrate is formed and stored as part of an aqueous material,  
circulation means for transmitting electrolyte through the battery,  
conduit means for transmitting halogen gas formed in the cell to hydrate forming means associated with the store means, and

fluid jet pump means operative to cause circulation of gases from the sump including hydrogen and halogen to contact



a reactor means whereby hydrogen and halogen are combined and returned to the sump.

4,414,293

#### PARASITIC CORROSION RESISTANT ANODE FOR USE IN METAL/AIR OR METAL/O<sub>2</sub> CELLS

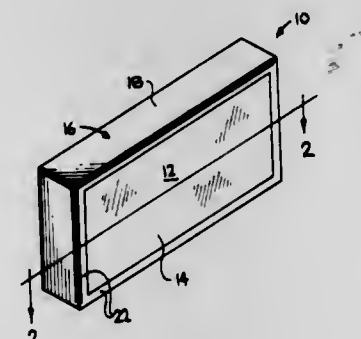
Richard W. Joy, Santa Clara, and David F. Smith, Boulder Creek, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,052

Int. Cl.<sup>3</sup> H01M 4/12

U.S. Cl. 429—27

7 Claims



1. A consumable anode for use in a corrosive environment of an electrochemical cell, said anode being in the form of a plate-like member having remote faces and a peripheral edge and being formed of a reactive metal, said anode being improved by a protective film of a corrosion inhibiting metal extending entirely over said peripheral edge and at least peripheral portions of said faces to prevent the peripheral edge from being adversely affected by the environment.

4,414,294

#### ELECTRICALLY INSULATING AND SEALING FRAME

Robin J. Guthrie, East Hartford, Conn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 424,111

Int. Cl.<sup>3</sup> H01M 2/08

U.S. Cl. 429—35

7 Claims

1. A combination electrical insulator and gas seal for use between a reactant gas plenum and a fuel cell comprising:  
a plurality of electrically insulative segments including segments with angular portions and segments with elongated portions arranged with adjacent ends in near abutment to form a closed frame between the plenum and fuel cell stack;

spline means for slidably connecting the segments together to form the frame configuration;



sealing means at opposite face surfaces of the frame engaging the reactant gas plenum and fuel cells stack for minimizing gas leakage from the plenum.

4,414,295

#### BATTERY SEPARATOR

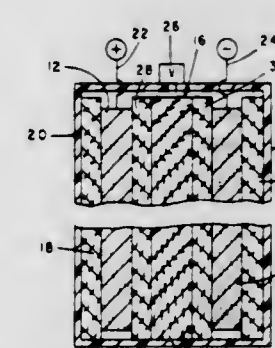
Toshio Uba, Denver, Colo., assignor to Gates Energy Products, Inc., Denver, Colo.

Filed May 6, 1982, Ser. No. 375,503

Int. Cl.<sup>3</sup> H01M 10/52, 2/18

U.S. Cl. 429—59

16 Claims



1. A normally sealed maintenance-free lead-acid electrochemical cell having at least one porous positive plate, at least one porous negative plate, a gas permeable separator interposed between such plates, and sulfuric acid electrolyte absorbed in the pores of the plates and separator, said separator comprising:  
a first outer porous layer formed of ultrafine fibers readily wetted by sulfuric acid electrolyte, having a fiber surface area in the range from about 0.1 to about 20 square meters per gram of such fiber material, and positioned against a given polarity electrode plate of the cell;  
a second such outer porous layer formed of ultrafine fibers, positioned against the opposite polarity electrode plate of the cell; and  
a third porous layer interposed between the first and second layers, comprised of ultrafine fibers readily wetted by the sulfuric acid electrolyte, having a fiber surface area on an equivalent weight basis substantially less than that of at least one of said first and second layers.



4,414,296

**ELECTROCHEMICAL STORAGE CELL OR BATTERY**

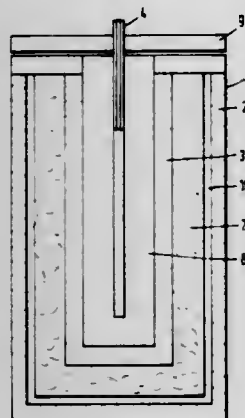
Stefan Mennicke, Leinen-Gau; Karl Reiss, Mühlhausen-Rettigheim, and Kurt Liebermann, Mannheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,123

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3117381

Int. Cl.<sup>3</sup> H01M 10/39

U.S. Cl. 429—50



1. Electrochemical storage cell or battery based on alkali metal and chalcogen as reactants with at least one anode space for a first reactant and a cathode space for a second reactant with the anode space and the cathode space separated from each other by an alkali-ion conducting solid electrolyte wall, and bounded by a cell wall of light metal, the combination therewith of a single strongly adhering metal coating on at least the area of the light metal wall in contact with at least one of the two reactants, said metal coating made of titanium and having a maximum thickness of 1  $\mu$ m.

4,414,297

**SHUNT ELEMENT**

Wilfried Fischer, Neckargemünd, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

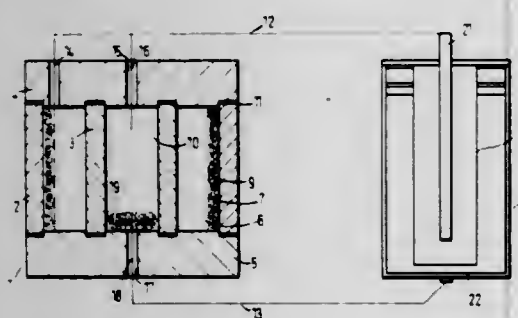
Filed Apr. 23, 1982, Ser. No. 371,121

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117385

Int. Cl.<sup>3</sup> H01M 10/42

U.S. Cl. 429—61

19 Claims



1. Shunt element for an electrochemical storage cell based on alkali metal and chalcogen, with at least one anode space for the anolyte and a cathode space for the catholyte, which spaces are separated from each other by an alkali ion-conducting solid electrolyte wall, and at least in places, are bounded by a metallic housing, comprising a first chamber with its interior space containing a metal or a decomposable metal compound, a second chamber with its interior space having two spaced contact surfaces, said two interior spaces adjoining one another, connecting means through which said metal in the first interior space moves into said adjoining second interior space, a first electrode connected to one spaced contact surface and a

second electrode connected to the other contact surface, said first electrode additionally connected to at least one electron-conducting surface of the first space, and said two electrodes adapted for connection to the electrochemical storage cell.

4,414,298

**PRINTED CIRCUIT BOARD MOUNT FOR BATTERIES AND THE LIKE**

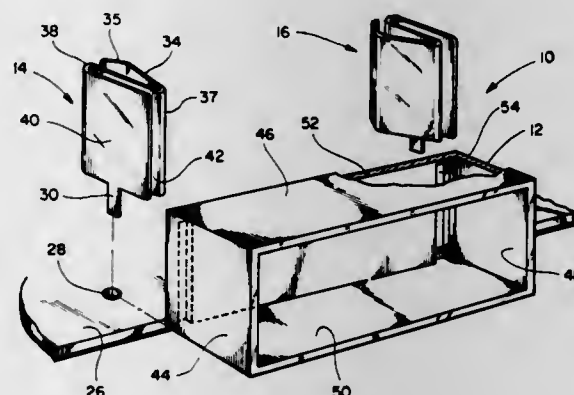
Horst M. Krenz, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jul. 9, 1982, Ser. No. 396,927

Int. Cl.<sup>3</sup> H01M 2/10

U.S. Cl. 429—99

1 Claim



1. A low-cost assembly for mounting a battery, fuse, or other terminal-bearing electrical device on a printed board supporting an electrically conductive pattern, comprising:

a one-piece molded receptacle sized and internally configured to receive one or more of such electrical devices, said receptacle having side walls and opposed end walls, said receptacle having in a side wall a pair of slots, one adjacent each of said end walls;

a pair of generally Z-shaped, resilient, electrically conductive, multi-function sheet material members for simultaneously providing total mechanical retention of said receptacle on the printed circuit board and for making electrical interconnection between an electrical device loaded in the receptacle and the printed circuit board conductive pattern, each member having a folded first portion configured to pass fold-first through one of said receptacle slots against the restorative forces in the fold and to snap into secure embracing engagement with the end wall adjacent the penetrated slot and with a free leg within the receptacle positioned and configured to resiliently engage a terminal of an electrical device loaded in the receptacle, a distal end of said free leg engaging the slot-containing wall of said receptacle to prevent inadvertent escape of said member therefrom, said member having integral with said first portion an outside leg which is external to said receptacle when said member is snapped into said receptacle, said outside leg having an edge tab adapted to be mechanically secured to said printed circuit board and soldered to said conductive pattern, said assembly thereby providing for total mechanical and electrical coupling between a terminal-bearing electrical device loaded into the receptacle and the printed circuit board.

4,414,299

**ELECTROCHEMICAL CELLS WITH BETA ALUMINA CERAMIC ELECTROLYTE MATERIAL**

Raymond O. Ansell, Warrington, England, assignor to Chloride Silent Power Limited, London, England

Filed Jun. 9, 1982, Ser. No. 386,842

Claims priority, application United Kingdom, Jun. 15, 1981, 8118321

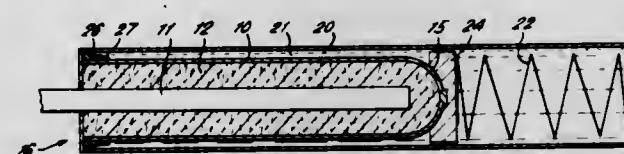
Int. Cl.<sup>3</sup> H01M 2/10

U.S. Cl. 429—104

9 Claims

1. An electrochemical cell having a tube of beta alumina

ceramic electrolyte material, wherein means are provided for applying a compressive load, at least when the cell is at the



operating temperature, to the beta alumina tube in the axial direction along the whole length or substantially the whole length of the tube.

4,414,300

**VISIBLE LIGHT TO ELECTRICAL ENERGY CONVERSION USING PHOTOELECTROCHEMICAL CELLS**

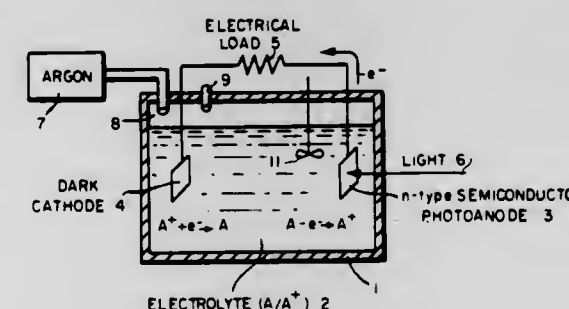
Mark S. Wrighton, Medford; Arthur B. Ellis, Brookline, both of Mass., and Steven W. Kaiser, South Charleston, W. Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 29, 1977, Ser. No. 782,596

Int. Cl.<sup>3</sup> H01M 6/36

U.S. Cl. 429—111

7 Claims



1. A photoelectrochemical cell comprising an n-type semiconductor anode, a metallic cathode, an alkaline electrolyte containing chalcogenide/polychalcogenide species, said anode and cathode being immersed in said electrolyte, said anode capable of being exposed to light, said chalcogenide/polychalcogenide is selenide/polyselenide, and said anode is GaAs.

4,414,301

**FORMED SEPARATOR SET FOR LEAD ACID BATTERIES**

Ronald L. Constain, Lancaster, Pa., assignor to Allied Corporation, Toledo, Ohio

Filed Dec. 10, 1981, Ser. No. 329,375

Int. Cl.<sup>3</sup> H01M 2/18

U.S. Cl. 429—136

10 Claims

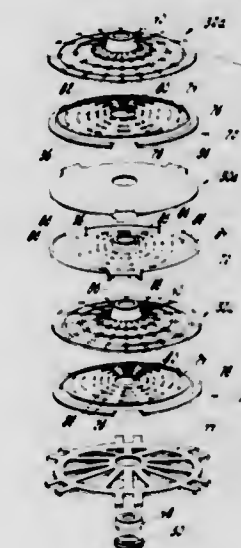
1. A battery, comprising: a cylindrical container forming a housing for said battery; a plurality of frustoconical positive electrodes disposed within said container; a plurality of frustoconical negative electrodes disposed within said container; said positive electrodes and said negative electrodes being alternately interleaved within said container; said negative electrodes being adapted to be joined together at a central portion thereof and to form a central negative column; said positive electrodes being joined together at predetermined intervals about their respective outer peripheries,

each said frustoconical positive electrode having an outer periphery;

a plurality of first unitary insulating and separating means and a plurality of second unitary insulating and separating means alternately disposed between said interleaved positive electrodes and negative electrodes;

said first unitary separating and insulating means including a first surface portion and a second surface portion and defining a first inner periphery and a first outer periphery, a first lip portion being disposed approximately perpendicular to said first surface portion about said inner periphery;

said second unitary separating and insulating means including a third surface portion and a fourth surface portion and defining a second inner periphery and a second outer



periphery, a second lip portion being disposed approximately perpendicular to said third surface about said second outer periphery;

each said first lip portion being disposed adjacent an inner periphery of one said positive electrode;

each said second lip portion being disposed adjacent an outer periphery of one said negative electrode;

each said first lip being adapted to contact one said fourth surface to insulate one said inner periphery of one said positive electrode;

each said second lip portion being adapted to contact one said second surface to insulate one said outer periphery of one said negative electrode;

one said first surface portion and one said fourth surface being disposed on opposite sides of one of said positive electrodes.

4,414,302

**METHOD OF MAKING A LEAD STORAGE BATTERY AND LEAD STORAGE BATTERY MADE ACCORDING TO THIS METHOD**

Otto Jache, and Heinz Schroeder, both of Bidingen, Fed. Rep. of Germany, assignors to Accumulatoranfabrik Sonnenschein GmbH, Bidingen, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,625

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041953

Int. Cl.<sup>3</sup> H01M 10/12, 10/06

U.S. Cl. 429—190

10 Claims

1. A method of making a lead storage battery with a thixotropic gel electrolyte consisting substantially of sulphuric acid and a gelling agent, and characterized in (a) that sulphuric acid is electrochemically bonded in the active material of the electrodes in the battery, and (b) that the battery thereafter is filled with a gelling agent and a sulphuric acid the concentration of which is insufficient for the formation of a gel, but which is sufficient for initiating a charging process upon application of a voltage.



4,414,303

## CADMIUM NEGATIVE ELECTRODE

Thomas R. Williamson, III, Sunrise; Beth B. Jones, Coral Springs; Harold Field, Plantation, all of Fla., and Robert F. Stephenson, El Toro, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 182,156, Aug. 28, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,376

Int. Cl.<sup>3</sup> H01M 4/24, 4/02

U.S. Cl. 429—217

6 Claims



1. An improved cadmium negative electrode comprising a substrate for carrying current, and a mass made of cadmium oxide mixed with cadmium metal powder, said cadmium metal powder having particles of irregular gnarled cylindrical shape and average size of approximately 8 to 25 microns and wherein said mass is electrochemically active, bound into a flexible polymer-bonded mass and attached to said substrate.

4,414,304

## FOREHARDENED HIGH ASPECT RATIO SILVER HALIDE PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR THEIR USE

Robert E. Dickerson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,910, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,574

Int. Cl.<sup>3</sup> G03C 1/02, 1/30, 1/76

U.S. Cl. 430—353

24 Claims

12. In a radiographic element comprised of a substantially specularly transmissive support having first and second major surfaces and, located on each of said major surfaces, one or more hydrophilic colloid layers including at least one emulsion layer containing radiation-sensitive silver bromide grains containing up to 6 mole percent iodide, the improvement wherein at least 50 percent of the total projected area of said silver bromide grains in at least one emulsion layer is provided by thin tabular silver bromide grains optionally containing iodide having a thickness of less than 0.2 micron and an average aspect ratio in the range of at least 12:1 and said hydrophilic colloid layers being forehardened in an amount sufficient to reduce swelling of said layers to less than 200 percent, percent swelling being determined by (a) incubating said photographic element at 38° C. for 3 days at 50 percent relative humidity, (b) measuring layer thickness, (c) immersing said photographic element in distilled water at 21° C. for 3 minutes, and (d) determining the percent change in layer thickness as compared to the layer thickness measured in step (b).

22. A process of producing a high covering power silver image comprising imagewise exposing a radiographic element according to any one of claims 12 through 19 and developing a viewable silver image in less than 1 minute.

24. A process according to claim 22 wherein processing is undertaken at a temperature in the range of from 25° to 50° C.

4,414,305

## IMAGE-FORMING METHOD

Koichi Nakamura, and Hiroyuki Hirai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 28, 1982, Ser. No. 402,703

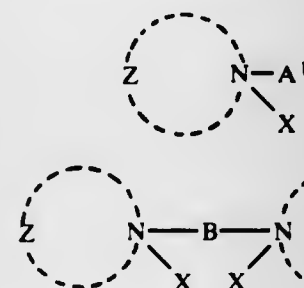
Claims priority, application Japan, Jul. 28, 1981, 56-117973

Int. Cl.<sup>3</sup> G03C 5/32

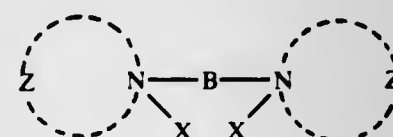
U.S. Cl. 430—373

14 Claims

1. An image-forming method, comprising the steps of: providing a silver halide color photographic material; imagewise exposing the material; and color-developing the exposed material in the presence of a nitrogen-containing heterocyclic compound having the general formula (I) or (II):



General formula (I)



General formula (II)

wherein A is an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an alicyclic hydrocarbon group, or an aryl group, each of which may be substituted, B is a substituted or unsubstituted di-valent hydrocarbon group, X is an anion other than iodide and Z is a non-metallic group which forms a heterocyclic ring with a nitrogen atom, wherein said compound is capable of reacting with or being adsorbed into a silver halide, with a mono-bath intensifying developing solution which includes hydrogen peroxide or a compound capable of releasing hydrogen peroxide and a color developing agent, the solution substantially excluding the presence of bromide ions and iodide ions.

4,414,306

## SILVER CHLOROBROMIDE EMULSIONS AND PROCESSES FOR THEIR PREPARATION

Jong-Shinn Wey, Penfield, and Herbert S. Wilgus, Conesus, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,899, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,854

Int. Cl.<sup>3</sup> G03C 1/02, 5/24

U.S. Cl. 430—434

36 Claims

1. A radiation-sensitive emulsion comprised of a dispersing medium and silver halide grains including tabular grains having opposed, substantially parallel {111} major faces, said tabular grains containing chloride and bromide in at least annular grain regions, said tabular grains having a thickness of less than 0.3 micron, a diameter of at least 0.6 micron, and an average aspect ratio of at least 5:1 accounting for at least 35 percent of the total projected area of said silver halide grains, and the average molar ratio of chloride to bromide in at least said annular grain regions ranging up to 2:3.

4,414,307

## METHOD AND COMPOSITION FOR PREPARATION OF PHOTOGRAPHIC COLOR DEVELOPING SOLUTIONS

Jon A. Kapecki; Thomas M. Gormel, and Sheridan E. Vincent, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,846

Int. Cl.<sup>3</sup> G03C 5/30

U.S. Cl. 430—465

24 Claims

1. A method of preparing a working strength aqueous alka-

line photographic color developing solution that functions to generate image dyes in a photographic element by the coupling reaction of an oxidized color developing agent with a photographic coupler and that contains a sparingly-soluble alcohol which serves to enhance coupling efficiency, said method comprising admixing together and dissolving in an aqueous medium a plurality of photographic processing agents, one of said agents being a primary aromatic amino color developing agent, a second of said agents being an alkaline agent, and a third of said agents being a solid water-soluble alkali-cleavable precursor of a sparingly-soluble alcohol that is cleaved by the alkaline environment of said color developing solution, whereby said sparingly-soluble alcohol is formed when said plurality of processing agents are admixed together and dissolved in said aqueous medium.

4,414,308

## SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Fumio Hamada, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,685

Claims priority, application Japan, Mar. 20, 1981, 56-42117; Dec. 3, 1981, 56-195317

Int. Cl.<sup>3</sup> G03C 1/40

U.S. Cl. 430—505

9 Claims

1. A silver halide color photographic photosensitive material, comprising a red light-sensitive emulsion layer, a green light-sensitive emulsion layer and a blue light-sensitive emulsion layer on a support, each emulsion containing a nondiffusible image forming coupler, being characterized in that at least one of the red light-sensitive emulsion layer, the green light-sensitive emulsion layer and the blue light-sensitive emulsion layer is separated into a high sensitivity silver halide emulsion layer and a low sensitivity silver halide emulsion layer, both layers having photosensitive regions in substantially the same spectral region, by an intermediate layer, and at least one DIR compound represented by formula (I) shown below is incorporated in at least one layer of said high sensitivity silver halide emulsion layer, said low sensitivity silver halide emulsion and the intermediate layer:



wherein A is a coupling component capable of reacting with an oxidized product of a color forming developing agent and releasing a TIME-Z group on reaction with an oxidized product of a color forming developing agent; TIME is a timing group; and Z is a development inhibitor.

4,414,309

## PHOTOGRAPHIC RECORDING MATERIAL CONTAINING AN ALDEHYDE REMOVER

Hans Langen, Bonn; Lothar Rosenhahn, Cologne, and Erich Wolff, Solingen, all of Fed. Rep. of Germany, assignors to Agfa-Gavaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,452

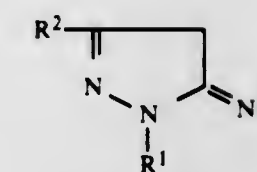
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148108

Int. Cl.<sup>3</sup> G03C 1/40

U.S. Cl. 430—551

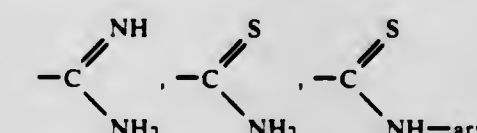
5 Claims

1. Colour photographic recording material containing at least one silver halide emulsion layer and a colour coupler associated therewith, containing an aldehyde scavenger in at least one light-sensitive or light-insensitive layer of binder, characterised in that the aldehyde scavenger contained in the material is a compound corresponding to the following general formula:



wherein

R<sup>1</sup> represents hydrogen, an aliphatic or cycloaliphatic group, an aralkyl group, an aryl group, a heterocyclic group or one of the following groups: —CO—alkyl, —CO—aryl, —CO—heterocyclic, —SO<sub>2</sub>—alkyl, —SO<sub>2</sub>—aryl, —CO—O—alkyl, —CO—NH—NH<sub>2</sub>,



and R<sup>2</sup> represents hydrogen, an aliphatic or cycloaliphatic group, an aralkyl group, an aryl group, alkoxy, aryloxy, carboxyl, carbamoyl, alkoxycarbonyl, an alkyl or aryl group attached through a carbonyl group, cyano, an amino group optionally substituted by alkyl, aralkyl, aryl or acyl, or a cyclic amino group.

4,414,310

## PROCESS FOR THE PREPARATION OF HIGH ASPECT RATIO SILVER BROMIODIDE EMULSIONS

Richard L. Daubendiek, Rochester, and Ronald W. Strong, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,906, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,587

Int. Cl.<sup>3</sup> G03C 1/02

U.S. Cl. 430—567

10 Claims

1. In a process for preparing a radiation-sensitive tabular grain silver bromiodide emulsion wherein silver and bromide salts are concurrently introduced into a reaction vessel containing an emulsion comprising a dispersing medium and high iodide silver halide grains,

the improvement comprising limiting in the reaction vessel prior to concurrent introduction of silver and bromide salts

the mean diameter of the high iodide silver halide grains to less than 0.1 micron and

the concentration of iodide to less than 10<sup>-2</sup> mole per liter,

thereby producing within the dispersing medium contained within the reaction vessel silver bromiodide grains having a thickness of less than 0.3 micron and a diameter of at least 0.6 micron exhibiting an average aspect ratio of greater than 8:1 and accounting for at least 50 percent of the total projected area of said silver bromiodide grains.

4,414,311

## CATHODIC DEPOSITION OF LIGHT SENSITIVE COMPONENTS

John E. Walls, Annandale, and Thomas A. Dunder, High Bridge, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 18, 1982, Ser. No. 359,458

Int. Cl.<sup>3</sup> G03C 1/54, 1/94

U.S. Cl. 430—157

11 Claims

1. A photographic element produced by the method which comprises

(i) electrochemically hydrophilizing an electrically conductive metal substrate surface; and

(ii) subsequently electrolyzing said substrate, which functions as an electrode, in an aqueous electrolytic solution



which comprises a suitable light sensitive, substantially water soluble diazo salt as determined by the herein specified Test Procedure, under electrolytic conditions, with an EMF applied via another electrode in the bath, sufficient to bond said light sensitive composition to said hydrophilized surface.

4,414,312

# **PHOTOPOLYMERIZABLE POLYAMIDE ESTER RESIN COMPOSITIONS CONTAINING AN OXYGEN SCAVENGER**

David L. Goff, Springfield; Edward L. Yuan, Philadelphia, both of Pa., and Stephen Proskow, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 183,648, Sep. 3, 1980, Pat. No. 4,329,419. This application Dec. 24, 1981, Ser. No. 334,164

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> G03C 1/68

U.S. Cl. 430—283

11 Claims

1. A radiation polymerizable comprising about
  - (a) 10–50% by weight, based on the weight of the composition, of a polyamide ester resin containing photopolymerizable groups,
  - (b) 50–90% by weight, based on the weight of the composition, of solvent for the resin,
  - (c) 5–30% by weight, based on the weight of the resin, of radiation polymerizable polyfunctional acrylate compound and
  - (d) 0.6–20% by weight, based on the weight of the resin, of a blend of polymerization initiators comprising hydrogen donor photoinitiator and aromatic biimidazole;
  - (e) 0.1–10% by weight, based on the weight of the resin, of an oxygen scavenger selected from the group consisting of mercaptobenzothiazole, mercaptobenzoxazole, n-phenyl glycine, triphenyl phosphine or mixtures thereof, wherein the polyamide ester resin upon heating converts to a polyimide resin.

4,414,313

**SENSITIVE POSITIVE ELECTRON BEAM RESISTS**  
Juey H. Lai, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1982, Ser. No. 363,334

Int. Cl.<sup>3</sup> B05D 3/06

U.S. Cl. 430—295

11 Claims

1. A method of producing a sensitive positive electron resist image comprising the steps of
  - coating a substrate with a solution of a radiation sensitive polymeric material comprising a copolymer of methacrylic acid (MAA) and methyl  $\alpha$ -chloroacrylate (MCA), wherein said copolymer contains from about 30 to 80 mole percent of MAA and from about 70 to 20 mole percent MCA, and wherein the weight average molecular weight of said polymeric material is equal to or greater than 125,000 to form a thin polymeric film of said polymeric material thereon;
  - prebaking the coated substrate at a temperature below the decomposition temperature of said polymer material;
  - exposing said polymeric film to electron-beam radiation in a predetermined pattern;
  - developing said polymeric film.

4,414,314

**RESOLUTION IN OPTICAL LITHOGRAPHY**  
Leon H. Kaplan, Yorktown; Richard D. Kaplan, Wappingers Falls, and Steven M. Zimmerman, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,929

Int. Cl.<sup>3</sup> G03C 5/00

U.S. Cl. 430—311

10 Claims

1. An optical lithography process for creating a patterned

photoresist on a silicon semiconductor substrate, comprising the steps of:

- providing a silicon semiconductor substrate;
- evaporating Sudan Black B dyestuff upon said silicon substrate to form a thin film of 4-phenylazo-1-naphthylamine;
- depositing positive resists having ether-type solvents on said 4-phenylazo-1-naphthylamine thin film; and
- exposing selected regions of said positive resist to light in the 250 to 440 nm wavelength range, the light passing through the selected regions of said positive resist and being absorbed by said 4-phenylazo-1-naphthylamine thin film thereunder, whereby said 4-phenylazo-1-naphthylamine thin film prevents reflection and scattering from the surface of said silicon substrate.

# **PROCESS FOR MAKING LITHOGRAPHIC PRINTING PLATE**

Robert F. Gracia, Scituate, Mass., and Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, assignors to Howard A. Fromson, Weston, Conn.

Continuation-in-part of Ser. No. 64,322, Aug. 6, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,342

Int. Cl.<sup>3</sup> G03F 7/20, 7/08

U.S. Cl. 430—302

10 Claims

1. Process for making an aluminum lithographic printing plate which comprises:
  - (a) providing a silicated aluminum substrate having a hydrophilic, anionic, negatively charged surface and a layer on said surface of a light sensitive, cationic, positively charged, water soluble diazo material having at least two reactive sites per molecule, each reactive site being capable of chemical alteration by actinic light or chemical reaction with an anionic material;
  - (b) selectively and incompletely exposing the diazo layer to actinic light to alter only a portion of the reactive sites, thereby adhering the diazo material to the substrate in the exposed areas;
  - (c) removing unexposed diazo by contacting the plate after exposure with a solution consisting essentially of an anionic material in water in a quantity and for a time sufficient to couple the diazo with the anionic material and dissolve the coupled product from the non-image area; and
  - (d) rinsing with water to provide a printing plate having a reinforced, oleophilic image and a clean, hydrophilic background.

4,414,316

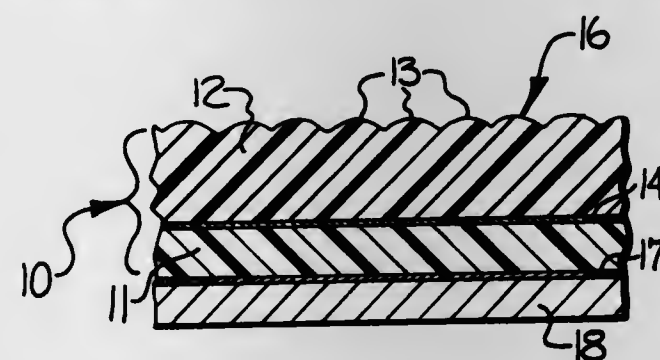
**COMPOSITE LENTICULAR SCREEN SHEET**  
Kenneth E. Conley, Matthews, N.C., assignor to Rexham Corporation, New York, N.Y.

Filed Sep. 5, 1980, Ser. No. 184,240

Int. Cl.<sup>3</sup> G02B 27/00

U.S. Cl. 430—496

9 Claims



1. A flexible, composite transparent lenticular screen sheet suitable for use in producing three-dimensional optical effects and characterized by having a uniform overall thickness and having lenticular formations of uniform fine definition and

quality and with a uniform focal length precisely correlated with the overall thickness of the composite sheet to provide uniform high quality three-dimensional optical effects throughout the lenticular screen sheet, said lenticular screen sheet comprising a flexible optically transparent base film having opposing front and rear surfaces with the distance therebetween varying over the extent of the base film due to inherent accuracy limitations in the production of said base film and resulting in relatively small but measurable undulating variations in the thickness of the base film, and an optically transparent coating of a cured thermosetting polymer extending over substantially the entire front surface of said base film and bonded thereto, said coating having a nonplanar outer surface defining a series of elongate rib-like lenticular lens formations of predetermined width and radius of curvature, said lenticular lens formations being of uniform width and radius of curvature throughout the lenticular screen sheet so that the lens formations have the same focal length throughout the lenticular screen sheet, the thickness of said cured thermosetting polymer layer in which the lenticular lens formations are formed compensatingly varying in relation to said undulating variations in thickness of said base film so that the distance from the center of curvature of the lenticular lens formations to the rear surface of said base film is uniform throughout the lenticular screen sheet in spite of said undulating variations in thickness of the base film whereby variations in thickness in the overall composite sheet are eliminated, and said overall thickness of the composite being correlated with the focal length of said lenticular lens formations so that the focal plane of the lenticular lens formations is located substantially at said rear surface of said base film.

4,414,317

# **TRANSPARENCY, A METHOD FOR FORMING IT AND A PHOTOGRAPHIC MASK WHOSE OPTICAL DENSITIES ARE CORRELATED WITH THE CONTOUR OF A SURFACE**

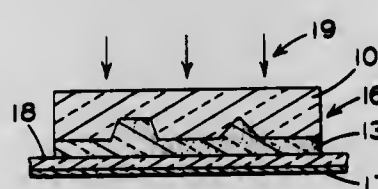
Charles R. Culp; Larrimore B. Emmons, and Walter J. Lewicki, Jr., all of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 21, 1982, Ser. No. 370,415

Int. Cl.<sup>3</sup> B05B 5/00; B65B 33/00; B32B 3/00

U.S. Cl. 430—4

15 Claims



1. A method for forming a transparency adapted to be used in a photo-resist and etching process, comprising:
  - (a) providing a substrate, having a contoured surface;
  - (b) forming a first conformed transparent layer on the contoured surface of the substrate to produce a sheet having one planar surface and one contoured surface;
  - (c) removing the first transparent layer from the substrate;
  - (d) forming a second conformed transparent layer on the contoured surface of said first transparent layer to form a composite two-layer transparency having substantially parallel, planar top and bottom surfaces, and a contoured interface therebetween, one of said first or second transparent layers being uniformly colored, the other of said layers being uncolored, or having a less intense, uniform, similar, or different color, each of said layers having a refractive index substantially equal to that of the other layer at all points, thus allowing light to enter and exit the two-layer transparency in a direction substantially perpendicular to its top and bottom surfaces in substantially unrefracted parallel rays, with the amount of light trans-

mitted therethrough being related to the variations in thickness of the most intensely colored layer.

2. The method for forming a transparency according to claim 1, wherein the first conformed transparent layer formed on the contoured surface of the substrate is the one that is uniformly and most intensely colored.

3. The method for forming a transparency according to claim 1, wherein the second conformed transparent layer formed on the contoured surface of the first transparent layer is the one that is uniformly and most intensely colored.

4. The method of forming a transparency according to claim 1 wherein the second conformed layer comprises a liquid.

9. A method for preparing a photographic mask for use in a photo-chemical etching process, comprising:

- (a) forming a two-layer transparency by the methods of either claims 1, 2, 3, or 4;
- (b) placing the transparency over a photographic film or plate;
- (c) passing light through the transparency to provide an exposed film or plate; and
- (d) developing the exposed film or plate to produce a mask having variations in optical density corresponding to the variations in the amount of light transmitted through the transparency and to variations in the contour of an original surface.

4,414,318

# **METHOD OF EXPOSING TO LIGHT FLUORESCENT SCREENS OF COLOR PICTURE TUBES**

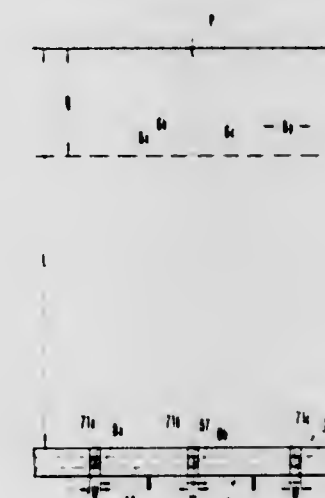
Masahiko Nishizawa, and Takashi Fujimura, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,267

Claims priority, application Japan, Mar. 27, 1981, 56-43855  
Int. Cl.<sup>3</sup> G03C 5/04

U.S. Cl. 430—24

1 Claim



1. In a method of exposing to light a fluorescent screen of an in-line dot type color picture tube wherein an inner surface of a panel of said tube coated with a photosensitive film, a shadow mask, and a linear type extra-high pressure mercury lamp covered by a shielding plate having an opening are disposed substantially in parallel so as to expose predetermined areas on the inner surface of said panel to light passing through apertures of said shadow mask, said method comprising: forming a plurality of openings in said shielding plate with a mutual longitudinal spacing of  $n \times B_p(L/Q)$  where  $B_p$  represents a lateral pitch between adjacent apertures of said shadow mask,  $L$  a distance between said mercury lamp and the inner surface of said panel,  $Q$  a distance between the shadow mask and the inner surface of the panel, and  $n$  a positive integer when the length of said mercury lamp lies in the lateral pitch direction of the shadow mask; and exposing said areas on the inner surface of the panel to light from the plurality of said openings through the apertures of



said shadow mask thereby increasing exposure efficiency corresponding to said plurality.

4,414,319

# PHOTOCONDUCTIVE MEMBER HAVING AMORPHOUS LAYER CONTAINING OXYGEN

Shigeru Shirai, Yokohama; Junichiro Kanbe, Yamato, and Tadaji Fukuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,552

Claims priority, application Japan, Jan. 8, 1981, 56-1785; Jan. 8, 1981, 56-1786; Jan. 9, 1981, 56-2274

Int. Cl.<sup>3</sup> G03G 5/082

U.S. Cl. 430—65

70 Claims

1. A photoconductive member, comprising a support for a photoconductive member and an amorphous layer which comprises silicon atoms as matrix containing at least one of hydrogen atom and halogen atom and exhibits photoconductivity, said amorphous layer having a layer region containing oxygen atom in at least a part thereof, the content of the oxygen atoms in said layer region being distributed unevenly in the direction of the thickness of said layer.

4,414,320

# BIS ARYL-AZO DERIVATIVES OF 2,3-NAPHTHALENE DIOL AND ELECTROPHOTOGRAPHIC LIQUID DEVELOPER COMPOSITIONS CONTAINING THEM

Domenic Santilli, Webster; Jeanne E. Kaeding, and Louis J. Rossi, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 264,312, May 18, 1981. This application

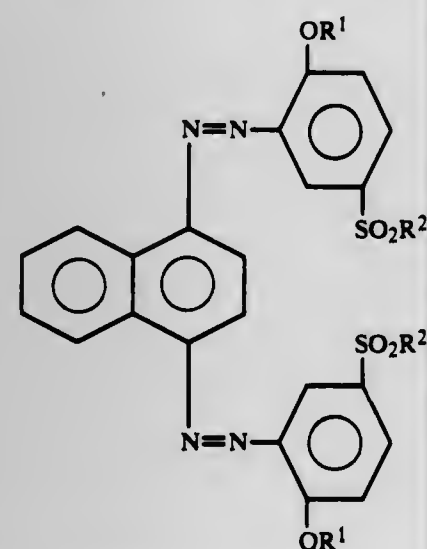
Jan. 31, 1983, Ser. No. 462,281

Int. Cl.<sup>3</sup> G03G 9/12

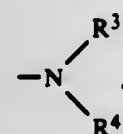
U.S. Cl. 430—106

3 Claims

1. In a liquid electrophotographic developer comprising a dispersion of a pigment and a binder resin in an electrically insulating liquid, the improvement wherein said pigment is a compound of the formula:



wherein R¹ is lower alkyl and R² is -F or:



wherein R³ and R⁴ are hydrogen, lower alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted by lower alkyl, and are the same or different.

4,414,321

# DRY COMPOSITE BLENDED MAGNETIC DEVELOPER OF RESIN ENCAPSULATED FINE MAGNETITE AND RESIN ENCAPSULATED COARSE MAGNETITE

Nobuhiro Miyakawa; Masanori Fujii, both of Suita, and Kouzi Maekawa, Kyoto, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Nov. 24, 1981, Ser. No. 324,652

Claims priority, application Japan, Nov. 27, 1980, 55-165828; Dec. 2, 1980, 55-169151

Int. Cl.<sup>3</sup> G03G 9/08

U.S. Cl. 430—106.6

14 Claims

1. A dry composite magnetic developer for electrophotography which comprises a mixture of (A) a first particulate shaped article of a composition comprising a binder resin medium and a non-pulverizing agglomerate of cubic particles of magnetite wherein numerous fine particles of magnetite are so densely aggregated with one another that the particle size distribution is not substantially changed even after ball-milling for five hours' treatment, said agglomerate having a number average particle size of 2 to 10 microns as measured by an electron microscope and an apparent density of 0.5 to 1.5 g/m as measured according to the method of JIS K-5101, and (B) a second particulate shaped article of a composition comprising a binder resin medium and fine magnetite particles having a particle size of 0.2 to 1 micron, each of the agglomerate in the component (A) and the fine magnetite in the component (B) being present in an amount of 35 to 75% by weight based on the sum of the amounts of the binder resin medium and the magnetite material, the component (A) and the component (B) being present at an (A)/(B) weight ratio of from 95/5 to 10/90, said component (A) having a number average particle size of 5 to 35 microns, said component (B) having a number average particle size of 5 to 30 microns.

4,414,322

# TWO-COMPONENT TYPE MAGNETIC DEVELOPER

Nobuhiro Miyakawa; Masanori Fujii, both of Suita, and Kouzi Maekawa, Kyoto, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jan. 22, 1982, Ser. No. 341,820

Claims priority, application Japan, Jan. 26, 1981, 56-8959

Int. Cl.<sup>3</sup> G03G 9/14

U.S. Cl. 430—106.6

4 Claims



1. A two-component type magnetic developer comprising a magnetic carrier consisting of a non-pulverizing agglomerate of cubic particles of magnetite wherein numerous fine particles of magnetite are so densely aggregated with one another that the particle size distribution is not substantially changed even by five hours' ball-milling treatment and an insulating magnetic toner consisting of particles having a particle size of 3 to 30 microns, said toner comprising a binder resin medium and magnetite having a particle size smaller than 1 micron, which is dispersed in the binder resin medium, said agglomerate having substantially the same configuration as that shown in the electron microscope photograph of FIG. 1 of the accompanying drawings, a particle size of 2 to 10 microns as measured by an electron microscope and an apparent density of 0.6 to 1.3 g/ml as measured by the method of JIS (Japanese Industrial

Standard) K-5101 and the magnetic carrier/magnetic toner mixing weight ratio is in the range of from 5/100 to 40/100.

4,414,323

# METHOD FOR MEASURING TRACE ENZYME

Nobuhito Masuda, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1981, Ser. No. 298,813

Claims priority, application Japan, Sep. 2, 1980, 55-120601

Int. Cl.<sup>3</sup> G01N 33/52, 33/54, 33/58

U.S. Cl. 435—7

6 Claims

1. A method for assaying a sample for enzyme activity and/or a quantity of an enzyme comprising:

- providing a synthetic substrate comprising at least one structure (A) catalytically affected by the enzyme being assayed and at least one photographically fogging agent structure (B), said structures (A) and (B) being found in the molecular structure of the synthetic substrate;
- contacting the sample with the provided synthetic substrate so as to bring about a chemical reaction by said enzyme;
- contacting either the reaction product resulting from (b) or the excess unreacted synthetic substrate also resulting from (b) with silver halide;
- photographically developing either product resulting from (c); and
- measuring the optical density of the silver image and/or the colored dye resulting from (d).

4,414,324

# IMMUNOASSAY METHOD AND APPARATUS

Robert L. Stout, Overland Park, Kans., assignor to BMA Laboratory Services, Inc., Kansas City, Mo.

Continuation of Ser. No. 40,641, May 21, 1979, Pat. No. 4,267,270. This application Apr. 9, 1981, Ser. No. 252,427

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> G01N 33/54

U.S. Cl. 435—7

18 Claims

1. In an assay process for the determination of an immunochemical component in a sample, wherein the sample, a first immunochemical component and a second immunochemical component are immunochemically incubated in a vessel, one of said first and second components being insolubilized in said vessel, one of said first and second components being labeled, said first and second components each having a specific immunochemical affinity for another component in said vessel, or for said component to be determined, during said incubation thereof, the insolubilized component is separated from the remainder of the reaction mixture, and it is thereafter determined whether said sample contained said component to be determined, the improvement which comprises:

covalently bonding to the walls of said vessel a site-deactivating medium for minimizing nonspecific interactions, said insolubilized component being covalently attached to said medium, and said medium being selected from the group consisting of water soluble animal-derived plasma, animal-derived sera, vegetable-derived gelatins and mixtures thereof.

11. A system for determining the presence of an immunochemical component taken from the group consisting of antigens and antibodies in a sample, comprising:

- a vessel having the internal walls thereof covalently bound with a site-deactivating medium,
- said medium being selected from the group consisting of water soluble animal-derived plasma, animal-derived sera, vegetable-derived gelatins and mixtures thereof;
- an amount of a first immunochemical component covalently bound to said medium; and
- an amount of a second unbound immunochemical component, one of said first and second components being labeled,

said first and second components being present in respective amounts sufficient to perform the assay process of claim 1.

4,414,325

# METHOD FOR MEASUREMENT OF TRACE ENZYME

Nobuhito Masuda; Yuji Mihara; Masaki Okazaki, and Hajime Makuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1981, Ser. No. 298,814

Claims priority, application Japan, Sep. 2, 1980, 55-120600

Int. Cl.<sup>3</sup> G01N 33/52, 33/54, 33/58

U.S. Cl. 435—7

10 Claims

1. A method for determining the activity and/or amount of a particular enzyme in a sample comprising:

- providing a synthetic substrate comprising at least one structure (A) catalytically affected by the enzyme being assayed and at least one spectrally sensitizing dye structure (B), said structures (A) and (B) being found in the molecular structure of the synthetic substrate;
- contacting the sample with the provided synthetic substrate so as to bring about a chemical reaction by said enzyme;
- contacting either the reaction product resulting from (b) or the excess unreacted synthetic substrate also resulting from (b) with silver halide;
- exposing the silver halide of either product resulting from (c) to light having wavelengths corresponding to the absorption spectra of the spectrally sensitizing dye structures (B);
- photographically developing the silver halide-treated product resulting from (d) with either a black-and-white or color development process; and
- measuring the optical density of the developed silver and/or colored dye resulting from (e).

4,414,326

# DIAGNOSTIC AGENTS

Jack M. Goldberg, 4612 W. Elm Ter., Skokie, Ill. 60076

Continuation of Ser. No. 108,846, Dec. 31, 1979, abandoned, which is a division of Ser. No. 899,597, Apr. 24, 1978, Pat. No. 4,226,713. This application Feb. 4, 1982, Ser. No. 345,705

Int. Cl.<sup>3</sup> C12Q 1/60

U.S. Cl. 435—11

8 Claims

1. A stable, aqueous enzymatic reagent for interaction in the presence of cholesterol to provide a measurable chromophore, said reagent capable of remaining stable for a relatively long period of time comprising:

effective amounts of cholesterol oxidase, cholesterol esterase derived from an animal source, peroxidase, 4-aminoantipyrine, an agent capable of forming a chromophore, a bile salt, a water-soluble polyglycol having an approximate weight average molecular weight in the range of 190-1000 selected from the group consisting of polyethylene glycol and polyethoxy glycol, in an amount of 0.1-1.0 grams per liter of enzymatic reagent and a stabilizer comprising a water-soluble polyglycol having an approximate weight average molecular weight of 6000 or higher in an amount sufficient to maintain solubility of free cholesterol, said enzymatic reagent having a pH in the range of 5.5 to 7.8.



4,414,327

**METHOD FOR THE ESTIMATION OF N-ACYLATED PRIMARY AROMATIC AMINES**

Peter M. Hammond, Melton Mowbray; Christopher P. Price, Stapleford; Michael D. Scawen, and Anthony Atkinson, both of Salisbury, all of England, assignors to Public Health Laboratory Service Board, London, England

Filed Dec. 1, 1981, Ser. No. 326,276

Claims priority, application United Kingdom, Dec. 2, 1980, 8038634

Int. Cl.<sup>3</sup> C12Q 1/34; C12R 1/39, 1/40

U.S. Cl. 435—18

46 Claims

1. In a method for the estimation of an anilide (N-acylated primary aromatic amine) comprising:

- (a) hydrolysing the anilide to an aniline, and
- (b) estimating the quantity of said aniline spectrophotometrically,

wherein the improvement comprises conducting step (a) above in the presence of an aryl acylamidase enzyme defined as group EC3.5.1.13, said enzyme being able to catalyse the hydrolysis of the anilide to the aniline.

4,414,328

**PROCESS FOR THE PREPARATION OF DEACETYLCEPHALOSPORIN C**

Hiroshi Imanaka, Osaka; Toshio Miyoshi, Fuji; Toshio Konomi, Tsushima; Yoshiaki Kubochi; Seiziro Hattori, both of Aichi, and Takeshi Kawakita, Tsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1981, Ser. No. 283,962

Claims priority, application United Kingdom, Jul. 21, 1980, 8023834

Int. Cl.<sup>3</sup> C12P 35/00; C12N 9/18; C12R 1/645

U.S. Cl. 435—47

5 Claims

1. A process for the preparation of deacetylcephalosporin C from cephalosporin C, which comprises:

- contacting cephalosporin C in an aqueous medium with an acylesterase produced by *Aureobasidium pullulans* strain IFO 4466, and
- recovering deacetylcephalosporin C from said medium.

4,414,329

**BIOCHEMICAL CONVERSIONS BY YEAST FERMENTATION AT HIGH CELL DENSITIES**

Eugene H. Wegner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 110,457, Jan. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 29,418, Apr. 12, 1979, abandoned. This application Oct. 29, 1981, Ser. No. 316,164

Int. Cl.<sup>3</sup> C12P 21/00

U.S. Cl. 435—68

58 Claims

1. In a continuous process of biochemical conversion of a carbon energy substrate to products of fermentation comprising yeast cells and extracellular products which comprises culturing at least one yeast under aerobic aqueous fermentation conditions, in aqueous ferment comprising a cellular phase and an aqueous extracellular phase, in fermentation means employing effective amounts of a yeast-assimilable carbon energy substrate, assimilable nitrogen source, water, molecular oxygen, and mineral salts, and withdrawing said aqueous ferment as effluent for recovery therefrom of said products of fermentation,

wherein the improvement comprises feeding said mineral salts to the aqueous ferment in amounts sufficient to maintain in said aqueous ferment the following elements in at least the designated weights per liter of aqueous ferment: P-1.9 g, K-1 g, Mg-0.15 g, Ca-0.06 g, S-0.1 g, Fe-6 mg, Zn-2 mg, Cu-0.6 mg, and Mn-0.6 mg,

thereby producing at least one product of fermentation and maintaining a yeast cell density in said aqueous ferment of

at least about 60 to 160 grams, on a dried basis, per liter of said aqueous ferment;

said fermentative means being a fermenter free from physical means to remove liquid medium from said aqueous ferment without removing cells.

4,414,330

**PROCESS FOR CONTINUOUSLY GRINDING AND MIXING STARCH-CONTAINING RAW MATERIALS**

Friedrich J. Zucker; Georg Osthaus, and Klaus Fisch, all of Neuss, Fed. Rep. of Germany, assignors to Supraton F. J. Zucker GmbH, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,229

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125566

Int. Cl.<sup>3</sup> C12C 1/00; C12P 19/20, 7/06; C13K 1/06

U.S. Cl. 435—93

4 Claims

1. A process for continuously grinding and mixing starch-containing raw materials for saccharification, characterized in that the material is mashed with hot water having a temperature of 70°–100° C., pre-gelatinized for 0.2–3 hours at a temperature of 80°–95° C. and then ground in the shearing field of a rotor-stator machine having intermeshing radial surfaces.

4,414,331

**PROCESS FOR PRODUCING A HIGHLY CONCENTRATED AQUEOUS ACRYLAMIDE SOLUTION BY MEANS OF MICROORGANISMS**

Ichiro Watanabe; Yoshiaki Satoh, and Yasumasa Yamaguchi, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1980, Ser. No. 160,792

Claims priority, application Japan, Jun. 19, 1979, 54-76351

Int. Cl.<sup>3</sup> C12P 13/02; C12N 11/04; C12R 1/00, 1/07, 1/13, 1/265, 1/365, 1/15

U.S. Cl. 435—129

11 Claims

1. A process for producing acrylamide from acrylonitrile by utilizing a microorganism or enzyme capable of hydrating acrylonitrile into acrylamide in the form of a highly concentrated aqueous acrylamide solution, comprising bringing acrylonitrile in contact with the microorganism or enzyme in an aqueous medium at a pH of from 6 to 10, at a temperature of from the freezing point to 30° C., and under such conditions that the concentration of acrylamide in the reaction solution after completion of the reaction is from 5% by weight to less than 20% by weight, and concentrating the resulting reaction solution by freezing and/or evaporation, wherein the reaction solution is concentrated to about 31% by weight or less of acrylamide by cooling the reaction solution after the end of the reaction to a temperature of from –4° C. to –9° C. to crystallize ice, separating the crystallized ice, and using the separated ice for cooling during the hydration reaction and wherein said process additionally includes using the ice and melted ice for a feed for the hydration reaction as a component of the aqueous medium.

4,414,332

**ENDOPROTEINASE-LYS-C AND PROCESS FOR ITS PREPARATION THEREOF**

Jürgen Schrenk, Weilheim, and Peter Wunderwald, Haunshofen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,480

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034045

Int. Cl.<sup>3</sup> C12N 9/50; C12R 1/01

U.S. Cl. 435—219

5 Claims

1. Endoproteinase-Lys-C from *Lysobacteriales* which cleaves proteins at the carboxyl group of lysine and consists of a chain of molecular weight 35000 to 38000 Dalton, having a pH optimum at pH 7.7 and inhibited by aprotinin but not

inhibited by  $\alpha_2$ -macroglobulin,  $\alpha_1$ -antitrypsin and ethylenediamine-tetraacetic acid.

4,414,333

**COMPOSITIONS FOR DEPOLLUTING FRESH WATER AND SALT WATER BODIES**

Roberto Olivieri, Mentana; Andrea Robertiello, and Ludwig Degen, both of Rome, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

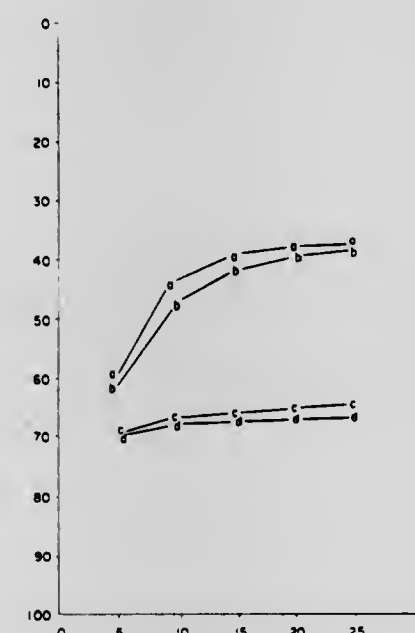
Division of Ser. No. 133,246, Mar. 24, 1981, abandoned, which is a continuation of Ser. No. 823,043, Aug. 8, 1977, Pat. No. 4,230,562. This application Oct. 27, 1981, Ser. No. 315,473

Claims priority, application Italy, Sep. 1, 1976, 26751 A/76; Jun. 8, 1977, 24495 A/77

Int. Cl.<sup>3</sup> C02F 3/02

U.S. Cl. 435—243

3 Claims



1. A composition adapted to depolluting fresh and sea water bodies from crude oil, petroleum products and their derivatives, containing phosphorus and slow-release nitrogen in a form which can be assimilated by aquatic micro-organisms capable of metabolizing hydrocarbons, said composition consisting essentially of soybean lecithin as said phosphorus source, and as said nitrogen source a nitrogen source selected from the group consisting of spermidin, butyl hydantoinate and butyl allantoinate, said lecithin and said nitrogen in said phosphorus and slow-release nitrogen containing composition being present in an amount sufficient to increase the natural biodegradation of said pollutants caused by the metabolism of hydrocarbons by said micro-organisms, the ratio by weight of said nitrogen to said phosphorus in said composition being greater than about 12 to 1.

4,414,334

**OXYGEN SCAVENGING WITH ENZYMES**

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 7, 1981, Ser. No. 291,146

Int. Cl.<sup>3</sup> C12N 9/04; C10G 32/00; C12R 1/84

U.S. Cl. 435—262

17 Claims

1. The process which comprises treating an aqueous liquid containing dissolved oxygen with sufficient alcohol oxidase and an alcohol, selected from the group consisting of straight-chain alcohols of 1 to 4 carbon atoms, effective to substantially eliminate said dissolved oxygen, wherein said aqueous liquid is an oil field fluid containing a polymer selected from the group consisting of polyacrylamide, carboxyalkyl cellulose ethers, biopolysaccharides and starch, thereby stabilizing said polymer solution.

4,414,335

**COMPOSTING SYSTEM WITH MOVABLE PROCESS CARS**

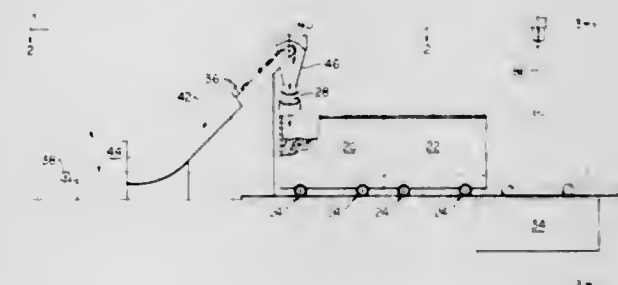
Carl E. Kipp, Jr., South Charleston, Ohio, assignor to Paygro, Inc., South Charleston, Ohio

Filed Dec. 23, 1981, Ser. No. 333,733

Int. Cl.<sup>3</sup> C12M 1/04

U.S. Cl. 435—313

27 Claims



1. An apparatus for processing organic waste material in a series of repeated cycles, comprising:

- (a) a first processing station;
- (b) a loading assembly positioned at the first processing station for charging organic waste material;
- (c) a second processing station;
- (d) movable containment means for receiving a charge of organic waste material from the loading assembly and storing the organic waste material in a quiescent state as the waste material undergoes aerobic decomposition, said movable containment means being operative to transport the organic waste material from the first to the second processing stations;
- (e) means for introducing pressurized air into the organic waste material to augment the growth of thermophilic bacteria as the waste material stored in the containment means undergoes decomposition;
- (f) means for discharging the partially decomposed organic waste material from the containment means at the second processing station and mixing the organic waste material with the ambient air; and
- (g) means extending from the second to the first processing station for transferring the discharged organic waste material back to the loading assembly independently of the containment means whereby the partially decomposed material may be recharged into the movable containment means.

4,414,336

**METHOD FOR PREPARING SAMPLE FOR USE IN ENDOTOXIN TEST**

Ryozo Watanabe, Takatsuki; Keiichi Kawasumi, Hirakata; Shoiichi Maeda, Osaka, and Takashi Shoji, Tondabayashi, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Sep. 29, 1981, Ser. No. 306,647

Claims priority, application Japan, Jan. 28, 1981, 56-11204; Jan. 28, 1981, 56-11205

Int. Cl.<sup>3</sup> G01N 33/48, 33/54

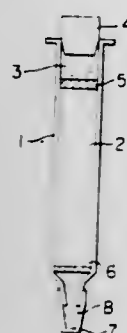
U.S. Cl. 436—502

7 Claims

1. A method for preparing a sample for use in endotoxin test which comprises subjecting a sample of plasma or blood preparation to a contact with water-insoluble anti-human  $\alpha_2$ -macroglobulin antibody and to a gel filtration by means of a carrier



for gel filtration which is a gel of allyl dextran crosslinked with N,N'-methylenebis acrylamide or a gel of polyvinyl alcohol



having many hydrophilic hydroxyl groups and recovering the maximum molecular weight fraction.

#### 4,414,337 SHAPED CERAMICS

Yoshio Ichikawa, Pittsburgh, and George M. Haigas, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1982, Ser. No. 379,813  
Int. Cl.<sup>3</sup> C04B 35/48

U.S. Cl. 501—103

27 Claims

1. A composition comprising:
  - (a) about 0.45 to about 5.5 percent of an organic water-soluble binder which has a thermal decomposition temperature of about 100° to about 500° C. and a viscosity of less than about 10,000 poises at 20° C.;
  - (b) about 1.5 to about 4.0 percent of a starch which has a thermal decomposition temperature of about 250° to about 535° C., where the thermal decomposition temperature of said binder and said starch are at least about 50° C. apart;
  - (c) about 1.5 to about 3.5 percent of cellulose;
  - (d) about 0.5 to about 2.0 percent of a dispersant;
  - (e) about 7 to about 11 percent of water; and
  - (f) about 75 to about 89 percent of a high temperature refractory material.

#### 4,414,338

##### CATION EXCHANGE MEMBRANE

Kyoji Kimoto, Yokohama, and Hirotsugu Miyauchi, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 52,604, Jun. 27, 1979, abandoned. This application Jun. 30, 1981, Ser. No. 279,156

Int. Cl.<sup>3</sup> B01J 39/20

U.S. Cl. 521—27

9 Claims

1. A fluorocarbon type cation exchange membrane consisting essentially of fluorinated polymers having sulfonic acid groups as side chains or as a part of the side chains bonded to the backbone of the fluorinated polymers and also including at least one other cation exchange group therein which is selected from the group consisting of carboxylic acid groups, sulfonamide groups and N-monosubstituted sulfonamide groups, and having an average equivalent weight in the range of from 1100 to 1600, said fluorinated polymers being prepared by blending homogeneously the following two different fluorinated polymers containing sulfonyl fluoride groups and having different cation exchange capacities on the basis of equivalent weight, so that the average equivalent weight is in the range of from 1100 to 1600:

- (1) a first sulfonyl fluoride group-containing fluorinated polymer having an equivalent weight of from 1350 to 1900 in terms of sulfonic acid groups converted therein, and
- (2) a second sulfonyl fluoride group-containing fluorinated polymer having an equivalent weight which is in the range of from 900 to 1300 in terms of sulfonic acid groups converted therein and which is smaller by at least 200 than that of said first fluorinated polymer, shaping the polymer

blend into a film, subjecting at least a surface of the film to a chemical treatment so as to convert the sulfonyl fluoride groups present at the surface of the film into carboxylic acid groups, sulfonamide groups or N-monosubstituted sulfonamide groups, and hydrolyzing the unaltered sulfonyl fluoride groups to convert them into sulfonic acid groups.

#### 4,414,339

##### LOW DENSITY, ELECTROMAGNETIC RADIATION ABSORPTION COMPOSITION

Jitka Solc, and Robert F. Harris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 15, 1982, Ser. No. 357,925

Int. Cl.<sup>3</sup> G21K 1/10; G21F 1/10

U.S. Cl. 523—137

12 Claims

1. An ELM absorption composition comprising (1) a solid dielectric material having dispersed therein (2) a colloidal-size particulate having a maximum dimension less than about 1 micrometer of an absorber for electromagnetic radiation and (3) a particulate of an attenuator for electromagnetic radiation, said composition further characterized by having a density less than 6 grams per cubic centimeter (g/cm<sup>3</sup>) and substantially all of the particles of the absorber being maintained in a spaced apart relationship by the solid dielectric.

#### 4,414,340

##### THERMOSETTING COMPOSITIONS

Guy Senatore, and Ralph C. Farrar, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1983, Ser. No. 466,691

Int. Cl.<sup>3</sup> C08K 3/40, 3/22

U.S. Cl. 523—219

17 Claims

1. A thermosetting composition comprising:
  - (a) 100 parts by weight of an O<sub>2</sub> or CO<sub>2</sub> terminated high vinyl alkadiene polymer, said alkadiene having 4-8 carbon atoms per molecule with the polymer having at least 50 percent content of 1,2 bonded vinyl units;
  - (b) 2-10 parts by weight of organic peroxide compound;
  - (c) 5-90 parts by weight polyolefin modifier; and (d) 50-1,000 parts by weight of inorganic filler selected from the group consisting of Group IIA metal carbonates, talc, mica, clay, wollastonite, aluminum trihydrate, and solid or hollow glass beads.

#### 4,414,341

##### FLASH EVAPORATION PROCESS FOR CONCENTRATING POLYMER SOLUTIONS

Albert G. Williams, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,202

Int. Cl.<sup>3</sup> C08J 3/00; C08L 67/00

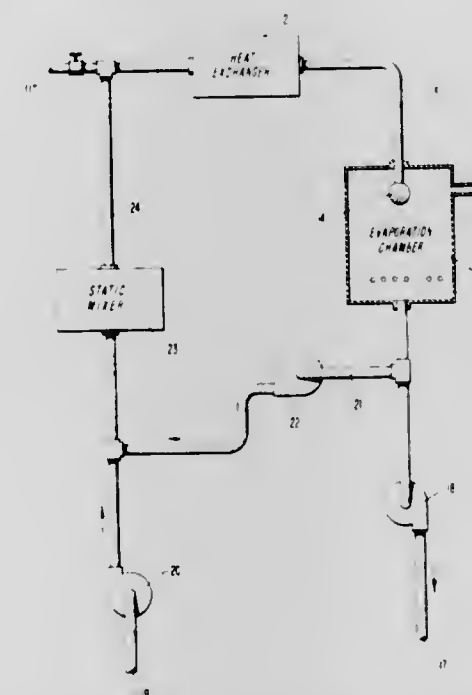
U.S. Cl. 523—340

32 Claims

1. A continuous process for concentrating a polymer solution having a polymer concentration of from about 5 to about 50% by weight in the substantial absence of gel formation wherein the solvent thereof has a boiling point below the decomposition temperature of the polymer comprising:

- (a) heating the polymer solution to a temperature of not less than the temperature at which the solvent thereof evaporates in the evaporation zone of (b), which temperature is in the range of from about 20° to about 300° C., by passing the solution through a heating zone;
- (b) passing the heated polymer solution of (a) from the heating zone through at least one orifice located in an evaporation zone, said evaporation zone containing prior to passage of the polymer solution therein a saturated atmosphere of the vapor of the solvent of the polymer solution at a temperature not greater than the temperature of the polymer solution after it exits the heating zone and not greater than the boiling point of the vapor at the pressure

present within the evaporation zone, to thereby produce a polymer solution having a final concentration of from about 8 to about 60% by weight polymer, based upon the total weight of the polymer solution; and



- (c) optionally admixing a part of said concentrated polymer solution of (b) with the unconcentrated polymer solution of (a) prior to passage of the resulting mixture through the heating zone.

#### 4,414,342

##### GLASS-FILLED THERMOPLASTIC RESINS

John C. Falk, Chicago, and Klementina F. Khait, Skokie, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 328,159

Int. Cl.<sup>3</sup> C08K 3/40; C08L 33/26, 63/08

U.S. Cl. 523—437

8 Claims

1. A composition comprising:
  - (a) from 95 to 50 wt. % of a blend of a rigid thermoplastic monovinylidene resin selected from the group consisting of styrenic resins and acrylic resins; and a copolymer of at least one monovinylidene monomer selected from the group consisting of monovinyl aromatic compounds, acrylic compounds, and methacrylic compounds and from 1 to 20 wt. % of at least one ethylenically-unsaturated monomer containing at least one functional radical selected from the group consisting of carbonyl radicals and epoxy radicals; and
  - (b) from 5 to 50 wt. % of a glass reinforcing fiber.

#### 4,414,343

##### EPICHLOROHYDRIN-BASED FLEXIBLE ELASTOMER COMPOSITION

Guy Bex, deceased, late of Gradignan, France; by Josette Bex, legal representative, 135, Route de Canejan, 33170 Gradignan, France, and Yve Carsoule, Residence du Parc du Chateau, Les Noyers "B", 33700 Merignac, France

Filed Nov. 22, 1982, Ser. No. 443,429

Claims priority, application France, Nov. 20, 1981, 81 21784

Int. Cl.<sup>3</sup> C08L 63/00

U.S. Cl. 523—440

15 Claims

1. An elastomer composition which comprises: 100 parts by weight of epichlorohydrin homopolymer or copolymer,

0.5 to 20 parts by weight of a plasticizer, 1 to 150 parts by weight of a reinforcing filler constituted by a slightly agglomerated, medium structure carbon black with an average particle size of 200 to 220 microns, an iodine absorption index of 115 to 127 mg/g, a dibutyl phthalate absorp-

tion index of 108 to 120 cm<sup>3</sup>/100 g and an apparent density of 295 to 395 kg/m<sup>3</sup>,

0.5 to 7.5 parts by weight of a first acid acceptor constituted by a metal salt of a carboxylic acid having at least 8 carbon atoms,

0.5 to 7.5 parts by weight of a second acid acceptor, constituted by an oxide, a hydroxide or a metal salt,

0.5 to 5.5 parts by weight of at least one protection agent chosen from the group of organic compounds with conjugate aromatic cycles containing amine or phenol functions and alkyl or aryl dithiocarbamate and

0.5 to 5.5 parts by weight of a vulcanizing agent.

#### 4,414,344

##### MODIFIED SYNTHETIC PLASTIC FROM THERMOPLASTIC SYNTHETICS AND COAL HYDROGENATION RESIDUES

Ingo Romey, Hünxe, Fed. Rep. of Germany, and Menachem El-Roy, Haifa, Israel, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 75,741, Oct. 29, 1979, abandoned. This application Feb. 12, 1982, Ser. No. 348,451

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1978, 2839377

Int. Cl.<sup>3</sup> C08L 95/00

U.S. Cl. 524—65

7 Claims

1. A synthetic plastic composition comprising a mixture of
  - (1) at least one elastomeric compound having thermoplastic properties and containing at least one polar, aromatic or cyclic group, and
  - (2) 50 to 70 weight percent of a low boiling carbonaceous material obtained from the liquefaction of coal having a softening point between 50° and 150° C. which has been freed of solid, non-melting components.

#### 4,414,345

##### COMPOSITIONS STABILIZED WITH DIOXAPHOSPHOPINES

Michael Rasberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 184,876, Sep. 8, 1980, abandoned, which is a division of Ser. No. 39,701, May 18, 1979, Pat. No. 4,259,492. This application Nov. 9, 1981, Ser. No. 319,351

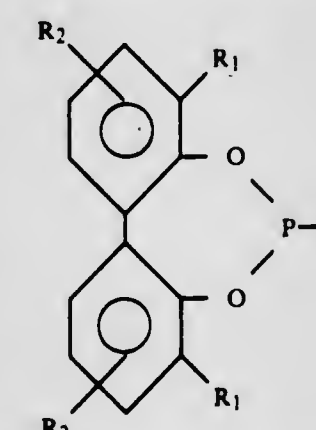
Claims priority, application Switzerland, May 18, 1978, 5390/78

Int. Cl.<sup>3</sup> C08K 5/15, 5/51

U.S. Cl. 524—108

22 Claims

1. A composition which comprises
  - (a) a polymeric organic material to be stabilized, and
  - (b) 0.005 to 5 percent by weight, based on component (a), of a compound of formula I



wherein

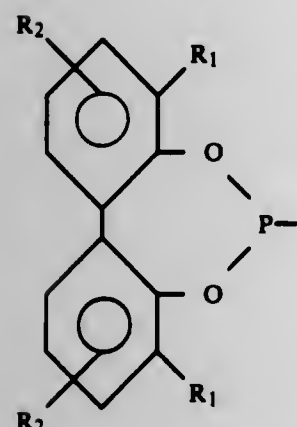
R<sub>1</sub> and R<sub>2</sub> are each α-branched C<sub>3</sub>-C<sub>8</sub> alkyl,

A is a group —N(R<sub>3</sub>)R<sub>4</sub> (III), wherein

R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>22</sub> alkyl, C<sub>2</sub>-C<sub>21</sub> oxa- or thiaalkyl, C<sub>3</sub>-C<sub>18</sub> alkenyl, C<sub>3</sub>-C<sub>18</sub> alkynyl, C<sub>2</sub>-C<sub>6</sub> hydroxyalkyl,

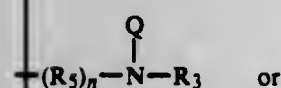


C<sub>3</sub>-C<sub>24</sub> alkoxyalkyl, C<sub>5</sub>-C<sub>12</sub> cycloalkyl, C<sub>6</sub>-C<sub>14</sub> aryl, C<sub>7</sub>-C<sub>15</sub> alkyl, C<sub>7</sub>-C<sub>15</sub> aralkyl, a C<sub>5</sub>-C<sub>17</sub> piperidin-4-yl group or said group substituted by up to five methyl or ethyl groups; or a group of the formula II

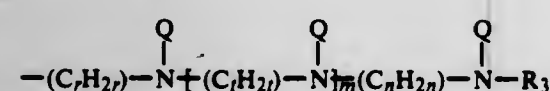


(II)

in which R<sub>1</sub> and R<sub>2</sub> have the meanings given above, R<sub>4</sub> is C<sub>1</sub>-C<sub>22</sub> alkyl, C<sub>2</sub>-C<sub>21</sub> oxa- or thiaalkyl, C<sub>3</sub>-C<sub>18</sub> alkenyl, C<sub>3</sub>-C<sub>18</sub> alkynyl, C<sub>2</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>3</sub>-C<sub>24</sub> alkoxyalkyl, C<sub>5</sub>-C<sub>12</sub> cycloalkyl, C<sub>6</sub>-C<sub>14</sub> aryl, C<sub>7</sub>-C<sub>15</sub> alkyl, C<sub>7</sub>-C<sub>15</sub> aralkyl, a C<sub>5</sub>-C<sub>17</sub> piperidin-4-yl group or said group substituted by up to five methyl or ethyl groups; a group of the formula IV

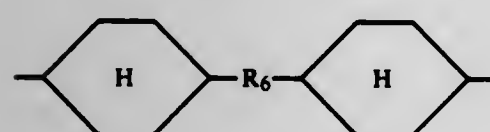


(IV)

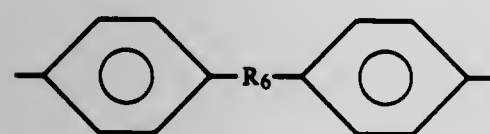


(V)

wherein R<sub>3</sub> has the meaning given above, n is 0 or 1, R<sub>5</sub> is C<sub>2</sub>-C<sub>22</sub> alkylene, C<sub>4</sub>-C<sub>22</sub> alkenylene, C<sub>4</sub>-C<sub>22</sub> alkynylene or C<sub>5</sub>-C<sub>9</sub> cycloalkylene, each of which can be interrupted with one or two oxygen or sulfur atoms, or R<sub>5</sub> is a group of the formula VI



in which R<sub>6</sub> is -O-, -S- or -(R<sub>7</sub>)C(R<sub>8</sub>)-, wherein R<sub>7</sub> and R<sub>8</sub> independently of one another are hydrogen or C<sub>1</sub>-C<sub>8</sub> alkyl, or R<sub>7</sub> and R<sub>8</sub> together with the C atom to which they are attached form C<sub>5</sub>-C<sub>12</sub> cycloalkyl, or R<sub>7</sub> and R<sub>8</sub> together are 1,4-cyclohexylenedimethylene or 1,3,3-trimethylcyclohexylene-1,5, or R<sub>5</sub> is also phenylene, biphenylene or a group of the formula



wherein R<sub>6</sub> has the meaning given above, and r, t and n independently of one another are 2, 3, 4, 5 or 6, m is 0, 1, 2 or 3, Q is a group of the formula II, wherein R<sub>1</sub> and R<sub>2</sub> have the meanings given above, or R<sub>3</sub> and R<sub>4</sub> together with the N atom to which they are attached form a pyrrolidine, oxazolidine, piperidine or morpholine ring; or said pyrrolidine, said oxazoli-

dine, said piperidine or said morpholine substituted by up to five methyl or ethyl groups; or R<sub>3</sub> and R<sub>4</sub> together form the radical -CH<sub>2</sub>-CH<sub>2</sub>-N(Q)-CH<sub>2</sub>-CH<sub>2</sub>- wherein Q has the meaning given above.

#### 4,414,346 AQUEOUS EMULSIONS OF HIGH SOFTENING POINT HYDROCARBON RESINS AND PROCESS FOR PREPARING THE SAME

Frank C. Jagisch, and Morris L. Evans, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 15, 1982, Ser. No. 339,647  
Int. Cl.<sup>3</sup> C08K 5/42

U.S. Cl. 524-158

5 Claims

1. An aqueous emulsion of a hydrocarbon resin, said resin having a ring and ball softening point of at least 90° C., consisting essentially of: from 3 to 10 parts by weight of an emulsifier of the class consisting of a nonionic polyoxyethylene alkyl aryl ether, an anionic alkyl aryl sulfonate and mixtures thereof with a mixture of 3 to 10 parts by weight of a resinplast and from 80 to 97 parts by weight of said hydrocarbon resin, said parts by weight being based on the combined weight of said emulsifier, said resinplast and said resin; and, the finished emulsion being 30 to 75 weight % water.

(IV)

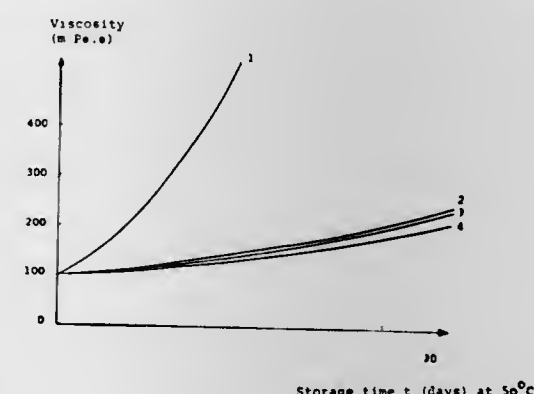
#### 4,414,347 CYANOACRYLATE ADHESIVE COMPOSITION

Karl Reich, Carlsberg, and Heinz Sieger, Eppelheim, both of Fed. Rep. of Germany, assignors to Teroson GmbH, Heidelberg, Fed. Rep. of Germany

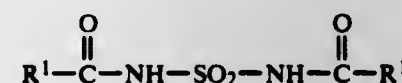
Filed Sep. 15, 1982, Ser. No. 418,496  
Int. Cl.<sup>3</sup> C08K 5/43

U.S. Cl. 524-168

5 Claims



1. An α-cyanoacrylate-based adhesive compositions containing a sulfamide compound of the general formula



in which the groups R<sup>1</sup> are each a radical separately selected from the group consisting of hydrogen, linear or branched alkyl with 1 to 18 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, phenyl methyl, trifluoro- or trichloromethyl or alkoxy -OR<sup>2</sup>, R<sup>2</sup> being selected from the group consisting of linear or branched alkyl with 1 to 18 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, phenyl, di- or triphenylmethyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl group, or alkylphenyl with 1 to 4 carbon atoms in the alkyl radical.

#### 4,414,348 STABILIZED POLYESTER COMPOSITIONS

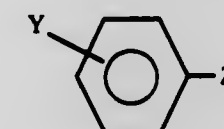
Richard E. Gloth, Copley; James J. Tazuma, Stow, and Max H. Keck, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 26, 1983, Ser. No. 460,980  
Int. Cl.<sup>3</sup> C08K 5/18

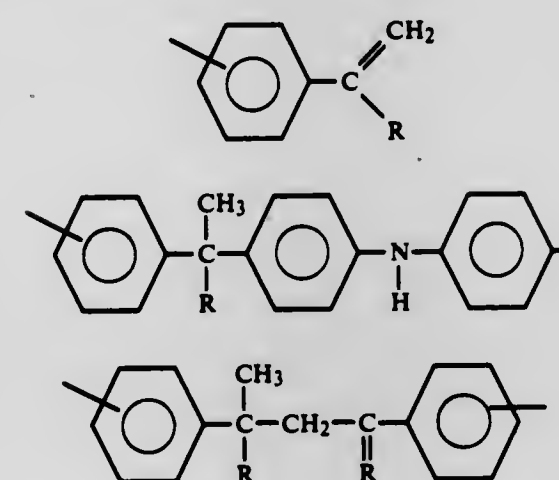
U.S. Cl. 524-255

10 Claims

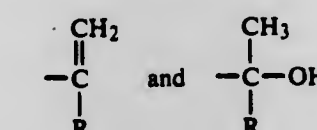
1. A stabilized polyester composition comprising a polyester having incorporated therein a stabilizing amount of a polymeric diphenylamine compound of randomly distributed repeat units derived from diphenylamine and an additional component, said additional component comprising one or more compounds of structural formula (10)



said polymeric compound containing one or more of structures V, VI and VII:



wherein Y is para or meta relative to Z, Y and Z are the same or different radicals selected from the group consisting of



and R is an alkyl radical of from 1 to 8 carbon atoms, said polymeric diphenylamine compound having a molecular weight of about 425 to about 200,000.

#### 4,414,349 SILICONE RESIN COATING COMPOSITION ADAPTED FOR PRIMERLESS ADHESION TO PLASTIC SUBSTRATES AND PROCESS FOR MAKING SAME

Howard A. Vaughn, Jr., and Ta-Yen Ching, both of Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,475  
Int. Cl.<sup>3</sup> C09D 3/82

U.S. Cl. 524-261

39 Claims

1. A coating composition adapted for adhesion to plastic substrates without a primer, said composition being prepared by:

- prehydrolyzing a silylated ultraviolet radiation screening compound by reaction with a mixture comprising alcohol, water, and a small amount of an agent to catalyze hydrolysis; and thereafter
- adding the silanol-functional reaction product to an aqueous partially condensed silicone resin composition containing colloidal silica.

#### 4,414,350 FERROUS COMPLEXING AGENT FOR AUTODEPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 79,647, Sep. 27, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,582  
Int. Cl.<sup>3</sup> C08K 5/09

U.S. Cl. 524-320

7 Claims

1. An acidic aqueous autodepositing coating composition of the ferric iron-containing type wherein ferrous iron tends to build up in concentration in the aqueous phase of the composition and affect adversely the coating capabilities of the composition as it is used continuously to form an autodeposited coating on ferrous surfaces, said composition comprising an organic coating-forming material, dissolved ferric iron and hydrofluoric acid, and including also dissolved ferrous iron and, in an amount effective to maintain the coating capabilities of the composition, a carboxylic acid which is soluble in the composition and which is effective in forming a complex with said ferrous iron in the composition, said carboxylic acid having a dissociation constant of about  $1.5 \times 10^{-5}$  to about  $1 \times 10^{-3}$  and being selected from the group consisting of succinic, citric, itaconic, malic, lactic, tartaric, fumaric, glacial acrylic, gallic and acetic acid and a mixture of two or more of said acids.

#### 4,414,351 PRIMER FOR POWDER COATING COMPRISING (A) DIENE POLYMER (B) MGO AND (C) COBALT OR MANGANESE ION

Hajime Suzuki; Ikuro Masuda, and Masaki Kosaka, all of Himaji, Japan, assignors to Daicel Ltd., Osaka, Japan

Division of Ser. No. 971,242, Dec. 20, 1978, Pat. No. 4,268,579, which is a continuation of Ser. No. 665,374, Mar. 10, 1976, abandoned. This application Nov. 5, 1980, Ser. No. 204,149

Claims priority, application Japan, Mar. 19, 1975, 50-33229; Sep. 26, 1975, 50-116099  
Int. Cl.<sup>3</sup> C08K 3/10; B05D 1/06

U.S. Cl. 524-413

4 Claims

1. A primer composition for use in the coating of a resin powder onto a metal substrate, consisting essentially of a film-forming diene polymer dissolved in an inert organic solvent to form a solution, said solution having dispersed therein from 30 to 110 parts by weight of magnesium oxide particles, per 100 parts by weight of said diene polymer, said solution containing dissolved therein a cobalt compound, a manganese compound or a mixture of said compounds in an amount such that the solution contains from 0.05 to 1.0 part by weight, per 100 parts of said diene polymer, of cobalt ion, manganese ion or mixture thereof.

#### 4,414,352 THERMOPLASTIC MOLDING COMPOSITIONS AND PROCESS

Stuart C. Cohen; Robert J. Kostelnik, and Allen D. Wambach, all of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 35,090, May 1, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,132  
Int. Cl.<sup>3</sup> C08K 3/34

U.S. Cl. 524-443

17 Claims

1. A flame retardant thermoplastic molding composition having improved physical properties, the composition consisting essentially of an intimate mixture of:

- a high molecular weight poly(1,4-butylene terephthalate) homo- or copolyester resin;
- (i) a copolymer comprised of ethylene and vinyl acetate in combination with an aromatic polycarbonate derived from bisphenol A; or (ii) a mixture of a reinforcing amount of glass fibers and a copolymer comprised of ethylene and



- vinyl acetate in combination with an aromatic polycarbonate derived from bisphenol-A;
- (c) a flame retardant amount of a flame retardant additive; and
- (d) a mineral filler selected from the group consisting of silica, mica, talc, pyrophyllite, wollastonite and mineral wool, and mixtures of any of the foregoing; component (d) being present in an amount of from about 5 to about 40% by weight sufficient to provide electrical arc track resistance superior to that of a corresponding composition in which mineral filler component (d) is not present.

4,414,353

## ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

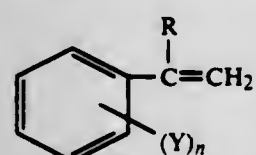
Division of Ser. No. 159,744, Jun. 16, 1980, Pat. No. 4,349,641, which is a division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Mar. 31, 1982, Ser. No. 364,149

Int. Cl.<sup>3</sup> C08L 33/26, 39/08

U.S. Cl. 524—458 6 Claims

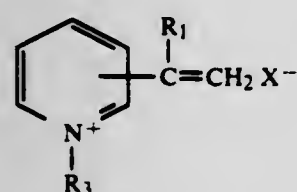
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount at least sufficient to provide cross linked graft copolymer particles, and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 1.0 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (a) being a monomer having the formula

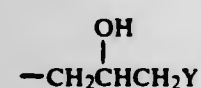


wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate; ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexane diol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate; trivinylbenzene; divinylanthracene; diallyl maleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

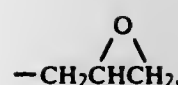
(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



wherein R<sub>1</sub> is hydrogen or methyl, R<sub>3</sub> is hydrogen, a C<sub>1</sub>–C<sub>4</sub> alkyl,



where Y is hydroxyl or halogen,



- and  $\text{---CH}_2\text{CH}_2\text{O---}$  where n is an integer 1 or more and X<sup>–</sup> is an anion, and
- (ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 2 parts to about 10 parts by weight for each 100 parts by weight of monomer (1) employed.

4,414,354

AQUEOUS POLYMERIC LATEX COATING COMPOSITIONS, PRODUCTS PRODUCED THEREBY, METHODS FOR PREPARING SUCH COMPOSITIONS, AND METHODS FOR USING SUCH COMPOSITIONS

Robert J. Slocombe, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 807,267, Jun. 16, 1977, Pat. No. 4,374,670. This application Apr. 2, 1982, Ser. No. 364,703

Int. Cl.<sup>3</sup> C08L 33/02

U.S. Cl. 524—460

35 Claims

1. A liquid coating composition comprising
- (a) colloidal polymer particles of at least one polymer capable of being deposited in the form of a film;
- (b) a precursor of a material capable of disrupting the colloidal stability of the polymer particles to cause film formation when the coating composition is applied to a substrate; and
- (c) a liquid dispersion medium.

4,414,355

## WIRE COATING COMPOSITION

Richard J. Pokorny, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 14, 1981, Ser. No. 283,292

Int. Cl.<sup>3</sup> C08L 27/12, 23/24; C08K 5/02

U.S. Cl. 524—462

10 Claims

1. A composition comprising an admixture of:
- a. 35 to 70 weight percent of an anhydride copolymer which is the reaction product of:
- (1) an alkyl or aryl substituted or unsubstituted unsaturated cyclic anhydride wherein each alkyl group contains up to 6 C atoms and the cyclic group contains 4 to 15 C atoms, and
- (2) an unsaturated C<sub>10</sub> to C<sub>24</sub> aliphatic hydrocarbon;
- b. 10 to 41 weight percent of a compatible flexibilizing polymer which is selected from polyisobutylene and polymers of ethylene copolymerized with vinyl acetate, acrylate esters, methacrylate esters and alpha-olefins, and
- c. 10 to 40 weight percent of a hydrophobic, compatible, fluoroaliphatic radical-containing composition, said fluoroaliphatic radical being a monovalent, fluorinated, aliphatic radical having 5 to 14 carbon atoms which can be interrupted by divalent O atoms or trivalent N atoms bonded to C atoms; said fluoroaliphatic radical-containing composition being capable of providing water-repellancy to said admixture; and
- d. up to 10 weight percent of a mercaptan compound.

4,414,356

## TETRAFLUOROETHYLENE COPOLYMER

Rudolph H. Michel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 310,068, Oct. 9, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,467

Int. Cl.<sup>3</sup> C08K 3/04

U.S. Cl. 524—496

1 Claim

1. A composition consisting of an intimate admixture of a major portion of (a) a melt-fabricable tetrafluoroethylene copolymer resin having a melt viscosity between  $1 \times 10^4$  and  $1 \times 10^7$  poises at 380° C. and an average particle size of below 400 μm, and wherein the comonomers used to make the copolymer are perfluorinated ethylenically unsaturated organic copolymerizable monomers, and a minor portion of (b) graphite fibers that have not been treated by a process which increases surface oxygen and nitrogen content and which have an average of less than 6 atom % oxygen and less than 3 atom % nitrogen in the outermost 5 nm of fiber cross section.

4,414,357

POLYESTER OR ALKYD RESIN COMPOSITION CONTAINING ACRYLIC MICROGELS

Howard J. Wright, Kansas City, Mo.; David P. Leonard, Overland Park, Kans., and Roger A. Etzell, Farmington Hills, Mich., assignors to Glasurit America, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 98,115, Nov. 27, 1979, Pat. No. 4,290,932. This application Aug. 31, 1981, Ser. No. 297,631

Int. Cl.<sup>3</sup> C08L 67/02, 67/08, 33/14, 33/02

U.S. Cl. 524—513

10 Claims

1. A method of making a polyester or alkyd resin composition containing an acrylic microgel for use in paint systems to provide coatings of improved sag resistance which comprises preparing an aqueous, microgel emulsion by the emulsion polymerization in water of a mixture of ethylenically unsaturated monomers, at least one of said monomers being an acrylic or methacrylic acid, or an —OH substituted alkyl ester thereof, and containing a —COOH or —OH group, and at least another of said monomers being selected from an alkyl ester of an acrylic or methacrylic acid, styrene and α-methyl styrene and being free from —COOH and —OH groups, and a multifunctional crosslinking agent present in an amount of 5–70 percent by weight of the total weight of said ethylenically unsaturated monomers and crosslinking agent, removing water from the emulsion by coagulation and/or azeotropic distillation with an organic solvent in which the microgel is insoluble and which forms an azeotrope with water, and incorporating the microgel into a polyester or alkyd resin to provide said polyester or alkyd microgel resin composition wherein the amount of microgel solids is in the range of 5 to 15 percent by weight of the total resin solids.

4,414,358

FILLED COMPOSITIONS OF THERMOPLASTIC POLYAMIDE AND POLYESTER

Eric Nield, Watton-At-Stone, and Martin K. Thompson, Biggleswade, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 23, 1981, Ser. No. 276,641

Claims priority, application United Kingdom, Jul. 14, 1980, 8022949

Int. Cl.<sup>3</sup> C08L 67/02, 77/06

U.S. Cl. 524—538

2 Claims

1. A thermoplastic composition suitable for extrusion into extruded profiled sections comprising a blend of a linear polyamide, a linear polyester containing at least 80% by weight of ethylene terephthalate units, and an inorganic fibrous filler wherein the composition contains from 5 to 60% by weight of the composition of the inorganic fibrous filler, the weight ratio of polyamide to polyester is between 1:1 and 49:1, and wherein the polyamide contains at least 20 g equivalents of terminal

amino groups per 10<sup>6</sup> g of polyamide in excess of the carboxyl groups.

4,414,359

DIENE-CONTAINING RUBBER COMPOSITIONS HAVING IMPROVED GREEN STRENGTH

David J. Dougherty, Akron; Binnur Günesin, Uniontown, both of Ohio, and John W. Splewak, Webster, N.Y., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

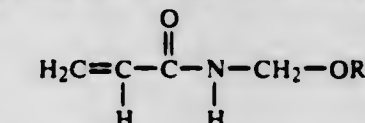
Division of Ser. No. 132,736, Mar. 24, 1980, Pat. No. 4,338,425. This application Jan. 25, 1982, Ser. No. 342,670

Int. Cl.<sup>3</sup> C08F 220/58

U.S. Cl. 524—555

3 Claims

1. A novel synthetic rubber composition having improved green strength formed by the emulsion copolymerization, at temperatures of about 0° to 30° C., of:
- from about 0.5 to about 10 percent by weight of an N-(alkoxymethyl)acrylamide having the formula



wherein R is selected from the group consisting of straight and branched alkyl chains having from 1 to about 20 carbon atoms;

from about 10 to about 90 percent by weight of a conjugated diene compound having from about four to about 20 carbon atoms; and

from about 1 to about 90 percent by weight of a monomer containing a vinyl group selected from the group consisting of monovinyl aromatic compounds having from eight to about 20 carbon atoms and acrylic compounds having from three to about five carbon atoms; and,

thereafter compounded with

from about 20 to about 80 phr of carbon black, from about 1 to about 40 phr of oil and from about 1 to about 10 phr each of sulfur and an accelerator.

4,414,360

SPRAY BUFF REACTANT AND APPLICATION THEREOF

Walter J. Hackett, Westminster, and Peter E. Galena, Huntington Beach, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Division of Ser. No. 253,300, Apr. 13, 1981, Pat. No. 4,363,835. This application Nov. 9, 1981, Ser. No. 319,634

Int. Cl.<sup>3</sup> C08L 25/14

U.S. Cl. 524—560

7 Claims

1. A liquid solution containing a polymerized film forming agent and a cross linking ingredient for use in producing a toughened, mar-resistant floor film as by application to an already formed floor surface film and buffing of the floor surface film with the solution thereon in moist condition to heat the solution and surface film and produce crosslinking with the floor surface, said solution having the following composition:

Ingredient	wt. percent range
(a) water-emulsion acrylic polymer, styrene acrylic, vinyl acetate-acrylic polymer	5.0–90%
(b) water soluble solvent	5.0–6.0%
(c) non-ionic surfactant	0.1–2.0%
(d) volatile amine	0.1–3.0%
(e) humectant	0.1–4.0%
(f) cross-linking agent selected from the group that consists of methylated melamine and sodium benzoate	0.1–10.0%
(g) ammonia	0.1–2.0%
(h) water	balance



4,414,361

**ORGANIC POLYISOCYANATE-CYCLOALKYLENE CARBONATE ADHESIVE BINDER COMPOSITIONS**  
James M. Gaul, Exton, and Tinh Nguyen, Chaddsford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1981, Ser. No. 293,564

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 97/00, 97/02

U.S. Cl. 524-702

25 Claims

1. An adhesive binder composition for the preparation of compression moldable lignocellulosic articles which comprises from about 20 to 95 percent by weight of an organic di- or polyisocyanate and from about 5 to 80 percent by weight of a liquid alkylene carbonate.

22. A method for the preparation of lignocellulosic composite articles comprising the steps of

- mixing together lignocellulosic particles and from about 1.5 to 12 weight percent based on oven dried lignocellulosic particles of an adhesive binder composition comprising from 20 to 95 weight percent organic di- and polyisocyanate and from about 5 to 80 weight percent liquid alkylene carbonate to form a moldable composition;
- introducing said moldable composition onto a metal mold, caul plate or platen which has been sprayed or coated with a release agent;
- compression shaping said composition at temperatures of between about 140° C. to 220° C. at pressures of from about 100 to 600 psi for a period of from about 1 to 10 minutes to form a composite article of desired shape and/or thickness; and
- thereafter releasing said lignocellulosic composite article from said metal mold, caul plate or platen.

4,414,362

**PREPARATION OF POLYAMIDES**

Gerd M. Lenke, Mogadore, and Hubert J. Fabris, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 4, 1982, Ser. No. 354,838

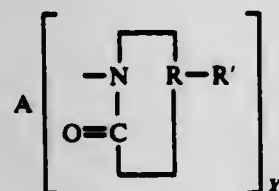
Int. Cl.<sup>3</sup> C08G 69/14

U.S. Cl. 525-178

6 Claims

1. The method which comprises reacting together copolymerizable components consisting essentially of

I. At least one initiator compound having the formula



where A is B(NHCO)<sub>x</sub>, B(CO)<sub>x</sub>, —CO—, —SO<sub>2</sub>—, —CS—,

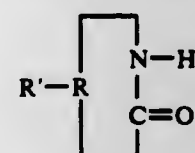


B(CS)<sub>x</sub>, B(SO<sub>2</sub>)<sub>x</sub> and B(PO)<sub>x/2</sub>, where B is a C<sub>4</sub> to C<sub>30</sub>, or a C<sub>6</sub> to C<sub>15</sub>, hydrocarbon radical selected from the group consisting of alkylene, cycloalkylene, alkylcycloalkylene, arylene, alkarylene and aralkylene radicals and mixtures thereof, where X is 2 to 4 and where R is an alkylene radical of from 4 to 11 carbon atoms and R' is hydrogen or an alkyl radical of from 1 to 4 carbon atoms.

II. at least one liquid nitrile copolymer having an average of from about 2 to 3 hydroxyl groups per molecule and an

average molecular weight of from about 1,500 to 10,000, said copolymer being a copolymer of from about 95 to 60 parts by weight of at least one conjugated diene of from 4 to 6 carbon atoms and from 5 to 40 parts by weight of at least one nitrile selected from the group consisting of acrylonitrile and methacrylonitrile and

III. at least one lactam monomer in admixture with  
IV. at least one anionic lactam polymerization catalyst in an amount of from about 1 to 20 meq., or from about 5 to 15 meq., of lactamate anion per 100 grams of I, II and III, the molar amount of III being substantially greater than the molar amounts of I and II, at a time, temperature and pressure sufficient to form a solid polyamide V, the lactam of III and IV having the formula



where R is an alkylene radical of from 4 to 11 carbon atoms and R' is hydrogen or an alkyl radical of from 1 to 4 carbon atoms, the equivalent ratio of the lactamate anion of the catalyst IV to the initiator compound I being from about 0.1:1 to 1:1 or from about 0.3:1 to 1:1, the equivalent ratio of the initiator compound I to the OH groups of the nitrile copolymer II being from about 0.8:1 to 4:1 or from about 1:1 to 3:1 and the nitrile copolymer II being used in an amount sufficient to provide from about 5 to 40% by weight of II copolymerized in the resulting polyamide V.

4,414,363

**RUBBER COMPOSITION**

Shuichi Akita; Takeshi Chida, both of Kamakura; Hiroyuki Watanabe, and Akio Ueda, both of Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,973

Int. Cl.<sup>3</sup> C08L 9/00, 47/00

U.S. Cl. 525-237

10 Claims

1. A rubber composition comprising as main components (1) 25 to 75% by weight of at least one essentially amorphous rubber having a glass transition temperature of from —45° C. to 0° C., a Mooney viscosity (ML<sub>1+4</sub>, 100° C.) of 20-200 and 1,2-linkages, 3,4-linkages or both 1,2- and 3,4-linkages and selected from the group consisting of an isoprene-butadiene copolymer rubber, polyisoprene rubber and mixtures thereof and (2) 75 to 25% by weight of at least one rubber selected from the group consisting of natural rubber; cis-1,4-polyisoprene rubber having a cis-1,4-linkage content and mixture thereof of at least 90 mole%, said composition having a value, defined by the following formula, of at least 10,

$$((R-53)+(S-100))$$

wherein R is a rebound (%) measured at 51° C. by a Dunlop Tripso meter for vulcanized product of said rubber composition, and a wet skid resistance index S which is determined at 19° C. by a portable skid tester for a vulcanized product of said rubber composition on a road surface defined by ASTM E-303-74.

4,414,364

**STABILIZATION OF POLYESTER**

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018  
Continuation of Ser. No. 32,633, Apr. 23, 1979, Pat. No.

4,243,779. This application Dec. 22, 1980, Ser. No. 218,501

Int. Cl.<sup>3</sup> C08G 63/76

U.S. Cl. 525-437

51 Claims

1. A polyester resin having the phenolic hydrogen end atoms and/or alcoholic hydrogen end atoms replaced by stress corrodant preventive groups which are halohydrocarbon groups or halocarbon groups.

4,414,365

**PROCESS FOR PRODUCING AN AROMATIC POLYESTER COMPOSITION**

Hiroaki Sugimoto, Nara, and Makoto Hanabata, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 8, 1982, Ser. No. 356,241

Claims priority, application Japan, Mar. 16, 1981, 56-38308; Apr. 8, 1981, 56-53338; Aug. 4, 1981, 56-122861; Sep. 2, 1981, 56-138727

Int. Cl.<sup>3</sup> C08G 63/60

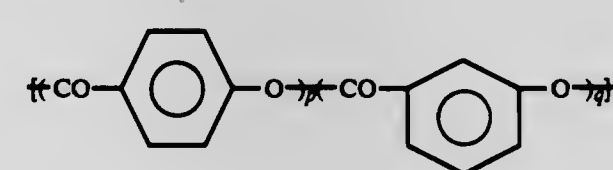
U.S. Cl. 525-437

4 Claims

1. A process for producing an aromatic polyester composition, which is characterized in that in producing an aromatic polyester represented by the general formula A,



(wherein X is an alkylene group having 1 to 4 carbon atoms, —O—, —SO<sub>2</sub>—, —S—, or —CO—; m and n are each 0 or 1; the ratio of d to e is in the range of from 1:1 to 10:1; the ratio of e to f is in the range of from 9:10 to 10:9; and the substituents attached to the benzene ring are in para or meta position to one another), the polymerization is carried out using substantially no solvent, by the method of bulk polymerization at a temperature from about 200° C. to about 400° C., by mixing the reactants for forming the aromatic polyester with at least one polymer selected from the group consisting of polyalkylene terephthalates in the amount of about 5 to about 20% by weight of the composition ultimately produced, polyphenylene sulfides in the amount of about 5 to about 30% by weight of the composition ultimately produced, aromatic polysulfones in the amount of about 5 to 40% by weight of the composition ultimately produced, and aromatic polyesters represented by the general formula B,



wherein (p+q) is in the range of from 10 to 1,000 and p/(p+q) ≥ 0.8, in the amount of about 5 to about 50% by weight of the composition ultimately produced.

4,414,366

**LOW COLOR COMPOSITIONS COMPRISING A CROSS-LINKED POLYCYANURATE POLYMER AND A THERMOPLASTIC POLYMER**

Tse C. Wu; Dusan C. Prevorsek, and David H. Wertz, all of Morristown, N.J., assignors to Allied Corporation, Morristown, Morris County, N.J.

Continuation-in-part of Ser. No. 213,530, Dec. 5, 1980, Pat. No. 4,334,045. This application Jun. 4, 1982, Ser. No. 384,857

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 69/00, 67/02

U.S. Cl. 525-439

18 Claims

1. A process for preparing a cured composition which comprises:

- combining a purified monomeric aromatic dicyanate with an effective amount of a catalyst selected from the group consisting of manganese(II), silver(II), iron(III) bismuth(III), indium(III) and hafnium(IV) salts and with a thermoplastic polymer;
- curing the aromatic dicyanate at at least one temperature at least about 150° C. and below about 200° C.; and
- further curing the aromatic dicyanate at at least one temperature between about 200° C. and about 300° C., for a time sufficient to cure the dicyanate without causing

such color formation that the Yellowness Index of the cured composition exceeds about 30.

4,414,367

**CURABLE MOLDING COMPOSITIONS**

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,213

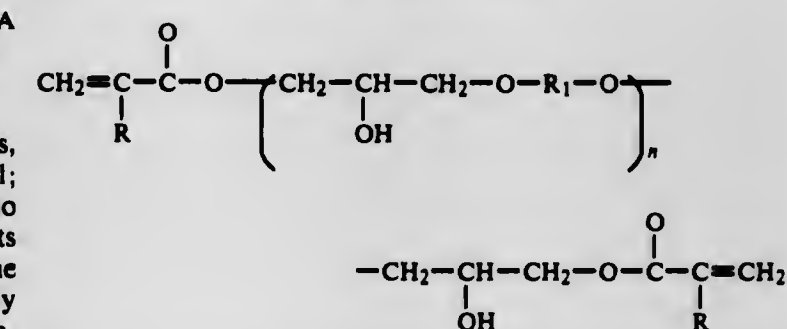
Int. Cl.<sup>3</sup> C08F 283/00

U.S. Cl. 525-531

11 Claims

1. A liquid homogeneous molding composition used for the rapid production of fiber-reinforced thermoset resin articles which composition comprises:

(a) a vinyl ester of the following formula:



wherein the R's are independently hydrogen or methyl, R<sub>1</sub> is the residue of a cycloaliphatic or aromatic diol and n has an average value of from 1 to about 5;

(b) a second crosslinkable oligomer containing two or more unsaturated groups selected from acrylate, or methacrylates; and

(c) a monoethylenically unsaturated monomer, wherein the weight ratio of (a) to (b) is greater than 0.3.

4,414,368

**CHLOROSULFONATED POLYSULFONES AND DERIVATIVES THEREOF**

Myron J. Coplan, Natick; Chungli H. Park, Sharon, and Samuel C. Williams, Lexington, all of Mass., assignors to Albany International Corp., Albany, N.Y.

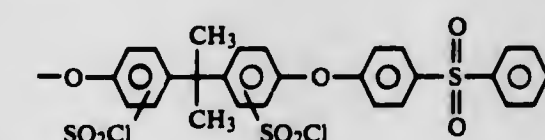
Filed Dec. 27, 1982, Ser. No. 453,163

Int. Cl.<sup>3</sup> C08G 65/48, 75/23

U.S. Cl. 525-534

3 Claims

1. A polysulfone sulfonyl chloride having recurring units of the formula:



4,414,369

**CONTINUOUS PROCESS FOR THE PREPARATION OF POLYOLEFINS HAVING WIDELY DISTRIBUTED MOLECULAR WEIGHTS**

Nobuyuki Kuroda, Yokohama; Tatsuo Horie, Tokyo; Kazuo Matsuura, Kawasaki; Kunimichi Kubo, Tokyo, and Mituji Miyoshi, Niomiya, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 911,761, Jun. 2, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 138,104

Claims priority, application Japan, Aug. 17, 1977, 52-97747; Jan. 6, 1978, 53-204

Int. Cl.<sup>3</sup> C08F 2/14, 4/66

U.S. Cl. 526-65

13 Claims

1. In a process for preparing polyolefins by polymerizing olefins in the presence of a solvent, hydrogen and a highly







divalent saturated aliphatic group of 1-7 carbon atoms, X represents hydrogen, halogen, hydroxy or  $\text{NR}''_2$ , and  $\text{R}''$  represents hydrogen or an alkyl group of 1-7 carbon atoms, said terpolymer being prepared by the steps of polymerizing in an aqueous emulsion at a temperature of  $0^\circ\text{--}35^\circ\text{C}$ . a monomer mixture consisting essentially of 55-82 percent by weight of butadiene, 12-35 percent by weight of styrene and 5-30 percent by weight of said acrylamide and thereafter recovering the polymer product from the reaction mixture.

4,414,375

# **OXYGEN PERMEABLE CONTACT LENS MATERIAL COMPRISING COPOLYMERS OF MULTIFUNCTIONAL SILOXANYL ALKYLESTERS**

Russell A. Neeffe, 1441 Pinnacle Peak, DeSoto, Tex. 75115  
Continuation-in-part of Ser. No. 185,000, Sep. 2, 1980, Pat. No. 4,306,042. This application Sep. 8, 1981, Ser. No. 300,189  
Int. Cl.<sup>3</sup> C08F 230/08

U.S. Cl. 526-260

6 Claims

1. An oxygen permeable material for the manufacture of contact lenses formed by copolymerizing (a) from 5 to 90% by weight of a multifunctional siloxanyl alkyl ester, monomer having two or more  $\alpha$ ,  $\omega$  terminally bonded through divalent hydrocarbon groups to an activated unsaturated group, (b) an effective amount of a copolymerizable monomer up to 90% by weight of an ester of acrylic or methacrylic acid or mixture thereof, or from (c) an effective amount of a copolymerizable monomer up an ester of itaconic acid, (d) from 0.5 to 40% by weight of a hydrophilic monomer for a surface wetting agent, and (e) from 0 to 20% by weight of an ester crosslinking agent in the presence of a free radical or a photo initiator.

4,414,376

# **RHODIUM- AND IRIIDIUM-NITROGEN COMPLEX CATALYSTS**

Allen R. Siedle, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 20, 1981, Ser. No. 246,104

Int. Cl.<sup>3</sup> C08G 77/06

U.S. Cl. 528-15

10 Claims

1. In a process for hydrosilation comprising the steps of: causing a reaction to occur between a silicon-containing compound having at least one silicon-hydrogen bond and a compound having at least one pair of aliphatic unsaturated carbon atoms linked by multiple bonds in the presence of a catalytically effective amount of a rhodium- or iridium-nitrogen complex catalyst, optionally heating the resulting mixture, and recovering the resulting product, the improvement comprising using as said catalyst a catalyst selected from the classes of complex compounds having the general formulae:

- (a) monometallic complexes,  $(\text{L})\text{MX}(\text{Y})_2$ , and  
(b) bimetallic complexes,  $(\text{L})[\text{RhX}(\text{CO})_2]_2$ ,

wherein:

M is a rhodium or iridium metal atom,  
L is a single or fused heterocyclic ligand comprising at least one five- or six-member ring, said ligand having 2 to 4 ring nitrogen atoms in the same ring,  
Y is an uncharged ligand that fills one or two coordination positions of the metal atom, and,  
X is independently Cl, Br, I, or CN.

4,414,377

# **EPOXIDE RESIN COMPOSITIONS CONTAINING ESTERS AS DILUENTS AND CURE ACCELERATORS**

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 26, 1982, Ser. No. 382,063

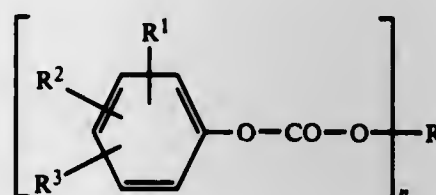
Claims priority, application United Kingdom, Jun. 3, 1981, 8117065

Int. Cl.<sup>3</sup> C08G 59/68

U.S. Cl. 528-88

9 Claims

1. A curable composition comprising  
(a) an ester of the formula



where

n represents an integer of from 1 to 6,

R represents the residue, after removal of n hydroxy groups, of an alcohol or a phenol,

$\text{R}^1$ ,  $\text{R}^2$ , and  $\text{R}^3$  may be the same or different and each represents a hydrogen atom, a halogen atom, or a straight chain or branched alkyl group having from 1 to 10 carbon atoms, with the proviso that one or two of  $\text{R}^1$ ,  $\text{R}^2$ , and  $\text{R}^3$  may alternatively represent an acyloxy group having from 1 to 10 carbon atoms,

(b) an amine having at least two hydrogen atoms directly attached to a nitrogen atom or to nitrogen atoms, which nitrogen atom or atoms is or are in turn directly attached to an aliphatic or cycloaliphatic carbon atom or atoms, and

(c) an epoxide resin.

4,414,378

# **GRANULAR OR POWDERY PHENOL-FORMALDEHYDE RESIN AND PROCESS FOR PRODUCTION THEREOF**

Hiroaki Koyama, Kobe, and Shigeo Shimizu, Osaka, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,729

Claims priority, application Japan, Apr. 23, 1981, 56-60613

Int. Cl.<sup>3</sup> C08G 8/10

U.S. Cl. 528-137

56 Claims

1. A granular or powdery resin which is a condensation product of a phenol and formaldehyde, said granular or powdery resin being characterized by

- (A) containing spherical primary particles and secondary particles resulting from the agglomeration of the primary particles, each of the particles having a particle diameter of 0.1 to 150 microns,  
(B) having such a size that at least 50% by weight thereof can pass through a 100 Tyler mesh sieve,  
(C) having a free phenol content, determined by liquid chromatography, of not more than 50 ppm,  
(D) having a  $\text{D}_{960-1020}/\text{D}_{1450-1500}$  ratio of from 0.2 to 9.0 and a  $\text{D}_{890}/\text{D}_{1600}$  ratio of from 0.09 to 1.0 in its infrared absorption spectrum measured by a KBr tablet method, wherein  $\text{D}_{1600}$  represents the absorption intensity of an absorption peak at  $1600\text{ cm}^{-1}$  assigned to benzene,  $\text{D}_{960-1020}$  represents the highest absorption intensity of absorption peaks at  $960$  to  $1020\text{ cm}^{-1}$  assigned to the methylenol groups, and the  $\text{D}_{890}$  represents the absorption intensity of an absorption peak at  $890\text{ cm}^{-1}$  assigned to a lone hydrogen atom of the benzene ring, and  
(E) having a weight increase by acetylation, I defined by the following equation, of 23 to 40% by weight,

$$I = (\text{W}_1 - \text{W}_0) / \text{W}_0 \times 100 (\%)$$

wherein  $\text{W}_0$  is the weight in grams of said resin before acetylation, and  $\text{W}_1$  is the weight in grams of the resin after acetylation,

said acetylation being carried out by gradually heating 10 g of said resin from room temperature to  $115^\circ\text{C}$ . over the course of 45 minutes in 300 g of an acetylation bath consisting of 78% by weight of acetic anhydride, 20% by weight of acetic acid and 2% by weight of orthophosphoric acid and maintaining it at  $115^\circ\text{C}$ . for 15 minutes.

22. A process for producing a granular or powdery phenol-formaldehyde resin which comprises contacting a phenol with a hydrochloric acid-formaldehyde bath containing 5 to 28% by weight of hydrochloric acid and 3 to 25% by weight of formaldehyde with the total concentration of hydrochloric acid and formaldehyde being 15 to 40% by weight, while maintaining a bath ratio, defined by the quotient of the weight of the hydrochloric acid-formaldehyde bath divided by the weight of the phenol, of at least 8, said contacting being effected such that after contacting of the phenol with the bath, white suspended particles are formed and thereafter developed into a pink-colored granular or powdery solid.

4,414,379

# **GRANULAR OR POWDERY NITROGEN-CONTAINING PHENOL-ALDEHYDE COPOLYMER RESIN AND PROCESS FOR PRODUCTION THEREOF**

Hiroaki Koyama, Kobe, and Shigeo Shimizu, Osaka, both of Japan, assignors to Kanebo Ltd. and Mitsubishi Chemical Industries Limited, both of Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,974

Claims priority, application Japan, Jul. 24, 1981, 56-115376

Int. Cl.<sup>3</sup> C08G 14/06, 14/08, 14/10

U.S. Cl. 528-137

69 Claims

1. A granular or powdery nitrogen-containing phenol-aldehyde copolymer resin which is a condensation product of a phenol, a nitrogen-containing compound having at least two active hydrogen atoms and an aldehyde, said granular or powdery resin being characterized by

- (A) containing spherical primary particles and secondary particles resulting from the agglomeration of the primary particles, each of said particles having a particle diameter of 0.1 to 100 microns,  
(B) having such a size that at least 50% by weight thereof can pass through a 150 Tyler mesh sieve,  
(C) having a free phenol content, determined by liquid chromatography, of not more than 50 ppm, and  
(D) having a  $\text{D}_{960-1020}/\text{D}_{1450-1500}$  ratio of from 0.1 to 2.0 in its infrared absorption spectrum measured by a KBr tablet method, wherein  $\text{D}_{960-1020}$  represents the highest absorption intensity of absorption peaks at  $960$  to  $1020\text{ cm}^{-1}$  assigned to the methylenol groups, and  $\text{D}_{1450-1500}$  represents the highest absorption intensity of absorption peaks at  $1450$  to  $1500\text{ cm}^{-1}$  assigned to the aromatic double bond.

27. A process for producing a granular or powdery nitrogen-containing phenol-aldehyde copolymer resin, which comprises contacting a phenol and a nitrogen-containing compound having at least two active hydrogen atoms with a hydrochloric acid-formaldehyde bath containing 3 to 28% by weight of hydrochloric acid, 3 to 25% by weight of formaldehyde and 0 to 10% by weight of another aldehyde with the total concentration of hydrochloric acid and formaldehyde being 10 to 40% by weight, while maintaining a bath ratio, defined by the quotient of the weight of the hydrochloric acid-formaldehyde bath divided by the total weight of the phenol and the nitrogen-containing compound, of at least 8, said contacting being effected such that after contacting of the phenol and the nitrogen-containing compound with the bath, white suspended particles are formed and thereafter developed into a granular or powdery solid.

4,414,380

# **UNSUBSTITUTED BIPHENYLENE AS A CROSS-LINKING MONOMER**

Raymond J. Swedo, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 29, 1982, Ser. No. 437,585

Int. Cl.<sup>3</sup> C08G 63/66, 63/68

U.S. Cl. 528-173

11 Claims

1. A polymer of the formula



where P, Q and R each is a divalent aromatic radical whose parent is:

- for P, diphenylether or di(phenoxyphenyl)sulfone;  
for Q, benzene;  
and for R, biphenylene,

and where y and z each are integers, with z being from 1 up to about 5 and the average value  $y/z$  being between about 4 and about 49.

4,414,381

# **THERMOTROPIC POLYESTER ANHYDRIDE POLYMERS**

Brian P. Griffin, St. Albans, and William A. MacDonald, Ware, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 7, 1981, Ser. No. 328,395

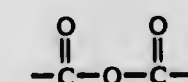
Claims priority, application United Kingdom, Dec. 22, 1980, 8040953

Int. Cl.<sup>3</sup> C08G 63/18, 63/60, 69/44

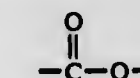
U.S. Cl. 528-190

7 Claims

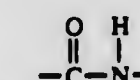
1. A melt-processable aromatic polyester anhydride characterized in that from 5 to 80% of the units linking the aromatic reactant residues in the polymer chain have the formula:



the remaining linkages between the residues of the aromatic reactants being of the formula:



optionally together with linkages of the formula:



substantially all of said remaining linkages being disposed in coaxial or parallel and oppositely directed manner with respect to the residues to which they are linked, the polyester anhydride having a solubility of less than 5% by weight in dimethyl sulphoxide at room temperature.

4,414,382

# **COPOLYESTERS DERIVED FROM 2,6-NAPHTHALENE DICARBOXYLIC ACID, TRANS-4,4'-STILBENE DICARBOXYLIC ACID AND ETHYLENE GLYCOL**

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,896

Int. Cl.<sup>3</sup> C08G 63/18, 63/54

U.S. Cl. 528-298

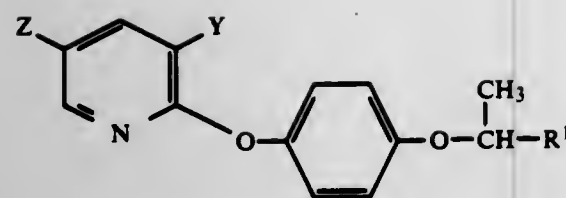
4 Claims

1. A copolyester containing repeating units prepared from about 90 to about 55 mol % 2,6-naphthalenedicarboxylic acid

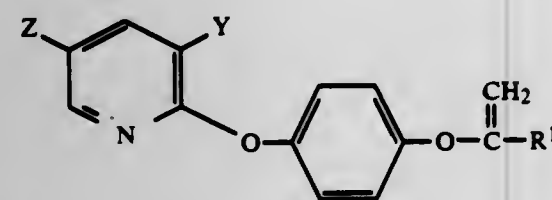








wherein Z is trifluoromethyl or difluoromethyl, Y is hydrogen or chlorine; and R<sup>1</sup> is optionally halo-, alkoxy- or hydroxy substituted alkoxy carbonyl of to 8 carbons; optionally halo- or methyl-substituted cyclohexyloxy carbonyl; (C<sub>3-6</sub> alkenyl) oxycarbonyl; optionally halo- or methyl-substituted phenoxy carbonyl; or benzyloxy carbonyl, the phenyl moiety of which is optionally ring-substituted with halogen or methyl; or, in the case of a said compound wherein R<sup>1</sup> is carboxyl, alkali metal, alkaline earth metal or ammonium salt thereof; said process consisting essentially of the step of selectivity reducing a compound of general formula (II):



wherein Z, Y and R<sup>1</sup> are as defined above, and if necessary, when R<sup>1</sup> in said compound of general formula (I) so obtained is carboxy, esterifying the compound to give a compound of general formula (I) wherein R<sup>1</sup> is as defined above other than carboxy or alkali metal, alkaline earth metal or ammonium salt thereof, or when R<sup>1</sup> in said compound of general formula (I) so obtained is as defined above other than carboxy, hydrolysing the compound to give a compound of general formula (I) wherein R<sup>1</sup> is carboxy or alkali metal, alkaline earth metal or ammonium salt thereof, said reduction involving hydrogenation of said compound (II) in the presence of a palladium or platinum catalyst, the reduction being performed until the alkene double bond is saturated after which the catalyst is removed and the product obtained corresponding to compound (I) is purified.

4,414,392

## HERBICIDAL COMPOSITIONS AND PYRAZOLE DERIVATIVES

Takuo Konotsune, Hiromachi, and Katsuhiko Kawakubo, Yasumachi, both of Japan, assignors to Sankyo Company, Ltd., Tokyo, Japan

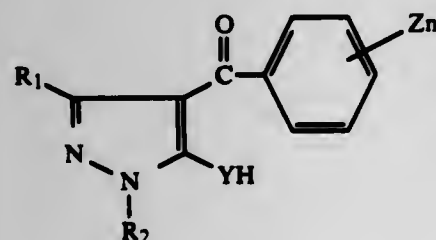
Division of Ser. No. 953,357, Oct. 23, 1978, abandoned, which is a continuation of Ser. No. 838,083, Sep. 30, 1977, Pat. No. 4,146,726, which is a division of Ser. No. 558,682, Mar. 17, 1975, Pat. No. 4,063,925. This application Mar. 20, 1980, Ser. No. 132,101

Claims priority, application Japan, Mar. 28, 1974, 49-34939 Int. Cl.<sup>3</sup> C07D 231/20

U.S. Cl. 548-105

13 Claims

1. A salt of a metal ion, complex ion or ammonium ion and a compound having the formula



wherein

R<sub>1</sub> represents hydrogen atom or a lower alkyl group, R<sub>2</sub> represents a lower alkyl group or a lower alkenyl group, n is an integer of 2 or 3, Z represents a halogen atom, nitro group or a lower alkyl group, and Z's may be the same or different, and Y represents an oxygen atom.

4,414,393

## ULTRAVIOLET-ABSORBING STABILIZERS SUBSTITUTED BY AN ALIPHATIC HYDROXYL GROUP

Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

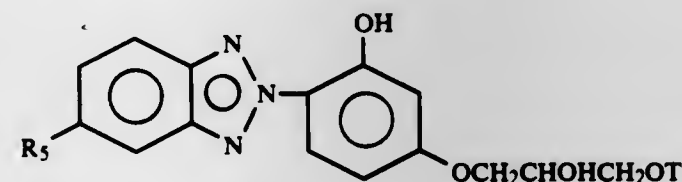
Filed Nov. 5, 1981, Ser. No. 318,648

Int. Cl.<sup>3</sup> C07D 249/20

U.S. Cl. 548-260

3 Claims

1. A compound having the formula



where T is alkyl of 4 to 14 carbon atoms, and R<sub>5</sub> is hydrogen or chloro.

4,414,394

## TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,419

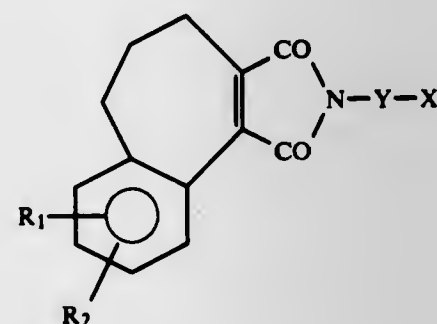
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.<sup>3</sup> C07D 209/94

U.S. Cl. 548-451

5 Claims

1. A compound of the formula



in which R and R<sub>1</sub> independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, Y is alkylene having 1 to 30 carbon atoms, cycloalkylene having 5 or 6 carbon atoms, methylenebis(cyclohexylene), arylene having 6 to 10 carbon atoms, aralkylene having 7 or 8 carbon atoms or alkylarylene having 7 or 8 carbon atoms; or said arylene substituted by one alkyl of 1 to 4 carbon atoms, by one alkoxy of 1 to 4 carbon atoms or by one nitro, and X is -OH.

4,414,395

## PROCESS FOR THE MANUFACTURE OF HYDRAZONO-ISOINDOLINES

Abul Iqbal, Ettingen, and Paul Lienhard, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,142

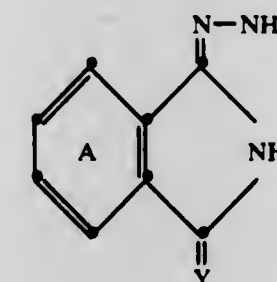
Claims priority, application Switzerland, Mar. 13, 1980, 1974/80

Int. Cl.<sup>3</sup> C07D 209/44

U.S. Cl. 548-471

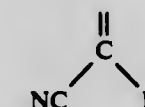
5 Claims

1. A process for the manufacture of a 1-hydrazono-isoindoline of the formula

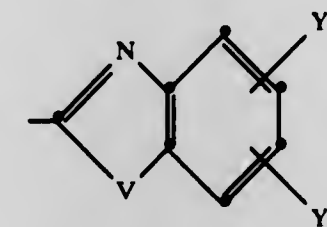


wherein

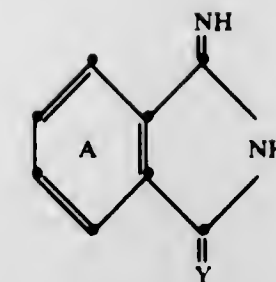
Y is a methine radical of the formula



wherein R is an alkoxy carbonyl, alkyl carbamoyl, carbamoyl or sulfamoyl group, a benzyl carbamoyl group, a phenyl carbamoyl or phenylsulfamoyl group which is unsubstituted or substituted by halogen atoms or alkyl groups of 2 to 6 carbon atoms, or by nitro, cyano or trifluoromethyl groups, or is a naphthyl carbamoyl group which is unsubstituted or substituted by chlorine atoms, or a phenylsulfonoyl group or a radical of the formula



wherein V is an oxygen or a sulfur atom or an imino group, Y<sub>1</sub>, Y<sub>2</sub> are hydrogen or halogen atoms, alkyl or alkoxy groups, each of 1 to 4 carbon atoms, or nitro groups, or a methine radical derived from a heterocyclic compound containing an active methylene group, or Y is an imine radical =N-E where E is the residue of an aromatic or heteroaromatic amine, the ring A is unsubstituted or is substituted by 1 to 4 chlorine atoms, 1 to 2 alkyl or alkoxy groups, each of 1 to 4 carbon atoms, a phenyl, phenoxy or nitro group, an alkanoylamino group containing 2 to 6 carbon atoms, or a benzoylamino group, consisting essentially of reacting an iminoisoindoline of the formula



with hydrazine or hydrazine hydrate, in a polar solvent, at a temperature from 10° C. to 40° C.

4,414,396

## POLYHALOPHTHALIMIDOALKYL-FUNCTIONAL CARBONATES AND HALOFORMATES

Nicodemus E. Boyer, Schaumburg, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

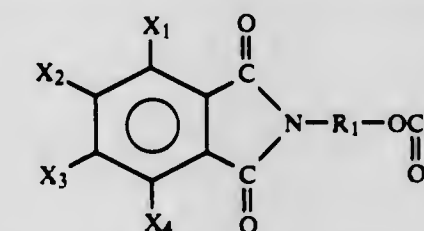
Filed Jan. 7, 1982, Ser. No. 337,660

Int. Cl.<sup>3</sup> C07D 209/48

U.S. Cl. 548-478

5 Claims

1. A compound represented by the structural formula:



wherein:

- R<sub>1</sub> is straight chain or branched chain alkylene having from about 2 to about 5 carbon atoms,
- X is chloro or bromo, and
- X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> are each independently hydrogen, chloro or bromo, with the proviso that at least three of X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> are each independently chloro or bromo.

4,414,397

## PRODUCTION OF ALKENYL SUBSTITUTED ALIPHATIC DICARBOXYLIC ANHYDRIDES

Justin C. Powell, Fairfax, Va., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 7, 1982, Ser. No. 337,564

Int. Cl.<sup>3</sup> C07D 307/60

U.S. Cl. 549-255

17 Claims

1. The method of preparing a product alkenyl-substituted aliphatic dicarboxylic acid anhydride, by reaction of components consisting essentially of olefin oligomer and unsaturated dicarboxylic acid anhydride in the presence of 1,3-dibromo-5,5-dialkyl substituted hydantoin catalyst, which comprises maintaining at 150° C.-300° C. a reaction mixture containing a molten olefin oligomer of molecular weight M<sub>n</sub> of 500-30,000, containing 5-200 ppm of 1,3-dibromo-5,5-dialkyl-substituted hydantoin catalyst wherein the alkyl substituents contain a total of 2-21 carbon atoms; adding an unsaturated aliphatic dicarboxylic acid anhydride to said reaction mixture containing said molten olefin oligomer over a reaction period during which said olefin oligomer and said unsaturated aliphatic dicarboxylic acid anhydride react to form product alkenyl-substituted aliphatic dicarboxylic acid anhydride; controlling the rate of addition of said unsaturated aliphatic dicarboxylic acid anhydride whereby unreacted unsaturated aliphatic dicarboxylic acid anhydride in said reaction mixture is present in amount less than about its maximum solubility in said reaction mixture at the conditions of reaction and the reaction mixture is maintained as a



substantially homogeneous reaction mixture of one phase; and recovering product alkenyl-substituted aliphatic dicarboxylic acid anhydride containing decreased quantities of unsaturated aliphatic dicarboxylic acid anhydride decomposition products.

4,414,398

# DEHYDRATION OF MALEIC ACID TO FORM MALEIC ANHYDRIDE

Roland Kotwica, Pont-Sainte-Maxence, France, assignor to Societe Chimiques des Charbonnages, Paris le Defense, France

Filed Jun. 11, 1981, Ser. No. 272,819

Claims priority, application France, Jun. 13, 1980, 80 13117

Int. Cl.<sup>3</sup> C07D 307/60

U.S. Cl. 549—262

8 Claims

1. In a continuous process for the dehydration of maleic acid to form maleic anhydride, comprising a first stage of concentrating an aqueous solution of maleic acid, and a second stage of dehydrating the concentrated maleic acid into maleic anhydride, each of the two stages being effected by evaporation as a thin film, the improvement wherein the evaporation in both of said stages is conducted as a thin film undisturbed by mechanical agitation in at least one static tubular evaporator having a plurality of tubes, said tubular evaporator having an upper and lower end wherein the liquid is distributed on the inner surface of the tubes of the said upper end of at least one static tubular evaporator and wherein both liquid and evaporated vapor flow downwardly in the same direction and are both withdrawn from said lower end, and wherein the stage of concentration of the maleic acid solution is conducted at a temperature of between 120° and 140° C. and a pressure of between 200 and 500 mm of mercury and with a residence time of between 1 and 60 seconds to obtain a maleic acid concentration of between 85 and 95% by weight; and where the stage of dehydration of the concentrated maleic acid is conducted at a temperature of between 140° and 160° C. at a pressure of between 150 and 250 mm of mercury and with a residence time of between 1 and 60 seconds.

4,414,399

# 5/6 CARBOXYPHTHALIDES

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

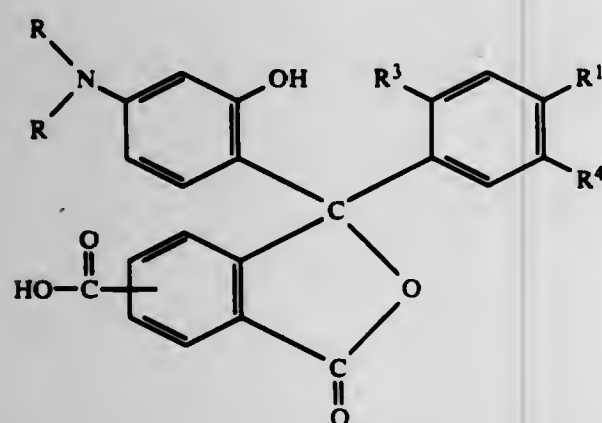
Division of Ser. No. 281,027, Jul. 6, 1981, which is a continuation-in-part of Ser. No. 135,855, Mar. 31, 1980, Pat. No. 4,298,215, which is a continuation-in-part of Ser. No. 39,017, May 14, 1979, Pat. No. 4,274,660. This application Apr. 15, 1983, Ser. No. 485,313

Int. Cl.<sup>3</sup> C07D 307/88

U.S. Cl. 549—309

7 Claims

1. A 3-[2-hydroxy-4-(R<sup>2</sup>)aminophenyl]-3-(2-R<sup>3</sup>-4-R<sup>1</sup>-5-anilinophenyl)-5/6-carboxyphthalide of the formula



wherein:

R represents a non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl;  
R<sup>1</sup> represents hydrogen or a non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl;

R<sup>3</sup> represents a non-tertiary C<sub>1</sub> to C<sub>4</sub> alkoxy;R<sup>4</sup> represents -N(R<sup>5</sup>)(R<sup>6</sup>) in which

R<sup>5</sup> represents hydrogen, non-tertiary C<sub>1</sub> to C<sub>18</sub> alkyl, benzyl or benzyl substituted by halo, nitro, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl or non-tertiary C<sub>1</sub> to C<sub>4</sub> alkoxy, and

R<sup>6</sup> represents hydrogen, phenyl, non-tertiary C<sub>1</sub> to C<sub>18</sub> alkyl, benzyl, benzyl substituted by halo, nitro, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl or non-tertiary C<sub>1</sub> to C<sub>4</sub> alkoxy or lower alkanoyl.

4,414,400

# PROCESS FOR THE PRODUCTION OF TETRONIC ACID

Raimund Miller, Hackensack, N.J., and Leander Tenud, Visp, Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Jun. 14, 1982, Ser. No. 388,432

Claims priority, application Switzerland, Jun. 17, 1981, 3982/81

Int. Cl.<sup>3</sup> C07D 307/60

U.S. Cl. 549—313

13 Claims

1. Process for the production of tetronic acid converting a 4-haloacetoacetic alkyl ester into the corresponding 4-tertiary-butoxyacetoacetic alkyl ester and converting the latter ester by cyclizing ether cleavage into tetronic acid.

4,414,401

# PROCESS FOR SEPARATING AND RECOVERING METAL CATALYSTS

Willi Wintermeyer, Seeheim-Jugenheim; Rolf Wittmann, Mühlthal, and Jürgen Butzke, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,381

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040631

Int. Cl.<sup>3</sup> C07D 407/00, 317/00

U.S. Cl. 549—370

9 Claims

1. In a process for producing diacetone ketogulonic acid, wherein diacetone sorbose is oxidized in aqueous alkaline solution in the presence of a suspended nickel hydroxide catalyst, and the gelatinous catalyst is separated from diacetone ketogulonic acid and separately recovered, the improvement comprising separating the gelatinous nickel hydroxide catalyst by a process comprising circulating the aqueous reaction mixture in contact with the surface of a microfiltration membrane at a flow rate such that its Reynolds number is at least about 1000, the pressure drop across the membrane being about 0.5–100 bar; periodically reversing the pressure drop across the membrane for a time interval sufficient to flush occluded catalyst out of the pores of the membrane by the brief reverse flow of permeate; and separately recovering a permeate containing diacetone ketogulonic acid, and a retentate of concentrated, substantially fully active nickel hydroxide catalyst which is uncontaminated by filter aids and suitable for recycling directly to the oxidation without regeneration.

4,414,402

[2S-(2β,2S\*,3β)]-3-AMINOTETRAHYDRO-5-METHOXY-α-METHYL-2-FURANMETHANOL, AN INTERMEDIATE IN THE CHIRAL SYNTHESIS OF AMINO SUGARS

Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 326,731, Dec. 2, 1981, Pat. No. 4,376,207, which is a division of Ser. No. 179,126, Aug. 18, 1980, Pat. No. 4,324,726, which is a division of Ser. No. 60,261, Jul. 25, 1979, Pat. No. 4,252,964. This application Sep. 27, 1982, Ser. No. 423,924

Int. Cl.<sup>3</sup> C07D 307/12

U.S. Cl. 549—475

1 Claim

1. The compound [2S-(2β,2S\*,3β)]-3-aminotetrahydro-5-methoxy-α-methyl-2-furanmethanol.

4,414,403

# BRANCHED POLYCARBOSILANES AND THEIR USE IN THE PRODUCTION OF SILICON CARBIDE

Curtis L. Schilling, Jr., Croton-On-Hudson, N.Y.; Thomas C. Williams, Ridgefield, Conn., and John P. Wesson, Croton-On-Hudson, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

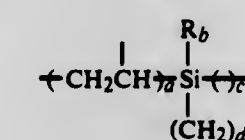
Continuation-in-part of Ser. No. 272,900, Jun. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 209,151, Nov. 21, 1980, abandoned. This application Mar. 23, 1982, Ser. No. 361,106

Int. Cl.<sup>3</sup> C07F 7/08

U.S. Cl. 556—430

20 Claims

1. A branched polycarbosilane comprising more than one unit of the formula



wherein R is lower alkyl, a is 0 or 1, b is 0–3, c is 0–4, d is 0–4, and a+b+c+d totals 4, with the provisos that, in different units, a, b, c, d, and R may differ, but that, in at least one unit, a+d must total 1 or more and, in at least 1 unit, a+c+d must total 3 or more.

4,414,404

# PROCESS FOR PRODUCING N-ACYL-D,L-PHENYLALANINE ESTER

Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 11, 1982, Ser. No. 357,232

Int. Cl.<sup>3</sup> C07C 101/08

U.S. Cl. 560—41

13 Claims

1. A process for preparing a racemic mixture of N-acyl-D,L-phenylalanine ester by reacting the azlactone of N-acyl-acetaminocinnamic acid with hydrogen at a hydrogen pressure of at least about 100 psig at a temperature within the range of from about 50°–200° C. in the presence of a nickel hydrogenation catalyst, a lower alkanol and an alkali metal or an alkaline earth metal alkoxide.

4,414,405

# PROCESS FOR PREPARING ESTERS OF 2-(6-METHOXY-2-NAPHTYL)-PROPIONIC ACID VIA REARRANGEMENT OF NEW KETALS OF 2-HALO-1-(6-METHOXY-2-NAPHTYL)-PROPAN-1-ONE AND NEW ESTERS OF 2-(5-BROMO-6-METHOXY-2-NAPHTYL)-PROPIONIC ACID THUS PREPARED

Claudio Giordano, Monza; Aldo Belli, Novara; Fulvio Uggeri, Codogno, and Giovanni Villa, Monticello Brianza, all of Italy, assignors to Blaschm S.p.A., Milan, Italy

Filed Feb. 20, 1981, Ser. No. 236,513

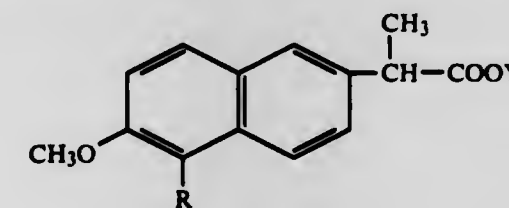
Claims priority, application Italy, Feb. 26, 1980, 20187 A/80

Int. Cl.<sup>3</sup> C07C 69/76

U.S. Cl. 560—56

1 Claim

1. Process for preparing a compound having the formula:

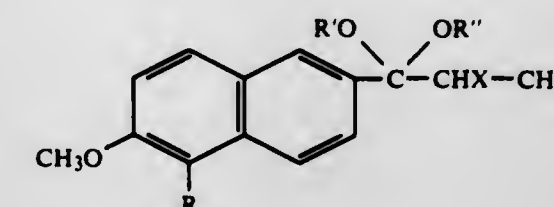


wherein

R is selected from the group consisting of a hydrogen and a bromine atom; and

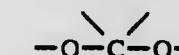
Y is selected from the group consisting of an alkyl radical

having from 1 to 6 carbon atoms, a haloalkyl radical having from 2 to 6 carbon atoms, and a benzyl radical; which comprises the rearrangement of a compound having the formula:



wherein

R has the above mentioned meaning;  
R' is selected from the group consisting of an alkyl radical having from 1 to 6 carbon atoms and a benzyl radical;  
R'' is selected from the group consisting of an alkyl radical having from 1 to 6 carbon atoms and a benzyl radical; or R' and R'', together, are an alkylene radical having from 2–6 carbon atoms which, together with the



group, forms a heterocyclic ring; and  
X is a halogen atom  
in the presence of a catalytic amount of a Lewis acid.

4,414,406

# CLASS OF FRIEDEL-CRAFTS CATALYSTS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 191,855, Sep. 29, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,220

Int. Cl.<sup>3</sup> C07C 69/76

U.S. Cl. 560—109

14 Claims

1. A process for the production of polybenzyls by aralkylation of aromatic hydrocarbons which comprises contacting the same or different aromatic halides in the presence of a molybdenum contacting catalyst selected from the group consisting of MoS<sub>2</sub>, MoSi<sub>2</sub>, MoTe<sub>2</sub>, and MoSe<sub>2</sub>, wherein the reaction is conducted at a temperature of about 60° to 250° C. and the catalyst concentration is in the range of about 0.01 to about 15% weight of reactants.

4,414,407

# FLUORO-PROSTAGLANDINS AND PROCESS FOR THEIR PREPARATION

Renato Pellegata, and Carmelo Gandolfi, both of Milan, Italy, assignors to Farmitalia Carlo Erba, Milano, Italy

Continuation of Ser. No. 163,164, Jun. 26, 1980, abandoned, which is a continuation of Ser. No. 92,854, Nov. 9, 1979, abandoned, which is a division of Ser. No. 944,614, Sep. 21, 1978, abandoned, which is a continuation of Ser. No. 779,632, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 667,261, Mar. 15, 1976, abandoned. This application Dec. 7, 1981, Ser. No. 328,245

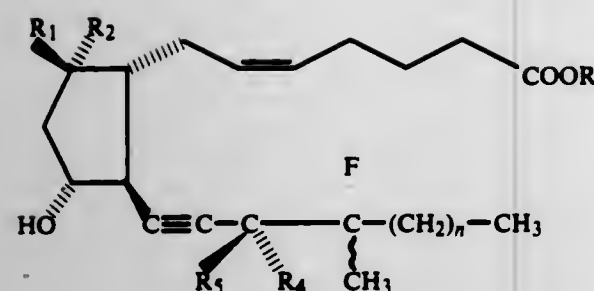
Int. Cl.<sup>3</sup> C07C 177/00

U.S. Cl. 424—305

8 Claims

1. A 16-fluoro prostaglandin analog of the formula:





wherein R is hydrogen, a C<sub>1</sub>-C<sub>12</sub> alkyl group or a cation of a pharmaceutically acceptable base; one of R<sub>1</sub> and R<sub>2</sub> is hydrogen and the other is hydroxy or an alkanoyloxy group containing up to 6 carbon atoms, a benzoyloxy or a p-phenylbenzoyloxy group, or R<sub>1</sub> and R<sub>2</sub> taken together from an oxo group; one of R<sub>4</sub> and R<sub>5</sub> is hydroxy and the other is hydrogen; and n is zero or an integer of 1 to 6.

4,414,408

## PHENOLIC ANTIOXIDANTS

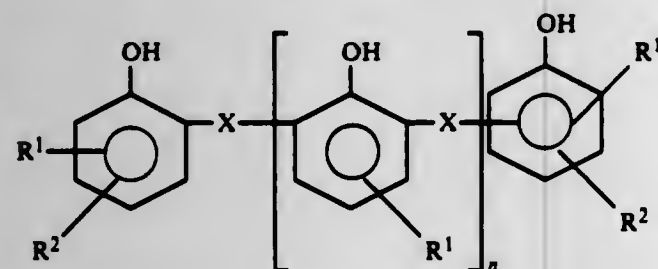
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio  
Continuation of Ser. No. 192,583, Sep. 30, 1980, abandoned, which is a continuation of Ser. No. 24,752, Mar. 28, 1979, abandoned, which is a continuation of Ser. No. 525,440, Nov. 20, 1974, abandoned. This application Feb. 16, 1982, Ser. No. 349,358

Int. Cl.<sup>3</sup> C07C 69/604

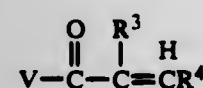
U.S. Cl. 560-144

7 Claims

1. Compounds comprising the reaction product of a polyphenolic compound having the formula

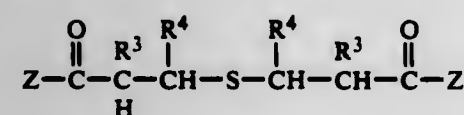


with an ester forming compound of the general formula

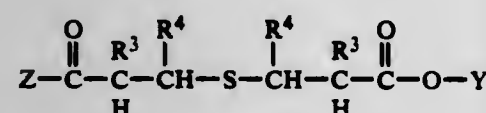


(B)

which are then joined through a sulfur atom to form compounds having a general formula selected from the group consisting of



and



wherein Z is a phenoxy radical derived from a polyphenolic compound having structural formula (A) and wherein R<sup>1</sup> and R<sup>2</sup> are the same or different radicals selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 16 carbon atoms, cycloalkyl radicals containing from 5 to 8 carbon atoms, aralkyl radicals containing from 7 to 12 carbon atoms and unsubstituted aryl radicals containing from 6 to 12 carbon atoms, X is the same or different radical selected from

the group consisting of (1) cyclic dienes with non-adjacent carbon to carbon double bonds within the ring structure having from 5 to 20 carbon atoms from which the divalent species are prepared and (2) divalent species selected from the group consisting of —S—,



—O—, —CH<sub>2</sub>— and —S—S— and wherein n is selected from the group consisting of 0 and integers from 1 to 5 and wherein R<sup>3</sup> is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 2 carbon atoms, R<sup>4</sup> is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aralkyl radicals having from 7 to 9 carbon atoms, substituted or unsubstituted aryl radicals having from 6 to 8 carbon atoms and wherein V is selected from the group consisting of chlorine, iodine and bromine.

4,414,409

## PALLADIUM SULFONATE CATALYST SYSTEMS FOR CARBONYLATION OF OLEFINS

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 21, 1981, Ser. No. 333,178

Int. Cl.<sup>3</sup> C07C 51/14, 67/38

U.S. Cl. 560-233

14 Claims

1. In an improved catalytic carbonylation process for preparing acids and esters by reacting an olefinically unsaturated compound, carbon monoxide and a hydroxylic compound, at about 50° to about 150° C., in the presence of a catalyst comprising an organic phosphine liganded palladium compound and an acid, wherein the improvement comprises using a perfluorosulfonic acid as the acid.

4,414,410

## PROCESS FOR PREPARING ALKYL ESTERS BY HOMOLOGATION OF THE NEXT LOWER ALKYL ESTER

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 13, 1982, Ser. No. 339,232

Int. Cl.<sup>3</sup> C07C 67/36, 69/003, 69/14

U.S. Cl. 560-265

24 Claims

1. A process for preparing a higher carbon number alkyl ester of an unsubstituted aliphatic carboxylic acid or an aromatic carboxylic acid selected from benzoic acid, naphthoic acid, toluic acid and phenylacetic acid, or an unsubstituted alicyclic monocarboxylic acid by homologation of the corresponding next lower carbon number alkyl ester which comprises contacting the lower alkyl ester with carbon monoxide and hydrogen in the presence of catalytic amounts of an iodide- or iodine-free catalyst composition comprising a ruthenium-containing compound, a cobalt-containing compound and a quaternary phosphonium salt or base, and heating the resulting mixture to a temperature above 150° C. and increasing the pressure to above 500 psi for a sufficient time to produce the desired alkyl ester.

4,414,411

## PROCESS FOR PREPARING UNSATURATED ACIDS WITH MO, V, TI-CONTAINING CATALYSTS

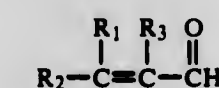
Harry J. Decker, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 408,416, Oct. 23, 1973, abandoned. This application May 5, 1980, Ser. No. 146,655  
Int. Cl.<sup>3</sup> C07C 51/25, 57/055

U.S. Cl. 562-534

20 Claims

1. A process for the production of unsaturated aliphatic carboxylic acid by vapor phase catalytic oxidation of the corresponding unsaturated aliphatic aldehyde with molecular oxygen in the presence of steam, said aldehyde having the structure



wherein R<sub>1</sub> is H or a C<sub>1</sub> to C<sub>6</sub> alkyl radical and R<sub>2</sub> and R<sub>3</sub> are the same or different and are H or CH<sub>3</sub>, which comprises contacting the reaction mixture with a catalytically effective amount of a calcined oxidation catalyst consisting essentially of the elements Mo, V, Ti, and X in the ratio



wherein X is selected from the group consisting of Fe, Cu, Co, Cr, and/or Mn

a is 12,

b is 1 to 14

c is 0.1 to 12, and

d is 0.01 to 1.0.

4,414,413

## 1,2-DI[N,N-BIS(2-FLUORO-2,2-DINITROETHYL)CARBAMYL]HYDROZINE

Michael E. Sitzmann, Adelphi, and William H. Gilligan, Ft. Washington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 228,032, Jan. 23, 1981. This application Dec. 21, 1981, Ser. No. 332,797

Int. Cl.<sup>3</sup> C07C 133/02

U.S. Cl. 564-35

1 Claim

1. 1,2-di[N,N-bis(2-fluoro-2,2-dinitroethyl)carbamyl]hydrazine.

4,414,414

## 4,4'-DITHIODIANIL

Thaddeus J. Novak, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

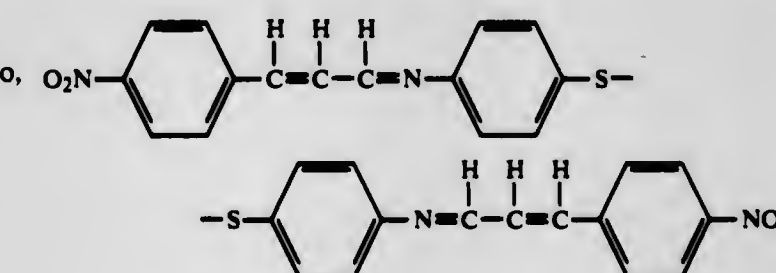
Filed Sep. 14, 1981, Ser. No. 301,507

Int. Cl.<sup>3</sup> C07C 149/42

U.S. Cl. 564-271

1 Claim

1. The 4,4'-dithiodianil compound of the formula:



4,414,415

## PROCESS FOR THE MANUFACTURE OF 2,6-DICHLORO-4-NITROANILINE, AND THE COMPOUND OBTAINED BY THIS PROCESS

Michel Aubouy, Paris; Pierre Hamel, Cleon, and Marc Molin, Neuilly-sur-Marne, all of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed May 13, 1981, Ser. No. 263,131

Claims priority, application France, Jun. 6, 1980, 80 13021

Int. Cl.<sup>3</sup> C07C 85/24

U.S. Cl. 564-412

5 Claims

1. A process for the manufacture of 2,6-dichloro-4-nitroaniline by the chlorination, with chlorine gas, of para-nitroaniline in an aqueous solution of hydrochloric acid, at the boil, wherein the reaction is carried out at a temperature of 95° to 110° C., the concentration of hydrochloric acid in the medium being between 4 and 7.5 N.

4,414,416

## CERTAIN DIACETYL-AMINO-PHENOLIC DERIVATIVES

Richard A. Raphael, Stephen C. Eyley, and Stephen C. W. Colman, all of Loughborough, England, assignors to Fisons Limited, London, England

Division of Ser. No. 212,331, Dec. 2, 1980, Pat. No. 4,328,341. This application Jan. 20, 1982, Ser. No. 340,974

Claims priority, application United Kingdom, Dec. 7, 1979, 7942248

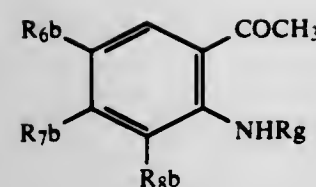
Int. Cl.<sup>3</sup> C07C 87/50; C07D 311/24

U.S. Cl. 564-443

3 Claims

1. A compound having the formula





in which

R<sub>6b</sub> and R<sub>7b</sub> together form a chain —COCH=C—(COOH)—O—, or a pharmaceutically acceptable salt or a lower alkyl ester thereof, or form the pair of groups —COCH<sub>3</sub> and —OM, respectively,

R<sub>g</sub> and R<sub>8b</sub>, which may be the same or different, each represent hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups each containing up to eight carbon atoms, and M is hydrogen or an alkali metal, provided that when R<sub>g</sub> is hydrogen, R<sub>6b</sub> is acetyl and R<sub>8b</sub> is hydrogen, then R<sub>7b</sub> is other than —OH.

4,414,417

#### PROCESS FOR THE CATALYTIC REDUCTION OF UNSATURATED KETONES

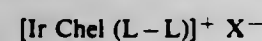
Giovanni Mestroni; Grazia Zassinovich, and Annamaria Camus, all of Trieste, Italy, assignors to Montedison, S.p.A., Milan, Italy

Continuation of Ser. No. 226,381, Jan. 19, 1981, abandoned. This application Dec. 30, 1981, Ser. No. 335,744

Claims priority, application Italy, Jan. 23, 1980, 19391 A/80 Int. Cl.<sup>3</sup> C07C 45/62

U.S. Cl. 568—315 12 Claims

1. A process for the reduction by the transfer of hydrogen from alcohols to linear, homo- and hetero-cyclic  $\alpha,\beta$ -unsaturated ketones, said reduction being catalyzed by iridium complexes, characterized in that an aliphatic, alicyclic primary or secondary alcohol is reacted with a ketone selected from the group consisting of benzylideneacetone, dibenzylideneacetone, chalcone, carvone and 2-methylcyclohexene-1-one in the presence of a complex catalyst of iridium having the formula:



wherein:

Chel is a chelating bidentate nitrogenous compound selected from the group consisting of 2,2'-dipyridyl; 4,4'-dimethyl-2,2'-dipyridyl; 1,10-phenantroline; 5,6-dimethyl-1,10-phenantroline; 4,7-dimethyl-1, 10-phenantroline and 3,4,7,8-tetramethyl-1, 10-phenantroline;

L-L is a molecule of an unsubstituted non-conjugated acyclic or cyclic diolefin, or two molecules of an unsubstituted acyclic or cyclic mono-olefin;

X represents an anion selected from the group consisting of Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, PF<sub>6</sub><sup>-</sup>, BF<sub>4</sub><sup>-</sup>, ClO<sub>4</sub><sup>-</sup> and B(C<sub>6</sub>H<sub>5</sub>)<sub>4</sub><sup>-</sup>;

and in the presence of small amounts of a mineral alkali at a temperature ranging from about 20° C. to the boiling temperature of the reaction mass, in an inert atmosphere.

4,414,418

#### PROCESS FOR THE PRODUCTION OF DIMEDONE

Pavel Lecky, Naters, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed May 19, 1982, Ser. No. 379,718

Claims priority, application Switzerland, May 27, 1981, 3473/81

Int. Cl.<sup>3</sup> C07C 45/48

U.S. Cl. 568—346 16 Claims

1. Process for the production of dimedone from isophorone, comprising converting isophorone in a solvent present in an amount sufficient to act as a solvent with ozone present in an amount sufficient to effect the isophorone-conversion into an ozone-addition product, said solvent being a hydrocarbon a halogenated hydrocarbon, an ester solvent or an alcohol having 1 to 6 carbon atoms, heating the ozone-addition product in

the presence of an acid which is present in an effective amount to a temperature of 20° to 150° C., adding an alcohol at the latest after the formation of the ozone-addition product when the solvent is a non-alcohol solvent whereby the intermediate product 3,3-dimethyl-5-oxo-hexanoic acid ester forms, the alcohol being present in an amount sufficient to form said ester, the alcohol corresponding to the ester radical, isolating the 3,3-dimethyl-5-oxo-hexonic acid ester, and converting said ester by treatment with an alkali alcoholate present in an amount sufficient to effect the ester-conversion in an anhydrous milieu into dimedone.

4,414,419

#### STABILIZATION OF ALDEHYDES

Jürgen Weber, Oberhausen; Volker Falk, Voerde, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,781

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905267; May 3, 1979, 2917789

Int. Cl.<sup>3</sup> C07C 47/058, 47/02

U.S. Cl. 568—421 15 Claims

1. A process for stabilizing a saturated aliphatic aldehyde having 3 to 14 carbon atoms against polymerization and autocondensation comprising adding an effective amount of triethanolamine or dimethylethanolamine to said aldehyde.

4,414,420

#### ALDEHYDE-ETHERS

Norman Harris, Stockton-on-Tees; Alan J. Dennis, Middlesbrough, and George E. Harrison, Billericay, all of England, assignors to Davy McKee (Oil & Chemicals) Limited, United Kingdom

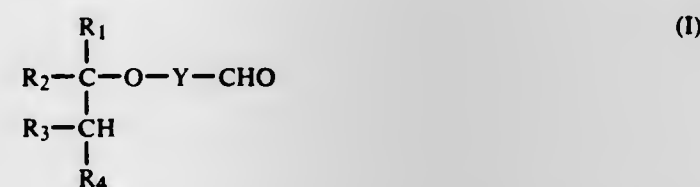
Division of Ser. No. 139,591, Apr. 11, 1980, Pat. No. 4,383,125. This application Apr. 7, 1982, Ser. No. 366,166

Claims priority, application United Kingdom, Apr. 11, 1979, 7912849

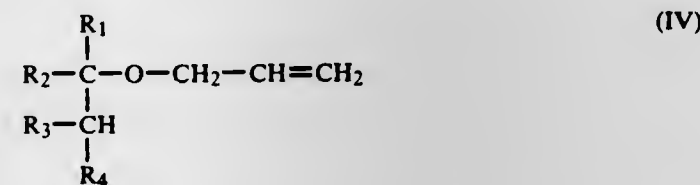
Int. Cl.<sup>3</sup> C07C 45/50

U.S. Cl. 568—454 13 Claims

1. A process for the preparation of an aldehyde-ether of the general formula:



wherein R<sub>1</sub> and R<sub>2</sub> each, independently of the other, represent a C<sub>1</sub> to C<sub>4</sub> alkyl radical, and R<sub>3</sub> and R<sub>4</sub> each, independently of the other, represent a hydrogen atom or a C<sub>1</sub> to C<sub>3</sub> alkyl radical, or wherein R<sub>1</sub> represents a C<sub>1</sub> to C<sub>4</sub> alkyl radical, R<sub>2</sub> and R<sub>3</sub> together with the carbon atoms to which they are attached form a 5-membered or 6-membered cycloaliphatic ring, and R<sub>4</sub> represents a hydrogen atom or a C<sub>1</sub> to C<sub>3</sub> alkyl radical, and wherein Y represents —CH<sub>2</sub>—CH<sub>2</sub>—CH<sub>2</sub>— or —CH<sub>2</sub>—CH(CH<sub>3</sub>)—, which comprises contacting a compound of the general formula:



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are as defined above, with hydrogen and carbon monoxide under hydroformylation conditions and in the presence of a catalytic amount of a hydroformylation catalyst.

4,414,421

#### PROCESS FOR THE PREPARATION OF GLYCOL ALDEHYDE

Elt Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 26, 1982, Ser. No. 382,029

Claims priority, application United Kingdom, Aug. 3, 1981, 8123691

Int. Cl.<sup>3</sup> C07C 45/49, 45/75

U.S. Cl. 568—462 7 Claims

1. In a process for the preparation of glycol aldehyde, by reacting formaldehyde with hydrogen and carbon monoxide at a temperature in the range from about 30° to 200° C. and pressure in the range from about 5 to about 200 bars in the presence of a rhodium and/or a cobalt-containing catalyst, and water the improvement which comprises that sulphur dioxide, is present during said reaction.

4,414,422

#### PURIFICATION OF 4,4-DIHYDROXYBIPHENYL

Mary L. Ash; Timothy R. Diephouse, and Robert M. Strom, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1982, Ser. No. 376,867

Int. Cl.<sup>3</sup> C07C 37/70

U.S. Cl. 568—724 8 Claims

1. A process for purifying crude 4,4'-dihydroxybiphenyl comprising contacting without substantially dissolving the crude 4,4'-dihydroxybiphenyl in a system comprising water and a water-miscible organic compound selected from the group consisting of acetone, and C<sub>1-6</sub> alkanols and diols at an

elevated temperature and for a time sufficient to remove substantial quantities of phenyl-substituted phenols and sulfur-containing impurities and thereafter recovering the purified 4,4'-dihydroxybiphenyl.

4,414,423

#### MULTISTEP OLIGOMERIZATION PROCESS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,679

Int. Cl.<sup>3</sup> C07C 2/02

U.S. Cl. 585—517 10 Claims

1. A process for preparing high boiling hydrocarbons from normally gaseous olefins, comprising:

(a) contacting a feed comprising normally gaseous olefins with a first catalyst comprising an intermediate pore size siliceous crystalline molecular sieve substantially free of hydrogen transfer activity selected from silicalite, an organosilicate disclosed in RE 29,948 and CZM, to produce a first effluent comprising normally liquid olefins; and

(b) contacting at least part of the normally liquid olefins contained in said first effluent with a second catalyst comprising an intermediate pore size siliceous crystalline molecular sieve substantially free of hydrogen transfer activity under oligomerization conditions to produce a second effluent wherein said second effluent comprises oligomers of said normally liquid olefins and wherein at least some of said oligomers are liquids under said oligomerization conditions.



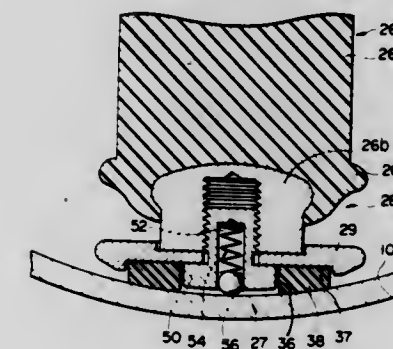
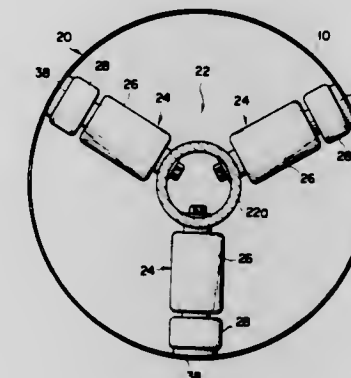
# ELECTRICAL

**4,414,424**  
**GAS-INSULATED BUS BAR**  
 Tetsuhiko Mizoguchi, and Akio Koyama, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 19, 1981, Ser. No. 312,726  
 Claims priority, application Japan, Oct. 20, 1980, 55-149299[U]

Int. Cl.<sup>3</sup> H02G 5/06; H01B 9/04  
 U.S. Cl. 174—28

3 Claims



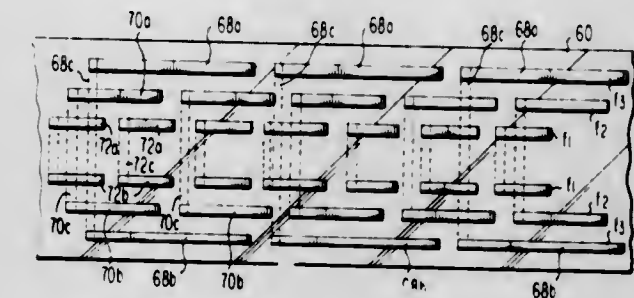
1. A gas-insulated bus bar, which comprises:
  - a case filled with highly pressurized electrically insulating gas;
  - bus conductors supported in the case substantially coaxially therewith; and
  - a plurality of support arms fitted to the bus conductors to let them extend substantially coaxially with the case, wherein each support arm comprises:
    - a proximal support member which is provided with an electrically insulating member, one end of which is fitted to the bus conductor, and a low voltage shield fitted to the other end of said electrically insulating member; and
    - a distal support member which is provided with an electric connection member which is electrically connected to the low voltage shield and elastically and slidably contacts the inner peripheral wall of the case, a metal member which contacts the end of the low voltage shield and is provided with a cavity open to the inner peripheral wall of the case, and a sliding member which is set between the cavity and the inner peripheral wall of the case to enclose the electric connection member and which is prepared from an elastic electrically insulating material and slidably contacts the inner peripheral wall of the case; and
- further wherein the electric connection member comprises:
  - a screw which is threadedly inserted into the lower voltage shield substantially toward the center of the case and is provided with a hole which is formed in substantially the same direction as that in which the thread is threadedly inserted and extends radially of the case;
  - elastic means held in the radially extending hole; and
  - a contact ball which is received in the radially extending hole and is made to project from said radially extending hole by the elastic means to be pressed against the inner peripheral wall of the case.

**4,414,425**  
**BROADBAND NON-CONTACTING RF SHIELDING GASKET**  
 Bruce F. Bogner, Mt. Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,355  
 Int. Cl.<sup>3</sup> H05K 9/00

U.S. Cl. 174—35 GC

12 Claims



1. An RF gasket for providing electrical shielding in the interface area between two conductive surfaces without direct electrical contact between the two surfaces, said gasket being effective to substantially reduce the flow of energy in a given frequency band, through said interface area, said gasket comprising:

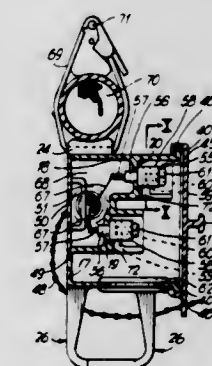
- a plurality of stub-pairs, each stub-pair comprising: a first elongated conductive stub-like member; a second elongated stub-like member; and means for electrically joining one end of said first stub-like member to one end of said second stub-like member;
- means for positioning said plurality of stub-pairs such that said first stub-like member in each pair is spaced and substantially parallel to one of said conductive surfaces and said second stub-like member is spaced and substantially parallel to the other of said conductive surfaces;
- said plurality of stub-pairs being dimensioned to fall into sub-groups, each stub-like member in each stub-pair of each sub-group forming an open circuit at the other end thereof and being dimensioned such that each open circuit is transformed into a low impedance in a sub-band of frequencies within said given band, each sub-group having a corresponding sub-band of frequencies, said low impedance paths effectively occurring between said one end of each stub-like member and the corresponding adjacent conductive surface;
- each stub-pair in a sub-group providing a low impedance path between said conductive surfaces in the corresponding sub-band of frequencies.

**4,414,426**  
**AERIAL CABLE TERMINAL**  
 Frederick W. Burtelson, Harvard, Ill., assignor to Northern Telecom Inc., Nashville, Tenn.

Filed Oct. 9, 1981, Ser. No. 310,398  
 Int. Cl.<sup>3</sup> H01R 9/00; H02G 15/10

U.S. Cl. 174—59

25 Claims



1. An aerial cable terminal, comprising:



a housing, the housing including top and bottom walls, end walls, and a dividing wall extending from said top wall to divide the interior of the housing into a back compartment and a front compartment;  
 apertures in said dividing wall and a conductor terminal positioned in each aperture, each conductor terminal having a rear portion extending into said back compartment and a front portion extending into said front compartment;  
 said rear portion of each conductor terminal adapted for connection of a stub cable conductor thereto;  
 said front portion of each conductor terminal having a hole therethrough, transverse to the longitudinal axis of the conductor terminal, for reception of a drop-wire conductor;  
 said conductor terminals arranged in pairs, the holes in said front portions of a pair inclined downwardly and inwardly towards each other;  
 shrouds extending forward from said dividing wall and surrounding each conductor terminal, and a channel in each shroud, the channel aligned with said hole in the related conductor terminal;  
 access means in one end wall for entry of a stub cable;  
 a back cover in the back of said housing for access to said back compartment and a removable front cover closing the front of said front compartment.

4,414,427

## CABLE ENTRY PORT MEANS FOR ELECTRICAL OUTLET BOX

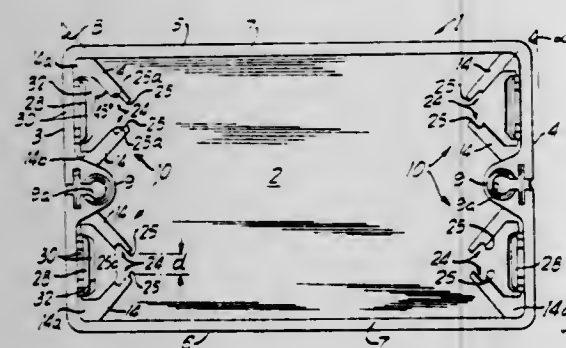
Thomas S. Slater, Port Washington, and Wade R. Bowden, Jr., Northport, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Division of Ser. No. 22,993, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 879,767, Feb. 21, 1978, Pat. No. 4,366,343. This application Apr. 27, 1981, Ser. No. 257,815. The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> H02G 3/08

U.S. Cl. 174—65 R

6 Claims



1. In an electrical outlet box having a wall structure providing front-to-rear wall means and a bottom wall interconnected therebetween, the front-to-rear wall means and bottom wall defining a chamber within the wall structure which opens through the front of the box, and wherein the improvement comprises cable entry port means on said wall structure for the passage of an electrical power cable into said box chamber, said cable entry port means including:

at least one aperture in a first portion of said wall structure, each said aperture being formed at the intersection of said front-to-rear wall means and said bottom wall and including:

a first generally rectangular opening extending upwardly into said front-to-rear wall means from said bottom wall, and

a second generally V-shaped opening converging inwardly into said bottom wall from the longitudinally extending side rims of said first rectangular openings, said generally V-shaped opening facing said front of said box;

closure panel means depending from the rim of said rectan-

gular opening portion of said aperture and extending angularly inwardly from the plane of said aperture, said closure panel means including a pair of opposed closure panel members converging angularly inwardly toward each other from said longitudinally extending side rims of said first rectangular portion of said aperture,

the convergent inner free ends of said converging pair of closure panel members extending generally perpendicular to said bottom wall and being separated from each other by a distance which is less than the narrowest dimension of said electrical power cable, and

the front facing converging edges of said closure panel members extending downwardly from said front-to-rear walls toward said convergent free ends at an acute angle;

said free end portions of said closure panel members adapted to deflect away from each other upon passage of said cable into said aperture and to thereafter resistingly bear against the installed cable; and

a third closure panel member extending inwardly from the inside surface of said front-to-rear wall means at an acute angle thereto and terminating closely adjacent to the front facing convergent edges of said converging closure panel members, said third closure panel member substantially closing said generally V-shaped opening formed between said opposed converging closure panel members facing said front of said box.

4,414,428

## EXPANDED METAL CONTAINING WIRES AND FILAMENTS

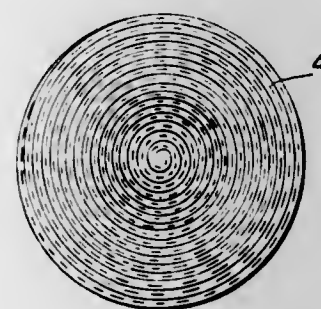
William K. McDonald, Salem, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Continuation-in-part of Ser. No. 42,893, May 29, 1979, Pat. No. 4,262,412. This application Jan. 30, 1981, Ser. No. 229,981

Int. Cl.<sup>3</sup> H01B 5/00

U.S. Cl. 174—126 S

20 Claims



1. An extruded metal wire having at least two layers coaxially laminated upon and to each other and wherein at least one layer is foraminous metal.

4,414,429

## END CAP ATTACHMENT TO LAMINATED INSULATOR CORE

Alexandre Kaczerginski, Bellerive sur Allier, and Michel Willem, Vichy, both of France, assignors to Societe Anonyme dite: Ceraver, Paris, France

Filed Jan. 27, 1982, Ser. No. 343,290

Claims priority, application France, Feb. 5, 1981, 81 02206

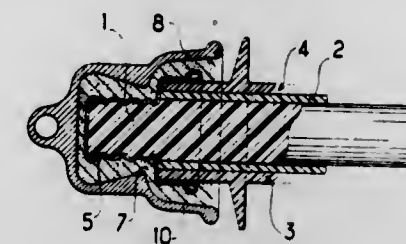
Int. Cl.<sup>3</sup> H01B 17/02, 17/38

U.S. Cl. 174—179

10 Claims

1. An insulator comprising a pair of fixing caps and an elongate core which includes a rod made of agglomerated fibers, one of said caps being fitted at each end of the core, and a protective covering of insulating material surrounding the rod between the caps, and each cap having a core-receiving recess supplied with embedding substance, wherein at least one end of the core has undercut fixing zones, and a ductile metal cup

is crimped directly onto said end, said cup having a rim which is sealed to said covering of insulating material, said cup itself



being embedded in the corresponding core-receiving cap recess by means of said embedding substance.

4,414,430

## DECODERS FOR FEEDING IRREGULAR LOUSPEAKER ARRAYS

Michael A. Gerzon, Oxford, England, assignor to National Research Development Corporation, London, England  
 PCT No. PCT/GB81/00018, § 371 Date Sep. 24, 1981, § 102(e)  
 Date Sep. 24, 1981, PCT Pub. No. WO81/02502, PCT Pub. Date Sep. 3, 1981

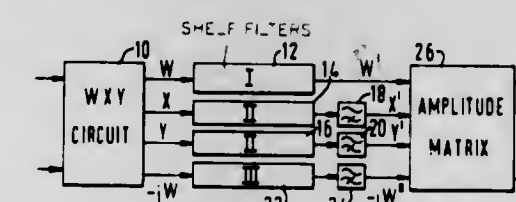
PCT Filed Feb. 12, 1981, Ser. No. 305,623

Claims priority, application United Kingdom, Feb. 23, 1980, 8006174

Int. Cl.<sup>3</sup> H04R 5/04

U.S. Cl. 381—22

24 Claims



1. A decoder for feeding an array of  $m$  (being three or more) pairs of diametrically opposite loudspeakers, the array being an irregular array, that is an array in which the loudspeakers are disposed in positions other than at the corners of a regular polygon or regular solid or a rectangle or rectangular cuboid, each loudspeaker being disposed substantially at an equal distance  $r$  from a common reference point, and the  $i$ th pair of loudspeakers having cartesian coordinates  $(x_i, y_i, z_i)$  and  $(-x_i, -y_i, -z_i)$  with respect to rectangular cartesian axes  $x, y$  and  $z$  at the reference point, said decoder comprising input means for receiving coded input signals representative of the desired acoustical pressure and velocity at the reference point and for outputting signals  $W, X, Y$  and, for a three-dimensional loudspeaker layout,  $Z$ , filter means connected to the input means for producing, from said signals  $W, X, Y, Z$ , a signal  $W'$  representative of the desired acoustical pressure at the reference point and independent of  $i$ , signals  $X', Y'$  and, where appropriate,  $Z'$  representative of the components of the desired acoustical velocity along the  $x, y$  and  $z$  axes and independent of  $i$ , and a signal  $jW''$  bearing a  $90^\circ$  phase relationship to  $W'$  for all encoded sound directions, and an amplitude matrix circuit connected to the filter means for producing, from the output signals of said filter means, signals  $S_i^+$  and  $S_i^-$  to be fed to the loudspeakers of each pair, the sum of which is the same for all pairs of loudspeakers, where

$$S_i^+ = W' + \alpha_i X' + \beta_i Y' + \gamma_i Z' - \delta_i W''$$

$$S_i^- = W' - \alpha_i X' - \beta_i Y' - \gamma_i Z' + \delta_i W''$$

where  $\alpha_i, \beta_i, \gamma_i$  and  $\delta_i$  are real gain coefficients such that  $\alpha_i, \beta_i$  and  $\gamma_i$  substantially satisfy the following matrix equation:

$$KM = \frac{k m r l}{\sqrt{2}}$$

where  $K$  is the  $m \times 3$  matrix:

$$\begin{pmatrix} x_1 & x_2 & \dots & x_m \\ y_1 & y_2 & \dots & y_m \\ z_1 & z_2 & \dots & z_m \end{pmatrix}$$

$M$  is the  $3 \times m$  matrix of coefficients:

$$\begin{pmatrix} \alpha_1 & \beta_1 & \gamma_1 \\ \alpha_2 & \beta_2 & \gamma_2 \\ \vdots & \vdots & \vdots \\ \alpha_m & \beta_m & \gamma_m \end{pmatrix}$$

$I$  is the identity matrix:

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \text{ for a three-dimensional loudspeaker layout}$$

or

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{pmatrix} \text{ for a two-dimensional, horizontal loudspeaker layout,}$$

and  $k$  is a positive real constant which may be frequency dependent.

4,414,431

## METHOD AND APPARATUS FOR DISPLAYING SPEECH INFORMATION

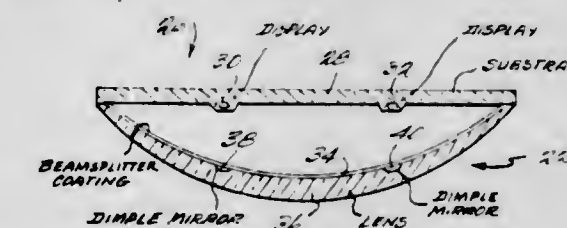
Michael L. McCartney, Durham, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.

Filed Oct. 17, 1980, Ser. No. 198,068

Int. Cl.<sup>3</sup> G10L 1/00; G02B 17/00

U.S. Cl. 381—48

11 Claims



1. A wearable display system for producing a virtual image for viewing by a person comprising:

a pair of spectacles adapted to be worn by the person and having at least one lens;

a transparent plate which supports and subtends said lens;

at least one lamp array mounted paraxially with the viewer's line of sight on said plate for producing one of a plurality of images each indicating a group of speech sounds and projecting said one image forward of the viewer; and

at least one light transmitting mirror mounted adjacent said lamp array on said lens for reflecting said one image back to the viewer.



4,414,432

**PSEUDO-FULL DUPLEX TELEVISION/TELEPHONE LOUDSPEAKER SYSTEM**

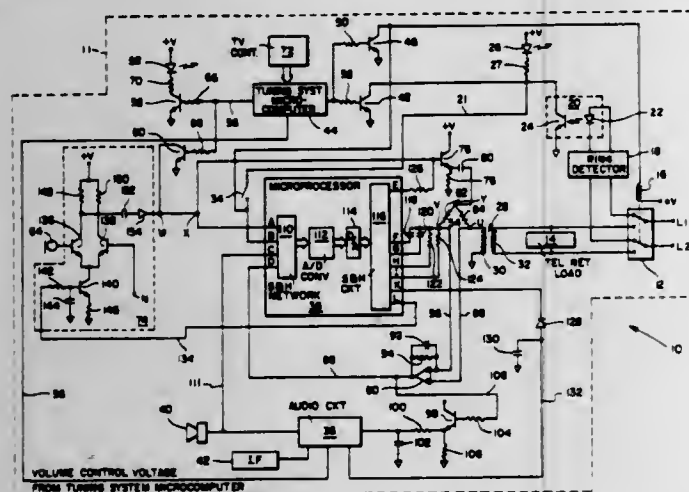
Peter C. Skerlos, Arlington Heights, and Thomas J. Zato, Palatine, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 21, 1981, Ser. No. 304,226

Int. Cl.<sup>3</sup> H04M 11/08

U.S. Cl. 179—2 TV

17 Claims



9. A pseudo-full duplex telephone system having a microphone and a loudspeaker, said telephone system comprising: differential coupling means for connection to a two-wire telephone line; line balance means connecting said microphone to said differential coupling means for providing an audio signal received by said microphone to said telephone line and connecting said differential coupling means to said loudspeaker for providing a received telephone signal to said loudspeaker; variable impedance means connected to said line balance means for varying the impedance thereof in accordance with the impedance of said telephone line; and signal processing means coupled to said variable impedance means and to said line balance means and responsive to an output signal provided by said line balance means to said loudspeaker during the transmission of an audio signal from said microphone to said telephone line for selectively coupling in circuit said variable impedance means to said line balance means in matching the impedance of said telephone system with that of said telephone line.

4,414,433

**MICROPHONE OUTPUT TRANSMISSION CIRCUIT**

Masso Horie, Tachikawa; Yusuke Sunada, Sumiyoshi, and Junta Inari, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

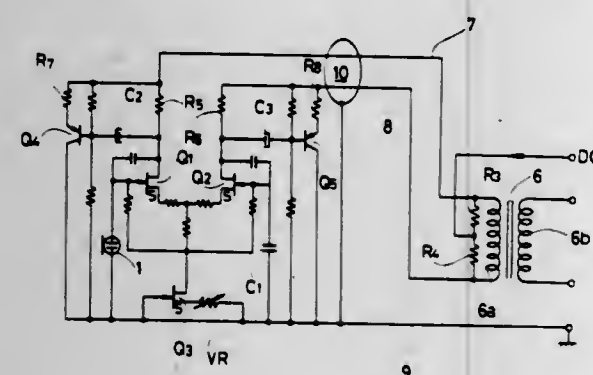
Filed Jun. 16, 1981, Ser. No. 274,261

Claims priority, application Japan, Jun. 20, 1980, 55-84271

Int. Cl.<sup>3</sup> H01M 1/60

U.S. Cl. 179—70

10 Claims



1. In combination with a capacitive microphone providing a microphone output; a microphone output transmission circuit

comprising a microphone cable including a pair of transmission lines and a ground line extending between transmission and reception ends of said cable, first coupling means connecting said microphone with said pair of transmission lines, at said transmission end, and being operative to apply said microphone output as a balanced signal to said pair of transmission lines, a source of DC power, received output means, and second coupling means connecting said pair of transmission lines, at said reception end, with said DC power source so as to impose substantially the same DC potential on said pair of transmission lines relative to said ground line, and with said received output means for providing a received output signal at the latter in response to said balanced signal on said transmission lines, at least one of said first and second coupling means including differential amplifier means powered by said DC power source and coupled in a transformerless connection between the respective end of said cable and said microphone or received output means, respectively.

4,414,434

**ELECTRONIC SUBSCRIBER LINE INTERFACE CIRCUIT HAVING MEANS TO EQUALIZE CURRENT THROUGH THE OUTPUT DIFFERENTIAL AMPLIFIER**

Gilbert M. M. Ferrieu, Bievres; Etienne J. R. Osmond, and Yves J. F. Hetet, both of Lannion, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

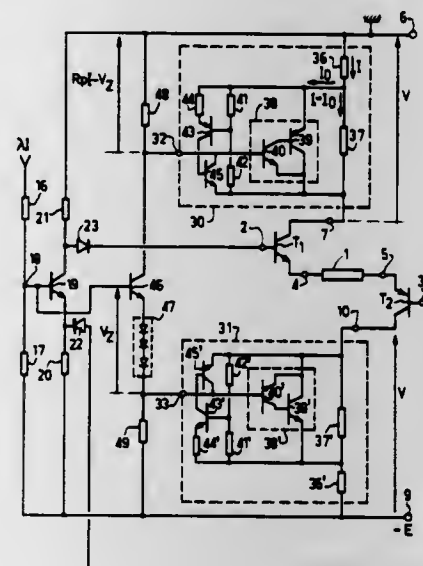
Filed Mar. 30, 1981, Ser. No. 249,283

Claims priority, application France, Apr. 18, 1980, 80 08770

Int. Cl.<sup>3</sup> H04M 19/00

U.S. Cl. 179—77

6 Claims



1. A subscriber's line interface circuit comprising: a pair of load impedance circuits, a d.c. voltage supply source, a pair of amplifiers, a first respective output terminal of each of said pair of amplifiers being connected one amplifier to one wire, the other amplifier to the other wire of two wires of said subscriber's line, a respective supply terminal of each of said pair of amplifiers being connected one amplifier to one load impedance circuit and the other amplifier to the other load impedance circuit of said pair of load impedance circuits, respective input terminals of said pair of amplifiers receiving by means of negative feedback respective voltages which are in phase and in anti-phase with a voltage at respective control terminals of said pair of impedance circuits through which a sum current flows which is equal to a weighted sum of currents which enter and leave the subscriber's line with substantially equal weighting coefficients and the supply terminals of said pair of amplifiers each being connected to said d.c. voltage supply source by means of said respective load impedance circuits, said interface circuit further comprises means for forming

4,414,436

**NARROW-FREQUENCY BAND ACOUSTIC TRANSDUCER**

Iwao Sashida, Saltmaken, and Tautomu Haga, Yamagata, both of Japan, assignors to Pioneer Speaker Components, Inc., Arlington Heights, Ill.

Filed Apr. 19, 1982, Ser. No. 369,589

Int. Cl.<sup>3</sup> H04R 17/00

U.S. Cl. 179—110 A

16 Claims



1. An acoustical transducer for conversion of energy between mechanical and electrical stimuli, to provide for the high conversion efficiency of a narrow-frequency band, which transducer comprises in combination:

- a conical-shaped, radiating, resonating diaphragm having a truncated area characterized by a depressed central area, to present a thin, circumferential, edge area about the truncated area of the diaphragm;
- a convex-shaped cap element extending over the truncated area and having an outer peripheral edge acoustically coupled generally about the circumferential edge area of the diaphragm;
- a piezoelectric element having a generally flat major surface and adapted to be driven in a planar mode by electrical energy;
- a thin vibration board having a natural resonance frequency within the narrow-frequency band and having a general diameter greater than the diameter of the truncated area of the diaphragm and less than the outer diameter of the diaphragm;
- adhesive means to secure the circumferential edge area of the diaphragm to the one side of the vibration board and generally centrally positioned thereof;
- means to secure the piezoelectric element to the other side of the vibration board and generally centrally of the vibration board and of the diaphragm; and
- electrical communication means to the piezoelectric element,

whereby, on the electrical energizing of the piezoelectric element, the vibration board, acoustically coupled to the circumferential edge area of the diaphragm, and the diaphragm, circumferentially coupled to the cap element, provide for the high decibel output of a narrow-frequency band about the natural resonance frequency of the vibration board.

4,414,437

**MOVING COIL DYNAMIC TRANSDUCER**

Herbert Trauernicht, Wennigsen, and Karl-Heinz Thiele, Peine-Stedderdorf, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 2, 1980, Ser. No. 212,280

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949115

Int. Cl.<sup>3</sup> H04R 9/04

U.S. Cl. 179—115.5 VC

7 Claims

1. In an electromagnetic transducer including means producing a magnetic field and presenting an air gap traversed by the field, a mass of magnetic liquid extending across the air gap, and a moving coil mounted on a moving coil carrier supported for movement through the air gap, the improvement wherein said carrier is provided with at least one passage located to

4,414,435

**INTERFACE CIRCUIT WITH FLUX CANCELLING TRANSFORMER CIRCUIT**

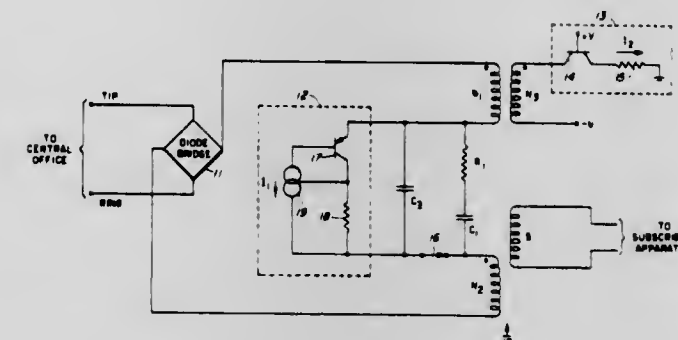
Bryan R. Parlor, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 22, 1982, Ser. No. 370,986

Int. Cl.<sup>3</sup> H04M 1/00

U.S. Cl. 179—81 R

8 Claims



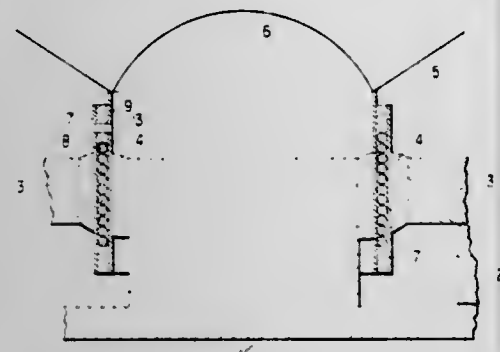
1. A circuit for interfacing a subscriber loop to subscriber terminal apparatus, comprising, a transformer having a split primary winding for connection to said loop, a secondary winding for connection to said apparatus and a balance winding having a polarization opposite to that of the primary winding, a constant current source connected to the balance winding for causing a predetermined amount of current to flow therethrough, a current sink circuit connected serially with the split primary winding for regulating the direct current flowing therethrough to an amount proportional to said predetermined amount of current whereby the DC flux generated thereby substantially cancels the DC flux generated by the current flowing through the balance winding.

8. In a circuit for interfacing a subscriber loop to subscriber apparatus, the interface circuit comprising a transformer having a split primary winding connected to the subscriber loop, a secondary winding connected to the subscriber apparatus and a balance winding, a method of cancelling the effect of the DC flux generated by the direct current flowing through the primary winding, comprising the steps of:

applying a predetermined constant current to the balance winding thereby to generate a predetermined level of DC flux; current sinking the DC current flowing through the primary winding to an amount proportional to said constant current; whereby the DC flux generated by the current flowing through the primary winding substantially cancels the DC flux generated by the current flowing through the balance winding.



communicate with the magnetic liquid during at least part of the movement of said coil carrier through the air gap for



permitting flow of magnetic liquid from one side to the other of said carrier in the direction of said air gap.

4,414,438

## VIDEO GAME CONTROLLER

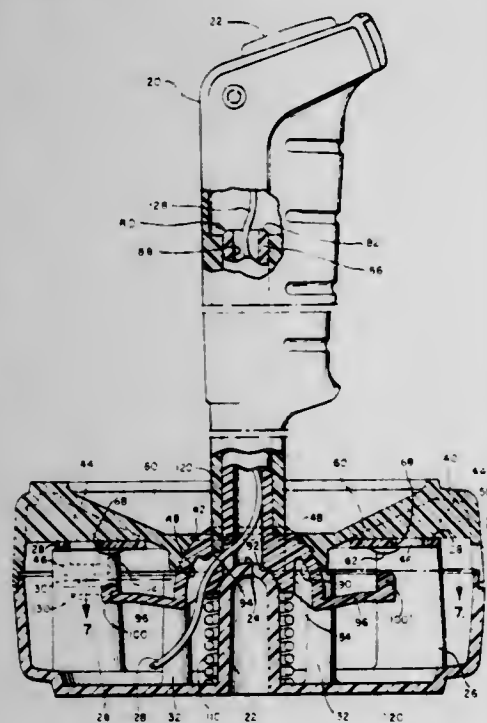
Bruce Maier, Columbia, Mo., and Brian J. Maloney, St. Charles, Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.

Filed Jun. 4, 1982, Ser. No. 384,923

Int. Cl.<sup>3</sup> H01H 25/04

U.S. Cl. 200—6 A

13 Claims



1. A video game controller comprising:

- a joystick handle defining a longitudinal axis and having a lower end portion which defines first and second concentric bearing surfaces spaced along the longitudinal axis;
- a housing sized to receive and support the lower end portion of the joystick handle, said housing defining third and fourth concentric bearing surfaces positioned to mate with and support the first and second bearing surfaces, respectively, with the second bearing surface nested within the first bearing surface such that the first and second bearing surfaces are captured between the third and fourth bearing surfaces to provide a smooth pivotal motion to the handle for a range of positive and negative axial forces on the handle, yet the joystick handle is free to pivot about the center of the first and second bearing surfaces;
- spring means for biasing the joystick handle to a central position; and
- switch means for sensing the pivotal position of the joystick handle;
- said first and fourth bearing surfaces being convex, said second and third bearing surfaces being concave, the radii of curvature of the first and third bearing surfaces being

substantially equal, the radii of curvature of the second and fourth bearing surface being substantially equal, and the radius of curvature of the second bearing surface being less than that of the first.

4,414,439

## TIMED SWITCH

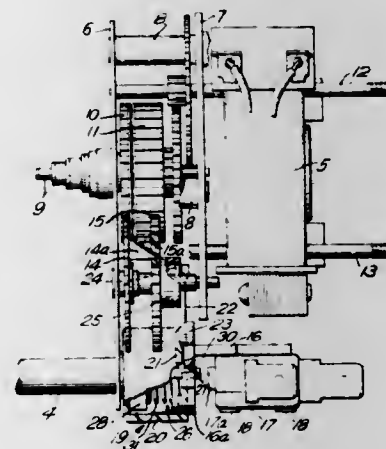
Edward V. Pomponio, Milford, Mass., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 30, 1982, Ser. No. 373,363

Int. Cl.<sup>3</sup> H01H 7/08

U.S. Cl. 200—38 R

6 Claims



1. In a timed switch of the type having a motor, a timing gear driven by said motor, a manually rotatable setting gear coaxially disposed and axially movable with respect to said timing gear and having means for axially shifting said gears with respect to one another at a time selectable by rotating the setting gear, the improvement comprising:

- a. a switch block disposed near said gears having guide means thereon,
- b. an electric switch held by said switch block and having a depressible button to open or close the switch,
- c. an actuator longitudinally movable in said guide means and having a plunger adapted to depress said switch button,
- d. means biasing the actuator away from the switch,
- e. a rotatable selector having a manual latching arm and an automatic latching arm, said selector having cam means cooperating with the actuator to move the actuator longitudinally toward the switch upon rotation of the selector either in a first rotational direction or in an opposite rotational direction, and
- f. detent means cooperating with the manual and automatic latching arms to latch the selector after it has turned in either of said rotational directions and to release the automatic latching arm when said gears are shifted axially with respect to one another.

4,414,440

## WATERPROOF ELECTRICAL SWITCH WITH SAFETY INTERLOCK

Stephen H. DeCoste, Chatham, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jul. 6, 1981, Ser. No. 280,542

Int. Cl.<sup>3</sup> H01H 9/20

U.S. Cl. 200—50 B

6 Claims

1. An electrical switch comprising:

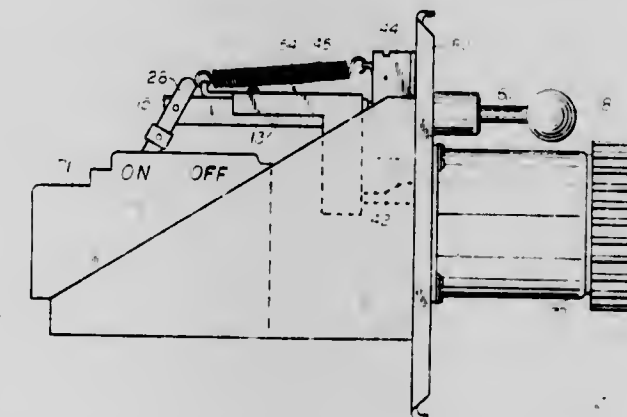
- a housing;
- a circuit breaker mounted in the interior of the housing, the circuit breaker being adapted to be connected to a source of electrical power;
- a plug receiving means for receiving an electrical plug, the plug receiving means having at least one electrical con-

nection means for providing an electrical connection between the circuit breaker and the electrical plug;

a circuit breaker actuator means extending from the housing exterior to the housing interior for changing the circuit breaker between ON and OFF states, the circuit breaker actuator means including an actuator rod slidably extending through a first passage means;

a second passage means for defining a passage from the plug receiving means into the interior of the housing;

a locking pin slidably mounted in the second passage means, the locking pin having a cam surface adjacent a first end and having a second end which is adapted to abut a received plug to be slidably moved in the passage means in response to receipt of an electrical plug from a first locking pin position to a second locking pin position;



a locking plate mounted for sliding movement transverse to the sliding movement of the locking pin, the locking plate being disposed in operative connection with the cam surface to be cammed in sliding movement thereby, the locking plate being disposed in a first locking plate position when the locking pin is in the first locking pin position and being slidably cammed to a second locking plate position by movement of the locking pin to the second locking pin position; and,

said first passage means being disposed adjacent the locking plate with the actuator rod and the locking plate interacting when the locking plate is in the first locking plate position for locking the actuator rod against sliding movement, whereby changing the state of the circuit breaker is prevented, changing of the circuit breaker state being permitted when the locking plate is in the second position allowing sliding movement of the actuator rod.

4,414,441

## HYDROCARBON RESPONSIVE SWITCH

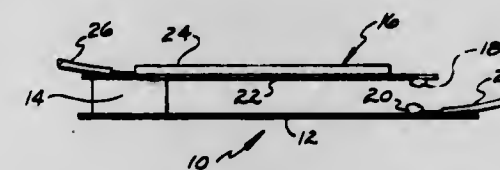
Ralph A. Perry, Indianapolis, and Raymond J. Andrejaskich, Carmel, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 2, 1982, Ser. No. 364,641

Int. Cl.<sup>3</sup> H01H 35/34

U.S. Cl. 200—61.04

4 Claims



1. A hydrocarbon responsive switch, comprising:

- an elongated flexible member which is impervious to hydrocarbon substances;
- means including ethylene propylene, bonded to said elongated flexible member for absorbing hydrocarbon substances and not absorbing water in contact therewith and

for swelling from said absorbing of hydrocarbon substances for causing said contact member to bend;

means for mounting one end of said elongated member;

first electrical contact means located at the other end of said elongated member; and

second electrical contact means for contacting said first contact means upon bending of said elongated flexible member and thereby making electrical connection in response to the absorption of hydrocarbon substances by said means for absorbing.

4,414,442

## STEERING COLUMN SWITCH

Werner-Ernst Berginski, Werdohl-Eveking, and Wilhelm Weasling, Luedenscheid, both of Fed. Rep. of Germany, assignors to Leopold Kostal GmbH & Co. KG, Luedenscheid, Fed. Rep. of Germany

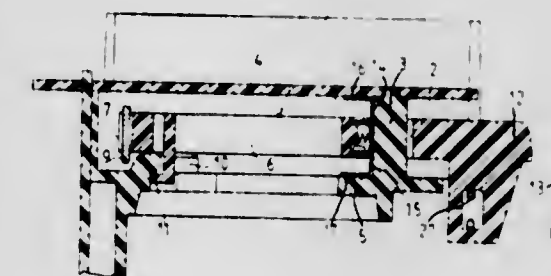
Filed Apr. 5, 1982, Ser. No. 365,238

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118214

Int. Cl.<sup>3</sup> H01H 3/16

U.S. Cl. 200—61.27

5 Claims



1. In a steering column switch to be mounted adjacent a steering spindle, a fixed rotary pin with a vertical axis parallel to the steering spindle and mounted between and in contact with two socket plates, a switching lever with an annular ring slider, the annular ring slider having opposite faces and having a passage which has its axis parallel to the pin vertical axis, the passage encompassing the fixed rotary pin and being rotatable about the rotary pin, the annular ring slider being mounted for pivoting such that the ring slider can tilt around a tilting axis that intersects the fixed rotary pin axis while the annular ring slider is rotatably shifted on the fixed rotary pin, the annular ring slider having a stopping profile diametrically opposite the passage for the fixed rotary pin and on the opposite side of the steering spindle, a stop spring engaging the stopping profile, the improvement comprising:

- a recess area within the passage;
- an electrical contact bridge within the recess area and abutting against the fixed rotary pin;
- at least two electrical contact plates mounted on the fixed rotary pin, the respective ones of the contact plates being positioned to be slidably engaged by the electrical contact bridge as the ring slider is tilted around the tilting axis and while the ring slider is rotatably shifted on the fixed rotary pin; and
- means for forcibly urging the contact bridge in abutting relationship with the fixed rotary pin, whereby the contact bridge slidably engages and establishes electrical contact with the respective ones of the contact plates as the ring slider is tilted around the tilting axis.



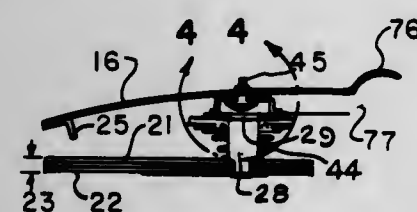
4,414,443

**ENVIRONMENTALLY PROTECTED SWITCH CONSTRUCTION**

Louis M. Gehrt, Jefferson County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 28, 1981, Ser. No. 315,738  
Int. Cl.<sup>3</sup> H01H 19/63

U.S. Cl. 200—80 R



11. In a switch assembly for a dynamoelectric machine, said dynamoelectric machine having at least one winding operable by the action of a centrifugal actuator, said switch assembly being mechanically operated by said centrifugal actuator to energize and de-energize said winding, said switch assembly having, at least one surface, a first switch contact mounted to said surface, and a switch arm mounted for movement with respect to said first switch contact, the improvement comprising a cap positioned about said first switch contact, said cap having a closed bottom and an opened top, said cap being movable with said switch arm; a first washer mounted inboard of said cap and sized to close said opened top, a second compressible washer seal mounted inboard of said first washer; a third non-compressible washer mounted inboard of said second washer; and a spring biased between said third washer and the surface of said switch assembly, said first, said second and said third washers being reciprocally movable on said first switch contact, in response to force applied to said switch arm and said spring, whereby movement of said switch arm makes and breaks electrical contact between said dynamoelectric machine and a source of electrical energy.

4,414,444

**PROCESS FOR PRODUCING A CONTACT ELEMENT**

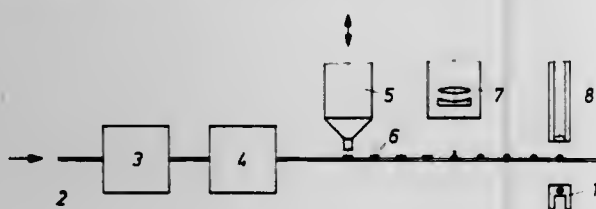
Friedrich Schneider, Pforzheim, Fed. Rep. of Germany, assignor to G. Rau GmbH & Co., Pforzheim, Fed. Rep. of Germany  
Filed Feb. 13, 1981, Ser. No. 234,546

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005662

Int. Cl.<sup>3</sup> B23K 27/00

U.S. Cl. 219—121 LM

11 Claims



1. A process for producing a contact element, said process comprising:  
providing a carrier of a non-noble metal material;  
positioning on said carrier a layer of a material including at least one of a noble metal and a noble metal alloy;  
directing to said layer in a punctiform manner high energy light radiation and thereby completely melting said material of said layer, causing the thus melted layer material to self form into a shape suitable for a contact, and fusing said layer to said carrier over the entire area of mutual contact therebetween; and  
stamping from said carrier a contact element formed of said fused layer and carrier material.

4,414,445

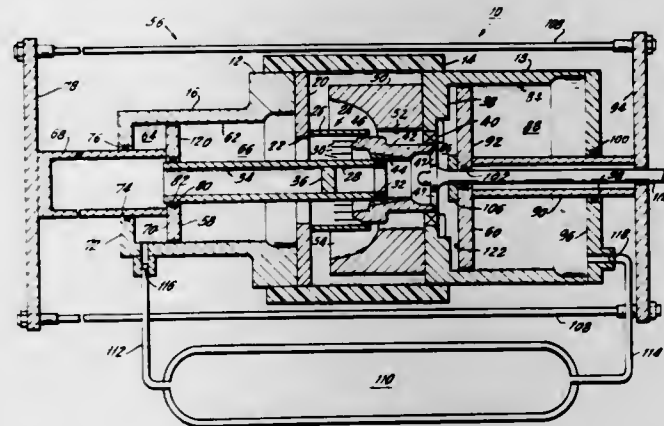
**LIQUID SF<sub>6</sub> INTERRUPTER WITH PROPORTIONAL FEEDBACK**

Ruben D. Garzon, Malvern, Pa., assignor to Brown Boveri Electric, Inc., Rolling Meadows, Ill.

Filed Aug. 12, 1981, Ser. No. 292,251  
Int. Cl.<sup>3</sup> H01H 33/88

11 Claims U.S. Cl. 200—148 A

14 Claims



1. A circuit interrupter, comprising;  
a housing containing a dielectric material in the liquid phase; stationary contact means disposed in said housing; movable contact means disposed in said housing and movable between an engaged position in which it is in electrical contact with said stationary contact means and a disengaged position in which it is mechanically remote from and electrically isolated from said stationary contact means; and  
a piston assembly movable between a first position and a second position, said piston assembly being for increasing pressure in a first region of said housing and for simultaneously decreasing pressure in a second region of said housing while moving from said first to said second position, thereby to create a pressure differential between said first and second regions, for causing said dielectric material to flow from said first to said second region as said piston assembly moves from said first to said second position; said piston assembly being adapted to be accelerated in a direction from said first toward said second position by energy generated by an arc between said stationary and said movable contact means; and said piston assembly being subject to a force exerted on it by said dielectric material urging said piston assembly in a direction from said second toward said first position, when the pressure of said dielectric material is substantially uniform throughout said housing; said piston assembly being movable independently of the movement of said movable contact means.

4,414,446

**ELECTRIC ARC COOLING APPARATUS FOR THE CHIMNEYS OF CUT-OUT DEVICES**

Jean-Philippe Gelez, Saint Mande, France, assignor to Societe Anonyme dite Alstom-Atlantique, Paris, France

Filed Oct. 30, 1980, Ser. No. 202,217

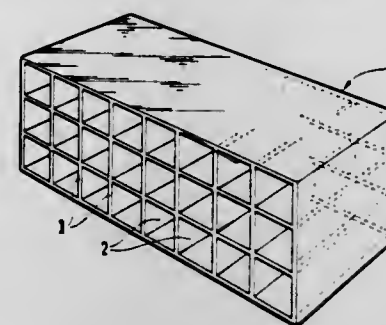
Claims priority, application France, Oct. 31, 1979, 79 27013  
Int. Cl.<sup>3</sup> H01H 33/08

U.S. Cl. 200—144 R

1 Claim

1. An electric arc cooling apparatus for chimneys of cut-out devices, said apparatus including at least one unit made of a refractory ceramic material including intersecting partitions forming in cross-section for said unit, cells passing through it, and wherein the thickness of the partitions defining said cells is less than or equal to one fifth of the width of said cells;

whereby, the arc plasma flows through the cells without great loss of head and without sustaining damage, even though said



arc may be at several thousand degrees, and said unit functions to absorb most of the heat energy of said arc.

4,414,447

**LOW DC VOLTAGE, HIGH CURRENT SWITCH ASSEMBLY**

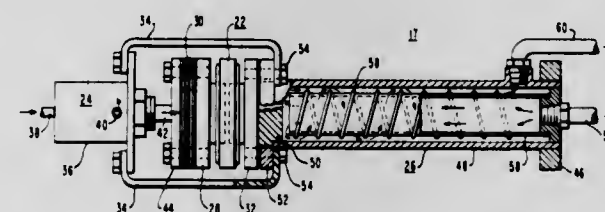
Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1981, Ser. No. 267,827

Int. Cl.<sup>3</sup> H01H 33/66

U.S. Cl. 200—144 B

16 Claims



1. A low voltage, high current DC switch assembly and integral operating means and resistive element for use as a shunt switch assembly connectable between generally parallel spaced apart electrical terminals or conductors, comprising:  
(a) a low voltage DC switch including a pair of relative reciprocally movable contacts disposed within a hermetically sealed envelope portion, with a first switch contact flexibly connectable to a first electrical terminal, and a second switch contact rigidly connectable to a resistive element;  
(b) switch operating means having a body portion rigidly connected to the second switch contact, and reciprocally movable drive member connected to the first switch contact to effectuate switch contact opening and closing;  
(c) a generally tubular resistive element having first connection means at one end for connection to the second switch contact, and second connection means at the other end for connection to the second electrical terminal, and means for passing cooling fluid through the tubular resistive element.

4,414,448

**VACUUM CIRCUIT INTERRUPTER**

Yutaka Kashimoto, Tokyo; Shinzo Sakuma, Kawasaki; Junichi Warabi, Shizuoka; Yukio Kobari, and Hidemi Kawaguchi, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Meldensha, Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,467

Claims priority, application Japan, Jul. 7, 1980, 55-92561  
Int. Cl.<sup>3</sup> H01U 33/66

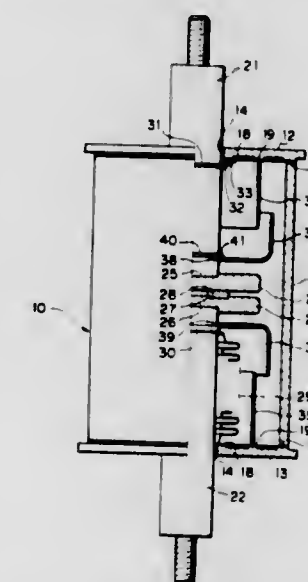
U.S. Cl. 200—144 B

4 Claims

1. A vacuum circuit interrupter comprising:  
(a) a plastically deformable metallic cylinder (11);  
(b) first and second insulating disks (12, 13) closing the opposite ends of the metallic cylinder to form therewith an evacuated envelope (10), the first and second disks each having a coaxial center aperture (14);  
(c) a stationary conductive rod (21) coaxially entering the

envelope through the center aperture of the first disk, the stationary rod being fixed to the first disk in such a manner as to provide a seal thereabout;

(d) a movable conductive rod (22) coaxially and movably entering the envelope through the center aperture of the second disk in such a manner as to align with the stationary rod;  
(e) a bellows (29) surrounding the movable rod inside the envelope, the bellows being fixed at its one end to the movable rod and at its other end to the second disk in such a manner as to provide a seal about the movable rod to allow for movement thereof without impairing the vacuum inside the envelope;



(f) stationary and movable electrodes (23, 24) connected to the stationary and movable rods respectively in such a manner as to engage with each other when the movable rod moves toward the stationary rod and disengage when the movable rod moves away from the stationary rod;  
(g) a first conductive shield (34) surrounding the stationary rod inside the envelope, the first shield being fixed to the first disk in such a manner as to be isolated electrically from the stationary rod and the metallic cylinder; and  
(h) a second conductive shield (35) surrounding the bellows inside the envelope, the second shield being fixed to the second disk in such a manner as to be isolated electrically from the movable rod and the metallic cylinder.

4,414,449

**QUICK OPEN AND CLOSE DISCONNECT SWITCH**

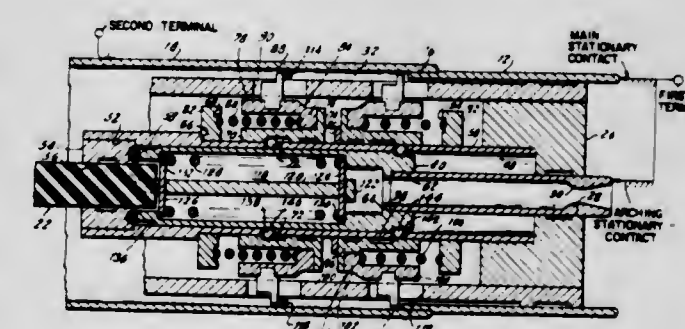
Ruben D. Garzon, Malvern, Pa., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed May 26, 1981, Ser. No. 267,372

Int. Cl.<sup>3</sup> H01H 9/38

U.S. Cl. 200—146 R

19 Claims



1. A disconnect switch, comprising:  
stationary contact means;  
first terminal means electrically connected to said stationary contact means;



a first moving contact;  
 a second moving contact;  
 second terminal means electrically connected to said first and second moving contacts;  
 means for moving said first moving contact at a first speed between a first position in which it is in electrical and mechanical contact with said stationary contact means and a second position in which it is spaced from and out of electrical contact with said stationary contact means, and for moving said second moving contact at a second speed greater than said first speed between a third position in which it is in electrical and mechanical contact with said stationary contact means and a fourth position in which it is spaced from and out of electrical contact with said stationary contact means;  
 latching means for retaining said second moving contact in said third position while said first moving contact moves from said first position towards said second position, until said first moving contact has moved a first predetermined distance towards said second position for retaining said second moving contact in said fourth position when said first moving contact moves from said second to said first position, until said first moving contact has moved a second predetermined distance toward said first position, and latch defeating means for defeating said latching means to release said second moving contact once said first moving contact has moved said first predetermined distance; said latch defeating means further defeating said latching means to release said second moving contact once said first moving contact has moved said second predetermined distance.

4,414,450

## HIGH VOLTAGE POWER SWITCH

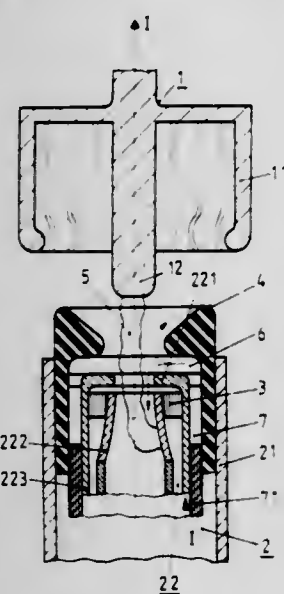
Rudolf Moll, Zollikon; Klaus Ragaller, Neuenhof, and Ekkehard Schade, Wettingen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland  
 Filed May 4, 1981, Ser. No. 260,203

Claims priority, application Switzerland, May 7, 1980, 3545/80

Int. Cl.<sup>3</sup> H01H 33/70, 33/82

U.S. Cl. 200—147 R

4 Claims



1. A high voltage power switch for interrupting alternating current flow, comprising:  
 an axially displaceable commutating contact;  
 a stationary hollow commutating contact having a first part that is configured as a nozzle and a second part disposed within said first part;  
 a nozzle that defines a gas flow path in conjunction with said first part to direct a flow of compressed gas into an expansion chamber of the switch;  
 a cylindrical electromagnetic coil disposed between said first and second parts of said stationary contact and electrically

connected between said first and second parts to generate a magnetic field that is parallel to the axis of an arc formed between said contacts; and  
 a compression device for producing a flow of compressed gas along said flow path defined by said nozzle, upon actuation of said contacts, having a magnitude sufficient to commutate an electrical arc between said contacts from said first to said second part of said stationary contact within a period of time that is shorter than the length of the half-wave of the current being interrupted and prior to the time that the current changes polarity to thereby energize said coil and magnetically extinguish the arc.

4,414,451

## DISCONNECT SWITCH

Rolf Bleidt, and Heinrich Neumaier, both of Hanau, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

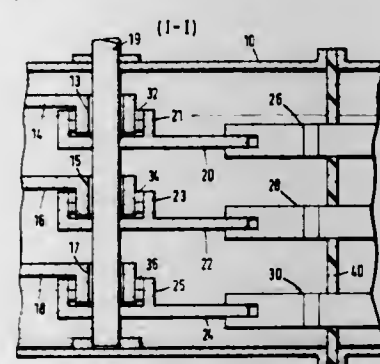
Filed Jul. 23, 1980, Ser. No. 171,344

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930075

Int. Cl.<sup>3</sup> H01H 33/64

U.S. Cl. 200—148 H

3 Claims



1. Disconnect switch, comprising a metal housing, SF<sub>6</sub> insulating gas filling said housing, a three-phase bus bar disposed outside said housing, three phase-feed conductors each being connected to a respective one of said phases of said bus bar and each having a fixed bus bar contact leading into said housing, a safety switch disposed outside said housing, three outgoing conductors each being connected to said safety switch and leading into said housing, an insulated drive shaft leading into said housing, three contact blades disposed in said housing and each being rotatable on said drive shaft into current-conducting connection with a respective one of said fixed bus bar contacts in an on position, three first bearing bushings each being integral with a respective one of said contact blades, three second bearing bushings each being integral with a respective one of said outgoing conductors in said housing, and three multi-contact bushings each being supported coaxially on said drive shaft in said housing and each forming a continuous current-conducting connection between a respective first and second bearing bushing.

4,414,452

## MEANS FOR ATTACHING AUXILIARY DEVICES TO A MEMBRANE SWITCH

Ronald S. Denley, Woodstock, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Dec. 13, 1982, Ser. No. 448,929

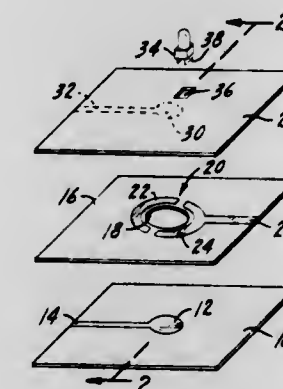
Int. Cl.<sup>3</sup> H01H 13/12, 9/02

U.S. Cl. 200—159 B

6 Claims

1. In a membrane switch of the type having a substrate, a first switch contact on the top surface of the substrate, a flexible membrane, a second switch contact on the bottom surface of the membrane and aligned with the first switch contact, a spacer between the substrate and membrane having an aperture in register with the switch contacts such that the contacts are normally in spaced, facing relation while pressure on the

membrane top surface moves the second contact through the aperture and into engagement with the first contact thereby closing the switch, the improvement comprising means for incorporating a discrete electrical component into the mem-



brane switch including a current supply circuit formed on the top surface of the spacer, an opening in the membrane providing access to the current supply circuit, and means for retaining the discrete component in the opening and in electrical contact with the current supply circuit.

4,414,453

## MICROWAVE OVEN FEED APPARATUS

James E. Simpson, Coralville, Iowa, assignor to Raytheon Company, Lexington, Mass.

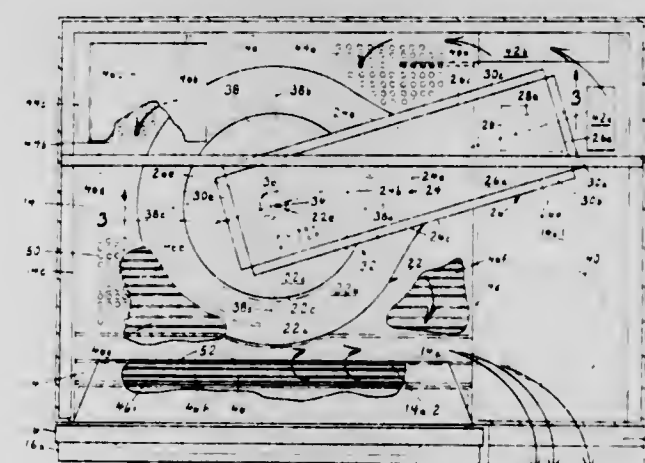
Division of Ser. No. 971,727, Dec. 21, 1978, Pat. No. 4,284,868.

This application Nov. 24, 1980, Ser. No. 209,847

Int. Cl.<sup>3</sup> H05B 6/72

U.S. Cl. 219—10.55 F

7 Claims



1. Directional rotating antenna for use in a microwave heating cavity comprising:

- a probe antenna extending through an aperture in a surface of said cavity for receiving microwave energy in a waveguide and coupling it into said cavity, said probe antenna being substantially perpendicular to said surface;
- a transmission line conductor connected to said probe antenna within said cavity, said transmission line conductor being adjacent and substantially parallel to said surface;
- first and second conductor legs respectively connected to the ends of said transmission line conductor, said legs extending inwardly to said cavity away from said surface;
- first and second antennas respectively connected to the inwardly extending ends of said first and second conductor legs, said first and second antennas being substantially parallel to said surface; and
- means to axially rotate said probe antenna whereby said first and second antennas radiate microwave energy in said cavity with uniform energy distribution.

4,414,454  
 METHOD OF WELDING CONTINUOUS RAILS AND APPARATUS THEREFOR

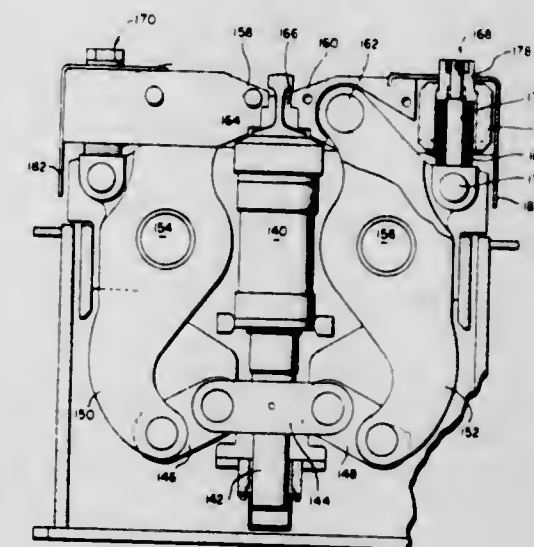
Hans R. Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Schlieren, Switzerland

Filed Aug. 13, 1981, Ser. No. 292,597

Int. Cl.<sup>3</sup> B23K 11/02; E01B 29/17

U.S. Cl. 219—53

12 Claims



12. Welding apparatus for welding workpiece sections together in end-to-end relationship to form a continuous length comprising a main frame, a fixed assembly supported by said main frame, a movable assembly supported by said main frame and longitudinally movable with respect to said fixed assembly, first and second electrodes respectively engageable with adjacent end portions of successive workpiece sections to be welded together and means for causing current flow between the electrodes and through the ends of the workpiece sections in order to make the weld, said fixed and movable assemblies each comprising a pair of clamp assemblies for clamping the ends of said workpiece sections to be welded together, said clamp assemblies each comprising a hydraulic cylinder, a pair of clamp arms pivotally supported in opposed relationship so as to clamp the workpiece section between them and a plurality of lever arms coupled to said hydraulic cylinder and the respective ones of said pair of clamp arms for pivotally operating said clamp arms to clamp the workpiece section between them upon operation of said hydraulic cylinder, a spring assembly associated with each of said clamp arms for transmitting to said clamp arms a vertical press-on force for clamping the workpiece section, said clamp assemblies being pivotally operable to clamp a workpiece section between them and to open to permit the workpiece section and the welding apparatus to be vertically displaced with respect to one another, each of said pair of clamp arms having removably affixed to the end thereof a clamp head formed to substantially correspond to the shape of said workpiece sections to be welded together, whereby said welding apparatus can be utilized to weld together in end-to-end relationship various workpieces such as pipes to form a continuous length pipeline, said electrodes likewise being correspondingly formed to the shape of the workpiece.



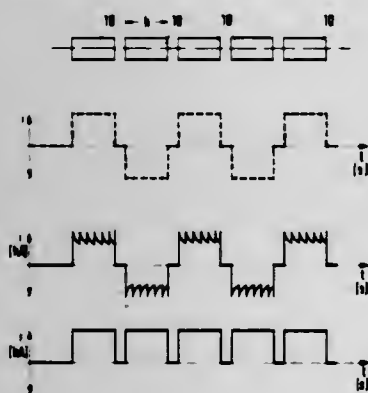
4,414,455

**METHOD OF AND APPARATUS FOR PRODUCING CAN BODIES WELDED ALONG THE LONGITUDINAL SEAM**  
 Franz Schneider, Walter Panknin, both of Göppingen, Fed. Rep. of Germany; Zelimir Belamaric, Marin, and Fred Schaleh, Le Landeron, both of Switzerland, assignors to L. Schuler GmbH, Göppingen, Fed. Rep. of Germany  
 Filed Feb. 12, 1981, Ser. No. 233,866  
 Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005083

Int. Cl.<sup>3</sup> B23K 11/06

U.S. Cl. 219—64

15 Claims



1. A method of making can bodies welded along a longitudinal seam on a resistance welding apparatus which includes a source of electric energy operable to produce nearly rectangular pulses of welding current and a pair of opposed welding electrodes operatively connected with said source so that overlapping portions of the can bodies are continuously welded as they are passed through said pair of electrodes, comprising the steps of controlling the duration of a half wave of a nearly rectangular welding current pulse in such a manner that it is matched to the time required for a given can body to pass between said welding electrodes, and reversing the polarity of the nearly rectangular welding current pulses from one can body to the next can body.

4,414,456

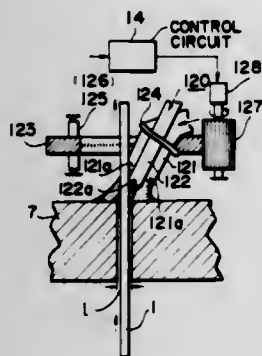
**ELECTROEROSIVE WIRE-CUTTING METHOD AND APPARATUS WITH A SHAPED HIGH-VELOCITY STREAM OF A CUTTING LIQUID MEDIUM**

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan  
 Filed Mar. 19, 1981, Ser. No. 245,597  
 Claims priority, application Japan, May 1, 1980, 55-58915

Int. Cl.<sup>3</sup> B23P 1/02

U.S. Cl. 219—69 W

31 Claims



1. In a method of electroerosively cutting an electrically conductive workpiece with a continuous wire electrode, wherein the wire electrode is axially transported to traverse the workpiece to define a cutting gap therewith flushed with a cutting liquid medium and is electrically energized to electroerosively remove material from the workpiece while the latter is displaced relative to the wire electrode transversely to the axis thereof, thereby forming a cutting slot behind the advancing wire electrode in the workpiece, the improvement which comprises flushing said cutting gap with said cutting liquid medium by:

(a) directing at a region of said cutting gap a high-velocity columnar stream of the cutting liquid medium having a width substantially equal to the width of said cutting slot at least in the direction of the latter width; and

(b) directing towards the region of said cutting gap in generally the same direction as the high-velocity columnar stream, a low-velocity stream of the cutting liquid medium so as to surround said high-velocity columnar stream and thereby to form a protective curtain about said high-velocity columnar stream and a pressure cushion to force the latter substantially in its entirety to pass into said cutting slot and said cutting gap without breakup or divergence.

4,414,457

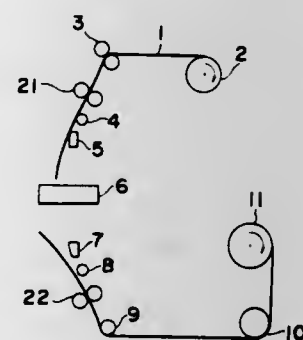
**WIRE-CUT, ELECTRIC DISCHARGE MACHINE**

Yoshiyuki Nomura, and Kanemasa Okuda, both of Hino, Japan, assignors to Fujitsu Fanuc Ltd., Tokyo, Japan  
 Filed Jun. 2, 1981, Ser. No. 269,594  
 Claims priority, application Japan, Jun. 3, 1980, 55-77229

Int. Cl.<sup>3</sup> B23P 1/12, 1/08

U.S. Cl. 219—69 W

6 Claims



1. A wire-cut electric discharge machine for machining of a workpiece into a desired shape by producing a discharge between the workpiece and a wire installed on its running system, including in sequence a supply reel, a first fixed running system guide, the workpiece, and a take-up means for taking up the wire, said take-up means including a driven roller pair and a second fixed running system guide disposed between the workpiece and the driven roller pair, comprising: undriven roller pair means for gripping the wire with constant pressure and for preventing the wire installed in the running system from coming out of the running system, said undriven roller pair means being provided between the first fixed running guide and the supply reel, the undriven roller pair means including a fixed roller, a pressure roller and a spring, said pressure roller being urged against the fixed roller by means of the spring.

4,414,458

**WIRE-CUT, ELECTRIC DISCHARGE MACHINE**

Yoshiyuka Nomura, Hino, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan  
 Filed Apr. 1, 1981, Ser. No. 249,834  
 Claims priority, application Japan, Apr. 14, 1980, 55-48969

Int. Cl.<sup>3</sup> B23P 1/08

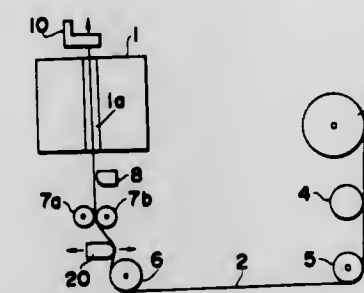
U.S. Cl. 219—69 W

13 Claims

3. An improved electric discharge machine of the type provided with a means for automatically installing an elongated electrode by gripping the elongated electrode with feed-up rollers after the elongated electrode has been released from a supply reel and by guiding the elongated electrode into a machining starting hole in the workpiece, wherein the improvement comprises:

straightening guide means positioned directly in front of the

feed-up rollers and between the feed-up rollers and the supply reel for straightening the elongated electrode out,



said straightening guide means having a curved surface which guides the elongated electrode thereacross.

4,414,460

**METHOD OF SEALING A TUBE USING A LASER BEAM**  
 Shigeru Sudo, Tokyo, and Masaaki Yada, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

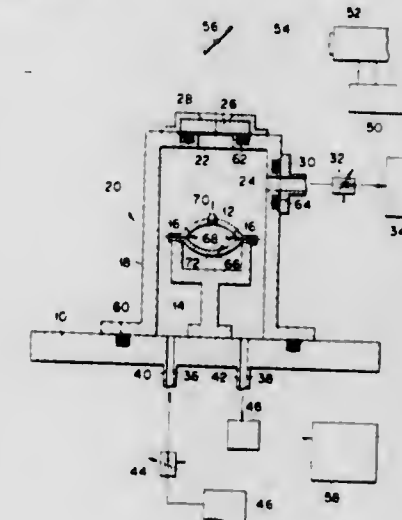
Filed Dec. 10, 1981, Ser. No. 329,436

Claims priority, application Japan, Dec. 26, 1980, 55-185829

Int. Cl.<sup>3</sup> B23K 27/00

U.S. Cl. 219—121 LD

6 Claims



4,414,459

**METHOD AND APPARATUS FOR OVERHEAD WELDING**

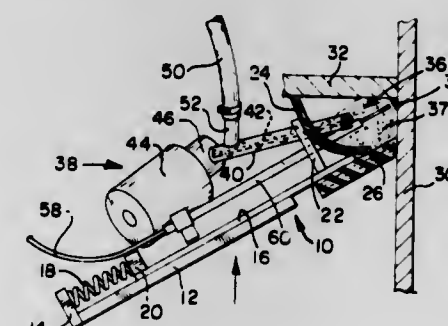
James E. Sims, Houston, Tex., and Robert C. Schmick, Elmhurst, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 2, 1981, Ser. No. 317,139

Int. Cl.<sup>3</sup> B23K 9/18

U.S. Cl. 219—73.2

9 Claims



1. A method of overhead welding which comprises: positioning first and second metal plates with respect to each other so that they can be joined together by overhead welding of a joint; placing an electrically insulated support means for granular flux so as to span the joint with flux in a section of the joint to be welded; forcing granular welding flux onto the flux support means to cover the joint section with flux; and traversing the joint section with a welding arc submerged in the flux on the flux support means thereby depositing a weld which joins the plates together at the joint.

4. Apparatus for overhead welding a first metal plate to a second metal plate comprising:

- a base;
- an electrically insulated support means for granular flux, adapted to span and cover with flux an overhead joint to be welded, on the base;
- a welding wire guide for directing the wire to an overhead joint covered by the flux support means; and
- flux feeder means at least partially supported by the base for forcing granular welding flux onto the flux support means to cover the joint with flux.

4,414,461

**LASER PUMPED SUPERCONDUCTIVE ENERGY STORAGE SYSTEM**

Alfred A. Wolf, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1981, Ser. No. 294,873

Int. Cl.<sup>3</sup> H02J 15/00; H01F 36/00; H01B 7/34

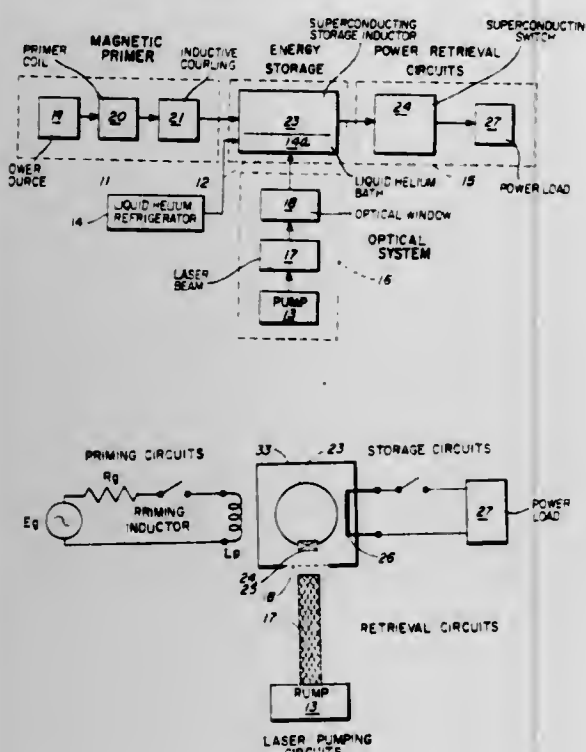
U.S. Cl. 219—121 L

2 Claims

1. A superconductive energy storage system comprising: a superconducting coil means for carrying large currents in a closed loop; refrigerating means for cooling said coil means to superconducting temperatures, including a dewar containing a liquid helium bath for receiving said coil means and a liquid helium refrigerator for replenishing liquid helium in said bath; primer means for inductively starting a circulating current in said coil means; a laser means for transmitting additional energy into said coil means; an optical window in said dewar through which light from said laser passes; an optical absorber mounted on said coil means for receiving light energy from said laser means to increase the current in said coil; and retrieval means for retrieving energy from said coil means; whereby said laser means is operated at a frequency below



the critical frequency of said superconducting coil so that when said laser means shines on said optical absorber, the temperature of the liquid lading above a predetermined temperature.



energy of said storage system and said current in said coil increase without causing normalization of the system.

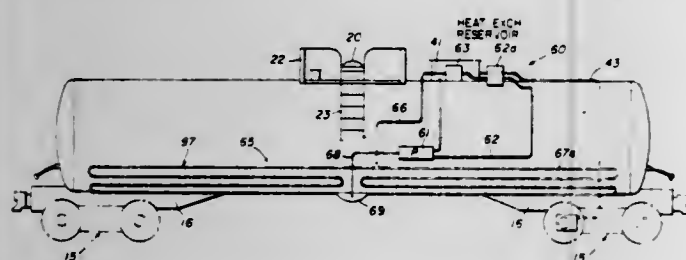
4,414,462

**TANK CAR HEATING SYSTEM**

Albert E. Price, Bolingbrook, Ill., assignor to General American Transportation Corporation, Chicago, Ill.

Filed Jul. 17, 1981, Ser. No. 284,460

Int. Cl.<sup>3</sup> B60L 1/02; H05B 3/00; B61D 5/00; F28D 1/06  
U.S. Cl. 219—202 9 Claims



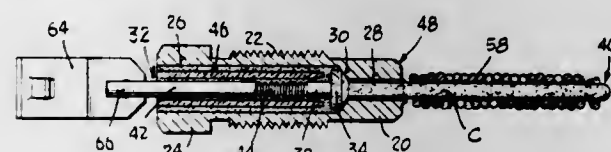
1. A heating system for the tank structure of a railway tank car adapted to contain a liquid lading that is to be maintained in a heated condition, said heating system comprising electrically-powered pump means carried by the tank car, said pump means having a fluid inlet and a fluid outlet and adapted to be coupled to an associated source of electric power, heating conduit means interconnecting the fluid inlet and the fluid outlet of said pump means for cooperation therewith to form a closed loop, said conduit means including a reservoir portion and an elongated sinuous heating portion disposed along the outside of the bottom of the associated tank structure and arranged to be in good heat exchange relationship with the lading contained therein, a heating fluid confined in said closed loop for recirculation therethrough by said pump means, a heat source consisting solely of a resistance-type electric heater disposed in said reservoir portion of said conduit means in heat exchange relationship with said heating fluid and adapted to be coupled to the associated source of electric power for heating said heating fluid as it flows through said conduit means, and thermostatic control means coupled to said pump means and to said heat source for automatic deactivation of both said pump means and said heat source in response to elevation of the

4,414,463  
**DIESEL GLOW-PLUG IGNITOR**  
John T. Petrik, Newtown, and Brooke N. Westover, Stratford, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,004  
Int. Cl.<sup>3</sup> F23Q 7/10

U.S. Cl. 219—270

7 Claims



1. A diesel glow-plug ignitor comprising, in combination:
  - (a) a tubular metal body having an inner end securely carried in a cylinder opening of an engine,
  - (b) an electrically conductive core pin insulatedly carried in the bore of the body, physically structurally united therewith, and having a portion projecting from said inner end thereof, said projecting portion of said core pin being coated with insulating material, and
  - (c) a tight-wound helical igniting coil of resistance wire on said projecting portion of the core pin, having its ends respectively welded to the body and welded substantially to the end of said projecting portion of the pin,
  - (d) the convolutions of said coil having an insulating oxide coating thereon to prevent them from short-circuiting each other,
  - (e) said insulating material on the core pin having ceramic-containing insulation and being plasma sprayed thereon to further prevent the convolutions of the coil from electrically contacting the projecting portion of the core pin.

4,414,464

**ELECTRICAL WATER HEATING DEVICE WITH IMPROVED INTERNAL CIRCULATION**

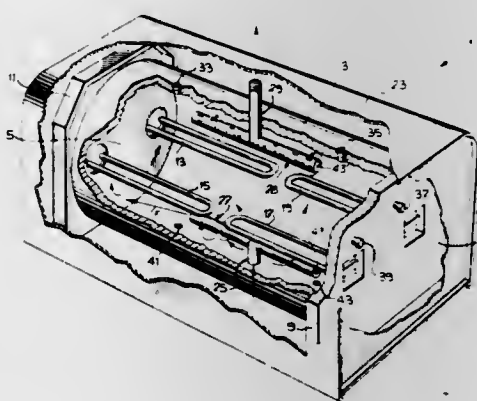
Louis Cloutier, 486 Principale St., Richmond, Comte de Richmond, Quebec, Canada

Filed Jun. 24, 1981, Ser. No. 276,759

Int. Cl.<sup>3</sup> F24H 1/20; H05B 3/82

U.S. Cl. 219—312

4 Claims



1. In an improved electrical water heating device of the type comprising a horizontal elongated hollow body having a top, a bottom, and a pair of opposite ends, at least two heating elements mounted opposite each other at the same horizontal level in the body at both ends thereof, a water inlet centrally located in the bottom of the body and a water outlet having the same diameter as said inlet centrally located in the top of the body, the improvement comprising first and second identical nozzles mounted in said body in a symmetrical manner, said

first nozzle connected to said inlet and said second nozzle connected to said outlet of the device, each of said first and second nozzles comprising a first vertical tubular section having a diameter substantially equal to the diameter of said inlet and outlet of the device, respectively, and a second horizontal tubular section connected to and having substantially the same diameter as the first tubular section, said second tubular section extending perpendicularly to one end of the first tubular section and connected thereto at its midpoint to form together with said first tubular section a hollow T-shaped element; the other end of said first tubular section of one of the first and second nozzles being connected to the inlet and the other end of the first tubular section of the other nozzle being connected to the outlet, said second section which forms the horizontal bar of the T being closed at both ends and provided with two sets of holes that are symmetrical with respect to a plane passing through the longitudinal axis of the first section perpendicularly to the axis of the second section; each set of holes in said second tubular section comprising a pair of first circular holes, each having a diameter smaller than the inner diameter of the second section and on an axis parallel to that of the second section, one of said first holes being eccentrically located on each closed end of the second section, said set of holes also comprising identically shaped second holes, each having a diameter equal to that of the first hole and an axis parallel to the longitudinal axis of the first section, said second holes being located close to each other at the vicinity of the closed ends of the second section and opening in the same direction as the first section, each set of holes further comprising three identical third holes each having a diameter smaller than that of the first and second holes, said third holes being located a short distance from each other according to a helicoidal line extending from the first section toward the closed end of the second section, the axis of the second of said third holes extending parallel to the longitudinal axis of the first section and opening in the same direction as the latter.

4,414,465

**COOKING APPARATUS**

Stephen J. Newton, Haslemere, and Abdul H. Patel, Fareham, both of England, assignors to Thorn Domestic Appliances (Electrical) Ltd., London, England

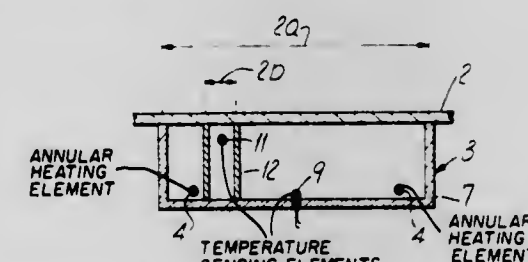
Filed Mar. 4, 1981, Ser. No. 240,324

Claims priority, application United Kingdom, Mar. 5, 1980, 8007544; Aug. 4, 1980, 8025339

Int. Cl.<sup>3</sup> H05B 3/68

U.S. Cl. 219—449

8 Claims



1. Cooking apparatus including: a glass ceramic hot plate; at least one heater for heating the hot plate disposed within an open-topped insulated housing below the hot plate; and a temperature responsive element spaced from the hot plate by a gap, and disposed, in use, to receive heat energy across the gap directly from the hot plate, so that the heat energy it receives is primarily radiant energy directly from the hot plate, and to produce a first electrical signal indicative of the temperature sensed thereby; the cooking apparatus also including a further temperature responsive element sensing the temperature of an area of the hot plate shielded from direct heating by the heater and to produce a second electrical signal indicative of the sensed temperature; and control circuitry wherein the first

signal is used for maximum temperature cut-out and the second signal is used for closed loop control of the heater.

4,414,466

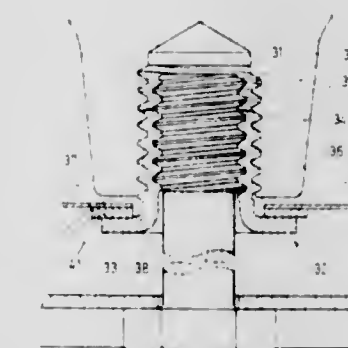
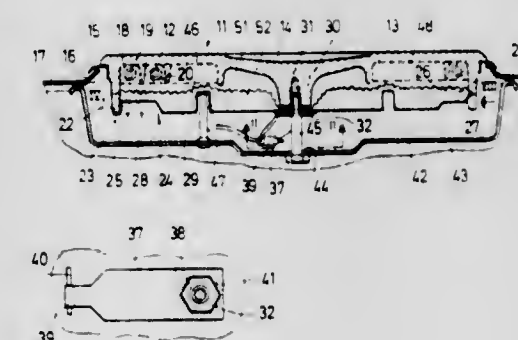
**ELECTRIC HOTPLATE**

Karl Fischer, Am Gänsberg, D-7519 Oberderdingen, and Felix Schreder, Oberderdingen, both of Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany  
Continuation of Ser. No. 177,873, Aug. 14, 1980, Pat. No. 4,348,581. This application Aug. 25, 1982, Ser. No. 411,426  
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933296

Int. Cl.<sup>3</sup> H05B 3/68

U.S. Cl. 219—459

9 Claims



1. An electrical hotplate for use in a cooking appliance having:
  - a hotplate member with a downwardly projecting pin with an internal thread,
  - electrical heating resistor means secured to the underside of said hotplate member,
  - a covering sheet covering the underside of the hotplate member,
  - screw means to secure both the covering sheet to the hotplate and the hotplate to the cooking appliance, the screw means comprising:
    - a hollow screw having an internal and an external thread and an outwardly projecting shoulder,
    - the external thread being screwed into said pin and securing the covering sheet between the shoulder and the pin and
  - a fastening screw for mounting the cooking hotplate at the cooking appliance, which fastening screw can be screwed into the internal thread.

4,414,467

**VENDING ORDERING TERMINAL**

George K. Gould, Pound Ridge, and Eric Steinberg, Bronx, both of N.Y., assignors to Video Corporation of America, New York, N.Y.

Continuation-in-part of Ser. No. 93,085, Nov. 13, 1979, Pat. No. 4,300,040. This application Jun. 29, 1981, Ser. No. 278,852

Int. Cl.<sup>3</sup> G06K 5/00

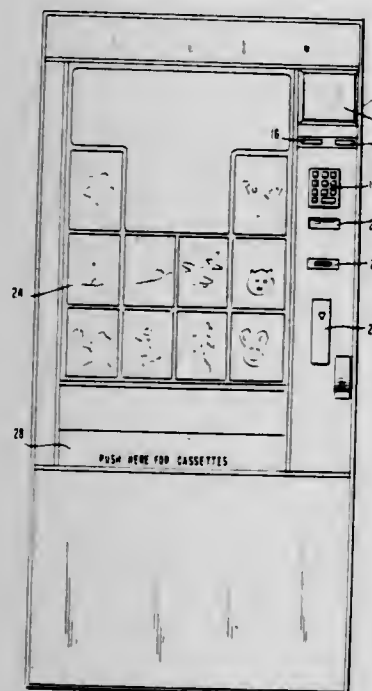
U.S. Cl. 235—381

8 Claims

1. A terminal at which a user can selectively preview or order a videocassette, said terminal comprising, customer identification means for receiving information relative to the



user; mode selection means enabling the user to choose a preview or order mode; cassette selection means for selecting and identifying a desired videocassette; terminal control means including a memory coupled to said customer identification means and said cassette selection means to receive and store information representative of the user, the data, and the selected videocassettes; vending means for storing a plurality of videocassettes and for selectively vending the selected video-



cassette; vending control means coupled to said terminal control means for communicating said information between said memory and said vending means to command the vending of the selected videocassette when the order mode has been selected; and preview display means coupled to said terminal control means for receiving said information and displaying a trailer corresponding to the selected videocassette when the preview mode has been selected.

4,414,468

#### SYSTEMATIC ERROR CORRECTION IN BAR CODE SCANNER

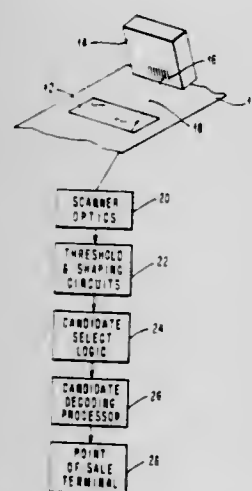
George J. Laurer, Wendell, and Olen L. Stokes, Jr., Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,879

Int. Cl.<sup>3</sup> G06K 7/10

U.S. Cl. 235-462

7 Claims



1. For use in a system for reading a bar-coded multicharacter label which may include characters which can be fully decoded only by use of a bar width measurement, an improved

method for correcting for systematic errors in apparent bar widths comprising the steps of:  
decoding the label characters in succession until a character is encountered which requires a bar width measurement in order to be fully decoded;  
correcting the apparent bar width of said character as a function of the measured character width and the measured and standard total bar width of the previously decoded character;  
fully decoding said character using the corrected bar width; and  
repeating the above-described steps until all characters in the label have been fully decoded.

4,414,469

#### AUTOMATIC FOCUSING APPARATUS WITH DETECTION ONLY WHEN THE LENS IS STATIONARY

Akira Ogasawara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

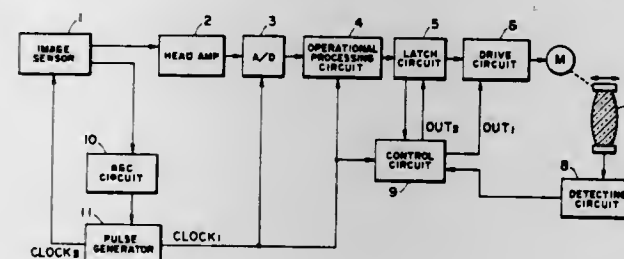
Filed Nov. 13, 1981, Ser. No. 321,076

Claims priority, application Japan, Nov. 18, 1980, 55-162339; Aug. 20, 1981, 56-130696

Int. Cl.<sup>3</sup> G01S 1/36

U.S. Cl. 250-201

9 Claims



1. An apparatus for focusing a focusing optical system to an object comprising:
  - (a) photoelectric converter means including a photoelectric cell array having a plurality of photosensor cells each capable of storing charge in accordance with a quantity of incident light, said photoelectric cell array being arranged on an effective focal plane of said optical system, said photoelectric converter means sequentially producing the charges stored in said photoelectric cells;
  - (b) means for determining a positional relation between said object and said optical system based on said sequential charge outputs to produce a control output to indicate a displacement of said optical system necessary to attain focused condition;
  - (c) store means for storing said control output;
  - (d) drive means responsive to said control output stored in said store means for moving said optical system; and
  - (e) control means for permitting said store means to store only the control output produced based on the sequential outputs produced when said optical system is stationary.

4,414,470

#### PUPIL DIVISIONAL FOCUSING POSITION DETECTION APPARATUS USING LENTICULAR LENS

Hideo Nakaoka, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 1, 1980, Ser. No. 117,818

Claims priority, application Japan, Feb. 8, 1979, 54-13655; Feb. 8, 1979, 54-13656

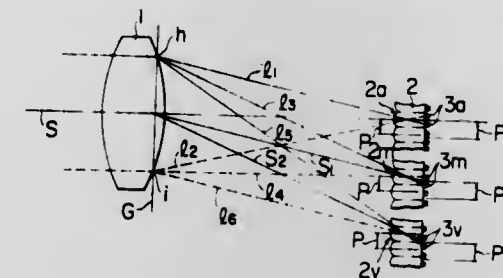
Int. Cl.<sup>3</sup> G03B 3/00; H01J 40/14

U.S. Cl. 250-204

12 Claims

1. In a focusing position detection apparatus for detecting a focusing position by causing rays of light coming from a peripheral portion of an exit pupil of a photographing lens to enter a pair of self-scanning type photoelectric element arrays through a lenticular lens group and then detecting the difference of the phases of the output signals from said photoelectric

element arrays, the improvement in which the pitch  $P_0$  between photoelectric elements which constitute said pair of photoelectric element arrays is determined so as to maintain a relationship of  $P_0 = P + W/P/D$ , wherein  $P$  is the pitch between small lens elements which constitute said lenticular lens group,



$D$  is the distance between the exit pupil plane of said photographing lens and the center of curvature of a small lens element located on the optical axis of said photographing lens, and  $W$  is the distance between the center of curvature of said small lens element on said optical axis and a plane on which said photoelectric element arrays are disposed.

4,414,471

#### FIBER OPTIC ACOUSTIC SIGNAL TRANSDUCER USING REFLECTOR

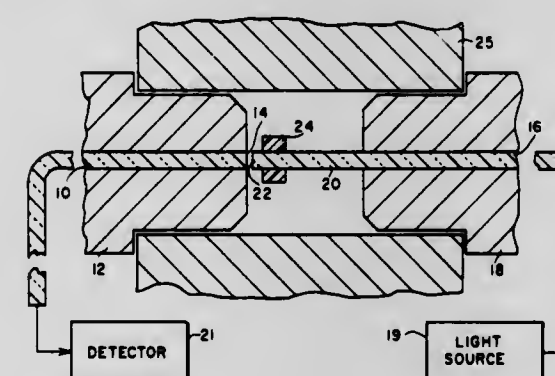
Glen A. Rines, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 209,441, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 138,385, Apr. 8, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 371,398

Int. Cl.<sup>3</sup> G02B 5/14

U.S. Cl. 250-227

11 Claims



1. Apparatus for sensing acoustic signals, comprising:
  - an optical fiber;
  - means for applying light to said optical fiber;
  - a reflective member displaced from said optical fiber;
  - means coupled to said optical fiber for detecting light incident on said reflective member from said optical fiber and reflected back to said optical fiber from said reflective member; and
  - a cantilevered beam responsive to acoustic signals to alter the path of light between said reflective member and said optical fiber.

4,414,472

#### METHOD FOR DETERMINING THE SOLIDS WEIGHT FRACTION OF A SLURRY

John S. Watt, Heathcote, Australia, assignor to Australian Atomic Energy Commission, New South Wales, Australia

Filed Sep. 17, 1980, Ser. No. 187,884

Claims priority, application Australia, Sep. 27, 1979, PE 0686

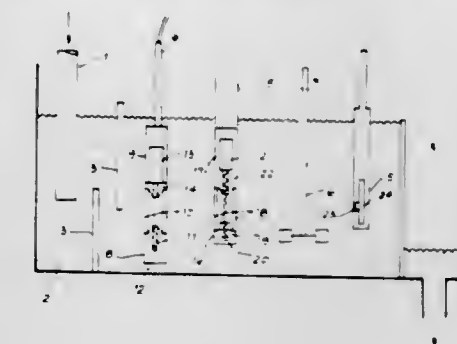
Int. Cl.<sup>3</sup> G01N 23/00

U.S. Cl. 250-359.1

14 Claims

1. A method for determination of the solids weight fraction

of a slurry comprising determining the relative concentration of hydrogen by weight in said slurry by neutron scatter or



transmission measurement, and calculating the solids weight fraction from said concentration of hydrogen.

4,414,473

#### RESILIENT MOUNT FOR MODULAR DETECTOR CELL

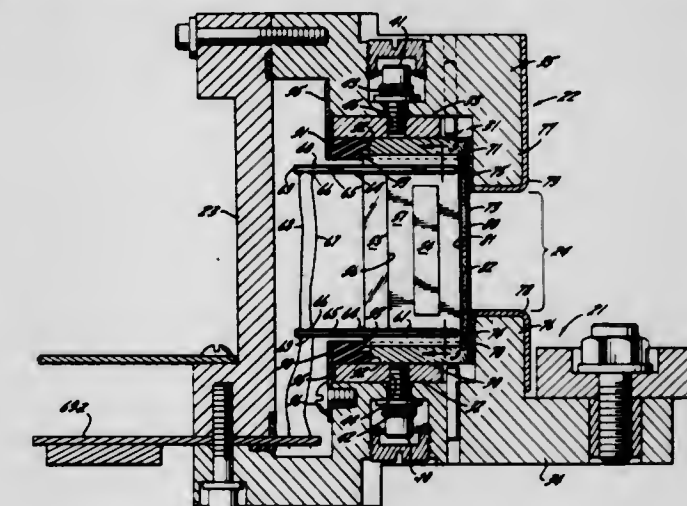
David M. Hoffman; Dennis Pritzkow, and George R. Lang, all of New Berlin, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 23, 1981, Ser. No. 236,804

Int. Cl.<sup>3</sup> G01T 1/20

U.S. Cl. 250-366

6 Claims



1. In a scintillation detector having a housing including a pair of arcuate opposed end members carrying slots for receiving collimator plates, a plurality of collimator plates for slidably but snugly fitting into opposed slots to define a plurality of detector cells, and means associated with each plate for detecting radiation received by its cell and producing an electrical signal in response thereto, the improvement comprising, arcuate stop means intersecting the slots for defining a plate reference position for each cell, window means disposed proximate the arcuate stop for admitting X-radiation but excluding light from the detector cells, resilient sealing means associated with the window and disposed to protrude past the plate reference position into the cells when uncompressed, the resilient sealing means being disposed to engage the plurality of collimator plates at discrete locations to effect an optical seal between adjacent cells, and resilient lock means adapted to bear at discrete locations against each of a plurality of plates for individually urging each of the plurality of plates against the arcuate stop and into the resilient sealing means to lock and seal the associated detector cells.



4,414,474

**CORRECTOR FOR AXIAL ABERRATIONS IN ELECTRON OPTIC INSTRUMENTS**

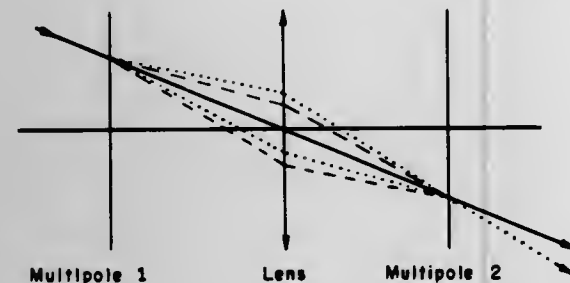
Albert V. Crewe, Palos Park, Ill., assignor to University Patents, Inc., Norwalk, Conn.

Filed Feb. 17, 1982, Ser. No. 349,442

Int. Cl.<sup>3</sup> H01J 3/12, 37/153

U.S. Cl. 250—396 R

6 Claims



1. In an electron optic system, having a source of electrons, the improvement in the system for correction of third-order aberrations such that the point resolving power is reduced to less than 1.0 Angstrom unit, comprising: aligned first and second spaced sextupole means and an intermediately disposed magnetic field lens means, all interposed between first and second conventional condenser lens means, such that the respective sextupole means are imaged on each other.

4,414,475

**SHIELDING CONTAINER FOR STORING WEAK TO MEDIANLY ACTIVE WASTE**

Gerhard Kratz, Rodgau, and Erich Marr, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

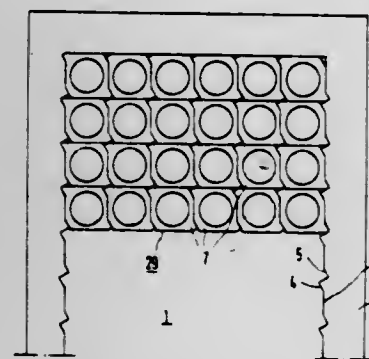
Filed Oct. 6, 1981, Ser. No. 309,069

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038592

Int. Cl.<sup>3</sup> G21F 5/00; G21C 19/40

U.S. Cl. 250—506.1

11 Claims



1. Shielding container assembly for storing weak to medianly active waste in a storage barrel, comprising a plurality of shielding containers each having massive concrete walls in a substantially square cross section surrounding the storage barrel, each shielding container having two pairs of oppositely-disposed sections, one of said pairs having symmetrical projections formed thereon with a given shape extended outward from said substantially square cross section and the other of said pairs having recesses with said given shape formed therein extended into said substantially square cross section, each of said projections being releasably anchored in a respective one of said recesses of an adjacent shielding container when stacking said shielding containers in a horizontal row.

4,414,476

**VARIABLE ANGLE OPTICAL SENSING SYSTEM FOR DETERMINING THE ORIENTATION OF WEFT THREADS**

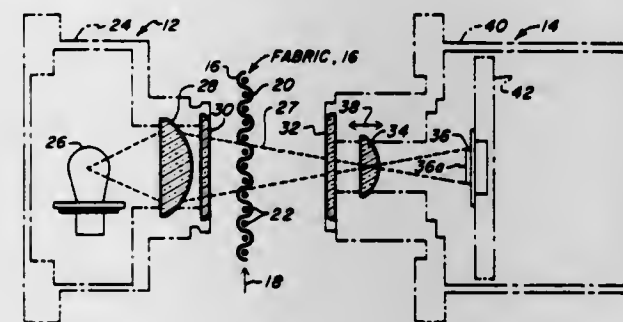
Edward L. Maddox, Lexington, Mass., and Thomas E. Pitts, Warren, R.I., assignors to SW Industries, Inc., Providence, R.I.

Filed Jun. 19, 1981, Ser. No. 275,203

Int. Cl.<sup>3</sup> G01N 21/88

U.S. Cl. 250—563

14 Claims



1. In a system for sensing the angular orientation of weft threads in a web that is moving in a first direction, said system including a light source that directs a beam of light onto the web and optical means for forming an image of the weft threads generated by transmitted light from said light source, the improvement comprising,

a sensor array disposed to receive said transmitted light image on a face thereof, said face including a plurality of elongated, narrow photosensitive areas that are radially aligned with respect to one another, each of said areas generating an electrical signal that is responsive to the total intensity of said transmitted light incident upon it, the width of each of said areas being selected so that the movement of said weft threads past said array which are substantially aligned with one of said areas produces a detectable degree of modulation of said electrical signal, and the length of each of said areas being selected to provide a good signal-to-noise ratio for said electrical signal; and

means for rotating said light source and said sensor array in coordination with one another and in a plane generally transverse to the direction of travel of said web to vary the angle of incidence of said light beam with respect to said web.

4,414,477

**WIND ENERGY CONVERTOR**

Anthony J. S. Mewburn-Crook, and Dominic T. Mewburn-Crook, both of 16 Avenue Rd., Isleworth, Middlesex, TW7 4JN, England

Filed Mar. 15, 1982, Ser. No. 357,867

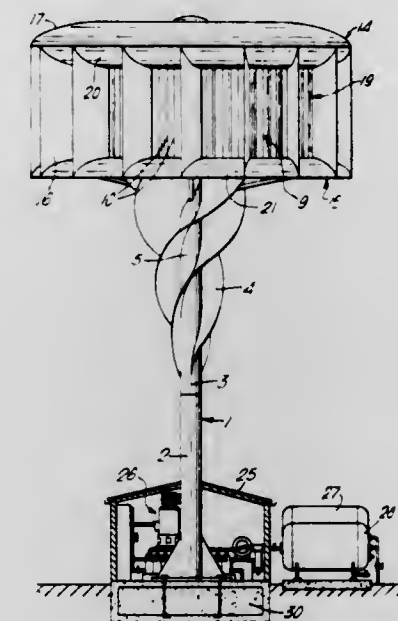
Int. Cl.<sup>3</sup> F03D 9/00

U.S. Cl. 290—55

18 Claims

1. A wind energy convertor comprising an upstanding column; a fan which is supported on the upper end of the column in such a way that the fan is freely rotatable about the axis of the column and which comprises a plurality of circumferentially spaced radially extending blades; and, supported by, and freely rotatable about the axis of, the column, a substantially circular turbine which surrounds and is radially spaced from an uppermost part of the column and which comprises a plurality of circumferentially spaced blades extending lengthwise with respect to the column, the arrangement being such that wind blowing against the blades of the turbine will drive the turbine rotatably about the axis of the column to cause wind to be

directed upwardly within the turbine to drive the fan rotatably about the axis of the column in the same rotational direction as



the turbine, thereby converting the energy of the wind into rotational mechanical energy.

4,414,478

**ELECTRONIC SWITCHING DEVICE**

Kenji Ueda, Otsu, and Kiyoshi Miyamoto, Nagaokakyo, both of Japan, assignors to Omron Tateisi Electronics Co., Nagaokakyo, Japan

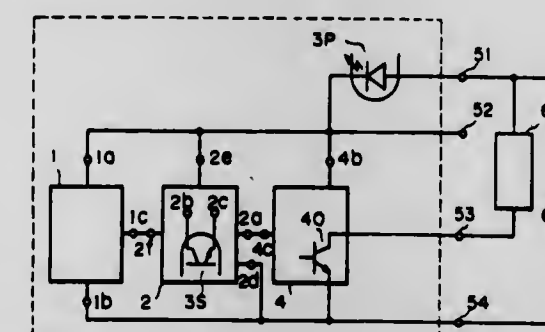
Filed Mar. 5, 1981, Ser. No. 240,939

Claims priority, application Japan, Mar. 3, 1980, 55-36426; Mar. 3, 1980, 55-36427; Mar. 3, 1980, 55-36428; May 16, 1980, 55-65131; May 16, 1980, 55-65132

Int. Cl.<sup>3</sup> H01H 35/00

U.S. Cl. 307—116

7 Claims



1. Electronic switching device comprising external terminal means for connecting the switching device with an external power source for power supply to the device and with a load for switching the same, detection circuit means for developing a detection signal, polarity switching means connected to said detection circuit means for switching a polarity of said detection signal to a predetermined polarity and generating a switched signal, and

output circuit means connected to said polarity switching means for, in response to said switched signal, switching said load which is connected to said external terminal means, said polarity switching means including an optocoupler member which includes a first light projecting element connected to said external terminal means and a first light receiving element interposed between said detection and output circuit means, whereby, when said first light projecting element is energized, the polarity of said detection signal is switched into said predetermined polarity by said first light receiving element.

4,414,479

**LOW DISSIPATION SNUBBER FOR SWITCHING POWER TRANSISTORS**

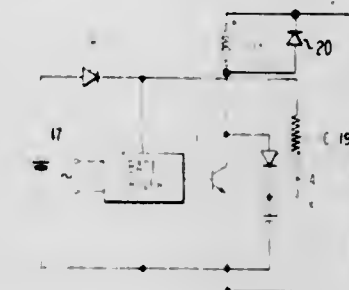
James W. B. Foley, Peru, Mass., assignor to General Electric Company, Salem, Va.

Filed Jul. 14, 1981, Ser. No. 283,219

Int. Cl.<sup>3</sup> H03K 17/04, 17/60

U.S. Cl. 307—253

5 Claims





a first transmission line connected between an output circuit and a receiver circuit, wherein the transmission line is not terminated at the receiver circuit end to thereby result in a reflection of a signal from the output circuit, said reflected signal combining with the signal from the output circuit to increase the amplitude of the signal at the receiving circuit and thereby reduce the current requirements of the output circuit, wherein the output impedance of the output circuit is approximately equal to the characteristic impedance of the transmission line so as to provide termination for the end of the transmission line connected to the output circuit to thereby absorb reflected signals.

4,414,481

## STATOR FOR ROTATING ELECTRIC MACHINE

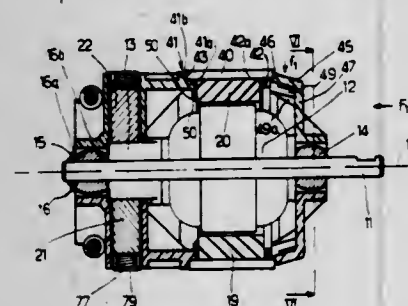
Gerrit de Jong, Maurepas, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Continuation of Ser. No. 60,738, Jul. 25, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,552

Claims priority, application France, Jul. 31, 1978, 78 22642 Int. Cl.<sup>3</sup> H02K 5/00

U.S. Cl. 310-42

10 Claims



1. In a rotating electric machine, a stator comprising induction means and a casing formed of two separable non-magnetic elements, a magnetizable integral cylindrical holding piece disposed outside said casing for holding said two separable non-magnetic elements in abutment one with the other, said magnetizable integral holding piece forming a closed circuit for the magnetic field flux of said induction means, said separable non-magnetic elements of the casing being identical with each other and applied one against the other along a plane passing through the axis of the rotating machine, each element of the casing having first and second outer axial abutments, between which the holding piece is maintained, the first abutment being stationary and the second abutment being resilient in a radial direction so that it may be retracted for allowing the axial mounting of said holding piece on said casing.

4,414,482

NON-RESONANT ULTRASONIC TRANSDUCER ARRAY FOR A PHASED ARRAY IMAGING SYSTEM USING  $\lambda$  PIEZO ELEMENTS

George K. Lewis, San Jose, and Michael Buchin, Palo Alto, both of Calif., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed May 20, 1981, Ser. No. 265,623

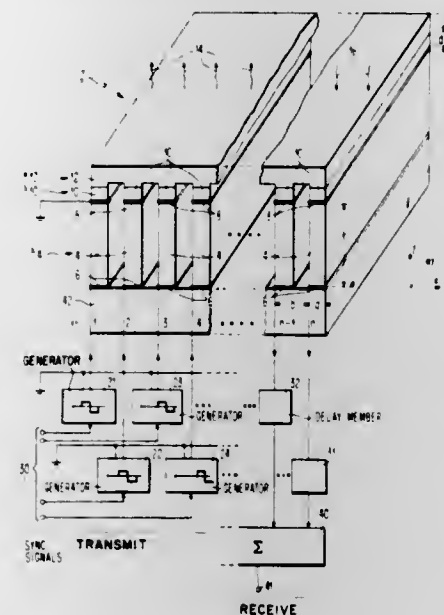
Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310-334

12 Claims

1. In a phased array transducer for transducing ultrasound of a predetermined frequency, comprising  
(a) a plurality of piezoelectric elements having all the same natural frequency, each of said elements having a first and a second surface which are located opposite to each other, and  
(b) a first and a second electrode provided on said first and said second surface, respectively, of each of said elements,

the improvement wherein a distance between said first and second surface is one quarter of the wavelength that ultra-



4,414,483

## SPARK PLUG AND MANUFACTURING PROCESS THEREOF

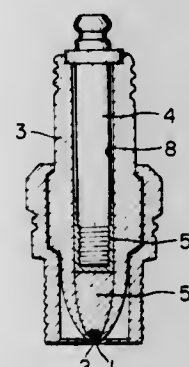
Kanemitsu Nishio, Komaki; Shunichi Takagi, Tajimi, and Yasuhiko Suzuki, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Sep. 10, 1980, Ser. No. 185,955

Claims priority, application Japan, Sep. 14, 1979, 54-118047 Int. Cl.<sup>3</sup> H01T 13/20; F23Q 3/70

U.S. Cl. 313-136

30 Claims



1. A spark plug, comprising:  
a refractory insulator with a center bore having a bottom end provided with a small end bore having a smaller diameter than the center bore; and  
a center discharge electrode therein which has a discharge end of semispherical or semispheroidal surface and is formed by melting metallic powder charged in said small end bore and/or in the bottom end of said center bore.

4,414,484

## ELECTRIC INCANDESCENT LAMP

Victor R. Notelteirs, and Stephanus J. Claessens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,437

Claims priority, application Netherlands, Jul. 14, 1980, 8004030

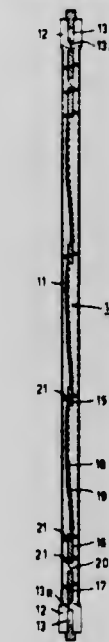
Int. Cl.<sup>3</sup> H01J 1/88, 19/42; H01K 1/18

U.S. Cl. 313-273

1 Claim

1. An electric incandescent lamp having a light-transmitting tubular lamp envelope having first and second ends, first and

second conductors disposed respectively at said first and second ends, a filament stretched longitudinally in the lamp envelope between said ends, said filament having respective ends electrically connected to said first and second conductors, said envelope being sealed respectively at said first and second ends in a vacuum-tight manner around said first and second conductors, said filament having a plurality of light-emissive axial sections of helically wound tungsten wire, adjacent light-emis-



sive axial sections being connected to each other by an axial section of the same piece of tungsten wire from which said light-emissive axial sections are wound, each of said axial sections of said piece of tungsten wire extending substantially in the longitudinal direction of the lamp envelope, and a wire of a less noble metal than tungsten being wound around said axial sections of the same piece of tungsten wire between adjacent light-emissive axial sections.

4,414,485

## CONTROL-SCREEN ELECTRODE SUBASSEMBLY FOR AN ELECTRON GUN AND METHOD FOR CONSTRUCTING THE SAME

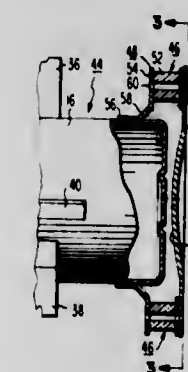
Frank D. Marschka, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1981, Ser. No. 276,264

Int. Cl.<sup>3</sup> H01J 29/46, 9/04

U.S. Cl. 313-451

5 Claims



1. In an electron gun for use in a cathode-ray tube, said gun including a cathode assembly, a control electrode, a screen electrode and at least one other electrode, each of said electrodes having an electron beam aperture therein, said beam apertures being aligned for the passage of an electron beam therethrough, the improvement comprising,  
said screen electrode having a plurality of control electrode alignment apertures disposed around the periphery thereof, and  
a plurality of insulative support assemblies, each of said support assemblies including a first support plate and a

ceramic member having two ends, said first support plate being bonded to one end of said ceramic member, the other end of said ceramic member being referenced to one of said alignment apertures disposed around the periphery of said screen electrode and interconnected thereto, each of said first support plates including a locating portion being located on a contour defining the outer shape of said control electrode, said locating portions being attached to said control electrode.

4,414,486

## COUPLED CAVITY TYPE TRAVELING WAVE TUBE

Kunio Tsutaki, and Takao Kageyama, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

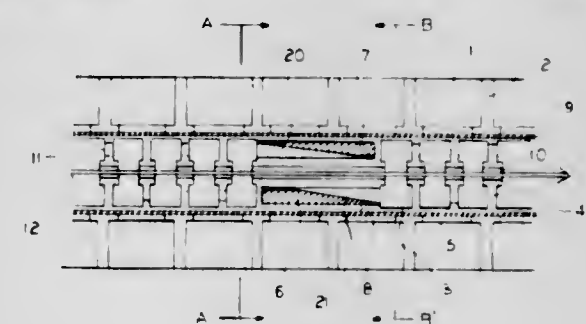
Filed Jul. 7, 1981, Ser. No. 281,297

Claims priority, application Japan, Jul. 9, 1980, 55-93441

Int. Cl.<sup>3</sup> H01J 25/34

U.S. Cl. 315-3.6

15 Claims



1. A coupled cavity type traveling wave tube having an electron gun and a collector, said tube comprising a plurality of coupled cavity type slow-wave circuit means, a first and second of said coupled cavity type slow-wave circuit means being mounted with separation to provide therebetween an electron beam drift space, two non-reflective waveguides elongating in the direction parallel to an axis of said tube along said electron beam drift space to sandwich said electron beam drift space therebetween, and an electron beam focusing device having a plurality of permanent magnets and a plurality of pole pieces which are alternately and periodically arrayed in the direction parallel to said axis of said tube to continuously cover said first slow-wave circuit means, said two non-reflective waveguides, and said second slow-wave circuit means without omission of any magnet, one of said non-reflective waveguides being coupled to said first slow-wave circuit means and the other being coupled to said second slow-wave circuit means with respect to a high frequency wave.

4,414,487

## SUPERCONDUCTING ELECTRON BEAM GENERATOR

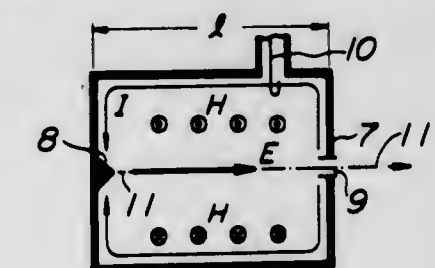
Tsutomu Yamashita, and Jinichi Matsuda, both of Nagaoka, Japan, assignors to Technological University of Nagaoka, Nagaoka, Japan

Filed Oct. 14, 1981, Ser. No. 311,238

Claims priority, application Japan, Dec. 29, 1980, 55-187596 Int. Cl.<sup>3</sup> H01J 23/065

U.S. Cl. 315-5

4 Claims



1. A superconducting electron beam generator, comprising:



a cavity resonator having a hollow cylindrical portion, a first end plate secured to one end of said cylindrical portion and a second end plate secured to the other end of said cylindrical portion, said second end plate having an aperture in the central part thereof, an electric field being applied to said resonant cavity; and

a metal member formed of a material having superconductive properties secured to said first end plate and projecting into said cavity, said superconductive metal member including a tip portion positioned opposite and spaced from said aperture by a distance on the order of the length of said cavity, the tip of said superconductive metal member being positioned within said cavity resonator in a region where said electric field has a maximum intensity and being maintained in a superconducting state, whereby a high energy electron beam is emitted from the tip of said superconductive metal member and passes through the aperture in said second end plate.

4,414,488

# APPARATUS FOR PRODUCING A DISCHARGE IN A SUPERSONIC GAS FLOW

Peter Hoffmann, Stuttgart; Helmut Hügel, Sindelfingen; Wolfgang Schall, Leinfelden-Echterdingen, and Schock, Wolfram, Sindelfingen, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

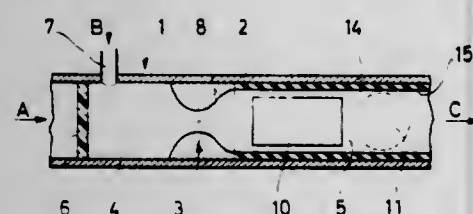
Filed Jun. 26, 1980, Ser. No. 163,281

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952046

Int. Cl.<sup>3</sup> H01J 7/46, 19/80

U.S. Cl. 315—39

7 Claims



1. Apparatus for producing a discharge in a supersonic gas flow comprising:

- (a) a waveguide;
- (b) a channel for gas flow formed within said waveguide;
- (c) means for causing gas flow through the channel;
- (d) a microwave generator connected to said waveguide for propagating microwaves substantially in the direction of gas flow;
- (e) a supersonic nozzle in the channel for expansion and simultaneous acceleration of the gas to supersonic speed, said nozzle dividing the channel into an upstream plenum and a downstream low pressure region;
- (f) said nozzle comprising a low-loss dielectric material; and
- (g) dielectric material placed adjacent the interior wall of said waveguide to concentrate gas flow in the region of high field strength.

4,414,489

# COMPACT ELECTRIC DISCHARGE LAMP-AND-BALLAST UNIT, AND PLUG-IN BALLAST MODULE THEREFOR

Robert G. Young, Nutley, N.J., assignor to North American Phillips Electric Corp., New York, N.Y.

Filed Nov. 4, 1981, Ser. No. 318,224

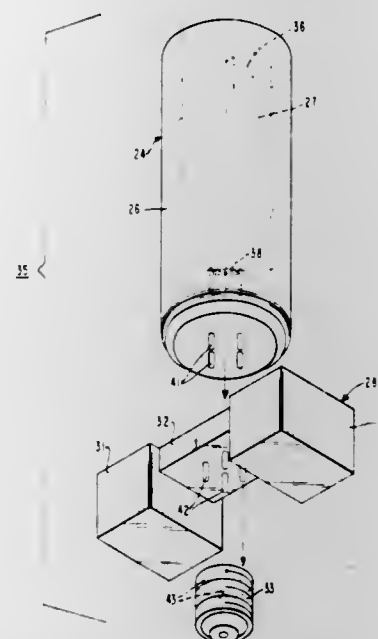
Int. Cl.<sup>3</sup> H01J 7/44, 13/46, 17/34, 19/78, 23/16, 29/96; H01K 1/62

U.S. Cl. 315—51

20 Claims

1. As a new article of manufacture adapted for use as a detachable ballast means for a compact electric discharge lamp, an elongated module having a medial segment and a pair

of laterally-extending offset segments each of which contains electrical components that comprise parts of the ballast circuit, the thickness and width dimensions of said module being less



than the length dimension thereof and said medial segment having plug-in type contact means that is connected to said electrical components and engageable in a direction transverse to the longitudinal axis of the module.

4,414,490

# DISPLAY PANEL

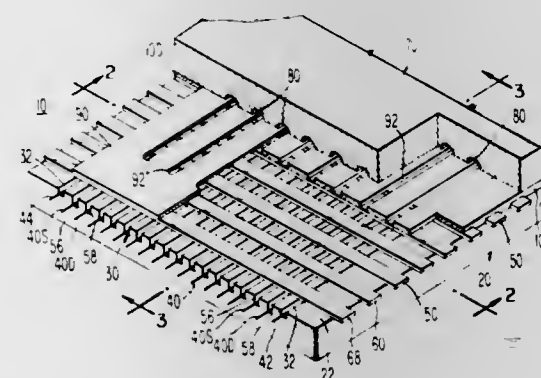
Edgar L. Harvey, Jamesburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1982, Ser. No. 355,677

Int. Cl.<sup>3</sup> H05B 37/00, 39/00

U.S. Cl. 315—169.4

7 Claims



1. A display panel comprising

a gas-filled envelope made up of a glass base plate and a glass viewing face plate,

anode and cathode means forming a plurality of columns of gas cells, the first, third, fifth, seventh, etc. columns of gas cells including both scan cells which do not perform a display function and display cells which perform a display function, the second, fourth, sixth, eighth, etc. columns of cells including only scan cells which do not perform a display function.

4,414,491

# CURRENT LIMITING POWER SUPPLY FOR ELECTRON DISCHARGE LAMPS

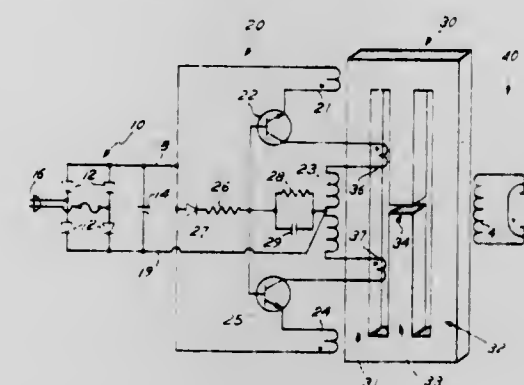
William J. Elliott, Zephyr Cove, Nev., assignor to Quietlite International, Ltd., Reno, Nev.

Filed Aug. 10, 1981, Ser. No. 291,394

Int. Cl.<sup>3</sup> H05B 37/00

U.S. Cl. 315—282

5 Claims



1. A current limiting power supply comprising, in combination,

a ferromagnetic transformer core structure, at least a portion of which comprises a magnetically saturable material, comprising first, second and third magnetic flux paths joined at one of their respective ends at a first common junction and joined at their opposing ends at a second common junction,

a primary winding wound about the first of said paths,

a secondary winding wound about the second of said paths,

an auxiliary winding wound about the third of said paths,

a semiconductor switching circuit having its input connected to a source of electrical energy and having its output connected to supply a high-frequency alternating current to the series combination of said primary winding and said auxiliary winding, said semiconductor switching circuit including at least one control winding for controlling the switching time of said semiconductor circuit in response to the saturation of said saturable material, and

a load circuit connected to said secondary winding.

4,414,492

# ELECTRONIC BALLAST SYSTEM

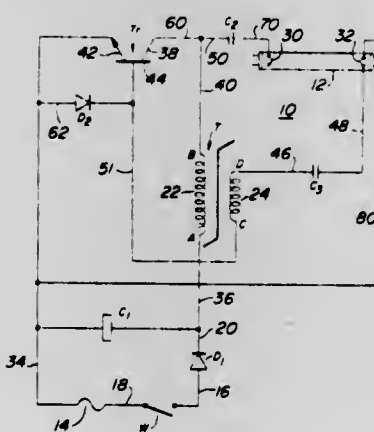
Jacques M. Hanlet, Loxahatchee, Fla., assignor to Intent Patent A.G., London, England

Filed Feb. 2, 1982, Ser. No. 344,155

Int. Cl.<sup>3</sup> H05B 37/00

U.S. Cl. 315—290

36 Claims



1. An electronic ballast system connected to an AC power source for a gas discharge tube having a first and second filament, comprising:

- (a) a first capacitor electrically coupled in series to said first filament of said gas discharge tube;

(b) a transistor having a base, emitter, and collector, said collector being connected to said first capacitor; and,

(c) transformer means having a primary winding coupled on a first end to said AC power source and on a second end to said first capacitor and said collector of said transistor, and a secondary winding coupled on opposing ends thereof in positive feedback relation to said base of said transistor and said emitter of said transistor, said primary winding being coupled in series relation with a parallel combination of (1) said emitter and collector of said transistor, and (2) said series coupled first capacitor and said gas discharge tube.

4,414,493

# LIGHT DIMMER FOR SOLID STATE BALLAST

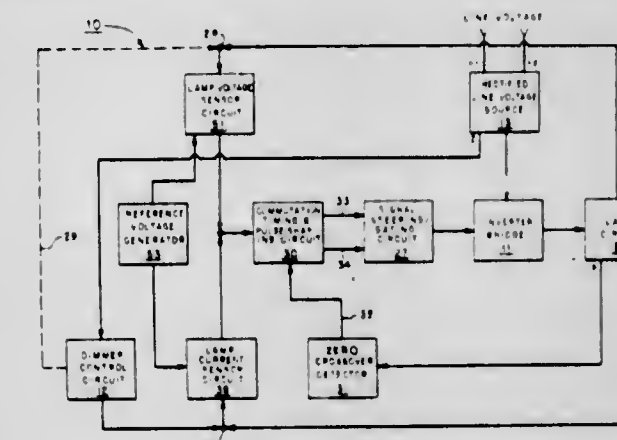
William H. Henrich, Sparta, Tenn., assignor to Thomas Industries Inc., Louisville, Ky.

Filed Oct. 6, 1981, Ser. No. 309,086

Int. Cl.<sup>3</sup> G05F 1/00; H05B 37/02

U.S. Cl. 315—308

12 Claims



1. In a high frequency solid state ballast for energizing gaseous discharge lamp means, a dimming circuit for varying the current in said gaseous discharge lamp means comprising:

an inverter circuit for receiving power from a line source and generating a high frequency inverter signal, said inverter circuit coupled to said lamp means for providing said high frequency inverter signal thereto;

first detector circuit means responsive to signals in said lamp means for generating a timing signal in timed relation with said inverter signal;

reference voltage generator means for generating a reference voltage;

current sensor circuit means coupled to said lamp means and responsive to the current flowing therein and coupled to said reference voltage source for receiving and comparing said reference voltage with a signal representing the current in said lamp means and for generating an output signal in response to said comparison;

control logic means responsive to said timing signal and said output signal for actuating said inverter circuit to regulate the current in said lamp means;

a current source derived from said line source; and

first variable control means coupled to said current source and to said current sensor circuit means and said lamp means for generating a dimming control signal and combining said dimming control signal with said signal representing the current in said lamp means for providing a composite control signal to said current sensor circuit means wherein said composite control signal is compared with said reference voltage for selectively varying the output signal provided to said control logic means in actuating said inverter circuit and controlling the intensity of said gaseous discharge lamp means.



4,414,494

REGULATION OF THE SCAN WIDTH OF A RASTER  
SCANNED CRT DEFLECTION SYSTEM

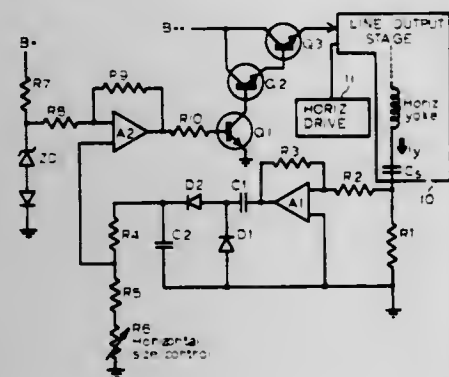
Terrance C. Schmidt, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Apr. 6, 1981, Ser. No. 251,517

Int. Cl.<sup>3</sup> H01J 29/70, 29/72

U.S. Cl. 315—395

5 Claims



1. In combination with a horizontal scanning system for a CRT, said system being of the resonant shunt efficiency type and including a damper diode, a tuning capacitor, a decoupling capacitor, switching means and a horizontal deflection coil; means for supplying a variable frequency drive signal to said scanning system to produce a horizontal scan of variable frequency; a variable output voltage power supply for supplying a variable power supply voltage to said horizontal scanning system; means for deriving an error signal indicative of a change in magnitude of the peak to peak deflection current in said coil from a predetermined magnitude; and means for supplying said error signal to said variable output voltage power supply to decrease said voltage in response to an increase in said magnitude of said peak to peak deflection current and to increase said voltage in response to a decrease in said magnitude of said peak to peak deflection current, thereby to maintain said magnitude of said peak to peak deflection current substantially constant regardless of changes in frequency of the horizontal scan.

4,414,495

SYNCHRONISM EQUIPMENT FOR GEAR CUTTING  
MACHINES

Masaki Sumi, and Tomoyuki Doi, both of Shiga, Japan, assignors to Kashifuji Works, Ltd., Kyoto, Japan

Filed Oct. 27, 1981, Ser. No. 315,417

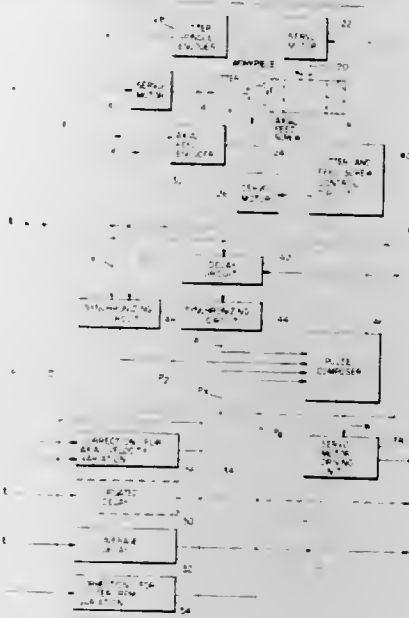
Int. Cl.<sup>3</sup> G05B 19/24

U.S. Cl. 318—571

14 Claims

1. Apparatus for controlling synchronism between a rotating cutter and a rotating workpiece of a gear cutting machine, said apparatus comprising means for receiving a cutter rotation signal representing rotation of said cutter, and workpiece synchronizing means for processing said cutter rotation signal to provide a command signal for driving said workpiece, said synchronizing means comprising a timing means for delaying or advancing in time the influence of said cutter rotation signal on said command signal by an amount which is dependent upon a predetermined estimate of a workpiece delay time and which is selected

to reduce synchronism errors due to said delay time, said workpiece delay time being the delay between application



of said command signal and the corresponding movement of said workpiece.

4,414,496

ELECTRONIC TYPEWRITER AND ITS CONTROL  
APPARATUS

Tomoyoshi Watanabe, Chiryu; Takanobu Hirayama, Chita; Motokazu Yoshimura, Nagoya; Kenji Mizuno, Nagoya, and Yukio Inukai, Nagoya, all of Japan, assignors to Brother Industries, Ltd., Nagoya, Japan

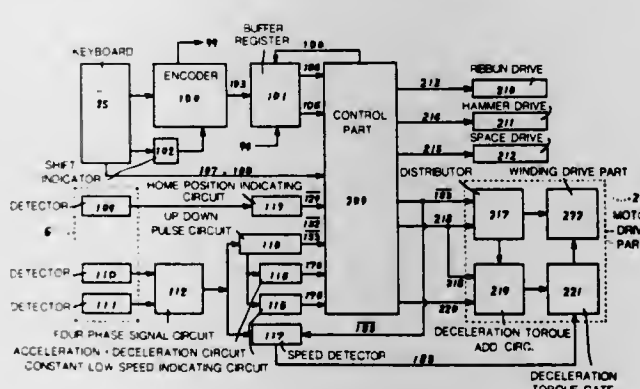
Division of Ser. No. 13,329, Feb. 21, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 204,675

Claims priority, application Japan, Mar. 7, 1978, 53-25856

Int. Cl.<sup>3</sup> H02K 29/04

U.S. Cl. 318—696

1 Claim



1. In a step motor arrangement which drives a rotor member, said step motor arrangement having clock pulse means and pulse energizing means for energizing said step motor arrangement to various stages of energization, said rotor member having a defined home position, said step motor arrangement driving said rotor member stepwise one or a number of desired angular rotational steps from said home position to a desired stable last step position, where each step spans a predetermined angle, all of the step angles being equal, a step motor control system for accelerating the rotational speed of said rotor member during an acceleration phase as it turns from said home position to a point at least prior to one-half of the step angle before said last step position and decelerating the rotational speed of the rotor member during a deceleration phase for the remaining distance, as it travels to said desired last step position, and wherein information as to said last step position is provided by utilization means, said step motor control system comprising in combination:

- (a) start-stop pulse means (300) coupled to the utilization means, said start-stop pulse means (300) generating a first pulse (328) to start the rotation of said step motor arrangement, said start-stop pulse means including one-shot means (200) and a pulse carrying circuit (201, 202, 203, 204) said pulse carrying circuit being coupled to said step motor arrangement and providing an input drive pulse (206) and an initiating signal (207) to a gate (203) which permits a driving clock pulse signal (205) from the clock pulse means to drive the step motor arrangement;
- (b) a detecting and signal giving circuit (6, 112) including a home position indicating circuit (113), said detecting and signal giving circuit detecting a plurality of angular step positions of said step motor arrangement and generating a position signal corresponding to each of said angular step positions, said detecting and signal giving circuit further including a shutter disc (6a) so coupled to said step motor arrangement as to rotate with said rotor member (3), light emitting means (109a, 110a, 111a) disposed on one side of said shutter disc (6a) cooperating with light sensitive detection means (109, 110, 111) on the other side of said shutter disc (6a), with direction reading means (122, 124) providing clockwise and counter-clockwise direction-of-rotation signal information (119, 121, 123, 125);
- (c) an accelerate-decelerate circuit (115) coupled to said detecting and signal giving circuit (6, 112), said accelerate-decelerate circuit generating an acceleration-deceleration pulse signal (170) in response to the position signal at each of said step positions, said acceleration-deceleration pulse signal being given at least more than a half-step but less than one step of rotation before said last step position, said acceleration-deceleration circuit including a speed detector (117), said speed detector (117) receiving said direction-of-rotation signal information outputs (119, 121, 123, 125);
- (d) drive pulse means (216) including a control part (209) coupled for driving said step motor arrangement according to said first pulse (328) and said acceleration-deceleration pulse signal generated by said acceleration-deceleration circuit, said drive means (216) being coupled to said speed detector (117) receiving a signal (185) therefrom whose strength corresponds to the rotational speed of the rotor member at each step, said drive means (216) including a distributor (217), a deceleration-torque adding circuit (219) and a deceleration torque gate (221), said step motor arrangement having a plurality of windings, said distributor (217) being coupled thereto and providing a signal for energizing at least one of the windings for rotation, and deceleration torque gate (221) being also coupled to said windings and supplying a flow of energizing force to windings other than the said one winding so as to apply a deceleration torque to the step motor arrangement;
- (e) boundary position indicating means (290) coupled to said drive means (216) for indicating the boundary position between the acceleration phase and deceleration phase, including an up-down counter (257) to count the number of clockwise and counter-clockwise steps from the rotor member home position at each step, a compare circuit (259) coupled to said up-down counter (257) and receiving an input as to said last step position from the utilization means, an operating circuit (278) and a divider (279) computing the number of steps to some boundary which is the midpoint of the entire number of steps to go from the home position to the last position, said boundary position indicating means (290) providing a boundary pulse; and
- (f) pulse suppressing means (346) with gate means (362, 363, 364, 365, 366, 368, 369) said pulse suppressing means (346) being coupled to said boundary position indicating means (290) and to said driving means (216) for monitoring the feeding of drive pulses and also for suppressing one pulse of said acceleration-deceleration pulse signals in said boundary position so as to change the energization state of the step motor arrangement during the acceleration phase to a lower state of energization at a position at least more than a half step but less than one step before said stable last

position and shifting the energization of the step motor arrangement during the deceleration phase to a lower state of energization, said pulse suppressing means (346) including a last signal forming circuit (282) triggered by said boundary pulse, and, said last signal forming circuit (282) supplying a last pulse (218k).

4,414,497

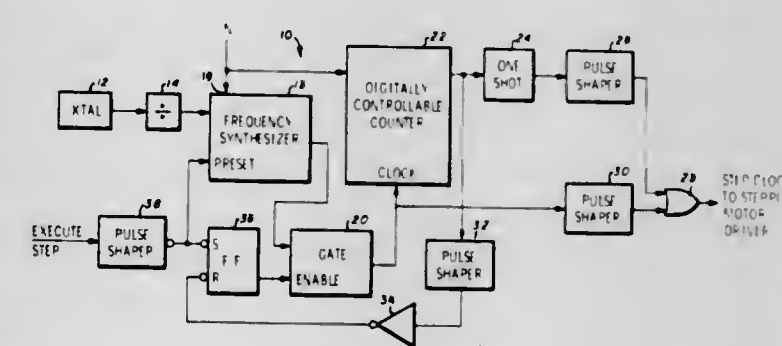
DIGITALLY CONTROLLABLE ELECTRONIC DAMPER  
Hubert Song, Sunnyvale, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Jan. 22, 1981, Ser. No. 227,180

Int. Cl.<sup>3</sup> G05B 19/40

U.S. Cl. 318—696

6 Claims



1. A digitally controllable electronic damper for stepper motors, comprising: digitally controllable frequency synthesizer means for generating a clock signal of a predetermined control frequency; first gate means for receiving said clock signal and including an enable input and an output whereby said clock signal is transmitted on said output when a signal is received on said enable input; digitally controllable counter means responsive to said clock signal on said output of the first gate means for generating a borrow signal after a digitally controllable number of pulses of said clock signal; delay means responsive to said borrow signal for generating a delayed pulse after a predetermined time; flip-flop means for generating an enable signal to be provided to said enable input of the first gate means and responsive to an execute signal to generate said enable signal and also responsive to said borrow signal to terminate said enable signal; and second gate means responsive to said clock signal transmitted by the first gate means and responsive to said delayed pulse for transmitting said clock signal and delayed pulse on an output.

4,414,498

## STEPPING MOTOR DRIVE CIRCUIT

Gerald A. Gessner, Munich, Fed. Rep. of Germany, assignor to Advanced Semiconductor Materials Die Bonding, Inc., Chandler, Ariz.

Filed Feb. 23, 1981, Ser. No. 236,840

Int. Cl.<sup>3</sup> G05B 19/40

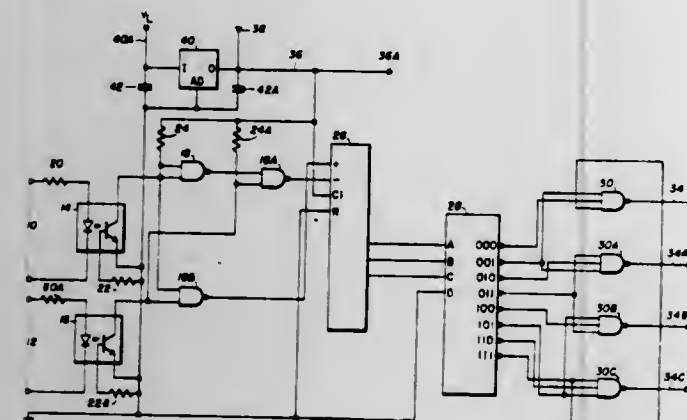
U.S. Cl. 318—696

22 Claims

1. A circuit for driving the motor coils of a stepping motor capable of bidirectional rotation, comprising: first means for receiving a control signal which when in a first state indicates a first desired direction of rotation and when in a second state indicates a second opposite desired direction of rotation; second means for receiving a plurality of stepping pulses; counting means coupled to said stepping pulses, said counting means incrementing when said control signal is in said first state and decrementing when said control signal is in said second state; third means coupled to said counting means for decoding selected states of said counting means to produce phase



voltage output pulses during which coil current is supplied to said motor coils;  
fourth means coupled to said third means and responsive to said phase voltage output pulses for producing coil current pulses;



fifth means for providing a high-voltage starting pulse at the beginning of each phase voltage output pulse to provide a desired coil current; and  
sixth means for maintaining said desired coil current after termination of said high voltage starting pulse for the remainder of said phase voltage output pulse.

4,414,499

#### MOTOR PROTECTING IMPROVED ENERGY ECONOMIZER FOR INDUCTION MOTORS

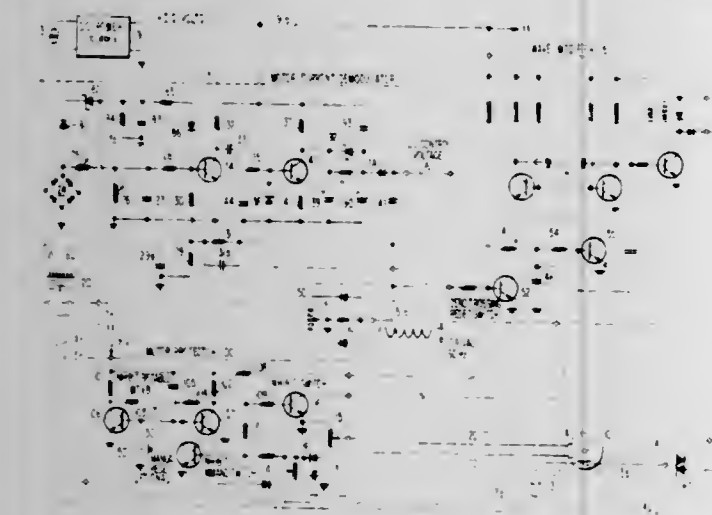
Rhey W. Hedges, Ft. Lauderdale, Fla., assignor to Dr. Louis W. Parker, Fort Lauderdale, Fla.

Filed Oct. 14, 1981, Ser. No. 311,122

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—798

15 Claims



1. A power control system comprising an AC induction motor having a rotor and a stator winding, a sine wave power supply, switching means coupling said power supply to said stator winding to effect rotation of said rotor, said switching means including a controllable wave modifier for applying varying fractions or complete cycles of the sine waves of voltage from said power supply to said stator winding in accordance with the inherent electromechanical properties of said motor and the energy requirements imposed on said motor by the rotor load at any given moment, means for monitoring the magnitude of inrush current to said stator winding for only a brief interval of time each time the current in said stator winding increases from zero, said brief time interval being a small fraction of each alternation from said power supply, said monitoring means including threshold means for providing an output pulse only when the magnitude of said inrush current is in excess of a predetermined value, pulse integrating means for integrating said output pulses, said pulse integrating means being operative to generate a control signal in response to persistent occurrence of said output pulses for a time period in excess of a predetermined time period, and control means

responsive to generation of said control signal by said pulse integrating means for inhibiting said switching means from coupling said power supply to said stator winding thereby to de-energize said stator winding.

4,414,500

#### VARIABLE MOTOR SPEED CONTROL

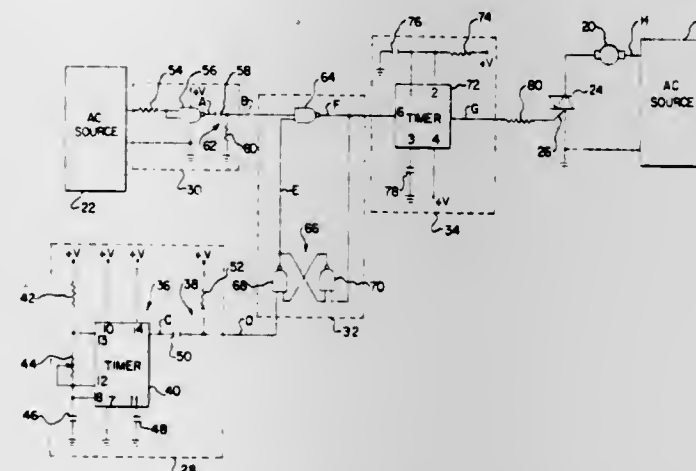
John T. Schneider, Apollo, Pa., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 1, 1982, Ser. No. 344,517

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—799

12 Claims



1. Apparatus for controlling the speed of a motor comprising:

- (a) a switch connected in series with the motor for controllably conducting an A.C. signal to the motor; and
- (b) means for controlling the switch which includes:
  - (1) first means for generating a series of pulses at a frequency which may be varied according to an input signal,
  - (2) second means for generating a pulse once per cycle at a zero crossing of the A.C. signal,
  - (3) third means for generating a pulse at said A.C. signal zero crossing if a pulse was produced by the first generating means during the A.C. cycle immediately preceding said zero crossing, and
  - (4) fourth means responsive to the output of the third generating means for generating a pulse which is supplied to and renders conductive said switch for one complete A.C. cycle.

4,414,501

#### PROGRAMMABLE SIGNAL AMPLITUDE CONTROL CIRCUITS

James F. Bedard; Charles W. Eichelberger, both of Schenectady, and Salvatore F. Nati, Jr., Syracuse, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 26, 1981, Ser. No. 267,274

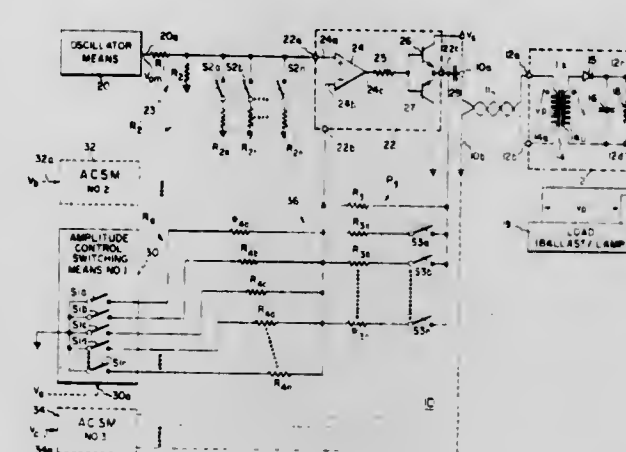
Int. Cl.<sup>3</sup> G01R 27/14; G05F 1/58

U.S. Cl. 323—280

15 Claims

1. A circuit for providing an output signal of controllable amplitude responsive to the data contained in at least one externally-provided digital control signal, comprising: an oscillator means for providing a periodic waveform having a selected frequency and a substantially constant amplitude; an operational amplifier having an inverting input, a non-inverting input and an output; first voltage divider means for providing the output waveform of said oscillator means to a selected one of said operational amplifier inverting and non-inverting inputs with an amplitude selected from a first plurality of selectable values, each less than the substantially constant amplitude of the oscillator means output waveform; second voltage divider means coupled to at least said opera-

tional amplifier output and a remaining one of said inverting and non-inverting inputs, for controlling the gain of said operational amplifier to said signal from said first voltage divider means, to a selected one of a second plurality of selectable values;  
means coupled to at least one of said first and second voltage



divider means for controllably switching the values thereof responsive to said at least one control signal; and  
a circuit output terminal coupled to said operational amplifier output, at which appears said circuit output signal with the frequency of said oscillator means output waveform and an amplitude controlled by the selected one of the first and second voltage divider means values.

4,414,502

#### CURRENT SOURCE CIRCUIT

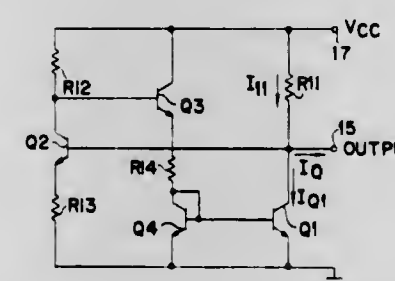
Thomas S. W. Wong, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 20, 1981, Ser. No. 285,180

Int. Cl.<sup>3</sup> G05F 3/20

U.S. Cl. 323—315

9 Claims



1. A current source circuit comprising  
a first resistance element coupled between a first voltage supply source terminal and an output node,  
a first transistor forming a collector-emitter current path between said output node and a second voltage supply source terminal,  
a first current path having a second resistance element coupled to said first voltage supply source terminal, a third resistance element coupled to said second voltage supply source terminal, and a second transistor forming a collector-emitter current path between said first and second resistance elements, and having a base electrode coupled to said output node,  
a second current path having a fourth resistance element, a third transistor forming a collector-emitter current path between said first voltage supply source and said fourth resistance element, and having a base electrode coupled to a collector electrode of said second transistor, and a fourth transistor in a diode-connected mode forming a collector-emitter current path between said fourth resistance element and said second voltage supply source terminal, and having a base terminal coupled to a base electrode of said first transistor.

4,414,503

#### LOW VOLTAGE REGULATION CIRCUIT

Masami Hashimoto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

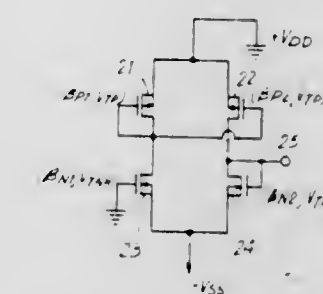
Filed Dec. 7, 1981, Ser. No. 328,348

Claims priority, application Japan, Dec. 10, 1980, 55-174162; Sep. 4, 1981, 56-139548

Int. Cl.<sup>3</sup> G05F 3/08

U.S. Cl. 323—315

19 Claims



1. A low voltage regulation circuit comprising:  
a power supply having a positive and a negative terminal;  
a first and second branch circuit in parallel across said power supply, each said branch circuit including a N channel and a P channel transistor with source/drains in series, the channel transistors of one conductivity type having different threshold voltages, the channel transistors of the other conductivity type having the same threshold voltages;  
a load terminal, said load terminal being connected in circuit with said parallel branch circuits and being adapted for connection with one end of a load, load current flowing from said load terminal through said connected load when the other end of said load connects to one said terminal of said power supply, the voltage between said load terminal and said one power supply terminal being the difference in threshold voltages of said one conductivity type of channel transistors.

4,414,504

#### FRACTIONAL DOPPLER COUNTING

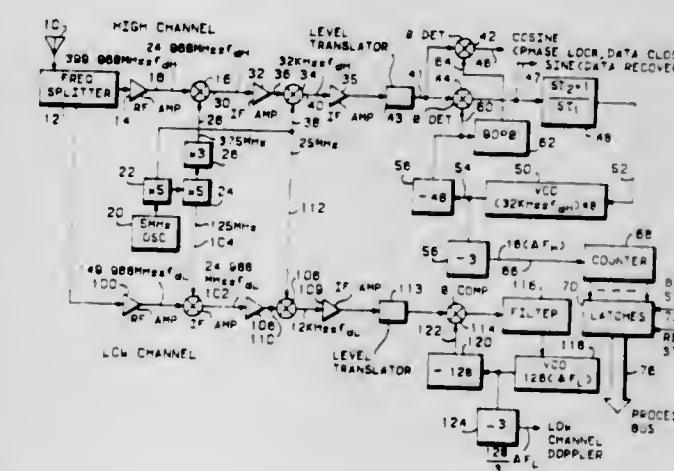
Howard L. Kennedy, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 5, 1980, Ser. No. 204,097

Int. Cl.<sup>3</sup> G01R 23/02

U.S. Cl. 324—78 R

6 Claims



1. An improvement in a system for measuring cycle counts of an unknown frequency varying signal, comprising a phase locked loop having a phase detector, the phase detector having at least an output terminal and two input terminals, and a controlled oscillator having at least an output signal terminal, the improvement comprising:  
an N factor divider circuit having an input terminal and an output terminal, said input terminal of said divider being



connected to the output terminal of the controlled oscillator, said output terminal of said divider being connected to one of the two input terminals of the phase detector; and a counter having an input terminal and a plurality of output terminals, said input terminal of said counter being connected to the output terminal of the controlled oscillator, said plurality of output terminals being adapted for producing an output signal responsive to a multiple of the cycle count of the unknown varying frequency, said multiple being equal to N.

4,414,505

### MICROWAVE INSTANTANEOUS FREQUENCY MEASUREMENT APPARATUS

Harry Cuckson, Farnham, and Peter D. Curtis, Pangbourne, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

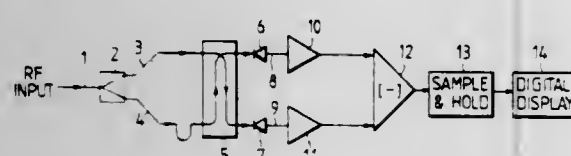
Filed Jul. 21, 1981, Ser. No. 285,524

Claims priority, application United Kingdom, Jul. 25, 1980, 8023981

Int. Cl.<sup>3</sup> G01R 25/00

U.S. Cl. 324—85

3 Claims



1. Microwave instantaneous frequency measurement apparatus comprising an RF input signal power divider for dividing said input signal into first and second signals, time delay means for introducing time delay into said first signal, a three decibel hybrid coupler connected to receive said delayed first signal and said second signal and arranged to quadrature sum and difference said delayed first signal and said second signal, a first logarithmic amplifier connected to receive quadrature summed output from said coupler, a second logarithmic amplifier connected to receive quadrature differenced output from said coupler, and a subtractor connected to receive output signals from both said amplifiers and to subtract the one from the other.

4,414,506

### ELECTRICAL CIRCUIT TEST PROBE

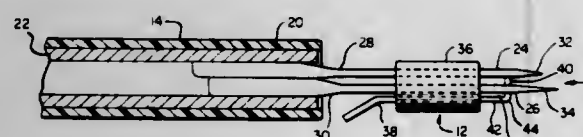
Jack M. Kelley, 119 S. Wasson, Apt. 21, Coos Bay, Oreg. 97420

Filed Dec. 30, 1980, Ser. No. 221,520

Int. Cl.<sup>3</sup> G01R 27/26; H01R 29/00

U.S. Cl. 324—158 P

13 Claims



2. The test probe apparatus in claim 1 wherein securing means component is a hook.

### 4,414,507 COPPER EMBEDDED FERRITE COIL ARRANGEMENT FOR SUPPLYING UNIFORM ROTATING FIELD IN FULL FREQUENCY RANGE FOR TESTING MAGNETIC BUBBLE DEVICES

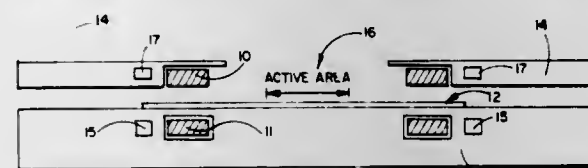
Thomas T. Chen, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1980, Ser. No. 191,546

Int. Cl.<sup>3</sup> G01R 33/12; G11C 19/08

U.S. Cl. 324—210

15 Claims



1. A coil arrangement for testing magnetically operative devices comprising:  
means for mounting a magnetically operative device to be tested by an external magnetic field;  
first and second coil means disposed symmetrically with respect to the plane of said device, with said first and second coil means on opposite sides of the plane of said device, said coil means functioning to produce an external magnetic field between said first and second coil means by producing magnetic lines which extend along said plane of said device for testing said device;  
characterized in that said first coil means is embedded within a metallic electrically conductive body for confining the magnetic field lines to a predetermined region along said plane of said device, so that at low magnetic field frequencies, said first and second coil means cooperate together to produce said external magnetic field, and so that at high magnetic field frequencies, said second coil means produces a magnetic field reinforced by a reflected magnetic field from said electrically conductive body for producing said external magnetic field.

4,414,508

### METHOD AND APPARATUS FOR AUTOMATED INSPECTION OF FASTENER HOLES BY EDDY CURRENT

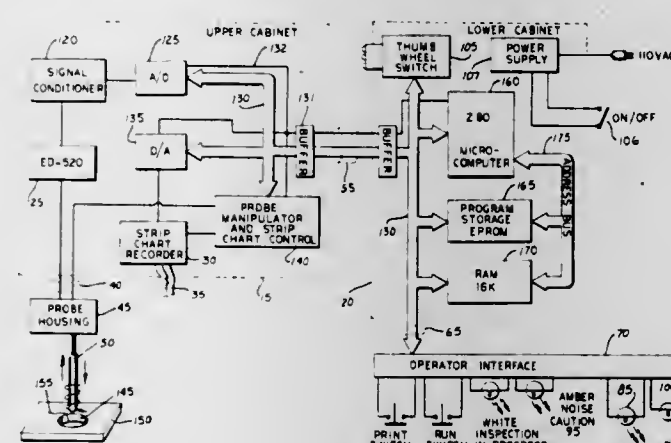
Hubert B. Davis, Tucker; Bonner W. Staff, Acworth, and James A. Willis, Smyrna, all of Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Mar. 30, 1981, Ser. No. 249,016

Int. Cl.<sup>3</sup> G01N 27/82; G01R 33/12; G05B 19/02

U.S. Cl. 324—238

17 Claims



1. In an apparatus for detecting discontinuities proximate the surface of a hole in a workpiece, said apparatus including a probe for radiating said workpiece with a magnetic field for inducing eddy currents in said workpiece, and said apparatus including detection means for providing input signals indica-

tive of values of said eddy currents, said input signals assuming a characteristic signature in response to each occurrence of a detection by said detection means of one of said discontinuities, the improvement of means for receiving and analyzing said input signals comprising:

first signature detection means operative to provide a first output signal in response to detection of a first one of said characteristic signatures;  
timing means for initiating and providing a time window of predetermined duration in response to said first output signal;  
second signature detection means operative to provide a second output signal in response to detection of a second one of said characteristic signatures; and  
crack alarm means responsive to said second output signal and said timing means for providing a crack alarm signal upon detection of said second characteristic signature within said time window.

4,414,509

### LOW ENERGY ELECTRON MAGNETOMETER USING A MONOENERGETIC ELECTRON BEAM

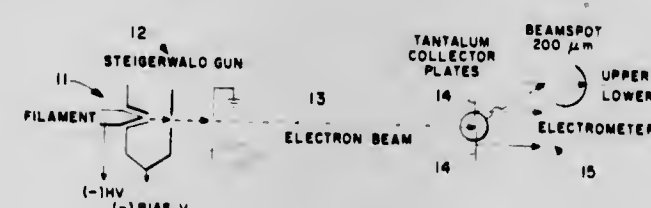
Jag J. Singh, Yorktown; George M. Wood, Jr., Newport News, both of Va.; Grayson H. Rayborn, Hattiesburg, Miss., and Frederick A. White, Schenectady, N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 26, 1980, Ser. No. 210,498

Int. Cl.<sup>3</sup> G01R 33/02

U.S. Cl. 324—250

6 Claims



1. A low energy electron magnetometer comprising:  
means for generating a low energy monoenergetic electron beam that passes through a magnetic field that is to be measured; and  
means receiving said monoenergetic electron beam after it has passed through said magnetic field for measuring the deflection of said electron beam caused by said magnetic field whereby said deflection measurement is a measure of the strength of said magnetic field;  
wherein said means for generating a low energy monoenergetic electron beam comprises:  
means for producing an inert gas atomic beam;  
means for exciting the atoms in said atomic beam to the Rydberg state;  
means for passing said atomic beam with the atoms in the Rydberg state through a gas to produce low energy electrons; and  
means for accelerating said low energy electrons to form said low energy monoenergetic electron beam.

4,414,510

### LOW COST SENSING SYSTEM AND METHOD EMPLOYING ANISOTROPIC MAGNETO-RESISTIVE FERRITE MEMBER

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed May 28, 1980, Ser. No. 153,886

Int. Cl.<sup>3</sup> G01R 33/06; H01L 43/10

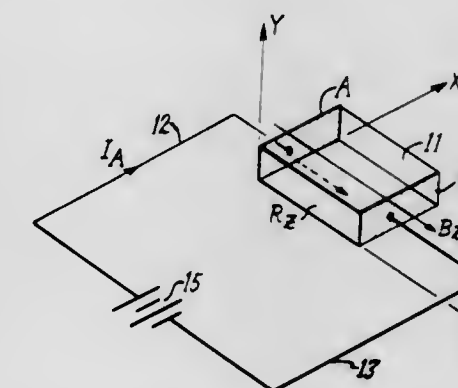
U.S. Cl. 324—252

32 Claims

1. A sensor comprising:  
a member of ferromagnetic ferrite material having anisotropic magneto-resistive properties wherein the resistivity characteristics of the ferrite member vary in response to varia-

tions in the strength of a magnetic field applied longitudinally with respect to a selected longitudinal axis of the ferrite member;

means for impressing a magnetic field on the ferrite member which is indicative of a physical phenomenon to be measured with the magnetic lines of flux extending along a longitudinal axis of the ferrite member which exhibits variable magneto-resistive properties;



means for causing a flow of electric current through the said longitudinal axis of the ferrite member along a current path that extends in the same direction or opposite to the direction of the magnetic lines of flux; and  
output means coupled to measure changes in the resistivity characteristics of the ferrite member as in indication of the value of a physical phenomenon being measured.

4,414,511

### LOW RESISTANCE, FLUID REPLENISHING, REFERENCE CELL AND METHOD FOR USING SAME IN STRUCTURE-TO-SOIL ELECTRICAL SURVEYS

Charles G. Waits, Hanover Park; Karl W. Nicholas, Roselle, both of Ill., and James B. Bushman, Medina, Ohio, assignors to Harco Corporation, Medina, Ohio

Filed Aug. 11, 1980, Ser. No. 176,915

Int. Cl.<sup>3</sup> G01V 3/15; G01N 27/30; G01R 31/00

U.S. Cl. 324—347

34 Claims



1. A reference cell assembly for conducting electrical earth surveys comprising a liquid-metal cell, means to support the cell and periodically to move the cell to force it against the earth and then to remove it from the earth, and means coupled with respect to the cell for automatically responding to such movement for automatically supplying make-up liquid to the cell.



4,414,512

## BROADBAND PEAK DETECTOR

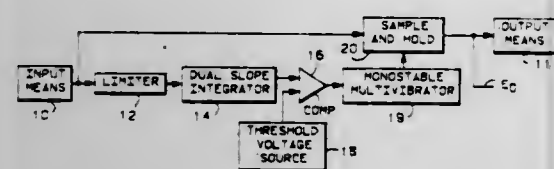
Robert N. Nelson, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 29, 1981, Ser. No. 268,430

Int. Cl.<sup>3</sup> H03K 5/153

U.S. Cl. 328—151

10 Claims



1. An apparatus for generating a quadrature signal in response to an input signal comprising in combination: means for providing an input; a dual slope integrator having a discharging rate equal to twice its charging rate, said integrator having an input coupled to said means for providing an input and said integrator having an output; a reference source; a comparator having a threshold voltage set by said reference source such that said comparator provides an output signal when said integrator is discharged, said comparator having an input coupled to said output of said integrator, said comparator having an output; means for generating a pulse responsive to a leading edge of said output signal from said comparator; and means for providing an output coupled to said means for generating a pulse.

4,414,513

## AMPLIFIER STAGE FOR PULSE-WIDTH-MODULATED SIGNALS

Walter Willer, Statzenhof, and Peter Fuchs, Vienna, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

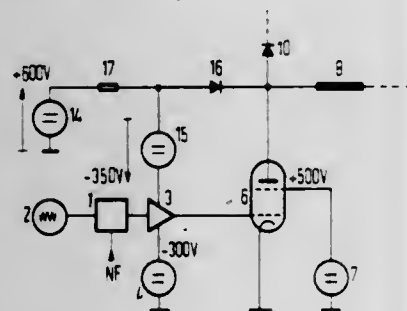
Filed Apr. 16, 1981, Ser. No. 254,867

Claims priority, application Austria, Apr. 18, 1980, 2099/80

Int. Cl.<sup>3</sup> H03F 1/02

U.S. Cl. 330—204

2 Claims



1. Circuit stage for the optimal driving and very highly efficient operation of a tetrode having a control grid and a plate, comprising a grid voltage bias circuit including two partial voltage sources, one of said partial voltage sources being connected to the control grid, and said two partial voltage sources being connected together at a common junction point with opposite polarity with respect to the control grid, and a control diode connected between said common junction point and the plate.

4,414,514

## TWO SIGNAL AMPLIFYING SYSTEM

Kunio Seki, Hinode, and Ritsuji Takeshita, Hino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

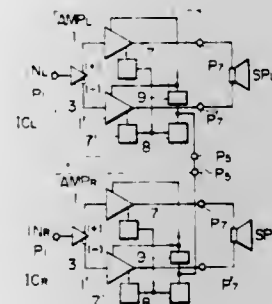
Filed Feb. 20, 1981, Ser. No. 236,502

Claims priority, application Japan, Feb. 20, 1980, 55-19006

Int. Cl.<sup>3</sup> H03F 3/26

U.S. Cl. 330—262

8 Claims



1. A two signal amplifying system comprising:  
a first BTL amplifier for amplifying a first input signal and a second BTL amplifier for amplifying a second input signal; each of said first and second BTL amplifiers including a first push-pull output circuit for delivering a noninverting output signal, and a second push-pull output circuit for delivering an inverting output signal;  
a first speaker load connected between an output terminal of the first push-pull output circuit and an output terminal of the second push-pull output circuit of said BTL amplifier;  
a second speaker load connected between an output terminal of the first push-pull output circuit and an output terminal of the second push-pull output circuit of said second BTL amplifier;  
a power source;  
said first push-pull output circuit of each of said first and second BTL amplifiers including a first output transistor connected between said power source and the output terminal thereof;  
said second push-pull output circuit of each of the first and second BTL amplifiers including a second output transistor connected between said power source and the output terminal thereof;  
first and second detectors connected with the first and second output transistors, respectively, for detecting the respective operating states of said transistors;  
a control circuit having its input connected to receive the outputs of the first and second detectors of each of the first and second BTL amplifiers for rendering nonconductive both of the first and second output transistors of both the first and second BTL amplifiers in case at least one of said first or second output transistors of either of said first or second BTL amplifiers deviates from a predetermined operating range.

4,414,515

## CR OSCILLATOR HAVING CONSTANT CURRENT CHARGING SOURCE

Yasoji Suzuki, Yokosuka, and Kenji Matsuo, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 10, 1980, Ser. No. 205,629

Claims priority, application Japan, Nov. 22, 1979, 54-150741

Int. Cl.<sup>3</sup> H03K 3/03, 3/354

U.S. Cl. 331—111

13 Claims

1. An oscillation circuit comprising:  
a CR oscillation section including first and second power source terminals;  
an odd number of inverters coupled to said power source terminals, one of said inverters being a first inverter and another of said inverters being a final inverter, each of said inverters having an input terminal, an output terminal, and first and second biasing terminals, said inverters being con-

nected in series such that, except for said first inverter, the input terminal of an inverter is connected to the output terminal of another inverter and the output terminal of said final inverter is not connected to the input terminal of another inverter.

resistive means connected between the output terminal of an odd-numbered inverter in said inverter series and the input terminal of said first inverter, and

guide, for connecting the receiver probe portion to the launch probe portion.

4,414,517

## NON-RINGING PHASE RESPONSIVE DETECTOR

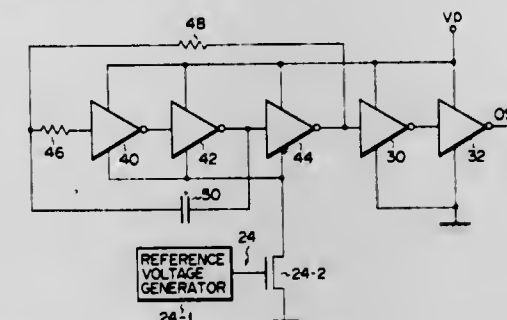
Joseph Mahlg, 701 SW, 91st St., Gainesville, Fla. 32601

Filed Jun. 12, 1981, Ser. No. 273,166

Int. Cl.<sup>3</sup> H03H 7/01; H03K 5/26

U.S. Cl. 333—167

10 Claims



capacitive means connected between the output terminal of an even-numbered inverter in said inverter series and the input terminal of said first inverter; and  
a constant current source means connected in series with the current path between the first and second biasing terminals of at least one of said inverters.

4,414,516

## POLARIZED SIGNAL RECEIVER SYSTEM

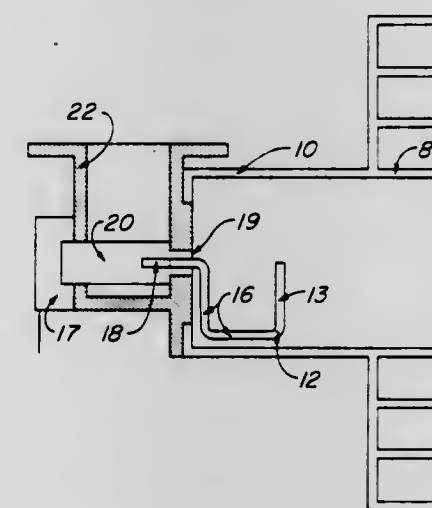
H. Taylor Howard, San Andreas, Calif., assignor to Chaparral Communications, Inc., San Jose, Calif.

Filed Nov. 18, 1981, Ser. No. 322,446

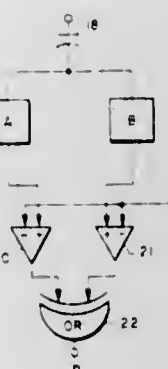
Int. Cl.<sup>3</sup> H01P 1/165

U.S. Cl. 333—21 A

15 Claims



1. A polarized signal receiver comprising:  
a first waveguide for transmitting polarized signals;  
a circular waveguide for receiving polarized signals at one end and coupled to the first waveguide at the other end, said other end having a rear wall;  
an insulator rod, rotatably mounted through said other end of the circular waveguide; and  
signal conducting means, fixedly mounted in the insulator rod concentric with the axis of rotation thereof having a receiver probe portion oriented in the circular waveguide orthogonal to the axis of said circular waveguide for receiving one polarization of the incident signal, a launch probe portion concentric with the insulator rod and extending into the first waveguide for launching said signal therein, and a transmission line portion, having a first section contoured to the inside surface of the circular wall, and substantially parallel to the axis, of the circular waveguide, and having a second section contoured to the inside surface, and substantially parallel to the plane, of the rear wall of the circular wave-



1. A non-ringing circuit for detecting the presence of a predetermined frequency component in an input signal and for delivering an output signal when said predetermined component is dominant, the detector comprising:

- multiple tuned filters each having an input terminal connected to receive said input signal and having an output terminal at which the frequency components appear, and each filter having a tuned frequency near said predetermined frequency, said tuned frequencies of the respective filters being different each from the other by increments of frequency;
- plural coincidence detector means coupled to selected paired filter output terminals, and said coincidence detector means being operative to deliver plural binary response signals indicating whether the dominant frequency components appearing at the respective filter output terminals are mutually in phase or out of phase; and
- gate means connected to receive said binary response signals, said gate means comprising a logic circuit responsive to the binary states of said response signals and operative to deliver said output signal when the predetermined frequency component dominates said input signal.

4,414,518

## VERTICAL DESCENT RATE DETECTOR SWITCH

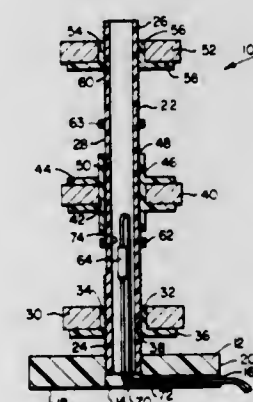
Aaron V. Farr, Logan, Utah, assignor to Abex Corporation, New York, N.Y.

Continuation of Ser. No. 197,395, Oct. 16, 1980. This application Nov. 30, 1982, Ser. No. 445,815

Int. Cl.<sup>3</sup> H01H 9/00

U.S. Cl. 335—205

1 Claim



1. A vertical descent rate detector switch actuated when force of gravity acting thereon is less than 1.0 comprising:



a non-magnetic means for guiding a magnet;  
a first magnet mounted at one end of the guide means;  
a movable second magnet;  
a bore formed in the second magnet characterized by;  
the guide means passing through the bore in the second magnet such that the second magnet is positioned above the first magnet; the first and second magnets positioned such that the lines of the magnetic field of the first magnet run opposite in direction to the lines of the magnetic field of the second magnet to cause the first and second magnets to repel each other and the second magnet is supported above the first magnet by the opposing magnetic fields such that the weight of the second magnet is cancelled;

first and second contacts positioned in the guide means between the first and second magnets;

the contacts being movable between a first position in which they are opened and a second position in which they are closed; the second magnet being movable between a first position in which the lines of the magnetic fields of the first and second magnets pass through the first and second contacts respectively such that the contacts have the same polarity and are opened and a second position in which the lines of the magnetic fields of one of the first and second magnets pass through the first and second contacts such that the contacts have opposite polarity and are closed; the second magnet is in one of the first or second positions when the switch is at rest and the gravity force acting on the switch and the first magnet is equal to 1.0; and the second magnet is in the other of the first or second positions when the rate of descent of the switch and the first magnet is equal to a gravity force of less than 1.0 and the relative distance between the first and second magnets is greater than when the switch is at rest.

4,414,519

## TEMPERATURE-SENSITIVE RELAY

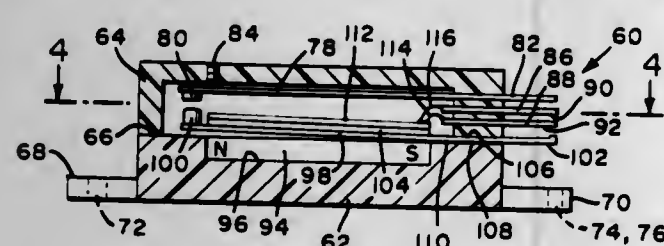
Philip M. Anderson, III, Chatham, and Ronald K. Reich, Philadelphia, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 10, 1982, Ser. No. 356,874

Int. Cl.<sup>3</sup> H01H 51/00

U.S. Cl. 335—208

12 Claims



1. A temperature-sensitive relay adapted to be connected to circuit means having a power source for providing an electrical current and switching means for activating said circuit means in response to a preselected condition, said relay comprising:

base means for mounting said temperature-sensitive relay;  
a resilient movable cantilever carrying a first contact member, said cantilever being a composite member having a first portion composed of conductive material and a second portion composed of amorphous ferromagnetic material having a Curie point;  
a second contact member disposed adjacent said first contact member for at least intermittently establishing electrical contact with said first contact member;  
said first contact member being connected to first terminal means;  
said second contact member being connected to second terminal means;

gripping means for supporting the cantilever and electrically connecting it to said first terminal means;  
support means for supporting said second terminal means;  
magnet means associated with and adapted to bias said cantilever to a first position that interrupts electrical continuity between said first and second contact members, said cantilever being transformed from a ferromagnetic phase to a paramagnetic phase when its temperature exceeds the Curie point, whereby said cantilever assumes a second position in which said electrical continuity is established;  
heating means connected to said circuit means and disposed in the vicinity of said cantilever to effect said transformation during a preselected time interval following activation of said circuit means; and  
bias means for urging said cantilever to move said first contact member to said second position.

4,414,520

## THERMOSTAT

Jonny Ruuth, Postlâda 9138, S-951 90 Luleå, Sweden

PCT No. PCT/SE81/00188, § 371 Date Mar. 1, 1982, § 102(e)

Date Mar. 1, 1982, PCT Pub. No. WO82/00219, PCT Pub. Date Jan. 21, 1982

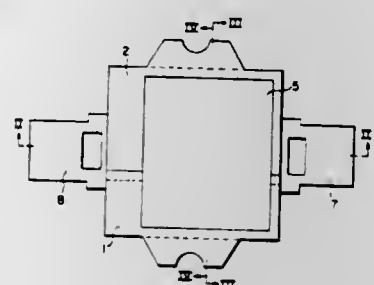
PCT Filed Jun. 26, 1981, Ser. No. 359,663

Claims priority, application Sweden, Jul. 4, 1980, 8004951

Int. Cl.<sup>3</sup> H01H 61/013

U.S. Cl. 335—208

9 Claims



1. A thermostat comprising:

a housing;  
a heat sensitive body made of ferromagnetic material connected to said housing, said body losing magnetic attraction with a change in temperature;  
magnet means having a magnet movably mounted to said housing from an attracted position toward said body to a spaced position away from said body, said magnet means including an outwardly extending lever element;  
a fixed contact connected to said housing;  
a movable contact mounted to said housing having a contact portion movable from a first position in contact with said fixed contact to a second position spaced from said fixed contact; and  
biasing means connected between said movable contact and said lever element for biasing said magnet means into its spaced position and simultaneously biasing said movable contact into its second position, said biasing means connected for moving said movable contact into its second position with said magnet means in its spaced position, and for moving said movable contact into its first position with said magnet means in its attracted position.

4,414,521

## LOW RELUCTANCE TRANSFORMER CORE

Daniel E. Reism, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 34,381, Apr. 30, 1979, Pat. No. 4,321,652. This application Mar. 23, 1981, Ser. No. 246,621

Int. Cl.<sup>3</sup> H01F 3/00

U.S. Cl. 335—281

7 Claims

1. A ferromagnetic core having a source of operating flux for establishing a magnetic field in said core, comprising:

4,414,523

## ENCAPSULATED MAGNET FOR MAGNETIC DRIVE

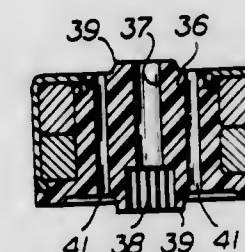
Ferdinandus A. Pieters, Walnut Creek, Calif., assignor to Milcropump Corporation, Concord, Calif.

Filed Sep. 4, 1981, Ser. No. 299,865

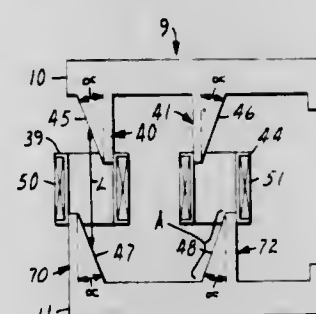
Int. Cl.<sup>3</sup> H01F 7/02

U.S. Cl. 335—302

4 Claims



a first member having first and second leg elements tapered in opposite directions; and  
a second member having first and second leg elements tapered in opposite directions;  
said tapered leg elements each having a continuous tapered interface, said continuous tapered interface of said first member being oriented opposite to said continuous tapered interface of said second member, said continuous tapered interfaces adapted to cooperatively mate with a wedging action;



said first and second leg elements of said first member and said second member having a coefficient of friction with respect to each other, said continuous tapered interfaces of said first and second leg elements of said first member and said second member forming a taper angle, the value of the tangent of said taper angle being not more than the value of said coefficient of friction;  
whereby low reluctance first and second legs are formed.

4,414,522

## FABRICATED LIFTING MAGNET ASSEMBLY

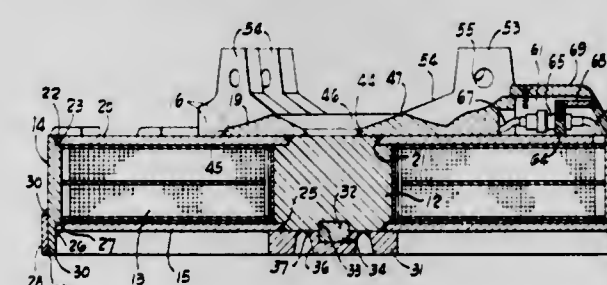
James P. Rybak, Solon, Ohio, assignor to Magnetics International, Inc., Maple Heights, Ohio

Filed May 3, 1982, Ser. No. 374,496

Int. Cl.<sup>3</sup> H01F 7/20

U.S. Cl. 335—291

25 Claims



1. A fabricated lifting magnet assembly comprising, in combination:  
a permeable magnetic case having a permeable magnetic core;  
electrical winding means surrounding said core;  
outer wall means in said case at the periphery thereof;  
support means underneath said winding means to support said winding means within said magnetic case; and  
a composite magnetically permeable case top in said case connected in flux passing relationship with said outer wall means and said core;  
said composite case top including a magnetically permeable cast member and magnetically permeable supplemental means of substantially uniform thickness;  
means securing said cast member to said supplemental means for flux flow in each;  
connector means for the dependent support of said lifting magnet assembly connected as an integral part of said cast member near the outer edges thereof,  
and said cast member at locations near said core being of considerably greater thickness than at the outer edges thereof.

4,414,524

## THERMALLY RESPONSIVE SWITCH

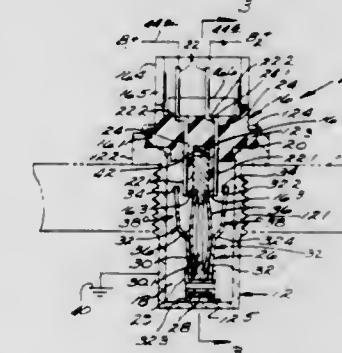
John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 7, 1981, Ser. No. 328,279

Int. Cl.<sup>3</sup> H01H 61/00

U.S. Cl. 337—87

11 Claims



1. A thermally responsive switch having electrically insulating support means, first contact means mounted on the support means, second contact means movable between an open circuit position spaced from the first contact means and a closed circuit position engaged with the first contact means, spring means biasing the second contact means to one of said circuit positions, and thermally responsive means moving the second contact means to the other circuit position against said bias on the occurrence of selected temperature conditions, characterized in that the spring means is secured to a carrier means, the second contact means are secured to the spring means, and the thermally responsive means is disposed between the carrier means and the spring means for moving the spring and second contact means relative to the carrier means in response to temperature change, the carrier means being mounted in se-



lected location relative to the insulating support means so that the second contact means is moved from said one circuit position to the other circuit position as the second contact means moves relative to the carrier means in response to the occurrence of said selected temperature conditions.

4,414,525

**SWITCH WITH REPLACEABLE FLASHER UNIT**

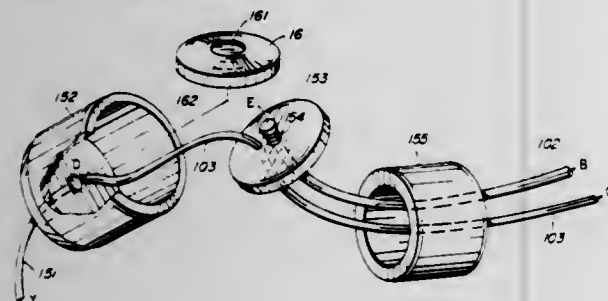
Ralph S. Garrabrants, 3674 W. Dahlia, Phoenix, Ariz. 85027

Filed Nov. 17, 1980, Ser. No. 207,283

Int. Cl.<sup>3</sup> H01H 61/06

U.S. Cl. 337—92

6 Claims



- Means for adapting a conventional electrical circuit to provide a choice of continuous or intermittent operation comprising: switch means adapted for mounting in a standard electrical interconnection box for selecting at least one of continuous and intermittent operation of an associated electrical circuit; and cartridge means for retaining a replaceable, commercially available flasher unit in electrical interconnection with said switch means and an associated electrical circuit, said cartridge means including: a base; first means affixed to said base for receiving said flasher unit; spring contact means disposed on said base within said first means for contacting a conductive contact on said flasher unit; and a spring-loaded extension coupled directly to a contact on said switch means for contacting said flasher unit and for retaining said flasher unit within said first means.

4,414,526

**ELECTRIC FUSE HAVING COMPOSITE FUSIBLE ELEMENT**

Robert J. Panaro, Byfield, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 62,434, Jul. 30, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 321,958

Int. Cl.<sup>3</sup> H01H 85/60

U.S. Cl. 337—163

10 Claims



- In an electric low voltage fuse having a tubular casing of electric insulating material having a pair of rims, a pulverulent arc-quenching filler inside said casing, a fusible element having serially arranged perforations embedded in said arc-quenching filler, said fusible element having an overlay of an M-effect metal having a considerably lower fusing point than the remainder of said fusible element, a pair of terminals electrically

connected to said fusible element and a pair of terminal caps mounted on the ends of said casing and enclosing said arc-quenching filler, said fusible element, and said pair of terminals within said casing, the improvement comprising:

- at least one of said pair of terminals including a tab of uniform thickness and cross-section made of a current-limiting metal extending from the inside of said casing across one of said pair of rims to the outside of said casing, said tab including a plurality of bends therein placing a significant portion of said tab in an abutting and electrically conductive relationship with one of said pair of terminal caps, said tab being electroconductively bonded to said fusible element;
- said fusible element being made of a relatively thin current-limiting sheet metal; and
- the ratio of the thickness of said tab to the thickness of said fusible element being between 2 and 5.

4,414,527

**CONTACT ASSEMBLY FOR A FUSE CUTOUT**

Bruce A. Biller, Chicago, Ill., assignor to S&amp;C Electric Company, Chicago, Ill.

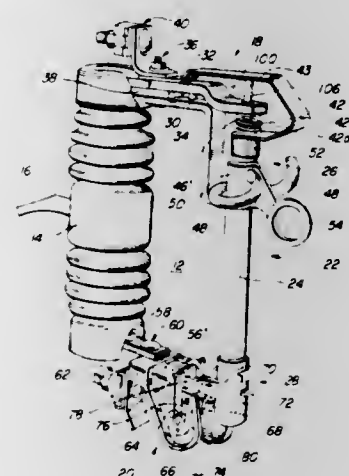
Continuation of Ser. No. 132,924, Mar. 24, 1980, abandoned.

This application Oct. 26, 1981, Ser. No. 314,636

Int. Cl.<sup>3</sup> H01H 85/22

U.S. Cl. 337—180

12 Claims



- In a cutout mounting having first and second contact assemblies between which a fuse tube of predetermined length is supportable, an improved second contact assembly of the type which includes:

- a generally J-shaped spring contact, the long leg of the J being attached to a rigid, recoil bar, a portion of the recoil bar extending into the space between the legs of the J, the short leg of which has a concavity formed therein for selectively receiving an end of the fuse tube and a convexity complementary with the concavity;
- a pin freely passing through a hole in the extending portion of the recoil bar and being attached between the long leg and the convexity, both legs being constrained to move together as the pin moves through the hole and the long leg flexes out of a rest location about its point of attachment to the recoil bar; and
- resilient means acting between the short leg and the recoil bar for setting the rest location of the long leg; closure of the cutout by rotating the fuse tube in the first contact assembly inserting an end of the fuse tube into the concavity so that the legs are deflected against the action of the resilient means and the flexing of the long leg out of its rest location; operation of the cutout causing the fuse tube to thrust both against and transverse to the concavity, such thrust (i) applying a bending force to the fuse tube which may fracture as a result thereof, (ii) randomly transversely moving the short leg and the pin until the pin engages the walls of the hole, and (iii) further deflecting the legs against the action of the resilient means and the

flexing of the long leg; wherein the improvement comprises:

- an offset formed in the recoil bar to position the extending portion and the hole substantially closer to the short leg and the convexity to
- limit the extent of the random transverse motion which the short leg can experience before the pin engages the hole walls, thereby limiting the bending force on the fuse tube, and
- accurately position the convexity sufficiently close to the recoil bar to accurately limit the amount of movement of the short leg before it engages the recoil bar, thereby earlier transferring force caused by such thrust to the recoil bar.

4,414,528

**CRIMP FUSE**

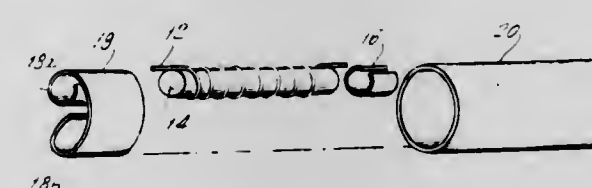
Elliot Bernstein, Rockville Centre, N.Y., assignor to Bel Fuse, Inc., Jersey City, N.J.

Filed Mar. 24, 1980, Ser. No. 133,331

Int. Cl.<sup>3</sup> H01H 85/16

U.S. Cl. 337—187

5 Claims



- A crimp fuse comprising: a length of fuse wire material; insulative rod means supporting said length of said fuse wire material; first and second conductive sleeves crimped onto respective ends of said rod means in good electrical contact with said length of fuse wire material; and an insulative coating covering said length of fuse wire material, said first conductive sleeve including a portion shaped for receiving an electrical conductor to be connected thereto by crimping.

4,414,529

**THERMAL SWITCH**

Hideoki Yoshioka; Ichiro Okino, and Toshiaki Toda, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

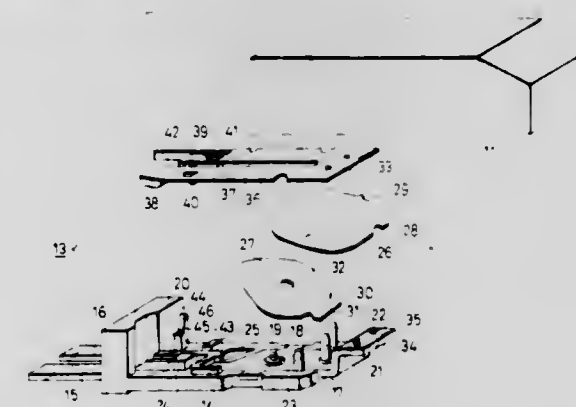
Filed Oct. 16, 1981, Ser. No. 311,944

Claims priority, application Japan, Dec. 10, 1980, 55-173977

Int. Cl.<sup>3</sup> H01H 37/54

U.S. Cl. 337—365

11 Claims



- A thermal switch including a switch body comprising a base, a plurality of outer terminals held on said base to be electrically independent of each other and respectively having a fixed contact, a plurality of movable contact springs corresponding in number to said outer terminals and respectively having a movable contact contactable with each of said fixed contacts, respective said movable contact springs being electri-

cally connected with each other, a movable-contact-spring fixing plate held onto the base for fixing said movable contact springs in mutually parallel relation in the horizontal direction, and a plurality of bimetallic strips each having a set-temperature different from that of the other and operating respectively independently so as to separate the movable contact of one of the movable contact springs from the fixed contact, whereby one of the movable contact springs operated by one of said bimetallic strips which has said set-temperature relatively lower than the other forms resetting-type switching contacts and the other of the springs of the set-temperature relatively higher forms non-resetting type switching contacts.

4,414,530

**MINIATURE MOTOR PROTECTOR APPARATUS AND METHOD FOR ASSEMBLING THEREOF**

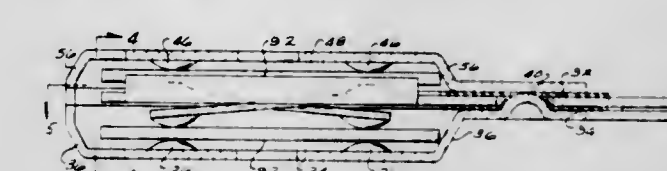
Michael L. Bouffard, Smithfield, R.I., and Radi Pejouhy, Marshfield, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 22, 1981, Ser. No. 276,226

Int. Cl.<sup>3</sup> H01C 7/02

U.S. Cl. 338—25

13 Claims



- A motor protector particularly suitable for use with a low current, intermittent duty motor comprising a metallic housing having top and bottom wall surfaces, and having a terminal extending from one of the surfaces, the housing comprising a sheet having first and second portions with a first recess formed in the first portion and a second recess formed in the second portion, the first and second portions being integrally connected and hinged together, first and second PTC wafers, the first wafer in physical and electrical engagement with the top wall surface, the second wafer in physical and electrical engagement with the bottom wall surface, an electrically conductive center contact disposed between the first and second PTC wafers and in physical and electrical engagement therewith, the center contact having a terminal extending therefrom beyond the top and bottom wall surfaces of the housing and electrically insulative material placed between the center contact and the housing.

4,414,531

**PARTIAL PRESSURE OF OXYGEN SENSOR-I**

Robert F. Novak, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,414

Int. Cl.<sup>3</sup> H01L 7/00

U.S. Cl. 338—34

3 Claims



- A partial pressure of oxygen sensor for insertion into an



exhaust system of a hydrocarbon fuel burning device, comprising in combination:

a mounting body formed of a metallic material threaded on one end for securement to the exhaust system and having a conical configured bore extending along a central axis thereof, said conical configured bore having its smaller end at said threaded end of said mounting body;

an elongated heated sensing element of generally rectangular cross section including: a ceramic support, a resistance heater element bonded to a leading portion of said ceramic support, a titania dioxide sensor element also bonded to said leading portion of said ceramic support so that said resistance heater heats said sensor element to a required temperature when a preselected voltage is applied across said resistance heater element, a plurality of electrically conductive paths bonded to said ceramic support, said paths for independently connecting said resistance heater element to a source of voltage and said titania dioxide sensor element to a sensing circuit;

a two-piece insulator body of ceramic material, each piece of said insulator body having a shape approximating a half-cone with the smaller cross section of said half-cone being at a leading portion of said two-piece insulator body, said two-piece insulator body sandwiching said heated sensing element therebetween with said leading portion of said heated sensing element projecting beyond said leading portion of said two-piece insulator body, said two-piece insulator body sandwiching said heated sensing element therebetween being received in said conical configured bore of said mounting body in a manner such that said leading portion of said heated sensing element projects beyond said threaded end of said mounting body;

a first protection tube means secured to said threaded end of said mounting body for protecting said leading portion of said heated sensing element, said first protection tube having an opening therein through which exhaust gases may flow into contact with said heated sensing element;

a plurality of fine electrical lead lines, one of said fine lead lines being bonded to and extending from each of said conductive paths bonded to said ceramic support;

a plurality of electrical lead lines equal in number to said fine electrical lead lines;

a plurality of crimped bands, each of said crimped bands interconnecting paired ones of said electrical lead lines and said fine electrical lead lines;

a second ceramic insulator body having a plurality of passageways therein equal in number to said plurality of crimped bands, said passageways being so constructed and arranged that each of said passageways has an associated pair of said interconnected leads passing therethrough with said clipped band interconnecting the same coming into locating engagement with the side walls defining said associated passageway;

a second protection tube means having one end secured to an end of said mounting body not having said threads thereon for enclosing and protecting said second ceramic insulator body and elements received therein and passing therethrough;

a ceramic cement occupying a volume between said second ceramic insulator body and a rear portion of said two-piece insulator body and heated sensing element sandwiched therebetween;

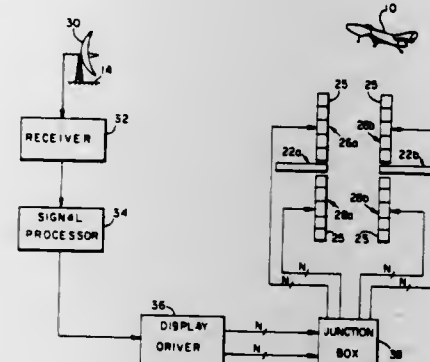
a high temperature resistant sealant material occupying a volume between said second ceramic insulator body and a free end of said second protection tube means; and

electrical terminal means connected to said plurality of electrical lead lines for independently connecting said lead lines as required to a source of voltage and to a sensing circuit.

#### 4,414,532 DISPLAY SYSTEM FOR AIRCRAFT LANDING GUIDANCE

Charles E. Kaul, 7101 Galgate Dr., Springfield, Va. 22152  
Filed Nov. 17, 1981, Ser. No. 322,289  
Int. Cl.<sup>3</sup> G08G 5/00; B64F 1/20  
U.S. Cl. 340—26

9 Claims



6. In an optical guidance system for remotely aiding a pilot in the landing of an aircraft along a desired glideslope, of the type wherein light sources located behind vertically-stacked Fresnel lenses situated between two horizontal light arrays produce a virtual image of light which moves vertically as seen by the pilot to provide glideslope displacement information, the improvement comprising:

a first pair of light arrays substantially parallel to each other and mounted above the horizontal light arrays on either side of the lenses, each of said first light arrays comprising a series of discrete light cells in a linear configuration;

a second pair of light arrays substantially parallel to each other and aligned with respective ones of said first light arrays, said second pair of light arrays being mounted below the horizontal arrays on either side of the lenses, each of said second light arrays comprising a series of discrete light cells in a linear configuration; and

drive means sensitive to amplitude and polarity of analog signals provided at its input and electrically coupled at its output to said first and second light arrays for continuously energizing said cells in succession in accordance with an analog input signal indicative of the magnitude and direction of instantaneous error in the appropriate descent rate of the aircraft relative to the glideslope.

#### 4,414,533 CLUTCH RELEASE MECHANISMS

Brian Scott, Halifax, and Robert Duncan, Huddersfield, both of England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Jun. 11, 1981, Ser. No. 272,600  
Claims priority, application United Kingdom, Jun. 14, 1980, 8019519

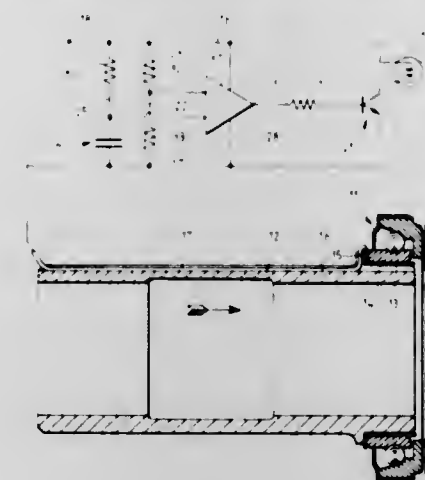
Int. Cl.<sup>3</sup> B60Q 1/00

U.S. Cl. 340—52 R

10 Claims

1. Means for indicating take-up of the clearance between a release bearing of a friction clutch and a release plate thereof against which said bearing abuts whenever the clutch is re-

leased comprising an electrically-insulated mounting for the bearing, a power line connecting an electric supply to the

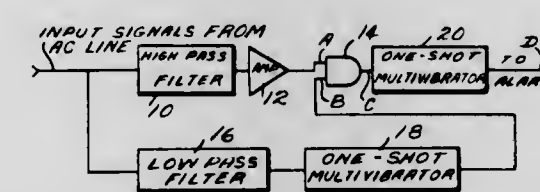


bearing, a warning device interposed in said line, and a return line connecting the release plate to the electric supply.

#### 4,414,534 RADIO FREQUENCY DETECTION CIRCUITRY HAVING NOISE DISCRIMINATION CAPABILITY

Glenn H. Whidden, 13214 L'Enfant Dr., Fort Washington, Md. 20022  
Filed Sep. 14, 1981, Ser. No. 302,116  
Int. Cl.<sup>3</sup> G08B 13/00; H03K 9/06; H04B 17/00  
U.S. Cl. 340—310 A

10 Claims



1. A circuit arrangement for use in detecting the presence of radio frequency signal transmission on an electrical power line, comprising:

a filter operatively related to said line, said filter being adapted to pass radio frequency signals while rejecting signals of lower frequency;

means for applying signals passed by said filter to a first input of a gate;

means connected to said line and responsive to a zero crossing of a power supply voltage applied to the line for producing a gating signal of predetermined duration commencing at the occurrence of said zero crossing;

means for applying the gating signal to a second input of said gate; and

means responsive to an output signal from said gate, obtained upon coincidence of signals on said first and second gate inputs, for energizing an alarm actuator.

#### 4,414,535 MAGNETIC RESONANCE GYRO SIGNAL PROCESSOR

Lincoln S. Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.

Continuation-in-part of Ser. No. 931,702, Aug. 7, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,145  
Int. Cl.<sup>3</sup> H03K 13/02

U.S. Cl. 340—347 AD

1 Claim

1. A signal processor operating on inherently analog signals for converting them to digital words representing gyro angle comprising:

a source of composite analog signals containing gyro angular displacement,

means for separating and frequency-multiplying said gyro analog signals retaining phase coherence,

phase detector means for detecting and comparing said

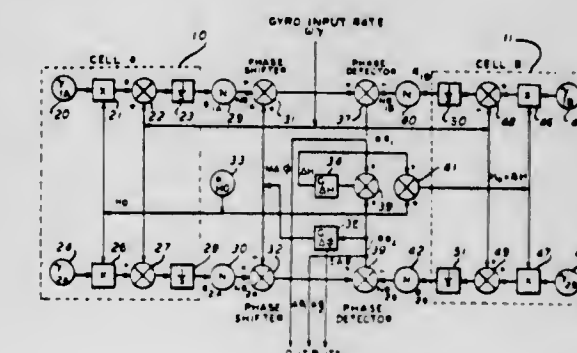
frequency multiplied signals and for producing a residual PDM signal,

means for incrementally phase shifting said frequency multiplied signals and accumulating the number of said increments such that subsequent phase comparisons remain within a fixed monotonic region of said phase detection means,

means for operating on said residual PDM signal producing a digital word representative of the duty cycle, and

means for scaling and adding said accumulated number of said increments produced by said phase shifting means to the result of said digital word thereby producing digital output words representing gyro angle,

wherein said means for incrementally phase shifting said signals comprises:



a shift register containing eight images of said gyro analog signals,

a multiplexer connected to said shift register for maintaining the phase shifted signal within a selected monotonic range,

an advance-retarder detector connected to said multiplexer for developing an electronic window for retarding the analog signals which fall within said electronic window, a gating circuit to maintain phase detection inputs within a monotonic range, and

an up/down counter connected to said gating circuit and providing a three bit address to the input of said multiplexer.

#### 4,414,536 DATA COMPRESSING SYSTEM

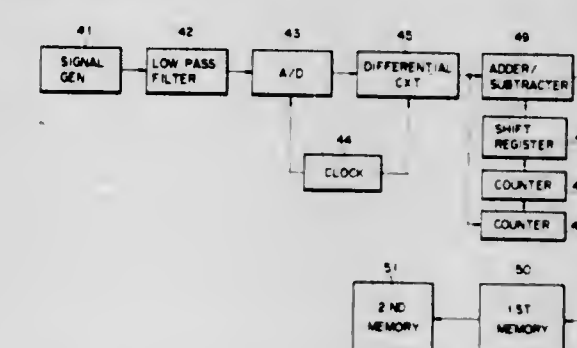
Masahiko Sumi, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 22, 1981, Ser. No. 285,802  
Claims priority, application Japan, Jul. 25, 1980, 55-102258; Apr. 8, 1981, 56-52823

Int. Cl.<sup>3</sup> H03K 13/00

U.S. Cl. 340—347 DD

11 Claims



1. A data compressing system comprising:  
sampling means for sampling an input signal at a given sampling period to produce a plurality of sampled data trains, each of said data trains containing a given number of sampled data elements;  
differential means connected to said sampling means for differentiating said sampled data elements to obtain a



plurality of differential data trains, each of said differential data trains containing a given number of differential data elements;

coding means connected to said differential means for applying code elements, each of the code elements including different weight codes, to the differential data elements of each of said differential data trains, said coding means including first counting means for counting said data elements of each of said differential data trains to generate carry data, second counting means for counting up in response to said carry data of said first counting means, and means for applying said weight codes corresponding to the contents of said counting means to said differential data trains; and

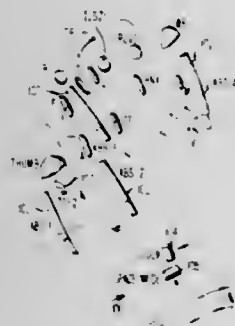
summing means connected to said coding means for summing said differential data trains with said weight codes to obtain compressed data.

4,414,537

**DIGITAL DATA ENTRY GLOVE INTERFACE DEVICE**  
Gary J. Grimes, Thornton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Sep. 15, 1981, Ser. No. 302,700  
Int. Cl. 3 G06F 3/02

U.S. Cl. 340-365 R

19 Claims



1. A man-machine interface for translating discrete character specifying positions of a hand into electrical signals representing said characters comprising:

flex sensors positioned with respect to said hand for detecting the flexing of associated digit joints,

contact sensors positioned with respect to the digits of said hand and adapted so that a selected pair of contact sensors contact each other as said hand assumes different character specifying positions,

additional sensors positioned with respect to the digits and metacarpus of said hand for detecting hand movements,

means including said flex sensors and said contact sensors and said additional sensors responsive as said hand assumes different character specifying positions for generating electrical signals representing each of said specified characters, and

means responsive to said electrical signals from said sensors as said hand assumes said different character specifying positions for applying output signals identifying each of said specified characters to a utilization device.

4,414,538

**KEYBOARD SENSE GATE**

Paul G. Schnitzlein, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 7, 1981, Ser. No. 327,859

Int. Cl. 3 G06F 3/02

U.S. Cl. 340-365 S

5 Claims

1. A circuit for scanning a plurality of keyswitches (16a-y) arranged in a matrix having a plurality of row conductors (12a-e) and a plurality of column conductors (14a-e), each of said row conductors (12a-e) being sequentially energized so that upon actuation of a keyswitch (16a-y) connecting an energized row conductor, a signal is coupled to a correspond-

ing one of the column conductors (14a-e); a plurality of sense gates (22a-e) each of which is associated with one of the column conductors (14a-e), each of said column sense gates (22a-e) comprising:

means (50a-e) when placed in a discharge mode for selectively discharging, in response to a first control signal, any signal present upon the associated column conductor (14a-e);

means (54a-e) when placed in a conductive mode for selectively coupling, in response to a second control signal, any signal upon the associated column conductor (14a-e) to a sense conductor (24), said selective discharge means



(50a-e) and said coupling means (54a-e) being alternatively operative;

means (18) for sequentially supplying said second control signals to said column sense gates (22a-e) so as to sequentially place said coupling means (54a-e) of each of said sense gates (22a-e) in the coupling mode and for placing the remaining sense gates (22a-e) in the discharge mode; and

a coding circuit (60, 62, 64, 66) responsive to signals identifying the matrix position of a keyswitch (16a-y) location currently being scanned and to the signal upon said sense conductor (24) for generating a coded representation of the actuated keyswitch.

4,414,539

**BUILT-IN PASSIVE FAULT DETECTION CIRCUITRY FOR AN AIRCRAFT'S ELECTRICAL/ELECTRONIC SYSTEMS**

James P. Armer, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1978, Ser. No. 972,501

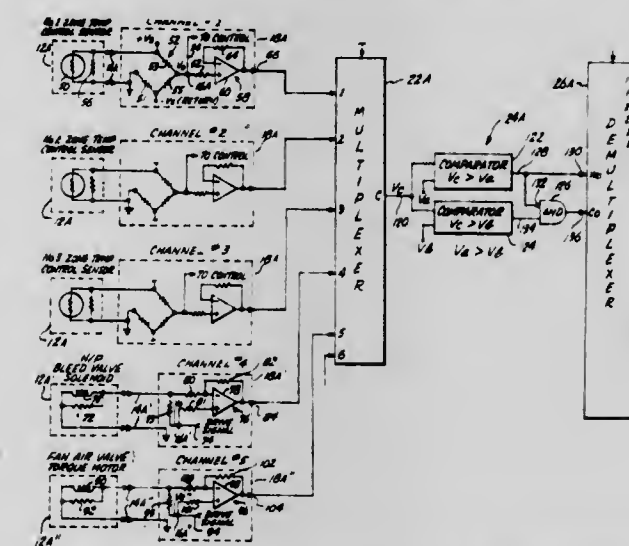
Int. Cl. 3 G08B 23/00

U.S. Cl. 340-500

9 Claims

1. In a built-in test apparatus for an aircraft's electrical/electronic system that has a plurality of LRUs each incorporating a nonswitching electrical LRU component, each of such LRU components having an impedance within a predetermined range of finite, non-zero impedance values, and wherein the plurality of LRUs are mounted at diverse locations throughout the aircraft, and the electrical/electronic system has a plurality of electrical terminal means disposed at a central equipment bay and LRU-to-terminal interconnect wiring extending between said terminal means and associated LRUs for communicating non-test electrical control signals between individual terminal means and the associated LRU component, wherein the improvement in the built-in test apparatus comprises:

a plurality of passive test shunts each of which is permanently connected across an associated one of said plurality of LRU components so as to be physically part of the corresponding LRU and thus removable and replaceable as a unit with the associated LRU component, said test shunts each having an impedance selected to lie between a predetermined minimum and a predetermined maximum, said predetermined minimum impedance being substantially equal to or greater than the lowest impedance value of said predetermined range of values of the associated LRU component, and said predetermined maximum impedance being substantially less than a predetermined open wire impedance of the associated interconnect wiring so that an application of an associated one of said non-test electrical control signals to such associated LRU component over the interconnect wiring causes a first predetermined electrical condition at the associated terminal means when such LRU component and associated shunt



and associated interconnect wiring are in an unfailed state, and causes a second predetermined electrical condition when such LRU component is in a failed open state and the associated interconnect wiring is in an unfailed state, and causes a third predetermined electrical condition when the associated interconnect wiring is in a failed open state;

fault detector means for detecting and distinguishing between said first, second and third predetermined electrical conditions at each of said terminal means, said detector means having first, second and third discrete electrical states, respectively representing unfailed states of one of said components and of its associated shunt and interconnect wiring, a failed open state of one of said components, and a failed open state of the associated interconnect wiring; and

coupling means for coupling said plurality of terminal means to said fault detector means so as to detect said electrical conditions at each of said terminal means.

4,414,540

**AUTOMATIC REDUNDANT TRANSDUCER SELECTOR FOR A STEAM TURBINE CONTROL SYSTEM**

Royston J. Dickenson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,672

Int. Cl. 3 G08B 21/00

U.S. Cl. 340-508

10 Claims

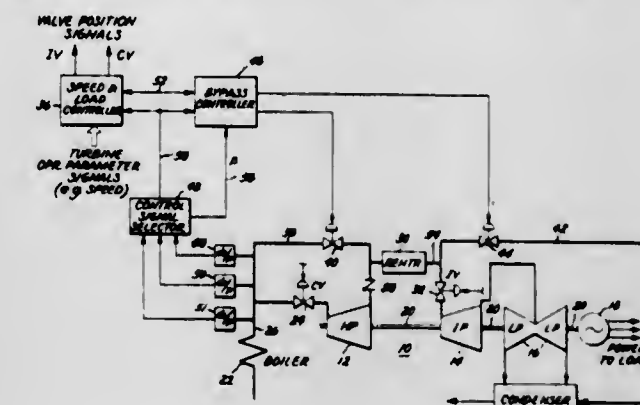
1. In a control system for a steam turbine, an automatic signal selector for assuring selection of a valid signal representation of a controlled parameter, comprising:

a plurality of redundant sensing means, each providing a signal representation of a single controlled parameter and said plurality of sensing means providing redundant multiple signals of a single controlled parameter;

a plurality of range detection means, each detection means receiving a corresponding one of said controlled param-

eter signals and said detection means providing an alarm signal output whenever said corresponding controlled parameter signal is outside a preselected range of values; and

a selector network receiving each said controlled parameter signal and each said alarm signal, and said network selecting, exclusive of any controlled parameter signals that



may be outside said preselected range of values, an output signal which is the highest valued one of said controlled parameter signals whenever any one of said alarm signals is received or an intermediate valued one of said controlled parameter signals whenever none of said alarm signals is received, the controlled parameter signal thus selected being taken as a valid controlled parameter signal for turbine control.

4,414,541

**MOTION SENSING SYSTEM**

Eugene Y. Ho, San Carlos, Calif., assignor to Techn Electronics Limited, Palo Alto, Calif.

Filed May 29, 1981, Ser. No. 268,569

Int. Cl. 3 G08B 13/00

U.S. Cl. 340-566

7 Claims



5. An apparatus for detecting motion of an object on which it is placed comprising:

an oscillator including a tuned circuit providing output oscillations,

motion responsive means in said apparatus coupled to said tuned circuit to move and modulate the amplitude of the oscillations responsive to motion of the object,

an envelope detector connected to said oscillator to receive the oscillations and provide an output signal whose amplitude is representative of the amplitude of the oscillations,

means for receiving said output signal and provide an alarm signal when the amplitude of said output signal falls outside a predetermined upper or lower level.

4,414,542

**TWO CHANNEL COMPARISON-TYPE FIRE OR EXPLOSION DETECTING SYSTEM**

Robert L. Farquhar, Woodley, and David N. Ball, Langley, both of England, assignors to Griviner Limited, England

Filed May 15, 1981, Ser. No. 265,016

Claims priority, application United Kingdom, May 17, 1980, 8016385

Int. Cl. 3 G08B 17/12

U.S. Cl. 340-578

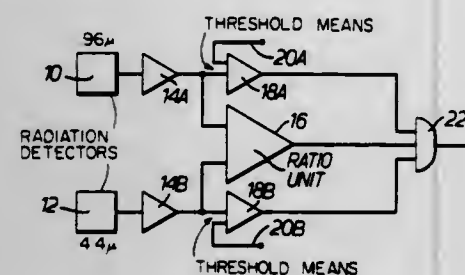
6 Claims

1. A system for detecting fires or explosions emitting radia-



tion having a characteristic wavelength and also emitting radiation at other wavelengths, comprising

first radiation sensing means to sense radiation in a narrow wavelength band including the characteristic wavelength and to produce a first electrical output dependent on the intensity of the radiation sensed but delayed with respect thereto,



second radiation sensing means to sense radiation in a wavelength band including one of the other said wavelengths and producing a second electrical output relatively instantaneously dependent on the intensity of the radiation sensed, means measuring the ratio of the two electrical outputs, and output means producing a fire or explosion indicating output only when the ratio of the first electrical output to the second electrical output exceeds a predetermined value.

4,414,543

## GROUND FAULT INDICATOR

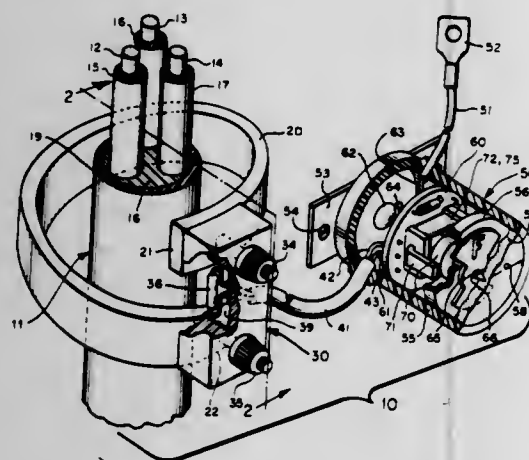
Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Sep. 25, 1980, Ser. No. 190,498

Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—651

15 Claims



1. A ground fault indicator for indicating the occurrence of a ground fault current in multi-conductor electrical mains, comprising, in combination:

magnetic circuit means comprising a helical magnetic pole piece having axially displaced ends encircling the conductors of the mains and forming a magnetic field between said axially displaced ends substantially parallel to the axis of said conductors dependent on the vector sum of the individual currents in the conductors;

magnetic sensing means disposed between said axially displaced ends and producing a control effect in response to said magnetic field exceeding a predetermined threshold level;

status indicating means having a reset-indicating state and a fault-indicating state; and

circuit means for conditioning said status indicating means to said fault-indicating state in response to said control effect.

4,414,544  
CONSTANT DATA RATE BRIGHTNESS CONTROL FOR AN AC PLASMA PANEL

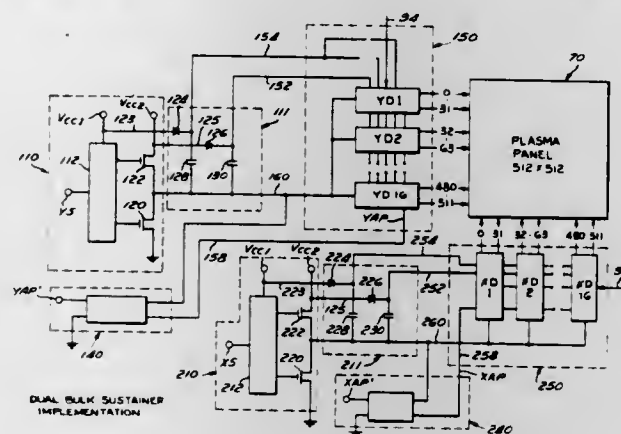
Joseph T. Suste, Orange, Calif., assignor to Interstate Electronics Corp., Anaheim, Calif.

Filed Jun. 12, 1981, Ser. No. 273,095

Int. Cl.<sup>3</sup> G09G 3/28

U.S. Cl. 340—767

18 Claims



1. A brightness control for an AC plasma panel having an inherent memory and having sustainer and driver circuitry, comprising:

means for generating:

(a) a first group of pulse trains controlling said sustainer and driver circuitry, said pulse trains executing sustain, write, and erase functions on said plasma panel with the emission of a first light level from said panel; and

(b) a second group of pulse trains controlling said sustainer and driver circuitry, said pulse trains executing sustain, write, and erase functions on said plasma panel with the emission of a second light level from said panel;

(c) wherein both said write functions set said inherent memory and both said erase functions unset said inherent memory; and

brightness selection means connected to said generating means and producing a signal which causes said generating means to selectively, alternatively output said first and second groups of pulse trains.

4,414,545

MEMORY CIRCUIT FOR GENERATING LIQUID CRYSTAL DISPLAY CHARACTERS

Hiroshi Sakurada, and Naofumi Aoyama, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

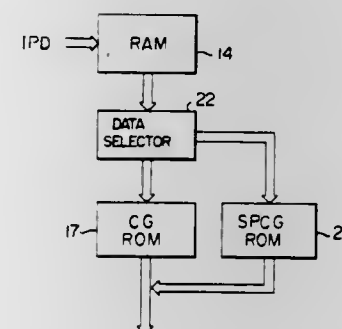
Filed Dec. 9, 1981, Ser. No. 329,047

Claims priority, application Japan, Dec. 17, 1980, 55-177271

Int. Cl.<sup>3</sup> G09G 3/36

U.S. Cl. 340—790

2 Claims



1. A liquid crystal display character generator circuit comprising:

a first RAM for temporarily storing information to be displayed on a liquid crystal display unit;

a ROM for storing in its respective addresses standard char-

acter patterns corresponding to information to be displayed and producing, when one of the addresses is designated, a signal representative of a character pattern stored in the designated address;

a second RAM capable of being dedicated for storing in at least one of its addresses at least one special character pattern corresponding to information to be displayed and operable to produce, when the address is designated, a signal representative of the character pattern stored in the designated address; and

a data selector for selecting one of the ROM and the second RAM in accordance with contents of the information stored in the first RAM and enabling the designation of the address in the selected one of the ROM and the second RAM in accordance with the information stored in the first RAM, said first RAM, ROM, second RAM and data selector being integrated in a one chip integrated circuit.

4,414,547

STORAGE LOGIC ARRAY HAVING TWO CONDUCTOR DATA COLUMN

William Knapp, Chandler; William Dunn, Scottsdale, both of Ariz., and Kent F. Smith, Salt Lake City, Utah, assignors to General Instrument Corporation, New York, N.Y.

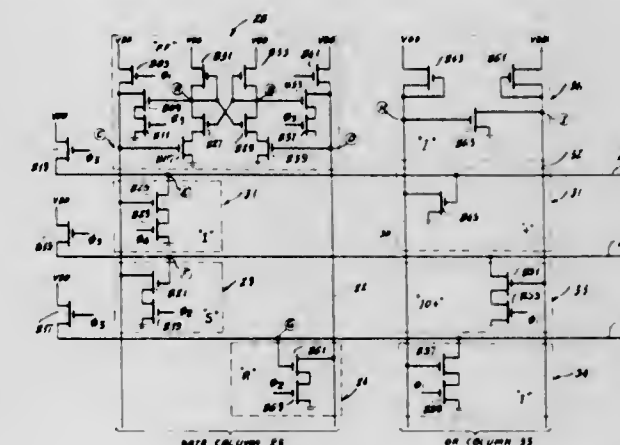
Filed Oct. 16, 1981, Ser. No. 312,188

Claims priority, application United Kingdom, Aug. 5, 1981, 8123966

Int. Cl.<sup>3</sup> H04Q 9/00; H03K 19/177

U.S. Cl. 340—825.83

44 Claims



1. An integrated circuit storage logic array comprising: at least one data column having first and second data column conductors;

a plurality of rows disposed substantially orthogonal to said column, each row comprising a row conductor;

clock means for generating a plurality of phase-displaced clock signals;

a storage cell operatively associated with said data column, said storage cell having a memory element, output means responsive to said clock means for transferring data from said memory element to said first and second data column conductors, and input means coupled for transferring data from said first and second data column conductors to said memory element; and

a plurality of functionally distinct logic cells connected between selected column and row conductors and adapted to be actuated by said clock means to manipulate data among said selected column and row conductors.

4,414,548

DOPPLER SPEED SENSING APPARATUS

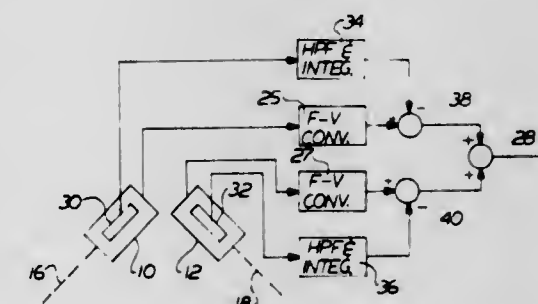
Daniel D. Carpenter, Manhattan Beach, and Ronald L. Lanning, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Cleveland, Ohio

Filed Mar. 30, 1981, Ser. No. 249,073

Int. Cl.<sup>3</sup> G01S 9/44

U.S. Cl. 343—8

15 Claims



1. A method of utilizing a data processing system to authenticate the identity of a horse by generating a digital code number which is related to physical characteristics distinguishing that horse from all other horses, the method comprising the steps of:

(a) storing in the system an assigned number particular to the horse,

(b) optically scanning each of the horse's chestnuts in sequence to produce an electrical output indicative of characteristics corresponding to the configuration of the chestnuts,

(c) converting the output of each scan into a digital signal relating to the dimensional parameters of the chestnut,

(d) combining the outputs from each converting step with a serial number of the system and said assigned number to produce a digital code number, and

(e) recording the digital code number on a magnetic medium.

4. In a speed sensing system wherein first and second doppler velocity sensors are used to determine the velocity of a vehicle by each providing a doppler output signal indicative of movement of the vehicle relative to the ground along its respective boresight, which doppler output signals are combined



to form the velocity indication signal, the improvement comprising:

- first and second accelerometer means for sensing accelerations of said vehicle along the boresight of said first and said second doppler velocity sensor respectively, each accelerometer means being insensitive to accelerations perpendicular to its respective boresight and thus providing an accelerometer output signal indicative of only the accelerations along said boresight,
- processing means for processing said accelerometer output signals to derive at least one velocity error signal indicative of vehicle velocity components other than a velocity component of interest, and
- first means for combining said doppler output signals and said at least one velocity error signal to derive a corrected velocity indication signal representative of said velocity component of interest.

4,414,549

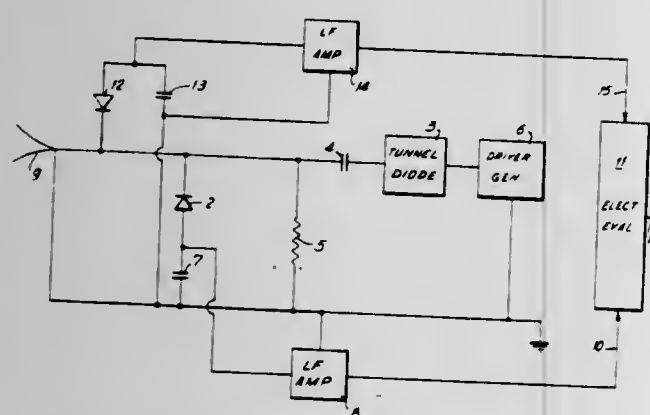
**METHOD AND APPARATUS FOR SENSING A TARGET**  
Günter Wichmann, Heidelberg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 721,136, Apr. 10, 1968, abandoned. This application Mar. 31, 1971, Ser. No. 130,024  
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1967, 1591117

Int. Cl.<sup>3</sup> G01S 7/36; F42C 13/04

U.S. Cl. 343—18 E

13 Claims



1. Apparatus sensitive to an object which has relative movement with respect to at least part of said apparatus; said apparatus comprising an antenna for transmitting radiation towards said object and receiving reflected radiation from the object, transmission impulse generating means coupled to said antenna to initiate the transmission of radiation from the latter, receiving means coupled to said antenna to receive signals therefrom and further coupled to said generating means to be actuated by the latter, and further means coupled to said receiving means and generating a signal based upon the movement of said object relative to said antenna; said further means including two means for generating low-frequency images of signals received by the antenna and means for algebraically mixing the images to cancel out jamming signals.

4,414,550

**LOW PROFILE CIRCULAR ARRAY ANTENNA AND MICROSTRIP ELEMENTS THEREFOR**

Carl P. Tresselt, Towson, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 4, 1981, Ser. No. 289,851

Int. Cl.<sup>3</sup> H01Q 3/30, 9/28

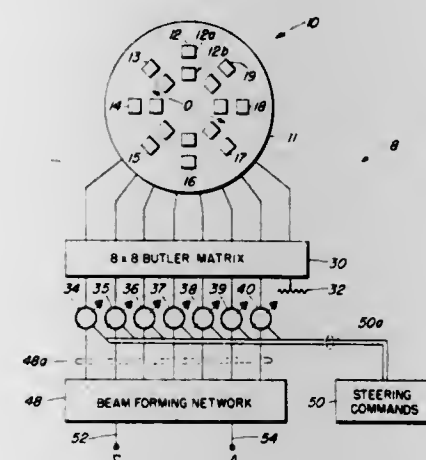
U.S. Cl. 343—700 MS

12 Claims

1. A low profile circular array antenna resonant at a design frequency comprising:

- a ground plane conductor;
- a plurality of N antenna elements, each comprised of at least two patch dipoles, each said dipole being comprised of a flat rectangular conductive plate arranged parallel to said

ground plane conductor and spaced a predetermined distance which is less than a quarter wavelength of said design frequency above said ground plane conductor and electrically shunted along at least one edge of said plate to said ground plane, the dipoles comprising an antenna element being arranged on a radial line from a common center on said ground plane conductor, there being N equally spaced radial lines from said common center, one said line for each said antenna element, each said plate having a feedpoint, the feedpoints on the dipoles comprising an antenna element being separated along said line a predetermined distance equivalent to a phase shift of said design frequency;



a plurality of N isolated power splitter means, one for each antenna element, having at least first, second and third ports, the power at said first port being split to said second and third ports, and including means for electrically isolating said second and third ports and additionally including first means for connecting said second port to the feedpoint of one of said dipoles of the associated antenna element and second means for connecting said third port to the feedpoint of the other of said dipoles of the same associated antenna element, each said power splitter means including means for shifting the phase of a signal of said design frequency at the feedpoint of said one dipole with respect to the signal of said design frequency at the feedpoint of said other of said dipoles by a phase angle equivalent to said predetermined distance.

4,414,551

**POWER ANTENNA CONTROL CIRCUIT USED IN VEHICLE**

Kazuhiro Tadauchi, Toyota, and Taketsugu Torii, Kasugai, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

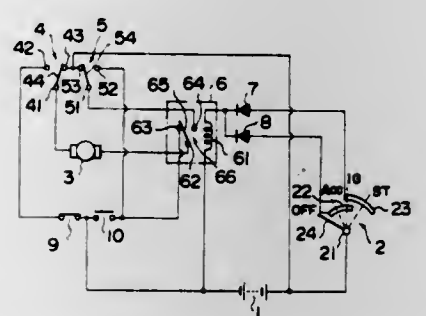
Filed Jul. 6, 1981, Ser. No. 280,214

Claims priority, application Japan, Jul. 7, 1980, 55-95395[U]

Int. Cl.<sup>3</sup> H01Q 1/32

U.S. Cl. 343—903

5 Claims



1. A power antenna control circuit, comprising:  
a reversible motor rotatable to raise or to lower an antenna;  
a motor having at least two terminals;  
a power source for said motor having at least two poles;

- a first switching means which normally connects a first terminal of said motor to a first pole of said power source, said switching means being switchable to connect the first terminal of said motor to a second pole of said power source to raise said antenna;
- a second switching means which normally connects a second terminal of said motor to the first pole of said power source, said second switching means being switchable to connect the second terminal of said motor to the second pole of said power source to lower said antenna;
- a first limit switch between said first switching means and the second pole of said power source which is in the off position when the antenna is fully raised and in the on position when the antenna is at all other positions;
- a second limit switch between said second switching means and the second pole of said power source which is turned off when the antenna is completely lowered and is turned on when said antenna is at all other positions;
- a first transistor which is turned on when an ignition switch is turned on and which is turned off when the ignition switch is turned off;
- a second transistor, the base of which is connected to the collector of said first transistor and the emitter of which is connected to the second limit switch for lowering the antenna, adapted to be turned on when said first transistor is turned off and turned off when said first transistor is turned on;
- a relay coil connected at one end to said first pole of said power source and at the other end to said second pole of said power source through the collector and the emitter of said second transistor and said second limit switch; and
- a relay switch which normally connects said second switching means for lowering said antenna to the second terminal of said motor and, when energized by said relay coil, connects the second terminal of said motor to the second pole of said power source by bypassing said second switching means for lowering the antenna.

4,414,552

**PRINTING HEAD FOR INK JET PRINTERS**

Udo Bergmann, Schwarzenbek; Heinrich Kurz, Pinneberg, and Wolfgang Radtke, Scharbeutz, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,276

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104077

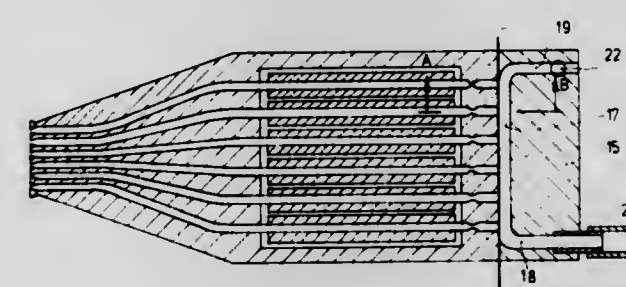
Int. Cl.<sup>3</sup> G01D 9/00, 15/16

U.S. Cl. 346—1.1

10 Claims

U.S. Cl. 346—74.5

10 Claims



8. A method of manufacturing a printing head for ink jet printers, comprising a plurality of tubular nozzle ducts, each of which has associated with it a drive member for the droplet-wise ejection of ink droplets at appropriate instants, the ink being applied thereto via a common distribution duct and individually associated damping members, each nozzle duct with its drive member forming a separate, operational droplet generator, the droplet generators being accommodated in a first block and the common distribution duct being accommodated in a second block, said blocks being preferably made of a plastic material, and being interconnected, comprising the steps of:

- obtaining the predetermined shape for each nozzle duct (1) and providing it with a drive member (2);
- testing each nozzle duct for suitable operation and droplet emission;
- aligning each nozzle duct in a mount (12) and encapsulating it in a first plastic block (10); cutting the first plastic block (10) at its rear to be perpendicular to the ends of the nozzle ducts (1); and connecting it to the distribution duct (17) which is encapsulated in a second plastic block (15).

4,414,553

**INK JET ARRAY**

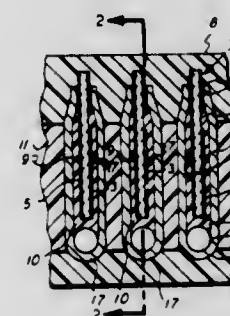
Theodore P. Perna, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1982, Ser. No. 364,064

Int. Cl.<sup>3</sup> G01D 15/18, 9/00

U.S. Cl. 346—1.1

1 Claim



1. A method of forming a fluid jet array, which comprises:
  - (a) producing at least two individual jets, each said jet comprising a substantially rectangular transducer and a channel for containing fluid, said transducer being positioned in operating relationship to said channel, and wherein each said transducer and said channel are at least partially enclosed in a rigid casing;
  - (b) testing each said jet to determine its acceptability as a droplet ejector; and
  - (c) assembling the acceptable jets into an array.

4,414,554

**MAGNETIC IMAGING APPARATUS**

Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Sunnyvale, Calif.

Filed Jul. 21, 1980, Ser. No. 170,788

Int. Cl.<sup>3</sup> G01D 15/12

U.S. Cl. 346—74.5

10 Claims



10. Thin-film, pancake-sandwich-like, electro-magnetic imaging structure comprising

- a flexible, thin-film magnetic web having an aperture opening to opposite faces of the web,
- a thin-film blanket of magnetic material including one portion spaced from said aperture in magnetic-circuit contact with, and distributed adjacent, one face of said web, and another portion extending in a magnetically gapped manner through said aperture with a facial expanse which is substantially flush with the other face of said web, and spiral coil means spaced from said aperture, and sandwiched between and encompassed by said web and blanket adjacent the web's said one face in a manner capable, when energized, of inducing magnetic flux in the web and blanket;



ket to produce on said web's said other face, in the region of said aperture, opposite-polarity magnetic poles.

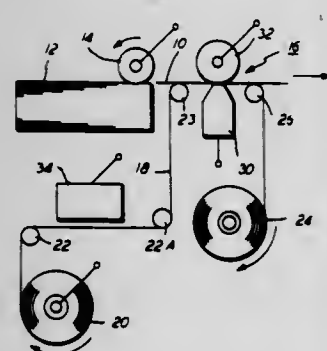
a film having format information recorded thereon, said film being arranged between said scanning means and said

**4,414,555**  
**METHOD AND APPARATUS FOR REPLENISHING MARKING MATERIAL TO A DONOR RIBBON IN A THERMAL MARKING PRINTER SYSTEM**  
Horace W. Becker, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 7, 1982, Ser. No. 375,772  
Int. Cl.<sup>3</sup> G01D 15/10

U.S. Cl. 346—76 PH

1 Claim



1. Apparatus for applying an ink coating to depleted areas of a ribbon used in a thermal transfer operation, the apparatus comprising:

an ink transfer ribbon connected between two feed rollers, means for advancing, during a print cycle, the ink-coated ribbon through a thermal printing station in a first direction, said ribbon being wound around a first feed roller acting as a take-up roller,

an ink applicator positioned adjacent the ribbon path, said applicator out of contact with said ribbon during said print cycle,

means for periodically reversing the direction of said ribbon during a non-print cycle so that the ribbon is rewound on said second roller,

means for causing said ink applicator to come into contact with the ink-depleted ribbon surface during a time coincident with said reversed ribbon travel, whereby a uniform ink coating is applied to said surface, and means for reactuating said ribbon advancing means coincident with initiation of the next print cycle.

**4,414,556**  
**LASER BEAM PRINTER**  
Mitsuo Ohno, Hadano, and Kikuo Hatazawa, Atsugi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Sep. 17, 1981, Ser. No. 303,135  
Claims priority, application Japan, Sep. 18, 1980, 55-128548  
Int. Cl.<sup>3</sup> G01D 15/14

U.S. Cl. 346—160

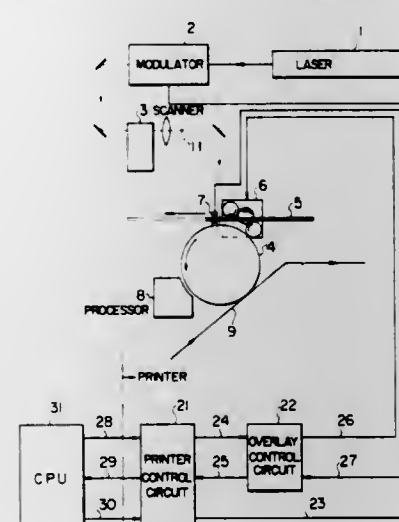
3 Claims

1. A laser beam printer for forming a latent image on a photosensitive body by a laser beam modulated in accordance with print information, comprising:

means for generating a laser beam modulated in accordance with print information;

a photosensitive body irradiated with said laser beam for forming a latent image on a surface of said photosensitive body;

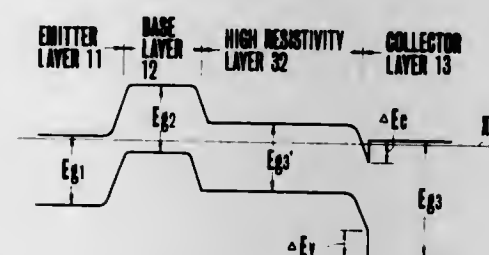
scanning means for line-scanning said photosensitive body by said laser beam; and



photosensitive body whereby said print information is superposed on said format information.

**4,414,557**  
**BIPOLAR TRANSISTORS**  
Yoshihito Amemiya, Fuchu; Tsuneo Urisu, Tokorozawa, and Yoshihiko Mizushima, Fuch, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan  
Filed Mar. 3, 1981, Ser. No. 240,148  
Claims priority, application Japan, Mar. 10, 1980, 55-30096  
Int. Cl.<sup>3</sup> H01L 29/161, 29/80, 45/00, 29/72  
U.S. Cl. 357—16

10 Claims



1. In a bipolar transistor of the type comprising an emitter region, a base region and a collector region, the improvement wherein said collector region has a larger forbidden band gap than that of said base region and is made of material having different conductivity type from that of said base region and further comprising a high resistivity semiconductor region interposed between said base region said collector region, said high resistivity semiconductor region having the same conductivity type as said collector region, a lower impurity concentration than said collector region and the same forbidden band gap as that of said base region.

**4,414,558**  
**HETERO-JUNCTION LIGHT-EMITTING DIODE**  
Jun-ichi Nishizawa, Sendai, and Toru Teshima, Yokohama, both of Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai and Stanley Electric Co., Ltd., Tokyo, both of Japan

Filed Feb. 9, 1981, Ser. No. 232,967  
Claims priority, application Japan, Feb. 7, 1980, 55-14504; Feb. 7, 1980, 55-14505; Feb. 7, 1980, 55-14506; Feb. 7, 1980, 55-14507; Feb. 7, 1980, 55-14508

Int. Cl.<sup>3</sup> H01L 33/00, 29/161; H01S 33/19  
U.S. Cl. 357—17

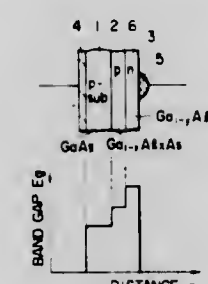
7 Claims

1. A hetero-junction light emitting diode for emitting light through a predetermined surface thereof comprising:

a p-type GaAs substrate having a first carrier concentration  $P_1$ ;

a relatively low band-gap p-type semiconductor region disposed on said substrate, said p-type region being composed of  $Ga_{1-x}Al_xAs$  ( $0.3 < x < 0.37$ ), and having a second carrier concentration  $p_2$ , where:  $p_2 < p_1$ , and  $4.5 \times 10^{17} \text{ cm}^{-3} < p_2 < 2.5 \times 10^{18} \text{ cm}^{-3}$ ; and

a relatively high band-gap n-type semiconductor region disposed on said p-type region adjacent to said predetermined diode surface, said n-type region being composed

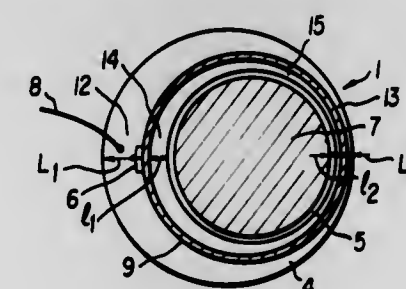


of  $Ga_{1-y}Al_yAs$  ( $y > x$ ), and having a carrier concentration  $n$ , where  $n$  is less than the carrier concentration  $p_2$  of said p-type region, and  $2 \times 10^{17} \text{ cm}^{-3} < n < 1 \times 10^{18} \text{ cm}^{-3}$ , said n-type region forming a pn hetero-junction with said p-type region having a face generally parallel to said diode predetermined surface;

said substrate, and n-type and p-type regions being disposed such that light rays derived in said diode are in a direction perpendicular to said face of said hetero-junction for emission through said predetermined surface.

**4,414,559**  
**SEMICONDUCTOR THYRISTOR DEVICE WITH LATERALLY DISPLACED AUXILIARY AND MAIN CATHODE REGIONS**  
Yukio Igarashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
Continuation of Ser. No. 25,652, Mar. 30, 1979, abandoned. This application Apr. 17, 1981, Ser. No. 255,167  
Claims priority, application Japan, Mar. 31, 1978, 53-37758  
Int. Cl.<sup>3</sup> H01L 29/74  
U.S. Cl. 357—38

16 Claims



1. A semiconductor device comprising:

a semiconductor body having first and second opposing principal surfaces including an anode layer of a first conductivity type having a surface exposed to said first principal surface, a first base layer of a second conductivity type superposed on said anode layer and forming a PN junction therewith, and a second base layer of said first conductivity type superposed on said first base layer and forming a PN junction therewith, said second base layer including a portion of its surface exposed to said second principal surface;

a cathode layer of said second conductivity type formed in said second base layer, a portion of the surface of said cathode layer being exposed to said second principal surface;

an auxiliary region of said second conductivity type formed in said second base layer, said auxiliary region being sepa-

rated from said cathode layer, said auxiliary region having a portion of its surface exposed to said second principal surface;

a cathode electrode in contact with a portion of the surface of said cathode layer;

an anode electrode in contact with the surface of said anode layer;

an auxiliary electrode in contact with a portion of the surface of said auxiliary region and in contact with a portion of the surface of said second base layer, said auxiliary electrode substantially surrounding said cathode layer and said cathode electrode and being spaced apart therefrom; and

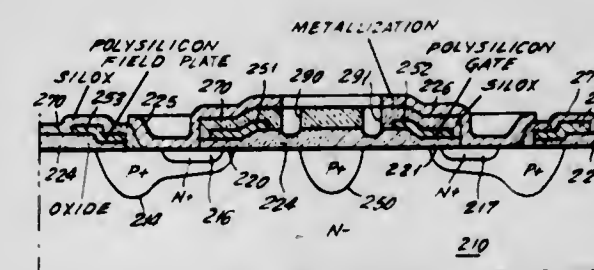
a gate electrode in contact with the surface of said second base layer, said gate electrode located external to said auxiliary electrode, said auxiliary region lying between said gate electrode and said cathode electrode;

wherein said semiconductor device includes a peripheral zone, said peripheral zone being the area of said second principal surface lying between said auxiliary electrode and an outer edge of said second base layer, said peripheral zone including a gate peripheral portion in the vicinity of said auxiliary region and said gate electrode, said gate peripheral portion having a greater width than any of the remaining portions of said peripheral zone; and

wherein said semiconductor device further includes a corridor zone, said corridor zone being the area of said second principal surface lying between said auxiliary electrode and said cathode electrode, said corridor zone including a gate corridor portion in the vicinity of said auxiliary region, said gate corridor portion having a greater width than any of the remaining portions of said corridor zone.

**4,414,560**  
**FLOATING GUARD REGION AND PROCESS OF MANUFACTURE FOR SEMICONDUCTOR REVERSE CONDUCTING SWITCHING DEVICE USING SPACED MOS TRANSISTORS HAVING A COMMON DRAIN REGION**  
Alexander Lidow, Manhattan Beach, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.  
Filed Nov. 17, 1980, Ser. No. 207,126  
Int. Cl.<sup>3</sup> H01L 29/747  
U.S. Cl. 357—39

5 Claims



1. A metal oxide semiconductor type device for switching high voltage and high current circuits; said device comprising a body of semiconductor material of one conductivity type extending to a given depth and having a planar surface; first, second and third spaced regions of the other conductivity type formed in said body and terminating on said planar surface and having depths less than said given depth; said second region disposed between said first and third regions; fourth and fifth regions of said one conductivity type formed within said first and third regions respectively and extending to said planar surface; said first and fourth regions and said third and fifth regions defining respective first and second elongated lateral conduction channels; first and second gate electrodes insulated from and disposed above said first and second conduction channels and operable to invert said conduction channels to



control their conductivity; said second region defining a floating guard region.

4,414,561

# **BERYLLIUM-GOLD OHMIC CONTACT TO A SEMICONDUCTOR DEVICE**

Vassilis G. Keramidas, Warren; Robert J. McCoy, Chatham, and Henryk Temkin, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. Division of Ser. No. 79,451, Sep. 27, 1979, Pat. No. 4,366,186. This application Sep. 7, 1982, Ser. No. 415,664.

Int. Cl.<sup>3</sup> H01L 23/48, 29/46, 29/62

U.S. Cl. 357-67

2 Claims



1. A semiconductor device comprising a layer of p-type semiconductor material, said semiconductor being selected from the group consisting of InP and InGaAsP, and an ohmic contact to said semiconductor characterized in that said ohmic contact comprises:

- a layer of beryllium-gold; and
- a layer of gold.

4,414,562

# **SEMICONDUCTOR HEAT SINK ASSEMBLY INCLUDING THERMALLY RESPONSIVE MEANS FOR INCREASING COMPRESSION AS THE TEMPERATURE OF SAID ASSEMBLY INCREASES**

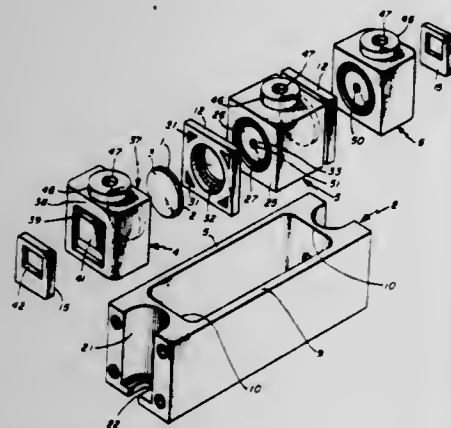
Richard F. Kiley, Stoneham, and Ralph I. Larson, Brookline, both of Mass., assignors to Thermal Associates, Inc., Stoneham, Mass.

Continuation of Ser. No. 171,827, Jul. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 142,862, Apr. 21, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,299.

Int. Cl.<sup>3</sup> H01L 23/02, 23/42

U.S. Cl. 357-81

9 Claims



1. A semiconductor assembly for facilitating electrical connection and double-side cooling of said semiconductor, comprising:

- a semiconductor element having opposing sides;
- two electrically and thermally conductive members having facing spaced surfaces;
- means on said surfaces for receiving and electrically and thermally contacting said opposing sides of said semiconductor element positioned between said members;
- compression means for maintaining said members and said semiconductor element under compression, with said surfaces in electrical and thermal contact with said semiconductor element, said compression means comprising a

thermally conductive rigid retaining frame at least partially surrounding said members and said semiconductor element, and further comprising a thermally responsive element for increasing said compression as the temperature of the assembly increases; and

bonding means for fixing said members in position within said frame, said members being electrically isolated from and thermally coupled to said retaining frame by said bonding means.

4,414,563

# **TELEVISION RECEIVER CIRCUIT ARRANGEMENT FOR IDENTIFYING THE STANDARD**

Klaus Juhnke, Rellingen, and Hartmut S. Harlos, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

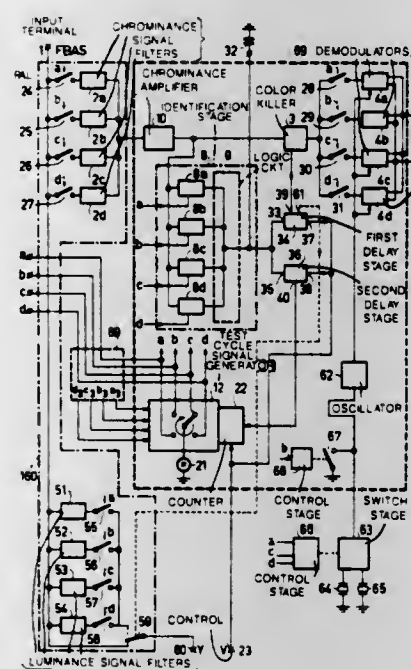
Filed Nov. 17, 1981, Ser. No. 322,122

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043573; Sep. 21, 1981, 3137447

Int. Cl.<sup>3</sup> H04N 9/32

U.S. Cl. 358-21 R

35 Claims



1. A circuit arrangement in a television receiver in which to identify the standard, the received colour television signal is applied to an identification circuit and the receiving channel is adjusted and/or switched over as regards its passband curve and demodulating circuit in accordance with the standard at which the received signal can be demodulated and reproduced, said circuit comprising:

- an identification circuit, a chrominance signal demodulator circuit, and a test signal generator, said identification circuit in response to a standard test cycle actuating signal received from said test signal generator is sequentially switched to each of the available television standards, as long as the standard of a received colour television signal has not been identified, said test cycle actuating signal is maintained in its condition and said test signal generator is not switched a further step when the standard of the received colour television signal has been identified.

4,414,564

# **NONLINEAR EDGE PEAKING SYSTEM AND METHOD**

James E. Hitchcock, Knoxville, Tenn., assignor to Magnavox Consumer Electronics Company, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,088

Int. Cl.<sup>3</sup> H04N 5/14

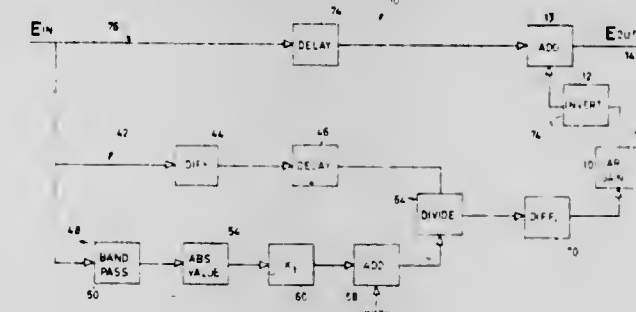
U.S. Cl. 358-37

12 Claims

1. A nonlinear edge peaking system for decreasing the rise and fall times of input signal transitions while maintaining a

substantially similar frequency response and attenuating the introduction of excessive preshoot and/or overshoot, said system including:

- first circuit means for delaying said input signal;
- second circuit means connected in parallel with said first circuit means including means for taking the widened second derivative of said input signal and means for taking the absolute value of said second derivative of said input signal and for adding a preselected bias to said input signal, whereby the output of said second circuit means is the approximate absolute value of the widened second derivative of said input signal having a preselected bias;
- third circuit means connected in parallel with said first circuit means and said second circuit means including means



for taking the first derivative of said input signal and for delaying said input signal such that the outputs of said second circuit means and said first circuit means are time coincident, whereby the output of said third circuit means is the delayed first derivative of the input signal;

- fourth circuit means including means for combining said output of said second circuit means and said output of said third circuit means in a preselected manner and means for modifying said signal produced by combining said output of said second circuit means and said third circuit means to produce a correction signal, and means for adding said correction signal to the delayed input signal produced by said first circuit means to produce an overall waveform modified to contain reduced rise and fall times at the signal transitions with attenuated preshoot and overshoot.

4,414,565

# **METHOD AND APPARATUS FOR PRODUCING THREE DIMENSIONAL DISPLAYS**

Ian A. Shanks, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB80/00167, § 371 Date Jun. 11, 1981, § 102(e) Date Jun. 11, 1981, PCT Pub. No. WO81/01201, PCT Pub. Date Apr. 30, 1981

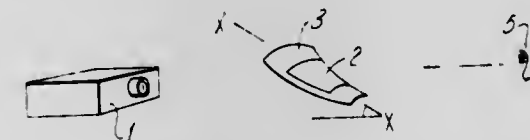
PCT Filed Oct. 15, 1980, Ser. No. 276,338

Claims priority, application United Kingdom, Oct. 16, 1979, 7935861; Feb. 27, 1980, 8006627

Int. Cl.<sup>3</sup> H04N 9/54, 5/72

U.S. Cl. 358-89

14 Claims



1. Apparatus for displaying an apparent three dimensional image comprising:

- (i) display means for providing a distorted two dimensional image of an original scene, the distorted image having a greater magnification at its top than at its bottom;
- (ii) means for displaying this distorted image on a real or virtual saddle shaped surface inclined with its bottom part

closer to an observer than its top part, the saddle shaped surface being convex in a horizontal plane with a smaller radius at the bottom than the top and straight or concave in a vertical plane.

4,414,566

# **SORTING AND INSPECTION APPARATUS AND METHOD**

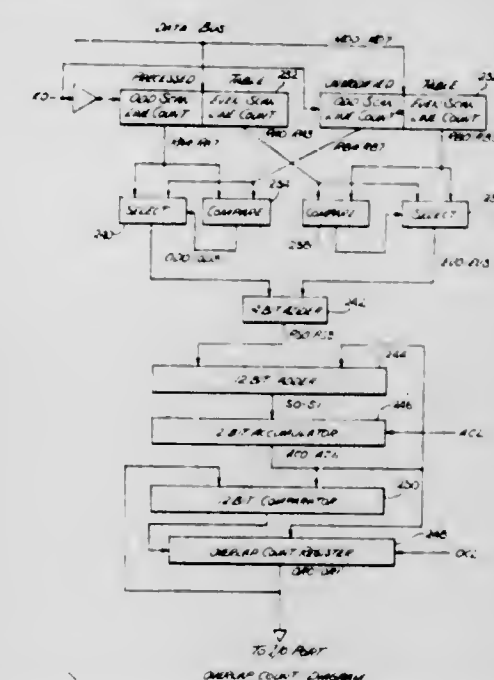
John J. Peyton, Santa Barbara; Robert L. Thomason, Corona del Mar, and Hubert W. Evinger, Tustin, all of Calif., assignors to Industrial Automation Corporation, Goleta, Calif.

Filed Apr. 3, 1981, Ser. No. 250,780

Int. Cl.<sup>3</sup> H04N 7/18

U.S. Cl. 358-101

39 Claims



1. In a bottle sorting system, the improvement comprising video camera means for receiving at least one two-dimensional image of at least a visually distinctive portion of a target bottle within the field of view of said video camera and for providing a video signal in response thereto digitizing means coupled to said camera means for providing a first plurality of digital signals responsive to said video signal, each said digital signal summarizing, in digital form, the features of a respective portion of the target bottle storage means for storing second pluralities of digital signals, each of said digital signals within one of said second pluralities of digital signals summarizing, in digital form, the features of a respective portion of a bottle of one of the predetermined types of bottle to be sorted; and correlation means for correlating said first plurality of digital signals with each of said second plurality of digital signals to identify which of said predetermined types of bottles the target bottle most closely correlates.

4,414,567

# **PATTERN GENERATING CIRCUIT**

Herbert Berke, Phoenix, Ariz., and Joseph Portoghesi, Altamonte Springs, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1981, Ser. No. 305,075

Int. Cl.<sup>3</sup> H04N 7/02

U.S. Cl. 358-139

9 Claims

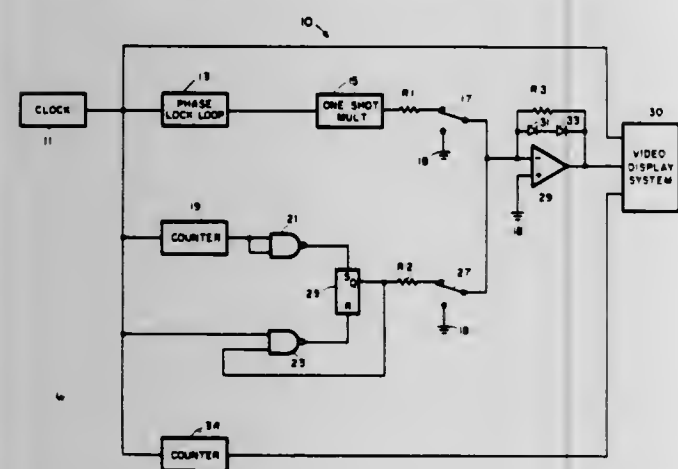
1. A pattern generating circuit for a one thousand line display comprising, in combination: means having an output, for generating a horizontal sync signal, said horizontal sync signal having a series of uniformly spaced pulses of a first predetermined frequency of 33 kilohertz;



means having an input connected to the output of said horizontal sync signal generating means, and an output, for producing, in response to said horizontal sync signal, a first video component signal having a series of uniformly spaced pulses of a second predetermined frequency, said second frequency selected to provide a particular horizontal spacing in said pattern;

a one-shot multivibrator having an input connected to the output of said first video component signal producing means and an output, for deriving a pulse suitable for generating narrow vertical lines from each pulse of said first video component signal;

means having an input connected to the output of said horizontal sync signal generating means and an output, for producing, in response to said horizontal sync signal, a second video component signal having a series of uniformly spaced pulses of a third predetermined frequency, said third frequency selected to provide vertical spacing equivalent to said horizontal spacing; said second video component signal producing means comprising:



a counter having an input connected to the output of said horizontal sync signal generating means, and an output;

a first NAND gate having first and second inputs connected to the output of said counter, and an output;

a second NAND gate having first and second inputs and an output, with the first input thereof connected to the output of said horizontal sync signal generating means;

a flip-flop having a set input connected to the output of said first NAND gate, a reset input connected to the output of said second NAND gate, and a Q output connected to the second input of said second NAND gate;

means having an input and an output, with the input thereof connected to the output of said multivibrator and the output of said second video component signal producing means, for summing said first and second video component signals so as to provide at the output thereof a video signal; and

means having an input connected to the output of said horizontal sync signal generating means and an output, for producing, in response to said horizontal sync signal, a vertical sync signal.

4,414,568

#### DEVICE FOR THE MEASUREMENT, IN OPERATION, OF NON-LINEARITY PRODUCTS IN A TELEVISION TRANSMITTER

Claude Cluniat, and Mariano Dominguez, both of Paris, France, assignors to L.G.T. Laboratoire General des Telecommunications, France

Filed Dec. 17, 1980, Ser. No. 217,458

Claims priority, application France, Dec. 21, 1979, 79 31488

Int. Cl.<sup>3</sup> H04N 7/62, 9/62

U.S. Cl. 358—139

6 Claims

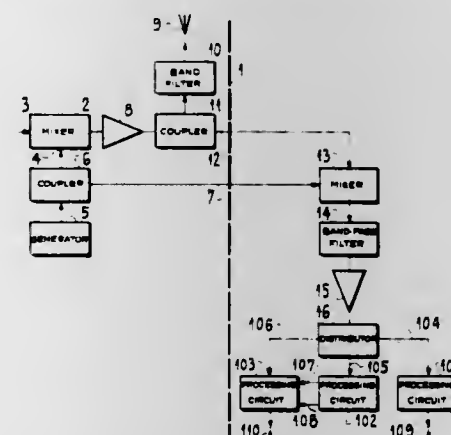
1. In an equipment for transmission and/or retransmission of television signals comprising a final power amplification stage having a modulated intermediate frequency information signal

input, a local oscillation signal input and an output coupled to a transmission antenna through a band filter,

a device for measuring in operation, level of non linearity products generated in said equipment comprising:

a mixer having two inputs respectively coupled to said output and to a said local oscillation signal input of said power stage, and an output,

a first processing circuit having a signal input coupled to the output of the mixer, a control input and an output, said first circuit comprising a first band-pass filter for selecting an intermodulation product outside the frequency band of the information signal having an output, said first circuit comprising a first band-pass filter for selecting an intermodulation product outside the frequency band of the information signal having an output, a first detector having an input coupled to the output of said band-pass filter and an output, a sampling circuit having a signal input coupled to the output of the first detector and a control



input which is the control input of said first circuit, and an output for supplying a signal having an amplitude proportional to the selected intermodulation product, and a measuring circuit having an input coupled to the output of said sampling circuit and an output which is the output of said first circuit for supplying corresponding intermodulation measure,

and a second processing circuit having an input also coupled to the output of the mixer and an output coupled to the control input of said first circuit comprising a second band-pass filter for selecting video frequency signal having an output, a second detector having an input coupled to the output of said second filter and an output and a control circuit having an input coupled to the output of said second detector and an output which is the output of said second circuit, for supplying a control signal during moments corresponding to at least one predetermined level of the video frequency signal.

4,414,569

#### TRANSISTOR CIRCUIT

Kazuo Tokuda, and Tokio Sawataishi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,225

Claims priority, application Japan, Jan. 14, 1981, 56-4264

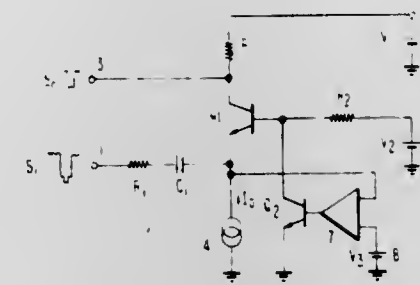
Int. Cl.<sup>3</sup> H04N 5/08

U.S. Cl. 358—153

17 Claims

1. A transistor circuit for separating a synchronizing signal from a composite video signal, comprising a transistor having an emitter connected to an input terminal via a capacitor and further connected to a constant-current source, a collector connected to an output terminal from which an output signal corresponding to said synchronizing signal is derived, and a base connected to a bias voltage source, said composite video

signal being supplied to said input terminal, a comparator for comparing a voltage at the emitter of said transistor with a



predetermined reference voltage, and means responsive to an output signal of said comparator for turning said transistor off.

4,414,570

#### CIRCUIT ARRANGEMENT FOR EXTRACTING A FIELD SYNCHRONIZING SIGNAL FROM A TELEVISION SYNCHRONIZING SIGNAL

Dirk Braune, Ahrensburg, and Wolfgang Schwartz, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

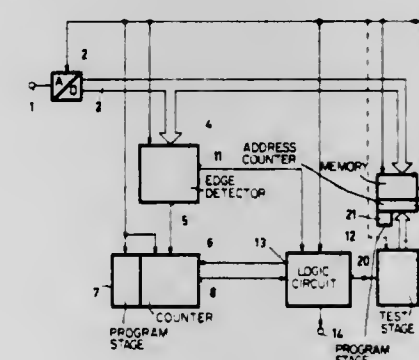
Filed Oct. 7, 1981, Ser. No. 309,334

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037987

Int. Cl.<sup>3</sup> H04N 5/04

U.S. Cl. 358—154

8 Claims



1. A circuit arrangement having binary clock pulse controlled stages for extracting a field synchronizing signal from a television synchronizing signal having at least line and field synchronizing pulses the amplitude of which extends between a black level and a peak level, said circuit arrangement comprising:

a source of said binary clock pulses,

means connected to said source of clock pulses for providing said television synchronizing signal,

a detector connected to said source of clock pulses, and

a time measuring element connected to said source of clock pulses, said means for providing said television synchronizing signal connected to said detector for applying said television synchronizing signal thereto, said detector being periodically made operative by a clock signal from said source of clock pulses for producing a first test signal when said television synchronizing signal substantially reaches said peak level, said first test signal starting said time measuring element which produces a switching signal when said time measuring element reaches a preset value before it is reset, said detector producing a second test signal when said black level is substantially reached, said second test signal resetting said time measuring element when the preset value has not yet been reached by said time measuring element, the period of said clock signal being significantly shorter than the duration of a line synchronizing pulse.

4,414,571

#### TELEVISION RECEIVER

Takeshi Kureha, Yawata; Teruo Kataoka, Sakai; Taiichi Saeki, Katano, and Minoru Takeda, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

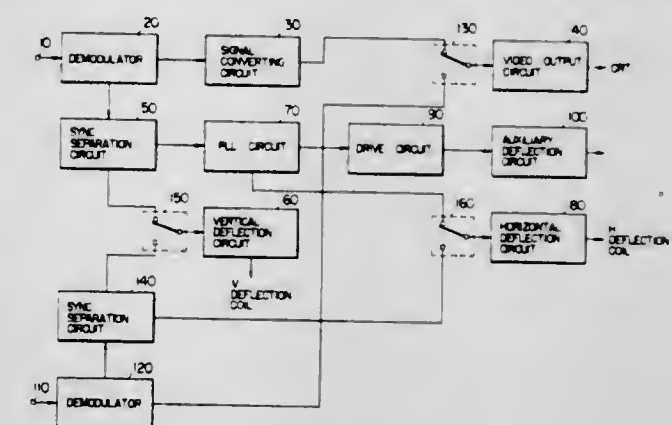
Filed Oct. 8, 1981, Ser. No. 309,850

Claims priority, application Japan, Oct. 9, 1980, 55-141201; Oct. 9, 1980, 55-141202; Oct. 9, 1980, 55-141203; Oct. 9, 1980, 55-141204; Oct. 9, 1980, 55-141205

Int. Cl.<sup>3</sup> H04N 5/04

U.S. Cl. 358—158

10 Claims



1. A television receiver comprising:

first demodulating circuit means for demodulating an applied video signal of a standard television system into signals containing primary color information;

first sync separation circuit means for separating a first horizontal synchronizing signal and a vertical synchronizing signal from said video signal of a standard television system;

PLL circuit means for receiving said first horizontal synchronizing signal and forming a second horizontal synchronizing signal having a frequency  $n$  times that of the first horizontal synchronizing signal where  $n \geq 2$ ;

signal converting means for converting said demodulated signals into signals having a time base compressed to  $1/n$  of that of said demodulated signals so as to correspond to the second horizontal synchronizing signal;

second demodulating circuit means for demodulating an applied video signal of a second television system into signals containing primary color information, said second television system utilizing a horizontal synchronizing signal having a frequency about  $n$  times that of the standard television system;

second sync separation circuit means for separating a horizontal synchronizing signal and a vertical synchronizing signal from said video signal of said second television system;

vertical deflection circuit means for driving a vertical deflection coil;

first switch means for supplying the vertical synchronizing signal separated in said first sync separation circuit means to said vertical deflection circuit means when said television receiver is to display the video signal of a standard television system and for supplying the vertical synchronizing signal separated in said second sync separation circuit means to said vertical deflection circuit means when said television receiver is to display the video signal of said second television system;

horizontal deflection circuit means which drives a horizontal coil;

second switch means for supplying said second horizontal synchronizing signal to said horizontal deflection circuit means when said television receiver is to display the video signal of said standard television system and for supplying the horizontal synchronizing signal separated in said second sync separation circuit means to said horizontal deflection circuit means when said television receiver is to display the video signal of said second television system;



video output circuit means for amplifying signals supplied from a third switch means and for driving a cathode ray tube; and  
third switch means for selectively supplying the signals converted in said signal converting means to said video output circuit means when said television receiver is to display said video signal of said standard television system and for supplying the signals demodulated in said second demodulating circuit means to said video output circuit means when said television receiver is to display said video signal of said second television system.

4,414,572

## CLAMP FOR LINE-ALTERNATE SIGNALS

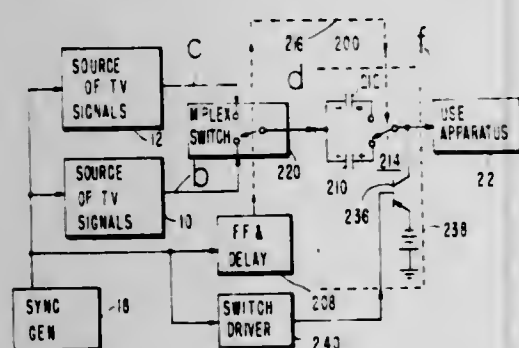
Robert E. Flory, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,381

Int. Cl.<sup>3</sup> H04N 5/18

U.S. Cl. 358—172

6 Claims



1. A clamp for television signals from a plurality of sources, comprising:

- a source of a first plurality of line-sequential television signals, each line including a recurrent identifiable portion;
- a second plurality of coupling capacitors having a terminal in common, each coupling capacitor having a second terminal, said terminal in common being coupled to said source of television signals, said first and second pluralities being equal;
- a source of reference voltage to which said recurrent identifiable portions of said television signals are to be clamped;
- first controllable switch means including a controlled current path having first and second terminals and a control electrode, said first terminal of said controlled current path being coupled to said source of reference voltage;
- second controllable switch means coupled to said second terminals of said coupling capacitors and to said second terminal of said controlled current path of said first controllable switch means;
- first control means coupled to said second controllable switch means for coupling said source of television signals to said second terminal of said first switch means by sequential coupling of said second terminals of said coupling capacitors with said second terminal of said first switching means in timed relationship with the line-sequence of said source of television signals; and
- second control means coupled to said control terminal of said first controllable switch means for rendering said controlled current path conductive during said recurrent identifiable portions of each horizontal line.

4,414,573  
PATTERN RECOGNITION CIRCUIT FOR RELIABLY  
DISTINGUISHING BETWEEN DIFFERENT PORTIONS  
OF A DIASCOPE PATTERN DURING VIDEO CAMERA  
SETUP

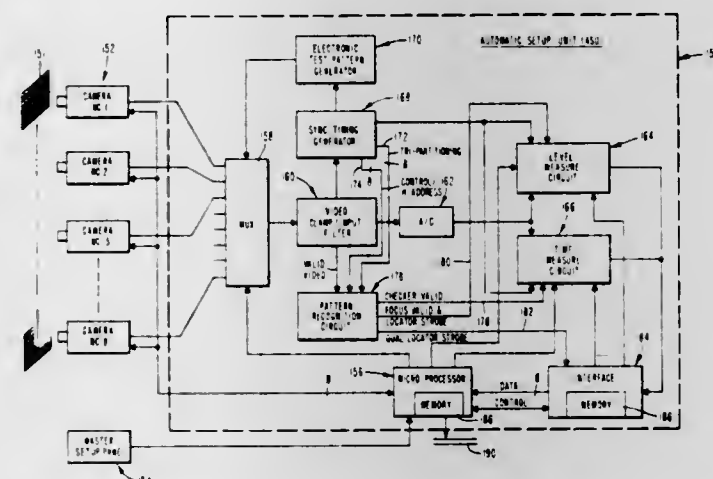
Karl H. Griesshaber, and Charles A. Bialo, both of San Jose, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1981, Ser. No. 252,108

Int. Cl.<sup>3</sup> H04N 9/62; G06K 9/00

U.S. Cl. 358—163

10 Claims



1. A pattern recognition circuit for distinguishing between given pattern configurations of an optical test pattern as the latter is being scanned by a beam on successive lines of a corresponding video field during automatic television camera setup, the pattern configurations including spaced white-to-black coarse locators having white-to-black transitions and bands of white-to-black checker blocks, comprising:

- strobe circuit means for generating a succession of continuous locator strobes within one field which are indicative of each locator's white-to-black transition in successive lines of the respective coarse locators within the field; and
- qualifying circuit means coupled to the strobe circuit means for qualifying a locator strobe of the continuous locator strobes generated by the strobe circuit means in response to a selected valid succession of locator strobes taken from successive lines of the respective coarse locators.

4,414,574

## VIDEO AMPLIFIER WITH BLANK STRETCHING

Harry W. Verlinden, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

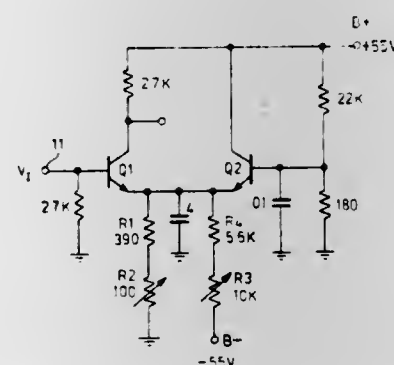
Filed Dec. 4, 1981, Ser. No. 327,432

Claims priority, application United Kingdom, Dec. 23, 1980, 8041239

Int. Cl.<sup>3</sup> H04N 5/14

U.S. Cl. 358—184

3 Claims



1. A video amplifier comprising first and second NPN transistors having base, collector and emitter electrodes; means connecting said collector electrode of said first transistor to a source of positive potential via a first resistor; means connecting said collector electrode of said second transistor to a source

of positive potential; means for connecting said emitter electrode to each other and via a first resistive network to a source of negative potential and via a second resistive network including a variable resistor to a terminal at a potential less positive than said positive potentials and less negative than said negative potential; a network for biasing on said second transistor connected to said base electrode of said second transistor; an input terminal connected to the base electrode of said first transistor; means for supplying to said input terminal a video input signal varying between a blanking level, a black level and a maximum brightness level, the maximum brightness level being more positive than the blanking level and the black level being more positive than the blanking level; and an output terminal connected to said collector electrode of said first transistor.

4,414,575

## AUTOFOCUS SYSTEM

Manabu Yamamoto, Odawara, and Shuhei Tanaka, Musashimurayama, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

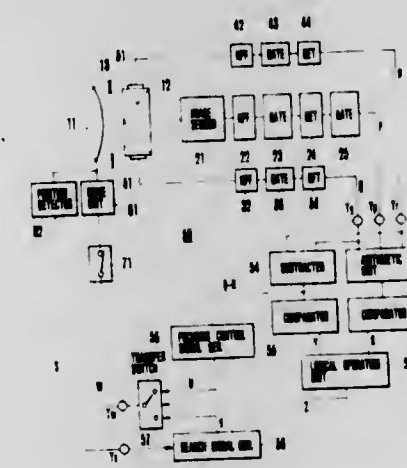
Filed Nov. 18, 1981, Ser. No. 322,704

Claims priority, application Japan, Nov. 21, 1980, 55-163340; Dec. 17, 1980, 55-178194; Dec. 17, 1980, 55-178598

Int. Cl.<sup>3</sup> H04N 9/28

U.S. Cl. 358—227

5 Claims



1. In an autofocus system in which the image definition of an object to be picked up is detected by image sensor means disposed on a light path of an image-forming optical system and converted into electric signals, and the image-forming position of the image-forming optical system is controlled by using the electric signals, the improvement wherein said autofocus system comprises:

- a main image sensor and at least one sub-image sensor disposed in a predetermined optical positional relationship with the main image sensor, said main and sub-image sensors being used as said image sensor means;
- means connected to said main image sensor and sub-image sensor, for converting the image definition from each of the sensors into an electric signal;
- control means for judging the focussed state of said image-forming optical system by a predetermined arithmetic operation performed on at least said electric signals and generating, in accordance with the results of said judgement, a control signal for adjustment of at least the image-forming position of said image-forming optical system;
- a beam splitter disposed between said image-forming optical system and said main image sensor;
- a single sub-image sensor for reception of separated light from the splitter provided movably along said light path; and
- electric signals representative of different image definitions generated at different positions of the sub-image sensor; whereby the image-forming position of the image-forming optical system is controlled by said control signal.

4,414,576

## HOUSING ASSEMBLY FOR ELECTRICAL APPARATUS

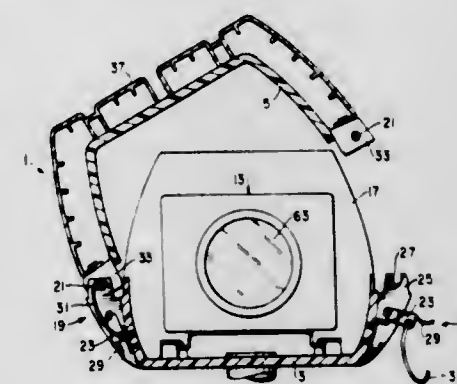
Rein S. Randmae, Fort Salonga, N.Y., assignor to Vicon Industries, Inc., Plainview, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,401

Int. Cl.<sup>3</sup> H04N 5/26, 7/18

U.S. Cl. 358—229

11 Claims



1. A housing assembly for electronic surveillance apparatus, comprising:

- complementary first and second housing members defining an enclosed region when joined together;
- first hinge means for joining said first and second housing members in hinged relationship about a first axis;
- second hinge means for joining said first and second housing members in hinged relationship about a second axis, different from said first axis; and
- said first and second hinge means each having means for independently releasing its respective hinge means to permit said first and second housing members to hinge about the axis of the other hinge means.

4,414,577

## MANUALLY GAIN PRESETTABLE KINESCOPE DRIVER IN AN AUTOMATIC KINESCOPE BIAS CONTROL SYSTEM

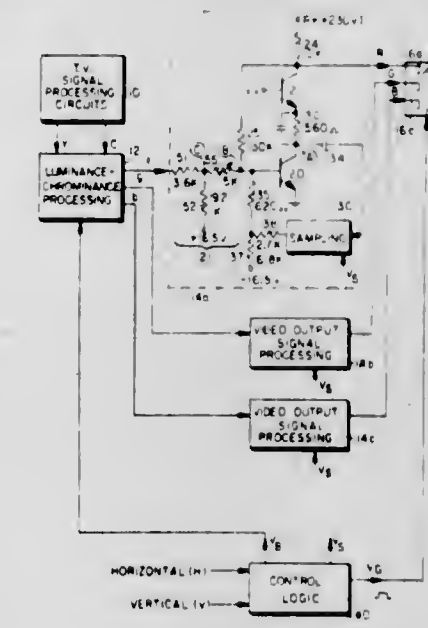
James C. Tallant, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,632

Int. Cl.<sup>3</sup> H04N 5/68

U.S. Cl. 358—242

13 Claims



1. In a video signal processing system including an image reproducing device for displaying an image in response to video signals applied to an intensity control electrode thereof, said video signals including image information and blanking intervals, apparatus comprising:



means for providing video signals at an output thereof, said output exhibiting a black level reference voltage during video signal blanking intervals;

amplifier means for supplying video signals to said intensity control electrode;

a signal path for coupling said output of said signal providing means to said amplifier means during said image and blanking intervals;

adjustable means coupled to said signal path for determining the signal gain of said amplifier means in accordance with a current conduction characteristic of said adjustable means varying with the setting thereof, said intensity control electrode being undesirably subject to bias variations with variations in the setting of said adjustable means;

bias control means, operative during given intervals within video signal blanking intervals, for automatically controlling the bias of said image reproducing device in response to the bias condition of said intensity control electrode to maintain a desired level of black image representative current conducted by said intensity control electrode; and means for maintaining a prescribed conduction characteristic for said adjustable means, independent of its actual setting, during said given intervals when said bias control means is operative.

4,414,578

## FLYBACK TRANSFORMER

Toshio Takeichi, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 101,433, Dec. 10, 1979, abandoned.

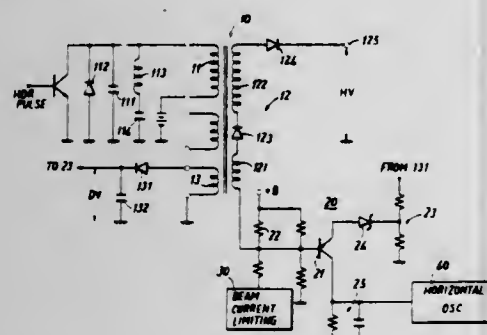
This application Apr. 6, 1982, Ser. No. 365,964

Claims priority, application Japan, Dec. 15, 1978, 53-158965

Int. Cl.<sup>3</sup> H04N 5/68

U.S. Cl. 358—243

13 Claims



1. An apparatus for use in a television receiver having a cathode ray tube for restricting the amount of X-ray radiation from said cathode ray tube comprising:

- a core;
- a low voltage coil wound outside said core, said low voltage coil for receiving an input voltage;
- a high voltage coil wound on a second bobbin outside of said low voltage coil in a coaxial relation with said low voltage coil for providing a high voltage which is induced therein;
- a voltage detecting coil means of a relatively small number of turns with respect to the number of turns of said high voltage coil, wound outside of said high voltage coil in a coaxial relation with said low voltage coil and said high voltage coil for having induced therein a relatively small voltage representing the magnitude of the output voltage of said high voltage coil, and for providing an output indicative of the output of said high voltage coil and wherein said voltage detecting coil means is electrically isolated from said high voltage coil and said low voltage coil and is electromagnetically coupled to said high voltage coil, and a third bobbin having a length substantially less than the length of said second bobbin, said voltage detecting coil means being wound on said third bobbin wherein said third bobbin has a hollow portion, and said second bobbin,

on which said high voltage coil is wound, is inserted into said hollow portion of said third bobbin; and means responsive to the output of said voltage detecting coil means exceeding a predetermined value for restricting the amount of X-ray radiation being radiated from said cathode ray tube.

4,414,579

## INFORMATION TRANSMITTING AND RECEIVING STATION UTILIZING A COPIER-PRINTER

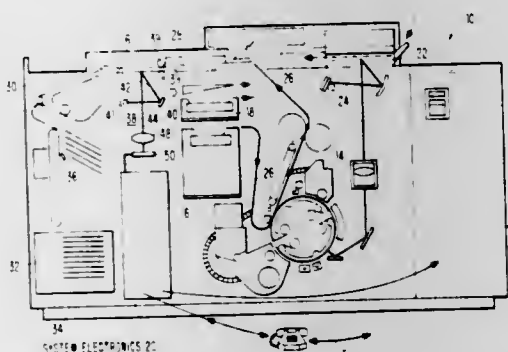
Anthony J. Dattilo; James F. McDonald, both of Longmont, and Carl A. Queener, Lyons, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,114

Int. Cl.<sup>3</sup> H04N 1/00, 1/30, 1/42

U.S. Cl. 358—256

17 Claims



1. A method of providing for delayed transmission of information contained in a multipage document without requiring a delay in manual operation upon the document itself, comprising the steps of:

- providing a multipage document containing information to be transmitted;
- providing a copier having a concealed paper storage tray and an optical scanner;
- making a visually perceptible paper copy of the document by immediate manual use of said copier;
- automatically storing the paper copy in the copier's paper tray, without manual intervention, as said copy is made;
- thereafter, and with possible delay, automatically fetching the paper copy stored in the copier's paper tray, without manual intervention, and delivering the copy to the optical scanner, to thereby scan the paper copy to determine visually perceptible information contained therein; and
- automatically, and without manual intervention, transmitting the information contained in the paper copy.

4,414,580

## PROGRESSIVE TRANSMISSION OF TWO-TONE FACSIMILE

Ottar Johnsen, Middletown, and Arun N. Netravali, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 1, 1981, Ser. No. 268,847

Int. Cl.<sup>3</sup> H04N 7/12

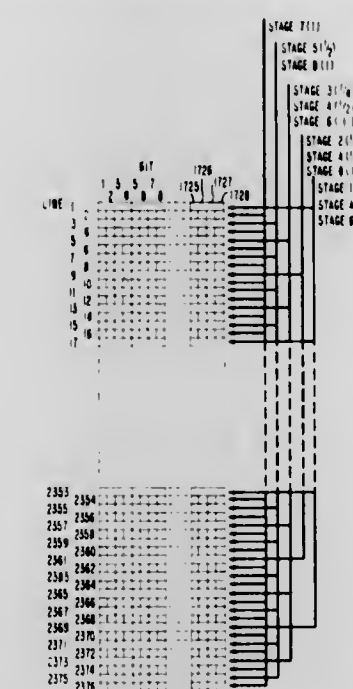
U.S. Cl. 358—260

45 Claims

1. A method for transmitting signals representing picture elements (pels) of a line scanned picture, the method CHARACTERIZED BY the steps of:

- transmitting signals which define each 2<sup>m</sup>th line of said line scanned picture, where n is an integer greater than one, and wherein each transmitted signal has a horizontal resolution of 2<sup>m</sup> pels, where m is an integer greater than zero and less than or equal to n; and
- progressively increasing the vertical resolution of the picture defined in the prior step by transmitting signals hav-

ing a horizontal resolution of 2<sup>m</sup> pels which define additional lines including each 2<sup>n</sup>-th line of said line scanned



picture, where p is an integer greater than zero and less than n.

4,414,581

## IMAGE SIGNAL PROCESSING METHOD AND APPARATUS THEREFOR

Yuzo Kato, Yokohama; Shunichi Ishihara, Kodaira; Yasushi Sato, Kawasaki; Nobuyoshi Tanaka, Yokohama; Naoto Kawamura, Inagi, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

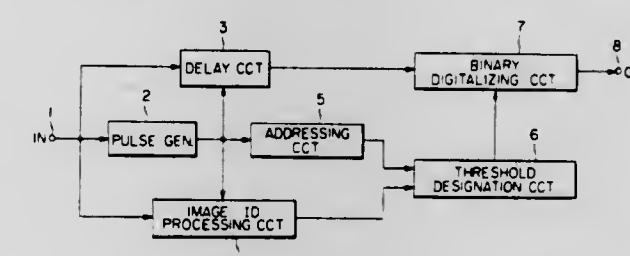
Filed Oct. 20, 1981, Ser. No. 313,302

Claims priority, application Japan, Nov. 1, 1980, 55-154017

Int. Cl.<sup>3</sup> H04N 1/40

U.S. Cl. 358—280

13 Claims



- 1. An image signal processing apparatus, comprising:
- means for identifying the content of entered image signals;
- means for storing plural groups of threshold values for binary digitalization of the image signals;
- means for selecting a suitable group of threshold values in accordance with the identification of the content of entered image signals by said identifying means, and for providing threshold values of the group so selected from said storing means; and
- means for binary digitalization of said image signals by means of the threshold values provided by said selecting and providing means.

4,414,582  
MULTIPLE LINE PROCESSING OF VIDEO SIGNALS IN A SCANNING TYPE DOCUMENT READER

Satoru Ogasawara, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

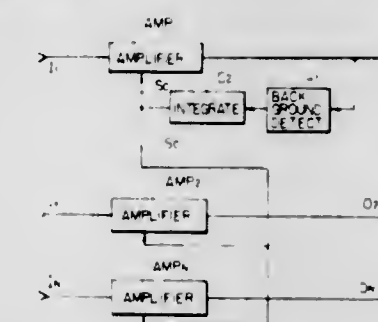
Filed Jan. 6, 1982, Ser. No. 337,551

Claims priority, application Japan, Jan. 9, 1981, 56-1904

Int. Cl.<sup>3</sup> H04N 1/40

U.S. Cl. 358—282

9 Claims



- 1. An original document reader capable of simultaneously scanning a first line and at least a second line on an original document to produce video signals corresponding to information read from each of said lines, comprising first video signal processing circuitry for said first line including processing means for processing first video signals from said first line in accordance with a control signal and means for generating said control signal in accordance with the said first line video signals, second video signal processing circuitry for processing second video signals from said at least second line in accordance with an input signal, and, said control signal applied to said second video signal processing circuitry as said input signal.

4,414,583

## SCANNED LIGHT BEAM IMAGING METHOD AND APPARATUS

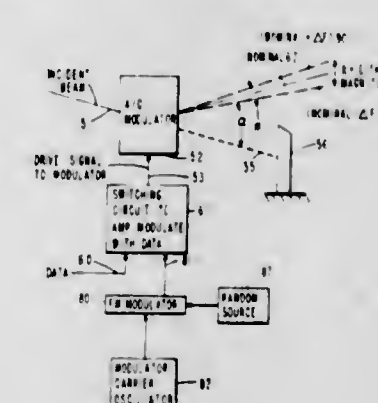
Roas B. Hooker, III, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,691

Int. Cl.<sup>3</sup> H04N 1/30

U.S. Cl. 358—300

20 Claims



- 1. An electrophotographic machine for producing printed sheets bearing an image of data produced on an electrophotographic medium by a scanning light beam driven across said medium in line by line fashion, comprising:
- an electrophotographic medium;
- charging means for charging said medium to a uniform electrostatic charge;
- imaging means for selectively discharging said medium in accordance with data to be reproduced in order to produce a desired latent image, said imaging means including a light source for producing a light beam and scanning means for repeatedly scanning said light beam in parallel and adjacent linear scan lines across said electrophotographic medium, said imaging means further including



beam modulation means including data signal producing means for causing said beam to produce said latent image in accordance with data desired for reproduction, said beam modulation means further including random signal means for displacing said light beam in a random manner orthogonal to said linear scan lines to prevent the development of a regular interstitial pattern at the boundaries of adjacent scan lines;

developer means for applying toner to said latent image to render said image visible; and  
fuser means for fusing the toned image to a printed sheet.

4,414,584

## HIGH-SPEED PLAYBACK FOR VIDEODISCS

Hirota Kurata, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

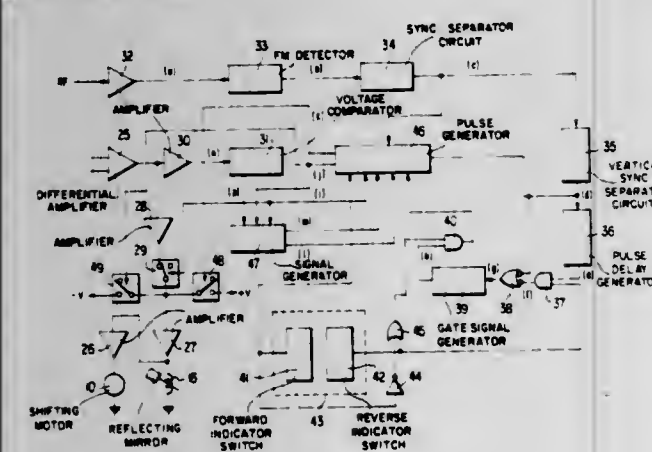
Filed Oct. 2, 1981, Ser. No. 307,878

Claims priority, application Japan, Oct. 7, 1980, 55-141774

Int. Cl.<sup>3</sup> H04N 5/783; G11B 21/08

U.S. Cl. 358-342

6 Claims



1. In a videodisc playback system of the type having means to mount and rotate a videodisc on which are recorded composite video signals in a spiral track, sensing means for reading the video signals from the spiral track, shifting means for shifting the position of said sensing means along a radial of the video disc, and control means for controlling said shifting means so that (a) the position of the sensing means is maintained on the track or (b) the sensing means is shifted from one track to another, the improvement consisting of a high speed playback circuit comprising:

sync separating means responsive to the output of said sensing means for extracting vertical synchronizing signals from the composite video signals read from the videodisc, delay pulse generator means responsive to the output of said sync separating means for producing at least one delay pulse for each vertical synchronizing pulse, where the delay pulses are delayed by a prescribed time from said vertical synchronizing signals such that the delay pulses and the vertical synchronizing pulse fall within a fixed time period greater than the horizontal blanking interval of the composite video signals,

a single forward indicator switch and a single reverse indicator switch producing, respectively, forward and reverse indicator signals where the forward indicator signal indicates movement along said radial in one direction and the reverse indicator signal indicates movement along said radial in the direction opposite said one direction, said control means including means responsive to said vertical synchronizing signals, said delay pulses, and said forward and reverse indicator signals for controlling said shifting means to shift said sensing means along said radial to effect fast playback in the direction selected by the operator controlled indicator switch, the number of tracks the sensing head is shifted each field of the composite video signal depending on whether one or both of said forward and reverse indicator switches are operated

where the fastest playback occurs in response to both indicator switches being operated.

4,414,585

## METHOD OF TRANSMITTING AN AUDIO SIGNAL VIA A TRANSMISSION CHANNEL

Wilhelmus J. Van Gestel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

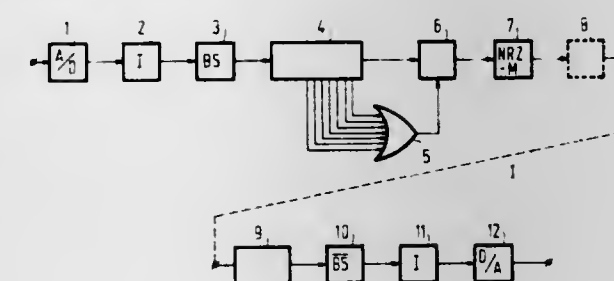
Filed Oct. 21, 1981, Ser. No. 313,446

Claims priority, application Netherlands, May 8, 1981, 8102251

Int. Cl.<sup>3</sup> G11B 5/09

U.S. Cl. 360-40

8 Claims



1. A method of converting an analog audio signal into a binary signal and vice versa, specifically intended for use in a transmission system for recording and reproducing said audio signal on a record carrier, the analog audio signal being converted into a binary signal by means of an analog-to-digital conversion, for converting samples of the analog audio signal into digital data words of M data bits each, and a modulation, for converting said data words into a binary signal, which modulation is such that in said binary signal data bits of a first type are represented by the presence of a level transition and data bits of a second type by the absence of such a level transition, and the binary signal being reconverted into the analog audio signal by means of a demodulation, by which the binary signal is demodulated and converted into digital data words of M data bits each, and a digital-to-analog conversion, by which said data words are converted into analog sample values of the audio signal, characterized in that the analog-to-digital conversion is adapted to supply data words comprising M-1 amplitude bits, which together in binary coded form represent the sample magnitude, and one sign bit, which represents the polarity of the sample, said digital-to-analog conversion being such that a sample having zero value results in M-1 amplitude bits of the first type and that prior to the modulation each data word is divided into N subwords, the data bits of the data word being arranged in such a way in the subwords that each subword contains one of the N most significant amplitude bits of the data words, while during reconversion of the binary signal into the analog audio signal, upon modulation of the binary signal, the data bits of the N subwords are again rearranged to form data words of M data bits and the digital-to-analog conversion is adapted to convert said data words comprising M-1 amplitude bits and one sign bit into an analog sample value.

4,414,586

## PILOT SIGNAL RECORDING AND REPRODUCING SYSTEM

Akira Hirota, Chigasaki; Seisuke Hiraguri, and Takashi Uchimi, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 5, 1981, Ser. No. 308,666

Claims priority, application Japan, Oct. 7, 1980, 55-139362; Oct. 7, 1980, 55-139363

Int. Cl.<sup>3</sup> G11B 21/04, 21/02

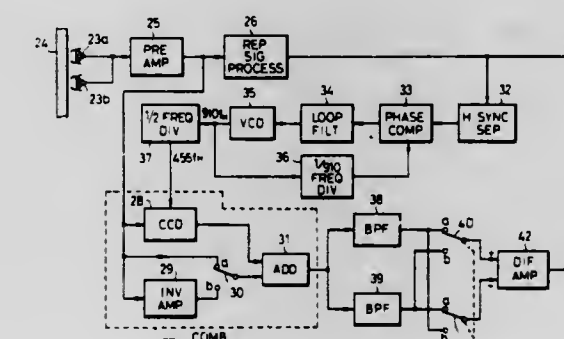
U.S. Cl. 360-70

6 Claims

1. A pilot signal recording and reproducing system in which mutually different first through fourth frequencies are recorded as pilot signals on a recording medium in a specific

order together with an information signal such that one pilot signal is recorded for one track, and pilot signals recorded on both sides of a track which is to be reproduced having mutually different frequencies and being included as crosstalk within a reproduced signal reproduced from said recording medium are respectively discriminated and separated by a filter circuit, to obtain a tracking error information, said pilot signal recording and reproducing system comprising:

a frequency generating circuit for successively generating a first frequency, a third frequency, a second frequency, and a fourth frequency in this frequency order or in a reverse order for every recording unit of one track, said first and second frequencies being mutually separated frequencies, selected from a first frequency group consisting of i frequencies satisfying an equation  $f_{ai} = K_i f_x$  where  $K_i$  is  $(N_i - \frac{1}{2})$  or  $N_i$  when i arbitrary natural numbers are designated by  $N_i$  and  $f_x$  is a predetermined frequency, said third



and fourth frequencies respectively being frequencies approximately equal to said first and second frequencies, selected from a second frequency group consisting of j frequencies satisfying an equation  $f_{bj} = K_j f_y$  where  $K_j$  is  $(N_j - \frac{1}{2})$  or  $N_j$  when  $K_i = N_i$  and  $K_j$  is  $(N_j - \frac{1}{2})$  when  $K_i = (-N_i - \frac{1}{2})$ , when j arbitrary natural numbers are designated by  $N_j$  and  $f_y$  is a predetermined frequency;

a comb filter for frequency-selecting pilot signals having mutually different frequencies recorded on both sides of a track which is to be reproduced;

a control circuit for alternately changing over and controlling a delay time of a delay circuit within said comb filter to  $1/f_x$  or  $1/f_y$  for every reproducing period of one track; and

first and second filter circuits for respectively discriminating and separating pilot signals having mutually different frequencies obtained from said comb filter.

4,414,587

## SKEW SENSING FOR DIGITAL TAPE PLAYBACK

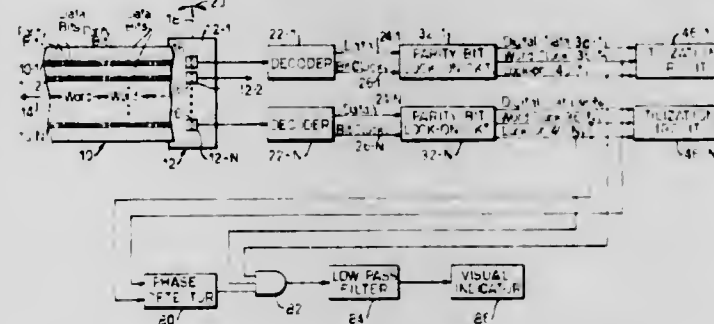
Charles S. Weaver, Palo Alto; Joseph H. Chadwick, Menlo Park; John M. Yarborough, Jr., Palo Alto; Floyd A. Brown, Mountain View, and Donald J. Burch, Los Altos, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Dec. 17, 1981, Ser. No. 331,566

Int. Cl.<sup>3</sup> G11B 5/43

U.S. Cl. 360-76

17 Claims



1. In a playback system for magnetically reproducing digital data signals which include parity bit signals recorded along

parallel tracks of a plural track magnetic recording medium, the combination comprising,

a transducing head having a transducing element for each of said plurality of tracks for reproducing signals recorded along said tracks, and means for detecting phase shifts between parity bit signals reproduced from two of said tracks.

4,414,588

## FLUID BEARING TAPE SCANNING DRUM

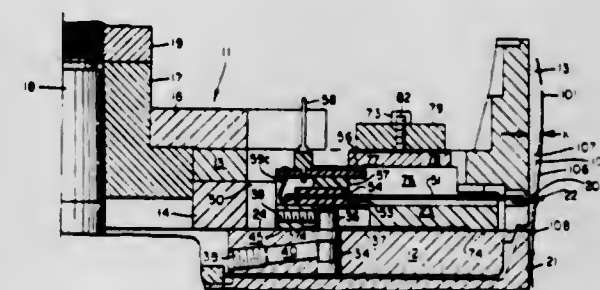
Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1980, Ser. No. 139,510

Int. Cl.<sup>3</sup> G11B 5/10, 5/60

U.S. Cl. 360-84

5 Claims



1. A helical scan magnetic tape transport comprising coaxially mounted fixed and rotating drums having an axial gap therebetween and at least one magnetic transducing head mounted on said rotating drum remote from said gap, together with means for moving said tape in a helical path around said drums and across said gap and for driving said rotating drum to produce a pressurized gas bearing film between said tape and drums, characterized in that:

said rotating drum is provided with means in the vicinity of the transverse plane of said head normal to the drum axis for controllably venting said gas bearing film so as to reduce the film thickness at said head plane to a desired dimension that is uniform along the length of the scan of said head in said plane.

4,414,589

## EMBEDDED SERVO TRACK FOLLOWING SYSTEM AND METHOD FOR WRITING SERVO TRACKS

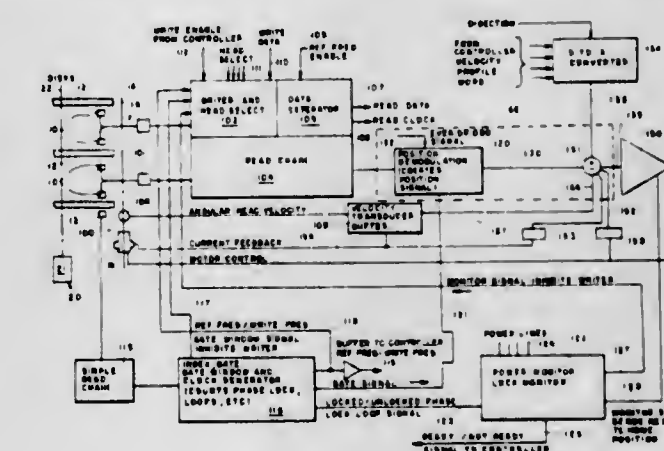
Theodore A. Oliver, Ann Arbor; David L. Nelson, Milford, and Keat-Lye Chan, Ypsilanti, all of Mich., assignors to Northern Telecom Inc., Nashville, Tenn.

Filed Dec. 14, 1981, Ser. No. 330,855

Int. Cl.<sup>3</sup> G11B 5/55, 5/58, 23/36, 27/36

U.S. Cl. 360-77

71 Claims



1. A servo system for positioning a read/write transducer relative to a magnetic storage disc to read and write data stored on the disc, said servo system comprising:



positioning means energizable for moving the read/write transducer to preselected radial recording positions on said disc;

drive means for providing relative movement between said disc and the read/write transducer thereby enabling the transfer of data between said disc and the read/write transducer;

a plurality of side-by-side, closely-spaced servo tracks recorded on said disc, said servo tracks identifying said preselected radial recording positions on said disc;

said servo tracks being provided with a nonuniform radial track density, said track density of said servo tracks varying substantially continuously from track to track according to the performance of the read/write transducer common to said tracks from generally more dense at the periphery of said disc where transducer performance is high to generally less dense at the interior of said disc where transducer performance is low;

servo control means for sensing the output of the read/write transducer and selectively energizing said positioning means for positioning said read/write transducer at preselected radial recording positions on said disc.

4,414,590

# MEDIA INTERCHANGE SWITCH FOR MAGNETIC DISK DRIVES

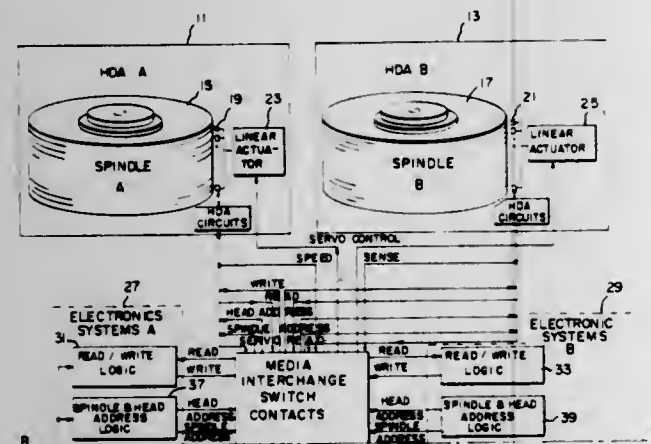
Anton W. Merdian, Jr., Boulder County; Joseph K. Jurneke, and Frank W. Pinteric, both of Adams County, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 29, 1981, Ser. No. 278,389

Int. Cl.<sup>3</sup> G11B 5/012, 21/08, 21/10

U.S. Cl. 360-97

9 Claims



1. In a magnetic disk drive comprising:

first and second head/disk assemblies each including a drive spindle for rotating magnetic disks, magnetic heads for writing and reading digital data signals on and from said disks, and an actuator responsive to a servo signal for moving said heads into read/write relationship with the tracks of said disks; and

first and second electronic systems each having means for generating a spindle and head address signals, logic circuits for processing said digital data signals, and means for processing servo signals;

a media interchange switch including: latching relay means operable to two positions; multiple pole, double throw relay contacts actuated by said latching relay means;

the spindle and head address signals, data signals and servo signals for said first head/disk assembly being connected through a first set of said poles to said first electronic system on one throw of said relay contacts and through a second set of said poles to said second electronic system on the other throw of said relay contacts;

the spindle and head address signals, data signals and servo signals for said second head/disk assembly being connected through a third set of poles to said second

electronic system on said one throw of said relay contacts and through a fourth set of said poles to said first electronic system upon said other throw of said relay contacts.

4,414,591

# DUAL ACCESS FLEXIBLE DISK DRIVE

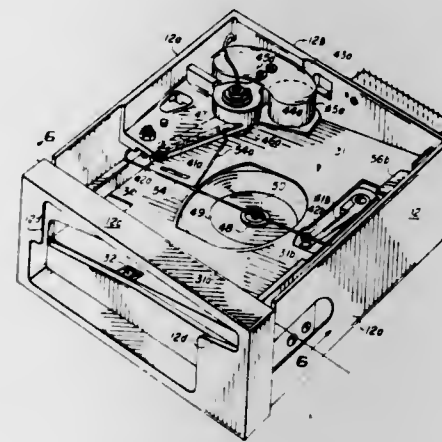
John W. Wenner, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,756

Int. Cl.<sup>3</sup> G11B 5/016, 5/54, 21/22, 23/02

U.S. Cl. 360-99

8 Claims



1. A device for mounting a cartridge containing a flexible magnetic recording disk therein, comprising drive means in said device for providing rotational motion to said disk;

a pair of transducing means in said device for simultaneously magnetically cooperating with both magnetic recording surfaces of said disk in a non-contact mode;

tray means pivotably mounted in said device, said tray means being adapted to receive said cartridge when said tray means is in a first position which is tilted from the horizontal, said tray means being pivotable about an axis which is offset horizontally from the centerline of said drive means to a second horizontal position after insertion of said cartridge therein to position both surfaces of said disk adjacent said transducing means and position a central portion of said disk adjacent said drive means.

4,414,592

# SUPPORT FOR STABILIZING THE MOVEMENT OF A MAGNETIC MEDIUM OVER A MAGNETIC HEAD

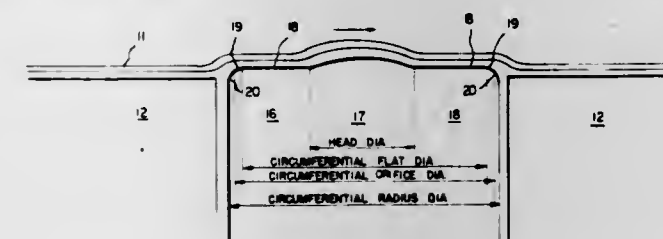
Paul D. Losee, Layton, and David G. Norton, Ogden, both of Utah, assignors to Iomega Corporation, Ogden, Utah

Filed May 1, 1981, Ser. No. 259,698

Int. Cl.<sup>3</sup> G11B 5/60, 5/22, 17/32, 15/64

U.S. Cl. 360-102

5 Claims



1. A magnetic head coupler which stabilizes the movement of a magnetic record medium in relation to said head comprising:

a circumferential member having an aperture in which said magnetic head is supported;

a flat circumferential surface on said member around said aperture on the side facing said record medium and extending in a plane substantially parallel to the plane of rotation of said medium; and

a circumferential orifice surface outside of and around said flat circumferential surface, and extending from said flat surface away from said plane of rotation of said record medium, said orifice surface forming an orifice for airflow control over said flat circumferential surface to couple said magnetic medium to said magnetic head by the Bernoulli effect created by movement of air between said medium and said flat circumferential surface.

4,414,593

# STREAMING CARTRIDGE TAPE DRIVE

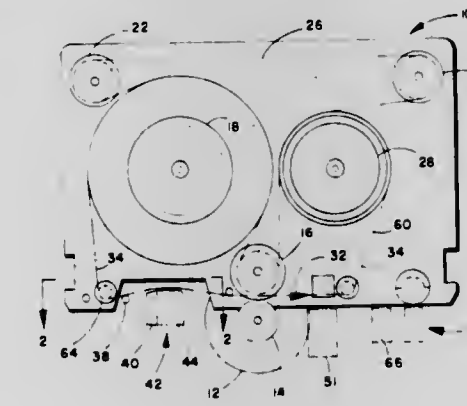
William R. Miller, and Jones V. Howell, both of Costa Mesa, Calif., assignors to Archive Corporation, Costa Mesa, Calif.

Filed Oct. 8, 1981, Ser. No. 309,573

Int. Cl.<sup>3</sup> G11B 21/08, 5/56, 5/58, 21/24

U.S. Cl. 360-102

21 Claims



1. A tape cartridge drive having a read-write head for writing and reading information on the tape wherein said head is driven into different respective locations with respect to the tape for providing different tracks or channels for writing and reading on the tape, wherein the improvement comprises:

means for supporting said magnetic head;

means for moving said magnetic head across said tape in a lateral manner in order to change the location of said head with respect to said tape; and,

means for causing said tape to move longitudinally and be provided with an air cushion between the tape and the magnetic head when said head is moved laterally across the face of said tape.

4,414,594

# LINEAR ACTUATOR FOR A MEMORY STORAGE APPARATUS

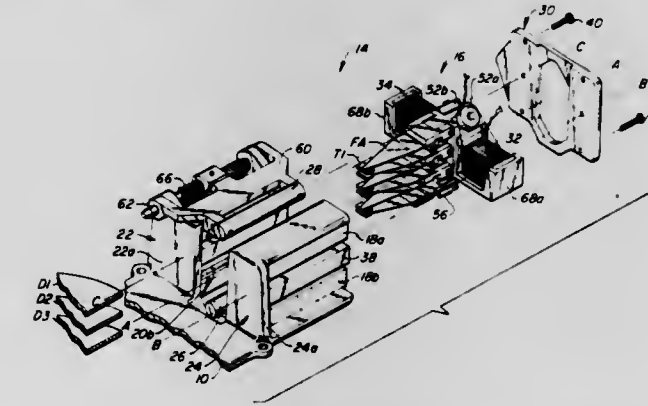
Paul L. Farmer, San Martin; Frank C. Gibeau, Los Altos; Stanley F. Brown, Cupertino, and Garold W. Plonczak, Santa Clara, all of Calif., assignors to Atasi Corporation, San Jose, Calif.

Filed Feb. 26, 1982, Ser. No. 352,943

Int. Cl.<sup>3</sup> G11B 5/55; H02K 41/02

U.S. Cl. 360-106

21 Claims



1. A transducer actuator assembly for a rotating disc memory apparatus comprising: a carriage; means for mounting at

least one transducer at one end of the carriage; means adjacent the periphery of the rotating disc of the memory apparatus for guiding the carriage for movement along a desired linear path of travel relative to the disc; a pair of symmetrically disposed electromagnetic motors, each including a central pole, for reciprocating the carriage to transfer the transducer to a desired track location on the rotating disc including drive coil means mounted to the carriage for forming at least two identical effective coil sections that are respectively symmetrically arranged about a plane that extends through the center of the carriage and that is parallel to its linear direction of travel, and at least two identical pairs of permanent magnets stationarily mounted to the memory apparatus near the periphery of the disc at the opposite sides of the carriage for forming two air gaps that respectively register with said two coil sections, said coil sections surrounding and forming air gaps with said central poles, whereby when said coil means is energized motive forces are applied generally along two transversely spaced lines that are symmetrical about said center plane of the carriage.

4,414,595

# SCANNING MAGNETIC HEAD WITH PROPAGATING DOMAIN WALL

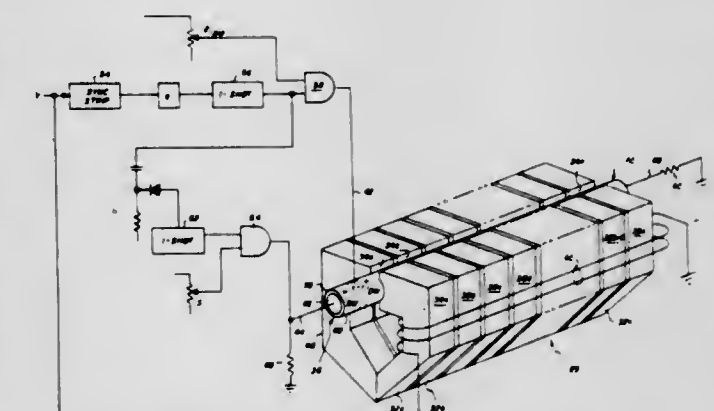
Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,846

Int. Cl.<sup>3</sup> G11B 5/12

U.S. Cl. 360-115

7 Claims



1. Magnetically actuatable apparatus comprising

(a) a plurality of magnetic structures having respective high reluctance gaps therein, each of said magnetic structures being actuatable when its respective high reluctance gap is magnetically short-circuited,

(b) means supporting a thin magnetic film of the type in which a domain wall may exist between regions thereof which are magnetically saturated in differing directions, said means being disposed to reside in the gaps of said plurality of magnetic structures in such a way that said thin film extends from one side to the other of each said gap,

(c) means for effecting a domain wall in said thin magnetic film, and

(d) means for positioning said domain wall so that it resides within and across one or another of the gaps within said plurality of magnetic structures, whereby the relatively high permeability of the thin film within the domain wall thereof effectively actuates the magnetic structure the gap of which is magnetically short-circuited by said domain wall at any given time, said means supporting a thin magnetic film being an electrically conductive wire having a circumferentially oriented thin film of magnetic material thereon, and said means for effecting a domain wall in said thin magnetic film being means coupled to said wire at a point thereof between its opposite ends for effecting a current



flow within said wire that is either simultaneously toward or simultaneously away from the opposite ends of said wire, whereby when said current flow within said wire is of sufficient strength a domain wall is effected within said thin magnetic film as the fields produced by said current flow respectively reinforce and counter the quiescent circumferential orientation of the magnetic material that forms said film.

#### 4,414,596 MAGNETIC HEAD ASSEMBLY

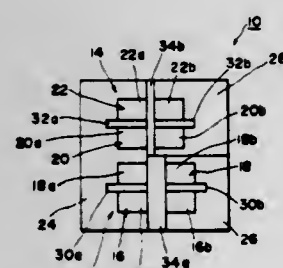
Niro Nakamichi, Higashikurume, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,554

Claims priority, application Japan, Jun. 24, 1980, 55-88331[U]  
Int. Cl.<sup>3</sup> G11B 5/10, 5/25

U.S. Cl. 360—129

3 Claims



1. A magnetic head for reversibly recording and reproducing having a plurality of operating gaps substantially in line which are formed between a plurality of pairs of left-hand and right-hand core pieces facing each other with shielding between adjacent pairs, said left-hand and right-hand core pieces including first and second core piece groups, characterized by the combination of: a common holding member to hold one-hand core pieces together; first and second divided holding members to hold first and second core piece groups of other-hand core pieces, respectively; first spacer means interposed between said first core piece group of said other-hand core pieces and the corresponding core piece group of said one-hand core pieces; and second spacer means interposed between said second core piece group of said other-hand core pieces and the corresponding core piece group of said one-hand core pieces; said first and second spacer means establishing recording and reproducing gap groups, respectively, with said recording gap group having a gap width greater than said reproducing gap width and substantially in line therewith.

#### 4,414,597 FLOPPY DISC LINER

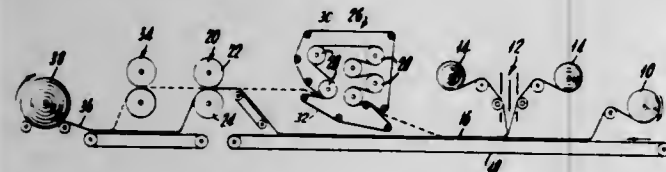
Annamaria Cornin, Plainsboro, N.J., assignor to Chicopee, New Brunswick, N.J.

Filed Sep. 14, 1981, Ser. No. 301,915

Int. Cl.<sup>3</sup> G11B 23/02

U.S. Cl. 360—133

2 Claims



1. A floppy disc envelope container comprising sheet material fabricated into an envelope, said sheet material having an inner surface on which is laminated a fabric comprising a thermal bonded and emboss bonded nonwoven fabric comprising textile grade polyester staple fibers and polyester staple fibers having a melting point below about 150° C.

#### 4,414,598 REGULATED POWER SUPPLY

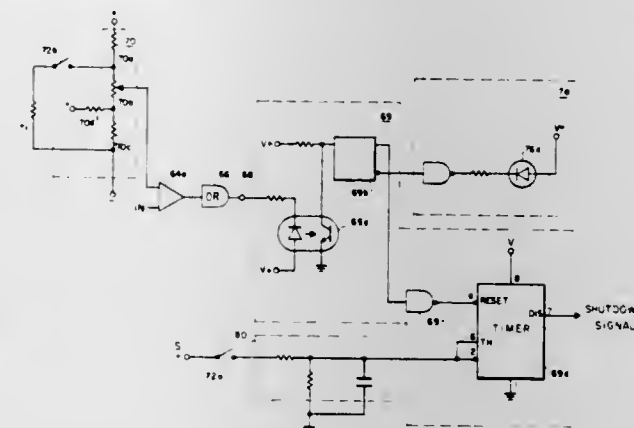
John R. Nowell, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 4, 1982, Ser. No. 384,848

Int. Cl.<sup>3</sup> H02H 3/10, 7/10

U.S. Cl. 361—18

4 Claims



1. A power supply, comprising:
  - (a) switching regulator means for outputting a regulated DC voltage over a variable range of DC current;
  - (b) over-current detector means, having a reference circuit, for detecting when said DC current exceeds a predetermined threshold, said predetermined threshold established by said reference circuit, thereupon outputting an over-current signal causing said switching regulator means to be shut down;
  - (c) a circuit element;
  - (d) gate means for operatively connecting said over-current detector means to said switching regulator means; and
  - (e) switch means for manually operatively connecting:
    - (i) said circuit element to said reference circuit to modify said predetermined threshold; and
    - (ii) an inhibit signal to said gate means thereby inhibiting said over-current signal from being transmitted to said switching regulator means.

#### 4,414,599 ARRESTER AND A SEMICONDUCTOR CIRCUIT ARRANGEMENT WITH A PROTECTION DEVICE INCLUDING THE SAME

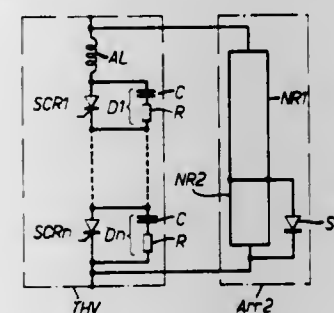
Sumio Kobayashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 11, 1982, Ser. No. 357,146

Claims priority, application Japan, Mar. 24, 1981, 56-41784  
Int. Cl.<sup>3</sup> H02H 7/09, 7/125

U.S. Cl. 361—56

14 Claims



1. An arrester comprising:
  - first nonlinear resistance means;
  - second nonlinear resistance means connected in series with said first nonlinear resistance means; and
  - by-pass circuit means connected in parallel with said second nonlinear resistance means for short-circuiting said second nonlinear resistance means only when a voltage of a predetermined polarity is applied to said second nonlinear resistance means.

#### 4,414,600 PROTECTION DEVICE FOR HIGH INTENSITY GASEOUS DISCHARGE LAMP STARTING CIRCUIT

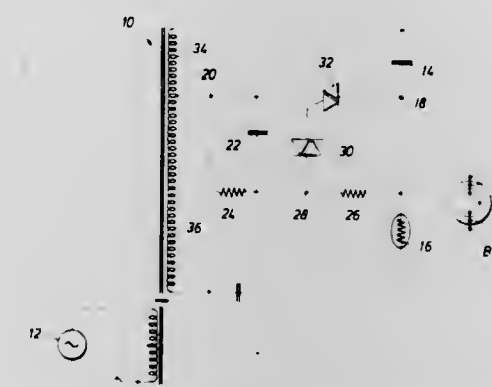
Karl Schweickardt, Cazenovia, N.Y., assignor to Esquire, Inc., New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,469

Int. Cl.<sup>3</sup> H02H 9/04

U.S. Cl. 361—56

3 Claims



1. A high voltage starting and protection circuit for a high intensity, gaseous discharge lamp, comprising transformer means connected to line power for providing transformed AC voltage, voltage divider means including a capacitor and a resistor connected to said transformer means, voltage breakdown means connected to said transformer means and said voltage divider, and trigger means for gating on said voltage breakdown means and discharging said capacitor to provide starting pulses to the HID lamp when it is unlit, said resistor having a non-linear negative coefficient of resistance for surges in voltage above a predetermined threshold resulting from a sudden open operating lamp, a sudden drop of resistance value of said resistor dissipating said voltage surges and preventing destructive conduction of said voltage breakdown means at said surges of high voltage.

#### 4,414,601 SOLID-STATE LOAD PROTECTION SYSTEM HAVING A TEST FEATURE

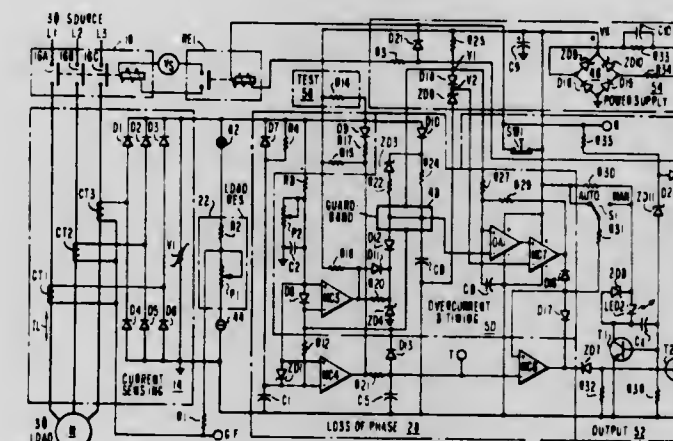
Ernest F. Conroy, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1981, Ser. No. 258,093

Int. Cl.<sup>3</sup> H02H 3/093

U.S. Cl. 361—97

5 Claims



1. A load protection system, comprising:
  - sensor means for sensing circuit current in an electrical circuit, said sensor means providing an output signal which is related to said circuit current;
  - inverse time overload means connected to said output of said sensor means, for receiving said output signal therefrom,

said overload means providing an output trip signal, said latter signal being provided at a delayed time which delayed time is inversely proportional to the magnitude of said electrical circuit current provided said magnitude of said electrical current exceeds a predetermined level for a predetermined period;

overload simulating means connected to said inverse time overload means for testing said load protection system, said overload simulating means providing an overload simulation signal to said inverse time overload means the magnitude of which exceeds said predetermined level for said predetermined period;

circuit control trip means connected to said inverse time overload means and to said electrical circuit for opening said electrical circuit when said output trip signal is provided; and

replaceable load resistor means connected in parallel circuit relationship with said sensor means for producing a voltage whose value is variable within a predetermined voltage range, said overload simulating means being connected in circuit relationship with said sensor means so that upon the removal of said overload simulation signal is produced.

#### 4,414,602 CURRENT DIRECTOR AND INTERFACE CIRCUIT FOR A TRANSFORMER RELAY

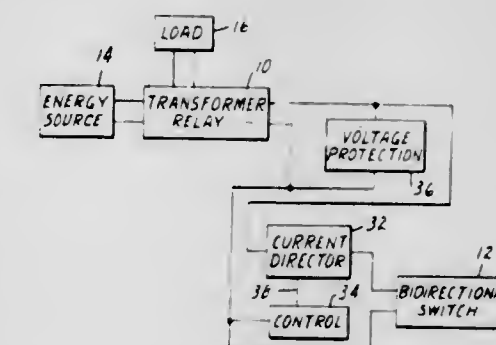
Douglas R. Mosler, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

Filed Dec. 18, 1981, Ser. No. 332,145

Int. Cl.<sup>3</sup> H01H 47/32

U.S. Cl. 361—190

29 Claims



1. A current director in combination with a transformer relay and a bidirectional switch, said transformer relay having a primary winding adapted to be coupled to an alternating current energy source, having a load switch adapted to control the application of said energy source to a load, and having a secondary winding which controls said load switch to a first position and a second position depending upon current flow in said secondary winding above a predetermined switching threshold in a first direction and a second direction, respectively, said current director operatively coupled to said secondary winding of said transformer relay and to said bidirectional switch, said current director preventing current flow in said secondary winding in said second direction above said predetermined switching threshold for a predetermined succeeding time period after current has flowed in said secondary winding in said first direction above a predetermined inhibit threshold during a predetermined preceding time period.



4,414,603

## PARTICLE CHARGING APPARATUS

Senichi Masuda, No. 605, Nishigahara 1-40-10, Kita-Ku, Tokyo-to, Japan

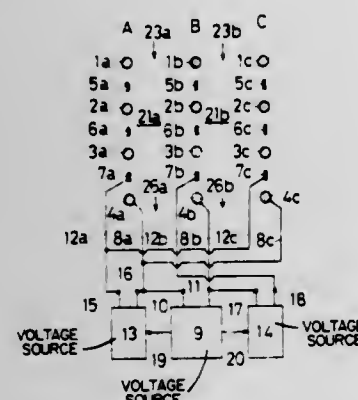
Filed Mar. 23, 1981, Ser. No. 246,397

Claims priority, application Japan, Mar. 27, 1980, 55-39559; Sep. 8, 1980, 55-124401; Sep. 22, 1980, 55-132112

Int. Cl.<sup>3</sup> H05B 5/02

U.S. Cl. 361—227

13 Claims



1. A Boxer-Charger particle charging apparatus, in which a plurality of electrode assemblies each including at least one corona discharge electrode and consisting of electrode elements divided into two groups as insulated from each other so that adjacent electrode elements may belong to different groups, are disposed in an opposed relation to each other with a charging space placed therebetween, there is provided a main a.c. voltage source for applying a main a.c. voltage between opposed ones of said electrode assemblies to establish a main alternating electric field in said charging space placed between said opposed electrode assemblies, there are also provided excitation voltage sources for applying a pulse high voltage having a very short pulse duration time of 1 ns to 1 μs between said adjacent two groups of electrode elements belonging to said opposed electrode assemblies during a period contained within a half cycle of said main a.c. voltage when said opposed electrode assemblies alternately take particular polarity as synchronized with said main a.c. voltage, thereby corona discharge is generated on the corona discharge electrode when the electrode assemblies opposed to each other with said charging space placed therebetween alternately take said particular polarity of said main a.c. voltage, resulting in formation of a plasma ion source, then monopolar ions of said particular polarity are made to be emitted from the plasma ion source into said charging space and to travel across the charging space to the opposed electrode assembly of the opposite polarity, thus a current of monopolar ions which travel as alternately inverting the direction of current in synchronism with the main alternating electric field, is formed within the charging space to bombard particles to be charged which enter said charging space, from the opposite sides with said monopolar ions, and thereby the particles can be charged effectively and quickly.

4,414,604

## HEAT RADIATION SYSTEM FOR ELECTRONIC DEVICES

Fumio Matsui, and Yutaka Takasu, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan  
Continuation of Ser. No. 97,110, Nov. 20, 1979, abandoned. This application Apr. 2, 1982, Ser. No. 364,708

Claims priority, application Japan, Nov. 22, 1978, 53-144774  
Int. Cl.<sup>3</sup> H05K 7/20

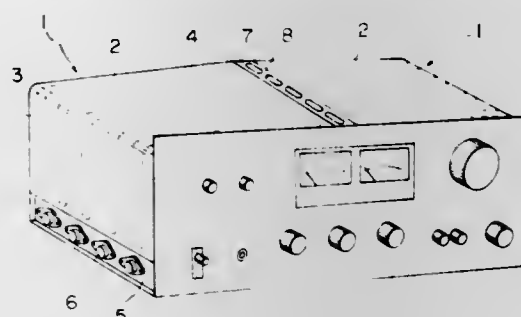
U.S. Cl. 361—385

4 Claims

1. An enclosed container for electronic devices having heat generating elements therein, comprising:  
a structure enclosed by a plurality of external walls, said enclosed structure containing heat generating elements at least partially within an interior portion thereof, said enclosed structure having at least a first vertical external wall portion having a closed conduit system and a heat

exchange medium filling said closed conduit system, said heat exchange medium changing states from liquid to vapor by absorbing heat generated by said elements, a lower end portion of said wall portion being thermally connected to said elements;

an inclined first roof portion having one end portion connected to an upper end portion of said first vertical external wall portion, said roof portion being formed therein with a closed conduit system, a lower end portion of said



closed conduit system of said roof portion being communicated with said closed conduit system of said first vertical external wall portion, whereby said first vertical external wall portion of said first roof portion forms a first Lean-to roof construction;

a second Lean-to roof construction having the same structure as that of said first Lean-to roof construction, and a connecting member having a plurality of air passages for connecting the other ends of said first and second Lean-to roof constructions to form a ridge shaped roof structure.

4,414,605

## POSITIVE LOCKING MECHANISM

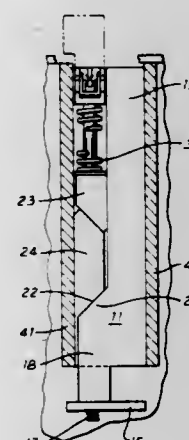
John J. Chino, Arnold; Paul LePage, Towson; Robert M. Rossi, Glen Burnie, and Herman Rossman, Randallstown, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1981, Ser. No. 278,820

Int. Cl.<sup>3</sup> H05K 7/20

U.S. Cl. 361—388

3 Claims



1. An apparatus comprising a mechanism locking an electronic plug-in module to a chassis and providing good thermal interface between said module and said chassis, said mechanism comprising:

a shaft having a threaded section on one end engaging a threaded hole in a chassis and having a slotted head on the opposite end,

wedging means slidably supported on said shaft and exerting a clamping force between said module and said chassis, spring means positioned between said slotted head and said wedging means,

a lever pivotally attached to said shaft and having a blade thereon engageable with said slotted head,

cams on said lever for compressively biasing said spring

means and said wedging means whereby said wedging means provides good thermal interface between said module and said chassis, and  
said spring means comprising a helical spring and a spring compressor positioned between one end of said helical spring and said cams.

4,414,606

## DEFOAMING ELECTRONIC HARDWARE

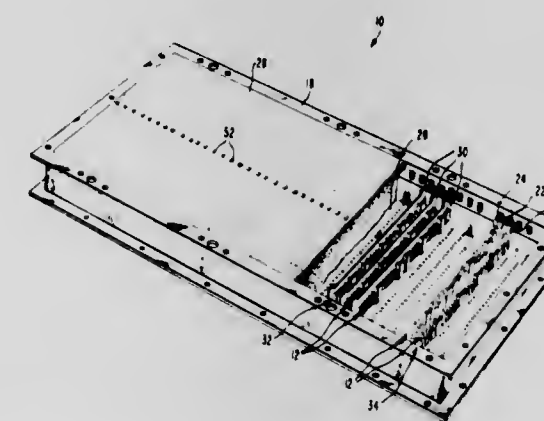
Edward A. Anderson, Yorba Linda; Benjamin Bennett, Beverly Hills, and Billy D. Gray, Hermosa Beach, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 15, 1981, Ser. No. 274,011

Int. Cl.<sup>3</sup> H05K 1/16, 3/00

U.S. Cl. 361—397

12 Claims



1. A method for uninjurious removal of electronic hardware encapsulated in foam, comprising the steps of positioning guided cutting apparatus adjacent the hardware within the foam, and cutting through the foam adjacent the hardware in a guided manner without contact with the hardware by use of the apparatus.

5. In combination, a device with encapsulated electronic hardware, said device being useful for defoaming electronic hardware and being encapsulated in foam comprising foam cutting apparatus and guide means precisely placed adjacent the hardware and embedded in the foam, said foam cutting apparatus adapted to be guided by said means when said cutting apparatus is removed from the foam and simultaneously to precisely cut through the foam in which it is embedded without harmful contact with the hardware.

4,414,607

## SOLID STATE ELECTRIC DOUBLE LAYER CAPACITOR

Satoshi Sekido, Yawata; Yoshito Ninomiya, Hirakata, and Yoshihiro Yamazaki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

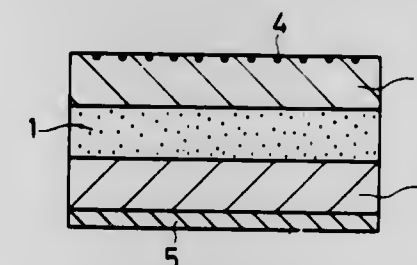
Filed Jun. 23, 1981, Ser. No. 276,518

Claims priority, application Japan, Jun. 26, 1980, 55-87292; Aug. 8, 1980, 55-109388; Dec. 25, 1980, 55-186427

Int. Cl.<sup>3</sup> H01G 9/00; B01J 17/00

U.S. Cl. 361—433

7 Claims



1. A solid state electric double layer capacitor comprising:  
a polarization electrode,  
a non-polarization electrode, and

a solid electrolyte disposed at least between said polarization electrode and said non-polarization electrode,  
said polarization electrode being a mixture of carbon and said solid electrolyte, mixed with each other in a predetermined ratio,

said non-polarization electrode being another mixture of said solid electrolyte and a composition containing Cu and a substance selected from a group consisting of Cu<sub>2</sub>S and TiS<sub>2</sub>, and

said solid electrolyte having a chemical composition of K<sub>x</sub>Rb<sub>1-x</sub>Cu<sub>4</sub>Cl<sub>5-y</sub> (0.1 ≤ x ≤ 0.25, 1.25 ≤ y ≤ 1.67).

4,414,608

## ENDOSCOPE WITH ADAPTER

Hiroyuki Furihata, Hamura, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

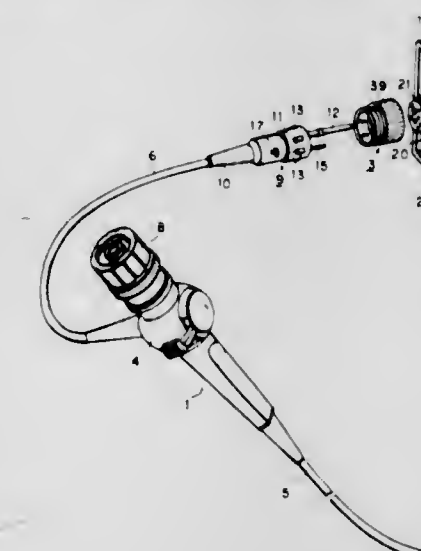
Filed Jul. 30, 1981, Ser. No. 288,404

Claims priority, application Japan, Aug. 7, 1980, 55-107779

Int. Cl.<sup>3</sup> F21V 7/04

U.S. Cl. 362—32

11 Claims



1. An endoscope with an adapter used in combination with a light source unit including a socket having an electrical contact and a light source for illumination, comprising:

an endoscope including a connector having at least one electrical contact and an elongated pipe projecting from said connector and having a light guide therein; and

an adapter including a main body portion having: a first connection portion adapted to be removably coupled to said connector of said endoscope and a second connecting portion adapted to be removably attached to said socket of said light source unit; a first electrical contact disposed at said first connecting portion for electrically connecting with said at least one electrical contact of said connector when said connector is attached to said first connecting portion; a second electrical contact disposed at said second connecting portion for electrically connecting with said electrical contact of said socket when said second connecting portion is attached to said socket; and means for electrically connecting said first and second electrical contacts together; said adapter having a bore therein for optically connecting said light guide in said elongated pipe of said endoscope with said light source of said light source unit when said adapter is attached to both said socket of said light source unit and said connector of said endoscope.

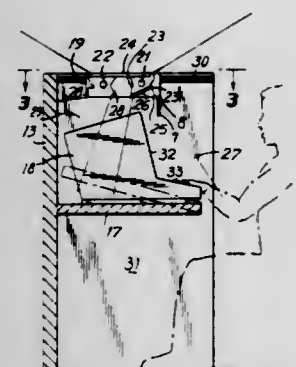


4,414,609

**LUMINAIRE FOR A VISUAL DISPLAY TERMINAL**  
Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz and Associates, Inc., West Haven, Conn.  
Filed Oct. 8, 1982, Ser. No. 433,509  
Int. Cl.<sup>3</sup> A61G 13/00

U.S. Cl. 362—33

16 Claims



1. An illumination system for a workstation having a backwall, a substantially horizontally disposed work surface, and a visual display terminal adapted to be viewed by an operator in a direction substantially perpendicular to said backwall, comprising:

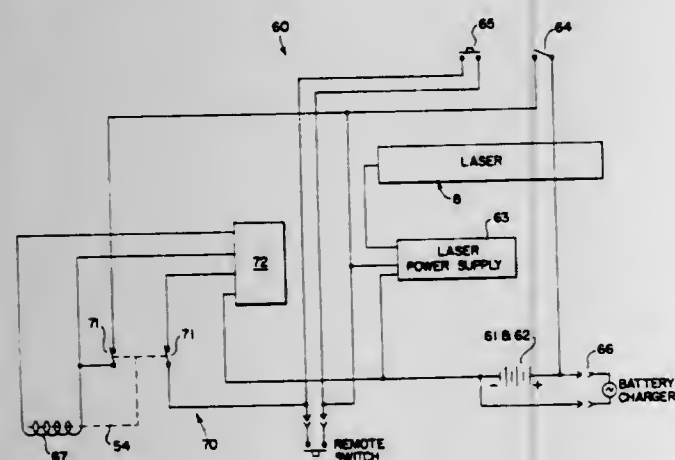
- a first light source having a first longitudinal axis, said first light source being mounted above said visual display terminal with said longitudinal axis substantially parallel to said work surface for directing light onto said backwall;
- a second light source having a second longitudinal axis, said second light source being mounted at substantially the same height above the visual display terminal as said first light source with said second longitudinal axis disposed substantially parallel to said first longitudinal axis; and
- reflector means associated with said second light source for directing upwardly a portion of the light emanating from said second light source to provide ambient room lighting and for directing downwardly another portion of said light toward said work surface.

4,414,610

**LASER-SIGHTED BRIEFCASE FIRING DEVICE**  
Edward A. Gale, 18104 Nottingham Rd., Cleveland, Ohio 44119; John J. Wetzel, III, 2005 Fernwood St., and James H. Wetzel, 2499 Trinity Dr., both of Middletown, Ohio 45042  
Filed Jan. 2, 1981, Ser. No. 222,028  
Int. Cl.<sup>3</sup> F41G 1/34

U.S. Cl. 362—113

8 Claims



1. A laser-sighted firing device comprising:
- a rigid mounting base,
  - a firing piece removably mounted on said base and including a mechanical trigger mechanism,
  - a sighting device mounted on said base and including a laser

generator for projecting a visible aiming spot on a target approximately in the line of fire of said firing piece, means on said base for supporting said laser generator and for adjusting the position of said laser generator relative to said firing piece to calibrate the laser beam projected therefrom relative to the line of fire of said firing piece, a lever pivotally mounted at one end on said base for pivotal movement about an axis perpendicular to said base, electrical actuating means connected between the other end of said lever and said base for moving said lever relative to said base, means intermediate the ends of said lever operatively associated with said trigger mechanism for firing said piece in response to movement of said lever, power supply means for said laser generator, electrical means for energizing said actuating means and including a manually operable switch therefor, and portable enclosing means in the form of a briefcase or the like for supporting said base and for concealing said firing piece, said manually operable switch including an element manually engageable from the exterior of the enclosing means, said electrical means including an electrical circuit having burst control means for limiting the number of rounds fired by said piece to a predetermined limited number each time said manually operable switch is actuated.

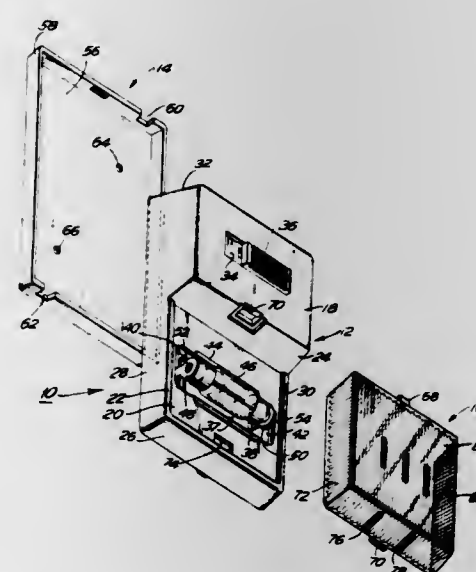
4,414,611

**PORTABLE LIGHT**

Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.  
Filed Nov. 15, 1982, Ser. No. 441,677  
Int. Cl.<sup>3</sup> F21L 7/00

U.S. Cl. 362—183

10 Claims



1. A portable light, comprising:
- a housing adapted to be selectively mounted on a support surface;
  - a single socket means supported on said housing for holding an illumination means in a position visible externally of said housing;
  - externally manipulatable switch means on said housing and;
  - circuit means contained within said housing, said circuit means comprising two terminal means each having a first connecting section for selectively connecting to an internal battery source, and a second connecting section for selectively connecting to an external energy source, and a common series circuit path serially interconnecting said single socket, said switch means and said circuit means, whereby said illumination means can be selectively energized by the internal battery source or the external energy source.

4,414,612

**HAND-HELD LIGHT WITH MEANS FOR CONTROLLING BEAM WIDTH**

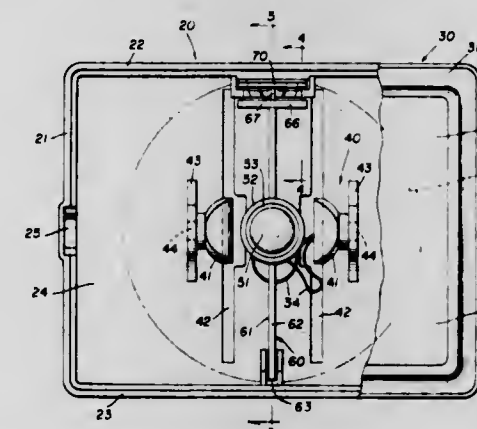
Frederick J. Conforti, Aurora, and Kenneth R. Fenne, Glen Ellyn, both of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Jan. 24, 1983, Ser. No. 460,176

Int. Cl.<sup>3</sup> F21L 7/00

U.S. Cl. 362—188

20 Claims



1. A battery operated flashlight comprising a housing portion for the battery, a separate head portion connected to said housing and having at least one wall, spaced-apart support members on said one wall, a carriage, support structure on said carriage extending between and slidably engageable with said support members for supporting said carriage for sliding movement between first and second extremes, a socket on said carriage for holding a bulb, and means on said carriage accessible on the exterior of said head portion for being engaged by one's finger to move said carriage to a selected position between said first and second extremes.

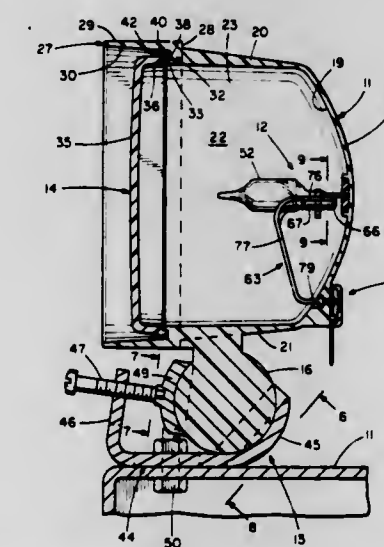
4,414,613

**RECTANGULAR SEAL BEAM LAMP AND SUPPORT WITH HALOGEN BULB**

William R. Mayer, Rochester, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.  
Continuation-in-part of Ser. No. 220,248, Dec. 23, 1980, Pat. No. 4,357,651. This application Mar. 6, 1981, Ser. No. 241,395  
Int. Cl.<sup>3</sup> F21Y 29/00

U.S. Cl. 362—267

19 Claims



1. A disposable seal beam lamp unit, comprising; a generally rectangular reflector constructed of plastic having a paraboloidal interior reflective surface, a fastener receiving projection integrally molded with and extending from the reflector to receive fastener means to provide the sole support for the lamp unit, a connector opening in the rear of the reflector, a halogen bulb assembly having connector means extending through the connector opening, epoxy material between the connector means and the connector opening for fastening the halogen

bulb assembly within the reflector, said reflector having a peripheral forwardly opening recess integrally formed therein, a generally rectangular lens having a peripheral rearwardly extending flange mounted in the forwardly opening recess in the reflector, and epoxy adhesive in the reflector recess engaging the flange for bonding the lens to the reflector said reflector, having an integrally molded forwardly extending peripheral hood directing adjacent the integral recess and surrounding the lens for limiting stray light and covering the epoxy in the lens recess.

4,414,614

**SPRING CLIP FOR A VEHICLE HEADLAMP RETAINER MEMBER**

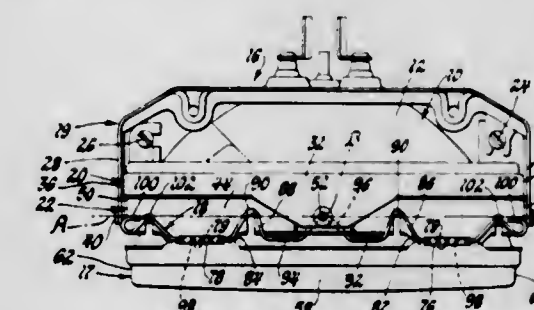
David R. McMahan, and Richard W. Nicholas, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,684

Int. Cl.<sup>3</sup> F21V 21/26

U.S. Cl. 362—269

3 Claims



1. In combination, a spring clip and a retainer member for maintaining a headlamp in a housing located at the front end of a vehicle body, said retainer member comprising a frame formed with a radially inwardly extending rim which is inclined towards the rear of said housing for engaging the frontal portion of the lens of said headlamp and biasing the headlamp into firm contact with said housing, hinge means formed on a first portion of said frame and adapted to connect said retainer member to said housing for pivotal movement about an axis perpendicular to the optical axis of the headlamp, a pair of flange members connected to a second portion of said frame, each of said flange members having an elongated horizontal channel formed therein, said spring clip including a pair of U-shaped sections carried by said housing and being interconnected by an intermediate section, a leg section connected to each of said U-shaped sections and including a straight portion adapted to be located in the channel of one of said flange members, and a tang formed on said straight portion and adapted to be releasably attached to said housing and cooperate with said straight portion for locking said retainer member to said housing when said hinge means is connected to said first portion of said frame.

4,414,615

**MOUNTING STRUCTURE FOR A HIGH PRESSURE SODIUM LAMP**

George Szeker, Toronto, and Charles G. Shepherd, Oakville, both of Canada, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,437

Claims priority, application Canada, Sep. 18, 1980, 360480

Int. Cl.<sup>3</sup> F21K 7/00

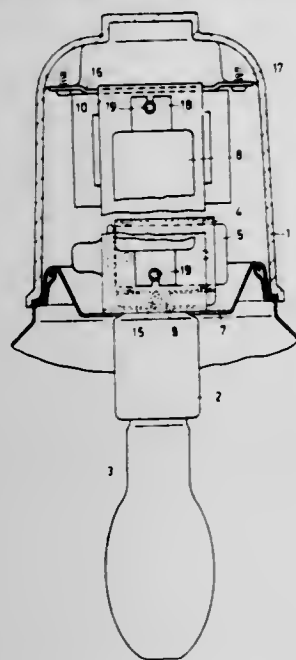
U.S. Cl. 362—264

12 Claims

1. A mounting arrangement for auxiliary operating components for an associated high-pressure vapor discharge lamp which comprises: an inverted open ended cup-shaped mounting structure, a U-shaped bracket having a base section from which elongated first and second legs extend, said first leg being attached to the interior of said structure and said second



leg being substantially centrally located in the open end of said structure, a holder for the associated lamp being attached to said second leg and projecting outwardly from said cup-shaped mounting structure, and a reflecting metallic heat shield extending around said U-shaped bracket and closing the open end



of said structure, the mounting arrangement also including a capacitor which is attached to the other side of said second leg in the interior of said structure by a mounting strap which spaces the capacitor from contact with other components and includes means to limit transfer of heat to said capacitor.

4,414,616

#### OUTDOOR LUMINAIRE HAVING IMPROVED LATCHING MEANS FOR THE COMPONENT MOUNTING PLATE THEREOF

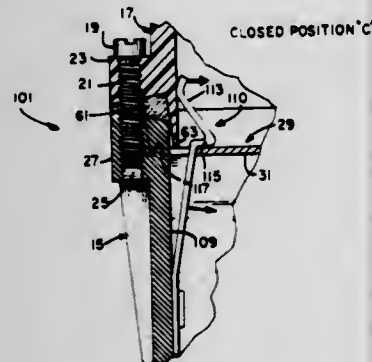
Hendrik A. J. de Vos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 4, 1981, Ser. No. 240,521

Int. Cl.<sup>3</sup> F21V 15/04

U.S. Cl. 362—308

10 Claims



1. In a luminaire including a housing member, a reflector positioned within said housing member, a lamp located within said housing member relative to said reflector, a component mounting plate having lamp ballast components secured thereto and a socket member located therein and having said lamp positioned within said socket member, and latching means for securing said component mounting plate within said housing, the improvement wherein said housing is comprised of a base portion and a forward refracting portion secured to said base portion and readily separable therefrom, and said latching means comprises a pair of depressible, resilient engagement members spacedly oriented within said base portion of said housing for engaging opposite sides of said component mounting plate to hold said plate in releasable securement to said base portion of said housing such that said lamp will be

accurately oriented within said forward refracting portion of said housing relative to said reflector, each of said resilient engagement members being biased in a first, closed position and movable against said biasing force in the opposite direction to a second, open position when engaged by said mounting plate during positioning and removal thereof within said base portion of said housing, said forward refracting portion of said housing member engaging said mounting plate and each of said resilient engagement members when said forward refracting portion is secured to said base portion of said housing member to assist in maintaining each of said resilient engagement members in said first, closed position against said mounting plate thereby assisting in retaining said mounting plate against said base portion.

4,414,617

#### TRACK LIGHTING SYSTEM

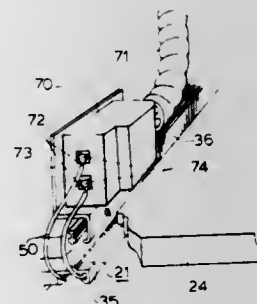
Rudolph D. Galindo, Brea, Calif., assignor to Bruce Petillo and Stan Pawlowski, both of Placentia, Calif.

Filed Oct. 19, 1981, Ser. No. 312,700

Int. Cl.<sup>3</sup> F21S 1/04

U.S. Cl. 362—404

14 Claims



1. A track lighting system comprising an elongated track member including an upstanding web adapted to act as a support point for the system and to provide stiffness thereto; said track member defining a longitudinally extending recess having a throat portion communicating with the side opposite the web and generally exposed to the room in which the track member is to be installed; a pair of insulated conductors extending parallel to each other within said recess and on opposite sides of said throat; a lighting fixture support adapted to be mechanically interlocked with said track member for physical support; said lighting fixture including a pair of insulation severing blades constituting the electrical connections to said fixture; and means for selectively moving said blades into insulation piercing and electrical contact making relationship with said conductors in said recess.

4,414,618

#### LAMP SHADE ADJUSTER AND HOLDER

Darwin J. Jacobson, P.O. Box 962, Port Angeles, Wash. 98362

Continuation of Ser. No. 342,502, Jan. 25, 1982, abandoned. This

application Feb. 17, 1983, Ser. No. 467,270

Int. Cl.<sup>3</sup> F21V 17/00

U.S. Cl. 362—417

6 Claims

1. A lampshade adjuster and holder comprising:  
(a) a lamp harp having a stud bracket affixed to an upper portion of the harp, said stud bracket carrying a substantially vertically extending harp stud;  
(b) a harp bracket having an opening to encompass the harp stud; and

(c) a plate having an opening to encompass the harp stud, resting on the harp bracket, and including means for ad-



justing the mutual angular relationship of the plate and harp bracket.

4,414,619

#### PROCEDURE AND APPARATUS FOR SWITCHING THYRISTOR BRIDGES IN STATIC ALTERNATING CURRENT/DIRECT CONVERSION

Matti Kahkipuro, Hyvinkää, Finland, assignor to Elevator GmbH, Baar, Switzerland

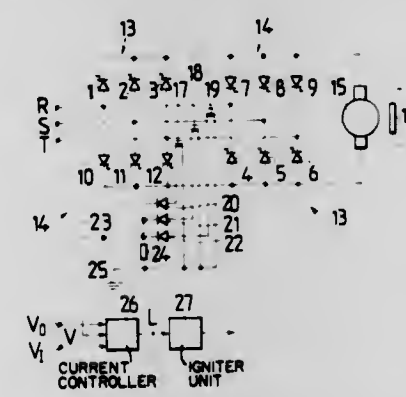
Filed Dec. 22, 1980, Ser. No. 218,766

Claims priority, application Finland, Dec. 28, 1979, 794075

Int. Cl.<sup>3</sup> H02M 7/17

U.S. Cl. 363—70

3 Claims



1. An improved method for switching thyristor bridges in converting alternating current statically to direct current, employing two thyristor bridges connected in parallel, whereby direct current motor means will receive both positive and negative current, comprising the steps of: applying a three phase A.C. input to said thyristor bridges and through to current sensing transformers in circuit relationship to said two thyristor bridges; feeding current sensing voltage as an input into a current controllers; directing an output voltage of said controller to an igniter unit for igniting in proper sequence respective thyristors of said bridges, each of said bridges is controlled by the same analog voltage; causing said first bridge to open in the presence of a positive controlling analog voltage; causing said second bridge to open in the presence of a negative controlling analog voltage; and shifting the bridges to a reciprocally oscillating mode of operation as the circuit approaches zero-current state; and feeding output D.C. voltages of said bridges to said motor means connected to said bridges as a load.

4,414,620

INTER-SUBSYSTEM COMMUNICATION SYSTEM  
Takamitsu Tsuchimoto, Kawasaki; Saburo Kaneda, Yokohama; Tatsushi Miyazawa, Kawasaki; Toshio Shimada, Kamakura; Hideo Suzuki, Kawasaki; Mitsuru Sanagai, and Kaoru Hiraoaka, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

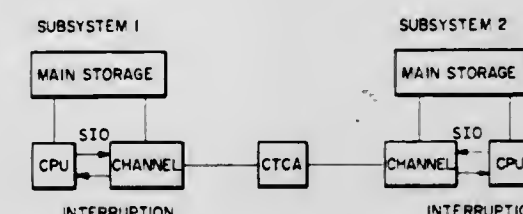
Filed Nov. 7, 1980, Ser. No. 204,931

Claims priority, application Japan, Nov. 12, 1979, 54-146164

Int. Cl.<sup>3</sup> G06F 15/16, 15/20, 7/00

U.S. Cl. 364—200

13 Claims



1. An intercomputer system communication system in a data processing system comprising first and second subsystems each having main storage and each operating under the control of an operating system;  
said first subsystem further comprising a sender subsystem having n sending buffers in the respective main storage;  
said second subsystem further comprising a receiver subsystem having m receiving buffers in the respective main storage;  
said sender subsystem further comprising a sending buffer address table in the respective main storage having n entries;  
said receiver subsystem further comprising a receiving buffer address table in the respective main storage having m entries;  
each of said n and m entries comprising header address information for corresponding said n sending and m receiving buffers and length information for the respective buffer;  
said sender subsystem further comprising a sender buffer control data block in main storage including:  
a header address for the sending buffer address table;  
said n entries in said sending buffer address table;  
an enqueue pointer which indicates which of said n entries is to be enqueued next; and  
a dequeue pointer which indicates which of said n entries is to be dequeued next into the respective main storage;  
said receiver subsystem further comprising a receiver buffer control data block in main storage including:  
a header address for the receiving buffer address table;  
said m entries in said receiving address buffer table;  
an enqueue pointer which indicates which of said m entries is to be enqueued next; and  
a dequeue pointer which indicates which of said m entries is to be dequeued next into respective main storage; and  
said communication system further comprising a communication unit, operatively connected between said sender subsystem and said receiver subsystem, for transferring data stored in said n sending buffers of the sender subsystem to said m receiving buffers of the receiver subsystem.

4,414,621

INTERACTIVE VISUAL COMMUNICATIONS SYSTEM  
Herbert G. Bown, Kanata, and C. Douglas O'Brien, Ottawa, both of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Continuation of Ser. No. 806,168, Jun. 13, 1977, abandoned.

This application Oct. 23, 1981, Ser. No. 314,407

Int. Cl.<sup>3</sup> G06F 3/14

U.S. Cl. 364—200

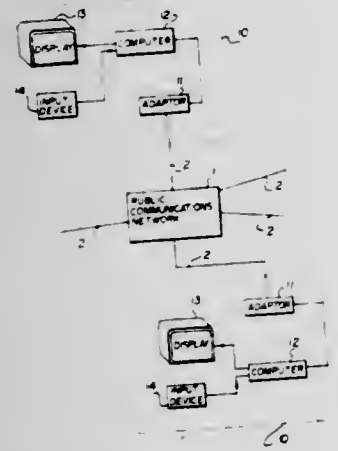
8 Claims

1. An interactive visual communications system for maintaining identical visual pictures at a number of terminals linked



by narrow bandwidth transmission lines, each of said terminals comprising:

- visual display means;
- input means for providing input instructions at said terminal;
- means coupled to the input means for converting said instructions to graphic task instructions;
- interaction handler means coupled to the converting means for receiving and for transmitting the graphic task instructions over the narrow bandwidth transmission lines to one or more further terminals, and for receiving graphic task



instructions generated at the one or more further terminals over the narrow bandwidth transmission lines; and processor means coupled to the interaction handler means for receiving the converting means graphic task instructions and the graphic task instructions received from the one or more further terminals for processing the graphic task instructions, said processor means being coupled to the display means for controlling the display means to modify and maintain the picture on the display means in accordance with said graphic task instructions.

4,414,622

#### ADDRESSING SYSTEM FOR A COMPUTER, INCLUDING A MODE REGISTER

Kelji Matsumoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 956,157, Oct. 31, 1978, abandoned.

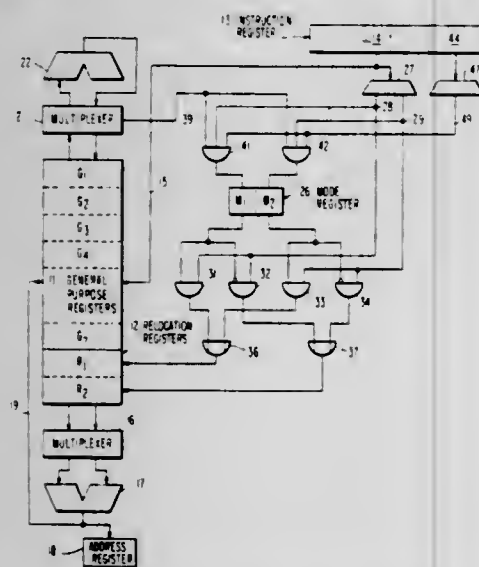
This application Feb. 19, 1981, Ser. No. 235,377

Claims priority, application Japan, Oct. 31, 1977, 52-131190

Int. Cl.<sup>3</sup> G06F 9/26

U.S. Cl. 364—200

8 Claims



1. An addressing system for generating a working address in a central processing unit of an electronic digital computer, said central processing unit comprising a plurality of general purpose registers (11) each storing general purpose register contents therein, a plurality of relocation registers (12) each stor-

ing relocation register contents therein, an instruction register (13) for storing a program instruction including a mode register content change instruction (44), and general purpose register specifying means (14, 15) responsive to at least a portion of said program instruction for specifying one of said general purpose registers, said addressing system comprising: mode register means (26) for producing a plurality of mode register output signals at one time; a first decoder (27) responsive to said portion of said program instruction for producing a decoder output signal designating one mode register output signal to be selected from the mode register output signals currently being produced by said mode register means; selecting means (31-34) responsive to said first decoder output signal for selecting said one mode register output signal and for reproducing a selection signal in accordance with said one mode register output signal; means (36, 37) responsive to said selection signal for selecting one of said relocation registers; means (16, 17) for combining the contents of the specified general purpose register and the selected relocation register to generate said working address; result signal producing means (22) responsive to the content of the general purpose register specified by said portion of said program instruction for producing a result signal; and gating means (41, 42) enabled by said decoder output signal and said mode register content change instruction for providing at least a portion of said result signal to said mode register means for use in changing at least one of said mode register output signals.

4,414,623

#### DUAL DEADMAN TIMER CIRCUIT

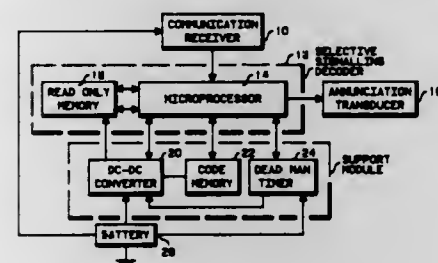
Walter L. Davis, Plantation, and James E. Jacobson, Jr., Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1980, Ser. No. 192,772

Int. Cl.<sup>3</sup> G06F 1/04

U.S. Cl. 364—200

10 Claims



1. In a device including a microprocessor having means to generate signal pulses indicative of proper function and a multi-mode power supply supplying power to the microprocessor, a deadman timer comprising:

- input means for receiving signal pulses from the microprocessor indicative that the microprocessor is functioning properly;
- first timing means coupled to the input means for determining if the signal pulses have been interrupted;
- second timing means coupled to the input means for determining if a pulse persists for a predetermined time interval;
- first output means coupled to said first and second timing means for providing a reset pulse to the microprocessor in response to either an interruption in the signal pulses or a pulse having an improper pulse width interval for reinitializing the operation of the microprocessor;
- second output means coupled to said first and second timing

means for switching the multi-mode power supply to a high output mode in response to either said interruption in signal pulses or improper pulse width interval thereby insuring that the multi-mode power supply can provide the power required to reinitialize the microprocessor.

4,414,624

#### MULTIPLE-MICROCOMPUTER PROCESSING

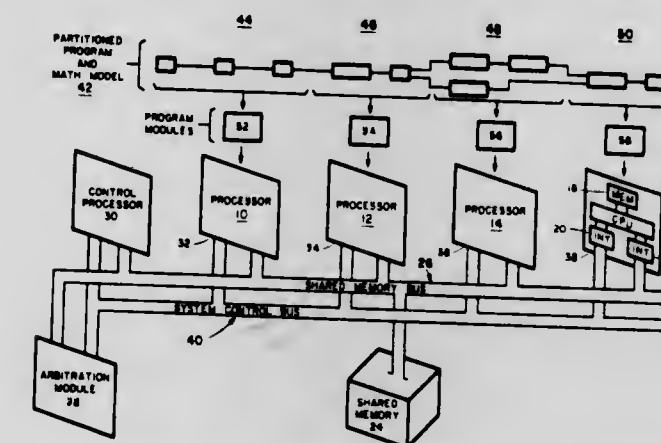
Charles F. Summer, Jr., Orlando, Fla.; Robert O. Pettus; Ronald D. Bonnell, both of Lexington, S.C.; Michael N. Huhns, Irmo, S.C., and Larry M. Stephens, Columbia, S.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1980, Ser. No. 208,355

Int. Cl.<sup>3</sup> G06F 13/00

U.S. Cl. 364—200

8 Claims



1. A processor that is an electronic machine for automatically manipulating data in accordance with a programmed task that is partitionable, comprising:

- a first microprocessor having memory, adapted to independently process data in accordance with a first portion of said task automatically;
- a second microprocessor having memory, adapted to independently process data in accordance with a second portion of said task automatically;
- first means interconnecting said first microprocessor and said second microprocessor for communicating data;
- second means interconnecting said first microprocessor and said second microprocessor for conveying machine instructions;
- means coupled to said first interconnecting means and to said second interconnecting means for providing global memory storage of data in computer processing format accessible to said first microprocessor and said second microprocessor;
- means coupled to said first interconnecting means and to said second interconnecting means for controlling interactions between said first microprocessor, said second microprocessor, and said storage means;
- means electronically immediately adjoining said interaction controlling means, coupled to said first interconnecting means and said second interconnecting means for controlling processor functions through action as master of said second interconnecting means;
- wherein selected portions of the data stored in said global memory means are duplicatively stored in said memory of said first microprocessor and pertain to said first portion of said task, and other selected portions of the data stored in said global memory means are duplicatively stored in said memory of said second microprocessor and pertain to said second portion of said task.

4,414,625

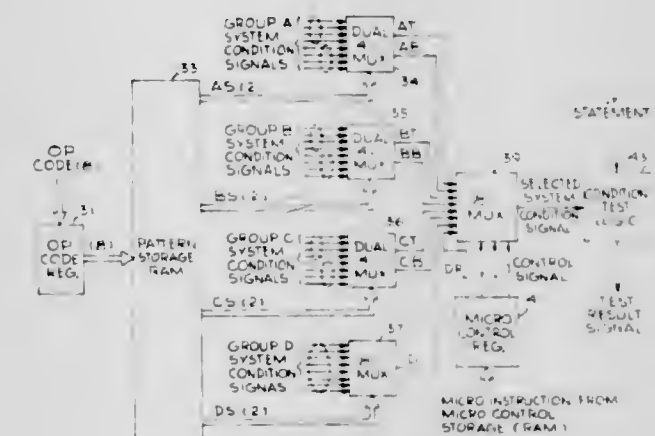
SYSTEM CONDITION SELECTION CIRCUITRY  
Christopher F. Miller, Diamond Bar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 24, 1980, Ser. No. 114,971

Int. Cl.<sup>3</sup> G06F 9/00, 9/22

U.S. Cl. 364—200

7 Claims



1. In a digital data processing system wherein data processing is performed by performing a plurality of macroinstructions, wherein each macroinstruction includes an operation code portion indicating the type of data processing to be performed thereby, and wherein each macroinstruction is performed by one or more microinstructions, an improved system condition signal selection means for selecting from a relatively large number of system condition signals provided by said system during operation thereof a particular system condition signal to be tested during each microinstruction, said improved system condition signal selection means comprising:

- operation code storage means for storing the operation code portion of each new macroinstruction to be performed;
- a memory for storing a plurality of predetermined signal patterns, each signal pattern being respectively associated with a different operation code, said memory being responsive to an operation code stored in said operation code storage means for outputting the respective signal pattern associated therewith;
- first selection means operative prior to the performance of the microinstructions corresponding to said new macroinstruction, said first selection means being responsive to a signal pattern outputted from said memory for preselecting a particular relatively small plurality of system condition signals from said relatively large plurality of system condition signals and for maintaining this preselection throughout the performance of the microinstructions of the macroinstruction corresponding thereto;
- microinstruction storage means for sequentially storing each microinstruction to be performed, each microinstruction including a predetermined portion for use in selecting a system condition signal to be tested during execution of the microinstruction; and
- second selection means operative in conjunction with the performance of each microinstruction, said second selection means being responsive to said predetermined bits of the microinstruction stored in said microinstruction storage means for selecting one of the preselected relatively small number of system condition signals for testing during performance of the microinstruction.



4,414,626

## INPUT/OUTPUT CONTROL SYSTEM AND METHODS

Michio Arai, Kawasaki; Yukio Shiraogawa, Kunitachi; Tsutomu Sakamoto, Kokubunji, and Keizo Aoyagi, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 949,942, Oct. 10, 1978, abandoned.

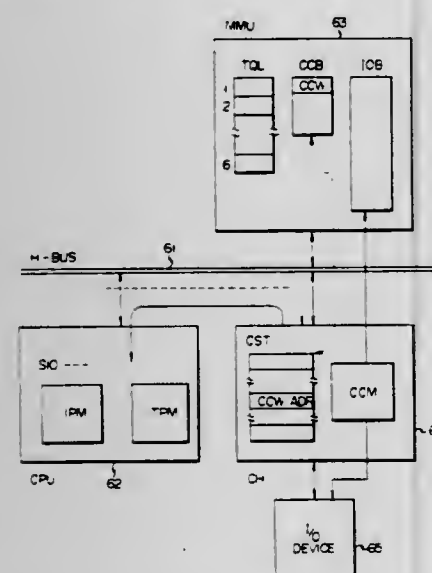
This application Dec. 5, 1980, Ser. No. 213,579

Claims priority, application Japan, Oct. 12, 1977, 52-121391

Int. Cl.<sup>3</sup> G06F 1/00

U.S. Cl. 364—200

11 Claims



1. A method for controlling an input/output control system having a plurality of input/output units, a plurality of channels for controlling the plurality of input/output units, a central processing unit, and a main memory unit connected to said central processing unit and to said channels for storing channel control blocks having control information to allow said plurality of channels to control the transfer of data between said main memory unit and the plurality of input/output units, said control information including at least one starting memory address which identifies locations in said main memory unit where data transfer with said plurality of input/output units will begin and at least one count value, each corresponding to a different one of said at least one starting memory address, each said at least one count value indicating the size of said data transfer with said corresponding one of said plurality of input/output devices, said method comprising the steps of:

storing, by said central processing unit, said control information in said channel control blocks in said main memory; executing, by the central processing unit, a single instruction containing a channel number identifying a designated channel, a unit number identifying an input/output unit to be activated, and channel control block address information to identify the location in said main memory for a selected channel control block, thereby delivering said channel control block address information to said designated channel;

accessing, by the designated channel, through a single operation of said designated channel, the location in said main memory corresponding to said channel control block address specified by said information contained in said single instruction and reading the selected channel control block specified by said channel control block address information into said channel; and

controlling, by the designated channel, the data transfer for said input/output unit identified by said single instruction in accordance with the control information in said selected channel control block read into said designated channel including identifying, by the designated channel, each location in said main memory unit for the specified data transfer with said input/output unit using said at least one starting address and count value.

4,414,627

## MAIN MEMORY CONTROL SYSTEM

Teruo Nakamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 54,176, Jul. 2, 1979, abandoned. This

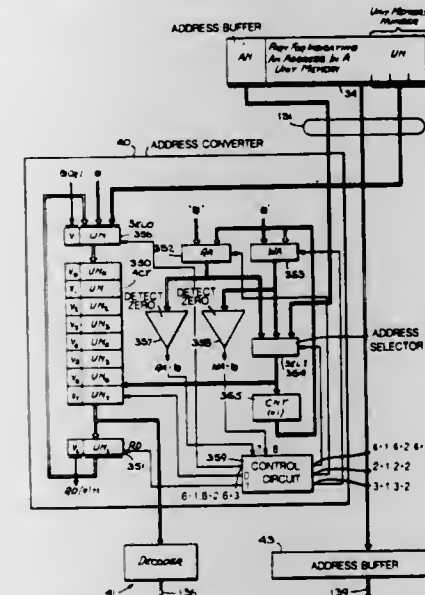
application Aug. 27, 1981, Ser. No. 296,978

Claims priority, application Japan, Jul. 3, 1978, 53-81321

Int. Cl.<sup>3</sup> G06F 13/00

U.S. Cl. 364—200

2 Claims



1. A data processing system comprising a central processing unit,

a main memory having a plurality of unit memories each of which is accessible by means of a unit memory number address,

an input/output control unit connected to said central processing unit and to said main memory for performing data transfer between said main memory and external devices, said central processing unit having an instruction execution portion arranged to produce a rescue type initial program load command signal following interruption of operation of the system in order to reconstruct the main memory to ensure continuous address space, and

a main memory control unit connected to receive from said central processing unit, and from said input/output control unit, address numbers and unit memory number addresses preassigned to corresponding address numbers, together with associated bits indicating whether the unit memory represented by each unit memory number address is operative, said main memory control unit being connected to receive from said central processing unit said rescue type initial program load command signal to reallocate unit memory number addresses with respect to said address numbers, said main memory control unit comprising an address converting apparatus having an address converting table comprising a plurality of storage locations for said unit memory number addresses and associated indicating bits, each of said storage locations being accessible by means of an address converting table storage location address number,

means connected to receive from said central processing unit and said input/output control unit said unit memory number addresses preassigned to the respective address numbers together with associated bits indicating whether the unit memory represented by each unit memory number address is operative and for storing said unit memory number addresses in the respective storage locations of said address converting table,

shifting means connected to receive said rescue type initial program load command signal from said central processing unit and, in response thereto, to perform a reconstruction operation in which the unit memory number addresses which have been stored in said storage locations

are shifted therein to ensure continuous storage space, and shifting means comprising:

read-out means and write-in means, each individually connected to said address converting table and responsive to the address number for sequentially applying address converting table storage location address numbers to said address converting table to sequentially access the different storage locations therein,

a read-out register connected to said address converting table to receive the unit memory number address and its associated indicating bit from the storage location in said address converting table accessed by said read-out means, a write-in register means connected to said read-out register and to said address converting table to receive from said read-out register each unit memory number address having an associated indicating bit which indicates the operative condition of the respective unit memory and to write said unit memory number address into the storage location which is accessed by said write-in means and not to write into said address converting table any unit memory number address having an associated indicating bit which does not indicate the operative condition of the respective unit memory and

sequencing means connected to said read-out means and said write-in means and programmed to cause said read-out means to sequentially access the different storage locations of said address converting table in succession upon each read-out operation by said read-out means and to cause said write-in means to sequentially access different storage locations of said address converting table in succession upon each write-in operation by said write-in means

whereby said storage locations of said address converting table are accessed sequentially according to the order of the address numbers so that the unit memory number addresses to which said address numbers are assigned are arranged in the storage locations of said address converting table according to said order of address numbers.

4,414,628

## SYSTEM FOR DISPLAYING OVERLAPPING PAGES OF INFORMATION

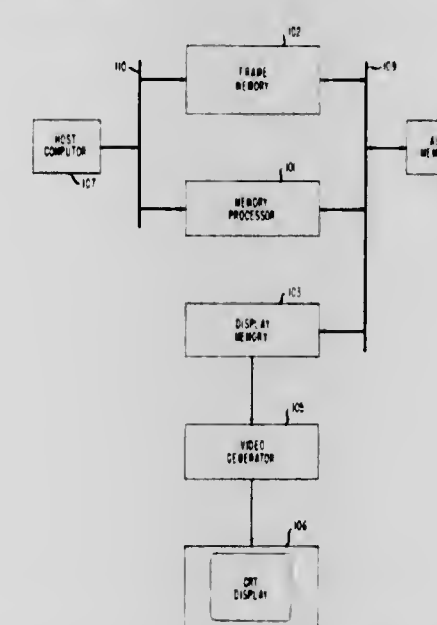
Sudhir R. Ahuja, Aberdeen, and Dhiraj K. Sharma, Gillette, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1981, Ser. No. 249,505

Int. Cl.<sup>3</sup> G06K 15/18

U.S. Cl. 364—200

10 Claims



1. In a display system for processing pages of display information elements, pages being designated as being on top of or below other pages with respect to visibility upon display, a display memory (103) having a plurality of locations for stor-

ing display information elements, a display means for displaying elements stored within said display memory means (102) for containing a plurality of pages of display information elements, each of said contained elements being destined to a respective location in the display memory, and means (101) for transferring the information element of the pages from the containing means to the display memory in accordance with the element destinations and in descending order of said top/bottom designations an auxiliary memory having a plurality of storage locations which respectively correspond to separate locations of said display memory for registering in said auxiliary memory storage locations whether an information element has been transferred to corresponding locations in the display memory, and

the transferring means includes means (201-210) for selecting pages for transfer from the containing means in a descending order, topmost designated page first, for writing an information element of the selected page into the destined location of the display memory when the auxiliary memory does not register that an information element has been priorly transferred to the destined location and for registering in the auxiliary memory that an information element has now been transferred to the destined location when the information element is written in such location, whereby when elements of a page are not transferred to the display memory because their destined locations in the display memory already contain elements previously transferred thereto, as ascertainable from the indications in said auxiliary memory, the non-transferred elements are not displayed by said display means and are thus hidden from view.

4,414,629

## METHOD AND APPARATUS FOR MAKING CORRELATIONS AND PREDICTIONS USING A FINITE FIELD OF DATA OF UNORGANIZED AND/OR PARTIALLY STRUCTURED ELEMENTS

John H. Waite, 46 Grove St., Haddonfield, N.J. 08033

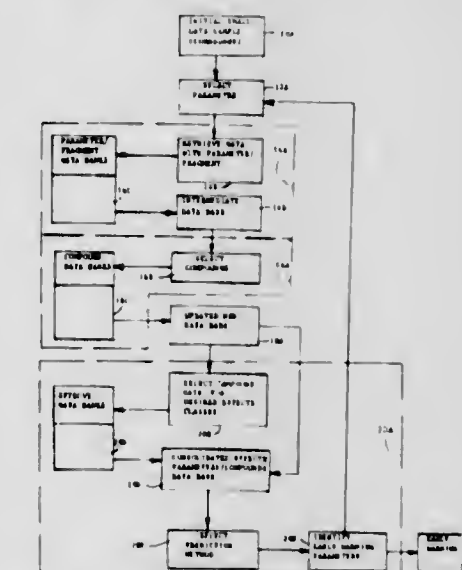
Continuation of Ser. No. 26,178, Apr. 2, 1979, abandoned. This

application Nov. 10, 1980, Ser. No. 205,339

Int. Cl.<sup>3</sup> G06F 7/00

U.S. Cl. 364—300

6 Claims



1. A method of identifying physical items with specific characteristics and sorting those items from a relatively large group of physical items, said method comprising the steps of: (a) providing descriptive names for the items in said group, (b) encoding said names and storing the corresponding codes in computer memory, (c) providing one or more descriptor words describing said specific characteristics, (d) encoding said descriptor words and storing the corresponding codes in computer memory, (e) sequentially matching said descriptor word codes with



- said name codes in a computer on a character-by-character basis,
- (f) counting the number of character coincidences for each of said names,
- (g) identifying each of said names for which the number of coincidences significantly exceeds the random coincidence level for the characters in said descriptor words and names, and
- (h) restructuring and organizing said physical items by sorting said physical items on the basis of said names so identified.

4,414,630

## ANTI-SKID VEHICLE BRAKING SYSTEMS

Alan L. Harris, Coventry, and Alfred K. White, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

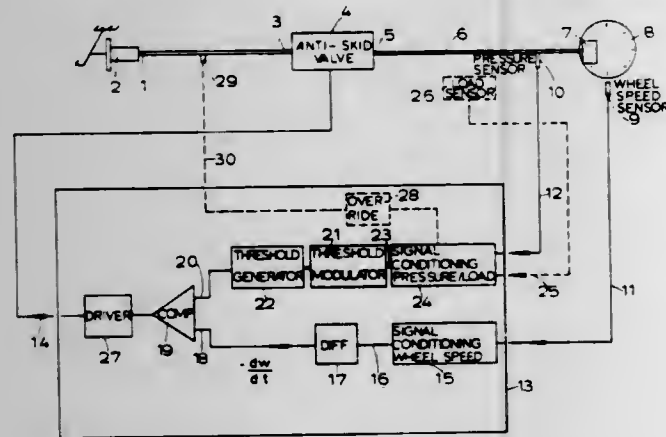
Filed Feb. 17, 1981, Ser. No. 234,956

Claims priority, application United Kingdom, Mar. 19, 1980, 8009186

Int. Cl.<sup>3</sup> G06F 15/20

U.S. Cl. 364-426

7 Claims

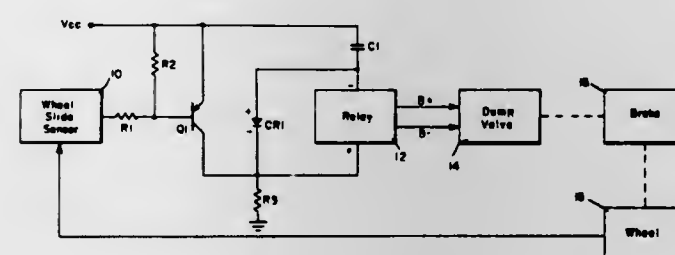


1. An anti-skid vehicle braking system comprising a brake actuator associated with a vehicle wheel, a modulator assembly for modulating the fluid pressure applied to said brake actuator, a deceleration sensor for measuring the deceleration of said wheel, an electronic control unit for controlling the operation of said modulator assembly in response to signals produced by said deceleration sensor, and a pressure sensor for producing a signal corresponding to the current brake actuator pressure, said control unit incorporating at least part of said deceleration sensor, a threshold generator circuit for generating a deceleration threshold value, a comparator for comparing a wheel deceleration signal produced by said deceleration sensor with said deceleration threshold value and a threshold modulator circuit responsive to said current pressure signal, an input of said threshold generator circuit being connected to an output of said threshold modulator circuit, an output of said threshold generator circuit being connected to a threshold value input of said comparator for providing said comparator with a current threshold value, an input of said threshold modulator being connected to said pressure sensor, said threshold modulator producing at its output a modulation signal for controlling the threshold generator, and the threshold generator being arranged to vary said current threshold value in response to said modulation signal in accordance with a predetermined relationship between the threshold value and the brake actuator pressure, said predetermined relationship providing a higher threshold value for a higher brake actuator pressure.

4,414,631  
BRAKE CONTROL SYSTEM  
Arden L. Schug, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.  
Filed Apr. 22, 1981, Ser. No. 256,363  
Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 364-426

24 Claims



1. A system for controlling a dump valve of a braking system on a wheel, comprising:  
a relay having an output connected to the dump valve; and means for energizing said relay during an occurrence of wheel slide to provide an actuating signal to the dump valve to prevent braking action on the wheel for the duration of the wheel slide or for a predetermined maximum time if the duration of the wheel slide exceeds said predetermined maximum time.

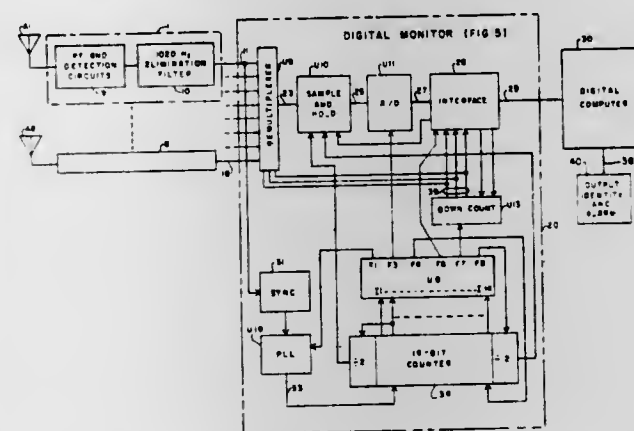
4,414,632  
AUTOMATIC MONITORING SYSTEM FOR RADIO SIGNAL

Robert A. Murrell, 45375 Fox La. E., 106, Utica, Mich. 48087  
Filed Apr. 7, 1981, Ser. No. 251,825

Int. Cl.<sup>3</sup> G06F 15/20

U.S. Cl. 364-487

8 Claims



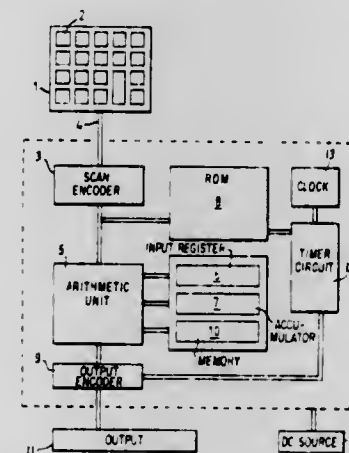
1. A system for monitoring a modulated RF signal for certain parameters of a radiated signal, wherein the modulation of the RF signal comprises a composite signal of plurality of tone frequencies which normally have a fixed phase relation such that the composite signal has repetitive cycles at a given lower frequency with respect to the tone frequencies, the RF signal being detected and demodulated to provide the composite signal; said system comprising:  
monitor apparatus comprising sample and hold means, input means to apply said composite signal to the sample and hold means, timing means to provide timing signals at predetermined points of time in the composite cycle, said timing signals being applied to said sample and hold means to obtain sample signals representing the voltage of the composite signal at said predetermined points during one cycle of the composite signal, said sample signals being supplied to computation means which perform arithmetic operations on combinations of the sample signals to determine said certain parameters.

4,414,633  
DATA PROCESSING AND RECORDING APPARATUS  
David A. Churchill, Leamington Spa, England, assignor to British Gas Corporation, London, England  
Filed Feb. 24, 1981, Ser. No. 237,764  
Claims priority, application United Kingdom, Nov. 17, 1980, 8036798

U.S. Cl. 364-510

Int. Cl.<sup>3</sup> G06F 15/20

3 Claims



1. A gas flow rate recording apparatus comprising:  
transducer means located in a gas supply line which provides an electrical signal having a pulse frequency representative of the magnitude of the parameter being measured, said parameter falling into one or a range of predetermined upper and lower limits and a plurality of data storage memories, each corresponding to one specific range of said parameter limits to record the incidence of a measurement of said parameter within the respective predetermined ranges.

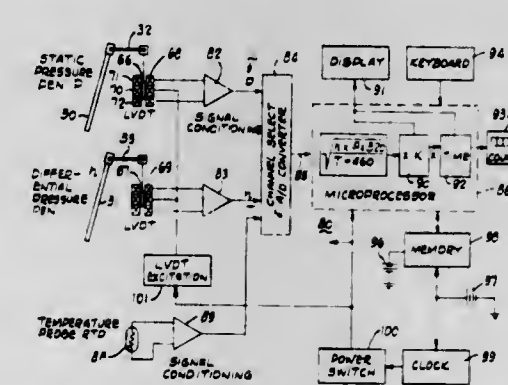
4,414,634  
FLUID FLOW TOTALIZER

Timothy R. Louis, Berea; Carl A. Gedeon, Middleburg Heights; Maw H. Lee, Broadview Heights, and Eugene V. Erjavec, Willowick, all of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Jul. 17, 1981, Ser. No. 284,526

Int. Cl.<sup>3</sup> G06F 15/32; G01F 1/00  
U.S. Cl. 364-510

20 Claims



9. A data totalizer for use with a fluid flow chart recorder, said chart recorder having a movable chart and a first marker to record thereon a first fluid pressure signal and a second marker to record thereon a second signal responsive to the fluid flow, and first and second motors to move the first and second markers, respectively, said data totalizer comprising, in combination:

first and second linear variable displacement transformers; an output winding and a movable core in each transformer; first and second means adapted to be connected to said first and second motors to move said first and second transformer cores in accordance with the static pressure and fluid flow, respectively, in a fluid flow line to establish

first and second signals on the respective output winding in accordance with the static pressure and fluid flow; electrical means responsive to the outputs of said output windings to utilize said first and second signals to perform a fluid flow rate calculation; and means to intermittently energize said electrical calculating means.

4,414,635  
METHOD AND CIRCUIT FOR RECOGNITION OF COLORS

Uwe Gast, Rammsee; Eggert Jung, Schöenberg; Franz Kuhn, Schönkirchen; Klaus Möllgaard, Kiel; Friedrich Redecker, Heikendorf; Ulrich Sendtko, Kiel; Rüdiger Sommer, Ralsdorf; Klaus Wellendorf, and Hans-Georg Knop, both of Heikendorf, all of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

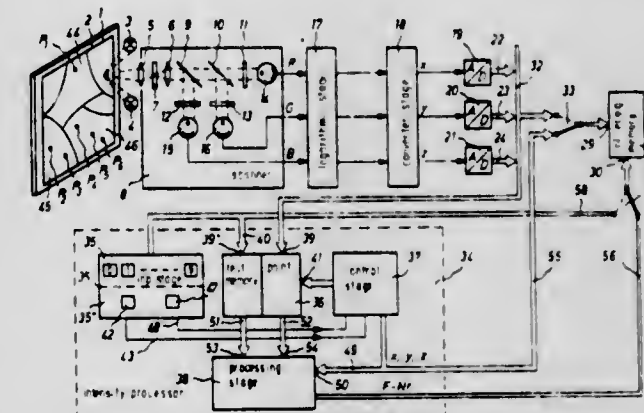
Continuation of Ser. No. 98,348, Nov. 28, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,615

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1978, 2851452; Jun. 9, 1979, 2923468; Jun. 9, 1979, 2923473; Jun. 9, 1979, 2923477

Int. Cl.<sup>3</sup> G01J 3/50; G06F 15/20

U.S. Cl. 364-526

39 Claims



1. In a method of preparing for and recognizing colors on a colored image with the aid of a light source of known spectral composition, each color corresponding to a color location in a color space, each color location being defined by a color component triplet representing the spatial coordinates of said color location in said color space, and being spaced from another color location by a spatial distance, said color space including at least one spatial color range being defined by at least one of said color locations,

the steps comprising:

preparatory to color recognition

selecting in said colors of said image a number of test points,

each test point having a test point color;

illuminating said image with said light source;

photoelectrically measuring the color component triplets of the selected test point colors;

defining a certain identification symbol for each selected test point color;

assigning the defined identification symbols to the color locations corresponding to respective selected test point colors;

calling up a plurality of said color locations from said color space;

determining for each called-up color location the spatial distance separating said called-up color location from the color location of each selected test point color;

selecting the color location of each test point color having the shortest distance from any of said called-up color locations respectively;

determining the identification symbols corresponding to the color locations of said test point colors having said shortest distances, respectively;



assigning said determined identification symbols to said corresponding called-up color locations, so as to form color recognition ranges around the color locations of the selected test point colors within said color space, all color locations assigned the same identification symbol forming said color recognition ranges corresponding to said color ranges, respectively; and thereafter performing the color recognition steps of: photo-electrically scanning said colored image point-by-point and line-by-line so as to obtain the color component triplets corresponding to each color scanned from said image; calling up the color locations represented by said color component triplets and the identification symbols associated therewith; and reading out said associated identification symbols, whereby the image colors are identified.

4,414,636

### COLOR CONTROL SIMULATOR FOR A PICTURE REPRODUCING MACHINE

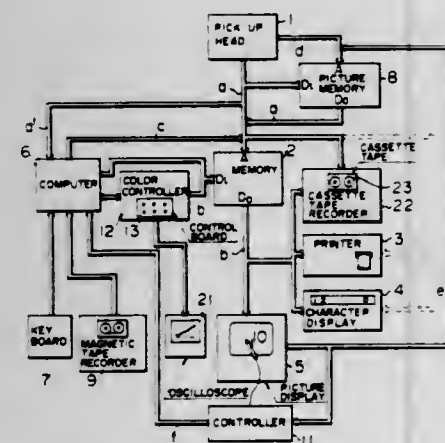
Sadao Ueda, Shiga; Isao Tokura, Uji, and Mitsuhiro Yamada, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Dec. 22, 1980, Ser. No. 218,669

Claims priority, application Japan, Dec. 28, 1979, 54-171134  
Int. Cl.<sup>3</sup> G03F 3/08; H04N 1/46

U.S. Cl. 364—526

4 Claims



1. A color control simulator for a picture reproducing machine comprising an input means which scans an original picture to obtain color separation picture signals, a memory storing a memory table indexed by the color separation picture signals, each of which is replaceable by a second color-corrected color separation picture signal, a color control means which outputs the second color-corrected color separation picture signals to the memory when the first color-corrected color separation picture signals are replaced with a second color-corrected color separation signals, a display means which displays color corresponding to the color-corrected color separation picture signals fed from the memory, and a computer which controls the input means, the memory, the control means and the display means;

the color control means being a color controller which comprises a triangular wave generator which generates a first triangular wave having linear slopes, a function generator which reforms from the first triangular wave to a second triangular wave having curved slopes, and analog digital converters for converting the first triangular wave and the second triangular wave into the digital picture signals to obtain the color separation picture signal and the second color-corrected color separation picture signal.

### 4,414,637 ADJUSTABLE CLOCK SYSTEM HAVING A DYNAMICALLY SELECTABLE CLOCK PERIOD

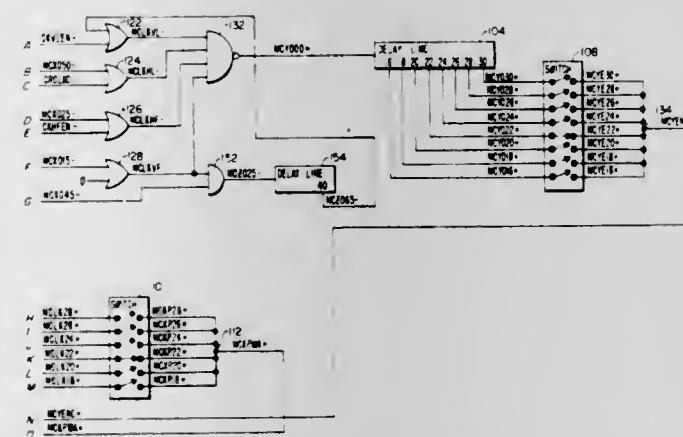
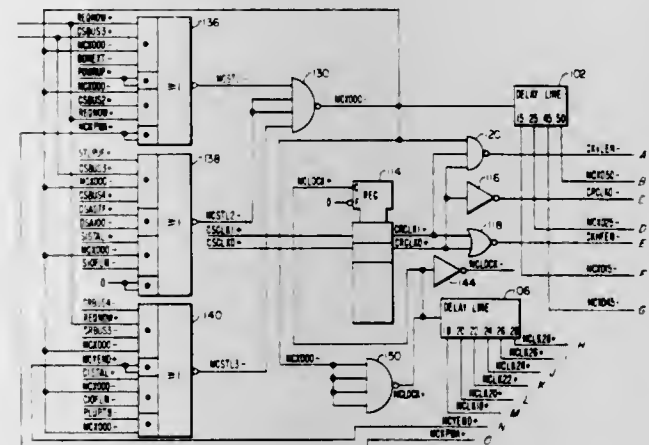
Philip E. Stanley, Westboro, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 13, 1981, Ser. No. 224,727

Int. Cl.<sup>3</sup> H03K 5/04, 5/159

U.S. Cl. 364—569

5 Claims



1. A multifrequency clock system operable to produce a clock signal of a selectable clock cycle period in response to a frequency select signal, said clock signal comprising a fixed width clock pulse in a first state and a dynamically selectable width pulse in a second state, said multifrequency clock system comprising:

- a inverter having an input and an output;
- a first delay line having an input and an output, said input of said first delay line is connected to said output of said inverter;
- a stall logic for stalling said clock system by inhibiting said clock signal from returning to said first state, said stall logic having a plurality of inputs and an output, a first input of said plurality of inputs of said stall logic is connected to said output of said first delay line, said output of said stall logic is connected to said input of said inverter;
- a multitapped second delay line having an input and a plurality of outputs, said input of said multitapped second delay line is connected to said output of said stall logic;
- a frequency selection logic having a plurality of inputs and an output, a first input of said plurality of inputs of said frequency selection logic for receiving said frequency select signal, a remainder of said plurality of inputs of said frequency selection logic connected to said plurality of outputs of said multitapped second delay line, said frequency selection logic for selecting among said plurality of outputs of said multitapped second delay line in response to said frequency select signal;
- a multitapped third delay line having an input and a plurality of outputs, said input of said multitapped third delay line is connected to said output of said frequency selection logic; and

a first switch assembly having a plurality of inputs and an output, said plurality of inputs of said first switch assembly are connected to said plurality of outputs of said multitapped third delay line, said output of said first switch assembly is connected to a second input of said plurality of inputs of said stall logic whereby selection of one of said plurality of outputs of said multitapped third delay line by said first switch assembly enables adjustment of said selectable clock cycle period by adjusting the width of said dynamically selectable width pulse.

4,414,638

### SAMPLING NETWORK ANALYZER WITH STORED CORRECTION OF GAIN ERRORS

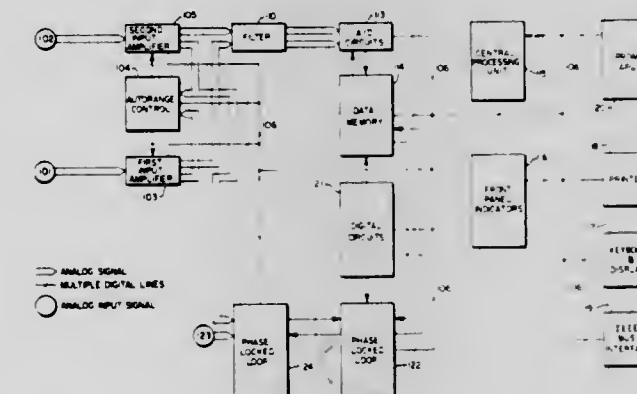
Robert P. Talambiras, Springfield, N.J., assignor to Dranetz Engineering Laboratories, Inc., Edison, N.J.

Filed Apr. 30, 1981, Ser. No. 258,953

Int. Cl.<sup>3</sup> G06J 1/00; G06F 15/20

U.S. Cl. 364—571

7 Claims



1. An improved network analyzer of the type having:
  - (a) first input port means, the first input port means for receiving a first analog input signal;
  - (b) first input amplifier means, electrically connected to the first input port means and responsive to the first analog input signal, the first input amplifier means for producing a first output signal that is related to the first analog input signal, the first input amplifier means characterized by a first midband voltage gain and a first voltage gain-vs.-frequency response;
  - (c) first gain control circuit means, electrically connected to the first input amplifier means, the first gain control circuit means for controlling the first midband voltage gain of the first input amplifier means to approximate one of a first set of predetermined midband voltage gains;
  - wherein the improvement comprises:
    - (d) first midband voltage gain correcting PROM means, connected to the first gain control circuit means, the first gain correcting PROM means for storing correction factors related to discrepancies between actual midband voltage gain of the first input amplifier means and each of the first set of predetermined midband voltage gains.

4,414,639

### SAMPLING NETWORK ANALYZER WITH SAMPLING SYNCHRONIZATION BY MEANS OF PHASE-LOCKED LOOP

Robert P. Talambiras, Springfield, N.J., assignor to Dranetz Engineering Laboratories, Inc., Edison, N.J.

Filed Apr. 30, 1981, Ser. No. 259,013

Int. Cl.<sup>3</sup> G06J 1/00

U.S. Cl. 364—602

9 Claims

1. An improved sampling network analyzer of the type having:

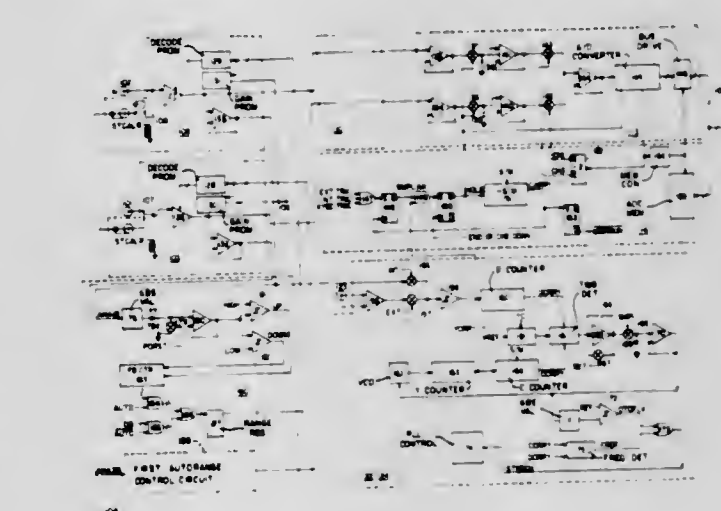
- (a) first sample-and-hold means for receiving a first analog signal and for producing a first sample-and-hold output signal that is a stepwise approximation to the first analog signal;
- (b) analog-to-digital converter means, electrically connected

to the first sample and hold means, the analog-to-digital converter means for receiving the first sample and hold output signal and for producing a discrete-time digital signal that is representative of the first sample and hold output signal;

(c) synchronizing means, electrically connected to the first sample-and-hold means, the synchronizing means for receiving a reference signal, characterized by a reference signal frequency, and for synchronizing, to the reference signal, operation of the first sample-and-hold means;

wherein the synchronizing means comprises:

- (d) time-difference detector means, electrically connected to a C counter means, the time difference detector means for producing a time difference detector output signal that is related to time difference between corresponding transitions of the reference signal and a C counter output signal;
- (e) integrating amplifier means, electrically connected to the time difference detector means, the integrating amplifier means for receiving the time difference detector output signal and for producing a sawtooth signal that is related to an integration, with respect to time, of the time difference detector output signal;
- (f) third sample-and-hold means, electrically connected to the integrating amplifier means, the third sample-and-hold



means for receiving the sawtooth signal and for producing a third sample-and-hold output signal that is related to the sawtooth signal;

- (g) voltage-controlled oscillator means, electrically connected to the third sample-and-hold means, the voltage-controlled oscillator means for receiving the third sample-and-hold output signal and for producing a VCO output signal characterized by a VCO output signal frequency that is related to the third sample-and-hold output signal;
  - (h) Y counter means, electrically connected to the voltage-controlled oscillator means, the Y counter means for receiving the VCO output signal and for producing a Y counter output signal, the Y counter output signal characterized by a Y counter output signal frequency that is equal to the VCO output signal frequency divided by an integer factor Y;
  - (i) C counter means, electrically connected to the Y counter means, the C counter means for receiving the Y counter output signal and for producing a C counter output signal that is characterized by a C counter output signal frequency that is equal to the Y counter output signal frequency divided by an integer factor C;
- wherein the Y counter output signal serves to synchronize, to the reference signal, operation of the first sample-and-hold means.



# 4,414,640

## ARITHMETICAL METHOD FOR DIGITAL DIFFERENTIAL ANALYZER

Shigeru Yabuuchi, Hinodemachi, and Takeyuki Endoh, Kodaira, both of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

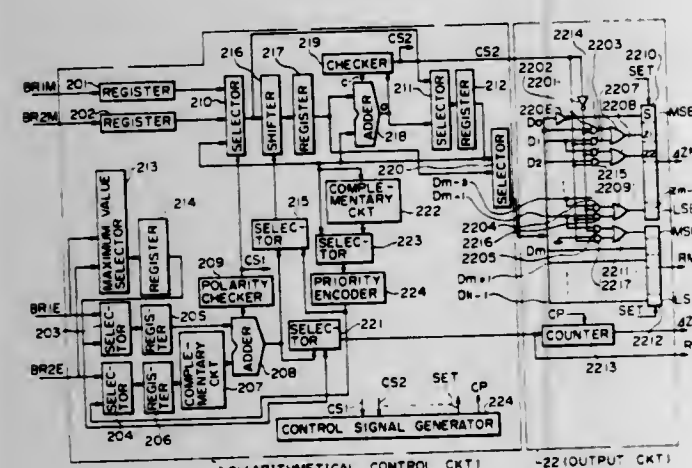
Filed Aug. 18, 1981, Ser. No. 294,061

Claims priority, application Japan, Aug. 18, 1980, 55-112739

Int. Cl.<sup>3</sup> G06F 7/64

U.S. Cl. 364-702

8 Claims



1. In an apparatus in which a first quantity BR1, expressed in the form of a mantissa BR1M and a base two exponent BR1E, and a second quantity BR2, expressed in the form of a mantissa BR2M and a base two exponent BR2E are summed, including means for aligning the mantissae BR1M and BR2M in accordance with the relative values of the exponents BR1E and BR2E, means for summing the values of the mantissae BR1M and BR2M in a register to obtain a quantity BRM, means responsive to the value of BRM for determining a mantissa value  $\Delta Z_M$  and a base two exponent value  $\Delta Z_E$  of a third quantity  $\Delta Z$ , where  $\Delta Z_M$  is expressed in m bits and BRM is expressed k bits, and means for determining a fourth quantity R, equal to  $BR1 + BR2 - \Delta Z$  in the form of a mantissa  $R_M$  and a base two exponent  $R_E$ , the improvement which comprises:

- BRM register means of k bits capacity for holding the value of BRM in the form of bits designated  $BRM_0, BRM_1, \dots$ , and an overflow bit;
- comparing means for comparing BR1E and BR2E to determine a difference j therebetween;
- shift register means for shifting the value of BRM by j bits;
- first buffer register means of m bits capacity for holding the value of  $\Delta Z_M$  in the form of bits designated  $S, Z_1, Z_2, \dots, Z_{m-1}$ ;
- second buffer register means for holding the value of  $R_M$ ;
- $R_E$  output means;
- $\Delta Z_E$  output means;
- checker means, for generating outputs dependent on whether the overflow bit of said BRM register means is set and on whether the contents of said BRM register means equals zero; and
- output circuit means for setting the values of said first buffer register means, said second buffer register means, said  $R_E$  output means; and said  $\Delta Z_E$  output means based on the output of said checker means.

# 4,414,641

## DIGITAL M OF N CORRELATION DEVICE HAVING INCREASED BIT RATE

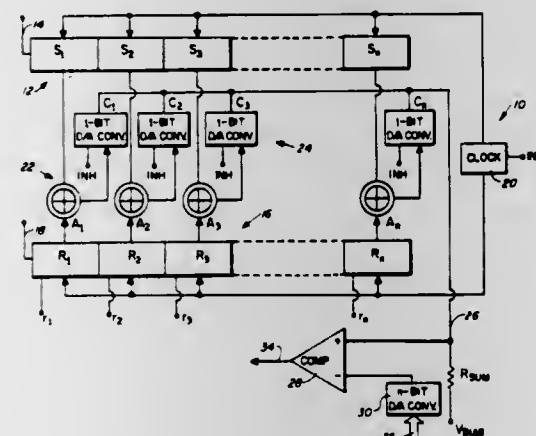
Bobby R. Jarrett, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,125

Int. Cl.<sup>3</sup> G06G 7/19; G06F 15/34; H03K 13/02

U.S. Cl. 364-728

13 Claims



1. A digital correlation device for producing a voltage sum corresponding to n individual analog currents in accordance with the bits in corresponding bit positions, the n individual analog currents being indicative of the number of agreements/disagreements in the corresponding bit positions, which comprises:

- a signal shift register including a plurality of signal multivibrators  $S_1-S_n$  arranged in a predetermined manner so as to store a binary sequence of signal data inputted at a signal input line of said signal shift register;
- a reference shift register including a plurality of reference multivibrators  $R_1-R_n$  arranged in a predetermined manner so as to store a binary sequence of reference data inputted thereto;
- a clock having one output operatively connected to said signal shift register and another output operatively connected to said reference shift register for shifting the states of the signal multivibrators  $S_1-S_n$  and the reference multivibrators  $R_1-R_n$  according to the modulation frequency of the signal data;
- a plurality of modulo 2 adders  $A_1-A_n$  operatively connected at each of their two inputs to the outputs of corresponding signal multivibrators  $S_1-S_n$  of said signal shift register and reference multivibrators  $R_1-R_n$  of said reference shift register for modulo 2 summing of the two bits in corresponding bit positions of said signal and said reference shift registers to provide a single bit representation of the agreements/disagreements in the corresponding bit positions; and
- a plurality of 1-bit digital-to-analog converters  $C_1-C_n$  operatively connected at one input to the corresponding output of each of said plurality of modulo 2 adders and at their outputs collectively to one end of a single analog summing resistor, the other end of said single analog summing resistor being connected to a voltage supply, said single summing resistor being an integral part of each one of said plurality of 1-bit digital-to-analog converters  $C_1-C_n$  so that they operate to convert the single bit representative of the agreements/disagreements of the n individual analog currents into the voltage sum.

# 4,414,642

## APPARATUS FOR GENERATING THE INVERSE OF BINARY NUMBERS

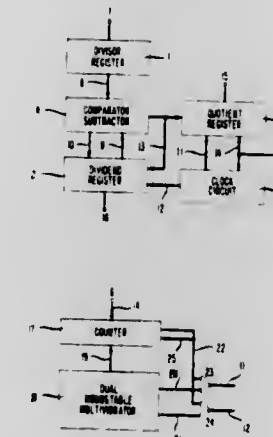
Gerald W. Grube, Long Valley, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1981, Ser. No. 252,278

Int. Cl.<sup>3</sup> G06F 7/52

U.S. Cl. 364-766

7 Claims



1. Apparatus for generating the inverse of a binary number comprising:

- a first register means for storing the binary number to be inverted;
- a second register means for initially storing a reference binary number;
- a comparison means connected to the first and second register means for either determining which of the contents of the first and second register means is greater or determining whether the contents of the first and second register means are equal, responsive to signals from the first and second register means, the comparison means also either sending a remainder difference to the second register means if the contents of the second register means is greater than or equal to the contents of the first register means or not disturbing the contents of the second register means if the contents of the first register means is greater than the contents of the second register means;
- a third register means connected to the comparison means for accepting and storing a one or zero received from the comparison means to form an integer scaled reciprocal of the binary number; and
- clock circuit means connected to the second and third register means for alternately shifting ones or zeros in the third register means over one digital position and either shifting the contents of the second register means over one digital position or shifting a binary number received from the comparison means within the second register means until a last digital position in the reference number has been operated on.

# 4,414,643

## ORDERING SYSTEM FOR PAIRING FEATURE INTERSECTIONS ON A SIMULATED RADAR SWEEP LINE

Jerome W. Meyer, San Jose, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed May 15, 1981, Ser. No. 263,846

Int. Cl.<sup>3</sup> G06F 7/00

U.S. Cl. 364-900

9 Claims

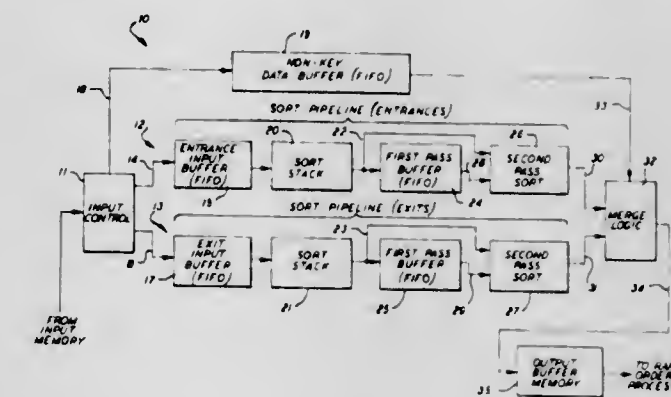
1. An ordering and pairing system for pairing feature intersections on a sweep line of a simulated radar visual display screen, regardless of shape, orientation and convexity, to arrange a variable length list of data in accordance with a desired correct order, comprising:

- input data control circuit means having one input connection means to receive and to store temporarily all of said input data, and having three output connection means; one of said three output connection means being connected

to receive data that has been divided out of all said input data in accordance with a first predetermined characteristic to represent "non-key" data;

two sorting pipeline circuit means to receive "key" data that has been divided out in accordance with a second predetermined characteristic for sorting and arranging the "key" data in each of said two sorting pipeline circuit means in accordance with a desired correct relationship of ranges;

circuit means connected with one of said three output connection means from said data control circuit means to



store temporarily that data divided out of all said input data which is associated with range information but which represents "non-key" data; and

merge logic circuit means having three input connections means, one for receiving "key" data from each of said two sorting pipeline circuit means and one for receiving "non-key" data associated with range data from said temporary storage circuit means, and having one output connection means for all of said input data which is now arranged and paired in accordance with said desired correct relationship of ranges.

# 4,414,644

## METHOD AND APPARATUS FOR DISCARDING DATA FROM A BUFFER AFTER READING SUCH DATA

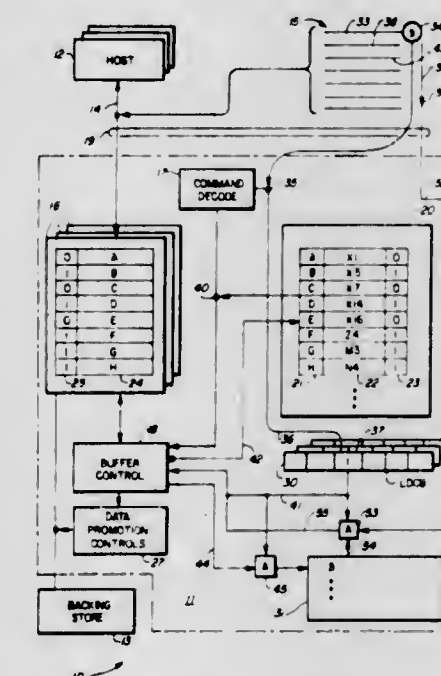
Gerald E. Taylor, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1981, Ser. No. 251,005

Int. Cl.<sup>3</sup> G06F 9/30

U.S. Cl. 364-900

13 Claims



1. A data store system having a backing store and a cache, first means for transferring data between said cache and said backing store, second means for transferring predetermined



data between said data store system and a host, chain means for indicating an end of chained sequences of operations in said data store system,

the improvement comprising:

first means coupled to said second transferring means for receiving from a host and storing a given indication that predetermined data transferred to a host from said cache can be quickly discarded, and that other data stored in the cache and transferred to a host is not to be quickly discarded,

second means coupled to said cache for indicating data stored in said cache as being different from corresponding and supposedly identical data stored in said backing store,

third means coupled to said second transferring means for being responsive to first predetermined data being transferred from said cache to said host for effectively erasing the first predetermined data from said cache, and

fourth means coupled to said second transferring means and to said chain means for being responsive to second predetermined data being transferred from said cache to said host during a given chained sequence of operations and to said indication of said end of chained sequences for effectively erasing said second predetermined data from said cache.

4,414,645

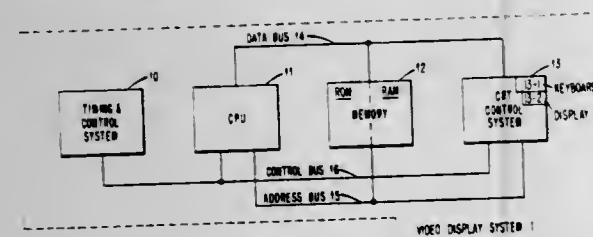
**HARDWARE-FIRMWARE CRT DISPLAY LINK SYSTEM**  
Joseph L. Ryan, Nashua, N.H., and Gerald N. Winfrey, Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 34,832, Apr. 30, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,932

Int. Cl.<sup>3</sup> G06F 3/153

U.S. Cl. 364-900

4 Claims



1. A hardware-firmware logic control system in a data processing system for accommodating the transfer of rows of display information of variable length stored in random order in a system memory unit to a CRT control system wherein said data processing system includes a timing control system for generating a plurality of timing signals, said memory including a random access memory (RAM) for storing each of said rows of display information and a read only memory (ROM) for storing command bytes indicative of the maximum number of characters in said each of said rows of display information, and a central processing unit (CPU), all coupled in common to a system bus, said CRT control system comprising:

(a) CRT control means coupled to said CPU and said ROM and responsive to a write command signal from said CPU for storing said command bytes received from said ROM and responsive to a start signal from said CPU for generating a direct memory access (DMA) request signal to said timing control system;

(b) DMA request logic means coupled to said CRT control means and said timing control means and responsive to the DMA request signal and a DMA cycle signal for generating a DMA acknowledge signal; said CRT control means coupled to said RAM and responsive to the DMA acknowledge signal for receiving a plurality of data byte signals and attribute byte signals followed by link byte signals and a plurality of address byte signals indicative of said each of said rows of display information;

(c) link character decode means coupled to said RAM and said timing control system and responsive to the DMA

acknowledge signal and the link byte signals for generating a link signal and a load signal;

(d) most significant byte address logic means coupled to said RAM and said link character decode means and responsive to the link signal for storing most significant byte signals representative of the most significant byte of the plurality of address byte signals; and

(e) memory address logic means coupled to said RAM and said most significant byte address logic means and responsive to the load signal for storing the most significant byte signals received from said most significant byte address logic means and least significant byte signals received from said RAM for transfer to said RAM the most significant byte signals and the least significant byte signals being indicative of an address location storing a byte representative of a first character of a next row of display information.

4,414,646

**MAGNETIC BUBBLE MEMORY DEVICES**

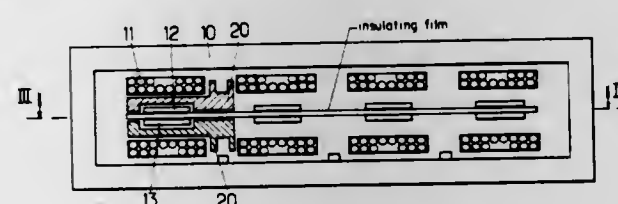
Xavier Boutin, Elancourt; Francis Compagnon, Saint-Gratien, and Michel Poirier, Eragny, all of France, assignors to Societe D'Applications Generales D'Electricite et de Mecanique Sagem, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,371

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-2

12 Claims



1. A magnetic bubble device, comprising a common package, at least one pair of memory chips located in said package with bubble propagation patterns in confronting relation, means for creating, duplicating, transferring and sensing bubbles, connecting means for connection of said means to the outside of said package, drive means common to all said chips, and bias magnetic field creating means common to all said chips, and a thin sheet of electrically insulating material located in a midplane of said drive means between said chips and carrying lead connections between said chips and electrical output pins, wherein the two chips of a same pair have bubble propagation patterns which are mirror images of each other and additionally angularly offset by 180°.

4,414,647

**BUBBLE DOMAIN REPLICATOR FOR CONTIGUOUS-DISK DEVICES**

William J. Kabelac, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,735

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-12

7 Claims

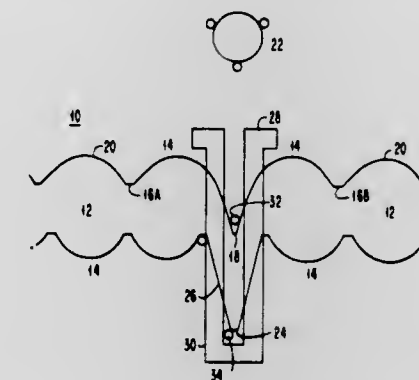
1. A bubble replicator for ion-implanted bubble devices having:

a non-implanted region having first and second sides, characterized by

a cusp portion on said first side extending substantially into the longitudinal plane of said region,

a tip portion on said second side extending substantially away from the longitudinal plane of said region, said tip

portion being in substantial alignment with said cusp portion, and



a hairpin loop conductor in overlying contact with said cusp portion and said tip portion and oriented such that the closed end portion thereof is in spaced surrounding relationship with the end of said tip portion.

4,414,648

**MAGNETIC BUBBLE DOMAIN SWAP GATE CIRCUIT**  
Takeyasu Yanase, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00159, § 371 Date Mar. 17, 1981, § 102(e) Date Mar. 11, 1981, PCT Pub. No. WO81/00322, PCT Pub. Date Feb. 5, 1981

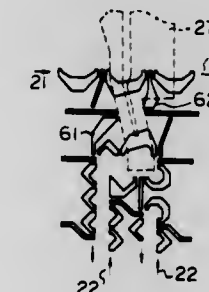
PCT Filed Jul. 16, 1980, Ser. No. 253,522

Claims priority, application Japan, Jul. 17, 1979, 54-90647

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-16

22 Claims



1. An improved magnetic bubble domain swap gate circuit comprising of the type which connects an information transmission line for transmitting a magnetic bubble domain and an information storage loop for storing the magnetic bubble domain wherein so that the magnetic bubble domain in the information transmission line is transmitted to the information storage loop and simultaneously, the magnetic bubble domain in the information storage loop is transmitted to the information transmission line, both the information transmission line and the information storage loops being formed of patterns of magnetic substance elements, wherein the improvement comprises: said magnetic bubble domain swap gate circuit being arranged to that the magnetic substance elements of the information transmission line are longer than the magnetic substance elements of the information storage loop; and in the information transmission line having a longer magnetic substance pattern period than the magnetic substance pattern period of the information storage loop and in the information storage loop, the following relations are established in bit length spacings:

$$AB \leq CD,$$

$$AD = CD \text{ and}$$

$$AB = BC,$$

wherein A represents an the outlet of the information transmis-

sion line to the information storage loop, B represents an the inlet of the information transmission line from the information storage loop, C represents an the outlet of the information storage loop to the information transmission line and D represents an the inlet of the information storage loop from the information transmission line.

4,414,649

**GAP TOLERANT MERGE ELEMENT FOR CONTIGUOUS-DISK BUBBLE DEVICES**

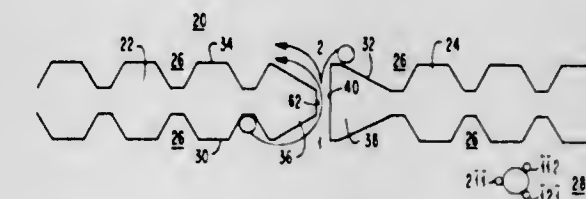
Timothy J. Gallagher, Mountain View, and Kochan Ju, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,814

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-36

5 Claims



1. A merge element for ion-implanted contiguous-disk bubble devices comprising

a first bubble propagation track having a first end portion, said first portion having a first straight edge region with a first length, and

a second bubble propagation track having a second end portion, said second portion having a second straight edge region with a second length, said second length longer than said first length, said second region facing said first region to form the opposite sides of a merge channel, said first end portion and said second end portion form angles with respect to a line passing through the center of said merge channel which are asymmetric to each other and which participate in the merge function wherein said merge channel allows only unidirectional bubble propagation therethrough.

4,414,650

**MAGNETO-OPTIC MEMORY ELEMENT**

Kenji Ohta, Yao; Akira Takahashi, and Toshihisa Deguchi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

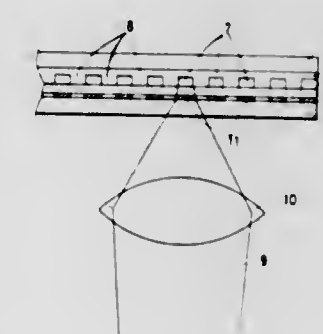
Filed Jun. 19, 1981, Ser. No. 275,388

Claims priority, application Japan, Jun. 23, 1980, 55-85695; Jul. 23, 1980, 55-101604; May 8, 1981, 56-70284

Int. Cl.<sup>3</sup> G11C 13/04

U.S. Cl. 365-122

4 Claims



1. A magneto-optic memory medium comprising:  
a reflector for reflecting light used for information reproduction;  
a magneto-optic magnetization film having an axis of mag-



netization perpendicular to its surface disposed adjacent said reflector; and  
means for directing light onto said magnetization film from a position on a side of said film opposite said reflector; wherein, when light is applied for information reproduction, the light passes through said magnetization film to said reflector and is reflected by the reflector back to said magnetization film for use in information reproduction.

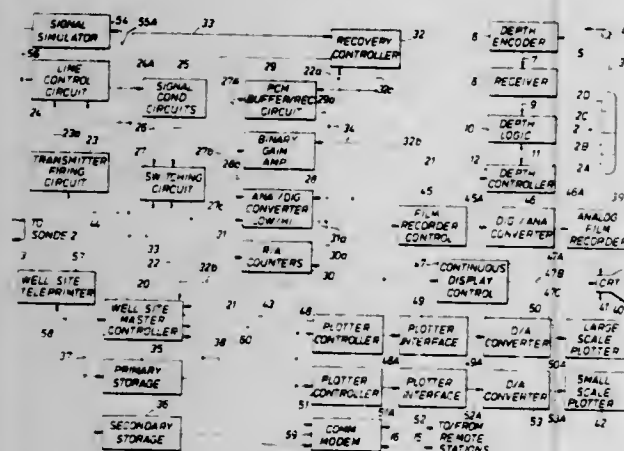
4,414,651

**INTEGRATED WELL LOGGING SYSTEM AND METHOD**  
Guy O. Buckner, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 1, 1980, Ser. No. 211,882  
Int. Cl.<sup>3</sup> G01V 1/40

U.S. Cl. 367-27

5 Claims



1. A method for detecting acoustic parameters from acoustic energy traversing a borehole, comprising:  
introducing a pulse of acoustic energy within said borehole at a first depth;  
receiving a first acoustic signature signal within said borehole in response to said pulse having first, second, third and fourth positive peaks;  
deriving a plurality of first digital representations from said received signal;  
determining from said first digital representations first and second compressional arrival times;  
determining from said first digital representations first and second shear arrival times;  
determining from said first digital representations a first, second, third and fourth amplitude corresponding to respective ones of said first, second, third and fourth peaks;  
determining a third compressional arrival time at a second depth adjacent said first depth;  
deriving a difference between said first and said third compressional arrival times; and  
selecting a compressional arrival time as a function of said difference.

4,414,652

ULTRASONIC LINE SENSOR

Scott D. Crist, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

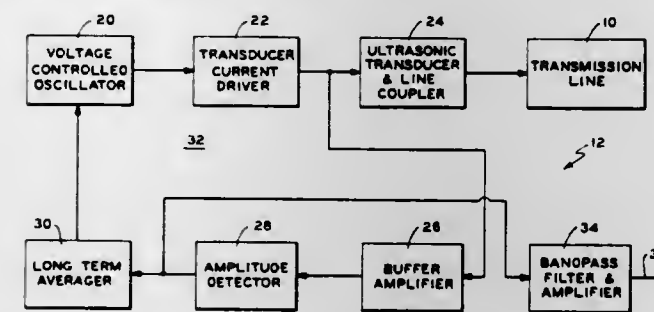
Filed Jun. 26, 1981, Ser. No. 277,757  
Int. Cl.<sup>3</sup> G08B 13/22

U.S. Cl. 367-93

3 Claims

1. A line sensor comprising, in combination:  
an elongated transmission line for longitudinal pressure waves which change transmission characteristics with change in the length of said line due to transverse mechanical loading;  
means for energizing said line with longitudinal pressure waves at a desired frequency of operation, including

means for maintaining said frequency of operation at a long-term value;



and means responsive to short term changes in said frequency of operation.

4,414,653

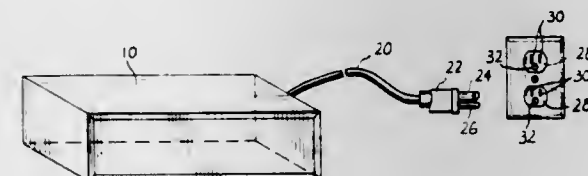
RODENT CONTROL DEVICE

Donald J. Pettinger, 2112 Meadowlane Dr., Chillicothe, Mo. 64601

Filed Jul. 22, 1982, Ser. No. 400,912  
Int. Cl.<sup>3</sup> H04B 11/00

U.S. Cl. 367-139

8 Claims



1. Apparatus for repelling rodents from a building having an AC wiring system including hot and neutral lines and a ground line all connected with a receptacle, said apparatus comprising:  
a housing;  
at least one coil in said housing operable to generate sound waves offensive to rodents when alternately energized and deenergized at a predetermined frequency;  
a plug adapted to be received by the receptacle, said plug having a pair of prongs establishing electrical connection with the hot and neutral lines and a ground prong establishing electrical connection with the ground line when the plug is received by the receptacle;  
means providing an electric circuit extending between said pair of prongs, said circuit including said coil therein to effect energization of the coil when said plug is received by the receptacle and said circuit is completed;  
frequency control means for alternately completing and interrupting said circuit at said predetermined frequency; and  
a ground wire extending through said coil to transmit the sound waves generated by the coil, said ground wire having one end connected to the housing and an opposite end connected to said ground prong of the plug to transmit the sound waves through the ground prong to the ground line of the wiring system of the building.

4,414,654

THINNED ARRAY TRANSDUCER FOR SONAR

Eugene E. Hill; Marvin S. Scrimshaw, both of Cornwall, Canada, and Edward W. Showalter, North Hollywood, Calif., assignors to Canadian Patents and Development Limited, Ottawa, Canada

Division of Ser. No. 232,314, Feb. 6, 1981, Pat. No. 4,380,808.  
This application Aug. 27, 1982, Ser. No. 412,249  
Int. Cl.<sup>3</sup> G01S 15/02

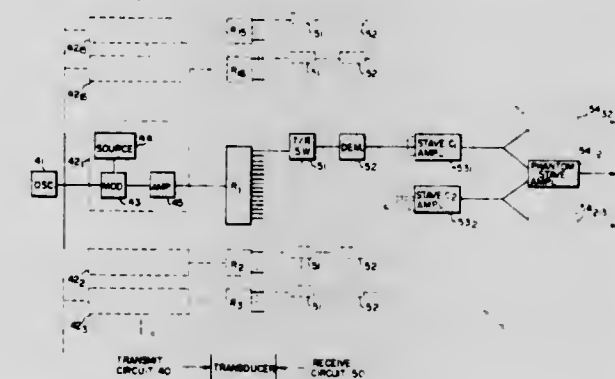
U.S. Cl. 367-103

2 Claims

1. A sonar transducer system for operation in a particular medium at a predetermined frequency  $f_0$ , comprising:  
an array of sonar elements mounted in rows and columns on

a structure to form a checkerboard pattern wherein the spacing between adjacent elements in the rows or columns is equal to or greater than  $\lambda_m/2$ , where  $\lambda_m$  is the wavelength of the signal of frequency  $f_0$  transmitted in the medium;

transmit means for separately providing a modulated signal to each of the rows of sonar elements whereby the elements are energized and transmit a predetermined sonar beam into the medium; and



receive means for receiving signals from the sonar elements when they are not transmitting, said receive means having first means for combining the signals from the sonar elements in the columns to provide an output signal for each column; and second means for combining the output signals from every adjacent pair of columns to provide an output for each pair of columns.

4,414,655

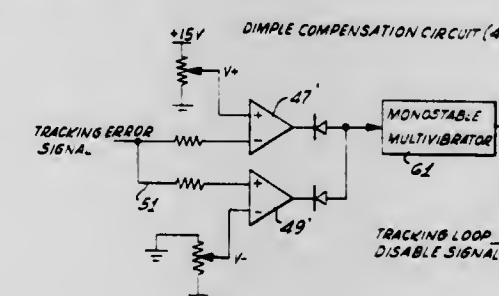
SCANNING BEAM CONTROL SYSTEM

Robert M. Shoji, Gardena, and John S. Chudy, Long Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Mar. 31, 1981, Ser. No. 249,550  
Int. Cl.<sup>3</sup> G11B 21/10

U.S. Cl. 369-44

14 Claims



1. Tracking apparatus for aligning a scanning reading beam in a prescribed position relative to a selected recording track on a record medium, comprising:  
means for determining the location of the reading beam relative to the selected track on the record medium, and for producing a corresponding tracking error signal;  
beam steering means, responsive to the tracking error signal, for controllably positioning the reading beam in the prescribed position relative to the selected track;  
means for monitoring the tracking error signal and determining when the reading beam is scanning a record medium defect of a type that causes the selected track to deviate momentarily from its normal position, and for starting a corresponding disable signal of a predetermined time duration; and  
means, responsive to the disable signal, for selectively uncoupling the tracking error signal from the beam steering means, whereby the reading beam is maintained in its current position relative to the record medium for the duration of said disable signal,  
said predetermined time duration corresponding to the nom-

inal duration of the defect being scanned by the reading beam.

4,414,656

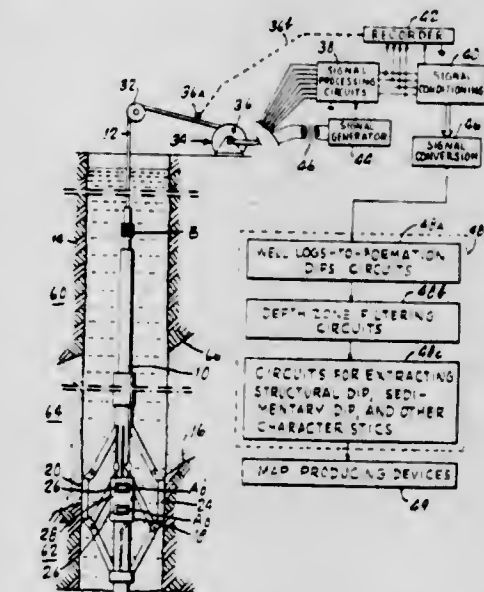
**WELL LOGGING SYSTEM FOR MAPPING STRUCTURAL AND SEDIMENTARY DIPS OF UNDERGROUND EARTH FORMATIONS**

Vincent R. Hepp, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,578  
Int. Cl.<sup>3</sup> G01V 1/40, 1/30

U.S. Cl. 367-25

42 Claims



1. A well logging method of producing a map showing the structural dips of depth zones of earth formations adjacent a borehole comprising the following machine-implemented steps:

deriving formation dips at a succession of closely spaced depth levels in a borehole from well log outputs of measuring devices carried on a dipmeter tool passed through the borehole;  
filtering the formation dips into a plurality of non-overlapping depth zones each encompassing a number of formation dips most, but not necessarily all of which are mutually consistent within the respective zone, wherein the depth extent of a zone is not preset, but is determined by the depth extent of the mutually consistent formation dips making up the zone;  
finding, from at least selected ones of the formation dips in the respective depth zones, the respective structural dips of the respective zones; and  
identifying the respective structural dips of the last recited zones, and producing respective traces on a map indicative of the last recited dips.

4,414,657

MOVING SYSTEM FOR A VIDEODISK READER-RECORDER

Louis Arque, and Michel Thirouard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 21, 1981, Ser. No. 226,905

Claims priority, application France, Jan. 24, 1980, 80 01525  
Int. Cl.<sup>3</sup> G11D 7/08

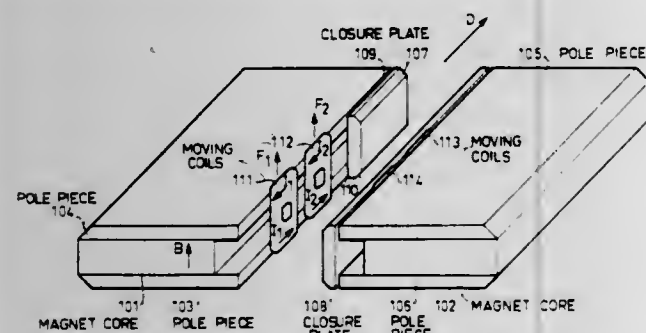
U.S. Cl. 369-45

7 Claims

1. A moving system for a videodisk reader-recorder of the type comprising an objective which serves to focus a light beam on a track carried by a videodisk along a first axis substantially perpendicular to the disk, a carriage adapted to support said objective and means for displacing said carriage radially with respect to said disk along a second axis so as to follow the track, wherein said moving system further comprises:



a frame for supporting the objective, means for joining said frame to said carriage whereby said frame is permitted to carry out a first longitudinal movement with respect to the carriage along the first axis in order to maintain focusing of the light beam on the disk and to carry out a second movement of rotation with respect to said carriage about a third axis perpendicular to the first two axes in order to maintain the focal point of the light beam on the track of the disk, magnetic field generation means having at least one magnet with two pole-pieces and one armature providing two air-gaps extending parallel to the direction of said second axis, one air-gap above the other air-gap with respect to said first axis, in which uniform magnetic fields are devel-



oped, in one direction for the upper pole-piece and in the other direction for the lower pole-piece and at least one first pair of flat coils attached to the frame in a plane at right angles to the third axis and symmetrical with respect to the first axis, said at least one first pair of flat coils circulating within said air-gaps in order, for each coil, to force current to flow parallel to the direction of said second axis and in one direction in a portion of said coil which is located within one of said air-gaps and in the other direction in a portion of said coil which is located within the other of said air-gaps, said coils developing forces which initiate said first and said second movement when said coils carry electric currents and are placed in said magnetic fields.

#### 4,414,658 LINEAR TRACKING ARRANGEMENT IN A PHOTOGRAPHIC DISC TYPE INFORMATION CONTAINING SYSTEM

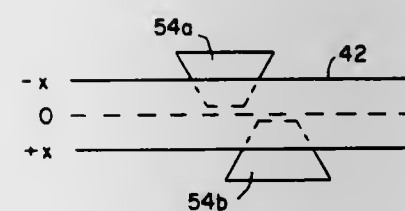
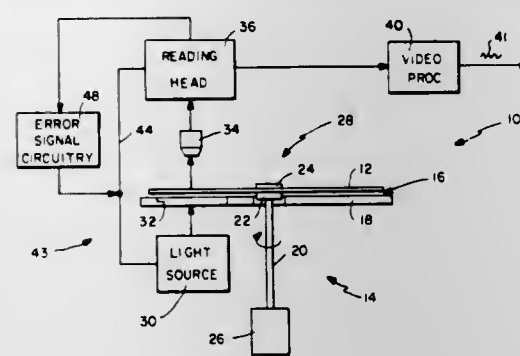
Glenn T. Yoshida, Cupertino, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.  
Filed Jun. 12, 1981, Ser. No. 273,235  
Int. Cl.<sup>3</sup> G11B 7/00, 21/10

U.S. Cl. 369-46

3 Claims

1. In an optical system for recording information on or retrieving information from a rotating disc in which a beam of light located on one side of said disc is directed onto and across a given track of said disc, which track serves to contain said information and which, ignoring said information, is characterized by a predetermined non-uniform light transmissivity curve in its cross-direction, an arrangement for maintaining said beam and track in a fixed lateral position relative to one another as said disc rotates, even if said track moves laterally from its intended path of movement to a limited extent, said arrangement comprising circuitry including light sensitive means disposed in optical alignment with said beam on an opposite side of said disc and responsive to the light passing through said disc for producing an electrical error signal corresponding in time and substantially linearly in magnitude with limited lateral deviations of said track from its intended lateral position with respect to said light beam, said light sensitive means being configured in accordance with said curve to maintain a linear relationship between the magnitude of said

error signal and said lateral track deviations, regardless of the non-uniform cross-directional transmissivity of said track; and



means responsive to said error signal and acting on said beam for minimizing said deviations.

#### 4,414,659 METHOD AND APPARATUS FOR ENCODING DIGITAL DATA SO AS TO REDUCE THE D.C. AND LOW FREQUENCY CONTENT OF THE SIGNAL

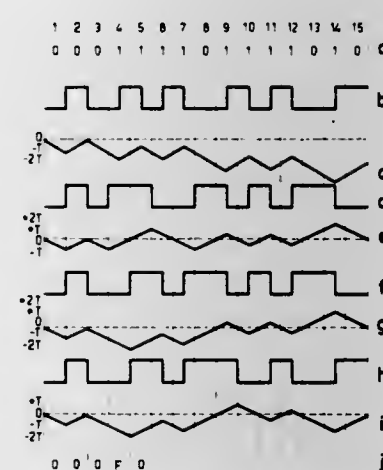
Hubertus F. M. Beckers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed May 4, 1981, Ser. No. 259,796

Claims priority, application Netherlands, Jun. 16, 1980, 8003476

Int. Cl.<sup>3</sup> G11B 7/00, 5/09

U.S. Cl. 369-59

4 Claims



1. A method of encoding digital data for recording on a record carrier, said data being defined by a stream of data bits of a first and second type which are encoded as signal level transitions or absence thereof in consecutive bit cells each associated with a respective one of the data bits in said stream, said method comprising the steps of:

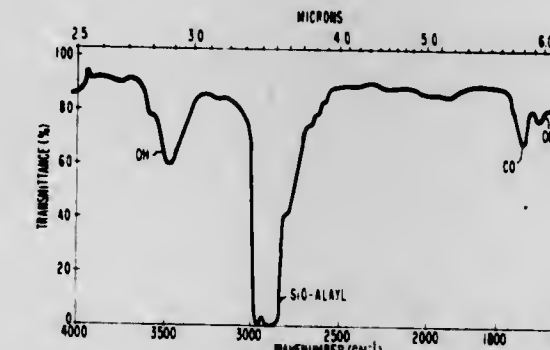
producing a signal level transition in the middle of an associated bit cell upon occurrence of a data bit of said first type in said stream, producing a signal level transition in the beginning of an associated bit cell upon occurrence of a data bit of the second type in said stream unless said second type data bit immediately follows a data bit of said first type in said stream, in which event no transition is produced in the bit cell associated with that second type bit, and upon each occurrence in said stream of a bit string consisting

of one data bit of said second type immediately followed by only two consecutive data bits of said first type, suppressing the production of a transition in the middle of the two cells associated with said two data bits of said first type in that string and producing a transition in the beginning of the bit cell associated with the second data bit of said two data bits of said first type in that string and upon occurrence in said stream of a bit string consisting of one data bit of said second type immediately following by n consecutive data bits of said first type, where n is an even number equal to or greater than four, suppressing the production of a transition in the middle of each of the two cells associated with the first and second data bits of said first type in that string and producing a transition in the beginning of the bit cell associated with the second data bit of said first type in that string so as to reduce the d.c. component in the encoded signal.

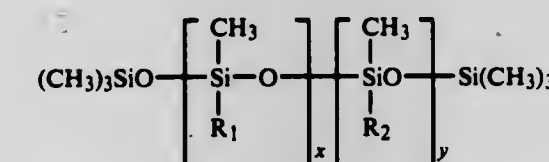
#### 4,414,660 HIGH DENSITY INFORMATION DISC Chih C. Wang, Hightstown, and Ronald F. Bates, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 13, 1982, Ser. No. 408,021  
Int. Cl.<sup>3</sup> C07F 7/18; G11B 3/70  
U.S. Cl. 369-286

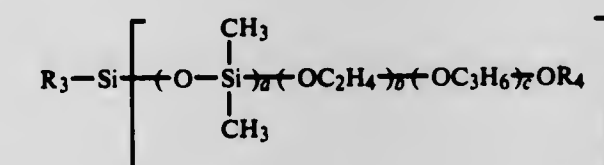
5 Claims



1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula



wherein R<sub>1</sub> and R<sub>2</sub> are alkyl groups of 4-20 carbon atoms, x is an integer of 2-4, y is an integer of 0-2 and wherein the sum of x plus y is 4 or less, the improvement which comprises including in said lubricant an alkylene oxide silicone copolymer of the formula



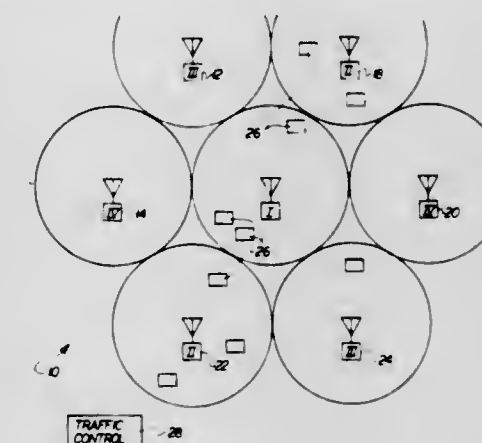
wherein R<sub>3</sub> and R<sub>4</sub> are lower alkyl, a is an integer of 1-2, b is an integer of 0-2 and c is an integer of 1-6.

#### 4,414,661 APPARATUS FOR COMMUNICATING WITH A FLEET OF VEHICLES

Krister Karlstrom, Stockholm, Sweden, assignor to Trancom AB, Sodertalje, Sweden  
Filed Jul. 2, 1981, Ser. No. 279,837  
Int. Cl.<sup>3</sup> H04J 3/02, 3/06

U.S. Cl. 370-95

8 Claims



1. Apparatus for use with a fleet vehicle adapted to participate in a single frequency time division multiplexed communications systems wherein each of plural participating vehicles communicates data to a central station in a respective assigned time slot of a multiple time slot, cyclically recurring communication cycle, wherein said central station transmits synchronizing information in a predetermined time slot of each communication cycle, and wherein requests by nonparticipating fleet vehicles for participation in the communication system are communicated to the central station during another predefined time slot in the communication cycle, said apparatus comprising clock means for measuring time intervals to identifying the time slots associated with said cyclically recurring communication cycle, transceiver means for receiving said synchronizing information from said central station, means for synchronizing said clock means to said cycle in accordance with said synchronizing information, and control means responsive to said clock means and actuatable to initiate participation in said communication cycle by causing said transceiver means to transmit a request for participation in said cycle to said central station a random period after the beginning of the time slot in which said requests are to be communicated, wherein said random delay has a maximum duration which is no greater than the length of said time slot.

#### 4,414,662 SYSTEM FOR THE TRANSMISSION OF DIGITAL DATA IN PACKETS

Jean-Claude Bousquet, 97, rue des Morillons, 75015 Paris, France

Filed Mar. 24, 1981, Ser. No. 247,170  
Claims priority, application France, Apr. 3, 1980, 80 07561  
Int. Cl.<sup>3</sup> H04L 4/02; H04J 3/00

U.S. Cl. 370-100

6 Claims

1. A system for the transmission of digital data in packets, comprising:

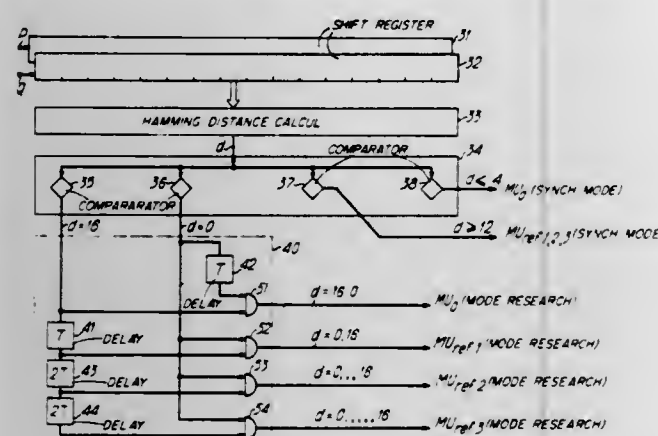
transmission means able to form packets comprising a preamble formed more particularly from a timing recovery bit sequence followed by a combination of bits called a single word; reception means more particularly comprising a decoder able to detect the presence of a single word in the signals received;

wherein:

(A) the transmission means is able to form single words taken in a group of words each having 2n bits and constituted by a word M of n bits between which are inserted the n bits of the complement word M, the bits of M being displaced relative to those of M by a number



n of ranks, the choice of p defining the single word of the group;  
(B) in the reception means there is only one single word

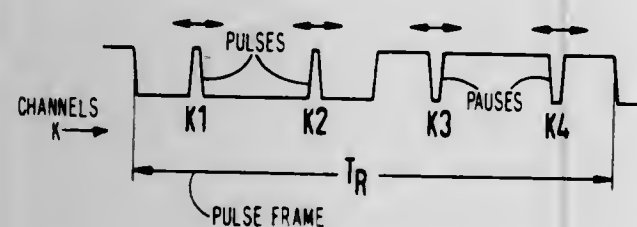


detector and it functions with n bits, said detector being able to detect the displaced appearances of p ranks of words M and M on each bit sequence of even rank and uneven rank.

**4,414,663**  
**TIME DIVISION MULTIPLEX SYSTEM HAVING TRANSMITTED PULSES IN TIME CHANNELS DISTRIBUTED OVER AND CO-TRANSMITTED WITH A FRAME CLOCK SIGNAL COMPONENT**  
Klaus Panzer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 5, 1980, Ser. No. 204,207  
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1979, 2947770

Int. Cl.<sup>3</sup> H04J 3/06  
U.S. Cl. 370—100 3 Claims



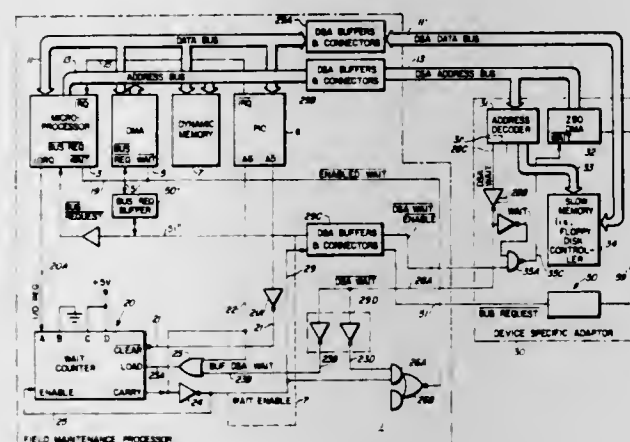
1. In a time division multiplex system having time division multiplexing of pulse modulated signals comprising pulses of identical shape and width, particularly of optically transmittable pulse phase modulation signals, the improvement therein comprising:

means for transmitting in a first half of each pulse frame, as defined by a frame clock, signals of a first portion of the time channels of a frame as pulses; and  
means for transmitting in a second half of each pulse frame the signals of another portion of the time channels as pulse-shaped pauses within a signal level which corresponds to that of the signals transmitted in the first half of the pulse frame, so that a clock component is co-transmitted superimposed with said pulses without requiring a separate sync channel.

**4,414,664**  
**WAIT CIRCUITRY FOR INTERFACING BETWEEN FIELD MAINTENANCE PROCESSOR AND DEVICE SPECIFIC ADAPTOR CIRCUIT**  
Edward H. Greenwood, Phoenix, Ariz., assignor to Genrad, Inc., Concord, Mass.

Filed Feb. 23, 1981, Ser. No. 236,885  
Int. Cl.<sup>3</sup> G06F 11/22

U.S. Cl. 371—20 13 Claims



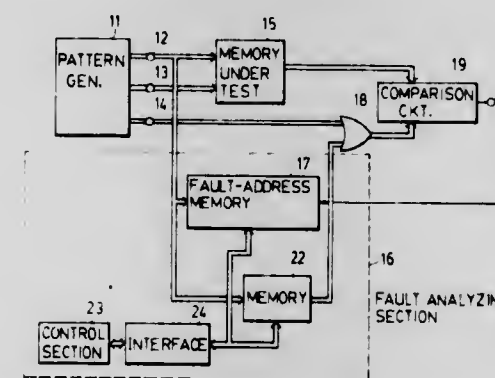
1. In a system including a dynamic random access memory and a processor which automatically effects transparent refresh operations on said dynamic random access memory during execution of program instructions in order to ensure refreshing of all locations of said dynamic random access memory, said system being capable of accessing a slow memory circuit having the characteristics that it generates a first wait signal if the access time of said slow memory circuit exceeds a predetermined amount of time, the improvement comprising in combination:

- counting means for counting from a first count to a second count in response to said first wait signal and producing a wait enable signal if said second count is attained by said counting means;
- a first wait signal conductor for conducting said first wait signal from said slow memory circuit if it has been addressed by said processor, said slow memory circuit being required to generate said first wait signal if the access time of said slow memory circuit exceeds a predetermined amount of time;
- count initiating means coupled between said counting means and said first wait signal conductor for responding to said first wait signal to initiate said counting;
- interrupt signal producing means responsive to said counting means for producing an interrupt signal in response to attaining of said second count by said counting means and applying said interrupt signal to said processor; and
- enabled wait signal producing means responsive to said wait enable signal and said first wait signal for producing an enabled wait signal and applying said enabled wait signal to a wait input of said processor;
- said processor including means for responding to said interrupt signal by executing a wait interrupt routine resulting in refreshing of all locations of said dynamic random access memory.

**4,414,665**  
**SEMICONDUCTOR MEMORY DEVICE TEST APPARATUS**  
Kenji Kimura, Saitama; Shigeru Sugamori, Gyoda; Kohji Ishikawa, Funabashi, and Naoki Narumi, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Takeda Riken Kogyo Kabushikisha, both of Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,902  
Claims priority, application Japan, Nov. 21, 1979, 54-150897; Nov. 21, 1979, 54-150898

Int. Cl.<sup>3</sup> G06F 11/26  
U.S. Cl. 371—21 14 Claims

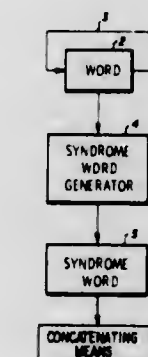


- An apparatus for testing a memory device, comprising a pattern generator for generating and supplying test patterns to the memory device, including address patterns for accessing the addresses of the memory device, expected value pattern generating means for providing expected data which is expected to correspond to data stored in each respective address of the memory device, in correspondence with the generation of addresses of said address patterns,
- a comparison circuit for reading out the memory device, for comparing the respective data read out from the memory device and the respective expected data, and for outputting a disagreement signal when the read-out data and the expected data do not agree as defect data of the respective address of the memory device, in correspondence with the generation of addresses of said address patterns,
- a fault-address memory comprising means for being accessed to read out the content of the respective address thereof, and for subsequently writing any respective defect data that is outputted from said comparison circuit into the same corresponding address, in correspondence with said generation of addresses of said address patterns,
- a counter for counting the number of said defect data outputted from said comparison circuit,
- means for inhibiting said counting of said counter when said output from said fault-address memory is a previously stored defect data corresponding to the same respective address of said memory device, and
- fault signal generating means for generating a fault signal to stop said generation of test patterns when the number counted by said counter exceeds a predetermined value.

**4,414,666**  
**ERROR CHECKING AND CORRECTING APPARATUS**  
Robert D. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.  
Filed Apr. 30, 1981, Ser. No. 260,158  
Int. Cl.<sup>3</sup> G06F 11/10

- U.S. Cl. 371—37 5 Claims
- A digital error detecting apparatus comprising means for storing a data word containing up to N-1 bits in error where N is the number of bits in said data word; and means responsive to said means for storing said data word for generating a unique syndrome word for each one of a plurality of possible error patterns in said data word,

wherein said unique syndrome word generating means comprises:  
means for generating a first syndrome word corresponding to the location of bits in error in said data word;  
means for changing the relative significance of the bits in said data word after said generating of said first syndrome word;





being further operative following the receipt, storage, and shifting within the input data register circuit means and the Golay register circuit means of the bits of the Golay codeword to produce an error detection and correction signal of a predetermined time period during which detection and correction of an erroneous Golay codeword is to take place;

said Golay register circuit means including divider means operative as the bits of the Golay codeword are shifted and recirculated within the Golay register circuit means to divide the codeword by a predetermined generator polynomial thereby to derive a recirculating syndrome word comprising a plurality of bits;

Kasami error trap circuit means coupled to the Golay register circuit means and operative during recirculation of the syndrome word in the Golay register circuit means and during the time period of the error detection and correction signal produced by the timer means to examine the syndrome word to detect one of three possible Kasami algorithm error patterns representing the existence of errors in the associated codeword, and operative in response to detecting any one of the error patterns to produce a corresponding error signal;

modulo-2 add means coupled to the input data register circuit means and to the Golay register circuit means and arranged for performing modulo-2 addition operations on the contents of the input data register circuit means and the Golay register circuit means; and

correction timer means coupled to the Kasami error trap circuit means and to the modulo-2 add means and arranged to receive an error signal produced by the Kasami error trap means, said correction timer means being operative if the error signal corresponds to a first one of the Kasami algorithm error patterns to cause the modulo-2 add means to modulo-2 add the contents of the input data register circuit means and the Golay register circuit means and to apply the result to the input data register circuit means, and said correction timer means being operative if the aforesaid error signal corresponds to a second or third one of the Kasami algorithm error patterns to alter the contents of the Golay register circuit means at a first or second time, respectively, and to cause the modulo-2 add means to modulo-2 add the contents of the input data register circuit means and the altered contents of the Golay register circuit means and to apply the result to the input data register circuit means; and

said timer means being operative after any one of the aforesaid modulo-2 addition operations to cause the codeword bits in the input data register circuit means and the Golay register circuit means to be shifted until the termination of the error detection and correction signal produced by the timer means.

4,414,668

**APPARATUS FOR REPRODUCING INFORMATION SIGNALS RECORDED ON A RECORDING MEDIUM**  
Yoshiaki Iwasaki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 2, 1981, Ser. No. 279,819

Claims priority, application Japan, Jul. 3, 1980, 55-90020

Int. Cl.<sup>3</sup> G06F 11/10; H04N 5/80

U.S. Cl. 371-38

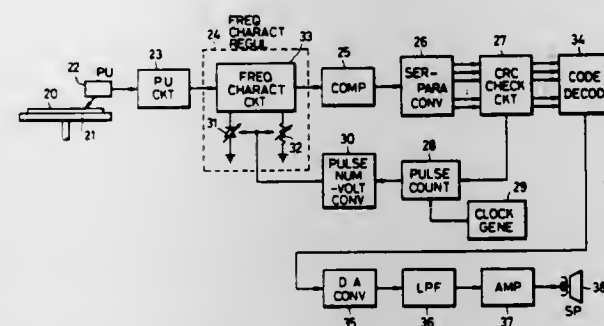
7 Claims

1. An apparatus for reproducing information signals recorded on a recording medium, said apparatus comprising: pickup means for picking up a recorded signal from the recording medium on which an analog information signal is successively recorded in units of a plurality of data blocks, each of said data blocks having a train of digital signals obtained by digitally modulating the analog information signal, error correcting words, and an error detection word;

frequency characteristic regulation means for regulating the

frequency characteristic of the signal picked up from said recording medium by said pickup means;

error detection means for detecting whether an error exists in the data block of a signal which has passed through said



frequency characteristic regulation means, by use of said error detection word; and control means for controlling said frequency characteristic regulation means to vary the frequency characteristic according to an output of said error detection means.

4,414,669

**SELF-TESTING PIPELINE PROCESSORS**

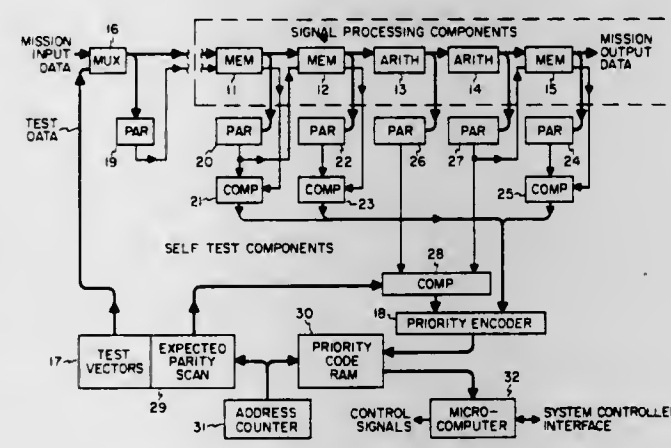
Richard W. Heckelman, Skaneateles; Christopher E. Marchant, Baldwinsville, and Jack B. Williams, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jul. 23, 1981, Ser. No. 286,210

Int. Cl.<sup>3</sup> G06F 11/10

U.S. Cl. 371-49

10 Claims



1. A self-testing pipeline processor comprising:  
A. a plurality of concatenated deducible-parity (DP) modules processing data at a given clock rate,  
(1) each module having an input for data and an input for parity, the parity being that of the input data,  
(2) each module propagating said data and said parity in a common path to an output at which said data and said parity are separately available in performing the same function on said parity as that performed on said data,  
(3) a parity encoder associated with each module to which the module output data is applied for parity encoding, and  
(4) a comparator electrically associated with each module to which the input parity propagated in said module and the parity of the module output data are applied to form comparison values at said clock rate, each non-comparison being indicative of a possible fault in said module,  
B. a priority encoder having a plurality of priority ordered inputs and producing a malfunction code at said clock rate identifying the highest priority input at which each non-comparison is produced,  
the priority ordered encoder inputs being connected to the comparator outputs in the order of the associated modules' positions in the processor giving each module a

unique priority code, the most upstream module having the highest priority code, and

C. a memory means coupled to said priority encoder for storing the malfunction codes at said clock rate to identify the highest priority module associated with each error as a quantity of data is processed.

4,414,670

**E-BEAM MAINTAINED PLASMA DISCHARGE ELECTRODES**

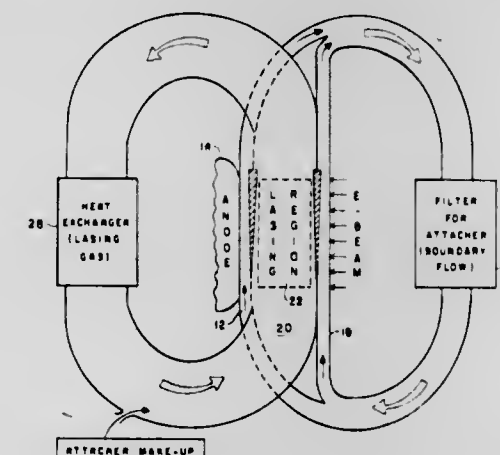
Rudolf Limpacher, Topsfield, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, 06, D.C.

Filed Sep. 29, 1981, Ser. No. 306,843

Int. Cl.<sup>3</sup> H01S 3/22

U.S. Cl. 372-58

8 Claims



1. In a flowing gas laser which includes opposite anode and cathode electrodes, the improvement which comprises:

- (a) an anode electrode flowing gas layer;
- (b) a cathode electrode flowing gas layer; and
- (c) an intermediate flowing gas layer forming a lasing medium, located between said anode and cathode electrode flowing gas layers and having a composition which differs from that of said anode and cathode flowing gas layers.

4,414,671

**COLLISION LASER**

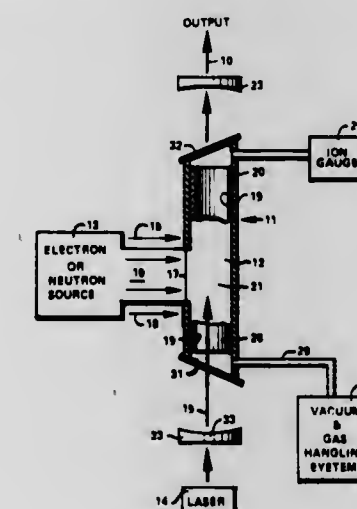
William E. Wells, Jr.; S. Douglas Marcum, both of Oxford; Lawrence W. Downes, Fairfield, all of Ohio, and Richard A. Tilton, San Diego, Calif., assignors to Miami University, Oxford, Ohio

Filed Oct. 5, 1981, Ser. No. 308,714

Int. Cl.<sup>3</sup> H01S 3/09

U.S. Cl. 372-73

33 Claims



1. Apparatus for providing stimulated emission of electromagnetic radiation, comprising

means for containing a mixture including a first gas, in the X(1) state, and a second gas, in the Y(1) state;

means for pumping the first gas to excite a high population density of its atoms or molecules from the X(1) state to the X(2) state; and

means for injecting photons of suitable frequency into the mixture, to excite, via a three-body radiative collision of an atom or a molecule of X(2) with a molecule of Y(1) and a photon,

a high population density of molecules of the second gas from the Y(1) state to the Y(3) state, followed by a substantially simultaneous return of a substantial portion of the excited first gas atoms or molecules to the X(1) state and a substantial depopulation of the Y(3) state of the second gas, causing the molecules thereof to drop to the lower energy Y(2) state,

thereby stimulating the emission from the second gas of two photons at the same wavelength for each absorbed photon, and thus providing a total quantity of photon emission with sufficient gain for amplification of electromagnetic radiation, and

finally resulting in the depopulation of the molecules in the Y(2) state by autoionization.

4,414,672

**PLASMA-ARC FURNACE**

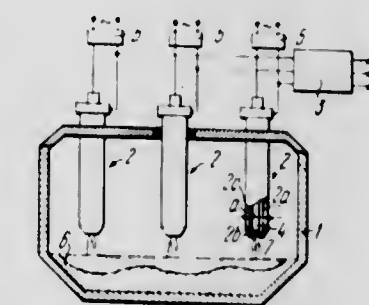
Boris E. Paton; Jury V. Latash; Oleg S. Zabarilo; Gary A. Melnik; Nikolai I. Zamulio; Anatoly A. Zhdanovsky; Alfred I. Bukalo; Vladimir V. Goncharenko; Stanislav S. Ivanchenko; Anatoly R. Slobodian, all of Kiev; Sergei P. Bakumenko, and Mikhail K. Zakamarkin, both of Izhevsk, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Sep. 15, 1981, Ser. No. 302,690

Int. Cl.<sup>3</sup> H05B 7/00; H05H 1/00

U.S. Cl. 373-22

1 Claim



1. A plasma-arc furnace comprising:  
a casing, and  
a plurality of plasma torches, each comprising  
a body provided with a nozzle and an axial conduit for feeding a plasma-forming gas, and  
a cylindrical electrode for connection to a three-phase power supply, said electrode being disposed within said conduit of said body; and being mounted within said casing in symmetrical relationship relative to the vertical axis thereof so that the distance between the centers of working ends of said plurality of electrodes of adjacent said torches is not more than 15 diameters of said electrode.

4,414,673

**PLASMA MELTING FURNACE**

Walter Lugscheider, Linz, and Ernst Riegler, Enns, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 21, 1982, Ser. No. 390,331

Claims priority, application Austria, Jul. 15, 1981, 3116/81

Int. Cl.<sup>3</sup> H05B 7/00

U.S. Cl. 373-22

6 Claims

1. In a plasma melting furnace of the type including a fur-







tive material supported by a substrate-type material, the improvement comprising said substrate-type material being a pair of X-ray transparent supports separated at a distance, and a grid-type structure sandwiched between said supports, wherein spaces between said grid type structure are filled with a foamed-in-place material.

4,414,680

**SELF SUPPORTING OPTICAL DIFFRACTION GRID**  
Heinz Kraus, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

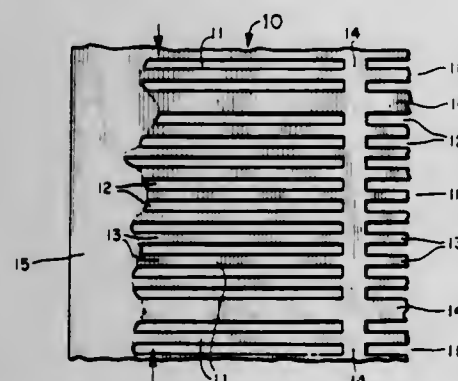
Filed Sep. 21, 1981, Ser. No. 304,082

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041067

Int. Cl.<sup>3</sup> G01M 23/20

U.S. Cl. 378—84

20 Claims



1. A self supporting optical diffraction grid for short wavelength electromagnetic radiation, said grid comprising: a peripheral frame; a grid foil secured to the frame, said grid foil defining a plurality of elongated slits; a supporting net, large meshed with respect to the grid constant of the grid foil, secured to the frame to support the grid foil; and at least one edge of the frame adjacent the grid foil defining a nonrectilinear pattern.

4,414,681

**ROTARY ANODE X-RAY TUBE**

Gerd Seifert, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich

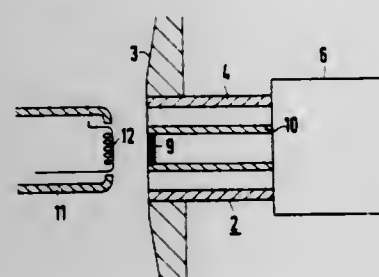
Filed Nov. 12, 1981, Ser. No. 320,734

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043670

Int. Cl.<sup>3</sup> H01J 35/04

U.S. Cl. 378—144

4 Claims



1. A rotary anode x-ray tube comprising an anode assembly (2), mounted magnetically without contact, and including a rotary anode part (3) rotating with the anode assembly, and means for carrying off the anode current, characterized in that, on the rotary anode part (3), rotating with the anode assembly (2), at least one auxiliary cathode (9) is arranged as part of said means, said means further comprising a stationary auxiliary anode (11) operatively associated with said auxiliary cathode (9), and that the auxiliary cathode (9) is an oxide cathode

which is centrally arranged on the anode assembly (2), a stationary heater (12, 12a, 14, 15) being disposed opposite said auxiliary cathode for supplying heat thereto.

4,414,682

**PENETRATING RADIANT ENERGY IMAGING SYSTEM WITH MULTIPLE RESOLUTION**

Martin Annis, and Jay A. Stein, both of Newton, Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

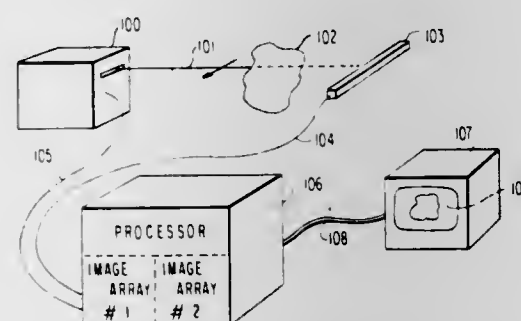
Filed Nov. 17, 1980, Ser. No. 207,492

The portion of the term of this patent subsequent to Dec. 28, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—146

10 Claims



1. A penetrating radiant energy imaging system comprising: a source of penetrating radiant energy, sweeping means for forming a pencil beam of penetrating radiant energy for repeatedly sweeping said pencil beam across a detector field; beam cross-section control means to control the cross-section of said pencil beam between at least a first smaller cross-section and a second larger cross-section in a fixed pattern, as said beam illuminates an object, detector means located at the detector field for generating signals related to the intensity of said beam impinging on said detector means, processor means responsive to said signals from said detector means for separately identifying sets of signals produced by beams of different cross-section and for developing from said signals an image array corresponding to each of said pencil beams of different cross-section, whereby an image array is developed for each pencil beam cross-section, display means for developing an image in response to said processor means, and amplifying means for relatively amplifying signals produced by said beam of smaller cross-section with respect to signals produced by said beam of larger cross-section.

4,414,683

**FILM HOLDER SUPPORT APPARATUS**

David R. Robinson, 8840 Nedonna Beach Rd., Rockaway, Oreg. 97136

Filed Mar. 26, 1981, Ser. No. 248,014

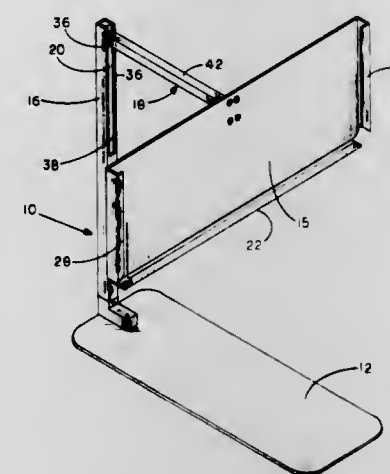
Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—177

3 Claims

1. An apparatus for placement of film relative to a patient lying on a bed having a frame which supports a compressible mattress, said apparatus comprising: (a) a base for supporting the apparatus, said base being arranged to allow placement thereof between the bed frame and the mattress;

- (b) film holder means for positioning film above the mattress adjacent to the patient; and



- (c) means for compressing the mattress between said film holder and said base and thereby making said film holder immovable relative to said mattress.

4,414,684

**METHOD AND APPARATUS FOR PERFORMING A COMPARISON OF GIVEN PATTERNS, IN PARTICULAR FINGERPRINTS**

Alain Blonder, Lyons, France, assignor to Interlock Sicherheitssysteme GmbH, Stuttgart, Fed. Rep. of Germany

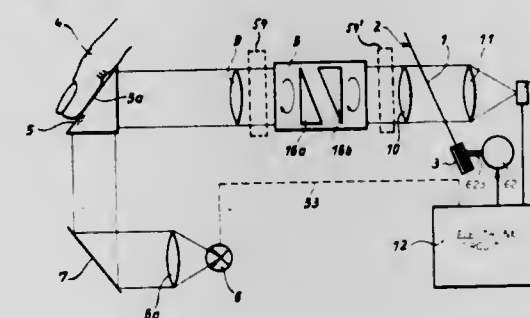
Filed Dec. 24, 1980, Ser. No. 219,802

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952402; May 19, 1980, 3018998; Nov. 28, 1980, 3044881

Int. Cl.<sup>3</sup> G06K 9/00

U.S. Cl. 382—4

60 Claims



1. A method of comparing a first fingerprint pattern with a second fingerprint pattern formed by a recorded representation which comprises positioning said first and second fingerprint patterns relative to each other, directing a light beam from a lamp onto said first fingerprint pattern which light beam is reflected thereby, scanning said reflected light beam directed from said first fingerprint pattern by use of a rotatable double wedge prism scanner, including first and second spaced wedge prisms while rotating said first wedge prism at a rotational speed different from said second wedge prism, superimposing said scanned light beam onto said second fingerprint pattern, directing said light beam from said second fingerprint pattern onto a photoelectric conversion means to produce an electrical output signal including an identification pulse, directing said electrical output signal into an electronic evaluation device, comparing said electrical output signal with an adjustable threshold value, prior to threshold comparison, preparing and discriminating said electrical output signal by which an identification pulse resulting in an event of identity between said first and second fingerprint patterns is compared with at least

one further electrical variable contained in said electrical output signal, relating said further electrical variable with said identification pulse and summing said compared identification pulse during a performance of a plurality of test criteria, producing at least one further signal derived from peripheral conditions during said comparison and comparing said derived signal in terms of a threshold value, whereby said identification pulse and said signal derived from peripheral conditions are utilized in an overall determination of matching said first and second fingerprints.

4,414,685

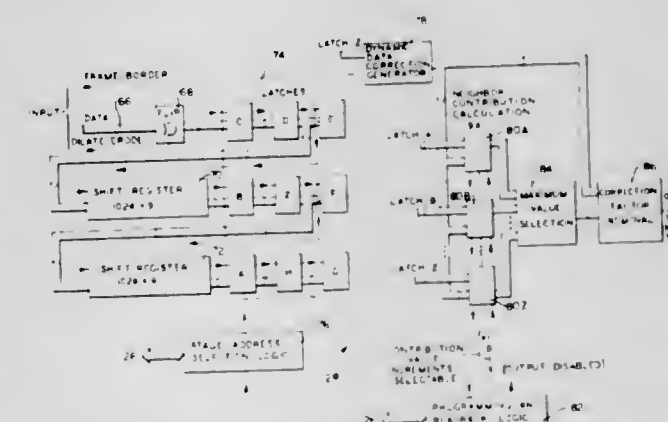
**METHOD AND APPARATUS FOR PATTERN RECOGNITION AND DETECTION**

Stanley R. Sternberg, 1606 Hillridge, Ann Arbor, Mich. 48103 Division of Ser. No. 73,818, Sep. 10, 1979, Pat. No. 4,322,716, which is a continuation-in-part of Ser. No. 919,171, Jun. 26, 1978, Pat. No. 4,174,514, which is a continuation-in-part of Ser. No. 742,127, Nov. 15, 1976, Pat. No. 4,167,728. This application May 29, 1981, Ser. No. 268,608

Int. Cl.<sup>3</sup> G06K 9/00

U.S. Cl. 382—49

27 Claims



1. A method of detecting patterns in an image consisting of a matrix of multivalued digital data signals, said method comprising:

- (a) electronically eroding the image matrix with a structuring element of a particular configuration to form a first transformation matrix;
- (b) electronically dilating the first transformation matrix by the same structuring element used in step (a) to form a second transformation matrix; and
- (c) comparing said first and second transformation matrices to detect patterns in the original image matrix.

4,414,686

**COMPENSATION OF NONLINEARITIES OF TRANSMISSION MEMBERS IN A RADIO RELAY SYSTEM**

Sigmund Lenz, Aspach, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,949

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113005

Int. Cl.<sup>3</sup> H04B 7/14, 1/10, 1/26

U.S. Cl. 455—20

14 Claims

1. In a method for compensating nonlinearities of a transmission member of a radio relay transmission system by means of a linear converter having a linear gain characteristic and a harmonic generator converter having a nonlinear gain characteristic, which method includes supplying an intermediate frequency signal modulated with a useful signal and a local oscillator signal to respective inputs of each converter to cause each converter to produce a radio frequency output signal, and linking the output signals of the two converters together in a network, the improvement comprising: setting the operating







**DESIGN PATENTS**

**GRANTED NOV. 8, 1983**

**ERRATA**

**For  
CLASS**

**See  
PATENT NO.**

D23-055 ..... 271,340



# DESIGNS

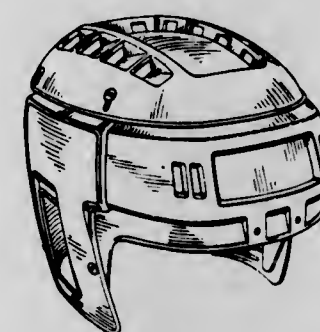
NOVEMBER 8, 1983

271,249

## HOCKEY HELMET OR SIMILAR ARTICLE

Charles R. Farquharson, Toronto, Canada, assignor to Amer Sport International Inc., Lachine, Canada  
Filed Jan. 18, 1982, Ser. No. 340,265  
Term of patent 14 years  
Int. Cl. D02-03

U.S. Cl. D2-232

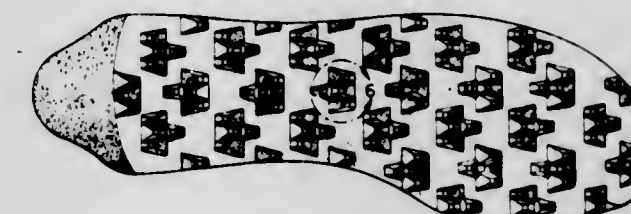


271,251

## OUTSOLE FOR ATHLETIC SHOE

Edward J. Norton, Kingston, N.H., assignor to New Balance Athletic Shoe, Inc., Boston, Mass.  
Filed Jun. 10, 1981, Ser. No. 272,106  
Term of patent 14 years  
Int. Cl. D2-04

U.S. Cl. D2-320



271,252

## BELT ATTACHED TOOL HANGER

Jack R. Sickler, P.O. Box 20803, Billings, Mont. 59104  
Filed Jul. 21, 1980, Ser. No. 170,530  
Term of patent 14 years  
Int. Cl. D2-99

U.S. Cl. D2-400

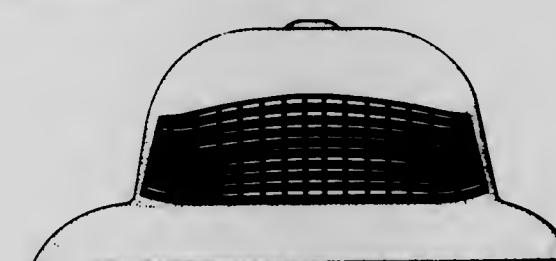


271,250

## VENTILATED HAT

Ralph C. Burgin, West Point, Iowa, and David B. Cale, Hamilton, Ill., assignors to Dadant & Sons, Inc., Hamilton, Ill.  
Filed Nov. 16, 1981, Ser. No. 321,875  
Term of patent 14 years  
Int. Cl. D02-03

U.S. Cl. D2-257



271,253

## TOOL POUCH

Paul Abatie, 16409 Boyle Ave., Fontana, Calif. 92335  
Filed Oct. 16, 1981, Ser. No. 312,291  
Term of patent 14 years  
Int. Cl. D02-07

U.S. Cl. D2-400

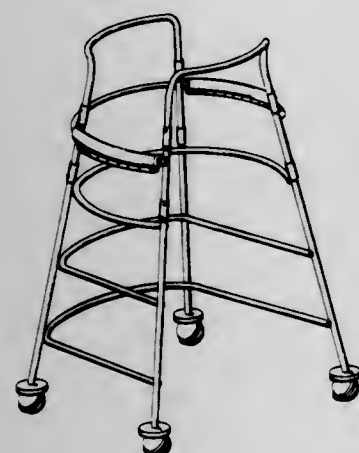




271,254  
WALKER

Arthur R. Morris, 80 S.1000 E., Zionsville, Ind. 46077  
Filed Nov. 21, 1980, Ser. No. 208,852  
Term of patent 14 years  
Int. Cl. D3-03

U.S. Cl. D3-5



271,255  
KEY RING

Jean-Pierre M. Rousseau, 98, rue de Miromesnil, 75008 Paris, France  
Filed Jan. 6, 1981, Ser. No. 222,831  
Claims priority, application France, Jul. 15, 1980, 80 2286  
Term of patent 14 years  
Int. Cl. D3-01

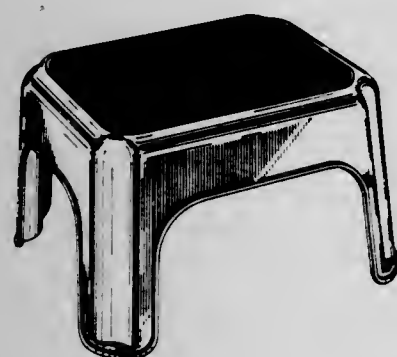
U.S. Cl. D3-61



271,256  
STEP STOOL

Donald R. McClelland, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio  
Filed Jul. 20, 1981, Ser. No. 285,395  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-32



271,257  
CHAIR

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate, Italy  
Filed Apr. 13, 1981, Ser. No. 253,230  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-47



271,258  
PLANT HANGER

Zoltan B. Gyebnar, 2340 Starr Ave., #3, Oregon, Ohio 43616  
Filed Sep. 3, 1981, Ser. No. 299,050  
Term of patent 14 years  
Int. Cl. D6-06

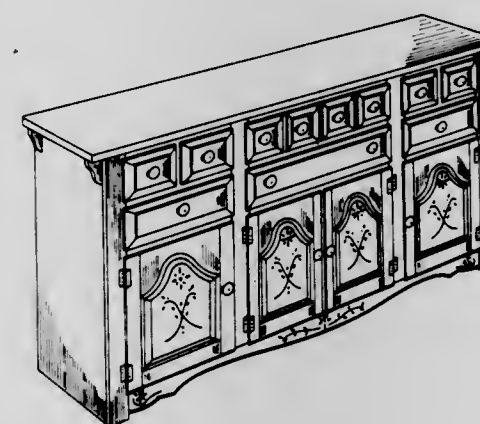
U.S. Cl. D6-137



271,259  
BUFFET

Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.  
Continuation-in-part of Ser. No. 956,211, Oct. 30, 1978. This application May 14, 1981, Ser. No. 263,412  
Term of patent 14 years  
Int. Cl. D06-04

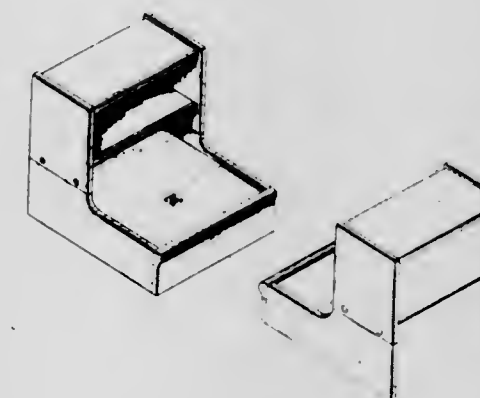
U.S. Cl. D6-154



271,261  
BOOKCASE OR SIMILAR ARTICLE

Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.  
Division of Ser. No. 72,765, Sep. 5, 1979. This application Mar. 19, 1981, Ser. No. 245,679  
Term of patent 14 years  
Int. Cl. D06-04

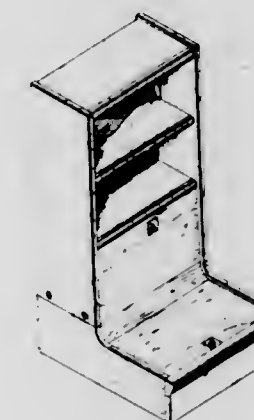
U.S. Cl. D6-167



271,262  
BOOKCASE OR SIMILAR ARTICLE

Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.  
Division of Ser. No. 72,765, Sep. 5, 1979. This application Mar. 19, 1981, Ser. No. 245,677  
Term of patent 14 years  
Int. Cl. D06-04

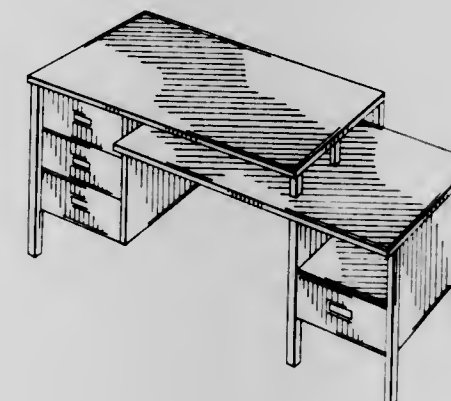
U.S. Cl. D6-168



271,260  
COMPUTER DESK

Jeffrey A. Turner, 2901 W. Laurel La., Phoenix, Ariz. 85029  
Filed Mar. 23, 1981, Ser. No. 246,284  
Term of patent 14 years  
Int. Cl. D06-04

U.S. Cl. D6-161





271,263

## TABLE OR SIMILAR ARTICLE

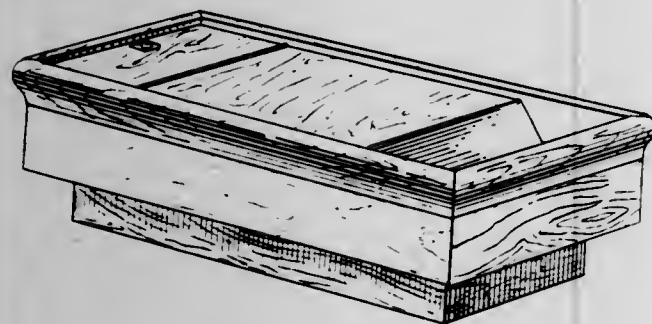
Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.

Division of Ser. No. 72,765, Sep. 5, 1979. This application Mar. 19, 1981, Ser. No. 245,676

Term of patent 14 years

Int. Cl. D06—04

U.S. Cl. D6—179



271,265

## COMBINED PICTURE FRAME AND SUPPORT THEREFOR

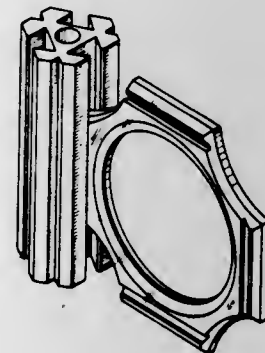
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002

Filed Oct. 26, 1981, Ser. No. 314,682

Term of patent 14 years

Int. Cl. D6—07

U.S. Cl. D6—235



271,266

## LOUNGE CHAIR COVER

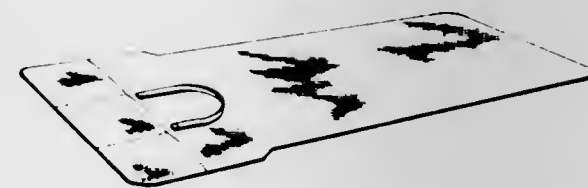
Robert G. Thom, 40 Kiers Rd., Miami, Qld. 4220, Australia

Filed Feb. 25, 1981, Ser. No. 237,915

Term of patent 14 years

Int. Cl. D6—13

U.S. Cl. D6—269



271,267

## FORK OR SIMILAR ARTICLE

Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,598

Term of patent 14 years

Int. Cl. D07—03

U.S. Cl. D7—137



271,264

## CRIB FOOTBOARD

Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

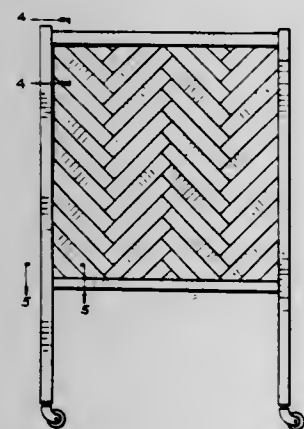
Filed Mar. 23, 1981, Ser. No. 246,354

The portion of the term of this patent subsequent to Jul. 19, 1997, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—06

U.S. Cl. D6—198



271,268

## PIZZA OVEN

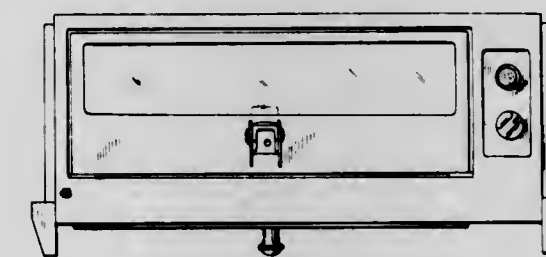
Ferdinand F. Salzmann, Prairie du Sac, and James P. Swinehart, Oregon, both of Wis., assignors to Wisco Industries, Inc., Oregon, Wis.

Filed Jun. 2, 1981, Ser. No. 269,638

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D7—350



271,270

## BEVERAGE DISPENSING VALVE

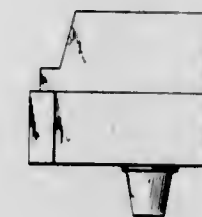
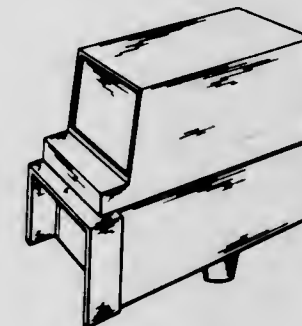
Forrest L. Austin, Brooklyn Center, and William B. Mackrell, New Brighton, both of Minn., assignors to The Corneliuss Company, Anoka, Minn.

Filed Aug. 31, 1981, Ser. No. 297,667

Term of patent 14 years

Int. Cl. D15—08

U.S. Cl. D7—398



271,269

## FLAT COOKING PANEL

Roland Vetter, Glengen, and Rolf Feil, Günzburg-Reisenburg, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

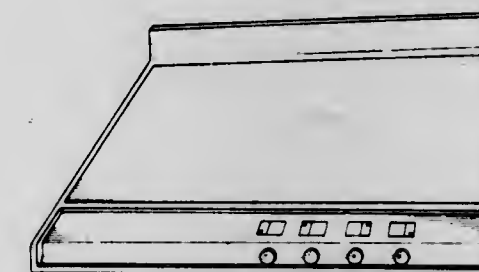
Filed Oct. 21, 1981, Ser. No. 313,618

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, MR 5288

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D7—363





271,271

## BEVERAGE DISPENSING VALVE

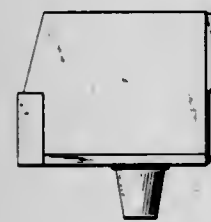
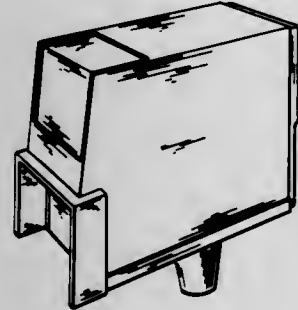
Forrest L. Austin, Brooklyn Center, and William B. Mackrell,  
New Brighton, both of Minn., assignors to The Cornelius  
Company, Anoka, Minn.

Filed Aug. 31, 1981, Ser. No. 297,668

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D7-398



271,272

## BEVERAGE DISPENSING VALVE

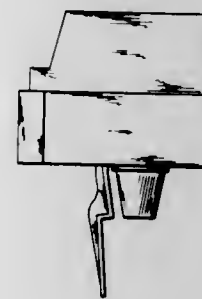
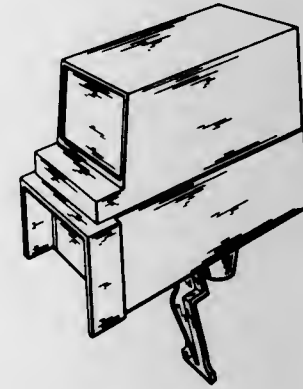
Forrest L. Austin, Brooklyn Center, and William B. Mackrell,  
New Brighton, both of Minn., assignors to The Cornelius  
Company, Anoka, Minn.

Filed Aug. 31, 1981, Ser. No. 297,669

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D7-398



271,273

## BEVERAGE DISPENSING VALVE

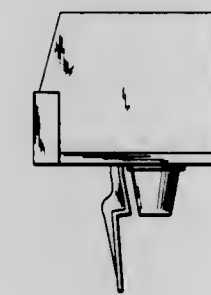
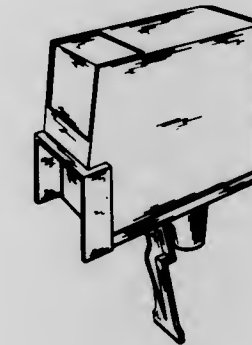
Forrest L. Austin, Brooklyn Center, and William B. Mackrell,  
New Brighton, both of Minn., assignors to The Cornelius  
Company, Anoka, Minn.

Filed Aug. 31, 1981, Ser. No. 297,670

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D7-398



271,275

## COMBINATION SPANNER WRENCH AND HAMMER

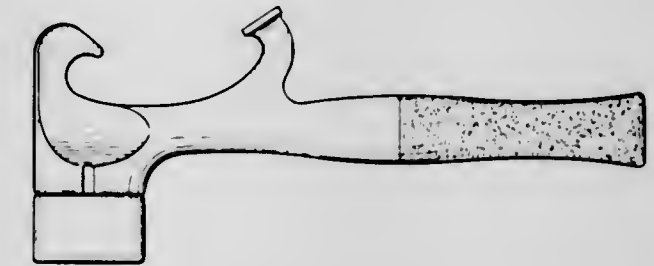
Vincent J. Richilano, Lakewood, Ohio, assignor to Zephyr In-  
dustries, Inc., Lakewood, Ohio

Filed Feb. 12, 1981, Ser. No. 233,631

Term of patent 14 years

Int. Cl. D8-02

U.S. Cl. D8-26



271,276

## CHAIN SAW GUIDE BAR GRINDING DEVICE

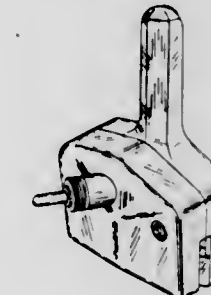
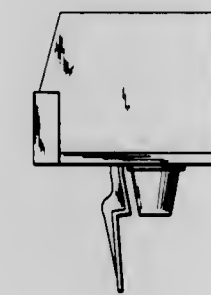
Michael J. Reynolds, Gladstone, Oreg., assignor to Omark  
Industries, Inc., Oreg.

Filed Jan. 30, 1981, Ser. No. 229,780

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-91



271,274

## CONSECUTIVE-DRIVE TYPE ADJUSTABLE WRENCH

Noboru Tasato, 57 Aza Asato, Naha, Okinawa, Japan

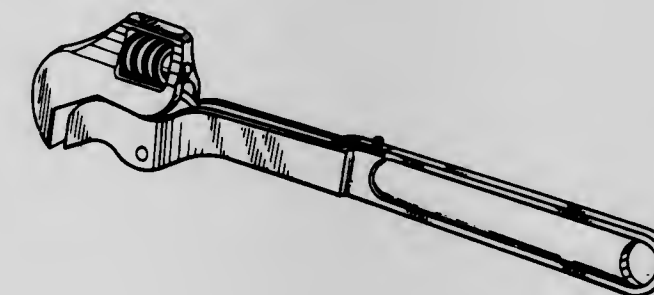
Filed Apr. 2, 1981, Ser. No. 250,184

Claims priority, application Japan, Dec. 3, 1980, 55-50564

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-23



271,277

## DOOR CLOSER

Mitsuaki Okazaki, Fuchu, Japan, assignor to Ryobi Limited,  
Hiroshima, Japan

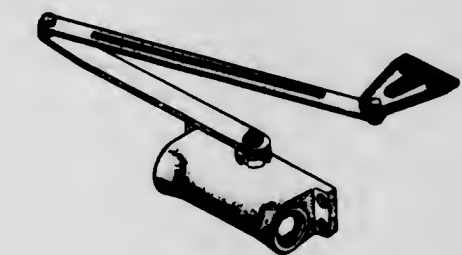
Filed Apr. 9, 1981, Ser. No. 252,281

Claims priority, application Japan, Oct. 17, 1980, 55-43480

Term of patent 14 years

Int. Cl. D8-07

U.S. Cl. D8-330





271,278

**COMBINATION LOCK**

Hisashi Saitoh, Kasugai, Japan, assignor to Saikosha Works Ltd., Kasugai, Japan

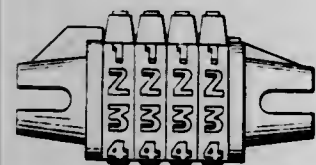
Filed Feb. 17, 1981, Ser. No. 235,384

Claims priority, application Japan, Oct. 24, 1980, 55-44749

Term of patent 14 years

Int. Cl. D8—07

U.S. Cl. D8—339



271,279

**ILLUMINABLE KEY HANDLE**

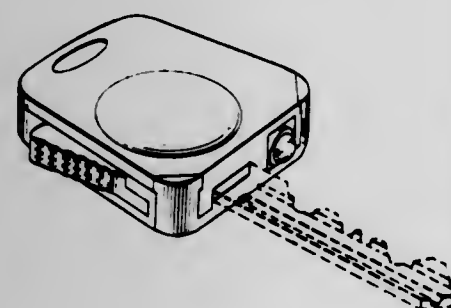
Avi Eziment, 6732 de Vimy Ave., Montreal, Quebec, Canada H3S 2R9

Filed Feb. 5, 1981, Ser. No. 231,769

Term of patent 14 years

Int. Cl. D8—07

U.S. Cl. D8—347



271,280

**BOTTLE**

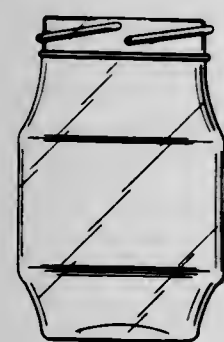
Marianne Gaillot, Meudon, France, assignor to Lesieur-Cotelle Et Associes S. A., Boulogne-Sur-Seine, France

Filed Nov. 18, 1980, Ser. No. 207,948

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—349



271,281

**CAN BODY**

James B. Abbott, Great Shefford, and Ernest O. Kohn, Abingdon, both of England, assignors to Metal Box Limited, Reading, England

Filed Feb. 26, 1981, Ser. No. 238,427

Claims priority, application United Kingdom, Sep. 5, 1980, 80996455

Term of patent 14 years

Int. Cl. D9—03

U.S. Cl. D9—351



271,282

**BOTTLE OR THE LIKE**

James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 140,180, Apr. 14, 1980. This application

May 14, 1982, Ser. No. 378,064

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—370



271,283

**PACKAGING FORM FOR RAZORS**

Anthony H. Taylor, London, England, assignor to Wilkinson Sword, Limited, England

Filed Jul. 6, 1981, Ser. No. 282,101

Claims priority, application United Kingdom, Jan. 6, 1981, 81998356

Term of patent 14 years

Int. Cl. D9—03

U.S. Cl. D9—415



271,284

**CONTAINER CLOSURE**

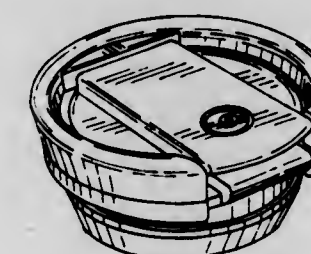
Donald J. Bainton, Greenwich, Conn., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,470

Term of patent 14 years

Int. Cl. D9—07

U.S. Cl. D9—438



271,285

**BOTTLE CAP**

Ralph Lauren, New York, N.Y., assignor to Warner/Lauren Ltd., New York, N.Y.

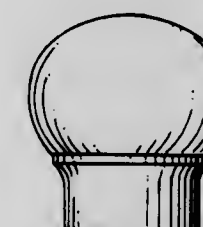
Division of Ser. No. 923,413, Jul. 10, 1978, Pat. No. Des.

259,173. This application May 8, 1981, Ser. No. 261,439

Term of patent 14 years

Int. Cl. D7—07

U.S. Cl. D9—454



271,286

**PIERCED EAR-RING HOLDER**

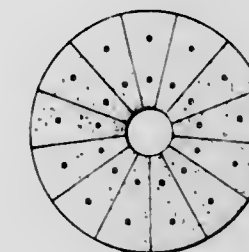
Howard Lauck, 17 Blossom Ct., Daly City, Calif. 94014

Filed Mar. 23, 1981, Ser. No. 246,899

Term of patent 14 years

Int. Cl. D09—099

U.S. Cl. D9—457



271,287

**SMOKE DETECTOR**

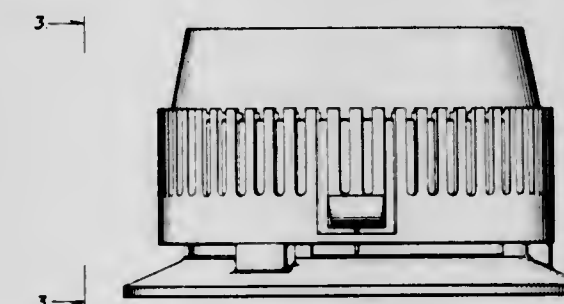
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Apr. 27, 1981, Ser. No. 257,529

Term of patent 14 years

Int. Cl. D10—05

U.S. Cl. D10—106



271,288

**CLOCK FACE OR SIMILAR ARTICLE**

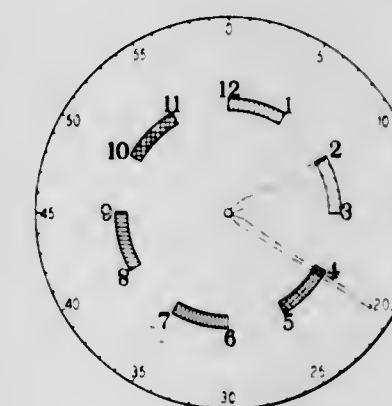
Herman C. Bernick, 795 Vernon Ave., Glencoe, Ill. 60022

Filed Jul. 22, 1981, Ser. No. 285,851

Term of patent 14 years

Int. Cl. D10—07

U.S. Cl. D10—126





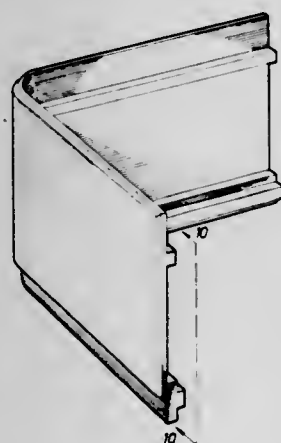
271,289

**PLANTING BOX CASING ELEMENT OR SIMILAR ARTICLE**

Lars G. Carlsson, Nicandersgatan 1, 252 39 Helsingborg, Sweden

Filed Jun. 3, 1980, Ser. No. 155,973  
Term of patent 14 years  
Int. Cl. D11-02

U.S. Cl. D11-164



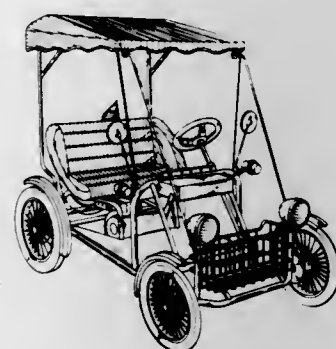
271,291

**AUTOMOBILE**

Terry C. Boone, 1343 N. Peach Ave., Fresno, Calif. 93727

Filed Dec. 8, 1980, Ser. No. 213,958  
Term of patent 14 years  
Int. Cl. D12-08

U.S. Cl. D12-86



271,292

**CONDENSATE COLLECTION AND REMOVAL DEVICE FOR PRESSURIZED AIR SUPPLY SUCH AS USED FOR OPERATING VEHICULAR AIR BRAKES**

Michael E. Wilson; William L. Dixon, and Eric J. Bettencourt, all of Modesto, Calif., assignors to Racor Industries, Inc., Modesto, Calif.

Filed Jan. 15, 1981, Ser. No. 225,314  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D12-180



271,290

**HEAVY DUTY MACHINE CARRIAGE**

William J. Coughlin, Lancaster; David E. Johnson, Pataskala, and Kenneth E. McCall, Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Feb. 17, 1981, Ser. No. 235,339  
Term of patent 14 years  
Int. Cl. D12-03

U.S. Cl. D12-36



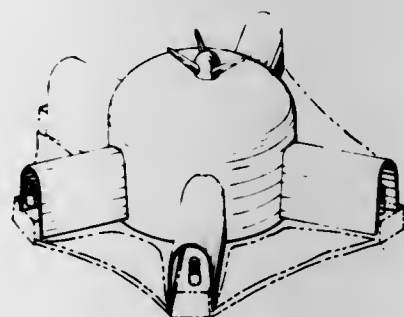
271,293

**WHEEL COVER FOR TRUCKS**

John G. Polka, 69 S. Lincoln Ave., Mundelein, Ill. 60060

Filed Dec. 22, 1980, Ser. No. 218,759  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D12-204



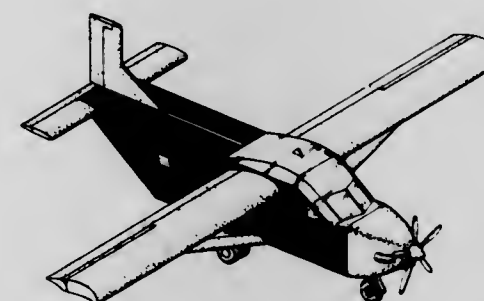
271,294

**AIRPLANE**

Ernest D. Hawk, Yucca Valley, Calif., assignor to Hawk Industries, Inc., Yucca Valley, Calif.

Filed Apr. 1, 1981, Ser. No. 250,072  
Term of patent 14 years  
Int. Cl. D12-07

U.S. Cl. D12-344



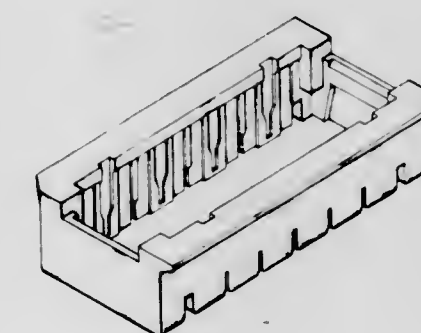
271,296

**COMBINED INTEGRATED CIRCUIT PACKAGE CARRIER AND SOCKET**

James C. Jones, Georgetown, and James A. Emerson, Pekin, both of Ind., assignors to Robinson-Nugent, Inc., New Albany, Ind.

Filed Feb. 23, 1981, Ser. No. 236,669  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-24



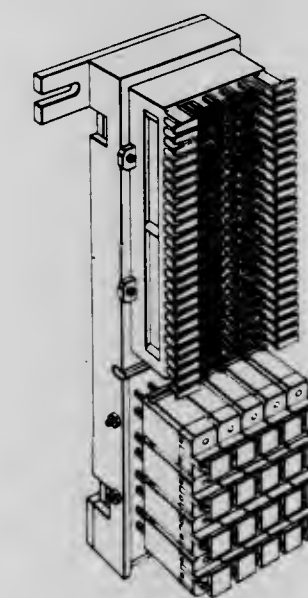
271,295

**COMBINED TELEPHONE CONNECTOR BLOCK AND CIRCUIT PROTECTOR**

Paul V. De Luca, Plandome Manor, and Thomas A. Hollfelder, Huntington, both of N.Y., assignors to Porta Systems, Corp., Syosset, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,341  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-24



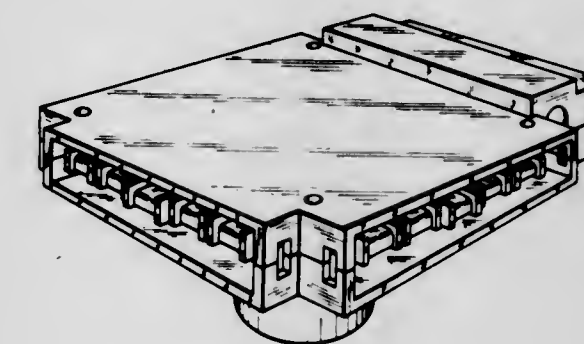
271,297

**COMBINED CIRCUIT CONNECTOR AND SWITCHING MODULE**

Nils G. Jonsson, Dunwoody, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Mar. 30, 1981, Ser. No. 248,967  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-24



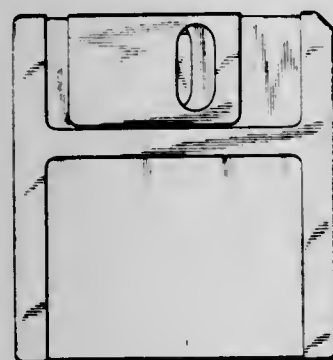


271,298  
FLOPPYDISK

Mazumi Fujimoto, Hino, Japan, assignor to Sony Corporation, Tokyo, Japan, 22153

Filed Jun. 5, 1981, Ser. No. 270,839  
Claims priority, application Japan, Dec. 9, 1980, 55-051362  
Term of patent 14 years  
Int. Cl. D14-02

U.S. Cl. D14-11

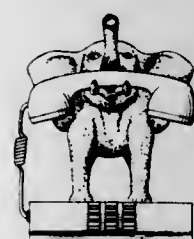
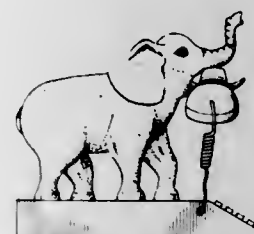


271,300  
DESK TELEPHONE

Ting H. Mak, 7816 Mulberry Bottom La., Springfield, Va. 22153

Filed Apr. 30, 1981, Ser. No. 259,118  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-53

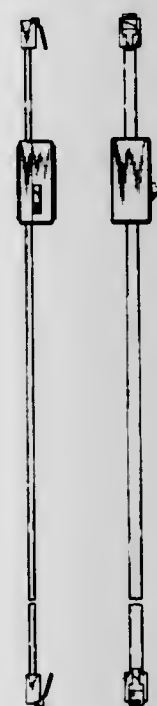


271,301  
TELEPHONE SWITCH-CONNECTOR UNIT

Frank B. Manning, Boston; Peter R. Kramer, Cambridge, both of Mass., and T. Pat Manning, St. Peters, Mo., assignors to Zoom Telephonics, Inc., Boston, Mass.

Filed Jan. 15, 1981, Ser. No. 225,447  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-59

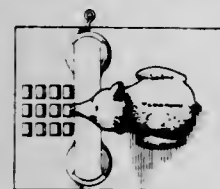


271,299  
DESK TELEPHONE

Ting H. Mak, 7816 Mulberry Bottom La., Springfield, Va. 22153

Filed Apr. 30, 1981, Ser. No. 259,117  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-53



271,302  
TELEPHONE SWITCH-CONNECTOR DEVICE

Frank B. Manning, Boston; Peter R. Kramer, Cambridge, both of Mass., and T. Pat Manning, St. Peters, Mo., assignors to Zoom Telephonics, Inc., Boston, Mass.

Filed Jan. 16, 1981, Ser. No. 225,858  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-59

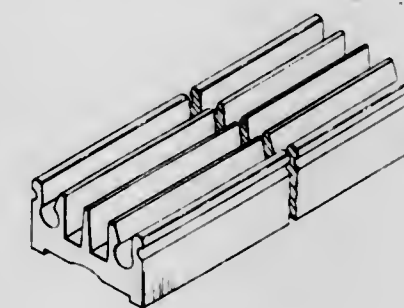


271,304  
WELDING SEAM BACK-UP EXTRUSION

Milo M. Kensrue, 601 Lido Park Dr., 8B, Newport Beach, Calif. 92663

Filed Jul. 14, 1980, Ser. No. 167,904  
Term of patent 14 years  
Int. Cl. D15-99

U.S. Cl. D15-144



271,305  
PHOTOGRAPHIC PRINT TONG OR SIMILAR ARTICLE

Edward Kostner, 218 Oakridge Dr., Bale d'Urfe, Quebec, Canada (H9X 2N4)

Filed Nov. 20, 1981, Ser. No. 323,377  
Term of patent 14 years  
Int. Cl. D16-04

U.S. Cl. D16-36

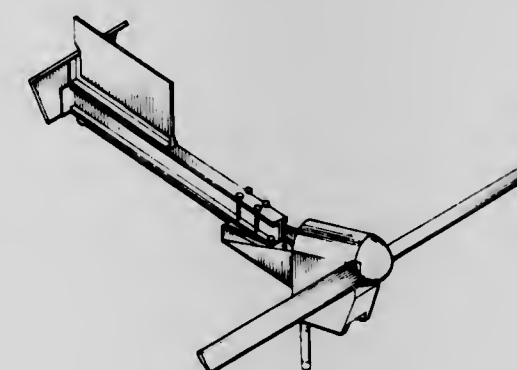


271,303  
WIND TURBINE

Sherman Ovelmen, Elgin, Ill., assignor to Windgen, Limited, Elgin, Ill.

Filed May 11, 1981, Ser. No. 262,103  
Term of patent 14 years  
Int. Cl. D15-01

U.S. Cl. D15-1

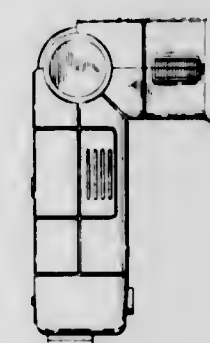


271,306  
COMBINED ELECTRONIC FLASH UNIT AND ADAPTER MODULE

Steven W. Shull, Culver City, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Apr. 3, 1981, Ser. No. 250,901  
Term of patent 14 years  
Int. Cl. D16-05

U.S. Cl. D16-42





271,307

## PAIR OF BINOCULARS

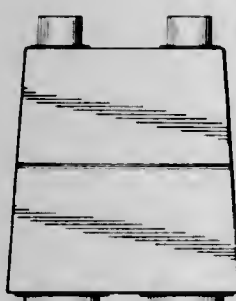
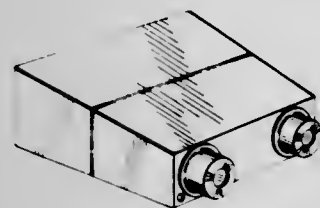
John R. Green, 19645 Rosita St., Tarzana, Calif. 98221, and  
Charles D. Turner, 48 Eastfield Dr., Rolling Hills, Calif.  
90274

Filed Mar. 27, 1981, Ser. No. 248,051

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-133



271,309

## TYPEWRITER

Takuo Hirano, Tokyo, Japan, assignor to Brother Kogyo Kabu-  
shiki Kaisha, Nagoya, Japan

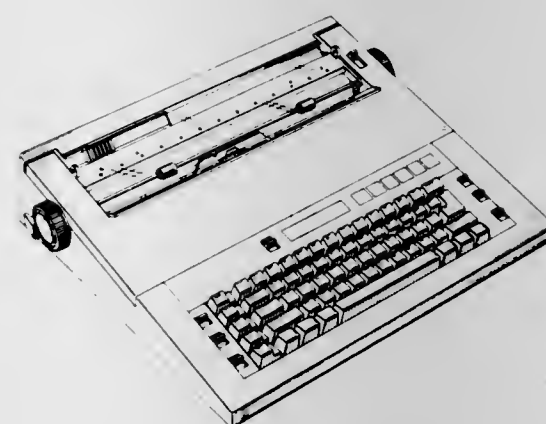
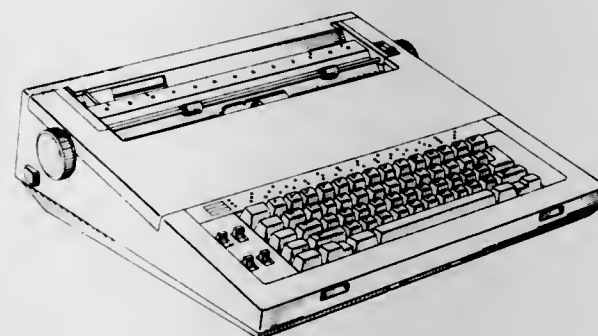
Filed May 6, 1982, Ser. No. 375,402

Claims priority, application Japan, Dec. 1, 1981, 56-53275;  
Jan. 22, 1982, 57-2397

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D18-1



271,308

COMBINED HOLDER AND MAGNIFIER FOR GEM  
EXAMINATION

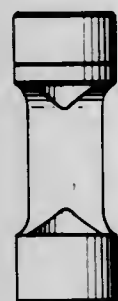
Susan Leo, New York, N.Y., assignor to Ridgecrest, Inc., New  
York, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,452

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-135



271,310

## RIBBON CARTRIDGE OR THE LIKE

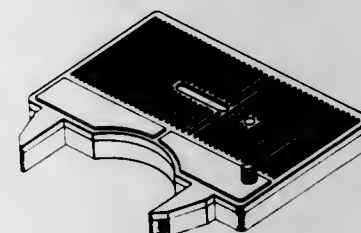
Daniel Canning, Dublin; Vito Viola, San Leandro, and James B.  
Jordan, Berkeley, all of Calif., assignors to Oume Corpora-  
tion, San Jose, Calif.

Filed Mar. 10, 1980, Ser. No. 129,271

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D18-12



271,311

## VIDEO GAME CONSOLE

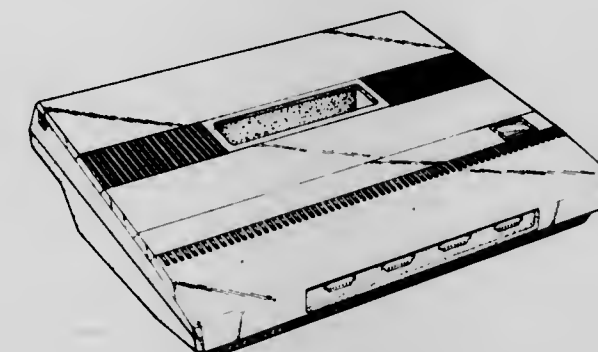
Regan L. Cheng, San Jose, Calif., assignor to Atari, Inc., Sun-  
nyvale, Calif.

Filed Jan. 7, 1982, Ser. No. 337,882

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-13



271,314

## RIDING TOY

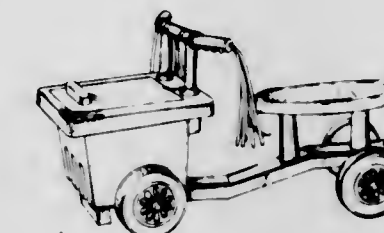
Rimvydas A. Tveras, Oak Park, Ill., assignor to Milton Bradley  
International, Inc., Springfield, Mass.

Filed Mar. 19, 1981, Ser. No. 245,618

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-76



271,312

## VIDEO GAME CONTROLLER

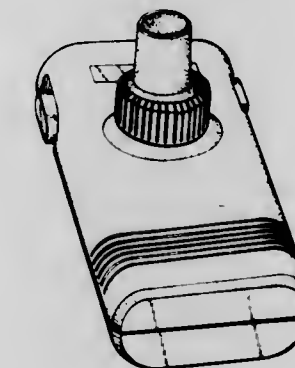
William J. Renteria, San Jose, Calif., assignor to Atari, Inc.,  
Sunnyvale, Calif.

Filed Jan. 7, 1982, Ser. No. 337,883

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-48



271,313

## VIDEO GAME CONTROLLER

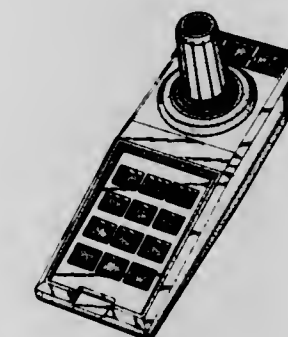
Roy M. Nishi, San Jose, Calif., assignor to Atari, Inc., Sun-  
nyvale, Calif.

Filed Jan. 7, 1982, Ser. No. 337,887

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-48



271,315

## TOY DUMP TRUCK OR SIMILAR ARTICLE

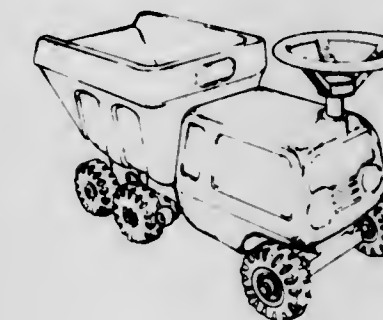
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio  
44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd.,  
Cleveland Heights, Ohio 44106

Continuation-in-part of Ser. No. 962,299, Nov. 20, 1978. This  
application Aug. 31, 1981, Ser. No. 297,563

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-78

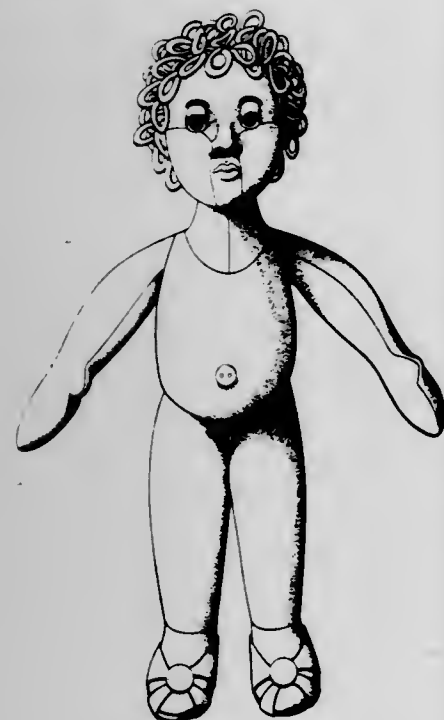




271,316  
DOLL

Betty H. Buckley, 662 Linden Ave., York, Pa. 17404  
Filed Aug. 21, 1981, Ser. No. 294,897  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-171

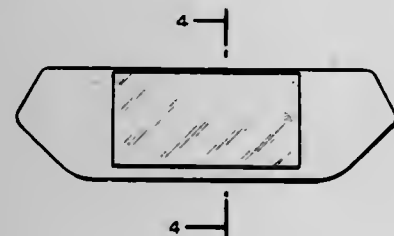


271,317

GOLF PUTTER HEAD

Robert J. Bretl, Menominee, Mich., assignor to R. A. Lockhart and Company, Grosse Point Woods, Mich.  
Filed Nov. 18, 1981, Ser. No. 322,406  
Term of patent 14 years  
Int. Cl. D21-02

U.S. Cl. D21-219

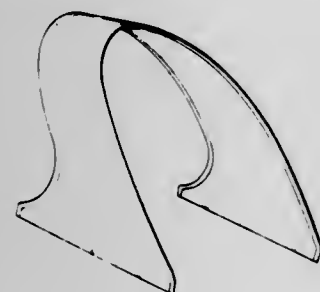


271,318

SURFBOARD FIN

Terrence L. Hope, 1326 1/2 Engracia Ave., Torrance, Calif. 90501  
Filed Jul. 13, 1981, Ser. No. 282,384  
Term of patent 14 years  
Int. Cl. D21-02

U.S. Cl. D21-231



271,319

GOLF SWING TRAINING AID

Ernest J. Barty, Jr., 105 Virginia Dr., Painesville, Ohio 44077  
Filed Sep. 17, 1981, Ser. No. 303,045  
Term of patent 14 years  
Int. Cl. D21-02

U.S. Cl. D21-234

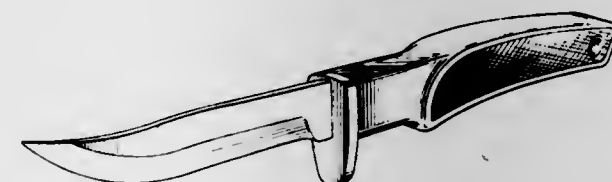


271,320

KNIFE

Robert Ferraro, Springfield, Mass., assignor to Bangor Punta Corporation  
Filed Sep. 21, 1981, Ser. No. 303,972  
Term of patent 14 years  
Int. Cl. D22-02

U.S. Cl. D22-1

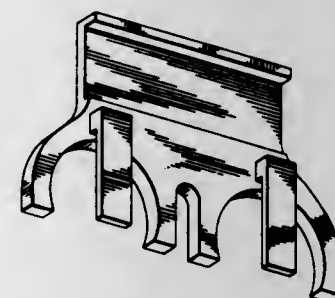


271,321

SHOTGUN LOADING DEVICE

Henry Ciciliot, Lorain Cir., R.D. 1, Box 270-A, and Robert Ciciliot, 1335 N. Ott St., both of Allentown, Pa. 18104  
Filed Aug. 21, 1981, Ser. No. 295,217  
Term of patent 14 years  
Int. Cl. D22-01

U.S. Cl. D22-7



271,322

FISHING LURE

John J. Wasson, Alexandria, La., assignor to Smithwick Lures, Inc., Shreveport, La.  
Filed Sep. 3, 1981, Ser. No. 299,112  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-27



271,323

LURE FOR TROUT

Bennie A. Leatherwood, Rte. 1, Box 282-B, Benton, Tenn. 37307  
Filed Sep. 16, 1981, Ser. No. 302,727  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-27



271,324

FISHING LURE

David D. Moore, 4970 Birch Ave., Rockford, Ill. 61111  
Division of Ser. No. 16,337, Feb. 28, 1979, Pat. No. Des. 261,921. This application Aug. 28, 1981, Ser. No. 297,516  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-28

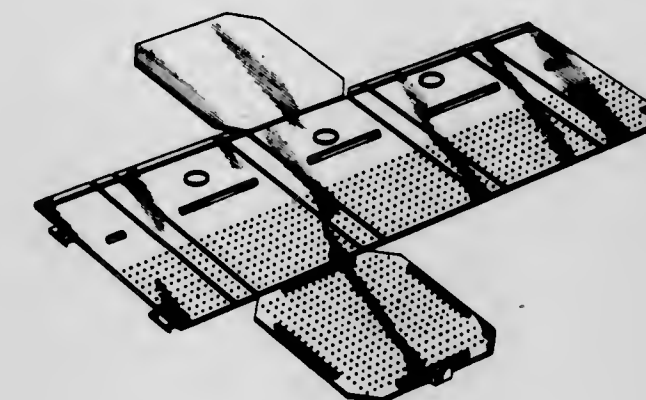


271,325

FILTER HOUSING BLANK

Laurence R. Gedy, East Doncaster, Australia, assignor to L.R. & N.R. Gedy Pty. Ltd., Australia  
Filed Feb. 9, 1981, Ser. No. 232,716  
Claims priority, application Australia, Aug. 7, 1980, 81732  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-4

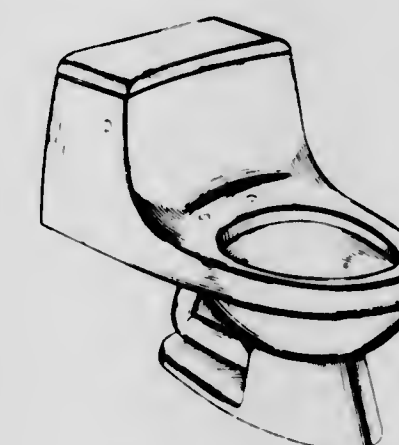


271,326

WATER CLOSET

Donald W. Doman, Janesville, and Norman J. Jaekels, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.  
Filed Oct. 22, 1981, Ser. No. 313,730  
Term of patent 14 years  
Int. Cl. D23-02

U.S. Cl. D23-65





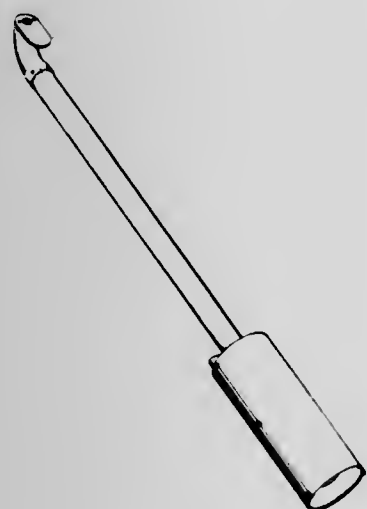
271,327

**IGNITER FOR GAS DISCHARGE PIPES**

Romeo E. Guerra, Dallas, and Robert H. Nelson, Plano, both of Tex., assignors to Nova Patents of North America, Inc., Dallas, Tex.

Filed May 26, 1981, Ser. No. 266,927  
Term of patent 14 years  
Int. Cl. D23—03

U.S. Cl. D23—90.1



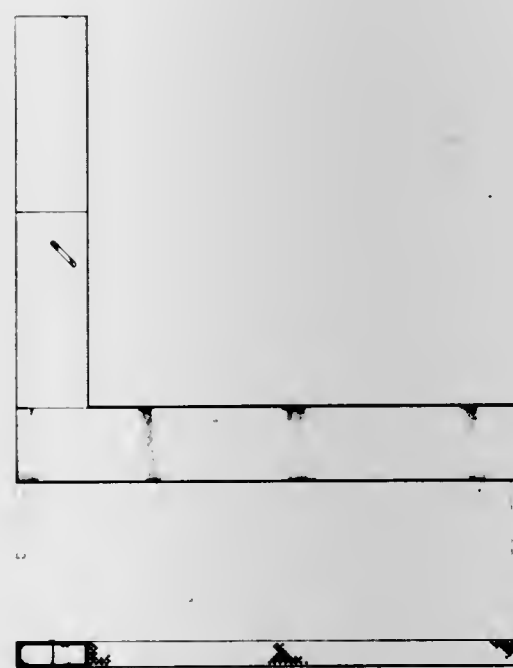
271,329

**FRESH AIR DUCT FOR A KITCHEN EXHAUST SYSTEM**

Clarke T. Welsh, Logansport, Ind., assignor to Logansport Distributors, Inc., Logansport, Ind.

Filed Aug. 1, 1980, Ser. No. 174,701  
Term of patent 14 years  
Int. Cl. D23—04

U.S. Cl. D23—163



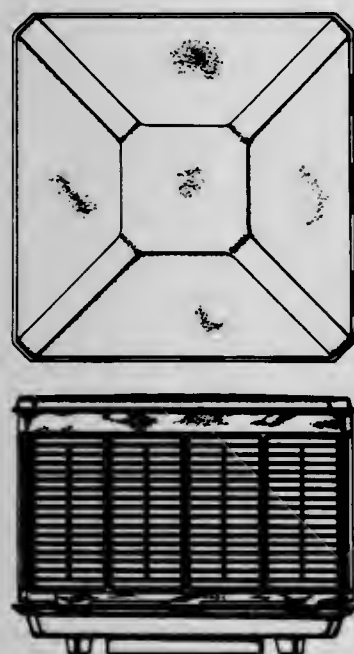
271,328

**EVAPORATIVE COOLER**

Ted B. Lanier, and Ras Redwine, V, both of Amarillo, Tex., assignors to RLI Inc., Amarillo, Tex.

Filed Jul. 21, 1980, Ser. No. 170,898  
Term of patent 14 years  
Int. Cl. D23—04

U.S. Cl. D23—139



271,330

**CEILING FAN COVER PLATE**

Yau Yung, Chaiwan, Hong Kong, assignor to Shell Electric Manufacturing Co., Ltd., Chaiwan, Hong Kong

Filed Nov. 13, 1981, Ser. No. 321,324  
Claims priority, application United Kingdom, May 13, 1981, 1000456

Term of patent 14 years  
Int. Cl. D23—04

U.S. Cl. D23—163



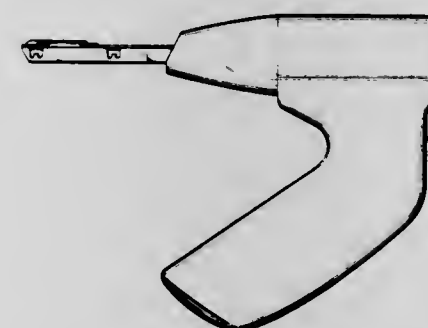
271,331

**POWERED SKIN STAPLER**

David T. Green, Norwalk; Paul Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jun. 3, 1981, Ser. No. 270,277  
Claims priority, application Australia, Dec. 19, 1980, 82,881; Dec. 19, 1980, 82,882; Canada, May 12, 1981, 12-05-81-5  
Term of patent 14 years  
Int. Cl. D24—02; D8—05

U.S. Cl. D24—26



271,333

**FIXED LENGTH BLOOD CONTAINER**

William Truglio, Sayville, N.Y., assignor to Wright Laboratories, Inc., Bohemia, N.Y.

Filed Oct. 1, 1980, Ser. No. 192,768  
Term of patent 14 years  
Int. Cl. D24—03

U.S. Cl. D24—56



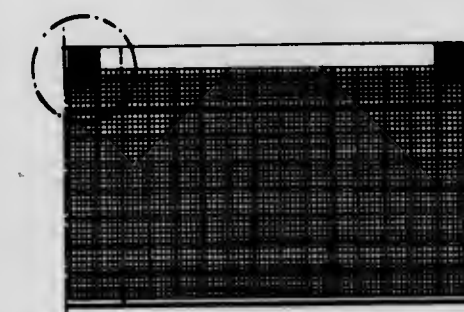
271,334

**ELECTROCARDIOGRAPHIC RECORDING PAPER**

Hyman Grossman, Buchanan, N.Y., assignor to Cambridge Instruments, Inc., Ossining, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,462  
Term of patent 14 years  
Int. Cl. D24—99

U.S. Cl. D24—99



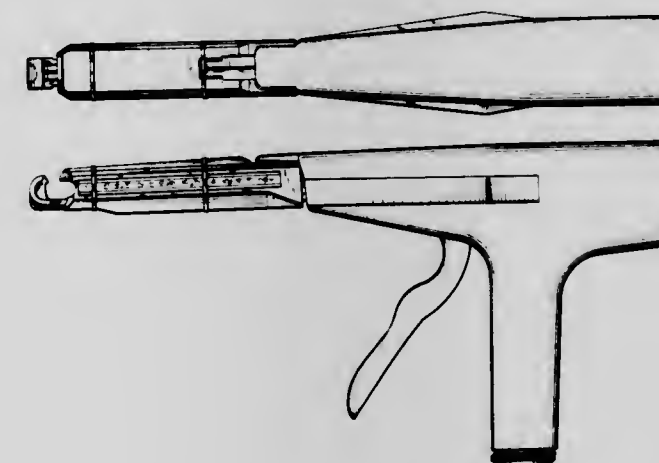
271,332

**SURGICAL OCCLUDING AND CUTTING INSTRUMENT**

David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jun. 3, 1981, Ser. No. 270,280  
Claims priority, application Australia, Dec. 19, 1980, 82,885; Dec. 19, 1980, 82,886; Canada, May 16, 1981, 12-05-81-6  
Term of patent 14 years  
Int. Cl. D24—02; D8—05

U.S. Cl. D24—26



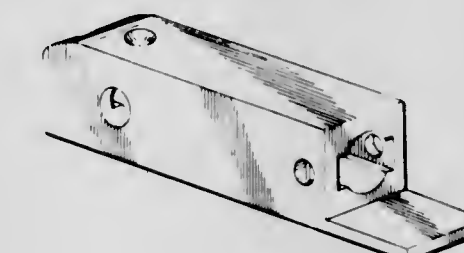
271,335

**CUVETTE HOLDER**

Sanford L. Simons, 9188 S. Turkey Creek Rd., Morrison, Colo. 80465

Filed Mar. 16, 1981, Ser. No. 243,756  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D24—99





271,336

## TASK LIGHT BRACKET

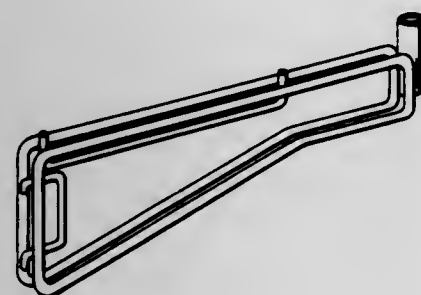
Robert J. Squitieri, 1900 Fullerton Rd., Rowland Heights, Calif. 91748, and David Bermant, 151 N. Corner Ave., Fullerton, Calif.

Filed Apr. 6, 1981, Ser. No. 251,513

Term of patent 14 years

Int. Cl. D8-08; D26-05

U.S. Cl. D26-138



271,337

## COSMETIC CONTAINER

Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Dec. 31, 1981, Ser. No. 336,076

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-85



271,338

## PORTABLE AIR FILTRATION UNIT

Hubert G. Dukowski, Suite 802, 555 W. 28th St., North Vancouver, British Columbia, Canada

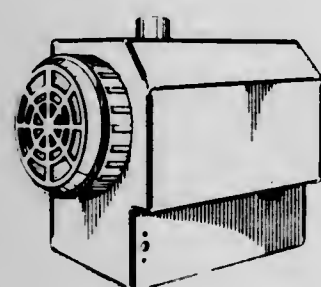
Filed Mar. 16, 1981, Ser. No. 244,485

Claims priority, application Canada, Sep. 16, 1980, 16-09-80-2

Term of patent 14 years

Int. Cl. D29-99; D23-04

U.S. Cl. D29-6



271,339

## COMBINED DISH RACK AND DRAINER

Keith K. K. Lee, Hong Kong, Hong Kong, assignor to Kee Cheong Lee's Co. Ltd., Hong Kong

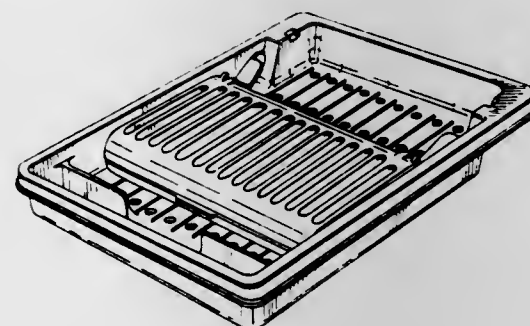
Filed May 1, 1981, Ser. No. 259,391

Claims priority, application United Kingdom, Dec. 29, 1980, 998248

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D32-55



271,340

## SIDE DRAINING DISH RACK

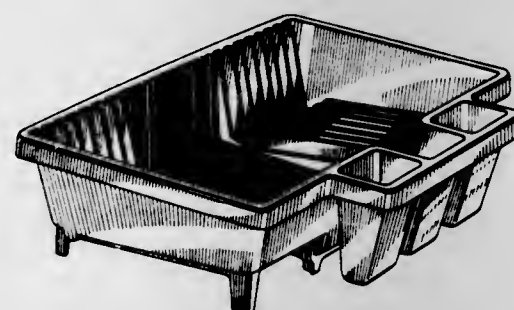
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Apr. 12, 1982, Ser. No. 367,579

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D32-55



271,341

## COMBINED CONVEYOR CARRIER AND TRACK UNIT

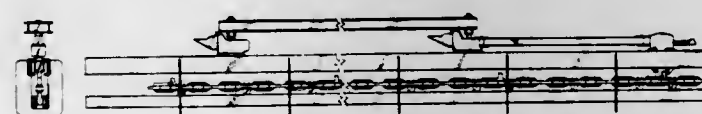
Clarence A. Dehne, Farmington Hills, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Apr. 17, 1981, Ser. No. 255,113

Term of patent 14 years

Int. Cl. D12-05

U.S. Cl. D34-28



271,342

## BARREL

Darrell L. Templeton, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Mar. 6, 1981, Ser. No. 241,409

Term of patent 14 years

Int. Cl. D9-02

U.S. Cl. D34-39



271,343

## BOX

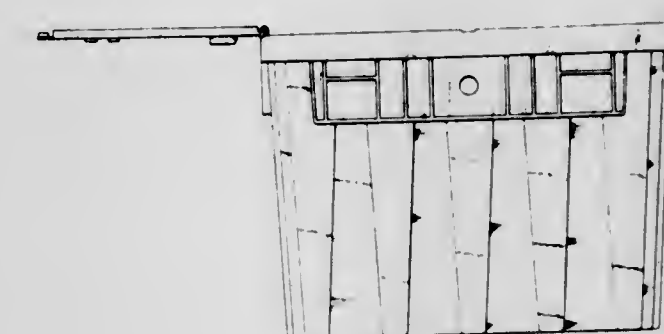
Daniel R. Miller, Cincinnati, Ohio, assignor to Nestler Corporation, Cincinnati, Ohio

Filed Mar. 26, 1981, Ser. No. 247,911

Term of patent 14 years

Int. Cl. D7-04

U.S. Cl. D34-43





## REEXAMINATIONS

NOVEMBER 8, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,219,126 (131st)**  
**SAFE CARTRIDGE FOR GAS**  
 Katsuo Oana, 17-6, 4 chome, Sugano, Ichikawa-shi, Chiba-ken, Japan  
 Reexamination Request No. 90/000,190, Apr. 14, 1982.  
 Reexamination Certificate for Patent No. 4,219,126, issued Aug. 26, 1980, Ser. No. 25,061, Mar. 29, 1979.  
 Int. Cl.<sup>3</sup> B65D 25/00  
 U.S. Cl. 220—89 A

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-3 are determined to be patentable as amended:

New claims 4-6 are added and determined to be patentable.

1. A cartridge assembly for containing gas, said cartridge being formed of a cylinder and a sealing plate, said plate serving to control the passage of gas out of said cylinder when excessive pressure is developed within said cartridge, including: a body, and said sealing plate positioned [at] to the top of said body, said plate being formed with a recess *creating a thinned portion* disposed along a central portion thereof, and being responsive to the formation of excessive pressure within said cylinder [.] to bow outwardly across its entire width, until the deformation of said plate under pressure is complete *with tension and shear stresses acting on the bottom of said recess*, said recess under pressure being [rupturable within a limited area] *formed in shape like a mortar in which the thickness of said plate increases from its center portion to the circumference, so as to rupture within a limited area by the formation of hairline-like cracks and without the softening or melting of said thin portion of said plate, to cause the gradual venting of the gas from within said [cylinder] chamber at a relatively slow and safely controlled rate of emission and without any blow-out of said plate or explosion of said cartridge.*

**B1 3,558,040 (132nd)**  
**TWO-WAY ENVELOPE**  
 Lloyd H. Krueger, Ontario, Canada, assignor to Century Envelope Co., Inc., Deer Park, N.Y.  
 Reexamination Request No. 90/000,210, Jun. 1, 1982.  
 Reexamination Certificate for Patent No. 3,558,040, issued Jan. 26, 1971, Ser. No. 827,768, May 26, 1969.  
 Claims priority, application Canada, May 25, 1968, 020950  
 Int. Cl.<sup>3</sup> B65D 27/06  
 U.S. Cl. 229—73

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended:

New claims 2-4 are added and determined to be patentable.

1. An envelope for two-way mailing, said envelope being formed from a one piece blank and comprising:  
 a. a front panel having side, top and bottom borders and having inner and outer surfaces,  
 b. a rear panel [also] having side, top and bottom borders and inner and outer surfaces,

c. the front and rear panels being joined together at their bottom borders about a first fold line and lying with their inner surfaces in opposed relation,  
 d. the front panel being of substantially the same width and of greater height than the rear panel,  
 e. a first closure flap joined to the front panel at the top border thereof [., said top border] *and forming a second fold line therewith, the first closure flap having inner and outer surfaces, the inner surface having adhesive thereon which, after activation and securing of said first closure flap to said rear panel, permits removal of said first closure flap without tearing of said rear panel,*  
 f. *said front panel including a line of perforations spaced substantially parallel to and spaced below said second fold line to define a strip therebetween, said line of perforations extending only through the said front panel to facilitate the removal of said first closure flap from said envelope,*  
 g. [.] a second closure flap joined to the rear panel at the top border thereof [., said top border] *and forming a third fold line therewith, the second closure flap having inner and outer surfaces, the inner surface having adhesive thereon, and said second closure flap being folded about said third fold line prior to formation of said envelope so that it is fully disposed between said front panel and said rear panel when said envelope is formed, and*  
 h. [g.] a pair of side flaps joined to the front panel at the side borders thereof and folded over the outer surface of the rear panel, the side flaps being sealed to the outer surface of the rear panel to maintain the inner surfaces of the front and rear panels in opposed relation, the side flaps being located on the said side borders so as to cover the edges of the said folded third fold line *to prevent the severing of said third fold line by the inadvertent insertion of a letter opener into said third fold line and the premature removal of said second closure flap therefrom, the top of said side flaps being substantially coextensive with said line of perforations, whereby the envelope may be closed initially by activating the adhesive on the first closure flap and folding the first closure flap about the second fold line down over the outer surface of the rear panel and sealing it thereto, and when received, the envelope may be opened and reused by removing the first closure flap by tearing along the said line of perforations without disturbing the remainder of the envelope, and then [by cutting along the second fold line and then closed for reuse by] removing the second closure flap from its position between the front and rear panels and activating the adhesive on the second closure flap and folding it about the third fold line down over the outer surface of the front panel and sealing it thereto.*

**B1 4,146,489 (133rd)**  
**POLYOLEFIN GRAFT COPOLYMERS AND LUBRICATING OILS AND FUELS CONTAINING SAME**  
 Robert L. Stambaugh, Hatboro, and Richard A. Galluccio, Perkasi, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.  
 Reexamination Request No. 90/000,220, Jun. 23, 1982.  
 Reexamination Certificate for Patent No. 4,146,489, issued Mar. 27, 1979, Ser. No. 843,300, Oct. 18, 1977.  
 Continuation-in-part of Ser. No. 600,652, Jul. 31, 1975, abandoned.  
 Int. Cl.<sup>3</sup> C10M 1/32, 3/26; C10L 1/14, 1/22; C08F 271/02  
 U.S. Cl. 252—50

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



Claims 1, 12, 17, 22-25, and 28 are determined to be patentable as amended:

Claims 2-11, 13-16, 18-21, 26, 27, and 29-34, dependent on amended claims, are determined to be patentable.

1. A lubricating oil containing a viscosity index improving and dispersant amount of a *chemically induced, free radical initiated* graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having graft polymerized thereon monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

12. A hydrocarbon fuel containing a dispersant amount of a *chemically induced, free radical initiated* graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having polymerized thereon graft monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

17. A process for preparing a *chemically induced, free radical initiated* graft copolymer, comprising intimately admixing (a) an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene copolymer diene modified terpolymer, (b) graft monomer selected from C-vinylpyridines and N-vinylpyrrolidone, and (c) a free radical initiator capable of hydrogen abstraction, said admixing being effected at a temperature below the decomposition temperature of the initiator, and raising the temperature of the reaction mixture to or above said decomposition temperature.

28. A *chemically induced, free radical initiated* graft copolymer effective for imparting dispersant properties to hydrocarbon fuels and both dispersancy and viscosity index improvement to lubricating oils, said graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having graft polymerized thereon monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

## LIST OF PATENTEEES

TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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 Atelier de Construction Steiger S.A.: See—  
 Steiger, Gerard, 4,413,482., Cl. 66-78.000.  
 Atkins, Michael W.: See—  
 Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674., Cl. 165-104.330.  
 Atkinson, Anthony: See—  
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 Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., 4,414,546., Cl. 340-825.300.  
 Aylor, Ronald L.: See—  
 Miller, Joseph S.; and Aylor, Ronald L., 4,414,263., Cl. 428-234.000.

- Azegami, Hitoshi: See—  
 Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,414,288., Cl. 428-694.000.  
 Azumi, Toshinori: See—  
 Kiriya, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadas; and Azumi, Toshinori, 4,414,276., Cl. 428-374.000.  
 B. F. Goodrich Company, The: See—  
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 Goans, Kip B., 4,413,651., Cl. 137-625.250.  
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 Baker Oil Tools, Inc.: See—  
 Callihan, Rudy B.; and Wainwright, Clyde, 4,413,682., Cl. 166-382.000.  
 Baker, Rees T. K.: See—  
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 Ballard, Donald E.: See—  
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 Bamberger, Carlos E. Preparation of metal phosphates by a reaction using boron phosphate. 4,414,187., Cl. 423-251.000.  
 Bannister, Ronald L.; and Beatty, John M., to Westinghouse Electric Corp. Turbine blade vibration detection apparatus. 4,413,519., Cl. 73-660.000.  
 Bantjes, John H.: See—  
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 Boyer, George C., 4,413,776., Cl. 236-49.000.  
 Barden, Charles R.: See—  
 Simpson, Robert E.; Amstead, Billy H.; and Barden, Charles R., 4,414,112., Cl. 210-512.100.  
 Barker, Kenneth M.: See—  
 Newberry, Michael E.; and Barker, Kenneth M., 4,414,035., Cl. 134-3.000.  
 Barnes, S. Thomas: See—  
 Berlik, Lee J.; Barnes, S. Thomas; and Levi, David E., 4,413,611., Cl. 126-39.00E.  
 Barr, Rodney E.; and Donovan, Daniel L., to Borg-Warner Corporation. Fuel feed and charge forming apparatus. 4,414,163., Cl. 261-69.00A.  
 Barre, Francoise: See—  
 Eranian, Armand; Dubois, Jean-Claude; Gazard, Maryse; and Barre, Francoise, 4,414,081., Cl. 204-159.180.  
 Bartley, Burton H.: See—  
 Petty, Randall H.; and Bartley, Burton H., 4,414,138., Cl. 502-73.000.  
 Barton, George G., Jr.: See—  
 Feldman, Sidney; and Barton, George G., Jr., 4,413,906., Cl. 356-141.000.  
 Basalay, Robert J.: See—  
 West, C. Thomas; and Basalay, Robert J., 4,414,122., Cl. 252-49.700.  
 Baschang, Gerhard: See—  
 Tarsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204., Cl. 424-177.000.  
 Base, Leonard C. Wood toter. 4,413,834., Cl. 280-47.260.  
 BASF Aktiengesellschaft: See—  
 Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.  
 Loeffler, Hans-Peter; and Adolph, Heinrich, 4,414,208., Cl. 424-224.000.  
 Wagner, Eckhart; Wagner, Ulrich; Volkamer, Klaus; and Vordrazka, Wolfgang, 4,414,004., Cl. 55-48.000.  
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 Patil, Arvind S.; Bantjes, John H.; and Ouderkerk, John T., 4,414,033., Cl. 423-367.000.  
 Wilson, Joe C., 4,414,126., Cl. 252-78.300.  
 Basiulis, Algerd, to Hughes Aircraft Company. Switchable on-off heat pipe. 4,413,671., Cl. 165-1.000.  
 Batchelor, Douglas R.: See—  
 Batchelor, William H.; and Batchelor, Douglas R., 4,413,607., Cl. 123-590.000.  
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 Bates, Ronald F.: See—  
 Wang, Chih C.; and Bates, Ronald F., 4,414,660., Cl. 369-286.000.  
 Battiston, Giancarlo: See—  
 DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412., Cl. 562-535.000.  
 Bauer, Klaus: See—  
 Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020., Cl. 71-108.000.  
 Bauer, Walter, to AFGA-Gevaert AG. Plane film cassette. 4,413,896., Cl. 354-277.000.  
 Baum, Kurt: See—  
 Berkowitz, Phillip T.; Baum, Kurt; and Grakauskas, Vytautas, 4,414,384., Cl. 528-417.000.  
 Baumgartner, Alfons, to Dr. Johannes Heidenhain GmbH. Electronic up-down counting system with directional discriminator. 4,414,678., Cl. 377-28.000.  
 Baur, Max, to Licinvest AG. Picture viewer. 4,413,435., Cl. 40-155.000.  
 Baxter Travenol Laboratories, Inc.: See—  
 Curchack, Leon T., 4,413,741., Cl. 215-100.00R.  
 Mittleman, Herbert, 4,413,990., Cl. 604-122.000.  
 Soika, Emil H., 4,413,992., Cl. 604-263.000.  
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 Brooker, Peter J.; and Goose, John, 4,414,222., Cl. 424-270.000.  
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 Ellendt, Gunther; Gleitsmann, Gunter; and Scheidel, Max, 4,414,074., Cl. 203-21.000.  
 Redmer, Frank; and Krippel, Kurt, 4,413,912., Cl. 366-69.000.  
 Bayer, Dean M.: See—  
 McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., 4,413,856., Cl. 296-188.000.  
 BBC Brown, Boveri & Company, Limited: See—  
 Moll, Rudolf; Ragaller, Klaus; and Schade, Ekkehard, 4,414,450., Cl. 200-147.00R.  
 Beach, Raymond D. Dental chair. 4,413,858., Cl. 297-188.000.  
 Beatty, John M.: See—  
 Bannister, Ronald L.; and Beatty, John M., 4,413,519., Cl. 73-660.000.  
 Beaver, William L.: See—  
 Anderson, Weston A.; Clark, Lloyd D.; and Beaver, William L., 4,413,630., Cl. 128-661.000.  
 Becker, Aaron J., to Aluminum Company of America. Production of zirconium diboride powder in a molten salt bath. 4,414,188., Cl. 423-297.000.  
 Becker, Horace W., to Xerox Corporation. Method and apparatus for replenishing marking material to a donor ribbon in a thermal marking printer system. 4,414,555., Cl. 346-76.00P.  
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 Beeghly, Bruce R., to Economy Engine Company, The. Electronic ignition with advance. 4,413,608., Cl. 123-599.000.  
 Bel Fuse, Inc.: See—  
 Bernstein, Elliot, 4,414,528., Cl. 337-187.000.  
 Belamaric, Zelimir: See—  
 Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455., Cl. 219-64.000.  
 Belkin, Michael; and Lund, David J. Instrument for object detection of ocular diseases. 4,413,890., Cl. 351-221.000.  
 Bell Telephone Laboratories, Incorporated: See—  
 Ahuja, Sudhir R.; and Sharma, Dhiraj K., 4,414,628., Cl. 364-200.000.  
 Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., 4,414,066., Cl. 204-129.300.  
 Grimes, Gary J., 4,414,537., Cl. 340-365.00R.  
 Grube, Gerald W., 4,414,642., Cl. 364-766.000.  
 Johnsen, Ottar; and Netravali, Arun N., 4,414,580., Cl. 358-260.000.  
 Keramidas, Vasilis G.; McCoy, Robert J.; and Temkin, Henryk, 4,414,561., Cl. 357-67.000.  
 Belletire, John L., to Pfizer Inc. Organic diamine therapeutic compositions. 4,414,220., Cl. 424-267.000.  
 Belli, Aldo: See—  
 Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,414,405., Cl. 560-56.000.



- Belius, Daniel: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,414,394, Cl. 548-451.000.
- Beloit Corporation: See—  
Truffitt, Alton D.; and Bringman, David J., 4,414,061., Cl. 162-295.000.
- Bendix Corporation, The: See—  
Tresselt, Carl P., 4,414,550., Cl. 343-700.0MS.
- Benerito, Ruth R.: See—  
Ward, Truman L.; and Benerito, Ruth R., 4,414,084., Cl. 204-165.000.
- Bennett, Benjamin: See—  
Anderson, Edward A.; Bennett, Benjamin; and Gray, Billy D., 4,414,606., Cl. 361-397.000.
- Bennett, James F., to GTE Products Corporation. Forward error correcting apparatus. 4,414,667., Cl. 371-37.000.
- Bennett, Moreland P.; and Ballard, Donald E., to General Electric Company. Processing amorphous metal into packets by bonding with low melting point material. 4,413,406., Cl. 29-609.000.
- Bentley Engineering Company Limited: See—  
Smith, William C.; and Seekings, Gerald A. G., 4,413,483., Cl. 66-125.00R.
- Berfield, Robert C., to Shop-Vac Corporation. Shoe attachment for wet/dry electric vacuum cleaner. 4,413,372., Cl. 15-414.000.
- Berg, John L. Wave pump apparatus. 4,413,956., Cl. 417-333.000.
- Berginski, Werner-Ernst; and Wessling, Wilhelm, to Leopold Kostal GmbH & Co. KG. Steering column switch. 4,414,442., Cl. 200-61.270.
- Bergmann, Udo; Kurz, Heinrich; and Radtke, Wolfgang, to U.S. Philips Corporation. Printing head for ink jet printers. 4,414,552., Cl. 346-1.100.
- Bergwerksverband GmbH: See—  
Romey, Ingo; and El-Roy, Menachem, 4,414,344., Cl. 524-65.000.
- Berke, Herbert; and Portoghesi, Joseph, to United States of America, Navy. Pattern generating circuit. 4,414,567., Cl. 358-139.000.
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- Bernelin, Daniel; and Meyer, Jacques, to Chloe Chimie. Binder compositions for powder coatings. 4,414,279., Cl. 428-413.000.
- Bernstein, Elliot, to Bel Fuse, Inc. Crimp fuse. 4,414,528., Cl. 337-187.000.
- Bernstein, Seymour: See—  
Nair, Vijay G.; and Bernstein, Seymour, 4,414,207., Cl. 424-180.000.
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- Besson, Rene, to ETA S.A. Fabriques d'Ebauches ETA 13. Watch having an analog display and a digital display. 4,413,915., Cl. 368-71.000.
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- Buchat, Roger, to Mefina S.A. Electronic fuse for projectiles. 4,413,563., Cl. 102-214.000.
- Bugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., to Conchemco, Incorporated. Control assembly for blade clutch unit. 4,413,466., Cl. 56-11.300.
- Beutel, Phillip R.: See—  
Jasso, Martin R., 4,413,636., Cl. 128-786.000.
- Bex, Guy, deceased; by Bex, Josette, legal representative; and Carsoule, Yve. Epichlorohydrin-based flexible elastomer composition. 4,414,343., Cl. 523-440.000.
- Bex, Josette, legal representative: See—  
Bex, Guy, deceased; Bex, Josette, legal representative; and Carsoule, Yve, 4,414,343., Cl. 523-440.000.
- BFG Glassgroup: See—  
Van Laethem, Robert; and Terneu, Robert, 4,414,015., Cl. 65-60.300.
- Bialo, Charles A.: See—  
Griesshaber, Karl H.; and Bialo, Charles A., 4,414,573., Cl. 358-163.000.
- Biava, Dominique: See—  
Cornu, Jean; Detriche, Jean-Marie; Turet, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910., Cl. 356-377.000.
- Bich, Rene, to Societe J. G. Allinquant. Plug device for the penetration of a plunger rod into a cylinder of gas spring of the like. 4,413,817., Cl. 267-64.110.
- Biederer, Hans H.: See—  
Niwiera, Wolfgang; Holtorf, Franz-Josef; and Biederer, Hans H., 4,413,768., Cl. 228-173.00A.
- Bielen, Denise M.: See—  
Bielen, Theodore J., Jr.; and Bielen, Denise M., 4,413,589., Cl. 119-109.000.
- Bielen, Theodore J., Jr.; and Bielen, Denise M. Collapsible animal leash. 4,413,589., Cl. 119-109.000.
- Bieringer, Hermann: See—  
Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020., Cl. 71-108.000.
- Bierwith, Robert S. Wedge and clamp locking system. 4,413,432., Cl. 37-142.00A.
- Bigelow-Sanford, Inc.: See—  
Wind, Joseph H., 4,413,737., Cl. 206-599.000.
- Biggar, Elizabeth Short: See—  
Biggar, Frank M., III, 4,413,541., Cl. 83-346.000.
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Mills, Walter H.; and Bilbrey, Joseph T., Sr., 4,413,966., Cl. 425-84.000.
- Billar, Bruce A., to S&C Electric Company. Contact assembly for a fuse cutout. 4,414,527., Cl. 337-180.000.
- Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, to Institut Francais du Petrole. Process for deasphalting an asphaltene containing hydrocarbon charge. 4,414,105., Cl. 208-309.000.
- Binz, Jorg: See—  
Guth, Christian; and Binz, Jorg, 4,413,998., Cl. 8-477.000.
- Bio-Rad Laboratories, Inc.: See—  
Abrams, David E.; Curbelo, Raul; and Turner, R. Brough, 4,413,908., Cl. 356-346.000.
- Bissell, Robert D., to Dresser Industries, Inc. Adjustably keyed pressure gauge construction. 4,413,529., Cl. 73-756.000.
- Bittaker, Gerald W.; and Martinez, Evidio E., to Pearce, Charlie I. Toilet light unit. 4,413,364., Cl. 4-661.000.
- Black Knight Investments Limited: See—  
Ginsburg, Stephen J.; and Draheim, Frederick E., 4,413,979., Cl. 433-41.000.
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- Blaschim S.p.A.: See—  
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,414,405., Cl. 560-56.000.
- Blaudzun, Bernd, to Lohmann GmbH & Co., KG. Process and apparatus for the recovery of solvents. 4,414,003., Cl. 55-18.000.
- Bleidt, Rolf; and Neumaier, Heinrich, to Brown, Boveri & Cie AG. Disconnect switch. 4,414,451., Cl. 200-148.00H.
- Blevins, Earl L.; and Blevins, Joan V. Stirrup adjusting and locking device. 4,413,465., Cl. 54-46.000.
- Blevins, Joan V.: See—  
Blevins, Earl L.; and Blevins, Joan V., 4,413,465., Cl. 54-46.000.
- Bliss, William R., to Thiokol Corporation. Extrusion die metering device. 4,413,968., Cl. 425-198.000.
- Blonder, Alain, to Interlock Sicherheitssysteme GmbH. Method and apparatus for performing a comparison of given patterns, in particular fingerprints. 4,414,684., Cl. 382-4.000.
- Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Far UV patterning of resist materials. 4,414,059., Cl. 156-659.100.
- Blytas, George C., to Shell Oil Company. Extraction process. 4,414,194., Cl. 423-573.00G.
- BMA Laboratory Services, Inc.: See—  
Stout, Robert L., 4,414,324., Cl. 435-7.000.
- Boden, Richard M., to International Flavors & Fragrances Inc. Use of prins and derivatives thereof in augmenting or enhancing the aroma or taste of a smoking tobacco composition or smoking tobacco article component. 4,413,639., Cl. 131-276.000.
- Bodenseewerk Perkin-Elmer & Co., GmbH: See—  
Tomoff, Toma; Mohr, Hans G.; and Kempf, Volker, 4,413,534., Cl. 73-864.210.
- Boehringer Mannheim GmbH: See—  
Schrenk, Jürgen; and Wunderwald, Peter, 4,414,332., Cl. 435-219.000.
- Boeing Company, The: See—  
Armer, James P., 4,414,539., Cl. 340-500.000.
- Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171., Cl. 264-249.000.
- Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,414,269., Cl. 428-290.000.
- Boettcher, Charles E.: See—  
Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,413,401., Cl. 29-571.000.
- Bogner, Bruce F., to RCA Corporation. Broadband non-contacting RF shielding gasket. 4,414,425., Cl. 174-35.0GC.
- Boise Cascade Corporation: See—  
Lambuth, Alan L., 4,413,459., Cl. 52-729.000.
- Boissevain, Mathew G.: See—  
Rice, Richard G.; Boissevain, Mathew G.; and Dubin, Robert R., 4,413,911., Cl. 356-438.000.
- Bollier, Willy, to Daverio A.G. Sorting conveyor for individual objects. 4,413,721., Cl. 198-365.000.
- Bonnell, Ronald D.: See—  
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624., Cl. 364-200.000.
- Boorman, Robert G.: See—  
Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., 4,414,546., Cl. 340-825.300.
- Borg-Warner Corporation: See—  
Barr, Rodney E.; and Donovan, Daniel L., 4,414,163., Cl. 261-69.00A.

- Falk, John C.; and Khait, Klementina F., 4,414,342., Cl. 523-437.000.
- Lamarche, Paul E., 4,413,711., Cl. 192-3.280.
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- Borneman, Paul R.: See—  
Aggen, George; and Borneman, Paul R., 4,414,023., Cl. 75-124.000.
- Bose, Ajit, to Leco Inc. Method for slitting and/or sealing plastic film material. 4,414,051., Cl. 156-198.000.
- Bouffard, Michael L.; and Pejouhy, Radi, to Texas Instruments Incorporated. Miniature motor protector apparatus and method for assembling thereof. 4,414,530., Cl. 338-25.000.
- Bourassa, Ronald R.; and Reeder, Michael R., to Inmos Corporation. Anisotropic silicide etching process. 4,414,057., Cl. 156-643.000.
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- Bouvet, Claude: See—  
Terrien, Michel E.; and Bouvet, Claude, 4,413,369., Cl. 14-27.000.
- Bowden, Wade R.: See—  
Slater, Thomas J.; and Bowden, Wade R., Jr., 4,414,427., Cl. 174-65.00R.
- Bowman, William W., to Hoffman Controls Corporation. Air flow sensor. 4,413,514., Cl. 73-204.000.
- Bowmar/ALI, Inc.: See—  
Forrest, John W.; and DeFusco, Thomas, 4,413,880., Cl. 350-96.200.
- Bown, Herbert G.; and O'Brien, C. Douglas, to Canadian Patents & Development Ltd. Interactive visual communications system. 4,414,621., Cl. 364-200.000.
- Boyer, George C., to Barber-Colman Company. Reset controller with improved air flow span adjustment. 4,413,776., Cl. 236-49.000.
- Boyer, Nicodemus E., to PPG Industries, Inc. Polyhalophthalimidoalkyl-functional carbonates and haloformates. 4,414,396., Cl. 548-478.000.
- Boynton, Robert J.: See—  
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883., Cl. 350-334.000.
- Bramlage GmbH: See—  
Mettenbrink, Herbert, 4,413,759., Cl. 222-213.000.
- Braun, Jack A.: See—  
Davis, Edwin W.; and Braun, Jack A., 4,413,849., Cl. 292-229.000.
- Braune, Dirk; and Schwartz, Wolfgang, to U.S. Philips Corporation. Circuit arrangement for extracting a field synchronizing signal from a television synchronizing signal. 4,414,570., Cl. 358-154.000.
- Breault, Richard D., to United Technologies Corporation. Method for reducing electrolyte loss from an electrochemical cell. 4,414,291., Cl. 429-14.000.
- Breda, Antoine G. L. J.; and Roussel, Jacques G. R., to P C U K Produits Chimiques Ugine Kuhlmann. Chromiferous complex dye-stuffs, a process for their preparation and their application. 4,414,151., Cl. 260-145.00B.
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- Breidenbach, Dieter; and Mosebach, Wilhelm, to WSW Stahl-und Wasserbau GmbH. Door for coking chamber of coke-oven battery. 4,414,072., Cl. 202-248.000.
- Breidenbach, Poul-Erik: See—  
Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, 4,414,014., Cl. 65-31.000.
- Brennan, William E.: See—  
Gavagan, James A.; and Brennan, William E., 4,413,385., Cl. 24-230.00A.
- Breslow, Jeffrey D., to Marvin Glass & Associates. Ball puzzle. 4,413,823., Cl. 273-153.00S.
- Bringman, David J.: See—  
Truffitt, Alton D.; and Bringman, David J., 4,414,061., Cl. 162-295.000.
- Bristol-Myers Company: See—  
Gordon, Maxwell; and Christie, George J., 4,414,206., Cl. 424-177.000.
- Britax-Excelsior Limited: See—  
Spalding, David N., 4,413,383., Cl. 24-164.000.
- British Gas Corporation: See—  
Churchill, David A., 4,414,633., Cl. 364-510.000.
- British Petroleum Company Limited, The: See—  
Webb, Alan D., 4,413,958., Cl. 417-424.000.
- Broggi, Renato; and Falciani, Marco. Cephalirin acetylcysteinate having antibacterial activity. 4,414,387., Cl. 544-28.000.
- Broken Hill Proprietary Company Limited, The: See—  
Kobak, Joseph, 4,413,932., Cl. 406-138.000.
- Brooker, Peter J.; and Goose, John, to Bayer AG. Anthelmintic pour-on veterinary composition. 4,414,222., Cl. 424-270.000.
- Brother Industries, Ltd.: See—  
Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496., Cl. 318-696.000.
- Brother Kogyo Kabushiki Kaisha: See—  
Hirota, Kunio; and Shimomura, Masao, 4,413,574., Cl. 112-121.120.
- Brouer, Robert L.: See—  
Gregoire, James L.; Wismer, Robert D.; and Brouer, Robert L., 4,413,662., Cl. 144-356.000.
- Brower, Gary M. Roof curb adapter. 4,413,450., Cl. 52-27.000.
- Brown, Boveri & Cie AG: See—  
Bleidt, Rolf; and Neumaier, Heinrich, 4,414,451., Cl. 200-148.00H.
- Fischer, Wilfried, 4,414,297., Cl. 429-61.000.
- Mennicke, Stefan; Reiss, Karl; and Liebermann, Kurt, 4,414,296., Cl. 429-50.000.
- Brown Boveri Electric, Inc.: See—  
Garzon, Ruben D., 4,414,445., Cl. 200-148.00A.
- Garzon, Ruben D., 4,414,449., Cl. 200-146.00R.
- Brown, Dennis N. Skate boot insert. 4,413,430., Cl. 36-44.000.
- Brown, Dennis R.: See—  
Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., 4,414,200., Cl. 424-63.000.
- Brown, Floyd A.: See—  
Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587., Cl. 360-76.000.
- Brown, George T. Pipe repair bypass system. 4,413,655., Cl. 138-97.000.
- Brown, Karen H.: See—  
Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, 4,414,059., Cl. 156-659.100.
- Brown, Stanley F.: See—  
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Harold W., 4,414,594., Cl. 360-106.000.
- Brown, Trevor P., to Pandrol Limited. Rail clip and an assembly on a railway track which includes the clip. 4,413,777., Cl. 238-349.000.
- Brown, Worthy H. Slug for a shotgun shell. 4,413,564., Cl. 102-501.000.
- Brunet, Michel, to Etablissements Valois. Metered aerosol valve for use in inverted position. 4,413,755., Cl. 222-402.200.
- Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, to Heraeus Quarzschmelze GmbH. Method of producing a bubble-free vitreous material. 4,414,014., Cl. 65-31.000.
- Bruno, Edward D.; and Bruno, Gary C. Potted plant package. 4,413,725., Cl. 206-45.330.
- Bruno, Gary C.: See—  
Bruno, Edward D.; and Bruno, Gary C., 4,413,725., Cl. 206-45.330.
- Bubley, Henry J., to American Screen Printing Equipment Company. Multi-speed drive for screen printing presses. 4,413,559., Cl. 101-123.000.
- Bucchianeri, Bernard A., to United States Steel Corporation. Process for separation of gas mixture. 4,414,007., Cl. 62-12.000.
- Buchholz, Rainer; Tomashauer, Josef; Zoderow, Rudolf; and Mohn, Hans-Werner, to Jagenberg Werke AG. Method and apparatus for foil-capping bottles. 4,414,056., Cl. 156-476.000.
- Buchin, Michael: See—  
Lewis, George K.; and Buchin, Michael, 4,414,482., Cl. 310-334.000.
- Buchwalter, Stephen L.: See—  
Patricca, Steven E.; and Buchwalter, Stephen L., 4,414,068., Cl. 204-181.00C.
- Buckner, Guy O., to Dresser Industries, Inc. Integrated well logging system and method. 4,414,651., Cl. 367-27.000.
- Buda, Charles: See—  
Liebowitz, Marvin; and Buda, Charles, 4,414,144., Cl. 252-548.000.
- Buechler, Peter R.: See—  
Milligan, Brian; Buechler, Peter R.; and Fearheller, Stephen H., 4,413,997., Cl. 8-94.210.
- Buhler, Allen C.: See—  
Bakal, Abraham I.; and Buhler, Allen C., 4,414,229., Cl. 426-98.000.
- Buhlmann, Niklaus: See—  
Matthey, Philippe; Salmon, Robert; and Buhlmann, Niklaus, 4,413,565., Cl. 102-503.000.
- Bukalo, Alfred I.: See—  
Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672., Cl. 373-22.000.
- Burch, Donald J.: See—  
Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587., Cl. 360-76.000.
- Burge, Russell W., to Mobay Chemical Corporation. Foam peeling process and apparatus. 4,413,540., Cl. 82-47.000.
- Burlington Industries, Inc.: See—  
Baldwin, A. Frank, 4,414,268., Cl. 428-289.000.
- Wang, Kenneth Y.; Hill, Bertie R.; and Pinson, Marvin J., Jr., 4,414,045., Cl. 156-73.200.
- Burnell, Elvin W.; and Deschner, David. Window security device. 4,413,852., Cl. 292-259.000.
- Burnham, Francis L., to Orangeburg Technologies, Inc. Small temperature differential heat-powered compressor. 4,413,952., Cl. 417-253.000.
- Burns, Carmen D., to National Semiconductor Corporation. Process for manufacturing a tear strip planarization ring for gang bonded semiconductor device interconnect tape. 4,413,404., Cl. 29-590.000.
- Burns, Walter G.: See—  
Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., 4,413,618., Cl. 126-450.000.
- Burrroughs Corporation: See—  
Harvey, Edgar L., 4,414,490., Cl. 315-169.400.
- Miller, Christopher F., 4,414,625., Cl. 364-200.000.



- Peter, Emmett B., III; and Rayfield, Wilson P., 4,413,902., Cl. 355-48.000.  
 Romania, Samuel R.; and Watson, Frank L., 4,413,413., Cl. 300-300.000.  
**Burroughs Wellcome Co.: See—**  
 Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.  
 Burry, Stephen W., to CTS Corporation. Apparatus for producing uniform density and weight briquettes, 4,413,967., Cl. 425-149.000.  
 Burtelson, Frederick W., to Northern Telecom Inc. Aerial cable terminal, 4,414,426., Cl. 174-59.000.  
**Bushman, James B.: See—**  
 Waits, Charles G.; Nicholas, Karl W.; and Bushman, James B., 4,414,511., Cl. 324-347.000.  
 Butterworth, Arthur L., to Trane Company. The Scroll machine with flex member pivoted swing link, 4,413,959., Cl. 418-14.000.  
**Butzke, Jürgen: See—**  
 Wintermeyer, Willi; Wittmann, Rolf; and Butzke, Jürgen, 4,414,401., Cl. 549-370.000.  
**Byk-Millinkrodt CIL B.V.: See—**  
 Panek, Karel J., 4,414,145., Cl. 252-645.000.  
 Cabardo, Alberto M., Jr. Periodontal powder containing exsiccated potassium alum, 4,414,203., Cl. 424-154.000.  
 Calandra, Frank, Jr., to Jenmar Corporation. Method and apparatus for combining resin bonding and mechanical anchoring of a bolt in a rock formation, 4,413,930., Cl. 405-261.000.  
 Callihan, Rudy B.; and Wainwright, Clyde, to Baker Oil Tools, Inc. Method and apparatus for installing a cementing float shoe on the bottom of a well casing, 4,413,682., Cl. 166-382.000.  
 Cameron, Donald S.; and Cooper, Susan J., to Johnson, Matthey & Co., Limited. Electrode, 4,414,071., Cl. 204-242.000.  
**Camus, Annamaria: See—**  
 Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,414,417., Cl. 568-315.000.  
**Canadian Patents & Development Ltd.: See—**  
 Bown, Herbert G.; and O'Brien, C. Douglas, 4,414,621., Cl. 364-200.000.  
 Hill, Eugene E.; Scrimshaw, Marvin S.; and Showalter, Edward W., 4,414,654., Cl. 367-103.000.  
 Candor, James T. Method for thermal/vacuum drying a wet web of material, 4,413,425., Cl. 34-1.000.  
**Canon Kabushiki Kaisha: See—**  
 Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581., Cl. 358-280.000.  
 Sato, Yasuhisa, 4,413,888., Cl. 350-432.000.  
 Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,414,319., Cl. 430-65.000.  
**Cantrel, James F.: See—**  
 Hughes, Robert W.; and Cantrel, James F., 4,413,689., Cl. 175-409.000.  
 Capasso, Ursula, to Exquisite Form Industries, Inc. Foundation garment, 4,413,626., Cl. 128-498.000.  
 Carini, Edward. Game ball holder, 4,413,762., Cl. 224-250.000.  
**Carl Freudenberg, Firma: See—**  
 Hartmann, Ludwig; and Ambros, Otto, 4,414,262., Cl. 428-222.000.  
**Carlson, Franklin B.: See—**  
 Hall, Robert N.; Carlson, Franklin B.; and Thomson, William J., 4,413,573., Cl. 110-347.000.  
 Carpenter, Daniel D.; and Lanning, Ronald L., to TRW Inc. Doppler speed sensing apparatus, 4,414,548., Cl. 343-8.000.  
**Carsoule, Yve: See—**  
 Bex, Guy, deceased; Bex, Josette, legal representative; and Carsoule, Yve, 4,414,343., Cl. 523-440.000.  
 Carter, Ernest E., Jr., to Halliburton Company. Inflation anchor, 4,413,653., Cl. 138-89.000.  
 Cartwright, David; and Turnbull, Michael, to Imperial Chemical Industries PLC. A process for preparing 2-pyridinyloxyphenoxy-lower-alkanoates, 4,414,391., Cl. 546-302.000.  
**Caselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: See—**  
 Roba, Giacomo; and Vergnano, Paolo, 4,414,164., Cl. 264-1.200.  
**Casio Computer Co., Ltd.: See—**  
 Iba, Akio, 4,413,543., Cl. 84-1.030.  
**Caterpillar Tractor Co.: See—**  
 Stedman, Robert N., 4,413,708., Cl. 187-9.00R.  
 Cavanagh, Peter R., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe upper construction, 4,413,431., Cl. 36-114.000.  
**Celanese Corporation: See—**  
 Conciatori, Anthony B.; Choe, Eui W.; and Hall, Henry K., Jr., 4,414,383., Cl. 528-336.000.  
 Costanza, John R.; and Trapasso, Louis E., 4,414,250., Cl. 427-386.000.  
 Williams, Albert G., 4,414,341., Cl. 523-340.000.  
 Centafanti, Rocco. Treadmill exerciser, 4,413,821., Cl. 272-69.000.  
**Centre d'Etudes et de Recherches de la Machine-Outil (C.E.R.M.O.): See—**  
 Lombard, Jean, 4,413,863., Cl. 308-5.00R.  
**Centre National d'Etudes et d'Experimentation de Machinisme Agricole: See—**  
 Lucas, Jean; Molle, Jean-Francois; Gille, Etienne; and Creze, Patrick, 4,414,002., Cl. 48-209.000.  
 Gerwin, Robert J.; and Alpern, Marvin, to Ethicon Inc. Folder retainer for surgical sutures, 4,413,727., Cl. 206-63.300.

- Chadwick, Joseph H.: See—  
 Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587., Cl. 360-76.000.  
 Chan, David C. K., to Chevron Research Company. Herbicidal 3-butyrolactones, 4,414,017., Cl. 71-88.000.  
**Chan, Hak-Foon: See—**  
 Miller, George A.; and Chan, Hak-Foon, 4,414,210., Cl. 424-245.000.  
 Chan, Keat-Lye: See—  
 Oliver, Theodore A.; Nelson, David L.; and Chan, Keat-Lye, 4,414,589., Cl. 360-77.000.  
**Chaparral Communications, Inc.: See—**  
 Howard, H. Taylor, 4,414,516., Cl. 333-21.00A.  
 Charlson, Paul M.; Schwieters, Clarence R.; and Souk, Jun H., to International Business Machines Corporation. Laser joining of thermoplastic and thermosetting materials, 4,414,166., Cl. 264-25.000.  
**Chaudhari, Dalsang K.: See—**  
 Michael, Richard A.; Chaudhari, Dalsang K.; and Marquart, Gordon L., 4,413,715., Cl. 192-53.00F.  
**Chemische Werke Huels Aktiengesellschaft: See—**  
 Keil, Hans S. H., deceased; Alfs, Helmut; and Schulze, Klaus, 4,414,125., Cl. 252-75.000.  
 Chen, Thomas T., to Rockwell International Corporation. Copper embedded ferrite coil arrangement for supplying uniform rotating field in full frequency range for testing magnetic bubble devices, 4,414,507., Cl. 324-210.000.  
 Cheng, Bao-ding, to Colgate Palmolive Company. Readily disintegrable agglomerates of insoluble detergent builders and detergent compositions containing them, 4,414,130., Cl. 252-140.000.  
 Chester, Arthur W.; and Garwood, William E., to Mobil Oil Corporation. Catalytic process for manufacture of low pour lubricating oils, 4,414,097., Cl. 208-59.000.  
**Chevron Research Company: See—**  
 Chan, David C. K., 4,414,017., Cl. 71-88.000.  
 Farrell, Thomas R., 4,414,103., Cl. 208-212.000.  
 Harrison, Jonas P., 4,414,185., Cl. 423-163.000.  
 Krug, Russell R.; and Hohmann, Robert P., 4,414,100., Cl. 208-153.000.  
 Miller, Stephen J., 4,414,423., Cl. 585-517.000.  
 Sigworth, Harry W., Jr., 4,413,615., Cl. 126-434.000.  
 Chianco, Bernard V.; Chianco, John B.; and Chianco, David B. Sit-down shower for children, 4,413,362., Cl. 4-567.000.  
**Chianco, David B.: See—**  
 Chianco, Bernard V.; Chianco, John B.; and Chianco, David B., 4,413,362., Cl. 4-567.000.  
**Chianco, John B.: See—**  
 Chianco, Bernard V.; Chianco, John B.; and Chianco, David B., 4,413,362., Cl. 4-567.000.  
**Chicago Bridge & Iron Company: See—**  
 Sims, James E.; and Schmick, Robert C., 4,414,459., Cl. 219-73.200.  
**Chicago Pneumatic Tool Company: See—**  
 Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,413,396., Cl. 29-407.000.  
**Chicopee: See—**  
 Cornin, Annamaria, 4,414,597., Cl. 360-133.000.  
**Chida, Takeshi: See—**  
 Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, 4,414,363., Cl. 525-237.000.  
**Chihara, Yasuaki: See—**  
 Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216., Cl. 424-251.000.  
 Chikaraishi, Takayo, to Nissan Motor Company, Limited. Guide rail for a sliding door, 4,413,444., Cl. 49-409.000.  
 Chin, John F.; Rhodes, Joseph A.; and Kusterer, James E., to Manville Service Corporation. Apparatus for attenuating mineral fibers, 4,414,010., Cl. 65-16.000.  
**China Steel Corporation: See—**  
 Yang, Chi-Ming, 4,414,025., Cl. 75-129.000.  
**Ching, Ta-Yen: See—**  
 Vaughn, Howard A., Jr.; and Ching, Ta-Yen, 4,414,349., Cl. 524-261.000.  
 Chino, John J.; LePage, Paul; Rossi, Robert M.; and Rossman, Herman, to United States of America, Navy. Positive locking mechanism, 4,414,605., Cl. 361-388.000.  
**Chloe Chimie: See—**  
 Bernelin, Daniel; and Meyer, Jacques, 4,414,279., Cl. 428-413.000.  
**Chloride Silent Power Limited: See—**  
 Ansell, Raymond O., 4,414,299., Cl. 429-104.000.  
**Cho, Hyun J.: See—**  
 Payne, Larry D.; Cho, Hyun J.; and Mehta, Kishor N., 4,413,370., Cl. 15-104.06R.  
**Choe, Eui W.: See—**  
 Conciatori, Anthony B.; Choe, Eui W.; and Hall, Henry K., Jr., 4,414,383., Cl. 528-336.000.  
**Choudhury, Abu N. M. M.: See—**  
 Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slaters); and Fonstad, Clifton G., 4,414,076., Cl. 204-15.000.  
**Christie, George J.: See—**  
 Gordon, Maxwell; and Christie, George J., 4,414,206., Cl. 424-177.000.  
**Christy, Marcia E.: See—**  
 Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,414,154., Cl. 260-245.700.

- Chudy, John S.: See—  
 Shoji, Robert M.; and Chudy, John S., 4,414,655., Cl. 369-44.000.  
 Churchill, David A., to British Gas Corporation. Data processing and recording apparatus, 4,414,633., Cl. 364-510.000.  
**Ciba-Geigy AG: See—**  
 Scherrer, Walter; and Portmann, Robert, 4,414,156., Cl. 260-352.000.  
**Ciba-Geigy Corporation: See—**  
 Andrews, Christopher M., 4,414,377., Cl. 528-88.000.  
 Dexter, Martin; and Winter, Roland A. E., 4,414,393., Cl. 548-260.000.  
 Guth, Christian; and Binz, Jorg, 4,413,998., Cl. 8-477.000.  
 Habicht, Ernst; and Zbinden, Paul, 4,414,214., Cl. 424-248.510.  
 Iqbal, Abul; and Lienhard, Paul, 4,414,395., Cl. 548-471.000.  
 Rasberger, Michael, 4,414,345., Cl. 524-108.000.  
 Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204., Cl. 424-177.000.  
 Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, 4,414,158., Cl. 260-438.100.  
 Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,414,394., Cl. 548-451.000.  
**Cibis, Norbert: See—**  
 Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, 4,414,014., Cl. 65-31.000.  
**Citizen Watch Company Limited: See—**  
 Ishizuka, Shinichi; and Sugimoto, Kenji, 4,413,539., Cl. 82-2.00R.  
**Claessens, Stephanus J.: See—**  
 Notelieirs, Victor R.; and Claessens, Stephanus J., 4,414,484., Cl. 313-273.000.  
**Clark, Lloyd D.: See—**  
 Anderson, Weston A.; Clark, Lloyd D.; and Beaver, William L., 4,413,630., Cl. 128-661.000.  
 Claxton, Kenneth W.; and Harris, Lewis K., to Combustion Engineering, Inc. System for dampening pulsations or oscillations in a force-balance instrument, 4,413,523., Cl. 73-701.000.  
**Clayton, Charles A.: See—**  
 Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674., Cl. 165-104.330.  
**Clegg, John W.: See—**  
 Skinner, Robert T. J.; and Clegg, John W., 4,413,780., Cl. 239-533.400.  
**Clevenson, Sherman A.: See—**  
 Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenson, Sherman A.; and Stephens, David G., 4,413,522., Cl. 73-646.000.  
 Cliff, John W., Jr., to John Morrell & Co. Meat processing apparatus, 4,413,375., Cl. 17-1.00R.  
 Clift, Dale L. Power assisting device for a manually operable vehicle, 4,413,692., Cl. 180-11.000.  
 Cline, Harvey E., to General Electric Company. Method for making surface acoustic wave devices, 4,414,243., Cl. 427-100.000.  
 Cloutier, Louis. Electrical water heating device with improved internal circulation, 4,414,464., Cl. 219-312.000.  
 Cluniat, Claude; and Dominguez, Mariano, to L.G.T. Laboratoire General des Telecommunications. Device for the measurement, in operation, of non-linearity products in a television transmitter, 4,414,568., Cl. 358-139.000.  
 Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, to General Tire & Rubber Company. The In-mold coating, 4,414,173., Cl. 264-257.000.  
 Cockeram, John M. Apparatus for and a method of selective plating of components including strip components, 4,414,075., Cl. 204-15.000.  
 Coe, Anthony D., to David Brown Tractors Ltd. Tractor front loader with locking strut, 4,413,944., Cl. 414-685.000.  
**Coleflexip: See—**  
 N'Guyen Duc, Xuong; and Szabo, Rene, 4,413,844., Cl. 285-16.000.  
 Cohen, Abraham B.; and Lazaridis, Christina N., to Du Pont de Nemours, E. I., and Company. Crosslinked triacrylate polymer beads, 4,414,278., Cl. 428-402.000.  
 Cohen, Ellen R.: See—  
 Schlanger, Samuel L., 4,413,702., Cl. 180-274.000.  
 Cohen, Samuel A.: See—  
 Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244., Cl. 427-105.000.  
 Cohen, Stuart C.; Kostelnik, Robert J.; and Wambach, Allen D., to General Electric Company. Thermoplastic molding compositions and process, 4,414,352., Cl. 524-443.000.  
**Colgate Palmolive Company: See—**  
 Cheng, Bao-ding, 4,414,130., Cl. 252-140.000.  
 Joshi, David P., 4,414,129., Cl. 252-135.000.  
 Liebowitz, Marvin; and Buda, Charles, 4,414,144., Cl. 252-548.000.  
**Collard, David: See—**  
 Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.  
 Colle, Roberto; Gozzo, Franco; and Prezioso, Ciro, to Montedison S.p.A. Herbicides, 4,414,018., Cl. 71-88.000.  
**Collin, Gerd: See—**  
 Palm, Jürgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, 4,414,192., Cl. 423-445.000.  
**Colt Industries Operating Corp.: See—**  
 Smitley, Marion L., 4,413,603., Cl. 123-510.000.  
**Coltman, Stephen C. W.: See—**  
 Raphael, Richard A.; Eyley, Stephen C.; and Coltman, Stephen C. W., 4,414,416., Cl. 564-443.000.

- Columbus, Richard L., to Eastman Kodak Company. Method for forming an electrode-containing device with capillary transport between electrodes, 4,413,407., Cl. 29-825.000.  
**Combustion Engineering, Inc.: See—**  
 Claxton, Kenneth W.; and Harris, Lewis K., 4,413,523., Cl. 73-701.000.  
 Smith, Donald A.; and Lexa, Gary F., 4,413,935., Cl. 406-181.000.  
**Commissariat a l'Energie Atomique: See—**  
 Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910., Cl. 356-377.000.  
**Compagnie Francaise des Aciers Speciaux: See—**  
 Duhomez, Roger; and Quenton, Guy, 4,413,815., Cl. 266-265.000.  
**Compagnon, Francis: See—**  
 Boutin, Xavier; Compagnon, Francis; and Poirier, Michel, 4,414,646., Cl. 365-2.000.  
**Companie Universelle d'Acetylene et d'Electrometallurgie: See—**  
 Gorgierino, Mario; and Videau, Daniel, 4,414,027., Cl. 420-578.000.  
 Comroe, Richard A., to Motorola, Inc. MSK and OK-QPSK signal demodulator, 4,414,675., Cl. 375-90.000.  
**Conchemco, Incorporated: See—**  
 Beugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., 4,413,466., Cl. 56-11.300.  
 Conciatori, Anthony B.; Choe, Eui W.; and Hall, Henry K., Jr., to Celanese Corporation. High molecular weight polybenzimidazole preparation with phosphorus containing polymerization catalyst, 4,414,383., Cl. 528-336.000.  
 Conforti, Frederick J.; and Fenne, Kenneth R., to Pittway Corporation. Hand-held light with means for controlling beam width, 4,414,612., Cl. 362-188.000.  
 Conley, Kenneth E., to Rexham Corporation. Composite lenticular screen sheet, 4,414,316., Cl. 430-496.000.  
 Connell, David A. Method of making black glass by utilizing incinerated waste glass, 4,414,013., Cl. 65-28.000.  
**Conoco Inc.: See—**  
 Convers, Ronald J., 4,414,136., Cl. 502-225.000.  
 Conrad, James R. Apparatus for twist-tying ceiling hangers from joists, 4,413,660., Cl. 140-119.000.  
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Lucas, Jean; Molle, Jean-Francois; Gille, Etienne; and Creze, Patrick, 4,414,002, Cl. 48-209.000.
- Crichlow, Charles A.: See—  
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,414,219, Cl. 424-267.000.
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Dunley, Benton A., III, 4,413,629, Cl. 128-660.000.
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- Stang, John H.; and Cusick, Steven N., 4,413,597, Cl. 123-41.420.
- Cuomo, Jerome J., to International Business Machines Corporation. Negative ion beam selective etching process. 4,414,069, Cl. 204-192.00E.
- Curbelo, Raul: See—  
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Klak, Roland; Frankle, Gerhard; and Woschec, Dieter, 4,413,606, Cl. 123-550.000.
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Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiro, 4,414,636, Cl. 364-526.000.
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Hill, Richard C.; and Daniele, Mark R., 4,413,571, Cl. 110-234.000.
- Dart Industries Inc.: See—  
Quinn, Leonard L., 4,413,515, Cl. 73-296.000.
- Dattilo, Anthony J.; McDonald, James F.; and Queener, Carl A., to International Business Machines Corporation. Information transmitting and receiving station utilizing a copier-printer. 4,414,579, Cl. 358-256.000.
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- Dausinger, Friedrich; Muller, Werner; and Arnold, Peter, to Arnold, Peter. Laser beam surface treatment process for materials of large reflectivity. 4,414,038, Cl. 148-4.000.
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- David Brown Tractors Ltd.: See—  
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- Scott, Brian; and Duncan, Robert, 4,414,533, Cl. 340-52.00R.
- Davidson, Thomas L., to Robertson Paper Box Co., Inc. Display box. 4,413,726, Cl. 206-45.130.
- Davis, Edwin W.; and Braun, Jack A., to Eastern Company, The. Tool-operated flush-mountable latch. 4,413,849, Cl. 292-229.000.
- Davis, Frank N.; and Podgurski, Harry H., to United States Steel Corporation. Continuous decarburization annealing with recycle to convert carbon monoxide. 4,414,043, Cl. 148-16.000.
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- Davis, Walter L.; and Jacobson, James E., Jr., to Motorola, Inc. Dual deadman timer circuit. 4,414,623, Cl. 364-200.000.
- Davy McKee (Oil & Chemicals) Limited: See—  
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,414,420, Cl. 568-454.000.
- Dayco Corporation: See—  
Foster, Randy C., 4,413,982, Cl. 474-138.000.
- Wetzel, Robert E.; and Marsh, Richard L., 4,414,047, Cl. 156-138.000.
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- DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, to Montedison S.p.A. Process for the preparation of unsaturated carboxylic acids by the catalytic oxidation in gaseous phase of the corresponding aldehydes and catalyst used in said process. 4,414,412, Cl. 562-535.000.
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- Dean, Gilbert J.; and White, Loren H., to General Electric Company. Liner assembly for gas turbine combustor. 4,413,477, Cl. 60-757.000.
- Dean, Robert, to Mars, Inc. Method and apparatus for detecting the presence of a coin in a passageway. 4,413,718, Cl. 194-1.00K.
- De Bievre, Paul J.; Vansant, Etienne F.; and Peeters, Guido J., to European Atomic Energy Community (Euratom). Method of encapsulating materials in a zeolite in a stable manner. 4,414,005, Cl. 55-75.000.
- Decker, Harry J.; and Thorsteinson, Erlind M., to Union Carbide Corporation. Process for preparing unsaturated acids with Mo, V, Ti-containing catalysts. 4,414,411, Cl. 562-534.000.
- DeCoste, Stephen H., to Midland-Ross Corporation. Waterproof electrical switch with safety interlock. 4,414,440, Cl. 200-50.00B.
- Deepsea Ventures, Inc.: See—  
Latimer, John P., 4,413,925, Cl. 405-195.000.
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- Ragon, Danny L., 4,413,862, Cl. 305-10.000.
- DeFusco, Thomas: See—  
Forrest, John W.; and DeFusco, Thomas, 4,413,880, Cl. 350-96.200.
- Degen, Ludwig: See—  
Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, 4,414,333, Cl. 435-243.000.
- Deguchi, Toshihisa: See—  
Ohta, Kenji; Takahashi, Akira; and Deguchi, Toshihisa, 4,414,650, Cl. 365-122.000.
- Deike, Robert F.: See—  
Lane, Vern E., 4,413,907, Cl. 356-141.000.
- de Jong, Gerrit, to Societe Anonyme Francaise du Ferodo. Stator for rotating electric machine. 4,414,481, Cl. 310-42.000.
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- Delaney, Dennis D.; and Fenton, Donald M., to Union Oil Company of California. Process for removal of metals from hydrocarbon oils. 4,414,104, Cl. 208-251.00R.
- Delio, Ralph D.: See—  
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- De Lorenzo, Bruce L.; and McCarthy, Daniel J. Leak detection arrangement for valve having sealing means. 4,413,647, Cl. 137-312.000.
- de Maigret, Herve C. Devices for supplying tube exchangers with cleaning bodies and for recovering these bodies. 4,413,673, Cl. 165-95.000.
- Dempsey, Thomas K.: See—  
Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenson, Sherman A.; and Stephens, David G., 4,413,522, Cl. 73-646.000.
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Haraga, Kousuke; and Hattori, Katsutoshi, 4,414,257, Cl. 428-182.000.
- Denley, Ronald S., to Oak Industries Inc. Means for attaching auxiliary devices to a membrane switch. 4,414,452, Cl. 200-159.00B.
- Dennis, Alan J.: See—  
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,414,420, Cl. 568-454.000.
- Dennison, Saul: See—  
Seltzer, Samuel M.; and Dennison, Saul, 4,414,611, Cl. 362-183.000.
- Dentsply Research & Development Corp.: See—  
Mosebrook, Dennis R.; and Seeley, Wayne C., 4,413,867, Cl. 312-111.000.
- Derby, Sherwin L. Mobile chair. 4,413,693, Cl. 180-74.000.
- Deroouane, Eric G.: See—  
Sherwood, Rexford D.; Baker, Rees T. K.; Deroouane, Eric G.; and Pieters, Wim J. M., 4,414,256, Cl. 428-163.000.
- Deschner, David: See—  
Burnell, Elvin W.; and Deschner, David, 4,413,852, Cl. 292-259.000.
- Desrantes & Huot: See—  
Delajoud, Pierre, 4,413,526, Cl. 73-745.000.
- Detriche, Jean-Marie: See—  
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- Dexter, Martin; and Winter, Roland A. E., to Ciba-Geigy Corporation. Ultraviolet-absorbing stabilizers substituted by an aliphatic hydroxyl group. 4,414,393, Cl. 548-260.000.
- Diamond Shamrock Corporation: See—  
Lipowski, Stanley A., 4,414,034, Cl. 106-90.000.
- Diasonics Cardio/Imaging, Inc.: See—  
Anderson, Weston A.; Clark, Lloyd D.; and Beaver, William L., 4,413,630, Cl. 128-661.000.
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- Dickenson, Royston J., to General Electric Company. Automatic redundant transducer selector for a steam turbine control system. 4,414,540, Cl. 340-508.000.
- Dickerson, Robert E., to Eastman Kodak Company. Forehardened high aspect ratio silver halide photographic elements and processes for their use. 4,414,304, Cl. 430-353.000.
- Diehl, John E.: See—  
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- Diemer, Donald J.; and Delio, Ralph D. Rolling key lock for forging die and press. 4,413,499, Cl. 72-446.000.
- Diephouse, Timothy R.: See—  
Ash, Mary L.; Diephouse, Timothy R.; and Strom, Robert M., 4,414,422, Cl. 568-724.000.
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- Diesel Kiki Co., Ltd.: See—  
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- Yanagawa, Hajime; and Suzuki, Yoshio, 4,413,600, Cl. 123-449.000.
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- Dittrich, Sebastian, to Magnetic Weather Stripping Corp. Threshold assembly. 4,413,446, Cl. 49-470.000.
- Dr. E. Fresenius Chemisch-pharmazeutische Industrie KG Apparatbau KG: See—  
Schindler, Johannes G., 4,413,627, Cl. 128-635.000.
- Dr.-Ing. Rudolf Hell GmbH: See—  
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Re-decker, Friedrich; Sendiko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635, Cl. 364-526.000.
- Dr. Johannes Heidenhain GmbH: See—  
Baumgartner, Alfons, 4,414,678, Cl. 377-28.000.
- Ernst, Alfons, 4,413,416, Cl. 33-125.00R.
- Kraus, Heinz, 4,414,680, Cl. 378-84.000.
- Dr. Karl Thomae GmbH: See—  
Landwehr, Frank; and Wanner, Heinz, 4,413,754, Cl. 222-209.000.
- Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225, Cl. 424-274.000.
- Dr. Louis W. Parker: See—  
Hedges, Rhey W., 4,414,499, Cl. 318-798.000.
- Doherty, John, Jr., to Texas Instruments Incorporated. Thermally responsive switch. 4,414,524, Cl. 337-87.000.
- Doi, Tomoyuki: See—  
Sumi, Masaoki; and Doi, Tomoyuki, 4,414,495, Cl. 318-571.000.
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Cluniat, Claude; and Dominguez, Mariano, 4,414,568, Cl. 358-139.000.
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Lahm, Albert H.; and LaLonde, Paul D., 4,413,457, Cl. 52-314.000.
- Donovan, Daniel L.: See—  
Barr, Rodney E.; and Donovan, Daniel L., 4,414,163, Cl. 261-69.00A.
- Doss, Richard C., to Phillips Petroleum Company. Flotation reagent. 4,414,107, Cl. 209-166.000.
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Wolf, Donald A.; Smith, Clarence G.; and Johnson, Charles S., 4,413,361, Cl. 4-506.000.
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- Dovan, Hoai T.: See—  
Sandiford, Burton B.; Doan, Hoai T.; and Hutchins, Richard D., 4,413,680, Cl. 166-270.000.
- Dow Chemical Company, The: See—  
Ash, Mary L.; Diephouse, Timothy R.; and Strom, Robert M., 4,414,422, Cl. 568-724.000.
- Au, Andrew T., 4,414,218, Cl. 424-263.000.
- Solc, Jitka; and Harris, Robert F., 4,414,339, Cl. 523-137.000.
- Downes, Lawrence W.: See—  
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- Doyel, John S. Rug hook system for hobby users. 4,413,847, Cl. 289-17.000.
- Draheim, Frederick E.: See—  
Ginsburg, Stephen J.; and Draheim, Frederick E., 4,413,979, Cl. 433-41.000.
- Draiswerke GmbH: See—  
Lipp, Eberhard, 4,413,790, Cl. 241-101.00B.
- Dranetz Engineering Laboratories, Inc.: See—  
Talambiras, Robert P., 4,414,638, Cl. 364-571.000.
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- Dresser Industries, Inc.: See—  
Bissell, Robert D., 4,413,529, Cl. 73-756.000.
- Buckner, Guy O., 4,414,651, Cl. 367-27.000.
- Conti, Jack, 4,413,525, Cl. 73-741.000.
- Kosh, William S., 4,413,524, Cl. 73-707.000.
- Marshall, Dale F.; and Evans, Ted C., 4,413,946, Cl. 415-28.000.
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- Dubin, Robert R.: See—  
Rice, Richard G.; Boissevain, Mathew G.; and Dubin, Robert R., 4,413,911, Cl. 356-438.000.
- Dubois, Jean-Claude: See—  
Eraniel, Armand; Dubois, Jean-Claude; Gazard, Maryse; and Barre, Francoise, 4,414,081, Cl. 204-159.180.
- Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., to Boeing Co. The Method of making an injection molded propeller. 4,414,171, Cl. 264-249.000.
- Duhomez, Roger; and Quenton, Guy, to Compagnie Francaise des Aciers Speciaux. Device for blowing swirling gas into a metal refinery converter. 4,413,815, Cl. 266-265.000.
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- Duncan, Robert: See—  
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- Dunklee, Timothy V. Laser-controlled ground leveling device with overfill sensor and wheel rise limiting device. 4,413,684, Cl. 172-4.500.
- Dunder, Thomas A.: See—  
Walls, John E.; and Dunder, Thomas A., 4,414,311, Cl. 430-157.000.
- Duneau, Claude. Air cushion vehicle. 4,413,697, Cl. 180-120.000.



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- Dunn, William: See—  
Knapp, William; Dunn, William; and Smith, Kent F., 4,414,547, Cl. 340-825.830.
- Du Pont de Nemours, E. I., and Company: See—  
Cohen, Abraham B.; and Lazaridis, Christina N., 4,414,278, Cl. 428-402.000.
- Farnham, William B.; and Sogah, Dotsevi Y., 4,414,372, Cl. 526-190.000.
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Miki, Yukio; and Egawa, Takeshi, 4,413,894, Cl. 354-195.000.
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Yabuuchi, Shigeru; and Endoh, Takeyuki, 4,414,640, Cl. 364-702.000.
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Kiwalke, Jozef; Galloway, James H.; and Rowan, John W., 4,414,292, Cl. 429-19.000.
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Engelbert, Carol D.; Muller, Larry M.; and Muller, Dan E., 4,413,785, Cl. 239-443.000.
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Hesse, Theodor; Rieke, Helmut; and Kleine-Konig, Johannes, 4,413,933, Cl. 406-152.000.
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Matson, Wayne R., 4,413,505, Cl. 73-61.10C.
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Ford, Joseph B., 4,414,088, Cl. 204-237.000.
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Hankin, Thomas E., 4,414,168, Cl. 264-49.000.
- Escher Wyss Limited: See—  
Hantelmann, Harald, 4,413,669, Cl. 165-1.000.
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Schweickardt, Karl, 4,414,600, Cl. 361-56.000.
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Becker, Werner; and Kistner, Heinz, 4,414,054, Cl. 156-384.000.
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Turner, Jesse H.; and Wallace, Elmer E., 4,413,975, Cl. 431-56.000.
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Besson, Rene, 4,413,915, Cl. 368-71.000.
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Frostig, Amos, 4,413,567, Cl. 102-525.000.
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Brunet, Michel, 4,413,755, Cl. 222-402.200.
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Terrien, Michel E.; and Bouvet, Claude, 4,413,369, Cl. 14-27.000.
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Cervin, Robert J.; and Alpern, Marvin, 4,413,727, Cl. 206-63.300.
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Roper, Jerry M., 4,414,404, Cl. 560-41.000.
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Jagisch, Frank C.; and Evans, Morris L., 4,414,346, Cl. 524-158.000.
- Evans, Ted C.: See—  
Marshall, Dale F.; and Evans, Ted C., 4,413,946, Cl. 415-28.000.
- Evinger, Hubert W.: See—  
Peyton, John J.; Thomason, Robert L.; and Evinger, Hubert W., 4,414,566, Cl. 358-101.000.
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Capasso, Ursula, 4,413,626, Cl. 128-498.000.
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Dickakian, Ghazi, 4,414,095, Cl. 208-44.000.
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- Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,414,256, Cl. 428-163.000.
- Wristers, Harry J., deceased, 4,414,371, Cl. 526-119.000.
- Eyley, Stephen C.: See—  
Raphael, Richard A.; Eyley, Stephen C.; and Coltman, Stephen C. W., 4,414,416, Cl. 564-443.000.
- Fabris, Hubert J.: See—  
Lenke, Gerd M.; and Fabris, Hubert J., 4,414,362, Cl. 525-178.000.
- Facet Enterprises, Incorporated: See—  
Wiermicki, Michael V., 4,413,950, Cl. 417-53.000.
- Faiveley S.A.: See—  
Milleville, Andre, 4,413,710, Cl. 191-70.000.
- Falciani, Marco: See—  
Broggi, Renato; and Falciani, Marco, 4,414,387, Cl. 544-28.000.
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Wallock, Richard G., 4,413,980, Cl. 464-82.000.
- Falk, John C.; and Khait, Klementina F., to Borg-Warner Corporation. Glass-filled thermoplastic resins. 4,414,342, Cl. 523-437.000.
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Weber, Jürgen; Falk, Volker; and Kniep, Claus, 4,414,419, Cl. 568-421.000.
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Peuhkurinen, Eino J.; Linnaketo, Erkki J.; Farm, Kari M. U.; Kivistö, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495, Cl. 72-196.000.
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- Farmitalia Carlo Erba: See—  
Pellegata, Renato; and Gandolfi, Carmelo, 4,414,407, Cl. 424-305.000.
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- Farr, Aaron V., to Abex Corporation. Vertical descent rate detector switch. 4,414,518, Cl. 335-205.000.
- Farrar, Ralph C.: See—  
Senatore, Guy; and Farrar, Ralph C., 4,414,340, Cl. 523-219.000.
- Farrell, Thomas R., to Chevron Research Company. Selective removal and recovery of ammonia and hydrogen sulfide. 4,414,103, Cl. 208-212.000.
- Faye, Lloyd H. Motorized system for cleaning drain troughs. 4,413,449, Cl. 52-16.000.
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Parsons, John H.; and West, Peter J., 4,414,221, Cl. 424-269.000.
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Milligan, Brian; Buechler, Peter R.; and Fairheller, Stephen H., 4,413,997, Cl. 8-94.210.
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- Fellner, Theodore F., to Mapatent, N.V. Horizontal accumulator. 4,413,724, Cl. 198-594.000.
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Conforti, Frederick J.; and Fenne, Kenneth R., 4,414,612, Cl. 362-188.000.
- Fenton, Donald M.: See—  
Delaney, Dennis D.; and Fenton, Donald M., 4,414,104, Cl. 208-251.00R.
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Springer, Gilbert D., 4,414,554, Cl. 346-74.500.
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- Fernandez, Helena J.: See—  
Fernandez, David; and Fernandez, Helena J., 4,413,822, Cl. 273-73.00C.
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- Ferretti, James: See—  
Meinsen, Edward; and Ferretti, James, 4,413,493, Cl. 70-422.000.
- Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., to Telecommunications Radioelectriques et Telephoniques T.R.T. Electronic subscriber line interface circuit having means to equalize current through the output differential amplifier. 4,414,434, Cl. 179-77.000.
- Ferriss, Lincoln S., to Singer Company. The. Magnetic resonance gyro signal processor. 4,414,535, Cl. 340-347.0AD.
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Piano, Renzo, 4,413,550, Cl. 98-2.000.
- Fiber Industries, Inc.: See—  
McClary, Edward B., 4,414,169, Cl. 264-210.700.
- Ficca, Vincent G., to Joseph E. Seagram & Sons, Inc. Special natural wines simulative of liqueurs. 4,414,231, Cl. 426-271.000.
- Fidock, Robert J. Method of retrieving and securing anchors, fish traps and lobster pots. 4,413,381, Cl. 24-131.00C.
- Field, Harold: See—  
Williamson, Thomas R., III; Jones, Beth B.; Field, Harold; and Stephenson, Robert F., 4,414,303, Cl. 429-217.000.
- Fields, Ellis K., to Standard Oil Company (Indiana). Class of Friedel-Crafts catalysts. 4,414,406, Cl. 560-109.000.
- Filtertek, Inc.: See—  
Leason, Hayden L., 4,414,172, Cl. 264-255.000.
- Finkle, Louis J. Portable power driven wire puller. 4,413,808, Cl. 254-134.3FT.
- Firestone Tire & Rubber Company, The: See—  
Dougherty, David J.; Gunesin, Binnur; and Spiewak, John W., 4,414,359, Cl. 524-555.000.
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- Fisch, Klaus: See—  
Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, 4,414,330, Cl. 435-93.000.
- Fischell, Norman L. Apparatus and process for nesting drum bodies. 4,413,400, Cl. 29-515.000.
- Fischer, Hanspeter: See—  
Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, 4,414,158, Cl. 260-438.100.
- Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Chain-type transport apparatus, for use with printing machines. 4,413,562, Cl. 101-408.000.
- Fischer, Karl; and Schreder, Felix, to Fischer, Karl. Electric hotplate. 4,414,466, Cl. 219-459.000.
- Fischer, Robert A. Anti-flashback cutting torch. 4,413,809, Cl. 266-48.000.
- Fischer, Robert R.; and Urschel, Joe R., to Urschel Laboratories, Incorporated. Method of making a tubular cylinder for extruding a product. 4,413,537, Cl. 76-101.00R.



- Fischer, Wilfried, to Brown, Boveri & Cie AG. Shunt element. 4,414,297. Cl. 429-61.000.
- Fisher, Harry M.; and Fisher, Stuart N., to Talon, Inc. Slide fastener chain with leg remnants at gap and method and apparatus of manufacture. 4,413,398. Cl. 29-410.000.
- Fisher, Robert P. Method for generating chlorine dioxide gas. 4,414,180. Cl. 422-186.000.
- Fisher, Stuart N.: See—  
Fisher, Harry M.; and Fisher, Stuart N., 4,413,398. Cl. 29-410.000.
- Fishman, Avraham. Device for holding an object on a smooth shelf surface. 4,413,802. Cl. 248-362.000.
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Raphael, Richard A.; Eyley, Stephen C.; and Coltman, Stephen C. W., 4,414,416. Cl. 564-443.000.
- Flambeau Product Corporation: See—  
Lanius, Charles A.; Hultstrum, Harold D.; and Rau, Gerald A., 4,413,804. Cl. 251-144.000.
- Flanagan, Francis. Sliding patio for travel trailers and mobile homes. 4,413,855. Cl. 296-162.000.
- Flat Auto S.p.A.: See—  
Leoni, Aldo, 4,413,605. Cl. 123-547.000.
- Fleig, Gunther: See—  
Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, 4,413,788. Cl. 239-703.000.
- Fleming, Mable L.: See—  
Dwyer, R. William, Jr.; and Fleming, Mable L., 4,413,641. Cl. 131-361.000.
- Flieter, Wilhelm: See—  
Klie, Jürgen; Lubos, Walter; and Flieter, Wilhelm, 4,413,548. Cl. 91-491.000.
- Flory, Robert E., to RCA Corporation. Clamp for line-alternate signals. 4,414,572. Cl. 358-172.000.
- Floyd, Levon R.: See—  
Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674. Cl. 165-104.330.
- Flye, Donald R.; and Heininger, Richard T., to Gem Industries, Inc. Safety latch for crib drop side. 4,413,365. Cl. 5-100.000.
- FMC Corporation: See—  
Peterson, Shepard J., 4,413,690. Cl. 177-54.000.
- Foley, James W. B., to General Electric Company. Low dissipation snubber for switching power transistors. 4,414,479. Cl. 307-253.000.
- Folk, Stewart H., to Stewart Folk & Company, Incorporated. Mining of sulphur with foam barrier. 4,413,859. Cl. 299-4.000.
- Fonstad, Clifton G.: See—  
Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slater); and Fonstad, Clifton G., 4,414,076. Cl. 204-15.000.
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- Ford, Edward J., Jr., to United States of America, Navy. Gas generator outlet having controlled temperature transition. 4,414,181. Cl. 422-240.000.
- Ford, Joseph B., to ERCO Industries Limited. Chlorate cell system. 4,414,088. Cl. 204-237.000.
- Ford Motor Company: See—  
Archer, Emmitt W.; and Gentle, Derek F., 4,414,266. Cl. 428-287.000.
- Jackson, Alan S., 4,413,551. Cl. 98-40.00V.
- Novak, Robert F., 4,414,531. Cl. 338-34.000.
- Shah, Ramesh H., 4,413,840. Cl. 280-784.000.
- Slocumbe, Joseph; and Parry, Michael A., 4,413,694. Cl. 180-89.140.
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- Whitney, Douglas A.; and Kavalhuna, Sergio, 4,413,536. Cl. 74-869.000.
- Forest Industries Machine Corp.: See—  
Gregoire, James L.; Wismer, Robert D.; and Brouer, Robert L., 4,413,662. Cl. 144-356.000.
- Forrest, John W.; and DeFusco, Thomas, to Bowmar/ALI, Inc. Adaptable connector for a fiber optic testing device. 4,413,880. Cl. 350-96.200.
- Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., to Bell Telephone Laboratories, Incorporated. Electrochemical photoetching of compound semiconductors. 4,414,066. Cl. 204-129.300.
- Foster, Ellis L.: See—  
Wickersham, Charles E.; and Foster, Ellis L., 4,414,085. Cl. 204-192.000.
- Foster, Randy C., to Dayco Corporation. Belt tensioner, part thereof and methods of making the same. 4,413,982. Cl. 474-138.000.
- Foti, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, to Revlon, Inc. Cosmetic pencil having a sharpenable polyethylene casing. 4,413,921. Cl. 401-96.000.
- Franken, Klaus: See—  
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667. Cl. 164-154.000.
- Frankle, Gerhard: See—  
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- Freed, Meier E., to American Home Products Corporation. 4-Substituted-piperidino carboxamides. 4,414,389. Cl. 544-349.000.
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- Fromson, Howard A.: See—  
Gracia, Robert F.; and Fromson, Howard A., 4,414,315. Cl. 430-302.000.
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Lowry, Hugh R.; and Frost, Robert T., 4,414,285. Cl. 428-577.000.
- Frostig, Amos, to Etablissement Salgad. Fin-stabilized mortar grenade. 4,413,567. Cl. 102-525.000.
- Fu, Cheng-Chyi, to Syntex (U.S.A.) Inc. Contact lens cleaning solutions. 4,414,127. Cl. 252-95.000.
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Ogasawara, Satoru, 4,414,582. Cl. 358-282.000.
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- Fujimura, Takashi: See—  
Nishizawa, Masahiko; and Fujimura, Takashi, 4,414,318. Cl. 430-24.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsu; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226. Cl. 424-279.000.
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Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,414,457. Cl. 219-69.00W.
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Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, 4,414,196. Cl. 423-633.000.
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Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,414,319. Cl. 430-65.000.
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Kigawa, Tomio; and Fukui, Kouetsu, 4,413,929. Cl. 405-260.000.
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Inaga, Hisashi; and Fukuoka, Takashi, 4,413,705. Cl. 181-240.000.
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Newsome, Thomas B.; and Fulford, Garry, 4,413,716. Cl. 192-70.120.
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Yanase, Takeyasu, 4,414,648. Cl. 365-16.000.
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- G. A. Serlachius Oy: See—  
Larikka, Leo, 4,413,485. Cl. 72-71.000.
- G. Dusterloh GmbH: See—  
Klie, Jürgen; Lubos, Walter; and Flieter, Wilhelm, 4,413,548. Cl. 91-491.000.
- G. Rau GmbH & Co.: See—  
Schneider, Friedrich, 4,414,444. Cl. 219-121.0LM.
- Gabriel, Fredy, to Stapro AG. Device for fastening elongated synthetic resin profiles. 4,413,799. Cl. 248-59.000.
- Gabriel, Nancy J. (Slater): See—  
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- Gale, Edward A.; Wetzel, John J., III; and Wetzel, James H. Laser-sighted breech firing device. 4,414,610. Cl. 362-113.000.
- Galena, Peter E.: See—  
Hackett, Walter J.; and Galena, Peter E., 4,414,360. Cl. 524-560.000.
- Galera, Richard: See—  
Cornu, Jean; Detriche, Jean-Marie; Turet, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910. Cl. 356-377.000.
- Galindo, Rudolph D., to Petillo, Bruce; and Pawlowski, Stan. Track lighting system. 4,414,617. Cl. 362-404.000.
- Gallagher, Timothy J.; and Ju, Kochan, to International Business Machines Corporation. Gap tolerant merge element for contiguous-disk bubble devices. 4,414,649. Cl. 365-36.000.
- Galloway, James H.: See—  
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- Galvin, Ralph B. Sun tracking device. 4,413,423. Cl. 33-268.000.
- Gandolfi, Carmelo: See—  
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- Gano, Lloyd D. Cooling system protective device. 4,413,675. Cl. 165-119.000.
- Garcia, Earl R.: See—  
Lu, Wen-Tong P.; and Garcia, Earl R., 4,414,092. Cl. 204-294.000.
- Gardner, Anthony R. Method of playing a board game utilizing cards. 4,413,828. Cl. 273-236.000.
- Gardner, Hugh C., to Union Carbide Corporation. Curable molding compositions. 4,414,367. Cl. 525-531.000.
- Garnier, Andre, to Vallourec SA. Method for fixing a tube by expansion. 4,413,395. Cl. 29-157.30C.
- Garrabrants, Ralph S. Switch with replaceable flasher unit. 4,414,525. Cl. 337-92.000.
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Ryan, William F., 4,413,795. Cl. 244-3.220.
- Schug, Arden L., 4,414,631. Cl. 364-426.000.
- Garth, Geoffrey C. Portable cervical collar. 4,413,619. Cl. 128-76.00R.
- Garwood, William E.: See—  
Chester, Arthur W.; and Garwood, William E., 4,414,097. Cl. 208-59.000.
- Garzon, Ruben D., to Brown Boveri Electric, Inc. Liquid SF<sub>6</sub> interrupter with proportional feedback. 4,414,445. Cl. 200-148.00A.
- Garzon, Ruben D., to Brown Boveri Electric Inc. Quick open and close disconnect switch. 4,414,449. Cl. 200-146.00R.
- Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, to Dr.-Ing. Rudolf Hell GmbH. Method and circuit for recognition of colors. 4,414,635. Cl. 364-526.000.
- Gates Energy Products, Inc.: See—  
Uba, Toshio, 4,414,295. Cl. 429-59.000.
- Gaul, James M.; and Nguyen, Tinh, to Atlantic Richfield Company. Organic polyisocyanate-cyclic alkylene carbonate adhesive binder compositions. 4,414,361. Cl. 524-702.000.
- Gavagan, James A.; and Brennan, William E., to Irvin Industries, Inc. Inverse clevis safety belt buckle. 4,413,385. Cl. 24-230.00A.
- Gazard, Maryse: See—  
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- Gazzarini, Vinicio, to Solis S.r.l. Device for trimming an edge of a tubular textile article. 4,413,575. Cl. 112-129.000.
- Gedeon, Carl A.: See—  
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., 4,414,634. Cl. 364-510.000.
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- Gehrmann, Klaus: See—  
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,414,160. Cl. 260-544.00A.
- Gehrt, Louis M., to Emerson Electric Co. Environmentally protected switch construction. 4,414,443. Cl. 200-80.00R.
- Geisbusch, Peter: See—  
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667. Cl. 164-154.000.
- Geisey, James W., to Rotek Incorporated. Bearing assembly with wear pads. 4,413,866. Cl. 308-217.000.
- Gelez, Jean-Philippe, to Societe Anonyme dite Alstom-Atlantique. Electric arc cooling apparatus for the chimneys of cut-out devices. 4,414,446. Cl. 200-144.00R.
- Gem Industries, Inc.: See—  
Flye, Donald R.; and Heininger, Richard T., 4,413,365. Cl. 5-100.000.
- Genentech, Inc.: See—  
Goeddel, David V., 4,414,150. Cl. 260-112.50R.
- General American Transportation Corporation: See—  
Price, Albert E., 4,414,462. Cl. 219-202.000.
- General Electric Company: See—  
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,414,501. Cl. 323-280.000.
- Bennett, Moreland P.; and Ballard, Donald E., 4,413,406. Cl. 29-609.000.
- Cline, Harvey E., 4,414,243. Cl. 427-100.000.
- Cohen, Stuart C.; Kostelnik, Robert J.; and Wambach, Allen D., 4,414,352. Cl. 524-443.000.
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- Dickenson, Royston J., 4,414,540. Cl. 340-508.000.
- Foley, James W. B., 4,414,479. Cl. 307-253.000.
- Heckelman, Richard W.; Marchant, Christopher E.; and Williams, Jack B., 4,414,669. Cl. 371-49.000.
- Hoffman, David M.; Pritzkow, Dennis; and Lang, George R., 4,414,473. Cl. 250-366.000.
- Lowry, Hugh R.; and Frost, Robert T., 4,414,285. Cl. 428-577.000.
- Milkovic, Miran, 4,414,510. Cl. 324-252.000.
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- Smith, Murray S., Jr.; Hilboldt, Mark S.; and Mathur, Pracheeshwar S., 4,414,178. Cl. 422-444.000.
- Vaughn, Howard A., Jr.; and Ching, Ta-Yen, 4,414,349. Cl. 524-261.000.
- Webster, Harold F., 4,413,766. Cl. 228-123.000.
- General Foods Corporation: See—  
Evans, David N.; Jarvis, Gary W.; Steensen, Wayne L.; and Shah, Manoj Kumar O., 4,414,237. Cl. 426-589.000.
- General Foods Limited: See—  
Oven, Judith L., 4,414,239. Cl. 426-607.000.
- General Instrument Corporation: See—  
Knapp, William; Dunn, William; and Smith, Kent F., 4,414,547. Cl. 340-825.830.
- General Motors Corporation: See—  
Fales, Douglas L., 4,413,953. Cl. 417-262.000.
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- McMahan, David R.; and Nicholas, Richard W., 4,414,614. Cl. 362-269.000.
- Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., 4,413,838. Cl. 280-751.000.
- General Products Company, Inc.: See—  
McKann, H. Smith, 4,413,397. Cl. 29-416.000.
- General Tire & Rubber Company, The: See—  
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,414,173. Cl. 264-257.000.
- Lenke, Gerd M.; and Fabris, Hubert J., 4,414,362. Cl. 525-178.000.
- Genrad, Inc.: See—  
Greenwood, Edward H., 4,414,664. Cl. 371-20.000.
- Gentle, Derek F.: See—  
Archer, Emmitt W.; and Gentle, Derek F., 4,414,266. Cl. 428-287.000.
- Georg Fischer Brugg-Oehler AG: See—  
Bernath, Oskar, 4,414,050. Cl. 156-166.000.
- George P. Reintjes Company, Inc.: See—  
Musser, John J., 4,413,572. Cl. 110-331.000.
- Gerlach, Horst. Method of assembling a spiral stair case. 4,413,460. Cl. 52-741.000.
- Gerzon, Michael A., to National Research Development Corporation. Decoders for feeding irregular loudspeaker arrays. 4,414,430. Cl. 381-22.000.
- Gessner, Gerald A., to Advanced Semiconductor Materials Die Bonding, Inc. Stepping motor drive circuit. 4,414,498. Cl. 318-696.000.
- GHA Lock Joint, Inc.: See—  
Swanson, Harold V., 4,414,385. Cl. 524-494.000.
- Giardino, David A.: See—  
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,413,396. Cl. 29-407.000.
- Gibeau, Frank C.: See—  
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., 4,414,594. Cl. 360-106.000.
- Gilad, Aviram: See—  
Gilead, Gideon; and Gilad, Aviram, 4,413,787. Cl. 239-542.000.
- Gilb, Tyrell T., to Simpson Strong-Tie Company, Inc. Mud-sill anchor. 4,413,456. Cl. 52-295.000.
- Gilead, Gideon; and Gilad, Aviram. Apparatus for drip irrigation. 4,413,787. Cl. 239-542.000.
- Gille, Etienne: See—  
Lucas, Jean; Molle, Jean-Francois; Gille, Etienne; and Creze, Patrick, 4,414,002. Cl. 48-209.000.
- Gillespie, Ronald G., to Texaco Development Corporation. Alarm means for use with apparatus protecting a device situated in a borehole. 4,413,678. Cl. 166-57.000.
- Gillette Company, The: See—  
Trotta, Robert A., 4,413,411. Cl. 30-85.000.



- Gilligan, William H.: See—  
Sitzmann, Michael E.; and Gilligan, William H., 4,414,413., Cl. 564-35.000.
- Gilvar, Martin; and Wykes, Phillips, to Morgan Construction Company. Pinch roll system for vertical laying heads. 4,413,494., Cl. 72-167.000.
- Ginsburg, Stephen J.; and Draheim, Frederick E., to Black Knight Investments Limited. Preform for molding custom dental impression trays. 4,413,979., Cl. 433-41.000.
- Giolito, Silvio L., to Stauffer Chemical Company. Process for producing low temperature stable tert-butylphenyl diphenyl phosphate. 4,414,161., Cl. 260-975.000.
- Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, to Blaschim S.p.A. Process for preparing esters of 2-(6-methoxy-2-naphthyl)-propionic acid via rearrangement of new ketals of 2-halo-1-(6-methoxy-2-naphthyl)-propan-1-one and new esters of 2-(5'-bromo-6'-methoxy-2-naphthyl)-propionic acid thus prepared. 4,414,405., Cl. 560-56.000.
- GKN Transmissions Limited: See—  
Palmer, Bertram J., 4,414,046., Cl. 156-73.500.
- Glaser, Herbert: See—  
Palm, Jürgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, 4,414,192., Cl. 423-445.000.
- Glaser, Robert L., to Single Vend, Inc. Newspaper dispensing apparatus and method. 4,413,749., Cl. 221-1.000.
- Glasurit America, Inc.: See—  
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,414,357., Cl. 524-513.000.
- Gleitsmann, Gunter: See—  
Ellendt, Günther; Gleitsmann, Gunter; and Scheidel, Max, 4,414,074., Cl. 203-21.000.
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- Goans, Kip B., to Baker Cac, Inc. Diaphragm valve and method. 4,413,651., Cl. 137-625.250.
- Godbey, John K., to Mobil Oil Corporation. System for measuring cuttings and mud carryover during the drilling of a subterranean well. 4,413,511., Cl. 73-155.000.
- Goeddel, David V., to Genentech, Inc. Hybrid human leukocyte interferons. 4,414,150., Cl. 260-112.50R.
- Goettler, Lloyd A.: See—  
Coran, Aubert Y.; and Goettler, Lloyd A., 4,414,267., Cl. 423-288.000.
- Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Photopolymerizable polyamide ester resin compositions containing an oxygen scavenger. 4,414,312., Cl. 430-283.000.
- Goffinet, Pierre C. E., to Procter & Gamble Company. The. Liquid detergent compositions. 4,414,128., Cl. 252-111.000.
- Goldberg, Jack M. Diagnostic agents. 4,414,326., Cl. 435-11.000.
- Goldner, Tibor: See—  
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.
- Goncharenko, Vladimir V.: See—  
Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672., Cl. 373-22.000.
- Goodall, Brian L.; van der Nat, Adrianus A.; and Sijardijn, Willem, to Shell Oil Company. Olefin polymerization catalyst compositions and a process for the polymerization of olefins employing such compositions. 4,414,132., Cl. 502-169.000.
- Goodyear Tire & Rubber Company, The: See—  
Cottman, Kirkwood S., 4,414,408., Cl. 560-144.000.
- Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., 4,414,348., Cl. 524-255.000.
- Hoffman, Ronald E.; and Freed, William K., 4,413,420., Cl. 33-180.0AT.
- Goose, John: See—  
Brooker, Peter J.; and Goose, John, 4,414,222., Cl. 424-270.000.
- Gordon, Jack D.: See—  
Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., 4,413,747., Cl. 220-225.000.
- Gordon, Maxwell; and Christie, George J., to Bristol-Myers Company. Animal feeds. 4,414,206., Cl. 424-177.000.
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- Gormel, Thomas M.: See—  
Kapecki, Jon A.; Gormel, Thomas M.; and Vincent, Sheridan E., 4,414,307., Cl. 430-465.000.
- Gould, George K.; and Steinberg, Eric, to Video Corporation of America. Vending ordering terminal. 4,414,467., Cl. 235-381.000.
- Gould Inc.: See—  
Panaro, Robert J., 4,414,526., Cl. 337-163.000.
- Gozzo, Franco: See—  
Colle, Roberto; Gozzo, Franco; and Prezioso, Ciro, 4,414,018., Cl. 71-88.000.
- Gracia, Robert F.; and Fromson, Howard A., to Fromson, Howard A. Lithographic printing plate and process. 4,414,315., Cl. 430-302.000.
- Graff, Roderich W. Method and apparatus for drying moist exhaust air from one or more bulk material drying hoppers. 4,413,426., Cl. 34-27.000.
- Graham, Robert M.: See—  
Dunn, J. James; and Graham, Robert M., 4,413,733., Cl. 206-446.000.
- Grakauskas, Vytautas: See—  
Berkowitz, Phillip T.; Baum, Kurt; and Grakauskas, Vytautas, 4,414,384., Cl. 528-417.000.
- Grandes Boulangeries Associes G.B.A.: See—  
Nourigeon, Andre, 4,414,228., Cl. 426-19.000.
- Grant, Willie T. Direct drive air register damper. 4,413,774., Cl. 236-9.00A.
- Grasselli, Robert K.: See—  
Friedrich, Maria S.; Suresh, Dev D.; and Grasselli, Robert K., 4,414,134., Cl. 502-204.000.
- Gratz, Eugene J.: See—  
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171., Cl. 264-249.000.
- Grau, Werner: See—  
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.
- Graviner Limited: See—  
Farquhar, Robert L.; and Ball, David N., 4,414,542., Cl. 340-578.000.
- Gray, Billy D.: See—  
Anderson, Edward A.; Bennett, Benjamin; and Gray, Billy D., 4,414,606., Cl. 361-397.000.
- Great Lakes Carbon Corporation: See—  
Prescott, Roger, 4,413,860., Cl. 301-63.0PW.
- Greater Glasgow Health Board: See—  
Paton, John S., 4,413,760., Cl. 222-309.000.
- Green Cross Corporation, The: See—  
Watanabe, Ryozo; Kawasumi, Keiichi; Maeda, Shoichi; and Shoji, Takashi, 4,414,336., Cl. 436-502.000.
- Green, Robert H.; and Simon, James D. Valve detent. 4,413,805., Cl. 251-297.000.
- Greenwood, Edward H., to Genrad, Inc. Wait circuitry for interfacing between field maintenance processor and device specific adaptor circuit. 4,414,664., Cl. 371-20.000.
- Gregoire, James L.; Wismer, Robert D.; and Brouer, Robert L., to Forest Industries Machine Corp. Edging system. 4,413,662., Cl. 144-356.000.
- Gregor Jonsson Associates, Inc.: See—  
Betts, Edmund D., 4,413,377., Cl. 17-73.000.
- Grell, Wolfgang: See—  
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.
- Gremelspacher, Cornelius J.: See—  
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- Hathaway, Richard A., to Ampex Corporation. Fluid bearing tape scanning drum. 4,414,588., Cl. 360-84.000.
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- Hayashi, Masaru: See—  
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Conrad, Walter W.; and Hebert, James G., Jr., 4,413,698, Cl. 180-305.000.
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Flye, Donald R.; and Heininger, Richard T., 4,413,365, Cl. 5-100.000.
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von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,414,000, Cl. 8-555.000.
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- Hellinger, David L., to Lincoln Manufacturing Co., Inc. Method of attaching a handle to a cooking vessel. 4,413,767, Cl. 228-136.000.
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- Henrich, William H., to Thomas Industries Inc. Light dimmer for solid state ballast. 4,414,493, Cl. 315-308.000.
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- Hercules Incorporated: See—  
Maslanka, William W.; and Spence, Gavin G., 4,414,353, Cl. 524-458.000.
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Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,414,434, Cl. 179-77.000.
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Tallant, James C., II; and Hettiger, James, 4,414,577, Cl. 358-242.000.
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Zandona, Oliver J.; and Hettiger, William P., Jr., 4,414,098, Cl. 208-120.000.
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Smith, Murray S., Jr.; Hilboldt, Mark S.; and Mathur, Pracheeshwar S., 4,414,178, Cl. 422-444.000.
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Kinoshita, Tomoo; and Hinuma, Minoru, 4,413,965, Cl. 425-71.000.
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Hirota, Akira; Hiraguri, Seisuke; and Uchimi, Takashi, 4,414,586, Cl. 360-70.000.
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Nakamura, Koichi; and Hirai, Hiroyuki, 4,414,305, Cl. 430-373.000.
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Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620, Cl. 364-200.000.
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Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496, Cl. 318-696.000.
- Hirayama, Tsutomu, to Toyota Jidosha Kabushiki Kaisha. Engine cooling system with optionally communicable head cooling circuit and block cooling circuit, and method of operating the same. 4,413,596, Cl. 123-41.100.
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- Hirota, Toshio, to Nissan Motor Company, Limited. Method and apparatus for starting an alcohol engine. 4,413,594, Cl. 123-3.000.
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Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,413,374, Cl. 16-121.000.
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Yabuuchi, Shigeru; and Endoh, Takeyuki, 4,414,640, Cl. 364-702.000.
- Yamamoto, Manabu; and Tanaka, Shuhei, 4,414,575, Cl. 358-227.000.
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Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,413,558, Cl. 101-93.140.
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Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717, Cl. 192-84.000.
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- Sakurada, Hiroshi; and Aoyama, Naofumi, 4,414,545, Cl. 340-790.000.
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Imaoka, Hiroshi; Sakiyama, Michio; and Yamamoto, Masahiro, 4,413,498, Cl. 72-405.000.
- Hitchcock, James E., to Magnavox Consumer Electronics Company. Nonlinear edge peaking system and method. 4,414,564, Cl. 358-37.000.
- Hitzman, Donald O., to Phillips Petroleum Company. Oxygen scavenging with enzymes. 4,414,334, Cl. 435-262.000.
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- Hobbs, Howard F., to Variable Kinetic Drives Limited. Power transmission apparatus. 4,413,535, Cl. 74-688.000.
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Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, 4,413,869, Cl. 312-236.000.
- Hockersmith, Harold M., to Hoffer, Inc. Lawn mower blade retainer. 4,413,468, Cl. 56-295.000.
- Hoda, Syed N., to Corning Glass Works. Glass-ceramic articles having metallic surfaces. 4,414,281, Cl. 428-433.000.
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Wellner, Edward; Michejda, Maria; and Hodgen, Gary D., 4,413,985, Cl. 604-9.000.
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Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020, Cl. 71-108.000.
- von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,414,000, Cl. 8-555.000.
- Hoechst Aktiengesellschaft: See—  
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,414,160, Cl. 260-544.00A.
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Gross, Heinz; Reith, Friedrich; Retzlaff, Friedhelm; and Schlusnus, Karl H., 4,414,042, Cl. 148-12.00R.

- Hoffco, Inc.: See—  
Hockersmith, Harold M., 4,413,468, Cl. 56-295.000.
- Hoffert, Robert S.: See—  
Moyer, James D.; and Hoffert, Robert S., 4,413,580, Cl. 112-262.200.
- Hoffman Controls Corporation: See—  
Bowman, William W., 4,413,514, Cl. 73-204.000.
- Hoffman, David M.; Pritzkow, Dennis; and Lang, George R., to General Electric Company. Resilient mount for modular detector cell. 4,414,473, Cl. 250-366.000.
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Quella, Ferdinand; and Hohmann, Eugen, 4,414,241, Cl. 427-2.000.
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Takano, Motoharu; and Hoshino, Minoru, 4,413,977, Cl. 432-56.000.
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Hareng, Michel; Huignard, Jean-Pierre; and Le Berre, Serge, 4,413,885, Cl. 350-342.000.
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Lancaster, Paul B.; and Huisentruit, Gordon A., 4,413,801, Cl. 248-316.00A.
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Lanius, Charles A.; Hulterstrum, Harold D.; and Rau, Gerald A., 4,413,804, Cl. 251-144.000.
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Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., 4,413,680, Cl. 166-270.000.
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Mehoudar, Raphael, 4,413,786, Cl. 239-542.000.
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Iijima, Takeshi, 4,413,924, Cl. 405-31.000.
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Otani, Junji; Ikenoya, Yasuo; and Iwashita, Kanau, 4,413,392, Cl. 29-157.00R.
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Tamura, Takeo; and Imai, Mamoru, 4,413,798, Cl. 248-27.100.
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Cartwright, David; and Turnbull, Michael, 4,414,391, Cl. 546-302.000.
- Griffin, Brian P.; and MacDonald, William A., 4,414,381, Cl. 528-190.000.
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Horie, Masao; Sunada, Yusuke; and Inari, Junta, 4,414,433, Cl. 179-70.000.
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Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424, Cl. 33-361.000.
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Roos, Johannes P., 4,413,428, Cl. 34-100.000.
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Hughes, Robert W.; and Cantrel, James F., 4,413,689, Cl. 175-409.000.
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Bourassa, Ronald R.; and Reeder, Michael R., 4,414,057, Cl. 156-643.000.
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Iwasako, Toshiyuki; and Inoue, Akio, 4,414,111, Cl. 210-500.200.
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Inoue, Kiyoshi, 4,414,028, Cl. 419-31.000.
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Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, 4,414,105, Cl. 208-309.000.
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Macriess, Robert A.; and Zawacki, Thomas S., 4,413,480, Cl. 62-112.000.
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Hanlet, Jacques M., 4,414,492, Cl. 315-290.000.
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Blonder, Alain, 4,414,684, Cl. 382-4.000.
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Applegate, Steven L.; and Molloy, James J., 4,413,919, Cl. 400-208.000.
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Thorogood, Robert M., 4,414,094, Cl. 208-8.0LE.
- International Flavors & Fragrances Inc.: See—  
Boden, Richard M., 4,413,639, Cl. 131-276.000.
- International Jensen Incorporated: See—  
Maier, Bruce; and Maloney, Brian J., 4,414,438, Cl. 200-6.00A.
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Lidlow, Alexander, 4,414,560, Cl. 357-39.000.
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Suste, Joseph T., 4,414,544, Cl. 340-767.000.
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Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078, Cl. 204-34.000.
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Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496, Cl. 318-696.000.
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Losee, Paul D.; and Norton, David G., 4,414,592, Cl. 360-102.000.
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Harmison, Herbert A., Jr., 4,413,488, Cl. 70-57.000.
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Iwasaki, Hiroshi; and Irii, Shinsuke, 4,413,843, Cl. 282-27.500.
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Inoue, Kazuo; Narisawa, Ryo; Wada, Ryuji; Sato, Toshihiko; and Irino, Hiroshi, 4,413,602, Cl. 123-486.000.
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Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899, Cl. 355-4.000.
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Doke, Hiroshi; Itomi, Kazunobu; and Ishihara, Kenshi, 4,413,405, Cl. 29-596.000.
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Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, 4,414,245, Cl. 427-127.000.
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Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581, Cl. 358-280.000.
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Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoki, 4,414,665, Cl. 371-21.000.
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Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, 4,414,245, Cl. 427-127.000.
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Yamataka, Kazunori; Isoya, Toshiro; and Kitaguchi, Nobuya, 4,414,079, Cl. 204-75.000.
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Doke, Hiroshi; Itomi, Kazunobu; and Ishihara, Kenshi, 4,413,405, Cl. 29-596.000.
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Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Siobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672, Cl. 373-22.000.
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Otani, Junji; Ikenoya, Yasuo; and Iwashita, Kanau, 4,413,392, Cl. 29-157.00R.
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Meeker, James A.; and Jackson, Christopher J., 4,413,820, Cl. 271-101.000.
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Morris, John C.; and Jackson, Winston J., Jr., 4,414,382, Cl. 528-298.000.
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Davis, Walter L.; and Jacobson, James E., Jr., 4,414,623, Cl. 364-200.000.
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- Jarvis, Gary W.: See—  
Evans, David N.; Jarvis, Gary W.; Steensen, Wayne L.; and Shah, Manoj Kumar O., 4,414,237, Cl. 426-589.000.
- Jasso, Martin R., to Beutel, Phillip R. Catheter, 4,413,636, Cl. 128-786.000.
- Jefco Laboratories, Inc.: See—  
Dunlap, David A., 4,413,613, Cl. 126-292.000.
- Jeffers, Frederick J., to Eastman Kodak Company. Scanning magnetic head with propagating domain wall, 4,414,595, Cl. 360-115.000.
- Jenkins, Walter L. Base support installation for tripod-type structures, 4,413,455, Cl. 52-295.000.
- Jennmar Corporation: See—  
Calandra, Frank, Jr., 4,413,930, Cl. 405-261.000.
- Jensen, Kenneth N.: See—  
Rupert, John G.; and Jensen, Kenneth N., 4,413,434, Cl. 40-10.00R.
- Jeter, John D.: See—  
Croom, Robert E., Jr.; and Jeter, John D., 4,413,516, Cl. 73-431.000.
- Jimenez, Albert. Motorcycle safety belt, 4,413,358, Cl. 2-321.000.
- John Morrell & Co.: See—  
Cliff, John W., Jr., 4,413,375, Cl. 17-1.00R.
- Johnsen, Ottar; and Netravali, Arun N., to Bell Telephone Laboratories, Incorporated. Progressive transmission of two-tone facsimile, 4,414,580, Cl. 358-260.000.
- Johnson, Charles S.: See—  
Wolf, Donald A.; Smith, Clarence G.; and Johnson, Charles S., 4,413,361, Cl. 4-506.000.
- Johnson & Johnson Baby Products Company: See—  
Pieniak, Heinz A., 4,413,623, Cl. 604-365.000.
- Johnson & Johnson Products, Inc.: See—  
McCracken, Robert W.; and Dellas, James P., 4,413,621, Cl. 128-156.000.
- Johnson, Matthey & Co., Limited: See—  
Cameron, Donald S.; and Cooper, Susan J., 4,414,071, Cl. 204-242.000.
- Johnson, Ralph E., to Singer Company. The Bobbin case retaining means, 4,413,579, Cl. 112-184.000.
- Jones, Beth B.: See—  
Williamson, Thomas R., III; Jones, Beth B.; Field, Harold; and Stephenson, Robert F., 4,414,303, Cl. 429-217.000.
- Jones, Brian H., to Kelsey-Hayes Company. Method of manufacture of an energy absorbing beam, 4,414,049, Cl. 156-166.000.
- Jones, George D. Water damage preventer pan, 4,413,592, Cl. 122-510.000.
- Jones, Robert L., to NDT Instruments, Inc. Apparatus and method for measuring the extension of bolts under stress, 4,413,518, Cl. 73-615.000.
- Jorge, Gerard: See—  
Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910, Cl. 356-377.000.
- Joseph E. Seagram & Sons, Inc.: See—  
Ficca, Vincent G., 4,414,231, Cl. 426-271.000.
- Joshi, David P., to Colgate Palmolive Company. Free-flowing builder beads and detergents, 4,414,129, Cl. 252-135.000.
- Joy, Richard W.; and Smith, David F. Parasitic corrosion resistant anode for use in metal/air or metal/O<sub>2</sub> cells, 4,414,293, Cl. 429-27.000.
- Ju, Kochan: See—  
Gallagher, Timothy J.; and Ju, Kochan, 4,414,649, Cl. 365-36.000.
- Juhnke, Klaus; and Harlos, Hartmut S., to U.S. Philips Corporation. Television receiver circuit arrangement for identifying the standard, 4,414,563, Cl. 358-21.00R.
- Jung, Eggert: See—  
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- Jurgensen, Arthur R.: See—  
Voigtman, Edward G.; Winefordner, James D.; and Jurgensen, Arthur R., 4,413,504, Cl. 73-61.10C.
- Jurmeke, Joseph K.: See—  
Meridian, Anton W., Jr.; Jurmeke, Joseph K.; and Pinteric, Frank W., 4,414,590, Cl. 360-97.000.
- Juvinall, John W.: See—  
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738, Cl. 209-523.000.
- Jwi Ltd.: See—  
Woodward, Derrick R., 4,413,644, Cl. 137-103.000.
- Kabel-und Metallwerke, Guthehoffnungshutte AG: See—  
Niwiera, Wolfgang; Holtorf, Franz-Josef; and Biederer, Hans H., 4,413,768, Cl. 228-173.00A.
- Kabelac, William J., to International Business Machines Corporation. Bubble domain replicator for contiguous-disk devices, 4,414,647, Cl. 365-12.000.
- Kabushiki Kaisha Arai Seisakusho: See—  
Washida, Akira; and Nakauchi, Yuji, 4,413,831, Cl. 277-40.000.
- Kabushiki Kaisha Komatsu Seisakusho: See—  
Iwata, Masatoshi, 4,413,781, Cl. 239-91.000.
- Kabushiki Kaisha Meidensha: See—  
Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,414,448, Cl. 200-144.00B.
- Kabushiki Kaisha Suwa Seikosha: See—  
Hashimoto, Masami, 4,414,503, Cl. 323-315.000.
- Kabushiki Kaisha Toyota Jidoshokki Seisakusho: See—  
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,413,955, Cl. 417-270.000.
- Kabushiki Kaisha Yakult Honsha: See—  
Kazumi, Ozawa; and Shinichiro, No, 4,413,709, Cl. 198-344.000.
- Kaczerginski, Alexandre; and Willem, Michel, to Societe Anonyme dite: Ceraver. End cap attachment to laminated insulator core, 4,414,429, Cl. 174-179.000.
- Kadin, Saul B., to Pfizer Inc. 1-Oxo-1H-thiazolo[3,2-a]pyrimidine-2-carboxamides, 4,414,388, Cl. 544-48.000.
- Kadowaki, Kunio: See—  
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162, Cl. 261-23.00A.
- Kaeding, Jeanne E.: See—  
Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., 4,414,152, Cl. 260-185.000.



- Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., 4,414,320, Cl. 430-106.000.
- Kageyama, Takao: See—  
Tsutaki, Kunio; and Kageyama, Takao, 4,414,486, Cl. 315-3.600.
- Kahkipuro, Matti, to Elevator GmbH. Procedure and apparatus for switching thyristor bridges in static alternating current/direct conversion. 4,414,619, Cl. 363-70.000.
- Kaiser, Steven W.: See—  
Wrighton, Mark S.; Ellis, Arthur B.; and Kaiser, Steven W., 4,414,300, Cl. 429-111.000.
- Kajiyama, Takashi: See—  
Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077, Cl. 204-35.00N.
- Kakugo, Masahiro: See—  
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seichiro; and Yamashita, Katsuyoshi, 4,414,373, Cl. 526-348.000.
- Kamimura, Tetsuro: See—  
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,413,793, Cl. 242-68.000.
- Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, to Hitachi, Ltd. Electromagnetic clutch and method of manufacture. 4,413,717, Cl. 192-84.00C.
- Kanatan, Kenji: See—  
Habata, Etsuro; Ohshima, Nobumasa; and Kanatan, Kenji, 4,414,052, Cl. 156-273.700.
- Kanbe, Junichiro: See—  
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,414,319, Cl. 430-65.000.
- Kanebo Ltd.: See—  
Koyama, Hiroaki; and Shimizu, Shigeo, 4,414,379, Cl. 528-137.000.
- Kaneda, Saburo: See—  
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620, Cl. 364-200.000.
- Kanzaki Paper Manufacturing Co., Ltd.: See—  
Iwasaki, Hiroshi; and Iri, Shinsuke, 4,413,843, Cl. 282-27.500.
- Tsuchiya, Hiroshi; Yamahira, Hitoshi; and Murakami, Takeshi, 4,414,259, Cl. 428-207.000.
- Kao Soap Co., Ltd.: See—  
Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255, Cl. 428-154.000.
- Kapecki, Jon A.; Gormel, Thomas M.; and Vincent, Sheridan E., to Eastman Kodak Company. Method and composition for preparation of photographic color developing solutions. 4,414,307, Cl. 430-465.000.
- Kaplan, Leon H.; Kaplan, Richard D.; and Zimmerman, Steven M., to International Business Machines Corporation. Resolution in optical lithography. 4,414,314, Cl. 430-311.000.
- Kaplan, Richard D.: See—  
Kaplan, Leon H.; Kaplan, Richard D.; and Zimmerman, Steven M., 4,414,314, Cl. 430-311.000.
- Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, to Ricoh Company, Ltd. Copying method and apparatus. 4,413,899, Cl. 355-4.000.
- Karim, Khalid A.; and Rea, James H., to Gulf Oil Corporation. Polymer blends and easy-peel films prepared therefrom. 4,414,053, Cl. 156-308.200.
- Karl, Walter, to Utilux Pty. Ltd. Electrical tab receptacle. 4,413,873, Cl. 339-74.00R.
- Karlstrom, Krister, to Trancom AB. Apparatus for communicating with a fleet of vehicles. 4,414,661, Cl. 370-95.000.
- Karplus, Henry H. B.; and Raptis, Apostolos C. Doppler flowmeter. 4,413,531, Cl. 73-861.250.
- Kasai, Shin: See—  
Kawaguchi, Yutaka; Sato, Michio; and Kasai, Shin, 4,413,791, Cl. 242-18.00G.
- Kashifuji Works, Ltd.: See—  
Sumi, Masaoki; and Doi, Tomoyuki, 4,414,495, Cl. 318-571.000.
- Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, to Kabushiki Kaisha Meidensha. Vacuum circuit interrupter. 4,414,448, Cl. 200-144.00B.
- Kataoka, Teruo: See—  
Kureha, Takeshi; Kataoka, Teruo; Saeki, Taiichi; and Takeda, Minoru, 4,414,571, Cl. 358-158.000.
- Kataoka, Yoshitaka: See—  
Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka, 4,413,612, Cl. 126-92.00C.
- Kato, Harumitsu; Yamada, Hironori; Yamazaki, Kaoru; Maruyama, Masashi; and Ogawara, Takashi, to Trio Kabushiki Kaisha. Bass-reflex type speaker system. 4,413,703, Cl. 181-156.000.
- Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate compressor. 4,413,955, Cl. 417-270.000.
- Kato, Yuzo; Ishihara, Shinichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, to Canon Kabushiki Kaisha. Image signal processing method and apparatus therefor. 4,414,581, Cl. 358-280.000.
- Katto, Atsuyuki: See—  
Tomomura, Toshiya; Takeishi, Koichi; Shimada, Mitsuhiro; and Katto, Atsuyuki, 4,413,616, Cl. 126-443.000.
- Kaul, Charles E. Display system for aircraft landing guidance. 4,414,532, Cl. 340-26.000.
- Kavalhuna, Sergio: See—  
Whitney, Douglas A.; and Kavalhuna, Sergio, 4,413,536, Cl. 74-869.000.
- Kawaguchi, Hidemi: See—  
Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,414,448, Cl. 200-144.00B.
- Kawaguchi, Hikotaro: See—  
Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255, Cl. 428-154.000.
- Kawaguchi, Yutaka; Sato, Michio; and Kasai, Shin, to Nitto Boseki Co., Ltd. Glass fiber strand winding apparatus. 4,413,791, Cl. 242-18.00G.
- Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,414,288, Cl. 428-694.000.
- Kawahashi, Akira: See—  
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424, Cl. 33-361.000.
- Kawakami, Tomio: See—  
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, 4,413,502, Cl. 73-23.000.
- Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, to Yoshitomi Pharmaceutical Industries, Ltd. Tetrahydrofuran compounds and analogs thereof. 4,414,216, Cl. 424-251.000.
- Kawakita, Takeshi: See—  
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328, Cl. 435-47.000.
- Kawakubo, Katsuhiko: See—  
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,414,392, Cl. 548-105.000.
- Kawamura, Go: See—  
Okamoto, Hiroshi; Kudo, Tetsuichi; and Kawamura, Go, 4,414,182, Cl. 423-652.000.
- Kawamura, Naoto: See—  
Kato, Yuzo; Ishihara, Shinichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581, Cl. 358-280.000.
- Kawamura, Yoshihisa; and Yasuhara, Seishi, to Nissan Motor Company, Ltd. Adjusting system for crank angle sensor. 4,413,508, Cl. 73-116.000.
- Kawasaki, Kiyoshi: See—  
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,414,026, Cl. 75-130.500.
- Kawasumi, Keiichi: See—  
Watanabe, Ryozo; Kawasumi, Keiichi; Maeda, Shoichi; and Shoji, Takashi, 4,414,336, Cl. 436-502.000.
- Kazumi, Ozawa; and Shinichiro, No, to Kabushiki Kaisha Yakult Honsha. Constant-speed conveyor apparatus. 4,413,709, Cl. 198-344.000.
- Kazuse, Yoshitaka: See—  
Iwama, Akio; and Kazuse, Yoshitaka, 4,414,157, Cl. 260-428.500.
- Kearney & Trecker Corporation: See—  
Kuczenski, Steven R., 4,413,938, Cl. 409-233.000.
- Keck, Max H.: See—  
Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., 4,414,348, Cl. 524-255.000.
- Kehrer, Hans-Peter: See—  
Drew, Jeffrey-Michael; Seitz, Max-Gerhard; Kehrer, Hans-Peter; and Eichelbroenner, Gottfried, 4,413,507, Cl. 73-104.000.
- Keil, Hans S. H., deceased (by Keil, Inge, legal representative); Alf, Helmut; and Schulze, Klaus, to Chemische Werke Huels Aktiengesellschaft. Alkali metal or amine salts of a mixture of 2- and 3-alkyladipic acids as corrosion inhibitors. 4,414,125, Cl. 252-75.000.
- Keil, Inge, legal representative: See—  
Keil, Hans S. H., deceased; Alf, Helmut; and Schulze, Klaus, 4,414,125, Cl. 252-75.000.
- Kelley, Jack M. Electrical circuit test probe. 4,414,506, Cl. 324-158.00P.
- Kellogg, Harvey J.; and Holm, Robert O. Groove refinishing tool. 4,413,447, Cl. 51-170.0PT.
- Kelsey-Hayes Company: See—  
Jones, Brian H., 4,414,049, Cl. 156-166.000.
- Kelson, Arthur F. Trash bag caddy. 4,413,800, Cl. 248-99.000.
- Kempf, Volker: See—  
Tomoff, Toma; Mohr, Hans G.; and Kempf, Volker, 4,413,534, Cl. 73-864.210.
- Kendall Company, The: See—  
Tucker, Samuel M., 4,413,620, Cl. 128-134.000.
- Kennametal Inc.: See—  
Newman, Harold C.; and Stoll, William M., 4,414,029, Cl. 75-252.000.
- Kennedy, Howard L., to Motorola Inc. Fractional doppler counting. 4,414,504, Cl. 324-78.00R.
- Keramidas, Vassilis G.; McCoy, Robert J.; and Temkin, Henryk, to Bell Telephone Laboratories, Incorporated. Beryllium-gold ohmic contact to a semiconductor device. 4,414,561, Cl. 357-67.000.
- Kern, Kenneth C., to Exxon Research and Engineering Co. Manifold to uniformly distribute a solid-liquid slurry. 4,413,934, Cl. 406-155.000.
- Kerr-McGee Chemical Corporation: See—  
Riggs, Olen L., Jr., 4,413,408, Cl. 29-825.000.
- Kervagoret, Gilbert, to Societe Anonyme DBA. Torque-amplifying servo-mechanism with compact structure for power steering systems. 4,413,962, Cl. 418-186.000.

- Kervin, Kendall G., to Well Research, Inc. Oil well monitoring device. 4,413,676, Cl. 166-53.000.
- Kessler, Milton; and Ullman, Myron E., to Kessler Products Co., Inc. Pinch cap. 4,413,748, Cl. 220-281.000.
- Kessler Products Co., Inc.: See—  
Kessler, Milton; and Ullman, Myron E., 4,413,748, Cl. 220-281.000.
- Kester, Bruce J.: See—  
Beugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., 4,413,466, Cl. 56-11.300.
- Ketterson, John B.: See—  
Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,413,506, Cl. 73-64.400.
- Keystone International, Inc.: See—  
Schils, Petrus J. R., 4,413,393, Cl. 29-157.10R.
- Khait, Klementina F.: See—  
Falk, John C.; and Khait, Klementina F., 4,414,342, Cl. 523-437.000.
- Kigawa, Tomio; and Fukui, Kouetsu, to Kubota, Ltd. Rock bolt. 4,413,929, Cl. 405-260.000.
- Kiley, Richard F.; and Larson, Ralph I., to Thermal Associates, Inc. Semiconductor heat sink assembly including thermally responsive means for increasing compression as the temperature of said assembly increases. 4,414,562, Cl. 357-81.000.
- Kimoto, Kyoji; and Miyauchi, Hirotosugu, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane. 4,414,338, Cl. 521-27.000.
- Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoki, to Nippon Telegraph & Telephone Public Corp.; and Takeda Riken Kogyo Kabushiki Kaisha. Semiconductor memory device test apparatus. 4,414,665, Cl. 371-21.000.
- Kimura, Tadashi, to Olympus Optical Co., Ltd. Zoom lens system. 4,413,887, Cl. 350-426.000.
- King Energy Systems, Inc.: See—  
Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., 4,413,618, Cl. 126-450.000.
- King, Merlon J.; and Wood, John E., Jr. Reflective golf ball putter alignment device. 4,413,824, Cl. 273-163.00R.
- Kinnunen, Seppo T.: See—  
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivistö, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495, Cl. 72-196.000.
- Kino, Eiko: See—  
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsu; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226, Cl. 424-279.000.
- Kinoshita, Tomoo; and Hinuma, Minoru, to Nihon Repromachine Kogyo Kabushiki Kaisha. Pelletizing device for plastic material. 4,413,965, Cl. 425-71.000.
- Kinugasa, Yukio: See—  
Matsuoka, Hiroki; Kinugasa, Yukio; and Yaegashi, Takehisa, 4,413,601, Cl. 123-480.000.
- Kioritz Corporation: See—  
Inaga, Hisashi; and Fukuoka, Takashi, 4,413,705, Cl. 181-240.000.
- Kipp, Carl E., Jr., to Paygro, Inc. Composting system with movable process cars. 4,414,335, Cl. 435-313.000.
- Kira, Gene S.; and Sorensen, Jens O. Geographically positioned, environmental, solar humidification energy conversion. 4,413,476, Cl. 60-641.800.
- Kirihara, Seishin: See—  
Siga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024, Cl. 75-126.00C.
- Kiriyama, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, to Teijin Limited. Novel assembly of composite fibers. 4,414,276, Cl. 428-374.000.
- Kirjavainen, Alvi, to Valmet OY. Headbox of a paper machine. 4,414,062, Cl. 162-336.000.
- Kirley, Joseph F. Aerosol insect exterminator device. 4,413,756, Cl. 222-402.110.
- Kistner, Heinz: See—  
Becker, Werner; and Kistner, Heinz, 4,414,054, Cl. 156-384.000.
- Kitaguchi, Nobuya: See—  
Yamataka, Kazunori; Isoya, Toshiro; and Kitaguchi, Nobuya, 4,414,079, Cl. 204-75.000.
- Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium and method of preparation thereof. 4,414,271, Cl. 428-328.000.
- Kitamoto, Tatsuji: See—  
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270, Cl. 428-325.000.
- Kitamura, Koichiro, to Kitamura Machinery Co. Ltd. Apparatus for detecting the position of a machine tool spindle. 4,413,422, Cl. 33-185.00R.
- Kitamura Machinery Co. Ltd.: See—  
Kitamura, Koichiro, 4,413,422, Cl. 33-185.00R.
- Kivistö, Tuomo V. J.: See—  
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivistö, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495, Cl. 72-196.000.
- Kiwalle, Jozsef; Galloway, James H.; and Rowan, John W., to Energy Development Associates, Inc. Metal halogen battery system. 4,414,292, Cl. 429-19.000.
- Klak, Roland; Frankle, Gerhard; and Woschke, Dieter, to Daimler-Benz Aktiengesellschaft. Heating device for preheating combustion air for an internal combustion engine. 4,413,606, Cl. 123-550.000.
- Klapp, Eberhard, deceased: See—  
Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114, Cl. 210-652.000.
- Klapp, Ursula, executrix: See—  
Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114, Cl. 210-652.000.
- Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., to National Semiconductor Corporation. Method for making a semiconductor capacitor. 4,413,401, Cl. 29-571.000.
- Kleine-Konig, Johannes: See—  
Hesse, Theodor; Rieke, Helmut; and Kleine-Konig, Johannes, 4,413,933, Cl. 406-152.000.
- Klempner, Daniel; and Frisch, Kurt C., to American Cyanamid Company. Reaction injection molding compositions and process. 4,414,174, Cl. 264-328.600.
- Klibanov, Alexander M.; and Langer, Robert S., to Massachusetts Institute of Technology. Methods of decreasing the hydrophobicity of fibroblast and other interferons. 4,414,147, Cl. 260-112.00R.
- Klie, Jürgen; Lubos, Walter; and Flieter, Wilhelm, to G. Dusterloh GmbH. Hydraulic motor with adjustable flow volume. 4,413,548, Cl. 91-491.000.
- Klockner-Humboldt-Deutz AG: See—  
Melcher, Gerhard, 4,414,022, Cl. 75-26.000.
- Schmidt, Martin; Kohler, Walter; Loch, Hans-Ulrich; and Weber, Albrecht, 4,414,186, Cl. 423-175.000.
- Knable, Raymond J., to Parker-Hannifin Corporation. Limit switch actuator for fluid cylinders. 4,413,549, Cl. 92-5.00R.
- Knapheide Mfg. Co., The: See—  
Leaver, John Y.; and Huggins, Harold D., 4,413,848, Cl. 292-59.000.
- Knapp, William; Dunn, William; and Smith, Kent F., to General Instrument Corporation. Storage logic array having two conductor data column. 4,414,547, Cl. 340-825.830.
- Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, to BASF Aktiengesellschaft. Magnetic recording medium and its manufacture. 4,414,287, Cl. 428-650.000.
- Knip, Claus: See—  
Weber, Jürgen; Falk, Volker; and Knip, Claus, 4,414,419, Cl. 568-421.000.
- Knifton, John F.: See—  
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- Knittel, Volker: See—  
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- Knoll International, Inc.: See—  
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- Knop, Hans-Georg: See—  
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- Kobayashi, Hisao: See—  
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- Kochs Adler AG: See—  
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- Koepke, Jeffery W.: See—  
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- Kohashi, Toru, to Yamato Scale Company, Limited. Automatic weight sorter. 4,413,739, Cl. 209-593.000.
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- Koho, Tauno T.: See—  
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- Koken Co., Ltd.: See—  
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- Kollar, Ernest P., to International Business Machines Corporation. Recirculating automatic document feeder. 4,413,901, Cl. 355-3.05H.
- Kollmann, Horst, to Schelling & Co., Firma. Machine tool support table and feeding device. 4,413,941, Cl. 414-35.000.
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- Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., 4,414,200, Cl. 424-63.000.
- Kolyada, Vladimir A.: See—
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- Komori, Minoru: See—
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- Komori Printing Machinery Co., Ltd.: See—
- Toyoda, Hideaki, 4,413,561, Cl. 101-365.000.
- Kondo, Akinobu: See—
- Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka, 4,413,612, Cl. 126-92.00C.
- Kondo, Yoshikazu: See—
- Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078, Cl. 204-34.000.
- Kondoh, Yoshinobu: See—
- Matsuoka, Hideoki; and Kondoh, Yoshinobu, 4,413,841, Cl. 280-802.000.
- Konishiroku Photo Industry Co., Ltd.: See—
- Abe, Shunichi; and Akiyama, Mitsuo, 4,413,900, Cl. 355-8.000.
- Hamada, Fumio, 4,414,308, Cl. 430-505.000.
- Kono, Hiroya: See—
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- Kontz, Robert F. Apparatus for making a multi-layered blown plastic container. 4,413,974, Cl. 425-523.000.
- Kontz, Robert F., to Owens-Illinois, Inc. Web splicing apparatus. 4,414,048, Cl. 156-159.000.
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- Kosh, William S., to Dresser Industries, Inc. Pulsation throttling device for a pressure gauge. 4,413,524, Cl. 73-707.000.
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- Kovats, Tibor F. I., to Northern Telecom Limited. Optical fiber hermetic seal. 4,413,881, Cl. 350-96.200.
- Koyama, Akio: See—
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- Koyama, Arata: See—
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- Kratz, Gerhard; and Marr, Erich, 4,414,475, Cl. 250-506.100.
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- Krahl, Douglas R.; and Marshall, James W., to Motorola, Inc. Signal synchronization system. 4,414,676, Cl. 375-116.000.
- Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Self supporting optical diffraction grid. 4,414,680, Cl. 378-84.000.
- Krauss, Alan R.; and Gruen, Dieter M., to United States of America, Energy. First wall and limiter surfaces for plasma devices. 4,414,176, Cl. 376-136.000.
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- Krug, Russell R.; and Hohmann, Robert P., to Chevron Research Company. Fluidized catalytic cracking. 4,414,100, Cl. 208-153.000.
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- Kubo, Kazuyuki: See—
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- Kubo, Kunimichi: See—
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- Kuczenski, Steven R., to Kearney & Trecker Corporation. Spindle motor powered drawbar. 4,413,938, Cl. 409-233.000.
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- Kuhlmann, Gerhard, to Robert Bosch GmbH. Control device in a machine tool. 4,413,936, Cl. 408-8.000.
- Kuhn, Franz: See—
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- Kulesza, Ralph J.; and Morrison, Howard J., to Marvin Glass & Associates. Toy vehicle device. 4,413,443, Cl. 46-206.000.
- Kumagai, Tadanobu, to Toyota Jidosha Kabushiki Kaisha. Transmission with offset differential and deep wide groove radial ball bearing supporting intermediate shaft. 4,413,701, Cl. 180-256.000.
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- Kuno, Mikio: See—
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- Kurata, Hirota, to Trio Kabushiki Kaisha. High-speed playback for videocdiscs. 4,414,584, Cl. 358-342.000.
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- Kurt Manufacturing Company, Inc.: See—
- Lenz, John C., 4,413,818, Cl. 269-81.000.
- Lenz, John O., 4,413,819, Cl. 269-99.000.
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- Lacks, Harold G. Sphygmomanometer construction. 4,413,631, Cl. 128-677.000.
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- Lai, Juey H., to Honeywell Inc. Sensitive positive electron beam resists. 4,414,313, Cl. 430-295.000.
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- Lamb, Steve R., and Lamoreux, Larry W. Adjustable prosthetic ankle assembly. 4,413,360, Cl. 3-30.000.
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- Lambuth, Alan L., to Boise Cascade Corporation. Laminated wooden structural assembly. 4,413,459, Cl. 52-729.000.
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- Lamoreux, Larry W.: See—
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- Lancaster, Paul B.; and Huisenruit, Gordon A. Ladder rack. 4,413,801, Cl. 248-316.00A.
- Lancaster, William G., to Lantech, Inc. Roller stretch pass through stretching apparatus and process. 4,413,463, Cl. 53-399.000.
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- Landwehr, Gunter; and Thiele, Horst, to Kochs Adler AG. Workpiece feeding device for a sewing machine. 4,413,582, Cl. 112-311.000.
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- Lane, Vern E., to Deike, Robert F. Remote control surveying. 4,413,907, Cl. 356-141.000.
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- Lawrence, Anthony J., to Tungum Hydraulics Limited. Pipe couplings. 4,413,845, Cl. 285-23.000.
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- Lawson, Richard L. Device for use in making doughnuts. 4,413,972, Cl. 425-290.000.
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- Newsome, Thomas B.; and Fulford, Garry, 4,413,716, Cl. 192-70.120.
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- Lazaridis, Christina N.: See—
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- Hareng, Michel; Huignard, Jean-Pierre; and Le Berre, Serge, 4,413,885, Cl. 350-342.000.
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- Bose, Ajit, 4,414,051, Cl. 156-198.000.
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- Lee, Joseph Y.: See—
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- Lee, Maw H.: See—
- Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., 4,414,634, Cl. 364-510.000.
- Leggett & Platt, Incorporated: See—
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- Lekhy, Pavel, to Lonza Ltd. Process for the production of dimedone. 4,414,418, Cl. 568-346.000.
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- Wright, Howard J.; Leonard, David P.; and Eitzell, Roger A., 4,414,357, Cl. 524-513.000.
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Smith, Donald A.; and Lexa, Gary F., 4,413,935, Cl. 406-181.000.
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Fellner, Theodore F., 4,413,724, Cl. 198-594.000.
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Michael, Richard A.; Chaudhari, Dalsang K.; and Marquart, Gordon L., 4,413,715, Cl. 192-53.00F.
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Dean, Robert, 4,413,718, Cl. 194-1.00K.
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Bittaker, Gerald W.; and Martinez, Evidio E., 4,413,364, Cl. 4-661.000.
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Winstead, Thomas W., 4,413,964, Cl. 425-66.000.
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Crawford, Alexander, 4,413,553, Cl. 100-4.000.
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Smith, Murray S., Jr.; Hilboldt, Mark S.; and Mathur, Pracheeshwar S., 4,414,178, Cl. 422-444.000.
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Hunter, Gary L.; Marason, Gabriel, Jr.; and Troup, Diana C., 4,413,441, Cl. 46-116.000.
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Schlanger, Samuel L., 4,413,702, Cl. 180-274.000.
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Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,414,154, Cl. 260-245.700.
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Moyer, James D.; and Hoffert, Robert S., 4,413,580, Cl. 112-262.200.
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Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, 4,413,877, Cl. 350-1.700.
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Landreau, Andre, 4,413,590, Cl. 122-18.000.
- Minnesota Mining and Manufacturing Co.: See—  
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- Pokorny, Richard J., 4,414,355, Cl. 524-462.000.
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Miki, Yukio; and Egawa, Takeshi, 4,413,894, Cl. 354-195.000.
- Missaire, Gerhard: See—  
Hubecker, Hans; Lenze, Friedrich; and Missaire, Gerhard, 4,414,247, Cl. 427-230.000.
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Miyakawa, Nobuhito; Fujii, Masanori; and Maekawa, Kouzi, 4,414,321, Cl. 430-106.600.
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Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, 4,413,877, Cl. 350-1.700.
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Koyama, Hiroaki; and Shimizu, Shigeo, 4,414,378, Cl. 528-137.000.
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Haraga, Kousuke; and Hattori, Katsutoshi, 4,414,257, Cl. 428-182.000.
- Hirata, Seiichiro, 4,414,687, Cl. 455-165.000.
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Nojiri, Naohiro; and Sakai, Yukio, 4,414,135, Cl. 502-224.000.
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Nambu, Kazuhiko, 4,414,261, Cl. 428-213.000.
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- Miwa, Hirohide: See—  
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520, Cl. 73-609.000.
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Edahiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008, Cl. 65-3.120.
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Ueda, Kenji; and Miyamoto, Kiyoshi, 4,414,478, Cl. 307-116.000.
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Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,413,506, Cl. 73-64.400.
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Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,413,558, Cl. 101-93.140.
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Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077, Cl. 204-35.00N.
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Matsutani, Yoshihide, 4,413,746, Cl. 220-89.00A.
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Kimoto, Kycji; and Miyauchi, Hirotosugu, 4,414,338, Cl. 521-27.000.
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Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520, Cl. 73-609.000.
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Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620, Cl. 364-200.000.
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Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, 4,414,369, Cl. 526-65.000.



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Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328, Cl. 435-47.000.
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Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496, Cl. 318-696.000.
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Okamoto, Eisaku; and Mizuno, Kohtaro, 4,413,545, Cl. 84-1.280.
- Mizushima, Yoshihiko: See—  
Amemiya, Yoshihiko; Urisu, Tsuneo; and Mizushima, Yoshihiko, 4,414,557, Cl. 357-16.000.
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Burge, Russell W., 4,413,540, Cl. 82-47.000.
- Mobil Oil Corporation: See—  
Chester, Arthur W.; and Garwood, William E., 4,414,097, Cl. 208-59.000.
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- Rankel, Lillian A.; and Rudnick, Leslie R., 4,414,102, Cl. 208-21.000.
- Tobias, Michael A., 4,414,283, Cl. 428-461.000.
- Zemanek, Joseph, Jr., 4,413,512, Cl. 73-152.000.
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Roth, Anton, deceased; and Moeller, Guenther, executor, 4,413,942, Cl. 414-253.000.
- Mohn, Hans-Werner: See—  
Buchholz, Rainer; Tomashauer, Josef; Zoderow, Rudolf; and Mohn, Hans-Werner, 4,414,056, Cl. 156-476.000.
- Mohr, Hans G.: See—  
Tomoff, Tonia; Mohr, Hans G.; and Kempf, Volker, 4,413,534, Cl. 73-864.210.
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Aubouy, Michel; Hamel, Pierre; and Molin, Marc, 4,414,415, Cl. 564-412.000.
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- Molle, Jean-Francois: See—  
Lucas, Jean; Molle, Jean-Francois; Gille, Etienne; and Creze, Patrick, 4,414,002, Cl. 48-209.000.
- Mollgaard, Klaus: See—  
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Re-decker, Friedrich; Sendiko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635, Cl. 364-526.000.
- Molloy, James J.: See—  
Applegate, Steven L.; and Molloy, James J., 4,413,919, Cl. 400-208.000.
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Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378, Cl. 19-258.000.
- Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, to Hitachi Koki Co., Ltd. Line printer and type carrier for use therein. 4,413,558, Cl. 101-93.140.
- Monsanto Company: See—  
Coran, Aubert Y.; and Goettler, Lloyd A., 4,414,267, Cl. 428-288.000.
- Slocumbe, Robert J., 4,414,354, Cl. 524-460.000.
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Colle, Roberto; Gozzo, Franco; and Prezioso, Ciro, 4,414,018, Cl. 71-88.000.
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- Moore, George G. I., to Riker Laboratories, Inc. 3,5-Di-(t-butyl)-4-hydroxyphenyl substituted pyridines. 4,414,217, Cl. 424-263.000.
- Moore, Richard L.: See—  
Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244, Cl. 427-105.000.
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- Morgan Construction Company: See—  
Gilvar, Martin; and Wykes, Philips, 4,413,494, Cl. 72-167.000.
- Morishita, Michio: See—  
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162, Cl. 261-23.00A.
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Kulesza, Ralph J.; and Morrison, Howard J., 4,413,443, Cl. 46-206.000.
- Morrone, John J.; and Morrone, Mary J. Chip dispenser. 4,413,750, Cl. 221-263.000.
- Morrone, Mary J.: See—  
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Bailey, Alan C.; and Morrow, Alan J., 4,413,882, Cl. 350-96.300.
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- Moscrip, William M. Heat transfer components for Stirling-cycle, reciprocating thermal machines. 4,413,473, Cl. 60-517.000.
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Breidenbach, Dieter; and Mosebach, Wilhelm, 4,414,072, Cl. 202-248.000.
- Mosebrook, Dennis R.; and Seeley, Wayne C., to Dentsply Research & Development Corp. Multi-unit storage cabinet. 4,413,867, Cl. 312-111.000.
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- Mosier, Douglas R., to Minnesota Mining and Manufacturing Co. Current detector and interface circuit for a transformer relay. 4,414,602, Cl. 361-190.000.
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Thoma, Martin, 4,414,039, Cl. 148-6.200.
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Comroe, Richard A., 4,414,675, Cl. 375-90.000.
- Davis, Walter L.; and Jacobson, James E., Jr., 4,414,623, Cl. 364-200.000.
- Kennedy, Howard L., 4,414,504, Cl. 324-78.00R.
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- Nakajima, Kunio: See—  
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,414,073, Cl. 204-299.00R.
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- Nakauchi, Yuji: See—  
Washida, Akira; and Nakauchi, Yuji, 4,413,831, Cl. 277-40.000.
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Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoki, 4,414,665, Cl. 371-21.000.
- Nati, Salvatore F., Jr.: See—  
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,414,501, Cl. 323-280.000.
- National Machine Company, Inc.: See—  
Seabase, Peter P.; and Crewes, Rickard N., 4,413,645, Cl. 137-223.000.
- National Research Development Corporation: See—  
Gerzon, Michael A., 4,414,430, Cl. 381-22.000.
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Burns, Carmen D., 4,413,404, Cl. 29-590.000.
- Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,413,401, Cl. 29-571.000.
- Nelson, Robert D., 4,414,666, Cl. 371-37.000.
- National Slag Limited: See—  
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- Nazarian, Miron M.: See—  
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Jones, Robert L., 4,413,518, Cl. 73-615.000.
- Neary, Michael P.; and Wilson, Thomas A. Process for cracking hydrocarbons. 4,414,082, Cl. 204-162.00R.
- Neeff, Russell A. Oxygen permeable contact lens material comprising copolymers of multifunctional siloxanyl alkylesters. 4,414,375, Cl. 526-260.000.
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- Nelson, Robert D., to National Semiconductor Corporation. Error checking and correcting apparatus. 4,414,666, Cl. 371-37.000.
- Nelson, Robert N., to Motorola Inc. Broadband peak detector. 4,414,512, Cl. 328-151.000.
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Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020, Cl. 71-108.000.
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Johnsen, Ottar; and Netravali, Arun N., 4,414,580, Cl. 358-260.000.
- Nettleton, James S., to Polysar Limited. Rubber recovery apparatus. 4,413,971, Cl. 425-311.000.
- Neumaier, Heinrich: See—  
Bleidi, Rolf; and Neumaier, Heinrich, 4,414,451, Cl. 200-148.00H.
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Alter, Seymour S., 4,413,984, Cl. 493-222.000.
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- Newcombe, Elliott H., Jr., to Atlantic Coast Carton Company. Multiple component film package. 4,413,734, Cl. 206-455.000.
- Newman, Harold C.; and Stoll, William M., to Kennametal Inc. Powder mixtures for wear resistant facings and products produced therefrom. 4,414,029, Cl. 75-252.000.
- Newsome, Thomas B.; and Fulford, Garry, to Laycock Engineering Limited. Friction clutches. 4,413,716, Cl. 192-70.120.
- Newton, Stephen J.; and Patel, Abdul H., to Thorn Domestic Appliances (Electrical) Ltd. Cooking apparatus. 4,414,465, Cl. 219-449.000.
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Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,414,483, Cl. 313-136.000.
- N'Guyen Duc, Xuong; and Szabo, Rene, to Coflexip. Swivel connector between a floating or semi-submerged structure and a riser or flow line. 4,413,844, Cl. 285-16.000.
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Gaul, James M.; and Nguyen, Tinh, 4,414,361, Cl. 524-702.000.
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Watts, Charles G.; Nicholas, Karl W.; and Bushman, James B., 4,414,511, Cl. 324-347.000.
- Nicholas, Richard W.: See—  
McMahan, David R.; and Nicholas, Richard W., 4,414,614, Cl. 362-269.000.
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- Nielsen, Anker J., Jr., to Omco Inc. Front entry locking ring assembly. 4,413,490, Cl. 70-164.000.
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Sano, Yoshiaki, 4,414,170, Cl. 264-242.000.
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Kinoshita, Tomoo; and Hinuma, Minoru, 4,413,965, Cl. 425-71.000.
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- Ninomiya, Yoshito: See—  
Sekido, Satoshi; Ninomiya, Yoshito; and Yamazaki, Yoshihiro, 4,414,607, Cl. 361-433.000.
- Nippon Electric Co., Ltd.: See—  
Matsumoto, Keiji, 4,414,622, Cl. 364-200.000.
- Nakamura, Teruo, 4,414,627, Cl. 364-200.000.
- Tokuda, Kazuo; and Sawataishi, Tokio, 4,414,569, Cl. 358-153.000.
- Tsutaki, Kunio; and Kageyama, Takao, 4,414,486, Cl. 315-3.600.
- Nippon Electric Industry Co., Ltd.: See—  
Sasaki, Ryoichi, 4,413,373, Cl. 16-54.000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Okamoto, Eisaku; and Mizuno, Kohtaro, 4,413,545, Cl. 84-1.280.
- Nippon Kogaku K.K.: See—  
Ogasawara, Akira, 4,414,469, Cl. 250-201.000.
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Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,414,026, Cl. 75-130.500.
- Nippon Light Metal Company Limited: See—  
Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077, Cl. 204-35.00N.
- Nippon Oil Company, Limited: See—  
Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, 4,414,369, Cl. 526-65.000.
- Nippon Oil and Fats Co., Ltd.: See—  
Takeuchi, Fumio; and Takahashi, Masao, 4,414,044, Cl. 149-2.000.
- Nippon Piston Ring Co., Ltd.: See—  
Ebihara, Tadashi, 4,414,284, Cl. 428-550.000.
- Nippon Soken, Inc.: See—  
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, 4,413,502, Cl. 73-23.000.
- Nippon Steel Corporation: See—  
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraiishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,413,657, Cl. 138-149.000.
- Nippon Telegraph & Telephone Public Corporation: See—  
Amemiya, Yoshihito; Urisu, Tsuneo; and Mizushima, Yoshihiko, 4,414,557, Cl. 357-16.000.
- Edahiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008, Cl. 65-3.120.
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- Nippon Zeon Co. Ltd.: See—  
Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, 4,414,363, Cl. 525-237.000.
- Nippondenso Co., Ltd.: See—  
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424, Cl. 33-361.000.
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- Nishida, Katsutoshi: See—  
Shimizu, Motoo; and Nishida, Katsutoshi, 4,414,190, Cl. 423-344.000.
- Nishihara, Toshio: See—  
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254, Cl. 428-34.000.
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- Nissan Design International, Inc.: See—  
Hirshberg, Gerald P., 4,413,854, Cl. 296-146.000.
- Nissan Motor Company, Limited: See—  
Chikarashi, Takayo, 4,413,444, Cl. 49-409.000.  
Hayashi, Kazuo, 4,413,857, Cl. 297-180.000.  
Hirota, Toshio, 4,413,594, Cl. 123-3.000.  
Kawamura, Yoshihisa; and Yasuhara, Seishi, 4,413,508, Cl. 73-116.000.  
Matsuoka, Hideoki; and Kondoh, Yoshinobu, 4,413,841, Cl. 280-802.000.  
Seki, Nakanobu, 4,413,947, Cl. 415-182.000.  
Tamura, Takeo; and Imai, Mamoru, 4,413,798, Cl. 248-27.100.  
Tsumumi, Saburo, 4,413,598, Cl. 123-306.000.
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Kawaguchi, Yutaka; Sato, Michio; and Kasai, Shin, 4,413,791, Cl. 242-18.000.
- Nitto Chemical Industry Co., Ltd.: See—  
Watanabe, Ichiro; Sato, Yoshiaki; and Yamaguchi, Yasumasa, 4,414,331, Cl. 435-129.000.
- Nitto Electric Industrial Co., Ltd.: See—  
Iwama, Akio; and Kazuse, Yoshitaka, 4,414,157, Cl. 260-428.500.
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- NL Industries, Inc.: See—  
Page, Enno H., 4,413,666, Cl. 164-72.000.
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- Nolan, John J., to Allis-Chalmers Corporation. Self back-flushing magnetic separator process, 4,414,116, Cl. 210-695.000.
- Nolf, Jean M. E., to N.V. Raychem S.A. Branch-off seal, 4,413,922, Cl. 403-341.000.
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Kolibas, James A., 4,414,248, Cl. 427-236.000.
- Norman, Robert D., to Spar Aerospace Limited. Universal service tool, 4,413,538, Cl. 81-57.130.
- Norota, Susumu: See—  
Kiriya, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, 4,414,276, Cl. 428-374.000.
- North American Philips Corporation: See—  
Liebert, Richard B.; and Haarman, Johan W., 4,414,679, Cl. 378-29.000.
- North American Philips Electric Corp.: See—  
Young, Robert G., 4,414,489, Cl. 315-51.000.
- Northern Telecom Inc.: See—  
Murtelson, Frederick W., 4,414,426, Cl. 174-59.000.  
Oliver, Theodore A.; Nelson, David L.; and Chan, Keat-Lye, 4,414,589, Cl. 360-77.000.
- Northern Telecom Limited: See—  
Haraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883, Cl. 350-334.000.  
Kovats, Tibor F. I., 4,413,881, Cl. 350-96.200.  
Lukas, Helmut H., 4,413,763, Cl. 225-2.000.  
Parlor, Bryan R., 4,414,435, Cl. 179-81.00R.
- Norton, David G.: See—  
Losee, Paul D.; and Norton, David G., 4,414,592, Cl. 360-102.000.
- Notelteirs, Victor R.; and Claessens, Stephanus J., to U.S. Philips Corporation. Electric incandescent lamp, 4,414,484, Cl. 313-273.000.
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- Novak, Thaddeus J., to United States of America, Army. 4,4'-Dithiodianil, 4,414,414, Cl. 564-271.000.
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- Nutriscience Company: See—  
Lee, Chang R., 4,414,240, Cl. 426-614.000.
- N.V. Klippan S.A.: See—  
Weman, Per O., 4,413,794, Cl. 242-107.40A.
- N.V. Raychem S.A.: See—  
Nolf, Jean M. E., 4,413,922, Cl. 403-341.000.  
Nye, Beatrice E. Rural mailbox, 4,413,770, Cl. 232-17.000.
- O. G. Hoyer A/S: See—  
Waldstrom, Ejvind, 4,413,461, Cl. 53-122.000.
- Oak Industries Inc.: See—  
Denley, Ronald S., 4,414,452, Cl. 200-159.00B.
- O'Brien, C. Douglas: See—  
Bown, Herbert G.; and O'Brien, C. Douglas, 4,414,621, Cl. 364-200.000.
- Occidental Chemical Corporation: See—  
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064, Cl. 204-37.00R.
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- Ogasawara, Takashi: See—  
Kato, Harumitsu; Yamada, Hironori; Yamazaki, Kaoru; Maruyama, Masashi; and Ogasawara, Takashi, 4,413,703, Cl. 181-156.000.
- Ogawa, Hidenori: See—  
Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,414,390, Cl. 546-121.000.
- Oguchi, Toshihiko: See—  
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124, Cl. 252-62.630.
- Ogura, Hiroyuki; and Kuroda, Toyoyuki, to Raschel Co., Ltd. Basket goal net, 4,413,484, Cl. 66-193.000.
- Ohe, Michisuke: See—  
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254, Cl. 428-34.000.
- Ohki, Kenji: See—  
Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255, Cl. 428-154.000.
- Ohno, Mitsuo; and Hatazawa, Kikuo, to Hitachi, Ltd. Laser beam printer, 4,414,556, Cl. 346-160.000.
- Ohshima, Nobumasa: See—  
Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, 4,414,052, Cl. 156-273.700.
- Ohta, Hisatoshi: See—  
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424, Cl. 33-361.000.
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- Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, to Nippon Soken, Inc. Gas detecting sensor, 4,413,502, Cl. 73-23.000.
- Ohtomo, Fumio: See—  
Hamada, Toshio; and Ohtomo, Fumio, 4,413,904, Cl. 356-5.000.
- Ohtsuki, Toshio: See—  
Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, 4,414,139, Cl. 502-72.000.
- Oil Air Industries, Inc.: See—  
Allewitz, Murry, 4,413,652, Cl. 138-31.000.
- Oil-Well Drilling Control, Inc.: See—  
Croom, Robert E., Jr.; and Jeter, John D., 4,413,516, Cl. 73-431.000.
- Oka, Yasuo: See—  
Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077, Cl. 204-35.00N.
- Okabe, Moisei: See—  
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717, Cl. 192-84.00C.
- Okada, Hiroshi: See—  
Sugiura, Junzi; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527, Cl. 73-754.000.
- Okamoto, Eisaku; and Mizuno, Kohtaro, to Nippon Gakki Seizo Kabushiki Kaisha. Music data reading type electronic musical instrument, 4,413,545, Cl. 84-1.280.

- Okamoto, Hiroshi; Kudo, Tetsuichi; and Kawamura, Go, to Hitachi, Ltd. Process for producing hydrogen, 4,414,182, Cl. 423-652.000.
- Okazaki, Masaki: See—  
Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Makiuchi, Hajime, 4,414,325, Cl. 435-7.000.
- Okazaki, Michio, to Diesel Kiki Co., Ltd. Swash-plate type compressor having pumpless lubricating system, 4,413,954, Cl. 417-269.000.
- Okino, Ichiro: See—  
Yoshioka, Hideoki; Okino, Ichiro; and Toda, Toshiaki, 4,414,529, Cl. 337-365.000.
- Okuda, Kanemasa: See—  
Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,414,457, Cl. 219-69.00W.
- Okutu, Toshimitu: See—  
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270, Cl. 428-325.000.
- Olechowski, Jerome R.; and Lawson, Nelson E., to Union Camp Corporation. Method of polymerizing rosin, 4,414,146, Cl. 260-97.000.
- Olin Corporation: See—  
Pryor, Michael J., 4,413,813, Cl. 266-216.000.
- Oliver, Theodore A.; Nelson, David L.; and Chan, Keat-Lye, to Northern Telecom Inc. Embedded servo track following system and method for writing servo tracks, 4,414,589, Cl. 360-77.000.
- Olivieri, Edgar S., to Texaco Puerto Rico Inc. Method of detecting leaks in a large storage tank, 4,413,503, Cl. 73-40.700.
- Olivieri, Roberto; Robertello, Andrea; and Degen, Ludwig, to Snamprogetti, S.p.A. Compositions for depolluting fresh water and salt water bodies, 4,414,353, Cl. 435-243.000.
- Olson, Joel J.: See—  
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- Olson, Larry D., to UOP Inc. Chip carrier substrates of hybrid woven glass cloths, 4,414,264, Cl. 428-241.000.
- Olympus Optical Co., Ltd.: See—  
Furihata, Hiroyuki, 4,414,608, Cl. 362-32.000.  
Kimura, Tadashi, 4,413,887, Cl. 350-426.000.  
Taira, Akio, 4,413,889, Cl. 350-501.000.
- Omco Inc.: See—  
Nielsen, Anker J., Jr., 4,413,490, Cl. 70-164.000.
- Omholt, Bruce D. Motorcycle, 4,413,699, Cl. 180-219.000.
- Omron Tateisi Electronics Co.: See—  
Ueda, Kenji; and Miyamoto, Kiyoshi, 4,414,478, Cl. 307-116.000.
- Ong, Helen H.: See—  
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichtlow, Charles A., 4,414,219, Cl. 424-267.000.
- Onoda, Michitoshi: See—  
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, 4,413,502, Cl. 73-23.000.
- Optimetrix Corporation: See—  
Phillips, Edward H., 4,413,864, Cl. 308-5.00R.
- Orangeburg Technologies, Inc.: See—  
Burnham, Francis L., 4,413,952, Cl. 417-253.000.
- Orifice Industries Ltd.: See—  
Jahn, Guenter, 4,413,654, Cl. 138-92.000.
- Orlander, Michael; Cosworth, Robert P.; and MacKenzie, Peter A., to National Slag Limited. Apparatus for the pelletization of heat-liquifiable solid materials, 4,414,016, Cl. 65-141.000.
- Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Glycine-D-arginine<sup>24</sup> calcitonin, 4,414,149, Cl. 260-112.50T.
- Ortho Diagnostic Systems Inc.: See—  
Dussault, Richard A., 4,414,197, Cl. 424-3.000.
- Osamu, Ohe: See—  
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226, Cl. 424-279.000.
- Oshima, Kazunori: See—  
Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, 4,414,133, Cl. 502-179.000.
- Osmond, Etienne J. R.: See—  
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,414,434, Cl. 179-77.000.
- Osthaus, Georg: See—  
Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, 4,414,330, Cl. 435-93.000.
- Ostrom, Carl R.; and Theilen, Dennis R., to Valmont Industries, Inc. Coupler for an irrigation system, 4,413,783, Cl. 239-183.000.
- Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, to Mitsubishi Chemical Industries Limited. Catalytic composition, 4,414,133, Cl. 502-179.000.
- Otani, Junji; Ikenoya, Yasuo; and Iwashita, Kanau, to Honda Giken Kogyo Kabushiki Kaisha. Method of making two-stage catalytic converter, 4,413,392, Cl. 29-157.00R.
- Otis Engineering Corporation: See—  
Perkins, Donald H., 4,413,677, Cl. 166-55.100.
- Otsuka, Kiyotaka; and Tanahashi, Masao, to Matsushita Electric Works, Ltd. Electric shaver with rotary blade, 4,413,410, Cl. 30-43.600.
- Otsuka, Pharmaceutical Co., Ltd.: See—  
Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,414,390, Cl. 546-121.000.
- Otsuki, Hiroyuki: See—  
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,414,073, Cl. 204-299.00R.
- Ott, Winfried: See—  
Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, 4,413,788, Cl. 239-703.000.
- Ouderik, John T.: See—  
Patil, Arvind S.; Bantjes, John H.; and Ouderik, John T., 4,414,033, Cl. 423-367.000.
- Outboard Marine Corporation: See—  
Hackbarth, Eugene R., 4,413,865, Cl. 308-207.00R.
- Outokumpu Oy: See—  
Makiipirtti, Simo A. I.; Peuralinna, Mauri J.; Makitalo, Valto J.; Lilja, Launo L.; and Krogerus, Helge J., 4,413,816, Cl. 266-270.000.
- Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495, Cl. 72-196.000.
- Oven, Judith L., to General Foods Limited. Topping coating, 4,414,239, Cl. 426-607.000.
- Owens-Corning Fiberglass Corporation: See—  
Seng, Stephen, 4,413,970, Cl. 425-222.000.
- Owens-Illinois, Inc.: See—  
Kontz, Robert F., 4,414,048, Cl. 156-159.000.  
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738, Cl. 209-523.000.
- Oxenrider, Bryce C., to Allied Corporation. Mixtures comprising fluorinated pyromellitate oligomers useful as surfactants and processes for the production and use thereof, 4,414,277, Cl. 428-395.000.
- P C U K Produits Chimiques Ugine Kuhlmann: See—  
Breda, Antoine G. L. J.; and Roussel, Jacques G. R., 4,414,151, Cl. 260-145.00B.
- Pacer Technology and Resources, Inc.: See—  
Stock, Hugh J., 4,413,753, Cl. 222-149.000.
- Packard Industries, Inc.: See—  
Hogue, Norman E., 4,413,489, Cl. 70-81.000.
- Packer, Jon D.: See—  
Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., 4,414,200, Cl. 424-63.000.
- Padovan, Mario: See—  
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412, Cl. 562-535.000.
- Page, Enno H., to NL Industries, Inc. Expendable die casting sand core, 4,413,666, Cl. 164-72.000.
- Palm, Jurgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, to Rutgerswerke Aktiengesellschaft. Method of producing a highly reactive pitch fraction and its usage, 4,414,192, Cl. 423-445.000.
- Palmer, Bertram J., to GKN Transmissions Limited. Friction welding, 4,414,046, Cl. 156-73.500.
- Palmer, Thomas W. Method for moisture-proofing refractory fiber for use in fire-resistant enclosures, 4,414,251, Cl. 427-407.100.
- Panaro, Robert J., to Gould Inc. Electric fuse having composite fusible element, 4,414,526, Cl. 337-163.000.
- Pandrol Limited: See—  
Brown, Trevor P., 4,413,777, Cl. 238-349.000.
- Panek, Karel J., to Byk-Millinkrodt CIL B.V. Preparation and use of a 195M-AU-containing liquid, 4,414,145, Cl. 252-645.000.
- Panknin, Walter: See—  
Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455, Cl. 219-64.000.
- Panock, Richard L.: See—  
Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., 4,414,066, Cl. 204-129.300.
- Panzer, Klaus, to Siemens Aktiengesellschaft. Time division multiplex system having transmitted pulses in time channels distributed over and co-transmitted with a frame clock signal component, 4,414,663, Cl. 370-100.000.
- Paquin, Patrick J., to Allied Corporation. Method of making low cross-talk ribbon cable, 4,413,469, Cl. 57-293.000.
- Park, Chung-Hi: See—  
Coplan, Myron J.; Park, Chung-Hi; and Williams, Samuel C., 4,414,368, Cl. 525-534.000.
- Parker-Hannifin Corporation: See—  
Knable, Raymond J., 4,413,549, Cl. 92-5.00R.
- Parlor, Bryan R., to Northern Telecom Limited. Interface circuit with flux cancelling transformer circuit, 4,414,435, Cl. 179-81.00R.
- Parry, Michael A.: See—  
Slocombe, Joseph; and Parry, Michael A., 4,413,694, Cl. 180-89.140.
- Slocombe, Joseph; and Parry, Michael A., 4,413,695, Cl. 180-89.140.
- Slocombe, Joseph; and Parry, Michael A., 4,413,696, Cl. 180-89.140.
- Parschat, Lothar: See—  
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667, Cl. 164-154.000.
- Parsons, John H.; and West, Peter J., to FBC Limited. Pesticidal 1,2,4-triazole compounds, 4,414,221, Cl. 424-269.000.
- Patel, Abdul H.: See—  
Newton, Stephen J.; and Patel, Abdul H., 4,414,465, Cl. 219-449.000.
- Patel, Bhupendra P.: See—  
Prusak, John J.; and Patel, Bhupendra P., 4,414,167, Cl. 264-40.500.
- Patil, Arvind S.; Bantjes, John H.; and Ouderik, John T., to BASF Wyandotte Corporation. Process for preparing ferrirocyanide pigments, 4,414,033, Cl. 423-367.000.
- Paton, Boris E.; Latash, Jury V.; Zabanilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.;



- Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR. Plasma-arc furnace, 4,414,672, Cl. 373-22.000.
- Paton, John S., to Greater Glasgow Health Board. Dispensing device having ratchet member, 4,413,760, Cl. 222-309.000.
- Patrica, Steven E.; and Buchwalter, Stephen L., to PPG Industries, Inc. Self-curable resinous compositions useful in coating applications, 4,414,068, Cl. 204-181.00C.
- Pawlowski, Stan: See—  
Galindo, Rudolph D., 4,414,617, Cl. 362-404.000.
- Paygro, Inc.: See—  
Kipp, Carl E., Jr., 4,414,335, Cl. 435-313.000.
- Payne, Larry D.; Cho, Hyun J.; and Mehta, Kishor N., to T. D. Williamson, Inc. Unitary pig for use in a pipeline, 4,413,370, Cl. 15-104.06R.
- Pearce, Charlie I.: See—  
Mittaker, Gerald W.; and Martinez, Evidio E., 4,413,364, Cl. 4-661.000.
- Peeters, Guido J.: See—  
De Bievre, Paul J.; Vansant, Etienne F.; and Peeters, Guido J., 4,414,005, Cl. 55-75.000.
- Pejouhy, Radi: See—  
Mouffard, Michael L.; and Pejouhy, Radi, 4,414,530, Cl. 338-25.000.
- Pellegrata, Renato; and Gandolfi, Carmelo, to Farmitalia Carlo Erba. Fluoro-prostaglandins and process for their preparation, 4,414,407, Cl. 424-305.000.
- Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., to Owens-Illinois, Inc. Apparatus and method for controlling the inspection of finished products, 4,413,738, Cl. 209-523.000.
- Pendleton, James E. Body sled, 4,413,832, Cl. 280-12.00R.
- Pennella, Filippo, to Phillips Petroleum Company. Removal of diene impurities from alkenes or alkanes over activated magnesium oxide under ultraviolet radiation, 4,414,083, Cl. 204-162.00R.
- Peris, John M., to Harding Brothers, Inc. Bar stock feeder, 4,413,939, Cl. 414-17.000.
- Perkins, Donald H., to Otis Engineering Corporation. Dual string well packer, 4,413,677, Cl. 166-55.100.
- Perkins, Thomas K., to Atlantic Richfield Company. Wellbore cathodic protection, 4,413,679, Cl. 166-248.000.
- Perna, Theodore P., to Xerox Corporation. Ink jet array, 4,414,553, Cl. 346-1.100.
- Perry, Ralph A.; and Andrejasic, Raymond J., to Emhart Industries, Inc. Hydrocarbon responsive switch, 4,414,441, Cl. 200-61.040.
- Personal Products Company: See—  
Morpmann, Ralf, 4,413,995, Cl. 604-368.000.
- Pervul Industries, Inc.: See—  
Rzepecki, Ray M.; and Weiss, Victor H., 4,414,260, Cl. 428-212.000.
- Peter, Emmett B., III; and Rayfield, Wilson P., to Burroughs Corp. Four-bar interposer mechanism for offset printing, 4,413,902, Cl. 355-48.000.
- Peters, Alan R., to Automation International Corp. Extrusion die, 4,413,973, Cl. 425-461.000.
- Peters Machinery Co., Subsidiary of Katy Industries: See—  
Rose, Edward, 4,413,462, Cl. 53-540.000.
- Peters, Thomas: See—  
Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114, Cl. 210-652.000.
- Petermann, Michael: See—  
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,413,374, Cl. 16-121.000.
- Peterson, Shepard J., to FMC Corporation. Weighing cup, 4,413,690, Cl. 177-54.000.
- Petillo, Bruce: See—  
Galindo, Rudolph D., 4,414,617, Cl. 362-404.000.
- Petri, John T.; and Westover, Brooke N., to Sun Chemical Corporation. Diesel glow-plug ignitor, 4,414,463, Cl. 219-270.000.
- Petrini, Guido: See—  
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412, Cl. 562-535.000.
- Petrolite Corporation: See—  
Newberry, Michael E.; and Barker, Kenneth M., 4,414,035, Cl. 134-3.000.
- Pettinger, Donald J. Rodent control device, 4,414,653, Cl. 367-139.000.
- Pettit, George R., to University Patents, Inc. Cell growth inhibitory substances, 4,414,205, Cl. 424-177.000.
- Pettus, Robert O.: See—  
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624, Cl. 364-200.000.
- Petty, Randall H.; and Bartley, Burton H., to Texaco Inc. Fluid catalytic cracking catalyst, 4,414,138, Cl. 502-73.000.
- Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., to Outokumpu Oy. Method for the stiffening and straightening of starting sheets, 4,413,495, Cl. 72-196.000.
- Peuralinna, Mauri J.: See—  
Makiipirtti, Simo A. I.; Peuralinna, Mauri J.; Makitalo, Valto J.; Lilja, Launo L.; and Krogerus, Helge J., 4,413,816, Cl. 266-270.000.
- Peyton, John J.; Thomason, Robert L.; and Evinger, Hubert W., to Industrial Automation Corporation. Sorting and inspection apparatus and method, 4,414,566, Cl. 358-101.000.
- Pfizer Inc.: See—  
Belletire, John L., 4,414,220, Cl. 424-267.000.
- Kadin, Saul B., 4,414,388, Cl. 544-48.000.
- Pflegler, Frederick W. Article handling apparatus, 4,413,720, Cl. 198-345.000.
- Philip Morris Incorporated: See—  
Dwyer, R. William, Jr.; and Fleming, Mable L., 4,413,641, Cl. 131-361.000.
- Irving, Christopher, 4,413,637, Cl. 131-84.00R.
- Phillips, Edward H., to Optimetrix Corporation. Gas bearing, 4,413,864, Cl. 308-5.00R.
- Phillips Petroleum Company: See—  
Doss, Richard C., 4,414,107, Cl. 209-166.000.
- Hitzman, Donald O., 4,414,334, Cl. 435-262.000.
- Pennella, Filippo, 4,414,083, Cl. 204-162.00R.
- Senatore, Guy; and Farrar, Ralph C., 4,414,340, Cl. 523-219.000.
- Small, William M., 4,413,394, Cl. 29-157.30B.
- Wegner, Eugene H., 4,414,329, Cl. 435-68.000.
- Photon Power, Inc.: See—  
Lampkin, Curtis M., 4,414,252, Cl. 427-424.000.
- Piano, Renzo, to Fiat Auto S.p.A. Ventilation system for the passenger compartment of a motor vehicle, 4,413,550, Cl. 98-2.000.
- Pichert, Ludwig: See—  
Tenberg, Werner; and Pichert, Ludwig, 4,413,810, Cl. 266-94.000.
- Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, to Sistemco N.V. Heat resistant cabinet and method of manufacture, 4,413,869, Cl. 312-236.000.
- Pieniak, Heinz A., to Johnson & Johnson Baby Products Company. Laminated structures having gathered and ungathered marginal portions and method of manufacturing the same, 4,413,623, Cl. 604-365.000.
- Pieters, Ferdinandus A., to Micropump Corporation. Encapsulated magnet for magnetic drive, 4,414,523, Cl. 335-302.000.
- Pieters, Wim J. M.: See—  
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,414,256, Cl. 428-163.000.
- Pietrini, Viktor: See—  
Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378, Cl. 19-258.000.
- Pietsch, Gunter, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Shaft sealing assembly, 4,413,829, Cl. 277-3.000.
- Pietsch, Gunter, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Seal assembly for rotating shafts, 4,413,830, Cl. 277-27.000.
- Pilot Man-Nen-Hitsu Kabushiki Kaisha: See—  
Tokorozawa, Sadao, 4,413,751, Cl. 222-1.000.
- Pinkston, Bruce H. W., to Union Carbide Corporation. Apparatus for mixing chemical components, 4,414,184, Cl. 422-133.000.
- Pinson, Marvin J., Jr.: See—  
Wang, Kenneth Y.; Hill, Bertie R.; and Pinson, Marvin J., Jr., 4,414,045, Cl. 156-73.200.
- Pinteric, Frank W.: See—  
Merdian, Anton W., Jr.; Jurneke, Joseph K.; and Pinteric, Frank W., 4,414,590, Cl. 360-97.000.
- Pioneer Electronic Corporation: See—  
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,413,793, Cl. 242-68.000.
- Matsui, Fumio; and Takasu, Yutaka, 4,414,604, Cl. 361-385.000.
- Pioneer Speaker Components, Inc.: See—  
Sashida, Iwao; and Haga, Tsutomu, 4,414,436, Cl. 179-110.00A.
- Pirklbauer, Wilfried; and Nagl, Martin, to Voest-Alpine Aktiengesellschaft. Apparatus for discharging hot flowable solids, particularly sponge iron, from a shaft furnace, 4,413,812, Cl. 266-195.000.
- Pithouse, Kenneth B., to Raychem Limited. Wrap-around device, 4,413,656, Cl. 138-110.000.
- Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., to King Energy Systems, Inc.; and Servamatic Solar Systems, Inc. Solar collector, 4,413,618, Cl. 126-450.000.
- Pitts, Thomas E.: See—  
Maddox, Edward L.; and Pitts, Thomas E., 4,414,476, Cl. 250-563.000.
- Pittway Corporation: See—  
Conforti, Frederick J.; and Fenne, Kenneth R., 4,414,612, Cl. 362-188.000.
- Plack, Albert R.: See—  
Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., 4,413,838, Cl. 280-751.000.
- Platt, Robert J.; and Shadbolt, Edward A., to Exxon Research and Engineering Co. Streamline coal slurry letdown valve, 4,413,646, Cl. 137-240.000.
- Platzter, Maximilian F.; and Simmons, John M., to United States of America, Navy. Jet excitation by an oscillating vane, 4,413,782, Cl. 239-102.000.
- Plonczak, Garold W.: See—  
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., 4,414,594, Cl. 360-106.000.
- Podgurski, Harry H.: See—  
Davis, Frank N.; and Podgurski, Harry H., 4,414,043, Cl. 148-16.000.
- Pohle, Richard H., to Lockheed Missiles & Space Co., Inc. Wavefront tilt measuring apparatus, 4,413,909, Cl. 356-354.000.
- Poindexter, Graham S.; and Temple, David L., Jr., to Mead Johnson & Company. Dihydropyridyl cyclic imide esters and their pharmaceutical use, 4,414,213, Cl. 424-248.500.

- Poirier, Michel: See—  
Boutin, Xavier; Compagnon, Francis; and Poirier, Michel, 4,414,646, Cl. 365-2.000.
- Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. Wire coating composition, 4,414,355, Cl. 524-462.000.
- Pokrzyk, Gerald F.: See—  
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064, Cl. 204-37.00R.
- Polak's Frutal Works, B.V.: See—  
van den Bosch, Steven; van't Land, Evert; and Stoffelsma, Jan, 4,414,233, Cl. 426-535.000.
- Polysar Limited: See—  
Nettleton, James S., 4,413,971, Cl. 425-311.000.
- Pomponio, Edward V., to Timex Corporation. Timed switch, 4,414,439, Cl. 200-38.00R.
- Portmann, Robert: See—  
Scherrer, Walter; and Portmann, Robert, 4,414,156, Cl. 260-352.000.
- Portoghesi, Joseph: See—  
Berke, Herbert; and Portoghesi, Joseph, 4,414,567, Cl. 358-139.000.
- Potter, Steven E.: See—  
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171, Cl. 264-249.000.
- Potts, John E., Jr. Diesel locomotive fuel savings and protection system, 4,413,595, Cl. 123-142.50R.
- Pouli, Dirk: See—  
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064, Cl. 204-37.00R.
- Powell, Justin C., to Texaco, Inc. Production of alkenyl substituted aliphatic dicarboxylic anhydrides, 4,414,397, Cl. 549-255.000.
- Powell, Willie A.: See—  
Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674, Cl. 165-104.330.
- Power, Roy J., to Power-Soler, Inc. Molded foot bed, 4,413,429, Cl. 36-44.000.
- Power, Royal A.: See—  
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171, Cl. 264-249.000.
- Power-Soler, Inc.: See—  
Power, Roy J., 4,413,429, Cl. 36-44.000.
- PPG Industries, Inc.: See—  
Boyer, Nicodemus E., 4,414,396, Cl. 548-478.000.
- Patricia, Steven E.; and Buchwalter, Stephen L., 4,414,068, Cl. 204-181.00C.
- Prescott, Roger, to Great Lakes Carbon Corporation. Composite disc, 4,413,860, Cl. 301-63.0PW.
- Prevorsek, Dusan C.: See—  
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., 4,414,366, Cl. 525-439.000.
- Prewo, Karl M.: See—  
Layden, George K.; and Prewo, Karl M., 4,414,011, Cl. 65-18.100.
- Preziuso, Ciro: See—  
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, 4,414,018, Cl. 71-88.000.
- Price, Albert E., to General American Transportation Corporation. Tank car heating system, 4,414,462, Cl. 219-202.000.
- Price, Christopher P.: See—  
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327, Cl. 435-18.000.
- Prinz, Peter: See—  
Erpenbach, Heinz; Gehrman, Klaus; Lork, Winfried; and Prinz, Peter, 4,414,160, Cl. 260-544.00A.
- Pritzkow, Dennis: See—  
Hoffman, David M.; Pritzkow, Dennis; and Lang, George R., 4,414,473, Cl. 250-366.000.
- Procter & Gamble Company, The: See—  
Goffinet, Pierre C. E., 4,414,128, Cl. 252-111.000.
- Proskow, Stephen: See—  
Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, 4,414,312, Cl. 430-283.000.
- Prusak, John J.; and Patel, Bhupendra P., to RCA Corporation. Method for molding an article, 4,414,167, Cl. 264-40.500.
- Pryor, Michael J., to Olin Corporation. Disposable bed filter apparatus, 4,413,813, Cl. 266-216.000.
- Psyhojos, Triffin G.: See—  
Villalobos, Joseph A.; and Psyhojos, Triffin G., 4,413,427, Cl. 34-46.000.
- Public Health Laboratory Service Board: See—  
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327, Cl. 435-18.000.
- PUMA-Sportschuhfabriken Rudolf Dassler KG: See—  
Cavanagh, Peter R., 4,413,431, Cl. 36-114.000.
- Purex Corporation: See—  
Aurthur, William B., 4,414,109, Cl. 210-278.000.
- Hackett, Walter J.; and Galena, Peter E., 4,414,360, Cl. 524-560.000.
- Purr, Gerhard, to Kraftwerk Union Aktiengesellschaft. Double shell steam turbine housing assembly, 4,413,948, Cl. 415-219.00R.
- Q.P. Corporation: See—  
Takano, Motoharu; and Hoshino, Minoru, 4,413,977, Cl. 432-56.000.
- Queener, Carl A.: See—  
Dattilo, Anthony J.; McDonald, James F.; and Queener, Carl A., 4,414,579, Cl. 358-256.000.
- Quella, Ferdinand; and Hohmann, Eugen, to Siemens Aktiengesellschaft. Method for lubricating bearing and gear surfaces, 4,414,241, Cl. 427-2.000.
- Quenton, Guy: See—  
Duhomez, Roger; and Quenton, Guy, 4,413,815, Cl. 266-265.000.
- Quest Corporation: See—  
Wetzel, Donald C., 4,413,691, Cl. 177-147.000.
- Quietlite International, Ltd.: See—  
Elliott, William J., 4,414,491, Cl. 315-282.000.
- Quinn, George P.: See—  
Smith, Jeffrey S.; Quinn, George P.; and Vasalos, Iacovos A., 4,414,101, Cl. 208-153.000.
- Quinn, Leonard L., to Dart Industries Inc. Barbecue fuel level gauge, 4,413,515, Cl. 73-296.000.
- Radtke, Wolfgang: See—  
Bergmann, Udo; Kurz, Heinrich; and Radtke, Wolfgang, 4,414,552, Cl. 346-1.100.
- Ragaller, Klaus: See—  
Moll, Rudolf; Ragaller, Klaus; and Schade, Ekkehard, 4,414,450, Cl. 200-147.00R.
- Ragon, Danny L., to Deere & Company. Track recoil system, 4,413,862, Cl. 305-10.000.
- RAI Research Corporation: See—  
D'Agostino, Vincent F.; and Lee, Joseph Y., 4,414,090, Cl. 204-252.000.
- Rainville Co., Inc.: See—  
Rainville, Dewey, 4,414,175, Cl. 264-531.000.
- Rainville, Dewey, to Rainville Co., Inc. Method for blowing oriented containers, 4,414,175, Cl. 264-531.000.
- Randmae, Rein S., to Vicon Industries, Inc. Housing assembly for electrical apparatus, 4,414,576, Cl. 358-229.000.
- Rankel, Lillian A.; and Rudnick, Leslie R., to Mobil Oil Corporation. Process for reducing nitrogen and/or oxygen heteroatom content of a mineral oil, 4,414,102, Cl. 208-211.000.
- Ransburg GmbH: See—  
Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, 4,413,788, Cl. 239-703.000.
- Raphael, Richard A.; Eyley, Stephen C.; and Colman, Stephen C. W., to Fisons Limited. Certain diacetyl-amino-phenolic derivatives, 4,414,416, Cl. 564-443.000.
- Rapp, Fred J.: See—  
Wade, Charles E., Jr.; and Rapp, Fred J., 4,413,557, Cl. 101-44.000.
- Raptis, Apostolos C.: See—  
Karplus, Henry H. B.; and Raptis, Apostolos C., 4,413,531, Cl. 73-861.250.
- Rasberger, Michael, to Ciba-Geigy Corporation. Compositions stabilized with dioxaphosphines, 4,414,345, Cl. 524-108.000.
- Raschel Co., Ltd.: See—  
Ogura, Hiroyuki; and Kuroda, Toyoyuki, 4,413,484, Cl. 66-193.000.
- Rasmussen, Chris R., to McNeilab, Inc. Heterocyclic derivatives of guanidine, 4,414,211, Cl. 424-246.000.
- Rau, Gerald A.: See—  
Lanius, Charles A.; Hultstrum, Harold D.; and Rau, Gerald A., 4,413,804, Cl. 251-144.000.
- Rauschenbach, Dieter: See—  
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585, Cl. 118-61.000.
- Rayborn, Grayson H.: See—  
Singh, Jag J.; Wood, George M., Jr.; Rayborn, Grayson H.; and White, Frederick A., 4,414,509, Cl. 324-250.000.
- Raychem Limited: See—  
Pithouse, Kenneth B., 4,413,656, Cl. 138-110.000.
- Rayfield, Wilson P.: See—  
Peter, Emmett B., III; and Rayfield, Wilson P., 4,413,902, Cl. 355-48.000.
- Raytheon Company: See—  
Berlik, Lee J., 4,413,610, Cl. 126-39.00K.
- Berlik, Lee J.; Barnes, S. Thomas; and Levi, David E., 4,413,611, Cl. 126-39.00E.
- Simpson, James E., 4,414,453, Cl. 219-10.55F.
- RCA Corporation: See—  
Bogner, Bruce F., 4,414,425, Cl. 174-35.0GC.
- Flory, Robert E., 4,414,572, Cl. 358-172.000.
- Marschka, Frank D., 4,414,485, Cl. 313-451.000.
- McCusker, Joseph H.; Thaler, Barry J.; and Tsien, Wei H., 4,413,510, Cl. 73-150.00A.
- Prusak, John J.; and Patel, Bhupendra P., 4,414,167, Cl. 264-40.500.
- Tallant, James C., II; and Hettiger, James, 4,414,577, Cl. 358-242.000.
- Wang, Chih C.; and Bates, Ronald F., 4,414,660, Cl. 369-286.000.
- Rea, James H.: See—  
Karim, Khalid A.; and Rea, James H., 4,414,053, Cl. 156-308.200.
- Recovery Technology Associates: See—  
Simpson, Robert E.; Amstead, Billy H.; and Barden, Charles R., 4,414,112, Cl. 210-512.100.
- Redecker, Friedrich: See—  
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635, Cl. 364-526.000.
- Redey, Laszlo; and Visser, Donald R. Multifunctional reference electrode, 4,414,093, Cl. 204-412.000.
- Redmer, Frank; and Krippel, Kurt, to Bayer Aktiengesellschaft. Apparatus for the production of a reaction mixture, 4,413,912, Cl. 366-69.000.



- Reed, Scott T.: See—  
McCollister, Howard L.; and Reed, Scott T., 4,414,282., Cl. 428-433.000.
- Reeder, Michael R.: See—  
Bourassa, Ronald R.; and Reeder, Michael R., 4,414,057., Cl. 156-643.000.
- Refractory Products Co.: See—  
Woodruff, Richard K.; and Tedesco, Joseph P., 4,414,674., Cl. 373-130.000.
- Regie Nationale des Usines Renault: See—  
Richard, Jackie, 4,413,712., Cl. 192-4.00A.
- Regioninvest i Norr AB: See—  
Wiklund, Thore K. E., 4,413,643., Cl. 137-68.00R.
- Reith, Karl; and Sieger, Heinz, to Teroson GmbH. Cyanoacrylate adhesive composition. 4,414,347., Cl. 524-168.000.
- Reith, Ronald K.: See—  
Anderson, Philip M., III; and Reich, Ronald K., 4,414,519., Cl. 335-208.000.
- Reichenbach, Donald F.: See—  
Cobbedick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,414,173., Cl. 257-000.
- Reism, Daniel E., to Minnesota Mining and Manufacturing Company. Low reluctance transformer core. 4,414,521., Cl. 335-281.000.
- Reiss, Karl: See—  
Mennicke, Stefan; Reiss, Karl; and Liebermann, Kurt, 4,414,296., Cl. 429-50.000.
- Reith, Friedrich: See—  
Gross, Heinz; Reith, Friedrich; Retzlaff, Friedrich; and Schlusnus, Karl H., 4,414,042., Cl. 148-12.00R.
- Relyea, Richard D.: See—  
Smith, Gary D.; and Relyea, Richard D., 4,413,642., Cl. 137-14.000.
- Rembaum, Alan: See—  
Williams, Roger M.; and Rembaum, Alan, 4,414,080., Cl. 204-129.000.
- Rempel, Delmar. Mat cutter and guide system. 4,413,542., Cl. 83-455.000.
- Remy, David C.: See—  
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,414,154., Cl. 260-245.700.
- Renard, Pierre: See—  
Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, 4,414,105., Cl. 208-309.000.
- Rendek, Dominic S., to Nalco Chemical. Method for sulfite pulping using water-soluble molybdenum containing compounds. 4,414,060., Cl. 162-36.000.
- Rendek, Robert B.: See—  
Sleeth, Rhule B.; Theiler, Richard F.; and Rendek, Robert B., 4,414,232., Cl. 426-266.000.
- Renilian, Armen; Curry, Thomas H.; and Siracusan, Elizabeth, to Albany International Corp. Resin containing textiles. 4,413,391., Cl. 28-166.000.
- Research Products Rehovot Ltd.: See—  
Linder, Charles; and Aviv, Gershon, 4,413,999., Cl. 8-540.000.
- Research Triangle Institute: See—  
McCartney, Michael L., 4,414,431., Cl. 381-48.000.
- Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Combustion control by prestratification. 4,413,593., Cl. 123-1.00A.
- Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Vinyl ether monomers and polymers therefrom. 4,414,159., Cl. 260-465.600.
- Resnick, Paul R.: See—  
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,414,280., Cl. 428-422.000.
- Restrepo, Jose M. Fiber-reinforced cement, and process. 4,414,030., Cl. 106-90.000.
- Retzlaff, Friedrich: See—  
Gross, Heinz; Reith, Friedrich; Retzlaff, Friedrich; and Schlusnus, Karl H., 4,414,042., Cl. 148-12.00R.
- Revlon, Inc.: See—  
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.
- Rexham Corporation: See—  
Conley, Kenneth E., 4,414,316., Cl. 430-496.000.
- Rhodes, Joseph A.: See—  
Chin, John F.; Rhodes, Joseph A.; and Kusterer, James E., 4,414,010., Cl. 65-16.000.
- Rhone-Poulenc Agrochimie: See—  
Aubouy, Michel; Hamel, Pierre; and Molin, Marc, 4,414,415., Cl. 564-412.000.
- Rice, Richard G.; Boissevain, Mathew G.; and Dubin, Robert R., to Messurex Corporation. Gas analyzer with fluid curtain. 4,413,911., Cl. 356-438.000.
- Richard, Jackie, to Regie Nationale des Usines Renault. Device for locking an element in a stationary position for an automobile vehicle. 4,413,712., Cl. 192-4.00A.
- Ricon Company, Ltd.: See—  
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.
- Rieker, Franz: See—  
Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,413,509., Cl. 73-117.300.
- Rieger, Ernst: See—  
Lugscheider, Walter; and Rieger, Ernst, 4,414,673., Cl. 373-22.000.
- Rieke Corporation: See—  
Summers, Kenneth L., 4,413,743., Cl. 215-216.000.
- Rieke, Helmut: See—  
Hesse, Theodor; Rieke, Helmut; and Kleine-Konig, Johannes, 4,413,933., Cl. 406-152.000.
- Rienecker, Reimund; and Stricker, Walter, to J. M. Voith GmbH. Rotor for a pulper. 4,413,789., Cl. 241-46.170.
- Rieter Machine Works Limited: See—  
Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378., Cl. 19-258.000.
- Riggs, Darius O.: See—  
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738., Cl. 209-523.000.
- Riggs, Olen L., Jr., to Kerr-McGee Chemical Corporation. Method for fabricating electrodes. 4,413,408., Cl. 29-825.000.
- Riker Laboratories, Inc.: See—  
Moore, George G. I., 4,414,217., Cl. 424-263.000.
- Rines, Olen A., to Sanders Associates, Inc. Fiber optic acoustic signal transducer using reflector. 4,414,471., Cl. 250-227.000.
- Ripa, John A.: See—  
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064., Cl. 204-37.00R.
- Ripley, Ian S.: See—  
McBride, Alistair D.; and Ripley, Ian S., 4,413,914., Cl. 366-137.000.
- Ritter, Alfred E., to Studiengesellschaft Kohle mbH. Process for the energy-saving recovery of useful or available heat from the environment or from waste heat. 4,413,670., Cl. 165-1.000.
- Ritter, Herbert W. Retainer strap for garbage can lid. 4,413,851., Cl. 292-259.000.
- Roba, Giacomo; and Vergnano, Paolo, to Caselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Process and apparatus for producing preforms for optical fibers. 4,414,164., Cl. 264-1.200.
- Robert Bosch GmbH: See—  
Kuhlmann, Gerhard, 4,413,936., Cl. 408-8.000.
- Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,413,509., Cl. 73-117.300.
- Robertello, Andrea: See—  
Olivieri, Roberto; Robertello, Andrea; and Degen, Ludwig, 4,414,333., Cl. 435-243.000.
- Roberts, Peter T.: See—  
Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.
- Robertson Paper Box Co., Inc.: See—  
Davidson, Thomas L., 4,413,726., Cl. 206-45.130.
- Robinette, Susan L., to Xerox Corporation. Process for making photo-receptors. 4,414,179., Cl. 420-579.000.
- Robinson, David R. Film holder support apparatus. 4,414,683., Cl. 378-177.000.
- Rockwell International Corporation: See—  
Akhtar-Khavari, Fuad; and Lobin, Bernard J., 4,413,388., Cl. 24-279.000.
- Chen, Thomas T., 4,414,507., Cl. 324-210.000.
- Enderson, Eugene S., 4,414,689., Cl. 455-221.000.
- Rodd, Charles R.; Rodd, Doris M. E.; and Scheuerman, Richard L. Air pressure regulator. 4,413,649., Cl. 137-505.390.
- Rodd, Doris M. E.: See—  
Rodd, Charles R.; Rodd, Doris M. E.; and Scheuerman, Richard L., 4,413,649., Cl. 137-505.390.
- Rodda, Donald, to Singer Company, The; and Rodda, Donald. Camming arrangement for thread handling device. 4,413,578., Cl. 112-254.000.
- Rogge, Dieter, to Windmoller & Holscher. Flexographic printing press. 4,413,560., Cl. 101-247.000.
- Rohde, Vernon C.; and Romanaukas, William A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for centrifugal separation. 4,413,771., Cl. 494-17.000.
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- Rohm and Haas Company: See—  
Miller, George A.; and Chan, Hak-Foon, 4,414,210., Cl. 424-245.000.
- Rohrman, Albert C., Jr.: See—  
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,414,189., Cl. 423-328.000.
- Rojey, Alexandre, to Institut Francais du Pétrole. Process for producing cold and/or heat by means of an absorption cycle. 4,413,479., Cl. 62-101.000.
- Rolls Royce (1971) Limited: See—  
Scott, Alexander, 4,413,949., Cl. 416-96.00A.
- Romanaukas, William A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for improving sedimentation field flow fractionation channels. 4,414,106., Cl. 209-155.000.
- Romanaukas, William A.: See—  
Rohde, Vernon C.; and Romanaukas, William A., 4,413,771., Cl. 494-17.000.
- Rohde, Vernon C.; and Romanaukas, William A., 4,413,772., Cl. 494-17.000.
- Rohde, Vernon C.; and Romanaukas, William A., 4,413,773., Cl. 494-37.000.
- Romania, Samuel R.; and Watson, Frank L., to Burroughs Corporation. Cutting tool for use on printed circuit board wiring. 4,413,413., Cl. 30-300.000.

- Romey, Ingo; and El-Roy, Menachem, to Bergwerksverband GmbH. Modified synthetic plastic from thermoplastic synthetics and coal hydrogenation residues. 4,414,344., Cl. 524-65.000.
- Roos, Johannes P., to Indola Cosmetics B.V. Hair dryer casing. 4,413,428., Cl. 34-100.000.
- Roper, Jerry M., to Ethyl Corporation. Process for producing N-acyl-D,L-phenylalanine ester. 4,414,404., Cl. 560-41.000.
- Rosato, Dennis W.; and Lister, Neil K., to Millmaster Onyx Group, Inc. Insulation board. 4,414,265., Cl. 428-285.000.
- Rose, Edward, to Peters Machinery Co., Subsidiary of Katy Industries. Accumulator and stacker for sandwiched biscuits and the like. 4,413,462., Cl. 53-540.000.
- Rosenblum, Philip: See—  
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.
- Rosenhahn, Lothar: See—  
Langen, Hans; Rosenhahn, Lothar; and Wolff, Erich, 4,414,309., Cl. 430-551.000.
- Rosenthal, Manfred: See—  
Weber, Wendelin; and Rosenthal, Manfred, 4,413,764., Cl. 226-170.000.
- Ross Hill Controls Corporation: See—  
Smith, Gary D.; and Relyea, Richard D., 4,413,642., Cl. 137-14.000.
- Ross, Michael O.; and Marshak, Kurt M. Machine for testing chain and sprocket type drive systems. 4,413,513., Cl. 73-162.000.
- Ross, William. Pivoting license plate bracket. 4,413,803., Cl. 248-475.00B.
- Rossi, Louis J.: See—  
Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., 4,414,152., Cl. 260-185.000.
- Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., 4,414,320., Cl. 430-106.000.
- Rossi, Michael J.: See—  
Miller, Paul S.; and Rossi, Michael J., 4,413,367., Cl. 5-411.000.
- Rossi, Robert M.: See—  
Chino, John J.; LePage, Paul; Rossi, Robert M.; and Rossman, Herman, 4,414,605., Cl. 361-388.000.
- Rossman, Herman: See—  
Chino, John J.; LePage, Paul; Rossi, Robert M.; and Rossman, Herman, 4,414,605., Cl. 361-388.000.
- Rotek Incorporated: See—  
Geisley, James W., 4,413,866., Cl. 308-217.000.
- Roth, Anton, deceased; and by Moeller, Guenther, executor, to Mercator Gesellschaft für Entwicklung und Technik mbH. Lift-type car park. 4,413,942., Cl. 414-253.000.
- Rothhaas, Friedrich: See—  
Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, 4,413,869., Cl. 312-236.000.
- Roto-Finish Company, Inc.: See—  
Balz, Gunther W., 4,413,448., Cl. 51-313.000.
- Roussel, Jacques G. R.: See—  
Breda, Antoine G. L. J.; and Roussel, Jacques G. R., 4,414,151., Cl. 260-145.00B.
- Rowan, John W.: See—  
Kiwallo, Jozef; Galloway, James H.; and Rowan, John W., 4,414,292., Cl. 429-19.000.
- Ruckle, Duane L.: See—  
Ulion, Nicholas E.; and Ruckle, Duane L., 4,414,249., Cl. 427-248.100.
- Rudnick, Leslie R.: See—  
Rankel, Lillian A.; and Rudnick, Leslie R., 4,414,102., Cl. 208-211.000.
- Rudszin, Willy: See—  
Wahle, Gunter; and Rudszin, Willy, 4,413,640., Cl. 131-281.000.
- Rudy, William J., Jr.; and Zimmerman, John A., Jr., to AMP Incorporated. Preloaded electrical connector. 4,413,872., Cl. 339-59.00M.
- Ruhrchemie Aktiengesellschaft: See—  
Weber, Jürgen; Falk, Volker; and Knip, Claus, 4,414,419., Cl. 568-421.000.
- Rupert, John G.; and Jensen, Kenneth N. Subsurface sign assembly. 4,413,434., Cl. 40-10.00R.
- Rupprecht, Eckhard: See—  
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.
- Rusk, Richard W. Guide system for flame cutting of pipe. 4,414,041., Cl. 148-9.600.
- Rutgerswerke Aktiengesellschaft: See—  
Palm, Jürgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, 4,414,192., Cl. 423-445.000.
- Ruuth, Jonny. Thermostat. 4,414,520., Cl. 335-208.000.
- Ruzic, David N.: See—  
Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244., Cl. 427-105.000.
- Ryan, Joseph L., and Winfrey, Gerald N., to Honeywell Information Systems Inc. Hardware-firmware CRT display link system. 4,414,645., Cl. 364-900.000.
- Ryan, Kenneth M.: See—  
Liu, Thomas M. H.; Meililo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Slettinger, Meyer, 4,414,155., Cl. 260-245.20T.
- Ryan, William F., to Garrett Corporation, The. Fluidic thruster control and method. 4,413,795., Cl. 244-3.220.
- Rybak, James P., to Magnetics International, Inc. Fabricated lifting magnet assembly. 4,414,522., Cl. 335-291.000.
- Rybicki, Edward B., to Warner Lambert Technologies, Inc. Refractor optical system. 4,413,891., Cl. 351-235.000.
- Rzepecki, Ray M.; and Weiss, Victor H., to Pervel Industries, Inc. Static dissipative upholstery fabric or the like. 4,414,260., Cl. 428-212.000.
- S&C Electric Company: See—  
Billar, Bruce A., 4,414,527., Cl. 337-180.000.
- S. C. Johnson & Son, Inc.: See—  
Hamielec, Archie E.; Lawless, Grant P.; and Schultz, Harold H., 4,414,370., Cl. 526-88.000.
- Sacks, Michael. Protective shields. 4,413,357., Cl. 2-2.500.
- Saeki, Taichi: See—  
Kureha, Takeshi; Kataoka, Teruo; Saeki, Taichi; and Takeda, Minoru, 4,414,571., Cl. 358-158.000.
- Sagae, Masayuki: See—  
Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255., Cl. 428-154.000.
- Sager, James R.: See—  
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738., Cl. 209-523.000.
- Saijo, Kinji: See—  
Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078., Cl. 204-34.000.
- Saito, Yoichi: See—  
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254., Cl. 428-34.000.
- Saitou, Masatoshi: See—  
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.
- Sakai Chemical Industry Co., Ltd.: See—  
Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, 4,414,196., Cl. 423-633.000.
- Sakai, Yukio: See—  
Nojiri, Naohiro; and Sakai, Yukio, 4,414,135., Cl. 502-224.000.
- Sakamoto, Tsutomu: See—  
Arai, Michio; Shiraogawa, Yukio; Sakamoto, Tsutomu; and Aoyagi, Keizo, 4,414,626., Cl. 364-200.000.
- Sakiyama, Michio: See—  
Imaoka, Hiroshi; Sakiyama, Michio; and Yamamoto, Masahiro, 4,413,498., Cl. 72-405.000.
- Sakuma, Shinzo: See—  
Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,414,448., Cl. 200-144.00B.
- Sakuma, Tsutomu: See—  
Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, 4,414,139., Cl. 502-72.000.
- Sakurada, Hiroshi; and Aoyama, Naofumi, to Hitachi, Ltd. Memory circuit for generating liquid crystal display characters. 4,414,545., Cl. 340-790.000.
- Salamon, Robert G.: See—  
Loeb, Alfred A.; and Salamon, Robert G., 4,413,566., Cl. 102-517.000.
- Sall, Gosta: See—  
Hok, Bertil; and Sall, Gosta, 4,413,528., Cl. 73-753.000.
- Salmon, Robert: See—  
Matthey, Philippe; Salmon, Robert; and Buhlmann, Niklaus, 4,413,565., Cl. 102-503.000.
- Sanagai, Mitsuru: See—  
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620., Cl. 364-200.000.
- Sanders Associates, Inc.: See—  
Rines, Glen A., 4,414,471., Cl. 250-227.000.
- Sanders, David H. Portable, hand held, high pressure pump. 4,413,957., Cl. 417-415.000.
- Sandhaus, Jeffrey. Child-resistant closure member. 4,413,742., Cl. 215-216.000.
- Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., to Union Oil Company of California. Permeability reduction in subterranean reservoirs. 4,413,680., Cl. 166-270.000.
- Sankyo Company, Ltd.: See—  
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,414,392., Cl. 548-105.000.
- Sano, Yoshiaki, to Nihon Plast Co., Ltd.; and Yamato Plastics Machinery Co., Ltd. Method of producing ventilator grills. 4,414,170., Cl. 264-242.000.
- Sanofi: See—  
Jansen, Franz K.; and Gros, Pierre, 4,414,148., Cl. 260-112.00B.
- Santa Barbara Research Center: See—  
Kvaas, Robert E., 4,414,040., Cl. 148-6.300.
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- Santini, Thomas F., to De Laire, Inc. Vapor dispersing device. 4,413,779., Cl. 239-45.000.
- Sanyo Electric Co., Ltd.: See—  
Takeichi, Toshio, 4,414,578., Cl. 358-243.000.
- Sarashina, Hiromi, to Senko Medical Instrument Mfg. Co., Ltd. Intestinal irrigator for use with artificial anus. 4,413,994., Cl. 604-327.000.
- Sasaki, Aki; and Echigo, Yoshiaki, to Unitika Ltd. Phenolic chelate resin, process for producing the same, and method of recovering heavy metal ions with the same. 4,414,183., Cl. 423-7.000.



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- Sasaki, Ryoichi, to Nippon Electric Industry Co., Ltd. Pivot hinge with removable door closing device. 4,413,373, Cl. 16-54.000.
- Sasaki, Sadayuki: See—  
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,414,026, Cl. 75-130.500.
- Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, to Nippon Steel Corporation. Exhaust pipe with vibration damping. 4,413,657, Cl. 138-149.000.
- Sasano, Mitunori: See—  
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162, Cl. 261-23.00A.
- Sashida, Iwao; and Haga, Tsutomu, to Pioneer Speaker Components, Inc. Narrow-frequency band acoustic transducer. 4,414,436, Cl. 179-110.00A.
- Sasse, Howard A. Golf club. 4,413,825, Cl. 273-175.000.
- Sato, Michio: See—  
Kawaguchi, Yutaka; Sato, Michio; and Kasai, Shin, 4,413,791, Cl. 242-18.00G.
- Sato, Soichiro. Connecting device for end of rope or bar and method for producing thereof. 4,413,386, Cl. 24-230.50R.
- Sato, Toshihiko: See—  
Inoue, Kazuo; Narisawa, Ryo; Wada, Ryuji; Sato, Toshihiko; and Irino, Hiroshi, 4,413,602, Cl. 123-486.000.
- Sato, Tsutomu: See—  
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899, Cl. 355-4.000.
- Sato, Yasuhisa, to Canon Kabushiki Kaisha. Compact photographic objective. 4,413,888, Cl. 350-432.000.
- Sato, Yasushi: See—  
Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581, Cl. 358-280.000.
- Satogosei Co., Ltd.: See—  
Suzuki, Tadashi, 4,413,380, Cl. 24-16.0PB.
- Sato, Yoshiaki: See—  
Watanabe, Ichiro; Sato, Yoshiaki; and Yamaguchi, Yasumasa, 4,414,331, Cl. 435-129.000.
- Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Ebele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung. Azepine derivatives and their anti-thrombotic compositions and methods. 4,414,225, Cl. 424-274.000.
- Sauvey, Donald R., to Marmon Group, Inc. The. Single channel string ensemble sound system for an electronic musical instrument. 4,413,544, Cl. 84-1.240.
- Savage, Charles E.: See—  
Geel, Zane H.; Hornby, Roger B.; Lipps, Bennie J.; Savage, Charles E.; and Vanat, Pierre, 4,414,110, Cl. 210-321.300.
- Sawada, Daisaku: See—  
Shigematsu, Takashi; Watanabe, Tomoyuki; and Sawada, Daisaku, 4,413,599, Cl. 123-425.000.
- Sawataishi, Tokio: See—  
Tokuda, Kazuo; and Sawataishi, Tokio, 4,414,569, Cl. 358-153.000.
- Sawruk, Stephen: See—  
Kokotailo, George T.; Rohman, Albert C., Jr.; and Sawruk, Stephen, 4,414,189, Cl. 423-328.000.
- Sayo, Kosaku: See—  
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717, Cl. 192-84.00C.
- Scawen, Michael D.: See—  
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327, Cl. 435-18.000.
- Schade, Ekkehard: See—  
Moll, Rudolf; Ragaller, Klaus; and Schade, Ekkehard, 4,414,450, Cl. 200-147.00R.
- Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, to Ransburg GmbH. Device for the feeding of enamel to an electrostatic paint emitter. 4,413,788, Cl. 239-703.000.
- Schalch, Fred: See—  
Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455, Cl. 219-64.000.
- Schall, Wolfgang: See—  
Hoffmann, Peter; Hugel, Helmut; Schall, Wolfgang; and Schock, Wolfram, 4,414,488, Cl. 315-39.000.
- Scheidel, Max: See—  
Ellendt, Gunther; Gleitsmann, Gunter; and Scheidel, Max, 4,414,074, Cl. 203-21.000.
- Schelling, Paul E.; and Laurelli, James A., to Electric Power Research Institute, Inc. Catalytic combustion system for a stationary combustion turbine having a transition duct mounted catalytic element. 4,413,470, Cl. 60-39.320.
- Schelling & Co., Firma: See—  
Kollmann, Horst, 4,413,941, Cl. 414-35.000.
- Scheier, Richard M., to Southbend Escan Corporation. Igniter for a gas burner. 4,413,976, Cl. 431-278.000.
- Scheiner, Walter; and Portmann, Robert, to Ciba-Geigy AG. Process for producing 2-methoxybenzanthrones. 4,414,156, Cl. 260-352.000.
- Scheuerman, Richard L.: See—  
Rodd, Charles R.; Rodd, Doris M. E.; and Scheuerman, Richard L., 4,413,649, Cl. 137-505.390.
- Schilling, Curtis L., Jr.; Williams, Thomas C.; and Wesson, John P., to Union Carbide Corporation. Branched polycarbosilanes and their use in the production of silicon carbide. 4,414,403, Cl. 556-430.000.
- Schilling, Walter: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,414,394, Cl. 548-451.000.
- Schils, Petrus J. R., to Keystone International, Inc. Method of manufacturing a valve assembly. 4,413,393, Cl. 29-157.10R.
- Schindler, Harvey D., to Lummus Company, The. Hydrotreating catalyst. 4,414,141, Cl. 502-314.000.
- Schindler, Johannes G., to Dr. E. Fresenius Chemisch-pharmazeutische Industrie KG Apparatebau KG. Polarographic catheter probe. 4,413,627, Cl. 128-635.000.
- Schjeldahl, Gilmore T.; and Sharma, B., to Angiomedics Corporation. Expandable occlusion apparatus. 4,413,989, Cl. 604-96.000.
- Schlanger, Samuel L., to Mauer, Gail B.; and Cohen, Ellen R., a part interest. Vehicle control safety system. 4,413,702, Cl. 180-274.000.
- Schlegel, Joachim: See—  
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585, Cl. 118-61.000.
- Schlessinger, Joseph E.; and Hamilton, Richard G., to Critikon, Inc. Pulmonary monitor. 4,413,632, Cl. 128-716.000.
- Schlumberger Technology Corporation: See—  
Hepp, Vincent R., 4,414,656, Cl. 367-25.000.
- Schlusnus, Karl H.: See—  
Gross, Heinz; Reith, Friedrich; Retzlaff, Friedhelm; and Schlusnus, Karl H., 4,414,042, Cl. 148-12.00R.
- Schmick, Robert C.: See—  
Sims, James E.; and Schmick, Robert C., 4,414,459, Cl. 219-73.200.
- Schmid & Wezel, Firma: See—  
Wetzel, Ludwig, 4,413,412, Cl. 30-169.000.
- Schmidt, Mary K., to Cutter Laboratories, Inc. Liquid elemental diet. 4,414,238, Cl. 426-602.000.
- Schmidt, Martin; Kohler, Walter; Loch, Hans-Ulrich; and Weber, Albrecht, to Klockner-Humboldt-Deutz AG. Method and apparatus for calcining limestone in a shaft kiln. 4,414,186, Cl. 423-175.000.
- Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. 5/6 Carboxyphthalides. 4,414,399, Cl. 549-309.000.
- Schmidt, Terrance C., to Electrohome Limited. Regulation of the scan width of a raster scanned CRT deflection system. 4,414,494, Cl. 315-395.000.
- Schmitz, John B.; and Schmitz, William L. Dual dose ampule. 4,413,991, Cl. 604-191.000.
- Schmitz, William L.: See—  
Schmitz, John B.; and Schmitz, William L., 4,413,991, Cl. 604-191.000.
- Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, to L. Schuler GmbH. Method of and apparatus for producing can bodies welded along the longitudinal seam. 4,414,455, Cl. 219-64.000.
- Schneider, Friedrich, to G. Rau GmbH & Co. Process for producing a contact element. 4,414,444, Cl. 219-121.0LM.
- Schneider, John T., to Allied Corporation. Variable motor speed control. 4,414,500, Cl. 318-799.000.
- Schnitzlein, Paul G., to Teletype Corporation. Keyboard sense gate. 4,414,538, Cl. 340-365.00S.
- Schock, Wolfram: See—  
Hoffmann, Peter; Hugel, Helmut; Schall, Wolfgang; and Schock, Wolfram, 4,414,488, Cl. 315-39.000.
- Schoeber, Gernot: See—  
Ostreich, Ulrich; Schoeber, Gernot; and Witt, Gerd, 4,414,165, Cl. 264-1.500.
- Schrattenholz, Walter; Hilgenfeldt, Eckhard; and Knittel, Volker, to Hoechst Aktiengesellschaft. Anti-flooding agent for paints and plasters. 4,414,032, Cl. 106-186.000.
- Schreder, Felix: See—  
Fischer, Karl; and Schreder, Felix, 4,414,466, Cl. 219-459.000.
- Schrenk, Jurgen; and Wunderwald, Peter, to Boehringer Mannheim GmbH. Endoproteinase-Lys-C and process for its preparation thereof. 4,414,332, Cl. 435-219.000.
- Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, to Mannesmann Aktiengesellschaft. Supervising the inclination of mold sides. 4,413,667, Cl. 164-154.000.
- Schrock, Peter. Apparatus for pressure testing tubing. 4,413,501, Cl. 73-49.600.
- Schroeder, Heinz: See—  
Jache, Otto; and Schroeder, Heinz, 4,414,302, Cl. 429-190.000.
- Schucker, Robert C., to Exxon Research and Engineering Co. Fluid coking with the addition of alkaline earth metal ferrite-containing catalysts. 4,414,099, Cl. 208-121.000.
- Schuetze, Nina. Combination bedspread and sleeping enclosure. 4,413,368, Cl. 5-494.000.
- Schug, Arden L., to Garrett Corporation, The. Brake control system. 4,414,631, Cl. 364-426.000.
- Schultz, Harley D. Gopher probe and poison dispenser. 4,413,440, Cl. 43-124.000.
- Schultz, Harold H.: See—  
Hamielec, Archie E.; Lawless, Grant P.; and Schultz, Harold H., 4,414,370, Cl. 526-88.000.
- Schulze, Klaus: See—  
Keil, Hans S. H., deceased; Alfs, Helmut; and Schulze, Klaus, 4,414,125, Cl. 252-75.000.

- Schwartz, Nathan H. Wound irrigation system. 4,413,987, Cl. 604-28.000.
- Schwartz, Wolfgang: See—  
Braune, Dirk; and Schwartz, Wolfgang, 4,414,570, Cl. 358-154.000.
- Schweickardt, Karl, to Esquire, Inc. Protection device for high intensity gaseous discharge lamp starting circuit. 4,414,600, Cl. 361-56.000.
- Schweitzer, Edmund O., Jr. Ground fault indicator. 4,414,543, Cl. 340-651.000.
- Schwieters, Clarence R.: See—  
Charlson, Paul M.; Schwieters, Clarence R.; and Souk, Jun H., 4,414,166, Cl. 264-25.000.
- Scott, Alexander, to Rolls Royce (1971) Limited. Rotor blade for gas turbine engines. 4,413,949, Cl. 416-96.00A.
- Scott, Brian; and Duncan, Robert, to David Brown Tractors Limited. Clutch release mechanisms. 4,414,533, Cl. 340-52.00R.
- Scott & Fetzer Company, The: See—  
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., 4,414,634, Cl. 364-510.000.
- Scott, Kenneth W. Water heater control system. 4,413,775, Cl. 236-20.00R.
- Scrimshaw, Marvin S.: See—  
Hill, Eugene E.; Scrimshaw, Marvin S.; and Showalter, Edward W., 4,414,654, Cl. 367-103.000.
- Seabase, Peter P.; and Crewes, Rickard N., to National Machine Company, Inc. Fluid swivel valve device. 4,413,645, Cl. 137-223.000.
- Seabourn, Joe M. Diverter valve. 4,413,688, Cl. 175-38.000.
- Sealright Co., Inc.: See—  
Young, Jerry W.; Eddy, William R.; and Taylor, Raymond C., 4,413,983, Cl. 493-30.000.
- Seekings, Gerald A. G.: See—  
Smith, William C.; and Seekings, Gerald A. G., 4,413,483, Cl. 66-125.00R.
- Seeley, Wayne C.: See—  
Mosebrook, Dennis R.; and Seeley, Wayne C., 4,413,867, Cl. 312-111.000.
- Segawa, Yasuhiko: See—  
Kiryama, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, 4,414,276, Cl. 428-374.000.
- Seguin, Herb J. J., to Majestic Contractors Limited. Power meter for lasers. 4,413,916, Cl. 374-32.000.
- Seibold, Gerhard: See—  
Lauckner, Joachim; Lutz, Felix; Seibold, Gerhard; Wessel, Gerhard; and Volz, Hans, 4,413,886, Cl. 350-392.000.
- Seifert, Gerd, to Siemens Aktiengesellschaft. Rotary anode x-ray tube. 4,414,681, Cl. 378-144.000.
- Seimiya, Motoo; and Nishida, Katsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of preparing silicon nitride. 4,414,190, Cl. 423-344.000.
- Seitz, Max-Gerhard: See—  
Drew, Jeffrey-Michael; Seitz, Max-Gerhard; Kehrer, Hans-Peter; and Eichelbroenner, Gottfried, 4,413,507, Cl. 73-104.000.
- Seki, Kunio; and Takeshita, Ritsui, to Hitachi, Ltd. Two signal amplifying system. 4,414,514, Cl. 330-262.000.
- Seki, Nakanobu, to Nissan Motor Company, Limited. Fan arrangement. 4,413,947, Cl. 415-182.000.
- Sekido, Satoshi; Ninomiya, Yoshito; and Yamazaki, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Solid state electric double layer capacitor. 4,414,607, Cl. 361-433.000.
- Seltzer, Samuel M., and Dennison, Saul, to Allison Corporation. Portable light. 4,414,611, Cl. 362-183.000.
- Senatore, Guy; and Farrar, Ralph C., to Phillips Petroleum Company. Thermosetting compositions. 4,414,340, Cl. 523-219.000.
- Sendtko, Ulrich: See—  
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Re-decker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635, Cl. 364-526.000.
- Seng, Stephen, to Owens-Corning Fiberglass Corporation. Rotary scrapers. 4,413,970, Cl. 425-222.000.
- Senko Medical Instrument Mfg. Co., Ltd.: See—  
Sarashina, Hiromi, 4,413,994, Cl. 604-327.000.
- Serinken, Nur M.: See—  
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883, Cl. 350-334.000.
- Serrin, Gunter: See—  
Grumer, Peter; Wiese, Wolfgang; and Serrin, Gunter, 4,414,253, Cl. 427-424.000.
- Servamatic Solar Systems, Inc.: See—  
Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., 4,413,618, Cl. 126-450.000.
- Sethi, Amar J.: See—  
Yong, Raymond N.; and Sethi, Amar J., 4,414,117, Cl. 210-710.000.
- Sethofer, Nicholas L.; and Harper, Michael C., to Timex Corporation. Guest-host liquid crystalline composition. 4,414,131, Cl. 252-299.100.
- Setoguchi, Michihide: See—  
Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216, Cl. 424-251.000.
- Setzer, Herbert J., to United Technologies Corporation. Catalyst for steam reforming. 4,414,140, Cl. 502-303.000.
- Seyler, Jay K.: See—  
Orlowski, Ronald C.; and Seyler, Jay K., 4,414,149, Cl. 260-112.50T.
- Shadbolt, Edward A.: See—  
Platt, Robert J.; and Shadbolt, Edward A., 4,413,646, Cl. 137-240.000.
- Shah, Manoj Kumar O.: See—  
Evans, David N.; Jarvis, Gary W.; Steensen, Wayne L.; and Shah, Manoj Kumar O., 4,414,237, Cl. 426-589.000.
- Shah, Ramesh H., to Ford Motor Company. Mechanism to control axial collapse of an open cross-section beam. 4,413,840, Cl. 280-784.000.
- Shamsha, Ljudmila F.: See—  
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; and Shamsha, Ljudmila F., 4,414,091, Cl. 204-277.000.
- Shanks, Ian A., to United Kingdom of Great Britain and Northern Ireland. The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method and apparatus for producing three dimensional displays. 4,414,565, Cl. 358-89.000.
- Shanoski, Henry: See—  
Cobbleddick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,414,173, Cl. 264-257.000.
- Sharma, B.: See—  
Schjeldahl, Gilmore T.; and Sharma, B., 4,413,989, Cl. 604-96.000.
- Sharma, Dhiraj K.: See—  
Ahuja, Sudhir R.; and Sharma, Dhiraj K., 4,414,628, Cl. 364-200.000.
- Sharp Kabushiki Kaisha: See—  
Ohta, Kenji; Takahashi, Akira; and Deguchi, Toshihisa, 4,414,650, Cl. 365-122.000.
- Shimada, Toshiya; Takeishi, Koichi; Shimada, Mitsuhiro; and Katto, Atsuyuki, 4,413,616, Cl. 126-443.000.
- Shell Oil Company: See—  
Aiello, Robert P., 4,414,121, Cl. 252-49.500.
- Blytas, George C., 4,414,194, Cl. 423-573.00G.
- Drent, Eit, 4,414,421, Cl. 568-462.000.
- Goodall, Brian L.; van der Nat, Adrianus A.; and Sijardijn, Willem, 4,414,132, Cl. 502-169.000.
- Shemitz, Sylvan R., to Sylvan R. Shemitz and Associates, Inc. Luminaire for a visual display terminal. 4,414,609, Cl. 362-33.000.
- Shepherd, Charles G.: See—  
Szeke, George; and Shepherd, Charles G., 4,414,615, Cl. 362-264.000.
- Sheppard, Clyde H.: See—  
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,414,269, Cl. 428-290.000.
- Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., to Exxon Research and Engineering Co. Chemically wetted film of metal phase on graphite and process for preparing same. 4,414,256, Cl. 428-163.000.
- Shibanuma, Tadao: See—  
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibanuma, Tadao, 4,414,153, Cl. 260-239.100.
- Shibata, Fujio; Hirabayashi, Kenji; and Mikura, Chihoto, to TDK Electronics Co., Ltd. High density magnetic recording medium. 4,414,289, Cl. 428-695.000.
- Shibata, Noriyoshi: See—  
Hattori, Kyo; Shibata, Noriyoshi; and Hagino, Isamu, 4,413,471, Cl. 60-276.000.
- Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, to Sumitomo Chemical Co., Ltd. Propylene-ethylene copolymer having improved stretchability. 4,414,373, Cl. 526-348.000.
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- Shimada, Mitsuhiro: See—  
Tonomura, Toshiya; Takeishi, Koichi; Shimada, Mitsuhiro; and Katto, Atsuyuki, 4,413,616, Cl. 126-443.000.
- Shimada, Toshio: See—  
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620, Cl. 364-200.000.
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Hirota, Kunio; and Shimomura, Masao, 4,413,574, Cl. 112-121.120.
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Kazumi, Ozawa; and Shinichiro, No, 4,413,709, Cl. 198-344.000.
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Berfield, Robert C., 4,413,372, Cl. 15-414.000.
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Hayashi, Yasuyuki, 4,413,837, Cl. 280-707.000.
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Reich, Karl; and Sieger, Heinz, 4,414,347, Cl. 524-168.000.
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- Haidinger, Erich, 4,413,409, Cl. 29-856.000.
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- Seifert, Gerd, 4,414,681, Cl. 378-144.000.
- Willer, Walter; and Fuchs, Peter, 4,414,513, Cl. 330-204.000.
- Siemens Gammasonics, Inc.: See—  
Lewis, George K.; and Buchin, Michael, 4,414,482, Cl. 310-334.000.
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- Silver Seiko Ltd.: See—  
Yamaguchi, Yoshimasa, 4,413,487, Cl. 66-60.00H.
- Silvetti, Anthony N. Composition for treatment of wounds. 4,414,202, Cl. 424-147.000.
- Simandoux, Jean-Claude: See—  
Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, 4,414,105, Cl. 208-309.000.
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Platzer, Maximilian F.; and Simmons, John M., 4,413,782, Cl. 239-102.000.
- Simon, James D.: See—  
Green, Robert H.; and Simon, James D., 4,413,805, Cl. 251-297.000.
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Gibb, Tyrell T., 4,413,456, Cl. 52-295.000.
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- Singer Company, The: See—  
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- Single Vend, Inc.: See—  
Glaser, Robert L., 4,413,749, Cl. 221-1.000.
- Siniuk, Nickolay. Picture hanging locator. 4,413,421, Cl. 33-180.00R.
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Renjilian, Armen; Curry, Thomas H.; and Siracusano, Elizabeth, 4,413,391, Cl. 28-166.000.
- Sistemco N.V.: See—  
Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, 4,413,869, Cl. 312-236.000.
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- Sjardijn, Willem: See—  
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,414,132, Cl. 502-169.000.
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McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., 4,413,856, Cl. 296-188.000.
- Slater Electric Inc.: See—  
Slater, Thomas S.; and Bowden, Wade R., Jr., 4,414,427, Cl. 174-65.00R.
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- Slaughter, Ronald W.: See—  
McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., 4,413,856, Cl. 296-188.000.
- Sleeth, Rhule B.; Theiler, Richard F.; and Rendek, Robert B., to Armour and Company. Process for preparing cooked bacon having reduced levels of N-nitrosamines. 4,414,232, Cl. 426-266.000.
- Sletzing, Meyer: See—  
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzing, Meyer, 4,414,155, Cl. 260-245.20T.
- Slobodian, Anatoly R.: See—  
Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672, Cl. 373-22.000.
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- Smith, Clarence G.: See—  
Wolf, Donald A.; Smith, Clarence G.; and Johnson, Charles S., 4,413,361, Cl. 4-506.000.
- Smith, David F.: See—  
Joy, Richard W.; and Smith, David F., 4,414,293, Cl. 429-27.000.
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Thomas, Robert D., 4,413,918, Cl. 384-95.000.
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- Smith, Kent F.: See—  
Knapp, William; Dunn, William; and Smith, Kent F., 4,414,547, Cl. 340-825.830.
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- Smith, Roger A.: See—  
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,414,280, Cl. 428-422.000.
- Smith, William C.; and Seekings, Gerald A. G., to Bentley Engineering Company Limited. Control mechanism for circular knitting machine. 4,413,483, Cl. 66-125.00R.
- SmithKline Beckman Corporation: See—  
Huffman, William F.; and Wilson, James W., 4,414,224, Cl. 424-274.000.

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- Snamproggett, S.p.A.: See—  
Oliveri, Roberto; Robertello, Andrea; and Degen, Ludwig, 4,414,333, Cl. 435-243.000.
- Snow, Paul. Serotum insulator. 4,413,624, Cl. 128-399.000.
- Societe Anonyme DBA: See—  
Kervagoret, Gilbert, 4,413,962, Cl. 418-186.000.
- Societe Anonyme dite Alsthom-Atlantique: See—  
Gelez, Jean-Philippe, 4,414,446, Cl. 200-144.00R.
- Societe Anonyme dite Ateliers et Chantiers de Bretagne-ACB: See—  
Ninet, Jean-Louis, 4,413,926, Cl. 405-204.000.
- Societe Anonyme dite Ceraver: See—  
Kaczerginski, Alexandre; and Willem, Michel, 4,414,429, Cl. 174-179.000.
- Societe Anonyme dite Cgee Alsthom: See—  
Borne, Andre; Vallod, Joseph; and Curvat, Rene, 4,413,876, Cl. 339-244.00B.
- Societe Anonyme Francaise du Ferodo: See—  
de Jong, Gerrii, 4,414,481, Cl. 310-42.000.
- Societe Chimiques des Charbonnages: See—  
Kotwica, Roland, 4,414,398, Cl. 549-262.000.
- Societe d'Applications des Machines Motrices: See—  
Devaud, Gerard L., 4,413,547, Cl. 91-216.00R.
- Societe D'Applications Generales D'Electricite et de Mecanique Sagem: See—  
Boutin, Xavier; Compagnon, Francis; and Poirier, Michel, 4,414,646, Cl. 365-2.000.
- Societe J. G. Allinquant: See—  
Bich, Rene, 4,413,817, Cl. 267-64.110.
- Societe Nationale Industrielle et Aerospatiale: See—  
Bousquet, Jean, 4,413,796, Cl. 244-35.00R.
- Societe Nouvelle de Bouchons Plastiques S.N.B.P.: See—  
Babiol, Pierre, 4,413,744, Cl. 215-355.000.
- Soden, Robert A., to Sonic Instruments, Inc. Apparatus and method for determining thickness. 4,413,517, Cl. 73-597.000.
- Sogah, Dotsevi Y.: See—  
Farnham, William B.; and Sogah, Dotsevi Y., 4,414,372, Cl. 526-190.000.
- Soika, Emil H., to Baxter Travenol Laboratories, Inc. Cannula support assembly and its method of manufacture. 4,413,992, Cl. 604-263.000.
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Gazzarrini, Vinicio, 4,413,575, Cl. 112-129.000.
- Sommer, Rudiger: See—  
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Re-decker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635, Cl. 364-526.000.
- Song, Hubert, to Verbatim Corporation. Digitally controllable electronic damper. 4,414,497, Cl. 318-696.000.
- Sonic Instruments, Inc.: See—  
Soden, Robert A., 4,413,517, Cl. 73-597.000.
- Sony Corporation: See—  
Horie, Masao; Sunada, Yusuke; and Inari, Junta, 4,414,433, Cl. 179-70.000.
- Ive, John G. S.; and Thirlwall, Alan C., 4,414,677, Cl. 375-116.000.
- Sorensen, Jens O.: See—  
Kira, Gene S.; and Sorensen, Jens O., 4,413,476, Cl. 60-641.800.
- Souk, Jun H.: See—  
Charlson, Paul M.; Schwieters, Clarence R.; and Souk, Jun H., 4,414,166, Cl. 264-25.000.
- Soule Fer et Froid S.A.: See—  
Huon de Kermadec, Jean, 4,413,568, Cl. 104-20.000.
- Southard, Jesse M.; and Diehl, John E. Rolled bale handler. 4,413,940, Cl. 414-24.600.
- Southbend Escan Corporation: See—  
Scherer, Richard M., 4,413,976, Cl. 431-278.000.
- Southwest Research Institute: See—  
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,414,227, Cl. 424-331.000.
- Spalding, David N., to Britax-Excelsior Limited. Buckles for harnesses. 4,413,383, Cl. 24-164.000.
- Spar Aerospace Limited: See—  
Norman, Robert D., 4,413,538, Cl. 81-57.130.
- Specht, Victor J. Positionable control device for a variable delivery pump. 4,413,960, Cl. 418-19.000.
- Spector, George: See—  
Ward, Michael L.; and Spector, George, 4,413,436, Cl. 40-160.000.
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Maslanka, William W.; and Spence, Gavin G., 4,414,353, Cl. 524-458.000.
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Walters, Ronald B.; and Hammond, Anthony G., 4,413,648, Cl. 137-486.000.
- Spiewak, John W.: See—  
Dougherty, David J.; Gunesin, Binnur; and Spiewak, John W., 4,414,359, Cl. 524-555.000.
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Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., 4,413,747, Cl. 220-225.000.
- Springer, Gilbert D., to Ferix Corporation. Magnetic imaging apparatus. 4,414,554, Cl. 346-74.500.
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Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., 4,414,546, Cl. 340-825.300.
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Zangerle, Ernst, 4,413,659, Cl. 140-3.0CA.
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- SRI International: See—  
Weaver, Charles S.; Chadwick, Joseph H.; Yarbrough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587, Cl. 360-76.000.
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Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, 4,414,059, Cl. 156-659.100.
- Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., to Occidental Chemical Corporation. Method for preparing low voltage hydrogen cathodes. 4,414,064, Cl. 204-37.00R.
- Staff, Bonner W.: See—  
Davis, Hubert B.; Staff, Bonner W.; and Willis, James A., 4,414,508, Cl. 324-238.000.
- Standard Oil Co., The: See—  
Friedrich, Maria S.; Suresh, Dev D.; and Grasselli, Robert K., 4,414,134, Cl. 502-204.000.
- Standard Oil Company (Indiana): See—  
Fields, Ellis K., 4,414,406, Cl. 560-109.000.
- Smith, Jeffrey S.; Quinn, George P.; and Vasalos, Iacovos A., 4,414,101, Cl. 208-153.000.
- West, C. Thomas; and Basalay, Robert J., 4,414,122, Cl. 252-49.700.
- Stanek, Jaroslav: See—  
Tarcay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204, Cl. 424-177.000.
- Stang, John H.; and Cusick, Steven N., to Cummins Engine Company, Inc. Oil cooled internal combustion engine. 4,413,597, Cl. 123-41.420.
- Stanley Electric Co., Ltd.: See—  
Nishizawa, Jun-ichi; and Teshima, Toru, 4,414,558, Cl. 357-17.000.
- Stanley, Philip E., to Honeywell Information Systems Inc. Adjustable clock system having a dynamically selectable clock period. 4,414,637, Cl. 364-569.000.
- Stapro AG: See—  
Gabriel, Fredy, 4,413,799, Cl. 248-59.000.
- Star Engineering Applications Limited: See—  
Tune, Herbert E., 4,413,604, Cl. 123-515.000.
- Stauffer Chemical Company: See—  
Giulio, Silvio L., 4,414,161, Cl. 260-975.000.
- Gutman, Arnold D., 4,414,019, Cl. 71-91.000.
- Stedman, Robert N., to Caterpillar Tractor Co. Industrial truck with pivotal front frames. 4,413,708, Cl. 187-9.00R.
- Steensen, Wayne L.: See—  
Evans, David N.; Jarvis, Gary W.; Steensen, Wayne L.; and Shah, Manoj Kumar O., 4,414,237, Cl. 426-589.000.
- Steffen, Alvin R.: See—  
Featherstone, Harry E.; and Steffen, Alvin R., 4,413,451, Cl. 52-28.000.
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- Stein, Jay A.: See—  
Annis, Martin; and Stein, Jay A., 4,414,682, Cl. 378-146.000.
- Steinberg, Eric: See—  
Gould, George K.; and Steinberg, Eric, 4,414,467, Cl. 235-381.000.
- Stephens, David G.: See—  
Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenston, Sherman A.; and Stephens, David G., 4,413,522, Cl. 73-646.000.
- Stephens, Larry M.: See—  
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624, Cl. 364-200.000.
- Stephenson, Robert F.: See—  
Williamson, Thomas R., III; Jones, Beth B.; Field, Harold; and Stephenson, Robert F., 4,414,303, Cl. 429-217.000.
- Sterling Drug Inc.: See—  
Schmidt, Paul J.; and Hung, William M., 4,414,399, Cl. 549-309.000.
- Sternberg, Robert L., to United States of America, Navy. Ellipticized acoustical liquid filled lens providing balanced astigmatism. 4,413,704, Cl. 181-176.000.
- Sternberg, Stanley R. Method and apparatus for pattern recognition and detection. 4,414,685, Cl. 382-49.000.
- Stewart Folk & Company, Incorporated: See—  
Folk, Stewart H., 4,413,859, Cl. 299-4.000.
- Stewart-Warner Corporation: See—  
Mayer, William R., 4,414,613, Cl. 362-267.000.
- Stobb, Inc.: See—  
Stobb, Walter J., 4,413,723, Cl. 198-415.000.
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- Stock, Hugh J., to Pacer Technology and Resources, Inc. Dispenser for cyanoacrylate adhesives. 4,413,753, Cl. 222-149.000.
- Stoffelsma, Jan: See—  
van den Bosch, Steven; van't Land, Evert; and Stoffelsma, Jan, 4,414,233, Cl. 426-535.000.



- Stokes, Olen L., Jr.: See—  
Laurer, George J.; and Stokes, Olen L., Jr., 4,414,468, Cl. 235-462.000.
- Stoll, William M.: See—  
Newman, Harold C.; and Stoll, William M., 4,414,029, Cl. 75-252.000.
- Storage Technology Corporation: See—  
Meridian, Anton W., Jr.; Jurneke, Joseph K.; and Pinteric, Frank W., 4,414,590, Cl. 360-97.000.
- Storage Technology Partners: See—  
Zasio, John J., 4,414,480, Cl. 307-443.000.
- Stormi, Angelo: See—  
Zweifel, Hans; Schilling, Walter; Stormi, Angelo; and Bellus, Daniel, 4,414,394, Cl. 548-451.000.
- Stout, Robert L., to BMA Laboratory Services, Inc. Immunoassay method and apparatus, 4,414,324, Cl. 435-7.000.
- Stovall, David T. Shaft alignment tool, 4,413,415, Cl. 33-181.00R.
- Strandwitz, Peter: See—  
McMillin, John R.; and Strandwitz, Peter, 4,413,752, Cl. 222-56.000.
- Strange, R. L. Deadbolt lock protector, 4,413,492, Cl. 70-416.000.
- Streater, Richard W.: See—  
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883, Cl. 350-334.000.
- Stricker, Walter: See—  
Rienecker, Reimund; and Stricker, Walter, 4,413,789, Cl. 241-46.170.
- Strobridge, John R., to Amway Corporation. Toothpaste, 4,414,199, Cl. 424-52.000.
- Strom, Robert M.: See—  
Ash, Mary L.; Diephouse, Timothy R.; and Strom, Robert M., 4,414,422, Cl. 568-724.000.
- Strong, Ronald W.: See—  
Daubendiek, Richard L.; and Strong, Ronald W., 4,414,310, Cl. 430-567.000.
- Stroud, Ray D., to Continental Plastics. Tray caddy for waitresses, 4,413,745, Cl. 220-23.400.
- Strzalka, Marion W. Hand held portable band saw, 4,413,414, Cl. 30-380.000.
- Stuchlik, Terence J.: See—  
Beugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., 4,413,466, Cl. 56-11.300.
- Studiengesellschaft Kohle mbH: See—  
Ritter, Alfred E., 4,413,670, Cl. 165-1.000.
- Studinka, Josef; and Meier, Peter E., to Ametex AG. Fiber-containing products made with hydraulic binder agents, 4,414,031, Cl. 106-90.000.
- Suda, Hiroyuki: See—  
Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, 4,414,012, Cl. 65-18.200.
- Sudo, Shigeru; and Yada, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of sealing a tube using a laser beam, 4,414,460, Cl. 219-121.0LD.
- Sugamori, Shigeru: See—  
Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoki, 4,414,665, Cl. 371-21.000.
- Sugimoto, Hiroaki; and Hanabata, Makoto, to Sumitomo Chemical Company, Limited. Process for producing an aromatic polyester composition, 4,414,365, Cl. 525-437.000.
- Sugimoto, Hiroshi: See—  
Sugiura, Junji; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527, Cl. 73-754.000.
- Sugimoto, Kenji: See—  
Ishizuka, Shinichi; and Sugimoto, Kenji, 4,413,539, Cl. 82-2.00R.
- Sugiura, Junji; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, to Nippondenso Co., Ltd. Semiconductor pressure sensor, 4,413,527, Cl. 73-754.000.
- Sullenger, Gordon A. Pneumatic tire, 4,413,663, Cl. 152-353.00R.
- Sulzer Brothers Limited: See—  
Mandrin, Charles, 4,414,195, Cl. 423-580.000.
- Sumi, Masahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Data compressing system, 4,414,536, Cl. 340-347.0DD.
- Sumi, Masaoki; and Doi, Tomoyuki, to Kashifuji Works, Ltd. Synchronism equipment for gear cutting machines, 4,414,495, Cl. 318-571.000.
- Sumitomo Chemical Company, Limited: See—  
Hanabata, Makoto; Maruyama, Takashi; and Ueno, Katsuji, 4,414,230, Cl. 426-106.000.
- Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, 4,414,373, Cl. 526-348.000.
- Sugimoto, Hiroaki; and Hanabata, Makoto, 4,414,365, Cl. 525-437.000.
- Sumitomo Electric Inds., Ltd.: See—  
Eda, Hiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008, Cl. 65-3.120.
- Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., to United States of America, Navy. Multiple-microcomputer processing, 4,414,624, Cl. 364-200.000.
- Summers, Kenneth L., to Rieke Corporation. Child-resistant safety closure, 4,413,743, Cl. 215-216.000.
- Sun Chemical Corporation: See—  
Petrik, John T.; and Westover, Brooke N., 4,414,463, Cl. 219-270.000.
- Sunada, Yusuke: See—  
Horie, Masao; Sunada, Yusuke; and Inari, Junta, 4,414,433, Cl. 179-70.000.
- Suncor, Inc.: See—  
Yong, Raymond N.; and Sethi, Amar J., 4,414,117, Cl. 210-710.000.
- Sundberg, Erik, to Waller Innovation AB. Wedge arrangement for locking together hammerhead and anvil, 4,413,686, Cl. 173-131.000.
- Sung, Rodney L.: See—  
Zoleski, Benjamin H.; and Sung, Rodney L., 4,414,123, Cl. 252-52.00A.
- Sunmaster Corporation: See—  
Dunlap, Glenn H.; and Zitkus, Wayne J., 4,413,617, Cl. 126-443.000.
- Supraton F. J. Zucker GmbH: See—  
Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, 4,414,330, Cl. 435-93.000.
- Suresh, Dev D.: See—  
Friedrich, Maria S.; Suresh, Dev D.; and Grasselli, Robert K., 4,414,134, Cl. 502-204.000.
- Suste, Joseph T., to Interstate Electronics Corp. Constant data rate brightness control for an AC plasma panel, 4,414,544, Cl. 340-767.000.
- Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, to Nippon Telegraph & Telephone Public Corporation. Fabrication methods of doped silica glass and optical fiber preform by using the doped silica glass, 4,414,012, Cl. 65-18.200.
- Suzuki, Hajime; Masuda, Ikuo; and Kosaka, Masaki, to Daiel Ltd. Primer for powder coating comprising (a) diene polymer (b) MgO and (c) cobalt or manganese ion, 4,414,351, Cl. 524-413.000.
- Suzuki, Hideo: See—  
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620, Cl. 364-200.000.
- Suzuki, Isao: See—  
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124, Cl. 252-62.630.
- Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, to Teijin Limited. Selectively light-transmitting laminated structure, 4,413,877, Cl. 350-1.700.
- Suzuki, Tadashi, to Satogosei Co., Ltd. Binding locker, 4,413,380, Cl. 24-16.0PB.
- Suzuki, Yasoji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. CR Oscillator having constant current charging source, 4,414,515, Cl. 331-111.000.
- Suzuki, Yasuhiko: See—  
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,414,483, Cl. 313-136.000.
- Suzuki, Yoshio: See—  
Yanagawa, Hajime; and Suzuki, Yoshio, 4,413,600, Cl. 123-449.000.
- SW Industries, Inc.: See—  
Maddox, Edward L.; and Pitts, Thomas E., 4,414,476, Cl. 250-563.000.
- Swanson, Harold V., to GHA Lock Joint, Inc. Concrete comprising sulfur, cyclopentadiene oligomers, aggregate and glass fibers, 4,414,385, Cl. 524-494.000.
- Swedo, Raymond J., to UOP Inc. Unsubstituted biphenylene as a cross-linking monomer, 4,414,380, Cl. 528-173.000.
- Swedo, Raymond J.: See—  
Malloy, Thomas P.; and Swedo, Raymond J., 4,414,120, Cl. 252-8.55D.
- Swengel, Robert C., Jr., to AMP Incorporated. Earth connection connector having provision for an electrical component, 4,413,871, Cl. 339-14.00R.
- Swinney, Dennis P., to Swinney Engineering Limited; and Lanso Products Limited. Press for the compression of loads, 4,413,555, Cl. 100-214.000.
- Swinney Engineering Limited: See—  
Swinney, Dennis P., 4,413,555, Cl. 100-214.000.
- Swiss Fabricating, Inc.: See—  
Lienhard, Robert W., Sr., 4,413,707, Cl. 182-150.000.
- Sylvan R. Shemitz and Associates, Inc.: See—  
Shemitz, Sylvan R., 4,414,609, Cl. 362-33.000.
- Sylvan, Richard: See—  
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,413,374, Cl. 16-121.000.
- Syntex (U.S.A.) Inc.: See—  
Fu, Cherng-Chyi, 4,414,127, Cl. 252-95.000.
- Szabo, Rene: See—  
N'Guyen Duc, Xuong; and Szabo, Rene, 4,413,844, Cl. 285-16.000.
- Szczepanek, Paul S.: See—  
Berthold, John W., III; and Szczepanek, Paul S., 4,413,879, Cl. 350-96.190.
- Szeker, George; and Shepherd, Charles G., to U.S. Philips Corporation. Mounting structure for a high pressure sodium lamp, 4,414,615, Cl. 362-264.000.
- T. D. Williamson, Inc.: See—  
Payne, Larry D.; Cho, Hyun J.; and Mehta, Kishor N., 4,413,370, Cl. 15-104.06R.
- Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slater); and Fonstad, Clifton G., to United States of America, Navy. Low resistance ohmic contact, 4,414,076, Cl. 204-15.000.
- Tadauchi, Kazuhiro; and Torii, Taketsugu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Power antenna control circuit used in vehicle, 4,414,551, Cl. 343-903.000.

- Tadmor, Zehev: See—  
Hold, Peter; and Tadmor, Zehev, 4,413,913, Cl. 366-75.000.
- Taguchi, Kazufumi, to Aisin Seiki Kabushiki Kaisha. Buttonhole device for a zig-zag sewing machine, 4,413,576, Cl. 112-158.00B.
- Tahara, Tetsuya: See—  
Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216, Cl. 424-251.000.
- Taira, Akio, to Olympus Optical Co., Ltd. Focusing device for microscopes, 4,413,889, Cl. 350-501.000.
- Takagi, Shunichi: See—  
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,414,483, Cl. 313-136.000.
- Takahashi, Akira: See—  
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takagi; and Takahashi, Akira, 4,413,793, Cl. 242-68.000.
- Ohta, Kenji; Takahashi, Akira; and Deguchi, Toshihisa, 4,414,650, Cl. 365-122.000.
- Takahashi, Masao: See—  
Takeuchi, Fumio; and Takahashi, Masao, 4,414,044, Cl. 149-2.000.
- Takahashi, Shintaro: See—  
Siga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024, Cl. 75-126.00C.
- Takahashi, Yonosuke: See—  
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,414,273, Cl. 428-336.000.
- Takano, Motoharu; and Hoshino, Minoru, to Q.P. Corporation. Apparatus for taking material to be treated into and out of high pressure tank, 4,413,977, Cl. 432-56.000.
- Takasu, Yutaka: See—  
Matsui, Fumio; and Takasu, Yutaka, 4,414,604, Cl. 361-385.000.
- Takata, Tadahiko: See—  
Watanabe, Hirosuke; and Takata, Tadahiko, 4,414,272, Cl. 428-331.000.
- Takeda, Minoru: See—  
Kureha, Takeshi; Kataoka, Teruo; Saki, Taiichi; and Takeda, Minoru, 4,414,571, Cl. 358-158.000.
- Takeda Riken Kogyo Kabushiki Kaisha: See—  
Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoki, 4,414,665, Cl. 371-21.000.
- Takeichi, Toshio, to Sanyo Electric Co., Ltd. Flyback transformer, 4,414,578, Cl. 358-243.000.
- Takeishi, Koichi: See—  
Tonomura, Toshiya; Takeishi, Koichi; Shimada, Mitsuhiro; and Katto, Atsuyuki, 4,413,616, Cl. 126-443.000.
- Takekoshi, Shukuko. Process for preparing instant macaronis, 4,414,235, Cl. 426-557.000.
- Takeshita, Ritsui: See—  
Seki, Kunio; and Takeshita, Ritsui, 4,414,514, Cl. 330-262.000.
- Takeuchi, Fumio; and Takahashi, Masao, to Nippon Oil and Fats, Co., Ltd. Water-in-oil emulsion explosive composition, 4,414,044, Cl. 149-2.000.
- Takeuchi, Hitoshi: See—  
Shionoya, Hiroshi; Arai, Haruyoshi; Koyanagi, Nozomu; and Takeuchi, Hitoshi, 4,414,201, Cl. 424-88.000.
- Talambiras, Robert P., to Dranetz Engineering Laboratories, Inc. Sampling network analyzer with stored correction of gain errors, 4,414,638, Cl. 364-571.000.
- Talambiras, Robert P., to Dranetz Engineering Laboratories, Inc. Sampling network analyzer with sampling synchronization by means of phase-locked loop, 4,414,639, Cl. 364-602.000.
- Talbert Manufacturing, Inc.: See—  
Losh, Russell L., 4,413,836, Cl. 280-423.00B.
- Tallant, James C., II; and Hettiger, James, to RCA Corporation. Manually gain presettable kinescope driver in an automatic kinescope bias control system, 4,414,577, Cl. 358-242.000.
- Talon, Inc.: See—  
Fisher, Harry M.; and Fisher, Stuart N., 4,413,398, Cl. 29-410.000.
- Tamazawa, Kazuharu: See—  
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazuharu; Murase, Kiyoshi; and Shibamura, Tadao, 4,414,153, Cl. 260-239.100.
- Tamulis, Walter G. pH Monitor electrode electrolyte cartridge, 4,413,628, Cl. 128-635.000.
- Tamura, Takeo; and Imai, Mamoru, to Nissan Motor Company Limited. Automotive vehicle parts and fitting structure therefor, 4,413,798, Cl. 248-27.100.
- Tanahashi, Masao: See—  
Otsuka, Kiyotaka; and Tanahashi, Masao, 4,413,410, Cl. 30-43.600.
- Tanaka, Hirokazu: See—  
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226, Cl. 424-279.000.
- Tanaka, Nobuyoshi: See—  
Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581, Cl. 358-280.000.
- Tanaka, Shuhei: See—  
Yamamoto, Manabu; and Tanaka, Shuhei, 4,414,575, Cl. 358-227.000.
- Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, to Ciba-Geigy Corporation. Antibiotic preparations having increased effectiveness, processes for their manufacture and method for increasing the antibiotic action of antibiotics, 4,414,204, Cl. 424-177.000.
- Taskinen, Martti P.: See—  
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivistö, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495, Cl. 72-196.000.
- Tatsumi, Hideo: See—  
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717, Cl. 192-84.00C.
- Taylor, Gerald E., to International Business Machines Corporation. Method and apparatus for discarding data from a buffer after reading such data, 4,414,644, Cl. 364-900.000.
- Taylor, Kevin D. Diaper with liquid retaining chamber, 4,413,996, Cl. 604-382.000.
- Taylor, Raymond C.: See—  
Young, Jerry W.; Eddy, William R.; and Taylor, Raymond C., 4,413,983, Cl. 493-30.000.
- Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., to Boorman, Robert G. Apparatus for and methods of identifying horses by scanning their chestnuts, 4,414,546, Cl. 340-825.300.
- Taylor, William J., Jr. Drum magazine for carbines or the like, 4,413,546, Cl. 89-33.00D.
- Tazuma, James J.: See—  
Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., 4,414,348, Cl. 524-255.000.
- TDK Electronics Co., Ltd.: See—  
Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,414,288, Cl. 428-694.000.
- Shibata, Fujio; Hirabayashi, Kenji; and Mikura, Chihoto, 4,414,289, Cl. 428-695.000.
- Techne Electronics Limited: See—  
Ho, Eugene Y., 4,414,541, Cl. 340-566.000.
- Technological University of Nagaoka: See—  
Yamashita, Tsutomu; and Matsuda, Jinichi, 4,414,487, Cl. 315-5.000.
- Tedesco, Joseph P.: See—  
Woodruff, Richard K.; and Tedesco, Joseph P., 4,414,674, Cl. 373-130.000.
- Teijin Limited: See—  
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254, Cl. 428-34.000.
- Kiriyama, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, 4,414,276, Cl. 428-374.000.
- Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, 4,413,877, Cl. 350-1.700.
- Watanabe, Hirosuke; and Takata, Tadahiko, 4,414,272, Cl. 428-331.000.
- Telecommunications Radioelectriques et Telephoniques T.R.T.: See—  
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,414,434, Cl. 179-77.000.
- Teledyne Industries, Inc.: See—  
McDonald, William K., 4,414,428, Cl. 174-126.00S.
- Teletype Corporation: See—  
Schulze, Paul G., 4,414,538, Cl. 340-365.00S.
- Temkin, Henryk: See—  
Keramidas, Vassilis G.; McCoy, Robert J.; and Temkin, Henryk, 4,414,561, Cl. 357-67.000.
- Temple, David L., Jr.: See—  
Poindexter, Graham S.; and Temple, David L., Jr., 4,414,213, Cl. 424-248.500.
- Tenber, Werner; and Pichert, Ludwig, to Mannesmann Aktiengesellschaft. Ascertaining the level of the slag-liquid-metal interface in metallurgical vessels, 4,413,810, Cl. 266-94.000.
- Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., to Spokane Industries, Inc. Floating lid for a liquid storage tank, 4,413,747, Cl. 220-225.000.
- Tenud, Leander: See—  
Miller, Raimund; and Tenud, Leander, 4,414,400, Cl. 549-313.000.
- Terneu, Robert: See—  
Van Laethem, Robert; and Terneu, Robert, 4,414,015, Cl. 65-60.300.
- Teroson GmbH: See—  
Reich, Karl; and Sieger, Heinz, 4,414,347, Cl. 524-168.000.
- Terrien, Michel E.; and Bouvet, Claude, to Etat Francais. Automatic device for lap-joint engagement of two bridge elements on intrados or extrados and bridge element comprising it, 4,413,369, Cl. 14-27.000.
- Teshima, Toru: See—  
Nishizawa, Jun-ichi; and Teshima, Toru, 4,414,558, Cl. 357-17.000.
- Texaco Development Corporation: See—  
Gillespie, Ronald G., 4,413,678, Cl. 166-57.000.
- Texaco Inc.: See—  
Lin, Jiang-Jen; and Knifton, John F., 4,414,410, Cl. 560-265.000.
- Petty, Randall H.; and Bartley, Burton H., 4,414,138, Cl. 502-73.000.
- Powell, Justin C., 4,414,397, Cl. 549-255.000.
- Zoleski, Benjamin H.; and Sung, Rodney L., 4,414,123, Cl. 252-52.00A.
- Texaco Puerto Rico Inc.: See—  
Olivieri, Edgar S., 4,413,503, Cl. 73-40.700.
- Texas Instruments Incorporated: See—  
Bouffard, Michael L.; and Pejouhy, Radi, 4,414,530, Cl. 338-25.000.
- Doherty, John, Jr., 4,414,524, Cl. 337-87.000.
- Ty, Henry, 4,414,286, Cl. 428-616.000.
- Thaler, Barry J.: See—  
McCusker, Joseph H.; Thaler, Barry J.; and Tsien, Wei H., 4,413,510, Cl. 73-150.00A.



- The, Paul J., to Aluminum Company of America. Removal of copper and zinc species from Bayer process liquor by filtration. 4,414,115. Cl. 210-665.000.
- Theilen, Dennis R.: See—  
Ostrom, Carl R.; and Theilen, Dennis R., 4,413,783. Cl. 239-183.000.
- Theiler, Richard F.: See—  
Sleeth, Rhule B.; Theiler, Richard F.; and Rendek, Robert B., 4,414,232. Cl. 426-266.000.
- Thermal Associates, Inc.: See—  
Kiley, Richard F.; and Larson, Ralph L., 4,414,562. Cl. 357-81.000.
- Thermal Designs, Inc.: See—  
Hune, R. G., 4,413,683. Cl. 169-48.000.
- Thiele, Horst: See—  
Landwehr, Gunter; and Thiele, Horst, 4,413,582. Cl. 112-311.000.
- Thiele, Karl-Heinz: See—  
Trauernicht, Herbert; and Thiele, Karl-Heinz, 4,414,437. Cl. 179-115.5VC.
- Thiokol Corporation: See—  
Bliss, William R., 4,413,968. Cl. 425-198.000.
- Thirion, Andre, to Antivols Simplex. Anti-theft device for the steering column of an automobile. 4,413,491. Cl. 70-252.000.
- Thirlwall, Alan C.: See—  
Ive, John G. S.; and Thirlwall, Alan C., 4,414,677. Cl. 375-116.000.
- Thirouard, Michel: See—  
Arque, Louis; and Thirouard, Michel, 4,414,657. Cl. 369-45.000.
- Thoma, Martin, to Motoren-und Turbinen-Union Munchen GmbH. Method of activating titanium surfaces. 4,414,039. Cl. 148-6.200.
- Thomas Industries Inc.: See—  
Henrich, William H., 4,414,493. Cl. 315-308.000.
- Thomas, Robert D., to Smith International, Inc. Thrust bearing for rock bits. 4,413,918. Cl. 384-95.000.
- Thomas, William S. Portable beverage cooler. 4,413,481. Cl. 62-371.000.
- Thomason, Robert L.: See—  
Peyton, John J.; Thomason, Robert L.; and Evinger, Hubert W., 4,414,566. Cl. 358-101.000.
- Thompson, Martin K.: See—  
Nield, Eric; and Thompson, Martin K., 4,414,358. Cl. 524-538.000.
- Thomson-CSF: See—  
Arque, Louis; and Thirouard, Michel, 4,414,657. Cl. 369-45.000.
- Eraniel, Armand; Dubois, Jean-Claude; Gazard, Maryse; and Barre, Françoise, 4,414,081. Cl. 204-159.180.
- Hareng, Michel; Huignard, Jean-Pierre; and Le Berre, Serge, 4,413,885. Cl. 350-342.000.
- Thomson, William J.: See—  
Hall, Robert N.; Carlson, Franklin B.; and Thomson, William J., 4,413,573. Cl. 110-347.000.
- Thorn Domestic Appliances (Electrical) Ltd.: See—  
Newton, Stephen J.; and Patel, Abdul H., 4,414,465. Cl. 219-449.000.
- Thorogood, Robert M., to International Coal Refining Company. Solvent refined coal reactor quench system. 4,414,094. Cl. 208-8.0LE.
- Thorsteinson, Erlind M.: See—  
Decker, Harry J.; and Thorsteinson, Erlind M., 4,414,411. Cl. 562-534.000.
- Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, to Ciba-Geigy Corporation. Phosphonomethylglycylhydroxamic acid and novel herbicidally active salts thereof. 4,414,158. Cl. 260-438.100.
- Tietjen, Marlene: See—  
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921. Cl. 401-96.000.
- Tilton, Richard A.: See—  
Wells, William E., Jr.; Marcum, S. Douglas; Downes, Lawrence W.; and Tilton, Richard A., 4,414,671. Cl. 372-73.000.
- Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M. Surface modification to waveguides. 4,414,244. Cl. 427-105.000.
- Timex Corporation: See—  
Pomponio, Edward V., 4,414,439. Cl. 200-38.00R.
- Sethofer, Nicholas L.; and Harper, Michael C., 4,414,131. Cl. 252-299.100.
- Ting, Raymond M. L. Building wall liner assembly. 4,413,458. Cl. 52-481.000.
- Tiret, Bernard: See—  
Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910. Cl. 356-377.000.
- Tisdale, Reynold D. Portable Hibachi-type charcoal grill with kindling structure. 4,413,609. Cl. 126-25.00R.
- Toa Medical Electronic Co., Ltd.: See—  
Iwata, Toyotarō; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,414,073. Cl. 204-299.00R.
- Tobias, Michael A., to Mobil Oil Corporation. Acrylic modified anionic water dispersible styrene allyl alcohol copolymers. 4,414,283. Cl. 428-461.000.
- Toda, Toshiaki: See—  
Yoshioka, Hideoki; Okino, Ichiro; and Toda, Toshiaki, 4,414,529. Cl. 337-365.000.
- Tokarz, Richard D. Liquid level, void fraction, and superheated steam sensor for nuclear reactor cores. 4,414,177. Cl. 376-247.000.
- Tokorozawa, Sadao, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Method for dispensing a preselected amount of liquid. 4,413,751. Cl. 222-1.000.
- Tokuda, Kazuo; and Sawataishi, Tokio, to Nippon Electric Co., Ltd. Transistor circuit. 4,414,569. Cl. 358-153.000.
- Tokura, Isao: See—  
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,414,636. Cl. 364-526.000.
- Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, to Kao Soap Co., Ltd. Water absorbing sheet assembly. 4,414,255. Cl. 428-154.000.
- Tokyo Kogaku Kikai Kabushiki Kaisha: See—  
Hamada, Toshio; and Ohtomo, Fumio, 4,413,904. Cl. 356-5.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—  
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- Ariizumi, Shoji, 4,413,403. Cl. 29-571.000.
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- Seimiya, Motoo; and Nishida, Katsutoshi, 4,414,190. Cl. 423-344.000.
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- Sumi, Masahiko, 4,414,536. Cl. 340-347.0DD.
- Suzuki, Yasoji; and Matsuo, Kenji, 4,414,515. Cl. 331-111.000.
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- Total Shooting Systems, Inc.: See—  
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- Toyoda, Hideaki, to Komori Printing Machinery Co., Ltd. Ink fountain devices for printing press. 4,413,561. Cl. 101-365.000.
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- Tracy, Fred L. Method and apparatus for in situ repair of a worn pipe section. 4,413,765. Cl. 228-119.000.
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- Trane Company, The: See—  
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- Tresselt, Carl P., to Bendix Corporation. The. Low profile circular array antenna and microstrip elements therefor. 4,414,550. Cl. 343-700.0MS.
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- Kurata, Hirotaka, 4,414,584. Cl. 358-342.000.
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- Trotta, Robert A., to Gillette Company, The. Razor handle. 4,413,411. Cl. 30-85.000.
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- Trout, Donald M. Spring-stretch-reducing window sash balance. 4,413,445. Cl. 49-445.000.
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- TRW Inc.: See—  
Carpenter, Daniel D.; and Lanning, Ronald L., 4,414,548. Cl. 343-8.000.
- Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,414,269. Cl. 428-290.000.
- Tsien, Wei H.: See—  
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- Tsutsumi, Saburo, to Nissan Motor Co., Ltd. Intake control device for automotive internal combustion engine. 4,413,598. Cl. 123-306.000.
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- Tucker, Samuel M., to Kendall Company, The. Abdominal restraint system. 4,413,620. Cl. 128-134.000.
- Tucker, Wayne R. Two-wheel hand truck. 4,413,833. Cl. 280-47.220.
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- Tune, Herbert E., to Star Engineering Applications Limited. Fuel blending installation. 4,413,604. Cl. 123-515.000.
- Tungum Hydraulics Limited: See—  
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- Ty, Henry, to Texas Instruments Incorporated. Composite thermostat metal. 4,414,286. Cl. 428-616.000.
- Uba, Toshio, to Gates Energy Products, Inc. Battery separator. 4,414,295. Cl. 429-59.000.
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- Union Carbide Corporation: See—  
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- Fuderer, Andrija, 4,414,191. Cl. 423-359.000.
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- Pinkston, Bruce H. W., 4,414,184. Cl. 422-133.000.
- Schilling, Curtis L., Jr.; Williams, Thomas C.; and Wesson, John P., 4,414,403. Cl. 556-430.000.
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- Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., 4,413,680. Cl. 166-270.000.
- Young, Dean A.; and Koepke, Jeffery W., 4,414,137. Cl. 502-162.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—  
Cuckson, Harry; and Curtis, Peter D., 4,414,505. Cl. 324-85.000.
- Lettington, Alan H., 4,413,878. Cl. 350-6.700.
- Shanks, Ian A., 4,414,565. Cl. 358-89.000.
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- Army: See—  
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- Novak, Thaddeus J., 4,414,414. Cl. 564-271.000.
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Krauss, Alan R.; and Gruen, Dieter M., 4,414,176. Cl. 376-136.000.
- Health and Human Services: See—  
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- National Aeronautics and Space Administration: See—  
Dea, Jack Y., 4,413,784. Cl. 239-426.000.
- Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenston, Sherman A.; and Stephens, David G., 4,413,522. Cl. 73-646.000.
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- Williams, Roger M.; and Rembaum, Alan, 4,414,080. Cl. 204-129.000.
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Berthold, John W., III; and Szczepanek, Paul S., 4,413,879. Cl. 350-96.190.
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Berke, Herbert; and Portoghesi, Joseph, 4,414,567. Cl. 358-139.000.
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- Feldman, Sidney; and Barton, George G., Jr., 4,413,906. Cl. 356-141.000.
- Ford, Edward J., Jr., 4,414,181. Cl. 422-240.000.
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- Wolf, Alfred A., 4,414,461. Cl. 219-121.00L.
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Beckers, Hubertus F. M., 4,414,659. Cl. 369-59.000.
- Bergmann, Udo; Kurz, Heinrich; and Radtke, Wolfgang, 4,414,552. Cl. 346-1.100.
- Braune, Dirk; and Schwartz, Wolfgang, 4,414,570. Cl. 358-154.000.



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- Hendriks, Johannes H.; and Van Daal, Johannes J. M., 4,414,688, Cl. 455-188.000.
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- Dunn, J. James; and Graham, Robert M., 4,413,733, Cl. 206-446.000.
- United States Steel Corporation: See—
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- Davis, Frank N.; and Podgurski, Harry H., 4,414,043, Cl. 148-16.000.
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- Layden, George K.; and Prew, Karl M., 4,414,011, Cl. 65-18.100.
- Setzer, Herbert J., 4,414,140, Cl. 502-303.000.
- Ulion, Nicholas E.; and Ruckle, Duane L., 4,414,249, Cl. 427-248.100.
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- Sasaki, Akio; and Echigo, Yoshiaki, 4,414,183, Cl. 423-7.000.
- Univar Corporation: See—
- McDonald, Roderick A., 4,413,931, Cl. 405-264.000.
- University of Florida: See—
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- University of Maine, The Board of Trustees of the: See—
- Hill, Richard C.; and Daniele, Mark R., 4,413,571, Cl. 110-234.000.
- University Patents, Inc.: See—
- Crewe, Albert V., 4,414,474, Cl. 250-396.00R.
- Pettit, George R., 4,414,205, Cl. 424-177.000.
- UOP Inc.: See—
- Malloy, Thomas P.; and Swedo, Raymond J., 4,414,120, Cl. 252-8.55D.
- Olson, Larry D., 4,414,264, Cl. 428-241.000.
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- Amemiya, Yoshihito; Urisu, Tsuneo; and Mizushima, Yoshihiko, 4,414,557, Cl. 357-16.000.
- Urschel, Joe R.: See—
- Fischer, Robert R.; and Urschel, Joe R., 4,413,537, Cl. 76-101.00R.
- Urschel Laboratories, Incorporated: See—
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- Hold, Peter; and Tadmor, Zehev, 4,413,913, Cl. 366-75.000.
- Utilux Pty. Ltd.: See—
- Karl, Walter, 4,413,873, Cl. 339-74.00R.
- Vallod, Joseph: See—
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- Vallourec SA: See—
- Garnier, Andre, 4,413,395, Cl. 29-157.30C.
- Valmet OY: See—
- Kirjavainen, Alvi, 4,414,062, Cl. 162-336.000.
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- Ostrom, Carl R.; and Theilen, Dennis R., 4,413,783, Cl. 239-183.000.
- Vanat, Pierre: See—
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- van der Nat, Adrianus A.: See—
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- VanDril, William A., to Whiting Corporation. Water-cooled, liningless cupola, 4,413,811, Cl. 266-190.000.
- Van Gestel, Wilhelmus J., to U.S. Philips Corporation. Method of transmitting an audio signal via a transmission channel, 4,414,585, Cl. 360-40.000.
- Van Kemenade, Martinus J. C., to U.S. Philips Corporation. Apparatus for examining an object by means of ultrasonic waves, 4,413,521, Cl. 73-626.000.
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- Vansant, Etienne F.: See—
- De Bievre, Paul J.; Vansant, Etienne F.; and Peeters, Guido J., 4,414,005, Cl. 55-75.000.
- Van Scoy, Davis A., to Grove Valve and Regulator Company. Orifice meter with isolation valve on the carrier, 4,413,532, Cl. 73-861.610.
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- Van Willigen, Durk: See—
- Nordholt, Ernst H.; and Van Willigen, Durk, 4,414,690, Cl. 455-283.000.
- Varadi, Andrew G.: See—
- Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,413,401, Cl. 29-571.000.
- Variable Kinetic Drives Limited: See—
- Hobbs, Howard F., 4,413,535, Cl. 74-688.000.
- Varian Associates, Inc.: See—
- Lamont, Lawrence T., Jr., 4,414,086, Cl. 204-192.00M.
- Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., to General Motors Corporation. Passenger restraint system, 4,413,838, Cl. 280-751.000.
- Vasalos, Iacovos A.: See—
- Smith, Jeffrey S.; Quinn, George P.; and Vasalos, Iacovos A., 4,414,101, Cl. 208-153.000.
- Vaughn, Howard A., Jr.; and Ching, Ta-Yen, to General Electric Company. Silicone resin coating composition adapted for primerless adhesion to plastic substrates and process for making same, 4,414,349, Cl. 524-261.000.
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- Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585, Cl. 118-61.000.
- Venuso, Nicholas A., to Metropolitan Sanitary District of Greater Chicago. Method and apparatus for remote measuring, 4,413,419, Cl. 33-174.00G.
- Verbatim Corporation: See—
- Song, Hubert, 4,414,497, Cl. 318-696.000.
- Vernano, Paolo: See—
- Roba, Giacomo; and Vergnano, Paolo, 4,414,164, Cl. 264-1.200.
- Verlinden, Harry W., to Electrohome Limited. Video amplifier with blank stretching, 4,414,574, Cl. 358-184.000.
- Verosol B.V.: See—
- Istha, Johannes, 4,413,664, Cl. 160-178.00C.
- Vicon Industries, Inc.: See—
- Randmae, Rein S., 4,414,576, Cl. 358-229.000.
- Victor Company of Japan, Ltd.: See—
- Hirota, Akira; Hiraguri, Seisuke; and Uchimi, Takashi, 4,414,586, Cl. 360-70.000.
- Iwasaki, Yoshiki, 4,414,668, Cl. 371-38.000.
- Videau, Daniel: See—
- Gorgerino, Mario; and Videau, Daniel, 4,414,027, Cl. 420-578.000.
- Video Corporation of America: See—
- Gould, George K.; and Steinberg, Eric, 4,414,467, Cl. 235-381.000.
- Vilargunte, Valentin S. Warp and weft weaving machine, 4,413,658, Cl. 139-436.000.
- Villa, Giovanni: See—
- Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,414,405, Cl. 560-56.000.
- Villalobos, Joseph A.; and Psychoj, Triffin G., to AER Corporation. Fuel control system for dryer, 4,413,427, Cl. 34-46.000.
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- Kapecki, Jon A.; Gormel, Thomas M.; and Vincent, Sheridan E., 4,414,307, Cl. 430-465.000.
- Visser, Donald R.: See—
- Redey, Laszlo; and Visser, Donald R., 4,414,093, Cl. 204-412.000.
- Vodrazka, Wolfgang: See—
- Wagner, Eckhart; Wagner, Ulrich; Volkamer, Klaus; and Vodrazka, Wolfgang, 4,414,004, Cl. 55-48.000.
- Voermans, Antonius B.: See—
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- Pirklbauer, Wilfried; and Nagl, Martin, 4,413,812, Cl. 266-195.000.
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Featherstone, Harry E.; and Steffen, Alvin R., 4,413,451. Cl. 52-28.000.
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Kaczerginski, Alexandre; and Willem, Michel, 4,414,429. Cl. 174-179.000.
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Rogge, Dieter, 4,413,560. Cl. 101-247.000.
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Oestreich, Ulrich; Schoeber, Gernot; and Witt, Gerd, 4,414,165. Cl. 264-1.500.
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Klak, Roland; Frankle, Gerhard; and Woschee, Dieter, 4,413,606. Cl. 123-550.000.

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Uskokovic, Milan R.; and Wovkulich, Peter M., 4,414,402. Cl. 549-475.000.
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Minalga, Philip F.; and Wurst, John W., 4,413,577. Cl. 112-158.00E.
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Gilvar, Martin; and Wykes, Philips, 4,413,494. Cl. 72-167.000.
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Becker, Horace W., 4,414,555. Cl. 346-76.0PH.
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Sudo, Shigeru; and Yada, Masaaki, 4,414,460. Cl. 219-121.0LD.
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Matsuoka, Hiroki; Kinugasa, Yukio; and Yaegashi, Takehisa, 4,413,601. Cl. 123-480.000.
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Lyon, Floyd A.; Yale, William H.; and Lyon, Donald, 4,413,614. Cl. 126-421.000.
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Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiro, 4,414,636. Cl. 364-526.000.
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Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, 4,414,271. Cl. 428-328.000.
- Yamaguchi, Masayuki: See—  
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,413,657. Cl. 138-149.000.
- Yamaguchi, Yasumasa: See—  
Watanabe, Ichiro; Satoh, Yoshiaki; and Yamaguchi, Yasumasa, 4,414,331. Cl. 435-129.000.
- Yamaguchi, Yoshimasa, to Silver Seiko Ltd. Hand-operated knitting machine, method of casting on and knit article obtainable on the machine. 4,413,487. Cl. 66-60.00H.
- Yamahira, Hitoshi: See—  
Tsuchiya, Hiroshi; Yamahira, Hitoshi; and Murakami, Takeshi, 4,414,259. Cl. 428-207.000.
- Yamamoto, Hideji: See—  
Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, 4,414,196. Cl. 423-633.000.
- Yamamoto, Manabu; and Tanaka, Shuhei, to Hitachi Denshi Kabushiki Kaisha. Autofocus system. 4,414,575. Cl. 358-227.000.
- Yamamoto, Masahiro: See—  
Imaoka, Hiroshi; Sakiyama, Michio; and Yamamoto, Masahiro, 4,413,498. Cl. 72-405.000.
- Yamamoto, Taku: See—  
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,413,955. Cl. 417-270.000.
- Yamanouchi Pharmaceutical Co. Ltd.: See—  
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibamura, Tadao, 4,414,153. Cl. 260-239.100.
- Yamashita, Katsuyoshi: See—  
Shiga, Akinobu; Matsuyama, Kiyoshi; Kōtōgo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, 4,414,373. Cl. 526-348.000.
- Yamashita, Tsutomu; and Matsuda, Jinichi, to Technological University of Nagaoka. Superconducting electron beam generator. 4,414,487. Cl. 315-5.000.
- Yamatata, Kazunori; Isoya, Toshiro; and Kitaguchi, Nobuya, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of a 4-butanolide compound. 4,414,079. Cl. 204-75.000.
- Yamato Plastics Machinery Co., Ltd.: See—  
Sano, Yoshiaki, 4,414,170. Cl. 264-242.000.
- Yamato Scale Company, Limited: See—  
Kohashi, Toru, 4,413,739. Cl. 209-593.000.
- Yamauchi, Shinya: See—  
Maruyama, Teruo; Yamauchi, Shinya; and Abe, Yoshikazu, 4,413,963. Cl. 418-259.000.
- Yamazaki, Atsuki: See—  
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibamura, Tadao, 4,414,153. Cl. 260-239.100.
- Yamazaki, Kaoru: See—  
Kato, Harumitsu; Yamada, Hironori; Yamazaki, Kaoru; Maruyama, Masashi; and Ogasawara, Takashi, 4,413,703. Cl. 181-156.000.
- Yamazaki, Toru: See—  
Sugiura, Junji; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527. Cl. 73-754.000.
- Yamazaki, Yoshihiro: See—  
Sekido, Satoshi; Ninomiya, Yoshito; and Yamazaki, Yoshihiro, 4,414,607. Cl. 361-433.000.
- Yanagawa, Hajime; and Suzuki, Yoshio, to Diesel Kiki Co., Ltd. Distributor type fuel injection pump adapted for partial cylinder operation of an internal combustion engine. 4,413,600. Cl. 123-449.000.
- Yanase, Takeyasu, to Fumitsu Limited. Magnetic bubble domain swap gate circuit. 4,414,648. Cl. 365-16.000.
- Yanashima, Tadahiko: See—  
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520. Cl. 73-609.000.
- Yanda, Roman L. Method and apparatus for monitoring body conditions. 4,413,633. Cl. 128-736.000.
- Yang, Chi-Ming, to China Steel Corporation. Process for addition of silicon to iron. 4,414,025. Cl. 75-129.000.
- Yarborough, John M., Jr.: See—  
Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587. Cl. 360-76.000.
- Yasuhara, Seishi: See—  
Kawamura, Yoshihisa; and Yasuhara, Seishi, 4,413,508. Cl. 73-116.000.
- Yokota, Hiroshi: See—  
Edahiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008. Cl. 65-3.120.
- Yong, Raymond N.; and Sethi, Amar J., to Suncor, Inc. Decarbonation of tailings sludge to improve settling. 4,414,117. Cl. 210-710.000.
- Yoshida, Glenn T., to McDonnell Douglas Corporation. Linear tracking arrangement in a photographic disc type information-containing system. 4,414,658. Cl. 369-46.000.
- Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, to Nippon Light Metal Company Limited. Method for production of colored aluminum article. 4,414,077. Cl. 204-35.00N.
- Yoshida, Takehiko: See—  
Siga, Masao; Kirihiara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024. Cl. 75-126.00C.
- Yoshikawa, Masao: See—  
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899. Cl. 355-4.000.
- Yoshimura, Motokazu: See—  
Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496. Cl. 318-696.000.
- Yoshioka, Hideoki; Okino, Ichiro; and Toda, Toshiaki, to Matsushita Electric Works, Ltd. Thermal switch. 4,414,529. Cl. 337-365.000.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—  
Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216. Cl. 424-251.000.
- Yosioka, Takatoshi: See—  
Siga, Masao; Kirihiara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024. Cl. 75-126.00C.
- Young, Dean A.; and Koepke, Jeffery W., to Union Oil Company of California. Catalytically active amorphous silica. 4,414,137. Cl. 502-162.000.
- Young, Jerry W.; Eddy, William R.; and Taylor, Raymond C., to Sealright Co., Inc. Apparatus for assembling ring-type closures. 4,413,983. Cl. 493-30.000.
- Young, Robert G., to North American Philips Electric Corp. Compact electric discharge lamp-and-ballast unit, and plug-in ballast module therefor. 4,414,489. Cl. 315-51.000.
- Young, William P., to William P. Young Co. Machine for applying base cups to bottles. 4,414,055. Cl. 156-423.000.
- Yuan, Edward L.: See—  
Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, 4,414,312. Cl. 430-283.000.
- Yung-hsiung, Yang: See—  
Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,414,390. Cl. 546-121.000.



- Zabarilo, Oleg S.: See—  
 Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672, Cl. 373-22.000.
- Zahnradfabrik Friedrichshafen, AG.: See—  
 Lang, Armin, 4,413,472, Cl. 60-420.000.
- Zaidan Hojin Handotai Kenkyu Shinkokai: See—  
 Nishizawa, Jun-ichi; and Teshima, Toru, 4,414,558, Cl. 357-17.000.
- Zakamarkin, Mikhail K.: See—  
 Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672, Cl. 373-22.000.
- Zama, Yoshimasa: See—  
 Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraiishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,413,657, Cl. 138-149.000.
- Zamulo, Nikolai I.: See—  
 Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672, Cl. 373-22.000.
- Zandona, Oliver J.; and Hettinger, William P., Jr., to Ashland Oil, Inc. Upgrading carbo-metallic oils with used catalyst, 4,414,098, Cl. 206-120.000.
- Zangerle, Ernst; to Spuhl AG. Apparatus for feeding spiral wire springs from coiling machines to a spring core assembly machine, 4,413,659, Cl. 140-3.00A.
- Zasto, John J., to Storage Technology Partners. CMOS Circuit using transmission line interconnections, 4,414,480, Cl. 307-443.000.
- Zassinovich, Grazia: See—  
 Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,414,417, Cl. 568-315.000.
- Zato, Thomas J.: See—  
 Skerlos, Peter C.; and Zato, Thomas J., 4,414,432, Cl. 179-2.0TV.
- Zawacki, Thomas S.: See—  
 Macriss, Robert A.; and Zawacki, Thomas S., 4,413,480, Cl. 62-112.000.
- Zbinden, Paul: See—  
 Habicht, Ernst; and Zbinden, Paul, 4,414,214, Cl. 424-248.510.
- Zeller, Claude: See—  
 Vogel, F. Lincoln; and Zeller, Claude, 4,414,142, Cl. 252-506.000.
- Zeller, Gary P.: See—  
 McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., 4,413,856, Cl. 296-188.000.
- Zemanek, Joseph, Jr., to Mobil Oil Corporation. Method of locating potential low water cut hydrocarbon reservoirs, 4,413,512, Cl. 73-152.000.
- Zenith Radio Corporation: See—  
 Skerlos, Peter C.; and Zato, Thomas J., 4,414,432, Cl. 179-2.0TV.
- Zhdanovsky, Anatoly A.: See—  
 Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672, Cl. 373-22.000.
- Zimmerman, John A., Jr.: See—  
 Rudy, William J., Jr.; and Zimmerman, John A., Jr., 4,413,872, Cl. 339-59.00M.
- Zimmerman, Steven M.: See—  
 Kaplan, Leon H.; Kaplan, Richard D.; and Zimmerman, Steven M., 4,414,314, Cl. 430-311.000.
- Zitkus, Wayne J.: See—  
 Dunlap, Glenn H.; and Zitkus, Wayne J., 4,413,617, Cl. 126-443.000.
- Zodrow, Rudolf: See—  
 Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,414,056, Cl. 156-476.000.
- Zoleski, Benjamin H.; and Sung, Rodney L., to Texaco Inc. Marine diesel cylinder oils containing polyoxyethylene sorbitol lanolin for improved spreadability, 4,414,123, Cl. 252-52.00A.
- Zollinger, Hans R., to H. A. Schlatter AG. Method of welding continuous rails and apparatus therefor, 4,414,454, Cl. 219-53.000.
- Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, to Supraton F. J. Zucker GmbH. Process for continuously grinding and mixing starch-containing raw materials, 4,414,330, Cl. 435-93.000.
- Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives, 4,414,394, Cl. 548-451.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fuji Electric Co., Ltd.: See—  
 Ueda, Shinya, Re. 31,438, Cl. 250-345.000.

Ueda, Shinya, to Fuji Electric Co., Ltd. Infrared ray gas analyzing apparatus. Re. 31,438, Cl. 250-345.000.

## LIST OF REEXAM PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

Century Envelope Co., Inc.: See—  
 Krueger, Lloyd H., B1 3,558,040, Cl. 229-73.000.

Galluccio, Richard A.: See—  
 Stambaugh, Robert L.; and Galluccio, Richard A., B1 4,146,489, Cl. 252-50.000.

Krueger, Lloyd H., to Century Envelope Co., Inc. Two-way envelope. B1 3,558,040, 11-8-83, Cl. 229-73.000.

Oana, Katsuo. Safe cartridge for gas. B1 4,219,126, 11-8-83, Cl. 220-89.00A.

Rohm and Haas Company: See—  
 Stambaugh, Robert L.; and Galluccio, Richard A., B1 4,146,489, Cl. 252-50.000.

Stambaugh, Robert L.; and Galluccio, Richard A., to Rohm and Haas Company. Polyolefin graft copolymers and lubricating oils and fuels containing same. B1 4,146,489, 11-8-83, Cl. 252-50.000.

## LIST OF DESIGN PATENTEEES

- Abatie, Paul. Tool pouch. 271,253, 11-8-83, Cl. D2-400.000.
- Abbott, James B.; and Kohn, Ernest O., to Metal Box Limited. Can body. 271,281, 11-8-83, Cl. D9-351.000.
- Adolph Coors Company: See—  
 Templeton, Darrell L., 271,342, Cl. D34-39.000.
- Amer Sport International Inc.: See—  
 Farquharson, Charles R., 271,249, Cl. D2-232.000.
- American Home Products Corporation: See—  
 Cassini, Oleg L., 271,267, Cl. D7-137.000.
- Anchor Hocking Corporation: See—  
 Thrush, James L., 271,282, Cl. D9-370.000.
- Arcair Company: See—  
 Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., 271,290, Cl. D12-36.000.
- Atari, Inc.: See—  
 Cheng, Regan L., 271,311, Cl. D21-13.000.
- Nishi, Roy M., 271,313, Cl. D21-48.000.
- Renteria, William J., 271,312, Cl. D21-48.000.
- Austin, Forrest L.; and Mackrell, William B., to Cornelius Company. The Beverage dispensing valve. 271,270, 11-8-83, Cl. D7-398.000.
- Austin, Forrest L.; and Mackrell, William B., to Cornelius Company. The Beverage dispensing valve. 271,271, 11-8-83, Cl. D7-398.000.
- Austin, Forrest L.; and Mackrell, William B., to Cornelius Company. The Beverage dispensing valve. 271,272, 11-8-83, Cl. D7-398.000.
- Austin, Forrest L.; and Mackrell, William B., to Cornelius Company. The Beverage dispensing valve. 271,273, 11-8-83, Cl. D7-398.000.
- Bainton, Donald J., to Continental Group, Inc., The. Container closure. 271,284, 11-8-83, Cl. D9-438.000.
- Bangor Punta Corporation: See—  
 Ferraro, Robert, 271,320, Cl. D22-1.000.
- Barty, Ernest J., Jr. Golf swing training aid. 271,319, 11-8-83, Cl. D21-234.000.
- Bermani, David: See—  
 Squitieri, Robert J.; and Bermani, David, 271,336, Cl. D26-138.000.
- Bernick, Herman C. Clock face or similar article. 271,288, 11-8-83, Cl. D10-126.000.
- Bettencourt, Eric J.: See—  
 Wilson, Michael E.; Dixon, William L.; and Bettencourt, Eric J., 271,292, Cl. D12-180.000.
- Boone, Terry C. Automobile. 271,291, 11-8-83, Cl. D12-86.000.
- Bosch-Siemens Hausgerate GmbH: See—  
 Vetter, Roland; and Feil, Rolf, 271,269, Cl. D7-363.000.
- Brett, Robert J., to R. A. Lockhart and Company. Golf putter head. 271,317, 11-8-83, Cl. D21-219.000.
- Brother Kogyo Kabushiki Kaisha: See—  
 Hirano, Takuo, 271,309, Cl. D18-1.000.
- Broyhill Furniture Industries, Inc.: See—  
 Smith, Melbourne F., Jr., 271,259, Cl. D6-154.000.
- Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,264, 11-8-83, Cl. D6-198.000.
- Buckley, Betty H. Doll. 271,316, 11-8-83, Cl. D21-171.000.
- Burgin, Ralph C.; and Cale, David B., to Dadant & Sons, Inc. Ventilated hat. 271,250, 11-8-83, Cl. D2-257.000.
- Cale, David B.: See—  
 Burgin, Ralph C.; and Cale, David B., 271,250, Cl. D2-257.000.
- Cambridge Instruments, Inc.: See—  
 Grossman, Hyman, 271,334, Cl. D24-99.000.
- Canning, Daniel; Viola, Vito; and Jordan, James B., to Oume Corporation. Ribbon cartridge or the like. 271,310, 11-8-83, Cl. D18-12.000.
- Carlsson, Lars G. Planting box casing element or similar article. 271,289, 11-8-83, Cl. D11-164.000.
- Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,267, 11-8-83, Cl. D7-137.000.
- Cheng, Regan L., to Atari, Inc. Video game console. 271,311, 11-8-83, Cl. D21-13.000.
- Ciciliot, Henry; and Ciciliot, Robert. Shotgun loading device. 271,321, 11-8-83, Cl. D22-7.000.
- Ciciliot, Robert: See—  
 Ciciliot, Henry; and Ciciliot, Robert, 271,321, Cl. D22-7.000.
- Continental Group, Inc., The: See—  
 Bainton, Donald J., 271,284, Cl. D9-438.000.
- Cornelius Company, The: See—  
 Austin, Forrest L.; and Mackrell, William B., 271,270, Cl. D7-398.000.
- Austin, Forrest L.; and Mackrell, William B., 271,271, Cl. D7-398.000.
- Austin, Forrest L.; and Mackrell, William B., 271,272, Cl. D7-398.000.
- Austin, Forrest L.; and Mackrell, William B., 271,273, Cl. D7-398.000.
- Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., to Arcair Company. Heavy duty machine carriage. 271,290, 11-8-83, Cl. D12-36.000.
- Cziment, Avi. Illuminable key handle. 271,279, 11-8-83, Cl. D8-347.000.
- Dadant & Sons, Inc.: See—  
 Burgin, Ralph C.; and Cale, David B., 271,250, Cl. D2-257.000.
- Dehne, Clarence A., to Jervia B. Webb Company. Combined conveyor carrier and track unit. 271,341, 11-8-83, Cl. D34-28.000.
- De Luca, Paul V.; and Hollfelder, Thomas A., to Porta Systems, Corp. Combined telephone connector block and circuit protector. 271,295, 11-8-83, Cl. D13-24.000.



Dixon, William L.: *See—*  
Wilson, Michael E.; Dixon, William L.; and Bettencourt, Eric J., 271,292, Cl. D12-180.000.

Doman, Donald W.; and Jaeckels, Norman J., to Kohler Co. Water closet. 271,326., 11-8-83, Cl. D23-65.000.

Draheim, Harvey J.: *See—*  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,264., Cl. D6-198.000.

Dukowski, Hubert G. Portable air filtration unit. 271,338., 11-8-83, Cl. D29-6.000.

Emerson, James A.: *See—*  
Jones, James C.; and Emerson, James A., 271,296., Cl. D13-24.000.

Farquharson, Charles R., to Amer Sport International Inc. Hockey helmet or similar article. 271,249., 11-8-83, Cl. D2-232.000.

Feil, Rolf: *See—*  
Vetter, Roland; and Feil, Rolf, 271,269., Cl. D7-363.000.

Fenne, Kenneth R., to Pittway Corporation. Smoke detector. 271,287., 11-8-83, Cl. D10-106.000.

Ferraro, Robert, to Bangor Punta Corporation. Knife. 271,320., 11-8-83, Cl. D22-1.000.

Fratelli Saporiti: *See—*  
Offredi, Giovanni, 271,257., Cl. D6-47.000.

Fujimoto, Kazumi, to Sony Corporation. Floppydisk. 271,298., 11-8-83, Cl. D14-11.000.

Gaillot, Marianne, to Lesieur-Cotelle Et Associes S. A. Bottle. 271,280., 11-8-83, Cl. D9-349.000.

Gedye, Laurence R., to L.R. & N.R. Gedye Pty. Ltd. Filter housing blank. 271,325., 11-8-83, Cl. D23-4.000.

Green, David T.; Rawson, Paul; and Yagami, Richard, to United States Surgical Corporation. Powered skin stapler. 271,331., 11-8-83, Cl. D24-26.000.

Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Surgical occluding and cutting instrument. 271,332., 11-8-83, Cl. D24-26.000.

Green, John R.; and Turner, Charles D. Pair of binoculars. 271,307., 11-8-83, Cl. D16-133.000.

Grossman, Hyman, to Cambridge Instruments, Inc. Electrocardiographic recording paper. 271,334., 11-8-83, Cl. D24-99.000.

Guerra, Romeo E.; and Nelson, Robert H., to Nova Patents of North America, Inc. Igniter for gas discharge pipes. 271,327., 11-8-83, Cl. D23-90.100.

Gyebnar, Zoltan B. Plant hanger. 271,258., 11-8-83, Cl. D6-137.000.

Hauk, Ernest D., to Hawk Industries, Inc. Airplane. 271,294., 11-8-83, Cl. D12-344.000.

Hawk Industries, Inc.: *See—*  
Hauk, Ernest D., 271,294., Cl. D12-344.000.

Hirano, Takuo, to Brother Kogyo Kabushiki Kaisha. Typewriter. 271,309., 11-8-83, Cl. D18-1.000.

Hollfelder, Thomas A.: *See—*  
De Luca, Paul V.; and Hollfelder, Thomas A., 271,295., Cl. D13-24.000.

Holloway, Thomas F., to Risdon Corporation. Cosmetic container. 271,337., 11-8-83, Cl. D28-85.000.

Hope, Terrence L. Surfboard fin. 271,318., 11-8-83, Cl. D21-231.000.

Jaeckels, Norman J.: *See—*  
Doman, Donald W.; and Jaeckels, Norman J., 271,326., Cl. D23-65.000.

Jervis B. Webb Company: *See—*  
Dehne, Clarence A., 271,341., Cl. D34-28.000.

Johnson, David E.: *See—*  
Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., 271,290., Cl. D12-36.000.

Jones, James C.; and Emerson, James A., to Robinson-Nugent, Inc. Combined integrated circuit package carrier and socket. 271,296., 11-8-83, Cl. D13-24.000.

Jonsson, Nils G., to National Service Industries, Inc. Combined circuit connector and switching module. 271,297., 11-8-83, Cl. D13-24.000.

Jordan, James B.: *See—*  
Canning, Daniel; Viola, Vito; and Jordan, James B., 271,310., Cl. D18-12.000.

Kee Cheong Lee's Co. Ltd.: *See—*  
Lee, Keith K. K., 271,339., Cl. D32-55.000.

Kensrue, Milo M. Welding seam back-up extrusion. 271,304., 11-8-83, Cl. D15-144.000.

Kohler Co.: *See—*  
Doman, Donald W.; and Jaeckels, Norman J., 271,326., Cl. D23-65.000.

Kohn, Ernest O.: *See—*  
Abbott, James B.; and Kohn, Ernest O., 271,281., Cl. D9-351.000.

Kostiner, Edward. Photographic print tong or similar article. 271,305., 11-8-83, Cl. D16-36.000.

Kramer, Peter R.: *See—*  
Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., 271,301., Cl. D14-59.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., 271,302., Cl. D14-59.000.

L.R. & N.R. Gedye Pty. Ltd.: *See—*  
Gedye, Laurence R., 271,325., Cl. D23-4.000.

Lanier, Ted B.; and Redwine, Ras, V., to RLI Inc. Evaporative cooler. 271,328., 11-8-83, Cl. D23-139.000.

Lauck, Howard. Pierced ear-ring holder. 271,286., 11-8-83, Cl. D9-457.000.

Lauren, Ralph, to Warner/Lauren Ltd. Bottle cap. 271,285., 11-8-83, Cl. D9-454.000.

Leatherwood, Bennie A. Lure for trout. 271,323., 11-8-83, Cl. D22-27.000.

Lee, Keith K. K., to Kee Cheong Lee's Co. Ltd. Combined dish rack and drainer. 271,339., 11-8-83, Cl. D32-55.000.

Leo, Susan, to Ridgecrest, Inc. Combined holder and magnifier for gem examination. 271,308., 11-8-83, Cl. D16-135.000.

Lesieur-Cotelle Et Associes S. A.: *See—*  
Gaillot, Marianne, 271,280., Cl. D9-349.000.

Logansport Distributors, Inc.: *See—*  
Welsh, Clarke T., 271,329., Cl. D23-163.000.

Mackrell, William B.: *See—*  
Austin, Forrest L.; and Mackrell, William B., 271,270., Cl. D7-398.000.

Austin, Forrest L.; and Mackrell, William B., 271,271., Cl. D7-398.000.

Austin, Forrest L.; and Mackrell, William B., 271,272., Cl. D7-398.000.

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Mak, Ting H. Desk telephone. 271,299., 11-8-83, Cl. D14-53.000.

Mak, Ting H. Desk telephone. 271,300., 11-8-83, Cl. D14-53.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., to Zoom Telephonics, Inc. Telephone switch-connector unit. 271,301., 11-8-83, Cl. D14-59.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., to Zoom Telephonics, Inc. Telephone switch-connector device. 271,302., 11-8-83, Cl. D14-59.000.

Manning, T. Pat.: *See—*  
Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., 271,301., Cl. D14-59.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., 271,302., Cl. D14-59.000.

McCall, Kenneth E.: *See—*  
Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., 271,290., Cl. D12-36.000.

McClelland, Donald R., to Rubbermaid Incorporated. Step stool. 271,256., 11-8-83, Cl. D6-32.000.

Metal Box Limited: *See—*  
Abbott, James B.; and Kohn, Ernest O., 271,281., Cl. D9-351.000.

Miller, Daniel R., to Nestier Corporation. Box. 271,343., 11-8-83, Cl. D34-43.000.

Milton Bradley International, Inc.: *See—*  
Tveras, Rimvydas A., 271,314., Cl. D21-76.000.

Moore, David D. Fishing lure. 271,324., 11-8-83, Cl. D22-28.000.

Morris, Arthur R. Walker. 271,254., 11-8-83, Cl. D3-5.000.

National Service Industries, Inc.: *See—*  
Jonsson, Nils G., 271,297., Cl. D13-24.000.

Nelson, Robert H.: *See—*  
Guerra, Romeo E.; and Nelson, Robert H., 271,327., Cl. D23-90.100.

Nestier Corporation: *See—*  
Miller, Daniel R., 271,343., Cl. D34-43.000.

New Balance Athletic Shoe, Inc.: *See—*  
Norton, Edward J., 271,251., Cl. D2-320.000.

Nishi, Roy M., to Atari, Inc. Video game controller. 271,313., 11-8-83, Cl. D21-48.000.

Norton, Edward J., to New Balance Athletic Shoe, Inc. Outsole for athletic shoe. 271,251., 11-8-83, Cl. D2-320.000.

Nottingham, John R.; and Spirk, John W., Jr. Toy dump truck or similar article. 271,315., 11-8-83, Cl. D21-78.000.

Nova Patents of North America, Inc.: *See—*  
Guerra, Romeo E.; and Nelson, Robert H., 271,327., Cl. D23-90.100.

Offredi, Giovanni, to Fratelli Saporiti. Chair. 271,257., 11-8-83, Cl. D6-47.000.

Okazaki, Mitsuaki, to Ryobi Limited. Door closer. 271,277., 11-8-83, Cl. D8-330.000.

Omark Industries, Inc.: *See—*  
Reynolds, Michael J., 271,276., Cl. D8-91.000.

Oume Corporation: *See—*  
Canning, Daniel; Viola, Vito; and Jordan, James B., 271,310., Cl. D18-12.000.

Ovelmen, Sherman, to Windgen, Limited. Wind turbine. 271,303., 11-8-83, Cl. D15-1.000.

Pittway Corporation: *See—*  
Fenne, Kenneth R., 271,287., Cl. D10-106.000.

Polka, John G. Wheel cover for trucks. 271,293., 11-8-83, Cl. D12-204.000.

Porta Systems, Corp.: *See—*  
De Luca, Paul V.; and Hollfelder, Thomas A., 271,295., Cl. D13-24.000.

R. A. Lockhart and Company: *See—*  
Breil, Robert J., 271,317., Cl. D21-219.000.

Racor Industries, Inc.: *See—*  
Wilson, Michael E.; Dixon, William L.; and Bettencourt, Eric J., 271,292., Cl. D12-180.000.

Rawson, Paul: *See—*  
Green, David T.; Rawson, Paul; and Yagami, Richard, 271,331., Cl. D24-26.000.

Rawson, Paul O.: *See—*  
Green, David T.; Rawson, Paul O.; and Yagami, Richard, 271,332., Cl. D24-26.000.

Redwine, Ras, V.: *See—*  
Lanier, Ted B.; and Redwine, Ras, V., 271,328., Cl. D23-139.000.

Renteria, William J., to Atari, Inc. Video game controller. 271,312., 11-8-83, Cl. D21-48.000.

Reynolds, Michael J., to Omark Industries, Inc. Chain saw guide bar grinding device. 271,276., 11-8-83, Cl. D8-91.000.

Richilano, Vincent J., to Zephyr Industries, Inc. Combination spanner wrench and hammer. 271,275., 11-8-83, Cl. D8-26.000.

Ridgecrest, Inc.: *See—*  
Leo, Susan, 271,308., Cl. D16-135.000.

Risdon Corporation: *See—*  
Holloway, Thomas F., 271,337., Cl. D28-85.000.

RLI Inc.: *See—*  
Lanier, Ted B.; and Redwine, Ras, V., 271,328., Cl. D23-139.000.

Robinson-Nugent, Inc.: *See—*  
Jones, James C.; and Emerson, James A., 271,296., Cl. D13-24.000.

Rousseau, Jean-Pierre M. Key ring. 271,255., 11-8-83, Cl. D3-61.000.

Rubbermaid Incorporated: *See—*  
McClelland, Donald R., 271,256., Cl. D6-32.000.

Taylor, William D., 271,340., Cl. D32-55.000.

Ryobi Limited: *See—*  
Okazaki, Mitsuaki, 271,277., Cl. D8-330.000.

Saikosha Works Ltd.: *See—*  
Saitoh, Hisashi, 271,278., Cl. D8-339.000.

Saitoh, Hisashi, to Saikosha Works Ltd. Combination lock. 271,278., 11-8-83, Cl. D8-339.000.

Salzmänn, Ferdinand F.; and Swinehart, James P., to Wisco Industries, Inc. Pizza oven. 271,268., 11-8-83, Cl. D7-350.000.

Schaffer, Michael J.: *See—*  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,264., Cl. D6-198.000.

Schweiger Industries, Inc.: *See—*  
Ungaro, Nicholas A., 271,261., Cl. D6-167.000.

Ungaro, Nicholas A., 271,262., Cl. D6-168.000.

Ungaro, Nicholas A., 271,263., Cl. D6-179.000.

Shell Electric Manufacturing Co., Ltd.: *See—*  
Yung, Yau, 271,330., Cl. D23-163.000.

Shull, Steven W., to Vivitar Corporation. Combined electronic flash unit and adapter module. 271,306., 11-8-83, Cl. D16-42.000.

Sickler, Jack R. Belt attached tool hanger. 271,252., 11-8-83, Cl. D2-400.000.

Simmons Universal Corporation: *See—*  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,264., Cl. D6-198.000.

Simons, Sanford L. Cupette holder. 271,335., 11-8-83, Cl. D24-99.000.

Smith, Melbourne F., Jr., to Broyhill Furniture Industries, Inc. Buffet. 271,259., 11-8-83, Cl. D6-154.000.

Smithwick Lures, Inc.: *See—*  
Wasson, John J., 271,322., Cl. D22-27.000.

Sony Corporation: *See—*  
Fujimoto, Kazumi, 271,298., Cl. D14-11.000.

Spirk, John W., Jr.: *See—*  
Nottingham, John R.; and Spirk, John W., Jr., 271,315., Cl. D21-78.000.

Squitieri, Robert J.; and Bermani, David. Task light bracket. 271,336., 11-8-83, Cl. D26-138.000.

Sun, George C. Combined picture frame and support therefor. 271,265., 11-8-83, Cl. D6-235.000.

Swinehart, James P.: *See—*  
Salzmänn, Ferdinand F.; and Swinehart, James P., 271,268., Cl. D7-350.000.

Tasato, Noboru. Consecutive-drive type adjustable wrench. 271,274., 11-8-83, Cl. D8-23.000.

Taylor, Anthony H., to Wilkinson Sword, Limited. Packaging form for razors. 271,283., 11-8-83, Cl. D9-415.000.

Taylor, William D., to Rubbermaid Incorporated. Side draining dish rack. 271,340., 11-8-83, Cl. D32-55.000.

Templeton, Darrell L., to Adolph Coors Company. Barrel. 271,342., 11-8-83, Cl. D34-39.000.

Thom, Robert G. Lounge chair cover. 271,266., 11-8-83, Cl. D6-269.000.

Thrush, James L., to Anchor Hocking Corporation. Bottle or the like. 271,282., 11-8-83, Cl. D9-370.000.

Truglio, William, to Wright Laboratories, Inc. Fixed length blood container. 271,333., 11-8-83, Cl. D24-56.000.

Turner, Charles D.: *See—*  
Green, John R.; and Turner, Charles D., 271,307., Cl. D16-133.000.

Turner, Jeffrey A. Computer desk. 271,260., 11-8-83, Cl. D6-161.000.

Tveras, Rimvydas A., to Milton Bradley International, Inc. Riding toy. 271,314., 11-8-83, Cl. D21-76.000.

Ungaro, Nicholas A., to Schweiger Industries, Inc. Bookcase or similar article. 271,261., 11-8-83, Cl. D6-167.000.

Ungaro, Nicholas A., to Schweiger Industries, Inc. Bookcase or similar article. 271,262., 11-8-83, Cl. D6-168.000.

Ungaro, Nicholas A., to Schweiger Industries, Inc. Table or similar article. 271,263., 11-8-83, Cl. D6-179.000.

United States Surgical Corporation: *See—*  
Green, David T.; Rawson, Paul; and Yagami, Richard, 271,331., Cl. D24-26.000.

Green, David T.; Rawson, Paul O.; and Yagami, Richard, 271,332., Cl. D24-26.000.

Vetter, Roland; and Feil, Rolf, to Bosch-Siemens Hausgerate GmbH. Flat cooking panel. 271,269., 11-8-83, Cl. D7-363.000.

Viola, Vito: *See—*  
Canning, Daniel; Viola, Vito; and Jordan, James B., 271,310., Cl. D18-12.000.

Vivitar Corporation: *See—*  
Shull, Steven W., 271,306., Cl. D16-42.000.

Warner/Lauren Ltd.: *See—*  
Lauren, Ralph, 271,285., Cl. D9-454.000.

Wasson, John J., to Smithwick Lures, Inc. Fishing lure. 271,322., 11-8-83, Cl. D22-27.000.

Welsh, Clarke T., to Logansport Distributors, Inc. Fresh air duct for a kitchen exhaust system. 271,329., 11-8-83, Cl. D23-163.000.

Wilkinson Sword, Limited: *See—*  
Taylor, Anthony H., 271,283., Cl. D9-415.000.

Wilson, Michael E.; Dixon, William L.; and Bettencourt, Eric J., to Racor Industries, Inc. Condensate collection and removal device for pressurized air supply such as used for operating vehicular air brakes. 271,292., 11-8-83, Cl. D12-180.000.

Windgen, Limited: *See—*  
Ovelmen, Sherman, 271,303., Cl. D15-1.000.

Wisco Industries, Inc.: *See—*  
Salzmänn, Ferdinand F.; and Swinehart, James P., 271,268., Cl. D7-350.000.

Wright Laboratories, Inc.: *See—*  
Truglio, William, 271,333., Cl. D24-56.000.

Yagami, Richard: *See—*  
Green, David T.; Rawson, Paul; and Yagami, Richard, 271,331., Cl. D24-26.000.

Green, David T.; Rawson, Paul O.; and Yagami, Richard, 271,332., Cl. D24-26.000.

Yung, Yau, to Shell Electric Manufacturing Co., Ltd. Ceiling fan cover plate. 271,330., 11-8-83, Cl. D23-163.000.

Zephyr Industries, Inc.: *See—*  
Richilano, Vincent J., 271,275., Cl. D8-26.000.

Zoom Telephonics, Inc.: *See—*  
Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., 271,301., Cl. D14-59.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat., 271,302., Cl. D14-59.000.

## LIST OF PLANT PATENTEEES

B. V. Handelskwekerij/M. C. van Staaveren: *See—*  
van Andel, Jacob, 5,133., Cl. 68.000.

Espinosa, Gavin, to Monrovia Nursery Company. Cortaderia 'Monvin'. 5,136., 11-8-83, Cl. 89.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 5,134., 11-8-83, Cl. 68.000.

Mikkelsen, James C., 5,134., Cl. 68.000.

Mikkelsen, James C., 5,135., Cl. 68.000.

Monrovia Nursery Company: *See—*  
Espinosa, Gavin, 5,136., Cl. 89.000.

van Andel, Jacob, to B. V. Handelskwekerij/M. C. van Staaveren. Alstroemeria named Stakaros. 5,133., 11-8-83, Cl. 68.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 5,135., 11-8-83, Cl. 68.000.

Mikkelsens, Inc.: *See—*  
Mikkelsen, James C., 5,134., Cl. 68.000.

Mikkelsen, James C., 5,135., Cl. 68.000.

Monrovia Nursery Company: *See—*  
Espinosa, Gavin, 5,136., Cl. 89.000.

van Andel, Jacob, to B. V. Handelskwekerij/M. C. van Staaveren. Alstroemeria named Stakaros. 5,133., 11-8-83, Cl. 68.000.



# CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 8, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	174 M	4,413,417	420	4,413,472	869	4,413,536	278	4,413,581	CLASS 138		
2.5	4,413,357	180 AT	4,413,420	517	4,413,473	CLASS 75	311	4,413,582	31	4,413,652	
321	4,413,358	180 R	4,413,421	521	4,413,474	0.5 AA	4,414,021	CLASS 114	89	4,413,653	
		181 R	4,413,415	641.8	4,413,475	26	4,414,022	350	4,413,583	92	4,413,654
CLASS 3	185 R	4,413,422	641.8	4,413,476	124	4,414,023	CLASS 118			97	4,413,655
1	4,413,359	268	4,413,423	757	4,413,477	126 C	4,414,024	56	4,413,584	110	4,413,656
30	4,413,360	361	4,413,424	CLASS 62		129	4,414,025	61	4,413,585	149	4,413,657
				12	4,414,007	130.5	4,414,026	56	4,413,586	CLASS 139	
506	4,413,361	CLASS 34		98	4,413,478	252	4,414,029	210	4,413,587	436	4,413,658
567	4,413,362	1	4,413,425	101	4,413,479	CLASS 76		106	4,413,588	CLASS 140	
599	4,413,363	27	4,413,426	112	4,413,480	CLASS 81		109	4,413,589	3 CA	4,413,659
661	4,413,364	46	4,413,427	371	4,413,481	CLASS 82		18	4,413,590	119	4,413,660
		100	4,413,428	CLASS 65		57.13	4,413,538	235 R	4,413,591	CLASS 144	
100	4,413,365	44	4,413,429	3.12	4,414,008	CLASS 83		510	4,413,592	2 Z	4,413,661
201	4,413,366	114	4,413,430	4.3	4,414,009	CLASS 84		1	4,413,593	356	4,413,662
411	4,413,367	CLASS 36		16	4,414,010	CLASS 85		3	4,413,594	CLASS 148	
494	4,413,368	142 A	4,413,432	18.1	4,414,011	CLASS 86		41.1	4,413,595	4	4,414,038
		190	4,413,433	18.2	4,414,012	CLASS 87		41.2	4,413,596	6.2	4,414,039
94.21	4,413,397	CLASS 40		28	4,414,013	CLASS 88		142.5 R	4,413,597	6.3	4,414,040
477	4,413,398	10 R	4,413,434	31	4,414,014	CLASS 89		306	4,413,598	9.6	4,414,041
540	4,413,399	155	4,413,435	60.3	4,414,015	CLASS 90		425	4,413,599	12 R	4,414,042
555	4,414,000	160	4,413,436	141	4,414,016	CLASS 91		449	4,413,600	16	4,414,043
		CLASS 42		60 H	4,413,487	CLASS 92		480	4,413,601	CLASS 149	
27	4,413,369	50	4,413,437	125 R	4,413,483	CLASS 93		486	4,413,602	2	4,414,044
104.06 R	4,413,370	CLASS 43		193	4,413,484	CLASS 94		510	4,413,603	CLASS 152	
405	4,413,371	43.11	4,413,438	57	4,413,488	CLASS 95		515	4,413,604	353 R	4,413,663
414	4,413,372	61	4,413,439	81	4,413,489	CLASS 96		547	4,413,605	CLASS 156	
		124	4,413,440	164	4,413,490	CLASS 97		550	4,413,606	73.2	4,414,045
54	4,413,373	CLASS 46		252	4,413,491	CLASS 98		590	4,413,607	73.5	4,414,046
121	4,413,374	116	4,413,441	416	4,413,492	CLASS 99		599	4,413,608	138	4,414,047
		151	4,413,442	422	4,413,493	CLASS 100				159	4,414,048
1 R	4,413,375	206	4,413,443	CLASS 71		CLASS 101				166	4,414,049
44.1	4,413,376	CLASS 48		88	4,414,017	CLASS 102					4,414,050
73	4,413,377	197 R	4,414,001	91	4,414,018	CLASS 103					4,414,051
		209	4,414,002	108	4,414,019	CLASS 104					4,414,052
258	4,413,378	CLASS 49		71	4,413,485	CLASS 105					4,414,053
		409	4,413,444	167	4,413,494	CLASS 106					4,414,054
3 J	4,413,379	445	4,413,445	196	4,413,495	CLASS 107					4,414,055
16 PB	4,413,380	470	4,413,446	356	4,413,496	CLASS 108					4,414,056
131 C	4,413,381	CLASS 51		405	4,413,497	CLASS 109					4,414,057
132 R	4,413,382	170 PT	4,413,447	446	4,413,498	CLASS 110					4,414,058
164	4,413,383	313	4,413,448	465	4,413,500	CLASS 111					4,414,059
230 A	4,413,385	CLASS 52		64.4	4,413,505	CLASS 112					
230.5 R	4,413,386	16	4,413,449	23	4,413,502	CLASS 113					
279	4,413,388	27	4,413,450	40.7	4,413,503	CLASS 114					
312	4,413,389	28	4,413,451	49.6	4,413,504	CLASS 115					
603	4,413,384	82	4,413,452	61.1 C	4,413,504	CLASS 116					
		127.1	4,413,453	64.4	4,413,505	CLASS 117					
CLASS 27		236.6	4,413,454	104	4,413,507	CLASS 118					
32	4,413,390	295	4,413,455	116	4,413,508	CLASS 119					
		314	4,413,456	117.3	4,413,509	CLASS 120					
166	4,413,391	481	4,413,457	150 A	4,413,510	CLASS 121					
		729	4,413,458	152	4,413,512	CLASS 122					
157 R	4,413,392	741	4,413,459	155	4,413,511	CLASS 123					
157.1 R	4,413,393	CLASS 53		162	4,413,513	CLASS 124					
157.3 B	4,413,394	122	4,413,461	204	4,413,514	CLASS 125					
157.3 C	4,413,395	399	4,413,463	296	4,413,515	CLASS 126					
407	4,413,396	412	4,413,464	431	4,413,516	CLASS 127					
410	4,413,398	540	4,413,462	597	4,413,517	CLASS 128					
416	4,413,397	CLASS 54		609	4,413,520	CLASS 129					
428	4,413,399	46	4,413,465	615	4,413,521	CLASS 130					
515	4,413,400	CLASS 55		626	4,413,522	CLASS 131					
571	4,413,401	18	4,414,003	646	4,413,523	CLASS 132					
	4,413,402	48	4,414,004	660	4,413,524	CLASS 133					
590	4,413,403	75	4,414,005	701	4,413,525	CLASS 134					
596	4,413,404	190	4,414,006	741	4,413,526	CLASS 135					
609	4,413,405	CLASS 56		745	4,413,527	CLASS 136					
825	4,413,406	11.3	4,413,466	753	4,413,528	CLASS 137					
	4,413,407	295	4,413,467	754	4,413,529	CLASS 138					
856	4,413,408	CLASS 57		756	4,413,530	CLASS 139					
	4,413,409	293	4,413,469	861.25	4,413,531	CLASS 140					
		CLASS 60		861.47	4,413,532	CLASS 141					
43.6	4,413,410	293	4,413,470	861.61	4,413,533	CLASS 142					
85	4,413,411	39.32	4,413,471	863.31	4,413,534	CLASS 143					
169	4,413,412	276	4,413,472	864.21	4,413,535	CLASS 144					
300	4,413,413	CLASS 33		CLASS 74		CLASS 145					
380	4,413,414	125 R	4,413,416	688	4,413,535	CLASS 146					
		174 G	4,413,418			CLASS 147					
		174 L	4,413,418			CLASS 148					



16	CLASS 357	12	4,414,647	155	4,413,934	331	4,414,227	157	4,414,311	538	4,414,350					
38	4,414,557	16	4,414,648	181	4,413,935			283	4,414,312	555	4,414,351					
17	4,414,558	36	4,414,649			CLASS 408	66	4,413,964	295	4,414,313	560	4,414,360				
39	4,414,559	122	4,414,650			8	4,413,936	302	4,414,315	702	4,414,361					
67	4,414,560			239 A	4,413,937			311	4,414,314							
81	4,414,562	69	4,413,912			CLASS 409	84	4,413,965	353	4,414,304	CLASS 525	4,414,362				
		75	4,413,913			233	4,413,938	373	4,414,305	178	4,414,363					
		137	4,413,914					385	4,414,306	237	4,414,364					
21 R	4,414,563			CLASS 366	4,413,939	CLASS 414	222	4,413,970	496	4,414,316	437	4,414,365				
37	4,414,564	25	4,414,656			17	4,413,939	505	4,414,308	439	4,414,366					
89	4,414,565	27	4,414,657			24.6	4,413,940	551	4,414,309	531	4,414,367					
101	4,414,566	93	4,414,652			35	4,413,941	567	4,414,310	534	4,414,368					
139	4,414,567	103	4,414,654			253	4,413,942									
	4,414,568	139	4,414,655			475	4,413,943	CLASS 426	56	4,413,975	65	4,414,369				
153	4,414,569			CLASS 367	4,414,656	685	4,413,944	19	4,414,228	278	4,413,976	88	4,414,370			
154	4,414,570			CLASS 368	4,414,657	739	4,413,945	98	4,414,229			119	4,414,371			
158	4,414,571	71	4,413,915					106	4,414,230	CLASS 432	56	4,413,977	190	4,414,372		
163	4,414,572			CLASS 369	4,414,655			255	4,414,232			217	4,414,373			
172	4,414,574	44	4,414,655			28	4,413,946	271	4,414,231	CLASS 433	6	4,413,978	260	4,414,374		
227	4,414,575	45	4,414,657			182	4,413,947	540	4,414,234	41	4,413,979	348	4,414,375			
229	4,414,576	46	4,414,658			219 R	4,413,948	557	4,414,235							
242	4,414,577	59	4,414,659			96 A	4,413,949	573	4,414,236	CLASS 435	15	4,414,376				
243	4,414,578	286	4,414,660					589	4,414,237	7	4,414,323	88	4,414,377			
256	4,414,579			CLASS 370	4,414,661			602	4,414,238			137	4,414,378			
260	4,414,580	95	4,414,662			53	4,413,950	607	4,414,239							
280	4,414,581	100	4,414,663					614	4,414,240	CLASS 427	11	4,414,324	173	4,414,379		
282	4,414,582			CLASS 371	4,414,662	253	4,413,952			18	4,414,325	190	4,414,380			
300	4,414,583					262	4,413,953	2	4,414,241	47	4,414,326	298	4,414,381			
342	4,414,584	20	4,414,664			269	4,413,954	43.1	4,414,242	18	4,414,327	336	4,414,382			
		21	4,414,665			270	4,413,955	100	4,414,243	68	4,414,328	417	4,414,383			
40	4,414,585	37	4,414,666			333	4,413,956	105	4,414,244	93	4,414,329	496	4,414,384			
70	4,414,586			CLASS 418	4,413,959	415	4,413,957	107	4,414,245	129	4,414,331					
76	4,414,587	38	4,414,667			424	4,413,958	127	4,414,246	219	4,414,332	28	4,414,385	CLASS 544	4,414,387	
77	4,414,589	49	4,414,668					222	4,414,247	243	4,414,333	48	4,414,388			
84	4,414,588			CLASS 372	4,414,670	19	4,413,959	230	4,414,248	262	4,414,334	349	4,414,389			
97	4,414,590	58	4,414,671			38	4,413,961	248.1	4,414,249	313	4,414,335			CLASS 546	4,414,390	
99	4,414,591	73	4,414,672			186	4,413,962	407.1	4,414,251	502	4,414,336	121	4,414,391	CLASS 548	4,414,392	
102	4,414,592			CLASS 373	4,414,673	259	4,413,963	424	4,414,252			302	4,414,393			
106	4,414,593	22	4,414,674			31	4,414,028			20	4,414,686			CLASS 549	4,414,394	
115	4,414,594			CLASS 374	4,414,675	578	4,414,029	34	4,414,254	165	4,414,687	105	4,414,395			
129	4,414,595	130	4,414,676			579	4,414,030	154	4,414,255	188	4,414,688	260	4,414,396			
133	4,414,597			CLASS 375	4,414,677	77	4,414,031	163	4,414,256	221	4,414,689	451	4,414,397			
		32	4,413,916					182	4,414,257	283	4,414,690	471	4,414,398			
18	4,414,598	173	4,413,917			CLASS 422	207	4,414,258	193	4,414,259	82	4,413,980	478	4,414,399		
56	4,414,599			CLASS 376	4,414,678	133	4,414,184	212	4,414,260					CLASS 549	4,414,400	
97	4,414,600	90	4,414,675			186	4,414,185	207	4,414,261	217	4,414,262	255	4,414,401			
190	4,414,602	116	4,414,676			240	4,414,186	213	4,414,262	213	4,414,263	262	4,414,402			
227	4,414,603			CLASS 377	4,414,677	444	4,414,187	222	4,414,263	234	4,414,264	398	4,414,403			
385	4,414,604							234	4,414,264	285	4,414,265	104	4,414,404			
388	4,414,605			CLASS 378	4,414,678	163	4,414,188	287	4,414,266	207	4,414,267	313	4,414,405			
388	4,414,606					7	4,414,189	288	4,414,268	207	4,414,269	370	4,414,406			
397	4,414,607	136	4,414,176			163	4,414,185	287	4,414,266	207	4,414,267	475	4,414,407			
433	4,414,607	247	4,414,177			175	4,414,186	288	4,414,266	207	4,414,267			CLASS 556	4,414,408	
		CLASS 362	4,414,608			251	4,414,187	289	4,414,267	207	4,414,268					
32	4,414,609	28	4,414,678			297	4,414,188	290	4,414,268	207	4,414,269	430	4,414,409			
33	4,414,610			CLASS 379	4,414,679	328	4,414,189	325	4,414,269	17	4,413,771			CLASS 560	4,414,410	
113	4,414,611					344	4,414,190	328	4,414,270	37	4,413,772	41	4,414,404			
183	4,414,612	29	4,414,679			359	4,414,191	331	4,414,271	103	4,413,773	56	4,414,405			
188	4,414,613	84	4,414,680			367	4,414,192	336	4,414,272			109	4,414,406			
264	4,414,614	146	4,414,681			445	4,414,193	352	4,414,273			144	4,414,407			
267	4,414,615	144	4,414,682			478	4,414,194	374	4,414,274			199	4,414,408			
269	4,414,616	177	4,414,683			573 G	4,414,195	395	4,414,275			233	4,414,409			
308	4,414,617			CLASS 381	4,414,684	580	4,414,196	402	4,414,276	72	4,414,139	265	4,414,410			
404	4,414,618	22	4,414,430			633	4,414,197	413	4,414,277	73	4,414,138			CLASS 562	4,414,411	
417	4,414,618	48	4,414,431			652	4,414,198	422	4,414,278	162	4,414,137	534	4,414,412			
		CLASS 363	4,414,619					433	4,414,280	169	4,414,132	535	4,414,412			
70	4,414,619			CLASS 382	4,414,685	3	4,414,197	433	4,414,281	179	4,414,133			CLASS 564	4,414,413	
		CLASS 364	4,414,620			4	4,414,198	450	4,414,282	204	4,414,134					
200	4,414,621	49	4,414,685			44	4,414,199	461	4,414,283	224	4,414,135	35	4,414,414			
		CLASS 384	4,414,622			52	4,414,200	461	4,414,284	225	4,414,136	271	4,414,415			
200	4,414,622	95	4,413,918			63	4,414,201	577	4,414,285	303	4,414,137	421	4,414,416			
	4,414,623			CLASS 400	4,413,919	88	4,414,202	616	4,414,286	314	4,414,138	212	4,414,417			
	4,414,624					147	4,414,203	650	4,414,287			443	4,414,418			
	4,414,625	208	4,413,919			154	4,414,204	694	4,414,288					CLASS 568	4,414,419	
	4,414,626	248	4,413,920			177	4,414,205	695	4,414,289	27	4,414,338	315	4,414,420			
	4,414,627			CLASS 401	4,413,921	180	4,414,206	700	4,414,290							
	4,414,628					224	4,414,207			137	4,414,339	421	4,414,421			
300	4,414,629	96	4,413,922			243	4,414,208	14	4,414,291	219	4,414,340	454	4,414,422			
426	4,414,630			CLASS 403	4,413,923	245	4,414,209	19	4,414,292	340	4,414,341	462	4,414,423			
	4,414,631	341	4,413,922			246	4,414,210	27	4,414,293	437	4,414,342	724	4,414,424			
487	4,414,632					247	4,414,211	35	4,414,294	440	4,414,343			CLASS 585	4,414,425	
510	4,414,633			CLASS 404	4,413,923	248.5	4,414,212	50	4,414,295							
	4,414,634	11	4,413,923			249	4,414,213	59	4,414,296							
526	4,414,635			CLASS 405	4,413,924	250	4,414,214	61	4,414,297	65	4,414,344	517	4,414,423			
	4,414,636					251	4,414,215	61	4,414,298	108	4,414,345			CLASS 604	4,414,424	
569	4,414,637	31	4,413,924			263	4,414,216	99	4,414,299	158	4,414,346	9	4,414,425			
571	4,414,638	195	4,413,925			263	4,414,217	104	4,414,300	168	4,414,347	14	4,414,426			
602	4,414,639	204	4,413,926			267	4,414,218	136	4,414,301	255	4,414,348	28	4,414,427			
702	4,414,640	252	4,413,927					190	4,414,302	261	4,414,349	29	4,414,428			
728	4,414,641	260	4,413,928			269	4,414,219	217	4,414,303	413	4					



## CLASSIFICATION OF DESIGNS

D2—	232	271,249		235	271,265		351	271,281	D14—	11	271,297		76	271,313		163	271,329
	257	271,250		269	271,266		370	271,282		53	271,298		78	271,314		26	271,330
	320	271,251	D7—	137	271,267		415	271,283			271,299		171	271,316			271,331
	400	271,252		350	271,268		438	271,284		59	271,301		219	271,317		56	271,332
D3—	5	271,254		363	271,269		454	271,285			271,302		231	271,318		99	271,333
	61	271,255		398	271,270		457	271,286					234	271,319			271,334
D6—	32	271,256			271,271	D10—	106	271,287					1	271,320			271,335
	137	271,257			271,272		126	271,288	D15—	144	271,304		7	271,321	D22—	138	271,336
	154	271,258			271,273	D11—	164	271,289		36	271,305		27	271,322	D28—	85	271,337
	161	271,259	D8—	23	271,274	D12—	36	271,290		42	271,306			271,323	D29—	6	271,338
	167	271,261		26	271,275		86	271,291		133	271,307			271,324	D32—	55	271,339
	168	271,262		91	271,276		180	271,292		135	271,308		28	271,325			271,340
	179	271,263		330	271,277		204	271,293	D18—	1	271,309		4	271,326	D34—	28	271,341
	198	271,264		339	271,278		344	271,294		12	271,310		65	271,327		39	271,342
				347	271,279	D13—	24	271,295		13	271,311		90.1	271,328		43	271,343
			D9—	349	271,280			271,296		48	271,312		139				

## CLASSIFICATION OF PLANTS

P—	68	5,133		5,134		5,135		89	5,136		
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## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,413,733	4,414,507	4,413,671	4,413,758	16 : 4,414,508	4,414,538
4 : 4,414,258	4,414,516	4,413,680	4,413,770	17 : 4,413,459	4,414,543
4,414,232	4,414,523	4,413,690	4,413,771	4,413,367	4,414,612
4,414,364	4,414,548	4,413,740	4,413,772	4,413,374	4,414,613
4,414,567	4,414,566	4,413,741	4,413,913	4,413,377	4,414,674
4,414,591	4,414,587	4,413,757	4,413,935	4,413,390	4,414,675
4,414,598	4,414,588	4,413,769	4,413,973	4,413,419	4,413,418
4,414,664	4,414,594	4,413,775	4,414,140	4,413,443	4,413,423
4,414,036	4,414,606	4,413,782	4,414,249	4,413,462	4,413,468
4,413,358	4,414,631	4,413,800	4,414,285	4,413,480	4,413,537
4,413,401	4,413,655	4,413,808	4,414,291	4,413,506	4,413,569
4,413,432	4,414,666	4,413,822	4,414,384	4,413,531	4,413,597
4,413,437	4,414,691	4,413,851	4,414,388	4,413,544	4,413,685
4,413,439	4,414,057	4,413,875	4,414,463	4,413,549	4,413,743
4,413,500	4,414,119	4,413,956	4,413,968	4,413,552	4,413,767
4,413,518	4,414,295	4,413,972	4,414,063	4,413,559	4,413,836
4,413,540	4,414,337	4,413,978	4,414,159	4,413,588	4,413,848
4,413,589	4,414,397	4,413,991	4,414,237	4,413,595	4,413,856
4,413,619	4,413,726	4,414,019	4,414,280	4,413,613	4,413,967
4,413,630	4,413,773	4,414,127	4,414,356	4,413,620	4,413,975
4,413,632	4,413,774	4,414,131	4,414,372	4,413,623	4,413,988
4,413,660	4,413,813	4,414,137	4,414,409	4,413,629	4,414,167
4,413,675	4,414,009	4,414,150	4,413,625	4,413,693	4,414,213
4,413,692	4,414,011	4,414,185	4,413,362	4,413,708	4,414,352
4,413,698	4,414,106	4,414,238	4,413,364	4,413,730	4,414,441
4,413,731	4,414,294	4,414,293	4,413,447	4,413,749	4,414,577
4,413,753	4,414,579	4,414,423	4,413,452	4,413,776	4,414,614
4,413,814	4,414,609	4,414,480	4,413,486	4,413,811	4,413,375
4,413,842	4,414,656	4,414,497	4,413,504	4,413,823	4,413,376
4,413,854	4,414,679	4,414,541	4,413,607	4,413,850	4,413,488
4,413,864	4,413,765	4,414,544	4,413,655	4,413,862	4,413,715
4,413,870	4,413,795	4,414,554	4,413,684	4,413,986	4,414,453
4,413,909	4,414,205	4,414,560	4,413,719	4,413,990	4,414,689
4,413,911	4,414,504	4,414,573	4,413,761	4,413,992	4,414,689
4,414,006	4,414,512	4,414,593	4,413,827	4,414,060	4,413,466
4,414,017	4,414,525	4,414,595	4,413,902	4,414,093	4,413,658
4,414,037	4,414,547	4,414,617	4,414,021	4,414,120	4,413,834
4,414,049	4,413,360	4,414,625	4,414,180	4,414,122	4,413,839
4,414,080	4,413,368	4,414,643	4,414,303	4,414,122	4,413,940
4,414,087	4,413,402	4,414,647	4,414,499	4,414,176	4,414,171
4,414,100	4,413,404	4,414,658	4,414,517	4,414,202	4,414,324
4,414,103	4,413,414	4,413,573	4,414,623	4,414,326	4,413,463
4,414,104	4,413,441	4,413,725	4,414,624	4,414,342	4,413,672
4,414,109	4,413,456	4,414,166	4,414,676	4,414,380	4,413,919
4,414,110	4,413,476	4,414,546	4,413,434	4,414,396	4,413,951
4,414,181	4,413,521	4,414,583	4,413,546	4,414,406	4,414,067
4,414,198	4,413,615	4,414,590	4,413,562	4,414,426	4,414,098
4,414,269	4,413,618	4,413,728	4,413,728	4,414,432	4,413,371
4,414,360	4,413,633	4,413,729	4,413,828	4,414,452	4,413,516
4,414,482	4,413,635	4,413,828	4,413,987	4,414,462	4,413,651
4,414,502	4,413,666	4,413,704	4,414,263	4,414,474	4,413,688
				4,414,511	4,414,084
				4,414,527	4,414,099
					4,414,346



## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

23 :	4,414,404 4,413,571 4,413,821 4,413,379 4,413,592 4,413,879 4,413,906 4,413,964 4,414,013 4,414,041 4,414,108 4,414,413 4,414,414 4,414,461 4,414,534 4,414,550 4,414,605 4,413,365 4,413,411 4,413,490 4,413,494 4,413,505 4,413,622 4,413,756 4,413,880 4,413,908 4,414,076 4,414,116 4,414,147 4,414,197 4,414,218 4,414,286 4,414,300 4,414,315 4,414,368 4,414,439 4,414,476 4,414,479 4,414,524 4,414,526 4,414,562 4,414,616 4,414,637 4,414,667 4,414,670 4,414,682 4,413,385 4,413,426 4,413,445 4,413,448 4,413,489 4,413,536 4,413,603 4,413,699 4,413,711 4,413,838 4,413,840 4,413,868 4,413,953 4,413,960 4,413,976 4,413,979 4,414,033 4,414,055 4,414,126 4,414,174 4,414,199 4,414,203 4,414,266 4,414,292 4,414,298 4,414,339 4,414,422 4,414,531 4,414,589 4,414,632 4,414,685 4,413,649 4,413,722 4,413,752 4,413,801 4,413,806	4,413,818 4,413,819 4,413,945 4,413,989 4,414,313 4,414,355 4,414,376 4,414,521 4,414,602 4,413,438 4,413,572 4,413,587 4,413,982 4,413,983 4,414,035 4,414,047 4,414,354 4,414,357 4,414,438 4,414,443 4,414,653 4,413,783 4,413,415 4,413,784 4,414,029 4,414,491 4,413,609 4,413,624 4,413,628 4,413,735 4,414,471 4,414,645 4,413,400 4,413,427 4,413,446 4,413,478 4,413,510 4,413,517 4,413,533 4,413,556 4,413,557 4,413,566 4,413,577 4,413,578 4,413,579 4,413,581 4,413,583 4,413,584 4,413,621 4,413,639 4,413,646 4,413,647 4,413,678 4,413,702 4,413,720 4,413,723 4,413,727 4,413,750 4,413,921 4,413,934 4,413,995 4,414,034 4,414,066 4,414,095 4,414,096 4,414,097 4,414,102 4,414,113 4,414,129 4,414,130 4,414,141 4,414,142 4,414,144 4,414,146 4,414,155 4,414,175 4,414,189 4,414,219 4,414,229 4,414,231 4,414,234	4,414,240 4,414,244 4,414,250 4,414,265 4,414,277 4,414,278 4,414,283 4,414,311 4,414,341 4,414,366 4,414,367 4,414,383 4,414,385 4,414,400 4,414,402 4,414,425 4,414,440 4,414,489 4,414,490 4,414,519 4,414,535 4,414,561 4,414,572 4,414,580 4,414,597 4,414,611 4,414,628 4,414,629 4,414,638 4,414,639 4,414,642 4,414,660 4,413,361 4,413,826 4,414,082 4,414,282 4,413,363 4,413,391 4,413,396 4,413,398 4,413,399 4,413,407 4,413,417 4,413,436 4,413,442 4,413,455 4,413,477 4,413,481 4,413,493 4,413,541 4,413,564 4,413,570 4,413,593 4,413,614 4,413,626 4,413,631 4,413,676 4,413,742 4,413,762 4,413,766 4,413,779 4,413,807 4,413,824 4,413,825 4,413,847 4,413,882 4,413,891 4,413,892 4,413,895 4,413,898 4,413,903 4,413,939 4,413,946 4,413,950 4,413,984 4,413,993 4,414,059 4,414,064 4,414,090 4,414,123 4,414,143	4,414,152 4,414,161 4,414,179 4,414,206 4,414,207 4,414,243 4,414,256 4,414,281 4,414,304 4,414,306 4,414,307 4,414,310 4,414,314 4,414,320 4,414,349 4,414,393 4,414,403 4,414,427 4,414,447 4,414,467 4,414,501 4,414,510 4,414,528 4,414,540 4,414,555 4,414,576 4,414,600 4,414,669 4,413,366 4,413,406 4,413,734 4,413,981 4,414,045 4,414,163 4,414,169 4,414,268 4,414,316 4,414,431 4,414,468 4,414,092 4,414,425 4,413,451 4,413,457 4,413,496 4,413,499 4,413,608 4,413,617 4,413,645 4,413,663 4,413,691 4,413,738 4,413,748 4,413,805 4,413,820 4,413,849 4,413,852 4,413,866 4,413,884 4,413,966 4,413,970 4,413,974 4,414,010 4,414,048 4,414,085 4,414,134 4,414,173 4,414,178 4,414,184 4,414,248 4,414,267 4,414,335 4,414,348 4,414,359 4,414,362 4,414,374 4,414,386 4,414,399 4,414,408 4,414,522 4,414,610 4,414,634 4,414,671	40 :	4,413,370 4,413,387 4,413,394 4,413,408 4,413,523 4,413,653 4,413,745 4,414,083 4,414,107 4,414,118 4,414,136 4,414,329 4,414,334 4,414,340 4,413,832 4,414,428 4,414,506 4,414,683 4,413,372 4,413,413 4,413,429 4,413,431 4,413,458 4,413,470 4,413,519 4,413,673 4,413,689 4,413,707 4,413,867 4,413,871 4,413,872 4,413,920 4,413,930 4,414,007 4,414,023 4,414,043 4,414,068 4,414,089 4,414,094 4,414,115 4,414,154 4,414,168 4,414,188 4,414,200 4,414,210 4,414,211 4,414,215 4,414,224 4,414,301 4,414,312 4,414,317 4,414,337 4,414,350 4,414,353 4,414,361 4,414,389 4,414,445 4,414,449 4,414,485 4,414,500 4,414,601 4,414,689 4,413,503 4,414,172 4,414,260 4,414,530 4,413,737 4,413,952 4,413,833 4,413,450 4,413,611 4,413,860 4,414,187 4,414,382 4,414,493 4,414,564 4,413,388 4,413,453 4,413,467	4,413,511 4,413,512 4,413,513 4,413,514 4,413,532 4,413,591 4,413,636 4,413,642 4,413,652 4,413,677 4,413,679 4,413,681 4,413,682 4,413,683 4,413,713 4,413,736 4,413,809 4,413,855 4,413,859 4,413,874 4,413,918 4,413,957 4,414,053 4,414,101 4,414,112 4,414,121 4,414,138 4,414,194 4,414,227 4,414,251 4,414,252 4,414,371 4,414,375 4,414,410 4,414,459 4,414,553 4,414,651 4,413,389 4,413,835 4,413,996 4,414,518 4,414,592 4,413,397 4,413,449 4,413,473 4,413,474 4,413,475 4,413,522 4,413,580 4,413,637 4,413,641 4,413,668 4,413,674 4,413,925 4,413,985 4,414,397 4,414,509 4,414,532 4,414,641 4,413,430 4,413,747 4,413,785 4,413,931 4,414,177 4,414,539 4,414,618 4,413,492 4,413,706 4,413,724 4,413,804 4,413,865 4,413,938 4,413,959 4,413,980 4,414,217 4,414,220 4,414,264 4,414,473 4,413,465 4,413,907
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## DESIGN PATENTS

6 :	271,304 271,306 271,260 271,253 271,286 271,291 271,292 271,294 271,307 271,310 271,311 271,312 271,313	08 :	271,318 271,336 271,335 271,342 271,284 271,331 271,332 271,337 271,297 271,287 271,288 271,293 271,303	18 :	271,314 271,324 271,254 271,296 271,329 271,250 271,261 271,262 271,263 271,322 271,301 271,302 271,320	26 :	271,317 271,341 271,270 271,271 271,272 271,273 271,252 271,251 271,265 271,267 271,285 271,295	37 :	271,308 271,333 271,334 271,259 271,256 271,258 271,275 271,282 271,290 271,315 271,319 271,340	41 :	271,343 271,276 271,316 271,321 271,323 271,327 271,328 271,299 271,300 271,264 271,268 271,326
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## PLANT PATENTS

6 :	5,136	39 :	5,134	5,135		
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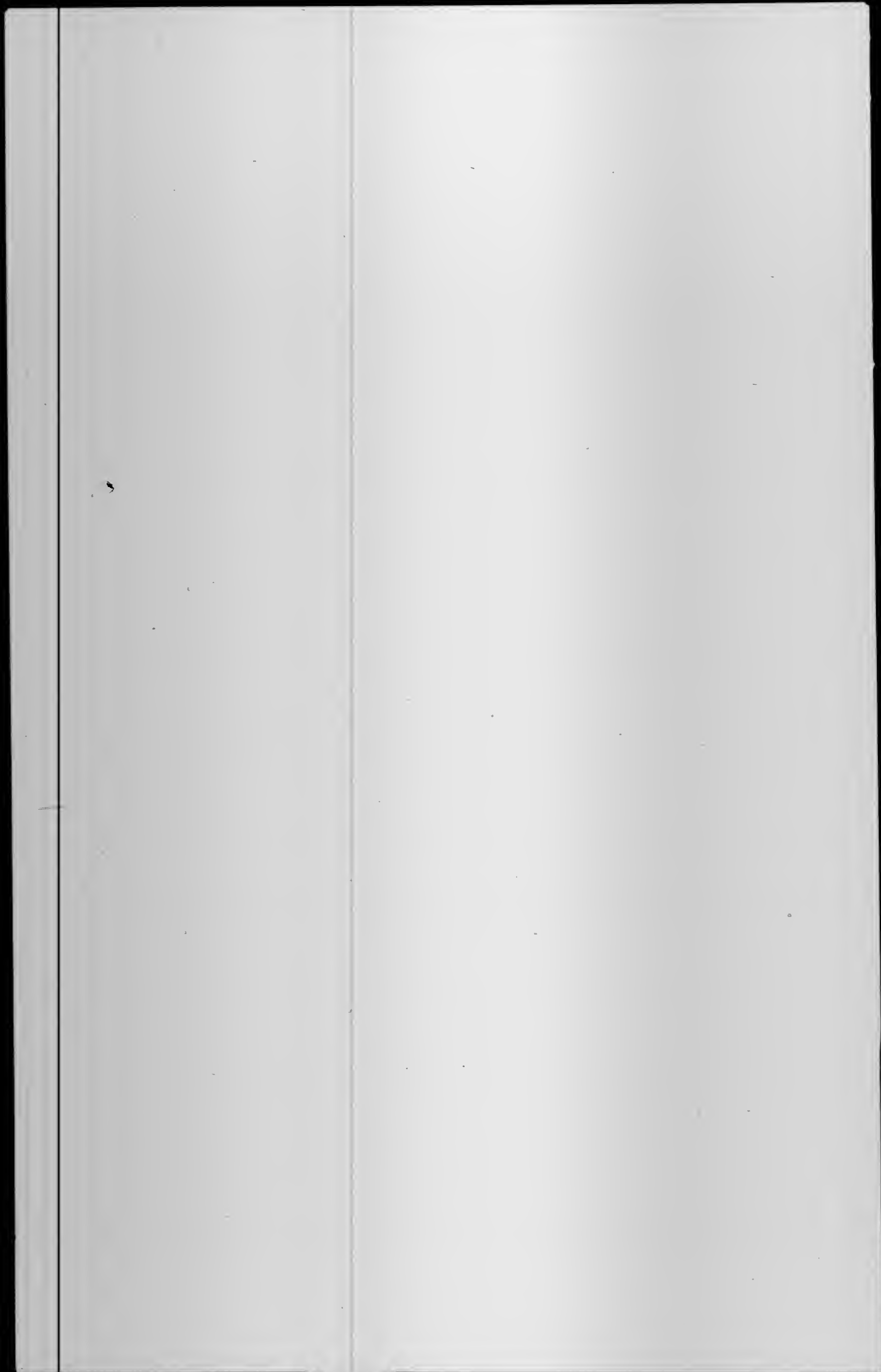
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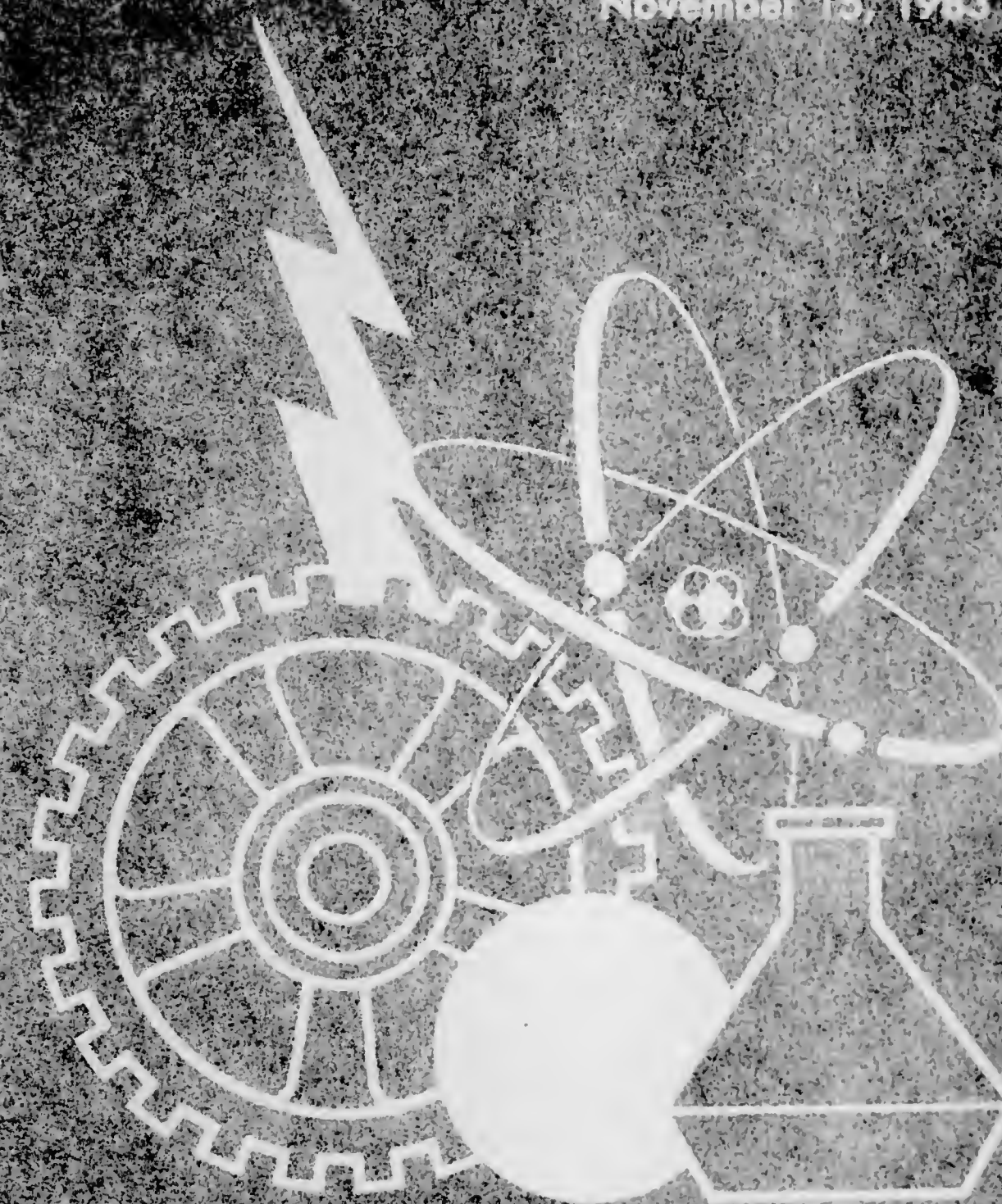
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# OFFICIAL GAZETTE

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PATENTS

November 15, 1983



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UNITED STATES PATENT AND TRADEMARK OFFICE  
November 15, 1983      Volume 1036      Number 3

CONTENTS		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1036 OG	14
Reissue Applications Filed	1036 OG	14
Request for Reexamination Filed	1036 OG	14
Notice of Availability for Licensing	1036 OG	14
Patent Suits	1036 OG	15
Service by Publication	1036 OG	19
Adverse Decisions in Interference	1036 OG	19
Patent Certificates of Correction	1036 OG	20
Reference Collections of U.S. Patents Available for Public Use in		
Patent Depository Libraries	1036 OG	21
Condition of Patent Applications	1036 OG	22
Reissue Patents Granted (31,439)		801
Plant Patents Granted (5,137)		803
Patents Granted		
General and Mechanical (4,414,691)		805
Chemical (4,415,331)		1027
Electrical (4,415,758)		1143
Design Patents Granted (271,344)		1235
Reexaminations		1255
Index of Patentees		PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees		PI 49
Classification of		
Patents (Including Reissues and Reexaminations)		PI 53
Designs and Plants		PI 56
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 57
Designs and Plants		PI 58
Change of Address Form and Subscription Order Form		Back Page

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

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Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.  
Dec. 3, 1982.

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**4,160,791**, Re. S.N. 436,854, Filed Oct. 26, 1982, Cl. 525/860, POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF, Willard S. Highley, et al., Owner of Record: *The United States of America as Represented by the Secretary of Health, Education, and Welfare*, Attorney or Agent: Lawrence I. Lerner, Ex. Gp.: 142

**4,343,080**, Re. S.N. 527,498, Filed Aug. 29, 1983, Cl. 29/571, METHOD OF PRODUCING A SEMICONDUCTOR DEVICE, Osamu Hataishi, et al., Owner of Record: *Fujitsu Ltd., Kanagawa, Japan*, Attorney or Agent: James D. Halsey, Jr., Ex. Gp.: 111

**4,382,492**, Re. S.N. 535,966, Filed Sept. 22, 1983, Cl. 188/71.8, DISC BRAKE HAVING A PISTON RETRACTION ASSEMBLY, Irving R. Ritsema, Owner of Record: *Bendix Corp., Southfield, Mich.*, Attorney or Agent: Paul David Schoenle, et al., Ex. Gp.: 314

**4,393,911**, Re. S.N. 527,410, Filed Aug. 29, 1983, Cl. 152/158, SAFETY LINER FOR TIRES, Mason C. Winfield, Owner of Record: *Astronics Corp., Orchard Park, N.Y.*, Attorney or Agent: Philip K. Fitzsimmons, Ex. Gp.: 161

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**3,709,369**, Reexam. No. 90/000,454, Requested: Oct. 5, 1983, Cl. 210/400, POWER DRIVEN TRANSFER ROLL FOR FLEXIBLE OIL COLLECTOR TUBE, Eugene L. Brill, et al., Owner of Record: *Inventor, Attorney or Agent: Baldwin, Egan, et al., Ex. Gp.: 176*, Requester: Oil Skimmers, Inc., Cleveland, Ohio

**3,784,110**, Reexam. No. 90/000,460, Requested: Oct. 14, 1983, Cl. 239/304, MIXING AND DISPENSING GUN HAVING A REPLACEABLE NOZZLE, William R. Brooks, Owner of Record: *Insta-Foam Products, Inc., Joliet, Ill.*, Attorney or Agent: Olson, Trexler, et al., Ex. Gp.: 313, Requester: Universal Foam Systems, Inc., Cudahy, Wis.

**4,326,938**, Reexam. No. 90/000,458, Requested: Oct. 12, 1983, Cl. 204/228, PLANAR CARBON FIBER ELECTRODE STRUCTURE, Sankar Das Gupta, et al., Owner of Record: *HSA Reactors Ltd., Rexdale, Canada*, Attorney or Agent: Lerner, David, et al., Ex. Gp.: 112, Requester: Owner

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### DEPARTMENT OF AGRICULTURE

SN 6-370,009 (4,405,806). BROMINE-CONTAINING 2,4-DIAMINOTRIAZINES.

SN 6-212,655 (4,400,391). CONTROLLED RELEASE OF BIOACTIVE MATERIALS USING ALGINATE GEL BEADS.

SN 6-258,489 (4,401,156). CONTROLLED RELEASE OF BIOACTIVE MATERIALS USING ALGI-

NOVEMBER 15, 1983

U.S. PATENT AND TRADEMARK OFFICE

1036 OG 15

NATE GEL BEADS.

SN 6-345,455 (4,400,114). EARTH ANCHOR APPARATUS AND METHOD.

SN 6-258,506 (4,400,983). MECHANICAL BUNCHER FOR LEAFY VEGETABLES.

SN 6-473,396 (4,405,514). PREPARATION OF ESTERS OF RESIN ACIDS, RESINS, ROSINS, AND DERIVATIVES THEREOF.

### DEPARTMENT OF COMMERCE

SN 6-300,363 (4,398,293). FREQUENCY STABILIZATION FOR TWO-MODE LASER.

### DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-239,015 (4,397,310). ANASTIGMATIC HIGH MAGNIFICATION, WIDE-ANGLE BINOCULAR INDIRECT ATTACHMENT FOR LASER PHOTOCOAGULATOR.

SN 6-331,989 (4,405,611). BISULFITE STABILIZATION OF 5-AZACYTIDINE.

SN 6-110,293 (4,404,182). ETHIODIZED OIL EMULSION FOR INTRAVENOUS HEPATOGRAPHY.

SN 6-222,936 (4,398,101). FOUR INPUT COINCIDENCE DETECTOR.

SN 6-262,806 (4,403,985). JET CONTROLLED CATHETER.

SN 6-279,443 (4,405,712). LTR-VECTORS.

SN 6-341,572 (4,397,843). MANNULOSE-6-PHOSPHATE-LOW DENSITY PROTEIN REAGENT EFFECTIVE AGAINST HYPERCHOLESTEROLEMIA.

SN 6-495,725. MONOCLONAL ANTIBODIES AGAINST NON SMALL CELL LUNG CANCER.

SN 6-339,886 (4,405,720). SILVER STAINS FOR PROTEIN IN GELS.

### DEPARTMENT OF THE AIR FORCE

SN 6-512,070. BEAM ADDRESSED MEMORY SYSTEM.

SN 6-307,347 (4,393,198). COPOLYMERS FROM OCTAFLUORONAPHTHALENE.

SN 6-300,761 (4,391,660). COPPER CONTAINING BALLISTIC ADDITIVES.

SN 6-387,580 (4,393,101). DIETHYNYLBENZENE-ETHYNYLPYRENE COPOLYMERS.

SN 6-512,847. ELECTRODING OF MULTI-LAYERED EPITAXIAL STRUCTURES.

SN 6-515,240. ELEVATED TRANSIENT TEMPERATURE LEAK TEST FOR UNSTABLE MICRO-ELECTRONIC PACKAGES.

SN 6-195,693 (4,392,775). FLAT WORKPIECE PICKUP.

SN 6-232,094 (4,392,624). IMPLANTED BOUNDARY LAYER TRIP.

SN 6-512,062. LOADING DOLLY.

SN 6-283,245 (4,395,469). LOW PRESSURE NICKEL HYDROGEN BATTERY.

SN 6-201,860 (4,392,709). METHOD OF MANUFACTURING HOLOGRAPHIC ELEMENTS FOR FIBER AND INTEGRATED OPTIC SYSTEMS.

SN 6-512,083. MODULAR AIR SHUT-OFF VALVE.

SN 6-506,919. POCKET SIZE ANTENNA MATCH INDICATOR.

SN 6-300,762 (4,395,684). R.F. PRIMED PLASMA LIMITER FOR RADAR RECEIVER PROTECTOR.

SN 6-368,785 (4,393,997). REMOVABLE SECONDARY AIRCRAFT FUEL ENCLOSURE.

SN 6-512,064. SIMULTANEOUS SIGNAL DETECTION FOR IFM RECEIVERS BY TRANSIENT DETECTION.

SN 6-308,973 (4,394,223). TIN AND GOLD PLATING PROCESS.

### DEPARTMENT OF THE ARMY

SN 6-510,710. A SOLID PROPELLANT SOUND GENERATOR FOR COAGULATION OF AEROSOLS.

SN 6-510,698. ANTIARMOR WEAPON SYSTEM.

SN 6-524,716. APPARATUS FOR DETERMINING SMR CODES.

SN 6-507,660. DISCRETE STEP ACTUATION SYSTEM.

SN 6-511,602. DUAL FIELD-OF-VIEW OPTICAL TARGET DETECTOR.

SN 6-510,709. ERECTABLE LARGE OPTIC FOR OUTER SPACE APPLICATION.

SN 6-517,613. IMPROVED DIELECTRIC WAVEGUIDE FERRITE RESONANCE ISOLATOR.

SN 6-512,831. INFRARED BEACON.

SN 6-526,848. INTERFERENCE CANCELLING RECEIVER HAVING HIGH ANGULAR RESOLUTION TRANSMITTED RADIATORS.

SN 6-517,191. INTERFERENCE CANCELLING TRANSMITTER.

SN 6-574,423. LIGHT OPERATED MEASURING SYSTEM CROSS-REFERENCE TO RELATED APPLICATION.

SN 6-522,949. LOW POWER RADIO SYNTHESIZER WITH HARMONIC IDENTIFICATION FEATURE.

SN 6-524,614. MAGNETIC FLUID GYRO BEARING AND CAGING MECHANISM.

SN 6-517,614. METHOD AND APPARATUS FOR DISPERSIVE SIGNAL PROCESSING.

SN 6-527,054. OPTICAL INTERFACE TO AN ELECTRICAL CENTRAL OFFICE.

SN 6-519,460. PATIN ANALYSIS PAPER.

SN 6-527,714. PERCUSSION INITIATED SPOTTING CHARGE.

SN 6-525,374. PUSH-PULL PULSED GAS LASER.

SN 6-509,577. QUICK ACCESS SPLICE FOR MISSILE SECTIONS.

SN 6-526,735. SMALL ANGULAR BEAMWIDTH ANTENNA SYSTEM.

SN 6-528,837. SOLID STATE RELAY WITH FAST TURNOFF.

SN 6-224,776. UNSYMMETRICAL POLYNITROCARBONATES AND SYMMETRICAL 1,3-BIS (HALO-AND NITROALKYL CARBONYLDIOXY)-2,2-DINITROPROPANES AND METHODS OF PREPARATION.

### DEPARTMENT OF THE INTERIOR

SN 6-168,823 (4,404,523). READOUT CIRCUIT FOR LINEAR DISPLACEMENT TRANSDUCER.

SN 6-348,118 (4,401,632). RECOVERY OF ARSENIC FROM FLUE DUST.

### Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**3,065,759**, Lewis-Parham Corp., HAIR STRAIGHTENING METHOD AND APPARATUS, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5863 (KTD), *Lewis-Parham Corp. v. Sunbeam Corp.* Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5866 (KTD), *Lewis-Parham Corp. v. Braun*. Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5867, *Lewis-Parham Corp. v. Schick, Inc.* Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5868 (KTD), *Lewis-Parham Corp. v. Macy & Co., Inc.* Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5869 (KTD), *Lewis-Parham Corp. v. The Gillette Co.* Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5870, *Lewis-Parham Corp. v. Korvettes, Inc.* Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5871, *Lewis-Parham Corp. v. General Electric*. Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5872, *Lewis-Parham Corp. v. Sperry Remington*. Same, filed Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5873 (KTD), *Lewis-Parham Corp. v. North American Philips Corp.*

**3,092,060**, Donald V. Reid, FLYING SUBMARINE, filed June 12, 1978, D.C., S.D. Fla. (Ft. Lauderdale),



Doc. 78-8185-CIV-NCR, *Donald V. Reid v. U.S. Government*.

3,108,261, Ampex Corp., RECORDING AND/OR REPRODUCING SYSTEM, filed Nov. 24, 1978, U.S. Ct. of Claims (Wash. D.C.), Doc. 513-78, *Ampex Corp. v. The United States*.

3,116,835, Theodore A. Brandon, LUMBER SORTING AND ACCUMULATING MECHANISMS, filed Dec. 28, 1979, D.C., W.D. Wash. (Tacoma), Doc. C79-575T, *Theodore A. Brandon v. Boise Cascade Corp., et al.*

3,216,674, Walter G. Finch, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE; 4,093,154, same, TARGET SEEKING GYRO FOR A MISSILE; Re. 26,887, same, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, filed Jan. 11, 1980, D.C. Md. (Baltimore), Doc. J-80-0055, *Walter G. Finch, et al. v. Hughes Aircraft Co.*

3,258,394, Shell Oil Co., DIMETHYL-1-METHYL-2-METHYL CARBAMOYL VINYL PHOSPHATE INSECTICIDE AND METHOD OF USE, filed Oct. 9, 1979, D.C., S.D. Calif. (San Diego), Doc. 79-1722-E, *Shell Oil Co. v. Jessen and Co., Inc.* Defendant is enjoined and restrained from further infringing Plaintiff's patent. Filed Jan. 15, 1980. Same, filed Jan. 2, 1980, D.C., S.D. Calif. (San Diego), Doc. 80-0002-N, *Shell Oil Co. v. Fifield Land Co., Inc.* Defendant has agreed not to commit any further acts of infringement of Pat. No. 3,258,394. Action is dismissed with prejudice with each party to bear its own costs. Filed July 28, 1980.

3,290,845, Butler Mfg. Co., PREFABRICATED INSULATED PANEL SYSTEM, filed Jan. 7, 1980, D.C., W.D. Okla. (Oklahoma City), Doc. Civ-80-016-D, *Butler Mfg. Co. v. Star Mfg. Co. of Oklahoma*. Claim and counterclaim dismissed with prejudice with each party to bear its own costs. Filed June 30, 1980.

3,298,322, Eugene L. Sherrod, PUMP FOR SEMI-FLUID MATERIALS; 3,380,388, same, AUTOMATIC CONTROL SYSTEM FOR CONCRETE PUMP; 3,465,685, same, SELF-CLEARING ROTATING CONVEYOR, filed Dec. 19, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75-3650, *Eugene L. Sherrod and Frances L. Sherrod v. Allentown Pneumatic Gun Co.* Complaint and counterclaim dismissed with prejudice and without costs to either party. Filed July 15, 1977.

3,308,065, The Dow Chemical Co., SCALE REMOVAL, FERROUS METAL PASSIVATION AND COMPOSITIONS THEREFOR; 3,413,160, same, PASSIVATION OF FERROUS METAL SURFACE; 3,438,811, same, REMOVAL OF COPPER CONTAINING INCRUSTATIONS FROM FERROUS SURFACES, filed Mar. 17, 1978, D.C., N.D. Miss. (Oxford), Doc. GC7831-K-P, *The Dow Chemical Co. v. Halliburton Co.*

3,308,065, The Dow Chemical Co., SCALE REMOVAL, FERROUS METAL PASSIVATION AND COMPOSITIONS THEREFOR; 3,438,811, same, REMOVAL OF COPPER CONTAINING INCRUSTATIONS FROM FERROUS SURFACES, filed Mar. 17, 1978, D.C., N.D. Miss. (Oxford), Doc. GC78320-K, *The Dow Chemical Co. v. Miss. Power & Light Co.*

3,328,961, Twin Disc, Inc., MULTIPLE STAGE, HYDRAULIC JET PROPULSION APPARATUS FOR WATER CRAFT; 3,405,526, same, filed Nov. 21, 1978, U.S. Ct. of Claims (Wash. D.C.), Doc. 508-78, *Twin Disc, Inc. v. The United States*.

3,344,692, David Volk, METHOD AND APPARATUS FOR PRODUCING ASPHERIC CONTACT LENSES; 3,482,906, same, ASPHERIC CORNEAL CONTACT LENS SERIES; 3,535,825, same, METHOD AND APPARATUS FOR GRINDING AND POLISHING ASPHERIC SURFACES OF REVOLUTION, filed Aug. 2, 1979, D.C., N.D. Ohio (Cleveland),

Doc. C 79-1510, *David Volk v. Breger-Mueller Welt Corp.*

3,380,388. (See 3,298,322.)

3,405,526. (See 3,328,961.)

3,413,160. (See 3,308,065.)

3,414,928, Jerome H. Lemelson, COMBINATION SPONGE AND SCOURER, filed Oct. 30, 1979, D.C., N.D. Tex. (Dallas), Doc. 3-79-1354-G, *Jerome H. Lemelson v. Minnesota Mining & Mfg. Co.* Motion for Defendant for summary judgment is granted on Feb. 4, 1980.

3,418,708, Chester A. Siver, METHOD OF MAKING VALVES BY ELECTRON BEAM WELDING, filed Jan. 8, 1980, D.C., W.D. Pa. (Pittsburgh), Doc. 80-31, *Conval, Inc. and Chester A. Siver v. Kerotest Mfg. Corp.*

3,438,811. (See 3,308,065.)

3,465,685. (See 3,298,322.)

3,482,906. (See 3,344,692.)

3,489,042, The Warner & Swasey Co., TOOLHOLD-ER; 3,664,215, same, MACHINE TOOL WITH BAR STOCK GRIPPER; 3,691,879, same, MACHINE TOOL; 3,798,722, same, COUPLING ASSEMBLY; 3,835,516, same, MACHINE TOOL WITH INDEX-IBLE TOOL SUPPORT; 3,877,323, same, TURRET INDEXING MACHINE, filed Nov. 21, 1979, D.C., N.D. Ohio (Cleveland), Doc. C78-2190, *The Warner & Swasey Co. v. Yamazaki Machinery Works, Ltd.*

3,507,547, Warren R. Thomas, TELESCOPE HAVING MULTIPLE OBJECTIVE MIRRORS, filed Jan. 16, 1980, U.S. Ct. of Claims (Wash. D.C.), Doc. 27-80 C, *Warren R. Thomas v. The United States*. Same, filed Mar. 12, 1980, D.C. Ariz. (Phoenix), Doc. 80-175-PHX, *Warren R. Thomas v. The Board of Regents of the State of Arizona, et al.*

3,519,309, Kennametal, Inc., ROTARY CONE BIT RETAINED BY CAPTIVE KEEPER RING; 3,752,515, same, RESILIENT KEEPER RING, filed Aug. 20, 1979, D.C., N.D. Ohio (Cleveland), Doc. C79-1613, *Kennametal, Inc. v. Austin Powder Co., Inc.* Same, filed Sept. 4, 1980, D.C., E.D. Mich. (Detroit), Doc. 80-73376, *Kennametal, Inc. v. Border City Tool & Mfg. Co., Inc.*

3,535,825. (See 3,344,692.)

3,565,454, Richard Lawrence Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, filed July 3, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75-2297, *Richard Lawrence Stevenson v. Grentec, Inc., et al.* Case closed on Nov. 30, 1979. Same, filed Sept. 24, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75-3233-ALS, *Richard Lawrence Stevenson v. Grentec, Inc.* Case closed on Nov. 30, 1979.

3,613,004, Keith H. Wycoff, SEQUENTIAL TONE SELECTIVE CALLING COMMUNICATION SYSTEM AND COMPONENTS THEREOF; 3,932,824, same, SIGNAL SELECTIVE CIRCUIT; Re. 28,222, same, COMMUNICATION RECEIVER INCORPORATING TONE OPERATED PULSER CIRCUIT AND ELECTRONIC SWITCH, filed Sept. 20, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 3923, *Keith H. Wycoff, et al. v. Nippon Electric Co., Ltd., et al.*

3,664,215. (See 3,489,042.)

3,691,879. (See 3,489,042.)

3,748,682, Oil Mop, Inc., OIL MOP; 3,999,232, Pro Diet Mop, Inc., DIETARY CONTROL GREASE MOP, filed Dec. 11, 1979, D.C., S.D.N.Y., Doc. 79-Civ-6719 MJL, *Pro Diet Mop, Inc. and Oil Mop, Inc. v. Empire Brushes, Inc., et al.*

3,752,515. (See 3,519,309.)

3,777,384, Sturm, Ruger & Co., Inc., MECHANISM

FOR SINGLE ACTION FIREARM, filed Sept. 19, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77 C 1858, *Sturm, Ruger & Co., Inc. v. United Sporting Arms, Inc.* Same, filed Oct. 19, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77 C 2081, *Sturm, Ruger & Co., Inc. v. U.S. Arms Corp.* Same, filed Jan. 23, 1980, D.C. Ariz. (Tucson), Doc. 80-19-TUC MAR, *Sturm, Ruger & Co. v. United Sporting Arms of Ariz., Inc., et al.* Final Judgment filed June 17, 1981.

3,798,722. (See 3,489,042.)

3,835,516. (See 3,489,042.)

3,847,489, Robert S. Van Riper, NOVEL FASTENER DEVICE, filed Jan. 12, 1979, D.C.N.J. (Newark), Doc. 79-123, *Robert S. Van Riper v. Construction Specialties, Inc.*

3,852,041, General Motors Corp., LOW PROFILE CATALYTIC CONVERTER, filed Jan. 26, 1976, D.C., S.D. Ohio (Dayton), Doc. C-3-76-28, *General Motors Corp. v. Toyota Motor Co., Ltd., et al.* Claims 5-8 of Pat. No. 3,852,041 are invalid for obviousness. Because claims 5-8 are invalid, General Motors' infringement allegations and Toyota's unenforceability allegation need not be examined. Each party to pay its own costs. Filed Feb. 1, 1979.

3,852,882, Bettcher Industries, Inc., AIR DRIVEN BONING AND TRIMMING KNIVES, filed Jan. 24, 1980, D.C., N.D. Ohio (Toledo), Doc. 80-32, *Bettcher Industries, Inc. v. Food Industry Equipment Intl., Inc.* Consent Judgment Order filed Nov. 10, 1981.

3,877,323. (See 3,489,042.)

3,882,751, Nippon Gakki Seizo Kabushiki Kaisha, ELECTRONIC MUSICAL INSTRUMENT EMPLOYING WAVESHAPE MEMORIES; 4,036,096, same, MUSICAL TONE WAVESHAPE GENERATOR; 4,161,128, same, ELECTRONIC MUSICAL INSTRUMENT; Re. 30,736, same, TONE WAVE GENERATOR IN ELECTRONIC MUSICAL INSTRUMENT; Re. 30,834, same, ELECTRONIC MUSICAL INSTRUMENT; Re. 30,906, same, ENVELOPE GENERATOR; Re. 31,004, same, ELECTRONIC MUSICAL INSTRUMENT UTILIZING DATA PROCESSING SYSTEM, filed Sept. 14, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV-81-2977-WPG, *Nippon Gakki Seizo Kabushiki Kaisha v. Casio, Inc., et al.*

3,932,824. (See 3,613,004.)

3,935,858, Orthopedic Equipment Co., Inc., KNEE IMMOBILIZER, filed Jan. 16, 1980, D.C., E.D. Mich. (Detroit), Doc. 80-70188, *Orthopedic Equipment Co., Inc. v. All Orthopedic Appliances, Inc.*

3,999,232. (See 3,748,682.)

4,016,624, Victor F. Weaver, Inc., POULTRY CUT-UP MACHINE, filed June 21, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-1300A, *Cagles, Inc. v. U.S. Industries, Inc., et al.*

4,016,711, Up-Right, Inc., VINE-FRUIT HARVESTING MACHINE WITH INCLINED TIP STRIKER RODS; 4,250,700, same, SHAKER-STRIKER VINE HARVESTER, filed May 14, 1981, D.C., E.D. Calif. (Fresno), Doc. CV-F-81-196-MDC, *Up-Right, Inc. v. Chisholm-Ryder Co., Inc.*

4,023,623, Chromalloy American Corp., CULTURAL IMPLEMENT WITH FOLDABLE TOOL SUPPORTING FRAME, filed Mar. 24, 1978, D.C., S.D. Miss. (Biloxi), Doc. S78-0080 (C), *Chromalloy American Corp. v. Poplarville Mfg. Co.* Consent judgment filed Jan. 22, 1980.

4,030,005, Papst Motoren GmbH & Co., KG, BRUSHLESS D.C. MOTOR HAVING ROTOR POSITION-DEPENDENT CONTROL MEANS; 4,322,666, same, BRUSHLESS, PERMANENT MAGNET D-C PULSE CURRENT CONTROLLED, ES-

SENTIALLY UNIFORM TORQUE DYNAMO ELECTRIC MACHINE PARTICULARLY MOTOR; 4,371,817, same, BRUSHLESS, PERMANENT MAGNET D-C PULSE CURRENT CONTROLLED ESSENTIALLY UNIFORM TORQUE DYNAMO ELECTRIC MACHINE, PARTICULARLY MOTOR, filed June 3, 1983, D.C.N.J. (Newark), Doc. 83-2060, *Matsushita Electric Corp. v. Papst Motoren GmbH & Co., KG, et al.*

4,033,136, Robert C. Stewart, VAPOR ACTUATED POWER GENERATING DEVICE; 4,285,201, same, VAPOR POWERED ENGINE ASSEMBLY, filed Mar. 9, 1983, D.C. Nev. (Las Vegas), Doc. CV-LV-83-167-HEC, *Quantum Energy, Inc. v. Robert C. Stewart, et al.*

4,036,096. (See 3,882,751.)

4,038,769, Sign-Up Corp., PORTABLE SIGN HOLDER, filed Sept. 17, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-73488, *Sign-Up Corp. v. Marketing Displays, Inc.* Stipulated Dismissal and Order filed May 24, 1983.

4,044,444, Richard T. Harris, TUBE TRAVELER, filed Oct. 18, 1982, D.C., E.D. Va. (Norfolk), Doc. 82-774-N, *Richard T. Harris v. Atlantic Nuclear Services, Inc.* Consent Judgment filed June 9, 1983.

4,057,704, Alexander Binzel Corp., GAS SHIELDED ARC WELDING TORCH, filed May 24, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 3558, *Alexander Binzel Corp. v. K & K Brothers Corp., et al.*

4,090,267, Casper Cuschera, SELF CAULKING TOILET DRAIN, filed Sept. 27, 1982, D.C., E.D. Tex. (Tyler), Doc. TY-82-507-CA, *Casper's Industries, Inc. and Casper Cuschera v. Tyler Pipe Industries, Inc.* Plaintiff dismisses action with prejudice as to facts alleged in Complaint. Dismissal is without prejudice to plaintiff's right to file an action in the event of breach of said Non-Exclusive License Agreement or for patent infringement should said License Agreement be terminated. Filed May 26, 1983.

4,093,154. (See 3,216,674.)

4,109,545, Enakichi Hayasaka, NOISELESS SPUR GEARS, filed July 22, 1983, D.C., N.D. Ohio (Cleveland), Doc. C83-3011, *Enakichi Hayasaka v. Matex Kabushiki Kaisha, et al.*

4,117,644, Roger Neil Weinart, WALLBOARD FASTENER, filed Oct. 31, 1979, D.C., E.D. Mich. (Ann Arbor), Doc. 79-74172, *Roger Neil Weinart v. Rollform, Inc., et al.* Rollform, Inc. is hereby enjoined from further infringing U.S. Pat. No. 4,117,644. Judgment dated May 20, 1983.

4,126,354, Stadiums Unlimited, Inc., BENCH SEATS WITH END ALIGNING AND REINFORCING INSERTS, filed Dec. 16, 1981, D.C., M.D. Ala. (Montgomery), Doc. 81-0142-S, *Stadiums Unlimited, Inc. v. Outdoor Aluminum, Inc.* Order of Dismissal filed May 16, 1983.

4,126,546, Rederiaktiebolaget Nordstjernan, METHOD FOR THE FILTRATION OF A SUSPENSION OR EMULSION; 4,197,201, same, APPARATUS FOR THE FILTRATION OF A SUSPENSION OR EMULSION, filed July 6, 1982, D.C. Dist. of Columbia (Wash. D.C.), Doc. 82-1877, *DMP Corp. v. Rederiaktiebolaget Nordstjernan*. Memorandum Opinion and Order granting motion of Defendant to dismiss complaint under Rule 12(b) (1) filed Apr. 14, 1983.

4,132,029, Positive Pyramids, Inc., PYRAMID FLYER, filed Oct. 13, 1982, D.C. Colo. (Denver), Doc. 82-C-1709, *Pyramid Creations, Inc. v. Positive Pyramids, Inc.* Judgment filed Dec. 1, 1982.

4,133,304, EMDE Corp., SYRINGE LIKE APPARATUS WITH REMOVABLE CAPILLARY CARTRIDGE, filed Jan. 15, 1980, D.C. Colo. (Denver),



Doc. 80-K-61, *Marquest Medical Products, Inc. v. EMDE Corp.* U.S. Pat. No. 4,133,304 is good and valid in law. The "Omnistik" and "Ministik" syringes presently made, used or sold by plaintiff do not infringe U.S. Pat. No. 4,133,304. Each party shall bear its own costs. Consent Decree filed Apr. 25, 1983.

4,139,955, Earl Reiback, DISPLAY DEVICE, filed July 26, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5536 WCC, *Earl Reiback v. Paramount Pictures Corp.*

4,161,128. (See 3,882,751.)

4,165,963, Rheem Mfg. Co., HOT WATER HEATER BURNER ASSEMBLY, filed May 11, 1983, D.C., M.D. Tenn. (Nashville), Doc. 3-83-0362, *State Industries, Inc. v. Rheem Mfg. Co.*

4,170,293, Cambelt Intl. Corp., ENCLOSED CONVEYOR, filed June 28, 1983, D.C., S.D. Ohio (Columbus), Doc. C-2-83-1164, *Cambelt Intl. Corp. v. Ashland Oil, Inc., et al.*

4,183,188, Claude W. Goldsby, SIMULATED BRICK PANEL, COMPOSITION AND METHOD, filed Apr. 19, 1983, D.C. Oreg. (Portland), Doc. 83-546, *Cast Products Corp. v. Claude W. Goldsby.*

4,197,201. (See 4,126,546.)

4,207,851, Charles Crisefi, EMERGENCY IGNITION FOR INTERNAL COMBUSTION ENGINES, filed May 29, 1980, D.C., M.D. Fla. (Tampa), Doc. 80-633 Civ.T.G.C., *E-Virotronics, Inc. v. Charles Crisefi, et al.* Pat. No. 4,207,851 is hereby declared invalid and unenforceable per Stipulated Permanent Injunction filed Oct. 1, 1982.

4,207,921, Albert H. Sloan, HEADER ASSEMBLY AND JETTING ADAPTER FOR WELL POINT PUMPING APPARATUS; 4,261,601, same, JETTING ADAPTER FOR WELL POINT PUMPING APPARATUS, filed July 6, 1983, D.C., S.D. Fla. (W. Palm Beach), Doc. 83-6496-Civ-JCP, *Albert H. Sloan v. Well Point Dewatering Rental & Mfg., Inc., et al.*

4,208,131, Robert L. Mendenhall, ASPHALTIC CONCRETE PATCH MIXING AND HEATING APPARATUS AND METHOD; 4,219,278, same, ASPHALT-AGGREGATE DRUM MIXING APPARATUS; 4,240,754, same, ASPHALTIC CONCRETE PATCH MIXING AND HEATING APPARATUS AND METHOD; 4,265,546, same, ASPHALT-AGGREGATE DRUM MIXING APPARATUS, filed Oct. 2, 1981, D.C. Mont. (Butte), Doc. CV-81-93-BU, *Robert L. Mendenhall v. Eugene R. Simpson, doing business as Simpson Mfg. Co.* Defendant is permanently enjoined from further infringement of Plaintiff's patents. Filed June 1, 1983.

4,219,278. (See 4,208,131.)

4,222,318, Patton, Patton and O'Donnell, COMBINATION WINDOW AND FLOOR FAN, filed July 1, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-3160, *Patton Electric Co., Inc. v. Lasko Metal Products, Inc.*

4,232,477, Shelcore, Inc., INFLATABLE HAS-SOCK-SHAPED TOY, filed Dec. 21, 1982, D.C.N.J. (Newark), Doc. 82-4309, *Shelcore, Inc. v. Glenco Infant Items, Inc.* Stipulation and Order of Dismissal of action filed Aug. 3, 1983.

4,232,501, Lantech, Inc., ECONOMY AUTOMATIC WRAPPING APPARATUS, filed June 6, 1983, D.C. Colo. (Denver), Doc. 83-JM-991, *Lantech, Inc. v. Master Conveyor Corp.*

4,240,754. (See 4,208,131.)

4,241,880, Nordson Corp., ELECTROSTATIC SPRAY GUN, filed Apr. 1, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-71186, *Nordson Corp. v. Graco, Inc.* Plaintiff is the owner of Pat. No. 4,241,880 which is good and valid in law and enforceable. Defendant is permanently restrained from further infringing Plaintiff's

patent. Filed June 28, 1983.

4,250,700. (See 4,016,711.)

4,253,845, Analytical Products, Inc., GAS-LIQUID EQUILIBRATION APPARATUS, filed May 4, 1983, D.C., N.D. Calif. (San Jose), Doc. C-83-20003 WAI, *Analytical Products, Inc. v. Corning Glass Works.*

4,258,250, Copar Corp., JAM DETECTOR, filed June 22, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 4316, *Copar Corp. v. Valco Cincinnati, Inc.*

4,261,601. (See 4,207,921.)

4,265,546. (See 4,208,131.)

4,285,201. (See 4,033,136.)

4,291,524, Alloway Mfg., Inc., METHOD OF DEFOLIATING; 4,308,714, same, THREE DRUM DEFOLIATOR, filed Aug. 27, 1982, D.C. N. Dak. (Fargo), Doc. A3-82-139, *Alloway Mfg., Inc. v. WIC, Inc., et al.* Stipulation and Order of Dismissal filed on June 7, 1983.

4,308,714. (See 4,291,524.)

4,308,901, Ag-Bag Corp., AGRICULTURAL BAG LOADING APPARATUS BRAKING MECHANISM; 4,337,805, same, AGRICULTURAL BAG LOADING APPARATUS, filed July 1, 1983, D.C., W.D. Pa. (Pittsburgh), Doc. 83-1636, *Ag-Bag Corp. v. Clarence Mowry.*

4,315,763, Stoller Enterprises, Inc., HIGH ANALYSIS LIQUID FERTILIZERS, filed July 6, 1983, D.C. Idaho (Boise), Doc. 83-1288, *Stoller Enterprises, Inc., et al. v. Ferti-Spec, Inc., et al.*

4,321,038, Van R Dental Products, Inc., BRAIDED GINGIVAL RETRACTION CORD, filed Dec. 20, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6662, *Van R Dental Products, Inc. v. Pascal Co., Inc.* Plaintiff's dismissal of complaint filed on May 31, 1983.

4,322,666. (See 4,030,005.)

4,337,805. (See 4,308,901.)

4,342,796, Advanced Chemical Technologies, Inc., METHOD FOR INHIBITING CORROSION OF INTERNAL STRUCTURAL MEMBERS OF REINFORCED CONCRETE, filed Apr. 14, 1983, D.C., W.D. Okla. (Oklahoma City), Doc. 83-822-E, *Dynamit Nobel of America, Inc., et al. v. Advanced Chemical Technologies, Inc., et al.*

4,366,730, Roberto Casadio, WIRE STRIPPING PLIERS, filed July 8, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-4137, *Creative Pioneer Products Corp. and Roberto Casadio v. K-Mart Corp.* Same, filed Aug. 11, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-5017, *Creative Pioneer Products Corp. and Roberto Casadio v. Capital Tools of Tex., et al.*

4,371,817. (See 4,030,005.)

4,380,327, Robert E. Fish, SAFETY BARRIER, filed July 26, 1983, D.C., S.D. Fla. (Ft. Lauderdale), Doc. 83-6557-Civ-JAG, *Robert E. Fish v. Roll-A-Way Protective Pool Fence, Inc.*

4,384,801, East-West Design, Inc., JUNCTION PLATE, filed May 24, 1983, D.C. Minn. (Minneapolis), Doc. 4-83 Civil 428, *United Steel Products Co. v. East-West Design, Inc.*

4,394,055, Richard D. Smith, CABINET FOR VIDEO GAME CONSOLES, CARTRIDGES, ACCESSORIES, AND INSTRUCTION BOOKLETS, filed July 21, 1983, D.C. Minn. (St. Paul), Doc. 3-83-898, *Richard D. Smith v. Hartzell Corp., Inc., et al.* Same, filed July 22, 1983, D.C., N.D. Calif. (San Jose), Doc. C-83-20155 WAI, *Richard D. Smith v. Imagic, Inc., et al.* Same, filed July 26, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5531 KTD, *Richard D. Smith v. Service Mfg. Co.*

Re. 26,887. (See 3,216,674.)

Re. 28,222. (See 3,613,004.)

Re. 30,736. (See 3,882,751.)

Re. 30,834. (See 3,882,751.)

Re. 30,906. (See 3,882,751.)

Re. 31,004. (See 3,882,751.)

#### Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

National Energy Management Systems, Inc., Fort Lauderdale, Fla., Reg. No. 1,140,667, for the mark "NEMS MICROMASTER" and design, Canc. No. 13,266.

File-O-Fax Corp., Snyder, N.Y., Reg. No. 903,002, for the mark "FILE-O-FAX" and design, Canc. No. 13,519.

Merri Dee Cosmetics, Inc., Chicago, Ill., Reg. No. 1,199,234, for the mark "MERRI DEE" and design, Canc. No. 13,698.

Charmaceuticals, Inc., Los Angeles, Calif., Reg. No. 849,581, for the mark "PLUS ULTRA", Canc. No. 13,760.

Maxine Anderson, assignee of The Du-Dad Lure Co., Dorchester, Wis., Reg. No. 817,710, for the mark "DU-DAD", Canc. No. 13,785.

Pro-Vita Corp., Anaheim, Calif., Reg. No. 1,132,544, for the mark "ULTIMATE", Canc. No. 13,792.

Cosmetically Yours, Inc., Yonkers, N.Y., Reg. No. 846,787, for the mark "FORTUNE KOOKIE", Canc. No. 13,825.

Golf Marks, N.V., Cleveland, Ohio, Reg. No. 790,280, for the mark "BLACK KNIGHT", Canc. No. 13,867.

ERMA S. BROWN,

Deputy Clerk,  
Trademark Trial and  
Appeal Board.  
For MARGARET M. LAURENCE,  
Assistant Commissioner  
for Trademarks.

#### Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,085,042, Christian B. Luginbuhl, PHY-TOTOXICITY OF MANGANESE ETHYLENE-BISDITHIOCARBAMATE REDUCED BY THE ADDITION OF ZINC AND CADMIUM IONS, Interference No. 94,033, decided May 31, 1967, claims 2, 5 & 7.

Patent No. 3,967,740, Desmond Walter Molins, ARTICLE-HANDLING APPARATUS, Interference No. 100,194, decided May 23, 1983, claims 23-26.

Patent No. 4,017,656, Henry R. Lasman, Robert J. Levenson and Reuben Wisotzky, IMITATION LEATHER MATERIAL AND METHOD OF

PREPARING SUCH MATERIAL, Interference No. 100,951, decided July 27, 1983, claims 1-33.

Patent No. 4,098,016, John P. Foote, AUTOMATIC AND SEMIAUTOMATIC SMALL CALIBER CONVERSION SYSTEM, Interference No. 100,221, decided June 23, 1983, claims 1, 2 & 3.

Patent No. 4,104,193, Walter H. Carter, Charles A. Christopher and Thomas Jefferson, IMPARTING SUPERIOR VISCOSITY TO AQUEOUS POLYSACCHARIDE SOLUTIONS, Interference No. 100,490, decided June 20, 1983, claims 1-8.

Patent No. 4,133,043, Minoru Hiroshima, Shigeru Yoshizawa, Nobuo Saito, Atsushi Asano, Hiroshi Suehiro, Minoru Saitoh and Keisuke Mise, SHIFT REGISTER TYPE MEMORY, Interference No. 100,438, decided Apr. 27, 1983, claims 1-4 & 11.

Patent No. 4,169,833, Marcel Menard and Gilles Caron, NOVEL PHOSPHORANE INTERMEDIATES FOR USE IN PREPARING PENEM ANTIBIOTICS, Interference No. 101,012, decided June 24, 1983, claims 1 & 2.

Patent No. 4,176,667, Julian N. Herring, DISPOSABLE LIQUID ABSORBENT PAD AND METHOD, Interference No. 100,933, decided Aug. 30, 1983, claims 1 & 3.

Patent No. 4,192,652, Robert H. Smith, PROCESS FOR PREPARING SULFUR-CONTAINING COAL OR LIGNITE FOR COMBUSTION HAVING LOW SO<sub>2</sub> EMISSIONS, Interference No. 100,844, decided July 22, 1983, claims 1, 2, 4-6.

Patent No. 4,207,876, Larry D. Annis, COMPRESSION DEVICE WITH VENTILATED SLEEVE, Interference No. 100,963, decided Sept. 23, 1983, claims 1-6.

Patent No. 4,226,601, Robert H. Smith, PROCESS FOR REDUCING SULFUR CONTAMINANT EMISSIONS FROM BURNING COAL OR LIGNITE THAT CONTAINS SULFUR, Interference No. 100,845, decided July 22, 1983, claims 1-4, 6 & 8.

Patent No. 4,242,395, Joseph L. Zuckerman and John W. Bzik, THERMOPLASTIC COMPOSITIONS AND AUTOMOTIVE CARPETING BACKED THEREWITH, Interference No. 100,870, decided Sept. 23, 1983, claims 1-4.

Patent No. 4,242,942, Reiner Bartholomaeus, Karl-Heinz Bernhardt, Wolfgang Eberhard, Hans-Dieter Kokus, Herbert Lembke and Heinz Schulte, HYDRAULIC POSITIONER WITH FEEDBACK DEVICE, Interference No. 100,985, decided Sept. 23, 1983, claims 9 & 10.

Patent No. 4,253,432, Hidetaka Nohira, Toshiaki Konomi and Hideaki Matsui, INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE OF A COUNTER-FLOW TYPE, Interference No. 101,006, decided July 19, 1983, claims 1-5 & 15-19.

Patent No. 4,260,669, Catherine A. Kerg, ALKALINE-MNO<sub>2</sub> CELL HAVING A ZINC POWDER-GEL ANODE CONTAINING STARCH GRAFT COPOLYMER, Interference No. 100,730, decided June 23, 1983, claims 1-4 & 7-11.

Patent No. 4,264,613, Gilbert Regnier, Alain Dhainaut, Jacques Duhault and Michelle Boulanger, PIPERIDYLBENZIMIDAZOLINONE COMPOUNDS, Interference No. 101,009, decided June 14, 1983, claims 1 & 2.

NANNIE B. HENRY,  
Deputy Clerk,  
Board of Patent Interferences.



## PATENT NOTICES

### Certificates of Correction for the Week of Nov. 15, 1983

Re. 30,906	4,377,031	4,393,152	4,400,403
Re. 31,281	4,377,149	4,393,282	4,400,917
3,978,457	4,377,332	4,393,724	4,400,930
4,112,308	4,377,333	4,393,936	4,401,101
4,180,740	4,378,706	4,394,679	4,401,269
4,238,220	4,379,755	4,395,098	4,401,289
4,286,122	4,380,875	4,395,328	4,401,482
4,289,404	4,380,982	4,395,458	4,401,822
4,294,822	4,382,194	4,395,676	4,402,063
4,304,727	4,382,611	4,396,005	4,402,462
4,311,494	4,382,677	4,396,390	4,402,742
4,323,094	4,383,038	4,396,425	4,402,760
4,327,151	4,383,608	4,396,448	4,402,797
4,329,929	4,384,687	4,396,725	4,403,131
4,331,751	4,384,786	4,396,869	4,403,255
4,338,376	4,385,191	4,397,163	4,403,412
4,339,361	4,385,472	4,397,189	4,403,551
4,351,146	4,388,565	4,397,597	4,403,764
4,355,357	4,389,007	4,397,712	4,403,798
4,357,601	4,389,468	4,397,810	4,403,804
4,360,777	4,389,498	4,398,253	4,404,204
4,366,959	4,390,452	4,398,923	4,404,238
4,368,472	4,392,046	4,399,544	4,404,269
4,371,969	4,392,416	4,399,550	4,404,392
4,373,016	4,392,722	4,399,907	
4,375,999	4,393,113	4,400,280	

1036 OG 20

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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State	Name of Library	Telephone Contact
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California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Delaware	Newark: University of Delaware	(302) 738-2238
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	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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\*Collection organized by subject matter.

\*\*Call only between the hours of 10:00 a.m. and 5:00 p.m.

1036 OG 21



**PATENT EXAMINING CORPS**  
**RENE D. TEGTMEYER, Assistant Commissioner**  
**WILLIAM FELDMAN, Deputy Assistant Commissioner**  
**CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983**

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
<b>GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director</b> . . . . .	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal- lurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
<b>GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director</b> . . . . .	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
<b>HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director</b> . . . . .	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthetics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
<b>COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director</b> . . . . .	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
<b>SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—</b> <b>R. F. WHITE, Director</b> . . . . .	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manu- facture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
<b>INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director</b> . . . . .	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
<b>SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director</b> . . . . .	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics; Communications, Op- tics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Composi- tions; Thermal and Photoelectric Batteries.	
<b>INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director</b> . . . . .	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
<b>RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—</b> <b>G. M. FORLENZA, Director</b> . . . . .	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
<b>ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director</b> . . . . .	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
<b>DESIGN, GROUP 290—KENNETH L. CAGE, Director</b> . . . . .	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
<b>HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director</b> . . . . .	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprin- kling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
<b>MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director</b> . . . . .	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
<b>AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—</b> <b>R. E. AEGERTER, Director</b> . . . . .	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Infor- mation Dissemination.	
<b>HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director</b> . . . . .	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Gener- ation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
<b>GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—</b> <b>A. L. SMITH, Director</b> . . . . .	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscel- laneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents . . . . . Numbers 2,616 to 2,627 inclusive

## REISSUES

NOVEMBER 15, 1983

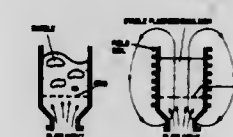
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,439  
**PROCESS FOR OPERATING A MAGNETICALLY  
STABILIZED FLUIDIZED BED**  
Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Re-  
search and Engineering Co., Florham Park, N.J.  
Original No. 4,115,927, dated Sep. 26, 1978, Ser. No. 786,613,  
Apr. 11, 1977. Continuation-in-part of Ser. No. 610,071, Sep.  
3, 1975, abandoned, which is a continuation-in-part of Ser. No.  
514,003, Oct. 11, 1974, abandoned. Application for reissue  
Sep. 24, 1980, Ser. No. 190,934

Int. Cl.<sup>3</sup> F26B 3/08

U.S. Cl. 34—1

47 Claims



35. A process for controllably transporting a flowable bed containing magnetizable particles within a vessel, said bed being expanded and levitated within said vessel by a fluid stream, wherein the superficial fluid velocity of said fluid stream ranges between:

- (1) more than the normal fluidization superficial fluid velocity required to expand and levitate said bed in the absence of said applied magnetic field; and
- (2) less than the superficial fluid velocity required to cause time-varying fluctuations of pressure difference through said expanded and levitated bed over a finite period of time during continuous operation in the presence of said applied magnetic field, said process comprising the steps:
  - (a) subjecting at least a portion of said bed to an applied magnetic field having a substantial component along the direction of a force field external to said bed; and
  - (b) controllably transporting said bed within said vessel in response to a pressure differential in said bed.

Re. 31,440  
**ELECTROCHEMICAL ELECTRODE WITH HEATING  
MEANS**

Patrick Eberhard, Allschwil, Switzerland; Konrad Hammacher, Tübingen, Fed. Rep. of Germany, and Wolfgang Mindt, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

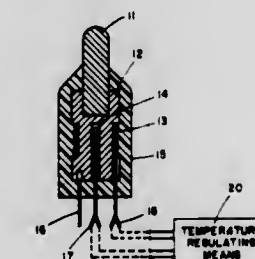
Original No. 3,795,239, dated Mar. 5, 1974, Ser. No. 177,231, Sep. 2, 1971. Application for reissue Jan. 18, 1978, Ser. No. 870,392

Claims priority, application Switzerland, Oct. 1, 1970, 14544/70

Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128—635

8 Claims



1. An electrode arrangement for application to a body surface for bloodless measurement in connection with the concentration or the partial pressure of a gas in the blood [including]

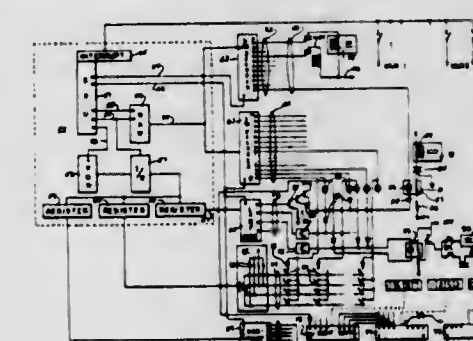
comprising, sensor means for electrochemically deriving, in vivo, electrical signals indicative of the concentration or partial pressure of gas in the blood [and having] , said sensor means including a face member [adapted] for body contact [ , the improvement comprising: ] ; and heating means in direct thermal contact with [said sensor means and adapted to transmit to said face member a thermal condition for thermal stimulation at the applied body surface of local blood circulation] the face member for transmitting heat throughout the face member into the body tissue directly therebeneath to produce a condition of sufficient hyperemia in said body tissue.

Re. 31,441  
**PLAYER OPERATED GAME APPARATUS**  
David J. Nutting, and Jeffrey E. Frederiksen, both of Milwaukee, Wis., assignors to Bally Manufacturing Corporation, Chicago, Ill.  
Original No. 4,093,232, dated Jun. 6, 1978, Ser. No. 576,980, May 13, 1975. Application for reissue Aug. 25, 1978, Ser. No. 936,784

Int. Cl.<sup>3</sup> A63F 7/00

U.S. Cl. 273—121 A

95 Claims



61. A game apparatus comprising:  
a processor having program means for programming the processor and memory means for storing signals;  
a physical mass capable of motion, said mass being a surface projectile;  
a game surface for supporting the surface projectile;  
player-operated control means for affecting the motion of the physical mass;  
a plurality of response means for detecting the mass, each response means having signaling means associated therewith and operatively connected to the processor for signaling the processor that the response means has detected the mass;  
a plurality of display means for presenting information based upon the detection of the mass by the response means, each display means having a display activation means associated therewith and operatively connected to the processor for activating the display means in response to a signal from the processor; and  
multiplexing means operatively connected to the processor for cyclicly and sequentially enabling each of the signaling means to signal the processor that its associated response means has detected the mass, and for cyclicly and



sequentially enabling each of the display activation means to activate its associated display means; said processor having means for storing the signals from the signaling means enabled by the multiplexing means into the memory means, and for addressing the program means and the memory means, and for signaling the display activation means enabled by the multiplexing means, in response to the program means and the memory means.

Re. 31,442

# METHOD AND APPARATUS FOR MANUFACTURE OF GLASS FILM

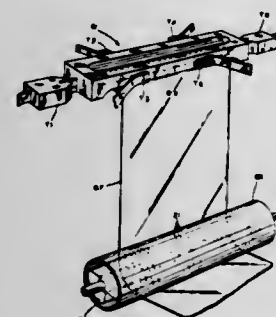
Lawrence V. Pfander, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Original No. 4,268,296, dated May 19, 1981, Ser. No. 99,457, Dec. 3, 1979. Application for reissue Sep. 15, 1981, Ser. No. 302,332

Int. Cl.<sup>3</sup> C03B 5/02, 17/06

U.S. Cl. 65—90

6 Claims



1. An apparatus for drawing glass film of a thickness less than 0.003 inch, comprising a block of hot glass-resistant material, means mounting said block in underlying relationship to a pool of molten glass, said block defining an elongated slot like orifice having a width in the range of 0.10 inch to 0.40 inch through which a film of glass may be continuously drawn, the walls of said orifice being electrically conductive, a plurality of electrical junctions connected to spaced areas of said walls, and power means for flowing electric current through said junctions and said orifice walls to maintain the lateral end portions of said orifice walls at a lower temperature than the central portions, thereby maintaining both edge areas of the drawn film at a lower temperature than the center area.

5. A method of controlling the temperature of a thin film of glass drawn from a slot-like metallic walled orifice, the orifice having a width of exceeding 0.40 inches, comprising the steps of passing separate electrical currents through the central portions of the orifice walls and through each of the lateral end portions of the orifice walls, and controlling said electrical currents to produce a temperature differential of the central portions of the orifice walls in excess of the temperature of the lateral end walls of the orifice, and drawing a film of glass of a final thickness not in excess of 0.003 inches through said orifice.

Re. 31,443

# TREATMENT OF SILICA

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,297,460, dated Oct. 27, 1981, Ser. No. 173,525, Jul. 30, 1980, Division of Ser. No. 44,809, Jun. 1, 1979, Pat. No. 4,248,735, which is a continuation-in-part of Ser. No. 857,552, Dec. 5, 1977, abandoned. Application for reissue May 3, 1982, Ser. No. 374,114

Int. Cl.<sup>3</sup> C08F 4/02, 4/24, 4/78

U.S. Cl. 526—98

24 Claims

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-containing support at an elevated temperature to a treating ambient selected from (1)

[carbon monoxide, (2)] a halogen-containing component selected from bromine, iodine, HBr, HI, organic bromides, and organic iodides, which halogen-containing component also either contains air or is followed by air or [(3)] (2) a carbon, oxygen and sulfur-containing composition, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

24. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-titania cogel support at an elevated temperature to a treating ambient comprising carbon monoxide, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

25. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-containing support at an elevated temperature to a treating ambient comprising carbon monoxide to produce a treated support, thereafter preoxidizing said treated support by subjecting said treated support to oxidation conditions, thereafter incorporating a chromium compound under anhydrous conditions to form said catalyst and thereafter activating said catalyst in an oxygen ambient.

Re. 31,444

# TWO-PHASE TRANSFORMER AND WELDING CIRCUIT THEREFOR

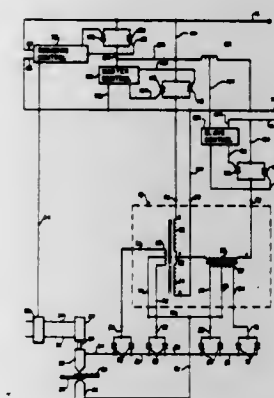
Merrill Block, 1736 Woodward, SE., Grand Rapids, Mich. 49506

Original No. 4,169,975, dated Oct. 2, 1979, Ser. No. 813,787, Jul. 8, 1977. Application for reissue Oct. 31, 1980, Ser. No. 202,733

Int. Cl.<sup>3</sup> B23K 11/24

U.S. Cl. 219—116

14 Claims



1. In a welding apparatus having Scott-connected transformers, three primary input terminals which are adapted to be connected to a three-phase power supply and four secondary output leads with which are connected to a first electrode through wafer diode assemblies, the transformer further having a center tap output lead from each of the secondary coils, which center tap output lead is connected to a second welding electrode, whereby a DC circuit is made through the first and second electrodes, the improvement comprising:

all of the four secondary output leads formed in a relatively flat configuration with top and bottom surfaces of greater extent than other surfaces of said leads, at least the top surfaces of each of said output leads lie entirely in a common plane;

deformable leads formed of multiple laminated straps of conductive material connected between each of the output leads and the diodes for firmly supporting the diodes; a common conductor plate member of relatively flat configuration having a surface of greatest extent lying entirely in a plane parallel to the common plane of the output leads; and

means clamping the diode assemblies under pressure between the common conductor plate and the deformable leads so that the leads deformably respond to any variation in thickness of the diodes as the diodes are secured in place so that equal pressure can be applied to each diode.

## PLANT PATENTS

GRANTED NOVEMBER 15, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,137

### PLUM TREE

John M. Garabedian, 3104 E. Huntington Blvd., Fresno, Calif. 93702

Filed Aug. 18, 1981, Ser. No. 294,038

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—38

1 Claim

1. A new and distinct variety of plum tree substantially as illustrated and described and being characterized by its early maturity, approximately one week to ten days earlier than the Red Beaut variety; by fruit which is slightly more oblate and compressed in shape than fruit of the Nubiana variety, has a more attractive dark maroon color when ripe than the Nubiana, a distinctive and alluring aroma, and a richer, more vinuous flavor than fruit of the Nubiana, and has a fruit stone which is characterized by its non-uniformity in size and shape, its irregular periphery, and its irregularly furrowed surface.

the tree and a more uniform ripening of the fruit throughout the tree.

5,139

### PEACH TREE

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Nov. 23, 1981, Ser. No. 324,257

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—43

1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by quite vigorous growth producing freestone fruit of very large size, having a bright red to a bright yellow color, a tough skin, very firm flesh of bright yellow color having very good flavor and aroma and a pit cavity bounded by a very slight rim of red; and ripening about the twentieth of July.

5,138

### APRICOT TREE (SPRING GIANT)

C. Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Apr. 7, 1982, Ser. No. 366,158

Int. Cl.<sup>3</sup> A01H 5/03

U.S. Cl. Plt.—39

1 Claim

1. A new and distinct variety of apricot tree of large size, vigorous upright growth and a regular and productive bearer of very large, firm yellow flesh, freestone fruit with excellent eating quality and the ability to ship to long distance markets; the apricot tree is further characterized when compared to the Flaming Gold Apricot Tree (U.S. Plant Pat. No. 2,822) as having a more uniform distribution of fruit within the center of

5,140

### PEACH TREE 'AUGUST SUN'

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Nov. 23, 1981, Ser. No. 324,256

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—43

1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by its freestone fruit of dark red color having very crisp bright yellow flesh with a bright red ring bounding the pit cavity and with a skin which is tenacious to the flesh ripening August 18 to August 24.



# PATENTS

GRANTED NOV. 15, 1983

## ERRATA

For	See
CLASS	PATENT NO.
128-325 .....	4,414,721
244-028 .....	4,415,124
366-165 .....	4,415,275
434-113 .....	4,415,326
434-249 .....	4,415,327
502-117 .....	4,415,474
502-206 .....	4,415,475
502-224 .....	4,415,476
502-178 .....	4,415,477
502-181 .....	4,415,478
502-185 .....	4,415,479
502-242 .....	4,415,480
502-062 .....	4,415,481
502-205 .....	4,415,482
502-255 .....	4,415,483
502-332 .....	4,415,484
502-100 .....	4,415,485
525-054 .....	4,415,490
381-045 .....	4,415,767
381-010 .....	4,415,768
369-060 .....	4,415,772
382-027 .....	4,415,880
378-058 .....	4,415,980



# PATENTS

GRANTED NOVEMBER 15, 1983

## GENERAL AND MECHANICAL

4,414,691

### REVERSIBLE BATHING GARMENT

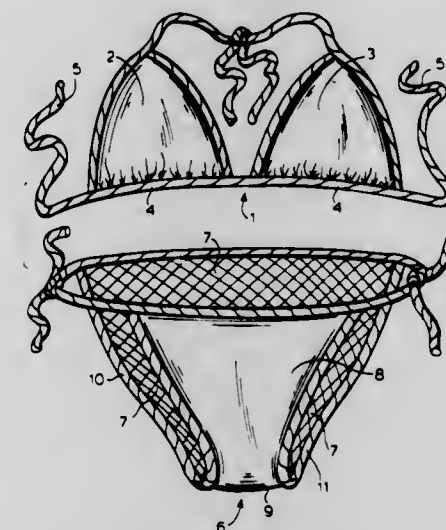
Jose Estruch, San Juan, P.R., assignor to Fabrilmalla, Inc.,  
Guaynabo, P.R.

Filed Jun. 3, 1982, Ser. No. 384,479

Int. Cl.<sup>3</sup> A41D 5/00; A41B 9/00

U.S. Cl. 2-67

3 Claims



1. A reversible bathing garment for wear by a human person which comprises;  
a single, unseamed cloth having a first planar surface and a second planar surface, said surfaces being mutually bounded by a single, peripheral edge;  
said cloth having been cut to a size and configuration whereby it will, when worn by said person, cover private parts of the person;  
a binding tape secured to the entirety of the peripheral edge;  
and means attached to the binding tape for supporting the cloth on the body of said person.

4,414,692

### DRINKING GLOVE

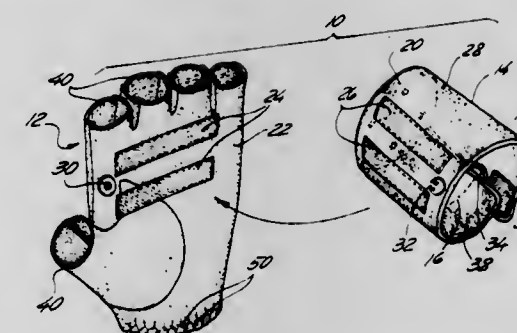
Mark A. Dzierson, and William V. Dzierson, Sr., both of Johnstown, N.Y., assignors to Elmer Little & Sons, Inc., Johnstown, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,806

Int. Cl.<sup>3</sup> A41D 19/00

U.S. Cl. 2-160

2 Claims



1. A drinking glove for facilitating handling of a drinking vessel comprising:  
a glove portion adapted to fit about a hand;  
a pocket portion defining a volume dimensioned to receive a drinking vessel, said pocket portion comprising a generally cylindrical member including a generally cylindrical side wall and a substantially continuous bottom wall, said cylindrical member being open at the top for defining an

opening in said pocket portion for accommodating insertion and removal of said drinking vessel;  
means for releasably securing said pocket portion to said glove portion;  
means for retaining the upper end of said pocket portion in close confronting relation with the palm of said glove portion; and  
means for adjusting the volume enclosed by said pocket portion comprising a generally axial longitudinally extending slit in said side wall, and means for releasably joining the portions of said side wall on either side of said slit and for adjusting the extent of overlap between said portions when joined.

4,414,693

### OPTICAL DEVICES FOR USE IN MOISTURE LADEN ATMOSPHERE

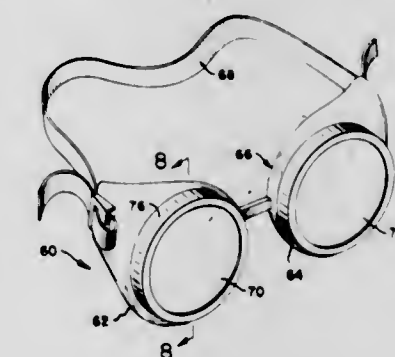
Samuel S. Brody, 5 Saxony Rd., Pittsford, N.Y. 14534

Filed May 4, 1981, Ser. No. 260,643

Int. Cl.<sup>3</sup> A61F 9/02

U.S. Cl. 2-435

13 Claims



11. In goggles having a frame and a lens which define the sealed region with the face of the wearer thereof, an opening in said frame, and a membrane consisting of hydrophylic perfluorosulfonic acid polymer for fogging prevention on said frame sealing said opening.

4,414,694

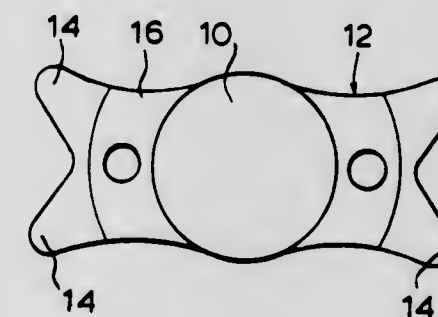
### INTRA-OCULAR LENSES

David P. Choyce, 9 Drake Rd., Westcliff on Sea, England  
Continuation-in-part of Ser. No. 287,628, Jul. 28, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 435,106  
Claims priority, application United Kingdom, Aug. 5, 1980, 8025426; May 11, 1981, 8114325

Int. Cl.<sup>3</sup> A61F 1/16

U.S. Cl. 3-13

3 Claims



1. An intra-ocular lens which is formed entirely of a polysulfone plastics material which is capable of being worked to produce a lens of optical quality, which has a refractive index



in excess of 1.55 and which is capable of being autoclaved in steam at a temperature in excess of 110° C.

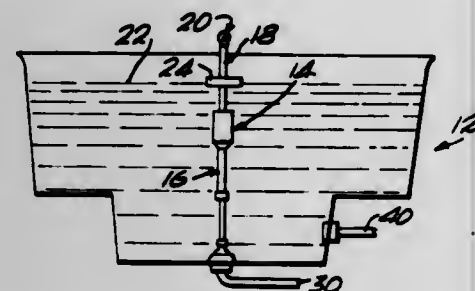
#### 4,414,695 HYDROJET

James F. Hart, 2012 NE. 17th Terr., Fort Lauderdale, Fla. 33305

Filed Aug. 24, 1981, Ser. No. 295,605

Int. Cl.<sup>3</sup> A61H 33/02; B01F 3/04

U.S. Cl. 4—542



1. In combination with a spa, tub or swimming pool defining a receptacle for water, and a pump for recirculating water into and out of said receptacle, the improvement which comprises: a jet head consisting of: an inner member having a central inlet for receiving water from said pump and a plurality of outwardly facing discharge passageways to each discharge a jet of water into the receptacle; an outer member extending around said inner member defining an annular chamber, said outer member having an orifice axially aligned with each discharge passageway; an air inlet tube in fluid communication with said chamber at one end of said tube and a source of air at the other end of said tube; and means for supporting and radially repositioning said jet head from a central position in the receptacle.

#### 4,414,696 MATTRESS WITH NON-WOVEN FABRIC COVERED SPRINGS

Edward W. Weitzel, Greenville, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

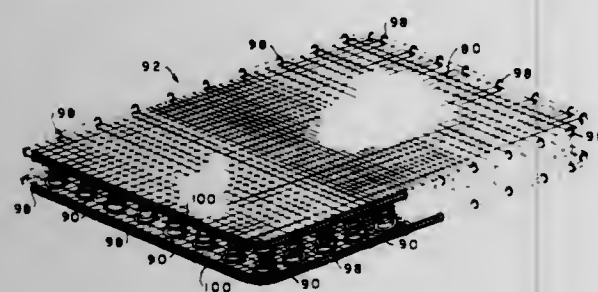
Division of Ser. No. 218,736, Dec. 22, 1980. This application Jul.

21, 1982, Ser. No. 400,564

Int. Cl.<sup>3</sup> A47C 23/32, 23/04

U.S. Cl. 5—475

1 Claim



1. A mattress comprising: a plurality of springs, a non-woven fabric covering both sides of said springs, a filling mat on both sides of each of said non-woven fabrics and a mattress ticking covering the filling mats to form a mattress cover, said non-woven fabric having a plurality of fill yarns extending lengthwise of said mattress and a plurality of warp yarns extending across the width of said mattress substantially perpendicular to said fill yarns and located above and below said fill yarns with the warp yarns above the fill yarn being mated with a warp yarn below said fill yarns, the warp having an end

count in the center of said mattress at least twice the end count at the extremities of said mattress.

#### 4,414,697 TOOL FOR FIBER OPTIC CABLE CLAMP

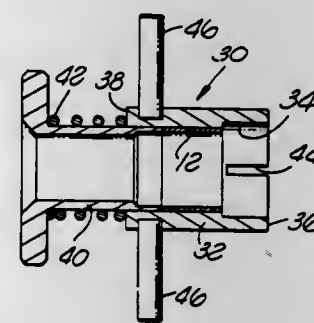
James T. Hartley, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,774

Int. Cl.<sup>3</sup> B25F 1/00; B23P 19/04; B21F 3/00

U.S. Cl. 7—107

8 Claims



1. A tool for a fiber optic cable strength member clamp comprising: a cylinder having a forward end and a rear end, said cylinder being adapted to slidably receive therein a crimp sleeve for said clamp having a predetermined length; a plunger slidably mounted into the rear end of said cylinder having a forward end adapted to engage one end surface of the sleeve for ejecting the sleeve outwardly through said forward end of said cylinder, said plunger normally being in a retracted position; an axially extending open slot in said cylinder opening at its forward end, said slot being dimensioned to receive a cable strength member therein; said forward end of said plunger when in its retracted position being spaced behind the inner end of said slot a distance at least as great as said predetermined length; and means for rotating said cylinder around its longitudinal axis for helically winding a cable strength member extending outwardly through said slot.

#### 4,414,698 AUTOMOBILE FUSE PULLER AND COMBINATION CIRCUIT TESTER

Harry Epstein, Seaford, N.Y., assignor to Kastar, Inc., Bellport, N.Y.

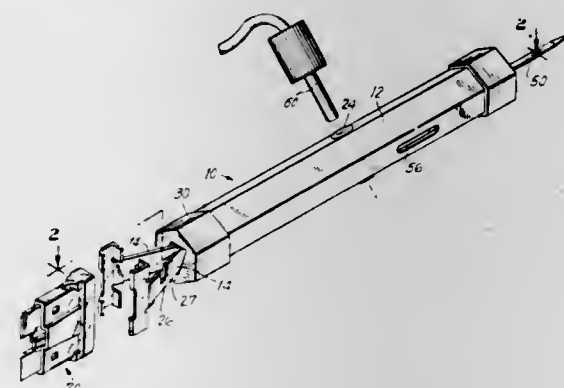
Continuation of Ser. No. 123,928, Feb. 25, 1980, Pat. No.

4,314,383. This application Nov. 17, 1981, Ser. No. 322,254

Int. Cl.<sup>3</sup> B25F 1/00; B25B 27/14

U.S. Cl. 7—170

7 Claims



1. An improved fuse pulling apparatus comprising an elongated housing; a pair of complementary jaws slidably mounted within said housing and extending partially outwardly thereof, means for urging the jaws towards one another as the jaws are

moved into the housing including a stationary plate having a substantially rectangular opening through which said pair of jaws are disposed, means for urging the jaws to rotate as the jaws are moved into the housing, and means for locking the jaws in a closed position such that forward movement without manual rotation of the device would cause the jaws to lock onto a fuse, said means for locking the jaws in a closed position includes at least one notch in each said jaw of a thickness slightly greater than that of said plate whereby each of said jaws may be disposed onto the edge of said plate when said notches are brought into adjacent position therewith.

a base having attachment means, a handle secured to said base, a pad removably connected to said base of said attachment means, said pad including a first abrasive material for removing said paint or similar material and a second liquid absorbing material for dispensing liquid onto said surface from which said paint or similar material is to be removed, and a rigid scraper secured to said handle including means for attaching a material removing device thereto.

#### 4,414,699 MECHANICAL SWEEPER FOR ATTACHMENT TO A CARRIER VEHICLE

Max Hirt, Waldshut, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt GmbH, Fed. Rep. of Germany

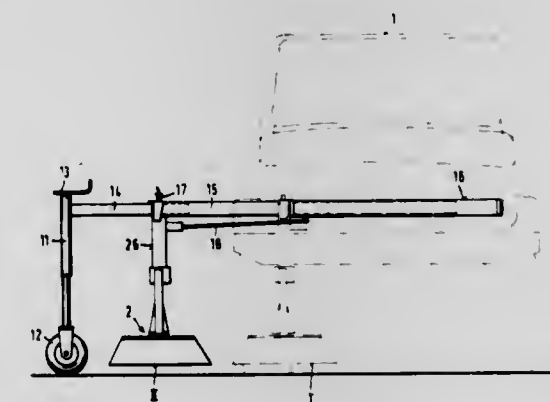
Filed Sep. 11, 1981, Ser. No. 301,369

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, 3034741

Int. Cl.<sup>3</sup> E01H 1/04

U.S. Cl. 15—87

9 Claims



1. Mechanical sweeper comprising a sweeping assembly arranged on a carrier vehicle having front and rear wheels, said sweeping assembly being attached as a single unit to and hence movable with a carrier frame, guide means for movably attaching said carrier frame to the vehicle, said carrier frame being movably attached to the carrier vehicle by said guide means for shifting the sweeping assembly into an inoperative position outside the lateral profile outline of the vehicle to facilitate servicing or removal of said sweeping assembly.

#### 4,414,700 DEVICE FOR PREPARING A SURFACE FOR PAINTING

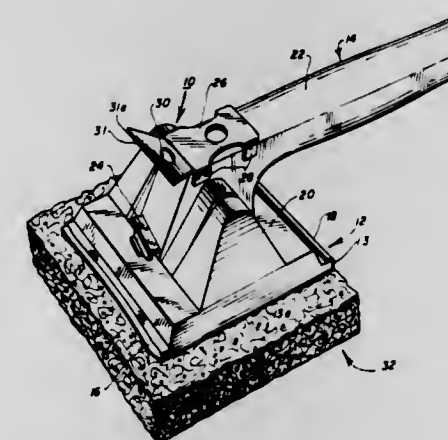
Fredrick B. Burns, S. Milwaukee, Wis., assignor to EZ Painter Corporation, Milwaukee, Wis.

Filed Aug. 24, 1981, Ser. No. 295,659

Int. Cl.<sup>3</sup> A47L 13/12

U.S. Cl. 15—105

5 Claims



1. A device for preparing a surface for coating and removing paint or similar material, comprising:

#### 4,414,701 DEVICE FOR CLEANING A HOSE COUPLING

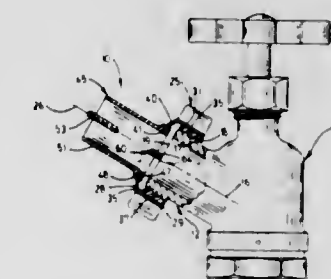
Douglas J. Johnson, 4455 N. Dickenson Ave., Fresno, Calif. 93711

Filed Jul. 19, 1982, Ser. No. 399,423

Int. Cl.<sup>3</sup> B08B 9/02; B23G 5/00

U.S. Cl. 15—105

5 Claims



1. A device for cleaning a coupling, the coupling having a surface circumscribing a predetermined axis of the coupling and a face disposed in a predetermined relation to the axis and the device comprising a first element having a surface conforming to the surface of the coupling and circumscribing a predetermined axis of the device, said surface defining a cleaning edge disposed to engage said surface of the coupling in cleaning relation when the surface of the element is disposed at the surface of the coupling and said axes are disposed in substantially coincident relation and the first element is rotated about said axes relative to the coupling; a second element defining a cleaning edge conforming to the face of the coupling; and means for mounting the second element on the first element for rotation relative thereto about the predetermined axis of the device with the cleaning edge of the second element disposed to engage the face of the coupling in cleaning relation when the second element is rotated about said axis relative to the first element, when said surface of the first element is disposed at said surface of the coupling, and when said axes are disposed in substantially coincident relation.

#### 4,414,702 CASTOR LOCKING DEVICE FOR ARRESTING THE ROTATION AND THE SWIVELLING OF THE CASTOR

Manfred Neumann, Radevormwald, Fed. Rep. of Germany, assignor to Firm Tente-Rollen Gesellschaft mit beschränkter Haftung Compagnie, Wermelskirchen, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,854

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119649

Int. Cl.<sup>3</sup> B60B 33/00

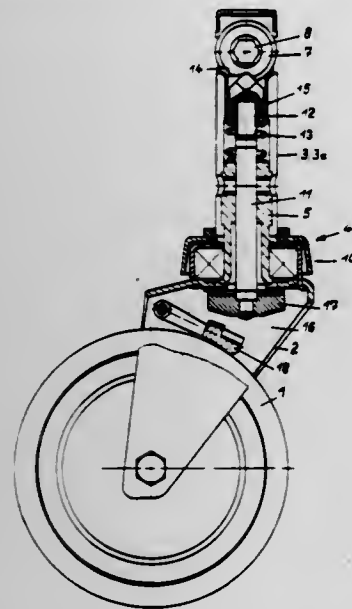
U.S. Cl. 16—35 R

5 Claims

1. In a castor having a locking device to arrest rotation of its wheel and/or swivelling of its fork, the improvement wherein the device comprises a mounting sleeve, an axially movable and rotatable locking pin extending through the mounting sleeve and through its fork head, said locking pin having an axial screw thread at its top portion and a vertically adjustable, non-rotatable top member threadedly mounted thereon, a cam disposed in the mounting sleeve and acting on the top member,



means connected to the locking pin for rotating the locking pin relative to the mounting sleeve wherein the mounting sleeve has means guiding the top member for axial movement while



preventing corotation with the locking pin, whereby the top member can be moved vertically and adjusted vertically by way of the screw thread by rotation of the locking pin relative to the mounting sleeve.

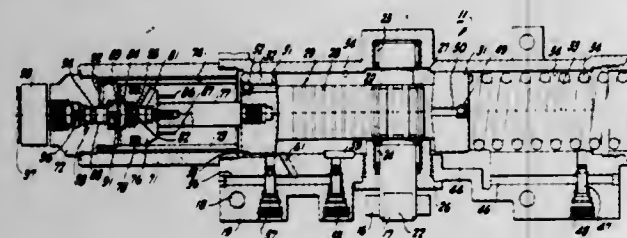
4,414,703

## DOOR CLOSER AND HOLDER

Raymond H. Schnarr, and Richard L. Zunkel, both of Princeton, Ill., assignors to Schlage Lock Company, San Francisco, Calif.  
Filed Sep. 1, 1981, Ser. No. 298,477  
Int. Cl.<sup>3</sup> E05F 3/12, 3/20

U.S. Cl. 16—52

4 Claims



1. A door closer and holder comprising a housing having a central chamber and a closing cylinder communicating with each other, a closing piston reciprocable in said closing cylinder, a sleeve extending said closing cylinder, a plunger reciprocable in said sleeve, means for connecting said plunger and said closing piston for movement together, a plug engaging said sleeve, said plug having a compound bore, a metering disc in said plug and opening into said compound bore and the interior of said closing cylinder, an auxiliary plunger reciprocable in said compound bore between a closed position in abutment with said metering disc and an open position out of abutment with said metering disc, an armature stem axially movable in said compound bore and disposed with one end in abutment with said auxiliary plunger, an armature disc fast on the other end of said armature stem, a solenoid coil surrounding said armature stem, and means mounting said solenoid coil on said plug for axial movement toward and away from said armature disc.

4,414,704

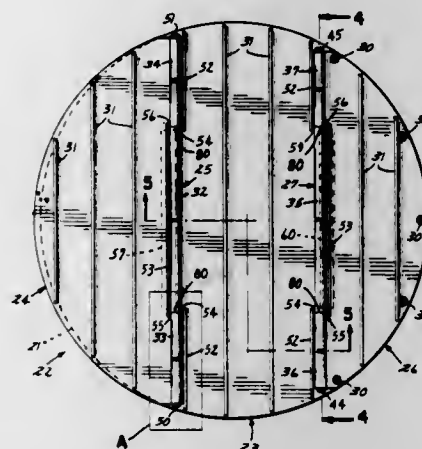
## HINGE FOR CONTAINER COVER

Edward J. Reuter, Excelsior, Minn., assignor to Reuter, Inc., Hopkins, Minn.

Division of Ser. No. 19,771, Mar. 12, 1979, Pat. No. 4,213,539.  
This application May 23, 1980, Ser. No. 152,708  
Int. Cl.<sup>3</sup> E05D 9/00

U.S. Cl. 16—223

7 Claims



1. In a hinge a section having a raised central tongue projecting beyond a pair of lateral portions which extend in alignment with said raised central tongue on opposite sides thereof; dams extending along and spaced inward from the edges of said lateral portions; and lateral extensions connecting the ends of said dams proximate said raised central tongue with the ends of said raised central tongue.

4,414,705

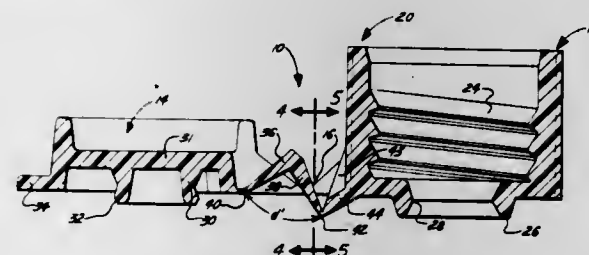
## OVERCENTER HINGE

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Richmond, Va.

Filed Jul. 17, 1981, Ser. No. 284,489  
Int. Cl.<sup>3</sup> E05D 1/02; B65D 51/04

U.S. Cl. 16—225

10 Claims



1. A thermoplastic biasing spring integrally formed with first and second plate members, said plate members being hingedly connected one to the other along a first hinge line, said plate members being pivotably moveable about said first hinge line from a first position to a second position, and said second plate member having a rigid post longitudinally displaced from said first hinge line, said biasing spring comprising: a first arm and a second arm resiliently connected at one of their ends and said first arm being hingedly connected at its other end to said first plate member to form a second hinge line and said second arm being hingedly connected at its other end to the furthest extent of said rigid post to form a third hinge line, said third hinge line being longitudinally displaced from said first hinge line whereby pivoting movement of one or both of said plate members about said first hinge line from one of said positions to the other said positions causes said second hinge line to move closer to said third hinge line thereby placing said biasing spring in compression, said compression urging said plate members to one of said positions dependent upon the location

of said second hinge line with respect to said first hinge line as said plate members accomplish said pivoting movement.

4,414,706

## FRICTION STAY WITH RESILIENT COUPLING FOR WINDOWS

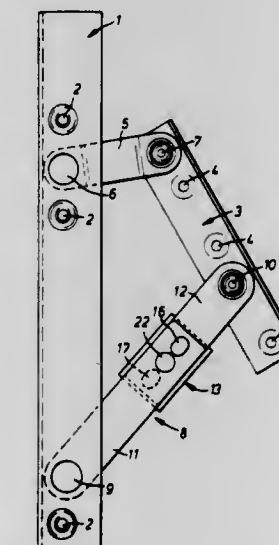
Jack E. Douglas, Walsall, England, assignor to Arthur Shaw Manufacturing Company, Willenhall, England  
Filed Sep. 8, 1981, Ser. No. 300,395

Claims priority, application United Kingdom, Sep. 23, 1980, 8030702

Int. Cl.<sup>3</sup> E05D 15/32

U.S. Cl. 16—370

8 Claims



1. In a friction window stay for pivotally mounting a sash on a frame, said stay comprises arms pivotally connected to respective sash and window frame mounting plates by friction pivot joints so as to permit restrained pivotal movement of said arms relative to said mounting plates; one of said stay arms comprises two links connected together by a resilient coupling for compression under load applied longitudinally of said one stay arm to store energy and to apply such stored energy to said one stay arm on resilient restoration, said resilient coupling comprising a connector locating said links co-axially for relative movement with at least one resilient element acting between said connector and said links.

4,414,707

## SAUSAGE CASING REMOVAL APPARATUS

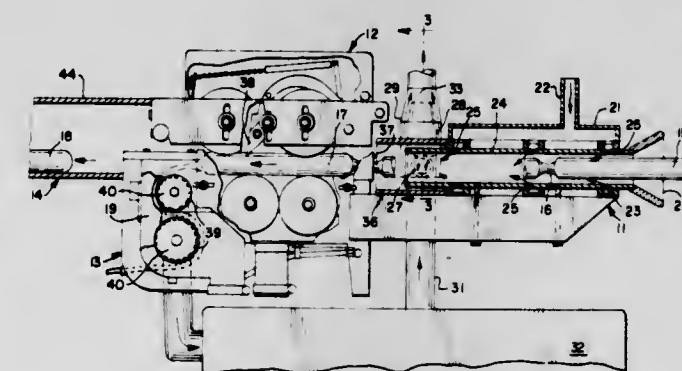
Ernest E. Koken, Madison, Wis., assignor to Oscar Mayer & Co., Inc., Madison, Wis.

Filed Jun. 30, 1981, Ser. No. 278,986

Int. Cl.<sup>3</sup> A22C 11/00

U.S. Cl. 17—1 F

11 Claims



1. In a sausage casing removal apparatus comprising a sausage trackway and means for conveying sausages along the trackway, the trackway having a plurality of operational stations including (a) a conditioning assembly having a product loading horn having means for contacting the casing of the sausage with conditioning fluid while the sausage is conveyed along the trackway, (b) means for longitudinally slitting the

conditioned casing, and (c) means for removing the slit casing from the sausages, said slit casing removing means being downstream of said conditioning assembly, the improvement comprising:

the conditioning assembly having venturi means for impelling the conditioning fluid through the product loading horn at a velocity greater than that velocity at which the conditioning fluid is supplied to the conditioning assembly; and the venturi means including a plurality of restricted passageways through the product loading horn of the conditioning assembly, fluid directing means overlies the restricted passageways along a peripheral area of the conditioning assembly, and the restricted passageways have a total cross-sectional area less than the peripheral area of the fluid directing means.

4,414,708

## AUTOMATIC LIVESTOCK HEAD SPLITTER

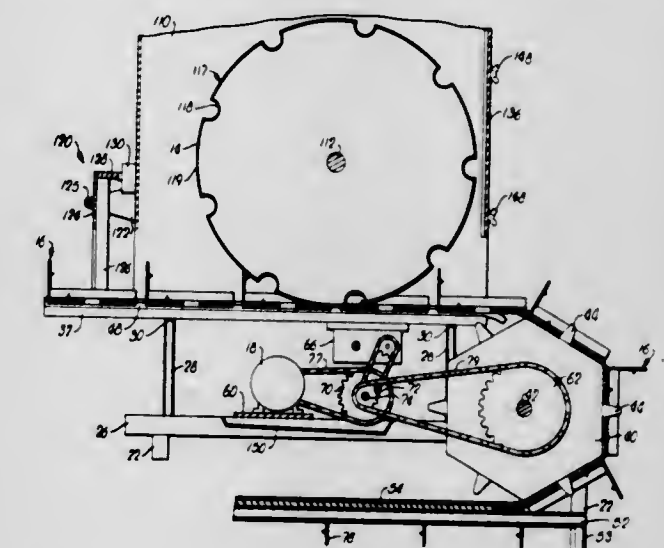
Phillip J. Sauvago, Denison, Iowa, assignor to Farmland Foods, Inc., Kansas City, Mo.

Filed Apr. 7, 1982, Ser. No. 366,160

Int. Cl.<sup>3</sup> A22B 5/20

U.S. Cl. 17—1 R

15 Claims



1. An apparatus for splitting the heads of livestock comprising:

frame means;  
a circular blade rotatably carried by said frame means and having a peripheral cutting edge including structure defining a plurality of circumferentially spaced apart notches intersecting said cutting edge to present a plurality of circumferentially spaced apart relieved zones at said periphery with portions of said cutting edge between respective relieved zones;  
a plurality of means moveably supported by said frame means for carrying said livestock heads;  
power means operably connected to said head supporting means for drawing said head supporting means seriatim into a cutting position for cutting of said carried heads by said blade; and  
means operably connecting said power means, head-supporting means and blade, for movement of said head-supporting means respectively into said cutting position, and for rotation of said blade in synchronism with said movement of said head supporting means in order that said portions of said blade edge split corresponding carried heads and a relieved zone on said blade prevents excess cutting of said carried head and damage to selected internal portions of said head.



4,414,709

**SHRIMP PROCESSING MACHINE HAVING IMPROVED CUTTING STRUCTURE**

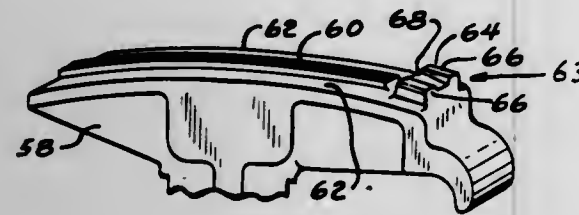
E. Douglas Betts, Libertyville, Ill., assignor to Gregor Jonsson Associates, Inc., Highland Park, Ill.

Filed Aug. 26, 1981, Ser. No. 296,573

Int. Cl.<sup>3</sup> A22C 29/02

U.S. Cl. 17-71

11 Claims



1. A shrimp processing machine comprising: a plurality of processing stations including a cutting station having a rotary blade means for cutting the shrimp lengthwise, and carrier means for gripping the shrimp and transferring the shrimp seriatim through said processing stations, said carrier means including a plurality of clamp sets for gripping the tail and body of a shrimp, each body clamp having a pair of spaced clamp arms defining an elongated space therebetween, a shrimp support member disposed contiguous to said elongated space for coaxing with said clamp arms for gripping the shrimp, said support member including a first pedestal having a groove therein, said groove being aligned with said cutting blade for allowing said rotary blade means to enter said groove for cutting entirely through a shrimp disposed on said support member.

4,414,710

**TEXTILE CARDING MACHINE FEED ASSEMBLY AND METHOD**

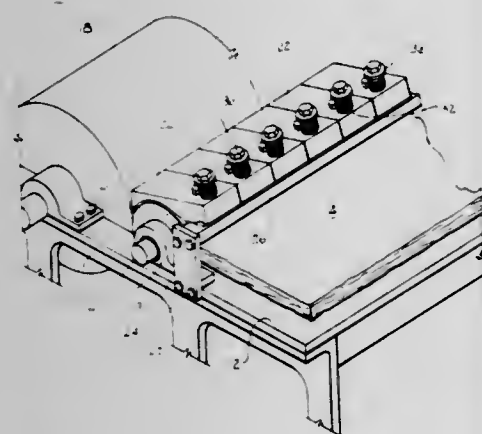
George F. Bolen, 107 Rockwood Dr., Greenville, S.C. 29605

Continuation-in-part of Ser. No. 959,227, Nov. 9, 1978, abandoned. This application Aug. 14, 1981, Ser. No. 292,932

Int. Cl.<sup>3</sup> D01G 15/40

U.S. Cl. 19-105

3 Claims



1. Apparatus for feeding a lap of fibers to a carding machine of the type which includes a feed roll which feeds fibers to a licker-in roll and a feed plate over which a layer of said fibers are conveyed to the feed roll, said apparatus comprising: a plurality of individual segmented presser means carried adjacent said feed roll; and means mounting said presser means to be individually movable towards and away from said feed roll; said individual segmented presser means being arranged generally side-by-side continuously without interruption across the entire length of said feed roll for applying an

even uniform pressure segmentally to segments of the lap of fibers continuously across the width of the lap for retaining control of fibers at the nip of said rolls should a fiber lump raise one of the presser means above the other presser means; and biasing means urging said presser means individually toward said feed roll exerting an even pressure against said lap of fibers along said feed roll regardless of the thickness of said layer of fibers.

4,414,711

**SECURITY CORD HOLDER**

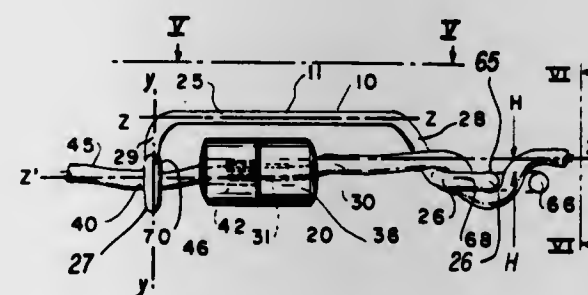
Merle H. Hubbard, 222 W. 2nd, P.O. Drawer YY, Cortez, Colo. 81321

Filed Aug. 27, 1981, Ser. No. 296,889

Int. Cl.<sup>3</sup> F16G 11/14

U.S. Cl. 24-129 C

10 Claims



1. A retainer unit for mounting about two spaced apart sections of an electrical cord unit so as to prevent separation of a connector assembly between and detachably joining said sections and adaptable to alternatively retain a coil of said cord between two cord sections comprising a shaped unitary resilient rod formed at a first end section with an eye section shaped with opening means so as to enable a first section of an entire electrical cord to be readily inserted into an opening in the center of said eye section through said opening means, and formed at the second end section with fastening means, said fastening means shaped to detachably engage or alternatively be disengaged about a second section of an electrical cord, together with an intermediate section of the retainer unit that joins said first end section to said second end section, said intermediate section shaped to extend at a distance from a longitudinal axis joining said first end section to said second end section so as to clear an object such as a cord connector assembly located between said first end section and said second end section of the unit, the longitudinal axis of said fastening means being located within a substantially horizontal plane and the longitudinal axis of said eye section extending along a substantially vertical plane with respect to the longitudinal axis of said fastening means.

4,414,712

**LINE FASTENING DEVICE**

Paul T. Beggins, The Keel, East Islip, N.Y. 11730

Filed Feb. 10, 1982, Ser. No. 347,670

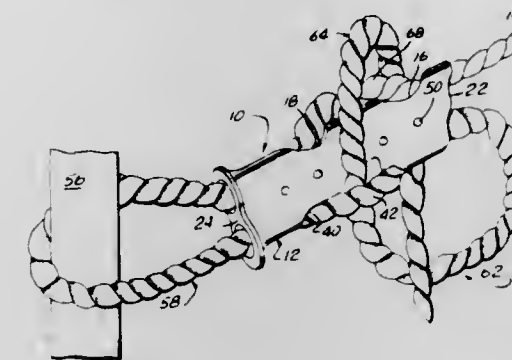
Int. Cl.<sup>3</sup> F16G 11/00; B63B 21/00

U.S. Cl. 24-129 R

16 Claims

1. A line fastening device for forming an eye in a line, comprising: an elongated body having first and second longitudinal ends with first and second passageways extending through the body between the ends and openings at the ends for passing line through each passageway, wherein the elongated body has a first lateral opening in the body extending into the first passageway allowing line within the passageway to depart the passageway, and two adjacent second and

third lateral openings in the body extending into the second passageway for passing a line out of the second passageway through the second lateral opening and back into



the second passageway through the third lateral opening, a body portion between the second and third lateral openings holding a line passing thereover out of the second passageway.

4,414,713

**QUICK-RELEASE STRAP BUCKLE**

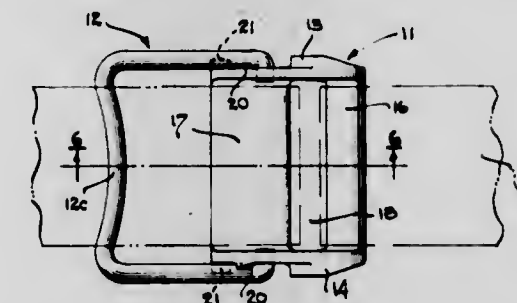
Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Oct. 2, 1981, Ser. No. 308,428

Int. Cl.<sup>3</sup> A44B 11/00

U.S. Cl. 24-193

5 Claims



1. A quick-release buckle for joining strap together comprising:
  - (a) a main body portion including
    - (a) a pair of oppositely positioned side walls
    - (b) first and second spaced apart cross arms running between said side walls,
    - (c) a slot being formed between said cross arms,
    - (d) a detent formed along the upper portion of the outer surface of at least one of said side walls, and
    - (e) a stop member formed below said detent on the other surfaces of said at least one of said side walls,
    - (f) an aperture formed in the outer surface of each of said side walls; and
  - (b) a handle of an elastic material including
    - (a) a pair of side arms,
    - (b) a cross arm joining one of the ends of said side arms together,
    - (c) the other of the ends of the side arms having turned-in end portions, said turned-in end portions being fitted in the apertures formed on the side walls of the main body portion such that the side arms extend partially along the outside of the main body portion;

the handle being movable from an "open" to a "closed" position, during which movement at least one of the side arms of the handle rides over the detent and slightly springs the turned-in end portion thereof out of its associated aperture, said at least one of said side arms finally snapping into a retained position between the detent and the stop member.

4,414,714

**EXPANSIBLE CLASP AND MODULE FOR WATCH STRAPS**

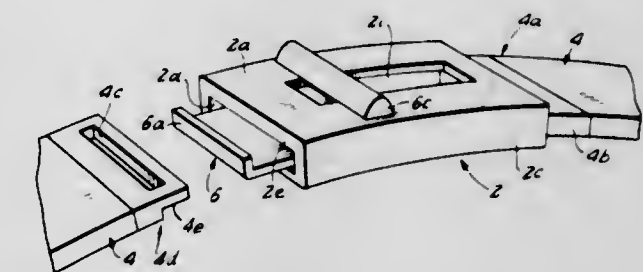
Andrew T. Kostanecki, Darien, Conn., and George Milleos, Riverdale, N.Y., assignors to Timex Corporation, Waterbury, Conn.

Division of Ser. No. 106,815, Dec. 26, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,757

Int. Cl.<sup>3</sup> A44C 5/18, 11/02

U.S. Cl. 24-265 WS

3 Claims



1. An expansible clasp for connecting the free ends of an elongated strap together, comprising:
  - (a) a housing elongated in the long direction of said strap, the housing having top and bottom walls connected together by spaced lateral side walls and having spaced ends transversely to the snap length, one of said ends defining an excess opening into the housing and an abutment wall and the other end being connected to one of the free strap ends, said top housing wall having a slot therethrough elongated along the strap length,
  - (b) an elongated sliding member disposed in the housing and adapted to slide into and out of the housing through said access opening for expansion purposes, said sliding member having means at the outer end adjacent said access opening for releasably connecting to the other free strap end and having at its opposite inner end an upturned shoulder extending through the elongated slot in the top wall of said housing with portions of said shoulder inside said housing forming an abutment wall in spaced, facing relation to the abutment wall of said housing end and portions terminating outside the housing forming a finger tab by which the sliding member can be manually slid out of the housing by the wearer to effect releasable engagement between the outer end of said sliding member and said other free strap end, and (c) spring means positioned in the housing between the spaced, facing abutment walls of said sliding member and housing end, the spring means being biased so as to urge the sliding member into the housing while permitting extension thereof out of said housing for expansion and engagement purposes.

4,414,715

**WIRE GRIP HOSE CLAMP**

Theodore R. Anjos, Shrewsbury; Robert F. Fay, York, both of Pa.; Robert H. Sebald, Baltimore, Md., and Henry T. Van Egmond, Grosse Pointe Woods, Mich., assignors to Murray Corporation, Cockeysville, Md.

Filed Apr. 8, 1981, Ser. No. 252,064

Int. Cl.<sup>3</sup> A43C 11/08; A44B 13/00

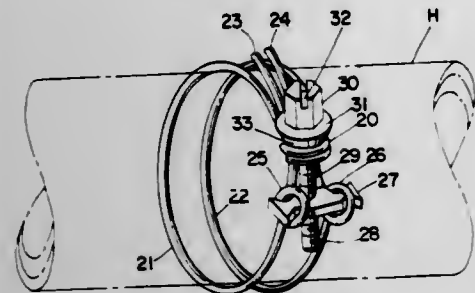
U.S. Cl. 24-283

4 Claims

1. In a wire loop hose clamp having a screw adapted to be tightened by a driving tool having a rotatable socket engageable with said screw, said clamp comprising a length of wire formed to provide a spiral grip loop and a pair of spaced hose-gripping circular portions which terminate in free ends disposed between said portions and extending substantially tangentially to said portions and tending to abut and exert disengaging pressure upon said socket when said socket is engaged with said screw, a nut interconnecting said hose-gripping portions, said screw having a stem extending through said spiral grip loop into threaded engagement with said nut, said screw having a head of polygonal configuration provided with an



annular base flange abutting and interposed between said free ends whereby said free ends are maintained in a spaced-apart relationship, said base flange being of substantially larger diameter than the distance between diametrically opposite corners



of said head, and said diameter preferably being at least equal to the outside diameter of said socket, whereby said flange isolates said socket from said free ends and said disengaging pressure of said free ends is transferred from said socket to said flange.

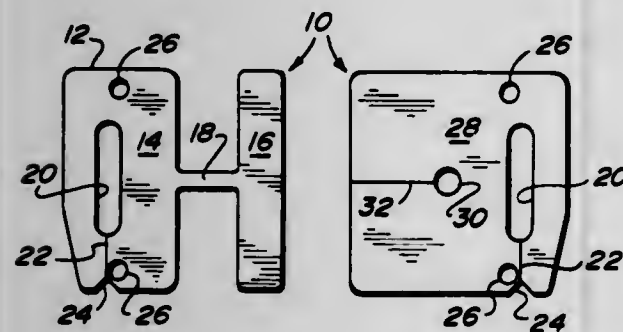
#### 4,414,716 GARMENT CLASPING DEVICE

Frank Stastney, 2nd & Dotts Sts., Apt. D-210, Pennsburg, Pa. 18073

Filed Oct. 5, 1981, Ser. No. 308,398  
Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 24—3 L

2 Claims



1. A clasp device for releasably securing small articles of clothing together for washing, storing or the like comprising:
  - (a) at least one flat, resilient H-shaped member, one leg of said H having at least one generally elliptical aperture therein and a divisionary cut extending from an edge of said member to said aperture, and said other leg providing the male fitting for
  - (b) a second, flat, resilient member having a generally elliptical aperture therein and a divisionary cut extending from an edge of said member to said aperture, said second member also including a second generally circular aperture and a second divisionary cut extending from an edge of said member to said second aperture, said second aperture providing the female fitting having said male member removably received therein, whereby said first and second members provide separable removably coupled garment claspers when a garment section is slipped within and along said cut by flexing said member at its cut edge and thereafter said garment is held by said member's rebounding.

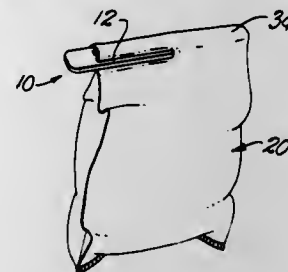
#### 4,414,717 CLOSURE CLIP FOR SNACK FOOD BAGS AND THE LIKE

David W. Payne, 7801 Juniper, Prairie Village, Kans. 66208  
Filed Aug. 12, 1981, Ser. No. 292,233

Int. Cl.<sup>3</sup> B65D 77/10, 33/16

U.S. Cl. 24—30.5 R

21 Claims



1. A clip for fastening closed a bag or the like comprising: a unitary, multi-slotted body having at least three elongated, juxtaposed, at least generally equally spaced apart members including at least one long member and a short member which is longitudinally fixed in position relative to the other members, said short member being approximately 40% to 70% of the length of said long member; and means integrally interconnecting said members adjacent a common end thereof, the ends of said members remote from said interconnecting means being free, the ratio of the length of said long member to the width of said clip at its widest point being not less than about 3 to 1, said members cooperating to define a pair of elongated, bag-receiving slots therebetween, each of which has substantially parallel, non-diverging lateral extremities throughout the length thereof for properly confining respective portions of a bag when attached thereto.

#### 4,414,718 SEPARABLE SLIDE FASTENER

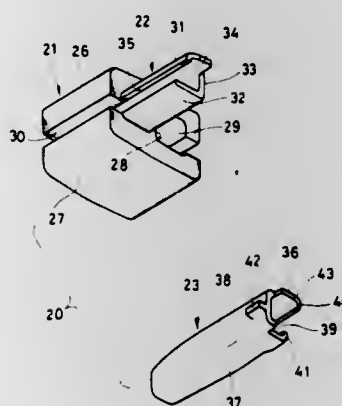
Isamu Kumano, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,318

Claims priority, application Japan, May 7, 1981, 56-65137[U]  
Int. Cl.<sup>3</sup> A44B 19/00

U.S. Cl. 24—396

4 Claims



1. A separable slide fastener, comprising:
  - (a) a pair of stringer tapes each carrying on its one longitudinal edge a row of continuous coupling elements of thermoplastic synthetic resin, each said coupling element having a coupling head, a pair of spaced legs extending from said coupling head in a common direction, and a connector extending from one of said legs to one leg of an adjacent coupling element;
  - (b) sewing stitches securing said rows of coupling elements to the respective stringer tapes; and

- (c) a separable terminal assembly comprising a box and a box pin extending therefrom mounted on one of said stringer tapes at one end thereof, and a separable pin mounted on the other stringer tape at one end thereof and engageable with said box;
- (d) said connectors of the endmost coupling elements located adjacent to said pins being fused with the respective stringer tapes, said pins each having a pair of opposite plates disposed one on each side of the respective stringer tapes, one of said plates extending beyond the other plate to overlie each said fused endmost connector, said other plate terminating short of the fused endmost connector.

#### 4,414,719 WRISTWATCH ATTACHMENT WITH INTERCHANGEABLE END PIECES

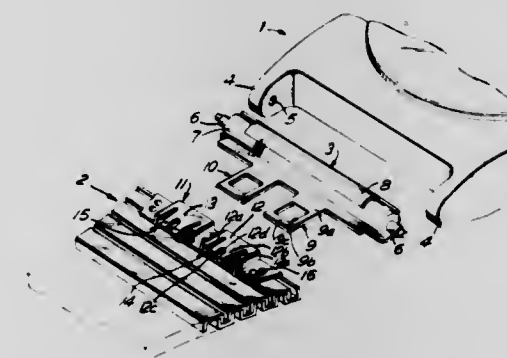
David F. Capolupo, Oakville, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 22, 1982, Ser. No. 360,142

Int. Cl.<sup>3</sup> A44C 5/14

U.S. Cl. 24—265 WS

2 Claims



1. An improved intermediate end piece for connecting a watchband to a watchcase having spaced lugs adapted to accommodate a conventional spring bar, said improvement comprising:
  - a retainer clip attached to the watchband having a first plate portion spaced from the watchband and defining at least one longitudinal passage therebetween,
  - an end piece member having a tubular section adapted to receive the spring bar and also having at least one longitudinal tongue adapted to slide into said passage, said tongue including a second plate portion enclosed between the first plate portion and the watchband;
  - at least one of said plate portions having an integral resilient tab defined therein biased toward the other plate portion, said resilient tab including a notch in the end thereof in order to facilitate entry of a tool for springing the tab to release the end piece, and
  - said other plate portion defining a notched out area arranged to receive said tab when said tongue is inserted in the passage and defining a transverse section preventing easy removal of the tongue due to interference with the tab.

#### 4,414,720 CRANIAL CLOSURE

Clarence Crooms, 19144 Coyle, Detroit, Mich. 48235

Filed Jul. 22, 1982, Ser. No. 400,809

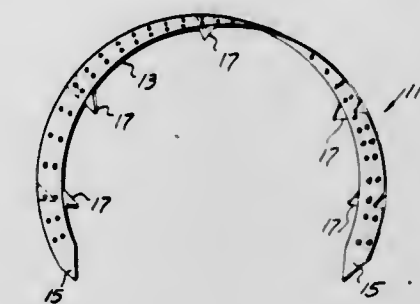
Int. Cl.<sup>3</sup> A01N 1/00

U.S. Cl. 27—21

2 Claims

1. A cranial closure comprising an elongated flexible metallic strip having a pair of opposing side edges and formed into U-shape between its ends; a plurality of longitudinally spaced opposed pairs of tapered tines projecting from said side edges and extending radially inward at right angles to said strip along its length and upon opposite sides thereof; and a pair of laterally spaced rows of longitudinally spaced

skin retaining spikes struck from said strip and extending radially inward thereof parallel to said tines; said strip adapted to overlie, span and extend along an incision of the cranium resulting from embalming, creating opposed registering skin sections of the scalp adjacent said incision and including sub tissue; the spikes retainingly extending through opposed registering



portions of said skin sections holding them substantially drawn together to close said incision, said tines retainingly projecting through adjacent skin sections and adjacent sub tissue for anchoring said strip upon said cranium; said strip being arcuate for substantial cooperative registry with the cranium, said tines and spikes being pointed; said tines being longer than said spikes with the respective ends extending radially outward thereof.

#### 4,414,721 OCCLUSIVE CLIP AND APPLICATOR FOR CONSTRICTING FLEXIBLE TUBULAR MEMBERS

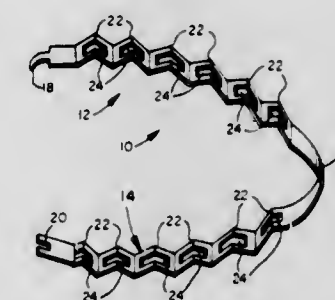
Charles A. Hufnagel, 4900 Massachusetts Ave., NW., Washington, D.C. 20016

Filed Nov. 7, 1980, Ser. No. 204,831

Int. Cl.<sup>3</sup> A61B 17/12, 17/00

U.S. Cl. 128—325

16 Claims



1. An occlusive clip configured to be compressed about and constrict a flexible tubular member, comprising a pair of opposed strip-like clamping legs hingedly interconnected at one end and adapted to receive a tubular member therebetween, the opposed inner surfaces of said legs being corrugated to present undulating surfaces of crests and valleys extending generally transversely of the length of said legs with the crests and valleys of one leg being prearranged with respect to the crests and valleys of the other leg, and at least one slot means in each of said legs for providing a relief area for the material of the compressed tubular member to stabilize the clip and prevent migration thereof.



4,414,722

**METHOD FOR THE MANUFACTURE OF ELECTRICAL COMPONENTS ESPECIALLY LAYER CAPACITORS**  
Ulrich Wehnelt, Söcking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

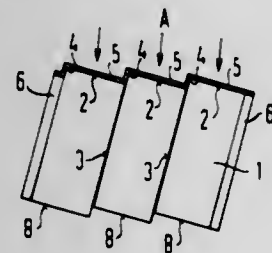
Filed Jun. 4, 1981, Ser. No. 270,223

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021786

Int. Cl.<sup>3</sup> H01G 4/32

U.S. Cl. 29—25.42

2 Claims



1. Method for the manufacture of layer capacitors with dielectric layers of glow polymerisate, which comprises sawing apart an unmetallized electrically insulating tape having smooth surfaces to form a plurality of separate strip-shaped carriers with smooth surfaces and relatively rough separating surfaces formed by the sawing operation, placing a plurality of the carriers against each other in such manner that their separating surfaces formed by the sawing are exposed, offsetting the carriers relative to each other perpendicularly to the separating surfaces to expose edges of the smooth surfaces of the carriers maintaining the plurality of carriers in the positions achieved by said placing and offsetting operations, while said plurality of carriers are so maintained, coating the two opposite surfaces of the carriers resulting from said separation from the tape and also the exposed edges of the carriers by applying contact layers of a metal which will not soften during later contacting of the metal, and subsequently metallizing a smooth unmetallized surface of each carrier by applying a metal layer thereto which overlaps at least one of the contact layers and forms with the latter an electrically conducting connection.

4,414,723

**ADJUSTABLE CYLINDER HEAD HOLDER**

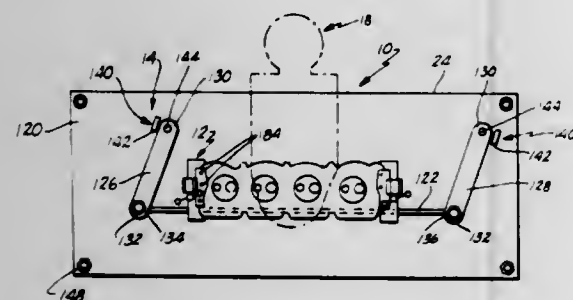
James A. Kammeraad, Holland, Mich., and Ronald L. Tiger, Joplin, Mo., assignors to K-Line Industries, Inc., Holland, Mich.

Division of Ser. No. 94,453, Nov. 15, 1979, abandoned. This application Jun. 11, 1981, Ser. No. 272,715

Int. Cl.<sup>3</sup> B23Q 3/04

U.S. Cl. 29—26 A

9 Claims



1. An apparatus for supporting a cylinder head in position beneath a drill press during boring of the head valve guides, the drill press including a vertical post and a head, said apparatus comprising:

- a base plate positionable below the drill press head;
- a pair of transversely spaced, opposed cylinder head stand means for supporting a cylinder head, each of said stand means including means for permitting rotational and

means for permitting angular positional adjustment of the cylinder head in a single vertical plane about two perpendicularly related axes; and

positioning means on said plate and supporting said pair of stand means for permitting selective positioning of said pair of stand means to valve guide boring positions beneath the drill press head, said pair of stand means being laterally shiftable on said base plate by said positioning means to permit alignment of each valve guide of the cylinder head with the drill press.

4,414,724

**TOOL CHANGING MECHANISM**

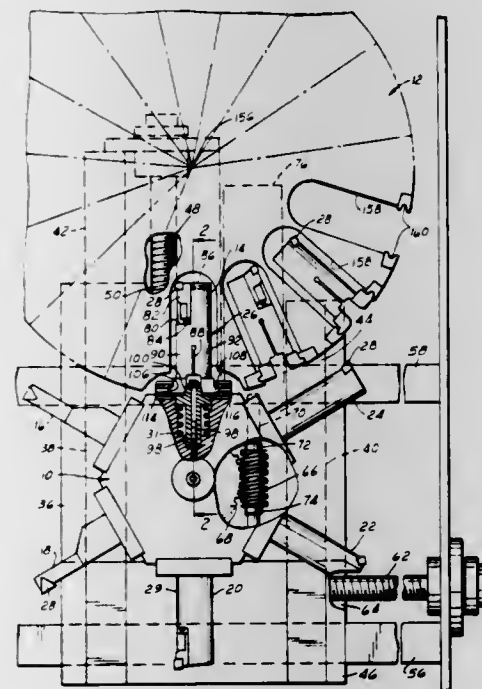
Donald W. Garnett, Grand Ledge, Mich., assignor to The Olofsson Corporation, Lansing, Mich.

Filed Jun. 24, 1981, Ser. No. 276,806

Int. Cl.<sup>3</sup> B23B 29/24

U.S. Cl. 29—39

21 Claims



1. Apparatus for holding a tool on the turret of a machine such as a boring or turning machine comprising spaced tool retaining means on said turret, spreading means on said turret between said retaining means and shiftable between advanced and retracted positions, a tool bar slotted at one end to provide a pair of legs and disposed in a position such that its legs are between said retaining means and adjacent to said spreading means, and means for shifting said spreading means to its advanced position to engage and spread said legs into engagement with said retaining means.

4,414,725

**METHOD FOR TURBOCHARGER REPAIR**

Steve Breitweiser, 744 N. 2nd Ave., Villa Park, Ill. 60181, and David Nelson, 210 N. Broadway, Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 28,072, Apr. 9, 1979, abandoned. This application Feb. 4, 1981, Ser. No. 231,401

Int. Cl.<sup>3</sup> F02B 37/00

U.S. Cl. 29—156.4 R

3 Claims

1. The method for repairing a failed engine turbocharger having a turbine section, a compressor chamber section connected into the fuel/air engine intake conduit and a turbine/compressor cartridge, which comprises the steps of temporarily converting the engine to a naturally aspirated engine by first removing the cartridge from the turbocharger leaving said turbine section open to the atmosphere and the fuel/air engine intake conduit open to the atmosphere, then closing the opening thereby left in the turbine section by fastening a plate over

said opening and providing connection means completing the fuel/air conduit to the engine, and thereafter removing the

brackets each including a first portion for securing relative to the ceiling of the bedroom substantially above a corner of the bed, a second portion pivotal relative to said first portion and

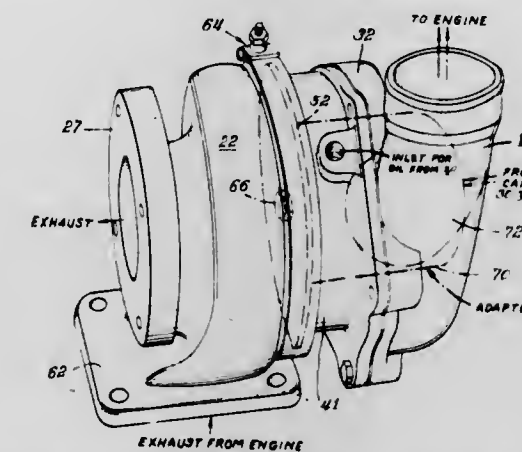


plate and the connection means and installing an operative cartridge to complete the repair of the turbocharger.

4,414,726

**METHOD OF MANUFACTURING CLEVIS END CONNECTING ROD**

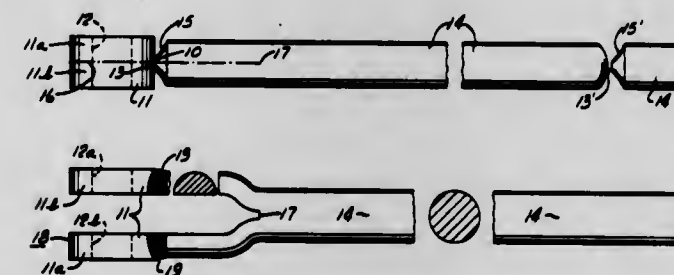
Roland E. Cale, Jr., 732 Lakeview Ave., Cortland, Ohio 44410

Filed Jul. 16, 1981, Ser. No. 283,945

Int. Cl.<sup>3</sup> B23P 15/00; B23K 31/00

U.S. Cl. 29—156.5 A

9 Claims



1. A method of manufacturing a metal rod connecting member having at least one bifurcated clevis end with aligned transverse bores to receive a connecting or clevis pin therethrough, comprising the steps of positioning an outside side surface of a metal eye member having a bore therethrough against one end of a metal rod with the bore running transverse to said rod, circumferentially welding said one rod end to said eye member side surface, thereafter transversely cutting said eye member in half to provide a gap therebetween in line with the axis of said rod, then axially cutting said one end of said rod to a predetermined depth to provide a bifurcated rod end and a bifurcation gap aligned with said gap between said eye member halves, and then spreading and re-shaping said bifurcated rod end to form a clevis end with the bores of said eye member halves in spaced alignment to receive a clevis pin.

4,414,727

**KIT FOR CONVERTING A BED INTO A FOUR-POSTER**

Ronald Steele, Cramlington, England, assignor to Development & Finance Limited, The Isle of Man, Isle of Man

Filed Nov. 18, 1981, Ser. No. 322,427

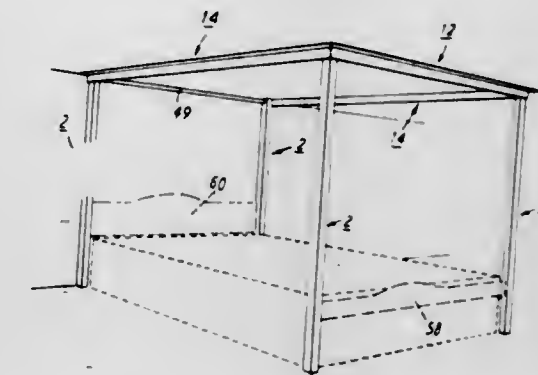
Claims priority, application United Kingdom, Nov. 24, 1980, 8037634

Int. Cl.<sup>3</sup> B23P 7/00; A61J 19/00; A61F 9/00

U.S. Cl. 29—401.1

7 Claims

1. A kit of parts for converting a bed in a bedroom into a four-poster, the kit of parts comprising at least three pelmets for securing to the ceiling of the bedroom, one to extend substantially above and the length of each side of the bed and one to extend substantially above and across the bottom end of the bed, four corner posts, one for each corner of the bed and each of a length just less than the height of the bedroom, and four



adapted to receive thereon the upper end of an associated corner post, and resilient means reacting between said bracket and the upper end of the associated corner post to urge the lower end of said post towards the floor of the bedroom.

4,414,728

**WHEEL RIM APPARATUS AND METHOD**

Charles R. Ford, and Stephen L. Gatsos, both of Indianapolis, Ind., assignors to Indus Wheel Company, Cincinnati, Ohio

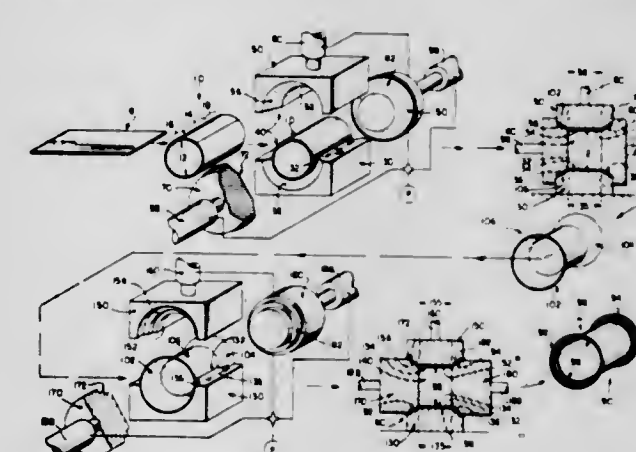
Continuation of Ser. No. 61,829, Jul. 30, 1979, abandoned. This

application May 20, 1981, Ser. No. 265,668

Int. Cl.<sup>3</sup> B21H 1/10; B21K 1/38

U.S. Cl. 29—159.1

13 Claims



1. A method of forming a wheel rim from a wheel rim blank having a well center region separating axially spaced wheel bead seat regions, the well center region of the blank having a finished diameter, consisting of a first step of simultaneously confining the well center region of the blank to maintain the finished diameter thereof and flaring the bead seat regions of the blank on each side of the well center region, and a second step of simultaneously confining the well center region of the blank to maintain the finished diameter thereof and final fashioning the flared bead seat regions to form a bead seat on each side of the well center region.

4,414,729

**TOOL AND METHOD FOR CROWNING TEETH**

Robert R. Ridley, Pontiac, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 1, 1981, Ser. No. 268,971

Int. Cl.<sup>3</sup> B21D 17/02, 53/28; B23P 13/00, 15/14

U.S. Cl. 29—159.2

3 Claims

1. A tool for pressure forming teeth on a cold rolled cylindrical member comprising a tooth forming rack having a tooth forming working surface having a leading edge and a trailing edge, said tooth forming rack including an undercut surface on the trailing end thereof having an insert supporting surface extending in spaced apart non-intersecting relation with the



tooth forming working surface, an insert supported on said undercut surface including side edges thereon with an insert working surface therebetween and having a plurality of pre-formed teeth extending in length toward the side edges on the working surface of the insert each having pre-formed straight ground tips, and means on said insert for deforming the pre-formed teeth on the working surface of the insert into a concave shape for producing a continuous concave curvature along the length of the teeth of the insert from one of said side edges to the other including intermediate insert portions therebetween such that said deforming means exerts a force on the insert in a transverse plane substantially normal to said undercut surface so that as the leading edge of the rack passes with respect to a part to be cold rolled by the tool the concave curvature of the teeth will form a predetermined true curvature crown on each tooth rolled on the cold rolled part.

3. An improved method for cold forming transversely directed uniform cross-section teeth along the length of a cylindrical part with a tooth forming rack including the steps of



pre-forming an insert to have a flat working surface thereon, grinding pressure forming teeth across the working surface by a grinding wheel following a straight line with respect to the depth of the working surface of the insert, providing the trailing end of a tooth forming rack having a tooth forming working surface with an undercut support surface extending in spaced apart non-intersecting relation with the tooth forming working surface, locating the insert at said trailing end of the tooth forming rack on said undercut support surface thereof and shaping the working surface of the insert by exerting a force on said insert in a direction substantially normal to the undercut support surface to cause the teeth to have a uniform concave curvature transversely along the length of the teeth thereof from one side to the opposite side of the insert and intermediate insert portions therebetween and moving the rack insert relative to the outer surface of a cylindrical cold rolled part with the axis of the part substantially parallel with the length of the teeth to produce a resultant uniformly crowned tooth on the cold rolled part along the length of each pressure formed tooth formed by the working teeth of the insert.

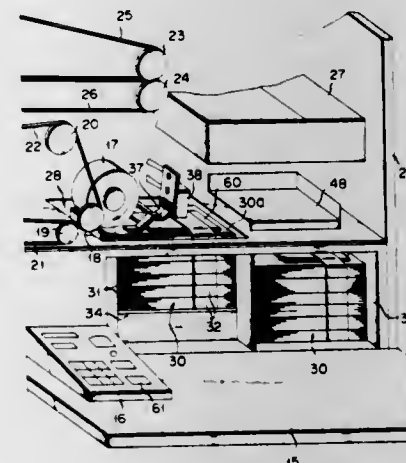
#### 4,414,730 METHOD FOR PROCESSING PAPER SHEETS OF BANDED PAPER SHEET BUNDLES AND A PROCESSING MACHINE THEREFOR

Hideo Ohmura, and Shigeo Horino, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 18, 1981, Ser. No. 303,491  
Claims priority, application Japan, Sep. 22, 1980, 55-132141;  
Oct. 2, 1980, 55-137910; Oct. 13, 1980, 55-142735  
Int. Cl.<sup>3</sup> B23P 19/00

U.S. Cl. 29—426.3

25 Claims



1. A method for processing paper sheets of paper sheet bundles each tied up with a band including steps of successively locating banded paper sheet bundles in layers in a setting section and removing the paper sheets of each located bundle from said setting section, the improvement which comprises steps of:

- attaching a to-be-detected medium bearing common detection information to each said bundle;
- disposing a detecting means over said setting section so as to detect the to-be-detected medium attached to the bundle which has reached said setting section;
- removing the band from the bundle located in said setting section;
- storing the removed band in a storing section; and
- removing the paper sheets one by one from the bundle having its band removed according to step (c); and
- detecting the to-be-detected medium attached to the next successive bundle by said detecting means after all the paper sheets of the bundle located in said setting section have been removed according to step (e) to once stop the delivery of the paper sheets.

#### 4,414,731 METHOD OF MANUFACTURE OF RAISED RELIEF ILLUMINATED GLOBE

Wolfgang J. Riemer, Chicago, Ill., assignor to Replogle Globes, Inc., Chicago, Ill.

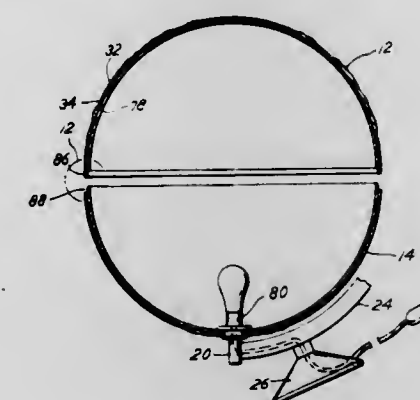
Division of Ser. No. 135,538, Mar. 31, 1980, Pat. No. 4,300,887.  
This application Jun. 4, 1981, Ser. No. 270,494  
Int. Cl.<sup>3</sup> B29D 9/00; B29C 17/04, 27/00

U.S. Cl. 29—453

6 Claims

1. A method for forming at least a portion of a globe in relief, comprising, in combination:
- imprinting a flexible, plastic sheet with a predetermined two-dimensional printed pattern;
  - stretch-forming said sheet into a generally concave, flexible curved form, said form having an outer surface and an inner surface;
  - positioning the stretch-formed sheet in a mold cavity, having a generally concave surface conforming generally to the form of said sheet and including relief areas, with

- the outer surface of said sheet in opposed relation to mold surfaces defining said cavity;
- subsequently orienting printed areas of said stretch-formed sheet with respect to corresponding said relief areas;
  - positioning a mold core in spaced relation to the inner surface;



- subsequently injecting a hardenable material intermediate said inner surface and the mold core and forcing the stretch-formed sheet to deform permanently into the relief areas of the mold defining said mold cavity by pressure of the injection material on the inner surface; and
- hardening said hardenable material to maintain the sheet in a form having relief areas conforming with the mold cavity pattern with said printed pattern substantially in register with said relief areas.

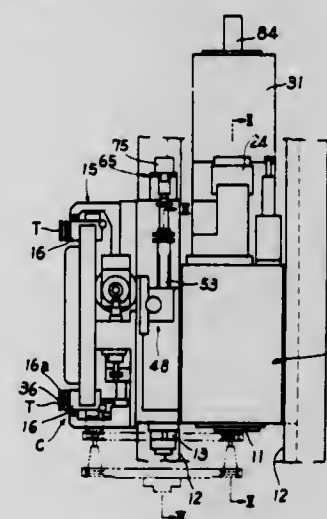
#### 4,414,732 MACHINE TOOL WITH AUTOMATIC TOOL CHANGE FUNCTION

Tamaki Tomita, Okazaki; Yoshikazu Sano, Kariya, and Kunimichi Nakashima, Anjo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 2, 1981, Ser. No. 250,101  
Int. Cl.<sup>3</sup> B23Q 3/157

U.S. Cl. 29—568

13 Claims



1. In a machine tool with an automatic tool change function having a tool spindle rotatably supported and capable of receiving a tool at one end thereof, the improvement comprising:
- a key fixedly mounted on one end of said tool spindle;
  - a key-way formed on said tool;
  - tool support means for rotatably supporting at least one tool to selectively insert and remove said at least one tool into and from said tool spindle;
  - control means responsive to a tool change command for rotating said tool spindle at a predetermined speed suitable for the engagement of said key with said key-way;
  - operating means for causing relative movement between said tool support means and said tool spindle in an axial direction of said tool spindle for a tool change operation

- with said tool spindle being rotated at the predetermined speed;
- stopping means for stopping said relative movement between said tool support means and said tool spindle at a predetermined position in the axial direction of said tool spindle before said key comes into engagement with said key-way;
- first detecting means for detecting a first predetermined angular position of said key relative to said key-way to thereby generate a first signal; and
- releasing means responsive to said first signal for permitting said relative movement between said tool support means and said tool spindle.

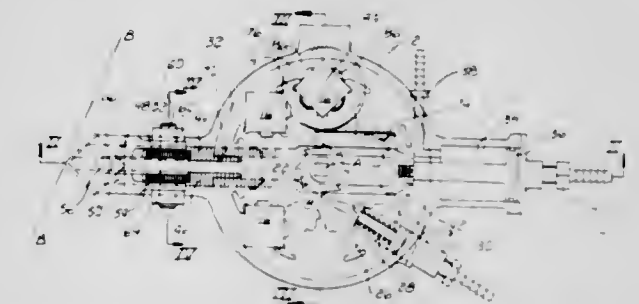
#### 4,414,733 MACHINE TOOL INSERT DISPENSER

Adam M. Janotik, Grosse Ile, and Lawrence P. Kazyak, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1981, Ser. No. 265,744  
Int. Cl.<sup>3</sup> B23Q 3/155

U.S. Cl. 29—568

8 Claims



1. A dispenser for supplying cutting tool inserts each insert having multiple cutting edges for use in machining comprising:
- a magazine mounted for rotation about an axis, adapted to carry a plurality of inserts at spaced locations, the cutting edges occupying fixed positions with respect to reference positions;
  - a rack mounted for reciprocating movement;
  - a first piston reciprocating within a cylinder and connected to the rack;
  - clamping means drivably engaged with the rack, rotatable as the rack moves, adapted to grip and hold an insert carried on the magazine, to remove an insert from the magazine and to return the insert to the magazine as the piston moves;
  - a second piston within a cylinder;
  - a surface adapted to rotate about an axis, movable into contact with an insert carried on the magazine whereby the insert is transferred from the magazine onto the surface as the second piston moves;
  - means for rotating the insert with respect to its reference position while the insert is supported on the surface so that another cutting edge of the insert is brought into alignment with the reference position;
  - means for transferring the insert from the support surface onto the magazine;
  - a gear wheel fixed to the third piston drivably engaged with the rack and adapted to rotate the surface as the first piston moves; and
  - means for incrementally advancing the position of the magazine with respect to the clamping means whereby each insert is sequentially removed from the magazine.



4,414,734

## TRIAD FOR ROCK BIT ASSEMBLY

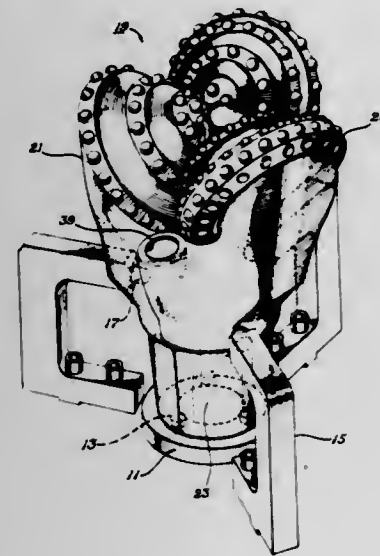
Gerald O. Atkinson, Pasadena, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Nov. 30, 1981, Ser. No. 326,083

Int. Cl.<sup>3</sup> B23K 31/00, 37/04; B23Q 3/18

U.S. Cl. 29—464

5 Claims



1. A method of positioning bit sections for welding, each section having faces intersecting each other at 120 degrees to provide a centerline, comprising:  
 providing a hole in each bit section at the centerline; and  
 providing a locking member having three pins joined together at a common point;  
 inserting each pin of the locking member into one of the holes and clamping the sections together.

4,414,735

## PROCESS FOR MAKING CONDUCTOR ELEMENT WITH DOUBLE CONTACT FACE

Raymond Buisson, Chabeuil, France, assignor to Crouzet, Paris, France

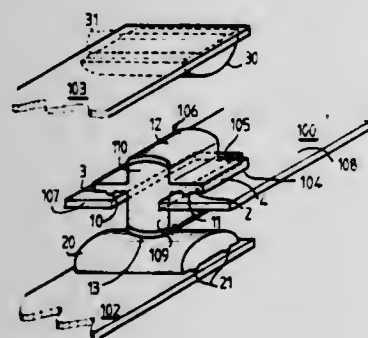
Filed Apr. 16, 1981, Ser. No. 254,852

Claims priority, application France, Apr. 16, 1980, 80 08506

Int. Cl.<sup>3</sup> H01R 43/02

U.S. Cl. 29—879

6 Claims



1. A process for making a conductor element having a movable conductor blade and a double contact carried by the blade, which comprises cutting out a multimetallic portion from a prefabricated section, said portion having a pair of contacts thereon; cutting out a notch in one end of said blade; introducing said portion into said notch, whereby said portion extends away from opposite sides of said blade; abutting said portion against the edges of said notch; and securing said portion to said blade with said contacts on either side of said blade.

4,414,736

## INSERTION AND EXTRACTION TOOL FOR CONNECTOR TERMINALS

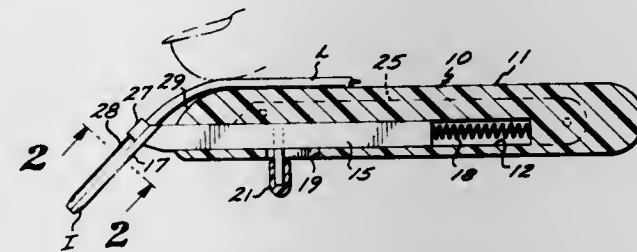
Russell F. Fieberg, Westminster, and Donald E. Fieberg, Sunset Beach, both of Calif., assignors to Russtech Engineering Company, Inc., Huntington Beach, Calif.

Filed Nov. 23, 1981, Ser. No. 324,155

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—747

1 Claim



1. A tool for inserting and withdrawing electrical leads in the body of a multiple lead connector comprising:  
 an elongate handle of substantially rectangular form provided with a longitudinal groove in one lateral surface thereof, said groove communicating through one end of said handle and terminating in an urging surface proximate the other end of said handle, said handle including an arcuate opposing surface formed on one edge thereof proximate said one end and a slot transversely extending through the other edge into the interior of said groove;  
 a substantially rectangular slide received in said groove for longitudinal translation therein, said slide including an end extension projecting through said one end of said handle and having an arcuate seat at the end thereof;  
 a helical spring received between said slide and said urging surface of said groove for urging said slide to extend outwardly from said one end of said handle;  
 a post attached to said slide and aligned to extend through said slot for manual articulation of said slide along a longitudinal motion segment determined by the width of said slot;  
 an elongate plate attached to said handle in alignment over said groove for retaining said slide in the interior thereof, said plate including an end projection extending along said slide beyond said one end of said handle and having an arcuate end segment aligned in opposition to said seat;  
 a first and second tubular section respectively fixed to said arcuate end segment and to said arcuate seat to extend in cantilever therefrom, said first and second sections cooperating to form a tubular structure conformed to retain said electrical leads when opposed relative each other and to release said leads when separated, said tubular sections being aligned to guide said leads over said arcuate opposing surface to be compressed thereat by the fingers of a user of said tool; and  
 detent means connected to said slide for fixing the sliding extension thereof in said opposing and separated alignments.

4,414,737

## PRODUCTION OF SCHOTTKY BARRIER DIODE

Atsuhiko Menjo, and Shinji Saitoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,588

Claims priority, application Japan, Jan. 30, 1981, 56-12742; Jan. 30, 1981, 56-12768; Jan. 30, 1981, 56-12769

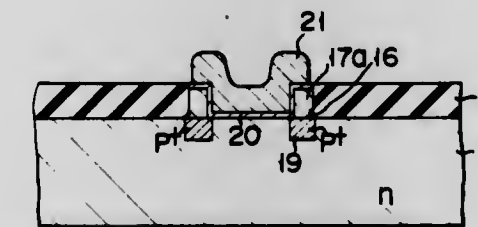
Int. Cl.<sup>3</sup> H01L 21/225

U.S. Cl. 29—578

9 Claims

1. A method of manufacturing a Schottky barrier diode comprising:

forming an insulating layer on the surface of a semiconductor substrate of a first conductivity type;  
 forming a first opening in said insulating layer, partly exposing the surface of said substrate;  
 forming a continuous semiconductor layer doped with an impurity of a second conductivity type opposite to said first conductivity type over said insulating layer and on said exposed substrate surface in said first opening;  
 etching said doped semiconductor layer in the direction of thickness thereof until those portions which lie on the insulating layer and the exposed surface of the substrate



are removed to provide as a diffusion source a portion of said doped semiconductor layer remaining on the side wall of said insulating layer which defines said first opening and also form a second opening partly exposing said semiconductor substrate surface within said first opening; causing diffusion of said impurity from said diffusion source into said semiconductor substrate to form a guard ring region therein; and  
 forming a metal layer on said exposed semiconductor substrate surface within said second opening, said metal layer forming a Schottky barrier with said semiconductor substrate.

4,414,738

## OPTICAL LITHOGRAPHIC TECHNIQUE FOR FABRICATING SUBMICRON-SIZED JOSEPHSON MICROBRIDGES

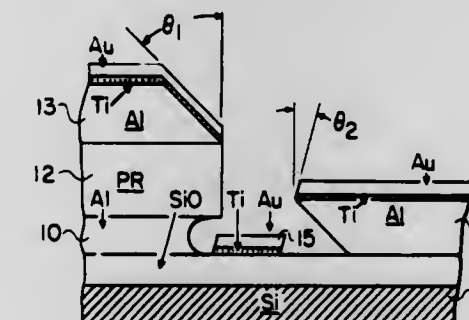
Edward C. Jelks; George L. Kerber, and Howard A. Wilcox, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,246

Int. Cl.<sup>3</sup> H01L 39/22

U.S. Cl. 29—579

10 Claims



1. A method of fabricating planar, Josephson microbridge devices and arrays of microbridge devices each microbridge device having a bridge dimensioned with a length and width each less than 0.3 micrometer and which extends between a first superconducting electrode and a second superconducting electrode all of which are disposed on a planar substrate, comprising:

depositing a first layer of a metal on the substrate;  
 disposing a first photoresist layer on top of at least a portion of the deposited first metal layer;  
 etching the first deposited metal layer to undercut the photoresist layer;  
 depositing a second metal layer on the substrate to define a submicron wide exposed substrate strip next to and beneath the photoresist layer, the depositing of the second

metal layer is at a first acute angle to the normal of the substrate over the upper edge of the photoresist layer to define the dimensions of the exposed substrate strip;  
 depositing the microbridge material on the exposed substrate strip to produce the submicron-sized microbridge, the depositing of the microbridge material is at a second acute angle to the normal of the substrate over the upper edge of the second deposited metal layer and under a lower exposed edge of the photoresist layer to define the lateral dimensions of the submicron-sized microbridge;  
 dissolving the photoresist layer; and  
 stripping away the first and second metal layers of the substrate to leave the submicron-sized bridge on the substrate, the submicron-sized bridge is included in a microbridge device by depositing the first and second superconducting electrodes along the submicron-sized microbridge to assure the creation of a submicron gap between the electrodes.

4,414,739

## APPARATUS FOR HYDRAULICALLY FORMING JOINTS BETWEEN TUBES AND TUBE SHEETS

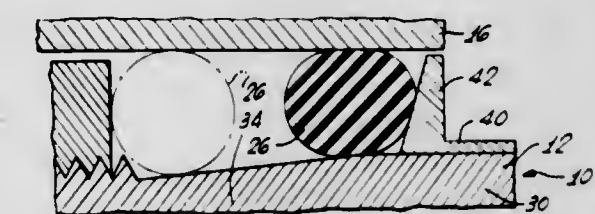
John W. Kelly, Burbank, Calif., assignor to Haskel, Incorporated, Burbank, Calif.

Filed Dec. 19, 1980, Ser. No. 218,431

Int. Cl.<sup>3</sup> B23P 15/26

U.S. Cl. 29—727

18 Claims



1. A swaging apparatus for expanding a tube disposed within a tube sheet to form a joint, said apparatus comprising:  
 a mandrel body for insertion in said tube;  
 inner and outer seal members carried by said body at axially spaced-apart locations to define a volume between said body and said tube bounded at opposite ends by said seal;  
 a ramp defined by said body and tapered radially inwardly toward said inner seal member, said ramp being adapted to permit said outer seal member to move therealong toward said inner seal member, thereby allowing said outer seal member to slide along said tube with reduced frictional forces as said mandrel body is inserted; and  
 means for urging said outer seal member to move axially toward said inner seal member as said mandrel body is inserted in said tube.

4,414,740

## INSULATION-PIERCE AND CRIMP TERMINATION TOOL

John P. Nijman, Scarborough, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 42,465, May 25, 1979, Pat. No. 4,264,118, which is a continuation of Ser. No. 897,076, Apr. 17, 1978. This application Nov. 6, 1980, Ser. No. 204,612

Int. Cl.<sup>3</sup> H01R 43/04

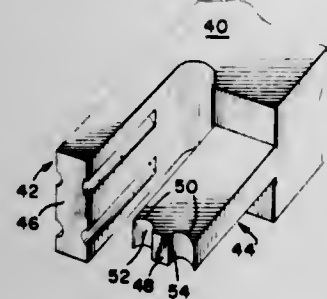
U.S. Cl. 29—751

1 Claim

1. A tool for terminating an insulated conductor in an insulation-piercing terminal portion of an electrical contact, said terminal portion being disposed within a connector insert cavity and including an elongated channel having side walls and a bottom wall with an upwardly extending insulation-piercing means, said tool comprising:  
 a bifurcated termination head including an insertion member and a crimping member, said insertion member having a generally planar end face for engaging a longitudinal



portion of said conductor and for properly positioning said conductor and terminal portion within said cavity for a subsequent crimping operation, and said crimping member having an end face including means for cutting portions of said side walls at a location coincident with said



insulation-piercing means and means for folding said side wall portions onto said conductor to mechanically retain said conductor in insulation-piercing and electrical engagement with said contact terminal portion, said insertion member and said crimping member operating simultaneously on adjacent contacts in the same connector.

#### 4,414,741 PROCESS FOR INTERCONNECTING COMPONENTS ON A PCB

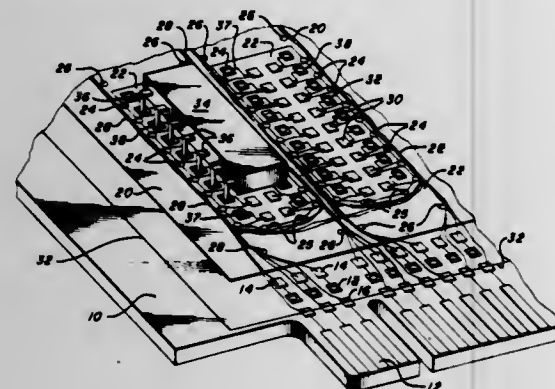
Richard C. Holt, Fairhaven, Mass., assignor to Augat Inc., Mansfield, Mass.

Filed May 22, 1981, Ser. No. 266,620

Int. Cl.<sup>3</sup> H05K 3/30

U.S. Cl. 29—837

8 Claims



1. A process for installing and interconnecting components on a printed circuit board comprising:  
interconnecting terminal pads on a single printed circuit board side with a network of wires routed in groups around selected upwardly projecting removable guide pins along pathways which exclude portions of the printed circuit board apertured to receive electrical leads from printed circuit board components;  
removing said removable guide pins;  
covering the network of interconnection wiring thus formed with a layer of material to adhere them to the circuit board;  
installing electrical components on said circuit board on the same side as the covered network of interconnecting wires with the electrical leads therefrom protruding the circuit board apertures to the opposite side thereof;  
applying an electrical interconnection medium to the side of said circuit board opposite to the one having said network of wires to provide electrical connection of the leads from said components to said terminal pads through said apertures.

#### 4,414,742 METHOD OF MAKING COMPOSITE ELECTRICAL CONTACT

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Tokyo, Japan

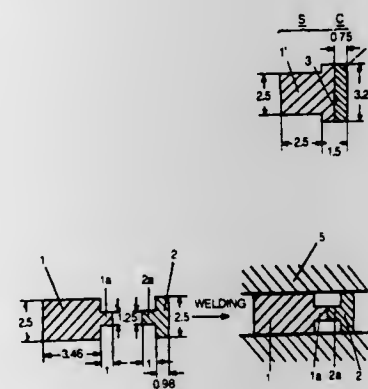
Filed Nov. 21, 1980, Ser. No. 208,827

Claims priority, application Japan, Nov. 22, 1979, 54-150665

Int. Cl.<sup>3</sup> H01R 43/04

U.S. Cl. 29—882

4 Claims



1. A method of making a composite electrical contact from a plurality of cut wires, including wires of different materials, by cold welding: which comprises providing at least one end of one of said wires of a first material with at least one projection which is smaller in diameter than the diameter of said one end of said one wire, locating said one end of said one wire and said projection within a die cavity having a diameter which corresponds to the diameter of said one end of said one wire, and with said projection abutting one end of another wire of a second material, and subjecting said wires to force along their axial directions to expand the projection outwardly over the abutting surfaces and thereby binding said surfaces together along an interface lying in a plane extending transversely of the axes of said wires.

#### 4,414,743 CIRCULAR SAW

Peter P. Pioch, Idstein, and Annette Schober, Niederams, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

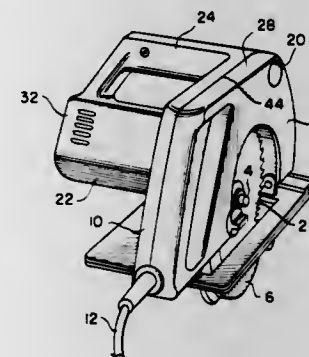
Filed Dec. 10, 1981, Ser. No. 329,218

Claims priority, application United Kingdom, Dec. 11, 1980, 8039712

Int. Cl.<sup>3</sup> B26D 7/06

U.S. Cl. 30—124

14 Claims



1. A portable circular saw or the like comprising:  
a saw-blade compartment for accommodating a circular saw-blade;  
a motor compartment secured to the saw-blade compartment and projecting transversely therefrom;  
a motor in the motor compartment for driving the saw-blade;  
a rear handle extending rearwardly from the saw-blade compartment;

a forward handle connected to the saw-blade compartment and projecting transversely therefrom on the same side thereof as said motor compartment;  
said saw blade compartment, said motor compartment, said rear handle and said forward handle being formed from three separate housing parts;  
the first of said housing parts forming one side of said rear handle, and a portion of said saw-blade compartment;  
the second of said housing parts forming the other side of said rear handle, a portion of said motor compartment, another portion of said saw-blade compartment, and a portion of said forward handle, said first and second housing parts abutting each other; and  
the third of said housing parts forming the remainder of said motor compartment, the remainder of said forward handle, and the remainder of said saw-blade compartment, said third and first housing parts abutting each other, and said third housing part abutting said second housing part along a plane transverse to the plane of rotation of the circular saw-blade.

said dog when said pommel engaging member is in non-locking position; and  
wherein said pommel engaging member further includes a slot extending parallel to the axis of said hinge and sized to permit said other end of said spring to project there-through on movement of said pommel engaging member to said locking position.

#### 4,414,745 GUIDING ARRANGEMENT FOR A HAND TOOL

Gerhard Kuhlmann, Stuttgart, and Erwin Wolf, Weissach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

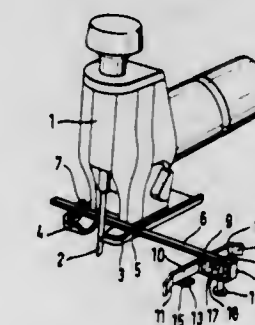
Filed Aug. 31, 1981, Ser. No. 298,164

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 8024714

Int. Cl.<sup>3</sup> B23D 51/04

U.S. Cl. 30—373

6 Claims



1. A guide arrangement for a hand saw with a blade having teeth with tips, comprising a tool support; a guide element connectable to said support; a guide rail secured to said element and adapted to abut an edge of a workpiece when a straight parallel cut is produced; said guide element having a strip-like shape and formed with a loop-like end portion rigidly connected to said guide rail, said guide rail extending normal to the elongation of said guide element and including two projections extending parallel to said guide element and provided with two openings, respectively; and a centering pin threadably releasably insertable in one of said openings selectively, said centering pin having such a length that when it is inserted into one of said openings it projects past said guide element towards the surface of the workpiece to enable the tool to produce a circular cut, said two openings being equally spaced from said strip-like guide element by a distance which corresponds to the distance between the tips of the teeth of the saw blade and said strip-like guide element along a line parallel to the guide rail.

#### 4,414,746 LINEAR SCALE TYPE MEASURING INSTRUMENT

Kinji Takizawa, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

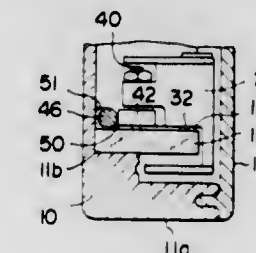
Filed Feb. 23, 1981, Ser. No. 236,920

Claims priority, application Japan, Feb. 27, 1980, 55-24766[U]

Int. Cl.<sup>3</sup> G01B 7/02, 11/02

U.S. Cl. 33—125 C

5 Claims



1. In combination a knife having a handle terminating in a projecting pommel and a blade, a sheath having a blade engaging portion and a hanger integral therewith, said hanger adapted to lie adjacent to said knife handle when the knife blade is inserted in said blade engaging portion, and lock means comprising a pommel engaging member, means pivotally supporting said pommel engaging member on said hanger and spring means selectively spring loading said pommel engaging member in either nonlocking or locking engagement with said pommel;  
wherein said means pivotally supporting said pommel engaging member includes a hinge supported in part by said hanger, and a dog integrally formed on said pommel engaging member adapted to be engaged by said spring;  
wherein said pommel engaging member comprises a rigid ring shaped to conform with and engage the periphery of said pommel and supported by said hinge for pivotal movement between a locking position in which the diameters of the ring are in a plane normal to the length of the knife when positioned in the sheath to a nonlocking position in which the diameters of the ring are in a plane substantially parallel to the length of the knife;  
wherein said dog extends normally from the plane containing the diameters of said ring;  
wherein said spring means comprises a leaf spring with one end secured to said hanger and the other engageable with

1. A linear scale type measuring instrument comprising a hollow case, a linear scale housed in said hollow case, a slider



movable on said linear scale and an index scale fixed to said slider facing to a graduated surface of said linear scale, characterized in that at least part of a travel guide mechanism of said slider includes at least two bearings rotatably supported on said slider and a guide bar, being circular in cross-section which is secured by a bonding agent to said hollow case and said linear scale along the longitudinal direction of said linear scale and abutting contact at the outer peripheral surface thereof with rotating members of said bearings, said rotating members being supported on said slider such that they are rotatable about their axes perpendicular to the graduated surface of said linear scale and engagable with said guide bar at portions longitudinally apart from each other, said slider being provided with sliding blocks which are slidably in contact with the graduated surface of said linear scale thereby to maintain a predetermined clearance between said linear scale and said slider.

4,414,747

## SURFACE DEVIATION MEASURING DEVICE

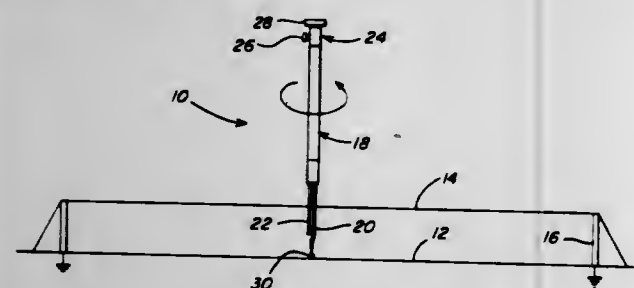
Samuel A. Face, Jr., and Samuel A. Face, III, both of P.O. Box 6341, Norfolk, Va. 23508

Filed Aug. 12, 1981, Ser. No. 292,145

Int. Cl.<sup>3</sup> G01B 7/28, 7/34

U.S. Cl. 33—174 P

11 Claims



11. In combination with electrical meter means for measuring resistance representing the spacing between a test surface and an electrically conductive datum line, a pair of elongated electrical elements connected to the meter means, supporting frame means for holding the elongated electrical elements in spaced relation to each other, and non-conductive means pivotally connected to one of the elements and engageable with the test surface for establishing a pivot on the test about surface about which the frame means is angularly displaceable to a measuring position in which the elements engage the datum line extending therebetween.

4,414,748

## BALL MOUNTING FIXTURE FOR A ROUNDNESS GAGE

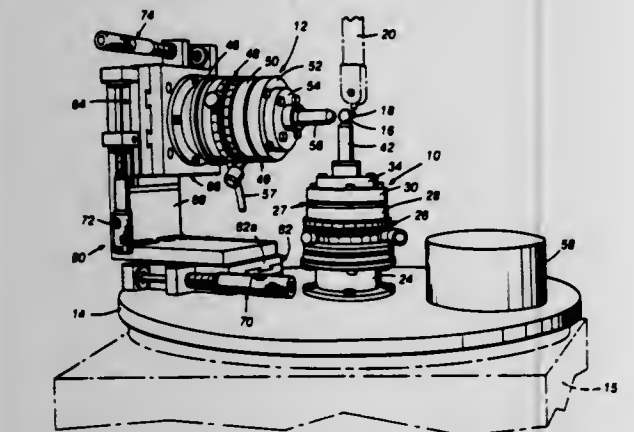
Allen L. Gauler, and Donald F. Pasieka, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 16, 1982, Ser. No. 349,224

Int. Cl.<sup>3</sup> G01B 7/28, 7/34

U.S. Cl. 33—174 Q

10 Claims



1. A ball mounting fixture for a roundness gage comprising first and second ball chuck assemblies mounted on a base

means, each ball chuck assembly including a rotatable stage means and ball chuck means, said ball chuck means being operable to selectively retain a ball to be measured for roundness, each chuck assembly further including positioning means attaching said ball chuck means to said rotatable stage means such that said ball chuck means is adjustably movable radially with respect to the axis of rotation of said stage means, whereby a ball supported by said ball chuck means may be centered on the axis of rotation of the respective stage means by radial adjustment of the position of said ball chuck means, the axes of rotation of said stage means of said first and second chuck assemblies being substantially orthogonal such that a ball to be measured for roundness may be rotated through selected angular increments in any angular orientation by successively supporting and rotating said ball as required with said first and second chuck assemblies.

4,414,749

## ALIGNMENT AND EXPOSURE SYSTEM WITH AN INDICIUM OF AN AXIS OF MOTION OF THE SYSTEM

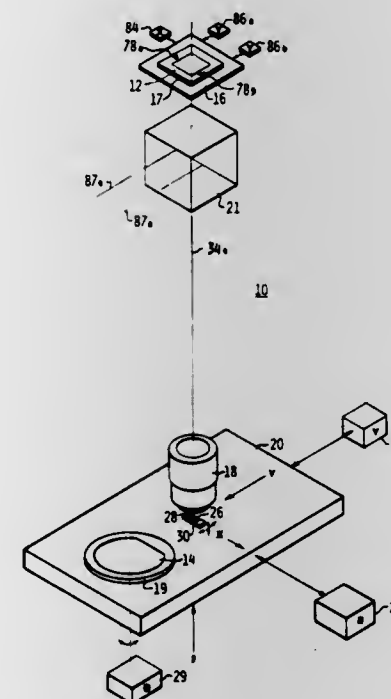
Karl-Heinz Johannsmeier, Los Altos, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Continuation of Ser. No. 53,995, Jul. 2, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,402

Int. Cl.<sup>3</sup> G01B 11/27

U.S. Cl. 33—180 R

28 Claims



1. Alignment apparatus comprising: an adjustable holder for holding a first object in a first plane; imaging means for producing an image of the first object in a second plane; a stage for holding a second object in the second plane; control means for moving the stage along coordinate axes to position the second object with respect to the image of the first object; an indicium of facilitating alignment of the image of the first object with respect to at least one of the axes of motion of the stage; and adjustable mounting means for mounting the indicium on the stage in the second plane to facilitate positioning the indicium in alignment with respect to said one of the axes of motion of the stage; said control means also being operable for moving the stage along the coordinate axes to position the indicium with respect to the image of the first object.

4,414,750

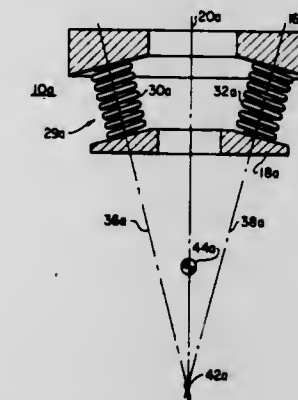
## SINGLE STAGE REMOTE CENTER COMPLIANCE DEVICE

Thomas L. De Fazio, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Oct. 19, 1981, Ser. No. 312,513

Int. Cl.<sup>3</sup> G01B 5/25

U.S. Cl. 33—185 R



1. A one stage remote center compliance (RCC) device having full translational and rotational compliance comprising: first and second spaced monolithic members which have a common axis extending therethrough, said stage including at least three discrete compression coil springs spaced about the axis of said monolithic members, each compression coil spring having an axis extending therethrough and being axially disposed along a region conically generated from a focus of the RCC device for interconnecting said monolithic members, each said compression coil spring being axially compressible and laterally deformable for providing both rotational and translational compliance about a remote center of compliance external to said RCC device and spaced from said focus.

4,414,751

## BOW SIGHT

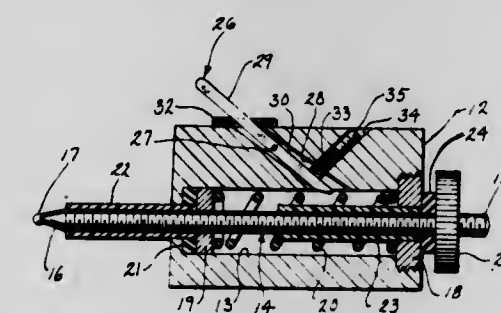
Nicholas A. Mathews, 234 Plumb St., Milton, Wis. 53563

Filed Jul. 24, 1981, Ser. No. 286,385

Int. Cl.<sup>3</sup> F41G 1/46

U.S. Cl. 33—265

7 Claims



1. A bow sight comprising: a sight support including a supporting block having a bore formed therein; a sighting pin slideably received within said bore of said sight support and movable between a sighting position and a non-sighting position; spring means including a compression spring surrounding said pin and housed within said bore for urging said pin into its said sighting position; latch means mounted on said sight support and with said latch means having a pin-engaging portion movable between an operative position engaged with said pin whereby said pin is held in its said non-sighting position and an inoperative position disengaged from said pin whereby said pin is released and said spring means forces said pin to its sighting position; said pin including a radially projecting latching face formed

by one side of a piston member fixedly connected to said pin, and with said latching face engaging said pin-engaging portion of said latch means; and means for mounting said sight support on a bow.

4,414,752

## DEVICE FOR THE CORRECTION OF AN ERROR IN THE ELECTRIC TRANSMISSION OF AN INDICATION

Piero M. Derosi, Corso Giovanni Lanza 55, Torino, Italy

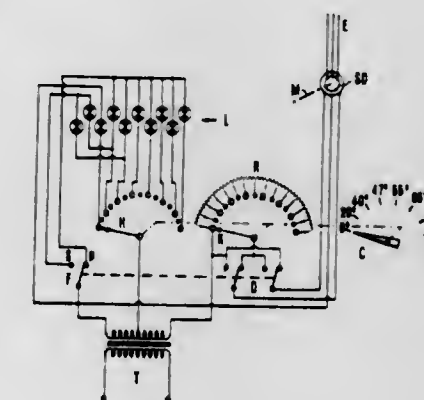
Continuation of Ser. No. 974,081, Dec. 28, 1978, abandoned. This application Aug. 22, 1980, Ser. No. 180,393

Claims priority, application Italy, Dec. 30, 1977, 69959 A/77

Int. Cl.<sup>3</sup> G01C 19/38

U.S. Cl. 33—320

7 Claims



3. A device for the electrical transmission of the indication of a gyrocompass, comprising: inductor means on a shaft mechanically linked with said gyrocompass for rotation about an axis defined by said shaft, said inductor means including a first, a second and a third winding angularly spaced apart in a Y-connection and centered on said axis; a source of single-phase alternating current having two terminals; first circuit means connecting a free end of said first winding to one of said terminals; second circuit means connecting free ends of said second and third windings to the other of said terminals, said second circuit means including selector means for introducing an impedance difference between the connections extending from said other of said terminals to said second and third windings to impart a corrective angle to the orientation of a magnetic field jointly generated by said windings; and pick-up winding means for detecting the orientation of said magnetic field and emitting signals representing the gyrocompass indication as modified by said corrective angle.

4,414,753

## PROCESS FOR COMPENSATING THE MAGNETIC DISTURBANCES IN THE DETERMINATION OF A MAGNETIC HEADING, AND DEVICES FOR CARRYING OUT THIS PROCESS

Michel Moulin; Jean-Claude Goudon, both of Valence; Jean-Marie Marsy, Bourg-les-Valence; Bernard Legendarme, Valence; Rene Presset, Portes-les-Valence, and Louis Dedreuil-Monnet, Valence, all of France, assignors to Crouzet, Paris, France

Filed Jun. 4, 1981, Ser. No. 270,356

Claims priority, application France, Jun. 5, 1980, 80 12725

Int. Cl.<sup>3</sup> G01C 17/38

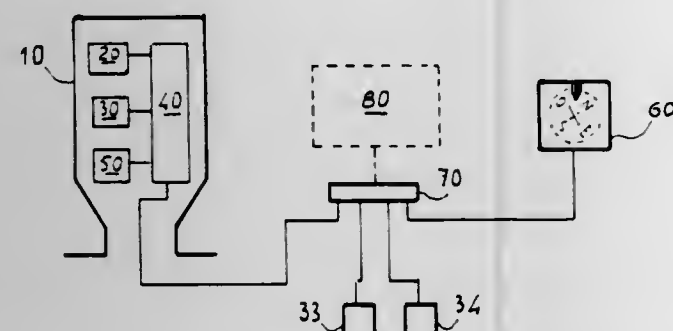
U.S. Cl. 33—356

15 Claims

1. A device for compensating the magnetic disturbances influencing the measurements of a device which determines a magnetic heading on board a land vehicle comprising a magnetometer for furnishing analog voltages proportional to the components of the disturbed magnetic field of the earth, along reference axes of the magnetometer, a memory of a computer

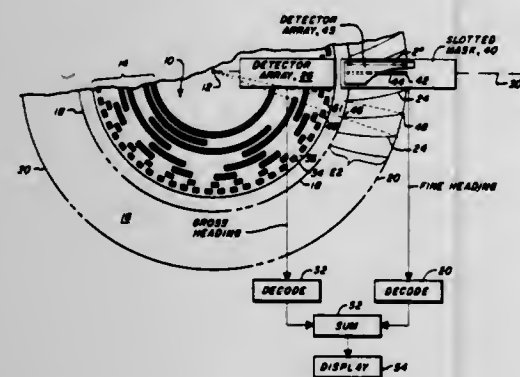


module associated with the magnetometer for receiving so-called compensation coefficients, which make it possible to correct the information delivered by the magnetometer to obtain the real heading, wherein the device further comprises: means for identifying a closed plane geometrical figure described by an end of a first vector  $H_{hp}$  indicative of the disturbed magnetic field when the vehicle rotates on itself through 360° on a horizontal plane;



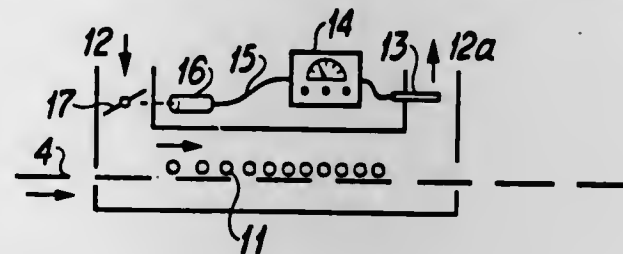
means for transforming this closed geometrical figure into a circle of any radius centered on the origin of the reference axes of the magnetometer and representing the locus of an end of a second vector  $H_h$  representative of the non-disturbed magnetic field, and means for calculating the coefficients serving to define the correspondence between all the points of said closed geometrical figure and their homologues on said circle.

**4,414,754**  
**HIGH RESOLUTION COMPASS CARD POSITION DECODER**  
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.  
Filed Mar. 4, 1982, Ser. No. 354,885  
Int. Cl.<sup>3</sup> G01C 17/28  
U.S. Cl. 33—363 K 29 Claims



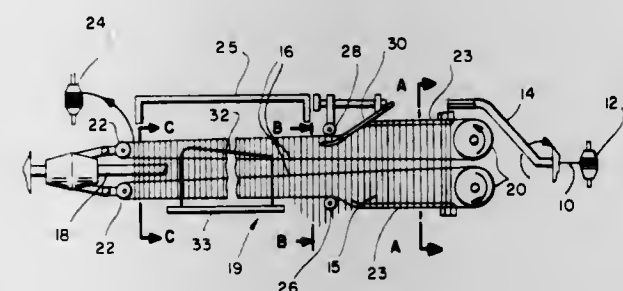
1. A high resolution compass card position decoder comprising:  
a compass having a card mounted for rotation within said compass about an axis perpendicular to said card through the center of said card, said compass card having an inner digital encoding pattern and an outer peripheral pattern arranged with respect to the center of said card, said outer peripheral pattern including a series of lines each running at an angle to a radius of said card from an inner circular position to an outer circular position;  
means along a first predetermined card radius for decoding the angular position of said card from said digital encoding pattern so as to decode gross compass heading; and  
means along a second predetermined card radius for detecting the position along said second radius of one of said lines so as to decode fine compass heading.

**4,414,755**  
**DRYING DEVICE INTENDED FOR DRYING MATERIAL BEARING PRINT ISSUING FROM A PRINTING MACHINE**  
Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silk-screen Maskiner AB, Norsborg, Sweden  
Filed Sep. 30, 1981, Ser. No. 307,307  
Claims priority, application Sweden, Oct. 1, 1980, 8006847  
Int. Cl.<sup>3</sup> F26B 21/12  
U.S. Cl. 34—4 3 Claims



1. A drying device intended for drying material bearing print issuing from a printing machine such as a screen-printing machine, comprising a conveyor for the material and heat-emitting elements arranged adjacent the conveyor, means for establishing a flow of air to pass over the conveyor for the material from an inlet duct to an exhaust duct thereby absorbing volatile substances released by the ink on the material during the drying process, a device for sensing the levels of volatile substances in a given quantity of exhaust air in the exhaust duct, said device being connected to a measuring apparatus for generating an output signal corresponding to the level of volatile substances or for generating an output signal when the level of volatile substances exceeds a predetermined value, an increased proportion of volatile substances in the exhaust air causing a control device to be activated by the output signal to allow a greater quantity of air per unit of time to pass from the inlet duct to the exhaust duct, said output signal being connected for controlling one of a motor for setting a throttle valve located in the inlet duct or a fan motor for regulating the quantity of air per unit of time.

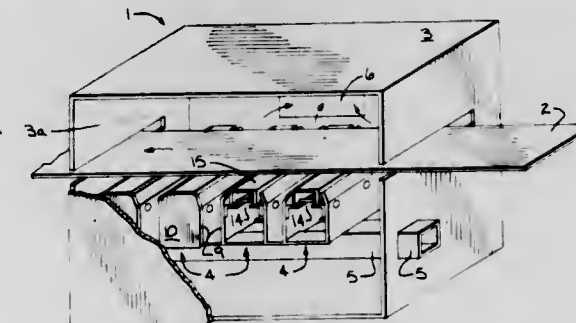
**4,414,756**  
**METHOD AND APPARATUS FOR TREATING STRAND-LIKE MATERIAL**  
Carroll Simpson, Greenville, and Ludwig Schlierl, Spartanburg, both of S.C., assignors to American Hoechst Corporation, Somerville, N.J.  
Filed Oct. 30, 1981, Ser. No. 316,581  
Int. Cl.<sup>3</sup> F26B 3/04, 13/12  
U.S. Cl. 34—23 13 Claims



1. A method for heat treating strand-like material whereby substantial irregularities in subsequent dyeing of the material is avoided, said method comprising:  
(a) drawing said material from a source;  
(b) laying said material in loops which surround and are supported by conveyor means;  
(c) conveying said material loops by said conveyor means through a heating zone wherein said material experiences shrinking;

(d) causing certain portions of said loop material to experience substantial peripheral sliding movement in their contact with and with respect to said conveyor means during the time the loops are being conveyed through said heating zone; and  
(e) drawing said strand-like material off of said conveyor means.

**4,414,757**  
**WEB DRYER NOZZLE ASSEMBLY**  
Rodger E. Whipple, Neenah, Wis., assignor to Overly, Incorporated, Neenah, Wis.  
Filed Oct. 7, 1981, Ser. No. 309,267  
Int. Cl.<sup>3</sup> F26B 13/20  
U.S. Cl. 34—155 6 Claims

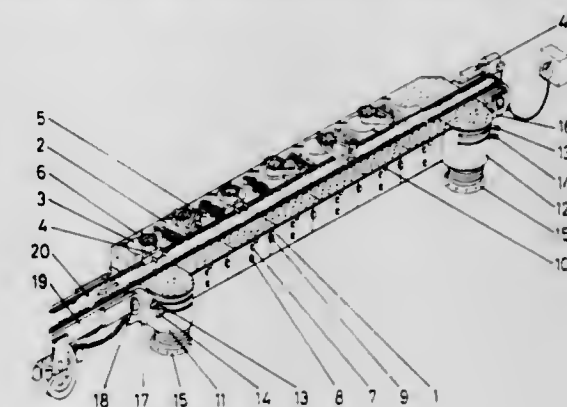


1. Apparatus for drying a moving flexible continuous web of material, said apparatus including a nozzle assembly comprising:  
(a) a horizontally disposed flat pressure plate adapted to be positioned in spaced relation to the moving web, said pressure plate having an upstream end portion and a downstream terminus portion generally coinciding with the downstream terminus portion of the nozzle assembly,  
(b) a primary gas discharge Coanda nozzle disposed at said upstream end portion of said pressure plate and forming means for continuously directing primary gas unidirectionally and horizontally downstream through a gas flow zone between said plate and the moving web,  
(c) a single secondary gas discharge nozzle disposed at the downstream terminus of said pressure plate, said secondary nozzle being of the impingement type and forming means for continuously directing secondary gas toward said web and into merging but generally separate interface relationship with said primary gas at a location downstream of said pressure plate terminus,  
(d) said impingement type secondary gas discharge nozzle cooperating with the web at said downstream location to form means for increasing the static pressure in said unidirectionally flowing primary gas in said gas flow zone for the full width of said pressure plate,  
(e) said secondary gas discharge nozzle being formed by a pair of plates disposed at the said downstream terminus of said pressure plate, with one of said pair of plates being generally vertically oriented and the other of said pair of plates being inclined from the vertical,  
(f) said pair of plates converging to form a discharge slot forming means for directing gas generally perpendicularly to said pressure plate.

**4,414,758**  
**CONVEYOR FOR COOLING AND REMOVAL OF OBJECTS FROM AN IN-LINE SECTIONAL PRODUCTION MACHINE**  
Fritz Peter, Binzmühlestr. 405, CH-8046 Zürich, and Gastonge Murialdo, Gaggio di Bioggio, CH-6981 Vernate, both of Switzerland  
Filed Mar. 23, 1981, Ser. No. 246,420  
Int. Cl.<sup>3</sup> F26B 25/00  
U.S. Cl. 34—233 12 Claims

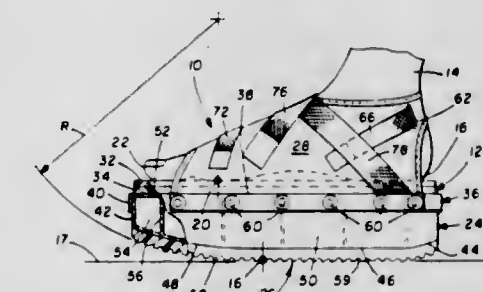
1. Apparatus for transferring articles from a first position on

a cooling plate on one side of a moving conveyor to a second position on said conveyor, said apparatus comprising:  
a disc mounted on the said one side of said conveyor for rotation about a first axis;  
an arm mounted on said disc for rotation about a second axis spaced laterally from and parallel to said first axis; and  
drive means powered by a single drive shaft for rotating both said disc and said arm about their respective axes, the



locations of said axes relative to each other and to said first and second positions in combination with the rotational speeds of said disc and arm being such as to cause said arm to engage articles at said first position, to transfer the thus engaged articles from said first position to said second position, and to withdraw from the thus transferred articles in a manner permitting continued movement of said articles by said conveyor.

**4,414,759**  
**ORTHOPEDIC SHOE**  
R. Dean Morgan, 414 Stiles, Midlothian, Tex. 76065; Donald M. Mauldin, 3631 Potomac, Dallas, Tex. 75205, and Thomas L. Taylor, 872 Russell, Bedford, Tex. 76021  
Filed Dec. 9, 1980, Ser. No. 214,752  
Int. Cl.<sup>3</sup> A43B 3/12  
U.S. Cl. 36—11.5 7 Claims



1. An orthopedic shoe for wear on a foot by a person while the person is walking on a surface comprising:  
an inner sole contoured to conform to the bottom surface of the foot having a first support face for supporting the heel of the foot and a second support face for supporting the metatarsal point of the foot;  
an outer sole beneath and spaced from said inner sole having a first contact face beneath said first support face for contacting the surface and a second contact face located beneath said second support face, said outer sole including a fulcrum located between said first and second support faces, said first contact face and fulcrum contacting the surface when the person is standing on the foot and when weight on the foot is applied to said fulcrum and said first contact face, said second contact face being curved upwardly from said fulcrum forward to the toe of the shoe, the metatarsal point of the foot being supported forward of said fulcrum for initiating a rolling motion of the shoe on said second surface as weight is shifted forwardly to



the second contact face of the shoe while the person is walking; and means for positioning and maintaining the foot adjacent said first and second support faces of said inner sole.

4,414,760

## AIR-CUSHION INSOLE

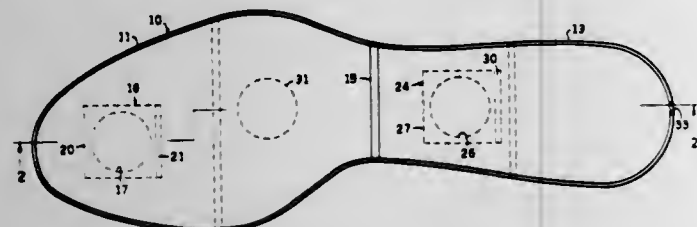
James Faiella, West Palm Beach, Fla., assignor to Kaepa, Inc., San Antonio, Tex.

Filed Apr. 16, 1982, Ser. No. 369,133

Int. Cl.<sup>3</sup> A43B 13/40, 13/20

U.S. Cl. 36—29

10 Claims



1. An air-cushion insole for a shoe, comprising:

(a) an envelope including:

1. a sole portion having a sole compartment, and
2. a heel portion having a heel compartment separate from the sole compartment,

(b) a first valve means including a valve port operatively interconnecting the sole compartment with ambience, a check valve flap over the valve port, the valve flap of the first valve means closing the valve port upon compression of the sole portion, and opening the valve port upon relief of compression of the sole portion to admit air into the sole compartment,

(c) a second port in the sole portion operatively interconnecting the sole compartment,

(d) a second valve means including a valve port and a check valve flap over the valve port, the check valve flap closing the valve port upon compression of the heel portion, and opening the valve port upon compression of the sole portion to admit air into the heel compartment from the sole compartment through the said second port, and

(e) the heel portion providing a first port operatively operatively interconnecting the heel compartment with ambience, the first port exhausting air from the heel compartment upon compression of the heel portion, and admitting air into the heel compartment upon relief of compression of the heel portion.

4,414,761

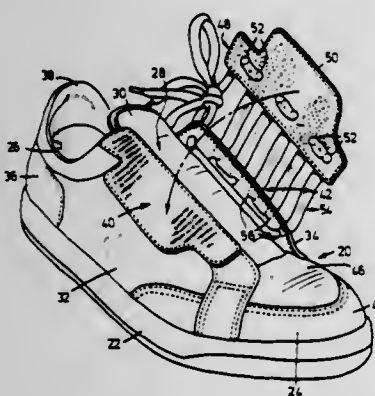
FOOTWEAR ARTICLE WITH ADJUSTABLE CLOSURE  
Douglas S. Mahood, 48 Glen Watford Dr., Agincourt, Ontario, Canada (M1S 2C3)

Filed Nov. 2, 1981, Ser. No. 317,375

Int. Cl.<sup>3</sup> A43B 11/00; A43C 1/00

U.S. Cl. 36—50

7 Claims



1. A footwear article comprising: a sole; an upper which defines a space above the sole for receiving a wearer's foot, the

upper including an ankle opening and an access opening which extends from the ankle opening towards the toe area of the article and which is arranged to permit portions of the upper adjacent said access opening to be raised to facilitate movement of a wearer's foot into and from said space; and a closure for said access opening, said closure comprising flexible flap means having a first portion secured to the upper adjacent a first side of said access opening, the flap means across said opening and having a second portion adapted to be releasably secured to the upper adjacent a second side of said access opening, the spacing between the first and second portions being adjustable, releasable and flexible fastening means on said second portion and on the upper for securing the second portion, said second portion of the flap means being a flexible flap member which has part thereof permanently affixed to the upper in a non-pivotal manner, whereby alignment of the flap member on the upper is readily accomplished by laying the flap member against the upper in its natural configuration.

4,414,762

## SLIPPER FOR A SKI BOOT, AND PROCESS FOR ITS MANUFACTURE

Georges P. J. Salomon, Annecy, and Alain Leveque, La Balme de Sillingy, both of France, assignors to Etablissements Francois Salomon & Fils, Annecy, France

Filed Oct. 22, 1981, Ser. No. 313,918

Claims priority, application France, Oct. 31, 1980, 80 23549

Int. Cl.<sup>3</sup> A43B 5/04, 7/14; A43D 9/00

U.S. Cl. 36—117

8 Claims



1. Process for the manufacture of a slipper for a ski boot comprising the injection of a plastic foam mixture between the walls of two socks, comprising an inner sock and an outer sock, placed on a form which is put in a mold, including the steps of

(a) producing said outer sock constituting the outer skin of said slipper from a thin, expansible sheet; and

(b) adjusting said outer sock to said inner sock constituting the inner wall of said slipper;

(c) said outer sock having dimensions no larger than those of said inner sock when both of said socks are in a state of rest.

4,414,763

## SOLE FOR A SPORTS SHOE OR BOOT

Alfred Bente, Herzogenaurach, Fed. Rep. of Germany, assignor to Messrs. Adidas Sportschuhfabriken Adi Dassler KG, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,909

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212980

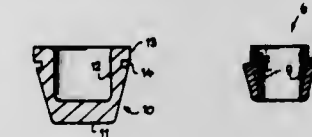
Int. Cl.<sup>3</sup> A43C 15/02

U.S. Cl. 36—134

10 Claims

1. A sole for a sports shoe comprising: fixing protrusions which project from the underside of the sole, each fixing protrusion comprising a shoulder facing towards the underside of the sole; a sleeve member adapted to be fitted on to each fixing protrusion and comprising a wall portion which in the fixed position is disposed around said fixing protrusion, said wall portion having at least one opening therein, and a latching means disposed movably in said at least one opening and adapted in an operative position to engage behind said shoulder on the respective fixing protrusion, with a portion of said

latching means still projecting outwardly of said opening; and a ground engaging projection member adapted to be fitted



over each said sleeve member and in frictional engagement with said outwardly projecting portion of said latching means.

4,414,764

## WEAR PARTS SYSTEM

Arne Johansson; Torsten Larsson, both of Karlskoga, and Ove Nilsson, Örebro, all of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

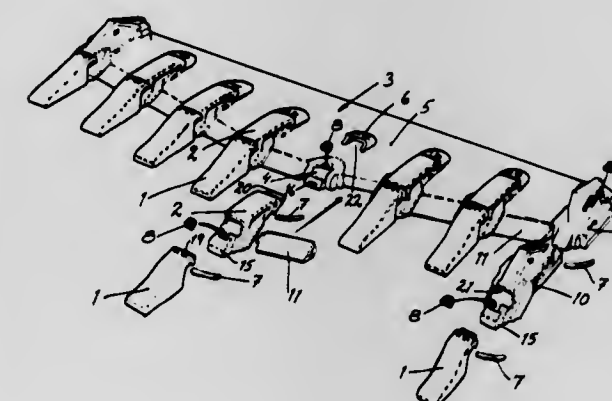
Filed Mar. 22, 1982, Ser. No. 360,867

Claims priority, application Sweden, Mar. 26, 1981, 8101935

Int. Cl.<sup>3</sup> E02F 9/28

U.S. Cl. 37—141 T

4 Claims



1. A system for holding teeth to an earth moving machine shovel front comprising:

at least one tooth member having a rearwardly extending overhang, and a male projecting part rearwardly extending from said overhang;

an adapter having a forward opening female part receiving said male projecting part, said adapter also having a rearwardly extending overhang and male projecting part rearwardly extending from said overhang;

a cover member connected to said shovel front having an opening for receiving said adapter male projecting part; a first tunnel through said adapter overhang and front shovel front part;

a second tunnel through said tooth overhang and said adapter;

said tunnels having surfaces forming locking surfaces, one of said surfaces comprising an edge of a right angled groove in a respective overhang, and the remaining surfaces comprising an opposite edge on a shovel front and tooth member;

first and second wedges inserted in said tunnels, said wedges being arcuate along a longitudinal direction and including teeth along opposite edges; and

first and second compressible locking devices having a toothed end extending through a groove in a respective locking surfaces for engaging teeth of said wedges, said locking devices maintaining said wedges in place.

4,414,765

## STEAM MANGLE WITH HEAT RECYCLING TO PREDRYER

Manfred Kreinberg, Vlotho, and Lothar Petzold, Bad Salzuflen, both of Fed. Rep. of Germany, assignors to Herbert Kannegger GmbH & Co., Vlotho, Fed. Rep. of Germany

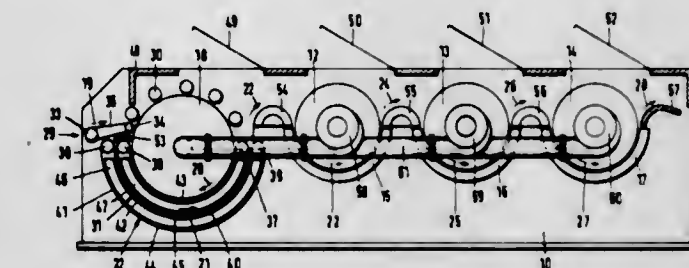
Filed Mar. 10, 1981, Ser. No. 242,211

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041244

Int. Cl.<sup>3</sup> D06F 65/10

U.S. Cl. 38—54

13 Claims



1. A mangle for pressing and drying damp laundry articles including a plurality of rotatably mounted, padded, perforated hollow drums attached to a vacuum device, and an equal plurality of cooperable, perforated, curved hollow troughs which define transport paths with the drums and which are heated by high pressure steam, characterized by: a rotatably mounted hollow imperforate pre-dryer cylinder (18) disposed in front of the drums (12-14) in the operating direction, means for heating the cylinder with used steam condensate withdrawn from the troughs, and means for conveying the laundry articles around and in frictionless contact with the outer wall of the cylinder.

4,414,766

## STEAM IRON SOLE PLATE DESIGN

Pierre Schwob, Lyons, France, assignor to SEB S.A., Selongey, France

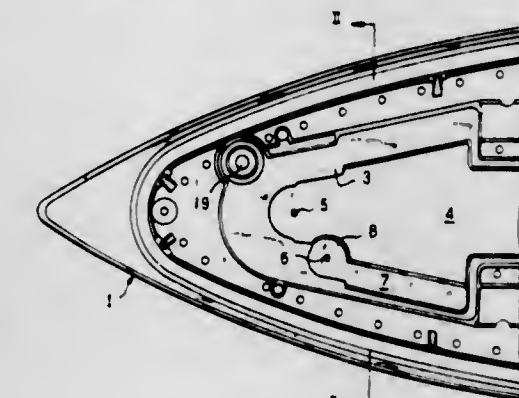
Filed Sep. 1, 1981, Ser. No. 298,372

Claims priority, application France, Sep. 10, 1980, 80 19492

Int. Cl.<sup>3</sup> D06F 75/18

U.S. Cl. 38—77.83

3 Claims



1. An electric steam iron, comprising a metallic sole-plate having a boss and a heating element, cast in said boss, said boss enclosing a vaporization chamber, a main injection device connected to a water reservoir for injecting water into said vaporization chamber adjacent to said boss, and an auxiliary injection device for injecting a supplementary amount of water for obtaining an instantaneous surplus of steam, said auxiliary injection device emptying into the vaporization chamber at a point situated on the boss just above the heating element cast in said boss, the metal of the boss in the area around said point being thin so that the heating element cast in said boss is close to said point, said area being in communication with the vaporization chamber.



4,414,767

**ROOM DECORATION**

Eric Staton, 34 Broad Walk, Winchmore Hill, London N.21, England

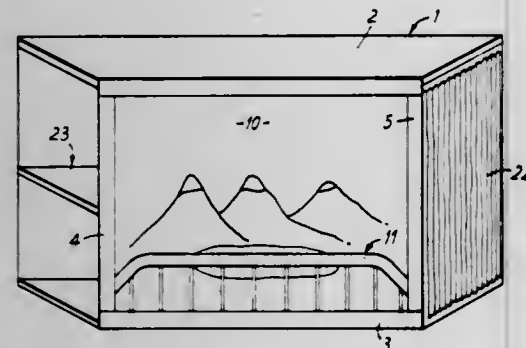
Filed Aug. 18, 1981, Ser. No. 293,940

Claims priority, application United Kingdom, Aug. 26, 1980, 8027600

Int. Cl.<sup>3</sup> G09F 19/00

U.S. Cl. 40—429

5 Claims



1. A decoration structure, especially for a room, comprising a stationary structure bounding an opening, an elongate background strip bearing serially on a face thereof a plurality of items of background subject matter each of which is of such dimensions as to occupy the opening of the structure, respective roller means on said structure at spaced positions at each side of said opening to carry said background strip and permit rolling up and unrolling of said strip for the presentation of a selected item in said opening, a foreground element positioned on said structure in said opening and having an item of foreground subject matter adapted to cooperate with the selected background item in the formation of an entire scene, and foreground element being spaced forwardly of said background strip, and means on said structure for illumination of at least part selectively of the background item of the foreground item, wherein selectively the foreground item and the background item is transparent or translucent and comprises a plurality of zones which are different coloured and which are arranged symmetrically or non-symmetrically.

4,414,768

**DISPLAY PANEL FOR VENDING MACHINES**

G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 244,818, Mar. 17, 1981. This application Jan. 20, 1982, Ser. No. 341,014

The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> G09F 7/00

U.S. Cl. 40—584

10 Claims

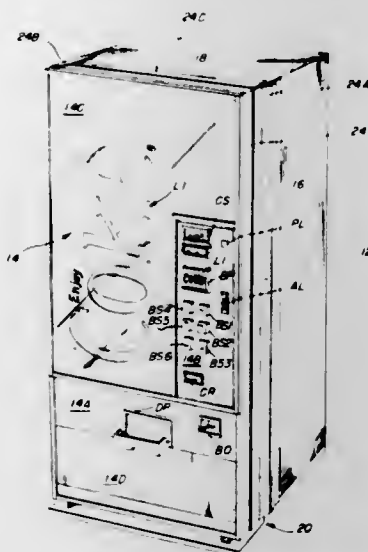
1. A vending machine including a control panel having a coin slot, an array of product selector buttons for controlling the vending of primary and secondary products from said machine and a sign panel having logo thereon representative of the primary product, comprising:

first and second adjacent vertical columns of secondary product selector buttons, each having a secondary product display area thereon bearing indicia representative of a given secondary product to be vended;

a primary product selector button, which is larger than the respective secondary product selector buttons, positioned above said secondary product selector buttons adjacent said coin slot, said primary product selector button being so shaped and so proportioned as to overlaid and extend across both said vertical columns of secondary product selector buttons and presenting a primary product display area thereon larger than said secondary product display area to provide a dominant presence therein in said control panel; and

said primary product display area bearing substantially the

same primary product logo as said sign panel inducing, in conjunction therewith, the predominate selection of said



primary product over said secondary products by a user of said vending machine.

4,414,769

**AMBIDEXTROUS SAFETY FOR GUNS**

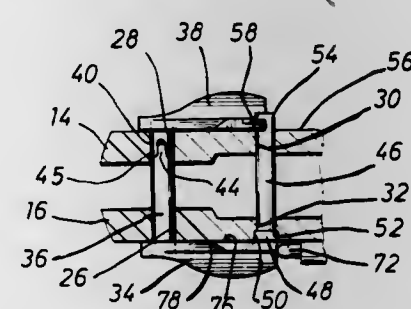
Herman W. Mueschke, 1003 Columbia St., Houston, Tex. 77008

Filed Jan. 26, 1981, Ser. No. 228,541

Int. Cl.<sup>3</sup> F41C 17/00

U.S. Cl. 42—70 R

18 Claims



1. An ambidextrous safety system for guns wherein such guns are adapted for efficient use by both right and left-handed users, and the guns incorporate a frame defining pivot bore means, said safety system comprising:

a right-hand safety means having first pivot shaft means extending into said pivot bore means;

left-hand safety means having second pivot shaft means extending into said pivot bore means;

connection means establishing nonrotatable relation between said first and second pivot shaft means, in the assembled relation of said first and second shaft means said connection means being positioned within said pivot bore means and said pivot bore means providing structural support for said connection means;

pin means extending through registering shaft apertures in the frame of said gun, said pin means having movable interlocking relation with said left-hand safety means to retain said left-hand safety means in assembly with said handgun.

4,414,770

**MAXI-BALL LUBRICATOR**

Charles E. Brinton, Sr., 1110 Penn St., Harrisburg, Pa. 17102

Filed Apr. 5, 1982, Ser. No. 331,669

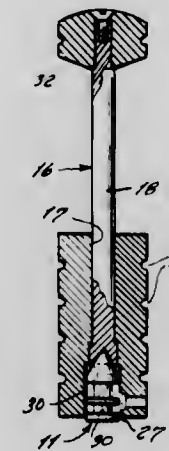
Int. Cl.<sup>3</sup> F41C 27/00

U.S. Cl. 42—90

2 Claims

1. A maxi-ball lubricator, comprising, in combination, a

cylinder and a plunger assembly slidable in said cylinder, a seat on one end of said cylinder for a maxi-ball bullet to be seated therein, while a hole in a side of said cylinder receives a lubricant container spout for discharging a lubricant into said seat and against said maxi-ball, and said plunger assembly being aligned with said seat for pushing said maxi-ball outward of



said seat and into a rifle muzzle; said plunger assembly comprising a push rod having an enlarged head at one end for pushing against an end of said maxi-ball, while an opposite end of said push rod is fitted with an enlarged knob for being grasped in a hand, and said push rod head having a conical recess in its end for receiving a conical point portion of said maxi-ball.

4,414,771

**METHOD AND APPARATUS FOR STORING, DISPENSING AND TYING FISH HOOKS**

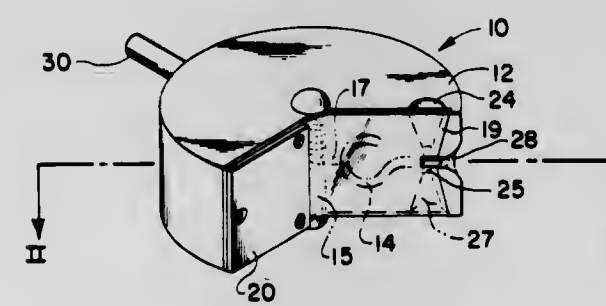
Harley D. Martin, 154 Willow Pl. South, Broomfield, Colo. 80020

Filed May 11, 1981, Ser. No. 262,095

Int. Cl.<sup>3</sup> A01K 97/06

U.S. Cl. 43—4

18 Claims



9. Apparatus for guiding and assisting in tying fish line to stored fish hooks, the apparatus comprising:

a body portion in the form of cylinder partially generated around a central axis, the body portion including an arcuate channel defined therein around the central axis and of a cross-section suitable for slidably securing a fish hook within the channel;

an end surface of the body portion defined by a plane extending from the central axis radially outward and communicating with the channel to provide an end opening of the channel at the end surface;

a pivot member disposed at the central axis; spring means carried on the pivot member and extending into the channel to bear towards the end surface;

a resilient containment member positioned at the end surface to nominally close the channel thereat, the containment member being attached to the body portion at a position adjacent the central axis thereof and extending in a cantilevered manner outwardly therefrom; and

at least one funnel shaped opening defined in the body portion adjacent the end surface at the portion of the channel

adapted to receive the eye portion of a fish hook, the funnel opening communicating with a second opening extending through the body portion and opening to the containment member;

whereby fish hooks may be disposed in the channel and maintained against the containment member by the spring means such that a fish line may be guided by the funnel shaped opening through the eye of a fish hook, a knot tied around the eye of the fish hook, and the fish hook and line removed from the channel by resiliently moving the containment member away from the end surface to permit removal of only the tied fish hook from the channel.

4,414,772

**TOP WATER FISHING LURE**

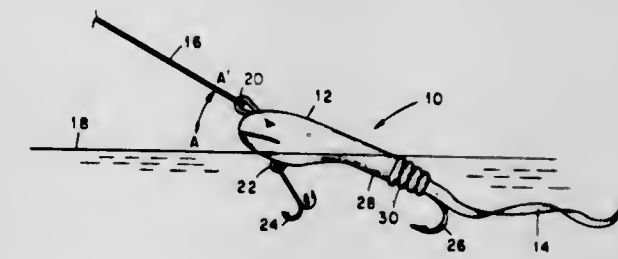
Samuel E. Duncan, 1514 Hidden Hills, Clinton, Tenn. 37716

Filed Jul. 2, 1981, Ser. No. 274,725

Int. Cl.<sup>3</sup> A01K 85/00, 83/06

U.S. Cl. 43—42.36

2 Claims



1. A top water fishing lure, comprising: a keeled and buoyant body portion, said body portion having an anterior end and a posterior end, said body portion having a first aperture extending downwardly through said anterior end thereof, said body portion having a second aperture extending downwardly partially through said body at a position posterior to said first aperture, and said body portion having a groove extending along the anterior-posterior centerline at the top surface of said body portion to connect said first and second apertures; a non-floating tail portion connected to said body portion at said posterior end thereof; a wire having a first loop disposed in said groove in the anterior portion of said body portion for receiving a fishing line, said wire having a second loop disposed in said first aperture and a third loop located in said second aperture; a first fishhook attached to said second loop disposed in said first aperture, a second fishhook attached to said third loop in said second aperture located at a position in said body portion posterior to said first aperture; and means disposed about the shank portion of said second fishhook for frictionally restraining a plastic dressing forming said tail portion onto the posterior end of said body portion, said lure having the general appearance of a reptilian creature.

4,414,773

**SAFETY DEVICE FOR ANIMAL TRAP**

Thomas L. Moyers, 2370 Sunset Strip, Mountain Home, Id. 83647

Filed May 7, 1981, Ser. No. 261,486

Int. Cl.<sup>3</sup> A01M 23/28

U.S. Cl. 43—97

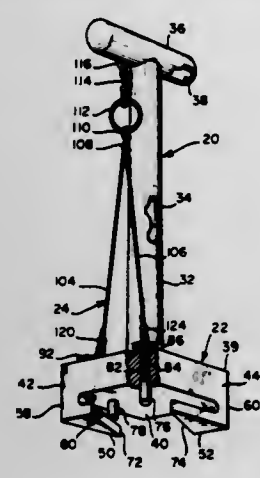
16 Claims

1. A safety device for animal traps of the rotating frame type having parallel spring-biased jaws when the trap is in set or open position, said device including

- (a) a body portion,
- (b) a first means extending from said body portion for holding the trap jaws in set or open position, said first means including stationary members engaged with said body portion and lying in spaced relation to each other and to said body portion, whereby the trap jaws may be positioned between the spaced members and body portion,
- (c) a second means including at least one pin carried by said



body portion and positioned to locate one of the jaws between a portion of said first means and said pin upon application of the device to the trap, and



(d) means for retracting said pin into said body portion during application of the device of the trap.

4,414,774

## FASHION AND HAIRSTYLE DOLL PLAY SET

A. Edward Fogarty, and Bonnie R. Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579

Filed May 13, 1982, Ser. No. 377,608

Int. Cl.<sup>3</sup> A63H 3/00

U.S. Cl. 46—22

9 Claims



1. A fashion and hairstyle doll play set, comprising:

- a self-standing, three-dimensional doll having (i) a rigid or semi-rigid body with integrally formed limbs and indicia simulating clothing, said body being configured such that its arms extend out from the body and downward from its shoulders at essentially forty-five degree angles, its waist being in the form of a right circular cylinder, and its hips, legs and feet being dimensionally smaller than the diameter of its waist in all horizontal planes below its waist, and (ii) a semi-rigid or flexible head with an integrally formed sculptured hair design, said head having an essentially horizontal, encircling recess above the lower periphery of said sculptured hair design;
- at least one semi-rigid or flexible, hollow article simulating an article of lower body clothing, said article having a pair of opposed open ends, and, positioned in one of said open ends, an integrally formed ring which flexes to engage said waist of said body of said doll to removeably attach said article to said body of said doll; and
- at least one article simulating both an article of headgear and coiffured natural hair, said article having a semi-rigid or flexible element which flexes to engage said recess above said lower periphery of said sculptured hair design of said head, and, fixedly attached to said element, coiffured strands of artificial hair.

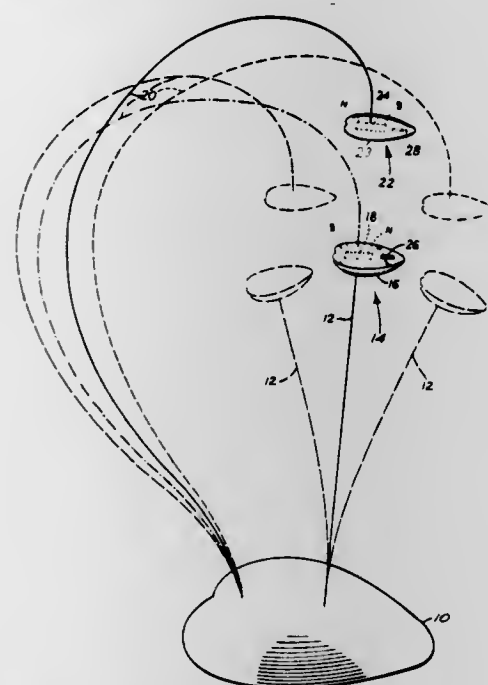
4,414,775  
MAGNETIC KINETIC AMUSEMENT DEVICE  
Flemming E. Jensen, 7911 NE. 33rd Ave., Unit 340, Portland, Oreg. 97211

Filed Apr. 26, 1982, Ser. No. 371,671

Int. Cl.<sup>3</sup> A63H 33/26

U.S. Cl. 46—241

8 Claims



1. A magnetic amusement device comprising:

- a base,
- a first resilient wire support mounted on the base and extending upwardly therefrom,
- a first magnetic member secured to the outer end of the first resilient wire support,
- a second resilient wire support mounted on the base and extending upwardly in a substantially continuously arcuate, reversely bent configuration to a plane above the plane of the first magnetic member, and
- a second magnetic member secured to the outer end of the second resilient wire support,
- the first and second magnetic members being arranged separably in vertical spaced opposition to each other when in static condition, being mutually magnetically attractable into contact with each other against the tension of their resilient wire supports when moved into close proximity to each other,
- whereby, upon moving one of the magnetic members away from the other and releasing it, prolonged to and fro up and down relative movement of the magnetic members occurs, induced by the attracting magnetic forces and opposing resilient wire forces, such relative movement eventually terminating in the releasable uniting of the magnetic members as the magnetic forces prevail.

4,414,776

## FIBROUS WEB FOR PLANTING SEEDS, METHOD OF USING SAME, APPARATUS FOR PRODUCING SAME

Harry J. Ball, P.O. Box 3009, Milford, Conn. 06460  
Continuation-in-part of Ser. No. 169,856, Jul. 17, 1980, Pat. No. 4,357,780, which is a continuation-in-part of Ser. No. 971,603, Dec. 30, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 363,078

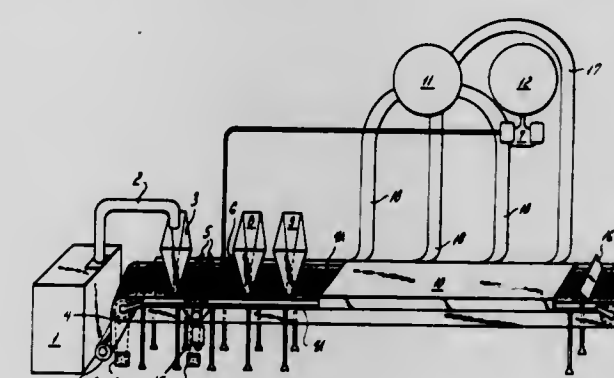
Int. Cl.<sup>3</sup> A01C 1/04

U.S. Cl. 47—56

7 Claims

1. The method of forming a fluffy uncompressed rolled seeded or unseeded straw-like mulch mat capable of being unrolled, which derives its entire structural strength and unity from tissue paper backing on which randomly oriented, unmodified, natural, elongated, straw-like cellulosic fibers, bonded together through spot contact bonding between contiguous straws and between the tissue paper backing and the

straws by a water soluble adhesive which due to the mat's density and thickness is spread substantially throughout, including the steps of,  
feeding onto tissue paper backing on a conveyor a mat of fluffy randomly oriented, unmodified, natural, elongated and dry straw-like cellulosic fibers,  
spraying water soluble adhesive onto said straw-like cellulosic fibers,  
spreading onto the adhesive a predetermined amount of



granular material from the class comprising seed and fertilizer,  
drying the adhesive and thereby bonding the straw-like fibers together and to the tissue paper backing and securing the granular material to the straw-like fibers by the adhesive on the straw-like fibers providing spot contact bonding only between contiguous fibers and with the granular material, and  
rolling the mat into a roll for storage and unrolling at the location of use.

4,414,777

## BREAK AWAY WALL STRUCTURE

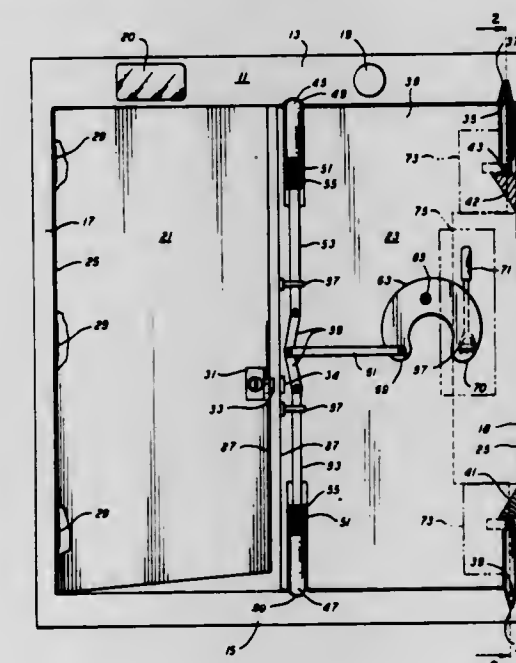
John Masacchia, P.O. Box 452, Marathon, Fla. 33050

Filed Nov. 10, 1980, Ser. No. 205,882

Int. Cl.<sup>3</sup> E05B 65/10; E05C 15/02

U.S. Cl. 49—141

2 Claims



1. A break away wall structure comprising:

- a frame;
- a door panel pivotably mounted along one edge within said frame;
- a wall panel, said wall panel and said door panel each having one edge abutting each other, said wall panel being pivotably mounted along one edge within said frame;

a locking means including a tongue slidably mounted on the door panel and extending into the wall panel;  
a pair of opposed vertically-oriented plungers slidably mounted in said wall panel along the edge abutting the door panel and extending into said door frame, each of said plungers having a semi-spherical shape;  
a pair of opposed vertically-oriented rods slidably mounted in said wall panel aligned with said pair of opposed vertically-oriented plungers, said pair of opposed vertically-oriented plungers being slidably mounted on said rods;  
a pair of vertically-oriented arms, each of said vertically-oriented arms being secured at one end to the end of a different one of said rods;  
spring means mounted on said rods between said opposed vertically-oriented plungers and said arms to force said opposed vertically-oriented plungers into said door frame;  
a pair of actuating levers, each pivotally connected at one end to the end of a different one of said arms remote from said rods and the other end of said actuating levers being pivotally connected to one another; and  
means including a handle pivotably mounted within said wall panel and pivotably connected to said pair of actuating levers where said actuating levers are connected to one another to pull said actuating levers toward said handle thereby pulling said vertically-oriented arms and vertically-oriented rods toward said levers and releasing said opposed vertically-oriented plungers from said door frame.

4,414,778

## TAPE DRIVE DOOR OPERATOR

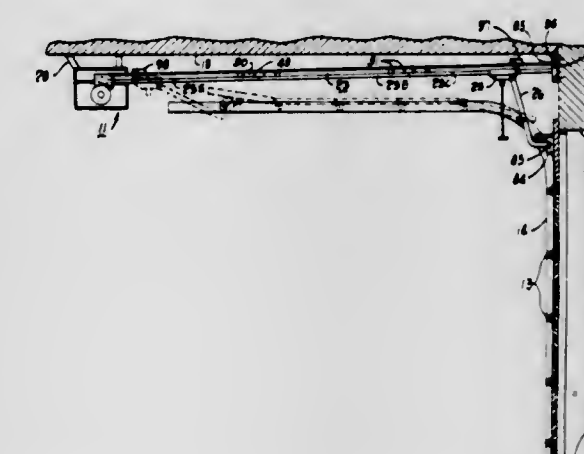
Alvin J. Carl, Sebring, Ohio, assignor to The Alliance Manufacturing Company, Inc., Alliance, Ohio

Filed Apr. 13, 1981, Ser. No. 253,689

Int. Cl.<sup>3</sup> E05F 11/00

U.S. Cl. 49—199

22 Claims



1. A garage door operator comprising, in combination:

- a base;
- elongated guide rail means having one end secured to said base and adapted to be mounted in a garage in a direction substantially parallel to at least part of the opening and closing movement of a garage door;
- first and second lengthwise guide channels in said guide rail means;
- a motor;
- a drive wheel journaled on said base;
- means connecting said drive wheel for drive by said motor;
- a flexible elongated tape having a first run longitudinally disposed in said first guide channel and a second run disposed in said second guide channel;
- a web connected to a lower flange of the guide rail means;
- said first and second tape guide channels being disposed in said lower flange;
- means establishing a positive drive engagement between an



arcuate portion of said tape and at least a 90° arcuate portion of the periphery of said drive wheel;  
 a carriage longitudinally guided on said guide rail means; surfaces defining a longitudinal slot in said guide rail means; means extending through said longitudinal slot and interconnecting said carriage and said first run of tape for movement therewith;  
 a link connected to said carriage and adapted to be connected to any said garage door for opening and closing movements by movement of said tape;  
 said first run of tape being stressed in tension during the opening movement of the door operator; and  
 said first guide channel closely enveloping and guiding said first run of tape on both sides and both edges sufficiently to prevent any substantial buckling of said first run of tape under compression forces during closing movement of the door, yet transmitting to the door during closing movement a lesser force than during the opening movement for an increase in safety of door operation.

4,414,779

## WINDOW REGULATOR FOR AN AUTOMOTIVE VEHICLE

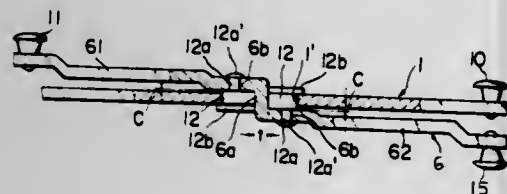
Kinichi Ishii, Yokohama, Japan, assignor to Kabushiki Kaisha Johnan Seisakusho, Japan

Filed Nov. 23, 1981, Ser. No. 324,079

Claims priority, application Japan, Dec. 13, 1980, 55-176233  
 Int. Cl.<sup>3</sup> E05F 11/44

U.S. Cl. 49—351

6 Claims



1. An improved X-arm type window regulator for an automotive vehicle for raising and lowering a window pane for a vehicle door which includes:

- a movable guide rail (8) attached to the lower edge of the window pane;
- a fixed guide rail (9) fixed to the vehicle door;
- a plurality of rollers (10, 11, 15) movable along said movable guide rail and said fixed guide rail,

the improvement which comprises:

- (1) a main arm (1) one end of which moves along said movable guide rail with one of said rollers rotatably attached thereto and the other end of which is pivotably supported on the vehicle door, said main arm being formed with a middle pivot hole (1') therein;
- (2) a crank-like subarm (6) having a first subarm portion (61), a second subarm portion (62), and a stepped portion to connect the first and second subarm portions, one end of which moves along said movable guide rail with one of said rollers rotatably attached thereto, the other end of which moves along said fixed guide rail with one of said rollers rotatably attached thereto, and the stepped portion of which is loosely positioned in the middle pivot hole of said main arm perpendicular to the plane of the middle pivot hole of said main arm by passing one end thereof through the middle pivot hole of said main arm; and
- (3) a pair of arc-shaped, roughly semicircular pivots (12) to rotatably support said crank-like subarm on said main arm with the stepped portion of said subarm sandwiched therebetween in the middle pivot hole of said main arm, whereby a compact X-arm can be realized by using one main arm and only one subarm.

4,414,780  
GEAR BURNISHING AND HONING MACHINE

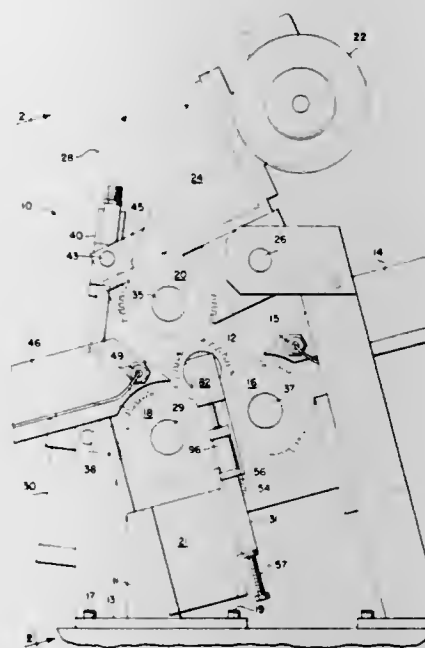
Arne R. Jorgensen, 1041 S. Norbury, Lombard, Ill. 60148

Filed Aug. 21, 1981, Ser. No. 295,173

Int. Cl.<sup>3</sup> B24B 39/00, 15/00

U.S. Cl. 51—26

11 Claims



1. A gear finishing machine comprising a plurality of rotational finishing elements which surround a work station, at least one of said finishing elements being a driven element, drive means for rotating said finishing elements, feed means for supplying a workpiece gear into said work station where it engages said finishing elements, and reciprocating means for imparting periodic reciprocating motion to said workpiece gear with respect to said rotating finishing elements at a rate independent of the rotation of said finishing elements, said reciprocating means including support means for holding said workpiece gear, said reciprocating means comprising a rotatable shaft, resilient rotary-to-linear motion converting means coupled to said shaft and said support means whereby linear motion is imparted to said workpiece gear, said converting means comprises a pair of spaced-apart leaf springs whereby said machine is capable of performing finishing operations at widely varying frequencies of reciprocation.

4,414,781

## TURBINE SANDER

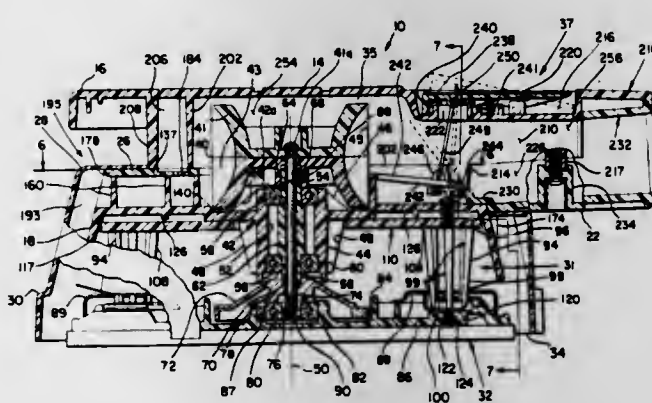
Colin Overy; Anthony J. Langenberg, both of Brockville, Canada; Arthur Powell, Baldwin, and Stanley Rodowsky, Jr., Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Sep. 1, 1981, Ser. No. 298,308

Int. Cl.<sup>3</sup> B24B 23/00, 47/06

U.S. Cl. 51—170 MT

7 Claims



1. A housing for a turbine-driven tool, comprising:

- (a) a first one-piece housing member having a first turbine chamber wall and a first valve chamber wall;
- (b) a second one-piece housing member defining a nozzle having two opposing walls, and having a second turbine chamber wall and a second valve chamber wall;
- (c) the first one-piece housing member being connected to the second one-piece housing member with the first and second turbine chamber walls forming a turbine chamber and the first and second valve chamber walls forming a valve chamber;
- (d) the nozzle and the valve chamber being adjacent to and connected with the turbine chamber;
- (e) connecting means for fastening the first housing member to the second housing member to simultaneously provide alignment and structural support for the housing members;
- (f) the connecting means including a first elongated support member extending from the second housing member adjacent one of the two opposing nozzle walls and being received within the first housing member;
- (g) the connecting means further including a fastener connecting the first housing member to the second housing member via the first elongated support member;
- (h) a removable nozzle cover plate located adjacent the nozzle and having a first mounting aperture, and having a rear portion sandwiched between the first and second housing members;
- (i) the nozzle cover plate being located upon the second housing member such that the first elongated support member is insertable through the first mounting aperture;
- (j) the nozzle cover plate rear portion having a curved flashed portion providing an air seal adjacent the nozzle connection with the turbine chamber; and
- (k) the nozzle cover plate further including a plurality of noise attenuation holes.

4,414,782

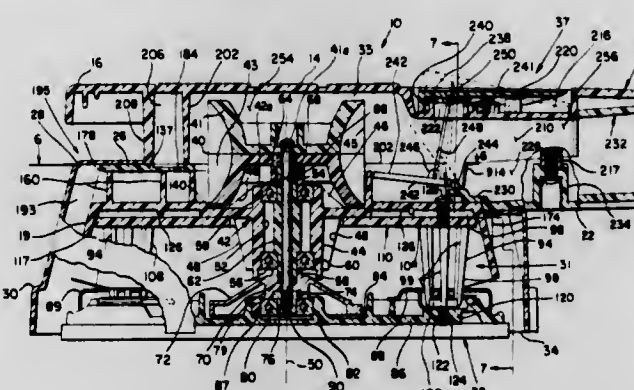
DIRECT DRIVE SYSTEM FOR A TURBINE SANDER  
Anthony J. Langenberg, Brockville, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 1, 1981, Ser. No. 298,311

Int. Cl.<sup>3</sup> B24B 23/00

U.S. Cl. 51—170 MT

8 Claims



1. An air-driven pad sander having a housing connected to a vacuum source, comprising:

- (a) a one-piece thermoplastic shaft having two ends and being rotatably journaled in the housing;
- (b) the shaft having a longitudinal axis and defining a clearance bore coaxial with the longitudinal axis;
- (c) a turbine powered by air flowing to the vacuum source and mounted on one end of the shaft;
- (d) the turbine having a turbine axis of rotation coincident with the shaft longitudinal axis;
- (e) a counterweight operatively connected to the other end of the shaft;
- (f) the counterweight including a bushing portion located eccentrically to the longitudinal axis of the shaft;
- (g) a connecting member slidingly mounted in the shaft

- clearance bore and connecting the turbine to the bushing portion; and
- (h) a platen connected to the housing and operatively associated with the bushing portion.

4,414,783

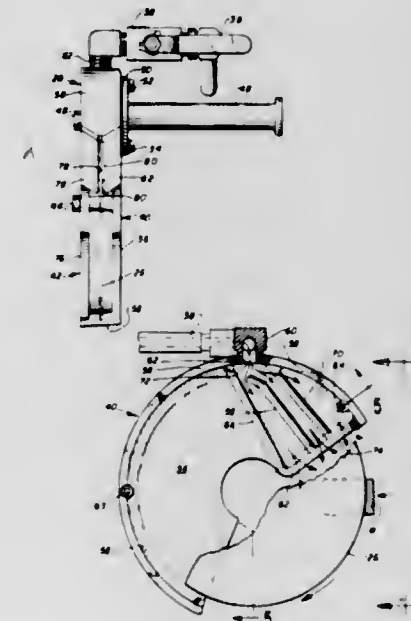
COOLANT SYSTEM FOR ROTATING BLADE CUTTER  
Donald P. Vincent, Lake Zurich, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.

Filed Aug. 19, 1981, Ser. No. 294,379

Int. Cl.<sup>3</sup> B24B 55/02, 55/04

U.S. Cl. 51—267

8 Claims



1. A coolant supply system for use with a cutter of the type having a vertically disposed motor-driven rotatable cutter wheel, a workpiece holder which is movable to feed a workpiece into engagement with a front portion of the cutter wheel for a cutting operation, and a wheel guard, the improvement comprising, in combination, wheel guard means covering an upper portion of said cutter wheel while leaving a front portion exposed for engagement with a workpiece, said wheel guard means having a top wall and a pair of opposed side wall portions which cover opposite sides of the upper portion of said cutter wheel, a coolant inlet opening formed in said wheel guard means generally above said cutter wheel and located to distribute coolant downwardly on both sides of said wheel within a space defined by said opposed side wall portions, and a coolant supply conduit connected to said coolant inlet opening for supplying coolant to the interior of said wheel guard means on both sides of said cutter wheel, at least one of said wheel guard side wall portions has directional vanes formed on the inside thereof for directing coolant from said coolant inlet opening toward a front exposed portion of said cutter wheel where the same is engaged by a workpiece to be cut.

4,414,784

## GREENHOUSE STRUCTURE

Richard M. Masters, 1 Burns Rd., Lexington, Mass. 02173

Filed Feb. 2, 1981, Ser. No. 230,853

Int. Cl.<sup>2</sup> E04b 1/34

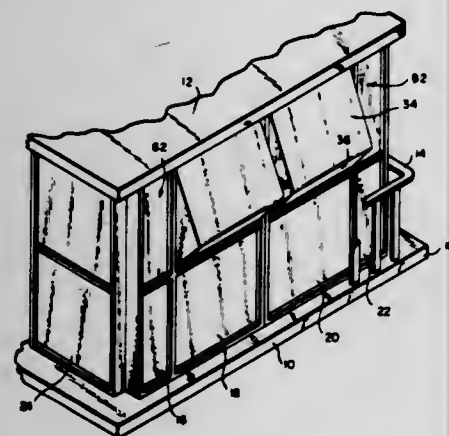
U.S. Cl. 52—73

3 Claims

1. A prefabricated enclosure module for installation within an opening between the roof and floor of an apartment house balcony to provide an enclosed balcony comprising a rectangular frame having spaced, parallel top and bottom members and spaced, parallel side members, a divider member positioned substantially midway between the top and bottom members and parallel thereto extending continuously transversely of the frame from one side member to the other, said divider member, in conjunction with the top member and the portions of the side members above it, defining an opening above the



divider member and said divider member, in conjunction with the bottom member and the portions of the side members below the divider member, defining an opening below the divider member, a window sash coextensive in length and height with the opening above the divider member defining a window opening, means at opposite sides of the sash pivotally mounting the sash within the opening above the divider member for rotation about a horizontal axis, a closure positioned in the opening in the window sash, comprising spaced, parallel side walls spaced apart a distance corresponding to the width of the opening in the window sash and perpendicular to the plane of the opening of right triangular configuration having long and short sides with the long sides extending downwardly and outwardly from the top of the opening and the short sides extending upwardly and outward from the bottom of the open-



ing, and transverse walls joining the long and short edges of the side walls, said side walls and transverse walls being integral, the transverse wall joining the long sides of the side walls defining an outwardly and upwardly-facing transparent panel and said side walls defining vertical transparent panels and the transverse wall joining the short sides of the side walls defining an inwardly and upwardly-facing reflecting panel, said window sash being pivotal about its horizontal axis to adjust the angle of reflected light entering through the transparent panel and reflected by the reflecting panel into the balcony enclosure, and clamping members releasably securing the top and bottom of the frame to the roof and floor, respectively, said clamping members being structured to fix the frame within the opening by frictional engagement with the surfaces of the roof and floor of the structure of the balcony.

4,414,785

## CONSTRUCTION FRAMING ANCHOR

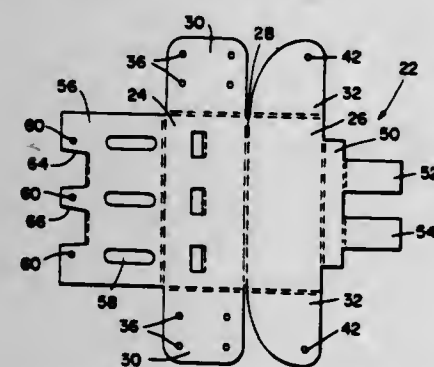
Venice T. Howell, 1425 Cabrillo Ave., Burlingame, Calif. 94010

Filed Nov. 24, 1980, Ser. No. 209,693

Int. Cl.<sup>3</sup> E02D 27/00; E04B 1/38

U.S. Cl. 52—169.1

4 Claims



1. In a framing anchor for securing the lower end of a vertical underpinning to a sill mounted on a concrete footing of a foundation embedded in the ground to support a building structure, said footing defining a sloping top surface corresponding generally to the slope of the ground in which said footing is disposed, said framing anchor being adjustable so

that the underpinning may be held in a vertical position even though the top surface of said foundation may be varied in its angle of slope, said framing anchor including a lower inclined plate resting on the top of said sill and an upper horizontal plate having the lower end of said vertical underpinning resting thereon, said lower and upper plates being joined together at one side of said framing anchor by a flexible interconnecting section, the improvement comprising:

means for integrally locking said lower inclined plate to said upper horizontal plate independently of said underpinning including:

at least one upwardly extending tab integrally connected with said upper horizontal plate on the side thereof opposite said flexible interconnecting section, said tab having said lower end of said underpinning abutted thereagainst; and

an upwardly extending flange formed integrally with said lower inclined plate on the side thereof opposite said flexible interconnecting section, said upwardly extending flange being positioned adjacent said underpinning and in a juxtaposed relationship with said tab, said tab being bendable over said second upwardly extending flange.

4,414,786

## HEAT INSULATING MODULE FOR HIGH TEMPERATURE CHAMBERS

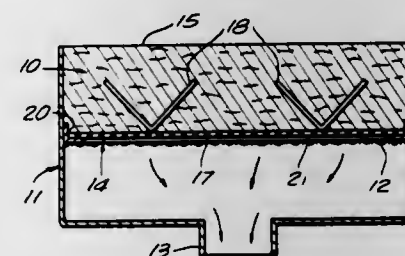
Carl E. Frahme, 26508 Sand Canyon, Canyon Country, Calif. 91351

Continuation-in-part of Ser. No. 135,138, Mar. 28, 1980, abandoned. This application Aug. 18, 1981, Ser. No. 293,970

Int. Cl.<sup>3</sup> E04B 1/38

U.S. Cl. 52—506

36 Claims



1. A heat insulating module for use in high temperature chambers comprising:

a module backing comprising a reticulated member having a plurality of elongated anchor members secured to spaced apart points inwardly of the perimeter of one face thereof before refractory fibers are accreted thereonto with a major portion of said anchor members inclined to said reticulated member; and

a thick mat of discrete refractory fibers bonded together by an inorganic bonding agent accreted onto said one face and about said anchor members by vacuum deposition from an aqueous slurry of said refractory fibers to a thickness substantially exceeding the height of said anchor members above said reticulated member.

4,414,787

## ROOF TRUSS ASSEMBLIES FOR HIPPED ROOFS, AND METHOD OF MANUFACTURING SAME

Burkhard Kappen, Skogslundsgatan 31, S-731 00 Köping, Sweden

Filed Jan. 19, 1981, Ser. No. 226,004

Claims priority, application Sweden, Feb. 4, 1980, 8000849

Int. Cl.<sup>3</sup> E04B 7/08; E04C 3/42

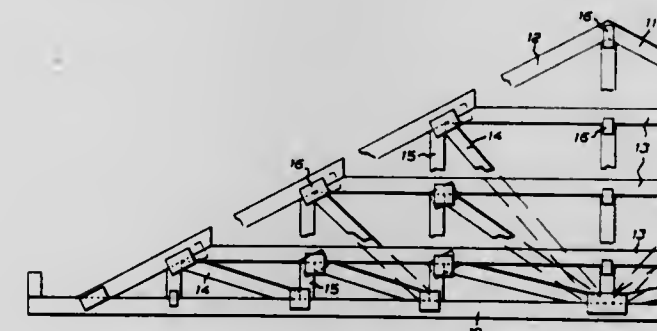
U.S. Cl. 52—643

2 Claims

1. A roof truss assembly for use in supporting hipped roofs comprising:

a plurality of roof trusses each having the same ceiling joist length, said trusses having different heights ranging from

a maximum to a minimum in a pre-determined number of height reduction steps, the trusses of less than said maximum height having a rafter piece which extends generally parallel to said ceiling joists, each of said trusses also having a rafter at opposite ends thereof extending generally at an angle from the highest portion of the truss to the ceiling joist;



a plurality of vertical struts disposed in each of said trusses extending from said ceiling joists to said rafters and said rafter pieces, each of said trusses having the same number of vertical struts, one of said vertical struts being generally centrally disposed in each truss, and the remainder of said vertical struts being spaced symmetrically about said central strut and equidistantly from one another; and a plurality of diagonal struts each extending generally from the top of a vertical strut to the ceiling joist.

4,414,788

## METHOD AND MEANS FOR PACKAGING EXPANSIBLE PRODUCTS

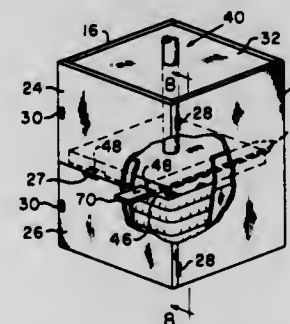
Allan Berg, 85 Alhambra Dr., Oceanside, N.Y. 11572

Filed Jun. 1, 1981, Ser. No. 269,358

Int. Cl.<sup>3</sup> B65B 1/24

U.S. Cl. 53—436

13 Claims



3. In a method for packaging expansible products in their fully expanded condition in a container, said method comprising the steps of:

introducing into a compressing apparatus having a side opening at least a container having an interior accessible through at least one open side thereof;

further introducing into the compacting apparatus through the side opening thereof products in their fully expanded condition to be packaged within the container through the container opening;

compressing the products from their expanded condition into the container through the open side thereof;

applying retainer means through the container to retain the products compressed in the container;

releasing the compression from the products to permit them to expand but retained compressed by the applied retainer means;

and removing the container with the retainer means from the side opening of the apparatus while products are retained compressed therein by the applied retainer means.

4,414,789

## APPARATUS FOR TRANSFORMING BLANKS INTO CORRESPONDING CONTAINERS BY PARALLELEPIPED SHAPE

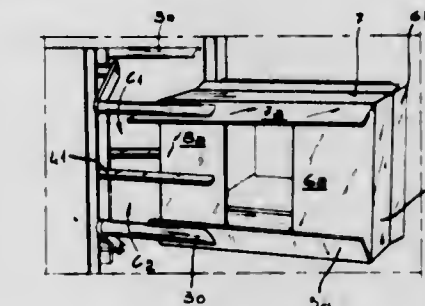
Domenico Pattarozzi, San Lazzaro di Savena, Italy, assignor to B.S.P. Packaging Systems Di Pattarozzi D. &amp; C. S.A.S., Ozzano Emilia, Italy

Filed Mar. 16, 1981, Ser. No. 243,808

Claims priority, application Italy, Mar. 18, 1980, 3358 A/80 Int. Cl.<sup>3</sup> B65B 43/24

U.S. Cl. 53—566

8 Claims



1. Apparatus for transforming blanks into corresponding containers of parallelepiped shape, each of the said blanks being constituted by two superposed sheets provided with longitudinal creasings that define lateral walls of the corresponding container, as well as with transverse creasings and longitudinal slits, the latter being aligned with the longitudinal creasings so that the transverse creasings define flaps of the base and the cover of the said container, said apparatus comprising:

a magazine for holding a vertical stack of said blanks, said magazine having an open lower portion and including means for supporting the bottom of said stack;

a support structure for said magazine;

a carriage supported below a base of said magazine for movement in a downward direction parallel to a vertical axis of the magazine, between three consecutive stations, namely, a first station for removing the blank at the bottom of the said stack, a second station for forming the blank into a corresponding parallelepiped container and for filling it, and a third station for releasing the filled container;

means for moving said carriage between said stations;

first and second suction operated grasping means carried by said carriage, said first grasping means grasping a first portion of the wall of the lower sheet of the blank that remains parallel with the base of the magazine, and said second grasping means grasping a second portion of the wall of the lower sheet that subsequently forms a lateral wall of the container for removing said blank from said means for supporting the stack;

a first and a second arm pivotally connected one to the other at one common extremity and, at the other, to said carriage and said support structure, respectively, said first arm being positionable to contact the lateral wall held by the second grasping means in order to open the blank, in conjunction with the first grasping means, as the carriage travels from the first station to the second station, and said second arm having two parts placed at an angle, the first part being articulated to the first arm and being positioned, when the carriage is in the second station, both perpendicular to the lateral wall held by the first grasping means and in a position at the side of the remaining wall of the lower sheet;

third suction operated grasping means for grasping a lateral wall of the container carried by the said first part of the second arm and being actuable prior to said carriage entering the second station;

first folding means for working on the opened blank positioned in the second station, at successive times, to fold a first base flap of the container perpendicular to the lateral wall held by the first grasping means, a second flap sym-



metrical with the first flap and, synchronously, the remaining flaps;  
means for inserting into the opened blank provided with its base an orderly pile of articles;  
second folding means for working on the said opened blank containing the said pile of articles for folding the cover flaps of the container made out of the said blank in the same sequence of folding operations as for the base flaps; and  
means, actuated concurrently with disengagement of the said first and third grasping means and with the displacement of the said carriage towards the said third station, for transferring the said filled container towards movement devices of a banding group.

4,414,790

**HARNESS AND ATTACHMENT METHOD**

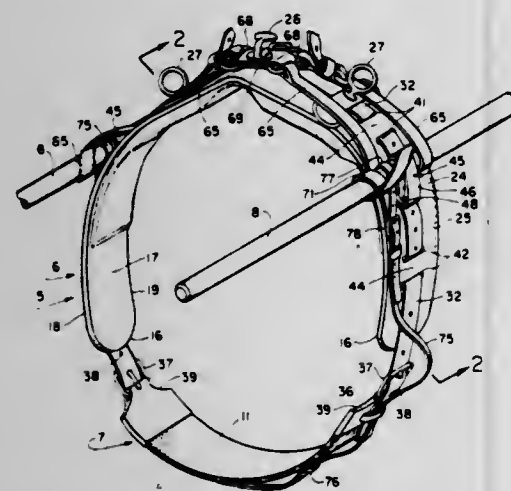
Ronald W. Mitchell, 271 SE. 5th Ter., Pompano Beach, Fla. 33060

Filed Jun. 3, 1982, Ser. No. 384,471

Int. Cl.<sup>3</sup> B68B 1/00

U.S. Cl. 54—2

22 Claims



1. A harness adapted to be fitted to a horse and the shafts of a sulky comprising a girth comprising a first elongated member, a saddle comprising a second elongated member curvingly extending from a top down each side thereof, means for attaching said girth to said saddle, each side of said saddle having a first strap extending down the side thereof, means for attaching said first strap to said saddle, said first strap including a sulky shaft loop adapted to be fitted to one of said sulky shafts, said shaft loop extending outwardly from said saddle whereby said sulky shaft is positioned relative to said saddle at the approximate location of said shaft loop, a second strap connected to said saddle and extending down the side thereof substantially parallel to said first strap, said second strap being wrapped around said sulky shaft and connected to a buckle attached to said saddle at the approximate top thereof such that said sulky shaft is pulled upward.

4,414,791

**RIDING SADDLE**

Eugene A. Freeze, 18211 Lost Knife Cir., #302, Gaithersburg, Md. 20760

Filed Jul. 24, 1981, Ser. No. 286,478

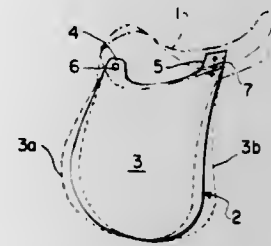
Int. Cl.<sup>3</sup> B68C 1/04

U.S. Cl. 54—44

23 Claims

1. In a riding saddle of the English style suitable for competition riding, the combination of  
a seat structure;  
two flaps each depending from a different side of the seat structure and each comprising  
a flexible main body portion adapted to lie between the corresponding side of the horse and the rider's leg, and at least one upper portion; and

fastener means for each of the two flaps,  
the fastener means for each flap including at least one releasable fastener and being constructed and arranged to secure at least one upper portion of the flap to the seat structure such that by releasing and reengaging the fastener means, with appropriate movement of the flap relative to the seat structure, the flap can be selectively secured and maintained in a forward position, appropri-



ate for jumping with shortened stirrups, a rearward position, appropriate for dressage with lengthened stirrups, and at least one intermediate position, appropriate for pleasure and trail riding,  
the main body portion of the flap being of such dimensions and configuration as to lie beneath the rider's leg when the flap is secured in any of said selected positions and the rider occupies a position in the saddle appropriate for the selected position.

4,414,792

**HEIGHT CONTROL FOR AGRICULTURAL MACHINE**

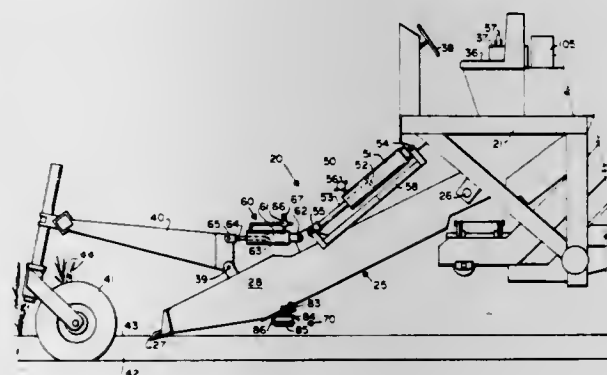
Darryl G. Bettencourt, Lodi, and Akos I. Szoboszlai, San Jose, both of Calif., assignors to Blackwelders, Rio Vista, Calif.

Filed Mar. 30, 1982, Ser. No. 363,642

Int. Cl.<sup>3</sup> A01D 46/20

U.S. Cl. 56—10.2

8 Claims



1. A method for keeping a machine member of an agricultural machine at a substantially constant height above a field during its movement through the field, said machine having a wheel-supported main frame and an auxiliary frame carrying said machine member and an ultrasonic transducer spaced at a constant distance away from said machine member, said auxiliary frame being supported by said main frame for generally vertical movement relative thereto, comprising:

setting said machine member at an initial position relative to the surface of said field, from which initial position the actual relative position of said machine member tends to diverge,  
determining the position of said machine member relative to said main frame and generating an electrical signal corresponding thereto,  
determining ultrasonically the height of said transducer above the field and generating an electrical signal corresponding thereto,  
calculating, from the electrical signals of said two determining steps, the amount and direction of divergence of said

actual position of said machine member relative to the field surface from its initial position relative thereto and producing an electrical correction signal corresponding thereto, and moving the position of said auxiliary frame relative to said main frame in response to said correction signal, to bring said actual position toward conformity with said desired position.

4,414,793

**FLEXIBLE CROP HARVESTING HEADER**

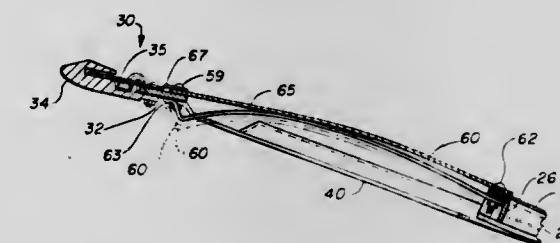
Lawrence M. Halls, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 28, 1981, Ser. No. 306,635

Int. Cl.<sup>3</sup> A01D 55/32

U.S. Cl. 56—14.4

11 Claims



1. A flexible crop harvesting header, attachable to a crop harvesting machine to sever standing crop material and convey the severed crop material to the crop harvesting machine for further harvesting treatment, comprising:

a frame including a rearward connection means and a transverse front connection member;  
a pair of spaced apart sidewalls supported by said frame and defining a width of said header;  
a transverse cutterbar extending between said sidewalls forwardly of said frame for severing standing crop material, said cutterbar including an elongated primary support bar and a strip-like member positioned above said support bar;  
a floor supported by said frame and forming a continuous surface over which severed crop can be conveyed toward said crop harvesting machine for further harvesting treatment, said floor terminating at a forward edge positioned between said strip-like member and said primary support bar;  
a plurality of transversely spaced attachment ribs pivotally connected to said frame at said rearward connection area and connected to said primary support bar of said cutterbar to support said cutterbar from said frame for vertical movement relative to said frame and to provide a support for said floor to permit a flexible movement thereof with said cutterbar; and  
a plurality of transversely spaced leaf spring members connected to the lower side of said front connection member and projecting forwardly therefrom to terminate beneath the primary support bar of said cutterbar, said leaf spring members providing an uplifting, counterbalancing force to the weight of said cutterbar without restrictive connection therebetween to facilitate the vertical movement of said cutterbar in following the contour of the ground and the flexible movement of said floor with said cutterbar while providing the capability of optionally stacking additional leaf spring members for selectively varying the amount of uplifting, counterbalancing force applied to said cutterbar.

4,414,794

**HINGE ARRANGEMENT FOR AN ARTICULATED COMBINE**

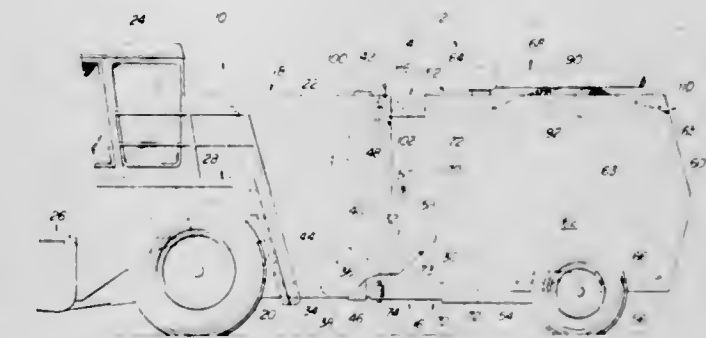
Franz W. Riedinger, Horizontina, Brazil, assignor to Deere & Company, Moline, Ill.

Filed Apr. 23, 1982, Ser. No. 371,045

Int. Cl.<sup>3</sup> B60D 1/00

U.S. Cl. 56—16.6

13 Claims



1. An articulated harvester having front and rear bogies each having a body of substantial vertical extent and each having axles carrying a pair of laterally spaced wheels, said bogies being connected by a hinge arrangement having spaced apart upper and lower portions and permitting pivoting between the bodies about upright steering and fore-and-aft oscillation axes, said upper portion comprising an elongated link pivotally connected at its opposite ends to the respective front and rear bogies characterized in that:

the pivot center of the connection of the upper link to the rear bogie is disposed substantially rearward of the axle of that bogie.

4,414,795

**SHAKING APPARATUS**

Theodore R. Johnstone, 28342 Avenue 11, Madera, Calif. 93637, and James P. Kaatz, 7 Hedge Ct., Apt. #1, Snyder, N.Y. 14226, assignors to Theodore R. Johnstone, Madera, Calif.; James P. Kaatz, Snyder, N.Y. and Edward T. Moon, Madera, Calif., a part interest

Filed Oct. 9, 1981, Ser. No. 310,239

Int. Cl.<sup>3</sup> A01D 46/26, 46/00

U.S. Cl. 56—328 TS

13 Claims



1. A shaking apparatus comprising an arm oriented substantially along a longitudinal axis and adapted to be mounted on a vehicle for earth traversing movement therewith; means for mounting said arm on the vehicle including a pair of linear members secured on the arm on opposite sides of said longitudinal axis of the arm and connected to a means of support operable to permit said linear members independently to adjust to limited movement of the arm substantially about said longitudinal axis while supporting said arm; a pair of jaws mounted on the arm and movable relative to each other between an opened attitude in which said jaws are separated from each other and a closed attitude in which said jaws are juxtaposed relative to each other; means borne by the arm for moving the jaws in being moved to the closed attitude are operable to capture an object therebetween and automatically to adjust to



the angle of the object by contact of the jaws therewith to cause said limited movement about said longitudinal axis as permitted by said linear members; and means mounted on the apparatus for shaking the jaws to impart a shaking motion to an object captured between the jaws in the closed attitude.

4,414,796

# METHOD OF RELEASING APRON TENSION IN ROLL BALING MACHINES

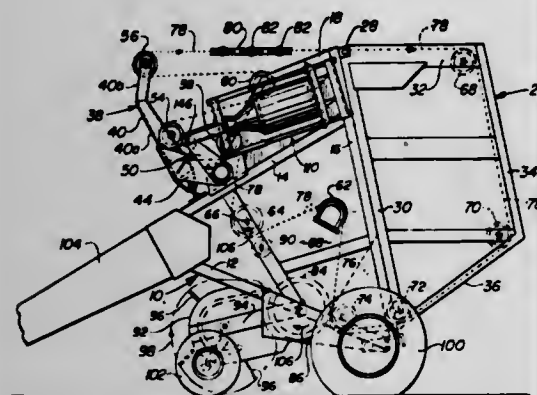
Willis R. Campbell, Ephrata, Pa., assignor to Sperry Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 333,002, Dec. 21, 1981. This application Mar. 25, 1982, Ser. No. 361,647

Int. Cl.<sup>3</sup> A01D 39/00; B30B 5/06

U.S. Cl. 56—341

2 Claims



1. In a roll baling machine having apron means defining an expandable bale chamber, said apron means moving from a first position to a second position during formation of a roll bale in said expandable bale chamber, air pressure spring means for maintaining tension in said apron means, said air pressure spring means including an air bag for containing air under pressure and a piston movable into said air bag to increase the air pressure therein, means for picking up crop material and for delivering said crop material to said expandable bale chamber, a method of releasing the tension in said apron means comprising:

reducing the air pressure in said air bag to a level where the tension in said apron means is relaxed to facilitate servicing of said apron means.

4,414,797

# GARDENING TOOL

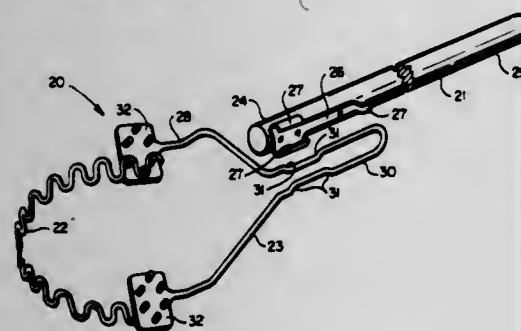
Gene R. Archer, 8225 Gale Rd., Rte. 1, Hebron, Ohio 43025

Filed Dec. 4, 1981, Ser. No. 327,556

Int. Cl.<sup>3</sup> A01D 7/06

U.S. Cl. 56—400.19

9 Claims



1. A gardening tool comprising:

a. a handle;

b. a comb element including attachment end sections on opposite sides of a working section of a sinuous serpentine plurality of projecting lobes constructed from a continuous member of elastic material, with the comb element supported by and attached to the handle only at the attachment end sections of the comb element, wherein the working section is characterized by having an elastic

response when applied to the work in gardening activities; and

c. a yoke between the ends of the comb element and the handle, the yoke being constructed at one end with projecting lateral pins for engagement with projecting lobes of the attachment ends of the comb element and to attach to an end of the handle at the other end.

4,414,798

# SPLICING APPARATUS FOR SPUN YARNS

Isamu Matsui, Kyoto, and Hiroshi Mima, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

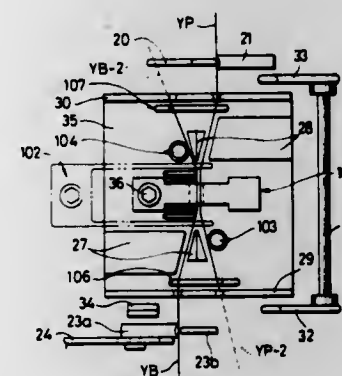
Filed Mar. 17, 1982, Ser. No. 359,041

Claims priority, application Japan, Mar. 18, 1981, 56-40033

Int. Cl.<sup>3</sup> D01H 15/00

U.S. Cl. 57—22

6 Claims



1. A splicing apparatus for spun yarns including a splicing member arranged at the center of the splicing apparatus and having a cylindrical splicing hole formed substantially at the center of the splicing member, a slit for insertion of the yarns into the splicing hole and a jet nozzle for jetting a compressed fluid into the splicing hole and opened to the splicing hole in the tangential direction, characterized in that control plates are located on both the outer sides of the splicing hole at such positions that certain side edges of the control plates respectively traverse a part of an opening of the splicing hole.

4,414,799

# ROPE SPLICER

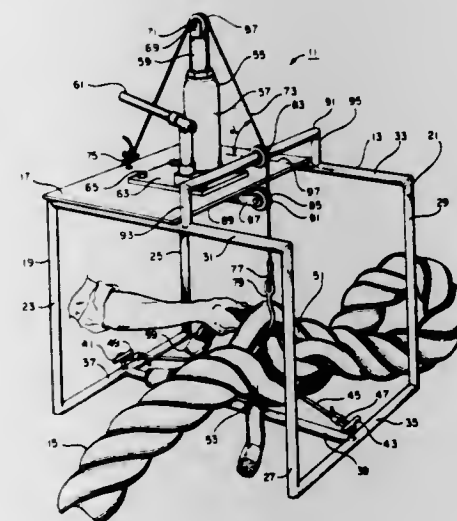
Louis Alexander, Rte. 3, Box 924, and Willie Brown, Jr., Rte. 1, Box 296, both of St. Martinville, La. 70582

Filed Apr. 12, 1982, Ser. No. 367,417

Int. Cl.<sup>3</sup> B65H 69/06

U.S. Cl. 57—22

3 Claims



1. A process for splicing a large diameter rope having a main elongated body with multiple strands and opposite free ends comprising the steps of:

passing a portion of the main body of said rope proximate a

selected free end thereof through a splicing frame, said frame defining a platform area supported by two support portions arranged at opposite extents of said platform area;

providing a flexible elongate member detachably engaged between said two support portions of said frame and a power stand separating means mounted on said platform area;

passing said flexible elongate member between a selected strand and the remaining rope strands of said rope portion and securing said member to said frame to bias said rope portion in a first direction with respect to said frame;

engaging said selected strand with said power strand separating means mounted on said platform and biasing said selected strand in a second opposite direction outwardly from said remaining rope strands to create an opening between said selected strand and said remaining strands;

passing a free end of one of said rope strands between said separated strand and the remaining strands;

relaxing said power strand separating means to thereby secure said free strand within said rope body; and

disengaging said flexible elongate member from said frame and moving said rope main body a selected distance through said frame for repeating said process with successive rope strands to effect a splice.

2. A portable, self-contained splicing frame for splicing strands of a large diameter rope, comprising:

a frame defining a platform area having two support portions arranged at opposite extents of said platform area;

a flexible elongate member detachably engaged between said two support portions of said frame and adapted to pass through said rope for securing the rope within the frame to bias said rope in a first direction with respect to said frame;

fluid power strand separating means mounted on said platform area on said frame for biasing said selected strand outwardly from said remaining strands of said rope, said power strand separating means including a fluid piston and a flexible line having a fixed end secured to said frame and an opposite free end with a coupling means carried thereon for engaging said selected strand of rope, said flexible line being operably associated with said piston cylinder of said power separating means whereby actuation of said power separating means retracts said coupling means to thereby bias said selected strand outwardly in a second opposite direction from said remaining rope strands secured within said frame; and

guide means on said frame for guiding and constraining said flexible elongate member during said biasing operation.

4,414,800

# TWISTED YARN AND METHOD OF PRODUCING THE SAME

Takashi Nakayama; Seichi Yamagata, both of Otsu, and Koji Kajita, Ohmihachiman, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,354

Claims priority, application Japan, Apr. 1, 1980, 55-42223; Oct. 31, 1980, 55-152332; Nov. 17, 1980, 55-160897

Int. Cl.<sup>3</sup> D02G 3/28

U.S. Cl. 57—236

10 Claims



1. A twisted yarn comprising at least two bundled sheaves of staple fibers, each said sheaf having a core having an initial twist of substantially zero and having wrapping fibers wrapped around said core, said sheaves being twisted upon each other, and said twisted yarn product having a coefficient of finishing twist utilization greater than 150%, said coefficient of finishing twist utilization (RF) being defined by the formula,

$$RF = \frac{STy}{SUTy} \times 100$$

where STy represents the strength of the twisted yarn and SUTy represents the strength of the yarn after detwisting the finishing twist of the yarn.

4,414,801

# PROCESS FOR MAKING SPUN-LIKE YARN WITH VARIABLE DENIER FILAMENTS

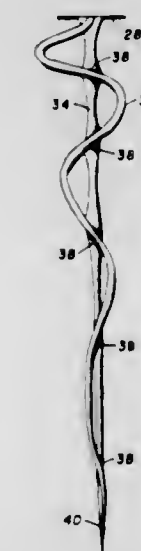
Lawrence E. Blackmon, Foley, Ala.; John R. Dees, and Wayne T. Mowe, both of Pensacola, Fla., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 922,937, Jul. 10, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,742

Int. Cl.<sup>3</sup> D02G 1/02; D01D 5/20, 5/30

U.S. Cl. 57—288

3 Claims



1. A process for making a spun-like yarn comprising:

(a) providing a feed yarn comprising a plurality of continuous polyester filaments, each of said filaments having been prepared by the steps comprising:

(1) metering polyester polymer through a combined orifice to form molten polyester streams traveling in different extrusion speeds;

(2) converging and attenuating said molten polymer streams to form a combined stream having thick and thin regions repetitively along its length; and

(3) quenching said combined stream into a filament and withdrawing said plurality of filaments thereby forming said feed yarn;

whereby each of said plurality of polyester filaments has a cross sectional area which varies repetitively from small values in thin regions to large values in thick regions along its length, said large values being at least 25% greater than said small values, said thick and thin regions being out of phase from filament to filament along length of said yarn;

(b) drawing while heating and false twisting said polyester feed yarn, said drawing being at a draw ratio selected to break a plurality of said filaments primarily in said thin regions.



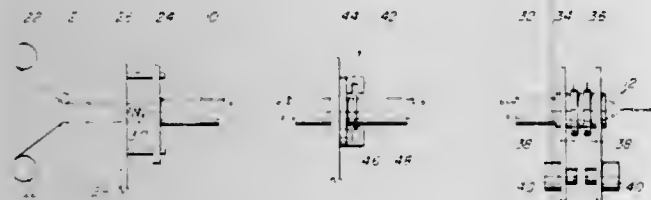
4,414,802

## APPARATUS FOR STRANDING WIRE

John N. Garner, Kingston; Jean M. Roberge, Pointe Claire, and Douglas G. Baxter, Kingston, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada  
Filed Aug. 30, 1982, Ser. No. 413,069  
Int. Cl.<sup>3</sup> H01B 13/04

U.S. Cl. 57—293

3 Claims



1. Apparatus for stranding wire comprising: a single tube defining a single axial passage which provides at least two side-by-side feedpaths for wire along the passage, the passage shaped to prevent wires from moving from feedpath to feedpath, the tube being rotationally flexible about an axis to torsionally twist the tube and thus the passage around said axis from an untwisted position so as to cause the feedpaths to follow a helical path around the axis;
- holding means to hold the tube against rotation about said axis at an upstream position of the tube;
- wire twisting means at the downstream position of the tube to torsionally twist the tube, the twisting means rotatable with the downstream part of the tube, said feedpaths extending through the twisting means;
- rotating means for rotating the twisting means together with the downstream part of the tube for a predetermined number of revolutions about the axis alternately in one direction and then the other;
- direction changing means to change the direction of rotation of the twisting means after the twisting means has rotated the predetermined number of revolutions in each direction; and
- resilient means associated with one of the ends of the tube to enable movement of said one end in the axial direction during twisting and untwisting of the tube.

4,414,803

## FALSE TWISTING APPARATUS

Peter Dammann; Heinz Schippers, and Karl Bauer, all of Remscheid-Lennep, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 168,734, Jul. 14, 1980, Pat. No. 4,339,915. This application Jun. 12, 1981, Ser. No. 273,078  
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928522; Jul. 9, 1980, 3025912

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> D02G 1/08

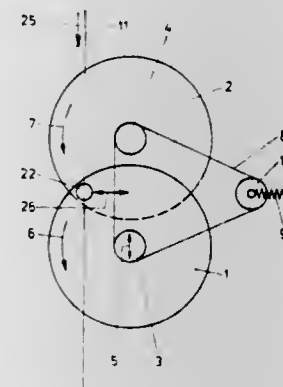
U.S. Cl. 57—340

8 Claims

1. A yarn false twisting apparatus characterized by the ability to adjust the ratio of twist to yarn advance speed, and comprising: a frame, a pair of twist imparting discs, with each disc having a yarn engaging friction surface on one face thereof, means mounting said discs to said frame for rotation about essentially parallel, spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, substantially non-contacting relationship and define a twisting zone therebetween, and including means permitting selective relative movement of said discs along a direction generally perpendicular to

their axes of rotation and parallel to the plane defined by such axes of rotation, and drive means for rotating each of said discs in a common rotational direction and such that their respective yarn engaging friction surfaces run in different directions through said twisting zones, whereby a yarn may be continuously moved through said twisting zone in a direction parallel to and laterally spaced from a line extending perpendicularly between said axes of rotation and so as to have twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces.

4. A yarn false twisting machine having a frame, a plurality of false twisting stations positioned in side-by-side relation along the length of said frame, and means for feeding a yarn through each of the false twisting stations, the improvement wherein said machine includes



- a pair of parallel, spaced apart shafts rotatably mounted to said frame and extending horizontally therealong,
- a pair of twist imparting discs mounted to respective ones of said shafts at each of said twisting stations, with the discs of each pair having a yarn engaging friction surface on one face thereof, and such that portions of the respective yarn engaging friction surfaces of each pair are disposed in opposing relationship and define a twisting zone therebetween,
- means for rotating said shafts and each of said pairs of discs in a common rotational direction,
- means for guiding the advancing yarn through said twisting zone of each of said pairs of discs and in a direction parallel to a line extending perpendicularly between said shafts, whereby each yarn may be continuously advanced through a twisting zone while having twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces.

4,414,804

## APPARATUS FOR IGNITION AND REIGNITION FOR A GAS TURBINE

Christian Menard, Maurepas; Daniel Marouby, Viroflay, and Alain Chollet, Paris, all of France, assignors to Automobiles Peugeot and Automobiles Citroen, both of Paris, France  
Filed Dec. 24, 1981, Ser. No. 334,220

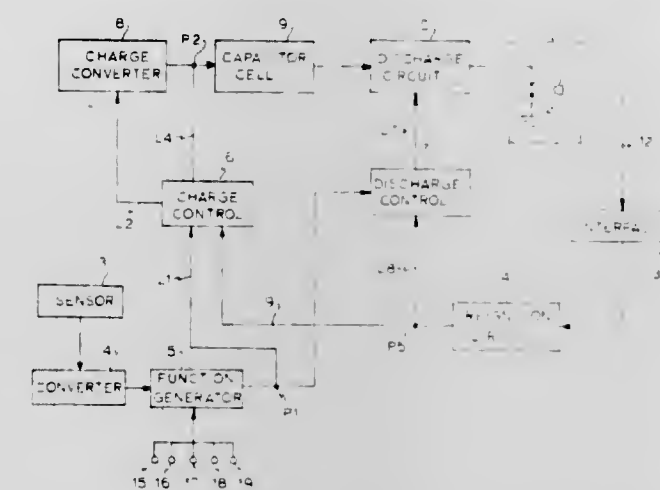
Claims priority, application France, Dec. 24, 1980, 80 27475  
Int. Cl.<sup>3</sup> F02C 7/26, 7/262

U.S. Cl. 60—39.141

9 Claims

1. In a system of spark ignition and reignition of fuel in a combustion chamber of a gas turbine, comprising a function generator (5) for generating a reference voltage as a function of at least the speed of the motor shaft of the turbine, charging means (8) for charging a capacitive cell, means responsive to the reference voltage for producing a regulating voltage, charge control means (6) responsive to said regulating voltage and a voltage indication of the voltage charge on said capacitive cell to control the maximum voltage charge on the cell by controlling said charging means, discharge means for discharging said capacitive cell to produce a spark across a spark gap,

means for deriving a control voltage in response to said reference voltage, and discharge control means (7) for controlling



the frequency of discharge of said discharge means in response to said control voltage.

4,414,805

## HYBRID GAS TURBINE ENGINE AND FLYWHEEL PROPULSION SYSTEM

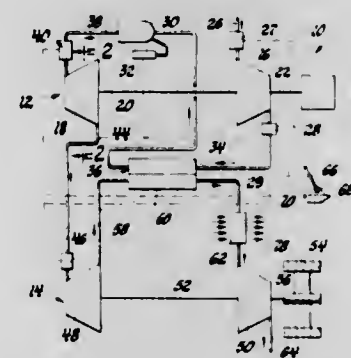
Frank H. Walker, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1981, Ser. No. 325,335

Int. Cl.<sup>3</sup> F02C 3/10

U.S. Cl. 60—39.161

5 Claims



1. In combination with a subambient pressure cycle gas turbine engine having a peak power output level and a steady state power output level substantially less than said peak power output level and including a load shaft, a combustor, a primary compressor, a primary turbine drivingly connected to said primary compressor and to said load shaft, a secondary compressor, a secondary turbine drivingly connected to said secondary compressor, and duct means serially connecting said primary compressor and said combustor and said primary turbine and said secondary turbine and said secondary compressor so that motive fluid generated in said combustor from combustion of fuel in air pressurized by said primary compressor may expand through respective ones of said primary and said secondary turbines to a subambient pressure level maintained by said secondary compressor and thereafter be compressed by the latter to ambient pressure, the combination comprising, a flywheel drivingly connected to said secondary compressor, and motive fluid expansion control means at said primary turbine and at said secondary turbine operative during engine operation at said steady state power output level to serially effect partial expansion of said motive fluid at said primary turbine whereby said steady state power output level is achieved at said load shaft and partial expansion at said secondary turbine whereby sufficient energy is extracted and directed to said secondary compressor to maintain said subambient pressure level and further operative during engine operation at said peak power output level to effect a substantially total expansion of said motive fluid at said primary turbine so that said peak power output level is achieved at said load shaft, said

flywheel being operative to drive said secondary compressor during engine operation at said peak power output level thereby to maintain said subambient pressure level for said total motive fluid expansion.

4,414,806

## NEEDLE SELECTION DEVICE FOR A KNITTING MACHINE

Reinhold Schimko, Aalen-Wasserralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG, Westhausen, Fed. Rep. of Germany

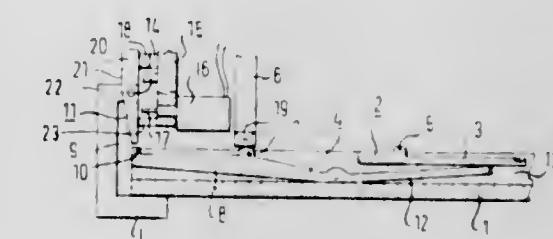
Filed Sep. 20, 1982, Ser. No. 419,899

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138035; Jul. 13, 1982, 3226193

Int. Cl.<sup>3</sup> D04B 7/00

U.S. Cl. 66—75.2

10 Claims



1. A needle selection device for a knitting machine with a Jacquard mechanism in which the knitting needles are brought in a controlled manner with the aid of cam means on the knitting machine carriage into various positions in which they are inactive, or are active for knitting, for forming tuck loops and for the transfer of stitches, in which blocking levers corresponding in number to the number of needle channels and arranged in accordance with the gauge of the needle spacing are provided on mounting means extending over the length of the needle bed, in which on the carriage at each needle selection position there is provided a cam element for pivoting the associated blocking lever and an electromagnet which is controllable for needle selection and which is pivoted with a tripping pin for pivoting the blocking lever, and in which the knitting needles, either directly or by way of respective associated tilting levers, are held in pivoted positions selected for work by the respective blocking levers located in blocking positions.

4,414,807

## METHOD AND APPARATUS FOR CONTROLLING A GAS TURBINE ENGINE

Walter B. Kerr, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1980, Ser. No. 214,376

Int. Cl.<sup>3</sup> F02K 1/17; F02C 9/28

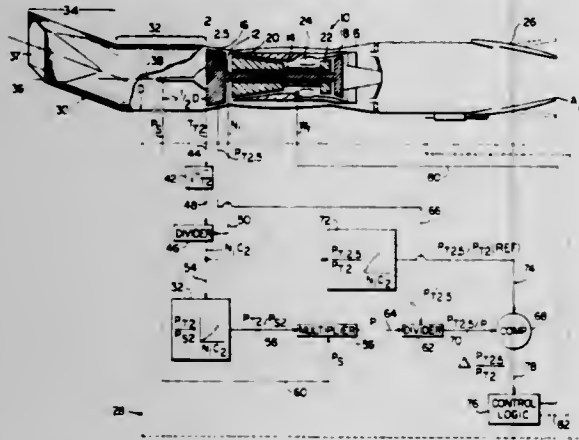
U.S. Cl. 60—204

5 Claims

1. Control means for controlling a gas turbine engine during flight, said engine having a variable area exhaust nozzle and including a compressor and a turbine for driving said compressor and burner means disposed downstream of said compressor and upstream of said turbine for generating hot gases for driving said turbine, said engine having an inlet face plane, engine air inlet duct means disposed upstream of said engine for directing air into said engine, said duct means including a straight portion of substantially constant cylindrical cross section extending axially upstream from said inlet face plane for a distance equal to at least one half of said straight portion diameter, wherein said control means includes means responsive to the static pressure at a point in said inlet duct straight portion at least one-half duct diameter axially upstream of the inlet face plane for generating a first signal indicative of said static pressure, means responsive to the rotational speed of said compres-



sor and to the temperature of the air at said inlet face plane for calculating a corrected compressor speed, means responsive to said corrected compressor speed for generating a second signal indicative of the average total to static pressure ratio at the inlet face plane, means responsive to said first signal and said second signal for generating a third signal indicative of the average total pressure in said inlet face plane, and means responsive to said third signal and to a total pressure at an engine



station downstream of said inlet face plane for generating a fourth signal indicative of a pressure ratio across said station, means responsive to said corrected compressor speed for generating a fifth signal indicative of a scheduled pressure ratio across said station, and, means responsive to the difference between said fourth and fifth signals for controlling either the flow of fuel to said burner means or the area of said exhaust nozzle.

4,414,808

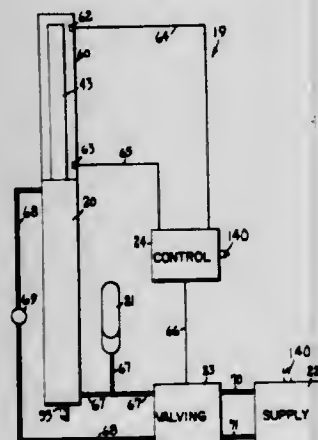
**HYDRAULIC ACTUATOR FOR WELL PUMPS**  
Terrence M. Benson, New Berlin, Wis., assignor to Oil & Sales Limited Partnership, Minneapolis, Minn.

Filed Nov. 10, 1980, Ser. No. 205,190

Int. Cl.<sup>3</sup> F15B 1/02

U.S. Cl. 60—372

4 Claims



2. Hydraulic apparatus for actuating a subsurface reciprocating pump, comprising, in combination:

I. a hydraulic actuator comprising,

- (a) a vertically disposed motor cylinder having upper and lower ends,
- (b) means, including a piston reciprocable in said cylinder dividing said cylinder into upper and lower closed chambers, the volumes of said chambers varying oppositely with movement of said piston, said piston having a lower working surface of area larger than its upper working surface so that said lower chamber is of larger volume than said upper chamber,
- (c) a lift rod actuated by said piston, and
- (d) upper and lower ports affording communication with said upper and lower chambers;

II. a hydraulic accumulator;

III. a source of hydraulic fluid under pressure including a pump and a receiver; and

IV. valving means operable between a first condition, in which fluid ingress from said pump is enabled to said lower port and said accumulator, and fluid egress to said receiver is enabled from said upper port, and a second condition in which said fluid egress to said receiver is prevented and fluid flow from said lower port and said pump to said accumulator and said upper port is enabled; and

V. said piston being reciprocable through a range between upper and lower limits of travel, and means effective when said piston reaches said levels of travel to actuate said valving means between said first and second conditions, whereby to reverse the direction of movement of said piston.

4,414,809

**HYDRAULIC POWER STEERING AND COOLING FAN DRIVE SYSTEM FOR VEHICLES**

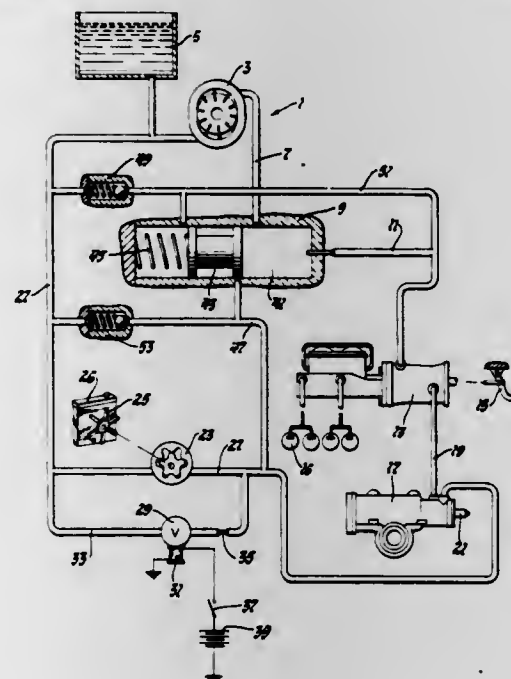
Darryl L. Burris, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1980, Ser. No. 201,513

Int. Cl.<sup>3</sup> F15B 11/16

U.S. Cl. 60—424

2 Claims



1. A hydraulic drive system in a vehicle for powering hydraulically driven vehicle accessories comprising a rotary hydraulic fan drive motor and a hydraulically powered steering gear hydraulically connected in series and with the steering gear having power priority over said motor, a fluid reservoir, hydraulic pump means for pumping fluid from said reservoir to said steering gear and to said hydraulic fan drive motor for powering said steering gear and fan drive motor, first fluid passage means hydraulically connecting the output of said hydraulic pump means to said steering gear, second fluid passage means for connecting the hydraulic output of said steering gear to said fan drive motor and from said motor to said reservoir for the continuous supply of pressure fluid for the hydraulic drive of said steering gear and said fan, flow control valve means hydraulically connected in said first passage means triggered when pressure demand from said steering gear drops below a predetermined pressure level for diverting a portion of the output of said hydraulic pump means to said fan drive motor in response to the predetermined buildup of fluid pressure in said accessory so that said fan drive motor is simultaneously driven by return fluid supplied from said steering gear and by bypass fluid from said control valve means.

4,414,810

**FLUID RESERVOIR FOR A HYDRAULIC BRAKE SYSTEM**

Hans-Dieter Reinartz, Frankfurt am Main, and Magdalene Buerger, Bischofsheim, both of Fed. Rep. of Germany, assignors to IIT Industries, Inc., New York, N.Y.

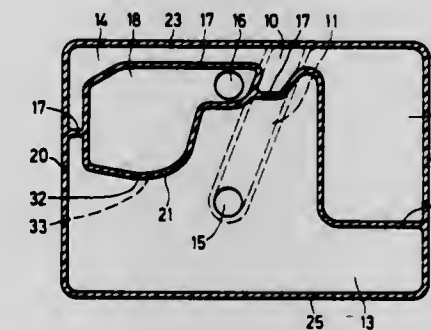
Filed Mar. 18, 1981, Ser. No. 244,949

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3013990

Int. Cl.<sup>3</sup> F15B 7/00

U.S. Cl. 60—535

13 Claims



1. A fluid reservoir for a master brake cylinder of a multi-circuit hydraulic brake system for an automotive vehicle comprising:

a reservoir housing including a lower section having two ports for connecting to said master cylinder and an upper section having a filler hole and two electric fluid level warning arrangements, said housing being subdivided into two separate compartments by a partition wall, each of said two compartments being disposed vertically below a different one of said two warning arrangements; one of said two ports being in direct fluid connection with one of said two compartments; and the other of said two ports being disposed in said one of said two compartments and being in direct fluid connection with only the other of said two compartments by a channel in said housing extending through said partition wall.

4,414,811

**MASTER CYLINDER**

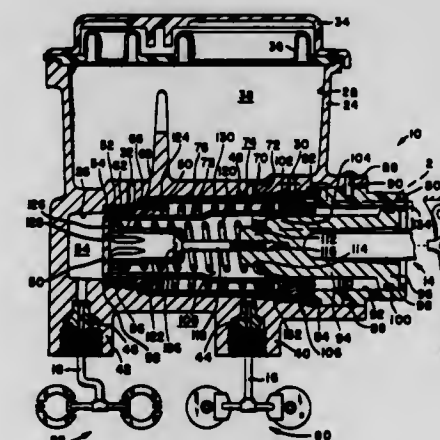
Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 19, 1981, Ser. No. 235,785

Int. Cl.<sup>3</sup> B60T 11/28

U.S. Cl. 60—589

6 Claims



1. A master cylinder comprising a housing defining an elongated bore therein and a fluid reservoir communicating with said bore via a passage, a stepped piston movably received in said bore and cooperating with said housing to define a pair of pressure chambers, valve means circumscribing said piston and sealingly cooperating with said piston and housing for controlling fluid communication through said passage, said valve

means including an annular valve member movably cooperating with a valve seat defined by a step on said housing bore to control fluid flow from one of said pair of pressure chambers to said reservoir via said passage, said annular valve member is reciprocally received in said bore, an annular lip seal received in said bore and engageable with said valve member and including a pair of yieldable concentric lips disposed away from said valve member and toward one of said pair of pressure chambers, said pair of lips sealingly and movably cooperating with said stepped piston and with said housing; an annular sealing member received in said bore and engageable with said valve member and including a pair of radially spaced oppositely disposed yieldable lips sealingly cooperating with said stepped piston and with said housing; the radially outer of said sealing member lips being disposed toward the other of said pressure chambers and cooperating with said housing, said sealing member defining an axially extending leg opposing said radially outer lip and movably cooperating with said stepped piston, said axially extending leg defining an axially extending groove communicating said other pressure chamber with the radially inner sealing member lip, said sealing member and said valve member cooperating to define an intermediate chamber communicating with said reservoir via said passage, said sealing member defining an axially extending annular protrusion projecting toward and sealingly engageable with said valve member to divide said intermediate chamber into a radially outer portion communicating with said reservoir via said passage and a radially inner portion, said valve member defining passage means communicating said radially inner portion with said valve seat and said valve member communicating said radially inner portion with said reservoir when said valve member is disengaged from said valve seat, and resilient means for urging said valve member toward said one pressure chamber and into sealing engagement with said valve seat.

4,414,812

**HOT AIR SOLAR ENGINE**

John F. W. Parry, Westlake Village, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Apr. 30, 1981, Ser. No. 259,049

Int. Cl.<sup>3</sup> F03G 7/02

U.S. Cl. 60—641.14

22 Claims

1. In a tracking solar collector and heat engine having a solar collector, radiation focusing means for concentrating and focusing sunlight on said solar collector, and positioning means for causing said radiation focusing means to be maintained in alignment with the position of the sun, said solar collector having a collector chamber exposed to said sunlight, the provision of an improved heat exchanger and engine for use with said solar collector comprising:

a recuperator chamber proximate to and in thermal communication with said collector chamber;

a compressor for drawing in working fluid of a first specific heat and compressing said working fluid to a first pressure;

a two-stage heat exchanger having a fixed volume and comprising parallel conduits having recuperator and collector portions for carrying and heating said working fluid;

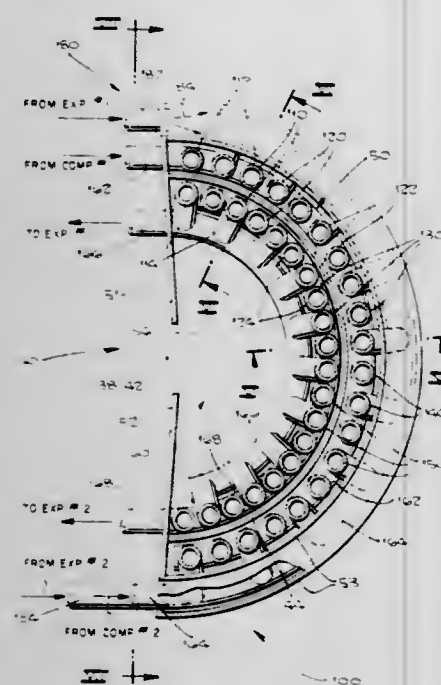
said two-stage heat exchanger having a recuperator stage within said recuperator chamber in which the recuperator portions of said parallel conduits are exposed to a recuperative heat source, and a collector stage within said collector chamber in which the collector portions of said parallel conduits are exposed to a solar radiation heat source;

said two-stage heat exchanger receiving working fluid compressed to a first specific heat and pressure from said compressor, heating said working fluid to a second, higher specific heat and pressure in said recuperator stage and from said solar radiation heat source in said collector stage;

an expander for receiving said working fluid at said second, higher specific heat and pressure from said two-stage heat



exchanger and causing said working fluid to perform useful work; and



combustion flue gases from the combustion unit are directed to heat the gaseous heat exchange fluid;  
a gas turbine directly connected to an electrical generator, the turbine including a compressor section for compressing the gaseous heat exchange fluid and a power section for powering the electrical generator;  
means for directing the compressed gaseous heat exchange fluid through the high temperature gas-to-gas heat exchanger and then directing the heated heat exchange fluid through the power section of the turbine;  
a steam generator;  
means to deliver the hot combustion flue gases, after their passage through the gas-to-gas heat exchanger, to the steam generator;  
one or more dryer units for removing moisture from the biomass prior to combustion; and  
means to direct residual heat energy contained in the combustion flue gases, after their passage through the steam generator, to the dryer units to aid in drying of the biomass fuel.

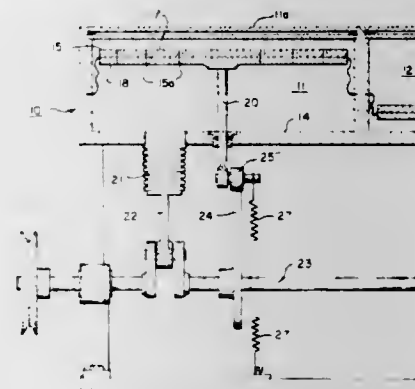
4,414,814

## SOLAR HEAT ENGINES

Eugene W. White, R.D. #2, Box 182, Rossiter, Pa. 15772  
Continuation-in-part of Ser. No. 181,790, Aug. 27, 1980, Pat. No. 4,356,697. This application May 28, 1981, Ser. No. 267,902  
The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> F03G 7/06

U.S. Cl. 60—682

11 Claims



1. A solar pressure oscillation generation device comprising a chamber having two spaced apart walls, means on one wall transmitting sunlight to provide heat at internal absorbing surface within the chamber, means on the other of said walls continuously cooling said other wall, a heat absorbing solar panel movable between said walls, means alternating said solar panel, back and forth between said walls whereby a gas contained in said chamber is alternately heated and cooled thereby causing said gas to undergo alternate expansion and contraction.

4,414,815

## GAS TURBINE WITH ATOMIZER NOZZLE

Oswald Conrad, Fellbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany  
Filed Jul. 25, 1980, Ser. No. 172,439  
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930055  
Int. Cl.<sup>3</sup> F02C 7/22

U.S. Cl. 60—726

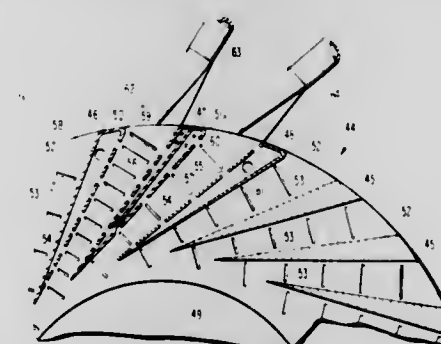
4 Claims

1. An energy conversion system for production of electric power, comprising:  
a combustion unit for burning biomass fuel to produce hot combustion flue gases;  
a high temperature gas-to-gas heat exchanger through which a gaseous heat exchange fluid essentially free of particulate matter is passed and through which the hot

gas turbine which includes an air compressor means for supplying compressed air to a combustion chamber, at least one atomizer nozzle means for supplying fuel to the combustion chamber, the air compressor means includes a secondary guide vane set having a plurality of ducts, means are provided at least one of said plurality of ducts for enabling a boundary layer bleed off, and in that means are provided for communi-

cating said at least one duct of the secondary guide vane set with the atomizer nozzle means so as to enable a direct supplying of high pressure compressed air to said atomizer nozzle means,

the secondary guide vane set includes a plurality of spaced solid blades and a pair of hollow blades defining said at least one duct, said blades being arranged between two annular shrouds, and in that means are provided for intensifying the bleed-off at said at least one duct, characterized in that



said intensifying means includes a plurality of slots provided in said annular shrouds communicating with collecting chambers, and a plurality of further slots provided in said hollow blades and terminating in an interior space of the respective hollow blades, bore means are provided in the respective hollow blades for communicating the interior space with the collecting chambers, and in that means are provided for communicating the collecting chambers with a low pressure area of the gas turbine.

4,414,816

## COMBUSTOR LINER CONSTRUCTION

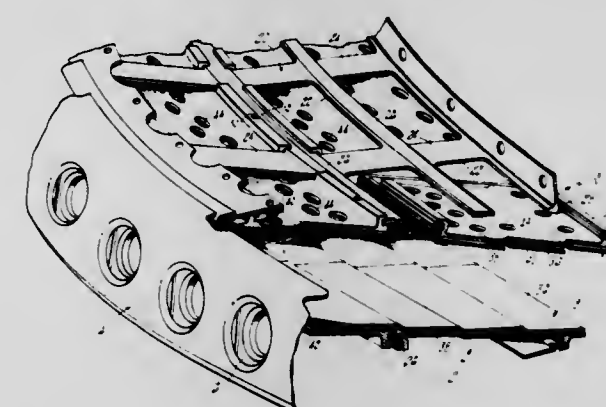
Harold M. Craig, West Hartford; Walter B. Wagner, Bolton, and William J. Strock, Vernon, all of Conn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 2, 1980, Ser. No. 136,652

Int. Cl.<sup>3</sup> F23R 3/60

U.S. Cl. 60—757

4 Claims



1. A combustor liner for a gas turbine engine disposed in a cavity supplied with cooling air, said liner having a lattice type frame in said cavity, a plurality of rectangularly shaped segments supported to said frame and stacked in a circumferential and axial direction and being contoured to define the combustion chamber and being between the combustion products and said frame, means for cooling said segments, means for permitting thermal expansion of said segments in a relatively unconstrained movement whereby the hoop stresses are substantially eliminated, means for securing said segments to said frame for defining a generally annularly shaped combustion zone.

4,414,817

## PURIFYING GEOTHERMAL STEAM

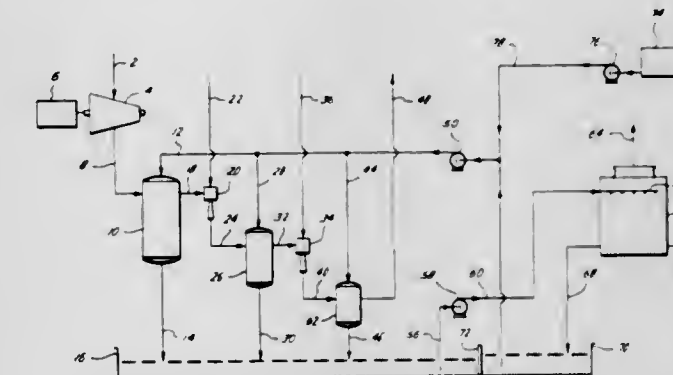
Robert T. Jernigan, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1981, Ser. No. 325,472

Int. Cl.<sup>3</sup> F03G 7/00

U.S. Cl. 60—641.2

3 Claims



1. A process for using geothermal steam containing H<sub>2</sub>S to generate electricity with subsequent purification of the residual steam comprising

- condensing said residual steam with an aqueous solution containing a ferric chelate in a condensing zone under temperature sufficiently low to convert said steam and said solution into an aqueous solution containing H<sub>2</sub>S and said ferric chelate;
- converting said aqueous H<sub>2</sub>S solution to an aqueous solution containing free sulfur and ferrous chelate by contacting said aqueous H<sub>2</sub>S solution with an aqueous solution of ferric chelate containing a sufficient amount of ferric chelate to completely oxidize the H<sub>2</sub>S to sulfur;
- converting said ferrous chelate solution with air in a cooling zone into an aqueous solution containing ferric chelate;
- continuously adding ferric chelate to said ferric chelate solution to maintain said sufficient amount; and
- recycling said ferric chelate solution back to said condensing zone.

4,414,818

## ENVIRONMENTAL CONTROL SYSTEM

Alan M. Turbard, Leighton Buzzard, and Peter N. Foley, Basingstoke, both of England, assignors to Borg-Warner Ltd., Letchworth, England

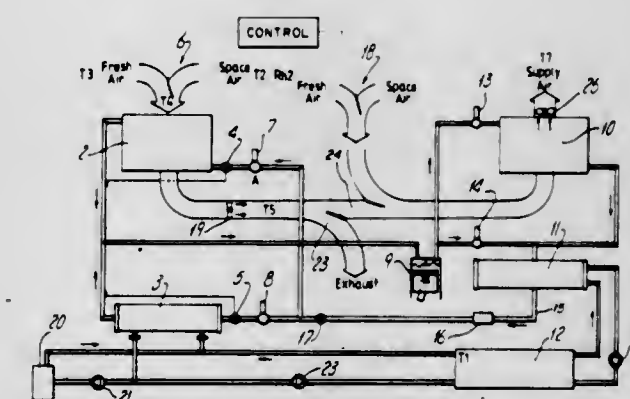
Filed Mar. 2, 1982, Ser. No. 354,130

Claims priority, application United Kingdom, Mar. 5, 1981, 8107003

Int. Cl.<sup>3</sup> F25D 17/04; G05D 23/00

U.S. Cl. 62—176.1

5 Claims



1. An environmental control system comprising in combination: a non-reverse cycle heat pump, said heat pump including means for selectively extracting heat from a plurality of different heat sources, at least one of said sources being an airstream,



said means including an evaporator for extracting heat energy from an air stream through which recirculated space air, fresh air, or mixtures thereof may be circulated; means for selectively rejecting the extracted heat into an air stream to provide heated environmental space air; means for recovering at least a portion of the rejected heat and utilizing the same to increase the heat content of at least one of said heat sources; and control means for selecting the heat sources and uses of the extracted heat in accordance with prevailing conditions and arranged so that, when available, heat is preferentially extracted from said air-stream source, said control means including means for selecting fresh air, recirculated space air, or a

4,414,819

**TEMPORARILY RIGIDIFYING SOFT MATERIALS**

Francois Contal, Grenoble, and Bernard Boyer, Sassenage, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude, Paris, France

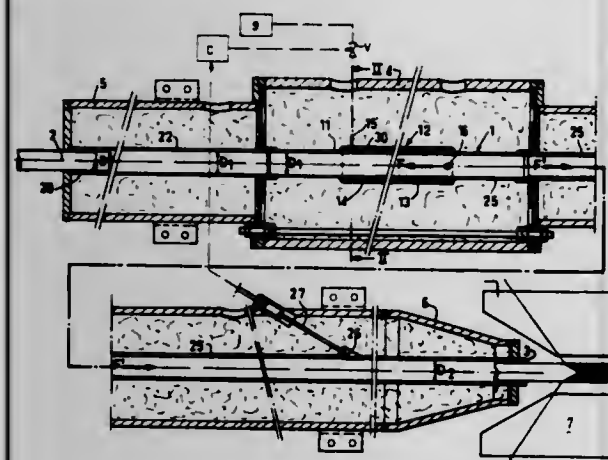
Filed Apr. 27, 1982, Ser. No. 372,313

Claims priority, application France, May 8, 1981, 81 09151

Int. Cl.<sup>3</sup> F25B 41/04

U.S. Cl. 62—222

2 Claims



1. An apparatus for temporarily rendering rigid a product of soft material of very elongated form before said product reaches a processing station, said apparatus comprising a tunnel of elongated shape, the tunnel comprising a refrigerating duct having an internal transverse outline matching with radial clearance an outer transverse configuration of said product from an entrance end to an exit end of the tunnel, the duct comprising an upstream section and a downstream section with respect to the direction of travel of said product, the upstream section being provided with a heat exchanger, the heat exchanger comprising conduit means connected to a source of liquid nitrogen and opening into the duct upstream section, the internal transverse outline of the duct upstream section having greater dimensions than those of the internal transverse outline of the duct downstream section, whereby a comparatively high rate of flow of vaporized nitrogen travels in counterflow with respect to the product, whereas a comparatively small rate of flow of vaporized nitrogen flows equidirectionally with respect to the product.

4,414,820

**ELECTRICAL CIRCUIT AND METHOD OF CONTROLLING SUCH**

George E. Morris, Sterling, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 16, 1982, Ser. No. 349,377

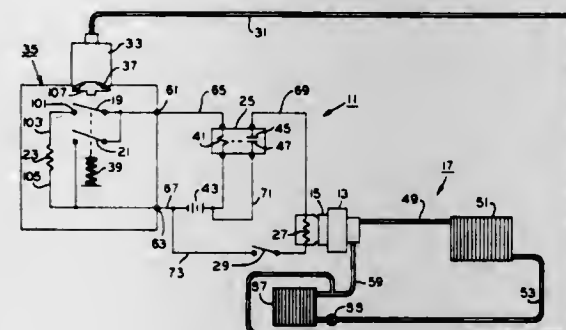
Int. Cl.<sup>3</sup> F25B 27/00

U.S. Cl. 62—226

14 Claims

1. An electrical circuit for controlling the operation of a refrigerant compressor having a suction side and a discharge side connected in an automotive type air conditioning system comprising:

a battery;  
a clutch device for coupling in driving relation with the compressor to effect the operation thereof in the system and including coil means adapted for energization across said battery to effect the coupling of said clutch device in the driving relation thereof with the compressor;  
a relay device including at least one set of contact means operable generally between a closed position and an open position for connecting and disconnecting said coil means across said battery, respectively, and another coil means adapted for energization across said battery to effect the operation of said at least one contact means set; and  
a control device including a pair of switch elements actuated between an open position and a closed position with said switch elements being connected in parallel with each other and in series with said another coil means of said relay device and said battery, respectively, diaphragm means subjected to fluid pressure on the suction side of the compressor and movable for actuating said switch elements, respectively, said diaphragm means being initially movable in response to the fluid pressure of a preselected value on the suction side of the compressor acting on said diaphragm means to actuate one of said switch elements to its closed position connecting said another coil means across said battery, a resistor placed in series with said another coil means upon the closure of said one switch element and having a preselected resistance value to obviate the operation of said at least one contact means set to the closed position thereof by said another coil means when it is connected across said battery upon the closure



of the one switch element, said diaphragm means being thereafter further movable in response to an increase in the fluid pressure on the suction side of the compressor to another preselected value greater than the first named preselected value to actuate the other of said switch elements to its closed position energizing said another coil means across said battery in shunt relation with said resistor and said one switch element in its closed position and said at least one contact means set being operated to the closed position thereof energizing said first named coil means of said clutch device across said battery thereby to effect the coupling of said clutch device in the driving relation thereof with the compressor when said another coil means of said relay device is energized upon the closure of said other switch element, and resilient means operable generally for opposing the switch element actuating movement of said diaphragm, said resilient means being initially operable to return other switch element to its open position replacing said another coil means in series relation with said resistor and said one switch element when the fluid pressure on the suction side of said compressor acting on said diaphragm means is reduced below the another preselected value with the preselected resistance value of said resistor acting to maintain said another coil means energized across said battery upon the operation of said other switch means to its open position and said resilient means being thereafter further operable to return said one switch means to its open position to effect the deenergization of said resistor and said another coil means across said battery when the fluid pressure on the suction side of the compressor acting on said dia-

phragm means is reduced below the first named preselected value thereby to effect the operation of said at least one contact means set to the open position thereof interrupting the energization of said first named coil means across said battery and the coupling relation of said clutch means with the compressor.

4,414,821

**ICE RINK REFRIGERANT DISTRIBUTION MEANS**

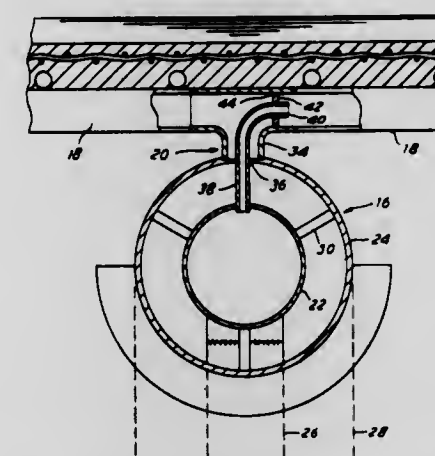
Li G. Jing, Block C8-31/F, Causeway Centre, Hong Kong

Filed Jul. 6, 1982, Ser. No. 395,855

Int. Cl.<sup>3</sup> A63C 19/10

U.S. Cl. 62—235

17 Claims



1. Refrigerant distribution means for ice rink refrigeration apparatus, comprising a supply pipe for the supply of liquid refrigerant; a plurality of rink pipes connected with the supply pipe to receive liquid refrigerant therefrom and positioned beneath the ice rink to effect cooling by refrigerant vaporization; and a collection pipe connected with the rink pipes to collect vaporized or partially vaporized refrigerant, characterized in that the supply and collection pipes are arranged one extending longitudinally within the other to form a common header for the rink pipes and in the provision of respective T-shaped means for the supply and return connections of each rink pipe with the common header.

4,414,822

**REFRIGERATED DISPLAY CASE WITH COLLIDING BAND AIR DEFOST**

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

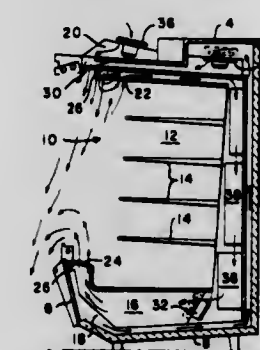
Continuation-in-part of Ser. No. 70,882, Aug. 29, 1979, Pat. No. 4,341,081, and Ser. No. 11,804, Feb. 14, 1979, abandoned. This

application Jan. 21, 1981, Ser. No. 226,769

Int. Cl.<sup>3</sup> A47F 3/04

U.S. Cl. 62—256

10 Claims



1. A refrigerated display case comprising:  
a cabinet having a display space and an access opening permitting access to the interior of said display space;  
an inner air conduit passing around said display space and having a first air outlet adjacent one side of said access

opening and a first air inlet adjacent an opposite side of said access opening;  
first air circulating means for circulating air through said inner air conduit and across said access opening between said first outlet and first inlet to establish a primary air band and a primary air curtain in a refrigeration mode;  
refrigeration means for cooling air passing through said inner air conduit during the refrigeration cycle of operation of said display case and being capable of being shut off during a defrost cycle of operation;  
a secondary air conduit passing around said cabinet adjacent to said inner air conduit but outwardly therefrom and having a second air outlet adjacent one side of said access opening and a second air inlet located adjacent an opposite side said access opening;  
second air circulating means for circulating air through said secondary air conduit and across said access opening between said second outlet and second inlet to establish a secondary air band with a secondary air curtain in the refrigeration mode; and  
defrost cycle control means, including means for reversing the air flow direction of said first air circulating means during a defrost cycle, and means for maintaining the air flow direction of said second air circulating means continuously in the same direction during both refrigeration and defrost cycles, the first inlet region and second outlet region being so aligned as to cause primary band air flowing out of the first inlet to collide with secondary band air flowing out of the second outlet during a defrost cycle, said secondary band air flow substantially reversing the primary band air flow direction, whereby a substantial portion of said primary band air flows outside the display case adjacent the inlet region thereof and adjacent the front of the display case.

4,414,823

**CRYOGENIC FREEZER**

Thomas E. McWhorter, Whitehall, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

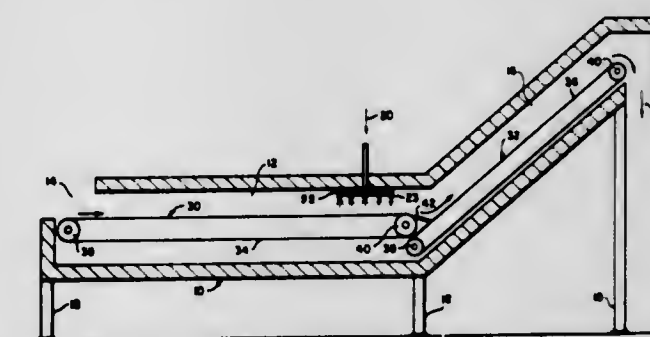
Continuation-in-part of Ser. No. 130,905, Mar. 17, 1980, Pat.

No. 4,312,156. This application Jan. 21, 1982, Ser. No. 341,351

Int. Cl.<sup>3</sup> F25D 23/02

U.S. Cl. 62—266

8 Claims



1. An apparatus for cryogenically freezing an article which comprises, (a) a housing including an entry port at one end thereof, a freezing station, an exit tunnel, and an exit port at the other end thereof and communicating between the exit tunnel and the exterior of the housing, said freezing station positioned intermediate said entry port and said exit tunnel, said exit tunnel extending from said freezing station upwardly to said exit port, (b) cryogen inlet means for introducing a cryogen into said freezing station, and (c) means for transporting the article to be frozen sequentially from the entry port, through the freezing station and the exit tunnel to the exit port, said freezing station being maintained at a cryogenic temperature and said exit port being at a sufficiently greater vertical elevation than said entry port and said freezing station to establish countercurrent flow of the cryogen relative to the movement of the article from said cryogen inlet means to said entry port.



4,414,824

## CRYOGENIC COOLER ADAPTER PLATE

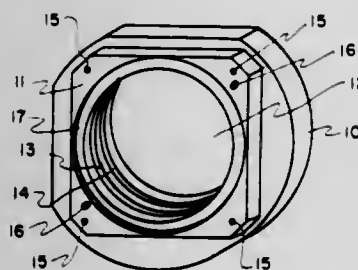
Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 429,655

Int. Cl.<sup>3</sup> F25D 19/00

U.S. Cl. 62—295

3 Claims



1. An adapter plate for mounting a cryogenic cooler having a mounting flange to either of two different thermal sights, wherein one sight has a mounting wall with a first round hole extending part way through said wall, a generally rectangular hole concentric with but larger than said round hole and extending an additional part through said wall, and a second round hole concentric with the other holes but larger than them and extending the remaining part through said wall, and with screw holes in said wall and alignment pin holes at the bottom of said generally rectangular hole; wherein the other sight has a mounting wall with a large round hole therethrough, with small screw clearance holes therethrough, and with large and small alignment pin blind holes in one surface thereof, wherein said adapter plate includes:

a generally discoid plate having first and second opposite faces and a central round hole through said plate, wherein said first has a generally rectangular embossment thereon concentric with said central round hole, said embossment has a plurality of screw holes in its surface and at least one alignment pin extending from said surface, and said central round opening has parallel seal grooves in its periphery and wherein said second face has at least one large alignment pin and at least one small alignment pin extending therefrom and a plurality of screw holes therein, and means for retaining said plate in either sight, wherein said central round opening corresponds in size to said cooler mounting flange.

4,414,825

## COOLING DEVICE FOR CARBON ANODES

Joachim Gittelbauer, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

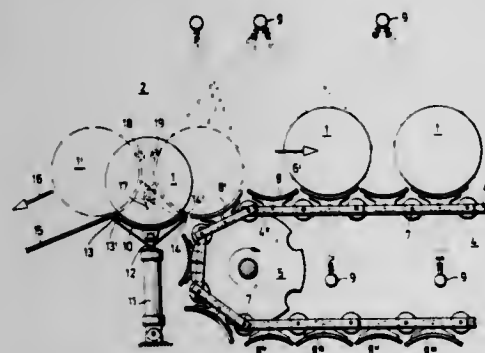
Filed Jul. 8, 1982, Ser. No. 396,400

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127909

Int. Cl.<sup>3</sup> F25D 17/02

U.S. Cl. 62—374

15 Claims



1. A mechanism for cooling molded bodies having moldable masses such as carbon anodes comprising in combination: a conveyor for gently carrying heated moldable bodies

through a cooling zone having a plurality of support stations; a concave receiving shaped transfer means at the receiving end of the conveyor for receiving individual bodies and gently transferring them to the individual support stations; a concave shaped grate-like support element shaped to provide surface shape retaining support to the moldable bodies for each of the support stations; cooling means positioned for directing a cooling medium over the bodies on the conveyor during travel through the cooling zone; and a discharge transfer means at the delivery end of the conveyor gently receiving the bodies.

4,414,826

## SUMMATION DRIVE FOR CONTROLLING SHOGGING IN A WARP KNITTING MACHINE

Kresimir Mista, Obertshausen, and Norbert Englert, Schaafheim, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik, GmbH, Obertshausen, Fed. Rep. of Germany

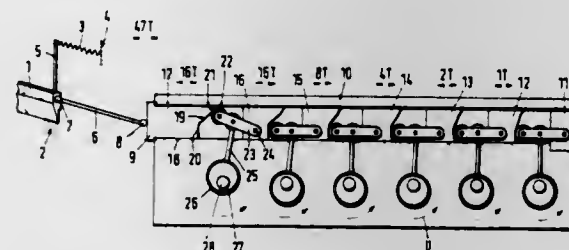
Filed Apr. 30, 1982, Ser. No. 373,730

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117683

Int. Cl.<sup>3</sup> D04B 23/00

U.S. Cl. 66—207

11 Claims



1. A summing arrangement for controlling the shogging movement of a guide bar of a warp knitting machine, comprising:

a plurality of ordered elements each having at least one curved face and each being mounted in said arrangement to allow a variation in the spacing between each; said ordered elements comprising one terminal fixed element, the remaining elements being movable in a longitudinally reciprocable manner, the most distant face of the movable element most distant from said fixed element being operatively couplable to said guide bar for moving said guide bar in a longitudinally reciprocable manner and a plurality of adjustable rolling means, a different corresponding one being engaged between each adjacent pair of said elements for rolling upon and pushing at least one of said elements at its curved face.

4,414,827

## COLLAPSIBLE KNITTING MACHINE

Yoshimori Sugita, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 13, 1982, Ser. No. 407,958

Claims priority, application Japan, Aug. 31, 1981, 56-137354

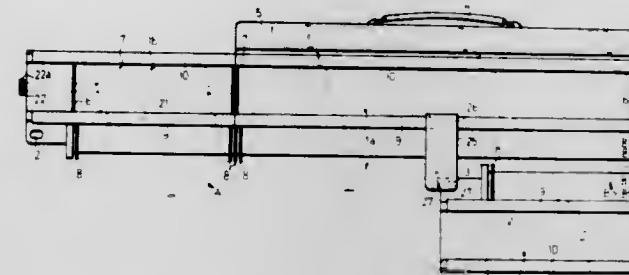
Int. Cl.<sup>3</sup> D04B 7/00

U.S. Cl. 66—60 H

3 Claims

1. A collapsible flat bed knitting machine, comprising: a needle bed including a major part and at least one minor part; a plurality of sinker elements arranged in parallel with each other and at regular intervals on the front edge of said needle bed in the longitudinal direction thereof; a plurality of latch needles aligned in a row in said needle bed and positioned alternately between said sinker elements; said latch needles being slidable in a direction perpendicular to the longitudinal direction of said needle bed; and

connector means for connecting said minor part to a longitudinal end of said major part to fold said minor part in a horizontal plane, said connector means including first and second



and connect members mounted on the each front portion of said major and minor parts, and a vertical axis located near the front edges of said sinker elements to joint the both connect members pivotally.

4,414,828

## LOCKING APPARATUS FOR COMPARTMENT DOOR OPERATED BY A KEY

Toshikazu Takinami; Masao Horaguchi, both of Toyota, and Kelzo Suzuki, Inazawa, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha Tokai-Rika-Denki-Selsakusho, Toyota, Japan

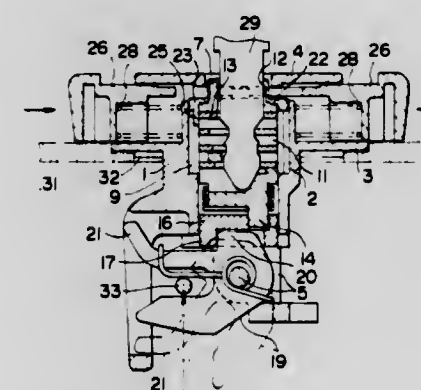
Filed Jun. 10, 1981, Ser. No. 272,279

Claims priority, application Japan, Jun. 18, 1980, 55-85442[U]

Int. Cl.<sup>3</sup> E05B 63/12, 65/06; E05C 3/10, 3/26

U.S. Cl. 70—84

9 Claims



1. A locking apparatus for a compartment door operated by a key comprising:

an outer cylinder fixed in the compartment door; a rotor inserted into said cylinder so as to freely rotate between a locking position and a door opening position substantially coaxially with said cylinder, one end of said rotor being exposed toward the outside of the compartment door, and said rotor being provided with a hole opening at said one end thereof so as to be available for inserting the key from the outside of the door; a plurality of locking plates which are inserted into said rotor radially slidably and are spaced apart from each other in the axial direction of said rotor; one or more engaging plates which are inserted into said rotor radially slidably; a ring surrounding said rotor and independently rotatable with respect to said rotor; a lip projected from said ring in the axial direction of said rotor and engageable with said engaging plate; operating means for rotating said ring; and engaging means which maintains the compartment door closed and is released by said rotor at the door-opening position; whereby said locking plates project radially out of said rotor to engage said outer cylinder at the locking position of said rotor before the key is inserted into said hole, the key pulls said locking plates into said rotor to release said

locking plates from said cylinder when the key is inserted into the hole, said rotor is rotated from the locking position to a releasing position between the locking position and the door-opening position, at this releasing position said engaging plates project radially out of the rotor to engage with said lip when the key is pulled out of the hole so that the rotor is operable by said operating means.

4,414,829

## LOCKING DEVICE FOR AN ELECTRIC METER BOX

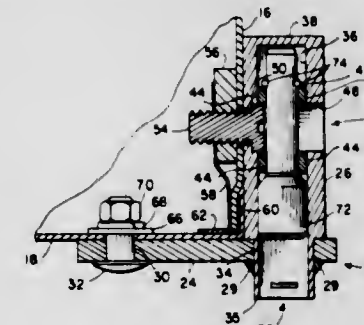
Anker J. Nielsen, Jr., Holden, and Richard E. Hoyt, Worcester, both of Mass., assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 9, 1981, Ser. No. 223,570

Int. Cl.<sup>3</sup> B65D 55/14; E05B 65/52; E05C 5/04, 13/02

U.S. Cl. 70—160

1 Claim



1. A locking device for an electric meter box comprising:

(a) an L-shaped lock housing having a first leg adapted to be securely fixed to the hinged front cover of the meter box, and having a second leg extending substantially perpendicular to said first leg and adapted to be positioned flush against and detachably fastened directly to a side wall of the meter box to lock the front cover in the closed position; (b) said second leg having an axial bore opening only at the front end of said second leg, said second leg also having a transverse bore intersecting said axial bore, said transverse bore opening at both sides of said second leg; (c) fastener means inserted into said second leg transverse bore for detachably fastening said second leg directly to the meter box side wall; (d) said second leg being sized and shaped to accommodate the insertion of a bolt-type lock into said second leg axial bore, said bolt-type lock having a barrel, a plunger and locking balls, said bolt-type lock, when in its locked position with its locking balls extended, being fixed against withdrawal from said axial bore and fixing said fastener means against withdrawal from said transverse bore, said bolt-type lock, when in its unlocked position with its locking balls retracted, being removable from said axial bore and permitting said fastener means to be removed from said transverse bore; (e) said inserted fastener means having a head portion which, when said bolt-type lock is inserted into said second leg axial bore is completely blocked by said bolt-type lock from exterior access; (f) said second leg axial bore having a reduced diameter portion spaced from its closed end, said reduced diameter portion being sized and located to engage the extended locking balls of said bolt-type lock to fix and bolt-type lock in said second leg axial bore to block said inserted fastener means; and (g) bushing means forming said reduced diameter portion, said bushing means fitted and fixed in said second leg axial bore, said bushing means defining part of said second leg transverse bore, said bushing means retained in said second leg axial bore by said fastener means.



4,414,830

**LOCKING DEVICE FOR MOTOR VEHICLES**

Giuseppe A. Maiocco, Druento, Italy, assignor to Champion Spark Plug Italiana S.p.A., Druento, Italy

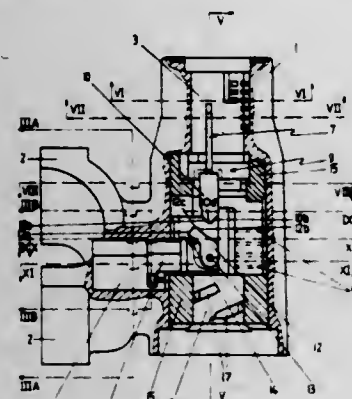
Filed Nov. 19, 1981, Ser. No. 323,065

Claims priority, application Italy, Nov. 28, 1980, 68820 A/80

Int. Cl.<sup>3</sup> B60R 25/02

U.S. Cl. 70—252

5 Claims



1. In a key-operated steering shaft locking device for a motor vehicle, the device comprising a rotatable lock cylinder having a key slot, a spring and a latch movable from a position wherein an associated steering shaft is locked to a position wherein the shaft is unlocked, the latch being operatively associated with the cylinder so that rotation of the latter causes axial movement of the former perpendicular to the axis of rotation of the cylinder from the locked to the unlocked position and also being operatively associated so that the spring urges the latch toward the locked position, the improvement wherein the locking device further comprises means including a rocker arm pinned for rotational movement between a first position wherein a portion of said arm extends into the key slot of the cylinder and said means is ineffective to lock the latch in the position where the shaft is unlocked and a second position wherein said arm does not extend into the key slot and said means is effective to lock the latch in the position where the shaft is unlocked, and means operatively associated with said rocker arm and the spring so that, when the latch is locked in the position where the shaft is unlocked, the spring urges said rocker arm toward the first position, whereby, a key inserted in the key slot moves said rocker arm to the second position and said last-named means urges said rocker arm toward the first position when the latch is locked in the position where the shaft is unlocked.

4,414,831

**KEY-OPERATED LOCK**

B. R. Perkut, Jochbergstr. 10, Benediktbeuern, Fed. Rep. of Germany (D-8174)

PCT No. PCT/DE80/00120, § 371 Date Apr. 15, 1981, § 102(e)

Date Apr. 15, 1981, PCT Pub. No. WO81/00586, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 14, 1980, Ser. No. 253,529

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933453

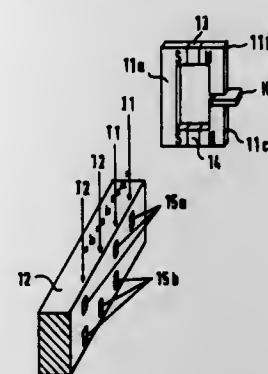
Int. Cl.<sup>3</sup> E05B 47/00, 49/00

U.S. Cl. 70—276

22 Claims

1. Key-operated lock, comprising a reading head with a Hall generator, the magnetic inductance of said Hall generator varying in dependence upon the position of the key provided along its axis with successively arranged for magnetically readable data locations, wherein the signal voltage of said key, which depends upon the momentary value of the inductance is compared by a receiver circuit with stored data as set, the receiver circuit, in case of matching data actuating the mechanical latching device of the lock, characterized by each magnetically readable data location (I1, I2) of the key forming a minimum bivalent (dual) code and by each data location (I,

being succeeded by a magnetically readable time-pulse plane (T) which controls the processing in the receiver circuit of that



data location previously read out by the Hall generator in the reading head.

4,414,832

**START-UP AND STEADY STATE PROCESS CONTROL FOR COOPERATIVE ROLLING**

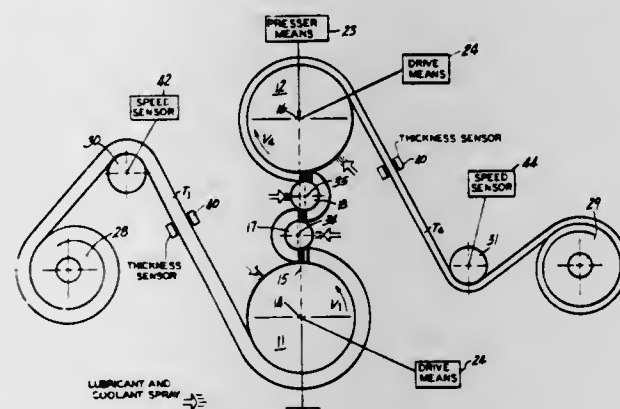
William L. Brenneman, Cheshire; Gary L. Ungarean, Woodbridge; Phillip A. Chatfield, West Haven; Michael J. Pryor, Woodbridge, and Joseph Winter, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1981, Ser. No. 301,331

Int. Cl.<sup>3</sup> B21B 37/12

U.S. Cl. 72—8

12 Claims



1. An apparatus for operating a rolling mill to produce a continuous strip material having a substantially constant final thickness, said apparatus comprising: said rolling mill having at least two rolls rotating at different speeds, said speeds defining a roll speed ratio; said strip material entering said mill at a first speed, passing through at least one roll bite formed by said at least two rolls, and exiting said mill at a second speed; a strip speed ratio being defined by the ratio of said first strip speed to said second strip speed; means for detecting the thickness of said strip material entering said mill; means for controlling said roll speed ratio as a function of said detected strip material thickness; means for producing a compressive force having a magnitude between said at least two rolls; and means for controlling the magnitude of said compressive force in response to said strip speed ratio so that said speed ratios are maintained substantially equal, whereby the amount of off-gage strip material produced during start-up of said mill is reduced and process stability and gage control during steady state operation of said mill is enhanced by maintaining said speed ratios substantially equal.

4,414,833

**METHOD AND APPARATUS FOR BENDING A LONG METAL MEMBER**

Jacques Nicolas, Bondues, and Paul Lenglet, Bievres, both of France, assignors to Societe Anonyme dite: Stein Industrie, Velizy-Villacoublay, France

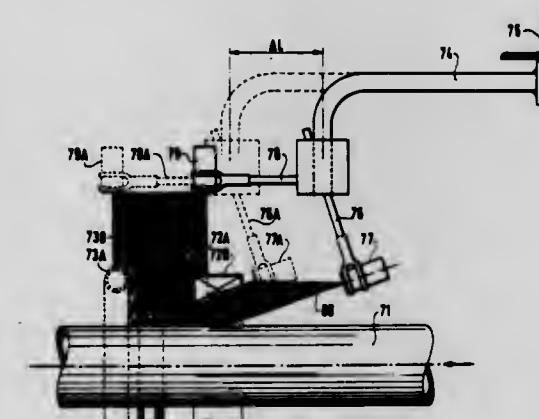
Filed Aug. 5, 1981, Ser. No. 290,044

Claims priority, application France, Aug. 5, 1980, 80 17297; Jan. 14, 1981, 81 00539

Int. Cl.<sup>3</sup> B21D 7/12, 7/16

U.S. Cl. 72—13

20 Claims



1. In a method of bending a long metal member of constant cross-section about a center of curvature by locally heating a narrow zone on the periphery of said member by means of a heating collar which surrounds said zone, said collar being spaced from the member by a radial gap, exerting thrust on one end of the member and supporting its other end by means of a pivoting arm, the improvement comprising:

keeping the temperature of the heated zone on the periphery of the member substantially constant by detecting the temperature of said zone or the radial gap which separates the heating collar from the periphery at said zone, at at least two points about said periphery, one of said points being nearest to the center of curvature and the other being furthest from the center of curvature, and increasing or reducing the input of heat at said one or said other of said points according to whether the detected temperature is lower or higher at said one point or said other point compared with a nominal value which corresponds to a uniform temperature of the heated zone around the periphery.

4,414,834

**METHOD FOR EXPANDING TUBULAR BLANKS**

Nelson R. Gratz, Liverpool, and William E. Wright, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 231,641, Feb. 5, 1981. This application Jan. 26, 1983, Ser. No. 461,091

Int. Cl.<sup>3</sup> B21D 26/04

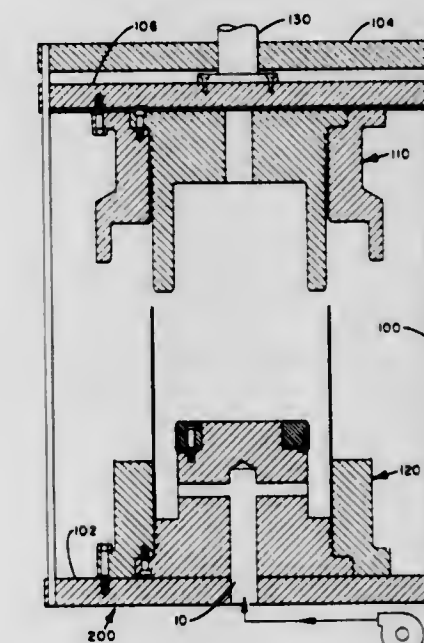
U.S. Cl. 72—58

4 Claims

1. A method of expanding a selected portion of a generally tubular workpiece which comprises the steps of: mounting a first die and a second die in relative sliding engagement, said first die including supporting means for the workpiece and a cylindrical center portion projecting within and spaced from the workpiece and said second die including an annular projection portion sized to mate with the cylindrical center portion to form a seal therewith and a bleed opening to allow fluid in the center space defined by the annular projection portion to bleed therefrom; placing the workpiece in the first die such that the supporting means secures the workpiece in position forming a seal between the workpiece and the first die, such that the center projection portion is located within the workpiece and such that the second die is not in contact with the first die or the workpiece; filling the interior of the workpiece with a non-compressible

fluid until the fluid overflows and all compressible gases are displaced;

displacing the second die towards the first die to engage the end of the workpiece to apply a compressive force to the workpiece, to have the annular projection portion mate with the center portion of the first die to define a pressure cavity filled with fluid between the workpiece, the center portion of the first die and the projection portion of the second die and to force the excess fluid within the workpiece and within the annular projection portion to bleed therefrom;



forming the workpiece by forcing the second die toward the first die thereby compressing the workpiece and placing the fluid in the pressure cavity under pressure to act to force the workpiece outwardly, the first and second dies together defining the desired workpiece configuration and the excess fluid within the annular projection being continually bled while the fluid within the pressurized cavity is sealed therewithin; and separating the die and removing the formed workpiece.

4,414,835

**FLANGE FORMING DRILL APPARATUS**

Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Finland

PCT No. PCT/Fin81/00006, § 371 Date Sep. 24, 1981, § 102(e) Date Sep. 24, 1981, PCT Pub. No. WO81/02118, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 29, 1981, Ser. No. 305,649

Claims priority, application Finland, Jan. 30, 1980, 800280

Int. Cl.<sup>3</sup> B21D 31/02, 53/00

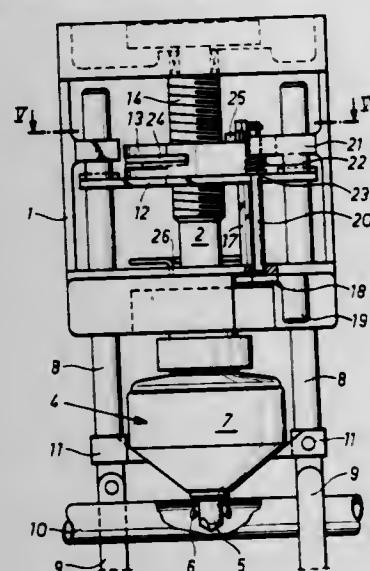
U.S. Cl. 72—71

13 Claims

1. Flange forming drill apparatus for producing a flanged hole in a workpiece, comprising: a body supporting a rotating drill rod thereon; leg means supporting said body for movement toward and away from said workpiece; a drill bit adjacent an end portion of said drill rod for drilling a hole upon movement of said body toward said workpiece; a plurality of flange forming members mounted on said end portion of said drill rod for movement between a retracted position when a hole is drilled and an outwardly projecting, flange forming extended position for forming a flange around the edge of said hole upon movement of said body and away from said workpiece; adjustment means on said drill rod for moving said flange forming members between said retracted and said extended position;



brake bit means on said legs engageable by said adjustment means for extending said flange forming members when said hole is completed; and



drive clutch means on said leg means movable into and out of driving engagement with said rotating drill rod for moving said body away from said workpiece when said flange forming members are extended to form a flange around the edge of said hole.

4,414,836

# METHOD OF AND APPARATUS FOR DEEP DRAWING METAL CONTAINERS

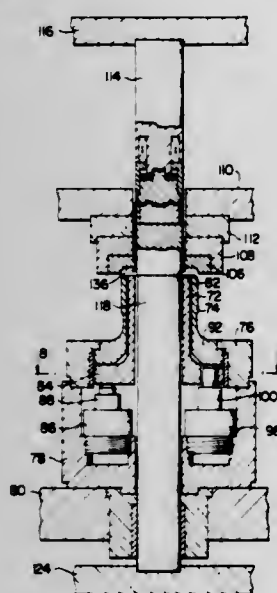
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 430,957

Int. Cl.<sup>3</sup> B21D 22/00

U.S. Cl. 72—349

28 Claims



1. Apparatus for forming a deep drawn metal container body by redrawing a drawn cup having an open top, a substantially flat bottom wall, a substantially cylindrical sidewall, and a curved transition section joining the sidewall and bottom wall, the apparatus comprising,

annular redraw sleeve means having a free end adapted to fit within and support a drawn cup, said free end having a first annular clamping surface thereon contoured and arranged to engage the inner surface of the transition section and the adjacent annular peripheral portion of the bottom wall of a drawn cup supported on the redraw sleeve means,

annular redraw die means having a second annular clamping surface thereon in axially aligned opposed relation to said first clamping surface, said second clamping surface being contoured and arranged to engage the outer surface of

said transition section and the adjacent annular peripheral portion of the bottom wall of a drawn cup supported on said redraw sleeve means,

one of said annular clamping surfaces being defined by an annular clamping surface portion on each of at least two concentric ring members with the annular clamping surface portion on the outer said ring member being contoured to engage and clamp the curved transition section of a cup,

means for moving said annular redraw sleeve means and said annular redraw die means relative to one another to clamp the transition section and the adjacent bottom wall portion of a cup supported on said redraw sleeve means, and male die means movable relative to said annular redraw die means and said annular redraw sleeve means to progressively draw a clamped cup from between said first and second clamping surfaces through said redraw die means to redraw the cup into a deep drawn container body.

4,414,837

# APPARATUS AND METHODS FOR THE SHUNT CALIBRATION OF SEMICONDUCTOR STRAIN GAGE BRIDGES

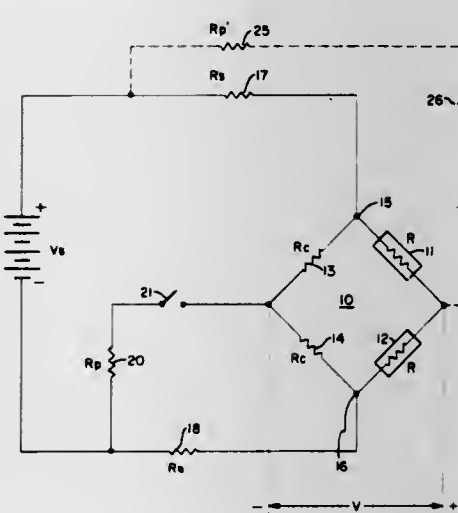
James W. Bice, Wayne; Charles L. Gravel, River Edge, and Harold Bernstein, Hillsdale, all of N.J., assignors to Arthur L. Plevy, Edison, N.J.

Filed Feb. 16, 1982, Ser. No. 348,919

Int. Cl.<sup>3</sup> G01L 25/00

U.S. Cl. 73—1 B

11 Claims



1. In a Wheatstone bridge array of the type having a first side comprising first and second equal temperature sensitive resistors in a series path between first and second terminals, and a second side comprising third and fourth equal temperature insensitive resistors in a series path between said terminals and in parallel with said first side, with an output voltage taken between the junction of said first and second resistors and the junction between said third and fourth resistors, the combination therewith of apparatus for shunt calibrating said array relatively independent of temperature, comprising:

means for applying a biasing potential between said first and second terminals,

selectively operable shunt calibration means operative to shunt only one of said temperature insensitive resistors in a first selectable position to cause said array to provide a calibrated output voltage independent of temperature.

4,414,838

# WIND TUNNEL BALANCE CALIBRATOR

Frederick D. Ward, and Claude Denis, both of Ste-Foy, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

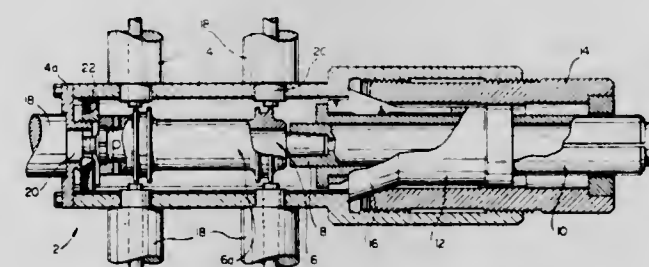
Filed Mar. 22, 1982, Ser. No. 360,556

Claims priority, application Canada, Apr. 22, 1981, 375949

Int. Cl.<sup>3</sup> G01L 25/00

U.S. Cl. 73—1 B

7 Claims



1. A check calibration device for a sting-held wind tunnel balance comprising:

- a housing adapted to be secured rigidly to the sting;
- a plurality of actuators secured to the housing, each positioned to act to generate a load force in a predetermined direction at a predetermined location on the body of the balance when the balance and housing are in position secured to the sting;
- means to vary the load force applied by each actuator;
- means to determine the load force applied by each actuator at a particular point in time;
- means to measure the behavior of the balance in response to the load force applied by each actuator corresponding to that point in time.

4,414,839

# GAS SENSING APPARATUS AND METHOD

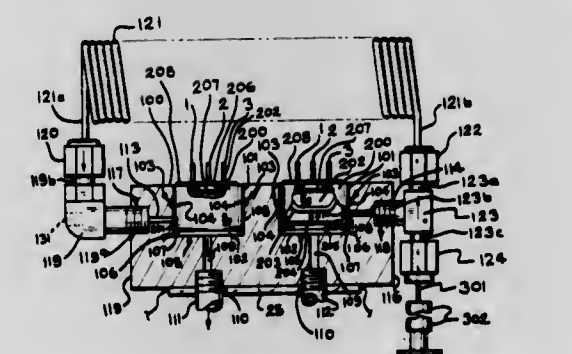
David R. Dilley, East Lansing; Julian J. L. Lee, Lansing, both of Mich., and Mikal E. Saltveit, Jr., Raleigh, N.C., assignors to Board of Trustees, a Constitutional corporation operating Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 29,293, Apr. 12, 1979, abandoned. This application Oct. 17, 1980, Ser. No. 198,113

Int. Cl.<sup>3</sup> G01N 27/12

U.S. Cl. 73—23

15 Claims



1. An electrically powered oxidizable gas detector apparatus which comprises:

- at least two gas sensor means each having a sensing element which decreases or increases resistance as a function of the adsorption of gaseous oxidizable compounds in air on the sensing elements in a parallel electronic circuit so that the difference in resistance of the two sensing elements can be detected when powered by a direct current power source, wherein the difference in resistance of the sensing elements is a function of the concentration of the compounds and is detected by the electronic circuit and wherein one sensor element is adapted to be used for

a reference gas and the other for an unknown oxidizable gas in the reference gas and wherein the oxidizable gas flow in at least the oxidizable gas sensor means is across the sensing element in one direction and out of the sensor means in another direction; (b) electrical heater means adjacent to each sensing element to provide a common operating temperature and powered in parallel by the direct current source and controlled by a voltage regulator means to maintain constant voltage to each heater means;

- detection means in conjunction with the sensing elements for detecting the difference in resistance between the sensing element for the reference sensing element and the other sensing element when there is a difference in composition of gaseous oxidizable compounds in carrier gases supplied to the two sensing means;
- tube means providing a sealed flow path between the sensor means to the sensing elements; and
- inlet means in the tube means for introducing an oxidizable gas in a carrier gas between the sensing means, wherein concentrations of ethylene as the oxidizable gas in the carrier gas between 0.1 and 10 ppm can be detected by the difference in the resistance of the sensing elements.

4,414,840

# KNOCK DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootaka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

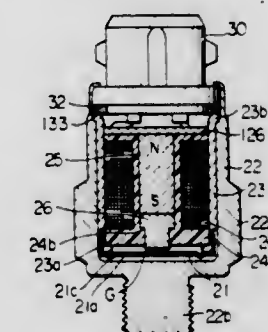
Filed Feb. 19, 1981, Ser. No. 235,986

Claims priority, application Japan, Feb. 22, 1980, 55-21770; Sep. 19, 1980, 55-130965

Int. Cl.<sup>3</sup> G01L 23/22

U.S. Cl. 73—35

8 Claims



1. A knock detecting apparatus for an internal combustion engine comprising:

- at least one vibrating element having a resonant frequency within a knock frequency range of said engine to be detected, said vibrating element including a disk-shaped vibrating portion, said vibrating portion including at least one rib portion along an outer periphery of said vibrating portion for adjusting the natural frequency thereof by changing the radius of said rib portion,



means for holding the outer peripheral portion of said vibrating element substantially over the entire periphery thereof; and  
vibration-electricity conversion means, coupled to said vibrating means, for generating an electric signal corresponding to the vibration of said vibrating portion of said vibrating element.

4,414,841

# METHOD AND APPARATUS FOR DETERMINING PERCENT SOLIDS IN A SLURRY

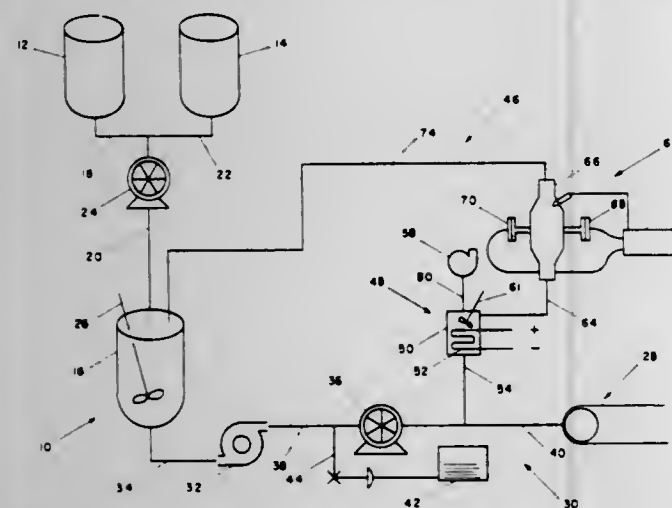
Harry S. Porenski, Jr., and Earl E. Kohnhorst, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 6, 1981, Ser. No. 280,200

Int. Cl.<sup>3</sup> G01N 15/06

U.S. Cl. 73—61 R

6 Claims



1. A method for determining the percent of solids in a solids-liquid mixture, the solids being at least two percent by weight of the mixture, comprising the steps of:  
continuously drawing off a sample of the solids-liquid mixture;  
heating said sample to a temperature sufficiently high enough to form vapor without boiling the liquid component of said sample;  
removing the vapor generated by heating the liquid component of said sample;  
continuously passing said heated sample through an ultrasonic signal generating device;  
continuously passing an ultrasonic signal through said heated sample;  
continuously measuring the velocity and attenuation of the ultrasonic signal in said heated sample;  
determining the percent of solids in the solids-liquid mixture corresponding to the measured sonic velocity and attenuation of the ultrasonic signal; and,  
continuously returning said sample back to the solids-liquid mixture from which it was drawn.

4,414,842

# ION EXCHANGE CHROMATOGRAPHY WITH INDIRECT PHOTOMETRIC DETECTION

Hamish Small, and Theodore E. Miller, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 153,814, May 27, 1980, abandoned.

This application Apr. 2, 1982, Ser. No. 364,705

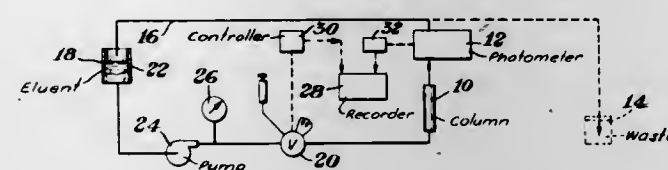
Int. Cl.<sup>3</sup> G01N 21/00

U.S. Cl. 73—61.1 C

20 Claims

1. A single column method of ion analysis using sensitive photometric detection in which liquid eluent containing monitor/displacing ions is added with sample to an ion exchange liquid chromatography column under suitable conditions to resolve for detection purposes sample ions of interest which

elute as sample bands in the effluent of the column, the sample ions being of the same charge and less absorbing than the monitor/displacing ions at the chosen photometric monitoring conditions in order to indirectly measure sample bands of interest by the decrements they cause in the absorbance re-



sponse of the eluent, said method being characterized by the selection and use of an eluent which contains not greater than about  $5 \times 10^{-3}$  molar of said monitor/displacing ions for the purpose of sensitive detection by the photometric monitoring step of the indirectly detected sample ions of interest.

4,414,843

# TIRE DYNAMIC IMBALANCE SCREENING SYSTEM

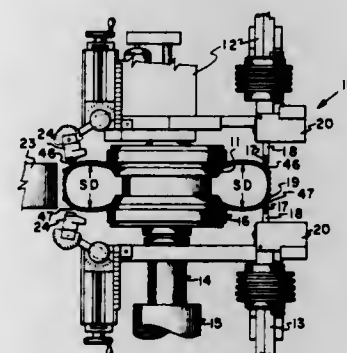
Kenneth L. Kounkel, Silver Lake, Kans.; Loren K. Miller, Tallmadge, Ohio; Kenneth A. Spriggle, Akron, Ohio, and Stephen L. Williams, Doylestown, Ohio, assignors to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

Filed Sep. 19, 1980, Ser. No. 188,707

Int. Cl.<sup>3</sup> G01M 1/14

U.S. Cl. 73—66

29 Claims



1. A measuring apparatus for predicting the magnitude of tire variables in addition to lateral runout comprising means to measure lateral runout on one side of said tire during rotation of said tire relative to said measuring means at a position between the area of maximum sectional width and the outer radial face of said tire, second means to measure lateral runout on the other side of said tire during rotation of said tire relative to said second measuring means at a second position having generally the same radius as said first-mentioned position, means to determine the first harmonic values for the runouts at each circumferential position around said tire and means to determine the sum of the first harmonic values at corresponding circumferential locations around said tire to indicate the magnitude of said tire variables.

4,414,844

# RAPID INSULATION RESISTANCE TEST FOR BISMUTH-CONTAINING CERAMIC CAPACITORS

Bharat Rawal, Myrtle Beach, S.C., assignor to AVX Corporation, Myrtle Beach, S.C.

Filed Jul. 24, 1981, Ser. No. 286,684

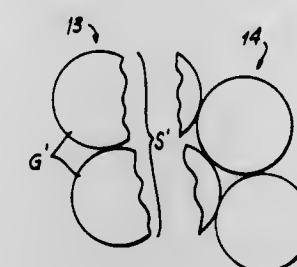
Int. Cl.<sup>3</sup> G01N 33/38

U.S. Cl. 73—104

3 Claims

1. The method of determining the insulation resistance characteristics of a ceramic capacitor containing bismuth ions which comprises the steps of causing the fracture of a fired

sample of said capacitor to expose an internal area thereof, and establishing an insulation resistance factor as a function of the



proportion of inter-granular fracture present in said exposed area.

4,414,845

# FUEL INJECTION NOZZLE, PARTICULARLY FOR DIESEL ENGINES

Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

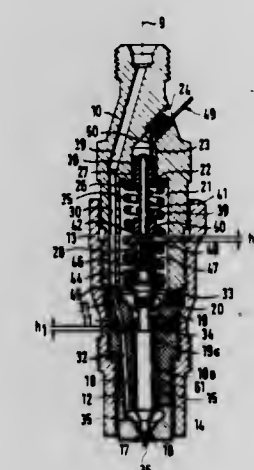
Filed Apr. 15, 1982, Ser. No. 368,881

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117779

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73—119 A

10 Claims



1. Fuel injection valve and nozzle combination, for use in an internal combustion engine having  
a valve body (10,11,12) of electrically conductive material;  
a needle valve element (15) of electrically conductive material formed with a valve cone (17) thereon;  
a valve seat (16) formed on the valve body;  
a valve spring (25) engaging the needle valve element to press the valve cone against the valve seat, and to seal the valve against injection of fuel and to establish an electrical contact between the needle valve element (15) and the valve body (10,11,12) and, upon lifting of the valve element during an injection stroke, to permit injection of fuel and to break the electrical contact so that the valve seat and valve cone will form a first electrical switch,  
and comprising, in accordance with the invention  
a second electrical switch (40,42; 51,52) electrically serially connected with said first switch, the second electrical switch being controlled by the needle valve element to open upon movement of the needle valve element (15) from the valve seat by a predetermined distance (h<sub>2</sub>) corresponding to a portion of the injection stroke (h<sub>1</sub>) of the needle valve element, and remaining open so long as the valve cone (17) of the needle valve element is spaced from the valve seat (16) by said predetermined distance.

4,414,846

# GAS WELL MONITORING DEVICE

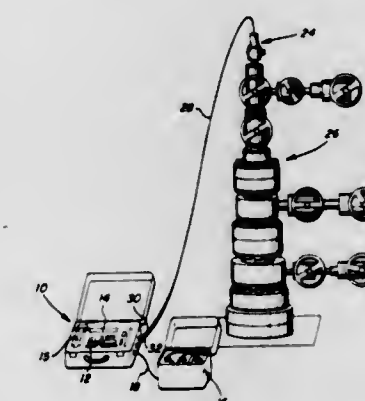
Wilbur L. Dublin, Jr., Round Rock, Tex., and Jack Schrenkel, 3709 S. Atlanta, Tulsa, Okla. 74105, assignors to Jack Schrenkel, Tulsa, Okla., a part interest

Filed Feb. 9, 1982, Ser. No. 347,342

Int. Cl.<sup>3</sup> E21B 47/06

U.S. Cl. 73—151

5 Claims



1. A gas well monitoring device for installation at a well head for the determination of bottom hole pressure in a well bore comprising:  
a fixed sensing unit disposed at the well head and including pressure transducer means and temperature transducer means, said transducer means being exposed to the atmosphere of gas in the well head to thereby measure pressure and temperature of the gas at the well head;  
automatic control means for periodically sampling the output of said transducer means;  
processor means interconnected to said automatic control means for calculating the value of bottom hole pressure based upon the output of said transducer means;  
storage means interconnected to said processor means for receiving and storing at predetermined time intervals related values of the sampled well head pressure and well head temperature, and the calculated value of bottom hole pressure at said predetermined time intervals; and  
display means for displaying well data stored in said storage means including bottom hole pressure values.

4,414,847

# GAS FLOW MEASURING APPARATUS

Tokio Kohama, Nishio; Hisasi Kawai, Toyohashi; Hideki Obayashi, Okazaki, and Tsuneyuki Egami, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

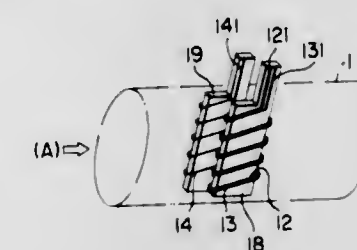
Filed Jul. 23, 1981, Ser. No. 286,344

Claims priority, application Japan, Jul. 28, 1980, 55-104048

Int. Cl.<sup>3</sup> G01F 1/68

U.S. Cl. 73—204

6 Claims



1. A gas flow measuring apparatus comprising  
a measuring tube in which a gas to be measured flows,  
a first support member made of an electric insulating material mounted at a position at the inside of said measuring tube, said position being exposed to the gas flow to be measured,  
an electric heater resistance wire,



a first temperature-dependent resistance wire, said electric heater resistance wire and said first temperature-dependent resistance wire being wound side by side but avoiding occurrence of any short-circuit therebetween on said first support member,

a second support member of an electric insulating material mounted at a position at the inside of said measuring tube, said position being exposed to the gas flow to be measured and adjacent to said first support member, to be free from the effect of heat of said electric heater resistance wire in said measuring tube,

a second temperature-dependent resistance wire would on said second support member, and

a measuring circuit for applying a voltage to said electric heater resistance wire and said first and second temperature-dependent resistance wires for measuring the flow of the gas.

4,414,848

## THREE-AXIS ACCELEROMETER

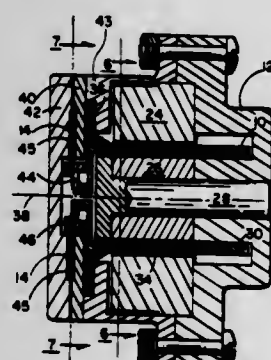
Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1981, Ser. No. 292,460

Int. Cl.<sup>3</sup> G01P 15/13

U.S. Cl. 73-497

9 Claims



1. An accelerometer, comprising:

a base;

a proof mass;

electromagnetic means for constraining displacement of said proof mass relative to said base in three degrees of freedom;

elastic suspension means for constraining displacement of said proof mass relative to said base, wherein said elastic suspension means comprises a plurality of filaments extending between said proof mass and said base, and wherein one end of each of said filaments is attached to a suspension region of said proof mass; and

capacitive pickoff means for sensing translational displacement along the longitudinal axis of said proof mass and for sensing rotational displacement about two orthogonal cross axes of said proof mass, wherein all capacitive elements of said pickoff means are clustered adjacent the suspension region of said proof mass.

4,414,849

## APPARATUS AND A METHOD FOR INDICATING VARIATIONS IN ACOUSTIC PROPERTIES ON AN INTERFACE

Michael H. Brown, Didcot, and Roger Martin, Faringdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 13, 1981, Ser. No. 310,867

Claims priority, application United Kingdom, Oct. 20, 1980, 8033737

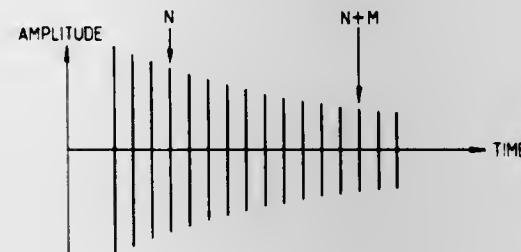
Int. Cl.<sup>3</sup> G01F 23/00, 23/28; G01N 29/00

U.S. Cl. 73-290 V

8 Claims

1. Apparatus for indicating variations in acoustic properties at the interface of a first material in contact with a second material, which first material is capable of transmitting elastic

waves therethrough, which apparatus comprises transducer means for injecting an elastic wave signal pulse into the said first material so as to be repeatedly reflected back and forth across the said first material between a surface of predetermined reflection properties and the interface between the first material and the second material, the first material being such that the attenuation with distance of elastic waves traversing therethrough is substantially constant, an amplifier for providing electrical signals corresponding to received reflected signal pulses, detector means for detecting the electrical signal corresponding to an early reflected signal pulse (N), automatic gain control means so controlling the amplifier as to set to a prede-



termined level the amplitude of the said electrical signal (N) and to determine the gain of the amplifier for subsequent electrical signals corresponding to later reflections of the pulse, comparison means for comparing with a reference standard the amplitude of an electrical signal corresponding to a selected later reflection (N+M) of the pulse, response means for indicating in response to the comparison a change in the attenuation of pulses upon reflection at the said interface, the said response means being inhibited from operating in response to signals corresponding to reflections of the pulse between the said early reflection (N) and the said selected later reflection (N+M).

4,414,850

## MEASUREMENT METHOD AND SYSTEM UTILIZING ULTRASONIC WAVE

Hirohide Miwa, Kawasaki; Takaki Shimura, Machida, and Keiichi Murakami, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

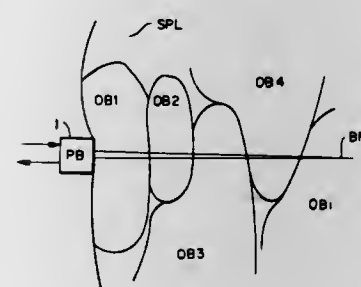
Filed Jun. 3, 1981, Ser. No. 269,861

Claims priority, application Japan, Jun. 3, 1980, 55-74680

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73-599

20 Claims



1. A measurement method utilizing ultrasonic waves for measuring attenuation characteristics of domains in an object, comprising the steps of:

- transmitting ultrasonic waves of plural different frequencies to an object;
- receiving the ultrasonic waves reflected from the object; and
- measuring the attenuation characteristics of the domains on the basis of the ratio of intensities of the received reflected ultrasonic waves.

4,414,851

## GAUGE PRESSURE SENSOR

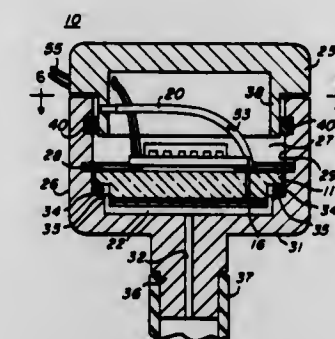
Rastko C. Maglic, Colorado Springs, Colo., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1981, Ser. No. 297,436

Int. Cl.<sup>3</sup> G01L 9/12

U.S. Cl. 73-706

16 Claims



1. In a gauge pressure sensor comprising:

a pressure transducer including a base and a flexible diaphragm mounted to said base, said diaphragm having first and second substantially parallel opposite facing external surfaces, said base and diaphragm first external surface substantially defining an internal transducer cavity for receiving a first predetermined pressure;

transducer housing means having peripheral walls and a main interior cavity, said housing means providing an outer protective mechanical shell surrounding said transducer; and

mounting means for mounting said transducer in said housing means main interior cavity and fixing said transducer to said housing means;

said second external diaphragm surface of said transducer and a portion of said housing means substantially defining an external transducer cavity for receiving a second predetermined pressure;

said diaphragm being displaceable and flexing with respect to said transducer base in response to changes in the pressure difference between said first and second predetermined pressures wherein electrical characteristics of said transducer are altered in response to the displacement of said diaphragm and are therefore altered in response to sensed differential pressure changes, and wherein one of said first and second reference pressures is representative of ambient atmospheric pressure existing external to said housing means;

the improvement comprising the combination of:

an ambient pressure receiving cavity formed in and by said housing means and opening directly external to said housing means for receiving therein the atmospheric pressure external to said housing means, said ambient cavity including openings in said peripheral walls of said housing means providing for direct coupling to the ambient atmosphere external to said housing means to said ambient pressure receiving cavity, said openings provided peripherally about said housing means and opening directly external to said housing means, said peripheral openings disposed over more than 180 degrees of rotation about an axis passing through said housing means and centrally located,

a pressure transmitting means comprising a tube provided in said main interior cavity of said housing means and having inlet and outlet ends, said inlet end coupled to and receiving the atmosphere in said ambient pressure receiving cavity and said outlet end coupled to and receiving the atmosphere in one of said internal and external transducer cavities, said pressure transmitting means transmitting pressure between said ambient pressure receiving cavity and said one of said internal and external cavities, and

an isolating means comprising a fluid present within said tube for preventing direct connection of the atmosphere contained in said inlet end with said atmosphere contained

in said outlet end but permitting the transmission of pressure changes therebetween by said pressure transmitting means, whereby ambient atmospheric contaminants external to said housing means are prevented from reaching and substantially impairing the operation of said transducer diaphragm thereby preventing erroneous pressure sensing operation.

4,414,852

## AUTOMATIC ZERO BALANCE CIRCUIT

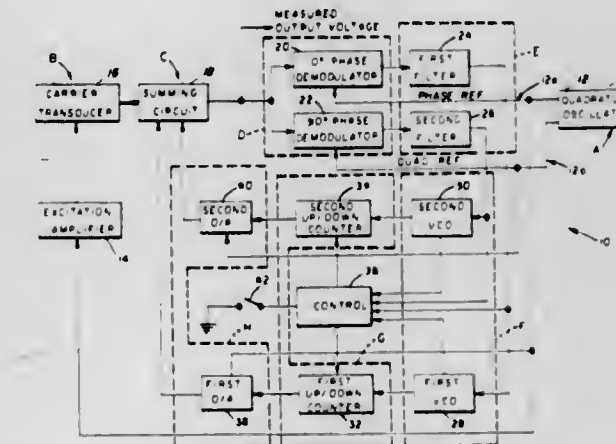
Thomas J. McNell, Lyndhurst, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 14, 1981, Ser. No. 301,628

Int. Cl.<sup>3</sup> G01B 7/00; H04B 1/12

U.S. Cl. 73-765

16 Claims



1. An automatic zero circuit for use with carrier transducers, said automatic zero circuit comprising:

a reference generator for generating a phase reference signal and a quadrature reference signal, said transducer being operatively connected to said reference generator and powered by said reference generator;

a summing circuit operatively connected to said transducer for receiving a return signal from said transducer, for summing said return signal with at least one other signal and for generating an output signal equal to the summation of said return signal and said at least one other signal; means operatively connected to said summing circuit for separating said output signal of said summing circuit into at least one component value with respect to said reference generator;

means operatively connected to said separating means for generating at least one DC signal with a value indicative of said at least one component value;

means operatively connected to said generating means for converting the value of said at least one DC signal into at least one modulated signal whose frequency is proportional to the value of said DC signal;

means operatively connected to said converting means for counting said at least one modulated signal; and

means operatively connected to said counting means and said summing circuit for generating said at least one other signal in response to the count and being proportional to and opposite from said at least one component value, the output signal from said summing circuit being nulled.

4,414,853

## PRESSURE TRANSMITTER EMPLOYING NON-LINEAR TEMPERATURE COMPENSATION

Janusz Bryzek, Santa Clara, Calif., assignor to The Foxboro Company, Foxboro, Mass.

Filed Aug. 10, 1981, Ser. No. 291,665

Int. Cl.<sup>3</sup> G01B 7/18; G08C 19/04, 25/02

U.S. Cl. 73-766

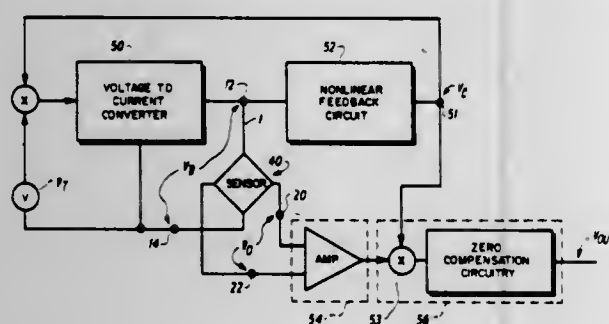
20 Claims

1. A pressure transmitter of the type including a substrate carrying a plurality of resistors at least one of which has a



resistance value varying with changes in strain developed in said substrate so as to provide a measure of the magnitude of the pressure producing such strain; said transmitter comprising:

- a resistance network including said one strain-responsive resistor;
- said network having input and output circuits;
- power supply means coupled to said input circuit of said network to produce a flow of current therein so as to activate said network and develop an output signal in said output circuit responsive to said changes in strain;
- temperature sensing means for producing a temperature signal which varies with changes in resistance of said network resulting from changes in temperature thereof;
- said output signal having an error which varies in accordance with said temperature changes;
- means responsive to said temperature signal including at least first amplifier means coupled to receive said tempera-



ture signal, means for saturating the output of said first amplifier means whenever the temperature signal corresponds to temperatures which are respectively less than a first temperature or greater than a second temperature, second amplifier means coupled to receive said temperature signal, and means for saturating the output of said second amplifier means whenever the temperature signal corresponds to temperatures which are respectively less than a third temperature or greater than a fourth temperature;

means for combining the outputs of said first and second amplifier means and producing a discontinuous signal having at least two discontinuous segments which are characterized by break points occurring at said first through fourth temperatures; and means responsive to said discontinuous signal for changing said output signal so that said temperature dependent errors therein are substantially eliminated.

4,414,854

## ROTARY ACTUATOR ASSEMBLY

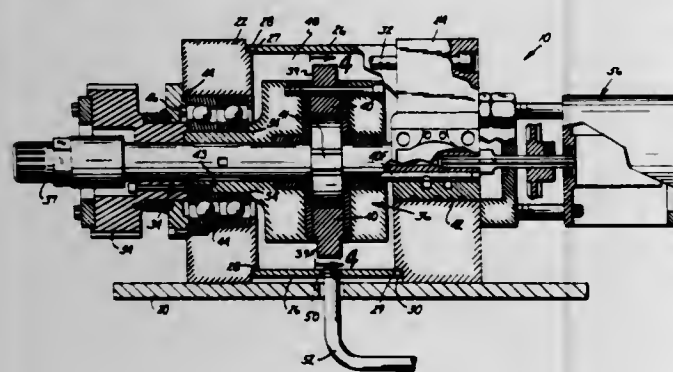
Steven R. Haeg, Shorewood, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Oct. 30, 1981, Ser. No. 316,679

Int. Cl.<sup>3</sup> G01N 3/22

U.S. Cl. 73-847

7 Claims



1. An improved rotary actuator assembly for introducing

dynamic torque loads into a rotatable test specimen, the improved assembly comprising:

- a first stationary support;
- a second stationary support in a fixed spatial relationship with the first stationary support;
- bearing means positioned on the first stationary support;
- a rotary hydraulic actuator rotatably supported by the bearing means and positioned between the first and second stationary supports, said rotary hydraulic actuator having a shaft and a housing, the relative rotational position of the shaft and housing being controllable and the shaft extending out of the housing and being mounted for rotation on the second support, said shaft having passageways therein, a hydraulic commutator mounted in the second support and surrounding the shaft, said passageway in the shaft mating with said commutator;
- means to couple the actuator to a rotatable test specimen and to couple the actuator to a load to permit loading the specimen under torque transmitted through the actuator; and
- a shroud extending between and mounted on the first and second stationary supports and surrounding the rotary actuator to shield the actuator with a closed stationary shield as the actuator and specimen are rotated.

4,414,855

## TORQUE SENSOR

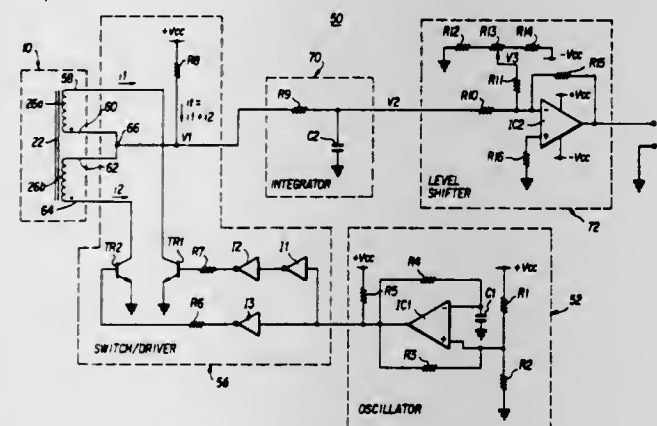
Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 1, 1981, Ser. No. 268,890

Int. Cl.<sup>3</sup> G01L 3/10

U.S. Cl. 73-862.36

2 Claims



1. A torque sensor, comprising:

- a non-magnetic drive shaft coupled between a source of torque and a load, said drive shaft including a cylindrical outer surface;
- a thin magnetically soft amorphous metal material affixed to said cylindrical surface of said drive shaft;
- first and second cylindrical pick-up coils, each having a longitudinal axis which is colinear with the longitudinal axis of said drive shaft;
- first electronic switch means coupled in series with a source of DC power and said first pick-up coil for controlling the flow of a first current through said first pick-up coil, said first current being proportional to the permeability of said amorphous material;
- second electronic switch means coupled in series with said DC power source and said second pick-up coil for controlling the flow of a second current through said second pick-up coil, said second current being proportional to the permeability of said amorphous material;
- oscillator means, connected to said first electronic switch means and said second electronic switch means, for generating an AC switching signal to control said first and second electronic switch means;
- integrator circuit means, coupled to said first and second

pick-up coils, for integrating said first and second currents;

level shifter current means, coupled to said integrator circuit means, for generating an output signal proportional to the stress of said drive shaft whereby the torque applied to said drive shaft is represented, said output signal having a zero level in the absence of applied torque to said drive shaft.

4,414,856

## METHOD AND APPARATUS FOR MEASURING STATIC AND DYNAMIC TORQUES IN A CONTACT FREE MANNER

Horst Winterhoff, Dreieich-Buchschlag, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

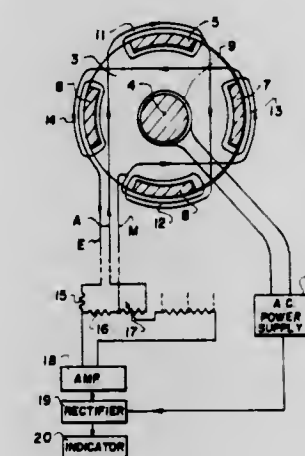
Filed Aug. 24, 1981, Ser. No. 295,500

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 3031997

Int. Cl.<sup>3</sup> G01L 1/12

U.S. Cl. 73-862.36

3 Claims



2. An apparatus for the contact-free measurement of torque on a magnetically permeable test piece, which permeability changes with torque applied to the test piece, comprising:

- at least one test head having a magnetic core with four mutually spaced pole portions adapted to be positioned close to a surface of the test piece, each pole portion being in the shape of a ring segment of a common ring, which ring is divided into the four spaced pole portions by four slots;
- a winding on each of said pole portions defining a magnetic bridge adapted to sense magnetic permeability changes in the test piece surface, said magnetic bridge including a separate winding on each of said mutually spaced pole portions with opposite pole portions carrying windings which are connected to each other in series and wound in the same direction;
- a substantially central pole portion connected to said magnetic core;
- an excitation winding on said central pole portion;
- a source of alternating current connected to said excitation winding; and
- a magnetic permeability circuit portion having three contacts, two of said contacts each connected to a respective pair of said series connected windings and a remaining one of said contacts connected to both pairs of said series connected windings;
- said source establishing an alternating magnetic field in the test piece surface to the point of magnetic saturation thereof, and said circuit portion connected to said magnetic bridge for sensing permeability changes in the test piece surface.

4,414,857

## METHOD AND APPARATUS FOR INJECTING SAMPLES INTO GAS CHROMATOGRAPH

Vadim V. Brazhnikov, ulitsa 26 Bakinskikh komissarov, 3, korpus 3, kv. 324; Eduard P. Skorniyakov, Kronshtadsky bulvar, 49, kv. 66; Jury A. Sultanovich, Profsojuznaya ulitsa, 3, korpus 3, kv. 53; Vladimir M. Poshemansky, 2 Pavlovsky pereulok, 20, kv. 80; Karl I. Sakodinsky, ulitsa Vavilova, 12, kv. 29; Semen S. Berlin, ulitsa Sovkhoznyaya, 53, korpus 1, kv. 33; Vladimir V. Ogurtsov, Fergansky proezd, 14, korpus 2, kv. 81, and Vladimir V. Alekhin, ulitsa Kuusinen, 6, korpus 7, kv. 79, all of Moscow, U.S.S.R.

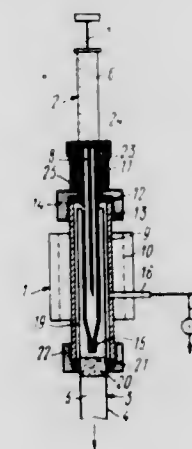
Filed Aug. 10, 1981, Ser. No. 291,390

Claims priority, application U.S.S.R., Aug. 16, 1979, 2808727

Int. Cl.<sup>3</sup> G01N 31/08

U.S. Cl. 73-863.11

15 Claims



1. A method of injecting samples into a gas chromatograph, comprising the steps of: communicating a sample carrier in which the sample to be analyzed is contained with an evaporator; pressure-sealing the evaporator with the sample carrier in communication therewith; introducing the sample into the evaporator while the latter is pressure-sealed to form vapours thereof; passing the vapours of the sample to be analyzed from the evaporator through a flow constrictor having a substantially constant cross-section and into a chromatographic column; subsequent to passing the vapours into the chromatographic column, communicating the evaporator with the atmosphere; and while the evaporator is in communication with the atmosphere, passing at least a portion of a carrier gas flow into the evaporator, whereby contaminants are prevented from entering into the chromatographic column with the sample.

4,414,858

## STEAM TURBINE FLUID SAMPLING APPARATUS

Steven H. Peterson, Murrysville, and David F. Pensenstadler, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1982, Ser. No. 360,739

Int. Cl.<sup>3</sup> G01N 1/26

U.S. Cl. 73-863.33

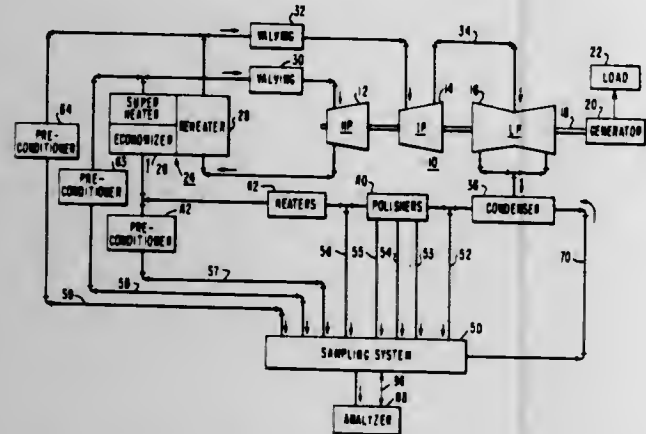
7 Claims

1. Apparatus for sampling fluids from a plurality of sampling points in a steam turbine system having a steam supply, a steam turbine arrangement driven thereby, a condenser for condensing exhaust steam from said turbine arrangement and a recirculating fluid path, for returning condensed steam back to said supply, comprising:

- (A) a valve arrangement having a plurality of valves each of which may be activated in response to an applied control signal;
- (B) a plurality of fluid sample lines connected between selected points in said steam turbine system and said valve arrangement;
- (C) analyzing means for analyzing selected fluid samples passed by said valving arrangement;



- (D) a common drain line connected to supply fluid back to said steam turbine system;
- (E) computer means operable to supply said applied control signals control signals to activate selected ones of said valves in accordance with a set of stored instructions, so as to place a single one of said fluid sample lines in fluid communication with said analyzing means;



- (F) said computer means and valve arrangement being such that all non-selected fluid sample lines are in continuous fluid communication with said common drain line so as to return fluid in said sample lines back to said steam turbine system from which it came, for reuse thereby.

4,414,859

# **BEVEL GEAR DIFFERENTIAL DRIVES AND METHODS FOR ADJUSTING THEIR TOOTH ENGAGEMENT**

Helmut Holthoff, Düsseldorf, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Company, Hilden, Fed. Rep. of Germany

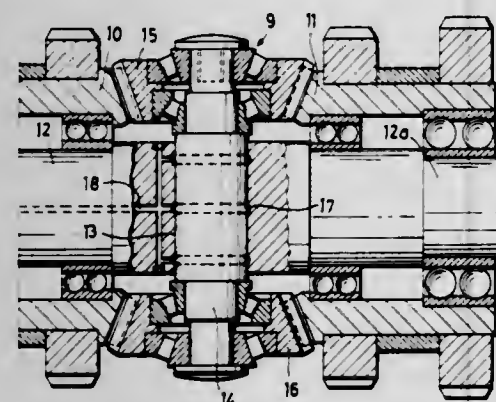
Filed Aug. 29, 1980, Ser. No. 182,605

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001342

Int. Cl.<sup>3</sup> F16H 1/14

U.S. Cl. 74-417

10 Claims



1. A bevel gear differential drive comprising a sun gear shaft having a transverse bore intermediate its ends, a pair of sun gears fixed against axial movement and rotatable on said sun gear shaft on opposite sides of said bore and functionally equally spaced therefrom, at least one planetary gear shaft in said transverse bore having an end extending from each side of said bore, a planetary gear fixed on each said end extending from the bore and means on said sun gear shaft for shifting the planetary gear shaft in the bore along with the planetary gears until flank play between the planetary gears and sun gears is substantially equal, and means frictionally fixing the planetary gear shaft as a press fit against a further movement in the transverse bore of the sun gear shaft.

4,414,860

# **CONNECTING ROD FOR AN ENGINE**

Klaus Brunsch, Weidach, and Rudolf Schindler, Riemerling, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

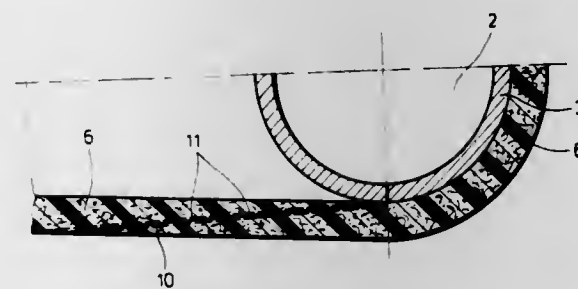
Filed Dec. 16, 1980, Ser. No. 217,040

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951111

Int. Cl.<sup>3</sup> G05G 1/00

U.S. Cl. 74-579 E

7 Claims



1. Connecting rod assembly for engines with rotating crankshaft, comprising an axially elongated member having a first opening and a second opening spaced apart in the axial direction of said member and the first opening located adjacent one end of said member for receiving a connecting rod and the second opening located adjacent the other end of said member for receiving a crankshaft bearing, the axes of said first and second openings extend substantially perpendicularly of the axis of said member, a connecting rod shaft extends in the axial direction of said member between the first and second openings, a belt of fiber reinforced plastics material extends around said first opening and said second opening and said connecting rod shaft extending between said openings, said belt comprises a first part partly encircling the axis of said first opening with said first part having a pair of ends spaced apart in the encircling direction, a second part partly encircling the axis of said second opening with said second part having a pair of ends spaced apart in the encircling direction, and a pair of third parts each located on an opposite side of the axis of said member and each extending between said first and second parts with each said third part extending between a different one of the ends on said first part and a different one of the ends on said second part, said first, second and third parts of said belt each having an inside surface closer to the axes of said first and second openings and said member and an outside surface, said belt is cut obliquely of the direction of said third parts extending between said first and second parts and adjacent the ends of said second part from the inside surface of said belt at the ends of said second part to the outside surface of said belt at a location spaced between the ends of said first and second parts with the oblique cuts extending approximately parallel to the axial direction of said member, each said oblique cut having a pair of facing oblique cut surfaces and a highly heat-resistant adhesive placed between the oblique cut surfaces of said oblique cut for splicing said belt together.

4,414,861

# **GEAR DRIVE COOLING**

Ronald A. Witt, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Feb. 17, 1982, Ser. No. 349,630

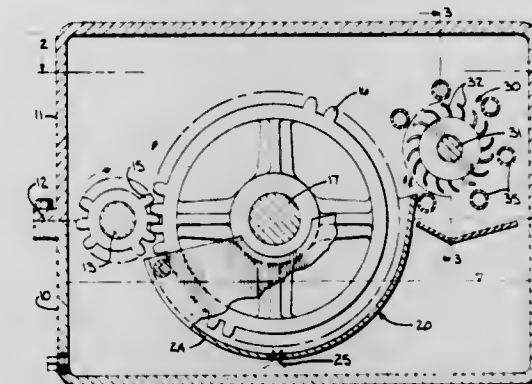
Int. Cl.<sup>3</sup> F16H 57/04, 57/02; F01M 5/00, 1/00

U.S. Cl. 74-606 A

6 Claims

1. In a gear drive which includes an enclosed housing defining a fluid reservoir, an input shaft and an output shaft each journaled in opposite side walls of the housing, and meshing

gearing connecting the shafts including a gear which rotates through fluid in the reservoir, the improvement comprising:



- a rotatable impeller mounted on a shaft in the housing and having vanes which are in the path of fluid ejected from the periphery of the gear as it rotates, and a fan connected to the impeller shaft exterior of the housing.

4,414,862

# **PLANETARY GEAR ARRANGEMENT FOR A CONTINUOUSLY VARIABLE TRANSMISSION**

Eugen Svab, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

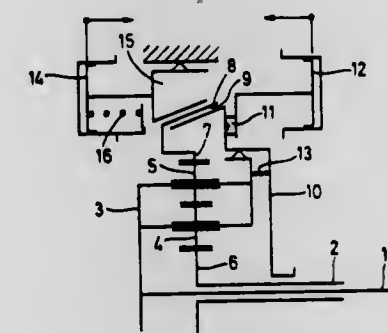
Filed Mar. 30, 1981, Ser. No. 249,577

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016485

Int. Cl.<sup>3</sup> F16H 3/44

U.S. Cl. 74-788

3 Claims



1. A forward and reversing gear arrangement for a continuously variable transmission comprising:  
input and output shafts for transmitting power to and from the gearset;  
a planetary gear unit including a planet pinion carrier connected to the input shaft, a ring gear, a sun gear connected to the output shaft, a first set of planet pinions driveably engaged with the sun gear and rotatably mounted on the carrier, and a second set of planet pinions rotatably mounted on the carrier driveably engaged with the ring gear and with the first set of planet pinions;  
first and second conical drive surfaces formed on the ring gear;  
a clutch continuously driveably connected to the carrier, mounted for axial movement toward and away from the ring gear drive surfaces, having a surface adapted to driveably engage one of the ring gear drive surfaces;  
a first piston moveable within a first chamber, adapted to move the clutch into engagement with the first drive surface of the ring gear as the first chamber is pressurized;  
a brake continuously driveably connected to the transmission housing, mounted for axial movement toward and away from the ring gear drive surfaces, having a surface adapted to driveably engage the second ring gear drive surface; and  
a second piston moveable within a second chamber, adapted to move the brake into engagement with the other drive surface of the ring gear as the second chamber is pressurized.

4,414,863

# **AUTOMATIC ELECTRONIC CONTROL FOR A POWER SHIFT TRANSMISSION**

Dean L. Helno, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

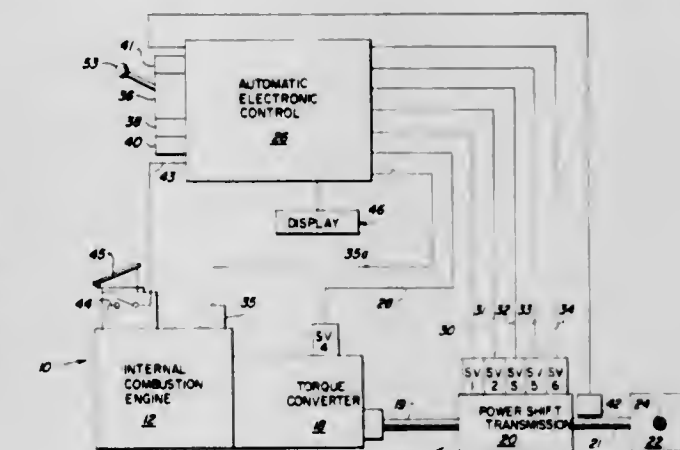
Continuation of Ser. No. 122,404, Feb. 19, 1980, abandoned.

This application Sep. 15, 1982, Ser. No. 418,145

Int. Cl.<sup>3</sup> F16H 3/74; B60K 41/18

U.S. Cl. 74-866

54 Claims



1. In a mobile vehicle having selectable first and second modes of operation, a transmission system including a torque converter driven by a throttle controlled engine, wherein in the first mode of operation the vehicle is typically subjected to substantially heavier and more abrupt loading than in the second mode, selectively activatable lockup means for locking and unlocking the torque converter to provide direct drive and torque converter drive, respectively, therethrough, a transmission operably connected to the torque converter, said transmission shiftable up and down among a plurality of gear ratios, wherein the torque converter provides cushioning effect between the engine and transmission when in the unlocked condition, and wherein the engine when throttled down provides braking action to the transmission when the torque converter is locked, selectively activatable shifting means operably associated with the transmission for shifting the transmission among the gear ratios, and a speed sensor responsive to the speed of the transmission output to provide a speed signal indicative of the speed thereof, control means for activating the shifting means and lockup means comprising:

- first means for establishing at least first, second and third selectable shifting patterns, each pattern defining a plurality of transmission gear ratio upshift points and downshift points corresponding to first, second and third sets of preselected speed signals, respectively, wherein at least said second shifting pattern also defines torque converter locking and unloading points corresponding to a fourth set of speed signals, respectively, and wherein said first shifting pattern also defines a torque converter locking point above a preselected output speed signal;  
second means operably associated with the engine throttle and the first means for causing the first shifting pattern to be selected when the throttle is below a pre-selected engine speed setting while the vehicle is operating in the second mode and for causing the second shifting pattern to be selected when the throttle is above the pre-selected setting while the vehicle is operating in the second mode;  
third means responsive to selection of the first mode of operation and operably associated with the first means for selecting the third shifting pattern when the first mode is selected and preventing torque converter lock-up so that said cushioning effect is provided; and  
fourth means connected between the first means and the shifting and lockup means responsive to the shifting pattern selected and to the speed signal to activate the shifting means and shift the transmission up and down in accordance with the defined upshift and downshift points of



the selected pattern and to selectively activate the lockup means in accordance with the defined locking and unlocking points when the second shifting pattern is selected, and to provide said braking action above said output speed when the first pattern is selected.

4,414,864

## MEANS FOR ACCOMMODATING AN INK ROLLER

Gerhard Nagel, Hirschhorn, and Klaus Dasting, Neckarsteinach, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Aug. 7, 1981, Ser. No. 291,127

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033572

Int. Cl.<sup>3</sup> B25B 9/00

U.S. Cl. 81—3 R



1. An apparatus for accommodating an ink roller having a circular cylindrical ink carrier body and end discs which are disposed at the end faces thereof and the diameter of which is greater than that of the ink carrier body, said apparatus comprising two U-shaped shells connected together whose width at their open ends is equal to the width of the ink roller to be accommodated, whose depth is equal to the diameter of the end discs of the ink roller to be accommodated, said shells having at their two sides regions which act as clamps for the end discs, the width of the one shell being constant over its entire depth and the width of the other shell increasing from the open end in the direction towards the closed end wherein the shells are joined together in such a manner that their open ends point in opposite directions.

4,414,865

## BEVERAGE BOTTLE AND CAN OPENER

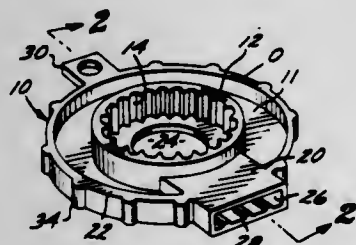
Paul Brooks, 2701 Edwin Pl., and John P. Brooks, 2112 Outpost Dr., both of Los Angeles, Calif. 90068

Filed Feb. 26, 1982, Ser. No. 352,806

Int. Cl.<sup>3</sup> B67B 7/44, 7/40, 7/18

U.S. Cl. 81—3.1 R

6 Claims



1. A combined opener for a twist-off bottle cap on a beverage can lift-off tab, said opener comprising:  
a body member provided with a downwardly opening recess formed about its periphery with protuberances adapted to complementarily mate with the knurls of said bottle cap;  
a horizontal socket extending outwardly from one side of said recess, said socket being formed with a tunnel to receive said lift-off tab;  
a downwardly depending peripheral lip member circumfer-

entially disposed about said side of said recess, said horizontal socket formed in one piece formation with said side of said recess and said lip member; and,  
with said body member being rotated when said recess is applied over a twist-off bottle cap to facilitate the removal of said cap from said bottle, and said body member being raised upwardly when said socket is applied over the lift-off tab of a can to lift said tab from said can.

4,414,866

## CAP REMOVER

Hiroshi Kichijyo, 1563, Oaza Koshibe, Oyodo-cho, Yoshinogun, Nara Prefecture, Japan

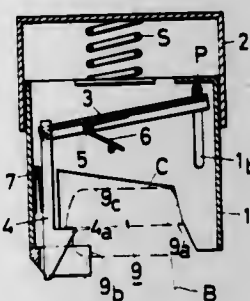
Filed Jan. 15, 1981, Ser. No. 225,321

Claims priority, application Japan, Feb. 6, 1980, 55-14050; May 30, 1980, 55-72908; Nov. 26, 1980, 55-167141

Int. Cl.<sup>3</sup> B67B 7/00

U.S. Cl. 81—3.46 R

12 Claims



1. A cap remover for removing a cap having an exposed rim undersurface from the mouth of a bottle, comprising:  
a main body having an opening in the bottom thereof for receiving the mouth of a bottle with a cap thereon, with main body including in said opening a lower surface and an upper surface above said lower surface for respectively engaging the mouth and the cap;  
a lever pivotally mounted to said main body to pivot about a first axis; and  
a hooking member having a hook portion at a lower end thereof for engaging the rim undersurface of the cap pivotally mounted to said lever for pivoting about a second axis spaced from said first axis with said upper and lower surfaces respectively engaging the cap and the mouth of the bottle, whereby pivoting of said lever about said first axis lifts said hooking member upward with respect to said upper and lower surfaces to pry said cap from the said bottle.

4,414,867

## JOINTED TOOL

Arthur O. Koltveit, 1410 S. Sterling St., Streator, Ill. 61364

Continuation-in-part of Ser. No. 52,450, Jun. 26, 1979, Pat. No. 4,277,992. This application Jul. 13, 1981, Ser. No. 283,016

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

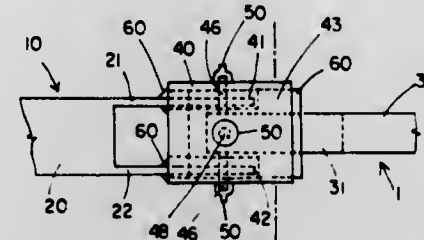
Int. Cl.<sup>3</sup> B25B 13/00

U.S. Cl. 81—177 UJ

5 Claims

1. A tool joint having a first portion for rotatably driving said joint, a second work-contacting portion, and a pin-mounted gimbal ring connection including outside and inside pin-like pivot means joining said first and second portions, the improvement in said gimbal connection comprising:  
said second portion including a tubular section having a rectangular inner periphery, and,  
said gimbal connection including a rectangular ring pivotally mounted within said tubular section by said outside pin-like pivot means in closely adjacent, spaced relation to said rectangular inner periphery,

whereby adjacent walls and surfaces of the joint abut each other during the rotation of said joint whereby torque



normally exerted on the pins of said gimbal connection is relieved.

4,414,868

## BOX JOINT FOR A PLIER-TYPE TOOL WITH REMOVABLE SECURING PLATE

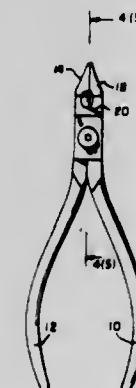
Nicholas S. Puro, Upper Saddle River, N.J., assignor to Micro Dent Industries, Inc., Hawthorne, N.J.

Filed Jan. 7, 1982, Ser. No. 337,663

Int. Cl.<sup>3</sup> B25B 7/06

U.S. Cl. 81—416

11 Claims



1. A box joint for a plier-type tool in which the movable member portions are pivotally retained and manipulated, this tool having handle and jaw portions integrally connected, said improved box joint enabling assembly and disassembly without distorting the box joint portion and requiring reshaping of the distorted portion by and with heat and pressure, the box joint including:

- a first member portion extending between a handle and jaw portion and providing a midportion of the box joint, this midportion having a length greater than its width and finished on its extending and transverse surfaces with said midportion providing substantially one-half the thickness of the box joint and with the finished surfaces substantially parallel to each other;
- a second member portion extending between a handle and jaw portion and providing two outer wall retentions of the box joint, the interior surfaces finished to snugly mate with and retain the midportion of the other member portion;
- a transverse opening formed in one of the outer wall portions of said second member forming the box joint, this opening having stepped shoulder end configurations, this opening having the narrower portion at the inner edges thereof and with this inner narrower portion opening greater than the width of the midportion of the first member, said narrower portion providing retention portions for the midportion of the first member after insertion and rotation of the first and second members toward and to an in-use and closed condition;
- a retaining plate sized so as to enter and be seated in said transverse opening of the second member and with ends formed on said plate providing stepped shoulders sized to be a sliding fit in said opening, the inner surface of said plate finished so as to provide a contiguous mating surface

with the facing misportion of the first member when said plate is mounted in said opening, and  
(e) a retaining cap screw having a head portion that engages the retaining plate to prevent unwanted outward movement, a shank of the screw passing through a hole in the plate and midportion and a threaded end of said screw entering into a threaded aperture in the outer wall of the second member, the screw adjusted to provide the desired tightening of the box joint.

4,414,869

## COUNTERBORE BORING AND REFACING TOOL

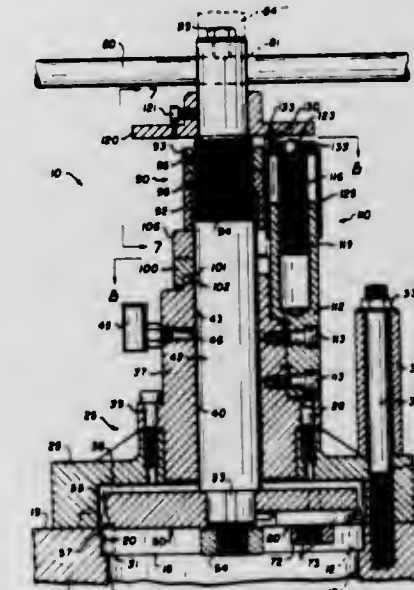
Paul M. Augustine, 418 E. First Ave., North Vancouver, British Columbia, Canada (V7L 1B7)

Filed Apr. 13, 1981, Ser. No. 253,599

Int. Cl.<sup>3</sup> B23B 3/24

U.S. Cl. 82—4 R

8 Claims



1. A tool for removing material from a cylindrical opening in a workpiece, said tool comprising a mounting hub adapted to be secured to the workpiece over the cylindrical opening, a shaft rotatably and axially movable in the mounting hub with the longitudinal axis of said shaft aligned with the corresponding axis of the cylindrical opening, a cutter head secured to the shaft for rotation within the cylindrical opening and including a cutting tool mounted in a position to engage a face of the cylindrical opening, means for rotating and advancing the shaft to operate the cutting tool, a first threaded feed member on the mounting hub alongside an upper portion of the shaft, a second threaded feed member threadedly engaging the first threaded feed member, a feed plate mounted on the upper portion of the shaft to rotate with said shaft while in operative engagement with the second threaded feed member, means for rotating the shaft, and drive-transmitting means operatively connecting the feed plate to the second threaded feed member whereby rotation of the shaft to operate the cutting tool results in rotation and advancement of the second threaded feed member allowing axial movement of the shaft at a rate of feed commensurate with the speed of rotation of the shaft, depth control means between the shaft and the mounting hub for selectively controlling axial movement of said shaft whereby to limit the distance the cutting tool is moved into the cylindrical opening, said depth control means comprising first and second adjusting nuts threadedly secured to the shaft above the mounting hub, and a slotted centering spacer removably mounted on the shaft between the first adjusting nut and the mounting hub.

3. A tool for refacing a counterbore of a cylinder formed in an engine block and comprising a mounting hub securable to the engine block, a shaft rotatably and axially movable in the mounting hub with the longitudinal axis of said shaft aligned with the corresponding axis of the counterbore, a cutter head secured to the shaft for rotation within the counterbore and



including a cutting tool, means for rotating the shaft to apply the cutting tool to the counterbore, an internally threaded body fixedly secured to the mounting hub alongside the shaft, a feed screw threaded into the body, a feed plate mounted on the shaft for rotation therewith, a thrust bearing on the feed screw engagable by the feed plate, a driven sprocket nonrotatably secured to the feed screw, and a drive pin carried by the feed plate to engage the driven sprocket whereby rotation of the shaft to operate the cutting tool results in advancement of the feed screw allowing axial movement of the shaft and cutting action of the cutting tool at a rate of feed commensurate with the speed of rotation of the shaft.

4,414,870

## CUTTING TOOL

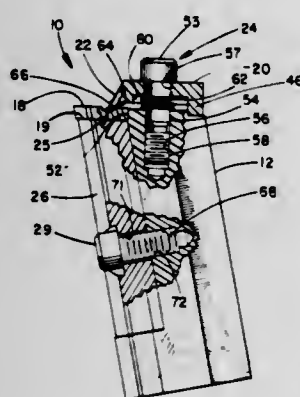
John L. Peterson, Jr., Davidson County; Fred E. Chaffin, Wilson County, and Gene T. Youree, Davidson County, all of Tenn., assignors to Peterson Tool Company, Nashville, Tenn.

Filed Feb. 19, 1981, Ser. No. 236,030

Int. Cl.<sup>3</sup> B23B 29/04; B26D 1/00

U.S. Cl. 82—36 R

15 Claims



## 1. A cutting tool comprising:

- a tool body;
- a support surface disposed on said tool body;
- a cutting insert for being mounted on said cutting tool, said cutting insert being configured for engaging and being supported on said support surface;
- a clamp disposed adjacent to said cutting insert when said cutting insert is positioned on said support surface;
- a clamp tip fixedly mounted on an edge of said clamp, extending away from said clamp toward said cutting insert, and being positioned and configured for securing said cutting insert on said support surface, said clamp tip being a generally rectangular strip of hard material that is resistive to wear relative to said clamp to protect the end of said clamp, said strip being mounted on an edge of said clamp and extending from said clamp toward said support surface; and

structure disposed on said cutting insert to engage said clamp tip for securing said cutting insert on said support surface so that said structure and said clamp tip interengage to resist movement of said cutting insert relative to said cutting tool.

## 5. A cutting tool comprising:

- a tool body;
- an anvil mounted on said tool body;
- a support surface formed on said anvil;
- a cutting insert disposed on said support surface for cutting metal;
- a clamp mounted on said tool body and having a front edge disposed adjacent to said cutting insert and a midsection and a rear edge disposed adjacent to said tool body;
- a clamp tip mounted on the front edge of said clamp and being constructed of a hard material relative to said clamp, said clamp tip extending away from said clamp and toward said cutting insert on said support surface; and
- positioning structure disposed on said insert for engaging only said clamp tip, said clamp tip and said positioning structure having interengaged surfaces disposed at angles

oblique to said support surface to resist movement of said cutting insert along said support surface relative to said tool body.

4,414,871

## CHUCK FORCE MODULATOR SYSTEM FOR ROTARY TYPE MACHINE TOOL

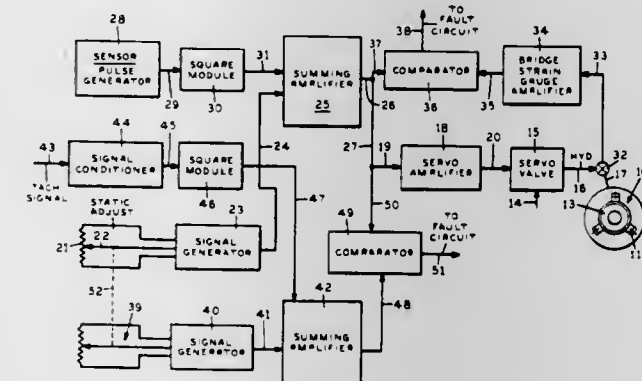
David H. Trout, Woodbury, Conn., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 3, 1981, Ser. No. 327,078

Int. Cl.<sup>3</sup> B23B 31/30

U.S. Cl. 82—40 R

4 Claims



## 1. A chuck force control and compensating means for a rotary machine tool or the like having a power operated rotary chuck with radially movable gripping element, which comprises

- (a) an hydraulic supply system for said chuck,
- (b) an electrically controlled servo valve in said supply system for regulating the fluid pressure delivered to said chuck in accordance with an electrical input to said servo valve,
- (c) a first electrical signal generator operative to provide an output signal corresponding to a function of the desired gripping pressure,
- (d) a second electrical generator operative to provide an output signal corresponding to a function of the speed of rotation of said chuck,
- (e) combining circuit means for effectively summing the outputs of said first and second signal generators and directing the combined signal to said servo valve,
- (f) a pressure transducer in said hydraulic supply system for generating a feedback signal as a function of pressure delivered by said servo valve,
- (g) comparator circuit means for comparing the outputs of said pressure transducer and said combining circuits, and
- (h) fault circuit means connected to said comparator circuit for outputting a fault condition in response to a consequential difference in signals from said pressure transducer and said combining circuit means.

4,414,872

## LENS TAPE CUTTER

George D. Bard, Brooklyn, Conn., and Robert J. Dusza, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 29, 1981, Ser. No. 258,720

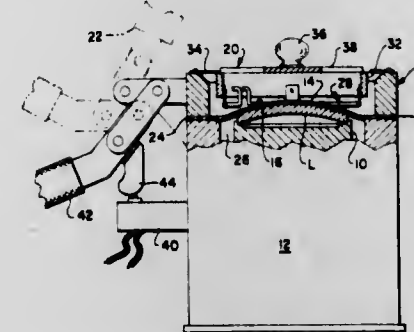
Int. Cl.<sup>3</sup> B26F 3/12

U.S. Cl. 83—171

2 Claims

- 1. An apparatus for severing excess tape at the edges of a lens surface which has been covered with tape comprising:
  - a base, said base including a lens support;
  - a length of electrical heating wire formed in the shape of said lens, said lens-shaped wire having a diameter approximately the same as that of said lens;
  - a sleeve made of dielectric material, said sleeve supporting said lens-shaped wire;

a housing for said sleeve, said housing pivoting between a position away from said lens support and a position in which said housing covers said lens support; at least two leaf springs, said at least two leaf springs suspending said sleeve from the upper surface of said housing;



an operating knob, said operating knob connected to a support, said support being fixed to said sleeve; means for energizing said lens-shaped wire; whereby when said ring is pivoted to a position covering said lens and said operating knob is depressed, said excess tape is severed from said tape covering said lens by said wire.

4,414,873

## DRIVING UNIT FOR THE KNIFE HOLDERS OF CROSS CUTTERS OR THE LIKE

Alfred Besemann, Hamburg, and Willi Rehwald, Böblingen, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

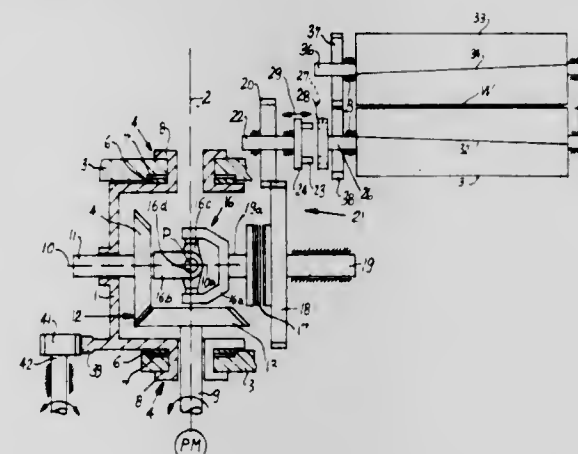
Filed Jun. 22, 1981, Ser. No. 275,663

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024603

Int. Cl.<sup>3</sup> D06H 7/02

U.S. Cl. 83—311

12 Claims



1. A driving unit for a rotary member in a cross cutter for running webs of paper or the like, comprising an angle drive having a rotary input element and a rotary output element receiving torque from said input element; means for rotating said input element; a universal joint including a rotary input shaft constituting the output element of said angle drive and having a first axis and a rotary output shaft driven by said input shaft and having a second axis intersecting said first axis at a predetermined point, one of said shafts being movable with reference to the other of said shafts to thereby change the angle between said axes and said input element having a third axis intersecting said first and second axes at said point; carrier means rotatably mounting said input shaft and turnable about said third axis; and means for transmitting torque from said output shaft to the rotary member of the cross cutter.

4,414,874

## FABRIC CUTTING

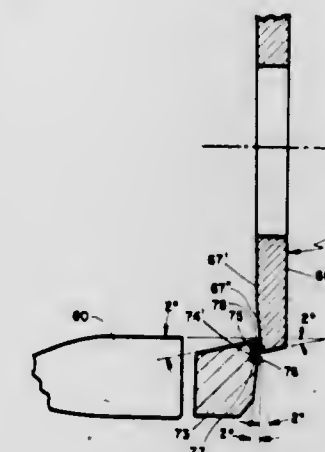
Thomas E. Barnes, Bloomington, Ind., and Clifford A. Landness, Akron, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,356

Int. Cl.<sup>3</sup> B26D 1/18, 1/20

U.S. Cl. 83—488

5 Claims



1. A cutting apparatus for cutting rubberized fabric with cords disposed therein comprising a support frame, a carriage mounted on said support frame for reciprocal movement, drive means connected to said carriage for reciprocating said carriage, a cutter support member mounted on said carriage, a cutter means journaled on said cutter support member for rotation thereon, power means mounted on said carriage operatively connected to said cutter means for continuously rotating said cutter means, said cutter means having a pair of said surfaces, one of said side surfaces having an outer perimeter defining a first convex polygon with a plurality of apexes and a plurality of linear cutting edges, the other of said side surfaces having an outer perimeter defining a second convex polygon, the outer circumferential surface of said cutter means between said polygons being a plurality of flat surfaces that taper inwardly from said first convex polygon towards said second convex polygon, anvil means mounted on said cutter support member for movement therewith, said anvil means having a linear cutting edge cooperative with successive linear cutting edges of said first convex polygon presented to said anvil means by rotation of said cutter means, said linear cutting edge of said anvil means being defined by the intersection of the edges of an anvil upper surface and an anvil forwardly disposed surface, said anvil upper surface and said anvil forwardly disposed surface being tapered away from their intersection such that said surfaces subtend an acute angle.

4,414,875

## GANG SAW APPARATUS

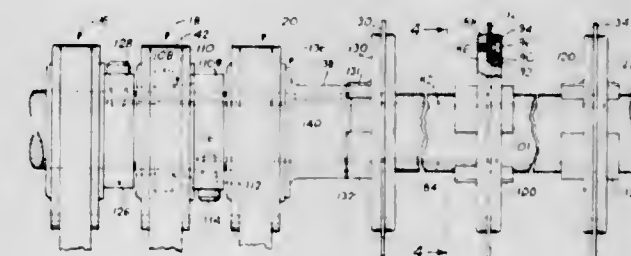
H. C. Pearson, Beaverton, Oreg., assignor to Portland Iron Works, Portland, Oreg.

Filed Jul. 27, 1981, Ser. No. 287,181

Int. Cl.<sup>3</sup> B27B 5/34

U.S. Cl. 83—508.3

5 Claims



1. In saw apparatus including an elongate power-driven saw



arbor and a collar adapted to mount a saw encircling said arbor and slidable axially on said arbor, a channel extending axially of the arbor, and means for shifting said collar to and fro on said arbor which, with rotation of the collar and arbor, results in centrifugal force producing positioning of the collar in a plane normal to said arbor, said shifting means comprising a rigid compression-transmitting shifter bar seating within said channel, and an attachment of said collar with said shifting means consisting of means connecting said bar with a portion of said collar disposed radially outwardly of said bar with the collar otherwise free of said shifting means, said attachment providing a single anchoring connection of the collar to the shifting means which anchoring connection, with rotation of the arbor, rotating in a path occupying a plane normal to the arbor's axis.

4,414,876

# CHAIN SAW FOR TREE CUTTING PINION TO BE USED IN COMBINATION WITH THE CHAIN, AND PROCESS FOR MAKING THE CHAIN

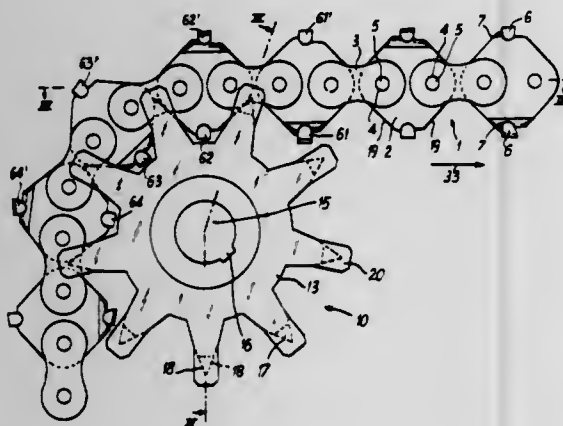
Jean Loigerot, Paris, France, assignor to Association pour la Rationalisation et la Mécanisation de l'Exploitation Forestière, Paris, France

Filed Mar. 9, 1981, Ser. No. 241,860

Claims priority, application France, Mar. 14, 1980, 80 05774 Int. Cl.<sup>3</sup> B27B 33/14

U.S. Cl. 83-830

7 Claims



1. A guideless saw chain for a tree cutting device without a guide bar, for sawing from either side of the longitudinal axis of the chain, said saw chain comprising, a series of cutting links, means pivotally connecting the cutting links together to form an endless chain having a plane extending through the series of cutting links, each of said cutting links comprising, a first tooth on one side of said longitudinal axis and a second tooth on the other side of said longitudinal axis, said cutting links being so connected in series that the chain has, on each side of its longitudinal axis, successively, a tooth displaced to one side of said plane, a tooth in said plane, a tooth displaced to the other side of said plane, a tooth in said plane, and so forth, along substantially the entire length of the chain.

4,414,877

# MUSICAL DOOR CHIME PREFERABLY ALSO COMBINED WITH A CLOCK FOR ANNUNCIATING THE TIME

Waller M. Scott, Jr., West Chester, Ohio, assignor to Scovill Inc., Waterbury, Conn.

Division of Ser. No. 100,163, Dec. 4, 1979, Pat. No. 4,326,276. This application Dec. 24, 1981, Ser. No. 334,321

Int. Cl.<sup>3</sup> G10H 3/00, 1/02

U.S. Cl. 84-1.13

5 Claims

1. An audible frequency tone generator comprising: a memory for storing a digitally encoded representation of

the frequency and the duration of at least one musical note;

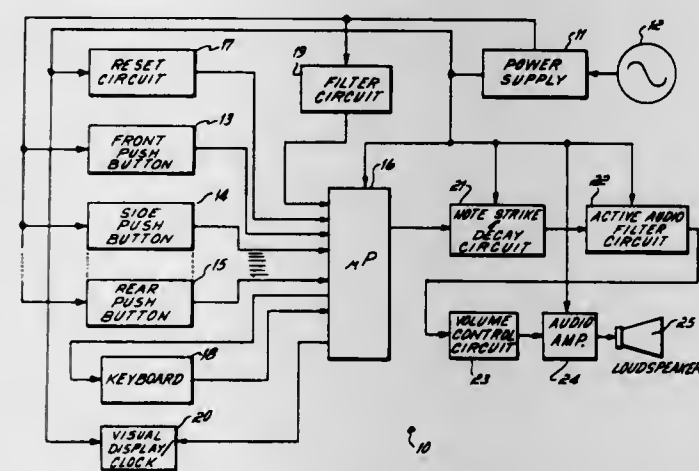
a tone generation means connected to said memory for converting said digitally encoded musical note representation for said at least one musical note into a squarewave having said frequency and said duration of said at least one musical note; and

circuit means connected to said tone generation means and responsive to said at least one squarewave for playing a pleasing sound of said at least one musical note;

said circuit means including a note strike and decay circuit connected to said tone generation means, said note strike and decay circuit comprising:

(a) a first capacitor connected between a charging circuit controlled by said tone generator means and common, said charging circuit being activated for charging said first capacitor at the time said at least one musical note is to be played;

(b) a first resistor connected at one end to said first capacitor;



(c) a second capacitor connected between the other end of said first resistor and common;

(d) a second resistor connected at one end to the junction of said first resistor and second capacitor and connected at the other end to the squarewave output of said tone generation means; and

(e) a third capacitor connected between the squarewave output of said tone generation means and common;

said first capacitor discharging over said duration of said at least one musical note for producing a decay envelope whose shape is determined by the time constant of said first capacitor and said first and second resistors and said frequency of said squarewave, the shape of the voltage within said decay envelope being determined by the charging of said second capacitor from said first capacitor through said first resistor and the discharging of said second capacitor through said second resistor, third capacitor, and squarewave output of said tone generation means.

4,414,878

# TONE DATA COMPRESSING AND EXPANDING SYSTEM FOR DIGITAL ELECTRONIC MUSICAL INSTRUMENT

Tsuyoshi Mitani, Yokohama, and Takeshi Yamaguchi, Kodaira, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 331,973

Claims priority, application Japan, Dec. 27, 1980, 55-188787 Int. Cl.<sup>3</sup> G10H 1/057, 1/06, 1/46

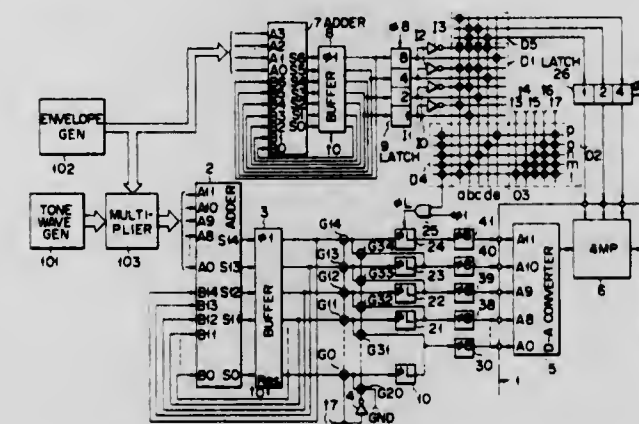
U.S. Cl. 84-1.19

6 Claims

1. In a digital electronic musical instrument of the type including means for forming digital tone data, means for forming envelope data for controlling the envelope of said digital tone data, means for combining the digital tone data and envelope data to obtain envelope controlled digital composite tone data, and a digital-to-analog converter having a certain number

of inputs for converting said digital composite tone data into an analog waveform signal,

a tone data compressing and expanding system including: means responsive to said envelope data forming means for setting a level of bit shift for the digital composite tone data before the digital composite tone data is supplied to the digital-to-analog converter according to the envelope data and for providing a corresponding output, and



control means for supplying the digital composite tone data to the inputs of said digital-to-analog converter after the digital composite tone data is bit shifted by a number of bits corresponding to the output of said setting means, wherein compression and expansion of the tone data according to said envelope data are effected by the bit shift operation.

4,414,879

# CHROMATIC HARMONICA WITH REMOTE ACTUATOR

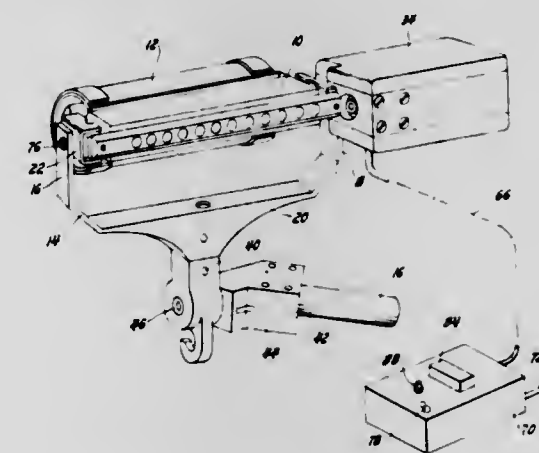
Joseph Ruiz, 11368 Braille, Detroit, Mich. 48228

Filed Mar. 11, 1982, Ser. No. 356,945

Int. Cl.<sup>3</sup> G10D 9/00

U.S. Cl. 84-379

4 Claims



1. In combination with an elongated chromatic harmonica having a movable valve member operative to change the harmonica so as to provide either sharp or flat tones depending upon the position of the valve member;

a yoke having a pair of arms for receiving the harmonica between them, and a base including a first arm and a second arm;

means for connecting the first arm to one end of the harmonica, and means for connecting the second arm to the opposite end of the harmonica such that the harmonica is supported between said arms;

a housing and means for mounting the housing on the yoke adjacent the valve member;

an electrically actuated solenoid mounted in said housing, the solenoid having a movable magnetic plunger, and lever means mounted on said housing between the valve member and the solenoid plunger such that the valve

member is moved from a first position to a second position as the solenoid is electrically energized;

a foot support;

a source of electrical energy and an elongated flexible electrical connector mounted between the solenoid and said source of energy; and

switch means mounted on the foot support and connected in the electrical connector means between the source of electrical energy and the solenoid such that the valve member is moved in response to a predetermined motion of the switch means.

4,414,880

# GAS REGULATED COMPENSATING VALVE MECHANISM FOR FIREARMS

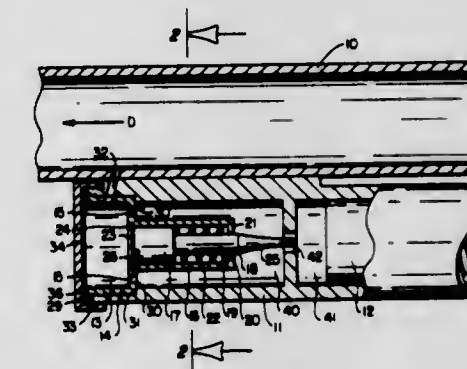
Guy C. Throner, Upper Arlington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Jan. 5, 1982, Ser. No. 337,182

Int. Cl.<sup>3</sup> F41D 5/08

U.S. Cl. 89-193

7 Claims



1. A compensating valve for a firearm with a gas operated loading mechanism comprising:

a. A gas pressure sensing first chamber means in fluid communication with a head end of a regulator first piston, which is reciprocally retained in a cylinder and biased for movement in one direction by an elastic means and biased in the opposite direction by the gas pressure in the first chamber, the first piston having a portion forming a stem of variable cross-section on the opposite end to the head end;

b. a gas regulating second chamber in gas fluid communication with the first chamber and having an orifice coaxial with the stem, the stem being positioned in the orifice, and the orifice providing communication between the second chamber and a third chamber operably containing a second piston which is connected to the loading mechanism of the firearm; and

c. the stem having an elongated tapered end portion longitudinally moveable and positionable in the orifice according to pressure variations in the first and second chambers, thereby regulating the rate of gas flow and pressure in the third chamber.

4,414,881

# HYDRAULIC CONTROL DEVICE

Gerard L. Devaud, Paris, France, assignor to Societe d'Applications des Machines Motrices, Issy-les-Moulineaux, France

Filed Jan. 21, 1981, Ser. No. 227,111

Claims priority, application France, Jan. 25, 1980, 80 01592 Int. Cl.<sup>3</sup> F01B 15/00; F16J 11/04

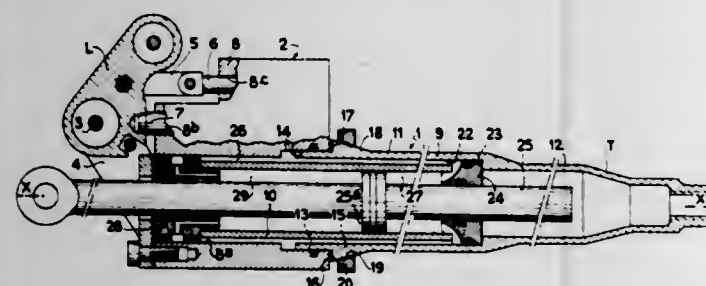
U.S. Cl. 91-216 R

6 Claims

1. A hydraulic control device for helicopters and aircraft of the type comprising a cylinder device (1) having a cylinder and a piston (25a) rigid with a rod (25), and a hydraulic control unit (2) having a body which is rigid with the cylinder, the body (8) of the hydraulic control unit defining a cavity for receiving the



cylinder of the cylinder device, and said cylinder comprising two main parts, namely a case (9) fixed to the body of the hydraulic control unit, and a tubular sleeve (10) which is positioned axially and radially inside the case and the cavity and cooperates with the piston, wherein the case and the cavity each contain an end member (24, 28) which has a cylindrical bearing surface and a radial shoulder and defines with the sleeve and the piston two chambers (27, 29) of the cylinder device, the sleeve being fitted on the cylindrical surfaces of said two end members and bearing axially against the two



radial shoulders of said end members, the sleeve being subjected to an axial compressive pre-stressing force when fixing the case to the body of the hydraulic control unit, wherein the piston and rod are fixed such that the selective application of pressurized hydraulic fluid to one of the two chambers causes movement of the hydraulic control unit body and the case fixed thereto, and wherein the case has an outer flange (15) which defines a substantially radial surface (16) bearing against an adjacent surface (17) of the unit, and a frustoconical surface (18) on which is engaged a surface (19) of complementary shape of a flange (20) for fixing to the unit.

4,414,882

# PNEUMATIC DRIVE FOR SWITCHING ELEMENTS AND CONTROL ELEMENTS

Willi Frei, Sennwald, Switzerland, assignor to VAT Aktiengesellschaft für Vakuum-Apparate-Technik, Haag, Switzerland

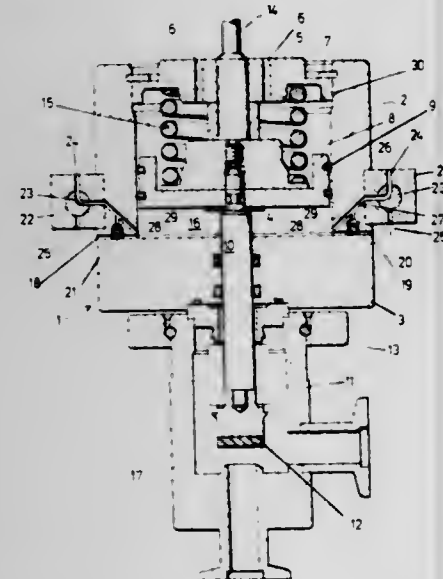
Filed May 19, 1981, Ser. No. 265,158

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019119

Int. Cl.<sup>3</sup> F01B 3/10

U.S. Cl. 91-442

5 Claims



1. A pneumatic drive for actuating switchable devices such as valves and the like, comprising an axially extending cylinder and a cylinder base which together form a cylinder space in the interior of said cylinder, said cylinder having an annular slot which extends in a plane transverse to the axis of said cylinder between said cylinder space and the exterior of said cylinder closely adjacent said cylinder base, said annular slot being bounded in the axial direction by two opposed annular surfaces

at least one of which is formed by said cylinder, a piston arranged for movement within said cylinder space in the axial direction of said cylinder, a piston rod connected to said piston for actuating a switchable device coupled at one end of said piston rod in response to movement of said piston, a supply line extending through one of said cylinder and said cylinder base and having an inner opening for communicating a pressurized gas to said cylinder space to move said piston away from said cylinder base, means for applying a bias force to said piston in the direction toward said cylinder base, valve means coupled to said supply line for venting said supply line to the exterior of said cylinder, a branch line connected at one end to said supply line between said inner opening and said valve means, an annular groove formed in one of the said annular surfaces so that said groove opens toward the opposed annular surface and extends in the axial direction of said cylinder to a closed end region, the other end of said branch line being connected to said closed end region of said annular groove, and a sealing ring coaxially seated in said annular groove for movement in the axial direction of said sealing ring and said cylinder to seal said annular slot when pressurized gas is communicated to said cylinder space and said branch line wherein said sealing ring is urged to project into said annular slot in response to pressurized gas which enters said end region of said annular groove from said branch line.

4,414,883

# POWER-ASSISTED STEERING DEVICE

Jean L. R. Dauvergne, 6 rue Maryse Hilsz, 93470 Fosses, France

Filed Feb. 1, 1980, Ser. No. 117,483

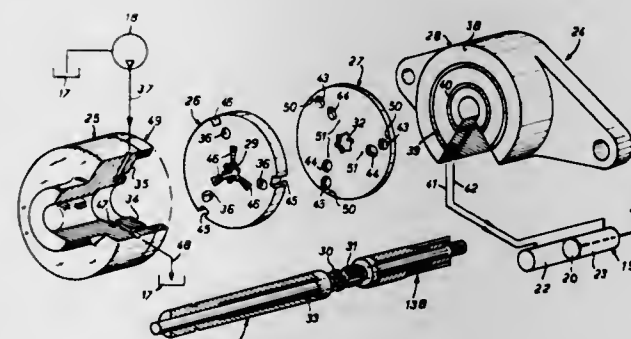
Claims priority, application European Pat. Off., Feb. 8, 1979, 79400085.1

The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> F15B 9/12

U.S. Cl. 91-467

5 Claims



1. In a power-assisted steering device for a vehicle, comprising control means acting on steering means, said control means incorporating a transmission element in two parts which parts are capable of limited relative angular displacement under the action of the said control means, and auxiliary assistance means operable to act on the steering means in the same direction as the control means in response to said relative angular displacement, the said auxiliary assistance means comprising a hydraulic power system including means for pressurizing a hydraulic fluid and a fluid reservoir, a hydraulic actuator acting on the said steering means, and a hydraulic distributor interposed between the power system and the actuator, the said distributor comprising an axially-stacked assembly composed of a first stator, a first rotor plate integral in rotation with one of said two parts of the transmission element, a second rotor plate integral in rotation with the other said part of the transmission element, and a second stator, said assembly comprising said first stator, said first rotor, said second rotor and said second stator stacked in side-by-side relationship with their side faces contiguous to each other, the said rotor plates having a series of hydraulic passages for feeding and returning fluid to and

from the actuator by the power system via the stators; the improvement comprising at least one pressure-equilibrating channel, in which no liquid circulates, in at least one of the rotors, said channel emerging through at least one of the faces of this rotor in an occluded region of at least one of the adjacent faces of the rotor and stator that are on opposite sides of said at least one rotor.

4,414,884

# COFFEEMAKER WITH COFFEE SPREADER

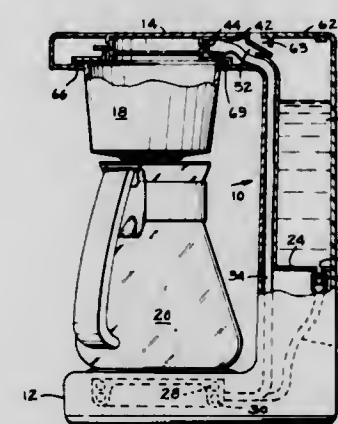
James O. McLean, Milford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,856

Int. Cl.<sup>3</sup> A47J 31/057

U.S. Cl. 99-304

9 Claims



1. In an electric drip brewing apparatus having an upright C-shaped housing, the lower horizontal leg having a heated carafe support and the upper leg having a water spreader over a supported coffee basket, the vertical leg enclosing a reservoir with an apertured bottom wall, and a cover over the upper leg with an opening to the reservoir, a pump and heating chamber in the lower leg with a connected tube delivering hot water through a central portion to the spreader, an improvement in said spreader comprising,

an open cup-shaped member having a central enclosed portion connecting with said reservoir and having a raised cut-away side towards the reservoir and connected to said tube, apertures in said cup dispensing hot water to the basket, overflow means in said cup, ribs on said cover coextensive with and making a closure for spreader and cut-away side and, with the cover and central portion, forming separate passage means away from the spreader for venting steam, whereby the spreader is closed and vented by the cover to reduce condensing and dripping at the spreader.

4,414,885

# FLAVOR INJECTOR

Harry C. Kelly, 4225 Colorado Ave., N.W., Washington, D.C. 20005

Filed Jun. 29, 1982, Ser. No. 393,410

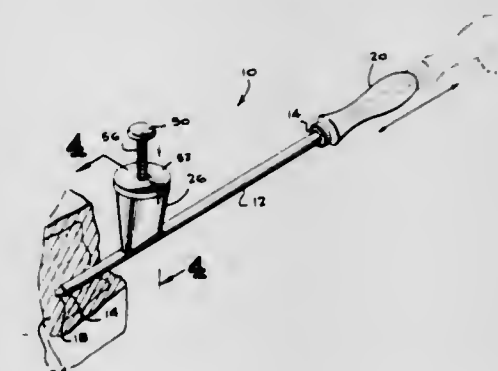
Int. Cl.<sup>3</sup> A23B 4/02; A23L 1/22

U.S. Cl. 99-494

1 Claim

1. In a flavor injector device for introducing a composition or additive internally into a body of meat and the like, said device consisting solely of a tube hollow throughout its entire length and having a generally constant diameter, a projecting rod enclosed by the tube in generally telescopic relation thereto, a reservoir mounted perpendicularly and in securement at an intermediate portion of the hollow tube and the interior of the reservoir being in communication with said hollow tube in air tight relation, the reservoir adapted for holding a predetermined quantity of additive or seasoning composition, the projecting rod being displaceable along the hollow tube into insertion relation with said body of meat and the like, and wherein clogging is prevented in said tube by said

projecting rod; a cover disposed on the reservoir at a point distal from the communication of the reservoir with the hollow tube; an axially extending shaft mounted plunger slideably mounted on the cover and being spring-biased away from the hollow tube by spring means retained between the cover and a handle on the shaft; said cover having a generally circular configuration throughout; said reservoir being secured onto said hollow tube; the outer surface of the projecting rod con-



taining indicia marks indicative of volume of additives or composition to be inserted into the body of meat and the like, the projecting rod being pointed for piercing a food project, a shaft mounted plunger extending through said cover; the plunger having a generally semi-cylindrical contour for packing and projecting additives or composition into the hollow tube; and said shaft mounted plunger being in slideable engagement with a mounting sleeve, and the sleeve being mounted on a plate secured to the cover.

4,414,886

# FRUIT SQUEEZER

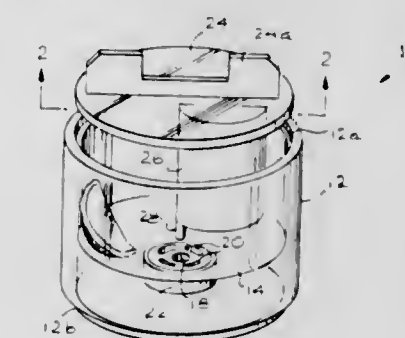
Louis P. Gonzales, 21114 S. Pioneer Blvd. #201, Lakewood, Calif. 90715, and Dennis M. Long, 1202 Le Gray Ave., Los Angeles, Calif. 90042

Filed Nov. 26, 1979, Ser. No. 97,558

Int. Cl.<sup>3</sup> A23N 1/00

U.S. Cl. 99-495

5 Claims



1. A fruit squeezer, comprising:

- A circularly shaped container, including a dished bottom, arranged off-set from the lower edge of the wall of the container and having a center opening, surrounded by a plurality of outlet apertures for the juice squeezed from the fruit, the upper and lower edges of the wall of the container being recessed to form inversely directed shoulders, capable of nestling within the lower and upper edges, respectively of additional containers for stacking purposes;
- A collar-shaped spout extending downwardly from the underside of and encompasses the apertures in the bottom of the container;
- A plurality of elongated vertically directed ribs extending from the interior wall of the container;
- A circularly shaped lid, rotatably mounted in the shoulder of the upper edge of the container wall, including a handle having a centered cut-out, extending upwardly



from and along a portion of the diameter of the lid, a portion of the shoulder of the upper container edge protrudes above the surface of the lid so that the shoulder of the lower edge of another container may be stacked thereon, abutting the protruding upper container edge and the surface of the lid, with its spout fitting within the cut-out of the handle of the underlying container;

- (e) A semi-circular block extending, from the center of the underside and along a portion of the radius of the lid, vertically downward, abutting the bottom of the container, and terminates in a pin-shaped projection, being rotatably insertable in the center opening of the bottom of the container, said semi-circular block will, when the lid of the container is rotated thereon, co-act with the ribs, extending from the container wall, causing juice to be pressed from a fruit placed within the container.

4,414,887

# PRESS SECONDARY MACHINING LINE CONTROL DEVICE

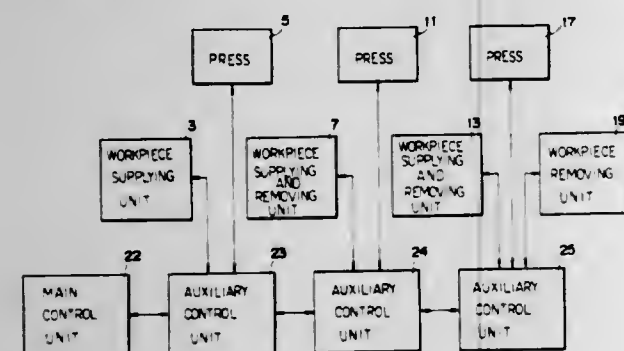
Takeshi Orii, Isehara, Japan, assignor to Kabushiki Kaisha Orii Jidoki Seisakusho, Japan

Filed Mar. 2, 1982, Ser. No. 353,993

Int. Cl.<sup>3</sup> B30B 15/30

U.S. Cl. 100—45

1 Claim



1. A control device of a press secondary machining line, which comprises:

a main control unit; and auxiliary control units which are operatively coupled to said main control unit and provided respectively in operation blocks which are obtained by dividing a press secondary machining line in such a manner that each operation block includes a press, each auxiliary control unit controlling a press and a workpiece supplying and/or removing unit in the respective block in response to a signal from said main control unit,

said main control unit comprising: a shift signal transmitting circuit for transmitting a shift signal; a workpiece conveyance signal transmitting circuit for transmitting a workpiece conveyance signal; a press operation signal transmitting circuit for transmitting a press operation signal; and a data switching circuit for transmitting data at a logic level "1" at the start of a press machining operation and during the press machining operation, and for transmitting data at a logic level "0" at the end of the press machining operation,

each auxiliary control unit comprising: a shift register for loading input data in response to said shift signal from said shift signal transmitting circuit; a conveyance signal receiving circuit for receiving said workpiece conveyance signal from said workpiece conveyance signal transmitting circuit when said shift register provides an output at a logic level "1"; a press operation signal receiving circuit for receiving said press operation signal from said press operation signal transmitting circuit when said shift register provides the output at the logic level "1"; and a shift register clear circuit for clearing the output at the logic level "1" of said shift register,

data input terminals and output terminals of said shift registers in said auxiliary control units being connected in

series to said data switching circuit in said main control unit.

4,414,888

# BALING MACHINE WITH AIR SPRING MEANS FOR MAINTAINING APRON TENSION

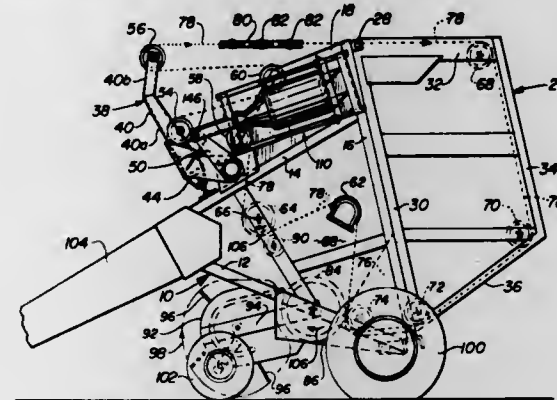
Willis R. Campbell, Ephrata, and Franklin A. Oellig, Leola, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Dec. 21, 1981, Ser. No. 333,204

Int. Cl.<sup>3</sup> B30B 5/02, 5/06

U.S. Cl. 100—88

2 Claims



1. In a roll baling machine having a frame, apron means supported on said frame for forming a roll bale of crop material, an arm assembly mounted on said frame supporting part of said apron means, said arm assembly rotating from a first position to a second position during bale formation, the improvement comprising:

- (a) air spring means urging said arm assembly toward said first position while resisting movement of said arm assembly toward said second position in order to maintain tension in said air spring means, said air spring means including an air bag for containing air under pressure and a piston movable into said air bag to increase the air pressure therein;
- (b) first means pivotally connecting said air spring means to said arm assembly, said first means including a bar member rigidly connected at one end to said piston and pivotally connected at the other end to said arm assembly;
- (c) second means rigidly connecting said air spring means to said frame, said second means including a bracket member rigidly connected to said air bag and to said frame;
- (d) guide rods connected to said bar member and extending through said bracket member; and
- (e) guide holes in said bracket member slidably receiving said guide rods, and the clearance between said guide rods and said guide holes being sufficient to allow rocking movement of said piston, said bar member and said guide rods as said arm assembly is rotated between said first and second positions.

4,414,889

# ROLLING DEVICE

Heinz Güttinger, Winterthur, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Jun. 23, 1981, Ser. No. 276,534

Claims priority, application Switzerland, Aug. 14, 1980, 6133/80

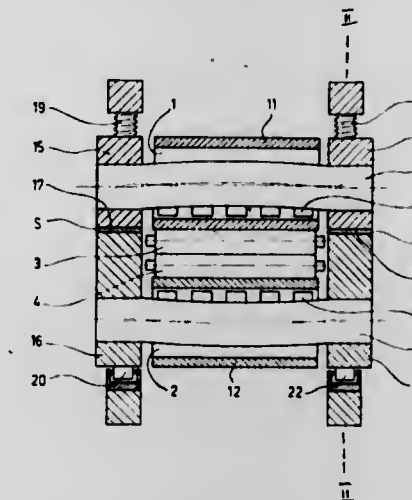
Int. Cl.<sup>3</sup> B30B 3/04

U.S. Cl. 100—162 B

8 Claims

1. A rolling device comprising a roller stand and two press rollers mounted on parallel axes between side panels of the stand, at least one of which rollers has an axial support with support elements upon which a roller shell is rotatable about the support, the roller shell being displaceable relative to the axial support in the plane containing the roller axes, wherein the axial support of said one roller extends beyond both ends of

the shell and has portions fixed in the side panels so as to be immovable with respect to the panels, whereby the side panels and the support portions form a force-locked construction



which gives to the support the character of a beam with fixed ends and thereby enhances the bending resistance of the support.

4,414,890

# PRESS ROLL WITH ADJUSTABLE FLEXION

Christian Schiel, Heldenheim, and Robert Wolf, Herbrechtlingen, both of Fed. Rep. of Germany, assignors to J. M. Volth GmbH, Fed. Rep. of Germany

PCT No. PCT/EP81/00085, § 371 Date Feb. 22, 1982, § 102(e) Date Feb. 22, 1982, PCT Pub. No. WO82/00165, PCT Pub. Date Jan. 21, 1982

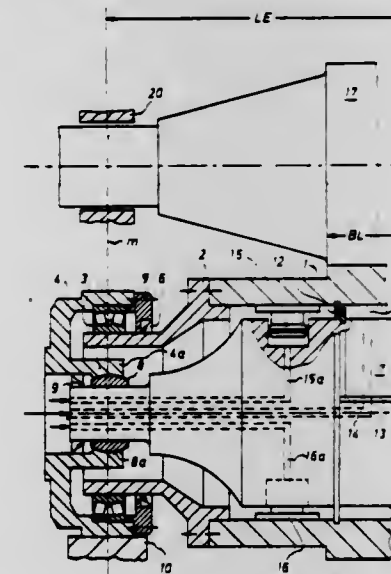
PCT Filed Jun. 26, 1981, Ser. No. 355,571

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024575; Dec. 24, 1980, 3049080

Int. Cl.<sup>3</sup> B30B 3/04

U.S. Cl. 100—162 B

20 Claims



1. A press roll with adjustable flexion for applying pressure in cooperation with a mating roll:

the press roll comprising:

a longitudinally extending yoke; a hollow shell around the yoke; the shell having first opposite ends;

a self-aligning bearing at each first end of said shell for supporting the shell for rotating around the yoke and for holding the shell away from the yoke;

the mating roll being adjacent the press roll; both the press roll and the mating roll having parallel rotation axes; both rolls together defining a press nip; the press nip and the roll axes being in a press plane; the mating roll having

second opposite ends and being supported at the second opposite ends by respective mating roll bearings;

the press roll yoke having third opposite ends; and support cap for each third end of the press roll yoke for supporting the yoke in position; at each third end, the yoke including a supported area which is supported by the respective support cap; each support cap including a collar extending into the interior of the hollow shell from the respective first end at which that support cap is positioned and the respective supported area of the yoke sitting on the respective collar;

the longitudinal distance between the center planes of the supported areas of the yoke, which planes are perpendicular to the rotation axes of the rolls, is at most as great as the distance between the mating roll bearings;

the distance between the self-aligning bearings of the roll shell is at least approximately the distance between the mating roll bearings.

4,414,891

# CRUSHING APPARATUS

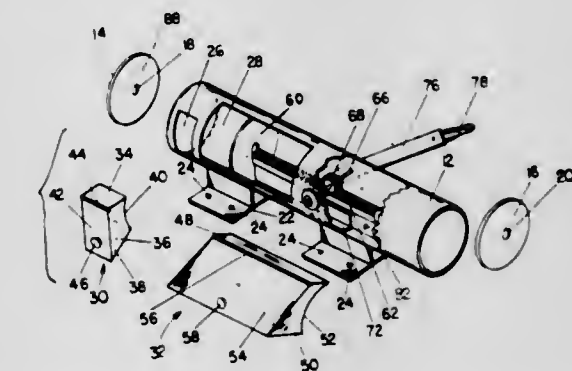
Donald G. Kitzman, 2004 W. 16th, Pueblo, Colo. 81003

Filed Jul. 6, 1981, Ser. No. 280,948

Int. Cl.<sup>3</sup> B30B 1/24

U.S. Cl. 100—245

15 Claims



1. A crushing apparatus comprising:

an elongated hollow housing having a surrounding sidewall and a first endwall defining a fixed crushing surface, said sidewall having a first opening adjacent said first endwall and a second opening longitudinally spaced from said first opening;

a piston assembly mounted for reciprocal motion in said housing and including a drive shaft oriented parallel to the axis of said housing and a crushing head attached to an end of said drive shaft facing said fixed crushing surface and defining a movable crushing surface, said drive shaft including a flat wing of reduced thickness projecting outwardly therefrom and extending substantially the full length of said drive shaft;

a pair of guide brackets each secured along one edge to said sidewall and having flat surfaces oriented in parallel relation to one another on either side of said flat wing, said guide brackets each having an edge opposite its respective said one edge that terminates in closely spaced parallel relation to said drive shaft, said guide brackets operative to support and guide said drive shaft during its reciprocal movement; and

drive means associated with said drive shaft for reciprocally moving said crushing head between a first location adjacent said fixed crushing surface and second location on a side of said second opening opposite said first opening whereby said movable crushing surface is movable completely past the longitudinal length of said second opening.

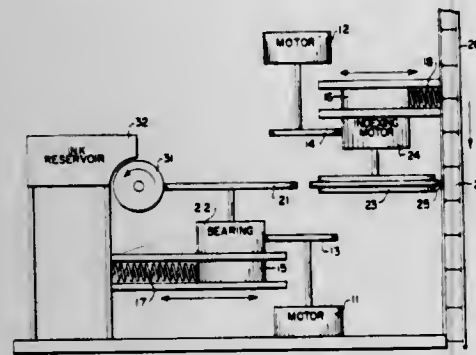


# 4,414,892 OFFSET PRINTING

Nicholas Strafello, 150 Charles St., Malden, Mass. 02148  
Filed May 17, 1982, Ser. No. 379,053  
Int. Cl.<sup>3</sup> B41F 17/00

U.S. Cl. 101—44

6 Claims



1. Offset marking apparatus comprising, print wheel means for receiving marking fluid, marking wheel means for receiving marking fluid from said print wheel means and transferring it to a component to be marked, means for supporting said print wheel means and said marking wheel means for relative displacement between a first position when said print wheel means and said marking wheel means are in contact and a second position when said print wheel means and said marking wheel means are separated, marking fluid delivery means for delivering marking fluid to said print wheel means when in said second position, window means for receiving said marking wheel means when in said second position, means for relatively displacing said print wheel means and said marking wheel means between said first and second positions, and means for angularly displacing said print wheel means and said marking wheel means when in said first position to transfer marking fluid from said print wheel means to said marking wheel means, said means for relatively displacing said print wheel means and said marking wheel means comprising, means for supporting said print wheel means and said marking wheel means for relative translational motion, spring means acting on said means for supporting for urging said print wheel means and said marking wheel means toward one of said first and second positions, and means acting on said means for supporting for urging said marking wheel means and said print wheel means toward the other of said first and second positions.

# 4,414,893 SERIAL PRINTER

Fumihisa Hori; Tadao Tamukai, both of Tamayama, and Mikio Miyajima, Nishine, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

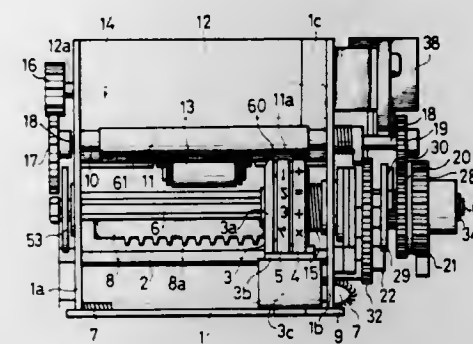
Filed Aug. 18, 1980, Ser. No. 178,891  
Claims priority, application Japan, Aug. 20, 1979, 54-105673  
Int. Cl.<sup>3</sup> B41J 9/04

U.S. Cl. 101—93.15

14 Claims

1. A printer including a type wheel carrying a plurality of type elements and a blank portion around respective areas of its circumference, means including a rotatable shaft held to said type wheel for positioning a selected area of said type wheel in a printing position along a line to be printed, impact means including a printing hammer located along said line to be printed for pressing a record member between said type wheel and said printing hammer, return means connected to said type wheel for moving said type wheel along said printing line to

print selectively along said line, means connected to said type wheel for returning said type wheel to its initial position, and



means operating said return means by actuation of said impact means with said blank portion in said printing position.

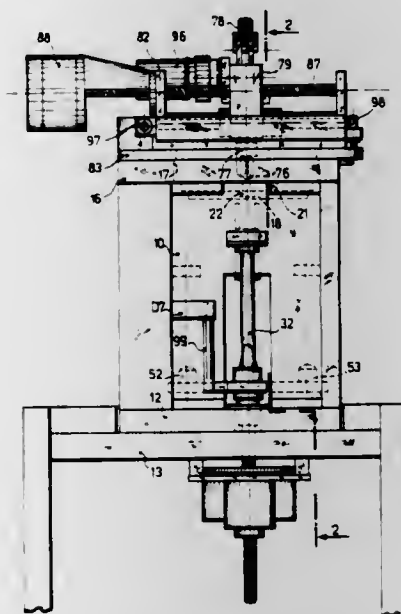
# 4,414,894 SCREEN PRINTING APPARATUS

Emile Bailly, Les Lilas, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France  
Filed Mar. 10, 1978, Ser. No. 885,153

Claims priority, application France, Mar. 10, 1977, 77 07044  
Int. Cl.<sup>3</sup> B41F 15/08

U.S. Cl. 101—123

6 Claims



1. Apparatus for printing onto a carrier by applying material to the carrier through a screen comprising support means for the screen, support means for the carrier, said carrier support means including a platen, said carrier support means being movable relative to said screen support means, and positioning means for controlling relative movement between the carrier and screen support means, said positioning means including: (1) guide means for providing translation in generally parallel planes between the carrier support means to control translation of the carrier support means toward and away from the screen support means, and (2) means for stopping the translation between said carrier support means and screen support means, said stopping means being coupled to said screen support means and said carrier support means, said stopping means positioning said platen and screen in predetermined substantially parallel planes where the material can be applied through the screen onto the carrier, said positioning means further comprising centering means coupled to said platen and said screen support means for centering said platen and said screen relative to each other, the screen having a pattern including a number of lines substantially parallel to a first predetermined direction, a blade having an elongated straight edge positioned for forcing the material through the screen onto the carrier, blade supporting and actuating means for displacing the blade

edge in a plane parallel to the plane of the screen and in a second direction, said blade supporting and actuating means including means for adjusting said second direction to any angle with respect to said first direction, whereby the blade can slide parallel to said lines in the screen.

# 4,414,895 METHOD AND APPARATUS FOR CONVERSION OF A PRINTING PRESS TO OFFSET PRINTING

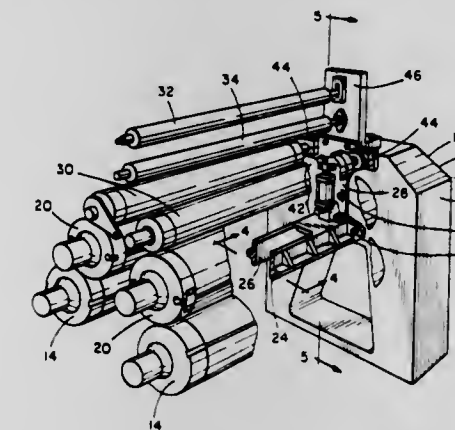
Michael A. Schwartz, Batavia, and Toshio Yamagata, Chicago, both of Ill., assignors to Press Machinery Corporation of Illinois, Bensenville, Ill.

Filed Jun. 19, 1981, Ser. No. 275,208

Int. Cl.<sup>3</sup> B41F 7/04, 5/06, 13/40

U.S. Cl. 101—177

1 Claim



1. In an apparatus for converting an existing, web-fed, newspaper printing press into a web-fed, offset, newspaper printing press, the existing, web-fed, newspaper printing press having an existing main frame of two spaced, main side frame members, and two existing pairs of horizontally spaced cylinders rotatably mounted on the main frame side members, and the apparatus including means for converting one pair of the two existing pairs of cylinders into offset plate cylinders and means for converting the other pair of the two existing pairs of cylinders into offset blanket cylinders, with a first of the offset blanket cylinders cooperating with a first of the offset plate cylinders, and a second of the offset blanket cylinders cooperating with a second of the offset plate cylinders, the improvement comprising:

- a pair of auxiliary side frame members each mounted on one of the two spaced, main side frame members, each facing the other between the main side frame members and each including first and second offset impression cylinder mounting portions and an actuator mounting position;
- a pair of auxiliary impression cylinders each having a dead shaft with a cylindrical central portion and two cylindrical end portions eccentric to the central portion, an annular, impression cylinder surface member having a cylindrical, outer, impression cylinder surface, and bearings for rotatably mounting the impression cylinder surface member on the central portion of the shaft;
- a first of the pair of auxiliary impression cylinders being pivotably mounted by the end portions of the shaft thereof to the first offset impression cylinder mounting portions of the pair of auxiliary side frame members between the auxiliary side frame members and adjacent the first offset blanket cylinder, the first offset impression cylinder thereby being pivotable between a position, of the first offset impression cylinder surface, of offset impression contact with a web passed between the first offset impression cylinder and the first offset blanket cylinder, and a thrown-off position of no contact with the web, the first offset impression cylinder being friction driven by the web in the position of offset impression contact with the web;
- a second of the pair of auxiliary impression cylinders being pivotably mounted by the end portions of the shaft thereof to the second offset impression cylinder mounting por-

tions of the pair of auxiliary side frame members between the auxiliary side frame members and adjacent the second offset blanket cylinder, the second offset impression cylinder thereby being pivotable between a position, of the second offset impression cylinder surface, of offset impression contact with a web passed between the second offset impression cylinder and the second offset blanket cylinder, and a thrown-off position of no contact with the web, the second offset impression cylinder being friction driven by the web in the position of offset impression contact with the web;

first means for driving the first auxiliary impression cylinder in pivotal movement about the end portions thereof to move the impression cylinder surface to and from the offset impression contact and thrown-off positions, the first driving means including a first actuator arm mounted to one of the end portions of the shaft of the first auxiliary impression cylinder and a first actuator mounted to the first actuator arm and to the actuator mounting portion of one of the pair of auxiliary side frame members between the main side frame members of the press; and second means for driving the second auxiliary impression cylinder in pivotal movement about the end portions thereof to move the impression cylinder surface to and from the offset impression contact and thrown-off positions, the second driving means including a second actuator arm mounted to one of the end portions of the shaft of the second auxiliary impression cylinder and a second actuator mounted to the second actuator arm and to the actuator mounting portion of the other of the pair of auxiliary side frame members between the main side frame members of the press.

# 4,414,896 SHEET-FED ROTARY PRIME AND VERSO OFFSET PRINTING MACHINE & METHOD

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

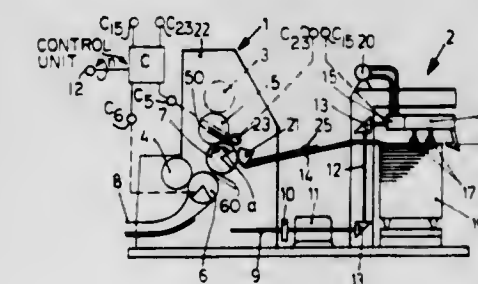
Filed Mar. 1, 1982, Ser. No. 353,235

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108807

Int. Cl.<sup>3</sup> B41M 1/14; B41F 5/16

U.S. Cl. 101—211

17 Claims



1. Method of printing in prime and verso printing mode on a substrate sheet by a printing machine having two plate cylinders (3, 4; 41, 42); two rubber blanket cylinders (5, 6; 43, 44) in continuous surface engagement with an associated respective plate cylinder; a printing or impression cylinder (7, 45) carrying a rubber blanket capable of receiving printing information, all said cylinders having essentially the same diameter comprising: controlling, respectively, engagement and disengagement of said rubber blanket cylinders and the impression cylinder by (a) separating one (5) of the rubber blanket cylinders and the impression cylinder (7, 45) during a first or printing phase of revolution of the impression cylinder while engaging a substrate sheet against the impression cylinder;



(a1) engaging said rubber blanket cylinder with the rubber blanket of the impression cylinder for transferring of printed information from the rubber blanket cylinder to the rubber blanket of the impression cylinder during a second phase of operation and when no substrate sheet is positioned between the rubber blanket cylinder and the impression cylinder to effect verso printing on said substrate sheet;

(a2) transferring printing information from the rubber blanket cylinder to the rubber surface of the impression cylinder by engagement of said rubber blanket cylinder (5, 43) with the impression cylinder (7, 45) during a second, or non-printing operating phase of the machine; (b) engaging the other (6, 44) rubber blanket cylinder against the printing or impression cylinder (7, 45) with the substrate sheet therebetween for prime printing on said substrate sheet during said first operating phase; (b1) separating the other rubber blanket cylinder (6, 44) from the printing or impression cylinder (7, 45) during said second operating phase to prevent ink smear by the second rubber blanket cylinder on the printing information transferred to the rubber surface of the impression cylinder by the first rubber blanket cylinder (5, 43).

4,414,897

## INKING MECHANISM IN A ROTARY PRESS

Masayoshi Sato, Kawasaki, and Kunio Suzuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

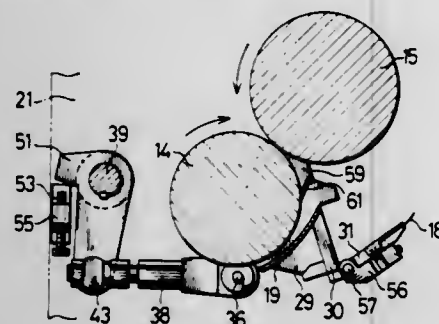
Continuation-in-part of Ser. No. 193,088, Oct. 2, 1980, abandoned. This application Jan. 18, 1983, Ser. No. 458,948

Claims priority, application Japan, Jun. 6, 1980, 55-076501

Int. Cl.<sup>3</sup> B41F 31/00

U.S. Cl. 101—216

1 Claim



1. An inking mechanism in a rotary press comprising an ink pan, a fountain roll having a circumferential surface for drawing ink from the pan and transferring it to a circumferential surface of a mesh roll, a plate cylinder to which the ink is supplied from the mesh roll via a pair of form rolls, said mesh roll rotating at a high speed equal to that of the plate cylinder, a doctor blade which is provided on a base being traversed on arms swinging along the circumferential surface of eccentric sleeves supporting both ends of said fountain roll, a scraped ink returning plate provided close to and along the circumferential surface of the fountain roll which is swingable with said base, means for swinging a free end portion of the doctor blade between a contact position in which said free end portion of the doctor blade makes contact with a position just progressed in the rotative direction on that portion of the circumferential surface of the mesh roll to which ink is transferred from the fountain roll and a non-contact position in which said free end portion of the doctor blade is removed from the circumferential surface of the mesh roll along the circumferential surface of the eccentric sleeves, and means for pivoting and doctor blade at said non-contact position in a direction away from both of the circumferential surfaces of the mesh roll and the fountain roll.

#### 4,414,898 MOUNTING FOR PRINTING CYLINDERS OR THE LIKE WITH ADJUSTABLE SIDE REGISTER

Jürgen Westerkamp, Westphalia, and Bruno Marquardt, Georgsmarienhütte, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

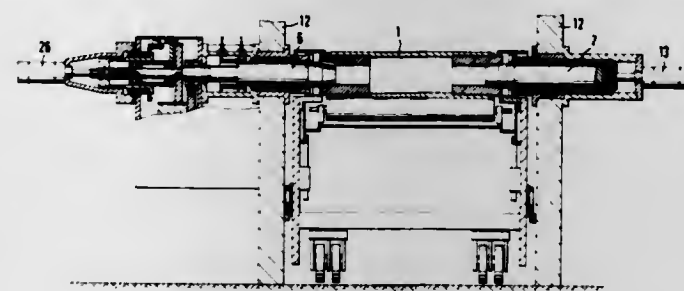
Filed Jul. 6, 1982, Ser. No. 395,317

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126561

Int. Cl.<sup>3</sup> B41F 13/24

U.S. Cl. 101—248

9 Claims



1. A mounting for printing cylinders or the like with an adjustable side register, wherein the cylinder having internal cones at the ends is clamped between complementary external cones of a shaft which is mounted in the machine frame and is mounted against axial displacement in a sleeve that has a screwthread and is axially displaceable by means of a screw connection to a sleeve which is axially undisableable with respect to the frame, characterised in that the external cones are disposed at the confronting ends of journals which are mounted in the frame and of which one is mounted against axial displacement in the sleeve which is axially displaceable but non-rotatable with respect to the machine frame, that the sleeve is screw-connected to an axially undisableable sleeve which is rotatable in the machine frame and provided with a rotary drive for adjusting the cylinder axially, and that the journals can be clamped towards each other by the piston rods of hydraulic piston-cylinder units of which the cylinder chambers, which have volumes varying in opposite senses when the side register is adjusted, can be interconnected.

4,414,899

## INK ROLLER ASSEMBLY ATTACHMENT

Forrest G. Hill, Belleville, Ill., assignor to Marsh Stencil Machine Company, Belleville, Ill.

Filed Mar. 29, 1982, Ser. No. 362,609

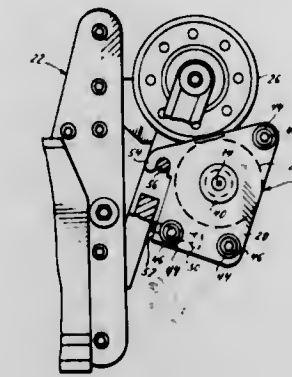
Int. Cl.<sup>3</sup> B41K 1/22

U.S. Cl. 101—331

6 Claims

1. An ink roller assembly for attachment to a tape printer or the like to replace the transfer roller thereof, the tape printer having a print wheel and a transfer roller in operational contact with the print wheel to apply ink thereto, said transfer roller being axially mounted on a shaft, the ink roller assembly replacing the transfer roller in the tape printer and having a pair of hanger brackets for suspending the ink roller assembly from the transfer roller shaft of the tape printer when said transfer roller has been removed, said ink roller assembly further including a pre-inked roller rotatably mounted on a shaft, said shaft being mounted solely to and between said

hanger brackets, and said ink roller assembly having means to urge the ink roller against the print wheel when said ink roller



assembly is mounted, said ink roller assembly thereby replacing the transfer roller.

4,414,900

## NON-LEAKING PRINTING INK TROUGH

Josef Kraus, and Erich Wech, both of Augsburg, Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

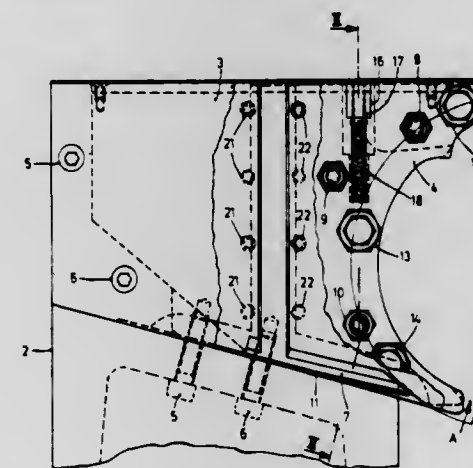
Filed Oct. 23, 1981, Ser. No. 314,218

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043234

Int. Cl.<sup>3</sup> B41F 1/46, 31/02

U.S. Cl. 101—363

8 Claims



1. Non-leaking printing ink trough construction having an elongated cross element (2); an ink duct roller (1) extending parallel to the cross element and having an end face at each end; a doctor blade (11) extending parallel to the ink duct roller; a side wall positioned perpendicularly to the cross element, closing off the cross element laterally, and forming there-with an ink trough construction in engagement with the end faces of the duct rather, said side wall including a fixed wall portion (3) and an elastically movable wall portion (4) in engagement with a duct roller end face (1),

the doctor blade (11) being longer than the duct roller (1) to form lateral projecting portions; a resilient force means (18), coupled to the elastically movable wall portion (4) to press said elastically movable wall portion against the top face of the doctor blade (11); and spring means (15) bearing on the elastically movable wall portion (4) of the side wall for pressing said elastically movable wall portion into engagement with an end face (A) of the duct roller (1), said movable portion thus sealing (a) against the end face (A) of the duct roller (1) and (b) against the top face of the doctor blade (11) to form a non-leaking end seal; and a sealing element (7) which, in plan view, is essentially T-shaped, having a cross portion and a leg portion, said cross portion forming a seal between the fixed and the elastically movable wall portions of the side wall and the blade (11), and the leg portion extending between and sealingly connecting said fixed portion and said elastically movable wall portion, while permitting movement of the elastically movable wall portion (4) with respect to the fixed portion (3) and movement of the elastically movable wall portion (4) in the direction of the leg portion of the sealing element (7).

4,414,901

## EXPLOSIVE DEVICE INCLUDING AN IGNITION CIRCUIT MONITOR

Raymund E. Sellwood, Slough, England, assignor to M.L. Aviation Company Limited, Slough, England

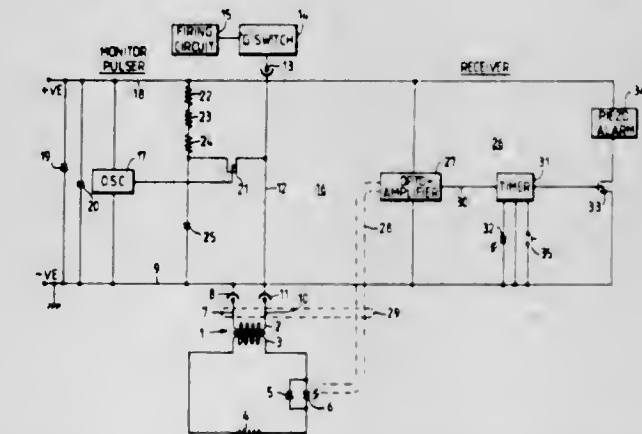
Filed Jun. 18, 1981, Ser. No. 274,739

Claims priority, application United Kingdom, Mar. 9, 1981, 8107359

Int. Cl.<sup>3</sup> F42C 11/00

U.S. Cl. 102—206

6 Claims



1. An explosive device, comprising an explosive charge; an igniter circuit including an electrically-energisable heating element for igniting the explosive charge; a firing circuit operable to feed electrical energy to the igniter circuit at a firing level sufficient to cause ignition of the explosive charge; a light-emitting diode connected in series with the heating element; and a monitoring circuit operable to feed electrical energy to the igniter circuit at a level less than said firing level and to monitor radiant energy produced by said light-emitting diode in order to check the integrity of the igniter circuit.



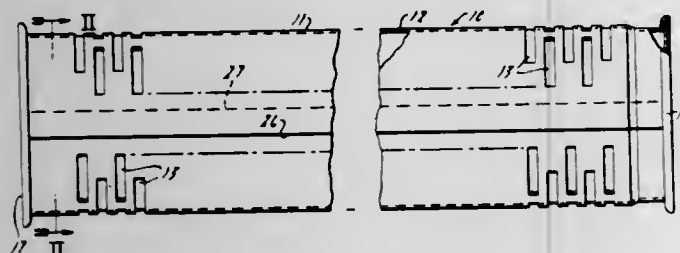
4,414,902

**CONTAINER FOR GAS GENERATING PROPELLANT**  
Robert A. Strasser, Livonia, and Stephen W. Goch, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 29, 1980, Ser. No. 220,347  
Int. Cl.<sup>3</sup> F42B 5/20, 9/18

U.S. Cl. 102—531

2 Claims



1. A container for a gas generating propellant comprising: an elongated thin wall metal cylinder having a plurality of perforations extending substantially around the periphery of the cylinder and for substantially the length of the latter;
- a hermetic liner sealingly attached to the imperforate portions of the inner surface of the cylinder to seal the perforated area of the wall;
- the hermetic liner comprising a laminated plastic film and metal foil composite having a thickness less than that of the cylinder wall and being rupturable under the pressure of gas generated within the cylinder;
- the laminated plastic film and metal foil composite including a first layer of an ionomer resin film, a layer of aluminum foil, a second layer of ionomer resin film, and a layer of polyester film;
- the first layer of ionomer resin film being in contact with the inner metal surface of the cylinder;
- the layer of aluminum foil being between the two layers of ionomer resin films;
- the layer of polyester film covering the second layer of ionomer film to isolate the latter from the gas generating propellant; and
- metal end caps closing the ends of the cylinder.

4,414,903

**AUTOMATIC GUIDANCE MECHANISM**

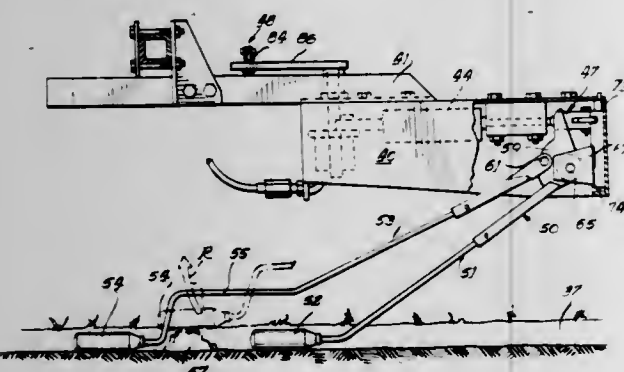
Mark E. Fasse, and Herbert C. Glesmann, both of Omaha, Nebr., assignors to Pathfinder Systems, Inc., Lexington, Nebr.

Continuation of Ser. No. 39,224, May 14, 1979, abandoned, which is a division of Ser. No. 779,684, Mar. 21, 1977, Pat. No. 4,161,143. This application Apr. 26, 1982, Ser. No. 371,957

Int. Cl.<sup>3</sup> B62D 1/26

U.S. Cl. 104—244.1

9 Claims



2. An improvement in furrow followers of a type adapted to connection to automatic steering mechanisms for causing a vehicle to selectively follow a furrow wherein the improvement comprises: a displacement sensing means for sensing a probe means

wherein said displacement sensing means is operably connected to the automatic steering mechanism;

a drag plate which is pivotally attached to said displacement sensing means about a horizontal pivot axis wherein said horizontal pivot axis lies within a plane substantially parallel to the surface transversely by said vehicle;

a first furrow probe means operably connected to said drag plate wherein said first furrow probe means is disposed in trail position behind said drag plate; and

a second furrow probe means operably connected to said drag plate wherein said second furrow probe means is disposed in spaced trail position behind said first probe means, and wherein said second furrow probe means is connected to said drag plate independently of said first probe means, whereby each probe means is capable of overriding an obstruction in said furrow independently of said other probe means.

4,414,904

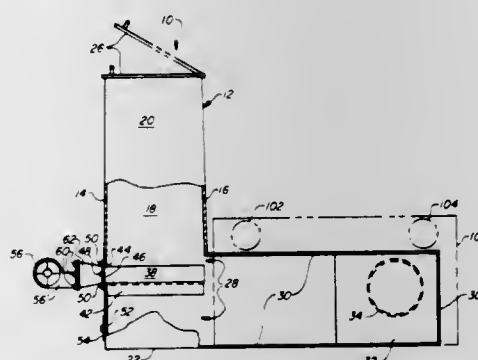
**WASTE-BURNING FURNACE**

Glenn M. Foster, Rte. 4, Box 559, Yadkinville, N.C. 27055  
Filed Dec. 2, 1981, Ser. No. 326,714

Int. Cl.<sup>3</sup> F23K 3/00

U.S. Cl. 110—102

9 Claims



1. A furnace for efficiently burning sawdust and similar waste-type fuel, comprising: an upstanding hopper-like member having a fuel inlet adjacent its upper end and a combustion gas passageway opening laterally from its lower end portion;
- a generally horizontally extending and box-like hollow grate disposed within said hopper-like member at an elevation spaced closely beneath the uppermost extremity of said passageway, said grate having a hollow border section and a plurality of hollow coplanar spacially aligned medial sections, said medial sections communicating with said hollow border section, rod means, said rod means being coplanar with upper surface of said medial sections, said rod means being laterally centered between said medial sections and rigidly joined to said border section, said grate having a plurality of laterally spaced slot-like openings extending horizontally of and vertically through the medial portion thereof;
- the interior of said hopper-like member being smooth surfaced and of gradually increasing cross-sectional area from said fuel inlet to said grate to facilitate gravity descent of said fuel within said member from said inlet to said grate;
- a manifold chamber extending generally horizontally outwardly from said lower end portion of said hopper-like member and communicating therewith through said passageway of said member;
- duct means communicating with said manifold chamber for conducting therefrom heated gaseous products of combustion introduced into said chamber from said passageway of said hopper-like member;
- blower means disposed exteriorly of said hopper-like member and communicating with said grate for, when actuated, conducting air to the interior of said grate; said grate having first aperture means therein for discharging jets of

air substantially vertically upwardly from said grate, and having second aperture means for discharging angularly upwardly jets of air from said grate, and having third aperture means for discharging jets of air substantially vertically downwardly from said grate, and having fourth aperture means for discharging jets of air angularly downwardly from said grate.

4,414,905

**METHOD AND EQUIPMENT FOR TREATMENT OF FUEL FOR FLUIDIZED BED COMBUSTION**

Jaroslav Beranek; Germak, Jan, both of Prague; Jaroslav Dobrozemsky, Uhliska, and Vratislav Fibinger, Vackava Vacka, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 150,317, May 16, 1980, Pat. No. 4,325,311.

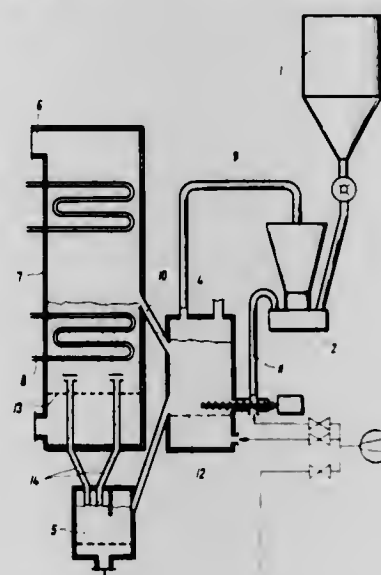
This application Mar. 9, 1982, Ser. No. 356,472

Claims priority, application Czechoslovakia, May 17, 1979, 3424-79

Int. Cl.<sup>3</sup> F23G 7/00

U.S. Cl. 110—245

1 Claim



1. Apparatus for treatment of fuel which comprises a fuel bunker, a fuel crusher and a fluidized bed dryer, said fluidized bed dryer being provided with a first piping for introduction of fluidizable fuel from the crusher into the fluidized bed dryer; a second piping for introduction of hot particles from a fluidized bed combustor to said fluidized bed dryer; a fluidized bed seal and piping for transfer of fluidized particles from the fluidized bed dryer to the fluidized bed combustor; and means for transfer of nonfluidizing particles from the bottom of the fluidized bed dryer to said fuel crusher.

4,414,906

**FUEL CARTRIDGE AND BURNER**

Edward Hartouni, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Aug. 24, 1981, Ser. No. 295,204

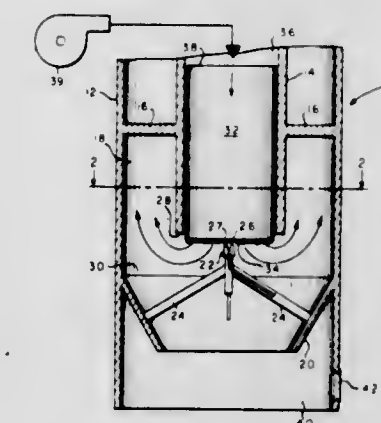
Int. Cl.<sup>3</sup> F23K 3/00

U.S. Cl. 110—293

2 Claims

1. A solid fuel cartridge and burner comprising: a vertically oriented burner casing for mounting in a furnace, a hollow cylindrical support sleeve mountable concentrically within and spaced from the burner casing to form a combustion gas passage therebetween for transferring the gaseous combustion products of said burner to other furnace components, a self-supportable fuel element mountable in the support sleeve with a close but slideable fit, the fuel element being formed of consolidated solid fuel particles and having a selected combustion surface, a mandrel positionable in the center of the casing and spaced

below the support sleeve upon which the lower end of the fuel element rests, a combustion chamber surrounding the mandrel formed by the burner casing and in communication with the combustion gas passage, pressure generating means for supplying air under pressure to the fuel element at its end opposite the mandrel for



combustion of the fuel particles at the selected combustion surface and in the combustion chamber, the fuel element including interstitial spaces between the consolidated fuel particles for permitting the passage of air for combustion through the fuel element to the selected combustion surface, and means contained within the mandrel for igniting the fuel particles at the combustion surface.

4,414,907

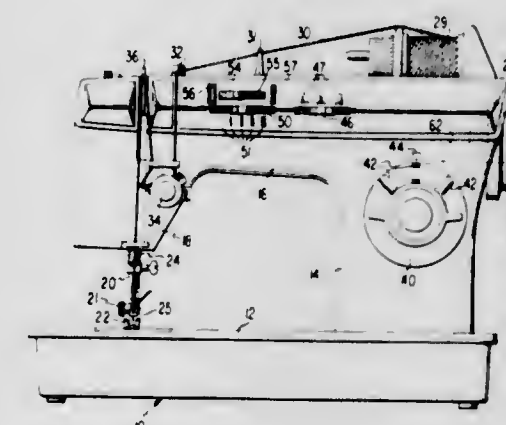
**BUTTONHOLE WIDTH ADJUSTING MECHANISM**  
Edward J. Tullman, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,754

Int. Cl.<sup>3</sup> D05B 3/02, 3/06

U.S. Cl. 112—158 B

5 Claims



1. A sewing machine having a needle bar gate arranged for pivotal vibratory motion along an axis; means for storing bight information; means for sensing said stored bight information; means for imparting pivotal vibratory motion to said needle bar gate in relation to said bight information sensed by said sensing means; means between said imparting means and said sensing means for selectively attenuating the motion imparted to said imparting means by said sensing means; and, control means interposed between said needle bar gate and said imparting means for selectively effecting specific proportions of said imparted pivotal vibratory motion.



4,414,908

**SUTURING MACHINE FOR MEDICAL TREATMENT**

Yasukata Eguchi, Kunitachi; Susumu Hanyu, Hachioji; Reishi Nemoto, Kanagawa, and Masayoshi Takahashi, Sagami-hara, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

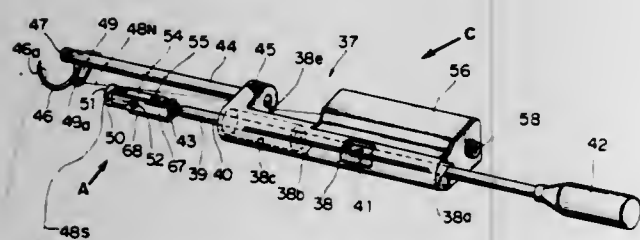
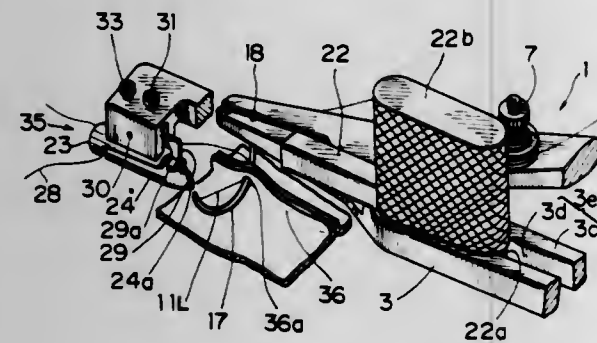
Filed Nov. 26, 1980, Ser. No. 210,764

Claims priority, application Japan, Dec. 4, 1979, 54-156358; May 12, 1980, 55-61713

Int. Cl.<sup>3</sup> D05B 1/02

U.S. Cl. 112-169

5 Claims



1. A suturing machine for use in medical treatment by producing continuous stitches on parts to be sutured, comprising a curved needle for holding a needle thread; means for holding said needle and operative for inserting said curved needle into the parts to be sutured to form a thread loop; a shuttle for holding a shuttle thread; means for holding said shuttle and operative for inserting the shuttle thread into said thread loop to thereby interlock said loop and to produce a lock stitch, said shuttle holding means being mounted on said needle holding means and being operative when said needle holding means is inoperative with said needle in the raised position, said needle holding means including a pair of grips each having an end portion, the end portions forming jaws operative for releasably holding said curved needle, one of said grips being formed with a guide groove, said shuttle holding means including an elongated support having a shuttle holder at one end thereof, displaceable lengthwise of said one grip and a guiding member at its other end; said guiding member being slidably positioned within said guiding groove for guiding said shuttle holder in its displacement lengthwise of said one grip towards and from the thread loop formed by said curved needle.

4. A suturing machine for use in medical treatment by producing continuous stitches on parts to be sutured, comprising a curved needle for holding a needle thread; means for holding said needle and operative for inserting said curved needle into the parts to be sutured to form a thread loop; a shuttle for holding a shuttle thread; means for holding said shuttle and operative for inserting the shuttle thread into said thread loop to thereby interlock said loop and to produce a lock stitch, said shuttle holding means being mounted on said needle holding means and being operative when said needle holding means is inoperative with said needle in the raised position, said needle holding means including an elongated frame formed with a grip, and a needle supporting bar connected to said frame and holding said curved needle, said frame being formed with a guiding bore, said shuttle holding means including a support rod and a shuttle holder connected thereto, said support rod being guided in said guiding bore of said elongated frame to be displaced lengthwise thereof for moving said shuttle holder

towards and from the thread loop formed by said curved needle.

4,414,909

**NEEDLE POSITIONER FOR SEWING MACHINE**

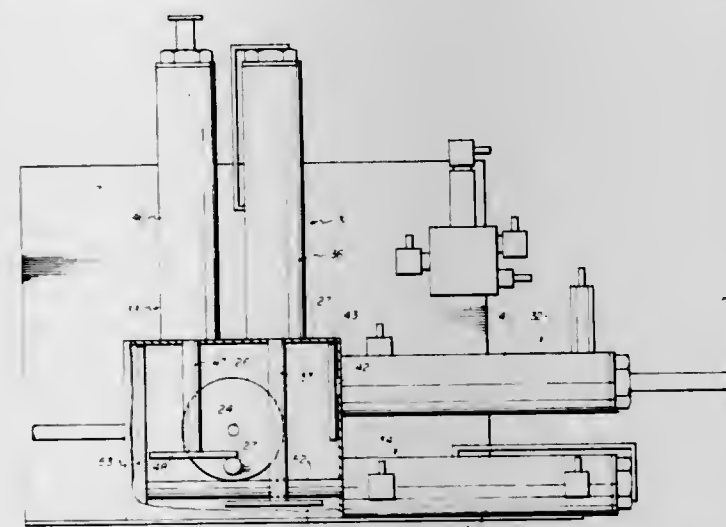
Murel B. Bray, 3112 Rosa Ave., El Paso, Tex. 79905

Filed Mar. 17, 1981, Ser. No. 244,598

Int. Cl.<sup>3</sup> D05B 69/22, 69/08

U.S. Cl. 112-274

8 Claims



1. A positioner assembly for a sewing machine having a head provided with shaft means and drive means connected to said shaft means to move a sewing machine needle reciprocally into and out of a workpiece comprising, in combination, means for disconnecting said drive means from said shaft means, a frame, crank means rotatably supported on said frame, means for drivably connecting said crank means to said shaft means, a plurality of pneumatically actuated drive units on said frame each selectively engagable with said crank means to move said crank means into a plurality of predetermined rotary positions, conduit means including valve means on said frame for selectively communicating said drive units with an associated source of pneumatic pressure for selective actuation of said drive units to thereby position said needle in a selected one of a needle position up and a needle down position wherein said valve means include a manually actuated first valve for selectively connecting said drive units to said associated source of pneumatic pressure to move said needle into the up position and a manually actuated second valve for selectively connecting said drive units to said associated source of pneumatic pressure to move said needle into the down position wherein said drive units include four main cylinder/piston assemblies, each of said main cylinder/piston assemblies being disposed on said frame for selective driving engagement of said pistons with said crank means to rotate said crank means sequentially through increments of approximately 90°.

4,414,910

**ASSEMBLY OF TURNABLE MEMBER AND MOUNTING THEREFOR**

Julian Renton, London, England, assignor to RWO (Marine Equipment) Limited, Benfleet, England

Continuation of Ser. No. 215,016, Dec. 10, 1980, abandoned.

This application Sep. 30, 1982, Ser. No. 431,622

Claims priority, application United Kingdom, Dec. 19, 1979, 7943785

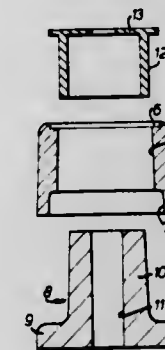
Int. Cl.<sup>3</sup> B63B 21/04

U.S. Cl. 114-218

24 Claims

1. An assembly comprising:  
a turnable member having a through bore and intended to be mounted for turning about the longitudinal axis of the through bore;  
a mounting member;  
a pillar to the mounting member, the mounting member having a through bore coaxial with the pillar, the through

bore of the turnable member and the outer surface of the pillar being tapered; and  
a deformable sleeve member of plastics material; the sleeve member being shaped to fit within the through bore in the



turnable member and the pillar being shaped to fit within the sleeve such that, by deformation of the sleeve, a press fit of the pillar in the sleeve is achieved sufficient to hold the assembly together during transport while still permitting rotation of the turnable member relative to the pillar.

4,414,911

**BERTH FOR MOORING SUPPLY SHIP TO AN OFFSHORE PLATFORM AND FOR TRANSFERRING PERSONNEL BETWEEN THEM**

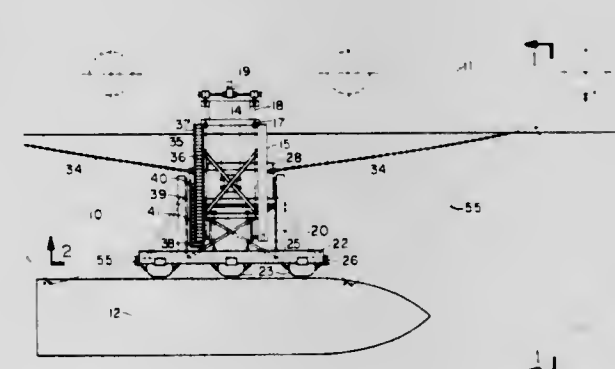
Sidney I. Belinsky, 40 Waterside Plaza, Apt. 29M, New York, N.Y. 10010

Filed Jun. 19, 1981, Ser. No. 275,491

Int. Cl.<sup>3</sup> B63B 59/02

U.S. Cl. 114-219

7 Claims



1. A berth for mooring ship to an offshore platform and transferring the personnel between them comprising  
a floating fendering system, having a breasting beam with positive buoyancy located along one of the sides of said offshore platform,  
a derrick crane located on an upper deck edge of said offshore platform and having a boom, tower and luffing winch,  
an intermediate massive platform,  
a pair of inclined levers through which said floating fendering system is connected to said intermediate massive platform,  
a berth suspension system having two pairs of suspension flexible lines, each pair of said suspension lines is connected through their lowest ends to said massive platform, forming a gravity balanced pendulum with two pivotal points, an outer pair of said lines is connected by its upper ends to said boom, of said derrick crane, the inner pair of said lines is connected to an upper deck of said offshore platform,  
a winch, for lifting said floating fendering system, located on the upper part of said boom and having hoisting ropes connected to said inclined levers,

an elevator for transporting personnel from said intermediate platform to the upper deck of said offshore platform, a system of ladders and gangways, providing a pass for personnel between the upper deck of the offshore platform and a moored supply ship,  
a system supporting mooring operation.

4,414,912

**BURGLAR ALARM**

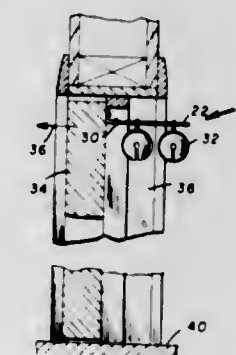
Charles W. Algire, 4730 Dunkirk Ave., Baltimore, Md. 21229

Continuation of Ser. No. 187,577, Sep. 15, 1980, abandoned. This application May 21, 1982, Ser. No. 380,860

Int. Cl.<sup>3</sup> G08B 17/02

U.S. Cl. 116-5

11 Claims



1. An alarm system, comprising:  
a base means;  
a support means, said support means being of a rod-like configuration, said support means having one end of said rod-like configuration further formed into a loop-like eye configuration, said loop-like eye being used to facilitate affixing said support means to said base means, said support means being of a single configuration;  
a fastening means, said fastening means being used to permanently affix said support means to said base means, said fastening means being passed through said loop-like eye configuration and permanently inserted into said base means, said fastening means permanently securing said support means to said base means during period of use and recurring reuse of said alarm system;  
an alarm means, said alarm means being capable of causing bell-like sounds, said alarm means being slideably and removably placed upon said support means, said alarm means being operated to cause said bell-like sounds when said alarm means is causably stripped from said support means;  
a wiper means;  
and a holding means, said wiper means being of eye-like configuration and having a mounting means affixed thereto, said wiper means being located and affixed in position on said holding means, said holding means being adjacent to and separate from said base means, said wiper means being affixed to said holding means by said mounting means, said wiper means being so located and affixed to said holding means so that said rod-like support means, affixed to said base means, will slideably and removably enter and pass into and partially through said eye-like wiper means, said wiper means causably stripping said alarm means from said support means when said alarm means is activated by the movement of said support means, said alarm means consisting of at least one sleigh bell of substantially spherical shape to cause said bell-like sounds.



4,414,913

**THERMO-ENGRAVING MACHINE FOR PRINTING IN RELIEF**

Jean L. Sarda, 25 Rue Pradier, 75019 Paris, France

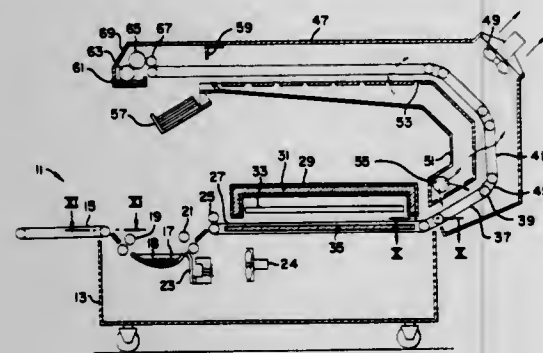
Filed Jul. 15, 1981, Ser. No. 283,515

Claims priority, application European Pat. Off., Jul. 18, 1980, 80401072-6

Int. Cl.<sup>3</sup> B05C 11/02, 19/00

U.S. Cl. 118—46

39 Claims



1. A thermo-engraving machine, comprising in combination: deposition means for depositing a heat sensitive powder deposit on wet ink of freshly printed individual sheets; heater means for heating the sheets to melt the powder deposit, the heater means having an entrance and an exit; advancing means for continuously advancing the sheets from a printing machine through the heater means; and cooling conveyor means for cooling the sheets exiting from the heater means and returning the sheets to a vicinity near the entrance of the heater means.

4,414,914

**SOLDER LEVELING DEVICE HAVING MEANS FOR VERTICALLY GUIDING PRINTED CIRCUIT BOARDS**

Hans P. Caratsch, Bremgarten, Switzerland, assignor to Sinter Limited, Bristol, England

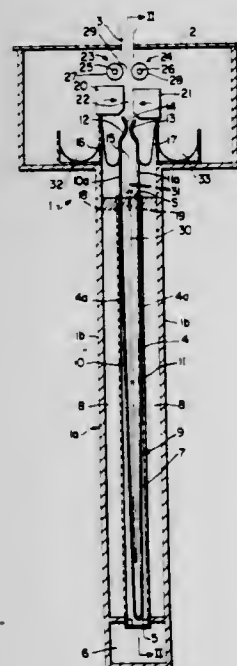
Filed Sep. 9, 1981, Ser. No. 300,971

Claims priority, application Switzerland, Sep. 9, 1980, 6760/80

Int. Cl.<sup>3</sup> H05K 3/24

U.S. Cl. 118—63

14 Claims



1. An apparatus for the application of solder to a printed circuit board, said apparatus comprising: a solder bath container adapted to contain therein a solder bath, said container having an open upper end, whereby a

printed circuit board is movable vertically through said open upper end into and out of the solder bath; and guide means for guiding the printed circuit board during movement thereof into and out of the solder bath by loose contact only with opposite sides of the printed circuit board and without contact with lateral edges thereof, said guide means comprising a plurality of generally vertically extending rod-shaped guide elements extending into the solder bath within said container and arranged in two parallel rows spaced from each other by a distance greater than the thickness of a printed circuit board to be soldered, each said row comprising plural said guide elements spaced from each other across the width of said container and adapted to confront and guide a respective side of the printed circuit board, at least one of said guide elements being mounted in such a manner so as not to impede contact of said solder both with said lateral edges of a printed circuit board.

4,414,915

**ROTARY SCREEN SQUEEGEE ROD**

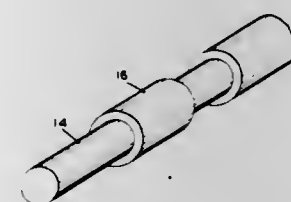
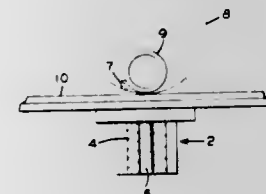
Harold N. Graybeal, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Mar. 22, 1982, Ser. No. 360,787

Int. Cl.<sup>3</sup> B41L 13/18; B05C 1/00

U.S. Cl. 118—213

2 Claims



1. In a device for treating a web of material, said device being the type including at least one roller-shaped element formed of magnetically attractable material, said roller-shaped element being positioned on one side of the web of material to be treated and comprising means for applying a treating substance to said one side of said web of material, and a magnetic element positioned on the opposite side of said web of material, said magnetic element including a series of electromagnets arranged one after the other in a longitudinal direction across the width of the web of material, said magnetic element being means for attracting said roller-shaped element and thereby forcing said roller-shaped element against one side of said web of material; the improvement comprising:

said roller-shaped element being a hollow steel rod, steel slugs of different lengths fitting within said rod and being positioned in different positions along the length of the rod, the steel slugs being hollow and positioned at different points on a wooden rod the same length as the hollow rod, said wooden rod with steel slugs being inserted in the hollow rod.

4,414,916

**AUTOMATIC TONING APPARATUS HAVING A VERTICALLY RECIPROCATING HOPPER**

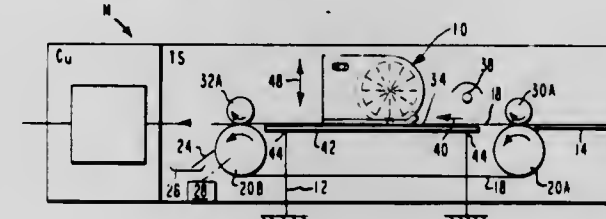
Jose V. Martin, Newark, Del., assignor to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

Filed May 20, 1981, Ser. No. 265,445

Int. Cl.<sup>3</sup> B05C 11/02, 19/00

U.S. Cl. 118—612

22 Claims



1. Apparatus for applying a particulate toner to an image-defining tacky surface on a photo-element comprising: means for transporting a photo-element along a predetermined transport path;

a hopper for receiving particulate toner therein, the hopper being spaced above the transport path and having a slot therein communicating with the transport path, the slot having a predetermined dimension measured in the direction of travel of the photo-element along the transport path;

a reciprocating device for vertically moving the hopper as a whole in a reciprocating fashion toward and away from the transport path to impart vibrational energy to the toner to fluidize the same to cause it to flow through the slot to form a toner pool from which pool toner is depositable on a photo-element transportable therebeneath, the reciprocating device imparting an oscillatory motion to the hopper at a frequency in the range from 0 to 50 Hertz ( $0 < \text{frequency} \leq 50$  Hertz), and at an amplitude (peak-to-peak) in the range from 0 to 0.150 inches ( $0 < \text{amplitude} \leq 0.150$  inches);

a toning pad disposed downstream of the pool in the direction of travel of the photo-element, the pad being attached to the hopper for reciprocating movement therewith; and a flat toning support surface disposed vertically opposite the pad and beneath the transport path, the toning support surface serving to support the photo-element while the reciprocating oscillatory motion of the hopper is transmitted to the pad such that the pad pats into the photo-element toner that has been deposited from the pool onto the photo-element.

4,414,917

**SYSTEM FOR SELECTIVELY TREATING CABLES AND THE LIKE**

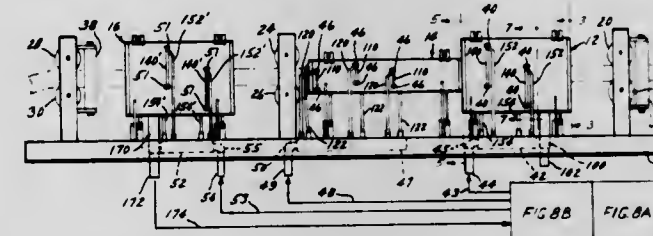
Joseph J. Bentley, Goleta; Thomas E. Brown, Los Angeles, and Jerome Unrine, Ventura, all of Calif., assignors to Industrial Cleaning and Coating, Inc., Ventura, Calif.

Filed Jan. 3, 1983, Ser. No. 455,409

Int. Cl.<sup>3</sup> B05C 5/00

U.S. Cl. 118—695

14 Claims



1. In combination: an elongated first cylinder adapted for receiving a cable, said cylinder having entrance and exit ends; nozzle means supported by said cylinder, said nozzle means

having spaced nozzle inputs along said cylinder beginning adjacent said exit end, each of the nozzle inputs being adapted to direct air tangentially of the cable, each of the nozzle inputs also being adapted to direct air towards said entrance end at a respective angle with respect to a diametral plane, the angles increasing so the angle of the nozzle inputs adjacent said exit end is less than the angle of nozzle inputs spaced along said cylinder; and means to apply air under pressure to said nozzle means.

4,414,918

**DISTRIBUTOR HEAD FOR A PIPE LINING MACHINE**

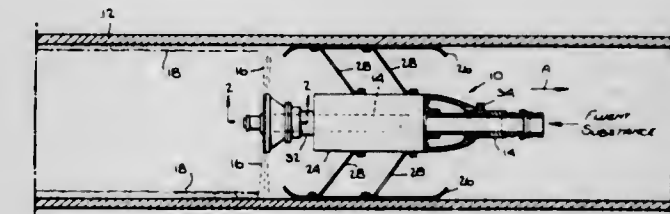
Henry A. Nelson Holland, and James Bandura, both of Houston, Tex., assignors to Raymond International Builders, Inc., Houston, Tex.

Filed Feb. 11, 1982, Ser. No. 347,934

Int. Cl.<sup>3</sup> B05C 7/02

U.S. Cl. 118—306

13 Claims



1. A distributor head for a pipe lining machine in which a fluent substance is thrown outwardly onto the inner wall of a pipe being lined, said distributor head comprising an outer rotating member having an outwardly flared inner surface, means for depositing said fluent substance onto the inner surface of said rotating member so that, as said member rotates, the fluent substance is caused, by centrifugal action, to flow along said inner surface toward its outer edge, said means for depositing said fluent substance comprising an inner conduit for receiving said substance, said inner conduit having elongated slots distributed thereabout and extending axially thereof through which said fluent substance may pass and a plurality of inner vanes mounted to revolve about said inner conduit over said slots to engage the fluent substance and throw it outwardly onto the inner surface of said rotating member, said inner vanes being individually and releasably fitted into a collar at the inner edge of said outer rotating member.

4,414,919

**FLOWDOWN REARING POND**

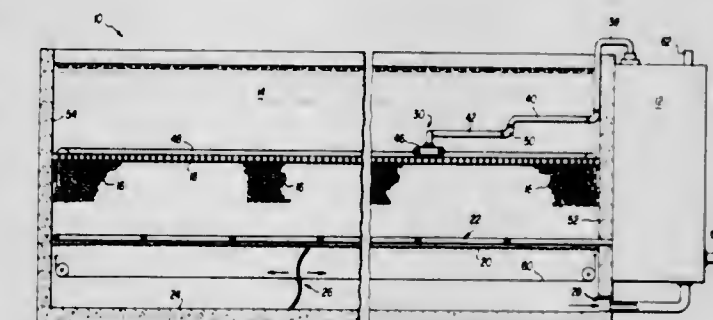
W. John Heas, 123 Union St., Walla Walla, Wash. 99362

Filed Oct. 27, 1981, Ser. No. 315,552

Int. Cl.<sup>3</sup> A01K 63/00

U.S. Cl. 119—3

12 Claims



1. A fish rearing, water-recirculating module comprising: (a) a housing having a filter media space therein; (b) a fluid filter media located within said filter media space; (c) means, located below said filter media space for collecting water that has passed through said filter media; (d) means for returning said filtered water to a location above said filter media space, and;



(e) means for spraying said returned water to cleanse said filter media.

4,414,920

# **BLOCK FOR SUPPORTING THE POLES OF EQUESTRIAN FENCES**

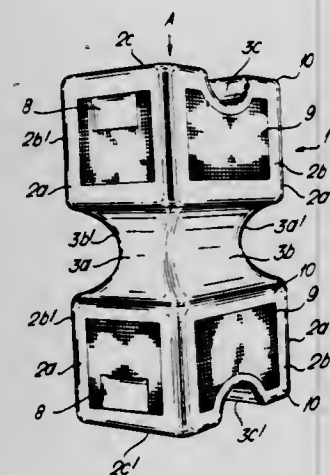
Peter K. Richards, Ballinacash, Rathdrum, County Wicklow, and Harry J. Hamilton, Amalurra, Newtownmountkennedy, County Wicklow, both of Ireland

Filed Oct. 29, 1981, Ser. No. 316,517

Claims priority, application Ireland, Oct. 31, 1980, 2267/80; Dec. 4, 1980, 2537/80

Int. Cl.<sup>3</sup> A63K 3/00

U.S. Cl. 119—29



1. A device for use in supporting one end of an equestrian fence pole, or for the like purposes, the device comprising a block which is rectangular in cross section and thereby has three mutually perpendicular pairs of opposed faces, at least one of the faces of each said pairs having a groove extending across the face, the groove being for receiving and supporting one end of the pole when the block is placed on the ground or on top of another such block, the three pairs of opposed faces being so dimensioned that the block can be used to support the pole at any one of three different heights selected by orienting the block with a face of a selected one of the pairs of faces facing upward.

4,414,921

# **TRAINING AID BELL FOR PETS**

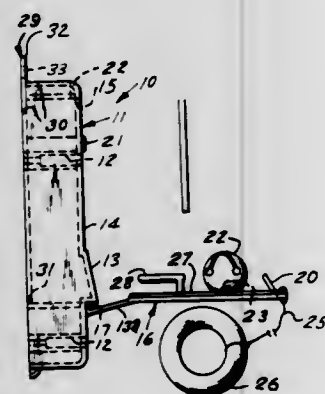
Joseph A. Cozzi, 212 Washington Ave., Little Ferry, N.J. 07643

Filed Nov. 25, 1981, Ser. No. 325,003

Int. Cl.<sup>3</sup> A01K 15/00

U.S. Cl. 119—29

17 Claims



1. A training aid for use in connection with training a pet and subsequently enabling the pet to communicate a particular desired activity to a person, the training aid comprising: a stationary housing; a sounding device on the housing; an actuator mounted on the housing for movement relative to the housing and coupled to the sounding device for

sounding of the sounding device in response to movement of the actuator relative to the housing by either one of the pet and the person; and a display member located on the housing in stationary relationship therewith and including a display area placed in view of the person for identifying and displaying the particular activity signified by the sounding of the sounding device.

4,414,922

# **BIRD FEEDER**

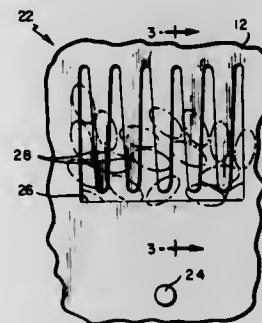
Donald B. Hyde, Jr., Stow, Mass., assignor to Hyde's Incorporated, Waltham, Mass.

Filed May 10, 1982, Ser. No. 376,526

Int. Cl.<sup>3</sup> A01K 39/01

U.S. Cl. 119—51 R

8 Claims



1. A bird feeder having a seed storage compartment at least partially defined by a side wall, and an improved feeding port through which birds may extract seeds from said compartment, said port comprising an opening in said side wall, resilient finger means coextensive with said side wall and extending across said opening to partially occlude the same, said finger means being arranged to prevent a free flowing escape of seeds from said compartment through said opening and being flexible to accommodate forcible extraction of seeds from said compartment through said opening.

4,414,923

# **HEAT RECOVERY BOILER FOR HIGH PRESSURE GAS**

Denis G. Csathy, and Robert J. Krowech, both of Minneapolis, Minn., assignors to Deltak Corporation, Minneapolis, Minn.

Filed Mar. 1, 1982, Ser. No. 353,129

Int. Cl.<sup>3</sup> F22D 1/00

U.S. Cl. 122—7 R

4 Claims

1. A boiler for generating steam by the recovery of heat from a hot gas stream comprising, in combination

- (1) a closed vertical pressure vessel;
- (2) a baffle extending across the pressure vessel to divide its interior into an upper compartment and a lower compartment, the baffle having a central opening therein;
- (3) an inlet for a hot gas stream communicating with the upper compartment and an outlet for the gas stream leading from the lower compartment;
- (4) an upper header arranged in the upper compartment;
- (5) a bundle of vertical water tubes supported from the upper header and extending through the opening in the baffle to have lower ends positioned in the lower compartment of the pressure vessel;
- (6) a lower header supported from the lower ends of the water tubes;
- (7) means for supplying water to the lower header and into the water tubes;
- (8) shroud means surrounding the perimeter of the bundle of water tubes in the lower compartment extending from the baffle towards the lower ends of the water tubes and adapted to direct the flow of hot gas downwardly through the lower compartment and longitudinally along the water tubes; and wherein hot gas entering the upper compartment of the boiler is directed into the lower compartment by the baffle

and directed downwardly parallel with the water tubes by the shroud means and steam generated by heat transfer



from the hot gas to water flowing upwardly through the water tubes is withdrawn from the upper header.

4,414,924

# **AIR JET UNIT**

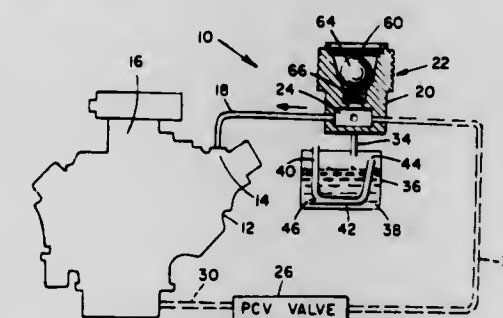
Hugh H. Harren, 1051 Site Dr. #81, Brea, Calif. 92621

Filed Jun. 22, 1981, Ser. No. 276,229

Int. Cl.<sup>3</sup> F02M 25/02

U.S. Cl. 123—25 E

9 Claims



1. For a supplemental air and water injection system for internal combustion engines: an air-water mixing chamber having water and air inlets and a water and air mixture outlet; water conducting means for conducting water to said water inlet of the mixing chamber; and a supplemental air flow valve in the form of a spring biased, normally open valve in which flow volume diminishes gradually as the valve is closed in response to increasing downstream negative pressure; the air inlet, the water inlet, and the water and air mixture outlet of said mixing chamber being arranged at angles to one another such that water appearing at said water inlet is aspirated from said water inlet at low negative outlet pressure by air flow from said air inlet and is sucked from said water inlet by negative pressure at said outlet when the negative pressure at said outlet is high.

# **ENGINE COOLING FAN WITH SHEARABLE DRIVE TO ELIMINATE FAN OVERSPEED**

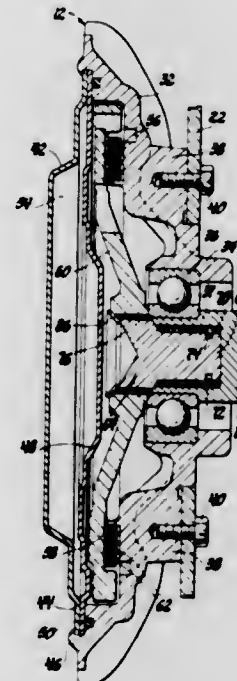
Robert C. Mellin, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1982, Ser. No. 370,417

Int. Cl.<sup>3</sup> F01P 5/14

U.S. Cl. 123—41.12

4 Claims



1. A rotatable fan and clutch assembly for cooling an internal combustion engine having a rotatable output for powering said fan, a clutch having rotatable clutch input means and rotatable output means driven by said clutch input means, a bladed fan operatively connected to said clutch output means, and a frangible metallic drive plug means drivingly connecting said output of said engine to said clutch input means to break on attainment of a predetermined fan speed to terminate the rotational input into said clutch input means and thereby the drive of said fan for limiting the centrifugal forces developed by said fan while effecting the cooling of said engine.

4,414,926

# **ENGINE PRESSURE-VACUUM COOLING SYSTEM WITH A HORIZONTAL COOLANT STORAGE TANK**

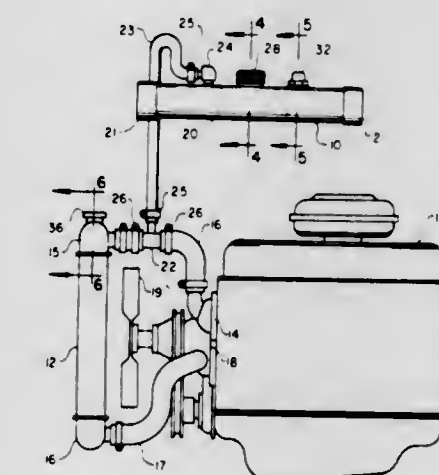
Robert C. Webber, 908 Holoma Dr., Indian River Shores, Fla. 32960

Filed Sep. 23, 1981, Ser. No. 304,832

Int. Cl.<sup>3</sup> F01P 11/18

U.S. Cl. 123—41.15

3 Claims



1. A pressure-vacuum cooling system for an internal combustion engine equipped with a radiator, wherein the cooling system may have on occasion a pressure less than atmospheric



pressure, said invention comprising a connector for liquid interposed between the engine and the radiator, through which connector liquid coolant flows when the engine is operating, conduit means attached to said connector and to an elongate storage tank for coolant, the long axis of which tank is horizontally disposed, said conduit means forming a path for liquid coolant to flow on occasion between said radiator and engine on the one hand, and said storage tank on the other hand, a removable cap which, when removed, enables additional liquid, when needed, to be added to said cooling system, said cap having therein a one-way valve set to open in the pressure range of between 10 and 20 pounds per square inch when the engine is operating and the coolant has been heated thereby, said cap, when in place, effectively preventing the admission of any atmospheric air to the cooling system after the engine has thereafter ceased operation and the liquid coolant has cooled, and means for warning when the internal pressure of the system has reached a certain established point less than atmospheric pressure.

4,414,927

## TWO STROKE OSCILLATING PISTON ENGINE

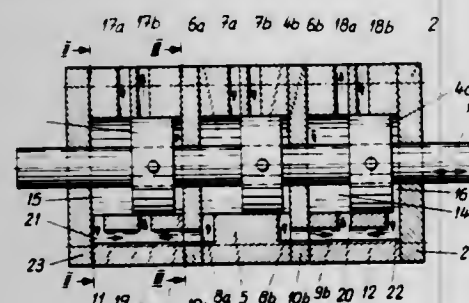
Istvan Simon, Ottergutstrasse 37, CH-8200 Schaffhausen, Switzerland

Filed Apr. 16, 1982, Ser. No. 368,985

Int. Cl.<sup>3</sup> F02B 33/06, 1/08, 75/28

U.S. Cl. 123—62

4 Claims



1. A two stroke oscillating piston engine with at least one reciprocating piston barrel and a corresponding number of hollow cylinders designed for two stroke operation and provided with fresh gas intake ports, fresh gas communication ducts and exhaust gas outlet ports, with this hollow cylinder composed of parallel sections bolted together and with the piston barrel actively connected with a crank gear so that the radial component forces on the piston barrel are kept as low as possible, characterized in that the piston barrel has a cylindrical shaft on which are fitted three cylinder-shaped rings acting as pistons, that the hollow cylinder surrounding the piston barrel has in its longitudinal center a cylinder section that is symmetrical with regard to this center and whose axial bore is divided by the middle ring of the piston barrel into two fresh gas feed chambers, with this cylinder section displaying, symmetrically to its longitudinal center, two fresh gas intake ports arranged side by side, and with the feed chambers connected at their outer ends each by one radial groove with the corresponding fresh gas communication duct, that on both front faces of the middle cylinder section is provided the same partition with the passing section of the pertaining fresh gas communication duct, that then and on these two partitions are assembled two reciprocally symmetrical working cylinder sections whose axial bores are divided by the two outer rings of the piston barrel into one inner combustion chamber and one outer fresh air feed chamber, that in the longitudinal center, at least, of these working cylinder sections are arranged two radial ports side by side, with the inner ports designed as exhaust gas outlet ports and the outer ports as fresh air intake ports, and that, diametrically opposed to the exhaust gas outlet ports, one radial communication port each leads to the pertaining fresh gas communication duct and at the outer ends of the fresh gas feed chambers, one radial fresh air groove each leads to the corresponding fresh gas communication duct.

4,414,928  
PORT SCAVENGING TYPE TWO-CYCLE INTERNAL COMBUSTION ENGINE

Hiroyasu Nakada, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Itawa and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

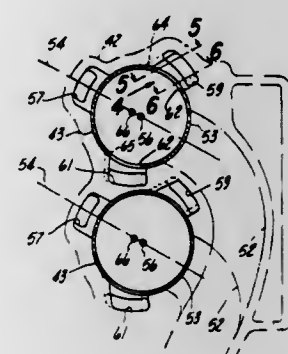
Filed Jan. 4, 1982, Ser. No. 336,718

Claims priority, application Japan, Jan. 22, 1981, 56-8880

Int. Cl.<sup>3</sup> F02B 33/04

U.S. Cl. 123—73 PP

13 Claims



1. In a porting system for a two-cycle engine having a cylinder, exhaust port means opening through a wall of said cylinder and being intersected by a plane passing through the axis of said cylinder, and a plurality of scavenging passages having scavenging ports in said cylinder on opposite sides of said plane, the improvement comprising the centers of said scavenging ports lying in a plane perpendicular to the first mentioned plane and offset from said cylinder axis on the side opposite said exhaust port means, said scavenging passages having an arcuate shape in cross-sections taken perpendicular to the cylinder axis and defined by inner and outer surfaces spaced substantially equally from each other, the centers of said arcuate configuration being offset from the cylinder axis on the side opposite the exhaust port means so that the side of said scavenging passages closer to the exhaust port means lies closer to the cylinder.

4,414,929

## LUBRICATION SYSTEM FOR TWO-CYCLE INTERNAL COMBUSTION ENGINES

Yoshihiro Sakurai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

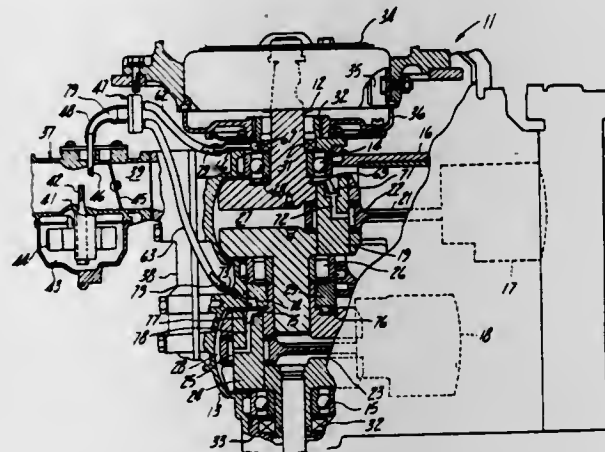
Filed Jun. 21, 1982, Ser. No. 390,376

Claims priority, application Japan, Jul. 1, 1981, 56-103720

Int. Cl.<sup>3</sup> F02B 33/04

U.S. Cl. 123—73 R

8 Claims



1. In a lubricating system for a two-cycle engine of the type in which fuel and lubricant are mixed and delivered to the engine from a charge forming device including an induction passage through which a fuel lubricant mixture is delivered

through an induction passage outlet to a chamber of the engine, the improvement comprising lubricant passage means communicating with at least a portion of said engine to be lubricated and means for delivering a fuel lubricant mixture to said lubricating passage means independently of said induction passage outlet.

4,414,930

## KINETIC ENGINE CONTROL

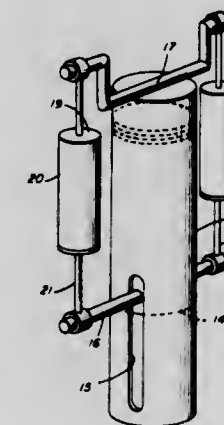
Douglas W. Hume, Crane Neck St., W. Newbury, Mass. 01985

Filed Oct. 2, 1981, Ser. No. 307,721

Int. Cl.<sup>3</sup> F02B 75/04

U.S. Cl. 123—78 E

4 Claims



1. Apparatus for transferring power in an internal combustion engine having at least one cylinder, each said cylinder having a head and a piston reciprocable on an axis on one side of said head in said cylinder toward and away from said head, a crankshaft mounted adjacent and external to said head located on a side of said head opposite that of said one side, said cylinder having diametrically oppositely disposed longitudinal slots formed in the walls thereof, a cross-shaft fixed to said piston and extending outwardly through said slots and links of variable length connecting said cross-shaft to said crankshaft, each said link of variable length being extensible to a relatively great extent during the intake and power strokes of said engine and compressible to a relatively short extent during the compression stroke of said engine.

4,414,931

## VARIABLE VALVE OPERATING MECHANISM FOR INTERNAL COMBUSTION ENGINES

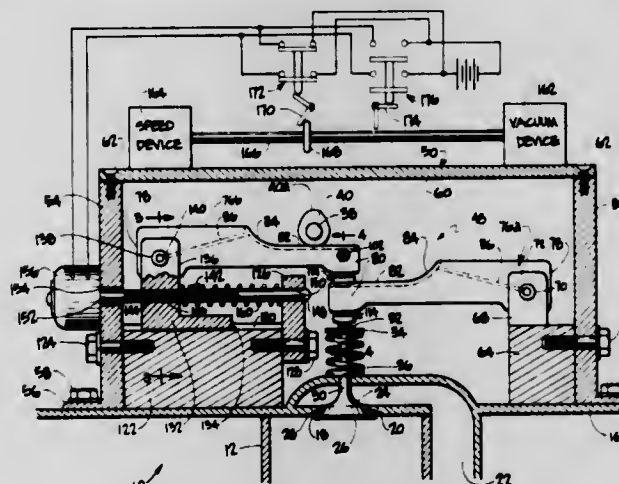
Corliss O. Burandt, Plymouth, Minn., assignor to Investment Rarities, Incorporated, Minneapolis, Minn.

Filed Oct. 13, 1981, Ser. No. 310,655

Int. Cl.<sup>3</sup> F01L 1/18

U.S. Cl. 123—90.16

25 Claims



13. A mechanism for operating a valve of an internal combustion engine having a camshaft, a cam on said shaft, and a reciprocable valve member for opening and closing a valve

port in communication with a combustion chamber of the engine, the mechanism comprising a first rocker arm, means mounting a portion near one end of said first rocker arm for pivotal movement about a first axis so that a certain portion nearer the other end of said rocker arm is engageable with said valve member, a second rocker arm, means mounting a portion near one end of said second rocker arm for pivotal movement about a second axis, means relatively moving said rocker arms in a direction toward and away from each other to vary the spacing between said axes so that the other end of said second rocker arm is engageable with various longitudinal portions of said first rocker arm between its said other end and its said one end, said cam being engageable with various longitudinal portions of said second rocker arm between its said other end and its said one end, the particular longitudinal portion being engaged by said cam depending on the spacing between said axes as determined by said moving means.

4,414,932

## METHOD AND APPARATUS FOR HEAT STORAGE IN INTERNAL COMBUSTION ENGINES

John E. Lindberg, Point Richmond, Calif., assignor to Owen, Wickersham & Erickson, San Francisco, Calif.

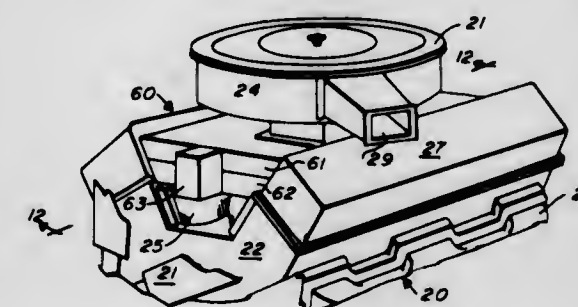
Continuation-in-part of Ser. No. 190,932, Sep. 25, 1980, Pat. No. 4,393,817, and a continuation-in-part of Ser. No. 190,933, Sep. 25, 1980, abandoned, said Ser. No. 190,932, is a division of Ser. No. 657,747, Feb. 13, 1976, abandoned, said Ser. No. 190,933, is a continuation of Ser. No. 657,747, Feb. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,867, Sep. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 356,589, May 3, 1973, abandoned, which is a

continuation-in-part of Ser. No. 227,440, Feb. 18, 1972, abandoned. This application Oct. 28, 1981, Ser. No. 315,943

Int. Cl.<sup>3</sup> F02M 31/00

U.S. Cl. 123—142.5 R

40 Claims



4. Apparatus for improving combustion and ignition upon cold start of an internal-combustion engine, comprising: change-of-state heat storage means disposed in heat-exchange relationship with the engine for absorbing engine heat from engine operation and hot soak following engine operation, and for maintaining increased engine temperature by gradually releasing stored heat back to the engine when the engine is at rest.

4,414,933

## COMPRESSION RELEASE MECHANISM USING A BIMETALLIC DISC

Gary P. Pribnow, Shorewood, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jun. 15, 1981, Ser. No. 273,474

Int. Cl.<sup>3</sup> F02N 17/00

U.S. Cl. 123—182

5 Claims

1. An automatic compression relief valve means for facilitating starting of an internal combustion engine of the type having a combustion chamber associated with a cylinder within a cylinder head and a piston having a compression stroke within said cylinder, comprising:

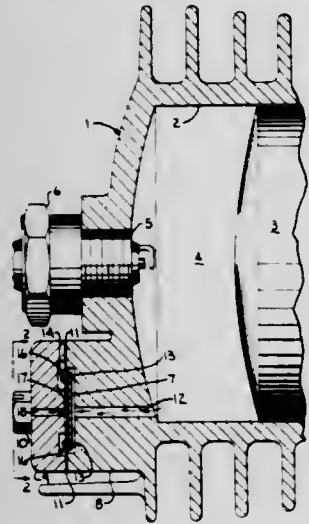
a housing member having a circular recess formed in its outer surface, said housing member including a centrally



located inlet vent hole communicating between said recess and said combustion chamber;

a cover member having a cavity formed in its outer surface, said cover member including a centrally located outlet hole communicating between said cavity and the outer atmosphere, said cover member removably secured to said housing member for enclosing said recess so that said cavity and recess provide a disc-receiving chamber;

said housing member further including a plurality of lands located at the bottom of said recess, said lands define a plurality of equiangularly spaced apart channels that extend radially from said inlet hole to a point beyond the



circumference of said recess for providing fluid communication between said inlet hole and said cavity, said inlet hole, channels, cavity and outlet hole defining a compression release passageway,

a thin, flexible disc member disposed in said chamber, said disc member normally relaxed in an open position supported by said lands so that compression in said combustion chamber is relieved through said passageway during engine starting and automatically flexible to a closed position overlying said outlet hole in response to an increase in the temperature in said combustion chamber to block off said passageway during engine running.

4,414,934

#### RECIPROCATING PISTON-TYPE INTERNAL COMBUSTION ENGINE WITH IMPROVED BALANCING SYSTEM

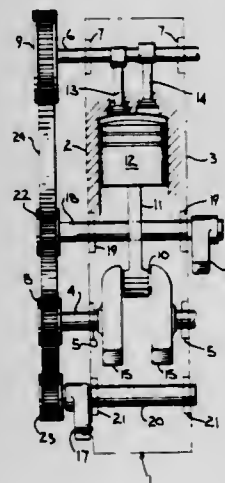
Norbert M. Vogl, Milwaukee; Ronald R. Gaulke, Waukesha, and Joseph R. Harkness, Germantown, all of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 30, 1981, Ser. No. 248,908

Int. Cl.<sup>3</sup> F02B 75/06

U.S. Cl. 123—192 B

5 Claims



1. An engine of the reciprocating piston type in which a

crankshaft that is journaled in opposite end walls of an engine block has crankpin means by which it is linked with the piston means of the engine and conventional counterweight means fixed to the crankshaft diametrically opposite its crankpin means, said engine being characterized by:

A. first and second auxiliary shafts extending through the engine block and rotatably journaled in the opposite end walls thereof, each of said auxiliary shafts includes an end portion extending exteriorly of the engine block from one of said end walls, said auxiliary shafts define rotational axes that are fixed with respect to and parallel with the crankshaft axis on diametrically opposite sides thereof in a common plane with the crankshaft axis at equal distances therefrom which is greater than the radius of the circumferential path of the conventional counterweight means;

B. first and second auxiliary counterweights in addition to said conventional counterweight means mounted on respective end portions of said auxiliary shafts exteriorly of the engine block adjacent said one end wall; and

C. means for imparting rotation to said auxiliary counterweights in the direction opposite to that of the crankshaft but at the same speed, comprising:

(1) a toothed pulley coaxially fixed with respect to the auxiliary counterweight on each of said auxiliary shafts exteriorly of said engine block,

(2) a toothed pulley coaxially fixed with respect to the crankshaft exteriorly of said engine block, said toothed pulleys being of the same diameter, and

(3) an endless flexible motion transmitting element having opposite faces, each of which is drivingly engageable with the circumference of a toothed pulley, said flexible motion transmitting element being trained over all of said toothed pulleys with one face thereof engaging the toothed circumference of the pulley that is fixed with respect to the crankshaft and the opposite face thereof engaging the toothed circumference of the other of said pulleys, so that when the engine is running, said auxiliary counterweights rotate at crankshaft speed but in the opposite direction from that of the crankshaft, and said endless flexible motion transmitting element holding said auxiliary counterweights in such angular relationship to the conventional counterweight means that the inertial forces produced by rotation of the conventional counterweight means and of said auxiliary counterweights combine to substantially balance the inertial forces resulting from reciprocation of the piston means when the latter approaches either terminus of its stroke, whereas at substantially the point the piston means passes in either direction through the midpoint in its stroke, the inertial forces resulting from rotation of said auxiliary counterweights oppose the inertial forces resulting from rotation of said conventional counterweight means, and the summation of the moments produced by the conventional counterweight means and the additional counterweight means is zero and the summation of the centrifugal forces of all counterweights acts essentially along the path of the center of gravity of the piston means.

4,414,935

#### CYLINDER DEACTIVATION DEVICE WITH SLOTTED SLEEVE MECHANISM

Nikolaus A. Curtis, 3182 Iron Dr., and Carroll M. Renshaw, 2160 S. 27th Ave., both of Yuma, Ariz. 85364

Filed Feb. 9, 1981, Ser. No. 232,878

Int. Cl.<sup>3</sup> F02D 13/06

U.S. Cl. 123—198 F

14 Claims

1. A cylinder deactivation device for installation on an internal combustion engine, said cylinder deactivation device comprising in combination:

a. rocker arm means for effecting opening a valve of said engine, said rocker arm means having a first end portion,

a second end portion, and a mid portion disposed between said first end portion and said second end portion;

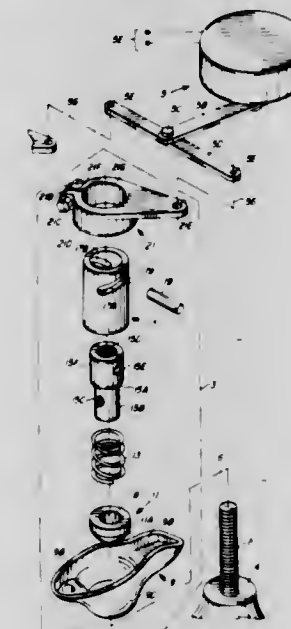
b. support means connected in fixed relationship with a head of said engine for supporting said cylinder deactivation device;

c. stand means for engaging said support means in an adjustable fixed relation thereto;

d. movable fulcrum means for selectively either,

i. assuming a first fixed relationship to said stand means to engage said mid portion and cause said rocker arm means to pivot about said mid-portion during operation of said engine, thereby causing a valve of said engine to open and close during operation of said engine, or

ii. yielding to movement of said mid portion to cause said rocker arm means to pivot about said second end portion during engine operation, said first end portion moving in response to a cam during engine operation, said second end portion engaging said valve, said valve



remaining closed during said pivoting about said second end portion, said movable fulcrum means including a movable sleeve disposed about said stand means;

e. selective engagement means disposed within said movable sleeve for selectively either

i. engaging both said movable sleeve and said stand means to cause said movable sleeve to assume said first fixed relationship to said fixed means, or

ii. releasing said movable sleeve from said first fixed relationship to allow said movable sleeve to yield to said movement of said mid portion; and

f. compression means for continuously exerting substantial opposed forces on said stand means and said movable fulcrum means to urge said movable fulcrum means against said mid portion,

wherein said movable fulcrum means includes a slot and said stand means includes a hole, a pin extending into both said hole and said slot to keep said slot aligned with said hole.

4,414,936

#### CHECK VALVE CYLINDER DEACTIVATION

Craig W. Huff, 12307 Swinbrook, Houston, Tex. 77039

Filed Feb. 4, 1982, Ser. No. 345,779

Int. Cl.<sup>3</sup> F02D 13/06

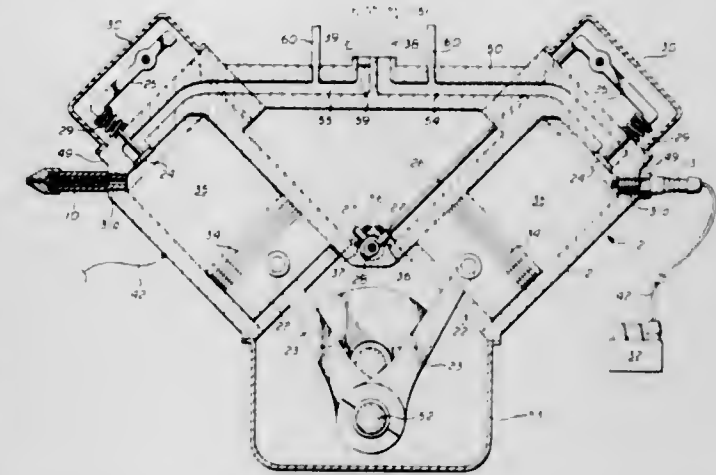
U.S. Cl. 123—198 F

5 Claims

1. In a multi-cylinder internal combustion engine, in which each cylinder has a piston, a spark plug, valves and valve actuating means, the improvement comprising:

a check valve replacing the spark plug in alternate cylinders in the firing order of the engine, each check valve having

engaging threads on one end to match the existing threads in the cylinder wall after removal of the spark plug;



and the valve actuating means in the said alternate cylinders being disconnected.

4,414,937

#### AUTOMATIC ENGINE STOP AND START APPARATUS

Masahiro Ueda, and Masahiko Noba, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

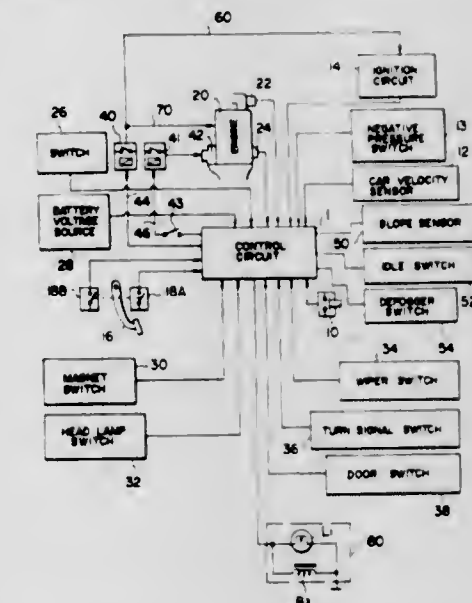
Filed Mar. 23, 1982, Ser. No. 360,975

Claims priority, application Japan, Aug. 25, 1981, 56-133079

Int. Cl.<sup>3</sup> F02B 77/08

U.S. Cl. 123—198 D

24 Claims



1. An automatic engine stop and start apparatus comprising: detection means for detecting operational conditions of a car; means for setting and resetting an automatic engine stop and start function; means for detecting necessity for braking the car; alarm means responsive to a control signal for issuing an alarm; a control circuit responsive to the output signals from said detection means and said setting and resetting means for producing a control signal to automatically stop or start an engine under a predetermined condition; and said control circuit producing said control signal to cause said alarm means to issue the alarm when the car starts to move and a car velocity exceeds a predetermined speed and a booster pressure of a brake falls below a predetermined level while the engine has been automatically stopped after the automatic engine stop or start function was set and the car is to be braked.



4,414,938

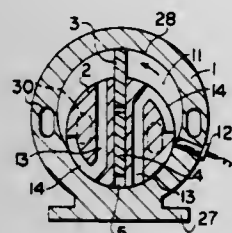
## ROTARY INTERNAL COMBUSTION ENGINE

Soei Umeda, 10-14, 3-chome, Mitsuyaminami, Yodogawa-ku, Osaka-shi, Japan

Continuation-in-part of Ser. No. 37,333, May 9, 1979, abandoned. This application Feb. 19, 1981, Ser. No. 236,289

Claims priority, application Japan, Aug. 25, 1978, 53-104302 Int. Cl.<sup>3</sup> F02B 53/00

U.S. Cl. 123-229



1. A rotary type internal combustion engine comprising: a cylindrical rotor having a diametrical vane groove parallel with the longitudinal axis of said rotor; a vane movably mounted in said vane groove and constituted by two vane parts opposed to each other at the center of the vane in the radial direction thereof; a housing having an internal chamber in which said rotor is rotatably mounted, said chamber having a lower inner wall part with a cross-sectional shape of part of a circle and with which said rotor is coaxially rotatable in close contact therewith, and an upper inner wall part with a cross-sectional shape of part of an approximately elliptical shape and the center of which is offset from the center of the circular cross-sectional shape in a direction away from said lower inner wall part, said approximately elliptical shape having a constant diameter through the center of said circular cross-sectional shape, said vane having a diametrical dimension equal to said constant diameter and said upper inner wall part being at least the part of the entire inner wall which is on the side of the center of the circular cross-sectional shape in the direction of offset of the center of the elliptical shape, the radially outer ends of said vane parts engaging the inner wall of said upper inner wall part in substantially gas tight relation during rotation of said rotor;

said housing further having vane guide chambers at opposite ends of said internal chamber and having said approximately elliptical cross-sectional shape coaxial with the upper inner wall part of said housing; and said vane having vane guide portions on the opposite axial ends thereof engaging the inner walls of said vane guide chambers during rotation of said rotor;

an annular wall extending into the elliptical portion substantially midway of the axial length of said chamber, and said vane having a recess therein into which said central annular wall projects and engaging said vane for guiding said vane; and

means for intermittently permitting aspiration of a combustible gas into the part of the internal chamber within said upper inner wall part, for igniting and burning the gas for driving said vane and rotor, and exhausting the burned gas.

4,414,939

## METHOD OF AND APPARATUS FOR PREPARING A FUEL MIXTURE FOR AN INTERNAL COMBUSTION ENGINE

Stanislav Jahoda, Praha, Czechoslovakia, assignor to Ustav Pro Vyzkum Motorovych Vozidel, Prague, Switzerland

Filed Dec. 28, 1979, Ser. No. 108,332

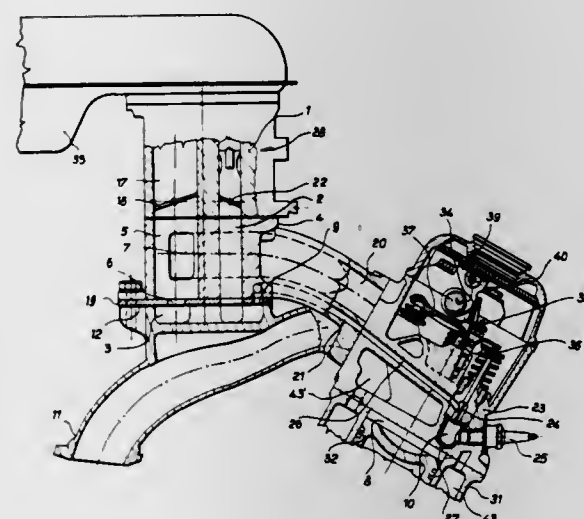
Claims priority, application Czechoslovakia, Dec. 29, 1978, 9148-78

3 Claims

Int. Cl.<sup>3</sup> F02M 11/00

U.S. Cl. 123-274

3 Claims



1. In an internal combustion engine having a major combustion chamber, and a minor combustion chamber, the improvement which comprises means for dividing a prepared rich fuel mixture into two flows, means for supplying one of said flows into the minor combustion chamber, means for mixing the other flow with air to form a depleted, lean fuel mixture, and means for supplying the thus depleted fuel mixture into the major combustion chamber, the means for dividing a prepared rich fuel mixture into two flows being a distribution chamber, the means supplying one of said flows into the minor combustion chamber being a minor suction tube, the means for mixing the other flow with air to form a depleted, lean mixture being a mixing chamber, the means to supply the depleted lean fuel mixture into the major combustion chamber being a major suction tube, and comprising means providing an air supply passage connected to the mixing chamber, the mixing chamber being connected to the major combustion chamber by the major suction tube, between the mixer and the mixing chamber there being provided the distribution chamber communicating with the mixer, the mixing chamber and the minor combustion chamber, the mixer communicating with the distribution chamber via a duct provided in the suction piping for the engine, there also being provided in said suction piping the mixing chamber which latter communicates, via at least one first aperture, with at least one major suction tube, as well as a recess communicating with a distribution chamber and, via at least one second aperture, with at least one minor suction tube.

4,414,940

## CONDITIONED COMPRESSION IGNITION SYSTEM FOR STRATIFIED CHARGE ENGINES

Robert W. Loyd, Rte. 4, Fond du Lac, Wis. 54935

Filed Apr. 13, 1981, Ser. No. 253,581

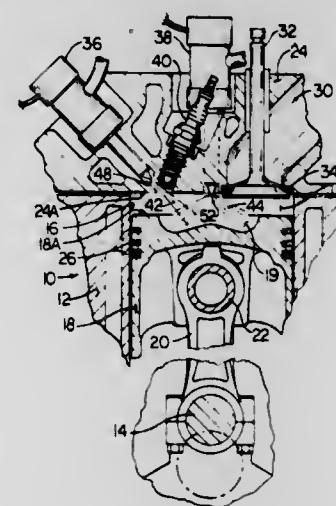
Int. Cl.<sup>3</sup> F02B 3/00

U.S. Cl. 123-299

22 Claims

1. A combustion process for use in a reciprocating internal combustion engine having at least one cylinder and a piston reciprocally movable in said cylinder to define a variable volume combustion chamber, said process comprising the steps of supplying air to the combustion chamber, said air being admitted to the combustion chamber through an intake passage which is substantially unthrottled thereby providing a minimum restriction on the intake of incoming air, said air entering

the combustion chamber in a flow path independent of any special air flow pattern or swirl pattern requirement to accommodate ignition of the fuel, compressing the air in the chamber, introducing a pilot fuel charge from a first fuel nozzle into the combustion chamber after the air therein has been partially compressed, igniting the pilot fuel charge substantially immediately upon its issuing into the combustion chamber to cause a pilot fuel burn, the energy derived from said pilot fuel burn serving to increase the temperature and pressure of the gas in the combustion chamber, and subsequent to said pilot fuel burn introducing a main fuel charge from a second fuel nozzle into said combustion chamber whereby auto ignition of said main fuel occurs, said main fuel injected into the combustion chamber by said second nozzle being in a spray pattern shaped to fit the combustion chamber for best burning efficiency rather than being in a spray pattern which provides contact with a flame front established by the ignition of the pilot fuel, the engine power output being controlled by varying the quantity of main fuel charge injected by said second nozzle, whereby the air-fuel ratio will vary with load changes but will always be substantially in the lean mixture range, said internal combustion engine with which said process is used having a compression ratio which is in a range characteristic of the compression ratio range of a carbureted engine, whereby the internal combustion engine with which said process is used may have a structural strength design characteristic of that of a carbureted engine rather than the heavy structure of a compression ignition engine.



15. A stratified charge reciprocating internal combustion engine comprising a crankcase having at least one cylinder and supporting a cylinder head which houses an air inlet valve and an exhaust valve for said cylinder, air being admitted to said combustion chamber through an air inlet passage which is substantially unthrottled, thereby providing a minimum of restriction on the charge of incoming air, said air inlet passage being openable and closable by said air inlet valve, said air entering the combustion chamber in a flow path independent of any special air flow pattern or swirl pattern requirement to accommodate ignition of the fuel, a piston reciprocally movable in said cylinder to define a variable volume combustion chamber, a pilot fuel injection nozzle mounted in said cylinder head and positioned to discharge a pilot fuel charge into said combustion chamber, ignition means mounted in said cylinder head and positioned adjacent said pilot fuel injection nozzle, a main fuel injection nozzle mounted in said cylinder head and positioned to discharge a main fuel charge into said combustion chamber, means for causing said pilot fuel injection nozzle to discharge a pilot fuel charge into said combustion chamber and for causing said ignition means to ignite said pilot fuel charge as it is discharged into said combustion chamber to thereby cause a pilot fuel burn, the energy derived from said pilot fuel burn serving to increase the temperature and pressure of the gas in the combustion chamber, and means for causing said main fuel injection nozzle to discharge a main fuel charge into said combustion chamber on the compression stroke of said piston subsequent to said pilot fuel burn whereby auto

ignition of said main fuel occurs, said main fuel injected into the combustion chamber by said main fuel nozzle being in a spray pattern shaped to fit the combustion chamber for best burning efficiency rather than being in a spray pattern which provides contact with a flame front established by the ignition of the pilot fuel, means for controlling the engine power output by varying the quantity of main fuel charge injected by said main fuel injection nozzle, whereby the air-fuel ratio will vary with load changes but will always be substantially in the lean mixture range, said internal combustion engine having a compression ratio which is in a range characteristic of the compression ratio of a carbureted engine, whereby the internal combustion engine has a structural strength design characteristic of that of a carbureted engine rather than the heavy structure of a compression ignition engine.

4,414,941

## METHOD AND APPARATUS FOR FUEL INJECTION IN ELECTRONIC FUEL INJECTION CONTROLLED ENGINES

Tatsuaki Nakanishi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

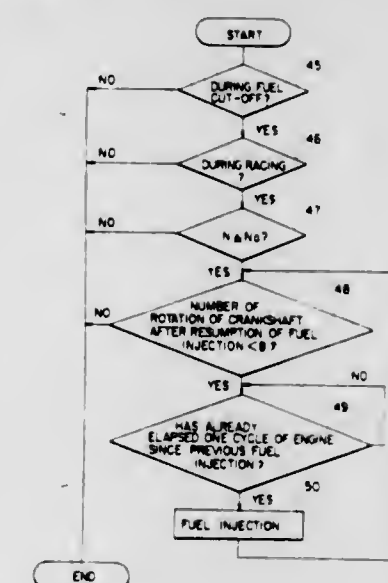
Filed Nov. 30, 1981, Ser. No. 326,075

Claims priority, application Japan, Aug. 7, 1981, 56-123099

Int. Cl.<sup>3</sup> F02D 31/00

U.S. Cl. 123-326

10 Claims



1. A fuel injection method for an electronic fuel injection controlled engine for controlling an amount of fuel injected from a fuel injection valve in an intake system by operating the fuel injection valve according to electric signals, said method comprising:

detecting a fuel cut-off period; detecting the rate of reduction of the rotational speed of the engine during the fuel cut-off period; discrimination between racing and idling conditions of the engine; resuming the injection of fuel; increasing, for a predetermined period of time, the fuel injection amount after the resumption of fuel injection after a fuel cut-off period caused by the racing condition more than for a fuel cut-off period caused by an idling condition even at the same rotational speed of the engine after the resumption of the fuel injection; and providing a period of at least one cycle of the engine between the plurality of injection times of the increased fuel injection amounts after the resumption of fuel injection.



4,414,942

# IDLING SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Hiroshi Itoh, Nagoya, and Haruo Watanabe, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

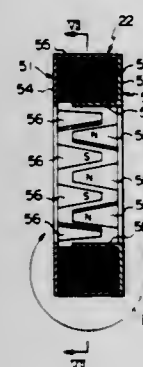
Filed Jun. 9, 1981, Ser. No. 271,931

Claims priority, application Japan, Sep. 16, 1980, 55-130226[U]

Int. Cl.<sup>3</sup> F02D 1/00

U.S. Cl. 123—339

3 Claims



1. An idling speed control device of an internal combustion engine having an intake passage and a throttle valve arranged in the intake passage, said device comprising:

a surge tank having an outer wall and arranged in the intake passage located downstream of the throttle valve;

a bypass passage interconnecting the intake passage located upstream of the throttle valve to said surge tank;

valve means arranged in said bypass passage and having a valve housing which has a flange directly fixed onto the outer wall of said surge tank, said valve means having a control valve which controls a flow area of said bypass passage;

a step motor connected to said control valve for controlling the amount of air flowing within said bypass passage in accordance with a change in the operating condition of the engine at the time of idling;

said step motor comprising a motor housing, a stator stationarily arranged in said motor housing, a rotor rotatably arranged in said motor housing and, a valve shaft axially movable in said motor housing and actuated by said rotor, said control valve being fixed onto said valve shaft;

said stator comprising first and second stator cores, each having a stator coil and a plurality of spaced pole pieces which are arranged along an outer circumferential wall of said rotor and are spaced from the outer circumferential wall of said rotor by a slight distance;

each of said stator cores comprising a first core member having an annular plate, and a second core member having an annular plate, said spaced pole pieces comprising a first pole piece group extending perpendicular to the annular plate of said first core member from an inner periphery of the annular plate of said first core member, and a second pole piece group extending perpendicular to the annular plate of said second core member from an inner periphery of the annular plate of said second core member, each of the pole pieces of said first pole piece group and each of the pole pieces of said second pole piece group being alternately arranged, and each of said pole pieces having a substantially triangular shape.

4,414,943

# METHOD OF AND APPARATUS FOR CONTROLLING THE AIR INTAKE OF AN INTERNAL COMBUSTION ENGINE

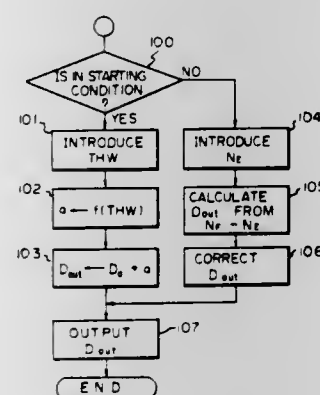
Massami Nagase, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 17, 1981, Ser. No. 303,107

Claims priority, application Japan, Sep. 24, 1980, 55-131454 Int. Cl.<sup>3</sup> F02D 9/02, 31/00

U.S. Cl. 123—339

10 Claims



1. A method of controlling the air intake of an internal combustion engine having an intake passage, a throttle valve disposed in the intake passage, and an air bypass passage which interconnects the intake passage at a position located upstream of the throttle valve with the intake passage at a position located downstream of the throttle valve, said method including the steps of:

detecting the actual rotational speed of the engine to produce a rotational speed signal which corresponds to the detected rotational speed;

by using the produced rotational speed signal, calculating the difference between the actual rotational speed of the engine and a desired idling rotational speed;

calculating a value of a control output signal from said calculated difference;

adjusting, in response to the control output signal, the sectional area of the air bypass passage to control the flow rate of air drawn through the air bypass passage so as to reduce the difference between the actual rotational speed and the desired rotational speed;

detecting whether the engine is in the starting condition or not, to produce a starting condition signal;

in response to the starting condition signal, when the engine is in the starting condition, calculating a modified value of the control output signal by adding an increment value to a base value which corresponds to an optimum control output signal value in the stable idling condition, said base value being a predetermined fixed value; and

when the engine is in the starting condition, adjusting, in response to the modified control output signal calculated during the starting condition, the sectional area of the air bypass passage to control the flow rate of air drawn through the air bypass passage.

4,414,944

# DEVICE FOR CONTINUOUS INJECTION OF A MIXTURE CONSISTING OF FUEL AND AIR INTO THE INTAKE LINE (OR MANIFOLD) OF AN INTERNAL COMBUSTION ENGINE

Klaus-Dieter Emmenhal; Otto Schäfer, both of Wolfsburg, and Rudolf-Helmut Strozzyk, Helmstedt, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

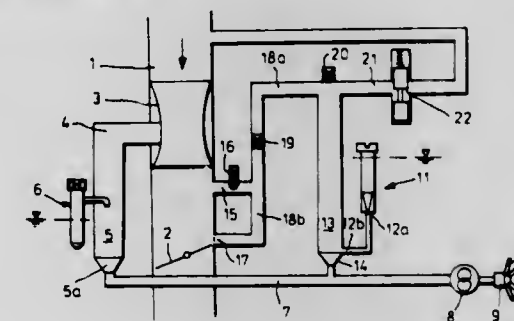
Continuation of Ser. No. 100,444, Dec. 5, 1979, abandoned. This application Jun. 3, 1982, Ser. No. 384,576

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2854988

Int. Cl.<sup>3</sup> F02D 33/00

U.S. Cl. 123—339

6 Claims



1. In an apparatus for continuously injecting a mixture of fuel and air into the cylinders of an internal combustion engine, said apparatus including an air intake pipe having an arbitrarily adjustable throttle flap arranged therein, a venturi in said intake pipe at a point upstream of said throttle flap, with an air channel branching off from the narrowest point of the venturi, a main fuel metering means for supplying fuel to the mixing chamber portion of said channel substantially as a function of the air pressure at said venturi, a suction line connected to receive the air and fuel from the mixing chamber in said channel, an idling fuel metering means for supplying fuel under constant pressure to said line during idling, and a fuel delivery pump connected to receive the air and fuel mixture in said line and to supply said mixture to the points of injection associated with the several cylinders of the engine; the improvement comprising a ventilation line associated with an exit orifice of the idling fuel metering means and communicating with a point of at least intermittent negative pressure on said intake pipe of the engine for drawing additional fuel from the idling fuel metering means, said point on said intake pipe comprising at least one port which is within the range of swing of said throttle flap and which, when the throttle flap is closed, is shut off from the portion of said intake pipe situated downstream from said throttle flap and which is acted upon by negative pressure, but wherein said port communicates with said lower portion of the intake pipe, which is acted upon by negative pressure, when the throttle flap is at least partly opened.

4,414,945

# DUAL-RANGE MECHANICAL GOVERNOR FOR FUEL INJECTION PUMPS

Jean-Claude Bonin, Blois, France, assignor to CAV RotoDiesel, Blois, France

Filed Jan. 25, 1978, Ser. No. 872,177

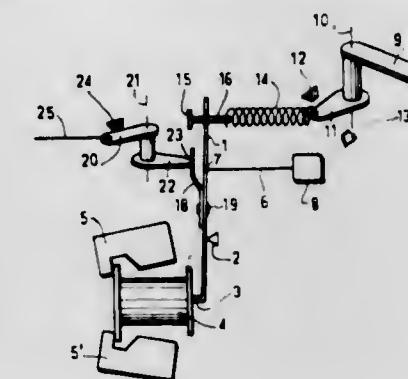
Claims priority, application France, Feb. 2, 1977, 77 02918 Int. Cl.<sup>3</sup> F02D 1/04

U.S. Cl. 123—368

5 Claims

1. A dual-range mechanical governor for the fuel injection pump of an internal combustion engine having a metering member for controlling the amount of fuel supplied by the pump to the engine, comprising engine speed responsive means, an engine speed responsive lever actuated by the engine speed responsive means and rigidly connected to the metering member to move the same and decrease said fuel amount in consequence of engine acceleration, a manually adjustable speed control lever movable between low speed and high speed positions, a high speed spring connected at opposite ends

between said speed responsive lever and said speed control lever, one of said connections being a lost motion connection, said high speed spring exerting a biasing force on said speed responsive lever to increase the amount of fuel supplied by the pump when said lost motion connection is operative, an idling speed spring having one end connected to said speed responsive lever and movable stop means independent of the control lever engaging the other end of said idling speed spring, said



idling speed spring exerting a biasing force on said speed responsive lever to increase the amount of fuel supplied by the pump when engaged by the stop means, said lost motion connection permitting movement of the speed responsive lever by the idling speed spring when engaged by the stop means without movement of the speed control lever but which is operative to move said speed responsive lever when said speed control lever is moved towards is high speed position.

4,414,946

# CONTROL SYSTEM FOR AN OPERATING EVENT IN A VEHICULAR POWER TRAIN

Rolf Däumer, Weil der Stadt; Winfried Klötzner, Maulbronn, and Manfred Schenk, Fellbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

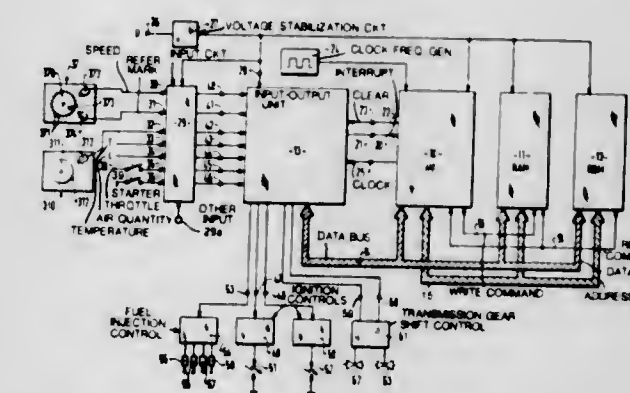
Filed Dec. 2, 1981, Ser. No. 326,507

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100825

Int. Cl.<sup>3</sup> G06F 15/20; G05B 15/02; F02D 5/02

U.S. Cl. 123—417

10 Claims



1. For combination with a vehicular power train, a control system to control an operating event within said power train and having a rotating shaft, said control system having a microprocessor unit (10); an input/output (I/O) unit (13); a data bus system (10) interconnecting the microprocessor unit and the input/output unit; a plurality of input sensor elements (37, 310, 372, 374, 313, T, L, 38, 39, 29a) providing sensing signals representative of operating parameters of the power train, connected to and providing said sensing signals to the input/output unit, one of said input sensor elements (370, 372) forming a crank-



shaft angle increment transducer (37) providing a train of crankshaft increment signals;

a plurality of output stages (49, 50, 54, 61) for carrying out operating commands connected to and controlled by the input/output unit;

a crankshaft angle increment counter (71) connected to receive said crankshaft angle increment signal train and counting the pulses of said pulse train at a rate determined by the frequency of said pulse train;

a first comparator (83) connected to the angle increment counter and to the data bus to receive a comparison signal from the data bus (14) and providing a first output signal when the count output from said angle increment counter (71) and from the data bus have a predetermined relationship;

said output signal being connected to at least one of the output stages to control operation thereof;

a second comparator (87) connected to the angle increment counter (71) and to the data bus (14) to receive a comparison signal from the data bus and providing a second output signal when the count output from the angle increment counter and from the data bus have a second predetermined relationship;

a second counter (100) having its output connected to the data bus (14) to provide output signals thereto for processing in the microprocessor unit (10) in accordance with a selected parameter or value, as determined by the signal applied to the second comparator (87) from the data bus, and comprising, in accordance with the invention,

a timing circuit (108) providing timing signals;

and transfer switch means (99) having its switching state controlled by data from the data bus (14) and transferring to the second counter (100), selectively, and in accordance with the switching state thereof,

(a) the output signals from said second comparator (87), or

(b) the timing signals from the timing circuit (108), to control the counting cycle of the second counter (100) selectively by

(a) the parameter-dependent pulse train derived from the second comparator (87), as counted by said angle increment counter (71), or

(b) the timing interval of the timing circuit (108), and wherein the angle increment counter (71), the second counter (100), said first and second comparators (85, 87) and the timing circuit (108) form part of the input/output unit, to permit the input/output unit to provide data to the data bus, and hence to the microprocessor, selectively, based on signals processed by a single shaft angle increment counter (71) or, selectively, based on time intervals determined by said timing circuit (108).

4,414,947

# FUEL INJECTION SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES, HAVING HIGH INJECTION PRESSURE

Hisaaki Nakamura, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,165

Claims priority, application Japan, Jul. 17, 1981, 56-111737

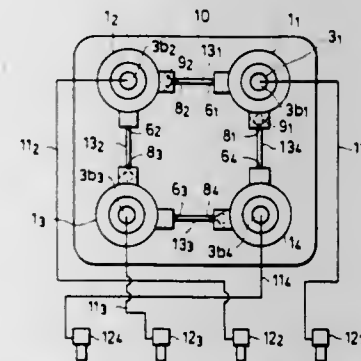
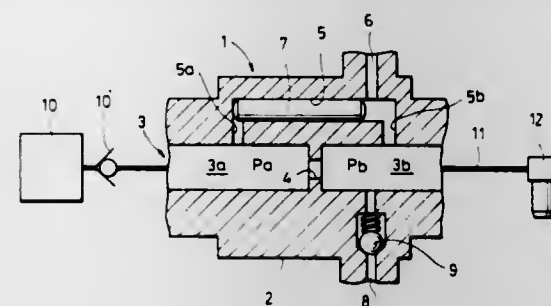
Int. Cl.<sup>3</sup> F02M 39/00

U.S. Cl. 123-446

2 Claims

1. A fuel injection system for an internal combustion engine having a plurality of cylinders, comprising: a fuel injection pump having delivery valves corresponding in number to the cylinders of the engine; injection nozzles disposed to inject fuel into the cylinders of the engine; injection pipes connected to said injection nozzles; a plurality of control means corresponding in number to the cylinders of the engine and each connected between each of said delivery valves and a corresponding one of said injection pipes, said control means being interconnected in an arrangement corresponding to a predetermined sequence of fuel injection through said delivery valves for allowing transfer of injecting fuel pressure present in each one of said control means to a next one thereof, said control

means each including a first valve responsive to differential pressure between injecting fuel pressure present therein on a side of said control means toward said fuel injection pump and fuel pressure present therein on another side of said control means toward a corresponding one of said injection nozzles, to interrupt transfer of the injecting fuel pressure on said corresponding injection nozzle side to a next one of said control means when the injecting fuel pressure on said fuel injection pump side is higher than the injecting fuel pressure on said corresponding injection nozzle side during each fuel delivery stroke of said fuel injection pump, and to allow transfer of the injecting fuel pressure on said corresponding injection nozzle



side to said next control means when the fuel pressure on said corresponding injection nozzle side exceeds the injecting fuel pressure on said fuel injection pump side at the termination of the fuel delivery stroke of said fuel injection pump, and a second valve disposed to prevent backflow of the injecting fuel pressure transferred to said next control means, whereby during a fuel delivery stroke of said fuel injection pump immediately following said first-mentioned fuel delivery stroke, the injecting fuel pressure transferred to said next control means is supplied to another one of said injection nozzles corresponding to said next control means, together with injecting fuel pressure newly delivered by said fuel injection pump.

4,414,948

# APPARATUS FOR FORMING THE OPERATING MIXTURE, IN PARTICULAR FOR MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINES HAVING EXTERNALLY SUPPLIED IGNITION

Siegfried Holzbaier, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,305

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218211

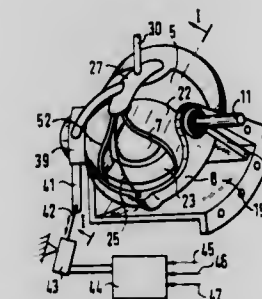
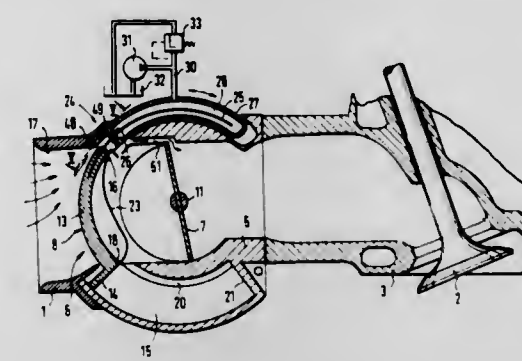
Int. Cl.<sup>3</sup> F02M 39/00

U.S. Cl. 123-452

8 Claims

1. An apparatus for forming the operating mixture for mixture-compressing internal combustion engines having externally supplied ignition, said apparatus further including an air measuring device which has at least one control body arranged to block the cross section of an intake tube provided with a zone and deflectable counter to a restoring force in accordance with air flow which is controlled by a throttle device, said control body further arranged to open said intake tube cross section to a greater or lesser extent, and said deflection of said

control body adapted to directly control a fuel metering valve, characterized in that said control body and said throttle device are rotably supported coaxially relative to each other and further that said control body has both a circularly curved control section which protrudes into said intake tube cross



section and an actuation section having oppositely disposed surfaces, said actuation section arranged to protrude into an actuation chamber and wherein one of said oppositely disposed surfaces of said actuation section is exposed to an upstream pressure and another of said sections is exposed to a downstream pressure in said intake tube.

4,414,949

# APPARATUS FOR THE CONTROL OF REPETITIVE EVENTS DEPENDENT ON OPERATING PARAMETERS OF INTERNAL COMBUSTION ENGINES

Günther Hönig, Ditzingen; Uwe Klencke, Ludwigshafen, and Alfred Schulz, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP79/00069, § 371 Date May 5, 1980, § 102(e) Date Apr. 28, 1980, PCT Pub. No. WO80/00597, PCT Pub. Date Apr. 3, 1980

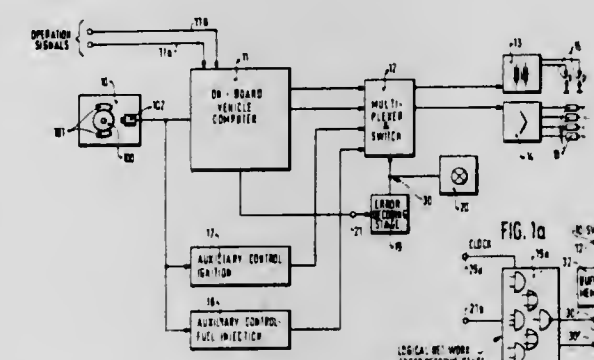
PCT Filed Sep. 5, 1979, Ser. No. 196,914

Claims priority, application Fed. Rep. of Germany, May 9, 1978, 2838619

Int. Cl.<sup>3</sup> F02P 5/04; F02B 3/00

U.S. Cl. 123-479

4 Claims



1. Apparatus for controlling repetitive events dependent upon operating parameters of a vehicular internal combustion engine, and including at least one of:

ignition events; fuel injection events; transmission events, comprising

a vehicular computer (11);

means (11a, 11b) applying vehicle operation signals to the computer;

an engine rotation sensor (10) coupled to a rotating shaft of the engine, said sensor being connected to and applying engine rotation signals to the computer,

the computer generating control signals in dependence on the signals applied thereto in accordance with a program stored therein;

at least one output control stage (13, 14) for triggering the event or events to be controlled;

at least one auxiliary control device (17, 18) connected to the engine rotation sensor and receiving the engine rotation signals;

a controllable switching device (12) having its output connected to the input of the at least one output control stage (13, 14) and inputs, respectively, connected to the output of the computer (11) and to the auxiliary control device, or devices (17, 18) and operative to selectively switch the output to one of the inputs;

an error decoding stage (19) connected to the computer, said error decoding stage including a clock source (29);

a shift register (22, 23, 24, 25) serially decoding signal sequences applied to the error decoding stage by the computer, and logic means (28) connected to the register, the register being periodically interrogated if the contents thereof match the logic conditions determined by the logic means.

4,414,950

# FAIL SAFE DEVICE FOR AIR/FUEL RATIO FEEDBACK CONTROL SYSTEM

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiha, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

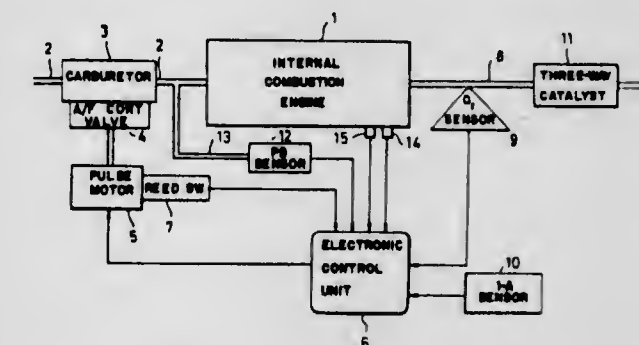
Filed Oct. 1, 1981, Ser. No. 307,445

Claims priority, application Japan, Oct. 6, 1980, 55-140046

Int. Cl.<sup>3</sup> F02B 33/00; F02M 7/00

U.S. Cl. 123-479

3 Claims

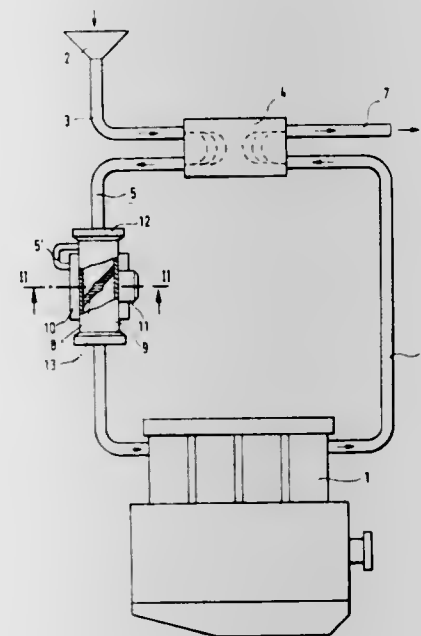


1. In an air/fuel ratio feedback control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine, said system comprising: a sensor for detecting the concentration of an exhaust gas ingredient emitted from said engine; an air/fuel ratio control valve having a valve body position thereof disposed to determine the air/fuel ratio of said air/fuel mixture being supplied to said engine; an actuator arranged to displace said air/fuel ratio control valve in a continuous manner in response to an output signal generated by said sensor; and reference position detecting means for generating a first signal when said actuator passes a predetermined reference position provided between two opposite extreme operating positions which mechanically limit a movable range of said actuator, a fail safe device comprising first means for detecting a failure in said air/fuel ratio feedback control system and generating a second signal when said failure is detected; and second means responsive to said second signal to drive said actuator, said



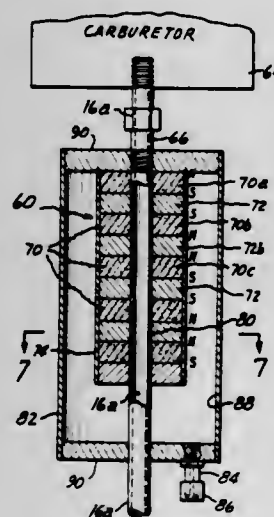
second means being adapted to stop said actuator at said predetermined reference position immediately upon being supplied with said first signal while it is driving said actuator, said second means including means for repeatedly driving said actuator over a predetermined operating range inclusive of said predetermined reference position in one direction and in a direction reverse thereto alternately a plurality of times when it is not supplied with said first signal upon said actuator passing said predetermined reference position, and means for driving said actuator from a second predetermined reference position which is one of said extreme operating positions, to a predetermined position and holding it same there when it is not supplied with said first signal even after a predetermined number of times of said repeated driving of said actuator.

**4,414,952**  
**ACTUATOR FOR AN AIR VALVE PLACED IN THE BOOST AIR DUCT OF AN IC ENGINE**  
 Reinhard Fried, Nussbaumen, Switzerland; Rudolf Heller, Munich, and Heimo Hubner, Greifenberg, both of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft, Brown, Boveri & Cie., Baden, Switzerland and Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany  
 PCT No. PCT/DE80/00078, § 371 Date Feb. 8, 1981, § 102(e) Date Feb. 4, 1981, PCT Pub. No. WO80/02725, PCT Pub. Date Dec. 11, 1980  
 PCT Filed May 23, 1980, Ser. No. 232,025  
 Int. Cl.<sup>3</sup> F02B 33/02  
 U.S. Cl. 123—559 20 Claims



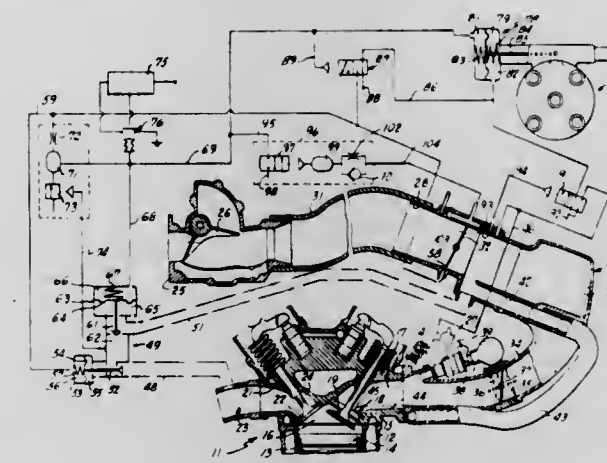
1. An apparatus for actuating an air throttle valve in the intake manifold of an internal combustion engine, particularly such an engine super-charged by a pressure wave super-charger, an air throttle valve disposed in an intake manifold and moveable between open and closed positions, spring means operatively connected to said air throttle valve for maintaining said air throttle valve in its closed position while the engine is shut off and while the engine is in a cold starting phase, during the cold starting phase there is a build-up in pressure of charge air in the intake manifold in front of the closed air throttle valve, a breather valve by-passing said air throttle valve to supply the engine with charge air around the closed air throttle valve, a pneumatic actuator operatively connected to said air throttle valve and operable by one of a pressure and a vacuum, said spring means being so selected and said actuator being so constructed that the charge air pressure accumulated in front of the closed air throttle valve at the end of the cold starting phase is sufficient to initiate the opening movement of the air throttle valve against the force of said spring means, said air throttle valve being further moved into its full open position by means of one of the charge air pressure and a vacuum, said air throttle valve being maintained in said open position while the engine is running, said air throttle valve returning to its closed position under the force of said spring means after the engine is shut down.

**4,414,951**  
**VEHICLE FUEL CONDITIONING APPARATUS**  
 Frank Saneto, P.O. Box 21421, Los Angeles, Calif. 90021  
 Continuation-in-part of Ser. No. 230,649, Feb. 2, 1981. This application Aug. 6, 1981, Ser. No. 290,660  
 Int. Cl.<sup>3</sup> F02B 75/10  
 U.S. Cl. 123—538 20 Claims



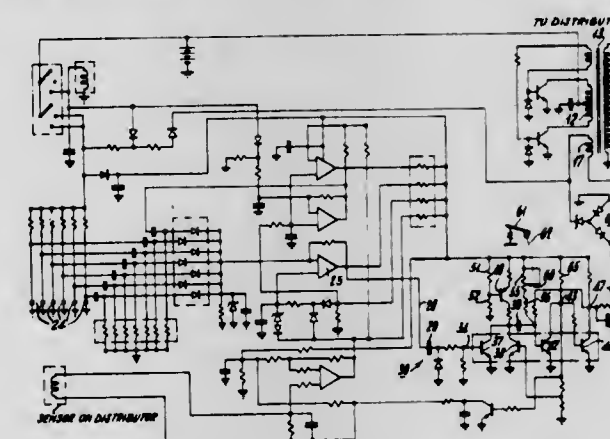
1. In combination a vehicle fuel system and a vehicle fuel conditioning apparatus for improved combustion of hydrocarbon fuel tending to acquire electrostatic charge during vehicle tank storage which charge inhibits full atomization of the fuel when mixed with air for combustion, said apparatus, being positioned between the vehicle tank storage and a fuel atomizing device and comprising an axial assembly of discrete magnetic bodies individually spaced by non magnetic spacers and arranged to define magnetic flux means providing an axially extended flux condition in said hydrocarbon fuel immediately in advance of fuel atomization, means maintaining said bodies in assembled relation, means defining a closed volume about said assembled bodies, and an inert gas within said closed volume means, said flux condition being adapted to strip electrostatic charge from fuel passing therethrough in subsequent fuel atomization facilitating relation, whereby fuel combustion is improved.

**4,414,953**  
**INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS RECYCLING SYSTEM**  
 Hiromitsu Matsumoto, Hamamatsu, and Kelichi Sugiyama, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan  
 Division of Ser. No. 88,466, Oct. 26, 1979, Pat. No. 4,306,533.  
 This application Oct. 19, 1981, Ser. No. 312,920  
 Claims priority, application Japan, Oct. 26, 1978, 53-132002  
 Int. Cl.<sup>3</sup> F02M 25/06  
 U.S. Cl. 123—571 2 Claims



1. In an internal combustion engine having a chamber of variable volume in which combustion occurs, a spark plug for firing a charge in said chamber, a main induction passage for supplying a charge to said chamber, an auxiliary induction passage having a significantly lesser effective cross sectional area than said main induction passage for delivering a charge to the chamber at a significantly greater velocity than the main induction passage, control valve means for controlling the proportion of the charge delivered to the chamber through the respective induction passages, exhaust gas recirculating means for recirculating a portion of the exhaust gases from the chamber back to the chamber, exhaust gas recirculation control valve means for controlling the amount of exhaust gases recirculated to said chamber, and spark timing means for delivering a timed spark to said spark plug, the improvement comprising means for advancing the timing of the spark delivered by said spark timing means in response to the recirculating of exhaust gases by said exhaust gas recirculating means.

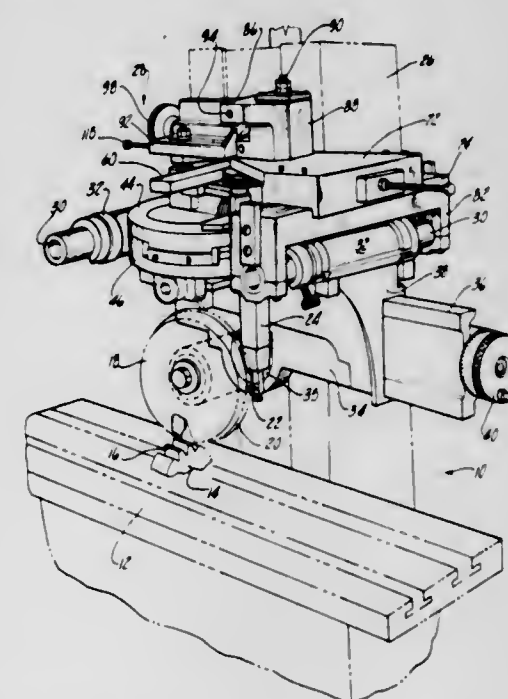
**4,414,954**  
**INTERNAL COMBUSTION ENGINE IGNITION SYSTEM WITH IMPROVEMENT**  
 Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.  
 Filed May 27, 1982, Ser. No. 382,545  
 Int. Cl.<sup>3</sup> F02P 1/00  
 U.S. Cl. 123—606 4 Claims



1. In combination, an internal combustion engine having a crank shaft and a fuel control arm and an electronic ignition circuit, said ignition circuit having a transformer with center

tapped primary winding forming an oscillator to develop a continuous high-voltage AC type spark signal of variable duration, said circuit including a control winding on said transformer for starting and stopping said oscillator and electronic switch means comprising a controlled rectifier for starting and stopping said spark signal, and control means for said controlled rectifier, comprising a transistor network having an input for receiving ignition control pulses in timed relation to said crank shaft and an output for controlling said controlled rectifier, said transistor network comprising means for cutting off said controlled rectifier to start said spark signals in timed relation to said crank shaft, said transistor network also comprising means for actuating said controlled rectifier to conduct in order to stop said spark signals after a variable time interval inversely related to the speed of said engine, said transistor network having circuit constants to provide a duration of said spark signals having a predetermined number of degrees of crank shaft rotation, and said transistor network also comprising means for varying one of said circuit constants to control said variable time interval, comprising a variable resistor, a coupling to said fuel control arm for varying said variable resistor, and a fixed resistor in series with said variable resistor to determine a minimum number of degrees of crank shaft rotation.

**4,414,955**  
**APPARATUS FOR DRESSING ABRASIVE WHEELS**  
 Lothar P. Bunge, 26648 Ryan, Warren, Mich. 48091  
 Filed Nov. 12, 1981, Ser. No. 320,276  
 Int. Cl.<sup>3</sup> B24B 53/00  
 U.S. Cl. 125—11 T 22 Claims



1. Apparatus for dressing a wheel, comprising:  
 a base;  
 a support;  
 means for mounting said support on said base including means for rotatably mounting said support relative to said wheel about a first axis;  
 a carriage having a pair of opposed guide surfaces;  
 a dressing tool attached to said carriage for movement therewith and extending outwardly from one side of said support;  
 means for slidably mounting said carriage on the other side



of said support, said carriage being rotatable with said support; and  
a frame assembly including first and second frame portions rotatable relative to each other about a second axis substantially parallel to said first axis, a cylindrical disc mounted on said first frame portion and having a section of the periphery thereof bearing against one of said opposing guide surfaces, and a pair of spaced apart rollers mounted on said second frame portion and bearing against the other of said guide surfaces.

4,414,956

## HEATER CLOSURE ATTACHMENT FOR DRUMS

Barman L. Webber, 116 Delinger Rd., Shelby, N.C. 28150  
Filed May 21, 1981, Ser. No. 266,096

Int. Cl.<sup>3</sup> F24C 1/16

U.S. Cl. 126—59

5 Claims



1. A closure attachment for empty metallic cylindrical open top drums to form therewith a portable outdoor drum heater comprising, in combination, a metal top closure unit adapted to rest on the open top of the drum when in upright position; said top closure unit having a large exhaust opening and air inlet opening means; a manually openable fuel insertion door comprising a hinged portion of the top closure unit; and air inlet tubing comprising two tubes disposed on opposite sides of the drum depending from said air inlet opening means having a length extending to a position adjacent the bottom of said drum thereby to provide turbulent inlet air in a position under fuel placed in the drum for efficient and rapid burning of the fuel wherein the closure unit comprises a knock-down set of parts with two sleeves about two apertures in the closure unit constituting the air inlet opening means and means for removably securing to the sleeves the two air inlet tubes.

4,414,957

## FIREPLACE AND STOVE APPARATUS

Jeffrey L. Evans, Aspen, Colo., assignor to Ting Enterprises, Inc., Aspen, Colo.

Filed Mar. 17, 1982, Ser. No. 359,061

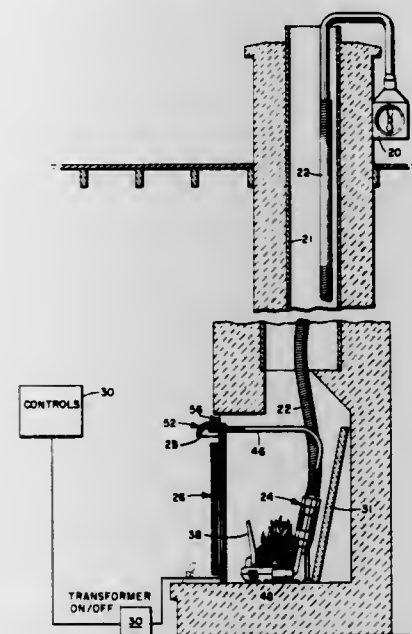
Int. Cl.<sup>3</sup> F24B 7/00

U.S. Cl. 126—121

19 Claims

1. A solid fuel burning apparatus for use in an enclosure having an exhaust flue, a combustion chamber, and a fuel-loading opening, comprising:  
means for substantially air-tightly sealing the fuel-loading opening;  
a hollow, fuel-holding grate having an air inlet opening therein at the rear thereof, a first air outlet opening therefrom through which air is directed directly toward the fuel, and a plurality of second air outlet openings therefrom at the rear of the grate through which air is fed exterior of said combustion chamber into the enclosure, said grate having air passage means therein fluidly connecting said inlet to said first and second outlets;  
a single variable speed blower means outside of said enclosure, said blower means having an air inlet and an air outlet, the air inlet of said blower means being below the level of the outlet of said exhaust flue;  
a first flexible conduit extending through said exhaust flue, said

flexible conduit directly fluidly connecting the air outlet of said blower means and said grate air inlet;  
a plurality of second flexible conduits each directly fluidly connecting a respective one of said second air outlets and said enclosure through said air-tightly sealing means; and  
said passage means extending forwardly from said grate air inlet to adjacent the front of said grate and from there ex-



tending rearwardly to said second air outlets so that air moving through said passage means to the exterior of said combustion chamber into said enclosure is heated within said flue and within said passage means over a distance corresponding to at least the length of the flue plus twice the distance between the front of the grate and the second air outlets at the rear of the grate plus the length of the second flexible conduit.

4,414,958

## SOLAR COLLECTOR

Shiro Hozumi, Sakai; Shin'ichi Aso, Ikoma; Minoru Tagashira, Katano; Kouji Ebisu, Moriguchi, and Hideo Uchino, Higashi-osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

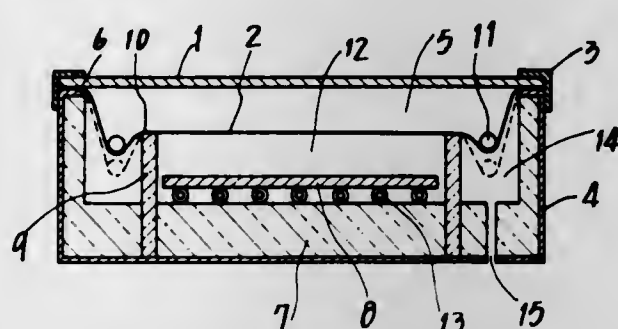
Filed Dec. 5, 1980, Ser. No. 213,339

Claims priority, application Japan, Dec. 11, 1979, 54-161104

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—450

5 Claims



1. A solar collector comprising:  
a heat collecting panel for receiving the sunlight and converting the sunlight to heat,  
a cover glass arranged a distance apart from and over the panel,  
a vessel having thereon the cover glass and accommodating therein the panel,  
a sunlight-pervious diaphragm disposed between the panel and the cover glass to form a closed space between itself and the cover glass, the diaphragm being adapted to ex-

pand and contract to vary the volume of the closed space in response to temperature variations,  
pressure equalizing means provided in the vessel on the side of the diaphragm opposite said closed space, and  
means for limitively stretching the central portion of the diaphragm substantially in parallel to and substantially a predetermined distance above the panel whereby said central portion of the diaphragm remains taut below a specified temperature but is allowed to start sagging at said specified temperature.

4,414,959

## SHELF FOR A RANGE

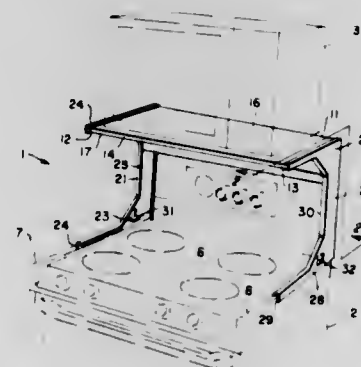
Rickey F. Fair, Sharpville, and John R. Wilcox, Farrell, both of Pa., assignors to Top Shelf Company, Inc., West Middlesex, Pa.

Filed Dec. 23, 1981, Ser. No. 333,644

Int. Cl.<sup>3</sup> F24C 15/16

U.S. Cl. 126—332

1 Claim



1. A shelf for use with a range, said range having a burner area which includes a first drip rail and a second drip rail at opposite sides thereof, said shelf comprising:

- a platform having a first end and a second end and further having a front edge, a top surface and a bottom surface;
- a first support having an upper portion and a lower portion, said upper portion of said first support being secured to said first end of said platform such that said platform is substantially parallel to said burner area, said lower portion of said first support having integrally formed therewith a first channel receptive to engaging said first drip rail of said range;
- a second support having an upper portion and a lower portion, said upper portion of said second support being secured to said second end of said platform such that said platform is substantially parallel to said burner area, said lower portion of said second support having integrally formed therewith a second channel receptive to engaging said second drip rail of said range;
- a stiffening member having a heat reflective surface, said stiffening member being secured to said bottom surface of said platform in proximity to said front edge thereof, said stiffening member being secured also to said first support and to said second support such that said heat reflective surface of said stiffening member is oriented toward said burner area of said range;
- a first tab integral with said lower portion of said first support and spaced apart from said first channel, said first tab being able to bear against said first drip rail; and
- a second tab integral with said lower portion of said second support and spaced apart from said second channel, said second tab being able to bear against said second drip rail.

4,414,960

## SOLAR COLLECTION MAT ELEMENT

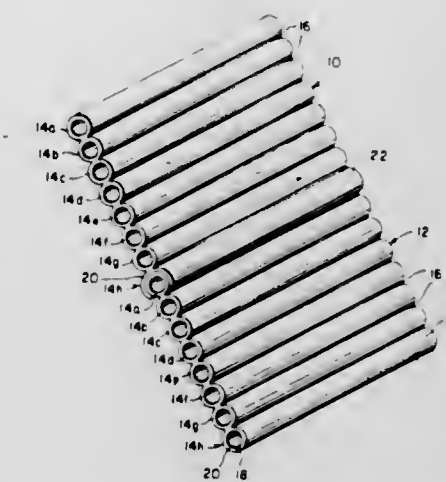
Kurt J. Wasserman, Westtown, N.Y., assignor to Insolar, Inc., Port Jervis, N.Y.

Filed May 10, 1982, Ser. No. 376,419

Int. Cl.<sup>3</sup> F24J 3/02; F28F 1/00

U.S. Cl. 126—426

2 Claims



1. A pair of substantially identical solar energy collection mat elements each said element comprising an elongated unitary structure of substantially black material selected from elastomers and flexible plastics and of substantially constant cross-section, configured as a series of side-by-side relatively thin-walled parallel pipes of substantially the same cross-sectional dimensions, each pair of adjacent pipes of each mat element being substantially tangent to each other, integral connecting material between each said pair of adjacent pipes defining a longitudinally directed tear line, said series of pipes of each mat element including a first pipe at one extreme side of said series and a last pipe at the opposite extreme side of said series, said last pipe having a longitudinally directed slit in its wall along a line generally most remote from the other of said pipes of said mat element and running the entire length of said last pipe, so as to divide said last pipe into opposed flexible wings of arcuate cross-section, said wings of one of said mat elements grippingly overlapping substantially the entire exterior of the first pipe of the other solar collection mat element, each pipe (of said series) heretofore mentioned with the exception of the last pipe of each mat element being configured for conveying fluid.

4,414,961

## SOLAR ENERGY COLLECTING PANEL AND APPARATUS

Robert W. Luebke, 522 Ponte Vedra Blvd., Ponte Vedra, Fla. 32082

Filed Feb. 18, 1981, Ser. No. 235,741

Int. Cl.<sup>3</sup> F24J 3/02

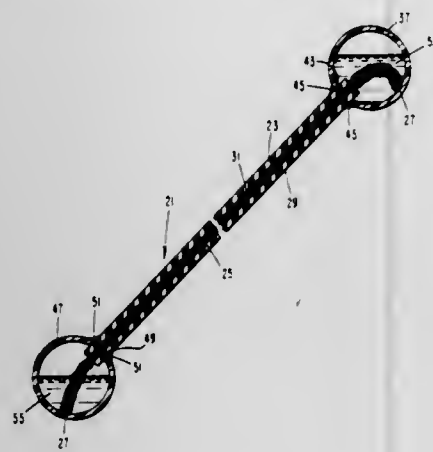
U.S. Cl. 126—432

17 Claims

1. A solar energy collecting panel comprising:  
a first layer of heat absorbing material, said material being black and opaque;  
fiber means for repeatedly transporting a fluid toward a first surface of the first layer to transfer heat from the layer to the fluid, said fiber means being bonded to said first sur-



face to ensure intimate contact between filaments of the fiber means and the first surface; and



a second layer arranged such that the fiber means is confined between the first and second layers.

4,414,962

## OPERATING ARTHROSCOPE

Robert W. Carson, 1419 Circle Way, Salt Lake City, Utah 84103  
Continuation-in-part of Ser. No. 806,833, Jun. 15, 1977, and Ser. No. 861,632, Dec. 19, 1977. This application Jan. 2, 1980, Ser. No. 109,150

Int. Cl.<sup>3</sup> A61B 1/06

U.S. Cl. 128—6

16 Claims



1. In an arthroscope with structural elements, including a lens system, an instrument channel and a fiber optic lighting system, fixed within a rigid sheath, the improvement which comprises:

- providing said sheath in association with a central housing, wherein the sheath includes
- a first, terminal, elongated sheath segment extending from said central housing said terminal segment having a longitudinal axis; and
- a second, viewing, elongated sheath segment carrying an eye piece at its distal end, extending in a direction opposite said terminal segment from said central housing at a location laterally offset from but approximately adjacent the longitudinal axis of said terminal segment, wherein said viewing segment is longer than said terminal segment, and
- said instrument channel is contained by said terminal sheath segment, and terminates with an entry, adapted to pass instruments from outside, at said central housing at a location offset from said viewing segment and spaced

from said eye piece approximately the length of said viewing sheath segment;  
the relative length of said terminal and viewing sheath segments, and the spatial arrangement of said eye piece and said entry being selected so that blind manipulations of instruments through said instrument channel may be accomplished by an operator looking through the eye piece with said operator's hands in front of the operator's torso and below the shoulder level of said operator.

4,414,963

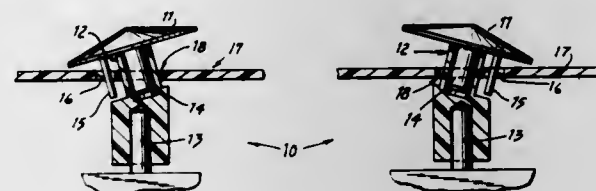
## MASSAGE DEVICES

Raymond W. Kunz, Monroe, Conn., assignor to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 41,277, May 21, 1979, abandoned. This application Apr. 9, 1980, Ser. No. 138,488  
Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128—60

12 Claims



1. A massage head mechanism comprising  
a massage head of generally short conical shape having a post fixedly attached essentially perpendicularly to the base of the head,  
a rotatable driver,  
a socket fixedly attached to said driver at an angle thereto and rotatable therewith, wherein said post is rotatably fitted into said socket and said post has an outside diameter smaller than the inside diameter of said socket to permit rotational slippage therebetween,  
resisting means cooperating with said massage head to enable the massage head to nutate without rotating when said driver is rotating.

4,414,964

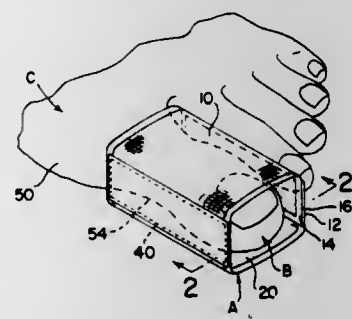
## POST-OPERATIVE TOE PROTECTOR DEVICE

Frank G. Farino, Shaker Heights, Ohio, and Richard P. Jacoby, Paradise Valley, Ariz., assignors to Richard P. Jacoby, Phoenix, Ariz.

Filed Jan. 19, 1981, Ser. No. 226,365  
Int. Cl.<sup>3</sup> A61F 5/00; A61B 19/00

U.S. Cl. 128—81 R

10 Claims



1. A device presenting a plurality of pads, one each engaging the upper, the lower, and the two sides of a human toe respectively to form a protective shield thereabout, said device comprising a generally rectangular strip having a transverse direction generally parallel the shorter edges thereof and an upper and a lower surface extending between a first end portion and a second end portion; a layer of cushion material secured to said upper surface; a layer of looped-type woven fabric secured to said lower surface; means associated with said layered strip and coacting therewith to define transversely extending fold lines thereacross in spaced generally parallel relationship

to each other to divide said cushion layer into a plurality of discrete pads which, when each one of said pads is disposed generally normal to each pad contiguous thereto on the fold line interposed therebetween, create a hollow rectangular member having said pads disposed therein; and means for detachably securing said rectangular member about a human toe to provide a protective shield therefor with each of said pads engaging, but not constricting, its contiguous surface of said toe.

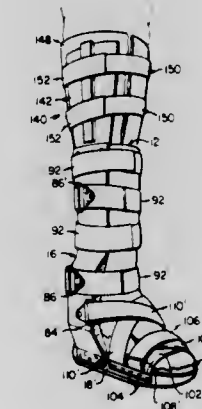
4,414,965

## BRACE FOR TIBIAL FRACTURES

Donald M. Mauldin, 3631 Potomac, Dallas, Tex. 75235, and Richard E. Jones, III, 5804 Prestonview, Dallas, Tex. 75240  
Continuation-in-part of Ser. No. 266,966, May 26, 1981, Pat. No. 4,378,793. This application Sep. 29, 1982, Ser. No. 426,851  
Int. Cl.<sup>3</sup> A61F 5/04

U.S. Cl. 128—87 R

3 Claims



1. A brace for treatment of tibial fractures comprising:  
a rigid shoe having a planar upper surface for engaging the sole of the patient's foot, side walls extending perpendicularly to the upper surface and downwardly therefrom, and an outer sole comprising the lowermost surface of the shoe;  
the outer sole of the shoe having a fulcrum, a planar first portion extending rearwardly from the fulcrum to the heel of the shoe and a second portion comprising a continuous curve extending from the fulcrum upwardly and forwardly to the toe of the shoe;  
means for locating the foot of the patient on the planar upper surface of the shoe with the metatarsal point of the foot positioned forward of the fulcrum so that the shoe normally sets on the planar first portion of the outer sole and pivots about the fulcrum onto the curved second portion as the weight of the patient shifts forward of the metatarsal point of the foot;  
left and right side members positioned on opposite sides of the shoe and each including a thermoplastic side piece and a metal ankle stay;  
the metal ankle stay of each side member engaging the adjacent side wall of the shoe and extending upwardly therefrom beyond the ankle of the patient;  
the thermoplastic side piece of each side member surrounding the metal ankle stay thereof on the front, on the outside, and on the rear and extending upwardly from the shoe in contact with the metal ankle stay;  
means securing the metal ankle stay of each side member to the side piece thereof;  
a plurality of fasteners extending through the metal ankle stay and the thermoplastic side piece of each side member and into the adjacent side wall of the shoe for rigidly securing the side members to the shoe;  
the metal ankle stay and the thermoplastic side piece of each side member comprising a first portion secured to the side wall of the shoe, a second portion extending from the upper end of the first portion angularly upwardly and outwardly with respect thereto and a third portion ex-

tending upwardly from the upper end of the second portion substantially parallel to the first portion;  
the metal ankle stay of each side member terminating at the upper end of the third portion thereof;  
the thermoplastic side piece of each side member further including a fourth portion extending from the end of the third portion angularly upwardly and inwardly with respect thereto and a fifth portion extending upwardly from the upper end of the fourth portion generally parallel to the first and third portions;  
the fifth portion of each side piece being positioned over the first portion thereof and being curved inwardly to conform to the calf of the patient;  
each side member further including a layer of foam padding secured to the inside surface thereof and extending upwardly along the inner surfaces of the second and third portions of the metal ankle stay and the thermoplastic ankle piece;  
a pair of extensions each secured to the upper end of the fifth portion of one of the side pieces and extending therefrom upwardly beyond the knee of the patient; and  
fastening means for securing the shoe, the side members and the extension in place relative to the leg of the patient.

4,414,966

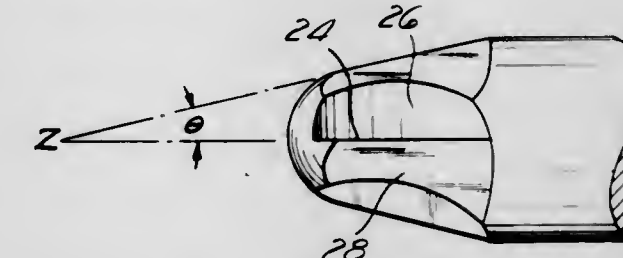
## FIXATION PIN

Denis P. Stednitz, Redondo Beach, Calif., assignor to Ace Orthopedic Manufacturing, Inc., Los Angeles, Calif.

Filed Apr. 9, 1981, Ser. No. 252,359  
Int. Cl.<sup>3</sup> A61F 5/04

U.S. Cl. 128—92 B

7 Claims



1. In an orthopedic fixation pin adapted to be threadably attached adjacent the distal end with a bone of the user patient and to be attached to a fixation frame adjacent the proximal end thereof, the pin comprising an elongate cylindrical shaft having threads formed at the distal end thereof for attachment to the bone, the improvement wherein the threaded distal end of the pin comprises:  
a symmetrical hemispherical dull tip portion having a maximum diameter less than the diameter of the shaft;  
a transition portion of increasing diameter between the tip portion and the shaft;  
threads formed on the pin from the tip portion through the transition portion and onto the shaft adjacent the transition portion;  
at least two flutes formed in the tip and transition portions, each of said flutes being defined by first and second surfaces, the first surface being generally planar and lying substantially in coincidence with a radius of the shaft and extending longitudinally from proximate the distal end of the transition portion to proximate the proximal end of the transition portion of the pin, the second surface being longitudinally generally coextensive with the first surface and curving from a surface coincident to a chord proximate the center of the shaft outwardly to terminate at a tangent to the shaft, the flutes being substantially symmetrically arranged about the axis of the shaft and so configured and constructed as to form non-fluted spaces therebetween;  
the non-fluted surfaces between the flutes being substantially flat to form a self-tapping cutting edge for the threads on the pin.



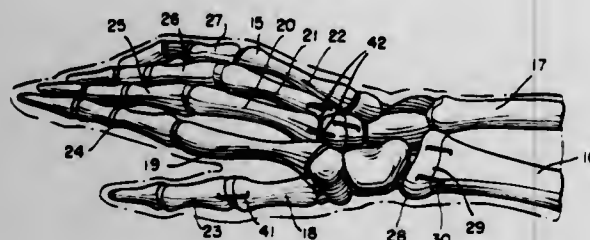
4,414,967

**INTERNAL FIXATION OF BONE, TENDON, AND LIGAMENTS**

Jules S. Shapiro, Evanston, Ill., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Jun. 22, 1981, Ser. No. 275,896  
Int. Cl.<sup>3</sup> A61F 5/04; A61B 17/04

U.S. Cl. 128—92 B

9 Claims



1. A method of fixation for two portions of bone comprising the steps of:

- holding the bone portions together;
- placing a stapler over the bone portions;
- activating the stapler to rapidly release stored energy;
- rapidly and reproducibly imparting a controlled amount of the released energy to a staple thereby propelling the staple, the staple comprising at least a pair of prongs and means for connecting the prongs; and
- guiding the propelled staple towards the bone portions whereby at least one prong of the staple is driven by momentum into and frictionally fits within each of the bone portions.

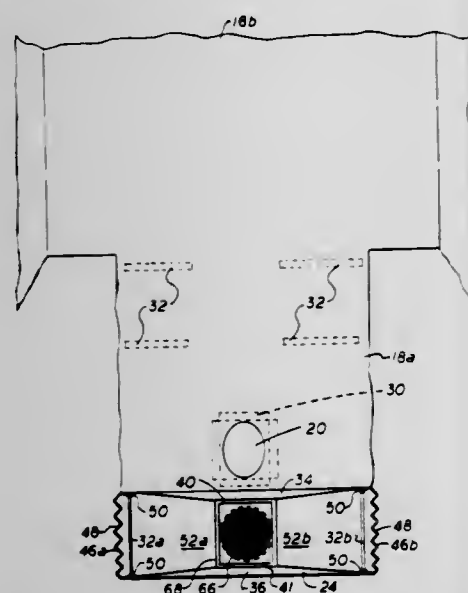
4,414,968

**SURGICAL DRAPE**

Shailesh R. Amin, 1417 Golf Ter., Danville, Ill. 61832  
Filed May 29, 1981, Ser. No. 268,367  
Int. Cl.<sup>3</sup> A61F 13/00

U.S. Cl. 128—132 D

2 Claims



1. A drape for covering the body of a patient during a medical procedure, comprising:

- a sheet of drapable material having a fenestration for access to the site of the procedure;
- a foldable pocket carried by the sheet at a location in the path of fluid runoff from the fenestration and having a pair of opposite sides;
- a frame member insertable into the pocket for maintaining the foldable pocket in an open position to receive the fluid runoff; and
- means carried by said pocket for holding said frame member in an operable position adjacent either of said sides.

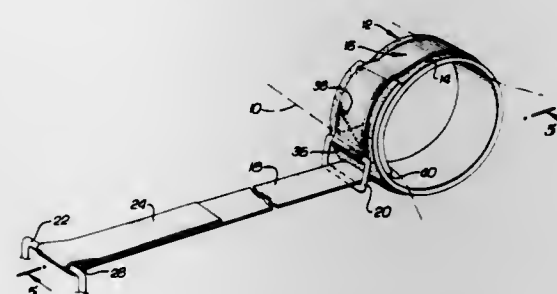
4,414,969

**WRIST RESTRAINT**

Arnold M. Heyman, Burbank, Calif.  
Filed Mar. 25, 1981, Ser. No. 247,270  
Int. Cl.<sup>3</sup> A61F 13/00

U.S. Cl. 128—133

12 Claims



1. A device for restraining a patient's limb or other body part comprising:

- a generally rectangular, flexible encircling member of a length sufficient to encircle the limb of the patient beginning with a second end, said member having an outside surface which contains Velcro pile along substantially its entire length;
- a securing strap means having a first end for peripherally holding said encircling member about said limb and having a second end for attachment to a support structure, said strap means being attached adjacent said first end to a first end of said encircling member and containing Velcro hook fibers on one surface along substantially its entire length for releasably engaging the Velcro pile located on the outside surface of said encircling member; said encircling member and securing strap means being configured and attached so that in elongated form, with said securing strap means extending beyond said first end of said encircling member, said surface of said securing strap means containing Velcro hook fibers faces in a direction opposite to that faced by the surface of said encircling member containing Velcro pile;
- a ring pivotally attached to the surface of said encircling member containing Velcro pile at a position adjacent the attachment of said strap means; and
- a fastening means contained on said strap means for releasably attaching the second end of said securing strap means to a structure, whereby a limb is restrained by extending the encircling member and securing strap means around said limb beginning with the second end of said encircling member so that said securing strap means extends peripherally around said encircling member to hold it in place by means of the engagement of said Velcro hook fibers and said Velcro pile, and by passing the second end of said securing strap means through said ring, directing it towards a support structure and attaching said second end about the support structure using said fastening means.

4,414,970

**ELASTIC BANDAGES**

Peter W. Berry, Bishops Stortford, England, assignor to Smith and Nephew Associated Companies Limited, United Kingdom  
Filed Jul. 24, 1981, Ser. No. 286,567  
Claims priority, application United Kingdom, Jul. 30, 1980, 8024855; Aug. 27, 1980, 8027719

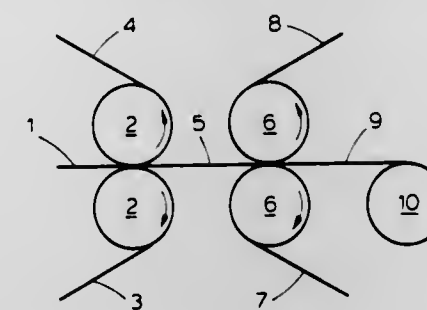
Int. Cl.<sup>3</sup> A61L 15/00

U.S. Cl. 128—156

12 Claims

1. A moisture vapour transmitting elastic bandage which comprises an inner layer of fabric and an outer layer of fabric bonded to a central layer, said central layer comprising an

apertured elastomeric film which allows the passage of wound exudate from the inner layer to the outer layer and whereby



the bandage has a recoverable elastic strain in the length direction of 25% to 150% at a stress of 180 g/cm.

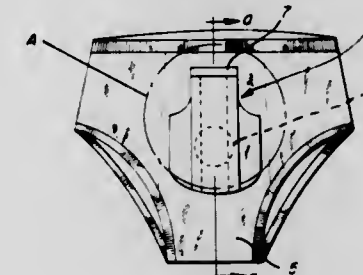
4,414,971

**SANITARY PANTS USED FOR THE MALE**

Seun Y. Chung, 309-1, Da, Shi Heung Dong, Yeung Deung Po-Ku, Seoul, Rep. of Korea  
Filed Jun. 2, 1981, Ser. No. 269,745  
Int. Cl.<sup>3</sup> A61F 5/40

U.S. Cl. 128—159

5 Claims



1. Sanitary underpants for the male which provide effective ventilation and absorption, said pants having a front and rear portion, said front portion being provided with a centrally disposed hole, and a unitary exterior cloth fastened to said front portion in the vicinity of the waist and along the sides thereof for surrounding said hole and forming a pouch, said exterior cloth being fastened along the lateral sides thereof to said front portion up to a location just above said hole to form said pouch with said front portion, whereby the genitals of the male are adapted to extend through said hole and be received by said pouch thereby separating said genitals from contiguous body parts, said exterior cloth including side panels which have a pleated expandable configuration for permitting said pouch to be expanded, and said lateral sides of said exterior cloth being unfastened from said location just above said hole up to said vicinity of the waist to provide a vent opening between said exterior cloth and said front portion.

4,414,972

**INHALATION DEVICE**

David M. Young, Loughborough; Donald F. Mitchell, Dismouth, near Derby, and Edward Amey, Loughborough, all of England, assignors to Fisons Limited, London, England  
Filed Jul. 29, 1981, Ser. No. 287,887  
Claims priority, application United Kingdom, Aug. 4, 1980, 8025385

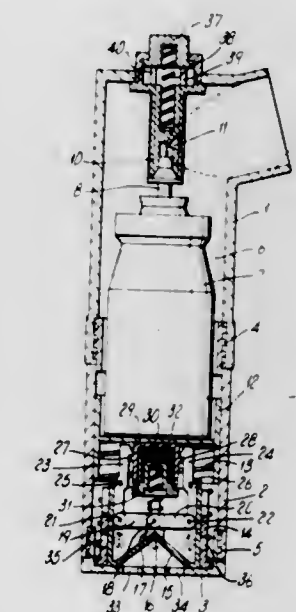
Int. Cl.<sup>3</sup> A61M 15/00

U.S. Cl. 128—200.23

10 Claims

1. An inhalation device for use with a pressurised container having an outlet valve mechanism and from which material may be discharged by depression of a portion of the valve mechanism thereof, which device comprises a chamber for receiving said pressurised container; a mouthpiece communicating with said chamber and an air flow passage means through said chamber and mouthpiece; actuating means

adapted to bear on the valve mechanism of the container without actuating the valve mechanism; and first and second biasing means both adapted to bias the container towards the actuating means, said first and second biasing means each being of insufficient force alone to depress the portion of the valve mechanism of the container against the actuating means but



together being of sufficient force to do so, said first biasing means being positioned to provide a continuous bias on the container toward said actuating means; and means for restraining said second biasing means in a position in which it does not bear on the container and releasing said second biasing means on inhalation through the device to a position in which it does bear on the container.

4,414,973

**RESPIRATOR FACE MASK**

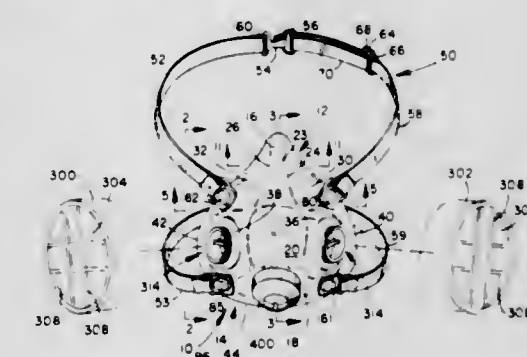
James N. Matheson, Mission Viejo, and Phillip L. Lowry, Santa Ana, both of Calif., assignors to U.S.D. Corp., Santa Ana, Calif.

Filed Mar. 10, 1981, Ser. No. 242,287

Int. Cl.<sup>3</sup> A62B 7/00

U.S. Cl. 128—206.15

7 Claims



1. An improved respirator having a facial configuration for covering the oral and nasal areas of a user's face where the improvement comprises:

- a respirator mask having a peripheral edge adapted to lie about the oral nasal area of a user's face and an oral and nasal cavity;
- passage means for attaching at least one air filtration cartridge to said respirator mask;
- inhalation valve means in said passage which upon exhalation will close off the cartridge passage means;
- an outlet in said mask having an exhalation valve for exhausting air from a user's lungs;
- sealing means extending around the peripheral edge of said mask for sealing the oral nasal cavity when positive or



negative pressure is applied internally thereto when the respirator is on one's face; and, support means for holding said respirator on a user's face formed with a resilient post attached to said respirator mask having a resilient enlarged head, and an eyelet having an opening which fits snugly about said post removably mounted over said head with a strap attached to said eyelet for attachment to a second resilient post having a resilient enlarged head attached to said respirator mask with an eyelet having an opening which fits snugly about said second post at the other end of said strap removably mounted on said second post, and wherein said heads have an eccentrically shaped portion for overlying a portion of said eyelet and an undercut thereto providing pivotal movement of said eyelet beneath said undercut around said post for various pivotal orientations of the strap.

4,414,974

## MICROSURGICAL KNIFE

Robert S. Dotson, Manhattan, Kans.; W. George Richeson, Marietta, Ga., and Herb M. Trenka, Clearwater, Fla., assignors to General Conveyors Limited, Stamford, United Kingdom  
Filed Jun. 9, 1981, Ser. No. 271,967

Int. Cl.<sup>3</sup> A61B 17/32

U.S. Cl. 128—305

7 Claims



1. A disposable microsurgical knife comprising an elongate knife body having a forward end and a rearward end, a cutting blade carried at said forward end and extending therefrom, and a shroud slidably received over said knife body, said shroud being selectively slidable towards and rearward end for exposing said cutting blade and providing a blade using position and slidable over said forward end for covering said cutting blade and providing a blade protecting position, said forward end of said knife body defining a slot therein, said slot having generally parallel side walls, said cutting blade including a cutting portion and a shank carrying said cutting portion, said shank having non-parallel edges, said shank being dimensioned to be received within said blade receiving slot to be locked therein by means of said non-parallel edges with said cutting portion extending from said shank beyond said knife body, said forward end of said knife body having a reduced diameter for allowing better visibility of said cutting blade, said rearward end of said knife body being a generally cylindrical portion and carrying an enlarged cap at the rearward end thereof, said shroud having a non-circular exterior configuration and defining a circular bore therethrough, said generally cylindrical portion having an external diameter sized to cause said shroud to wedge in place when said shroud is slid to said blade using position, said knife body including means for centering said shroud when said shroud is slid to said blade protecting position, said shroud having a length sufficient to be supported by

said cylindrical portion of said knife body and to extend beyond said cutting portion of said blade.

4,414,975

## BLOOD LANCET

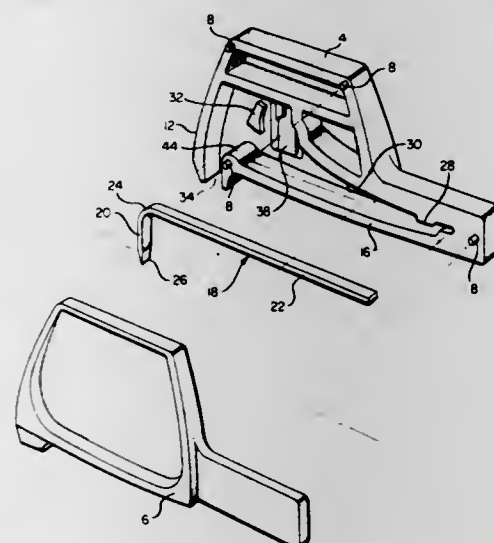
Francis E. Ryder, and Michael D. Thomas, both of Arab, Ala., assignors to Ryder International Corp., Arab, Ala.

Filed May 15, 1981, Ser. No. 264,189

Int. Cl.<sup>3</sup> A61B 17/32

U.S. Cl. 128—314

3 Claims



1. A surgical lancet for use in obtaining a blood sample, or the like, said lancet comprising: a housing including a longitudinal side wall having a shoulder formed thereon, which shoulder extends transversely of the interior surface of said side wall; a resiliently biased blade member mounted within said housing, said blade member comprising a resilient strip of metal material including an elongate first portion having one end fixed with respect to the housing, and a relatively short, transverse second portion joined to said first portion at the other end thereof, said second portion including an edge for penetrating a patient's skin, said blade member being capable of being flexed to a first retracted position wherein the edge of said blade is disposed within the housing, with said first portion of the blade member engaged upon said shoulder extending transversely of the interior surface of the housing side wall and said blade member being moveable off said shoulder such that the resiliency of said blade member will cause it to move to a second extended position wherein the edge projects from an opening in said housing; and triggering means selectively operable to move said blade member transversely of the housing side wall and off said shoulder whereby said blade is then free to move from said first retracted position to said second extended position, said triggering means including a resilient tab formed integral with said housing side wall structure adjacent said shoulder, said tab, in its normal unstressed condition not extending inwardly of the interior surface of the housing side wall a sufficient distance to prevent engagement of the blade member on said shoulder, said tab being moveable transversely of said side wall such that said tab may be pressed inwardly to engage against said blade member and to move the blade member transversely of the side wall to disengage said blade member from said shoulder thereby permitting said blade to move from the retracted position to the extended position wherein the edge thereof projects from said housing.

4,414,976

## TISSUE ADHESIVE

Otto Schwarz, Yendra Linnaus, Franz Löblich, and Thomas Seelich, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für chemischmedizinische Produkte, Vienna, Austria

Division of Ser. No. 118,529, Feb. 4, 1980, Pat. No. 4,362,567.  
This application Sep. 13, 1982, Ser. No. 417,538

Claims priority, application Austria, Feb. 15, 1979, 1189/79  
Int. Cl.<sup>3</sup> A61B 17/04

U.S. Cl. 128—334 R

3 Claims

1. A method of seamlessly connecting tissue or organ parts, for sealing wounds, stopping bleeding and stimulating wound healing in mammals which comprises reconstituting lyophilized tissue adhesive of mammalian protein origin which comprises fibrinogen, albumin, factor XIII, cold-insoluble globulin and plasminogen-activator inhibitor or plasmin inhibitor wherein the fibrinogen is present in at least 33% by weight, in the lyophilized state, the ratio of factor XIII to fibrinogen, expressed in units of factor XIII per gram of fibrinogen, is at least 80, and fibrinogen and albumin are present in a ratio of 33 to 90:5 to 40 and applying said reconstituted tissue adhesive containing at least 70 mg of fibrinogen per ml to the organ tissue or wound of a mammal in an amount sufficient to function as an adhesive.

4,414,977

## NASAL DILATOR

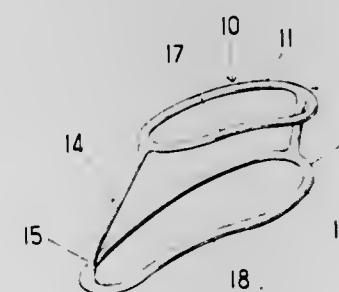
Saeed Rezakhany, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 20, 1981, Ser. No. 284,654

Int. Cl.<sup>3</sup> A61M 29/00; A61F 5/08

U.S. Cl. 128—342

6 Claims



1. A nasal dilator adapted for emplacement in the vestibule of the nose to retain the tissues therein and provide a free air passage, comprising:  
(a) a top ring member having a generally elongated oval shape;  
(b) a bottom ring member having a generally elongated oval shape and being longer in the elongated dimension than the top ring;  
(c) a substantially straight rear strut extending between the rear elongated ends of the top and bottom ring members;  
(d) a front strut extending between the front elongated ends of the top and bottom ring members, the front strut being substantially longer than the rear strut and having a bend therein spaced closer to the bottom ring than to the top ring and arranged such that the front strut engages the bottom ring approximately perpendicular to the plane of the bottom ring, the top ring being sized to extend approximately the length of the ostium internum of the human nose, the bottom ring being sized to extend approximately the length of the bottom of the vestibule adjacent to the opening of the nostril, the struts spacing the top ring from the bottom ring a distance approximately equal to the distance from the ostium internum of the nostril to the bottom thereof, the top and bottom rings and the struts being formed of a non-irritating, biocompatible material.

4,414,978

## UNIVERSAL PROGRAMMER FOR OPERATING IMPLANTABLE DEVICE REED SWITCH

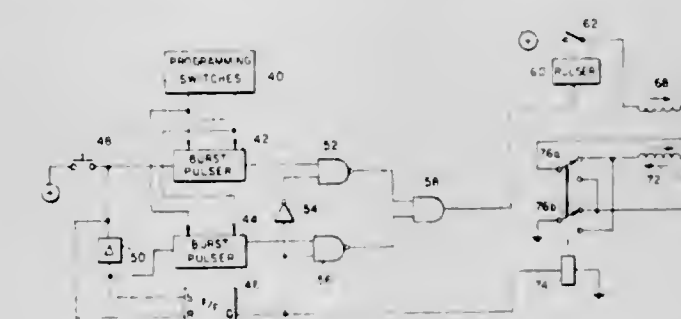
Victor E. Church, Hornsby Heights, Australia, assignor to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Aug. 26, 1981, Ser. No. 296,458

Int. Cl.<sup>3</sup> A61N 1/38

U.S. Cl. 128—419 PG

21 Claims



1. A system for generating magnetic flux to control flux-responsive switching in a plurality of medical prostheses to adjust the operating characteristics thereof, such medical prostheses being sensitive to the path of magnetic flux therethrough, a first group of said medical prostheses being responsive to fluxes primarily in a first direction therethrough, and a second group being responsive to fluxes primarily in a second direction therethrough when placed in a human body in the same position as the medical prostheses in said first group; comprising a housing; means within said housing for generating two fluxes having a different paths, each to control flux-responsive switching in medical prostheses in a respective one of said first and second groups when said housing is held in the same orientation relative to the medical prostheses in both groups; and means for selectively controlling the path of the flux which is generated by said flux generating means.

4,414,979

## MONITORABLE BONE GROWTH STIMULATOR

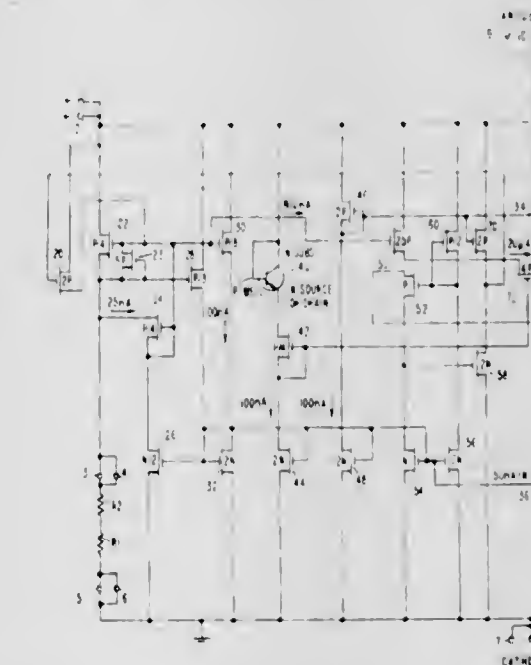
Michael S. Hirshorn, Sydney; David K. Money, Pennant Hills; Stephen J. Swift, Hornsby, and Robert J. Evans, Chatswood, all of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Feb. 23, 1981, Ser. No. 237,089

Int. Cl.<sup>3</sup> D61N 1/20

U.S. Cl. 128—419 F

23 Claims



1. A monitorable implantable bone growth stimulator comprising an hermetically-sealed metal container and at least one electrode lead exiting therefrom; said container having therein



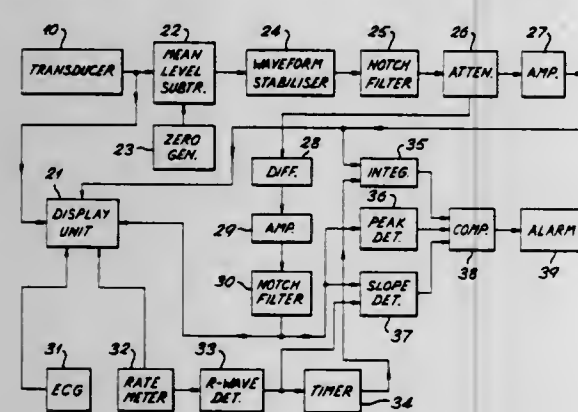
continuously updating said memories as said recording is scanned while simultaneously reading and displaying an

**BLOOD FLOW MONITOR APPARATUS**

Claims priority, application United Kingdom, May 29, 1980,  
8017845

U.S. Cl. 128-664

### 8 Claims



arrhythmiagraph corresponding to a larger segment of ECG signals based on said R-R signal memory.

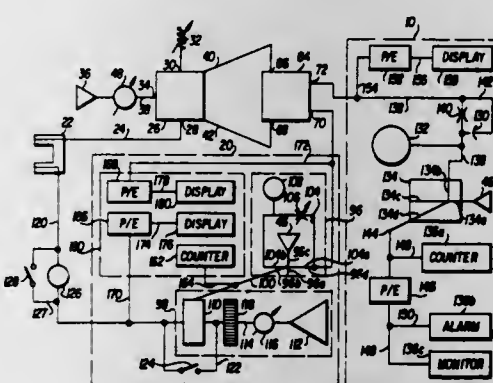
# APNEIC EVENT DETECTOR AND METHOD

**Filed Nov. 26, 1980, Ser. No. 210,653**

Int. Cl.<sup>3</sup> A61B 5/08

U.S. Cl. 128-716

## 14 Claims



## ELECTROCARDIOGRAPH COMPUTER DISPLAY SYSTEM

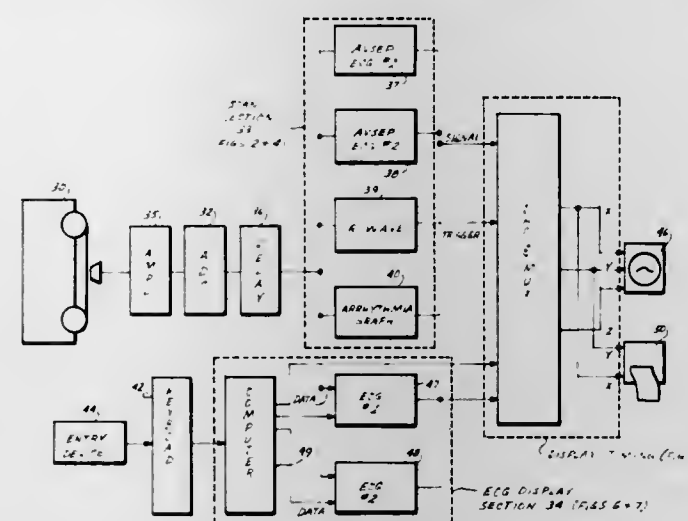
Continuation of Ser. No. 192,600, Sep. 30, 1980, abandoned. This application Apr. 21, 1982, Ser. No. 370,332

U.S. Cl. 128-712

### 30 Claims

1. A method of detecting apneic events comprising the steps of:

- sensing pressure in an in vivo respiratory system, negative pressure in said respiratory system being created by an attempt to inspire and nonnegative pressure in said system being indicative of noninspiration;
- generating a first fluid signal whenever nonnegative pressure occurs in said in vivo respiratory system, said first fluid signal having a duration related to the duration of said nonnegative pressure;
- applying said first fluid signal to an elastic capacitance device, said elastic device having a pre-determined maximum capacity for storing a volume of fluid substantially equal to a volume of fluid created by the continuous application of said first fluid signal for a predetermined time period;
- discharging said elastic capacitance whenever negative pressure occurs in said in vivo respiratory system and,
- activating a signaling means to indicate an apneic event whenever the pressure created in said elastic capacitance device by the continuous application of said first fluid signal for a time greater than the pre-determined time period exceeds the maximum capacity of the elastic capacitance device.



## MEDICO-SURGICAL INSTRUMENTS

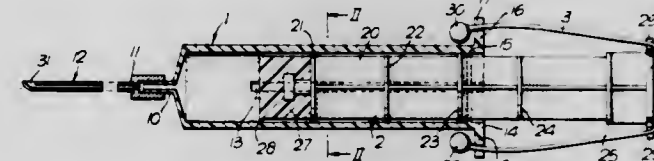
Filed Aug. 19, 1981, Ser. No. 294,126  
Claims priority, application United Kingdom, Sep. 12, 1980.

Claims priority, application United Kingdom, Sep. 12, 1986,  
8029617

Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128-747

## 7 Claims



representative of a sequence of tactile exploration of a plurality of points of said object;  
 recording on a suitable support a second sequence of signals provided by sensing means operative to sensing, at least one parameter representative of tactile sensation given by each of said plurality of points of said object, said sensing means being operatively moved in contact with said object, so as to reproduce spatially and temporally, the above mentioned sequence of tactile exploration;  
 applying simultaneously to a part of the body of said human subject, transducer means respectively operative to impart movement to said part of the body in response to said recorded first sequence of signals  
 to exert tactile stimuli to said part of the body in response to said recorded second sequence of signals.

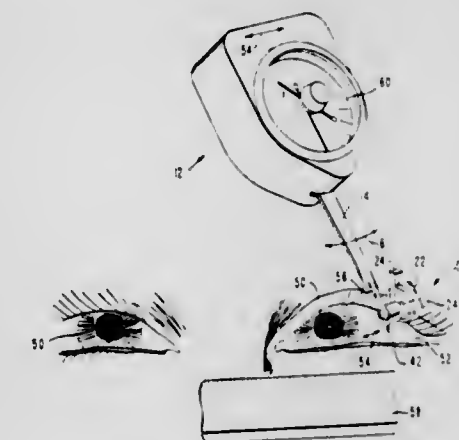
## OPHTHALMIC CLIP

Division of Ser. No. 137,682, Apr. 7, 1980. This application Jun. 7, 1982. Ser. No. 385,356

Int. Cl.<sup>3</sup> A61B 5/10

U.S. Cl. 128-782

### 5 Claims



1. A method for measuring torque on an eyeball to correct a strabismus condition, comprising the steps of:  
displacing the eyeball in a single plane by means gripping the eyeball's sclera to exert a force on the eyeball sufficient to correct the condition while isolating any forces outside the single plane from being exerted on the eyeball; and  
simultaneously with said displacing step, measuring the force exerted on the eyeball.

## METHODS AND APPARATUS FOR RECORDING AND OR REPRODUCING TACTILE SENSATIONS

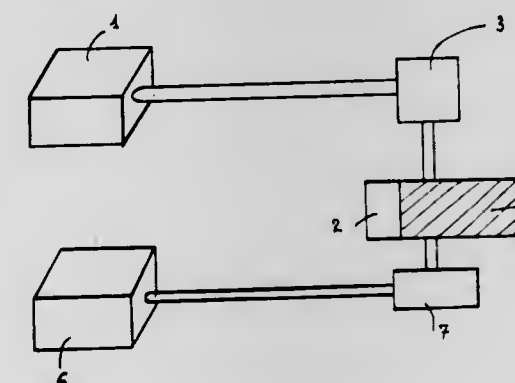
Filed Dec. 14, 1978. Ser. No. 969,295

Claims priority, application France, Dec. 19, 1977, 77 38181

Int. Cl.<sup>3</sup> A61B 5/10

U.S. Cl. 128-774

### 5 Claims



1. A method of providing to a human subject tactile sensation simulating the tactile exploration of an object, comprising the steps of:

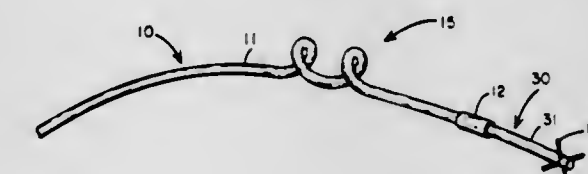
recording on a suitable support a first sequence of signals corresponding to spatial and temporal parameters, repre-

## BIOMEDICAL STIMULATION LEAD

U.S. Cl. 128—785 10 Claims

U.S. Cl. 128-785

## 10 Claims



1. A biomedical stimulation lead for insertion in an epidural space comprising:  
a lead body, having a distal end and a proximal end, including a conductor and an external casing made of pliable material generally inert to body fluids, the casing enclosing the conductor;



attachment means mounted adjacent the distal end of the lead body for attaching by fibrosis within the epidural space;  
 an exposed electrode mounted on the lead body spaced proximally away from the attachment means for stimulating within the epidural space, the electrode being conductively connected to the conductor; and  
 wherein the lead body is formed in a helix at a location proximally spaced from the electrode, the helix being generally coaxial with the lead body for bearing outward to hold the lead body within its position in the epidural space and for absorbing intermittent longitudinal pressure on the lead body in a proximal direction.

4,414,987

# PROCESS FOR INCREASING THE FILLING POWER OF TOBACCO LAMINA FILLER

Francis V. Utsch, Midlothian; Roger Z. de la Burde, Powhatan; Patrick E. Aument, and Henry B. Merritt, both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,814  
 Int. Cl.<sup>3</sup> A24B 3/18

U.S. Cl. 131—296

10 Claims

1. A single step process for increasing the filling power of tobacco lamina filler comprising contacting tobacco lamina filler with a heat transfer medium such that heat is rapidly and substantially uniformly transferred from the medium to the filler for a total contact time sufficient to stiffen and expand said filler, said filler being free of exogenous impregnants immediately before being contacted with said medium, having an OV value, immediately before being contacted with said medium, within the range of from about 8% to about 30%, and having an OV value, immediately after being contacted with said medium, of less than about 5%.

4,414,988

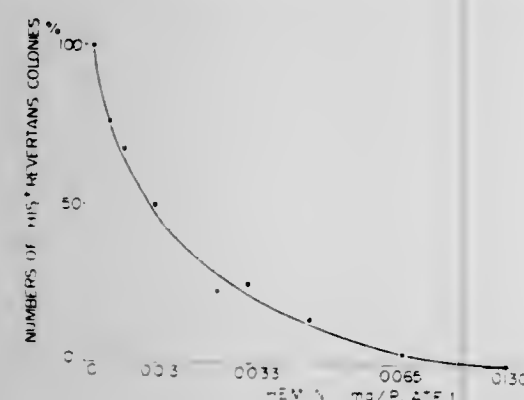
# TOBACCO SMOKE FILTER

Michiko Yagi, Tokyo, Japan, assignor to Kabushiki Kaisha Advance Kaihatsu Kenkyujo, Nihonbashi, Japan  
 Filed Aug. 21, 1981, Ser. No. 294,991

Claims priority, application Japan, Aug. 23, 1980, 55-116144  
 Int. Cl.<sup>3</sup> A24D 3/00, 3/14, 3/16

U.S. Cl. 131—334

10 Claims



1. A tobacco smoke filter comprising an aqueous solution of at least one compound having a metallic ion binding protoporphyrin ring structure as a removal agent of carcinogenic substances from tobacco smoke, and a porous carrier or container therefore, said compound in the aqueous solution being present at a concentration ranging from 0.1 to 20 mM, said concentration being sufficient for effectively removing said carcinogenic substances from the tobacco smoke.

4,414,989

# IMPACT FILTER FOR TIPPED CIGARETTES

Miguel S. Moragrega, Diagonal 523, 11<sup>a</sup>, F (Atalaya), Barcelona, Spain

Filed Sep. 29, 1981, Ser. No. 306,814  
 Int. Cl.<sup>3</sup> A24D 1/04, 3/04

U.S. Cl. 131—339

1 Claim



1. An impact filter for tipped cigarettes, characterized in that it comprises a cylindrical chamber, of somewhat hard and transparent material, the diameter whereof is equal to that of the cigarette, which has coupled thereto a lower base with a series of very small peripheral orifices, their diameters being oriented perpendicularly to the flow of smoke, in order to impart greater velocity to the smoke which passes through them on being inhaled by the smoker and therefore make it impinge with greater force against the inner surface of an upper base of the mentioned chamber, which chamber is not very high in relation to its diameter, so that the mentioned impingement is as intense as possible and the smoke is thus rejected by the impact and directed against the inner surface of the aforementioned lower base, a large portion of the tar contained in the cigarette smoke thus being deposited on both of said bases, the smoke then ascending again, as a result of the suction to which it is subjected, to emerge from the chamber through a downward tubular orifice provided in the centre of the upper base thereof, the chamber being located between two portions of conventional absorbent material, the chamber and portions being connected by a likewise conventional wrapping, so that the specified unit presents the aspect of the filters usually incorporated by tipped cigarettes.

4,414,990

# FLUORIDATED DENTAL ARTICLES

Kevin G. Yost, Short Hills, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Apr. 2, 1982, Ser. No. 364,716  
 Int. Cl.<sup>3</sup> A61C 15/00

U.S. Cl. 132—91

15 Claims

1. A fluoridated dental article comprising: a plurality of filaments of a substrate material formed into a thread having a diameter which permits insertion between the teeth; a wax coating substantially covering said thread and; a polymeric coating including a fluoride salt substantially covering said wax coating.

4,414,991

# APPARATUS FOR USE IN CUTTING HAIR

Bernadine A. Marcotte, 10515 Prouty Rd., Painesville, Ohio 44077

Filed Sep. 16, 1982, Ser. No. 418,754  
 Int. Cl.<sup>3</sup> A45D 24/36

U.S. Cl. 132—45 R

9 Claims

1. An apparatus for use in cutting hair to a nonlinear pattern in which the length of the hair varies, said apparatus comprising first and second panels, each of said panels having major sides extending between a first edge portion and a nonlinear pattern edge portion, said pattern edge portion on each of said panels including surface means for guiding a device to cut hair

along a nonlinear path, said pattern edge portion on said first and second panels having the same configuration with crests projecting outwardly away from the first edge portions and troughs between the crests, said surface means on each of said panels being disposed along the outer edges of said crests and troughs to guide cutting of the hair at the crests and troughs with the hair cutting device, and connector means interconnecting said first and second panels for enabling said panels to move between an open condition in which the major sides of said panels are spaced apart so that hair can be positioned between said panels and a closed condition in which a first major side of said first panel is disposed in a side-by-side rela-



tionship with a first major side of said second panel with hair between the first major sides of said first and second panels, said crests of the pattern edge portion on said first panel being aligned with said crests of the pattern edge portion on said second panel and said troughs of the pattern edge portion on said first panel being aligned with said troughs of the pattern edge portion on said second panel when said panels are in the closed condition to enable said surface means to guide the hair cutting device to cut the hair disposed between the major sides of said first and second panels along a nonlinear path extending along the crests and troughs of the pattern edge portions on said first and second panels.

4,414,992

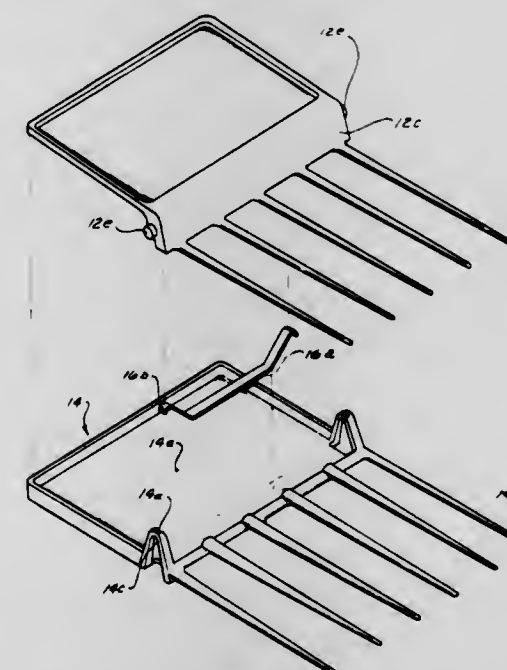
# HAIR FLUFFING DEVICE

Joseph W. Russell, 9465 Hobart Ave., Los Angeles, Calif. 90047  
 Filed Mar. 29, 1982, Ser. No. 351,194

Int. Cl.<sup>3</sup> A45D 24/06

U.S. Cl. 132—129

4 Claims



1. A hair fluffing device, insertable in the hair, comprising: (a) a first comb including a holding part with teeth extending therefrom, wherein said teeth all lie in a single plane; (b) a second comb including a holding part with teeth extending therefrom and lying substantially in a single plane, wherein said second comb is pivotally interconnected with said first comb such that in the normal, unstressed condition the lengths of the teeth of said first comb sub-

stantially occupy the space formed along and between the lengths of the teeth of said second comb;  
 (c) resilient means mounted between the holding parts of said first and second combs causing the teeth of each of said combs to separate when pressure is exerted on said holding parts of said combs.

4,414,993

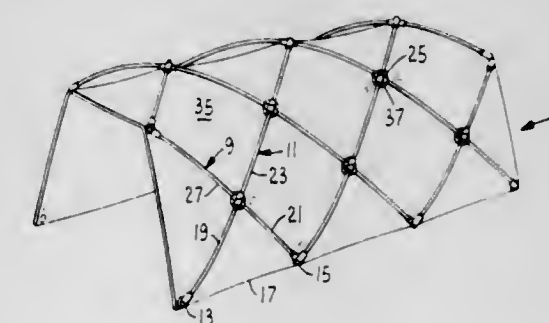
# FLEXIBLE VAULT STRUCTURE HAVING MULTIPLE PIECE POLES

Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

Continuation-in-part of Ser. No. 290,661, Aug. 6, 1981, abandoned. This application Oct. 29, 1981, Ser. No. 316,089 The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.  
 Int. Cl.<sup>3</sup> A45F 1/16

U.S. Cl. 135—104

4 Claims



1. A vault structure having an arcuate shape in cross section and a generally rectangular shape in plan, said vault structure extending from a plane and having no member from side-to-side in said plane comprising in combination:

- a plurality of rod-like members,
- each of such rod-like members being held in tension by stress means and thereby formed into a generally arcuate shape, and a plurality of said rod-like members extending from the level of the plane on one side, over the top of the arcuate structure to the level of the plane on the opposite side,
- said stress means comprising a flexible member attached to said rod-like members at a plurality of points,
- said stress means forming a plurality of geometric cords with respect to said arcuate rod-like members and,
- at least some of said rod-like members consisting of short members having connectors for connecting said short members in end to end relationship.

4,414,994

# EARTHQUAKE FIRE SAFETY SYSTEM

Roderick D. Hogan, 22487 Fuller Ave., Hayward, Calif. 94541  
 Filed Nov. 18, 1981, Ser. No. 322,522

Int. Cl.<sup>3</sup> F16K 17/36

U.S. Cl. 137—38

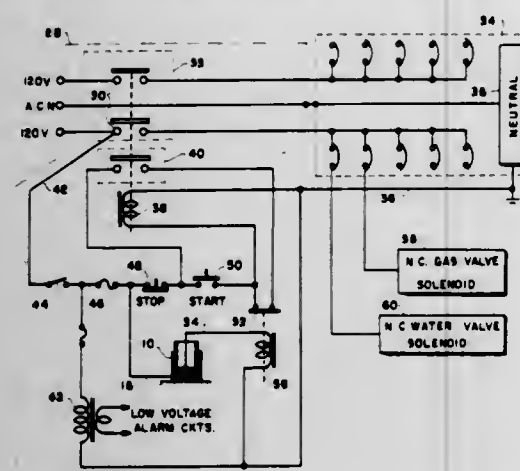
7 Claims

1. A safety system for instantaneously switching off electricity upon occurrence of a shock of predetermined magnitude, said system including:

- a power distribution box having an input terminal and a plurality of electric output terminals;
- an electrical power contactor connected into the electrical path between input power terminals of the safety system and said distribution box input terminals, the contacts of said contactor being closed by current flow through a first electrical winding and being opened by current flow through a second electrical winding; and
- an adjustable shock-sensitive switch coupled between one of said input power terminals and said second electrical winding, said shock-sensitive switch comprising: a vertical tubular non-conductive housing having a first electrical conductor overlying the internal floor



thereof, said conductor being a first electrical terminal of said switch;  
 an electrically conductive fluid within said non-conductive housing, said fluid overlying said first electrical conductor;  
 a core member vertically slidable within the bore of said housing, said core member having an electrically con-



ductive floor providing a second electrical terminal of said switch, the bottom surface of said electrically conductive floor being spaced from the top surface of said conductive fluid; and  
 means coupled between said core member and said housing for clamping said member and said housing against relative vertical movement.

4,414,995

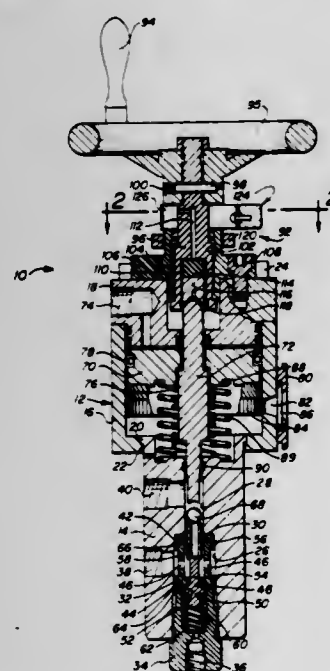
**THREE-WAY HYDRAULIC CONTROLLER**

Larry K. Spencer, 1204 Tappan Cir., Carrollton, Tex. 75006  
 Filed Apr. 8, 1982, Ser. No. 366,605

Int. Cl.<sup>3</sup> F16K 13/04

U.S. Cl. 137-77

12 Claims



4. A three-way control valve comprising:  
 a body having a supply port, a valve port, an exhaust port and a pilot port for receiving a pilot pressure therein;  
 valve element means disposed in said body for movement between a position to block fluid flow through the supply port while permitting fluid communication between the valve and exhaust ports and a position to permit fluid communication between the supply and valve ports while blocking fluid flow through the exhaust port;  
 means disposed in said body for urging said valve element means to the position with fluid flow through the supply

port being blocked while permitting fluid communication between the second and third ports;  
 means disposed within said body for acting against said urging means to move said valve element means to the position with the supply port being in fluid communication with the valve port while blocking fluid flow through the exhaust port in response to pilot pressure; and  
 override means connected to said body for overriding said urging means to place the supply port in fluid communication with the valve port, said override means including heat responsive means for permitting said urging means to move said valve element means to prevent fluid communication between the supply and valve ports whenever said controller is subjected to elevated temperatures even though said override means is positioned to place the supply port in fluid communication with the valve port.

4,414,996

**SYSTEM FOR AUTOMATICALLY DISPENSING LIQUID CHEMICALS INTO AN INTERMITTENTLY FLOWING LIQUID STREAM**

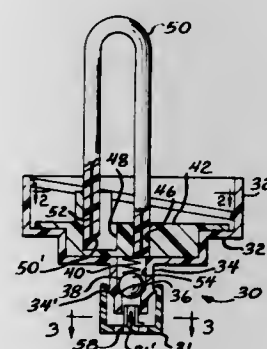
Peter P. Klepa, Los Angeles, Calif., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 13, 1981, Ser. No. 310,018

Int. Cl.<sup>3</sup> G05D 11/02

U.S. Cl. 137-101.27

7 Claims



1. An apparatus for dispensing a liquid chemical into an intermittently flowing liquid stream contained in a feeder chamber housing having an inlet opening for receiving said liquid stream and an outlet opening in the form of a siphon tube which is positioned within the chamber so as to intermittently empty substantially all of the liquid in the chamber when the level of the liquid reaches a predetermined maximum elevation, said apparatus comprising mounting means for mounting an inverted container of a liquid chemical on an upper surface of the feeder chamber housing; valve means on said container having an actuating portion extending into said feeder chamber; means mounted in said feeder chamber for actuating said actuating portion of said valve means in response to the liquid in said feeder chamber reaching, or at least closely approaching, said predetermined maximum elevation; said valve means having a metering chamber sized to contain substantially the quantity of liquid chemical which is to be dispensed upon each actuation of the actuating portion; said metering chamber being selectively sealed at its lower end by a sealing means which is controlled by said actuating portion; said metering chamber having its upper end in communication with the liquid in said inverted container by means of an inverted U-shaped capillary siphon tube, said capillary siphon tube serving to slowly fill said metering chamber following each actuation of the actuating portion to empty the chamber.

4,414,997  
SIPHON

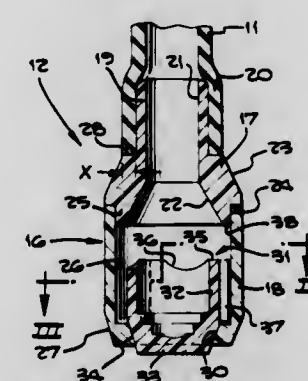
Jeff A. Jacobson, 22 Woodgrove, Irvine, Calif. 92714, and Louis G. Valle, 7283 Pennway, Stanton, Calif. 90680

Filed Jun. 27, 1980, Ser. No. 163,708

Int. Cl.<sup>3</sup> F04F 10/00

U.S. Cl. 137-151

2 Claims



1. In a self-contained portable siphon having a flexible tubing and a valve, said valve having a freely movable valve element therein, said valve comprising a valve body having a throughbore with a valve seat in the bottom wall thereof, said valve element having a bottom wall substantially conforming to said valve seat to provide a generally fluid tight seal between said element and said seat, the improvement which comprises:

said valve seat having tapered walls;

said valve element being loosely disposed in said valve and consisting of a generally cup-shaped body having a throughbore closed off by an imperforate bottom wall integral with an imperforate peripheral side wall tapered similarly to the tapered walls of said valve seat and spacing means including a plurality of spaced fins extending along the outer wall of said cup-shaped body in a direction generally parallel to the longitudinal axis thereof spacing said cup-shaped body away from the inner wall of said valve body thereby forming a cup-shaped cavity on said element adapted to hold fluid therein whereby fluid entering said valve body enters the cavity in said element and weighs down said element into said valve seat pressing the tapered side wall of said element against the tapered wall of said valve seat to provide said seal;

stop means on the inner wall of said valve body for stopping upward movement of said valve element including an inner flange in said valve body surrounding said throughbore for stopping upward movement of said valve element and wherein said element includes an upper peripheral wall and the outer diameter of the wall of said element is substantially as large as the area of said throughbore at said inner flange whereby said element abuts against the inner flange when it moves upwardly thereagainst; and

a plurality of spaced arcuate-shaped cut-out areas in said element about the periphery of the upper wall thereof providing fluid flow past said element through said cut-out areas and into said tubing.

4,414,998

**AIR GAP SYSTEM TO MAINTAIN PURE LIQUID SUPPLIES**

Helmut Rudler, York, and Ralph J. Williams, New Oxford, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Aug. 11, 1981, Ser. No. 291,893

Int. Cl.<sup>3</sup> E03C 1/10; F16K 24/00; F16L 55/07

U.S. Cl. 137-216

5 Claims

1. An air gap unit and system comprising in combination:

a. a housing;

b. a reservoir in said housing of less area than said housing and extending upward from the bottom of the housing and

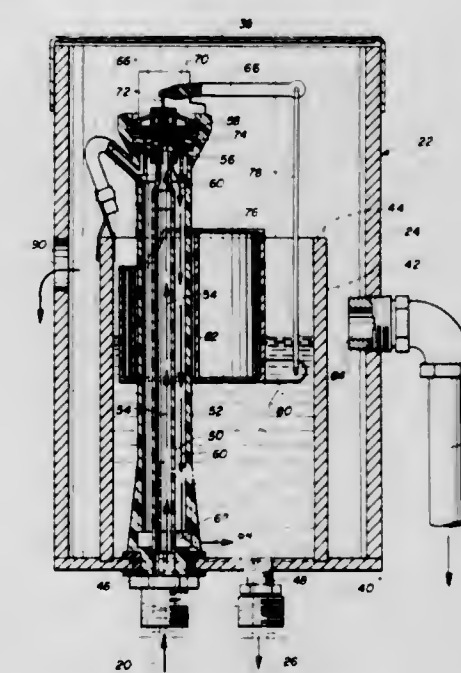
terminating a predetermined distance from the top of said housing;

c. a coaxial pair of inner and outer tubes of different diameters nested in said housing and extending vertically from the bottom of said housing, the upper ends of said tubes extending a predetermined distance substantially above the top of said reservoir;

d. first conduit means extending from the lower end of said inner tube to a municipal fresh water supply;

e. second conduit means connectable to the bottom of said reservoir for delivery of fresh water from said reservoir to a mechanism requiring the same;

f. a flow control valve at the upper end of said coaxial tubes to control the flow of water from said top of the inner tube to the top of the outer tube;



g. the lower end of the outer tube having fresh water discharge opening means to permit the flow of fresh water therefrom into said reservoir;

h. a float operable vertically in said reservoir and connected to said valve for operation thereof to determine a normal level of fresh water in said reservoir;

i. said housing having in one sidewall thereof at a level substantially below the top of said reservoir an outlet to a drain to prevent accidentally filling the housing with water in the event of a malfunction of the system; and

j. an air gap opening in one wall of said housing at a level above that of said outlet in said housing but no higher than the top of said reservoir to permit overflow water from said reservoir to discharge from said housing in the event of a malfunction of said outlet.

4,414,999

**CONTINUOUS FLUSHING DEVICE**

Michael I. Basta, 503 N. Roosevelt Blvd. - Apt. A314, Falls Church, Va. 22044

Filed Dec. 12, 1980, Ser. No. 215,870

Int. Cl.<sup>3</sup> F16K 51/00

U.S. Cl. 137-240

18 Claims

1. A flow regulating assembly for providing a continuous regulated small-volume flow of medical fluid to a catheter system for monitoring hemodynamic functions and for providing an intermittent operator-controlled large-volume flushing flow of the fluid to the catheter system, said assembly comprising:

a housing;

means defining a fluid inlet passage to said housing;

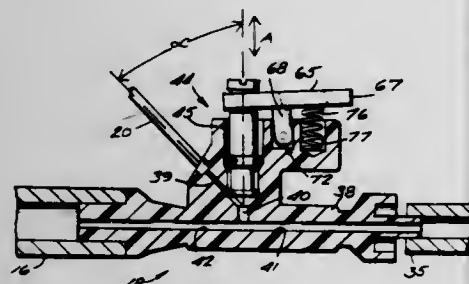
means defining a fluid outlet passage from said housing directly intersecting with said fluid inlet passage;

a fluid flow-occluding member;

means for mounting said fluid flow-occluding member in



said housing for movement from a first position wherein said flow-occluding member is generally at the intersection of said inlet and outlet passages and wherein fluid flow between said fluid inlet and fluid outlet passages is occluded, to a second position wherein said flow-occluding member is moved out of the path of fluid flow from said inlet passage to said outlet passage so that intersecting imaginary straight lines extending in said inlet passage and said outlet passage do not intersect any portion of said flow-occluding member so that said flow-occluding mem-



ber introduces substantially no turbulence in a flushing flow of fluid from said inlet passage to said outlet passage which takes place with said flow-occluding member in said second position; and means defining a restricting passage in said flow-occluding member so that when said member is in said first position in a small-volume continuous regulated flow of fluid from said inlet passage through said occluding member to said outlet passage takes place even when said flow-occluding member is in said first position.

4,415,000

## T-JOINT FITTING

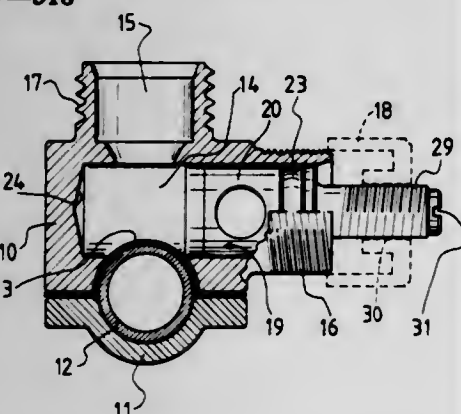
Gert O. Ödmann, Askim, Sweden, assignor to Gotaverken Motor U.S. Inc., Southfield, Mich.

Filed May 17, 1982, Ser. No. 379,156

Int. Cl.<sup>3</sup> F16K 43/00

U.S. Cl. 137—318

3 Claims



1. A T-joint fitting comprising a housing having a first part and a second part, cooperating recesses in said parts which when said parts are fitted together form a cavity to receive a portion of a transport pipe, aligned bores in said first and second parts to receive fastening bolts on each side of said transport pipe, fastening bolts in said bores for clamping said first and second housing parts together with said pipe therebetween, an operating passage in said first housing part extending substantially transversely to the longitudinal axis of said transport pipe, an externally threaded portion on said first housing part extending colinearly with respect to said passage, a second passage communicating with said first passage and terminating in a portion of said first housing part adapted to receive a branch pipe, a piston member slidably disposed within said operating passage, a transverse flow passage extending through said piston member, a cutting means on the end of said piston

member facing said pipe for cutting through the wall of said transport pipe when said piston is moved inwardly, a screw threaded bar on the opposite end of said piston member extending outwardly therefrom and coaxially with respect to said externally threaded portion, a packing of elastomeric material of sufficient size to be clamped between said first and second housing parts at the bolts clamping said housing parts about said transport pipe and to cover that part of said transport pipe fitting into the part of said cavity located in said first housing part, said packing having a waffle-textured surface on the side engaging said transport pipe, and an actuating means comprising a nut having an internal screw thread cooperatively engaging said externally threaded portion of said first housing part and an internal screw threaded bore cooperatively engaging said screw threaded bar, the screw threads of said bar and of said externally threaded portion having the same pitch, but being oppositely handed so that rotation of said nut onto said externally threaded portion displaces said piston member in said operating passage to cut through said packing and the wall of said transport pipe.

4,415,001

## PRESSURE RISE RATE LIMITER VALVE

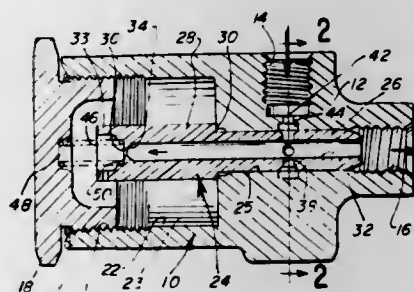
Preben Kent, Altadena, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 24, 1981, Ser. No. 257,225

Int. Cl.<sup>3</sup> F16K 31/12

U.S. Cl. 137—497

6 Claims



1. A pressure rise rate limiter valve, comprising: a housing having an elongate bore axially aligned with an enlarged opening defining a cavity in communication with said bore, said housing having an axially extending outlet port communicating with said bore at the end of the bore opposite to said cavity, a radially extending inlet port in said housing between said cavity and said outlet port and communicating with said bore, a valve spool slidably mounted in said bore and having an axially extending passageway communicating with said axially extending outlet port, an axially facing internal shoulder in the passageway at the end of the passageway remote from said outlet port, said shoulder having a restricted orifice formed therein in communication between said passageway and said cavity, said spool having radially directed feeder ports located between said outlet port and said shoulder communicating with said axial passageway in said spool, said feeder ports being selectively alignable with said inlet port in said housing, and resilient means for urging said spool into position to align the feeder ports with said inlet port, said resilient means being located in said cavity and bearing against the end of said spool containing said restricted orifice, whereby a sudden increase in pressure of a fluid connected to the inlet port or the outlet port causes the fluid to contact the shoulder surrounding the orifice in the passageway to move the spool axially against the resilient means to decrease or to cut off the fluid flow between the inlet port and the feeder

ports, said fluid in the passageway bleeds through the orifice into the cavity to increase the pressure in the cavity which pressure combines with the urging of said resilient means to gradually move the spool toward the original position as the fluid pressure in the cavity approaches an equilibrium with the fluid pressure in the passageway in the spool, wherein the feeder ports and inlet port will gradually realign until full fluid flow is directed through the passageway and through the outlet port.

4,415,002

## HYDRAULIC CONTROL APPARATUS

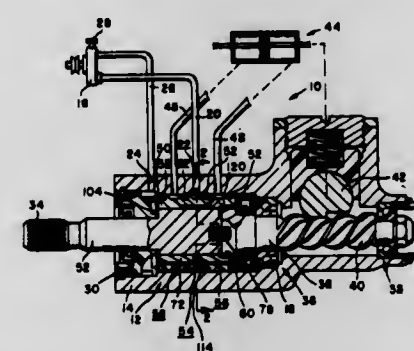
Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 8, 1981, Ser. No. 271,295

Int. Cl.<sup>3</sup> F15B 9/08

U.S. Cl. 137—625.23

14 Claims



1. Hydraulic control apparatus comprising a rotatable sleeve member defining a bore receiving a relatively rotatable member, said members defining axially extending grooves, said grooves in registry cooperating to define an axially extending aperture, said aperture movably receiving an elongated pin coupling said members for rotation in unison, said pin and said members cooperating to define a pair of fluid flow paths adjacent said pin for communicating pressurized fluid through said apparatus, characterized by said sleeve member and said pin cooperating to define a pressure chamber, and passage means for communicating pressurized fluid from said pair of flow paths to said pressure chamber, the axially extending groove in said sleeve member includes radially extending walls which are substantially parallel, said elongated pin including a portion which is received in the axially extending groove in said sleeve member, said portion including surfaces which are substantially parallel.

4,415,003

## CONTROL OF FLUID FLOW USING A FLEXIBLE DISC

Joseph R. Paradis, Holden, and Edward W. Kaleskas, Jefferson, both of Mass., assignors to Nypro Inc., Clinton, Mass.

Continuation-in-part of Ser. No. 235,668, Feb. 18, 1981, Pat. No. 4,369,812, which is a continuation-in-part of Ser. No. 50,823, Jun. 21, 1979, Pat. No. 4,286,628. This application Aug. 27, 1981, Ser. No. 297,057

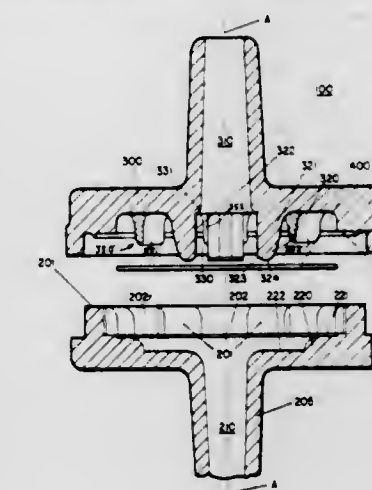
Int. Cl.<sup>3</sup> F16K 15/14

U.S. Cl. 137—843

7 Claims

1. A flow control device comprising: a housing; a control channel in said housing extending to a flow channel; a flexible disc on a valve seat in said control channel; means for prebiasing said flexible disc comprising a set of prongs for engaging a central portion of said disc and being separated by passageways that extend to said flow channel; and

a segmented ring surrounding said flow channel to prevent said flexible disc from overflexing when said device is



4,415,004

## PNEUMATIC SWITCH

Daniel Bouteille, Michel Nicholas, Eric Petrimaux, and Pierre Prudhomme, all of Nanterre, France, assignors to La Telemecanique Electrique, France

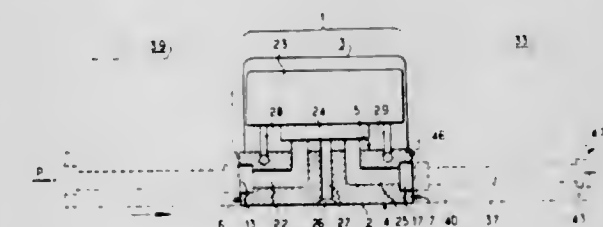
Filed Dec. 1, 1980, Ser. No. 211,964

Claims priority, application France, Nov. 30, 1979, 79 29820

Int. Cl.<sup>3</sup> F15B 13/07

U.S. Cl. 137—884

8 Claims



1. In the assembly of a switching unit (1) and a distributor unit (33), the distributor unit having a feed entry (40) and the switching unit having a body (2-3) which has first (4) and second (5) parallel faces and comprises: (i) an entry (13) and an outlet (17) for fluid under pressure, an exhaust (27) and a control entry (18 or 19); (ii) a distributing means (23) adapted to couple this outlet (17) selectively to said entry (13) and to said exhaust (27), as a function of the absence or the presence of a control signal applied to said control entry (18 or 19), the said outlet (17) for fluid under pressure being in communication with the said feed entry (40) of the distributor unit (33); the improvement which consists in that: (A) the distributor unit (33) has: (a) first (46) and second (47') opposed parallel faces and first (50-50') and second (49-49') coupling means on the said first (46) and second (47') parallel faces; (b) at least first (37) and second (34) parallel channels each having a first orifice (40-44) on the first face (46) and a second orifice (43-47) on the second face (47'), said first and second channels passing through the said distributor unit, for circulation of a fluid under pressure and of an exhaust fluid respectively, the first orifice (40) of the first channel (37) constituting the said feed entry of the distributor unit; (B) the body of the switching unit (1) has third (6) and fourth (7) parallel and opposed faces which are substantially at right angles to the first (4) and second (5) parallel faces of the said body and on which are respectively disposed the



said entry (13) and the said outlet for fluid under pressure (17) of the switching unit;

(C) a channel (30) for circulation of an exhaust fluid disposed in said body opens on the third and on the fourth face of the body through respective first (10) and second (14) exhaust orifices;

(D) further second coupling means (45-48) on the fourth face (7) of the said body, said further second coupling means being adapted to cooperate with the first coupling means (50-50') of the distributor unit when the first face of the distributor unit is placed against the fourth face of the said body, the said outlet (17) of the switching unit being then coupled to the said first orifice (40) of the first channel and the said second exhaust orifice (14) of the switching unit being coupled to the said first orifice (44) of the second channel of the distributor unit.

4,415,005

## PIPE THREAD PROTECTOR DEVICE

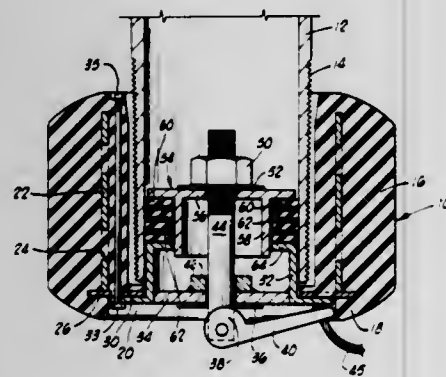
Harlo W. Janzen, Box 356, Fairview, Okla. 73737

Filed Jul. 27, 1981, Ser. No. 287,499

Int. Cl.<sup>3</sup> F16L 57/00

U.S. Cl. 138—96 T

9 Claims



1. A device for protecting pipe threads comprising: an annular elastomeric sleeve dimensioned to surround a pipe thread to be protected;

stop means connected to an end of said sleeve for limiting axial movement of the sleeve on a pipe; and

a radially expandable internal gripping subassembly carried on said stop means, and extending into said annular elastomeric sleeve from said end thereof for gripping the inner surface of a pipe upon which said thread protector device is mounted, said gripping subassembly comprising:

a pair of radially expandable, elastomeric gripping elements each constituting a compression disc, and each having a convexly curved surface facing the other of said elastomeric gripping elements;

a rigid compression plate having said elastomeric gripping elements disposed on opposite sides thereof with the convexly curved surfaces of the gripping elements in contact with said compression plate, said rigid compression plate having a central aperture therethrough;

a compression shaft extending through the center of said radially expandable elastomeric gripping elements and through the central aperture in said rigid compression plates;

means adjacent an end portion of the compression shaft for transmitting axial movement from the compression shaft to said gripping elements; and

manually operable camming arm means connected to the compression shaft and operative to cam the compression shaft into axial movement upon actuation of the camming arm means;

a pair of guide posts each having one end secured to said stop means and projecting in an axial direction therefrom through said compression discs and said compression plate;

a pair of spacer tubes around said guide posts and each having an end bearing against said stop means; and a back-up plate bearing against the ends of said spacer tubes opposite their ends which bear against said stop means, and flatly abutting the one of said compression discs closest to said stop means.

4,415,006

## MARKER SLEEVES

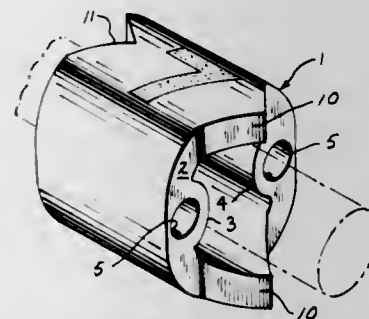
Joseph C. Barbieri, Cedarburg, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Dec. 26, 1978, Ser. No. 972,934

Int. Cl.<sup>3</sup> F16L 11/12

U.S. Cl. 138—115

6 Claims



1. In a marker sleeve of slightly elastic material of the type comprising an outer wall defining a tubular body which is to be positioned about an article and a plurality of inner webs each secured at its ends to the outer wall and extending longitudinally along the interior of the tubular body for engagement with an article to which the marker sleeve is applied, the improvement wherein:

(a) the plurality of inner webs are equally spaced from one another about the interior of the tubular body,

(b) each inner web is separated from its respective overlying portion of the outer wall by a longitudinally extending aperture of circular, oval, rectangular or triangular cross section, and

(c) the inner webs have an initial position wherein they extend radially inwardly of the tubular body and a second position assumed upon engagement with an article in which they straighten relative to their initial position and stretch their respective overlying portion of the outer wall to provide for firm engagement of the sleeve with an article to which it is applied.

4,415,007

## APPARATUS FOR EFFECTING BACK-AND-FORTH MOVEMENT OF A GUIDE SYNCHRONOUSLY WITH THE INTERMITTENT ROTARY MOVEMENT OF A SHAFT

Walter Kleiner, Hirzel-Zuerich, Switzerland, assignor to Staebli Ltd., Horgen-Zuerich, Switzerland

Filed Aug. 11, 1981, Ser. No. 292,106

Claims priority, application Switzerland, Aug. 18, 1980, 6203/80

Int. Cl.<sup>3</sup> D03C 1/24, 1/22, 3/34

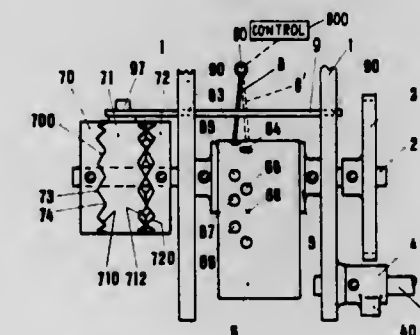
U.S. Cl. 139—329

8 Claims

1. In an apparatus which includes a rotatably driven shaft, a member supported for movement in a direction which is approximately parallel to said shaft, and means for effecting back-and-forth movement of said member in synchronism with rotational movement of said shaft, the improvement comprising first and second spaced outer disks fixedly supported on said shaft and a central disk axially slidably supported on said shaft and fixed against rotation therewith, said member being secured to said central disk, said first and second disks each having on an axially inwardly facing surface thereof an annular tooth system which is concentric to said shaft, and said central disk having on each of two axially facing surfaces thereof an

annular tooth system which is concentric to said shaft, the angular spacing between adjacent teeth of each said tooth system being a common, predetermined value, said tooth systems on said outer disks being angularly aligned and said tooth systems on said central disk being angularly offset with respect to each other by half said predetermined value.

8. A dobby for controlling a weaving machine, comprising a rotatably driven shaft; a drive cylinder fixedly and coaxially supported on said shaft for rotation therewith; a pattern card extending over and operatively driven by rotation of said drive cylinder, said pattern card having axially spaced first and second rows of control points extending therealong substantially in the direction of movement thereof and having perforations at a plurality of said control points; an elongate guide member spaced from and extending substantially parallel to said shaft and drive cylinder, having an opening therethrough, and supported for movement in a direction generally parallel to said drive cylinder and shaft between first and second positions; a reading needle supported for lengthwise movement



toward and away from said pattern card approximately normal thereto, the end of said reading needle nearest said pattern card extending slidably through said opening in said guide member; said end of said reading needle being aligned axially with said first and second rows of control points when said guide member is respectively in said first and second positions; means defining first and second annular, axially spaced tooth systems which are coaxial with and fixed against rotation relative to said shaft and which each include a plurality of angularly spaced teeth, means defining a first tooth and a second tooth on said guide member which are respectively engageable with teeth of said first and second tooth systems when said guide member is in said first and second positions, engagement of said first tooth with a tooth of said first tooth system in response to rotation of said shaft and tooth systems causing said guide member to be moved from said first position to said second position, and engagement of said second tooth with a tooth of said second tooth system in response to rotation of said shaft, and tooth systems causing said guide member to be moved from said second position to said first position.

4,415,008

## DEVICE FOR MONITORING THE WEFT THREAD TRAVEL ON AN AIR JET WEAVING MACHINE

Hans-Peter Keller, Oberdürnten, and Max Bossard, Dürnten, both of Switzerland, assignors to Loepfe Brothers Limited, Wetzikon, Switzerland

Filed Sep. 14, 1981, Ser. No. 301,652

Claims priority, application Switzerland, Oct. 14, 1980, 7648/80

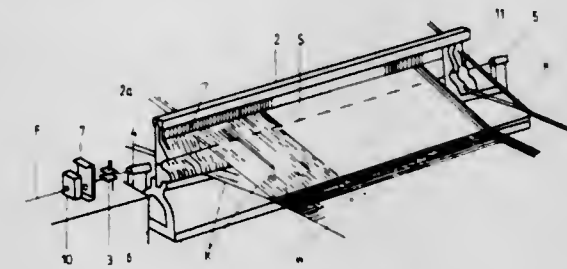
Int. Cl.<sup>3</sup> D03D 51/34

U.S. Cl. 139—370.2

6 Claims

1. In a device for monitoring the weft thread travel on an air jet weaving machine which is provided with a lathe beam and a reed fixed thereon, an air jet for inserting the weft thread, and weft thread receiving means comprising suction means, said device comprising an optoelectrical weft thread sensor including a measuring area and arranged at the reed such that the measuring area is crossed by the path of the weft thread travel, the improvement which comprises:

a tactile weft thread travel sensor arranged at the machine upstream of the air jet; a start pulse generator controlled by the weaving machine; the optoelectrical sensor being located near the end of the reed adjacent the weft receiving means; and



electronic circuitry controlled by said start pulse generator and optoelectrical sensor for producing an activating signal defining the time interval during which the weft thread travel is monitored.

4,415,009

## WEFT INSERTING DEVICE FOR PNEUMATIC WEAVING LOOMS

Henry A. Shaw, Ieper, Belgium, assignor to N. V. Weefautomaten Picanol, Belgium

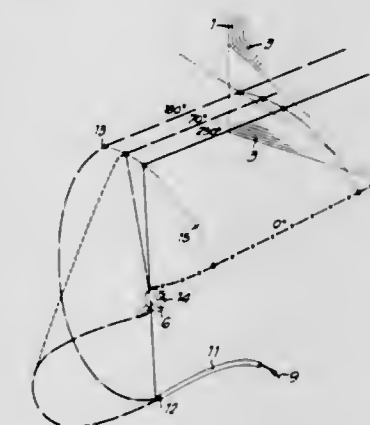
Filed Oct. 15, 1981, Ser. No. 311,643

Claims priority, application Belgium, Oct. 15, 1980, 58806

Int. Cl.<sup>3</sup> D03D 47/29, 47/34

U.S. Cl. 139—435

5 Claims



1. Weft inserting device for pneumatic weaving looms, of the type comprising a yarn pulling off mechanism, a first air jet nozzle next to an edge of the warp, and a clamp which is located between these two last named components, this clamp being cyclically controlled to clamp the yarn at the end of the insertion of a weft until the beginning of the insertion of the next weft, characterized in that the mutual geometrical positions of the yarn pulling off mechanism and of the clamp are selected in relation to the position of the first air jet nozzle so that the yarn completely leaves the clamp whilst the latter is open.

4,415,010

## RETRACTOR APPARATUS FOR A WEFT-INSERTING PROJECTILE IN A WEAVING MACHINE

Gerd Schmitz, Sulz, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 20, 1981, Ser. No. 313,175

Claims priority, application Switzerland, Oct. 24, 1980, 7930/80

Int. Cl.<sup>3</sup> D03D 47/24

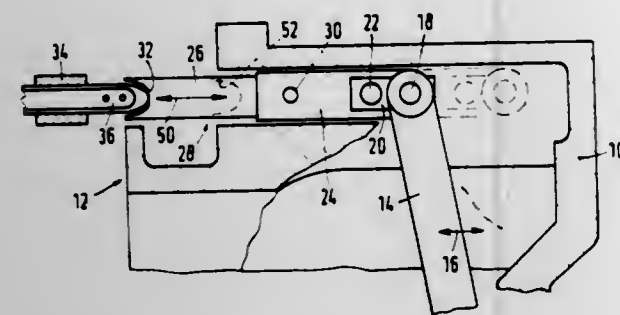
U.S. Cl. 139—439

9 Claims

1. In a weaving machine, the combination comprising a retractor having a stop surface for abutting a weft-inserting projectile;



a retractor lever connected to said retractor for moving said retractor; and



at least one elastically yielding and damping body of annular shape between said stop surface and said lever, said body having an elasticity at least three times greater than that of steel.

4,415,011

## SAMPLE COLLECTOR

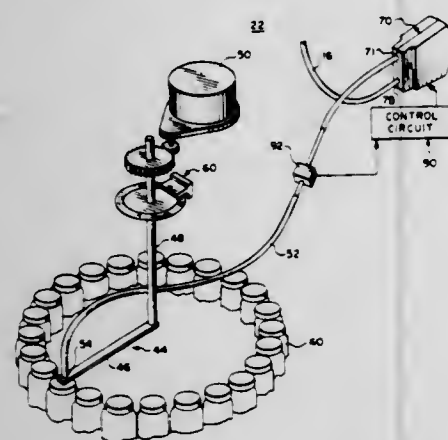
Douglas M. Grant, Lincoln, Nebr., assignor to ISCO, Inc., Lincoln, Nebr.

Filed Nov. 2, 1981, Ser. No. 316,979

Int. Cl.<sup>3</sup> B65B 3/04; B67C 3/28

U.S. Cl. 141-284

10 Claims



1. A sample collector for transferring liquid from a body of liquid to plurality of containers comprising:  
a conduit means having a flow passage, an inlet port and an outlet port;  
said inlet port being adapted to be inserted in a body of liquid;  
means for positioning said outlet port sequentially over certain of said plurality of containers, whereby samples of said liquid may be inserted into said containers;  
pump means operatively coupled to said conduit means for selectively pumping liquid through said flow passage between said inlet port and said outlet port for insertion into said different ones of said plurality of containers;  
control means coupled to said pump means for controlling the pumping operation thereof;  
detection means operatively coupled to said conduit means at a predetermined position between said pump means and said outlet port for detecting the presence of a liquid interface within said conduit means at said position and providing a signal representative thereof; and  
said control means including means for controlling the volume of liquid pumped through said conduit means by said pump means from the time said interface signal is received, whereby a predetermined volume of liquid is applied to said selected container.

4,415,012

## RUCKSACK ASSEMBLY

Herbert Böse, Am Dachsbad 9, Bad Soden, Neuheim, Fed. Rep. of Germany (D - 6239)

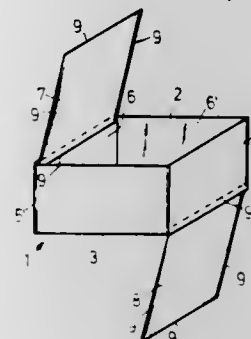
Filed Sep. 24, 1981, Ser. No. 305,150

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036258

Int. Cl.<sup>3</sup> A45F 3/08; B65D 30/22, 33/16

U.S. Cl. 150-51

3 Claims



1. A rucksack assembly comprised of a plurality of superposed box-shaped sections of textile fabric consisting of four side walls each having an upper edge and a lower edge, a top cover hingedly attached to one of the upper edges of one of the side walls and a bottom cover hingedly attached to one of the lower edges of one of the side walls, the covers having three free edges for connection to, and separation from, corresponding ones of upper and lower free edges of the side walls; and two-piece fastening elements between the corresponding free edges of the covers and the side walls, the fastening element pieces being connectable to, and separable from, each other, one of the corresponding free edges carrying one piece of a respective one of the fastening elements and the other one of the corresponding free edges carrying the other piece of the respective fastening element whereby the free edges of the side walls may be selectively connected to the free edges of the covers or the free edges of the side walls of an adjacent one of the superposed sections.

4,415,013

## REPAIR FOR THE TIRE SEPARATIONS

Fred B. Vine, Britt Township, St. Louis County, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 28, 1982, Ser. No. 383,380

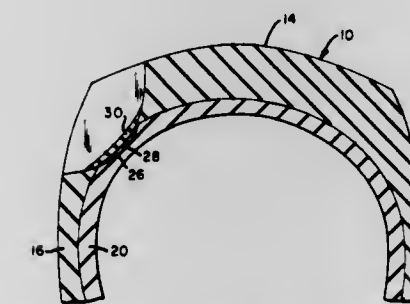
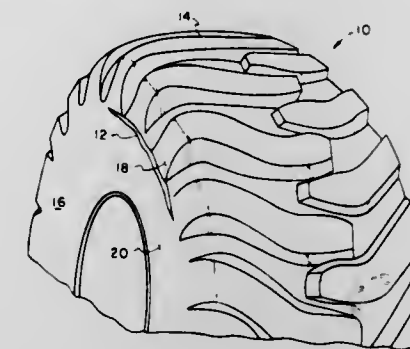
Int. Cl.<sup>3</sup> B60C 21/02, 21/00

U.S. Cl. 152-367

6 Claims

1. A method for repairing tires which have experienced the separation of exterior rubber from the tire carcass in the shoulder and/or face area of the tire which comprises:  
(a) removing any rubber separated from the tire carcass down to the depth of said separation;  
(b) buffing the area of the tire carcass exposed by said removal to a smooth finish;  
(c) applying a rubber adhesive means to the buffed area;  
(d) covering said buffed area with a blanket of uncured rubber the thickness of which blanket is between one-fourth ( $\frac{1}{4}$ ) and one and one-half ( $1\frac{1}{2}$ ) inches and substantially less than the thickness of the rubber removed from the tire carcass, so as to prevent a substantial differential in flexure between said blanket and said tire carcass and to prevent excessive heat

buildup between said blanket and said tire carcass when said tire is in operation;



(e) stitching said blanket to the tire carcass; and  
(f) curing the said blanket to the tire carcass.

4,415,014

## BEAD BREAKING TOOL

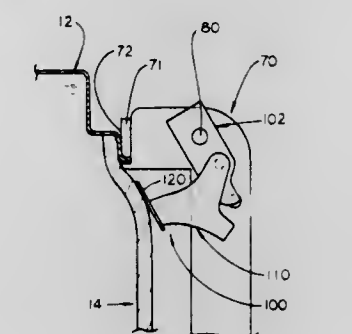
Eugene W. Turpin, 66 N. Academy, Sanger, Calif. 93657

Filed Apr. 20, 1981, Ser. No. 255,522

Int. Cl.<sup>3</sup> B60C 25/06

U.S. Cl. 157-1.28

10 Claims



1. A bead breaking tool for mounting releasably on a wheel rim which has a pair of annular, axially spaced flanges and is provided with a tire having a pair of beads disposed between the flanges and individually engaged therewith, the tool comprising:

- A. a pair of shoes individually fitted to the flanges outwardly of the beads;
- B. a frame extended between the shoes and secured individually thereto to retain the shoes in a disposition wherein each shoe engages the corresponding flange oppositely of the beads, the frame being shaped to span the tire outwardly of the rim when the shoes are engaged with the flanges;
- C. a blade insertable between one of the flanges and the one of the beads engaged therewith;
- D. means mounted on the one of the shoes engaged with the one flange for guiding the blade in a first path generally radially of the rim between the one flange and the one bead to insert the blade therebetween;
- E. means mounted on the one shoe for guiding the blade in

a second path generally axially of the rim with the blade inserted between the one flange and the one bead; and  
F. means for urging the blade along the second path away from the one flange and pushing the one bead axially from said flange to break engagement therebetween, said means for urging the blade along the second path being mounted on the one shoe and transferring thereto a reaction force from said pushing; and  
G. means for releasably clamping the one shoe to the one flange and for transferring the force from the shoe to the flanges so that force is not exerted on the frame.

4,415,015

## PROCESS OF COMPACTING MOULDING SAND

Lumir Zadera, Flurlingen, Switzerland, assignor to George Fischer, Ltd., Switzerland

PCT No. PCT/CH80/00008, § 371 Date Oct. 2, 1980, § 102(e)

Date Oct. 1, 1980, PCT Pub. No. WO80/01544, PCT Pub.

Date Aug. 7, 1980

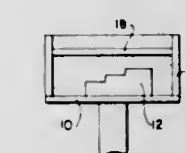
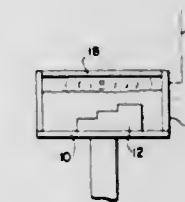
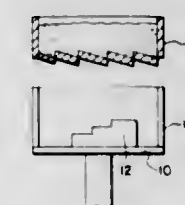
PCT Filed Jan. 24, 1980, Ser. No. 207,959

Claims priority, application Switzerland, Feb. 2, 1979, 1037/79

Int. Cl.<sup>3</sup> B22C 15/00

U.S. Cl. 164-37

5 Claims



1. A process for compacting moulding sand to form a casting mould, comprising the steps of:  
filling a moulding space located between a pattern plate and a pressure plate with moulding sand;  
pre-compacting the moulding sand, after the moulding space is filled with moulding sand and closed by the pressure plate, by an explosive-type shock pressure; and subsequently  
re-compacting the moulding sand by mechanically pressing the moulding sand between the pattern plate and the pressure plate.

4,415,016

## MACHINE FOR CONTINUOUSLY CASTING BATTERY GRIDS

Jack E. McLane, Raymond L. Schenk, Robert R. Rader, and John W. Wirtz, all of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Filed May 20, 1982, Ser. No. 380,056

Int. Cl.<sup>3</sup> B22D 11/10

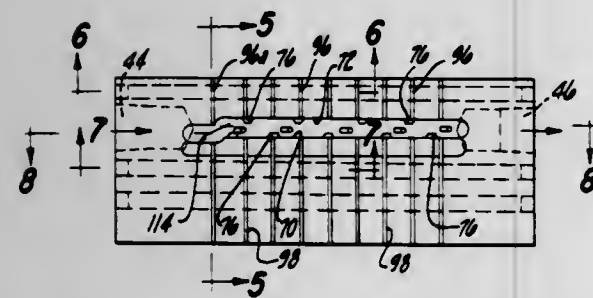
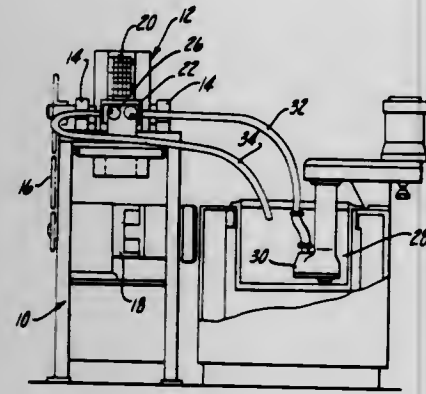
U.S. Cl. 164-429

11 Claims

1. In a machine for continuously casting battery grids, the machine including a drum adapted to be rotated in one direction and having on its outer peripheral surface a cavity which defines the pattern of the battery grid, said grid pattern com-



prising two sets of intersecting grooves, the grooves in one set extending circumferentially of the drum and being spaced axially apart and the grooves in the other set extending axially of the drum and being spaced apart circumferentially, said grooves defining pads therebetween which form the outer peripheral surface of the drum and which define the open spaces between the wires of the cast battery grid, said machine including a shoe having an arcuate surface in mating engagement with said pads around an arcuate segment of the drum, said shoe having an orifice slot therein which is axially co-extensive with said cavity and which is open at a portion of said arcuate surface that is intermediate the circumferentially



opposite ends of the shoe, said shoe having an inlet and an outlet communicating with axially spaced portions of the orifice slot, said machine also including means for directing molten lead at superatmospheric pressure to said inlet in an amount in excess of that required to progressively fill the grid cavity as it rotates past the opening in the orifice slot so that the excess is discharged through said outlet, that improvement which comprises means on said shoe on the upstream side of said orifice slot and registering with the circumferentially extending grooves on the drum for blocking the flow of molten lead through said circumferential grooves in a direction upstream from the orifice slot.

#### 4,415,017 CONTROL OF LIQUID-SOLID INTERFACE IN ELECTROMAGNETIC CASTING

John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 26, 1981, Ser. No. 277,759  
Int. Cl.<sup>3</sup> B22D 11/16, 11/00

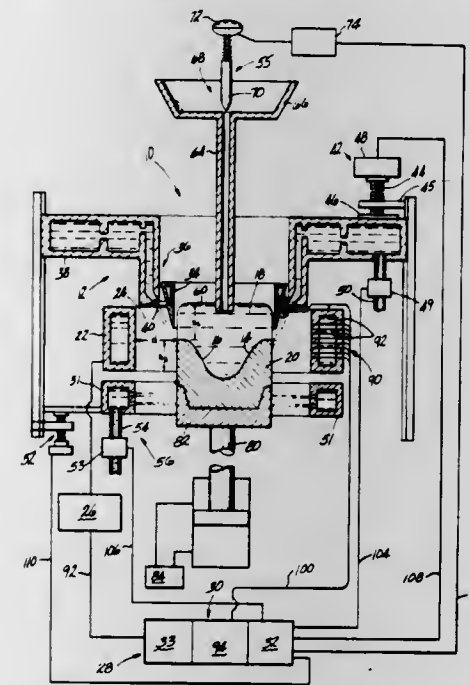
U.S. Cl. 164—453

8 Claims

1. In a process for casting materials, comprising the steps of: electromagnetically containing and forming molten material during a casting run into a casting of desired shape, delivering molten material at a set flow rate into the containment zone whereby a desired height of molten material is established, said casting including during said casting run a liquid-solid interface defined by molten material head and solid material portions of said casting; providing an inductor for applying a magnetic field to said molten material, said magnetic field defining a containment zone for said molten material, applying an alternat-

ing current to said inductor to generate said magnetic field, and applying coolant to said casting for solidifying the molten material, the improvement comprising the steps of:

automatically maintaining the location of the liquid-solid interface at a desired set point in said containment zone, said location maintaining step comprising the steps of: continuously sensing the location of said liquid-solid interface along the periphery of said casting; responsive to said sensing step in a first mode of operation when the liquid-solid interface varies from said desired set point less than a desired percentage of the length of the



inductor, controlling said coolant while maintaining the flow rate of molten material into the containment zone substantially constant in a manner to keep the location of the liquid-solid interface substantially constant; and responsive to said sensing step in a second mode of operation when the liquid-solid interface varies from said desired set point more than said desired percentage, changing the flow rate of molten material delivered to the containment zone and adjusting the coolant in a manner so as to return the location of the liquid-solid interface to said desired set point, and responsive to said liquid-solid interface returning to said desired set point, cycling back to the first mode of operation.

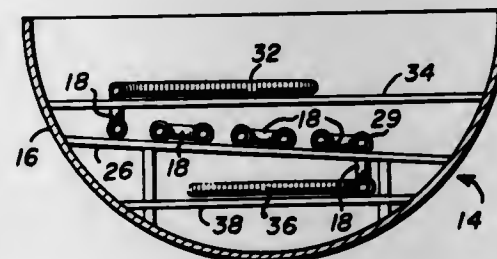
#### 4,415,018 HEAT TRANSFER APPARATUS FOR TRANSPORTABLE LIQUID CONTAINERS

Leonard S. Rosenberger, Saratoga, Calif., assignor to Kaydee Engineering, Inc., Saratoga, Calif.

Filed Jun. 1, 1981, Ser. No. 269,386  
Int. Cl.<sup>3</sup> F28F 9/00

U.S. Cl. 165—41

9 Claims



1. An apparatus for providing heat transfer to the contents of the mobile tank comprising:  
an inlet port;  
a flexible inlet loop attached at one terminal end to the inlet port;

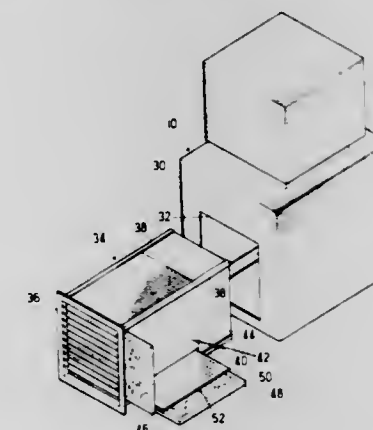
a continuous pipe means attached to the second terminal end of the inlet loop, said continuous pipe means including a planar array of a plurality of parallel open loops extending within the tank along the tank's axis of motion;  
a flexible outlet loop, having a first terminal end attached to the opposite end of the continuous pipe means and having a second terminal end attached to an outlet port;  
a support structure, rigidly engaged with the tank and slidably engaged with the pipe means; and  
shock absorbing means engaged with the continuous pipe means.

#### 4,415,019 HEAT EXCHANGE VENTILATING UNIT Dean L. Hunzicker, Madison, Wis., assignor to Hunzicker-Riley, Inc., Verona, Wis.

Filed Apr. 12, 1982, Ser. No. 367,477  
Int. Cl.<sup>3</sup> F28F 9/00

U.S. Cl. 165—47

10 Claims



1. A combined ventilating and heat exchanging unit for a building comprising:  
a heat exchange housing (12) having an open bottom, an intake portal (32) on one side thereof, and an exit portal (18) on the top thereof, the heat exchange housing (12) adapted to being mounted on the roof of a building with the open bottom opening into the interior of the building;  
a ventilator fan (14) received on the top of the heat exchange housing (12) to draw air out from the exit portal (18) and exhaust it to the atmosphere;  
air handling and conditioning means connected to the bottom of the heat exchange housing (12) for conducting stale air to be exhausted to the housing (12) and to convey fresh air from the housing into the interior of the building; and  
a heat exchange assembly (34) capable of conducting a heat exchange between air passing from the air handling means through to the exit portal (18) and air passing from the intake portal (32) through to the air handling means; the heat exchange assembly (34) sized and shaped so that it can slide into and out of the heat exchange housing (12) through the intake portal (32) so that the heat exchange assembly (34) can easily be serviced from the roof of the building.

#### 4,415,020 VESSEL CONSTRUCTION EMPLOYING MULTIPLE INTERNAL HEAT EXCHANGE TUBES

Paul G. Daugirda, Evergreen Park, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.

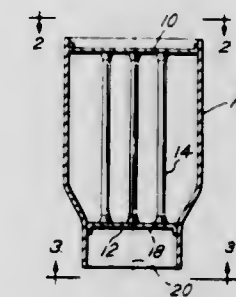
Division of Ser. No. 116,272, Jan. 28, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,447  
Int. Cl.<sup>3</sup> F28F 9/16

U.S. Cl. 165—76

3 Claims

1. An improved vessel in a water heater tank construction, the improvement comprising, in combination:  
a plurality of open heat exchange tubes having terminal ends;  
first and second opposed headers including opposed open-

ings for receipt of the tubes; means for affixing the tubes in sealed relationship with the header and for retention thereof in generally parallel sealed array, each end of a tube being metallurgically affixed to one of the headers, said headers having an identical configuration and a separate uniform constant transverse dimension, the first one of said headers defining a uniform constant transverse dimension smaller than the transverse dimension of the second header, said assembled tubes and headers being coated with a protective material to define a header subassembly; and



a tank body having a uniform cross sectional interior shape along the length of the body, said cross sectional shape identical to the shape of the headers for slidable and adjustable receipt of the headers, said body having two transverse dimension regions, one of said regions having a uniform constant transverse dimension to slidably receive the first header and the other region having a different uniform constant transverse dimension to slidably receive the second header, said first header being slidably positioned within the one region and metallurgically affixed to the body in the one region and the second header being slidably positioned within the second region and metallurgically affixed to the body in the second region.

#### 4,415,021 POSITIONING A THIN WALL ROUND WRAPPER WITHIN A HEAVY WALL OUT-OF-ROUND SHELL OF A HEAT EXCHANGER

John R. Bayless; Homer G. Hargrove, and Edwin G. Thompson, all of St. Petersburg, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1981, Ser. No. 293,725  
Int. Cl.<sup>3</sup> F28F 7/00

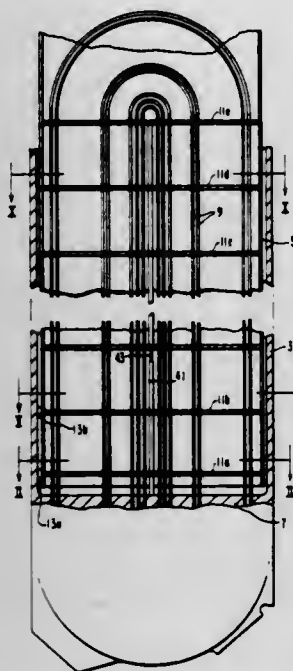
U.S. Cl. 165—76

10 Claims

1. A heat exchanger comprising a tubesheet with a plurality of holes for receiving tubes;  
a heavy wall rolled cylindrical shell portion attached to the tubesheet;  
a thin wall round wrapper portion disposed within said shell portion and spaced therefrom;  
a plurality of generally parallel tube support plates longitudinally spaced within said wrapper portion and having a plurality of holes for receiving tubes;  
jacking members disposed circumferentially about said wrapper portion adjacent the location of said support plates, said jacking members extending radially outwardly from said wrapper portion into engagement with said shell portion;  
a first array of lugs affixed to said shell portion;  
a first array of blocks affixed to said wrapper;  
said first array of lugs and blocks being cooperatively associated to prevent longitudinal movement of said wrapper portion with respect to said shell portion adjacent said first array of lugs;  
a second array of lugs affixed to said shell;  
a second array of blocks affixed to said wrapper;  
said second array of lugs and blocks being cooperatively associated to prevent relative rotation of said shell portion



with respect to said wrapper portion adjacent said second array of lugs;  
wedges disposed between said wrapper portion and said tube support plates; and



means for preventing rotation of said tube support plate with respect to said wrapper, whereby said holes in said tube support sheets can be aligned with said holes in said tube-sheet and the support plate can be accurately spaced within the wrapper portion to provide a controlled annular space therebetween.

4,415,022

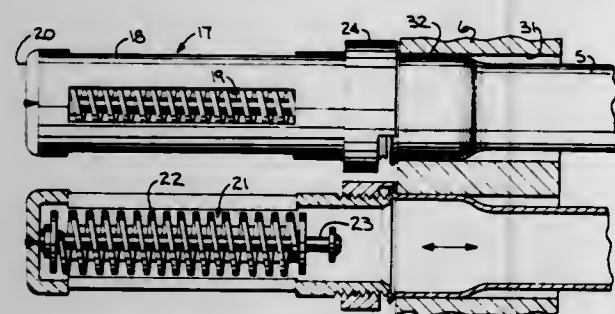
# MOUNTING FOR HEAT EXCHANGER TUBE CLEANER CAPTURING DEVICES

Walter J. Baron, and Laird C. Cleaver, both of Milwaukee, Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Feb. 18, 1982, Ser. No. 350,288  
Int. Cl.<sup>3</sup> F28G 1/12

U.S. Cl. 165—95

4 Claims



1. A heat exchanger comprising:

- a housing,
- a plurality of longitudinally extending fluid flow tubes disposed within said housing,
- tube sheets disposed within said housing and with said tube sheets having openings receiving said tubes,
- longitudinally extending cages disposed in communication with said tubes for receiving shuttling tube cleaning elements,
- the end portions of said tubes extending longitudinally outwardly of said tube sheets,
- and means for quick releasably mounting said cages to said tube end portions outwardly of said tube sheets, said mounting means including:
  - an arcuate undercut seat disposed on the inner end of a respective cage,
  - and a flared lip on the outer end portion of a respective adjacent tube,

- said seat and lip engaging to releasably hang said cage from said tube.

4,415,023

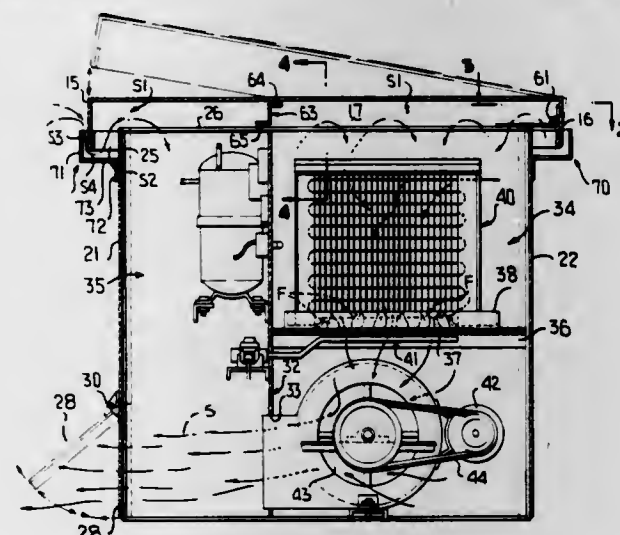
# HEAT EXCHANGER HOUSING WITH AIR DEFLECTING BAFFLE AND HINGE DOOR

Gerry Vandervort, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Filed Jun. 3, 1981, Ser. No. 269,947  
Int. Cl.<sup>3</sup> F24H 3/06, 9/02; F28F 13/06

U.S. Cl. 165—122

28 Claims



1. A housing for a heat exchanger comprising a generally upstanding peripheral wall having an upper peripheral end portion terminating in an upper peripheral terminal edge, a cover over said upper peripheral end portion, said cover being defined by an end wall and a depending peripheral skirt, said upper peripheral terminal edge being spaced from said end wall and defining therebetween a first space, said peripheral skirt and upper peripheral end portion being in relatively spaced telescopic relationship and defining therebetween a second space in communication with said first space whereby air can flow through said spaces from the exterior to the interior of said housing, further means disposed contiguous said upper peripheral end portion and said terminal edge for restricting the flow of air into said housing through said spaces about substantially the entire peripheral-extent thereof, and means for generating an open flame in said housing whereby the restricted air flow within said housing reduces the possibility of the open flame being blown out by high air movement exteriorly of said housing.

4,415,024

# HEAT EXCHANGER ASSEMBLY

Robert L. Baker, Amherst, N.Y., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

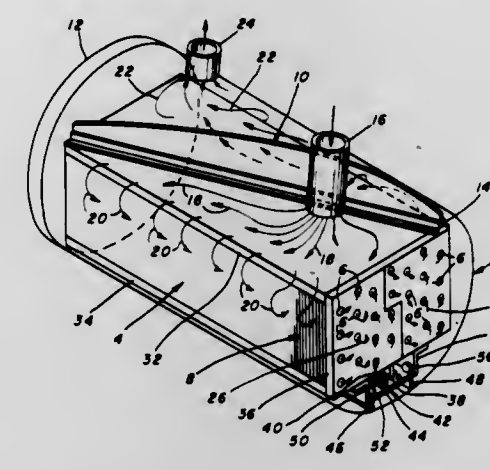
Filed Nov. 5, 1980, Ser. No. 204,321  
Int. Cl.<sup>3</sup> F28D 7/00

U.S. Cl. 165—160

19 Claims

1. A heat exchanger assembly comprising an elongated shell having a fluid inlet and a fluid outlet, an elongated bundle assembly received within said shell, said bundle assembly having a plurality of elongated tubes extending generally longitudinally within said bundle assembly and a plurality of generally parallel fin plates oriented generally transversely with respect to said elongated tubes, said bundle assembly having a top sheet and a bottom sheet, bundle assembly support means interposed between said bottom sheet and said elongated shell, baffle means interposed between said top sheet and said elongated shell, said baffle means separating said fluid inlet and said fluid outlet, and said baffle means including an elongated baffle plate extend-

ing longitudinally generally diagonally on said bundle assembly between said fluid inlet and said fluid outlet,



whereby said baffle plate directs said fluid through the full longitudinal extent of said bundle.

4,415,025

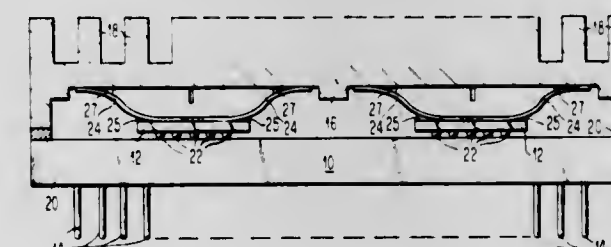
# THERMAL CONDUCTION ELEMENT FOR SEMICONDUCTOR DEVICES

Joseph L. Horvath, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,218  
Int. Cl.<sup>3</sup> H01L 23/36

U.S. Cl. 165—185

15 Claims



1. In a semiconductor package having a substrate, at least one semiconductor device mounted on said substrate, and a cold plate located over and in close proximity to the device, the improvement comprising

- a thermal bridge element for conducting heat from said device to said cold plate, said thermal bridge element comprising
- a bulged disk of resilient heat conductive material, a first plurality of spaced radial slots emanating from a central opening and terminating short of the outside edge,
- a second plurality of spaced radial slots located between said first plurality of radial slots in alternating relation extending inwardly from the outside edge, and terminating short of the center of said disk.

4,415,026

# ROLLER GUIDE FOR OIL-WELL PUMP

Joe Rezewski, Box 1199, and Wayne Bernes, Box 1387, both of Drayton Valley, Alberta, Canada

Filed Jan. 22, 1981, Ser. No. 227,316

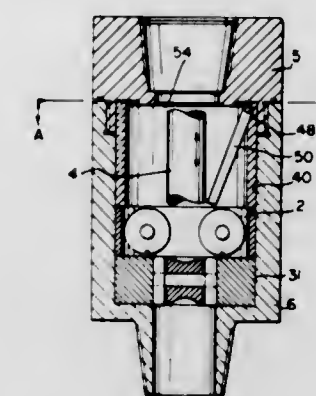
Claims priority, application Canada, Jan. 23, 1980, 344271  
Int. Cl.<sup>3</sup> E21B 33/03

U.S. Cl. 166—97

5 Claims

1. A guide for guiding a pump-rod in a well-head consisting of:  
a housing capable of being held between a wellhead tee and a stuffing box comprising an enclosure having two pairs of transversely rotatable rollers positioned substantially at right angles to each other, each pair of transverse rollers being held in a separate cage, each having a pair of parallel

pins upon which the rollers are rotatably mounted and one cage being located above the other and being located relative to the other by a dowel between the mating faces



of the cages, each roller of each pair being off-set from the center line of the pump-rod such that the pump-rod will pass between both sets of rollers to be guided, during operation, in a reciprocating path.

4,415,027

# ACCUMULATOR RECHARGING VALVE

Larry R. Russell, 6025 Edgemoor, Suite C, Houston, Tex. 77081  
Filed Jun. 16, 1982, Ser. No. 389,072

Int. Cl.<sup>3</sup> E21B 34/10, 43/00

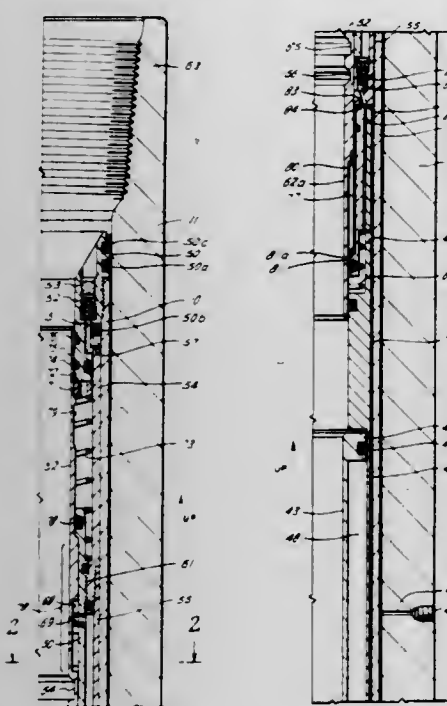
U.S. Cl. 166—113

18 Claims

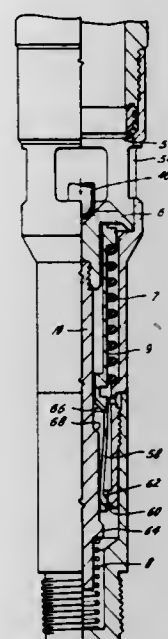
1. Accumulator recharging valve for use in charging a pressure accumulator of a well tool while the well tool is incorporated in a pipe string downhole in a well, comprising a tubular housing disposed within a tubular tool body, a tubular sleeve spaced annularly inward of said tubular housing to form an annular space therebetween, said tubular sleeve having a circular annular gap in its upper portion providing flow communication between the pipe string interior and said annular space when open, control valve means for controllably closing and opening said circular gap, said annular space being divided by partition means at an intermediate point of its axial length into a lower annular accumulator space and an upper annular flow communication space, said gap communicating with said flow communication space, said partition means including bleed valve means for providing flow communication from said accumulator space to said pipe string interior when said control valve means is fully opened, charging valve means for permitting pressured fluid flow from said flow communication space to said accumulator space when the fluid pressure in said flow communication space exceeds the fluid pressure in said accumulator space, cam means for controlling movement of said control valve means whereby said control valve means may be fully opened to cause opening of said bleed valve means and bleeding off of pressure within said accumulator



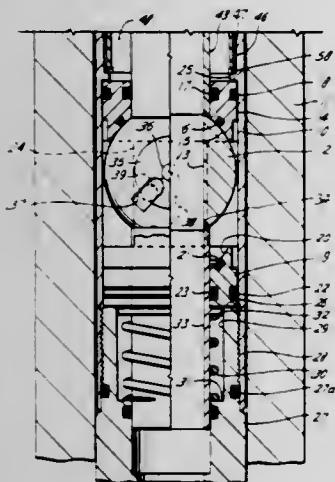
space, and may be partially opened to provide recharging of said accumulator space from said pipe string interior through



said collet engaging and held in a latched open position by the backup shoulder, means initially holding the backup shoulder against the collet,



spring means urging the valve element to the closed position when the backup shoulder is longitudinally moved out of engagement with the collet.



said flow communication space and said charging valve means while said bleed valve means is closed.

#### 4,415,028 APPARATUS FOR MEASURING BOTTOM HOLE WELL CONDITIONS

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Sep. 8, 1981, Ser. No. 300,087

Claims priority, application United Kingdom, Dec. 18, 1980, 8040474

Int. Cl.<sup>3</sup> E21B 23/00, 34/06

U.S. Cl. 166—206

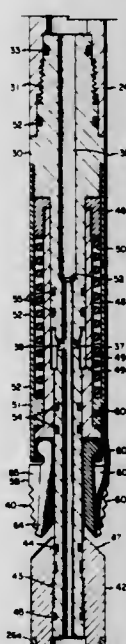
3 Claims

1. An apparatus for use in the tubing of a well for shutting off flow through the tubing comprising, an isolation valve having a bore with an annular seat in the bore,

side ports leading into the bore below said annular seat, a valve element longitudinally movable in the valve between an open position below said ports and a closed position seated on the seat, said valve including means for supporting a measuring instrument below said valve, said valve element having an elongate mandrel having a backup shoulder, a longitudinally movable latch mechanism for initially holding the valve element in the open position including, a longitudinally movable collet initially engaging the mandrel and holding the valve element in the open position,

1. In a downhole chemical cutting tool having a chemical section adapted to contain a chemical cutting agent and a cutting section in fluid communication with said chemical section and having cutting ports for the discharge of chemical cutting agent, said tool adapted to be inserted into a wellbore and anchored at a downhole location thereof, the combination comprising:

- (a) an elongated slip shaft extending longitudinally of said tool;
- (b) a slip array comprising a plurality of slip segments having serrated outside gripping surfaces slidably disposed on the



#### 4,415,029 DOWNHOLE WELL TOOL AND ANCHORING ASSEMBLY

Donna K. Pratt, and Jamie B. Terrell, both of Fort Worth, Tex., assignors to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Jul. 23, 1981, Ser. No. 286,146

Int. Cl.<sup>3</sup> E21B 23/04, 29/02

U.S. Cl. 166—212

18 Claims

peripheral surface of said slip shaft and pivotally mounted at one end to slip actuation means;

- (c) slip expansion mandrel means secured to said shaft at a location between said cutting ports and said slip array and having a tapered surface adapted to receive said slip segments to expand said array in a deployed position upon the movement of said array in the direction of said mandrel means.
- (d) means biasing said slip segments inwardly about said slip shaft as said slip array is withdrawn from a deployed position and moved away from said mandrel means to a retracted position, said biasing means comprising cantilever springs secured to a structural member of said tool behind said slip array and projecting forwardly into engagement with said slip segments to bias said slip segments inwardly as said slip array is withdrawn from said deployed position to the retracted position; and
- (e) said slip array being arranged in the retracted position to provide a spacing between adjacent slip segments with the maximum distance between adjacent slip segments occurring between the gripping surfaces of adjacent slip segments.

4,415,030

#### CASING RE-ENTRY APPARATUS FOR USE IN INCLINED OIL AND GAS BOREHOLES

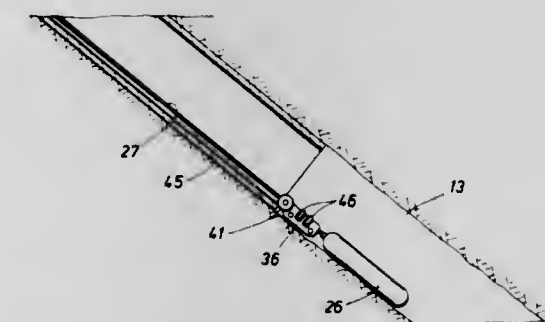
Arnold M. Walkow, and Eugene J. Linyaev, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 9, 1981, Ser. No. 232,607

Int. Cl.<sup>3</sup> E21B 17/10, 31/00, 47/00

U.S. Cl. 166—241

7 Claims



1. Apparatus for traversing a deviated borehole, comprising: a well logging cable; an elongated logging instrument attached to said cable; and a casing re-entry assistor mounted on said cable at a location immediately above said logging instrument, said re-entry assistor formed by two conjugate body halves with a pair of wheels rotatably mounted thereon.

4,415,031

#### USE OF RECYCLED COMBUSTION GAS DURING TERMINATION OF AN IN-SITU COMBUSTION OIL RECOVERY METHOD

William C. Hunt, III, Farmers Branch, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,367

Int. Cl.<sup>3</sup> E21B 43/243

U.S. Cl. 166—261

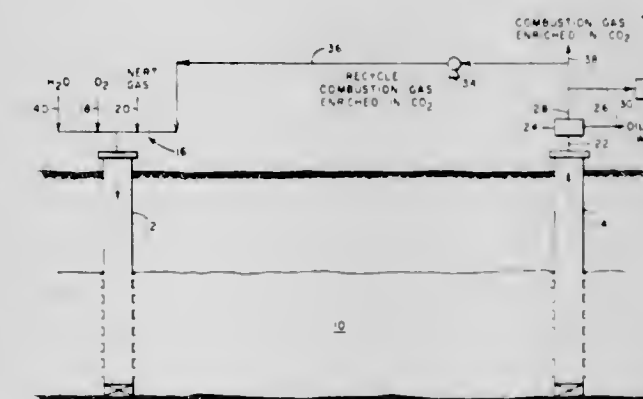
34 Claims

1. In a method for the recovery of viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and at least one spaced-apart production well, said injection well and said production well in fluid communication with said formation, comprising:

- (a) injecting into the formation via said injection well a mixture of oxygen and an inert gas having a predetermined low oxygen concentration to initiate an in-situ combustion operation adjacent said injection well resulting in the formation of a combustion front in the oil-containing formation and production of a combustion gas predominantly containing carbon dioxide;
- (b) continuing the injection of said mixture of oxygen and an

inert gas for a predetermined period of time to advance the combustion front toward said production well;

- (c) recovering fluids including oil and the combustion gas enriched in carbon dioxide from the formation via said production well;
- (d) separating said oil from said combustion gas enriched in carbon dioxide;
- (e) increasing the oxygen concentration of said injected gaseous mixture to a predetermined level and continuing injection of said gas for a predetermined period of time;
- (f) injecting a mixture of oxygen and said combustion gas enriched in carbon dioxide recovered from the formation having a predetermined oxygen concentration and con-



tinuing injection of said mixture for a predetermined period of time;

- (g) maintaining the oxygen concentration of said injected mixture of oxygen and combustion gas at a predetermined level so that the concentration of oxygen in the combustion gas is maintained at a predetermined value low enough to avoid the danger of an explosion or burning of the production well;
- (h) terminating injection of oxygen when the oxygen concentration of the injected gas is reduced to a predetermined value and continuing to inject combustion gas until the combustion front is discontinued; and
- (i) continuing to recover fluids including oil from the formation via said production well.

4,415,032

#### CARBONATED WATERFLOODING FOR VISCOUS OIL RECOVERY USING A CO<sub>2</sub> SOLUBILITY PROMOTER AND DEMOTER

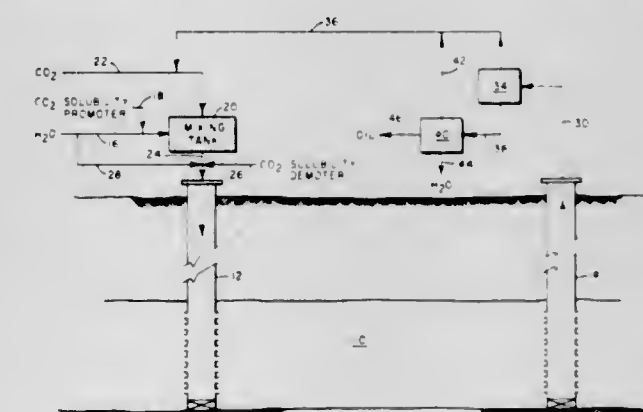
Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,370

Int. Cl.<sup>3</sup> E21B 43/20, 43/22

U.S. Cl. 166—273

8 Claims



1. A method for the recovery of viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and at least one spaced-apart production well, said injection well and said production well in fluid



communication with a substantial portion of the formation, comprising:

- (a) injecting into the formation via said injection well a predetermined amount of a fluid comprising water containing a CO<sub>2</sub> solubility promoter and saturated at the injection pressure with carbon dioxide;
- (b) injecting a predetermined amount of an aqueous solution of a CO<sub>2</sub> solubility demoter into the formation via said injection well;
- (c) injecting a driving fluid comprising water into the formation via said injection well; and
- (d) recovering fluids including oil from the formation via said production well.

4,415,033

## INVERSE VISCOSITY GRADING

Albert F. Chan, and Jerry F. Casteel, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Sep. 14, 1981, Ser. No. 301,490

Int. Cl.<sup>3</sup> E21B 43/22

U.S. Cl. 166—274

6 Claims

1. A method of fluid flooding to increase oil recovery from a subterranean oil-bearing formation penetrated by an injection well and a production well, comprising grading the viscosity of all injected fluids in the fluid flood from a given viscosity at the initiation of the fluid flood to a higher viscosity at the end of the fluid flood to prevent the formation of viscous zones within the injected fluids.

4,415,034

## ELECTRODE WELL COMPLETION

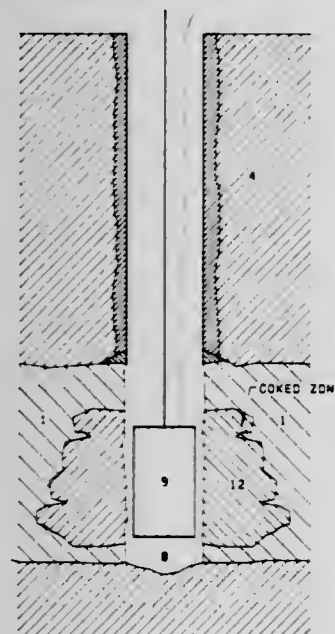
Larry S. Bouck, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed May 3, 1982, Ser. No. 374,581

Int. Cl.<sup>3</sup> E21B 36/04, 43/24

U.S. Cl. 166—302

7 Claims



AT THE END OF THE COIL-PRODUCING PROCESS

1. A process for creating an effective electrode of enlarged radius, said electrode being a carbonaceous, current-carrying deposit in a subterranean, hydrocarbon-bearing formation surrounding the electrode, having the serial steps of:

- (a) forming a borehole in the hydrocarbon-bearing formation,
- (b) placing a heating device in said borehole,
- (c) energizing the device to heat the surrounding formation to a temperature high enough to produce coking of at least a portion of the hydrocarbon-bearing formation, and
- (d) maintaining the temperature of step (c) for a length of

time to obtain the current-carrying electrode of desired radius.

6. A carbonaceous, current-carrying electrode, formed in a subterranean, hydrocarbon-bearing formation by the steps of:

- (a) forming a borehole in the hydrocarbon-bearing formation,
- (b) placing a heating device in said borehole,
- (c) energizing the device to heat the surrounding formation to a temperature high enough to produce coking of at least a portion of the hydrocarbon-bearing formation, and
- (d) maintaining the temperature of step (c) for a length of time to obtain the desired electrode radius.

4,415,035

## METHOD FOR FRACTURING A PLURALITY OF SUBTERRANEAN FORMATIONS

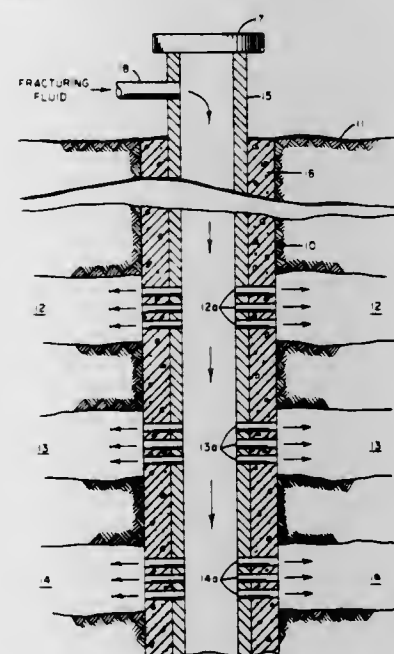
William L. Medlin, Dallas; Malcolm K. Strubhar, Irving, and John L. Fitch, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,398

Int. Cl.<sup>3</sup> E21B 43/26

U.S. Cl. 166—308

4 Claims



1. A method for forming fractures in a plurality of vertically disposed hydrocarbon-bearing formations communicating with a well equipped with a casing penetrating a subterranean earth formation, comprising the steps of:

- (a) identifying those hydrocarbon-bearing formations penetrated by said well casing that exhibited at least a predetermined minimum pressure increase during previous individual fracturing treatments in other nearby production wells in the area,
- (b) forming perforations in said well casing at the locations of said identified hydrocarbon-bearing formations, and
- (c) applying hydraulic pressure through said perforations to said plurality of hydrocarbon-bearing formations simultaneously, whereby each of said identified hydrocarbon-bearing formations is fractured in proportion to the pressure increase in each of said hydrocarbon-bearing formations during the application of said hydraulic pressure.

4,415,036

## PRESSURE EQUALIZING FLAPPER TYPE SAFETY VALVE FOR SUBTERRANEAN WELLS

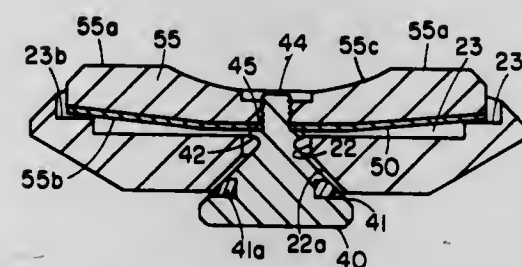
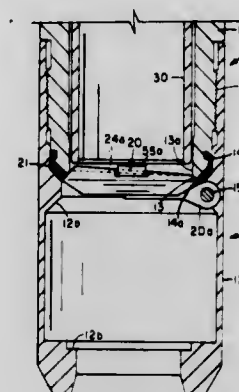
Michael A. Carmody, Broken Arrow, and Michael L. Cognevich, Tulsa, both of Okla., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 22, 1982, Ser. No. 350,670

Int. Cl.<sup>3</sup> E21B 34/14

U.S. Cl. 166—324

15 Claims



1. A flapper type safety valve for a subterranean well comprising, in combination, a tubular conduit, means on said tubular conduit defining a downwardly facing, annular valve seat, a flapper valve having an annular surface cooperable with said valve seat in sealing relation, pivot means on one side of said tubular conduit for mounting said flapper valve to said conduit to permit downward pivotal movement of said flapper valve away from said valve seat to a vertical position, resilient means urging said flapper valve to its closed sealing position, a valve actuating sleeve disposed in said tubular conduit, means for moving said actuating sleeve downwardly to engage and open said flapper valve, said flapper valve having a bypass aperture therethrough defining a downwardly facing annular sealing surface, a sealing plug insertable in said bypass aperture from the bottom, whereby well fluid pressure below said flapper valve urges said plug into sealing engagement with said downwardly facing sealing surface, means including a leaf spring diametrically traversing said flapper valve for biasing said sealing plug upwardly into sealing engagement with said downwardly facing annular sealing surface to maintain said bypass aperture closed, upstanding means on said sealing plug projecting upwardly through said bypass aperture, and abutment means secured to said upstanding means and projecting into the path of downward movement of said actuating sleeve, whereby initial downward movement of said actuating sleeve shifts said sealing plug downwardly to open said bypass aperture.

4,415,037

## BALL VALVE LOADING APPARATUS

Robert T. Brooks, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Aug. 7, 1981, Ser. No. 290,742

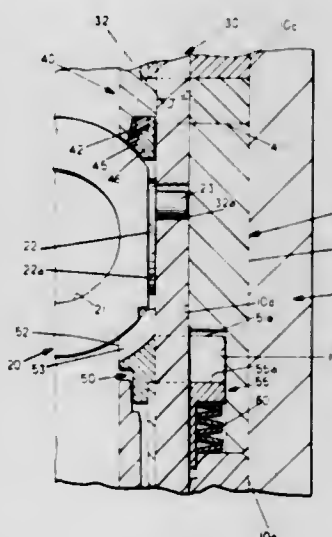
Int. Cl.<sup>3</sup> E21B 34/06

U.S. Cl. 166—331

3 Claims

1. Apparatus for selectively opening and closing a subterranean fluid conduit in a well by rotation of a ball between two 90° displaced positions, said apparatus comprising: a hollow

cylindrical housing; an annular seal support secured transversely within said housing by at least a pair of opposed radial ribs; annular sealing means mounted on the radially inner portions of said annular seal support; a pair of ball camming sleeve segments axially slidably mounted within the bore of said housing and passing through the annular segment spaces defined between said radial ribs; a ball valve having a cylindrical fluid passage therethrough and a spherical segment surface cooperating with said annular seal in sealing relation; opposed pins projecting from said ball and offset from the ball center; cam slots in said ball camming sleeve segments respectively receiving said pins, whereby axial movement of said camming



sleeve segments rotates said ball 90° between an open and a closed position relative to the bore of said annular seal; an annular loading element engaging the ball surface portion diametrically opposite to the portion engaged by said annular seal, said housing defining an annular interior recess adjacent said annular ball loading element, said loading element having at least two radially projecting ribs extending between said camming sleeve segments and into said housing annular recess; and a compressed spring in said recess transmitting a substantially constant axial force to said loading element, thereby producing a substantially constant loading force between said ball and said annular seal.

4,415,038

## FORMATION PROTECTION VALVE APPARATUS AND METHOD

Phillip W. Schmuck, Spring, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 10, 1981, Ser. No. 282,295

Int. Cl.<sup>3</sup> E21B 34/14

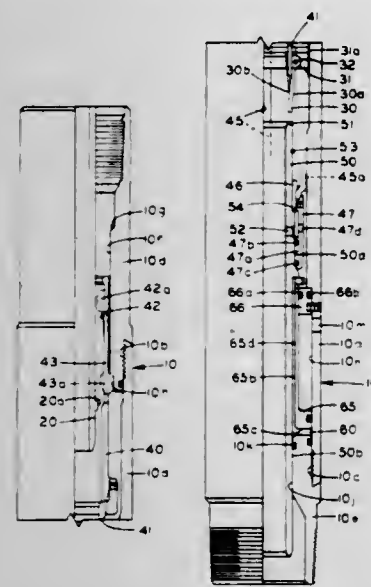
U.S. Cl. 166—373

26 Claims

1. A repeatedly operative valve for positioning in a conduit of a subterranean well, comprising: a tubular housing; an annular valve seat secured within said housing; a shiftable valve element cooperable with said annular valve seat to open or close the bore thereof, said valve element being resiliently urged to a bore closing position; and actuator sleeve mounted in said tubular housing for vertical movements relative thereto and being operatively associated with said valve element; and means on said actuator sleeve engageable with an inserted tubing string for limited axial co-movement therewith during both insertion and retraction movements of said inserted tubing string, the resulting limited movement of said actuator sleeve in one direction producing movement of said valve element to a bore opening position and the resulting limited movement of said actuator sleeve in the opposite direction permitting said valve element to move to the bore closing position said actuator sleeve being provided with extension arms passing downwardly through the outer portions of said annular valve seat, and pressure equalizing valve means connected to the lower portions of said extension arms, said pressure equalizing valve means being exposed on one side to fluid pressure within the



conduit below said annular valve seat on the other side to the fluid pressure above said annular valve seat, said pressure equalizing valve means being closed by the initial movement of



said actuator in one direction and opened by the initial movement of said actuator in the other direction, thereby equalizing pressure on said valve element prior to opening thereof.

4,415,039

## SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.W., Maasland, Netherlands

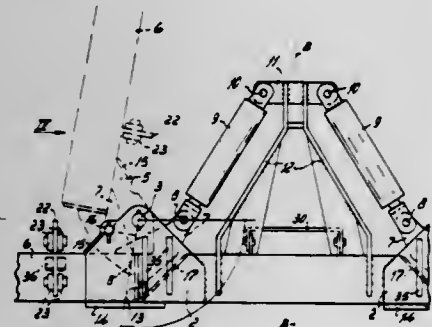
Filed Mar. 3, 1981, Ser. No. 239,973

Claims priority, application Netherlands, Mar. 3, 1980, 8001263

Int. Cl.<sup>3</sup> A01B 23/04, 33/06, 59/043

U.S. Cl. 172-47

9 Claims



1. A rotary harrow implement comprising frame means for mounting a transverse row of at least one group of power-driven soil working members mounted along the length of elongated portions of said frame means, a forward transverse carrier interconnected to said elongated portions to support said frame means, said carrier comprising a central part having connecting means attachable to the lifting device of a prime mover and a pair of spaced cheek plates at each end thereof, said central part having a width not substantially greater than that of said prime mover, a respective lateral arm connected to each pair of cheek plates by a pivot pin that defines a substantially horizontal axis and said lateral arm being interconnected to a respective said elongated frame portion so as to be tiltable with that portion upwardly about said pivot pin to an inoperative transport position and reduce the overall width of the implement, the inner end of said lateral arm being hinged to said cheek plates adjacent the upper sides thereof by said pivot pin and said inner end being fitted between said plates in the implement's working position, a displacing arm interconnecting said inner arm end to one end of a corresponding hydraulic piston and cylinder assembly and a pivotal connection between said displacing arm and said hydraulic assembly, said pivotal

connection being located at substantially the same horizontal level as said pivot pin and inboard thereof when said lateral arm is in working position, said pivotal connection being displaceable by said assembly from a first location substantially the same level and inboard of said pivot pin to a second location substantially vertically beneath said pivot pin when said lateral arm together with respective frame portion is pivoted about the axis of rotation of said pivot pin and raised in its transport position, said connecting means comprising an upwardly extending triangular trestle that mounts a said hydraulic piston and cylinder assembly at opposite sides thereof, each said assembly extending substantially parallel to a respective upwardly inclined side of said trestle, the lower end of each said assembly being extendable to displace said pivotal connection with respect to said pivot pin from said first location to said second location when said lateral arm is raised to its transport position.

4,415,040

## FULLY MOUNTED VARIABLE WIDTH PLOW

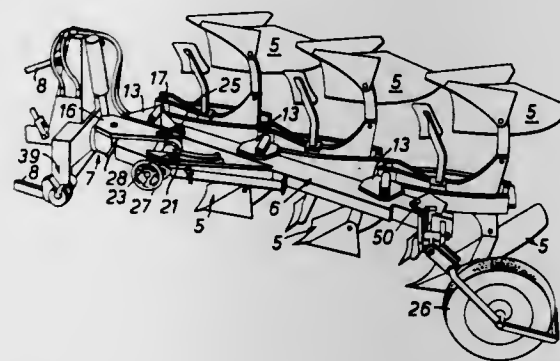
Henri E. Salva, Croix, France, assignor to International Harvester Co., Chicago, Ill.

Filed Aug. 7, 1981, Ser. No. 290,903

Int. Cl.<sup>3</sup> A01B 3/46, 3/28

U.S. Cl. 172-225

10 Claims



1. A fully mounted plow system adapted to be mounted on and pulled by a tractor, said system comprising a hitch assembly including link arms adapted to be supported by the tractor at their forward ends such that they are capable of slight pivotal displacement about vertical axes, a forecarriage unit mounted on the rearward ends of said link arms such that a slight pivotal movement about vertical axes are permitted therebetween, an elongated plow beam extending generally in a horizontal plane and inclined to the direction of forward travel, said forecarriage being pivotally attached to said plow beam about a generally vertical axis, a plurality of plow bottom assemblies each including a support bracket, each plow bottom assembly being pivotally attached through said support brackets along said plow beam such that said plow bottom assemblies are equally spaced along said plow beam, an elongated coupling member extending generally parallel to said plow beam and being pivotally connected to each of said support brackets forming a set of interconnected plow bottom assemblies, a coupling member pivotally attached at one end to said forecarriage unit and at its other end to the foremost plow bottom assembly, a double acting hydraulic cylinder anchored at one end to said plow beam and at its other end to said set of interconnected plow bottom assemblies such that actuation of said hydraulic cylinder will result in equal pivotal movement of each plow bottom assembly relative to said plow beam as well as a pivotal movement between said forecarriage unit and said plow beam about their pivotal connection.

4,415,041

## MINIMUM TILL ROTARY HOE

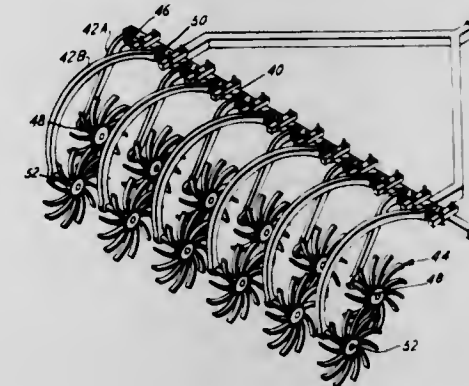
Charles K. Fackler, Gibson City, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Nov. 13, 1981, Ser. No. 321,114

Int. Cl.<sup>3</sup> A01B 39/08

U.S. Cl. 172-551

1 Claim



1. An improved rotary hoe implement, comprising, in combination:

a plurality of generally circular, multiple tined, rotary hoe members, each hoe member including a center pivot axis about which the member rotates as it moves through earth;

a tool bar and a support arm for each hoe member connected to the tool bar for mounting the hoe members with their pivot axis generally transverse to the direction of travel of the hoe members in the earth, alternate longer support arms being mounted over adjacent hoe members and positioned above the hoe members by a distance at least equal to or greater than 1.30, the radius of a hoe member, said support arms providing for the axis of mounting of adjacent hoe members being offset in the direction of the hoe member travel, said offset being less than the maximum diameter of the hoe members and greater than 0.8 times the diameter of the hoe member and defining means for partial overlap of the rotary path of adjacent hoe members to clean out field trash from the tines of adjacent hoe members.

4,415,042

## REPLACEABLE RIPPER SHOE

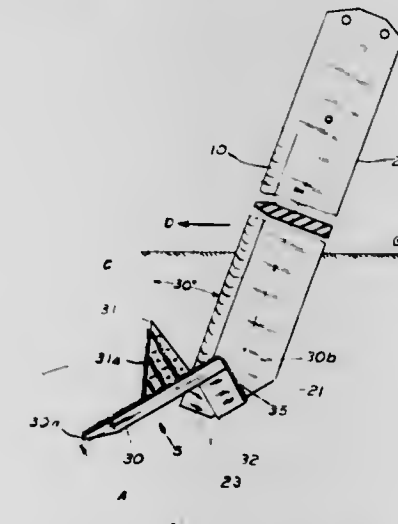
Keith J. Cosson, Hwy. 85, P.O. Box 968, Eaton, Colo. 80615

Filed Aug. 20, 1981, Ser. No. 294,495

Int. Cl.<sup>3</sup> A01B 13/08

U.S. Cl. 172-749

19 Claims



1. In combination, with a substantially vertical, straight ripper implement shank operably held by an agricultural cultivator implement, with the lower front edge portion of the shank sharpened and having a slot therein formed near its lower end and rearwardly of the shank from its front edge, and

the shank having a substantially straight bottom edge surface parallel with the slot, the combination therewith of a single replaceable slip-on ripper shoe member adapted for slip-on frictional securement to the lower end of the shank wherein said shoe member comprises a plate portion having a sharpened leading edge portion and a downwardly extending stirrup portion secured to the underside of the rearward portion of said plate, and an upstanding rigid fin having a leading edge, said fin being secured to the plate midway of its ends on the side thereof opposite from the stirrup, with said slot and said rearward portion of said plate being of respective sizes with relation to each other for adapting said rearward portion of the plate to be frictionally fit inserted into and be frictionally held by the slot, and with said stirrup being of a size adapting it to frictionally fit snugly over the portion of the shank below the slot for a frictional stirrup holding of the replaceable shoe member onto said lower end of the ripper shank, and whereby upon use of the implement cultivator ripper with the shoe so secured thereto said fin will divert the soil from directly striking the front lower edge of the sharpened ripper shank as it is drawn through the soil and consequently upon such ripper use said fin will reduce soil wear of the front lower sharp edge of the shank, and whereby the fin will prevent soil chunking damage to adjacent growing crop rows on row crop cultivation; wherein the leading edge of said fin is substantially vertical and is aligned with, and directly ahead of, the front edge of said shank member when said shank and shoe attachment are in working position.

4,415,043

## TOOLBAR WITH WINGS FOLDABLE SUBSTANTIALLY 180 DEGREES

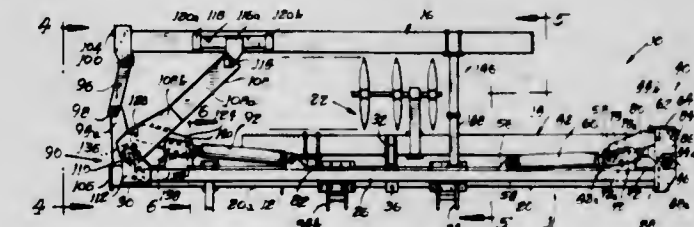
Howard D. Hadler, Kewanee, and James R. Kreftmeyer, Naperville, both of Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Oct. 1, 1981, Ser. No. 307,372

Int. Cl.<sup>3</sup> A01B 73/00

U.S. Cl. 172-776

12 Claims



11. In a foldable frame assembly having a main frame section and lateral wing sections each of which is pivotally connected to the main frame section for folding movement between a first working position substantially longitudinally aligned with the main frame section and a second folded position raised substantially 180° about its pivot connection to said main frame section so as to overlie said main frame section, one of said wing sections being foldable to lie in relatively close proximity to said main frame section when in its folded position, and the other of said wing sections being foldable to overlie said main frame section and said one of said wing sections when in its folded position, the improvement comprising:

hinge mechanism means interconnecting said other of said wing sections to said main frame section including a first link pivotally connected at one end to said main frame section at a first pivot axis spaced from the longitudinal axis of said main frame section and pivotally connected at its opposite end to said other of said wing sections at a second pivot axis spaced from and parallel to said first pivot axis, a second link pivotally connected at one end to said main frame section at a third pivot axis parallel to and spaced from said first pivot axis, and pivotally connected at its opposite end to said other of said wing sections at a fourth pivot axis parallel to and spaced from said second pivot axis.



said first and second links being cooperative to move said other of said wing sections from a position generally longitudinally aligned with said main frame section to a position overlying said main frame section and said one of said wing sections when in its folded position upon movement of said second link through a predetermined pivotal arc about said third pivot axis,

and operator means operatively associated with said second link and operative to move said second link through said predetermined pivotal arc.

4,415,044

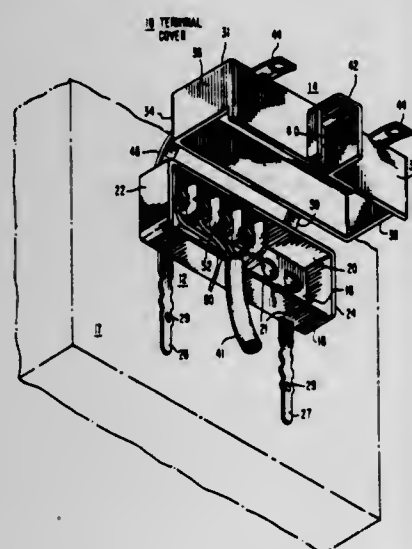
**WEATHERPROOF TERMINAL COVER**

Steven B. Davis, St. Mathews Township, Wake County, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Apr. 9, 1981, Ser. No. 252,684

Int. Cl.<sup>3</sup> H01R 13/44, 13/52

U.S. Cl. 174—138 F

8 Claims



1. A one-piece terminal cover for providing a weatherproof enclosure externally of an associated field-mounted component for associated connectable incoming and outgoing conductors, said terminal cover comprising:

a first member having a back face adapted for external connection to an associated field-mounted component, a top face, a bottom face, and two side faces, said back face having at least one opening for communicating with an associated field-mounted component and for receiving therethrough associated outgoing conductors, said back face further having external raised portions around said opening for providing a gasket;

a second member having a front face, a top face, a bottom face, and two side faces, said bottom face having at least one opening for receiving therethrough associated incoming conductors;

means flexibly connecting said first and second members and for defining a closed position therebetween wherein said first and second members cooperate to define a weatherproof enclosure; and

means for locking said first and second members in said closed position.

4,415,045

**OFFSHORE DRILLING OF LARGE DIAMETER HOLES IN ROCK FORMATIONS**

Lindsey J. Phares, Sugar Land, Tex., assignor to Raymond International Builders, Inc., Houston, Tex.

Filed Apr. 30, 1981, Ser. No. 259,046

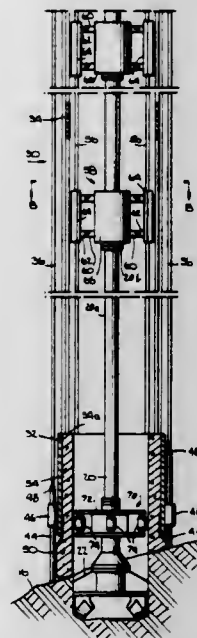
Int. Cl.<sup>3</sup> E21B 7/136

U.S. Cl. 175—9

3 Claims

1. A method of drilling large diameter holes in a rock outcropping of uneven surface configuration on a sea bed, said method comprising the steps of positioning a form on said rock outcropping, pouring a hardenable fluid substance into said

form so that said substance forms itself to the contours of said rock outcropping and so that said hardenable fluid substance attains a flat upper surface, allowing said substance to harden in said form, thereafter drilling, with a drill, into the flat upper



surface of the hardened substance to form in the substance a guide to hold the drill against lateral deflections which might otherwise occur when it encounters the underlying rock outcropping and then continuing to drill down through said substance and into said rock outcropping.

4,415,046

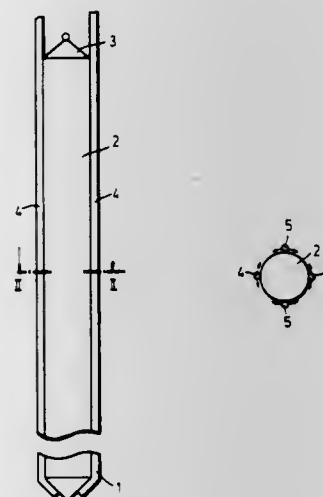
**DEEP VIBRATOR APPARATUS AND METHOD OF USE**  
Franz Eichkorn, Renchen, Fed. Rep. of Germany, assignor to Fritz Pollems Kommanditgesellschaft, Fed. Rep. of Germany  
Filed Apr. 30, 1981, Ser. No. 259,150

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016841

Int. Cl.<sup>3</sup> E21B 7/18, 7/24

U.S. Cl. 175—56

6 Claims



1. A deep vibrator comprising a suspension tube having a longitudinal axis; a propulsion head secured to the lower end of said suspension tube and adapted for vibration in a transverse direction with respect to the longitudinal axis of said suspension tube such that an annular space is formed around said propulsion head; a plurality of pipes fixedly attached along the length of the outer wall of said suspension tube; and each of said pipes ending in a nozzle and having at least one additional nozzle along its length, said nozzles adapted for spraying water under pressure into the annular space around said suspension tube as said suspension tube is inserted into the ground, thereby washing ground material toward said propulsion head.

5. A process for inserting a deep vibrator into the ground,

said deep vibrator comprising a suspension tube having a longitudinal axis and a propulsion head secured to the lower end of said suspension tube, comprising the steps of:

vibrating said propulsion head in a transverse direction with respect to the longitudinal axis of said suspension tube as the propulsion head is inserted into the ground;

ejecting water under pressure from said suspension tube in the area of the tip of said propulsion head as said propulsion head is inserted into the ground; and

releasing water under pressure from a plurality of sites along the length of said suspension tube into the ground material surrounding said suspension tube as said propulsion head is inserted into the ground causing portions of said ground material to be washed into the annular space surrounding said propulsion head.

4,415,047

**DOWNHOLE CASE DRIVING APPARATUS FOR IMPACT DRILLS**

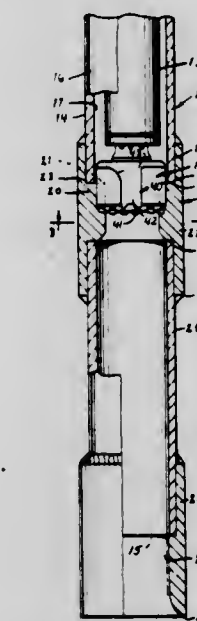
Gerald L. Adcock, 2033 3rd Ave. North, Lewiston, Id. 83501

Filed Nov. 24, 1980, Ser. No. 210,122

Int. Cl.<sup>3</sup> E21B 17/14

U.S. Cl. 175—305

10 Claims



1. Apparatus for pulling a well casing downwardly into a drilled hole from a downhole position adjacent the casing bottom end utilizing a drill string having a downhole percussion drill tool at a lower end thereof, comprising:

an anvil affixed to the casing spaced upwardly from the casing bottom end to project inwardly into the casing, defining a lower casing section extending between the anvil and the casing bottom end;

a tubular drive shoe affixed coaxially to the casing bottom end with a central open bore allowing free elevational passage of the drill tool therethrough;

said anvil having an anvil surface within the casing thereon facing upwardly; and

percussion drill bit means mountable to the downhole percussion drill tool for normally drilling earth material below the drive shoe with means thereon for selectively engaging the percussion drill bit means with the anvil surface to drive the anvil and casing downwardly with the lower casing section and drive shoe projecting through the drilled earth material forward of the bit means when the percussion drill bit is engaged with the anvil surface.

4,415,048

**WEIGHT MEASURING, PRICE COMPUTING AND PACKING APPARATUS**

Kazuharu Teraoka, a/c Teraoka Seikoshu Co., Ltd., 13-12, Kugahara 5-chome, Ota-ku, Tokyo, Japan

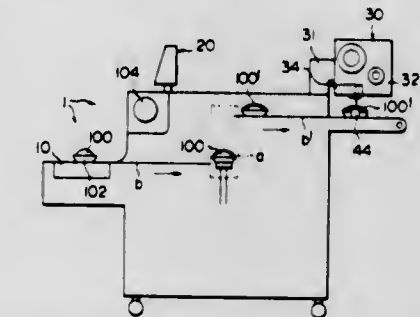
Filed Feb. 23, 1981, Ser. No. 236,721

Claims priority, application Japan, Feb. 26, 1980, 55-23601; Oct. 21, 1980, 55-147061; Oct. 30, 1980, 55-152730; Oct. 30, 1980, 55-152731

Int. Cl.<sup>3</sup> G01G 23/38, 23/22, 23/00, 13/00

U.S. Cl. 177—5

46 Claims



1. A weight measuring, price computing and packing apparatus for a commodity comprising:

(a) a packing section for automatically packing said commodity;

(b) an inlet passage located upstream of said packing section;

(c) an outlet passage located downstream of said packing section;

(d) a weight measuring unit located along said inlet passage for measuring the weight of said commodity, said weight measuring unit comprising a main weight measuring section and an input control section;

(e) a printing and labelling unit located along said outlet passage for printing a label and sticking said label on said packed commodity, said printing and labelling unit having a printing section and a label sticking section, said printing section including means for printing necessary data on said label and for thereafter transferring said printed label to said label sticking section, said label sticking section comprising means for automatically sticking a printed label to said packed commodity;

(f) a mechanism for controlling the printing operation in accordance with input data delivered from said weight measuring unit to said printing and labelling unit; and

(g) a commodity height detecting means and a commodity adjusting means, wherein said weight measuring unit and said printing and labelling unit are connected by a control mechanism.

4,415,049

**ELECTRICALLY POWERED VEHICLE CONTROL**

John A. Werek, Concord, Ohio, assignor to Instrument Components Co., Inc., Painesville, Ohio

Filed Sep. 14, 1981, Ser. No. 301,872

Int. Cl.<sup>3</sup> B62D 11/04

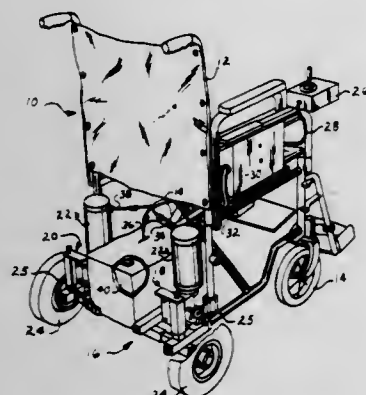
U.S. Cl. 180—6.5

8 Claims

6. An electrically powered vehicle having a differential drive and steering system comprising right and left drive wheel assemblies which each include a direct current motor operably connected to a drive wheel, a source of electric power for providing a power signal to each of said motors, manually adjustable means for providing electrical control signals indicative of desired drive wheel speeds, means for providing feedback signals indicative of actual drive wheel speeds, and an electrical control circuit including a closed loop control circuit to provide a speed command signal proportional in magnitude to differences between said control and feedback signals, a motor energizing network to vary the power signal to said motor in proportion with the magnitude of said speed command signal at values thereof in excess of a first predetermined value, and a dynamic brake network including brake means



operable to decelerate each of said motors together with its associated drive wheel in response to speed command signals lower in value than a second predetermined value, said dynamic brake network including power signal modulator means for varying said power signal in accordance with the magnitude of said speed command signal, said power signal modula-



tor means including energizing switch means operable to electrically connect and disconnect said source of electric power from said motor, said power signal modulator means also including a source for providing a fixed frequency and amplitude reference signal which is compared with said speed command signal to provide a power modulating control signal which is proportional to said speed command signal.

4,415,050

#### DRIVE PUMP ARRANGEMENT FOR WORKING VEHICLE

Chikashi Nishida, late of Osaka (by Shinobu Nishida, Legal representative); Yoshishiro Okita, Sakai, Japan; Ryoichi Tanaka, Neyagawa, Japan; Takeshi Kajimoto, and Hitoo Nasu, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

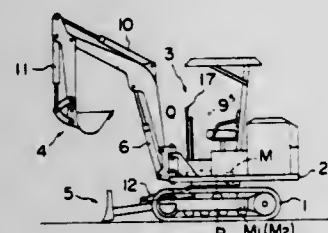
Filed Dec. 28, 1981, Ser. No. 335,286

Claims priority, application Japan, Dec. 26, 1980, 55-191014

Int. Cl.<sup>3</sup> B62D 11/04

U.S. Cl. 180-6.48

3 Claims



1. A working vehicle having two pumps P1, P2 for driving hydraulic motors M1, M2 provided for opposite running devices 1, 1 respectively, a valve mechanism for bringing the vehicle into a low-speed state wherein a fluid is supplied from the pumps P1, P2 to the motors M1, M2 respectively or alternatively into a high-speed state wherein the combined fluid from the pumps P1, P2 is supplied to the motors M1, M2 in series, valves V2, V4 for reversibly rotating and stopping the motors M1, M2 respectively, and manual operating means 17, 17 provided for the valves V2, V4 respectively, the working vehicle comprising an operating assembly 15 provided for the valve mechanism and including a power supply circuit C for an electric operating unit 16 or 16a for bringing the valve mechanism into the high-speed state when energized, a manual switch S1, a safety switch S2 provided with a driven cam 18, the switches S1, S2 being connected in series with the power supply circuit C, the safety switch S2 being attached to one of

the manual operating means 17, 17, and a cam-type operating member 19 provided for the driven cam 18 and attached to the other operating means 17, the safety switch S2 being closed when both the operating means 17, 17 are in a specific position relative to each other for running the vehicle straight, the safety switch S2 being opened when the operating means 17, 17 are brought out of the specific relative position to run the vehicle in a turning state.

4,415,051

#### MULTIPLE PERSONNEL TRANSPORTER VEHICLE FOR LOW VEIN MINES

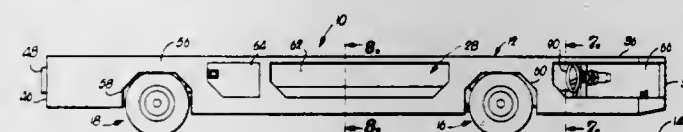
Jerry F. Taylor, Mt. Vernon, Ill., assignor to Mine Equipment Company, Mt. Vernon, Ill.

Filed May 8, 1981, Ser. No. 261,922

Int. Cl.<sup>3</sup> B62D 23/00; B60K 1/00

U.S. Cl. 180-65 R

8 Claims



1. A mine car, comprising:

an elongated, personnel-carrying body;  
surface-engaging means supporting said body; and  
electric power means drivingly coupled to said surface-engaging means for propelling said car,  
the maximum height of said body supported on said surface-engaging means being as low as about 26 inches,  
said body including

structure defining a first personnel compartment for accommodating at least two persons in a generally horizontal position, said structure comprising a bottom wall, a pair of upstanding, opposed end walls spaced apart a distance greater than the length of an average man's legs and less than an average man's height, and means defining an access opening between said end walls permitting entry into said compartment by said persons;  
means defining a compartment forwardly of and separate from said personnel compartment and configured for accommodating a driver in a substantially horizontal position;

means defining second and third personnel compartments respectively disposed on opposite sides of said driver compartment and forwardly of the first compartment and also configured for accommodating individuals in substantially horizontal positions;

electric battery means operatively coupled to said power means and situated rearwardly of said first personnel compartment.

4,415,052

#### ENGINE COMPARTMENT ENCLOSURE

Larry C. Gauer, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 8, 1981, Ser. No. 300,339

Int. Cl.<sup>3</sup> B62D 25/12

U.S. Cl. 180-69 R

4 Claims

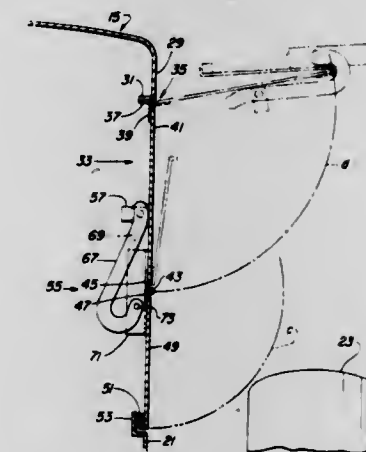
1. In an engine enclosure having a top, side shields and opposite ends operatively enclosing an engine, the improvement comprising:

a first panel hingedly supported from the enclosure top and extending downwardly therefrom to form a portion of the enclosure side;

a first hinge means joining said panel to the enclosure top for pivotal movement relative thereto;

a second hingedly supported panel, forming another portion of the enclosure side, extending downwardly from said

first panel with an edge of said second panel spaced from the lowermost side edge of enclosure side;  
a second hinge means joining said second panel to said first panel for pivotal movement relative thereto;  
a restraining means for supporting and generally maintaining said second panel co-planar with said first panel in a first position and generally parallel and opposite to said first panel in a second position including,  
a mounting brace fixably mounted to said second panel;



a J-member having a general J configuration, having its lower curved portion pivotally mounted to said mounting brace to allow said curved portion to pass below said first panel such that the stem of said member has a generally vertical extension;  
means for maintaining said stem of said J-member in close proximity to said first panel to allow said stem vertical motion, and for restraining motion of said J-member when said second panel is in a second position.

4,415,053

#### TRACTOR DRIVE MECHANISM

Dennis R. Fulford, Colchester, England, assignor to A. F. Trenchers Limited, England

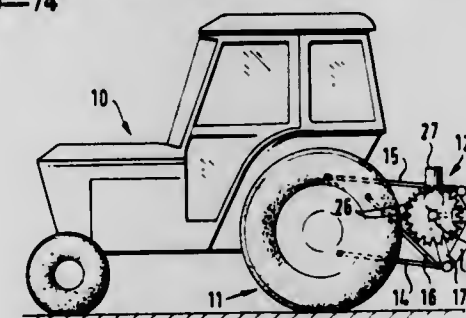
Filed Jan. 16, 1981, Ser. No. 225,360

Claims priority, application United Kingdom, Jan. 16, 1980, 8001517

Int. Cl.<sup>3</sup> B60K 25/08

U.S. Cl. 180-74

16 Claims



1. A drive mechanism for a tractor, which mechanism comprises a support frame adapted for mounting on a tractor, at least one drive wheel rotatably supported on said support frame so that said drive wheel is adjacent a rear wheel of the tractor when said frame is mounted on a tractor, said drive wheel defining a ring of internally-directed teeth, operating means arranged to move said drive wheel to and from a drive position in which position said drive wheel drivingly engages a tire of the adjacent rear wheel of the tractor, and power drive means arranged to effect rotation of said drive wheel at least when said operating means has moved said drive wheel to said drive position, said power drive means including a power-driven toothed wheel which is meshed with said internally-directed teeth of said drive wheel.

4,415,054

#### STEERING GEAR

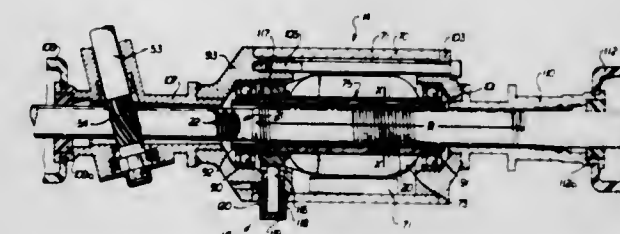
Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 5, 1982, Ser. No. 405,705

Int. Cl.<sup>3</sup> B62D 5/04

U.S. Cl. 180-79.1

6 Claims



1. An assembly for pivoting the steerable wheels of a vehicle upon manual rotation of a steering wheel, said assembly comprising:

a member which is axially movable to effect turning movement of the steerable vehicle wheels;

ball screw and nut means for applying force to said member to move said member axially, said ball screw and nut means including;

thread means connected with said member, rotatable nut means circumscribing at least a portion of said thread means and ball means for transmitting forces between said nut means and said thread means;

an electric motor for rotating said nut means about the central axis of said member, said electric motor including a stator for providing a magnetic field, and a rotor disposed in a coaxial relationship with said member and rotatable under the influence of the magnetic field from said stator to rotate said nut means relative to said thread means;

control means for energizing the stator of said electric motor to rotate said motor and nut means in response to rotation of the steering wheel; and

a rack and pinion gear set for applying force transmitted from the steering wheel to said member and for moving said member axially and imparting rotary motion to said nut means to turn the steerable vehicle wheels upon failure of said electric motor, said rack and pinion gear set including

a pinion gear rotatable with the steering wheel and a rack gear disposed in meshing engagement with said pinion gear and connected with said member.

4,415,055

#### TRACKED VEHICLE

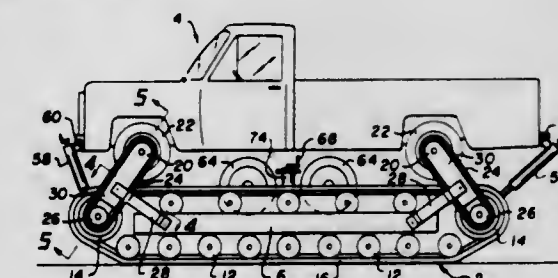
Min H. Ahn, 5111 Maple Rd., Richmond, British Columbia, Canada

Filed Aug. 3, 1981, Ser. No. 289,024

Int. Cl.<sup>3</sup> B62D 55/08

U.S. Cl. 180-198

7 Claims



1. A tracked vehicle to receive a wheeled vehicle and to be driven by the wheeled vehicle, the tracked vehicle comprising:  
a chassis;  
guide wheels mounted on the chassis at each side;



drive wheels mounted at at least the rear of the chassis, at each side;  
a track at each side of the vehicle driven by the drive wheels and guided by the guide wheels;  
first drive members attached to each drive wheel;  
said drive member being adapted to receive a drive transmission means;  
the chassis being adapted to receive and retain the wheeled vehicle by jacks contacting the front and rear of the wheeled vehicle and contacting the tracked vehicle; and  
second drive members attachable to the driven wheels of the wheeled vehicle to receive said drive transmission means whereby driving of the driven wheels of the wheeled vehicle drives the tracks of the tracked vehicle.

4,415,056

**HANDICAPPED-DRIVEN SIDECAR**

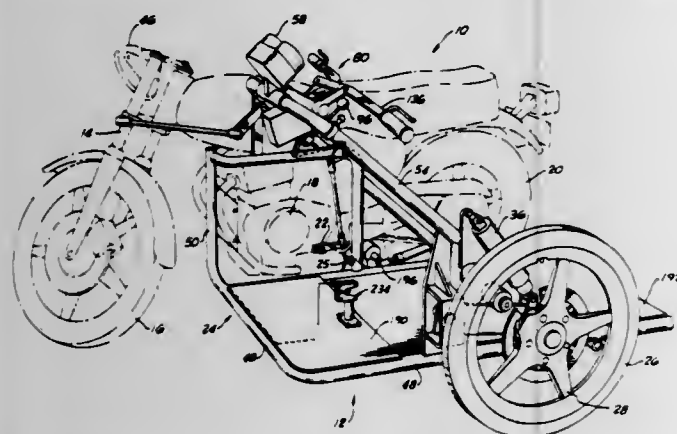
Frederick A. Smith, 5410 E. Saginaw, Fresno, Calif. 93727

Filed Dec. 11, 1981, Ser. No. 329,691

Int. Cl.<sup>3</sup> B62K 27/00

U.S. Cl. 180—210

11 Claims



1. A handicapped driven apparatus comprising:
  - (a) a motorcycle having a front fork assembly, an automatic transmission and conventional hand brake and throttle controls;
  - (b) a side car designed and constructed to accommodate therein a conventional wheelchair and occupant, said sidecar attached to said motorcycle;
  - (c) means attached to said sidecar for control by the wheelchair occupant of the speed of the apparatus, said means comprising a main gear box attached to the sidecar, a pair of interdigitating gears housed within said gear box, a rotatable arm attached to a first gear of said gear pair such that rotational movement of said arm is communicated to said first gear and hence to the second gear of said gear pair, said arm extending out of said gear box toward the wheelchair occupant, a main actuating bar pivotally attached to said arm and within easy reach of the wheelchair occupant such that rotational movement of said actuating bar is communicated to said arm while pivotal movement of said actuating bar is not communicated to said arm, a throttle bar for communicating movement of said actuating bar to the throttle control of the motorcycle to control thereby the supply of fuel to the motorcycle, a linkage attached to the main actuating bar and to each of the hand brake controls, which controls are attached to the sidecar, such that pivotal movement of the actuating bar operates the brake controls, and
  - (d) means attached to the sidecar and within each reach of the wheelchair occupant for controlling the direction of the apparatus and the transmission mode of the motorcycle.

4,415,057  
**REAR WHEEL DAMPER DEVICE FOR MOTORCYCLE**  
Ken Yamaguchi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

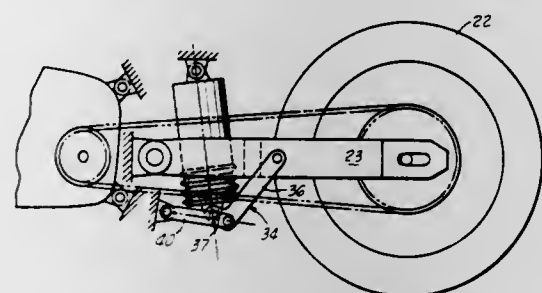
Filed Sep. 8, 1981, Ser. No. 300,036

Claims priority, application Japan, Sep. 23, 1980, 55-132082; Sep. 23, 1980, 55-132083; Sep. 23, 1980, 55-132085; Sep. 24, 1980, 55-132694

Int. Cl.<sup>3</sup> B62K 25/20

U.S. Cl. 180—227

11 Claims



9. In a rear wheel suspension device for a motorcycle having a main frame, the combination of
  - a rear wheel support frame having side bars and a cross member extending between said side bars;
  - a horizontal bearing member pivotally mounting said support frame to the main frame;
  - an upright damper pivoted to the main frame at its upper end and extending between said side bars and between said cross member and said horizontal bearing member, the lower end of said upright damper being below said side bars;
  - a rigid link having a horizontal support member and a pair of parallel bell crank members, each bell crank member having a long arm and a short arm, one end of each said long arm being pivotally mounted to a said side bar and one end of each said short arm being pivotally mounted to the lower end of said upright damper; and
  - two tension rods being pivotally connected to said rigid links at a distance from said one end of said long arms and at a distance from said one end of said short arms and pivotally mounted to the main frame, said tension rods being spaced apart on either end of said horizontal support member.

4,415,058

**FOUR-WHEEL DRIVE SYSTEM FOR A WHEELED VEHICLE**

Kunihiko Suzuki, Sagami-hara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

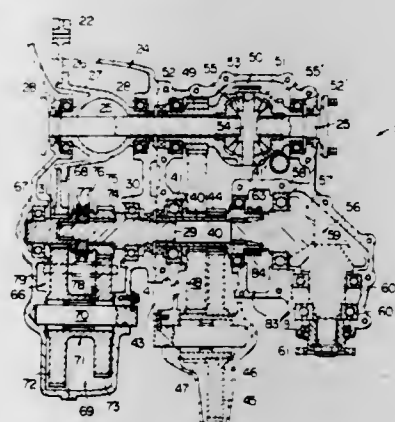
Filed Dec. 30, 1981, Ser. No. 335,680

Claims priority, application Japan, Jan. 9, 1981, 56-2527

Int. Cl.<sup>3</sup> B60K 17/34

U.S. Cl. 180—247

5 Claims



1. A four-wheel drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road

wheels and a pair of rear road wheels, comprising in combination:

- a power unit having an output shaft having an axis of rotation in a lateral direction of the vehicle,
- a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle, and gears mounted on the transmission input and output shafts and arranged to be capable of selectively producing a plurality of gear ratios between the transmission input and output shafts, the output shaft of the power unit being operatively coupled to the transmission input shaft, said gears including a transmission output gear rotatable with the transmission output shafts; and
- a power distribution gear unit comprising (a) a power distribution shaft having an axis of rotation in a lateral direction of the vehicle, (b) a power distribution input gear coaxially rotatable with respect to the power distribution shaft, (c) an intermediate power transfer gear operatively intervening between the transmission output gear and the power distribution input gear and operative to transmit driving power therethrough from the transmission output shaft to the power distribution shaft, (d) two-wheel/four-wheel shifting clutch means arranged on said power distribution shaft and operative to split into two driving power components the driving power carried to the power distribution shaft, (e) a final reduction gear assembly operative to transmit therethrough one of said driving power components with reduction of speed at a predetermined ratio, (f) a pair of drive shafts axially aligned with each other in a lateral direction of the vehicle and operatively connected to one of said pair of front road wheels and said pair of rear road wheels, (g) a wheel drive differential gear assembly mounted on said drive shafts, said final reduction gear assembly operatively intervening between said two-wheel/four-wheel shifting clutch means and said wheel drive differential gear assembly, (h) a right-angle power transfer gear assembly operative to transmit the other of said driving power components to the other of said pair of front road wheels and said pair of rear road wheels, said right-angle power transfer gear assembly including a driven gear having an axis of rotation in a fore-and-aft direction of the vehicle, and (i) a low-and-high speed shifting clutch mechanism which comprises a low-speed gear coaxially rotatable on the power distribution shaft, clutch means operative to provide coupling engagement selectively between the power distribution input gear and the power distribution shaft and between said low-speed gear and the power distribution shaft, and a reduction gear assembly which has an axis of rotation substantially parallel with the axis of rotation of said power distribution shaft and which is held in mesh with both of the power distribution input gear and said low-speed gear.

4,415,059

**MUFFLER**

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Yokohama, Japan

Filed Jun. 17, 1982, Ser. No. 389,267

Claims priority, application Japan, Jul. 22, 1981, 56-114888

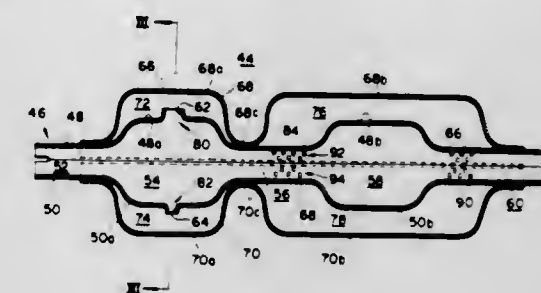
Int. Cl.<sup>3</sup> F01N 1/02

U.S. Cl. 181—250

7 Claims

1. A muffler comprising:
  - an inner shell having first and second expansion chambers which are coaxially arranged and connected to each other through a communicating passage;
  - an outer shell spacedly covering said inner shell to define therebetween first, second, third and fourth isolated chambers, said first and second isolated chambers surrounding said first expansion chamber, while, said third and fourth isolated chambers surrounding said second expansion chamber;
  - first means connecting said first expansion chamber with

said first isolated chamber to allow the latter to show a sound damping effect;  
second means connecting said first expansion chamber with said second isolated chamber to allow the latter to show a sound damping effect;  
third means connecting the upstream and downstream portions of said second expansion chamber with said third chamber to allow the latter to show a sound damping effect;



- fourth means connecting the upstream and downstream portions of said second expansion chamber with said fourth chamber to allow the latter to show a sound damping effect;
- an inlet means leading to said first expansion chamber to introduce thereto an exhaust issued from a noise source; and
- an outlet means extending from said second expansion chamber to the open air to discharge the exhaust in the second expansion chamber into the atmosphere.

4,415,060

**MUFFLER FOR COMPRESSORS**

Alfredo Bar, Pavia, Italy, assignor to Necchi, S.p.A., Pavia, Italy

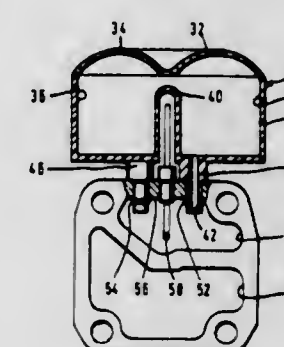
Filed Feb. 17, 1982, Ser. No. 349,474

Claims priority, application Italy, Feb. 24, 1981, 42905 A/81

Int. Cl.<sup>3</sup> F01N 1/08; F25D 19/00

U.S. Cl. 181—272

1 Claim



1. A muffler for compressors which compressors consist of an electric motor, a cylinder and a head for the cylinder in which are located the intake and compression chambers for refrigerant gas, comprising a muffler body constructed from plastic material resistant to the action of the chemical agents of the refrigerant gas and the lubricating oil and which consists of first and second chambers separated partially by a central wall, said muffler body having a hole therein communicating with said first chamber for the passage of said refrigerant gas and an external small tube extending therefrom through which said second chamber communicates with the intake chamber located in said head, a second small tube extending from the muffler body below said first chamber and co-operating with said small tube interconnecting the second chamber and the intake chamber of said head, said head having two holes communicating with said intake chamber for receiving and projecting both small tubes into said intake chamber, and two rings one on each tube which hold the muffler body to the head.



4,415,061

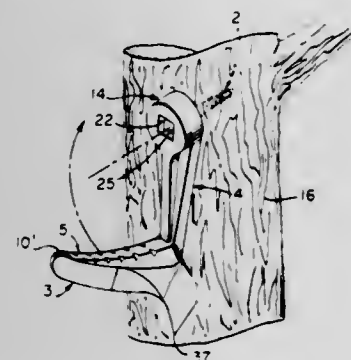
**PORTABLE TREE CLIMBING DEVICE**

Leonard S. Meyer, Columbia, S.C., assignor to Victor United, Inc., Chicago, Ill.

Filed Sep. 1, 1982, Ser. No. 413,760  
Int. Cl.<sup>3</sup> A63B 27/00, 29/04

U.S. Cl. 182—92

12 Claims



1. A portable step unit for climbing a tree or the like comprising, an angular climbing member provided with an upright crank arm and an offset step arm, said crank arm including opposite inner and outer faces and having a lower end from which said step arm projects, a mounting portion adjacent an opposite upper end of said crank arm and having a socket therein intermediate said inner and outer faces, said socket configured to accept a fastener member angular head therein, said mounting head including a bore communicating with said socket and inner face and adapted to pass a fastener member threaded portion therethrough, said mounting head having a passageway communicating with said socket and outer face, said passageway having a radial periphery configured to allow axial passage of a fastener member angular head therethrough into said socket while precluding angular displacement of said head within said passageway, and captivating means in said socket precluding axial displacement of said fastener member head toward said outer face when said head is arcuately shifted within said socket.

4,415,062

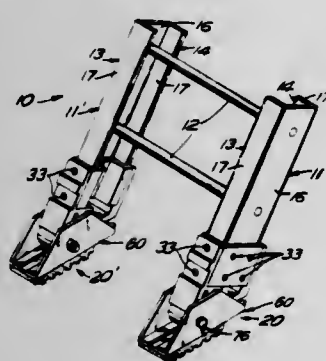
**LADDER FOOT**

Jonathan L. Shaw, Clinton Township, Hunterdon County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,212  
Int. Cl.<sup>3</sup> E06C 7/44, 7/46

U.S. Cl. 182—109

11 Claims



1. A foot for a ladder having longitudinal rails, lateral rungs and transversely separated front and back sides for said rails, said foot comprising:

- (1) bracket means attachable at its upper end to the bottom of one such rail and having
  - (a) a stud extending downward from said end at the back of said bracket means and having front and back sides separated by the transverse thickness of said stud, said stud
    - (i) having an upper range over which its front and back

sides are substantially longitudinal and said thickness remains substantially the same, and

- (ii) a lower range in which the radial distance from any point therein on such front side to any point therein on such back side at most approximates said thickness in said upper range, and said bracket means also having
  - (b) upper stop means frontward of the front side of said stud at the top of its upper range;
- (2) a shoe of U-shape in lateral cross section and including:
  - (a) a central lateral sole plate disposed outward of said bracket means, and
  - (b) a pair of upper plates extending from said sole plate towards such bracket means to straddle laterally opposite sides thereof, and
- (3) a lateral pin fixedly secured at its opposite ends with said upper plates, such pin passing from one to the other of such plates through said bracket means adjacent said stud to be movable longitudinally relative thereto over such upper range, the separation between said pin and sole plate permitting the upper range of said stud to fit therebetween with a clearance facilitating such longitudinal movement; and
- (4) said pin pivotally coupling said shoe to said bracket means in a manner which
  - (a) when said pin is in such lower range, permits angular adjustment of said shoe between flat and toe-down positions for which said sole plate is, respectively, transversely disposed in contact with the lower end of said bracket means and longitudinally disposed at the back side thereof, and
  - (b) when said pin in said upper range, said shoe is locked in toe-down position, and
  - (c) when said pin is at the top of said upper range, said upper stop means contacts said pin and is adapted to transmit longitudinal force thereto.

4,415,063

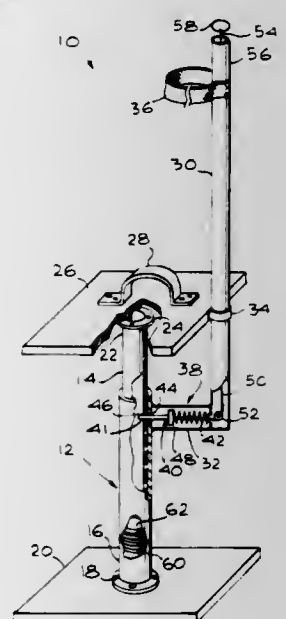
**STILT DEVICE**

James Hutchison, 2780 Calle Bienvido, Thousand Oaks, Calif. 91360

Filed Jul. 26, 1982, Ser. No. 402,024  
Int. Cl.<sup>3</sup> A63B 25/00

U.S. Cl. 182—230

16 Claims



1. An improved leg stilt device, said device comprising, in combination:

- (a) a first hollow vertical support member;
- (b) a second vertical support member disposed in telescoping relation inside said first member and extending vertically therefrom;
- (c) a horizontal support platform connected to the upper end of said vertical member which extends up from the other

of said vertical members and adapted to receive one leg of a user;

- (d) a broad, flat, horizontal base connected to the lower end of the lowermost-extending one of said vertical members to impart stability to said device;
- (e) a leg brace extending above and connected to said platform; and,
- (f) stilt height adjusting means releasably coupling said first and second vertical members together, said adjusting means comprising, in combination:
  - i. means for moving said platform vertically,
  - ii. pin means releasably disposable through aligned horizontal openings in said vertical members, and
  - iii. pin moving means, including pin retraction means disposed, in part, above said platform in said leg brace accessible to the user of said device and connected to said pin for moving said pin out of said openings and into the unlocked position, and pin biasing means urging said pin into said aligned openings to lock said vertical members together, said pins means and pin moving means being concealed within said device and protected against damage.

4,415,064

**SPEEDOMETER CABLE LUBRICATION TOOL**

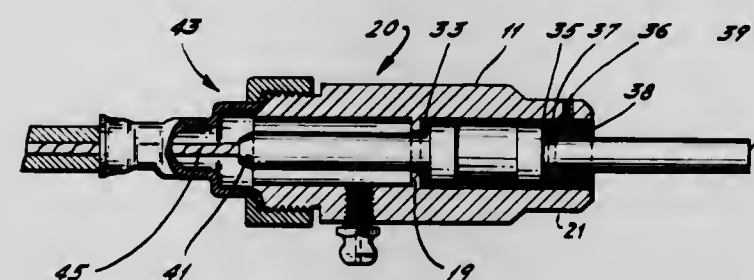
Casey Olemuller, 1209 Orchid Rd., Warminster, Pa. 18974

Filed Aug. 14, 1981, Ser. No. 293,031

Int. Cl.<sup>3</sup> F16N 1/00, 13/08

U.S. Cl. 184—15 R

20 Claims



1. A lubrication tool for an encased speedometer cable, said cable being disconnectable from a transmission to provide a free coupling and casing end thereof with the speedometer cable end projecting therefrom, comprising:

- means for providing a sealed connection with the end of said speedometer cable casing, said sealed connection means including a lubrication fitting; and
- means for rotatably coupling to said end of said speedometer cable, said rotatable coupling means being positioned within said sealed connection means and being capable of rotating said speedometer cable end.

4,415,065

**RESTAURANT OR RETAIL VENDING FACILITY**

Gary O. Sandstedt, 3837 Harrison Blvd., Kansas City, Mo. 64109

Filed Nov. 17, 1980, Ser. No. 207,744

Int. Cl.<sup>3</sup> E04H 3/04; G06F 3/02

U.S. Cl. 186—39

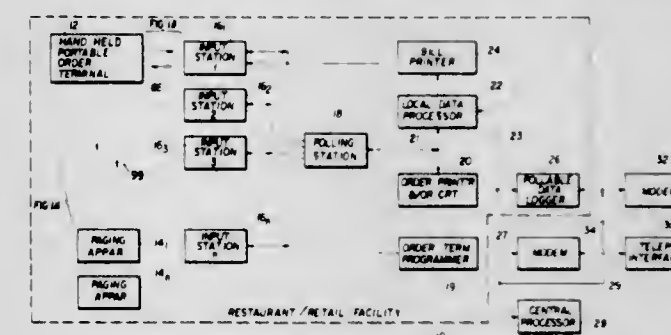
13 Claims

1. In a vending system including a portable data terminal adapted to interact with a data processor for implementing an order transaction, the combination comprising:

- a plurality of ordering stations, each having respective bidirectional paging transceiver apparatus of a selected energy type adapted to communicate with like paging transceiver apparatus located in at least one portable hand held ordering terminal;
- at least one portable hand held ordering terminal including, like transceiver apparatus of said selected energy type adapted to provide an indication of a page to an operator carrying said ordering terminal and to provide operator

communications with said ordering stations and any other location having like transceiver apparatus of said selected energy type, a first digital memory, means for entering digital data corresponding to an order transaction into said first memory for temporary storage, means providing a visual instructional sequence to the operator for properly entering the order data into said first memory and providing error indicator for improper operator entry, a second digital memory and being of a down loaded reprogrammable type having stored data therein corresponding to a programmed library of product codes of orderable items and being operable to output an alpha-numeric code sequence of an ordered item in response to an order entry by said operator, means providing a print out of each ordered item in alpha-numeric form and means coupled to said first memory for transferring said data in temporary storage to a selectively addressed wireless communications link under program control;

said communications link comprising a pollable bidirectional wireless communications link of a selected type including



a controlled polling station, a plurality of pollable input stations coupled to said polling station, said polling station being operable to repetitively interrogate said plurality of input stations and lock onto an input station in communication with said hand held ordering terminal to accept data therefrom and couple said data to means providing a visual representation of an order entry and to a data processor;

means coupled to said communications link and being responsive to the data from said temporary storage provided by said first memory to provide a visual representation of the order entry in said terminal, said visual representation means being located at an order filling location separate from said ordering station;

a data processor coupled to said communications link and being responsive to data translated thereto from said first memory of said hand held ordering terminal to maintain a running account of the transaction and provide billing information therefrom; and

means coupled to said data processor for providing a printed record including a bill at the end of the transaction.

4,415,066

**MANHOLE SERVICE VEHICLE**

Alphonse J. Mensik, 7933 127th Pl. NE., Kirkland, Wash. 98033

Filed Jun. 5, 1980, Ser. No. 156,805

Int. Cl.<sup>3</sup> B66B 9/20

U.S. Cl. 187—9 R

22 Claims

1. A manhole service vehicle comprising:

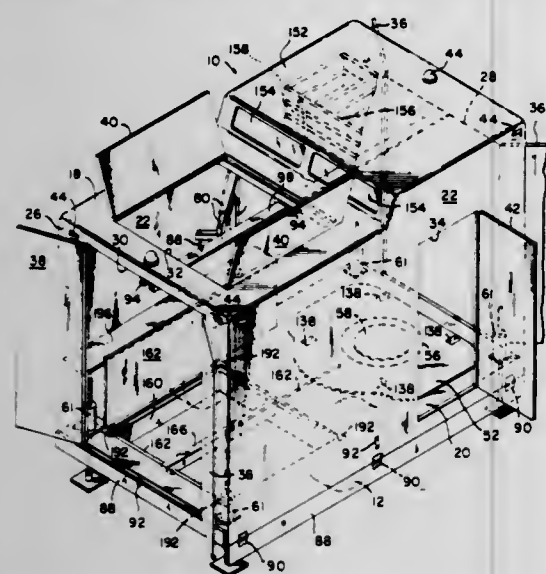
- a. frame means;
- b. wheels mounted on said frame means for easy movement of said vehicle;
- c. top, bottom, side and front and rear wall means mounted on said frame means to provide an enclosed, sheltered, work space within said vehicle within which a workman may work while standing at least generally upright during normal use of the vehicle for its intended purpose;
- d. a selectively openable and closeable door means in at least one of said side, front and rear wall means of said vehicle,



said door means being sized and located to permit the easy entry and exit of said workman into and out of said enclosed working space within said vehicle;

e. wherein said bottom wall means of said vehicle defines, within said workspace, a substantially flat, horizontal workfloor means within said vehicle upon which said workman can walk, during normal use of the vehicle for its intended purpose;

f. wherein said bottom wall means of said vehicle defines at least one bottom wall opening means wherein said bottom wall opening means is provided with a cover adapted to



prevent the entry of debris of the elements into said vehicle when said bottom wall opening means is not being used, wherein said bottom wall opening means is at least partially surrounded by said workfloor means, is sized to easily permit a workman to pass therethrough, and wherein said vehicle and bottom wall opening means are positioned, during use of the manhole service vehicle, over a manhole to enable said workman to have access to said manhole from the interior of said vehicle and to have access to the interior of said vehicle from said manhole through said bottom wall opening means while said workman and said manhole are protected from the environment by said service vehicle.

4,415,067

## LIQUID COOLED BRAKE UNIT

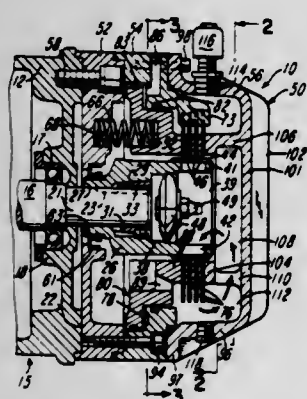
Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Fairfield, Ohio

Filed May 29, 1981, Ser. No. 268,339

Int. Cl.<sup>3</sup> F16D 55/36

U.S. Cl. 188—71.5

16 Claims



1. An improved brake unit adapted to be mounted on a motor for quickly stopping the rotation of a shaft projecting from the motor, said brake unit comprising a hub member having a center bore for receiving the shaft and including an annular portion projecting axially from a mounting portion adapted to engage the shaft to define a liquid coolant inlet,

means for rigidly securing said hub member to the shaft, a plurality of annular brake discs mounted on said annular portion of said hub member for rotation therewith and for axial movement relative to said hub member, said annular portion of said hub member having circumferentially spaced and generally radially extending passages connecting said inlet to the inner portions of said brake discs, a housing surrounding said hub member, a liquid coolant within said housing, means connected to said housing and supporting a plurality of non-rotatable annular brake plates disposed between said brake discs in interfitting relation, said coolant being forced outwardly from said inlet through said passages and between said brake discs and plates in response to rotation of said hub member and said brake discs, an annular non-rotating piston supported by said housing concentrically with said hub member and for axial movement relative to said hub member, means for moving said piston axially to effect axial compression and release of said brake discs and plates, said housing including an end closure portion for confining said coolant within said housing, and means defining a passage within said housing for recirculating the coolant from said brake discs and plates and within the lower portion of said housing to said inlet of said hub member.

4,415,068

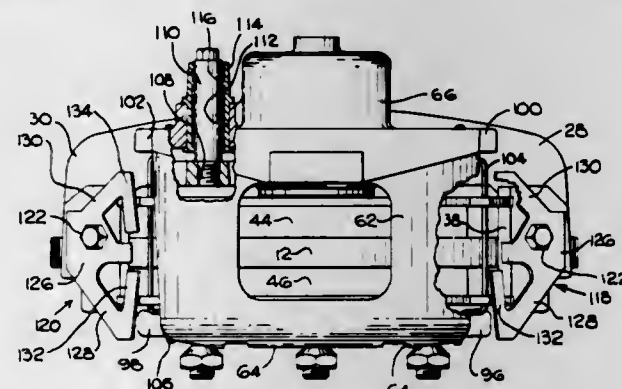
DISC BRAKE AND ANTIRATTLE SPRING THEREFOR  
Bert A. Gumkowski, South Bend, and John F. Limberg, Granger, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 16, 1981, Ser. No. 283,756

Int. Cl.<sup>3</sup> F16D 55/22

U.S. Cl. 188—72.3

1 Claim



1. A disc brake of the type having a rotatable brake disc, a caliper straddling said brake disc and cooperating with a pair of friction elements to urge the latter axially into engagement with said brake disc, each of said friction elements having a backing plate, a non-rotatable support member supporting said caliper, said support member including a pair of support arms opposing rotation of said pair of friction elements, and an antirattle spring engaging said pair of friction elements to restrain rattling thereof, the improvement wherein said antirattle spring includes a body portion, a pair of divergent arms extending axially outwardly from said body portion to a position outside said pair of friction elements, a pair of resilient arms integral with said pair of divergent arms, respectively, and extending axially toward one another and radially toward said disc from said pair of divergent arms to engage said pair of friction elements, said body portion being secured to the radially outer surface of one of said support arms and said divergent and resilient arms extending substantially in a direction toward said other support arm in order to position said pair of resilient arms on top of said pair of friction elements.

4,415,069

BRAKING DEVICE FOR THE COVER OF A CHAMBER  
IN A RECORDING AND/OR REPRODUCING APPARATUS

Kurt Eisemann, Berlin, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

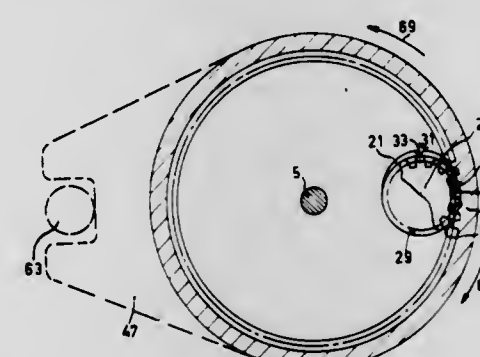
Filed Apr. 20, 1981, Ser. No. 255,922

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026909

Int. Cl.<sup>3</sup> F16D 63/00, 41/04; G11B 1/00

U.S. Cl. 188—82.84

4 Claims



1. A braking device, comprising:  
a non-rotatable plate;  
a shaft connected to said plate and extending generally in a direction perpendicular therefrom;  
a first member rotatably arranged on said shaft, for movement in a first direction and in a second direction opposite to said first direction, said first member directions lying in a plane generally transverse of said shaft;  
a second member coaxial with said first member and rotatably arranged on said shaft between said plate and said first member, for movement in a plane parallel to said first member plane;  
a damping material provided between said plate and said second member, said plate and said second member being arranged such that said material contacts both said plate and said second member;  
means, associated with said shaft, for urging said first and said second members simultaneously toward said plate; and  
means, associated with said first and said second members, for uniting said first and said second members and providing simultaneous unidirectional rotation by said first and said second members only when said first member is rotated in said first direction, whereby said unidirectional rotation is damped by said material between said plate and said second member,

characterized in that said second member includes a damping disc having an edge, said first member includes an actuating disc coaxial with said damping disc, and said uniting and providing means includes a recess provided in said damping disc and a plurality of teeth provided on said actuating disc, said recess adjoining said edge and having a shallow depth, said teeth being adjacent said edge and said recess, and said uniting and providing means further includes a toothed disc accommodated within said recess, said teeth of said toothed disc being meshed with said teeth of said actuating disc, said toothed disc having a thickness substantially corresponding to said depth of said recess, said recess being partly formed by an oval-shaped wall tangential to said toothed disc, and said wall being provided with a cam on a diameter of said recess, so that said toothed disc moves along said diameter toward said cam when said first member rotates in said first direction.

4,415,070

## HOSE CONNECTOR

John F. Pickering, Rugby, England, and David Evans, Queenswood, South Africa, assignors to Lucas Industries Limited, Birmingham, England

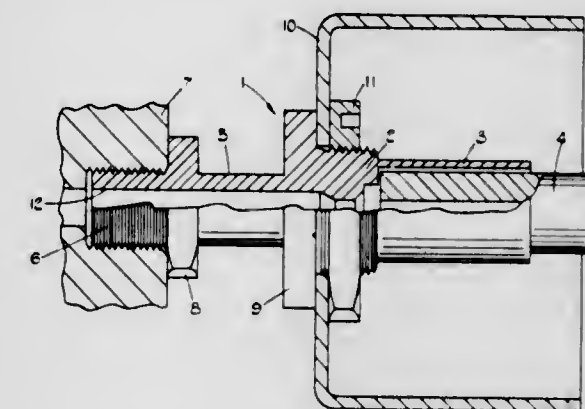
Filed May 29, 1981, Ser. No. 268,240

Claims priority, application United Kingdom, Jun. 4, 1980, 8018244

Int. Cl.<sup>3</sup> F16D 65/78

U.S. Cl. 188—264 F

7 Claims



1. A hose connector for a hydraulic brake comprising a connector body having a first portion connectable to a flexible hydraulic fluid supply hose and a second portion, connectable to a brake actuator, a bore extending through the body and said first and second portions, means to secure said hose to said first portion in fluid communication with said bore and means to secure said second portion to said brake actuator in fluid tight relationship therewith so that hydraulic fluid flows in said bore in one direction towards said actuator when the brake is applied and in the opposite direction in said bore when the brake is retracted, and means for minimizing the amount of heat from the brake reaching said hose comprising a collector in at least a portion of said bore extending through said second body portion having a predetermined volume in relation to the brake actuator sufficient to contain at least a major part of the heated fluid expelled from the actuator during retraction of the brake.

4,415,071

## DEVICE FOR BLEEDING BRAKES AND REFILLING BRAKE SYSTEM

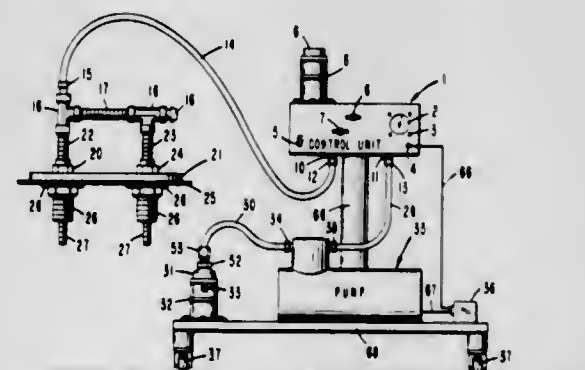
Eric S. Butler; William H. Butler, Jr., both of Murfreesboro, 37130 and Malcolm H. Butler, Nashville, all of Tenn. 37212

Filed Jul. 27, 1981, Ser. No. 287,482

Int. Cl.<sup>3</sup> B60T 11/30

U.S. Cl. 188—352

1 Claim



1. A brake fluid changing device for changing brake fluid and bleeding the brake system of automobiles and trucks, the device having a control unit affixed to an adjustable stand mounted on a platform on wheels, a brake fluid and air extractor unit mounted on the platform on wheels, a brake fluid application container affixed to the top of the control unit, the control unit having an electrical on/off switch with electrical



conductors, a brake fluid application control valve, a vacuum meter indicator, a brake fluid and air extractor control valve, a brake fluid application container and a master cylinder brake reservoir top with U-bolts, and controls means for controlling the operation of the fluid changing device, said control unit controlling the brake fluid and air extractor unit by the electrical on/off switch and a brake fluid and air control valve, the control unit of changing device controlling the brake fluid application by way of the brake fluid application control valve, the control unit being connected to the master cylinder brake reservoir top by a heavy duty dual function extractor/application hose and the control unit being connected to the brake fluid and air extractor unit by a heavy duty vacuum hose, the brake fluid and air extractor unit of the fluid changing device having a vacuum pump, a brake fluid collection container, a brake fluid collection hose, a heavy duty vacuum hose, and a junction box, the vacuum pump of the extractor unit being connected to the control unit by a heavy duty vacuum hose, the vacuum pump being connected to the brake fluid collection container by a brake fluid collection hose, the junction box of the extractor unit being connected to the control unit by electrical conductors, the control unit of the brake fluid changing device controlling the action of the extractor unit such that the electrical on/off switch located on the control unit controls the suction action of the vacuum pump, with the master cylinder brake reservoir top secured to the master cylinder of the vehicle, the on/off switch in the on position, the brake fluid application control valve in the closed position, and the brake fluid and air extractor control valve in the open position, the suction action of the vacuum pump causes the brake fluid and air to be extracted from the master cylinder of the motor vehicle's brake system, through the extractor/application hose to the control unit, through the heavy duty vacuum hose to the vacuum pump, through the brake fluid collection hose to the brake fluid collection container, new brake fluid being applied to the brake system by closing the brake fluid and air extractor control valve, by turning the electrical on/off switch to the off position, and by opening the brake fluid application control valve thereby new brake fluid travels from the brake fluid application container through the brake fluid application control valve to the control unit through the dual function extractor/application hose, through the master cylinder brake reservoir top into the master cylinder into the motor vehicle brake system with the brake fluid application being closed when the master cylinder is full by pumping the brake pedal which pedal action causes brake fluid to be circulated throughout the brake system, and continuing this operation until brake fluid level in the brake fluid container stops dropping.

4,415,072

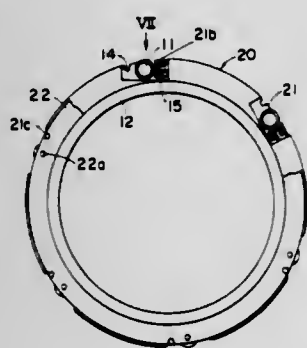
## ONE-WAY CLUTCH

Masao Shoji, Fujisawa, and Yoshio Kinoshita, Chigasaki, both of Japan, assignors to NSK-Warner K. K., Tokyo, Japan  
Filed Mar. 27, 1981, Ser. No. 248,351  
Claims priority, application Japan, Apr. 10, 1980, 55-46175; Apr. 10, 1980, 55-47612[U]

Int. Cl.<sup>3</sup> F16D 41/06

U.S. Cl. 192-45

19 Claims



1. A unitary structure for a one-way clutch assembly adapted to be disposed between two relatively rotatable mem-

bers so as to permit relative axial rotation between the two members in one direction but prevent relative axial rotation between the two members in the other direction, comprising a race formed with grooves at the periphery thereof, each groove being defined by a bottom and by first and second side walls extended in the direction of the depth of the groove and distant from each other in the peripheral direction of the race; a pair of parallel annular cage plates positioned relative to said race to form radial side walls of the grooves; a plurality of rollers received in the respective grooves; a plurality of springs disposed in the respective grooves to bias the rollers toward the direction to prevent the relative rotation between said two members; means for connecting the two parallel cage plates to fix the cage plates to each other and to the race in the axial direction; means for preventing relative rotation between the race and the two cage plates; and wherein said connecting means includes a plurality of axial members that extend from a peripheral portion of one of said annular cage plates and that engage the other of the annular cage plates.

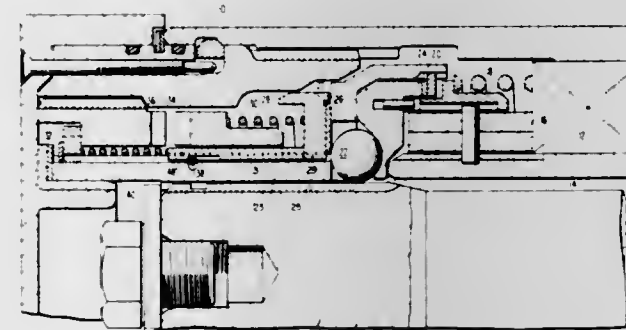
4,415,073

## AUTOMATIC HUB CLUTCH

Chris A. Campbell, Janesville, Wis., and Robert B. Overbeek, Rochelle, Ill., assignors to Dana Corporation, Toledo, Ohio  
Filed May 23, 1980, Ser. No. 152,635  
Int. Cl.<sup>3</sup> F16D 43/20

U.S. Cl. 192-54

15 Claims



1. An automatic clutch for effecting a driving connection between a rotatable power shaft and a wheel hub, the combination comprising:  
(a) a non-rotative cam member having a cam ramp;  
(b) a control plate keyed to said power shaft and positioned adjacent to said cam member;  
(c) a ball element interposed between said control plate and said cam ramp;  
(d) a race washer cup and race washer arranged in concentric relation to said power shaft and engagable by said ball element;  
(e) a gear affixed to said wheel hub in concentric relation to said power shaft;  
(f) a gear slidably mounted on said control plate with an engagement spring interposed between said race washer cup and said gear; and  
(g) said control plate rotatably engaging said ball element upon the rotation of said shaft and moving said ball element up said ramp for engaging and moving said race washer cup axially of said shaft and into engagement with said sliding gear to force said sliding gear towards said fixed gear.

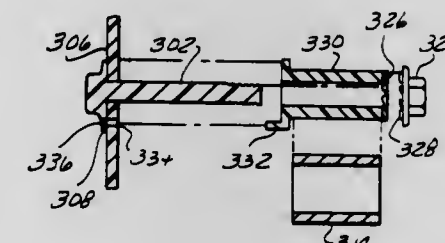
4,415,074

## WORKPIECE SUPPORT BEARING FOR MODULAR CHUTING

John T. Leininger, Pontiac, Mich., assignor to Modular Automation, Inc., Pontiac, Mich.  
Continuation-in-part of Ser. No. 265,664, May 20, 1981, Pat. No. 4,381,834, and a continuation-in-part of Ser. No. 312,541, Oct. 19, 1981. This application Jan. 18, 1982, Ser. No. 340,370  
Int. Cl.<sup>3</sup> B65G 13/00

U.S. Cl. 193-37

4 Claims



1. In a workpiece support bearing for modular chuting comprising a chute for passing the workpiece; a support engaging a first aperture formed in a chute wall; a low friction bearing member carried by the support; said bearing member including a flange extending radially outward abutting the chute wall; a bushing rotatably carried by the bearing member; the invention comprising:

the support including a support flange extending radially outward abutting the chute wall, an aperture formed in said support flange, a second aperture formed in the chute wall aligned with the aperture formed in said support flange, and a projection extending longitudinally from the bearing member flange engaging the aperture formed in said support flange and the second aperture in the chute wall wherein rotation of the support and the bearing member is prevented.

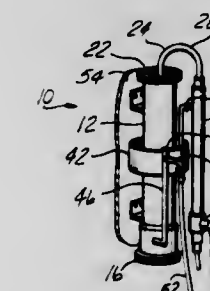
4,415,075

## WALL MOUNTED LIGHT WEIGHT AUTOMATIC WATER DISTILLER

Guy P. McNesky, Port St. Lucie, and E. Dale Rice, Tampa, both of Fla., assignors to General Molding, Inc., Tampa, Fla.  
Filed Sep. 16, 1981, Ser. No. 302,883  
Int. Cl.<sup>3</sup> B01D 3/02

U.S. Cl. 202-177

8 Claims



1. A light-weight, compact and efficient distillation apparatus for periodically removing impurities from a quantity of water from a water supply by heating the water to be purified to form steam and condensing the steam to form distilled water, said distillation apparatus comprising:  
a generally tubular vertically disposed member having a closed upper end and a closed lower end and forming a vaporization chamber therein;  
a rim member extending about said tubular member at an intermediate level between said upper and lower end thereof and forming an annular rim trough for water around said tubular member, said rim trough having an opening permitting visual inspection of the level of water therein and fur-

ther providing an overflow for said rim to limit the water level therein to a predetermined maximum level;  
at least one aperture in said tubular member extending between said vaporization chamber and said rim trough for fluid communication therebetween such that said rim trough supplies water to said vaporization chamber and the water level in said vaporization chamber corresponds to the water level in said rim trough, said water in said rim trough forming a liquid seal between said vaporization chamber and the portion of said rim trough above said aperture such as to prevent the escape of steam from said vaporization chamber; heating means disposed in said vaporization chamber below the level of said aperture such as to vaporize said water in said vaporization chamber;  
a collector tube having a first end interconnected with said tubular member at a location above said aperture and communicating with said vaporization chamber and having a second end being reversely bent and extending downwardly therefrom such that vaporized water from said vaporization chamber is diverted therefrom along said collector tube;  
a condenser tube having a larger diameter than said collector tube, said collector tube passing through the interior of said condenser tube and being affixed thereto, the ends of said condenser tube being closed off to define a sealed annular condensing chamber between said condenser tube and said collector tube;  
an inlet to said condenser chamber;  
first valve means for selectively regulating inflow from said water supply through said inlet into said condenser chamber such that the water from said water supply condenses the vaporized water in said collector tube;  
a fill tube interconnecting said condenser chamber and said rim trough for fluid flow therebetween such that said fill tube supplies water to said rim trough and, thereby, to said vaporization chamber;  
second valve means disposed along said fill tube and regulating the flow of water through said fill tube of said rim trough to provide a selectively controllable feed stock water supply for said vaporization chamber; and  
an outlet at said second end of said collector tube as to provide a supply of said condensed water from collector tube.

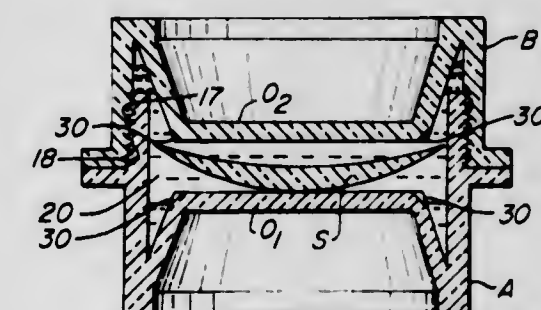
4,415,076

## SOFT CONTACT LENS CONTAINER

Charles E. Campbell, 2908 Elmwood Ct., Berkeley, Calif. 94705  
Filed Nov. 23, 1981, Ser. No. 324,301  
Int. Cl.<sup>3</sup> A45C 11/04; B08B 3/04

U.S. Cl. 206-5.1

11 Claims



1. A soft contact lens container including in combination:  
a fluid tight housing having opposed end walls and at least one side wall for confining there within an aqueous soft lens preservative solution, said side wall having a dimension larger than the diameter of said contact lens for confining side-to-side movement of a soft contact lens placed with said preservative solution interior of said container;  
first and second opposed frustoconical indentations intruding interiorly of said container from a base portion of said frustoconical indentations in confronting relationship for confining therebetween a soft contact lens; and  
optically transparent flat surfaces, in opposing juxtaposed



relation to said frustoconical indentations, for providing a view path through said aqueous solution, whereby it is possible to determine both base curve and power of contained soft contact lenses within said container as desired, and whereby air within said container is trapped between the side walls of said housing and the base portion of said frustoconical indentations.

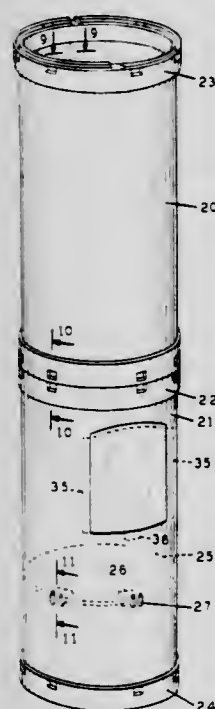
4,415,077

**MODULAR MERCHANDISE DISPLAY TOWER**

Thomas V. Murphy, Design Productions, P.O. Box 318, Oradell, N.J. 07649

Continuation-in-part of Ser. No. 238,376, Feb. 26, 1981, Pat. No. 4,377,231. This application Jun. 8, 1981, Ser. No. 271,666. The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> B65D 3/24; A47F 1/04, 3/14; B65D 5/50  
U.S. Cl. 206—44 R 5 Claims



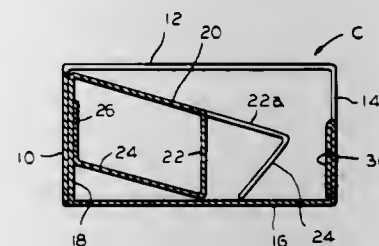
1. A multi-story tower structure for the display and dispensing of articles of merchandise which comprises
  - (a) a plurality of cylindrical tower modules formed of sheet-like material having characteristics of substantial dimensional stability and at least limited flexibility;
  - (b) a connecting ring having opposed oppositely directed axially opening annular recesses of short axial length in relation to the axial length of said tower modules;
  - (c) a pair of said tower modules being received in said annular recesses to define a multi-story tower structure having a continuous tubular interior for the reception of display merchandise or the like;
  - (d) generally circular bottom-forming means removably supported in one of said tower modules;
  - (e) one of said tower modules having a merchandise access opening therein at a level above said bottom-forming means;
  - (f) a merchandise dispensing spout extending outward and upward from said access opening to enable removal of display merchandise from said structure;
  - (g) at least the lower one of said tower modules being formed of vertically fluted corrugated board; and
  - (h) an annularly recessed ring element mounted at the lower end of said lower tower module and forming a capping ring.

4,415,078

**DISPLAY CARTON**

Joseph J. Hart, Philadelphia, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 25, 1982, Ser. No. 361,750  
Int. Cl.<sup>3</sup> B65D 5/50 8 Claims



1. A collapsible, display carton, for holding an article such as a tube, bottle, or can, said carton being formed of a unitary blank of foldable paperboard and comprising:
  - (a) pairs of opposed front and rear major side walls and first and second minor side walls foldably joined to each other to form an external tubular structure open at the ends;
  - (b) flap means for closing opposite ends of said structure;
  - (c) said front major side wall presenting, intermediate the ends of thereof, an opening for viewing the interior of said carton;
  - (d) an internal tubular structure positioned within said external tubular structure and secured to said first minor side wall;
  - (e) said internal tubular structure being spaced from said second minor side wall to define therewith and with said bottom wall a channel for receiving a packaged article;
  - (f) a major portion of said internal tubular structure being disposed under said front major side wall opening and including:
    - (i) a display panel foldably joined at its outer edge to a front portion of said first minor side wall and sloping toward said second minor side wall and said rear major side wall;
    - (ii) a central panel foldably joined at its front edge to the inner edge of said display panel and extending rearwardly toward said rear major side wall and in spaced parallel relation with said second minor side wall;
    - (iii) a back panel foldably joined at its inner edge to the rear edge of said central panel and sloping toward said first minor side wall panel and said front major side wall panel in spaced parallel relation with said display panel;
    - (iv) a glue flap foldably joined at its rear edge to the inner edge of said back panel and being secured to the inner side of said first minor side wall panel.

4,415,079

**HOLDER FOR PHOTOGRAPHIC PRINTS**

Peter Ackeret, Küssnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Mar. 12, 1982, Ser. No. 357,763  
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1981, 3110058

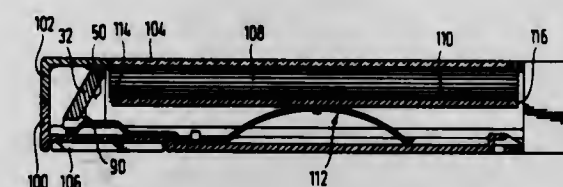
Int. Cl.<sup>3</sup> B65D 25/00 17 Claims

1. A holder for accommodating a variable number of photographic prints comprising:
  - housing means, said housing means having a planar viewing window in first side thereof, said housing means having a hollow structure;
  - slide means for supporting a plurality of prints, said slide means being at least in part positioned within said housing means and being movable relative thereto, said slide means defining a control bar at a first end thereof, said

slide means having an opening in registration with prints carried thereby;

and

spring means positioned within and fastened to an interior surface of said housing means, said spring means including at least a first contact region which extends in the direction of movement of said slide means, said contact region extending through the opening in said slide means when



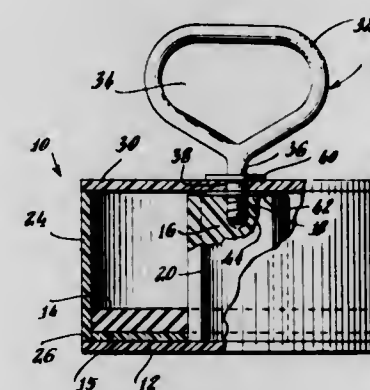
said slide means is fully inserted in said housing means and contacting the lowermost print to urge the print against the inwardly facing surface of said housing means window, said slide means control bar cooperating with said spring means to cause movement of the contact region thereof away from the viewing window upon movement of said slide means from the fully inserted position toward the withdrawn position.

4,415,080

**SLITTER BLADE CARRYING CASE**

Donnie Romine, Rogersville, and Harry L. Woodard, Moulton, both of Ala., assignors to Champlon International Corporation, Stamford, Conn.

Filed Jan. 22, 1982, Ser. No. 341,845  
Int. Cl.<sup>3</sup> B65D 85/02, 85/62, 25/28  
U.S. Cl. 206—303 1 Claim



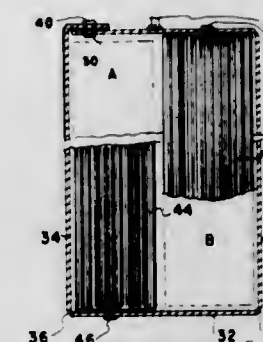
1. A carrying case for slitter blades, said case comprising:
  - (a) a circular base;
  - (b) an upright post secured to said base and extending upwardly from the center thereof, said post including a threaded opening in a top surface thereof, and said post including a pair of diametrically opposed elongated grooves thereon complementary to a slitter blade hub;
  - (c) a cylindrical hood adapted to overlie said base and post, said hood having a cylindrical side wall and a top wall closing one end of said cylindrical side wall; and
  - (d) a centrally located handle element rotatably mounted on said top wall of said hood, said handle element including a threaded shank portion extending through an opening in said hood top wall for threaded engagement with said threaded opening in said upright post, said handle element further comprising a pair of washers secured thereto on each side of said hood top wall of connect said handle element to said hood while permitting rotation of said handle element with respect to said hood.

4,415,081

**CARRIER ALBUM CASE**

Antonio Goncalves, 379 N. 6th St., Newark, N.J. 07107

Filed Sep. 9, 1982, Ser. No. 416,215  
Int. Cl.<sup>3</sup> B65D 5/50, 85/57, 85/62  
U.S. Cl. 206—311 9 Claims



1. A carrier album case comprising:
  - a plurality of case members;
  - hinge members;
  - connecting said members for movement between an open position wherein said case members lie in generally coplanar relationship and a closed position with at least some of said case members folded on adjoining case members to form said case;
  - releasable fastening means fixed on said adjoining case members to secure same in said closed position;
  - a pair of stacks of envelopes secured at their middle to spaced apart case members and forming article-receiving holders at each end;
  - said stacks coming into contact in upside-down relationship when said case is closed.

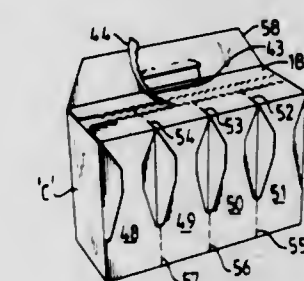
4,415,082

**MULTI-UNIT PACKAGE**

Claude Martin, Deols, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 26, 1981, Ser. No. 314,911  
Claims priority, application United Kingdom, Oct. 28, 1980, 8034657; Jan. 22, 1981, 8101997

Int. Cl.<sup>3</sup> B65D 65/00, 75/00  
U.S. Cl. 206—431 13 Claims



1. A package comprising a plurality of parallelepiped containers arranged in at least one row and accommodated within a wrapper of foldable sheet material adapted to cover at least portions of the tops, sides and bottoms of said containers and secured to at least portions of each of said containers, said wrapper comprising a top panel, a front panel hinged to said top panel along one side edge thereof and extending between the upper and lower ends of said containers, and a base panel hinged to said front panel remote from said top panel, said front panel being formed to provide at least one handle strip for each container, said handle strips being detachably connected to adjacent strips by means of frangible connections, each of said handle strips having its opposite ends integral with adjacent portions of said top panel and said base panel, said adjacent portions being secured to the top and bottom, respectively, of said container while said handle strip is left detached



from the underlying wall of said container, said adjacent portions being provided with tear lines in extension of said frangible connections between said handle strips so that individual containers may be detached from each other while said handle strip and said adjacent portions remain associated with said containers.

4,415,083

# PACKING FOR A STACK OF ELECTRICAL AND/OR ELECTRONIC PARTS

Pieter Kemkers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1981, Ser. No. 308,965

Claims priority, application Netherlands, Nov. 4, 1980, 8006017

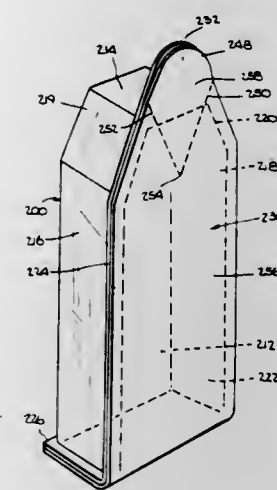
Int. Cl.<sup>3</sup> B65D 59/00, 85/00, 81/00

U.S. Cl. 206—334

4 Claims



(b) a sheetlike cover closely overlying both of said flanges and overlying said opening.



4,415,085

# DRY PHARMACEUTICAL SYSTEM

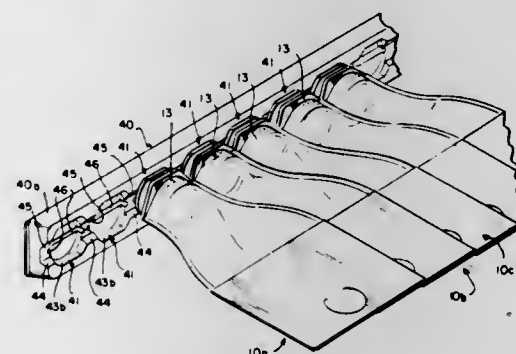
John W. Clarke, Indianapolis, and Dale C. Harris, Fairland, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1981, Ser. No. 332,495

Int. Cl.<sup>3</sup> B65D 85/62; B65B 57/02, 67/12; B65D 1/02

U.S. Cl. 206—526

29 Claims



11. A system for handling dry pharmaceuticals, comprising a plurality of containers, each container being formed from two layers of flexible film and a port-forming member, said layers of flexible film being sealed at the periphery and to one end of the port-forming member to form a bag container for dry pharmaceuticals, said port-forming member having an inner surface forming a bore to provide access to the interior of the bag and a sealing surface for a container closure and having an exposed outer surface defining a projection, each of said containers having a closure sealed on the sealing surface of the port-forming member, and a flexible plastic strip formed with a plurality of centrally located sites adapted to engage and retain the projection of the exposed end of the port-forming member of each of the plurality of containers, said system permitting the plurality of containers to be handled as an assembly.

4,415,084

# BLISTER PACKAGE

Ivo J. Hauser, White Plains, N.Y., and Bruno Lutz, Stamford, Conn., assignors to The Nestle Company, Inc., White Plains, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,499

Int. Cl.<sup>3</sup> B65D 75/36

U.S. Cl. 206—461

14 Claims

1. A package comprising:  
(a) a unitary blister defining a cavity and having an opening to said cavity extending over two faces of said blister, and having two flanges extending outwardly from the remainder of the blister, at the periphery of said opening, one of said flanges being disposed at one of said faces, the other one of said flanges being disposed at the other one of said faces, each such flange defining a planar support for said blister,

the planes of said supports angularly intersecting one another; and

4,415,086

# INOCULUM TRAY

John T. Bennett, Jr., P.O. Box 155, 21131 Georgia Ave., Brookeville, Md. 20833

Filed Mar. 4, 1983, Ser. No. 472,369

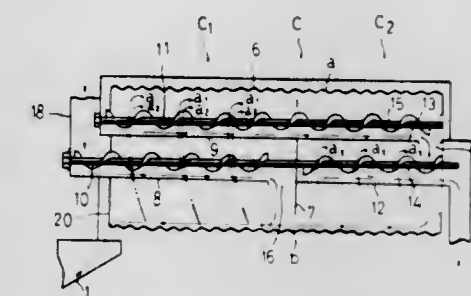
Int. Cl.<sup>3</sup> B65D 1/34, 6/04

U.S. Cl. 206—564

3 Claims



1. A liquid handling tray having an upper surface, a reservoir formed in the upper surface of said tray with a bottom surface spaced below said upper surface and a side wall having a plurality of apertures therein with the bottom of each aperture being at least at the level of the bottom surface of said reservoir and a plurality of grooves formed in the upper surface of said tray with the bottom surface thereof being disposed below the bottom surface of said reservoir whereby the liquid poured into said reservoir will be uniformly distributed through said apertures into said grooves.



1. A cylinder-type rotary sorting apparatus including a sorter cylinder (6) substantially horizontally and rotably disposed which, on the inner periphery thereof, has a multiplicity of recesses (a), and receiving troughs provided in said sorter cylinder (6) for removal of sorted grains as scooped up by said recesses (a), wherein one half portion, left-hand side, of said sorter cylinder (6) constitutes a first-sorting segment (C1) and the other half portion, right-hand side, of said cylinder (6) constitutes a second sorting segment (C2) in which partially sorted grains as sorted out in said first sorting segment (C1) are re-sorted, and wherein means is provided for recycling unsorted grains from said second sorting segment (C2) to said first sorting segment (C1) for another cycle of sorting operation.

4,415,087

# LAMINATED PRESSURE SENSITIVE ADHESIVE STRIP FOR USE IN PLASTIC BAGS

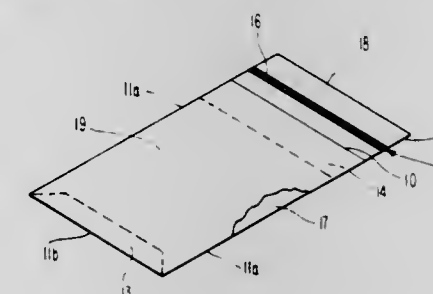
William J. Clayton, Fairport, and William G. Outhouse, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,799

Int. Cl.<sup>3</sup> B65D 65/40

U.S. Cl. 206—632

9 Claims



9. A resealable flexible bag comprising a first wall having a top edge, two sides and a bottom portion, a second wall having a top edge, two sides and a bottom portion, wherein said first wall and said second wall are sealingly attached along a major portion of said side edges and said bottom portions to form an open-topped bag body, said top edge of said first wall extending beyond said top edge of said second wall to define a closure flap, an adhesive system affixed to one of an outer surface of said second wall or said flap at a preselected distance from said opening, said adhesive system comprising a first layer of hot melt adhesive and a thin second layer of a liquid-based pressure sensitive adhesive applied over said first layer, said liquid-based pressure sensitive adhesive comprising a water-based acrylate or a solvent-based acrylate, said adhesive system being contained in a channel strip.

4,415,089

# SUTURE AND SURGICAL ACCESSORY RACK

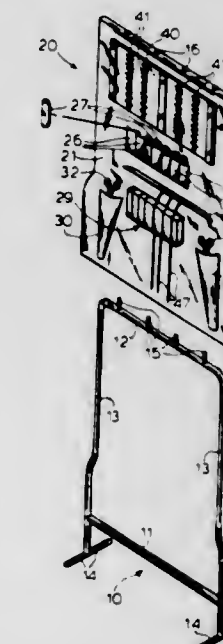
Rose Ruffa, R.D. 2 Farberhill Rd., Boonton Township, Morris County, N.J. 07005

Filed Nov. 3, 1981, Ser. No. 317,588

Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211—13

23 Claims



1. A suture and surgical accessory rack, comprising:  
a disposable sterile member supportable in an upright manner, having a generally, vertically-disposed front panel, said front panel having secured thereto a multiplicity of first pockets, each configured and dimensioned for partial receipt therein of a suture-containing package, a needle count board



including at least one numbered row to which used needles may be secured, and a surgical tie holder including a generally, horizontally-disposed wall member projecting outwardly from said front panel having a multiplicity of parallel, vertically-extending slits formed therein in which surgical ties may be individually inserted, said front panel having a horizontally-disposed slit formed therethrough positioned above said wall member of said tie holder.

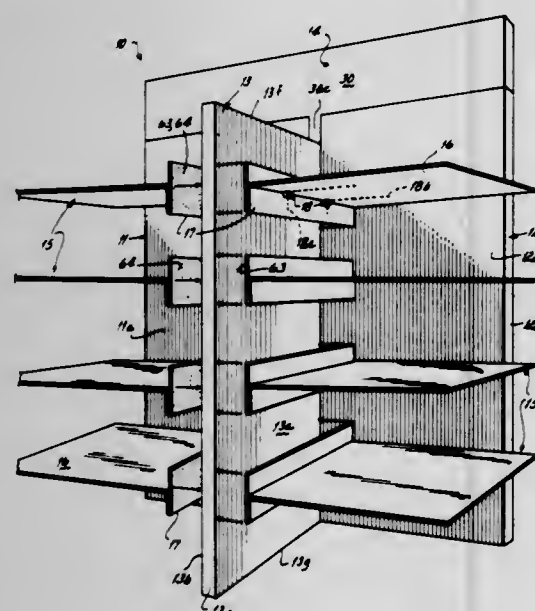
4,415,090

**AISLE END MERCHANDISING DISPLAY DEVICE**  
Rafael T. Bustos, Atlanta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mich.

Filed May 21, 1981, Ser. No. 266,124  
Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211—49 S

25 Claims



1. A merchandise display device for displaying stacks of containers on the end of a store aisle, said display device comprising,  
a pair of colinearly aligned wing panels located in a generally vertical plane,  
a center panel, said center panel having one vertical edge located between and in juxtaposition to said wing panels, said center panel being located in a vertical plane which is perpendicular to said wing panels, and  
a plurality of shelves secured to opposite sides of said center panel, each of said shelves including spring means interconnecting said shelf to said center panel and operable to bias said shelves into a position in which each shelf is located in a generally vertically extending attitude parallel to said center panel but is movable against the bias of said spring means into a generally horizontal load supporting plane.

4,415,091

**ACCESSORIES FOR MOVABLE PARTITION SYSTEMS**  
Douglas F. Wolff, Marshall, Mich., assignor to Wolff Wire Corporation, Ludington, Mich.

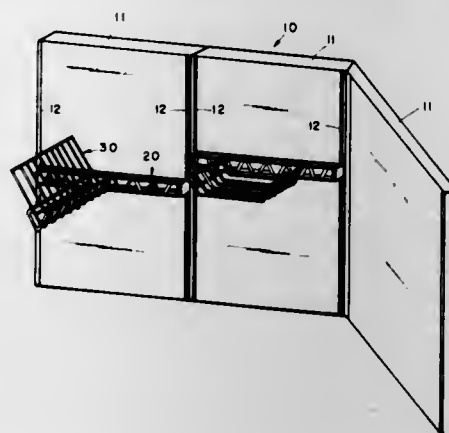
Filed Jun. 1, 1981, Ser. No. 269,417  
Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211—50

14 Claims

1. An article support for use with a modular panel space divider system having support means along the vertical edges of each panel for detachably mounting accessory members, said article support including a rigid beam of a length to extend between said support means and having anchor means at each of its ends for detachably securing it to said support means in spaced and parallel relationship to the surface of a panel, said beam characterized by a pair of rigid elongated upper elements and a pair of rigid elongated lower elements, intermediate elements rigidly secured to and between said upper elements and between said lower elements and vertically spacing said

upper elements from said lower elements, said intermediate elements forming a plurality of vertical pockets between said upper and lower elements opening through both the top and



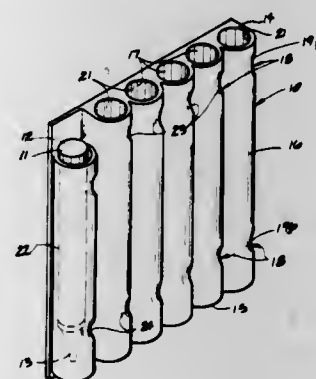
bottom of said beam, said pockets being arranged in tandem along said beam for receiving the complementary-shaped hooks of an article supporting rack.

4,415,092

**HOLDER FOR UNIFORMLY SHAPED ARTICLES**  
Thomas B. Boyer, 1926 Mullowney #49, Billings, Mont. 59102  
Filed Jun. 1, 1981, Ser. No. 268,733  
Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211—60 R

8 Claims



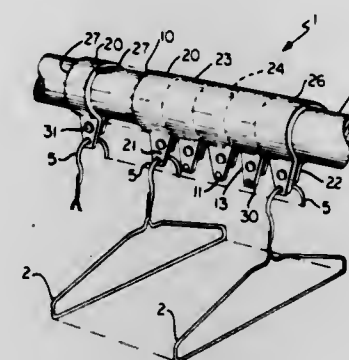
1. A magazine for storing a plurality of elongated uniformly shaped articles and for permitting selective removal of one of the articles when replaced by another article, comprising:  
a portable magazine housing having a plurality of separate storage compartments in which compartment is adapted to store only one article at a time therein;  
biasing means associated with each compartment for releasably engaging each article in its respective compartment to prevent removal of the article from the compartment by gravity;  
each elongated compartment having a longitudinal entrance opening and a spaced longitudinal exit opening in which spaced distance between the openings is greater than the normal length of the article to prevent the direct manual removal of the article from the compartment but to permit an unstored elongated article to be longitudinally inserted into one of the entrance openings and to be manually pushed into the compartment engaging and progressively axially forcing the article stored in the compartment longitudinally out through the exit opening as the unstored elongated article is pushed through the entrance opening into the compartment displacing and replacing the previously stored article.

4,415,093

**GARMENT HANGER SPACING APPARATUS**  
Lucy J. Livingston, 9803 Colony Place, Kansas City, Mo. 66131  
Filed Jul. 30, 1981, Ser. No. 288,471  
Int. Cl.<sup>3</sup> A47J 51/142

U.S. Cl. 211—113

5 Cl



1. An apparatus for spacing garment hangers having suspension hooks on a garment-supporting rod, which comprises:  
(a) a continuous elongated strip of flexible material having a first and a second outer margin positioned opposite with respect to each other, each of said outer margins having a plurality of longitudinally evenly spaced notches extending inwardly therefrom;  
(b) a transverse tear line extending across said strip between a respective corresponding opposite pair of said notches;  
(c) said strip comprising a plurality of juxtaposed, transverse strap members, each of said strap members having:  
(1) a middle portion;  
(2) a first end portion positioned adjacent said first outer margin and having a hook-receiving aperture therethrough for receiving a respective garment hanger suspension hook and a first clasp member aperture therethrough positioned inwardly of said hook-receiving aperture; and  
(3) a second end portion positioned adjacent said second outer margin and having a second clasp member aperture therethrough;  
(d) a plurality of first clasp members each positioned in a respective first clasp member aperture; and  
(e) a plurality of second clasp members each positioned in a respective second clasp member aperture;  
(f) said strip having an open flat position with a substantially planar configuration and a closed position with said strap middle portions substantially encircling said garment-supporting rod, said clasp member apertures aligned and each said second clasp member being attached to a respective first clasp member whereby respective strap member first and second end portions are connected in mutually opposed, downwardly-depending relationship from said garment-supporting rod.

4,415,094

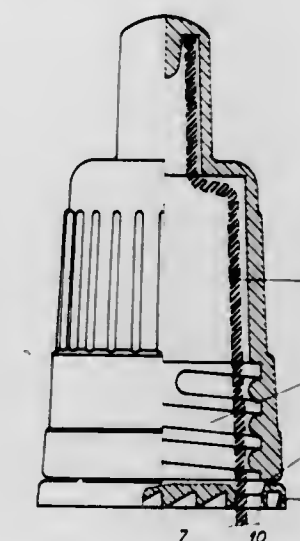
**SAFETY CAP**  
Hans Bavnsfelt, Copenhagen, Denmark, assignor to Mogens Rued Nielsen ApS, Tappernøje, Denmark  
Filed Jan. 11, 1982, Ser. No. 338,525  
Claims priority, application Denmark, Jan. 27, 1981, 354/81  
Int. Cl.<sup>3</sup> B65D 41/34

U.S. Cl. 215—252

7 Claims

1. A two part security cap of plastic or like material adapted to be mounted on a mouth of a container and constructed to provide indication of unauthorized opening, the two part security cap including a base subassembly to be mounted on the mouth of the container and a closure subassembly for mounting on the base subassembly respectively comprising a base collar member and a closure cap member each having a security ring at the bottom thereof connected to the associated base collar member and closure cap member by thin frangible bridges, the security ring of the closure subassembly and the base collar member of the base subassembly having interengaging

formations restraining the same against relative movement whereby the frangible bridges interconnecting said security ring with its associated closure cap member are caused to fracture when the closure subassembly is removed from the



base subassembly, and the security ring of the base subassembly having means securing the same against rotation on the mouth of the container whereby forced removal of the base subassembly from the container produced fracture of the frangible bridges associated with the last mentioned security ring.

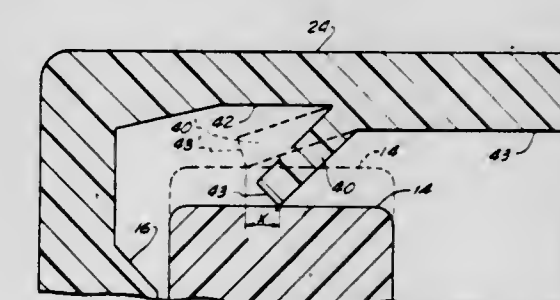
4,415,095

**LID AND SEAL FOR JAR**  
Lothar L. Schweigert, 3609 Cody Rd., Sherman Oaks, Calif. 91403, and Stephen R. Palk, 821 Thrd Ave., Los Angeles, Calif. 90005

Filed Jan. 19, 1982, Ser. No. 340,603  
Int. Cl.<sup>3</sup> B65D 53/00

U.S. Cl. 215—329

2 Claims



1. In a container and lid arrangement including and integral sealing gasket, the combination of:

a. a container having an access opening surrounded by a rim having an end engagement surface,  
b. a closure for said container adapted to be screwed on and from said container and having a cover wall, and  
c. a gasket comprising an annular wall at least partly of frusto conical shape mounted on said cover wall, having its smaller end adjacent said cover wall and its lower larger end having an annular lower edge adapted to engage said engageable surface of said container rim, said larger end of said gasket expanding outwardly along said engageable surface and in contact therewith, said gasket having sufficient stiffness to resist bending so that the inner surface of said gasket will not contact said engageable surface of said container rim.



4,415,096

**CONTAINER CLOSURE HAVING AN IMPROVED LINER**

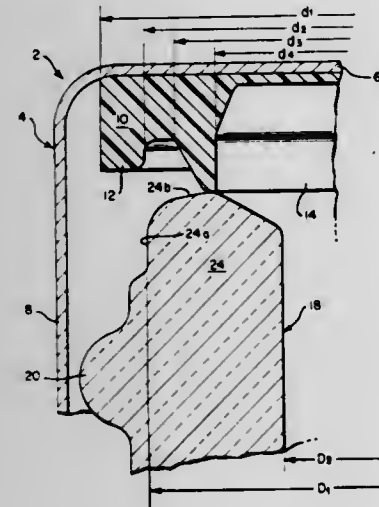
Hidehiko Ohmi, Hirazuka, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,018

Claims priority, application Japan, Sep. 2, 1980, 55-120687  
Int. Cl.<sup>3</sup> B65D 53/00

U.S. Cl. 215-343

7 Claims



1. A container closure for a container having an upwardly facing annular surface forming an opening therein having an outer opening diameter and an inner opening diameter, said closure including a metal shell having a circular top surface and a substantially cylindrical skirt depending from the peripheral edge of the top surface, and a synthetic resin liner press-formed on the inside top surface of the shell; the improvement comprising in that said liner has at least first and second circular projecting rims on the surface thereof opposite said inside top surface of the shell and where the second rim has an inner end second rim diameter and an outer second rim diameter, in that the first rim is positioned radially outwardly of the second rim and has an inner circumferential surface adapted to engage an outer circumferential surface of a container when said closure is sealed to said container, in that said second rim has a height greater than a height of said first rim, in that said second inner rim diameter is greater than said inner opening diameter, and in that said second rim is adapted to engage the upwardly facing surface of said container during initial application of said liner to said container and when sealed to said container.

4,415,097

**DRINKING AID FOR CONTAINERS OF BEVERAGES AND OTHER LIQUIDS**

Wolfgang Meins, Alsterredder No. 44, D-2000 Hamburg 65, Fed. Rep. of Germany

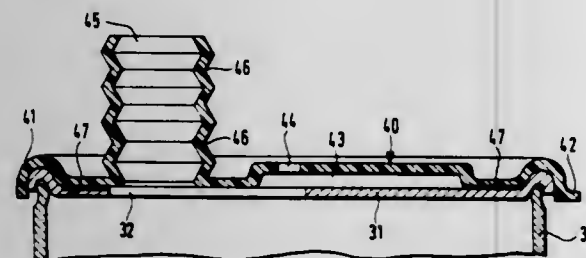
Filed Jun. 23, 1981, Ser. No. 276,782

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023751

Int. Cl.<sup>3</sup> B65D 25/48

U.S. Cl. 220-90.4

11 Claims



1. A drinking aid for containers which are adapted to contain beverages and other liquids and are respectively provided

with a tab opener associated with a container lid for creating a container opening therein, said aid comprising:

- a cover of plastic synthetic material including an outer surface and a surface facing said container lid, said cover being releasably fastened to said container lid for sealingly covering the surface of said lid; and
- a nipple-like mouthpiece, one end of which is connected to said cover in the region of said container opening, said cover including a vent in the vicinity of said mouthpiece, said mouthpiece having a longitudinal axis as well as being flexible and being foldable into the region of the outer surface of said cover, said mouthpiece being bendable about the longitudinal axis thereof, said mouthpiece having a non-circular cross-section, the smallest diameter of which is directed in the desired bending direction, that surface of said cover facing said container lid being provided with a recess for receiving said tab opener prior to use thereof for creating said container opening.

4,415,098

**SINGLE BEAD DISPENSER**

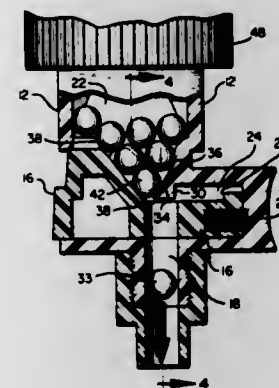
Tommy B. Haas, Antioch, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 15, 1981, Ser. No. 274,002

Int. Cl.<sup>3</sup> B65H 3/60

U.S. Cl. 221-202

7 Claims



1. A bead dispenser for gravity feed dispensing one bead at a time from a plurality of beads, said bead dispenser comprising:

- a main body having a reservoir for said beads, an outlet below said reservoir, and a cavity intermediate the reservoir and outlet;
- a slidable plunger adapted for insertion into said main body cavity, including an aperture through said plunger alignable with the main body outlet upon slidable insertion of the plunger to a bead dispensing position;
- said reservoir including opposite interior surfaces angled inwardly convergent towards the cavity intermediate the reservoir and outlet, on both sides of the plunger with interior surfaces formed of different respective convergent angles;
- said plunger and angled feed chute extending upwardly away from said plunger aperture;
- a guide ramp on said main body projecting downwardly from the reservoir on a reservoir side opposite from said feed chute;
- said guide ramp including an angled ramp face extending upwardly away from said aperture and opposite from said feed chute with said plunger in the bead dispensing position;
- said angled feed chute and said opposing angled ramp face cooperating to individually feed said beads into said plunger aperture for dispensing;
- said plunger and guide ramp adapted to substantially restrict all but one bead of said plurality of beads from being positioned immediately above said plunger aperture with the plunger in the bead dispensing position; and

said feed chute is grooved to substantially conform to the size of a single bead.

4,415,099

**APPARATUS FOR MAINTAINING FREE MOVEMENT OF A MIXING OBJECT IN A PRESSURIZED CONTAINER**

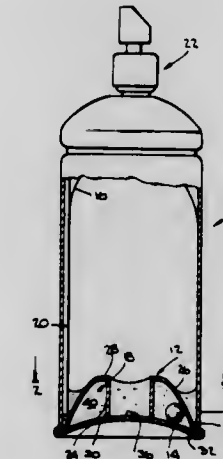
Rafael R. Paris, Largo, Fla., assignor to Grow Group, Inc., New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,476

Int. Cl.<sup>3</sup> B65D 35/22

U.S. Cl. 222-94

32 Claims



1. Apparatus for maintaining unimpeded movement of an object in a pressurized container having a flexible chamber for isolating a fluent product and a propellant which aids in dispensing of the product, the object being freely movably disposed in the product which is located outside the flexible chamber and adapted to mix the product upon shaking the container, the apparatus being structured to define in cooperation with a portion of the container a volume in which the object is movable and for allowing passage of the fluent product and the object into and out of the volume while substantially preventing entry of the flexible chamber into the volume.

4,415,100

**DRIP CATCH RESERVOIR**

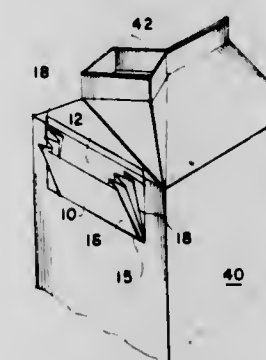
Robert S. Hutchinson, P.O. Box 938, 710 County Rd., Pocahontas, Mass. 02559

Continuation-in-part of Ser. No. 137,181, Apr. 9, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,043

Int. Cl.<sup>3</sup> B65D 23/06

U.S. Cl. 222-108

3 Claims



1. An expandable drip receptacle, comprising in combination:

- sheet material including a flat section formed along its lower periphery in the shape of a foldable pocket open to its top, said pocket being of liquid-tight construction at least along its bottom and side sections,
- said pocket including sides forming corrugated folded sec-

tions to enable the front section of said pocket to be folded towards and away from said flat section;

said flat section having a top section, a flat foldable along said top section for fastening against an external surface of a liquid container below and adjacent a pouring spout of said container;

whereby drippings falling from said spout flow into said device.

4,415,101

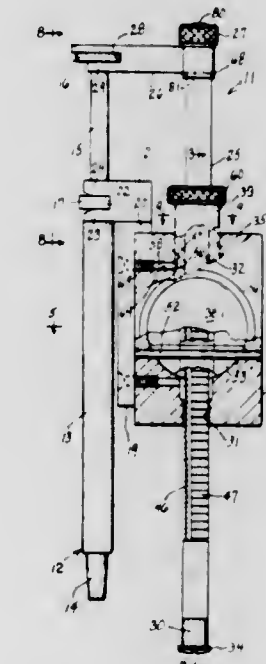
**INCREMENTAL LIQUID DISPENSING DEVICE**  
Justin J. Shapiro, 620 Hearst Ave., Berkeley, Calif. 94710, and  
Bruce R. MacDermott, 2835 Prince St., Berkeley, Calif. 94705

Filed Jan. 22, 1982, Ser. No. 341,649

Int. Cl.<sup>3</sup> G01F 11/06

U.S. Cl. 222-288

13 Claims



1. A liquid repetitive dispensing device comprising a main body, an elongated ratchet bar, means slidably and rotatably supporting said ratchet bar in said main body, means to operatively connect a liquid dispensing syringe between said main body and said ratchet bar, said ratchet bar having at least two angularly spaced longitudinal ratchet faces with ratchet teeth of different pitch, and actuating member movably connected to said main body, pawl means movably mounted in said main body and extending toward said ratchet bar, means operatively coupling said actuating member to said pawl means, means constraining said pawl means to drivingly engage said ratchet teeth responsive to movement of said actuating member, and means for selectively securing said ratchet bar in either of two rotated positions in said main body wherein said pawl means is operatively engageable with one ratchet face in a first rotated position of said ratchet bar and with the other ratchet face in a second rotated position in said main body, and wherein said means for selectively securing the ratchet bar includes bushing means slidably and non-rotatably receiving the ratchet bar and rotatably mounted in said main body, and means to fixedly clamp the bushing means to the main body in a selected rotated position of the bushing means.



4,415,102

**DEVICE FOR EMPTYING A ROUND BULK-MATERIAL SILO**

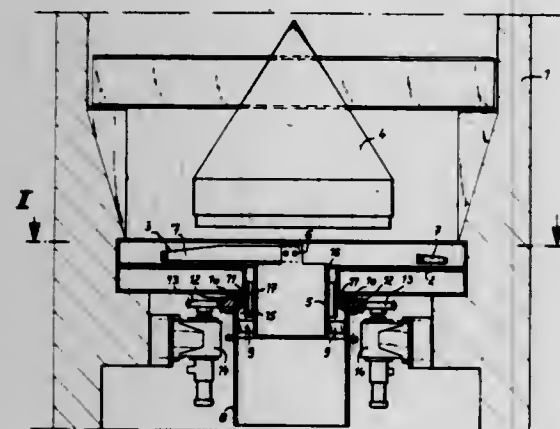
Lothar Teske, Hegelstr. 15, 5000 Cologne 90, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,565

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107966

Int. Cl.<sup>3</sup> B65G 65/48

U.S. Cl. 222—411



1. A device for emptying a vertical, round, bulk-material silo comprising an annular silo having a horizontal box-like enclosed bottom secured to a frame of the side and a centrally disposed bulk-material discharge opening in said bottom, a series of bucket wheel arms secured at one end above said bottom rotatable around a vertical axis and sweeping synchronously over said bottom to convey bulk material in the silo to the central discharge opening, a conical insert in the silo above the bucket wheel arms and disposed coaxially thereof, being larger in diameter at its base than the discharge opening and having its tip pointing upward, the bucket wheel arms being fastened to a first tubular chute arranged coaxially with respect to the discharge opening and rotatably supported below the bottom of the silo, motor drives fixed to opposite sides of the frame below the bottom of the silo for rotating the bucket wheel arms, the first chute having an upper opening terminating approximately flush with the upper side of the silo bottom with clearance from the soffit of the discharge opening, and the first chute being provided with bucket-wheel arm mounts extending above the bottom of the silo and a second tubular chute of larger inside diameter than the discharge opening and arranged coaxially of the first chute which supports the bucket wheel and into which second chute the first chute extends into the upper part of the second chute terminating just above a flanged connection to the lower part of the second chute, the second chute being firmly connected to the first chute by a plurality of struts distributed around the circumference of the first chute dimensioned and arranged to form an annular passage larger than the cross-section of the annular passage between the first chute and the edge portions of the discharge opening, the second chute being rotatably mounted on the silo bottom and the motor drives being arranged exteriorly of the second chute to rotate the same.

4,415,103

**FULL THROTTLE VALVE AND METHOD OF TUBE AND GATE CHANGE**

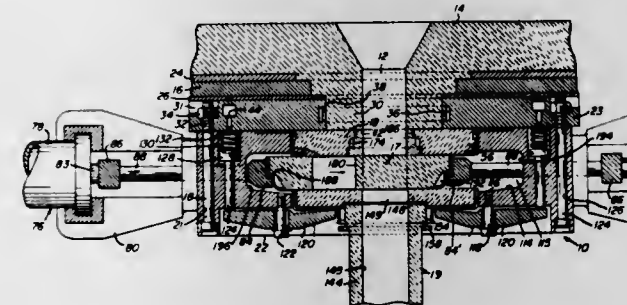
Earl P. Shapland, Sarasota, Fla., and Patrick D. King, Rantoul, Ill., assignors to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 73,588, Sep. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 945,441, Sep. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 732,867, Oct. 15, 1976, abandoned. This application Jan. 19, 1981, Ser. No. 225,895

Int. Cl.<sup>3</sup> B22D 37/00, 41/08

U.S. Cl. 222—590

123 Claims



1. Valve apparatus for controlling the flow of liquid from the pour opening of a teeming vessel, comprising:  
(a) a frame for connection to said vessel;  
(b) gate supporting means extending longitudinally through said frame for slidably supporting blank and orificed refractory gates for movement along a first path of travel between a loading section adjacent one frame end, an operating section subjacent said vessel pour opening, and a gate discharge section adjacent the other frame end;  
(c) first moving means for moving said gates sequentially along said gate supporting means between said frame sections; and  
(d) second moving means operable independently of said first moving means and operative to move an orificed gate disposed in said operating section of said frame with its orifice in registry with said vessel opening along a second path of travel to vary the degree of registry of the gate orifice with respect to said vessel opening between a position of coaxial alignment therewith and a position out of registry therewith.

4,415,104

**MATERIAL SPREADING IMPLEMENT**

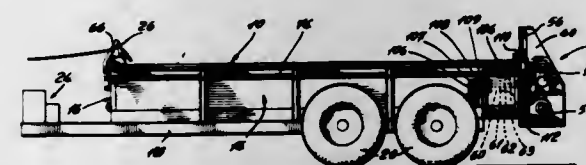
Laurent Boudreault, 187 rang Caron, La a la Croix, Lac St-Jean, P.Q., Canada G0W 1W0

Filed May 5, 1981, Ser. No. 260,676

Int. Cl.<sup>3</sup> A01C 3/06

U.S. Cl. 222—610

7 Claims



1. A material spreading implement, comprising:  
a box-like structure defined by a front wall and opposite side walls, being opened at the rear end thereof;  
a hydraulically operated beater assembly detachably mountable at said rear end so that said box-like structure may be freed of said beater assembly and used for other chores, said beater assembly including:  
(a) a pair of upwardly extending spaced side frames;  
(b) a rotary material beater mounted to said side frames and extending therebetween;

(c) a first hydraulic motor mounted to one of said side frames for operating said beater;  
(d) a rotatable chain-wrapping member extending between said side frames below said beater;  
(e) a second hydraulic motor mounted to one of said side frames for rotating said member;  
(f) valve means mounted to one of said side frames and connected to said second hydraulic motor, said valve means including lever means disposed on said one side frame to be contacted by said gate, said lever means, when contacted, causing actuation of said second hydraulic motor and rotation of said chain-wrapping member in opposite direction to return said gate to the front wall of said box-like structure; and,  
(g) hydraulic conduit means connected to said valve and motor means;  
a push-off transverse gate movable from front to rear between said side walls in said box-like structure to push material into said rotary beater;  
chain means connecting said gate to said chain-wrapping member of said beater assembly whereby said chain means are wrapped around said member as said gate moves to said rear end of said box-like structure;  
hydraulic conduit means mounted on said box-like structure detachably connectable to the hydraulic conduit means of said beater assembly;  
means detachably connectable to said valve means for actuating said valve means, said actuating means being mounted to one of said side walls of said box-like structure; and,  
securing means for fixedly mounting said beater assembly to said rear end of said structure, said securing means being releasable to allow said beater assembly to be detached from said rear end of said structure with said push-off gate mounted to said beater assembly and said chain means wrapped on said chain-wrapping member.

4,415,105

**ARTICLE CARRIER APPARATUS**

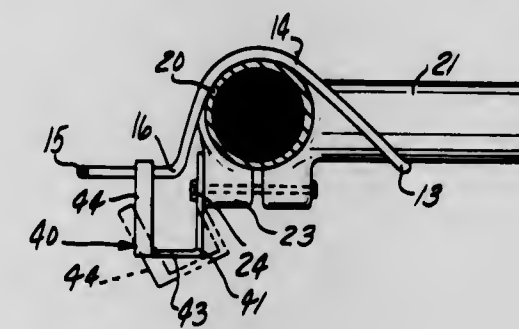
W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 229,820, Jan. 30, 1981, abandoned. This application Nov. 3, 1981, Ser. No. 317,720

Int. Cl.<sup>3</sup> B62J 7/04, 7/06

U.S. Cl. 224—41

14 Claims



10. In an article carrier for mounting on right-and-left projecting bar portions of stem-supported cross-bars of a cycle including a bent-wire carrier frame having a rigid central mounting loop with the respective reaches of the loop extending over the right and left bar portions and including longitudinally extending portions longitudinally spaced from the stem, the loop being in supporting engagement with the stem such that the bar portions provide cantilever support for the carrier frame,

the improvement comprising a stem-supportable latch member having a pair of elongate resilient retention fingers, the first end of each of the retention fingers being fixedly secured to the latch members, the second end of each of the retention fingers projecting outwardly therefrom, the fingers being maintained generally parallel to each other and extending in a direction generally perpendicular to the longitudinally extending portions of the reaches such

that the second ends of the retention fingers may be flexibly biased until the reaches are flexibly received and maintained under compression in locking engagement with the retention fingers, thereby rigidly securing the reaches of the loop adjacent the stem front and preventing anti-cantilever movement of an article carrier thus mounted.

4,415,106

**MAP HOLDER**

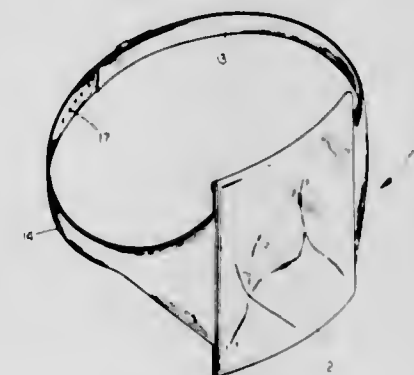
Michael J. Connell, 2766 S. 13th St., and Ronald L. Swanson, 200 Richelleu Ave., both of Omaha, Nebr. 68108

Filed Jun. 19, 1981, Ser. No. 275,552

Int. Cl.<sup>3</sup> A44C 5/00

U.S. Cl. 224—221

3 Claims



1. A map holder which is adaptable for use by a skier while skiing, comprising:  
a pliable planar support element including a rectangular map supporting section, a male strap section, and a female strap section, said strap sections being attached to and extending outwardly from opposite sides of said map supporting section;  
said map supporting section including an interior side having a plurality of spaced apart friction nipples formed thereon and a pair of bosses attached thereto and extending outwardly therefrom;  
said male strap including an outwardly extending boss attached near its free end and a retaining loop attached intermediate said boss and said map supporting section;  
said female strap including a plurality of perforations formed therein and spaced along a section of its length, said perforations adapted to matingly engage said boss on said male strap to secure said map holder on a limb of the skier;  
a pliable planar translucent rectangular map enclosing element sealed along three of its outer edges to three outer edges of said map supporting section thereby forming a map pocket therebetween;  
a flap attached to and extending from a fourth edge of said map enclosing element, said flap being disposed to fold over the interior side of said map supporting section, said flap including a plurality of spaced apart friction nipples formed thereon and a pair of perforations formed therein and adapted to matingly engage said pair of bosses on the interior side of said map supporting section to secure said flap in a closed position, thereby providing a water-resistant map pocket.

4,415,107

**APPARATUS FOR INTRAOPERATIVE DIAGNOSIS**

Beniamino Palmieri, Boito Street No. 45, Modena, Italy

Filed Feb. 20, 1981, Ser. No. 236,574

Claims priority, application Italy, Jun. 23, 1980, 22959 A/80

Int. Cl.<sup>3</sup> B26F 3/00

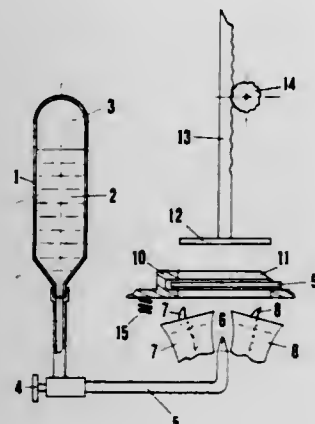
U.S. Cl. 225—93.5

8 Claims

1. An apparatus for preparing a section of an organ for intraoperative diagnosis which comprises a refrigerating de-



vice which sprinkles a cryogenic liquid on the surface of a slide whereby the surface of the slide is cooled to at least  $-4^{\circ}\text{C}$ . up to  $-8^{\circ}\text{C}$ ., at least one cooling fan which increases the evaporation of the cryogenic liquid to achieve the necessary hypo-



thermia on the slide; an appositor which exerts a measurable and graduated pressure onto the section of the organ which has been interposed between said appositor and the slide at the time in which said section has reached a predetermined temperature.

#### 4,415,108 ROLL FEED APPARATUS

Heizaburo Katoh, Tokyo, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

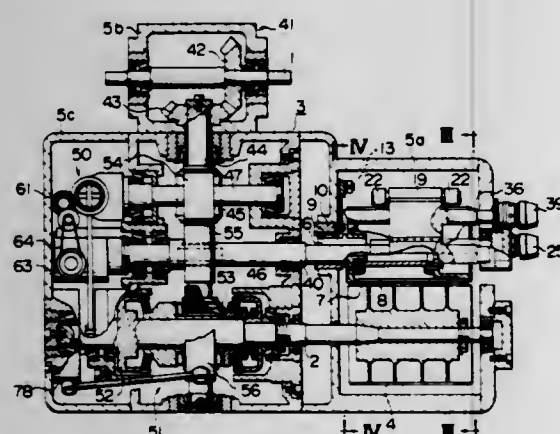
Filed Oct. 28, 1981, Ser. No. 315,798

Claims priority, application Japan, Oct. 30, 1980, 55-152684

Int. Cl.<sup>3</sup> B65H 17/22

U.S. Cl. 226—138

17 Claims



1. A roll feed apparatus comprising:
  - an intermittent motion mechanism adapted to translate the continuous rotation of an input shaft into the intermittent rotation in one direction of an output shaft;
  - a main roll rigidly fitted over said output shaft;
  - a roll housing;
  - a subroll shaft extended substantially in parallel with said output shaft;
  - eccentric means for rotatably supporting said subroll shaft in said roll housing;
  - a subroll rigidly supported on said subroll shaft and adapted to coact with said main roll to clamp and feed a workpiece therebetween, said subroll comprising
  - a rotation-transmission roll disposed at one axial end of and rigidly supported by said subroll shaft, said rotation-transmission roll having a cylindrical peripheral surface for rolling contact with said main roll,
  - a workpiece-engaging roll surrounding said subroll shaft, and
  - means for flexibly supporting said workpiece-engaging roll from said rotation-transmission roll;
  - a first adjusting means operatively associated with said eccentric means for rotating said eccentric means to cause

said subroll shaft to move toward or away from said output shaft, whereby the contact pressure between said main roll and said rotation-transmission roll can be adjusted;

a roll holder rotatably supporting said workpiece-engaging roll, said roll holder being supported by said roll housing; and

second adjusting means for moving said roll holder in unison with said workpiece-engaging roll to cause said workpiece-engaging roll to move toward or away from said main roll.

#### 4,415,109 APPARATUS FOR THE TRANSPORT OF A LIGHT SENSITIVE MATERIAL IN A PHOTOTYPESETTING MACHINE

Joseph Pfister, Niederteufen, Del.X, assignor to H. Berthold, AG, Berlin, Fed. Rep. of Germany

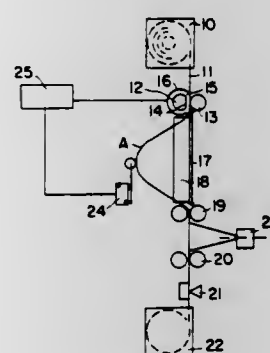
Filed Jul. 16, 1981, Ser. No. 283,958

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3028238

Int. Cl.<sup>3</sup> B65H 77/00, 17/22

U.S. Cl. 226—181

4 Claims



1. Apparatus for inserting, guiding, and transporting recording material of different widths along a straight path extending from a storage cassette into a phototypesetting machine comprising:

- a guide stop (18) positioned along one side of the path;
- a pair of opposing, rotatable transport rollers (12, 13) lying across the path adjacent said guide stop at an angle to the path, said rollers receiving the material therebetween for moving the material along the path when rotated while providing a bias force urging the material against said guide stop, said roller pair being so formed as to disengage the material at at least one rotary position of the rollers to permit threading of the material between the rollers and to release the bias force to avoid buckling the material against said guide stop; and

drive means for rotating at least one of said rollers.

#### 4,415,110 LP GAS-OPERATED IMPACT TOOL

C. LaMont Hunter, 715 N. University, Blackfoot, Id. 83221

Filed Aug. 17, 1981, Ser. No. 293,659

Int. Cl.<sup>3</sup> B25C 1/08

U.S. Cl. 227—10

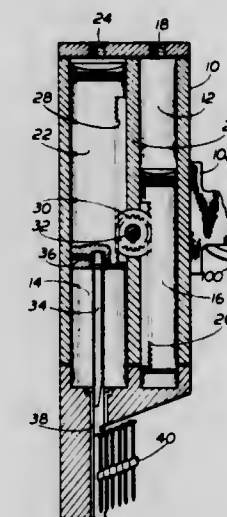
7 Claims

1. A high speed impact tool comprising:
  - a housing,
  - a gas fueled internal combustion engine within said housing, said engine having first and second parallel cylinders each having first and second ends and each containing a piston longitudinally moveable within its respective cylinder;
  - a pinion gear interconnecting opposite ends of parallel facing racks on the exterior walls of pistons in said first and second cylinders;
  - fuel supply means for admitting a fuel air mixture into said first and second cylinders;

means for urging the piston in said first cylinder toward the first end of said first cylinder for compressing the fuel air mixture in said first cylinder end;

first electrical spark-generating means in the first end of said first cylinder; and

voltage generating means coupled to said spark-generating means and responsive to actuation by an external force for



generating a high electrical voltage output for firing said spark-generating means and said fuel air mixture to drive the piston in said first cylinder through said first cylinder toward the second end of said cylinder and the piston in said second first cylinder toward the first end of said second cylinder to thereby compress the fuel air mixture in said second cylinder.

#### 4,415,111 STAPLING DEVICES

John C. McHarrie, 28 Hall Rd., Fulwood, Preston, Lancashire; Peter W. Hopcroft, 17 Balmoral Dr., Formby, Liverpool, Lancashire, and Donald B. Case, 'Alderley', 6 Church Ave., Penwortham, Preston, Lancashire, all of England

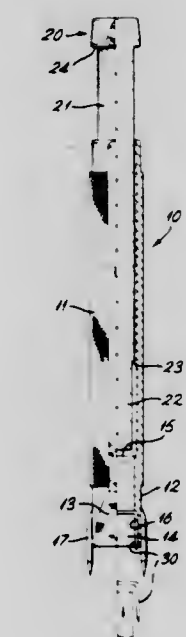
Filed Apr. 22, 1981, Ser. No. 256,613

Claims priority, application United Kingdom, Apr. 22, 1980, 8013230

Int. Cl.<sup>3</sup> A61B 17/18; B25C 5/02

U.S. Cl. 227—19

4 Claims



1. An orthopaedic stapling device comprising:
  - a staple locator in the form of a tubular member having an inner surface narrowed towards a slot shape at one end thereof and an external surface tapered towards said one end to conform generally with said slot shape, said member having a pair of like parallel grooves extending in opposed relation longitudinally part-way along said inner

surface from said one end, said member having a pair of bone penetrating pins connected thereto and projecting longitudinally therefrom at said one end for a short length relative to that of said grooves, said pairs of grooves and pins each being located respectively adjacent to the ends of said slot shape;

a bone penetrating staple having a bridge portion and a pair of leg portions projecting in slightly divergently splayed manner from the opposite ends of the former, said bridge portion having a length equal to the spacing between said locator member grooves, said leg portions having mutually like length not substantially greater than the length of said grooves, and said staple being substantially wholly locatable within said locator member, bridge portion first, with said leg portions engaged under compression respectively in said grooves; and

a punch member longer than said tubular member and slidably locatable therein over substantially the whole length of the latter member from the other end thereof, and also slidably locatable in said locator member one end substantially wholly over the length of said grooves.

#### 4,415,112 SURGICAL STAPLING ASSEMBLY HAVING RESILIENTLY MOUNTED ANVIL

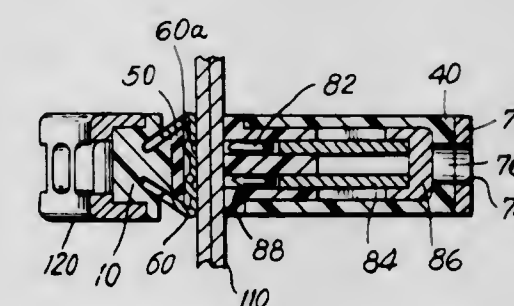
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 27, 1981, Ser. No. 315,448

Int. Cl.<sup>3</sup> A61B 17/04

U.S. Cl. 227—19

10 Claims



1. A surgical stapling assembly for use with an actuator assembly for simultaneously forming a plurality of surgical staples in body tissue comprising an anvil support member, resilient means mounted on the anvil support member, an anvil member mounted on the resilient means, a staple holding assembly, and means mounting the staple holding assembly relative to the anvil support member for movement into spaced relation to the anvil member to clamp tissue inserted therebetween, said staple holding assembly containing a plurality of surgical staples and including staple driving means for simultaneously driving all of the staples from the staple holding assembly through the clamped tissue and then into contact with the anvil member to crimp the staples, said anvil member being mounted on said resilient means so that when the stapling assembly is overloaded with tissue and the anvil member and staple holding assembly are moved into spaced relation, the anvil member is displaced, relative to the staple holding assembly, a distance sufficient to reduce pressure on the overloaded tissue, said displacement being such that the distance between the staple holding assembly and the displaced anvil member is less than the length of the legs of the uncrimped surgical staples.



4,415,113

## IMPACT PINNER APPARATUS

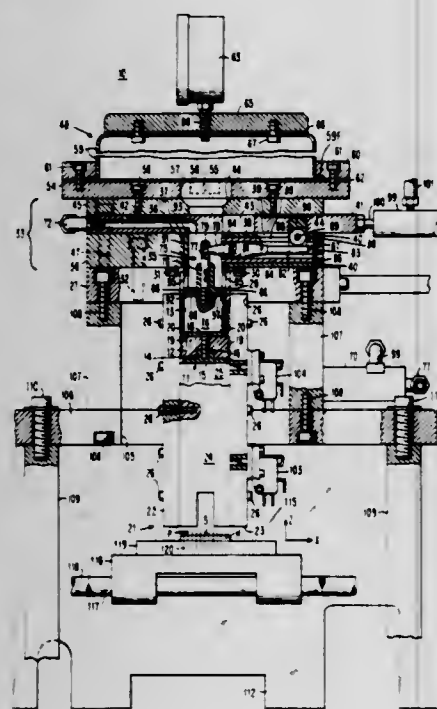
David E. Houser, Apalachin; Harold Kohn, Endwell, and Gordon L. Williams, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 7, 1981, Ser. No. 223,191

Int. Cl.<sup>3</sup> B27F 7/00

U.S. Cl. 227—130

4 Claims



1. Machine apparatus for pinning plural metallic pins to a cured substrate of ceramic particles, said pins being located in respective pre-formed openings of said substrate prior to being pinned thereto, said apparatus comprising:

tube-like chamber means,

piston means slidably operable in said chamber means in first and second opposite direction,

a magnetizable member affixed to said piston means,

pneumatic first means for driving said piston means in said first direction within said chamber means and away from a predetermined first position, said piston means simultaneously impacting said plural pins at a predetermined second position when being driven in said first direction, pneumatic second means for returning said piston means in said second direction within said chamber means away from said second position and to said first position,

selective valve means for selectively interconnecting said first and second pneumatic member means to said chamber means,

air bearing means for laterally supporting said piston means relative to said chamber means at least during the movement of said piston means within said chamber means between said first and second positions,

said piston means impacting said pins with a predetermined impact force that places said pins in a temporary viscoelastic fluid state causing each of said pins to flow between said particles of said substrate in the region surrounding the particular hole in which each said pin is located, said fluid flow forming an integral extension in each of said pins in interlocking engaged relationship with the ceramic particles of said substrate region surrounding the particular hole in which each said pin is located upon return of each said pin and said fluid flow to its undisturbed solid state, and

delay means for delaying release of said piston means from said first position to said second position until said air pressure from said pneumatic first means becomes stabilized in said chamber means and in said air bearing means, said delay means further comprising:

a permanent magnet maintaining said piston means in said first position by a magnetic force of attraction of said magnetizable member thereto, and

release means for interrupting said magnetic force of attrac-

tion when said air pressure from said pneumatic first means becomes stabilized in said chamber means.

4,415,114

## PURGE GAS UNIT WITH CONES

Emerson J. Hallenbeck, 2934 Shoreland Ave., Toledo, Ohio

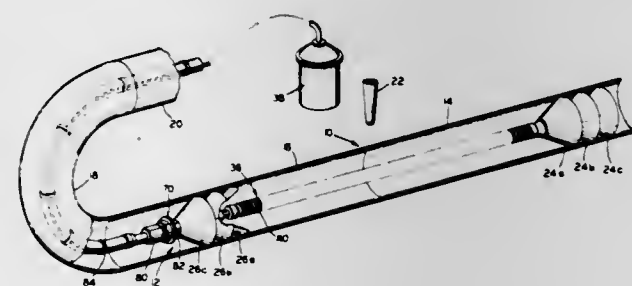
43611

Filed May 7, 1981, Ser. No. 261,577

Int. Cl.<sup>3</sup> B23K 37/00

U.S. Cl. 228—57

10 Claims



1. A purge gas unit for use with tubular members, portions of which are to be joined by welding performed by welding apparatus positioned at a predetermined location relative to the length of the tubular members, said purge gas unit comprising at least one first cone to be positioned on one side of the welding apparatus location and within the tubular members, at least one second cone to be positioned on the other side of the welding apparatus location and within the tubular members, a gas supply tube connected to the apex of the first cone and extending through the apex of the second cone, said gas supply tube having an opening between said first and second cones for emitting purge gas therefrom, means for supplying the purge gas under pressure to said gas supply tube upstream of said second cone, and a monitoring tube extending inside said gas supply tube to a point between said first and second cones and communicating with the space between said first and second cones.

4,415,115

## BONDING MEANS AND METHOD

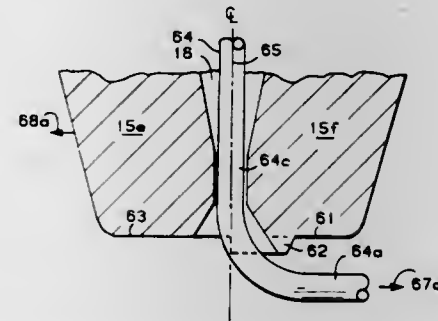
Kristi L. James, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 8, 1981, Ser. No. 271,444

Int. Cl.<sup>3</sup> B23K 31/02

U.S. Cl. 228—170

11 Claims



10. A wire bonding and cutting capillary having an axial bore for receiving a wire to be bonded, said bore exiting said capillary at a first end which forms a bonding tip, comprising:

a first surface portion on said bonding tip adjacent to but not surrounding said bore and adapted for severing said wire when said capillary and said wire are oriented relatively so that said wire passes beneath said first surface portion; and

a second surface portion on said bonding tip, surrounding said bore and enclosing said first surface portion, located non-coplanar with respect to said first surface portion, and adapted for deforming said wire to produce bonds.

4,415,116

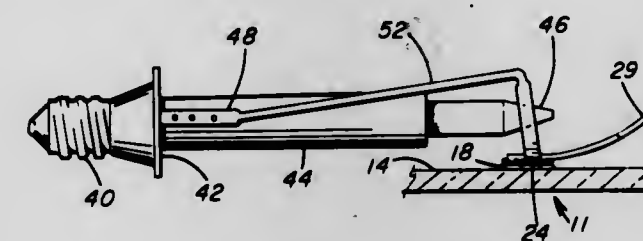
SOLDERING TOOL WITH RESILIENT HOLD-DOWN ATTACHMENT AND METHOD OF USING SAME  
W. Jack Norton, Kittanning, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 6, 1981, Ser. No. 290,631

Int. Cl.<sup>3</sup> B23K 3/02; H05B 3/06; B23K 31/02

U.S. Cl. 228—180 A

8 Claims



6. A method of soldering a braided lead wire to an elongated bus bar fused to a glass substrate comprising applying at least a portion of said braided lead wire over said elongated bus bar to overlie said bus bar along its length, applying a length of solder wire to the upper surface of said braided lead wire at a solder application point, applying a soldering tool having a heated soldering tip and a pair of hold-down means resiliently supported in flanking relation to said soldering tip so that said heated soldering tip engages said length of solder wire while said pair of hold-down means engage said braided lead wire at a pair of engagement points flanking said solder application point to melt said length of solder wire and form a liquid pool of solder, a portion of which permeates the braided lead wire and makes electrical contact through the braided lead wire with said bus bar, lifting said heated soldering tip from said liquid pool of solder while maintaining said hold-down means in engagement with said engagement points until said pool of liquid solder that has permeated through said braided lead wire and contacted said bus bar cools sufficiently to form a solid solder connection between said braided lead wire and said bus bar, and removing said soldering tool including said hold-down means from said engagement at said solder application point and said pair of engagement points.

4,415,117

## CONTAINER WITH SELF LOCKING BOTTOM

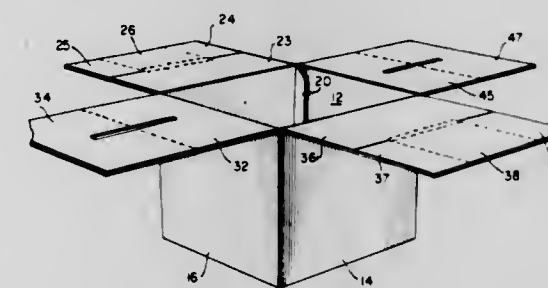
William T. Pollard, Hinsdale, Ill., assignor to Westvaco Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,161

Int. Cl.<sup>3</sup> B65D 5/10, 5/46

U.S. Cl. 229—39 R

10 Claims



1. A container formed from a single blank of foldable material comprising a plurality of foldably connected side walls, self locking bottom flaps foldably connected to the bottom edges of said side walls and top closure flaps with integral handle portions and locking elements foldably connected to the top edges of said side walls, said self locking bottom flaps comprising opposed female locking flaps and opposed male locking flaps which are engaged and interlocked in an overlapping manner to produce a container bottom consisting of four thicknesses of the blank material, said top closure flaps comprising first and second pairs of opposed flaps, two of which have

diagonal score lines which divide the flaps into handle portions and closure portions.

4,415,118

## VEHICLE CABIN SPOT HEATER

Takuya Endo, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

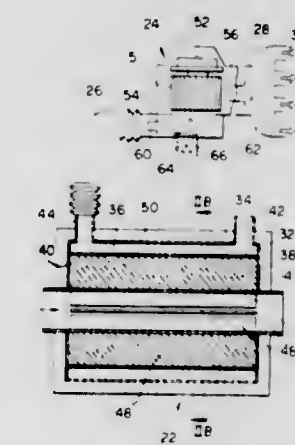
Filed May 12, 1981, Ser. No. 263,343

Claims priority, application Japan, May 13, 1980, 55-63070

Int. Cl.<sup>3</sup> B60H 1/20

U.S. Cl. 237—12.3 A

8 Claims



1. A spot heater mounted on an engine-driven vehicle for preheating a vehicle cabin, comprising:

a regenerator mounted on an exhaust tube of said engine, said regenerator including a heat accumulating material substantially completely surrounding and intimately disposed about a portion of said exhaust tube to accumulate heat given off by exhaust gas passing through said exhaust tube, and casing means disposed coaxially about said heat accumulating material and said exhaust tube portion in a spaced, contact-free relationship with the material, to define an air conducting clearance extending continuously about and immediately adjacent said heat accumulating material for preheating the cabin,

said casing means further including an inner wall member located between the clearance and heat accumulating material to isolate said tube from the clearance;

inlet and outlet tubes in communication with the continuous clearance established within said casing means, said inlet and outlet tubes being spaced axially to said casing means, and

an air distributor unit including a housing with air inlet and outlet openings, a connecting duct connecting the outlet tube of the regenerator with the air inlet opening of said housing, an air carrying duct having one end connected to said air outlet opening of said housing and the other end exposed to a certain area of said vehicle cabin, and means for producing an air stream flowing from the inlet tube of the regenerator to the other end of said air carrying duct through said clearance, said connecting duct and said air carrying duct.

4,415,119

## BOILER

Lars-Olof Borking, and Ragnar Bernstein, both of Fagersta, Sweden, assignors to Fagersta AB, Fagersta, Sweden

Continuation-in-part of Ser. No. 259,561, May 1, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,376

Claims priority, application Sweden, Apr. 1, 1981, 8102104

Int. Cl.<sup>3</sup> F24D 3/08; F22B 5/00

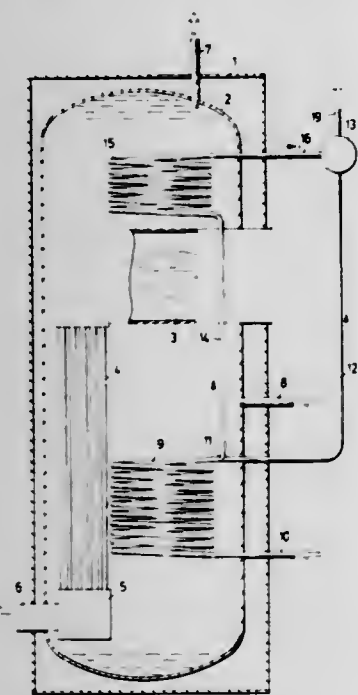
U.S. Cl. 237—19

6 Claims

1. A boiler for a heating system and hot water supply system comprising a tank (2) for holding a heat-transfer medium, a combustion chamber (3) located within said tank in heat-conductive contact with the heat-transfer medium, a plurality of combustion-gas exhaust pipes (4) extending from the combus-



ion chamber downwardly through said tank, and a collecting chamber (5) connected to the lower end of said exhaust pipes having a discharge outlet (6); an outlet (7) for said heat-transfer medium at the top of said tank for passing the heat-transfer medium to the infeed line of the heating system and a return inlet (8) below said combustion chamber from the outfeed line of said heating system, and; a primary reservoir (9;20) located in said tank below said combustion chamber having a lower



portion located beneath said return inlet and a reservoir inlet (10) connected to a supply of fresh water and a reservoir outlet comprising a first branch (12) extending to a mixer valve (13) and a second branch (14) passing to a secondary reservoir (15;17), said secondary reservoir having an outlet (16;18) to said mixer valve (13) arranged to supply fresh water having a higher temperature than that supplied from said first branch pipe (12), said mixer valve being connected to said hot water supply system (19).

4,415,120

**DEVICE FOR SLEEPERS FOR RAILWAY TRACKS**  
Stig Thim, Växjö, Sweden, assignor to A. Betong AB, Växjö, Sweden

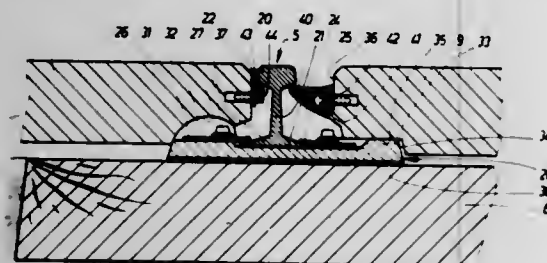
Filed Jan. 27, 1981, Ser. No. 228,731

Claims priority, application Sweden, Jan. 30, 1980, 8000728

Int. Cl.<sup>3</sup> E01C 9/04

U.S. Cl. 238—8

6 Claims



1. A device for an arrangement at a crossing between a road and railroad tracks, the arrangement being of the type having a row of sleepers adapted to support the rails of the track, the sleepers being substantially perpendicular to the rails, outer slabs positioned between the rails and the road, an inner slab positioned between the rails, said slabs having top surfaces substantially level with the top surfaces of the rails, said outer slabs having inner edges positioned proximate to the rails and outer edges positioned proximate to the road,

a pair of elongated support strips positioned adjacent to the

road and adapted to support the outer edges of the outer slabs, and

first and second clamping devices for holding down the foot of each rail to said sleepers,

said device comprising:

a unitary support element including a substantially planar underside adapted to rest upon the topside of each sleeper, said sleeper having a substantially planar topside,

a groove formed in said element, said groove being adapted to support said foot of said each rail, said element having an inner portion and an outer portion, said inner portion being on the side of the groove toward the other rail and said outer portion being on the side of the groove toward the road,

a first heel positioned on said inner portion of said groove, a second heel positioned on the outer side of said groove,

said second heel having a partially cylindrical top surface the axis of which extends substantially parallel to said rail,

said first heel having a first section adapted to receive said first clamping device, said clamping device being adapted to hold down one side of said foot of said rail of said element,

said second heel having a second section adapted to receive said second clamping device, said second clamping device being adapted to hold down the other side of said foot of said rail to said element and to secured said element to said sleeper,

said first heel being adapted to support one edge of said inner slab,

said second heel being adapted to support the inner edge of said outer slab, said inner edge forming a partially cylindrical recess adapted to correspond with said partially cylindrical top surface of said second heel, whereby said partially cylindrical top surface of said element acts as a pivot for said outer slab during displacement in height

between the edge of the road and said sleeper, said support element being made of a resilient material.

4,415,121

**VALVE FOR SPRAYING A MIST**

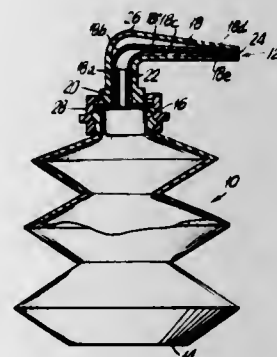
Richard F. Berger, Huntington; Greg Pardes, New York, and Bernard R. Gerber, Jamaica, all of N.Y., assignors to The Reseal Corporation of America, New York, N.Y.

Filed Jun. 12, 1981, Ser. No. 273,023

Int. Cl.<sup>3</sup> B05B 3/14

U.S. Cl. 239—229

29 Claims



1. A mist valve comprising wall means forming an axially elongated passageway having an inlet end arranged to receive the material to be sprayed as a mist and an outlet end from which the mist is sprayed, at least a portion of said wall means is flattened from the outlet end toward the inlet end, said wall means having an at-rest condition and a mist spraying condition and comprising a generally flat first wall and a generally flat second wall located opposite said first wall with said first and second walls disposed in contact in the at-rest condition of said wall means from said outlet end for at least a part of the length of said passageway toward said inlet end, at least one of said first and second walls having capillary-like channels therein extending in the elongated direction of and open to said

passageway with said channels extending from approximately said outlet end for a part of the length of said passageway disposed in contact in the at-rest condition of said wall means, at least a part of said wall means between said inlet end and said channels is flexible and vibrates when said passageway is in the mist spraying condition and material to be sprayed is forced therethrough, and the facing surfaces of said first and second walls are in sealing contact for a portion of the length of said passageway between the ends of said channels closer to said inlet end and said inlet of said wall means and form a seal closure preventing the flow of material through said passageway while said wall means is in the at-rest condition.

4,415,122

**RIGHT-ANGLE SPRAY NOZZLE**

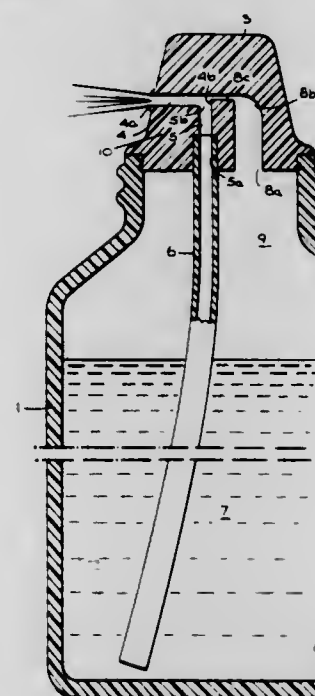
Robert H. Laauwe, Franklin Lakes, N.J., assignor to Essex Chemical Corporation, Clifton, N.J.

Filed Jul. 14, 1981, Ser. No. 283,335

Int. Cl.<sup>3</sup> B65D 1/32

U.S. Cl. 239—327

1 Claim



1. A spray-dispensing nozzle comprising a one-piece body having a side and a bottom and internally formed with a transverse first passage having a front end opening through said side; a longitudinal second passage having a bottom end opening from said bottom and a top end opening into the first passage without velocity-increasing restrictions so as to cause a solid column of liquid to rise with an exposed top surface in said first passage when the second passage's said bottom end is supplied with a flow of solid liquid, said first passage overlapping said top end of the second passage and having a back end adjacently behind the second passage's said top end, said body having a longitudinal third passage having a bottom end opening from said bottom and adapted to be supplied with a flow of air, said third passage opening into the first passage's said back end via a bend and a velocity-increasing orifice pointing axially forward into said first passage toward the latter's said front end and at a level spaced above the second passage's said top end and adapted to eject a high-velocity air jet which shears off liquid from said top surface of said solid column of liquid, when the bottom end of said third passage is supplied with said flow of air; said body having a longitudinal fourth passage having a bottom end opening from the body's said bottom and a top end opening into said first passage between its said front end and the top end of said second passage, said fourth passage being of small cross-section as compared to that of the other of said passages; and in which the front end of said first passage forms a counterbore of enlarged cross-section relative to that of the first passage and the fourth passage's said top end opens transversely into this counterbore and a fitment having a nozzle orifice is inserted in said recess, said counterbore form-

ing an annular shoulder and said fitment having an inner end formed by vanes which curve around the fitment's said nozzle orifice and having interspaced circumferential ends, said vanes having inner sides substantially contacting said shoulder.

4,415,123

**ATOMIZER NOZZLE ASSEMBLY**

Hiroshi Ikeuchi, Ashiya, Japan, assignor to H. Ikeuchi & Co., Ltd., Osaka, Japan

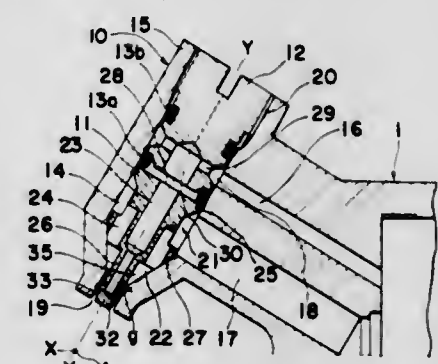
Filed Jul. 7, 1981, Ser. No. 281,047

Claims priority, application Japan, Aug. 22, 1980, 55-116215

Int. Cl.<sup>3</sup> B05B 7/06

U.S. Cl. 239—425

4 Claims



1. An atomizing nozzle assembly comprising at least one pair of nozzle heads of identical construction, each of said nozzle heads comprising a generally elongated body having a longitudinal axis and having an interior space cylindrically symmetrical with respect to said longitudinal axis, said body having an end opening and a constricted discharge port at opposite ends of said body opening to said space in coaxial relation to said longitudinal axis, said body also having first and second supply ports communicated to said space on the one hand and adapted to be fluid-connected to respective sources of compressible and incompressible fluids on the other hand; an externally cylindrically symmetrical elongated nozzle tip member having first and second passage means defined therein and housed within said space in coaxial relation thereto, said tip member having opposite end portions respectively reduced and enlarged in diameter with the reduced diameter end portion situated adjacent said discharge port; and a plug member closing said end opening and held in contact with the enlarged diameter end portion of said tip member to hold said tip member in position steadily within said space, said first passage means communicating said first supply port to said discharge port and said second passage means communicating said second supply port to said discharge port, the nozzle heads of said at least one pair of nozzle heads being so supported relative to each other that the respective longitudinal axes of said nozzle heads can intersect with each other at an angle within the range of 70° to 160° with said discharge port of each of said nozzle heads facing towards the point of intersection of the respective longitudinal axes of said nozzle heads and spaced from said point of intersection a distance within the range of 3 to 15 mm;

said second passage means including a radially extending discharge passage opening from said reduced diameter end portion of said tip member into said discharge port, said reduced diameter end portion including a tip having a free end surface crossing said longitudinal axis substantially within said discharge port and a surface surrounding said longitudinal axis extending from the opening of said discharge passage to said free end surface, said surrounding surface having a circular cross-section perpendicular said longitudinal axis of non-increasing diameter along said longitudinal axis from said opening of said discharge passage to said free end surface, said surrounding surface including a frusto-conical surface terminating at said free end surface, whereby incompressible fluid flow through



said discharge passage into said discharge port does not form bulges of incompressible fluid on said surrounding surface.

#### 4,415,124 METHOD FOR THE PRODUCTION OF MICROPOWDERS FROM CELLULOSE ETHERS OR CELLULOSE

Franz-Josef Carduck, Haan; Wilfried Röhse, Düsseldorf; Willi Wiist, Ratingen-Hösel, and Hans Pabel, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,379

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3038001

Int. Cl.<sup>3</sup> B02C 7/00, 19/06

U.S. Cl. 241—28 13 Claims  
1. A method for the production of micropowders from cellulose ethers or cellulose comprising:

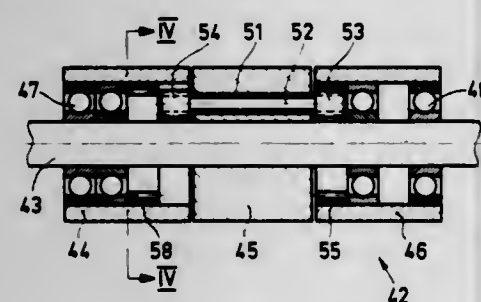
- (a) subjecting a cellulose ether or a cellulose having a fine-fiber, cottony or woolly structure to a consolidation or embrittlement sufficient whereby in one mill pass through a jet mill under standard conditions 98% by weight of the consolidated or embrittled material charged is recovered as a powder of less than 100 $\mu$ , and
- (b) subjecting the consolidated or embrittled material in the form of scales to a grinding step of one mill pass through a jet mill or a pinned disk mill or a baffle plate mill, producing a size reduction sufficient that a grain size distribution with at least 90% by weight of less than 125 $\mu$  is attained, with a macromolecular degradation of from 2% to 26%.

4,415,125  
APPARATUS FOR WINDING A THREAD  
Peter Schwengeler, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland  
Filed Apr. 5, 1982, Ser. No. 365,512  
Claims priority, application Switzerland, Apr. 24, 1981, 2691/81

Int. Cl.<sup>3</sup> B65H 54/46

U.S. Cl. 242—18 DD

5 Claims



1. An apparatus for winding a thread upon a rotatable, substantially conical bobbin tube into a bobbin package, comprising:

- a rotatable friction drive drum;
- said rotatable friction drive drum comprising a plurality of substantially cylindrical rotational elements;
- a common driving shaft upon which there are mounted said rotational elements;
- said rotatable friction drive drum contacting the bobbin tube and when thread is wound upon the bobbin tube the wound bobbin package along a generatrix;
- said bobbin package and the friction drive drum rolling upon one another during the thread winding operation;
- said plurality of cylindrical rotational elements comprising three of said rotational elements constituting a first element rigidly connected for rotation with said shaft and at least two further rotational elements;

one of said rotational elements constituting an intermediate element;

the remaining two rotational elements each being respectively arranged at an opposite end of the intermediate element;

a respective rotational bearing provided for each of said at least two remaining rotational elements of the friction drive drum and at each of which rotational bearings there is mounted a related one of said two remaining rotational elements so as to be supported to be freely rotatable upon said shaft; and

differential gearing means for mutually coupling said two remaining rotational elements with one another.

#### 4,415,126 TRAVERSE MOTION FOR USE WITH APPARATUS FOR WINDING CONTINUOUS ELONGATE ELEMENTS

Kogi Nakazawa; Michio Sato; Shin Kasai; Yutaka Kawaguchi, and Toshiaki Kikuchi, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

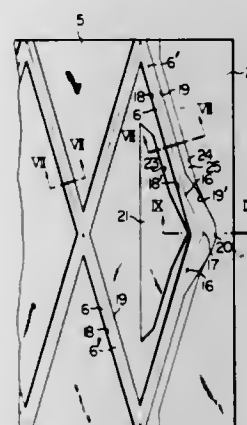
Filed Dec. 18, 1981, Ser. No. 332,146

Claims priority, application Japan, Dec. 24, 1980, 55-182998

Int. Cl.<sup>3</sup> B65H 54/30

U.S. Cl. 242—43 R

2 Claims



1. A traversing motion for use with apparatus for winding continuous elongate elements, said traversing motion comprising: a scroll cam means having a rotatable cylindrical body and an endless cam groove consisting of at least one right-handed and one left-handed helical groove provided on a surface of said cylindrical body, the grooves merging with each other at both ends thereof; and a second cam groove formed in superposed relationship with said endless cam groove at least in each of end portions around turning points thereof and having a greater lead angle than said endless cam groove over a predetermined distance adjacent each end thereof, and for guiding said elements, guide means provided with a cam follower to fit into said helical grooves of said scroll cam means for reciprocal movement of the guide means in parallel with the rotation axis of said cylindrical body of said scroll cam means, said cam follower being pivotally attached to said guide means and elongate in the direction of displacement along said helical grooves, said guide means having a further cam follower to fit into said second cam groove, said further cam follower being cylindrical and coaxial with said elongate cam follower, in which said elongate cam follower has opposite side surfaces defined by two similar partial cylindrical surfaces merging to each other at the ends thereof at an acute angle, and said endless cam groove is such that, considering a developed view thereof, the inner wall of the cam groove extends substantially linearly to each turning point while the outer wall of the cam groove extends parallel with said inner wall to a first point slightly before a point where the lead angle changes, tapers outwardly from said first point to a second point slightly before the associated turning point so as to gradually increase the distance from said inner wall, and merges at the second point into an arc around said turning point.

#### 4,415,127 METHOD AND DEVICE FOR REPLACING A FIRST, NEARLY EMPTY REEL OF STRIP MATERIAL WITH A SECOND, NEW REEL

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa' per Azioni, Bologna, Italy

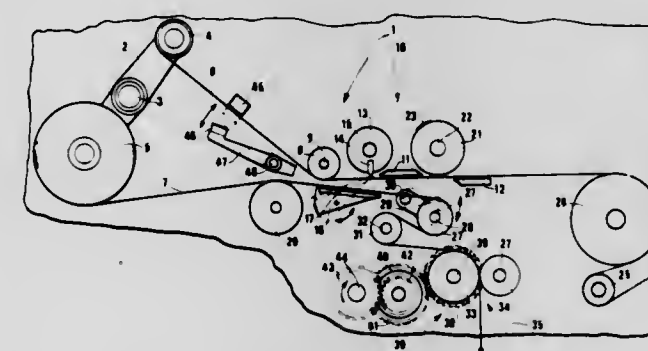
Filed Oct. 5, 1981, Ser. No. 308,670

Claims priority, application Italy, Dec. 22, 1980, 3598 A/80

Int. Cl.<sup>3</sup> B65H 19/18, 19/16

U.S. Cl. 242—58.1

5 Claims



2. A device for replacing a first, nearly empty reel (4) of strip material with a second, new reel (5) on a user machine, the device comprising:

- first and second reels (4, 5) containing a first and a second strip (6, 7) respectively;
- a support element (2) for said first and second reels (4, 5),
- traction means (33, 34) for advancing said second strip (7) at a speed equal to that of said first strip (6);
- first cutting means (14, 17) for effecting a partial cut simultaneously to the said two strips (6, 7) in overlying position;
- clamping means (45, 46) adapted to cooperate with, and stop, a portion of said first strip (6) extending upstream from said partial cut;
- adhesive applicator means (21) for applying an adhesive material (23) astride said partial cut;
- and, second cutting means (12) arranged downstream from said adhesive-applicator means (21) for cutting the said second strip (7) along the said partial cut.

#### 4,415,128 RIDER ROLLS IN SUPPORT-ROLL WINDING MACHINES

Willi Heymanns, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Düsseldorf, Fed. Rep. of Germany

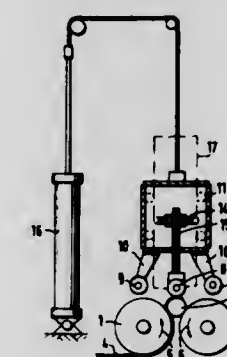
Filed Sep. 3, 1981, Ser. No. 299,269

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035652

Int. Cl.<sup>3</sup> B65H 17/08, 17/12

U.S. Cl. 242—66

2 Claims



1. In an apparatus for winding a web on a roll supported by two driver rolls and including a rider roll bearing on the top of the web roll and mounted for vertical displacement in lateral guides, two further rider rolls symmetrically mounted on either side of the web roll and with their axes parallel thereto, and means for contacting the further rider rolls with the cir-

cumference of the web roll only after the latter has attained a predetermined diameter, all three rider rolls being mounted on a crossbeam which is vertically guided, the improvement wherein the first rider roll is mounted on the crossbeam for displacement relative thereto and the further rider rolls are mounted on the cross beam by means of rigid bearing brackets.

#### 4,415,129 THUMB STOP RETENTION AND ANTI-RATTLE SPRING

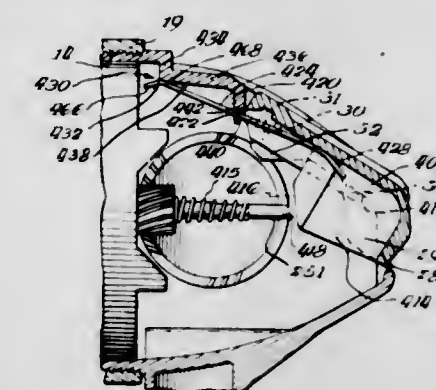
Henry L. Neufeld, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 289,036, Jul. 31, 1981, abandoned. This application Dec. 9, 1982, Ser. No. 448,415

Int. Cl.<sup>3</sup> A01K 89/01

U.S. Cl. 242—84.2 A

5 Claims



1. In a spinning reel having a rotatable spinner head retained within a housing, which spinner head is displaceable axially by depressing a pivotable thumb button, and stop means associated with the thumb button which abut the reel housing to confine the rearward rotation of the button away from its depressed position, the improvement comprising:

- outwardly extending pivots on the button and received in slotted openings in the housing, the button being pivotable about the pivots;
- an elongate resilient spring member engageable with the housing and with the underside of the thumb button, said elongate resilient spring member is comprised of a pair of spaced, substantially parallel, elongate legs interconnected by a closed end, a portion of one of the legs being offset away from the other leg to define a substantially laterally extending edge; and
- tab means associated with the housing and engageable with the legs of the elongate resilient member at an intermediate position thereon, the tab means including at least one aperture through which the leg of the elongate resilient member having the offset portion is extended, the laterally extending edge of the offset portion of the leg engaging the tab at the edge of the aperture to restrain longitudinal movement of the resilient member relative to the housing, the resilient member biases the stop means toward the reel housing and retains the pivots in the slotted openings.

#### 4,415,130 MISSILE SYSTEM WITH ACCELERATION INDUCED OPERATIONAL ENERGY

John H. Staehlin, Lutherville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 12, 1981, Ser. No. 224,347

Int. Cl.<sup>3</sup> F42B 15/00; F41G 7/22

U.S. Cl. 244—3.15

10 Claims

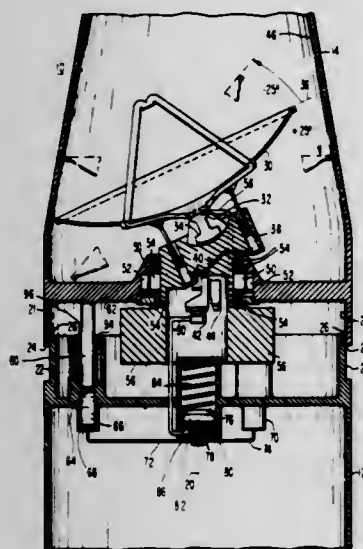
1. A missile system comprising:  
a main support housing section having two ends oppositely disposed along a longitudinal axis of said missile, said housing section including a propulsion mechanism operative to effect thrust at one end thereof causing accelera-



tion of said missile at least in a direction along the longitudinal axis thereof;

a nose cone section slidably, mechanically interconnected to the other end, opposite said one end, of said housing section and operative to move with respect to said housing section under the induced acceleration of said missile;

a fluidic system operative to collect and store the energy resulting from the acceleration induced movement of said nose cone section with respect to said housing section;



at least one mechanism disposed on said missile and which requires energy for operation during the flight time of the missile; and

a regulating means operative to provide energy from said fluidic energy storage system to said at least one mechanism for operation thereof during the flight time of said missile.

4,415,131

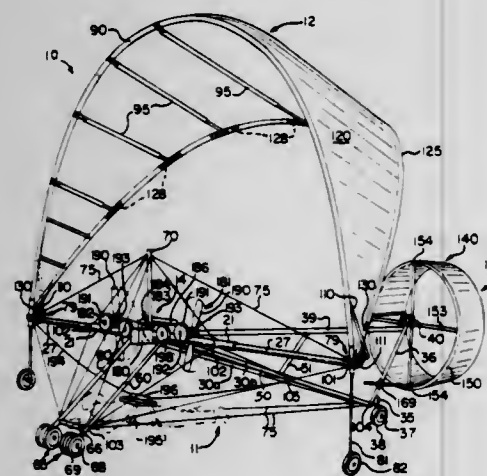
## ARC WING AIRCRAFT

William R. Bertelsen, Rock Island, and William D. Bertelsen, Neponset, both of Ill., assignors to Bertelsen Inc., Neponset, Ill.

Filed May 5, 1980, Ser. No. 146,636  
Int. Cl.<sup>3</sup> B64C 3/54, 9/00

U.S. Cl. 244—13

23 Claims



1. An aircraft comprising fuselage means forming the support structure of an aircraft, airfoil means carried by said fuselage means and adapted to provide aerodynamic lift during flight of the aircraft, said airfoil means forming a continuous wing surface of an arcuate configuration during flight, said continuous wing surface being formed of a flexible, fabric-like, material assuming said configuration during flight.

said airfoil means extending upwardly from said fuselage means and having respective ends coupled thereto, said wing surface forming an increasing chord length from said ends to the upper portion of said airfoil means, said fuselage means includes a plurality of elongated fuselage members coupled to a rigid member to form a support structure having a skeletal frame construction, a airfoil means including a rigid leading edge member to which said material is pivotally attached, and said airfoil means further including a tensioned flexible trailing edge assuming the trailing edge configuration of said wing surface during flight, said airfoil means further including a plurality of airfoil form retaining means for supporting and defining said chord length of said airfoil means, said airfoil form retaining means having means to selectively adjust said chord length at predetermined positions along the arcuate configuration of said airfoil means.

4,415,132

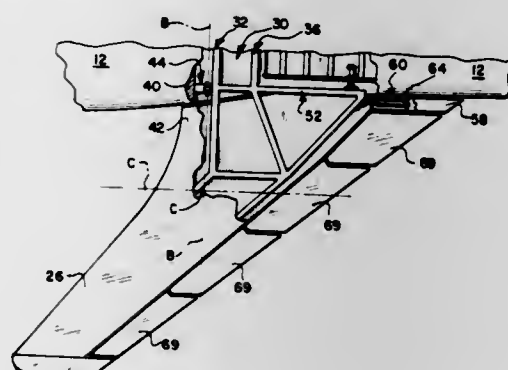
## AIRCRAFT HAVING VARIABLE INCIDENCE FORWARD-SWEPT WING

Michael H. Shirk, Vandalia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1981, Ser. No. 324,913  
Int. Cl.<sup>3</sup> B64C 3/38

U.S. Cl. 244—48

6 Claims



1. In an aircraft of the type having a fuselage, a pair of forward-swept wings, and a wing carry through extending transversely through said fuselage and outwardly therefrom to form an integral part of each of said wings thereby joining said wings together so as to form with said wings a unitary wing structure, the improvement comprising:

at least two hinge means, each located forwardly of said wing carry through adjacent a different one of said wings and interconnecting said fuselage and said wing carry through, for rotatably mounting said unitary wing structure via its wing carry through to said fuselage, each of said hinge means also being located on a spanwise axis intersecting aerodynamic centers of each of said wings such that an axis of rotation of said unitary wing structure defined by said hinge means is substantially collinear with said spanwise axis; and means attached to said fuselage rearwardly of said unitary wing structure, and extending between and interconnecting said fuselage and said wing structure, for selectively rotating said wing structure about said axis of rotation to vary the angle of incidence of said wing structure as a unit and therewith said wings with respect to said fuselage but without varying the angle of forward sweep of said wings with respect to said fuselage.

4,415,133

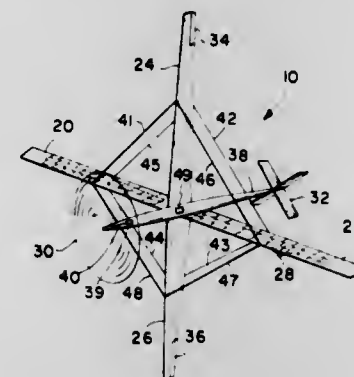
## SOLAR POWERED AIRCRAFT

William H. Phillips, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1981, Ser. No. 263,829  
Int. Cl.<sup>3</sup> B64D 27/02

U.S. Cl. 244—53 R

10 Claims U.S. Cl. 248—161



1. An aircraft comprising: airfoil means having surfaces normal to each other for sustaining free flight of the aircraft; solar cells carried by at least one of said airfoil means surfaces for powering the flight of the aircraft; control means for orienting said airfoil means normal to the path of the sun's rays; and means for constantly maintaining said solar cells normal to the path of the sun's rays during an uninterrupted flight from at least sunrise to sunset.

4,415,134

## HALL EFFECT TRACK CIRCUIT RECEIVING ELEMENT

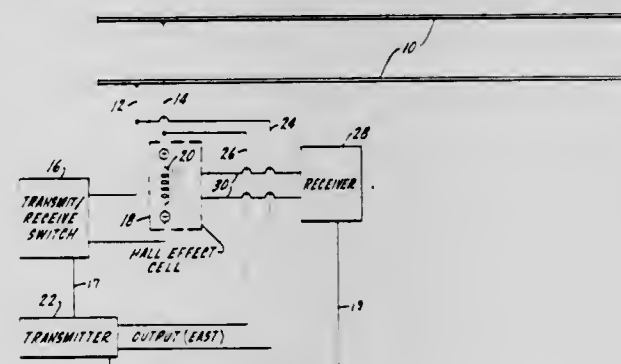
H. James Wilson, La Grange, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 167,694, Jul. 11, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,618

Int. Cl.<sup>3</sup> B61L 21/00

U.S. Cl. 246—34 CT

4 Claims



1. A railroad signal circuit including a transmitter and receiver having a common connection to the track rails at one end of a signal block, a transmit/receive switch connected to said transmitter and a code following element connected to said receiver and connected to said transmit/receive switch and transmitter, said code following element comprising a Hall effect cell whose output is connected to said receiver, said transmit/receive switch preventing signals from said transmitter being received by said receiver.

4,415,135

## SUPPORT DEVICES FOR SWIVEL CHAIRS

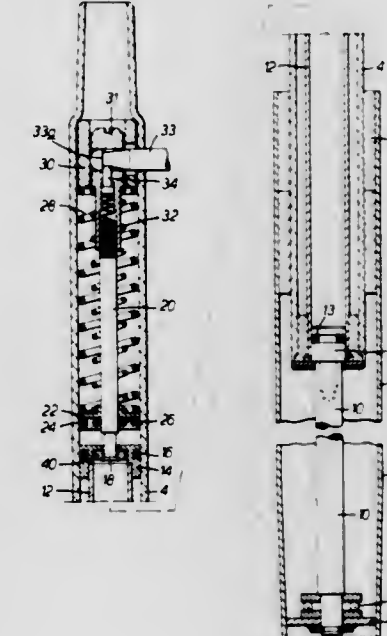
John A. W. French, Milton Keynes, England, assignor to WIPAC Group Sales Limited, Buckingham, England

Filed Mar. 22, 1982, Ser. No. 360,677

Claims priority, application United Kingdom, Mar. 24, 1981, 8109104; Jun. 30, 1981, 8120162

Int. Cl.<sup>3</sup> F16M 11/00

9 Claims



1. A device for supporting a chair at a selected height, comprising a hydraulic cylinder arranged to support the chair, the cylinder being contractable to lower the chair under the weight of the chair occupant, a spring member acting to extend the cylinder to raise the chair when unoccupied, means defining two fluid-filled chambers in the cylinder, valve means separating the chambers, and manually-operated control means for selectively opening and closing the valve means during adjusting expansion and contraction of the cylinder, and said valve means when closed blocking the fluid flow whereby to hydraulically lock the cylinder against expansion and contraction, each chamber including a portion immediately adjacent the valve means, said portions being axially spaced such that there is a substantially direct axial flow between the chambers substantially without reversal of the flow direction, one of said chamber being of smaller cross-sectional area than the other of said chambers, a plunger reciprocable within the cylinder and defining a boundary of said other chamber, said spring member acting between the plunger and the cylinder to bias the plunger in a sense to reduce the volume of the said other chamber, and the fluid flowing from said one chamber to said other chamber during contraction of the cylinder and causing the plunger to be displaced against the bias of said deformable spring member.

4,415,136

## PEDESTAL FOR CONSOLES

Peter R. Knoll, Fountain Valley, Calif., assignor to Dentronix Systems, Inc., Santa Ana, Calif.

Filed May 12, 1981, Ser. No. 262,929  
Int. Cl.<sup>3</sup> F16M 11/14

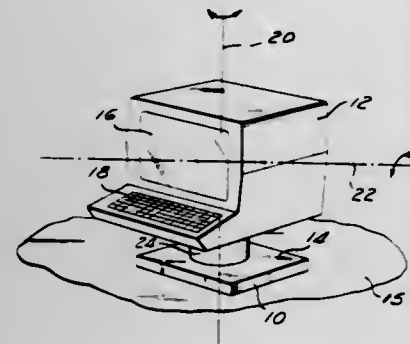
U.S. Cl. 248—181

16 Claims

1. A pedestal for adjustably supporting, positioning and orienting display consoles which include a display face, comprising: a base for being mounted upon a supporting structure; a hollow, partially spherical journal for supporting the display console; a first bearing on the upper edge of the base for supporting in



frictional sliding relationship the convex surface of the journal;  
 a second bearing positioned between the guide element and concave portion of the journal for supporting the guide element in frictional sliding relationship with the concave portion of the journal;  
 means for securing the first and second bearings in constant compression against the convex and concave surfaces respectively of the hollow, partially spherical journal;  
 the base, journal, guide element, first and second bearings and compression means being so disposed and constructed as to



permit the supported console to be tilted and pivoted thereon by movement against constant frictional force as the first and second bearings slide over the concave and convex journal surfaces, said friction being sufficient by reason of the compression applied to the first and second bearings to maintain the console at a selected position and orientation without additional means; said first and second bearing formed of a low friction, cold flowable self-lubricating polymer and said compression means comprising resilient means under compression within the Hooke's law range of said means to maintain the frictional sliding relationship between the first and second bearings and the journals.

4,415,137

**CANTILEVER ATTACHMENT**

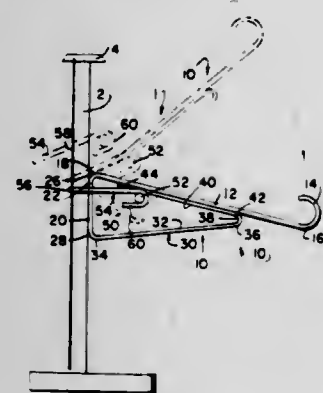
John C. Garves, 10 Post Office Rd., Silver Spring, Md. 20910

Filed Apr. 2, 1982, Ser. No. 364,591

Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—629

22 Claims



1. Detachable cantilever apparatus for hanging objects at a distance from vertical posts comprising a cantilever having a substantially vertical base for lying against a vertical post, resilient means extending outward from the base beneath the cantilever, first attachment means connected to the resilient means remote from the base for cooperating with complementary second attachment means to connect the base and the cantilever to the vertical post, the resilient means urging the first attachment means outward away from the post, and second complementary attachment means, separable from the first attachment means and connectable thereto with a portion of the second complementary attachment means positioned on an

opposite side of the post for cooperating with the first attachment means to capture and hold the base against the post.

4,415,138

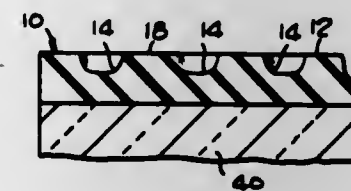
**ELASTOMER VIDEO DISC MOLD**

Manfred H. Jarsen, Jr., Calif., assignor to Discovision Associates, Costa Mesa, Calif.  
 Continuation of Ser. No. 905,115, Nov. 15, 1978, abandoned, which is a division of Ser. No. 755,184, Dec. 22, 1976, Pat. No. 4,130,620, which is a division of Ser. No. 401,586, Oct. 15, 1973, abandoned. This application Aug. 8, 1982, Ser. No. 404,793

Int. Cl.<sup>3</sup> B29C 1/14; B29D 17/00

U.S. Cl. 249—114 R

6 Claims



1. A mold for use in forming at least the information layer of a videodisc, comprising:  
 a rigid plate member; and  
 a thin, disc-shaped, elastomeric body on the order of 14 mils thick bonded to a surface of said rigid plate and having an upper surface including a planar portion and a non-planar portion.

said planar portion of said upper surface being employed for establishing a substantially planar surface in the resulting molded videodisc suitable for reflecting light incident thereupon, and said non-planar portion of said upper surface being formed by a plurality of spaced discrete, curvilinear-shaped, discontinuous surface regions extending out of the plane of said planar portion of said first surface,

said upper surface carrying information in the form of a spiral-shaped track having a plurality of individual turns in the spiral, each of said turns being separated from an adjacent one of said turns by a planar portion of said upper surface, said spiral-shaped track being formed by said curvilinear-shaped discontinuous surface regions, said regions being arranged in sequential order, and each of said discontinuous surface regions being separated from the next one of said discontinuous surface regions by a planar portion of said upper surface,

each of said discontinuous surface regions having a constant width in a radial direction on the order of 1 micron and a constant maximum dimension in a direction perpendicular to said surface on the order of 0.7 microns, the length of each discontinuity in the circumferential direction and the distance between adjacent discontinuities in the circumferential direction representing the stored information.

4,415,139

**AUTOMATIC SLIDING GATE VALVE**

P. Keith Potts, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,349

Int. Cl.<sup>3</sup> F16K 25/00

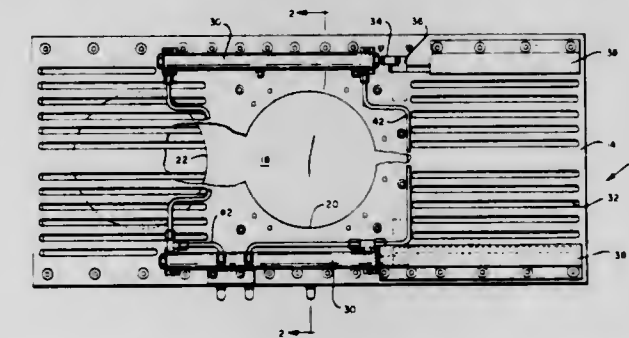
U.S. Cl. 251—62

2 Claims

1. An automatic sliding gate valve adapted to be connected to the ingress or egress opening of a vibrating dryer or other structure operable under either vacuum or pressure, said sliding gate valve comprising:

a pair of parallelly spaced apart side walls;  
 a pair of outer plate members connected in spaced apart parallel relation at right angles to and by said pair of parallelly spaced apart side walls, each outer plate member defining therethrough an opening of predetermined size in coaxial alignment and coalignment with the opening through the other outer plate member and adapted to be in coaxial alignment with said ingress or egress opening

of said dryer or other structure when said gate valve is connected thereto;  
 a flat slide plate member;  
 said pair of parallelly spaced apart side walls having opposed slotted guide rails adapted to slidably receive therebetween the opposite side edges of said flat slide plate member;  
 said flat slide plate member defining therethrough adjacent one end thereof an opening of predetermined size adapted to be in coaxial alignment with said outer plate member openings when slidably moved thereto;  
 pneumatic seal means bordering each of said outer plate member openings on the side of each of said outer plate members that is adjacent to one of the flat surfaces of said flat slide plate member and adapted when expanded to provide an airtight seal between each of said outer plate members and the adjacent flat surfaces of said flat slide plate member and around each of said outer plate member openings;  
 means for expanding and contracting said pneumatic seal means; and



means connected to said flat slide plate member and adapted to slidably move said flat slide plate member along said opposed slotted guide rails until the opening in said flat slide plate member is in said coaxial alignment with said outer plate member openings or the flat surface of said flat slide plate member extends over said latter openings, said means adapted to slidably move said flat slide plate member including a pair of fluid powered cylinders, each being operably connected adjacent one of said opposite side edges of said flat slide plate member on one side thereof, and each outer plate member defining through its opposite end portions along the length of the outer plate member a plurality of longitudinally extending slots each parallel to the others, and wherein each fluid powered cylinder is secured to the outer surface of one of said outer plate members and has means extending from one end of said fluid powered cylinder and through one of said longitudinally extending slots for said operable connection to said flat slide plate member.

4,415,140

**NET HAULING SHEAVE DEVICE WITH TAILING PRESSURE WHEEL**

Kenneth J. Deering, Seattle, Wash., assignor to Marine Construction &amp; Design Co., Seattle, Wash.

Filed Mar. 18, 1982, Ser. No. 359,215

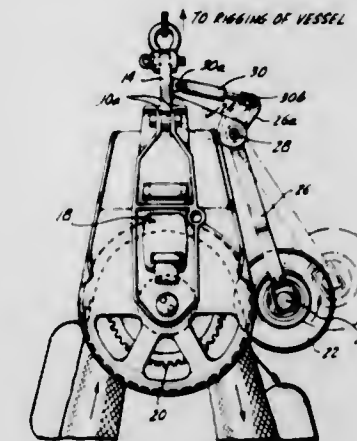
Int. Cl.<sup>3</sup> A01K 73/06

U.S. Cl. 254—371

7 Claims

1. Net hauling apparatus comprising a power-driven hauler sheave having an annular net-engaging groove therein, a support frame for said sheave comprising upright side members with means for rotatively supporting and driving said sheave on a generally horizontal axis between said side members, said frame further including means rigidly interconnecting said side members and further including hanger means on said frame having a substantially transversely central suspension means for pendulously suspending the apparatus by said hanger means, with clearance space provided beneath said hanger means for passage of a fishing net draped over the sheave and being advanced progressively upwardly to, over and down-

wardly from the sheave, said hanger means including a pivot mount substantially centered in the rotational plane of the hauler sheave at a location generally above the downturning side of the hauler sheave, a presser wheel formed to press the fishing net into the sheave groove in aid of net advancement by the sheave, and a generally upright presser wheel support arm



hingedly secured at its upper end to said pivot mount and carrying said presser wheel at its lower end in position to press the net into the sheave groove in a generally horizontal direction radially inwardly of the sheave on the downturning side thereof, and force applying means interacting between said frame and said support arm yieldably urging said presser wheel against the net and thereby the net into the sheave groove.

4,415,141

**WALL BAR**

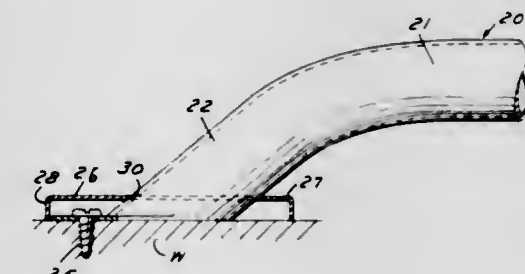
Torbett B. Guenther, Plymouth, Mich., assignor to C. D. Sparling Company, Plymouth, Mich.

Filed Jun. 7, 1982, Ser. No. 385,914

Int. Cl.<sup>3</sup> E04F 11/18

U.S. Cl. 256—69

14 Claims



1. A wall bar comprising a length of tubular material, the ends of said length extending at an angle to the adjacent portions, said ends having integral flattened portions lying in a plane intersected by the inclined portions and defining an obtuse angle with the axis of the inclined portions, said flattened portions being adapted to engage a wall and be attached thereto, a cover plate for each end, each said cover plate having an elongated opening which has a long axis having a dimension greater than the width of the flattened portion such that the cover plate may be telescoped over the flattened portion to mount the plate on the bar after the flattened portion has been formed and the plate can be placed in position over the flattened portion after the flattened portion has been attached to a wall.



4,415,142

**APPARATUS FOR HANDLING CONVERTER GAS**

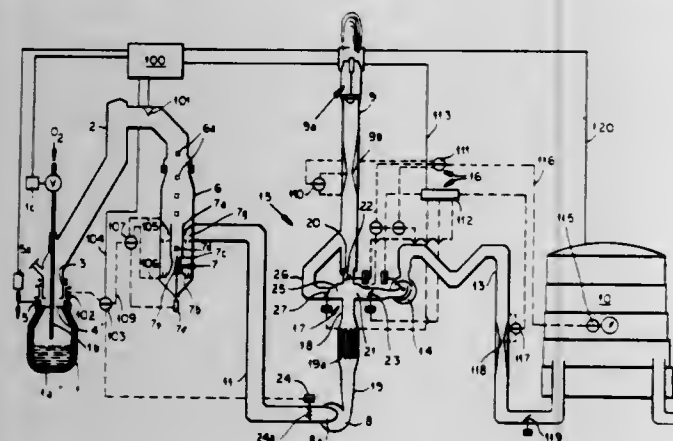
Karl-Rudolf Hegemann, Essen-Bergerhausen; Helmut Weissert, Bochum-Hiltrop, and Kurt Hinsken, Mülheim, all of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau Koml. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,500

Claims priority, application Fed. Rep. of Germany, Int. Cl.<sup>3</sup> C21C 5/40

U.S. Cl. 266—89

4 Claims



1. A gas handling plant for an oxygen blown steel-making converter comprising:

- a gas collection hood adapted to communicate with the mouth of a steel-making converter for receiving converter gas therefrom;
- a blower having an intake connected with said hood and an outlet for drawing said gas from said hood and forcing said gas from said outlet;
- a T-connection having a first branch connected to said outlet, a second branch opposite said first branch, and a third branch;
- a flaring stack connected to said second branch;
- a storage vessel connected to said third branch by a duct provided with a check valve;
- a throttle valve in said second branch;
- an open/close two-position valve in said third branch; and
- control means responsive to pressure in said storage vessel, pressure in said T-connection and pressure drop in said duct for controlling said throttle valve during initiation of gas storage to establish pressure balance across said two-position valve prior to the opening thereof upon the establishment of a predetermined set of gas storage conditions and for establishing equilibrium between the sum of said pressure drops and the pressure in said vessel with the pressure in said T-connection prior to closing of said two-position valve for flaring operation, said throttle valve being fully opened for flaring operation, said control means being responsive to the pressure in said vessel and forming a setpoint value for said throttle valve during gas storage and for forming a setpoint value of zero for flaring operation.

4,415,143

**CONTINUOUS HARDENING DEVICE OF STEEL PLATE**

Sadao Ebata, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP81/00356, § 371 Date Jul. 6, 1982, § 102(e) Date Jul. 6, 1982, PCT Pub. No. WO82/01894, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 27, 1981, Ser. No. 396,904

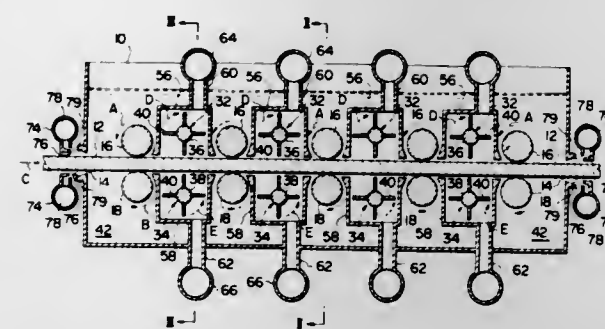
Claims priority, application Japan, Nov. 27, 1980, 55-167102 Int. Cl.<sup>3</sup> C21D 1/64

U.S. Cl. 266—112

9 Claims

1. A continuous hardening device of steel plate wherein steel plate is continuously cooled by cooling water, characterized in that said steel plate is passed through a water vessel into and

out of which said cooling water is supplied and exhausted for maintaining a continuous circulation of said water, a plurality of rollers for moving the steel plate and a plurality of paddle



wheels located adjacent to the surface of the steel plate are provided in said water vessel, and said paddle wheels stir and cause cooling water to flow at a predetermined relative speed with respect to said steel plate.

4,415,144

**PROCESS AND APPARATUS FOR REMOVING A LAYER OF FLUID ON TOP OF A BATH**

Peter Klotz, Stadland, and Henry Böttcher, Nordenham, both of Fed. Rep. of Germany, assignors to Preussag-Boliden-Blei GmbH

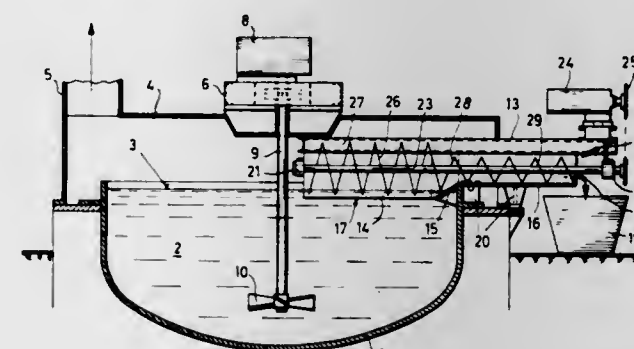
Filed Apr. 24, 1981, Ser. No. 257,230

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016160

Int. Cl.<sup>3</sup> C22B 9/00

U.S. Cl. 266—228

7 Claims



1. Apparatus for the removal of a slag layer floating on the surface of a melt, such as the removal of a slag layer from the surface of a lead melt during refining, comprising a melting vessel, and an axially elongated mechanical screw conveyor located within said vessel and extending into the slag layer, wherein the improvement comprises that said screw conveyor has a first axially extending stage located within said melting vessel and a second axially extending stage located outside of said melting vessel, a closed housing enclosing said first and second stages of said screw conveyor and having a stepped bottom, said stepped bottom comprises a lower stage located within said melting vessel and enclosing said first stage of said screw conveyor and an upper stage spaced upwardly from said lower stage and located outside of said melting vessel and enclosing said second stage of said screw conveyor, an inlet opening located in and extending in the axial direction of said lower stage of said housing, an outlet opening located in the bottom of the upper stage of said housing spaced outwardly from said lower stage, and said inlet opening arranged to be located within the slag layer so that said first stage of said screw conveyor removes the slag and conveys the slag to the outlet opening.

4,415,145

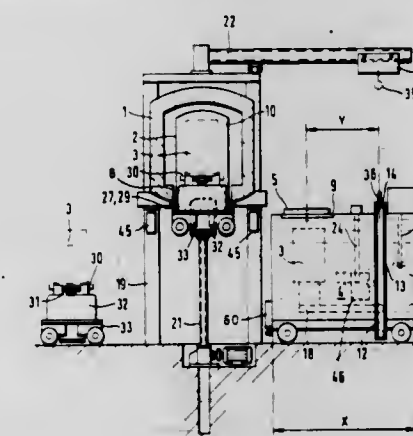
**METAL CHARGE TREATMENT APPARATUS**

Rainer Herdieckerhoff, Unna, Fed. Rep. of Germany, assignor to Firma Dr. Werner Herdieckerhoff, Unna, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 159,679, Jun. 16, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 412,019 Int. Cl.<sup>3</sup> C21D 1/06

U.S. Cl. 266—253

20 Claims



1. Apparatus for treating a metal charge, the apparatus comprising a furnace, the furnace housing a shroud within which the charge is heated, means for introducing the charge into the furnace, a container containing material for treating the charge, and separate charge-transfer means arranged within and supported by the container for transferring the charge from the furnace to the container, the shroud and the container being provided with alignable openings through which the heated charge can be transferred from the furnace to the container, wherein the furnace is a box furnace mounted on props, the props being sufficiently long as to permit the container to be positioned under the furnace, said opening in the shroud being positioned at the base of the furnace, and said opening in the container being positioned at the top of the container, said charge-introducing means being effective to lift the charge into the shroud through said opening in the base of the shroud, said charge transfer means comprising carrier means supported within the container beneath the charge and second support means positioned laterally of the charge and operable from outside the container, whereby vertical movement of the support means relative to the container causes vertical movement of the carrier means.

4,415,146

**SUSPENSION STRUT ASSEMBLY**

James R. Sitko, 5431 Vandewater, Waterford, Mich. 48095

Continuation of Ser. No. 231,265, Feb. 3, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,619

Int. Cl.<sup>3</sup> F16F 3/10

U.S. Cl. 267—9 C

24 Claims

1. An improved strut for use in a suspension system of a motor vehicle comprising:

- a plurality of rubber spring members positioned in a stacked relationship;
- a first elongated tubular member extending through said stack of rubber spring members and having support means engaging one end of said stacked rubber spring members;
- a second elongated tubular member disposed in substantially coaxial relationship with said first tubular member and being telescopically movable with respect thereto;
- friction damping means; and
- actuating means operative to urge said friction damping means into engagement with one of said first and second tubular members in response to an axially directed loading on said strut whereby said damping means may operate to create a friction drag resisting telescopic movement of said first and second tubular members, said rubber spring

members being operative to resiliently support a portion of said motor vehicle to provide a desired ride frequency over substantially the full vehicle load range said actuating means comprising first and second relatively movable annular members surrounding one of said first and second tubular members and said damping means comprising a plurality of damping shoes moveably positioned between said first and second relatively movable members, compressive loading on said strut being operative to urge said first and second relatively movable members in a converg-



ing direction whereby said damping shoes are urged into engagement with said one of said first and second tubular members; and

a third elongated tubular member positioned in telescopic substantially coaxial relationship with said first and second tubular members, one of said first and second relatively movable members engaging one end of said third elongated tubular member and the other end of said third elongated tubular member engaging the other end of said rubber spring members.

4,415,147

**SEATING SPRING ASSEMBLY AND METHOD**

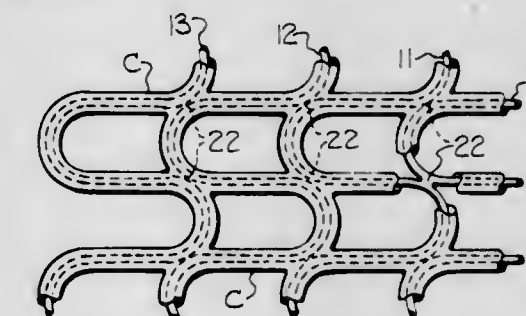
Thomas S. Blscoe, Columbia, and Rodney S. Taylor, Folsom, both of Pa., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,145

Int. Cl.<sup>3</sup> A47C 7/30

U.S. Cl. 267—111

8 Claims



1. A seating spring assembly comprising

(A) a series of elongate sinuous spring wires, each of said spring wires touching each of its adjacent spring wires at frequent intervals along their lengths,

(B) frangible weld means provided at substantially the middle and at spaced apart additional touching locations



intermediate opposite ends of adjacent spring wires, said frangible weld means temporarily securing together the touching locations of adjacent spring wires, and  
(C) a sleeve-like plastic coating surrounding said spring wires and said frangible weld means, said plastic coating following the sinuosity of said spring wires and joining said spring wires together where said spring wires touch so that said spring wires, said frangible weld means, and said plastic coating comprise a unitary assembly, and whereby said frangible weld means is broken when said spring assembly is occupied by a person so that said plastic coating then constitutes the sole means holding said spring wires of said assembly together and the full flexibility and comfort of said seating spring assembly is retained.

4,415,148

### RESILIENT MOUNTINGS FOR MACHINES OR MACHINE COMPONENTS, PARTICULARLY ENGINES IN MOTOR VEHICLES

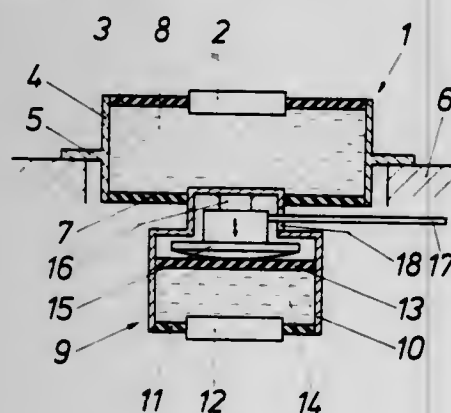
Christian Mair, Munich; Johannes Van den Boom, Kosching, and Heinz Hollerweger, Ingolstadt, all of Fed. Rep. of Germany, assignors to Boge GmbH, Eitorf and Audi NSU Auto Union AG, Neckarsulm, both of, Fed. Rep. of Germany  
Filed Dec. 14, 1981, Ser. No. 330,728

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048888

Int. Cl.<sup>3</sup> F16F 15/04

U.S. Cl. 267—122

9 Claims



1. Apparatus for resiliently mounting supported members such as machines, machine components or rotary machinery to a supporting member, such as an internal combustion engine in a motor vehicle, comprising a mounting core member for coupling to the supported member, a support means for coupling to the supporting member, at least one spring means arranged between the mounting core member and the support means and coupled also for transmission of movement to an oscillatory damper mass such that oscillatory movement of said spring means excites oscillatory movement of said damper mass, said damper mass having a container filled with pressure fluid, a resilient diaphragm closing said container, a selectively adjustable pressure plate means disposed closely adjacent said diaphragm for variably contacting the diaphragm and varying its spring rate by varying the free area of the diaphragm, and means for selectively adjusting said pressure plate means so as to vary the damping action of said damper mass on said spring means and mounting core member.

4,415,149

### PORTABLE WORKBENCH

Spencer C. Rees, Sugar Grove, Ill., assignor to Wen Products, Inc., Chicago, Ill.

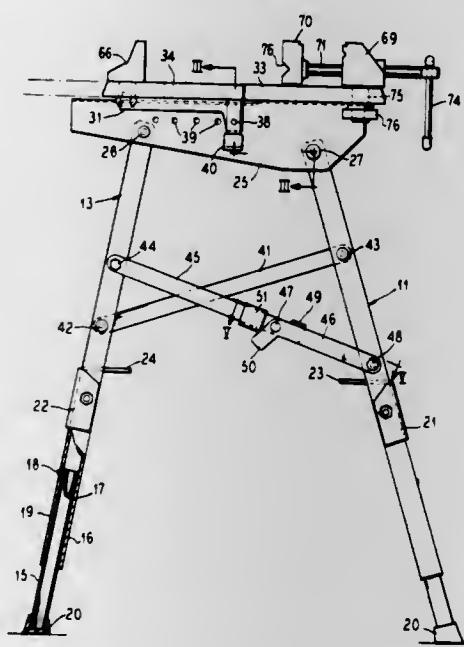
Filed Jun. 25, 1981, Ser. No. 277,255

Int. Cl.<sup>3</sup> B43L 5/00; B25B 1/10

U.S. Cl. 269—88

1. A portable workbench comprising:  
a plurality of spaced legs,  
support means extending between said legs,

a pair of beams extending laterally across said support means and providing a work surface therefor,  
adjustment means cooperating between said pair of beams and said support means to permit said beams to be positioned at a plurality of predetermined spacings relative to each other, each of said beams having a plurality of spaced vertical axis apertures extending therethrough,  
struts interconnecting the two front legs with the two rear legs, linkage means interconnecting said struts and permitting tilting of said work surface downwardly into a position such that said work surface is disposed angularly downwardly.



releasable lock means comprising a slidable sleeve for locking said linkage means in said position,  
a vise member having a mounting shaft extending therefrom, said mounting shaft being proportioned to be received through one of said vertical apertures, said vise member further including:  
a stationary jaw,  
a movable jaw, a screw means extending between said stationary jaw and said movable jaw for moving said movable jaw toward and away from said stationary jaw, said stationary jaw and said movable jaw having confronting planar faces arranged to clamp a workpiece therebetween.

4,415,150

### PORTABLE KNOCK-DOWN PARALLEL BAR EXERCISE FIXTURE

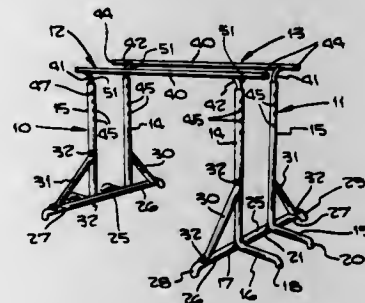
Franco S. Iezza, Los Angeles, Calif., assignor to J. Daniel Scherling, Montrose, Calif.

Filed Aug. 5, 1981, Ser. No. 290,236

Int. Cl.<sup>3</sup> A63B 3/00

U.S. Cl. 272—63

8 Claims



1. A relatively lightweight demountable gymnastic bar set for mounting on a horizontal supporting surface, said bar set comprising two identical end assemblies and at least one bar assembly, each end assembly comprising three tubular elements forming respectively a vertically disposed tubular stationary post, a tubular transverse beam having at each end a laterally outwardly disposed section extending beyond the

respective post and a diagonal bracing between the stationary post and the beam, the stationary post having a tubular section extending when in assembled condition transversely end-wardly of said bar set, said bar assembly comprising an elongated tubular bar, a pair of identical tubular extension posts of the bar rigidly anchored to the bar at locations adjacent respective ends of the bar and in right angular relationship to the bar, each extension post being adapted to telescopically engage a respective one of said stationary posts when the bar set is in assembled condition for use.

4,415,151

### COLLAPSIBLE REBOUND EXERCISE DEVICE

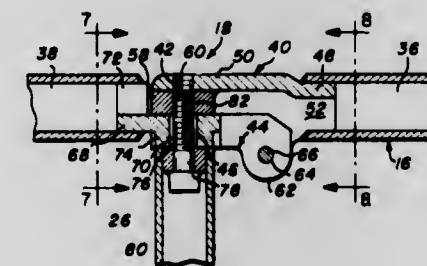
Kenneth M. Daniels, 125 Roberta Dr., Woodside, Calif. 94062

Filed Mar. 1, 1982, Ser. No. 353,689

Int. Cl.<sup>3</sup> A63B 5/18

U.S. Cl. 272—65

10 Claims

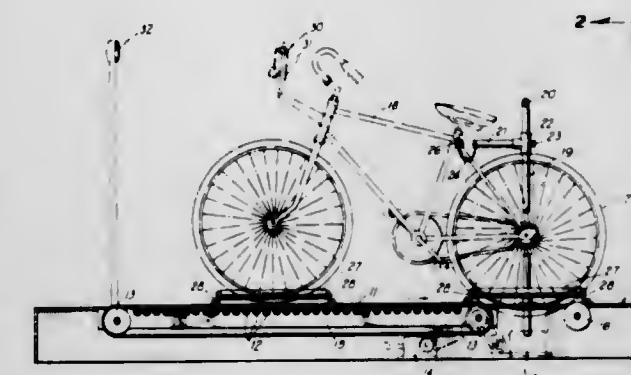


1. A collapsible rebound exercise apparatus comprising:  
mat means for providing a resilient, flexible exercise surface;  
frame means for supporting said mat means and including an open framework having first and second portions which are mirror images of each other and which are joined together by first and second hinge means that allow said framework to be folded along an axis of symmetry from an open configuration lying in a plane defined by said framework to a folded configuration wherein said second portion is disposed in overlying relationship with said first portion, each said hinge means including:  
a first bracket affixed to one of said first and second portions and provided with a hole, and  
a second bracket provided with a bore and affixed to the other of said first and second portions in opposed relationship with and pivotally attached to said first bracket, said first bracket and said second bracket being pivotal relative to one another about said axis of symmetry; and  
support means affixed to said frame means for positioning said frame means above a supporting surface when said frame means is in said open configuration, said support means including bolt means extending therefrom in such a manner as to pass through said holes and into said bores to lock said hinges and restrain said frame means from folding.

4,415,152  
BICYCLE TRAINING AND EXERCISE DEVICE  
Sebie B. Smith, 1252 Peachtree St., Montgomery, Ala. 36106  
Filed Aug. 27, 1981, Ser. No. 296,984  
Int. Cl.<sup>3</sup> A63B 69/16, 23/06

U.S. Cl. 272—73

4 Claims



1. A bicycle rider training device also adapted for use as an exerciser for walkers or joggers comprising a low elevation level base, a level moving beltway on the base extending lengthwise of the base for a major portion of the length of the base, said beltway comprising an endless belt having a top run substantially flush with the top of the base, a series of spaced transverse axis support rollers for said upper run preventing it from sagging, a pair of forward and rear guide rolls engaging opposite ends of the endless belt, power means to drive the rear drive roll in a direction causing movement of the top run of the belt toward the rear of said base, a transverse axis idler roll on the base near its rear end and spaced rearwardly of and being substantially at the elevation of the rear guide roll for the endless belt, whereby the rear wheel of a conventional bicycle may be cradled on the idler roll and the rear of the endless belt as it passes around said rear guide roll for the belt, forward and rear pairs of laterally spaced parallel horizontal longitudinal axis bicycle wheel restraint rollers mounted on said base, said wheel restraint rollers all being at one elevation slightly above the level of the top of the base and top run of the endless belt, the rollers of each pair being disposed adjacent to and parallel to the opposite longitudinal edges of the belt to prevent the wheels of a bicycle from leaving the lateral confines of the belt, the rear pair of wheel restraint rollers being disposed immediately above the rear guide roll for the belt and said rear idler roll, the lengths of the wheel restraint rollers in said pairs and the longitudinal spacing of said pairs enabling all sizes of conventional bicycles to have their front and rear wheels placed between the forward and rear pairs of restraint rollers, an upright inverted U-shaped substantially rigid frame including side vertical bars and a top transverse bar disposed substantially midway between the rear idler roll and the rear guide roll for said belt, said substantially vertical bars being anchored to said base at points spaced laterally outwardly of the side longitudinal edges of the endless belt, said top transverse bar being at a sufficient elevation above the base to form a convenient hand grip for a walker or jogger whose feet are placed on the top run of said belt, a pair of comparatively short horizontal longitudinal arms on the vertical bars projecting forwardly thereof, coupling carrying said arms and being adjustable and lockable at desired elevations on the vertical bars so that the heights of said arms may be varied, a clamp plate adapted for attachment removably to the frame of a bicycle near and below the seat thereof, and a pair of equal length flexible substantially non-stretchable restraint elements connected between opposite ends of said clamp plate and said adjustable arms, whereby lateral tilting of a bicycle is restrained within safe limits during use of the device.



4,415,153

## FIGURE DISPLAYING GAME APPARATUS

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

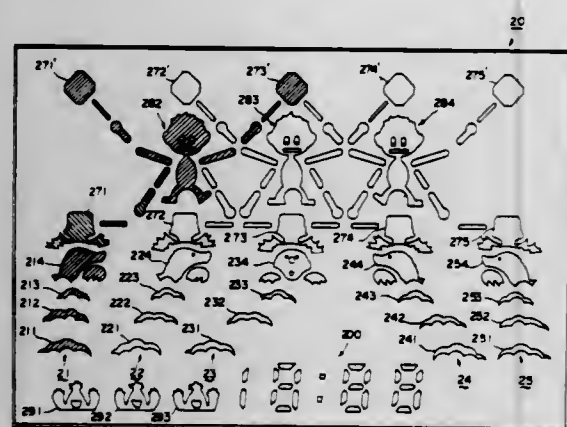
Filed Jun. 15, 1981, Ser. No. 273,954

Claims priority, application Japan, Jun. 19, 1980, 55-83776

Int. Cl.<sup>3</sup> A63F 9/00

U.S. Cl. 273—1 GC

16 Claims



1. A figure displaying electronic game apparatus, comprising display means including at least a first symbol displaying region and a second symbol displaying region, said first symbol displaying region having a plurality of first kind symbol segments operable for display, said second symbol displaying region having a plurality of second kind symbol segments operable for display independently of said first kind symbol segments, operating means responsive to operation by a player for selecting at least one of said plurality of first kind symbol segments to be driven for display, first display driving means responsive to operation of said operating means for selectively driving for display said first kind symbol segments, display driving signal generating means for generating signals for driving for display said second kind symbol segments for automatically and sequentially changing the display state of said second kind symbol segments, second display driving means responsive to said display driving signals for driving for display automatically and sequentially at least one out of said plurality of second kind symbol segments, and display state determining means responsive to said display driving signals for said first and second kind symbol segments for determining that said display state of said first kind symbol segments contained in said first symbol displaying region and movable along a plurality of paths, at least one path intersecting said first direction line in which at least some of said first kind symbol segments are arranged, said apparatus further comprising game mode selecting means for selecting a first game mode for playing a game using all of the paths out of said plurality of paths of second kind symbol segments, and a second game mode for playing a game using a predetermined smaller number of paths of said plurality of paths of second kind symbol segments, and disabling means responsive to selection of said second game mode by said game mode selecting means for acting upon said second display driving means for disabling the driving for display of a predetermined number of paths of said plurality of paths of second kind symbol segments.

4,415,154

## BALL AND TARGET

Gerald J. Engelhardt, 312 Blackberry Ln., Yorkville, Ill. 60560

Filed Feb. 25, 1981, Ser. No. 238,147

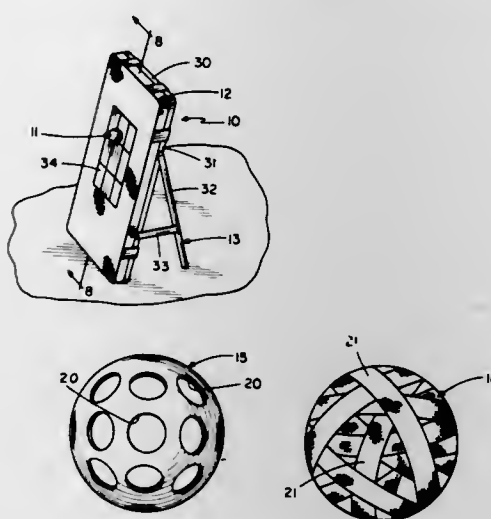
Int. Cl.<sup>3</sup> A63B 69/00, 39/06

U.S. Cl. 273—26 A

8 Claims

1. A practice ball and a ball target for use with said ball comprising a hollow spherical plastic ball body having openings therethrough, a covering on the surface of said sphere for enclosing and strengthening said sphere as a ball, and a target for receiving said ball, said covering having a resilient inner

layer adhered to said sphere substantially uniformly to and over the outer surface of said sphere for resiliently reinforcing



said sphere, and an outer layer for providing a ball surface to contain said resilient reinforcing inner layer and said sphere.

4,415,155

## BATTING PRACTICE APPARATUS

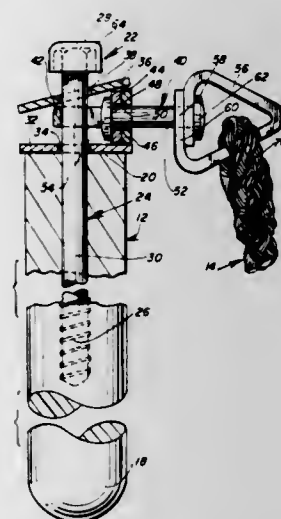
Noel Goudreau, Bourbonnais; Nick Colevris, Bradley, and Carl Southard, Bourbonnais, all of Ill., assignors to Trico Products, Incorporated, Bradley, Ill.

Filed Jul. 23, 1981, Ser. No. 285,960

Int. Cl.<sup>3</sup> A63B 69/40

U.S. Cl. 273—26 E

1 Claim



1. A batting practice apparatus comprising; an elongated cylindrical rod being adapted to be gripped, said rod having a circular cross section along its length, an axle fixed to one end of the rod, said axle being substantially parallel to the axis of the rod, a wear plate movably mounted on the axle adjacent to the one end of the rod, said wear plate having a circular outer periphery and having a diameter greater than the diameter of the rod, an upper plate movably mounted on the axle, said upper plate having a circular outer periphery and having a diameter substantially equal to the diameter of the wear plate, said axle having an enlarged portion on its free end to retain the upper plate, a swivel rotatably mounted on the axle between the wear plate and the upper plate, said swivel having an inner collar rotatably receiving the axle, a portion of the inner collar engageable with the wear plate and the upper plate, a swivel stud rotatably mounted in the inner collar, an outer collar rotatably connected to the swivel stud, a braided polypropylene hollow rope having a closed loop positioned in the outer collar, a solid core ball having a radial aperture and an enlarged aperture aligned with the radial aperture, and a holding plate mounted in the enlarged aperture, said holding plate having a rope aperture aligned with the radial aperture, said

braided rope positioned in the radial aperture and passing through the rope aperture of the holding plate, said rope having a portion knotted and fused together in the enlarged aperture to lock the rope to the ball, said rope having a length more than two times greater than the length of the rod.

4,415,156

## MATCHED SET OF GOLF CLUBS

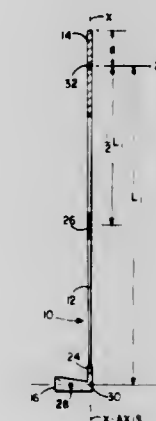
Theodore P. Jorgensen, 3455 L St., Lincoln, Nebr. 68510

Filed Aug. 26, 1981, Ser. No. 296,572

Int. Cl.<sup>3</sup> A63B 53/00

U.S. Cl. 273—77 A

14 Claims



1. A correlated set of more than two golf clubs in which the golf clubs have different lengths and each has a shaft representing an x axis with a grip having a preselected wristcock axis at one end and a club head having a center of mass at the other end, one of said clubs being selected as a master club having the desired characteristics for the golfer and all of the clubs but the master club having an added mass rigidly secured to the golf club at a point one half the distance between the wristcock axis of the grip and the center of mass of the clubhead, each of the clubs having the same overall mass despite their difference in length, the mass of the club head and the mass of the added mass rigidly secured at the midpoint being so computed that the first moment of each club in the correlated set is within fifteen one-hundredths of a percent (0.15%) of the first moment of each adjacent club in the set and the second moment of each club in the correlated set is within fifteen one-hundredths of a percent (0.15%) of the second moment of each adjacent club in the set, with the first and second moments of each club being measured about said wristcock axis.

4,415,157

## TWO-WAY SLOTLESS ROAD RACING GAME

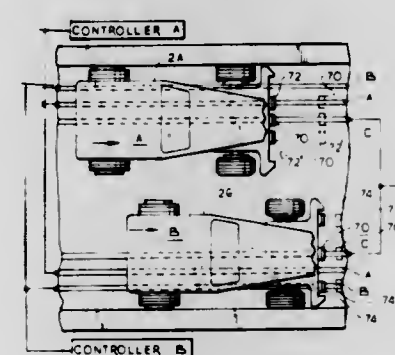
Robert G. Lahr, New York, N.Y., assignor to Ideal Toy Corporation, Secaucus, N.J.

Filed Sep. 28, 1981, Ser. No. 306,043

Int. Cl.<sup>3</sup> A63F 9/14; A63H 18/12

U.S. Cl. 273—86 B

10 Claims



6. A toy vehicle game including a relatively flat slotless track having spaced sidewalls defining a pair of lanes therebetween; a pair of toy vehicles each having a body, reversible

electric motor and means for steering said vehicle into one or the other of said lanes depending upon the polarity of current supplied to the vehicle's motor; means for supplying current of the same polarity to each reversible electric motor regardless of the direction of travel of said toy vehicles; means for selectively and independently reversing the polarity of current supplied to the motors of said toy vehicles regardless of the lane each vehicle is in and the direction in which the vehicle is traveling on the track.

4,415,158

## PUZZLE

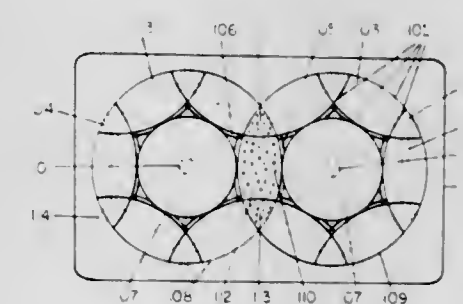
Douglas A. Engel, Englewood, Colo., assignor to General Symmetries, Inc., Englewood, Colo.

Filed Sep. 21, 1981, Ser. No. 304,092

Int. Cl.<sup>3</sup> A63F 9/08

U.S. Cl. 273—153 S

12 Claims



1. A puzzle comprising a base for rotatably supporting segmented sections cooperating to form at least two geometric figures of circular cross section, said segmented sections being rotatable about non-orthogonal axes, the geometric figures overlapping to form an area of common intersection in a plane through the geometric figures, said segmented sections being defined along an outer edge by the locus of said circular cross sections and along an inner edge by an arc of radius equal to the radius of said circular cross section in said plane, each of said segmented sections dissected by at least two other arcs of radius equal to the radius of said circular cross section in said plane to form at least three separate pieces, each of said pieces being movable to a position anywhere in any of said geometric figures including the area of common intersection.

4,415,159

## GOLF STANCE VIEWER

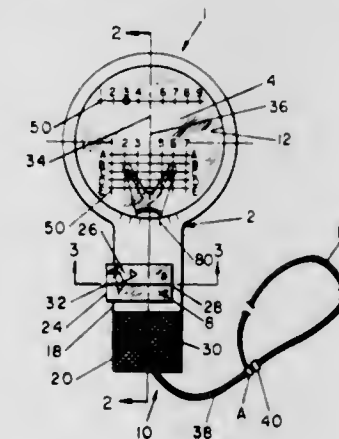
Paul Matheny, and Frances V. Matheny, both of 6491 Fox Run Cir., Jupiter, Fla. 33458

Filed Sep. 21, 1981, Ser. No. 304,026

Int. Cl.<sup>3</sup> A63B 69/36

U.S. Cl. 273—187 A

16 Claims



1. A golf stance viewer including a mounting body, said mounting body having lens means therein to allow a golfer to look through said lens means and view his feet, said mounting



body having a reflective device to aim in a desired direction away from said golfer while said lens means is positioned to view the golfer's feet, an indicating means comprising at least one feet indicating line so that as the golfer looks through said lens means said feet indicating line is viewed with the golfer's feet, said feet indicating line indicating feet placement therewith so that desired feet placement can be repeated.

4,415,160

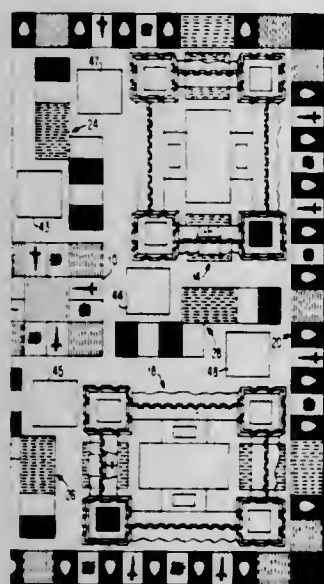
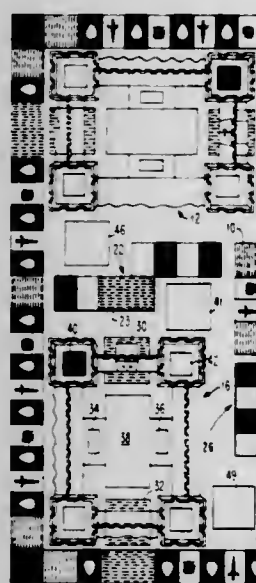
## GAME APPARATUS

Herbert J. Lamb, 244 Maryland Ave., Staten Island, N.Y. 10305  
Continuation of Ser. No. 86,716, Oct. 22, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,711

Int. Cl.<sup>3</sup> H63F 3/00

U.S. Cl. 273-243

8 Claims



3. A game apparatus comprising in combination:  
a first game piece;  
a first inner game-playing area comprising a number of contiguous spaces upon which game pieces may be played;  
a second outer game-playing area comprising a number of contiguous spaces upon which game pieces may be played;  
said second outer game playing area being peripheral to said first inner game-playing area;  
first means associated with a first number of said spaces identifying said first number of spaces as being first-deck spaces;  
second means associated with a second number of spaces identifying said second number of spaces as being second-deck spaces;  
at least one pathway comprising a number of contiguous

spaces upon which game pieces may be played, said pathway located intermediate to said first and second game-playing area,  
said pathway forming a route between said first and said second game-playing areas, said pathway being further provided with at least one game-playing area entry point adjacent each of said first and second playing areas;  
said pathway and said first and second game playing areas being structured with respect to each other such that a game piece entering play can be moved from space to space along said pathway toward either said first game-playing area or said second game-playing area to thereby enter one or the other of said game-playing areas via one of said game-playing area entry points,  
a defended zone adjacent said pathway, said defended zone having at least one defended zone entry point;  
a first deck of playing cards, said first deck of cards having first indicia thereon for identifying them as first-deck cards and for correlating said first deck of cards with said first-deck spaces;  
a second game piece;  
a second deck of second playing cards, said second deck of cards having second indicia thereon for identifying them as second-deck cards and for correlating said second deck of cards with said second-deck spaces;  
said first and second game pieces and said first and second spaces having distinguishing markings thereon for distinguishing said first game pieces and said second game pieces from each other and for correlating said first game pieces with said first number of spaces and for correlating said second game pieces with said second number of spaces.

4,415,161

## GAME BOARD

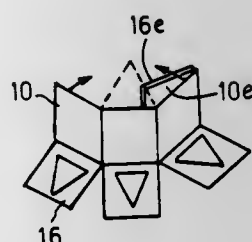
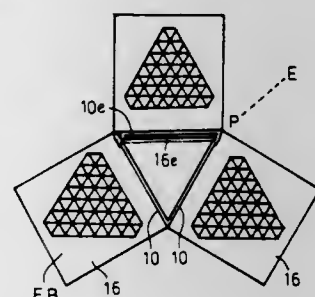
David A. Westell, Box 69792, Station K, Vancouver, B.C., Canada

Filed Jun. 4, 1981, Ser. No. 270,572

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273-285

6 Claims



3. Game board assembly comprising:  
a central column designed to stand upwardly on a horizontal surface,  
not less than three and more than four playing board panels designed to rest on said playing surface,  
said playing board panels being connected to said central column to extend outwardly therefrom,  
the directions of horizontal extension of said playing board

panels being approximately equally spaced about said column,  
a playing board delineated on each of said playing board panels, said playing boards being substantially identical to each other,  
wherein the dimensions of said column and the dimensions of said playing boards and the playing board location on each said playing board panel are such that each playing board is obscured by said column to a person seated at the horizontal surface and located in the opposite direction from said column to the playing board,  
wherein said column is composed of substantially similar rectilinear panels hinged to each other on side edges as defined by the erected attitude of the column and said playing boards are each hinged to a respective bottom edge of one of said rectilinear panels.

4,415,162

## DART TARGET SYSTEM

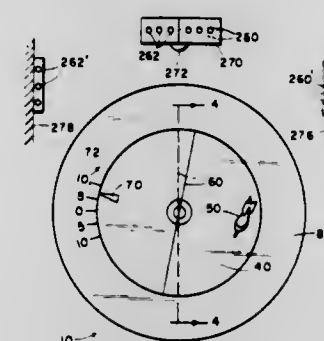
David P. Sheppard, 7928 State St., Ralston, Nebr. 68127

Filed Jul. 27, 1981, Ser. No. 287,362

Int. Cl.<sup>3</sup> F41J 3/00, 3/02

U.S. Cl. 273-371

6 Claims



1. A target system comprising a frame, first target module movably mounted on said frame for rotation about a first substantially horizontal axis, said first target module having a target module surface disposed transversely to said axis, said surface being suitable for penetration by pointed ends of darts sufficient to support and retain darts stuck therein whereby a dart stuck in said first target module on one side of a vertical plane extending through said axis tends to cause said first target module to rotate about said first axis downwardly on the side of said vertical plane in which said dart is stuck, a dart with a pointed end, said pointed end being stuck in said target module surface, a victory indication means correlated with said first target module and said frame, whereby at a given time the position of said first target module with respect to said frame can be sensed by the players, said victory indication means comprising an electrical signal system having a sensible signal, said signal being activated responsive to the position of a magnetically attractable member with respect to a magnetically operated switch, the magnetically attractable member and the magnetically operated switch being permanently mounted during use of said system one on said target module and one on a portion of said system which is fixed to said frame.

4,415,163

## PORTABLE VOLLEYBALL APPARATUS

Darrell A. Schoenig, 432 Clover La., Ft. Collins, Colo. 80521

Filed Feb. 22, 1982, Ser. No. 351,254

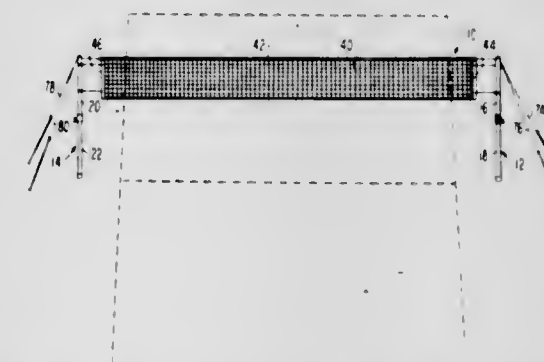
Int. Cl.<sup>3</sup> A63B 61/04, 71/02

U.S. Cl. 273-411

2 Claims

1. A portable volleyball apparatus comprising:  
a pair of space-opposable poles each composed of a pair of mutually-telescopic tubes;  
a pair of adjustable clamps individually disposed on respective ones of said poles in a position to enable locking of

said tubes of each pair thereof at a desired degree of telescopic extension;  
a rectangular, elongated net having space-opposed side margins and a top margin;  
a rope secured to said top margin and securable between the tops of said poles;  
a first pair of ties each secured individually at one end to an upper portion of a corresponding side margin and each secured individually at its other end to a corresponding upper end of a respective one of said poles, said ties being so secured as to induce resilient tension in said ties;



- a second pair of ties each secured individually at one end to a lower portion of a corresponding side margin and each secured individually at its other end to a corresponding intermediate portion of a respective one of said poles, said second pair of ties also being so secured as to induce resilient tension therein;  
and a plurality of lines each of selectively adjustable length, respective pairs of said lines diverging downwardly and outwardly from the top of corresponding ones of said poles into securement with a substrate upon which the lower ends of said poles are placed.

4,415,164

## METHOD AND DEVICE FOR ALIGNING AND SECURING A MECHANICAL SEAL ELEMENT AND THE LIKE ON A SHAFT

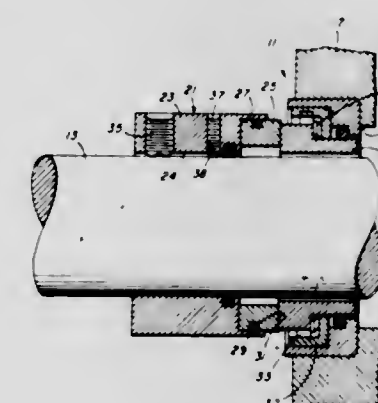
Norman E. Johnson, Barrington, R.I., assignor to EG & G Sealol, Inc., Warwick, R.I.

Filed Jul. 1, 1982, Ser. No. 394,309

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277-1

9 Claims



4. A method of fixing an annular member to a shaft and aligning their centerlines comprising the steps of positioning said annular member on said shaft with clearance therebetween, causing a first adjustable means at a first axial location on said annular member to engage said shaft, and causing a second adjustable means at a second axial location on said annular member and axially aligned with said first adjustable means to engage said shaft, said first and second adjustable means operable to take up clearance between said annular member and said shaft and to render their centerlines parallel



or concentric, and thereafter securing said annular member to said shaft.

#### 4,415,165 INTEGRAL ELASTOMERIC/GRAPHITE DYNAMIC FACE SEAL

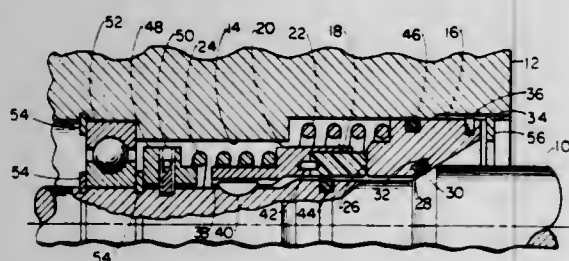
Leonard J. Martini, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,294

Int. Cl.<sup>3</sup> F16J 15/34, 15/40

U.S. Cl. 277-27

18 Claims



1. A shaft seal combination wherein a rotating shaft mounted in an aperture through a wall with a pressure differential existing between its inner and outer surfaces is dynamically sealed against low and high pressure leakage, said shaft seal comprising:

a face-type rotary mechanical seal assembly fitted between the shaft surface and the aperture surface, said assembly having:

a first sleeve keyed nonrotatably to the aperture in a manner that the sleeve can slide back and forth along the shaft's axis; and

a second sleeve keyed to rotate with the shaft in a manner that said second sleeve can slide back and forth along the shaft's axis, wherein the first and second sleeves contain matching face-type seal surfaces which make sealable contact during the existence of high pressure differentials between the inner and outer surfaces of the wall;

an O-ring;

means for holding the O-ring, said means fitted not to rotate with the shaft but to slide back and forth axially in a manner that the O-ring is brought into sealable contact with the surface of the rotating shaft during periods of low pressure differential between the inner and outer surfaces of the wall; and

means for forcing the holding means and O-ring against the surface of the shaft during periods of low pressure differential between the inner and outer surfaces of the wall.

#### 4,415,166 BEARING SEAL ASSEMBLY WITH DUAL ANNULAR SUPPORT RINGS

Thomas S. Beia, Cadillac, Mich., assignor to Cadillac Rubber & Plastics, Inc., Cadillac, Mich.

Filed Jan. 31, 1983, Ser. No. 462,545

Int. Cl.<sup>3</sup> F16J 15/18

U.S. Cl. 277-51

19 Claims

1. A bearing seal assembly comprising:

first and second annular rings of substantially identical construction, each having:

an outer face;

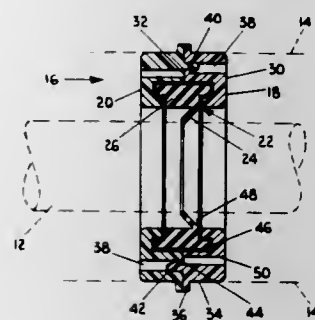
an inner face;

an outer circumferential surface; an inner circumferential surface; a cavity formed in the inner face of the inner circumferential surface; and

means formed in the inner face to snap-fit together two of said substantially identical annular rings with said inner faces thereof in juxtaposed facing relationship;

an annular gasket member having an annular portion and an

inwardly-extending flange of relatively flexible nature to seal against a shaft, the annular portion of said gasket member being shaped to fit snugly within the cavities formed in the first and second rings which are joined together at inner faces thereof; and



said first and second annular rings being joined together at the inner faces thereof with said annular gasket member therebetween.

#### 4,415,167 ASSEMBLED MULTI-COMPONENT SEAL

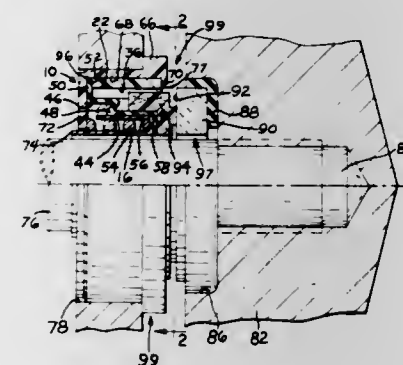
Norbert W. Gits, 6417 Blackhawk Trail, Indian Head Park, Ill.

Filed Dec. 13, 1982, Ser. No. 449,188

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277-88

16 Claims



1. A rotary end face seal unit comprising, in combination, a seal housing having a first, outer surface portion adapted for reception into a machine member and an inner diameter adapted to receive a seal ring drive unit, said housing further including, at one end thereof, a radially inwardly extending end wall with an interior wall surface, and adjacent the other end thereof, a stiff but resilient, radially inwardly directed locking rib, a drive member having axially inner and outer faces and a contoured inner surface adapted to mate with the outer surface of an associated primary seal ring in driving engagement, and to permit said seal ring to slide axially thereof, a primary seal ring disposed within at least a portion of said drive member and having driving surfaces corresponding to and directed oppositely to counterpart drive surfaces on said drive member, an exterior end face seal band forming a pair of said primary rings, said primary ring further including an annular seat for locating a spring shroud, an elastomeric secondary sealing sleeve having axially inner, intermediate, and outer portions, an axially acting coil spring, and a shroud enclosing said spring on its inner diameter, on one end thereof and at least a portion of its outer diameter, said sleeve being held into fluid-tight sealing relation at its axially inner end between said housing end wall and said inner end wall of said drive member, and at its axially outer end between a portion of said spring shroud and said annular seat on said seal ring, said sleeve further having an intermediate portion lying adjacent a portion of said spring shroud and being adapted for a rolling or buckling action to permit free but limited axial movement of said primary seal ring relative to said housing and drive member.

4,415,168

#### MECHANICAL SEAL

Akira Takenaka, and Tatsuhiko Fukuoka, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

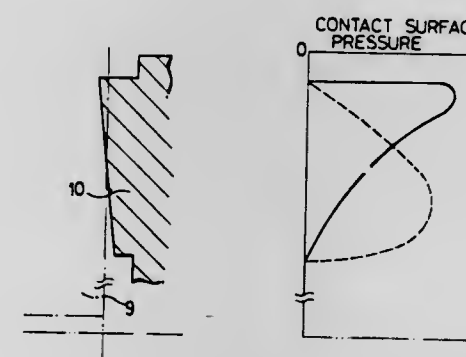
Continuation of Ser. No. 133,713, Mar. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 895,072, Apr. 10, 1978, abandoned. This application Apr. 8, 1982, Ser. No. 366,809

Claims priority, application Japan, Apr. 12, 1977, 52-41838; Mar. 3, 1978, 53-24137; Mar. 4, 1978, 53-24138

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277-96.1

8 Claims



1. A mechanical seal which comprises:

(a) stationary means including a seating ring which receives therethrough a rotatable shaft and has an annular sliding contact surface, and

(b) a follower ring mounted to rotate with said rotatable shaft and has another annular sliding contact surface in sliding contact with the sliding contact surface of said seating ring when the shaft is rotated causing relative motion in one direction between said sliding contact surfaces,

(c) in said mechanical seal, a pressurized fluid which consists of a liquid or a mixture of a gas and a liquid being sealed in on the outside of said follower ring and the inside thereof is connected to the air,

(d) said mechanical seal being composed of a material that is subject to thermal deformation under high temperature conditions and is effective to avoid the leakage of said pressurized sealed fluid from the outside to the inside thereof,

(e) a raised portion is disposed along the periphery of said sliding contact surface of the follower ring,

(f) said raised portion being defined by swelling said periphery in the direction of the axis of said rotatable shaft as compared with the inside portion of said sliding contact surface, and

(g) the height of said outside raised portion on said sliding contact surface being effective to compensate for thermal deformation taking place during operation of the seal, the axial extent of said raised portion being in the range of about 1 to 3 microns, said raised portion being a circumferentially continuous annular surface, said contact surface having a diametral cross section which continues from the radially inner edge of said contact surface away from the shaft, smoothly and without interruption to and through said raised portion to the radially outer periphery of said contact surface.

4,415,169

#### SEAL FOR CONCENTRIC TUBULAR MEMBER

Yung J. Kim, Hacienda Heights, Calif., assignor to Baker International Corporation, Orange, Calif.

Filed Sep. 28, 1981, Ser. No. 306,458

Int. Cl.<sup>3</sup> F16L 15/02, 55/00

U.S. Cl. 277-125

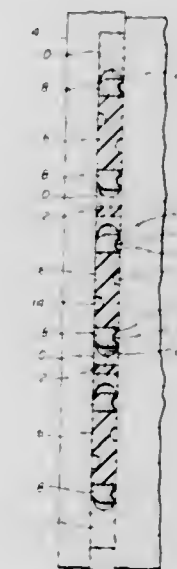
32 Claims

1. A seal system for establishing sealing integrity between an inner tubular member and a concentric outer tubular member, comprising:

a cylindrical sealing element encircling said tubular member; cylindrical back-up means, axially spaced from said sealing

element, for preventing axial extrusion of said sealing element therepast; and

an intermediate member between said sealing element and said back-up means, at least one peripheral surface of said intermediate member being recessed from the cooperating surface of the adjacent tubular member to form a cavity



4,415,170

#### DOUBLE TORIC SEALING RING

Maurice Bonafous, Oloron, France, assignor to Applications Mecaniques et Robinetterie Industrielle A.M.R.I., France

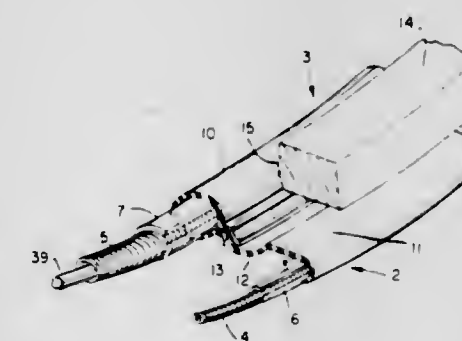
Filed Jan. 5, 1982, Ser. No. 337,279

Claims priority, application France, Jan. 13, 1981, 81 00460

Int. Cl.<sup>3</sup> F16J 15/12, 15/32

U.S. Cl. 277-163

8 Claims



1. A flexible double toric sealing ring comprising first and second sealing ring structures 2, 3, positioned about a common concentric axis, which ensure respectively a static seal and a dynamic seal, a counter ring which absorbs the compressive forces at the valve seat and also distributes contact pressure along the circumference, said counter ring movably mounted around the second sealing ring structure to allow self-centering of the sealing ring structure on the valve seat, and a sealing membrane, having an elastically deformable part, which interconnects the two sealing ring structures while partially covering them, said double toric sealing ring being characterized by said sealing membrane having one lateral side facing in a first direction along said common concentric axis and having an opposite lateral side facing in a second direction, opposite said first direction, along said common concentric axis, and by the



placement of the two sealing ring structures on opposite lateral sides of the middle section of the membrane.

4,415,171

# CONTROL SYSTEM AND SHAFT SEAL FOR STIRLING CYCLE MACHINE

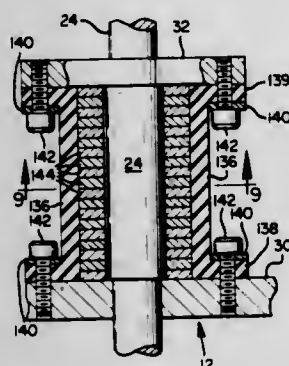
Linton A. Edwards, 13610 SE. Foster Rd., Portland, Oreg. 97236

Filed May 5, 1981, Ser. No. 260,822

Int. Cl.<sup>3</sup> F16J 15/02; F02G 1/00

U.S. Cl. 277-12

2 Claims



1. A seal for preventing passage of a fluid between the interior of an opening of a wall and the surface of a shaft extending through said opening, said shaft having an annular flange extending radially therefrom, the seal comprising:

- a flexible elastic tubular member having first and second ends and an interior diameter greater than the exterior diameter of said shaft;
- first and second attachment means for attaching said first and second ends respectively to said wall and to said annular flange; and
- a plurality of annular spacer members each having an outer diameter which is no greater than the interior diameter of said tubular member and an interior diameter which is no less than the exterior diameter of said shaft, the number of said spacer members being sufficient to substantially fill the interior of said sleeve between said first and second attachment means.

4,415,172

# FRICTION WELDING MACHINE HAVING AN EXPANDING MANDREL BACKSTOP ASSEMBLY

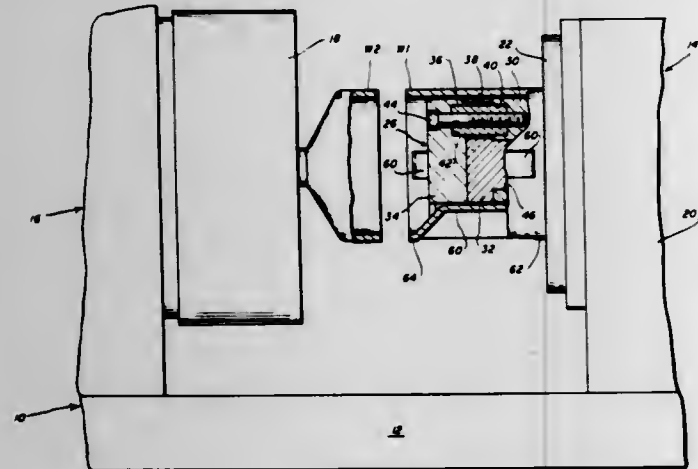
Christopher T. S. Stevenson, New Britain, Conn., assignor to Litton Industrial Products, Inc., New Britain, Conn.

Filed Dec. 10, 1981, Ser. No. 329,247

Int. Cl.<sup>3</sup> B23B 31/12

U.S. Cl. 279-33

2 Claims



1. A mandrel chuck for a backstop assembly of a friction welding machine for holding a first interiorly lobed workpiece, the friction welding machine including a movable workhead assembly for displacing a second rotating workpiece into

forceful engagement with the first workpiece, the chuck comprising

- a main body portion,
- an end portion rigidly fixed to said main body portion,
- an intermediate portion mounted between said main body portion and said end portion, all of said chuck portions having similar exterior lobes in a configuration which complements the interior lobes of said first workpiece, and
- means for rotating said intermediate portion relative to said main body and end portions to interiorly grip the first workpiece wherein one end of the first workpiece projects from and is proximate to said chuck end portion, whereby said chuck will not contribute to any outward bowing or distortion of said workpiece end.

4,415,173

# WHEELED CORNER MEMBERS FOR LUGGAGE

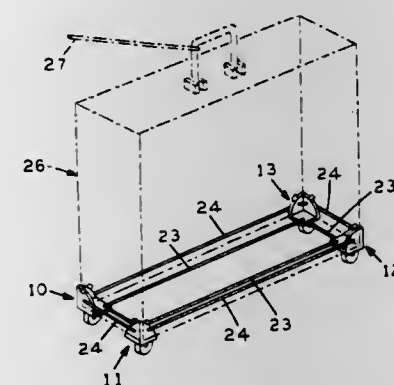
Jerry C. Tenebruso, 31-07 91st St., Jackson Heights, N.Y. 11369

Filed Jun. 24, 1981, Ser. No. 276,954

Int. Cl.<sup>3</sup> B62B 3/02

U.S. Cl. 280-47.13 R

2 Claims



1. In combination, four, wheeled corner members for luggage each comprising a flat rectangular base, a caster roller attached to and depending from said base, two flat sides extending perpendicularly from said base in a direction opposite to said roller and being joined to said base along two contiguous sides thereof and being joined to each other along contacting sides thereof, each said corner member being adapted to closely fit around a base corner of a rectangularly based oblong-sided stiff piece of luggage, the base of each corner member being in contact with the base of said piece of luggage and the flat sides of each corner being in contact with the sides of said luggage adjacent to the base thereof, elongated elastic members connected to and interconnecting each said base of a corner member, elongated elastic members connected to the side of one corner member and connected to and interconnecting the side



rings having a plurality of strain gages thereon, said strain gages measuring flexure of said strain rings in response to dynamic forces causing relative movement between said platform and said ski and being interconnected to develop a plurality of electrical signals as a function of components of said forces, each of said electrical signals being associated with one of said components;

control means responsive to said signals for analyzing said signals and operative to develop a release signal upon one of said components exceeding a predetermined limit, said bias means being further responsive to said release signal and operative to rotate each of said clamps to said second position.

4,415,177

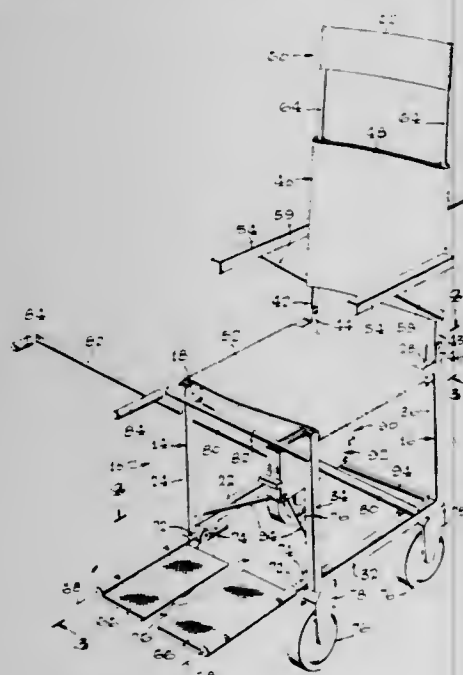
**FOLDING WHEELCHAIR**

Thomas K. Hale, Glendale, and Peter P. Kavaloski, Los Angeles, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 15, 1981, Ser. No. 330,837  
Int. Cl.<sup>3</sup> B62B 11/00

U.S. Cl. 280—650

11 Claims



1. A folding wheelchair having a seat, backrest, and a plurality of wheels, comprising:

(a) two frame members, said frame members each including upper segments defining therebetween the width of said seat when said wheelchair is in an unfolded position and lower segments for accepting said wheels;

(b) a spider mechanism adapted for holding said frame members in a spaced-apart wheelchair "unfolded" position and for providing means to collapse said frame members into a close proximity wheelchair "folded" position, said spider mechanism comprising:

first and second pairs of leg elements, each of said leg elements having upper and lower support legs including a central portion therebetween, first and second pairs of said upper support legs being rotatably secured to upper segments of first and second ones of said frame members, respectively, and corresponding first and second pairs of said lower support legs being rotatably secured to corresponding lower segments of said first and second frame members; and

an elongated body having at least two generally parallel guide slots, said central portions of said first pair of leg elements being slidably retained in a first one of said guide slots and said central portions of said second pair of leg elements being slidably retained in a second one of said guide slots, said elongated body being arranged relative to said frame members such that when said wheelchair is in the unfolded condition said central portions are maintained against respective opposite ends of said guide slots,

and when said wheelchair is in the folded condition, said central portions are positioned in the longitudinal center area of said guide slots; and means for maintaining said leg element central portions against said guide slot ends.

4,415,178

**SUSPENSION FOR MOTOR VEHICLES**

Suehiro Hatsushi, Asaka; Tetsuro Mitsui, Niiza, and Takeomi Miyoshi, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

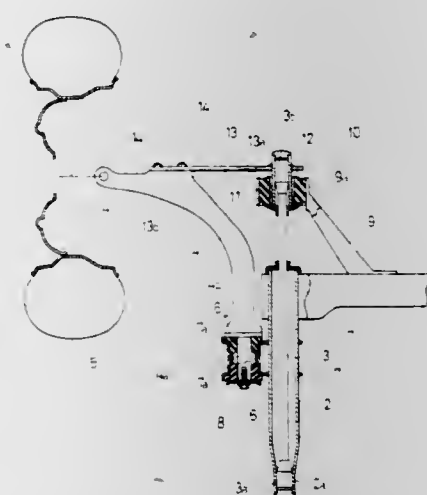
Filed Dec. 23, 1981, Ser. No. 333,986

Claims priority, application Japan, Dec. 26, 1980, 55-186280; Jan. 6, 1981, 56-478[U]; Apr. 28, 1981, 56-64512[U]

Int. Cl.<sup>3</sup> B60G 11/20

U.S. Cl. 280—664

7 Claims



1. A suspension system for a motor vehicle having a body, said suspension system including at least a pair of lateral suspensions each comprising:

a shock absorber having an upper end thereof adapted to be mounted on said body of said motor vehicle;

a knuckle operatively connected to said shock absorber for supporting a wheel thereon;

a radius arm adapted to be mounted at one end thereof on said body and at a distal end thereof on said knuckle;

a rubber bushing which is resilient in substantially the fore-and-aft direction of said motor vehicle, said rubber bushing supporting said one end of said radius arm on said body;

a torsion bar spring having one end thereof adapted to be fixed to said body, and having a substantially twistable and flexible distal end, and being adapted to extend in substantially the fore-and-aft direction of said motor vehicle;

a resilient lower arm having one end thereof fixed to said distal end of said torsion bar spring and the other end thereof fastened to said distal end of said radius arm, said lower arm being resiliently flexible in substantially the fore-and-aft direction of said motor vehicle and rigid in substantially the vertical direction thereof; and said lower arm comprising a leaf spring.

4,415,179

**AXLE AND AIR BAG SUSPENSION**

Joseph A. Marinelli, P.O. Box 859, Frew Mill Rd., New Castle, Pa. 16103

Filed Apr. 15, 1981, Ser. No. 254,399

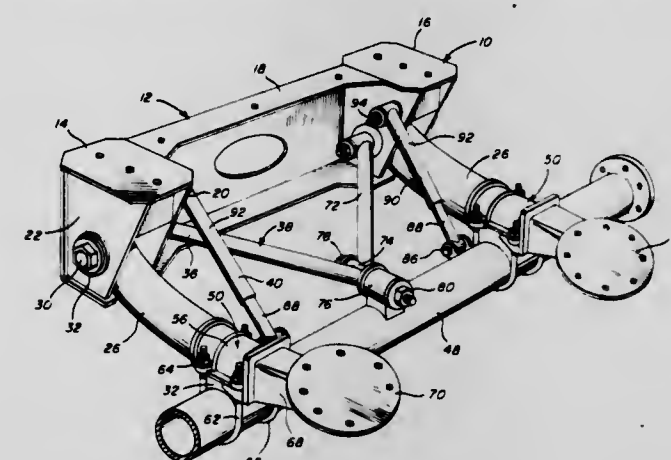
Int. Cl.<sup>3</sup> B60G 11/62

U.S. Cl. 280—713

13 Claims

1. In a trailing arm suspension including a forward chassis mount portion, a front-to-rear extending trailing arm having its forward end pivotally supported from said mount portion for oscillation about a horizontal axis extending transversely of said arm, an elongated axle end disposed generally parallel to

said axis, resilient material bushed sleeve means stationarily mounted on said axle in position generally normal thereto and mounted longitudinally on the rear end of said arm for limited angular displacement thereabout against longitudinal displacement relative to the arm, said sleeve means including an air bag lower mount portion stationarily mounted thereon, said resilient material bushed sleeve means including a lower upwardly



opening generally semi-cylindrical sleeve section stationarily supported on said axle end, an upper downwardly opening generally semi-cylindrical sleeve section disposed over and opposing said lower sleeve section, resilient sleeve structure disposed about said rear end of said arm, and means operatively clamping engaged with said sleeve sections with the latter clamped about said resilient sleeve structure and the rear end of said arm.

4,415,180

**STROLLER LATCH**

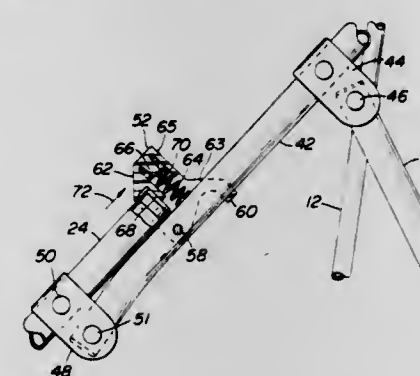
Rex E. Payne, Jr., Elverson, Pa., assignor to Dawn Designs, Inc., Elverson, Pa.

Filed Apr. 27, 1981, Ser. No. 258,198

Int. Cl.<sup>3</sup> B62B 7/08

U.S. Cl. 280—650

9 Claims



1. A latch comprising a latch member extending between first and second frame members whose end portions overlap one another and which are generally parallel, the first frame member having one end pivotally connected to the second frame member at a location spaced from and adjacent one end of the second frame member, the latch member being pivotally supported on the first frame member and spring biased to a position wherein it embraces said one of the second frame member, a surface on said latch member where finger pressure may be applied to release the latch member so that said first and second frame members may pivot relative to one another, said surface being a cam surface so that said one end of said second frame member may contact said cam surface to pivot the latch member and then be snapped to a latched position without finger manipulation of the latch member, said latch member being generally U-shaped so as to have legs generally parallel to one another, a loop connected by extensions to said legs so as to define a hole through which the first frame member extends.

4,415,181

**LOW GROUND CLEARANCE TRAILER**

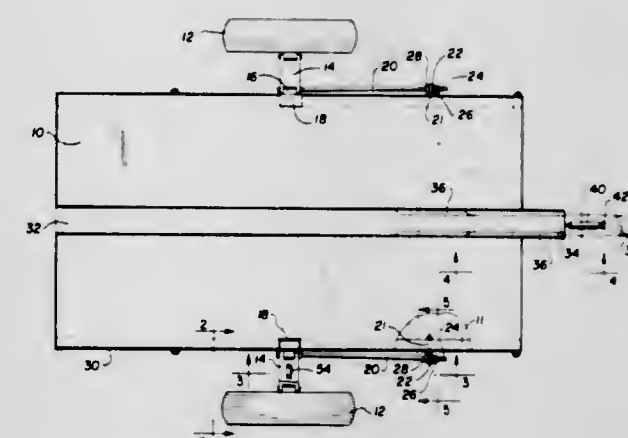
Charles F. McCall, 1703 Dorchester, and William P. Seelye, 220 Nicki La., both of Arlington, Tex. 76014

Filed Nov. 9, 1981, Ser. No. 319,258

Int. Cl.<sup>3</sup> B60G 11/18

U.S. Cl. 280—700

9 Claims



1. In a trailer suitable for towing behind a vehicle such as an automobile or light truck, a suspension height adjusting mechanism comprising:

(a) a horizontal trailer frame having a generally flat floor surface and having first and second opposite sides;

(b) at each of said first and second opposite sides of said trailer frame, an upright pylon affixed to said trailer frame extending above the plane of said flat floor surface and having thereon first and second pivot bearings in spaced vertical relationship;

(c) at each pylon, a wheel hub having first and second pivot bearings in spaced vertical relationship;

(d) between each pylon and each wheel hub, a first floating link connecting the first pivot bearing of said upright pylon to the first pivot bearing of said wheel hub;

(e) between each pylon and each wheel hub, a second floating link in spaced parallel relationship with said first floating link and connecting the second pivot bearing of said pylon to the second pivot bearing of said wheel hub;

(f) on each said opposite side of said trailer and in spaced parallel relationship therewith, a torsion bar having first and second ends;

(g) means for adjustably fixing said first end of said torsion bar to said trailer frame so that axial rotation is prevented or allowed according to such adjustment wherein, with respect to each of said opposite sides of said trailer frame, the means for adjustably fixing said first end of said torsion bar to said trailer frame comprises:

(i) a drilled collar block extending from said side of said trailer frame for receiving said first end of said torsion bar;

(ii) screw threads at said first end of said torsion bar;

(iii) a raised annular shoulder on said torsion bar;

(iv) a nut and washer combination for turning onto said screw threads when said screw threads are inserted through said drilled collar block so that said drilled collar block is tightly held between the said annular shoulder and the said nut and washer combination; and

(v) adjacent knurled surfaces on said annular shoulder and said drilled collar block for binding said torsion bar against axial rotation when said nut and washer combination is turned tightly against said collar block; and

(h) means for fixing said second end of said torsion bar to said second floating link so that the pivot axis at said second pivot bearing of said pylon is coaxial relative to the torsion axis of said torsion bar.

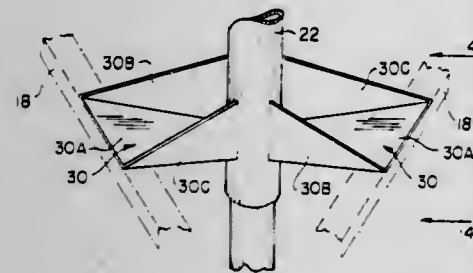


4,415,182

**MOUNT FOR TRAILER JACK**

Margie M. Smith-Williams, and Robert E. Williams, both of 7929 Stewart & Gray #10, Downey, Calif. 90241  
Continuation-in-part of Ser. No. 228,184, Jan. 26, 1981, abandoned. This application Sep. 2, 1982, Ser. No. 414,652  
Int. Cl.<sup>3</sup> B60S 9/02, 9/14, 9/22  
U.S. Cl. 280—763.1

9 Claims



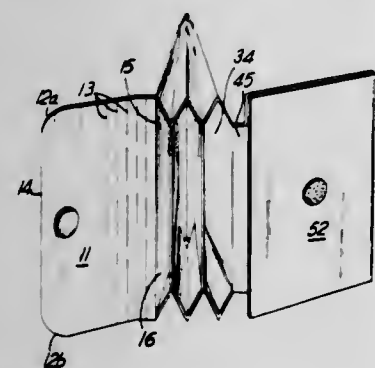
1. In a trailer which includes a forwardly extending tongue for coupling the trailer to a towing vehicle, and which includes a vertically adjustable jack having an elongated tubular housing extending through the tongue; a mounting for the jack comprising bracket means having first and second bracket sections mounted on the tongue and engaging the tubular jack housing in essentially diametrically opposite relationship with respect to the jack housing; each of the bracket sections having a truncated triangular-shaped plate forming a bottom therefor with an arcuate forward edge for receiving the jack housing, and each bracket section having a pair of integral turned-up side walls on opposite side edges of said plate extending upwardly from the plane of the tongue at right angles to said plate, with the forward edge of each of the side walls engaging and extending along the jack housing.

4,415,183

**MULTI-POCKET PAD RETAINING FOLDER AND BLANK THEREFOR**

Albert A. Benham, Granville, Mass., assignor to Champion International Corporation, Stamford, Conn.  
Filed Oct. 15, 1981, Ser. No. 311,798  
Int. Cl.<sup>3</sup> B42D 3/12; B65D 27/08; A45C 11/34  
U.S. Cl. 281—31

9 Claims



1. A one-piece paperboard blank to be erected and glued to form a multi-pocket folder having means to retain a notebook, said blank comprising:

a series of substantially rectangular panels lying in tandem along an imaginary central axis and consisting of, aligned in order, a cover panel, a first body panel, a second body panel, a first pad retention panel and a second pad retention panel connected by a fold line to said first pad retention panel and having means to retain said notebook;  
a plurality of flap members which, when adhered, form the multi-pockets, a pair of said flap members being connected by fold lines parallel to said central axis at opposite ends of each of said body panels, each pair of flap members comprising a short flap member having a second fold line parallel to its connecting fold line and a long flap member

having four fold lines parallel to its said connecting fold line;  
glue means to adhere portions of the inside faces of said two pad retention panels to each other; and  
glue means to adhere portions of said flap members to form a plurality of pockets.

4,415,184

**HIGH TEMPERATURE INSULATED CASING**

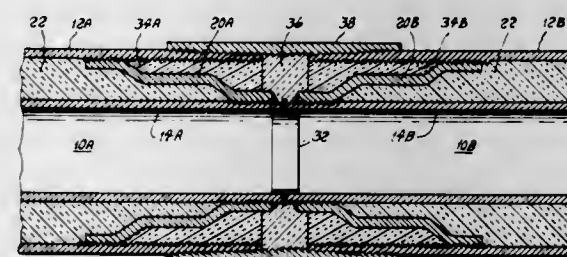
Edgar O. Stephenson, and Victor R. R. Brown, both of Tacoma, Wash., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,547

Int. Cl.<sup>3</sup> F16L 59/14

U.S. Cl. 285—47

8 Claims



1. In an insulated casing assembly for conveying a heated fluid, said casing having spaced, concentrically positioned inner and outer tubulars with insulation sealed therebetween, an improved joining arrangement comprising:  
a rigid thrust ring joining the inner and outer tubulars at each end of said casing;  
said thrust ring joined to said inner tubular near its end and to the outer tubular at a location spaced a substantial distance from its end whereby a long path for heat transfer by conduction from the inner to the outer tubular exists;  
the annular space between the outer surface of said thrust ring and the inner surface of said outer tubular constituting a coupling cavity;  
coupling cavity insulation contained in said coupling cavity;  
said outer tubular having threads at each end;  
a threaded coupling ring for joining threaded ends of adjacent outer tubulars;  
a seal ring sized to fit within said inner tubular and having a centrally positioned radially outwardly extending rib sized to fit between the ends of adjacent inner tubulars; and  
a gap insulation ring contoured to fit in the gap between the coupling cavity insulation of similar adjacent casings.

4,415,185

**FLEXIBLE METAL COUPLING FOR JOINING UNDERWATER PIPES LAID AT GREAT DEPTH**

Costantino Vinciguerra, Florence, and Giampaolo Bonfiglioli, Inzago, both of Italy, assignors to Nuovo Pignone S.p.A., Florence and Snam S.p.A., Milan, both of Italy

Filed May 13, 1981, Ser. No. 263,158

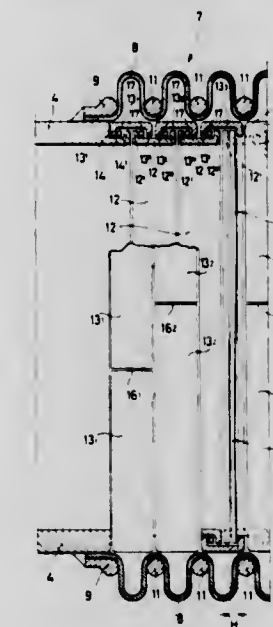
Claims priority, application Italy, May 26, 1980, 22313 A/80  
Int. Cl.<sup>3</sup> F16L 13/04

U.S. Cl. 285—114

3 Claims

1. A flexible coupling for joining two pipes which can be laid under water at great depths out of alignment and at different inclines, comprising:  
metal bellows intermediate the free facing ends of the pipes, means secured to said pipes for fixing each end of said metal bellows to an end of a pipe in a sealed manner, closed steel rings disposed about said bellows in its grooves for strengthening the coupling,

an inner reinforcing structure having an aligned series of steel rings of U-shaped cross-section kept side by side and coupled to each other in succession in an axial direction by an overlying series of steel rings of inverted U-shaped cross-section, wherein the lips of said inverted U-shaped steel rings are inserted into the grooves of two adjacent



rings of the underlying series of said U-shaped steel rings, and  
an axial undulated circular spring inserted between each lip of said inverted steel rings and each facing lip of said underlying steel rings which resiliently and alternately press against said facing lips to allow a high degree of deformation of the coupling.

4,415,186

**FLANGING SYSTEM FOR SUSPENDING CASTING AND TUBING COLUMNS FOR HIGH PRESSURE OIL OR GAS WELLS**

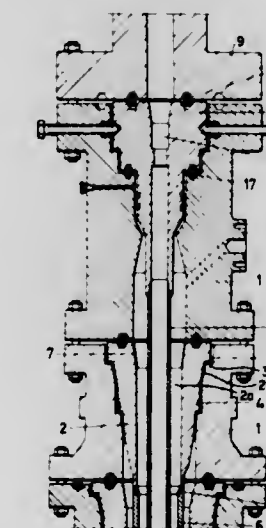
Marino Maestrami, Piacenza, Italy, assignor to Saipem S.p.A., Milan, Italy

Filed Dec. 9, 1980, Ser. No. 214,797

Claims priority, application Italy, Feb. 19, 1980, 20003 A/80  
Int. Cl.<sup>3</sup> E21B 19/10

U.S. Cl. 285—142

4 Claims



1. A system for suspending columns for high pressure oil or gas wells within superimposed spools having adjacent flanges thereon for joining the spools and hangers in bores in the spools having axial cylindrical bores therethrough comprising:  
a lower spool with the surface of the bore therein including an inner annular horizontal projection at the upper end thereof and a depending frusto conical shape, and an upper spool contiguous therewith having an annular counter seat in the bottom thereof for receiving a sealing

ring, and means extending through the adjacent flanges for joining said spools together,  
a hanger within said lower spool having a lower end which is threaded for connecting a column thereto, an upper end which is threaded for connecting a hanging tube thereto, and an outer surface between said ends which has a frusto conical shape that is complimentary to and is received by said frusto conical portion of said bore in said spool with an outer horizontal annular projection at said upper end which rests upon said corresponding inner annular projection of said lower spool,  
an outer seal including an annular gasket made from a metal selected from the group consisting of copper and steel which rests between said projections, an annular groove in the outer frusto conical surface of said hanger, and an annular sealing gasket in said groove wherein the weight of the column squeezes said gasket to facilitate sealing, and  
an inner seal including an annular upper seat in the top of said lower spool which opposes said counter seat in said spool thereabove and a steel ring joint in said seat and counter seat which is squeezed to provide sealing as said spools are joined together.

4,415,187

**COMPOSITE METAL NIPPLE**

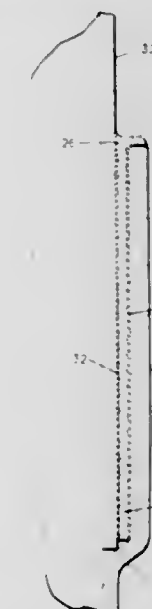
Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed Feb. 9, 1981, Ser. No. 232,646

Int. Cl.<sup>3</sup> F16L 55/00

U.S. Cl. 285—173

2 Claims



1. A composite metal nipple comprising: a tubular steel outer casing having a larger diameter end section connected to a smaller diameter section, an annular shoulder intermediate said sections, tubular copper sleeve extending from beyond the outer end of said larger diameter casing section to said shoulder and defining a circumferentially continuous, surface thereat, said sleeve being concentrically disposed on the inside of said larger diameter casing section and having an outside diameter less than the inside diameter of the surrounding portion of said casing to provide an annular space therebetween, all of said portion of said sleeve extending beyond said casing being flared outwardly and extending radially outward a sufficient distance to cover the edge of said casing completely and defining a continuation of said annular space between said flare and said edge and to further provide an annular solder well in cooperation with an adjacent portion of a copper tube when such a tube is inserted into said nipple, and an impervious layer of fused copper alloy brazing material completely filling said annular space integrally joining said sleeve to said casing.



4,415,188

**AUTOMOBILE EXHAUST PIPE CLAMPING DEVICE**

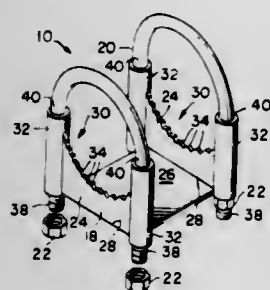
Tom Ginter, Jr., Box 193, Clearfield, Ky. 40313

Filed Nov. 20, 1981, Ser. No. 323,601

Int. Cl.<sup>3</sup> F16L 25/00, 13/14

U.S. Cl. 285—420

4 Claims



1. A clamping member using a pair of U-bolts for securing pipe portions of an automobile exhaust system to each other, said clamping member comprising

- first and second generally vertically extending end flanges spaced from each other,
- a generally horizontally extending section intermediate of and connecting to each of said first and second end flanges at an edge thereof,
- each of said end flanges having a cut-out portion on an opposite edge from the edge connected to said intermediate section for reception of a pipe portion to be clamped therein,
- first and second sleeve portions connected to remaining opposite edges of each of said end flanges adapted to receive and support respective legs of each of the U-bolts, said first and second end flanges, said intermediate section, and said sleeve portions being integral and formed from a single blank.

4,415,189

**LOCK SYSTEM FOR REMOVABLE AUTOMOBILE ROOFS**

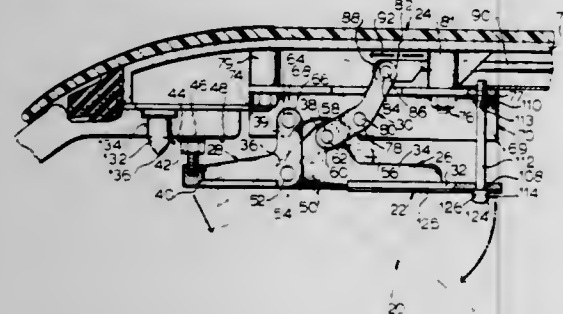
Frank M. Kastelic, Jr., Warren, Mich., assignor to Falk, Kastelic, Heartwell, Inc., Warren, Mich.

Filed Mar. 5, 1981, Ser. No. 240,751

Int. Cl.<sup>3</sup> E05C 3/08

U.S. Cl. 292—196

4 Claims



1. For use with an automobile roof having a plurality of ears which cooperate with a latch mechanism to retain said roof in position on an automobile, said latch mechanism secured to the frame of said removable roof and having a lever arm which is pivotally attached near a first end and is free to move at a second end between a locked position and an unlocked position and having a relatively flat face at said second end being exposed to a user of said automobile and forming a part of a gripping area for moving said lever arm,

- a locking system comprising:
- a fastening device in the form of a threaded screw member having an axially elongated threaded body portion and a head portion at one end, said head portion being diametrically larger than said body portion and having a generally circular circumference and a generally hemispherical shape with only a single flat surface at the point of attachment to said body portion, said head portion having an

axial opening extending thereinto opposite said body portion, said opening having at least one flat internal surface, a tool having an end engageable with said flat internal surface in said head portion of said fastening device,

- a first hole having a diameter larger than said body portion, but smaller than said head portion in said lever arm flat face and extending through said lever arm at said second end, said first hole having a diametrically enlarged area at said flat face a part of the depth of said first hole and having a diameter large enough to receive said head portion and of a depth sufficient to allow a portion of said head portion to be recessed below said flat surface,
- a second hole formed in said automobile roof frame aligned with said first hole when said lever arm is in the locked position, said second hole having a threaded internal wall complementary to said body portion

whereby when said lever arm is in said locked position, said screw member can be inserted through said first hole and threaded to engage said wall of said second hole, by using said tool, to retain said lever arm in said locked position.

4,415,190

**LOCKABLE RING ASSEMBLY FOR ELECTRIC METER**

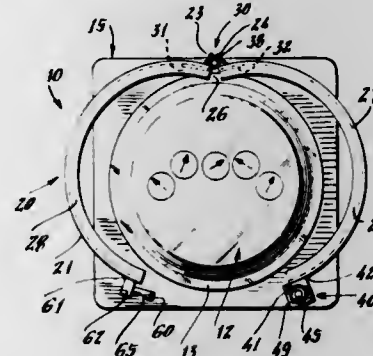
Frederick P. Finck, Jr., and Timothy B. Ely, both of Fairfield, Conn., assignors to Highfield Mfg. Company, Div. of Clarkson Industries, Inc., Bridgeport, Conn.

Filed Apr. 6, 1981, Ser. No. 251,272

Int. Cl.<sup>3</sup> E05C 19/18

U.S. Cl. 292—256.6

12 Claims



1. A lockable ring assembly for securing an electric meter in a meter box wherein the electric meter and meter box are of the type having radially outwardly extending flanges disposed adjacent each other when the electric meter is installed in the meter box, the lockable ring assembly comprising:

- (A) a split ring having a U-shaped cross section for embracing the adjacent flanges of the electric meter and meter box, the split ring being formed in two substantially semi-circular ring parts and the split ring having a first joint permitting the split ring to be opened for installation over the adjacent flanges of the electric meter and meter box, and a second joint, the ring parts being joined together for articulated opening and closing action by hinge means joining the ring parts across the second joint, the hinge means comprising a bendable metal plate spanning the second joint and welded to the respective ring parts on both sides of the second joint;
- (B) a keeper stud mounted to the split ring on one side of the first joint therein; and
- (C) a lock housing mounted to the split ring on the other side of the first joint therein, the lock housing defining a keeper stud opening for receiving the keeper stud and a lock receiving opening for removably receiving a barrel lock, wherein the keeper stud is received in the keeper stud opening when the split ring is closed, and when a barrel lock is inserted into the lock receiving opening, it retains the keeper stud in the lock housing, thereby preventing the split ring from being opened without removal of the barrel lock.

4,415,191

**DOOR LOCKING MECHANISM**

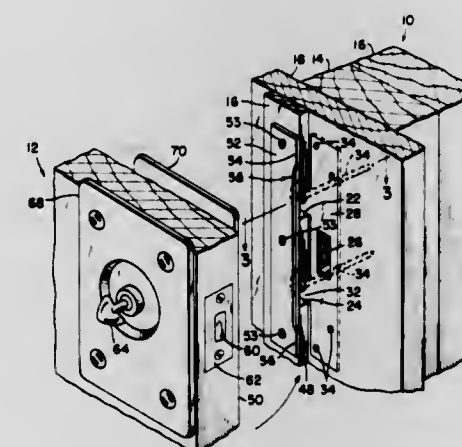
James B. Thorp, 5739 Rowland, Temple City, Calif. 91780

Filed Jul. 20, 1981, Ser. No. 284,644

Int. Cl.<sup>3</sup> E05C 21/00

U.S. Cl. 292—346

8 Claims



1. A reinforcing structure for a door and lock mechanism wherein the door abuts an elongated door stop on a door jamb in the closed position of the door, said structure comprising:

- a door stop defining at least one recess;
- a strike plate defining a bolt receiving aperture and having tab portions dimensioned and configured to extend into said at least one recess in the door stop, and having fastening means for mounting said strike plate on the door jamb; and
- a jamb plate dimensioned and configured for mounting on the door stop with a first edge thereof in generally parallel relationship to a side of said strike plate and extending substantially to an edge of said door stop which abuts the door.

4,415,192

**DOOR LOCKING KNOB FOR VEHICLE**

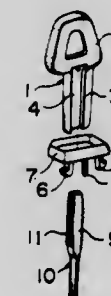
Yutaka Kodama, Yokosuka, and Masakazu Miyoshi, Yokohama, both of Japan, assignors to Nissan Motor Co. Ltd. and Kato Hatsujo Kaisha, Ltd., both of Yokohama, Japan

Filed Mar. 23, 1981, Ser. No. 246,631

Int. Cl.<sup>3</sup> E05C 13/02

U.S. Cl. 292—347

1 Claim



1. A door locking knob arrangement including a head grip (2) with a vertically extending narrow part, said head grip being for a motor vehicle to prevent the vehicle door from opening when said head grip (2) is pushed down, said door locking arrangement being placed in a vehicle door trim and connected to a vehicle door lock, said door locking knob arrangement comprising in combination:

- (a) an elongated knob body (1) integral with and extending from said head grip (2) including a leg portion (3) with an outer end, having an engaging hole (5) extending from said outer end through said leg portion (3) to the head grip (2), said engaging hole (5) being slit-shaped in cross-section, and, a pair of guide grooves (4), defined axially on both sides of said leg portion (3);
- (b) a rod (10) with sides, said rod being disposed to be con-

nected at one end portion of said rod to a door lock and having at least one engaging portion at the other end portion, said engaging portion extending along one side of said rod, and, at least one flat surface (9) extending axially along the other side substantially parallel to the engaging portion, said rod being so disposed as to enter said engaging hole (5); and,

- (c) a fixing member (7) having a rectangular aperture therein, said fixing member having a pair of engaging pawls (6) loosely engaged with said leg portion (3) and guide keys (8) loosely engaged with guide grooves (4), said engaging pawls (6) also securing said knob body (1) to the upper portion of an automobile trim;

whereby, after said rod (10) is placed in the vehicle trim, said knob body (1) is inserted over said rod (10) through the aperture of said fixing member (7) along at least one flat surface (9) and then the head grip (2) together with the knob body (1) and the rod are turned 90° with respect to each other thus securing the head grip and knob body to the rod as the engaging portion of the rod engages the wall of said engaging hole.

4,415,193

**SLIP SETTING RING**

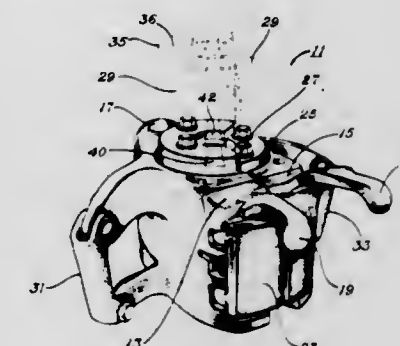
Charles E. Carlberg, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 27, 1981, Ser. No. 239,308

Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 294—102 A

7 Claims



1. A slip setting ring for slip type derrick elevators of the type having a tapered bowl with a central bore adapted to receive pipe, said bowl having a plurality of pipe gripping slips slidably mounted in said bowl for movement between an upward pipe receiving position and a downward pipe gripping position, wherein the improvement comprises:

- a setting ring selectively positioned with respect to said slips in said bowl so that downward movement of said ring causes movement of said slips from said pipe receiving to said pipe gripping position;
- said setting ring having a pipe receiving opening concentrically aligned with said central bore of said elevator and having a pair of oppositely facing recesses, said recesses being transversely aligned with said pipe receiving opening;
- a pair of matching inserts adapted to be slidably received within said oppositely facing recesses; and
- biasing means for urging said inserts inwardly toward said pipe receiving opening for contacting said pipe.

4,415,194

**VEHICLE HATCHBACK CLOSURE**

Steven W. Bauer, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1981, Ser. No. 323,252

Int. Cl.<sup>3</sup> B60R 5/04

U.S. Cl. 296—76

2 Claims

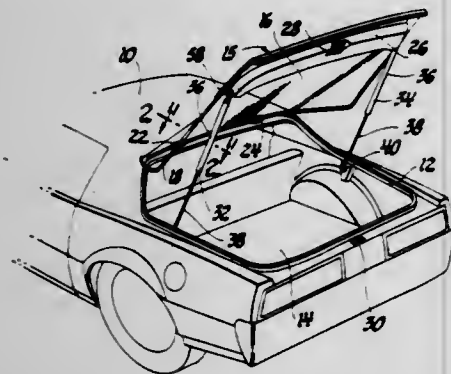
1. In combination with a vehicle body having an opening:

- a glass panel;
- hinge means mounting one end of the glass panel on the



vehicle body for movement between positions opening and closing the opening;

- a tail member mounted on the glass panel at the end thereof opposite the hinged end and adapted to mount a latch element for latching the glass panel in the closed position;
- a pair of telescoping struts having first ends mounted on the vehicle body and second ends connected to the tail member to bias the glass panel to the open position;



- a decorative molding extending from the tail member to the end of the glass panel hingedly mounted on the vehicle body to cooperate with the telescoping struts in holding the tail member at the open position in the event of a breakage of the glass panel; and
- rotation limiting means in the connection between the telescoping struts and the tail member whereby the tail member is limited in rotation about the telescoping struts in the event of breakage of the glass panel and bending of the decorative molding.

4,415,195

## AUTOMOBILE WINDOWS

Akira Furukawa, Hamamatsu; Minoru Araki, Shizuoka, and Hideyuki Genma, Hamamatsu, all of Japan, assignors to Suzuki Motor Company Limited, Japan

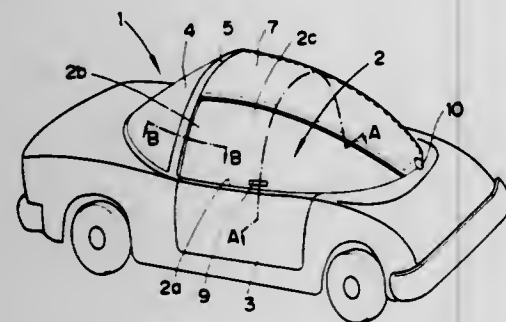
Filed Apr. 13, 1981, Ser. No. 253,578

Claims priority, application Japan, Apr. 30, 1980, 55-57460

Int. Cl.<sup>3</sup> B60J 7/04

U.S. Cl. 296—146

8 Claims



1. An automobile window structure for an automobile having a roof, at least one door and a windshield, comprising:
- a windshield frame connected to the windshield and having a slide guide;
- a window on each side of the automobile at least one of which is slidable in said slide guide, each slidable window being curved outwardly and arcuately with respect to an interior of the automobile by a selected radius, said slide guide having the same selected radius for permitting each slidable window to slide by any selected amount into said guide from a fully closed to a fully open position, each slidable window being separate from a door of said automobile adjacent each slidable window respectively, and openable away from the respective door;
- the roof of the automobile having a recess for receiving each of said slidable windows with at least a portion of each slidable window in said recess in a closed position of each

slidable window, said recess for each slidable window having said selected radius;

- each of said windows being slidable, said roof having two recesses, one for each window, said recesses being one above the other so that, with both of said windows in an open position, said windows substantially overlap each other.

4,415,196

## GLASS WITH CONDUCTIVE STRIPS FOR SUPPLYING WINDSHIELD WIPER

Hans Baum, and Egbert Balling, both of Cologne, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, France

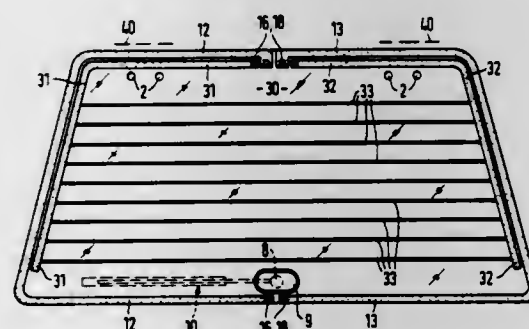
Filed Jan. 30, 1981, Ser. No. 229,831

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004457

Int. Cl.<sup>3</sup> B60J 1/20

U.S. Cl. 296—201

11 Claims



1. A window for use with a vehicle comprised of safety glass and an electric motor carried by said window, means supporting said window on said vehicle for movement about a pivot axis, said pivot axis being located adjacent an edge of said window and said electric motor disposed adjacent another edge of said window, conducting means characterized by current feed lines for the electric motor, said current feed lines formed of conducting strips disposed within the region of the edges of said window and along the edges of said window, said conducting strips comprised of a conductive enamel composition including silver particles, and connector means carried by said conducting strips adapted for connecting said conducting strips both to a power source of said vehicle and said electric motor.

4,415,197

## HINGED HATCH ROOF ASSEMBLY FOR A VEHICLE CAB

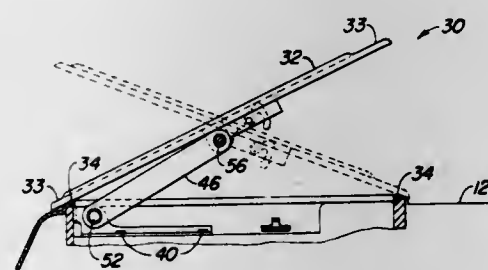
Raymond J. Meyer, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 31, 1981, Ser. No. 298,237

Int. Cl.<sup>3</sup> B60J 7/08

U.S. Cl. 296—216

3 Claims



1. A hinged hatch assembly comprising:
- (a) a hatch completely covering an opening in a roof when in a closed position;

- (b) a frame formed about the periphery of said opening having front and rear surfaces aligned approximately parallel to front and rear surfaces of said roof, said frame having a seal attached to a top surface thereof which cooperates with said hatch when said hatch is in said closed position;
- (c) a first pair of brackets each attached to both a rear surface of said frame and to a side surface of said frame and which extend forward within the periphery of said frame;
- (d) a second pair of brackets attached to a bottom surface of said hatch which extend downward therefrom;
- (e) a pair of support arms each having a first and a second forked end, each of said support arms being pivotally attached at said first forked end to one of said first pair of brackets and being pivotally attached at said second forked end to one of said second pair of brackets for permitting said hatch to pivot relative to said pair of support arms in two directions such that in one direction one side of said hatch will contact the rear surface of said frame and in the other direction an opposite side of said hatch will contact the front surface of said frame;
- (f) a rod supported by said second pair of brackets and fastened at opposite ends to said second forked end of each of said support arms to prevent said hatch from being opened askewly;
- (g) frictional washers located between said first and second forked ends of said support arms and each of said adjacent pair of brackets for providing frictional contact therebetween;
- (h) adjustable spring means for applying a predetermined force between said frictional washers and said corresponding bracket and forked ends of said support arms to retain said support arms and said hatch in a predetermined position relative to said roof; and
- (i) locking means for locking said hatch to said roof, said locking means including a catch secured to a bottom side of said hatch which is engageable with a latch secured to said roof.

4,415,198

## SEAT FOR INVALID WALKER

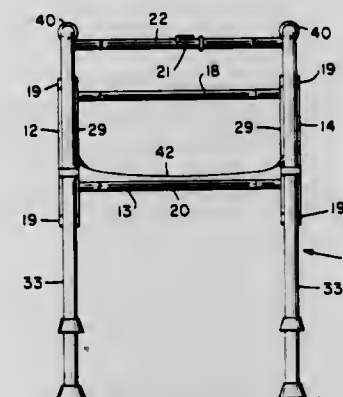
Gordon D. Brearley, P.O. Box 8335, Alta Vista Terminal, Ottawa, Ontario, Canada K1G 3H8

Filed Nov. 18, 1980, Ser. No. 208,071

Int. Cl.<sup>3</sup> A61H 3/04; A63C 3/04

U.S. Cl. 297—6

4 Claims



1. An invalid support apparatus readily convertible by a person using the apparatus between a first configuration in which it serves as a walker and a second configuration in which it serves as a seat, comprising:
- a. two side frames, each including forward and rearward upright rigid frame members;
- b. a front frame including horizontal rigid frame members extending between the forward upright frame members, said side frames and front frame cooperating as a walker to support an invalid;
- c. a plurality of clamping means, one for each of the upright frame members, each clamping means comprising a strap

wrappable about a frame member, and means for tightening or loosening the strap, said clamping means being adjustable along its associated upright frame member to any selected position within a substantial range;

- d. a sheet of material of sufficient strength to support a person and readily foldable by a person using the apparatus;
- e. means readily operable by a person using the apparatus to connect the sheet to and detach it from the clamping means, said sheet and frames cooperating when the sheet is so connected to define a seat, said sheet being readily portable when detached, said connecting and detaching means including:
1. a plurality of hooks, each fixed on and extending upwardly from one of said clamping means, each hook being open at its upper end; and
  2. a plurality of hook engaging and disengaging means readily operable by a person using the apparatus and affixed to spaced points on the sheet, said sheet and frames cooperating to form a seat when the hook engaging means are engaged with their respective hooks.

4,415,199

## FOLDING PICNIC TABLE

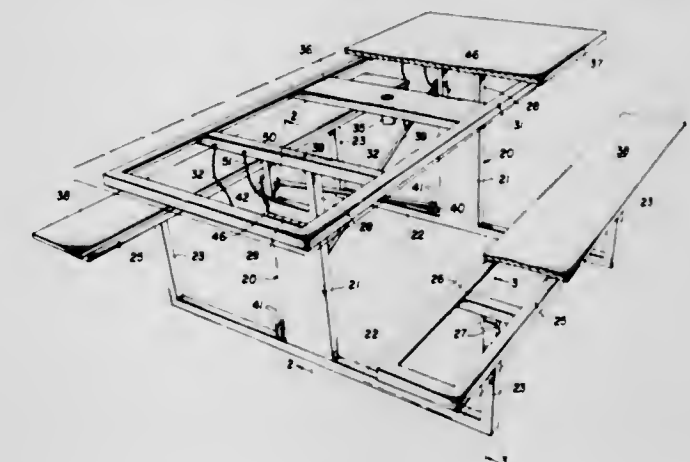
Clem B. Wright, South Fulton, Tenn., assignor to Waymatic, Inc., Fulton, Ky.

Filed Jan. 29, 1982, Ser. No. 343,747

Int. Cl.<sup>3</sup> A47B 39/00

U.S. Cl. 297—159

8 Claims



1. A folding picnic table comprising a pair of spaced parallel end frames each having a pedestal formed in two hinged sections adapted to fold inwardly toward each other and also adapted to assume extended positions with the hinged sections of the pedestals in end-to-end relationship, a table top frame pivotally attached to the upper hinged section of each folding pedestal, uprights on said end frames lying substantially in the planes occupied by the lower hinged sections of the pedestals, bench frames pivotally attached to the tops of the uprights and lying in planes which are parallel to the plane occupied by the table top frame, a single pair of cross braces having corresponding ends permanently, pivotally attached to said end frames and having opposite corresponding ends adapted for releasable attachment to the pedestals when their hinged sections are extended, and releasable locking pins for said opposite corresponding ends of the braces when they are engaged with the extended pedestals to lock the picnic table in an extended use position, said locking pins passing through locking openings in the braces and registering locking openings in the pedestals.



4,415,200

**COMBINATION INFANT SEAT AND SWING**

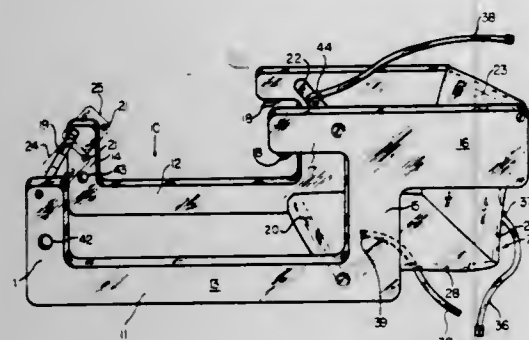
Carol Bourne, 1226 Villanova Dr., Davis, Calif. 95616

Filed Oct. 6, 1980, Ser. No. 194,763

Int. Cl.<sup>3</sup> A47D 1/10

U.S. Cl. 297-174

8 Claims



1. A device mountable on a conventional table as a seat for an infant, which device upon orientation generally 90° is employable as an infant swing for attachment to a swing support, said device comprising:

a pair of spaced planar supporting side sections, said sections being interconnected by a plurality of bracing members to form an integral unit;

a seat body disposed between said planar supporting side sections, said seat body comprising a back portion supported generally vertically at one end of said unit and a seat portion extending generally normal to and from the bottom of said back portion inwardly of said unit and generally horizontally;

said spaced planar supporting side sections each including a first elongated horizontal member extending forwardly from a point along the side of said seat portion, and generally coaxial therewith, said horizontal member terminating in

a pair of terminal generally vertical extending support members, said terminal support members also being generally parallel to said back portion, namely a forward and a rearward one, the rearward one of which is connected on its distal end to

a second generally horizontal member extending forwardly from the top of the side of said back portion, above, spaced from, and parallel to said first horizontal member, said horizontal second member being connected along the length thereof to said rearward terminal vertical extending support, said horizontal second member terminating at a point beyond said rearward support member and distant from the forward terminal vertical support member, and wherein said bracing members which interconnect said planar side sections include a first bracing member interconnecting the forward terminal vertical members adjacent said upper ends thereof;

a second bracing member interconnecting said first horizontal members adjacent said seat portion;

a third bracing member interconnecting said second horizontal members at their fronts; and

a fourth bracing member interconnecting said second horizontal members adjacent the top of said back portion,

suspension means on or adjacent to the upper ends of each forward vertical terminal member for attaching a rope or chain thereto so said device can swing,

whereby said device can be mounted to a table or the like by inserting said forward support members under said table in abutting engagement with the underside thereof, and the second horizontal members abutting against the upper surface of said table thereby providing a seat for an infant, said device also being adapted to be removable from said table and converted into a swing by attaching elongated flexible members to said suspension means, and positioning the infant's buttocks on the back portion, and the infant's back against the seat portion of said device.

4,415,201

**FOLDING CHAIR HAVING A REVERSIBLE SEAT**

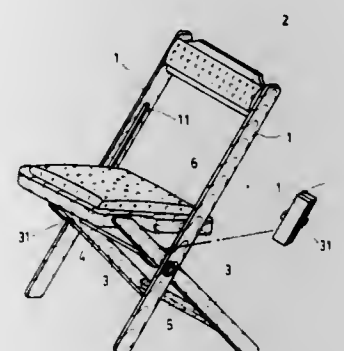
Teng-Ching Wang, Room 600, Chung An Bldg., 16, Ming Sheng W. Rd.3, Taipei, Taiwan

Filed Apr. 28, 1981, Ser. No. 258,294

Int. Cl.<sup>3</sup> A47C 27/00, 4/00

U.S. Cl. 297-57

30 Claims



1. A folding chair having a seat which is reversible to expose either a first sitting area or a second sitting area, said chair comprising:

a pair of separated long and short legs, each of said pairs having an upper end portion and a lower surface engaging end portion;

a seat back member connected between and separating said pair of long legs in the vicinity of said upper end portion of said pair of long legs;

pivot means connecting said pair of long legs and said pair of short legs one to another for permitting relative pivotal movement thereof;

a chair seat having front and rear ends and defining a surface upon which a person can sit when said chair seat is disposed substantially horizontally, said chair seat including a first sitting area on the upper surface and a second sitting area on the lower surface thereof;

connecting means pivotably connecting said front end of said chair seat to said upper end portion of said pair of short legs and slideably pivotably connecting said rear end of said chair seat to said pair of long legs for permitting said chair seat to be moveable between (a) a first unfolded position wherein said chair seat is disposed substantially horizontally exposing said first sitting area as the area upon which a person sits and each of said surface engaging end portions of each of said pairs of short and long legs are spaced apart relative to one another to support the weight of a person sitting upon said first sitting area; (b) a folded position wherein said pairs of short and long legs and said chair seat are substantially aligned one with another; and (c) a second unfolded position wherein said chair seat is disposed substantially horizontally exposing said second sitting area as the area upon which a person sits and each of said surface engaging end portions of each of said pairs of short and long legs are spaced apart relative to one another to support the weight of a person sitting upon said second sitting area; wherein

said connection means is for permitting reversal of said first and second areas by allowing movement between said first and second unfolded positions by virtue of the sliding connection of said rear end of said chair seat and said pair of long legs thus permitting said rear end to be simultaneously upwardly slideable and pivotable relative to said pair of long legs while said pivotable connection between said front end of said chair seat and said pair of short legs permit said chair seat and said pair of short legs to be moved into alignment with said pair of long legs in response to said upward sliding movement and, thereafter, downward sliding movement of

said rear end of said chair seat responsively effects movement of the front end of said chair seat to expose one or the other of said first and second sitting areas to permit a person to sit thereon as desired.

4,415,202

**WHEELCHAIR ELEVATING APPARATUS ENABLING A USER TO LIFT HIMSELF FROM THE FLOOR TO A WHEELCHAIR SEAT**

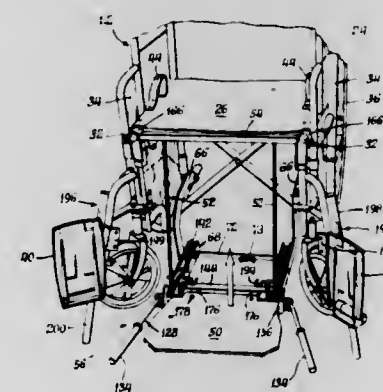
Melvin E. Pew, 211 Albert St., Washington, Ill. 61571

Filed Oct. 26, 1981, Ser. No. 314,753

Int. Cl.<sup>3</sup> A61G 7/08

U.S. Cl. 297-217

11 Claims



1. In a wheelchair having a main frame with wheels on opposite sides and a seat, user-elevating apparatus storable in the space between the wheels and below the wheelchair seat comprising:

a forwardly extending elevating frame pivoted at the rear of the main frame for up and down tilting movement about a transverse horizontal axis relative to the main frame;

a rearwardly extending leveling frame pivoted at the forward end of the elevating frame for up and down tilting movement about a transverse horizontal axis relative to the elevating frame;

a substantially horizontal user-lifting seat supported at the front of the leveling frame;

manually movable lifting lever means located on one of said frames readily accessible to a user on the lifting seat;

means responsive to movement of the lifting lever means to lift the elevating frame; and

means responsive to movement of the elevating frame to tilt the leveling frame relative to the elevating frame and thereby maintain the lifting seat in a substantially horizontal position throughout a range of movement between floor level and the wheelchair seat level.

4,415,203

**DENTAL CHAIR**

Reginald E. Cawley, 24815 Bent Tree La., Lake Forest, Calif. 92630

Filed Aug. 15, 1980, Ser. No. 178,612

Int. Cl.<sup>3</sup> A47C 7/36

U.S. Cl. 297-391

4 Claims

1. A dental chair comprising

a seat,

a back,

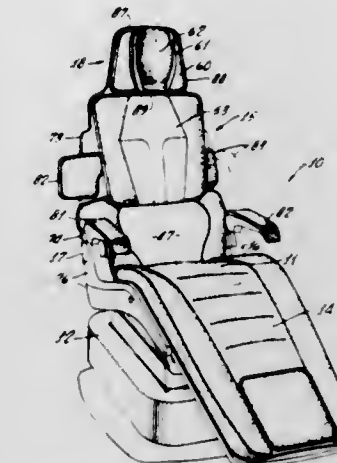
and a headrest having an outer part remote from said seat and an inner part adjacent said seat, said headrest including

a head support member having recess means for receiving the back of a human head,

a base member beneath said head support member for supporting said head support member,

pivot means for pivotally connecting the outer part of said head support member to said base member,

and means for tilting said base member from side to side for thereby tilting said head support member from side to side,



said head support member being pivotal about said pivot means upon such tilting for thereby imparting rotational movement to a head supported thereby.

4,415,204

**EMERGENCY SYSTEM FOR MINES**

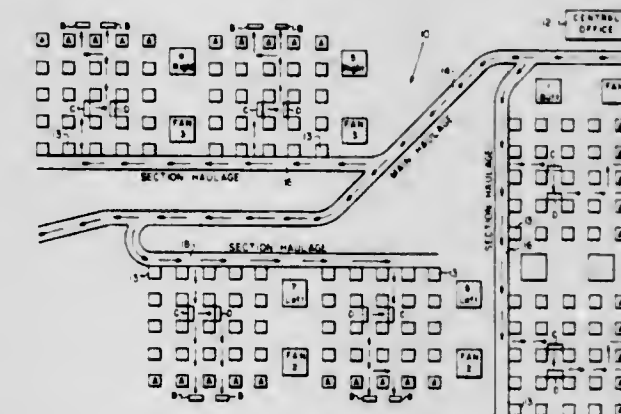
Thomas Cavarak, R.D. #1, Box 77, Grindstone, Pa. 15442

Filed May 13, 1982, Ser. No. 377,983

Int. Cl.<sup>3</sup> E21C 41/00

U.S. Cl. 299-1

4 Claims



1. In an underground mine having a plurality of locations capable of being mined and including fans associated with locations for providing fresh air thereto, mining equipment operable at at least certain of said locations, a load center in each location for providing power to the mining equipment and a central dispatcher or operator station, the improvement comprising a safety communication system including:

A. a cable extending from the central station to each of the locations;

B. an emergency receiver tied into the cable in each location and connected to the load center, the receiver including an alarm, an emergency switch and an oral communication system; and

C. a switchboard located at the central station and tied into the cable in independent signal communication with each location, the switchboard including a power on-off switch for each location and an oral communication system tied into the system of each location

whereby an operator in the central station on the switchboard can selectively turn off and on power from the load center to the mining equipment in any given location while activating an alarm in that section, a mine personnel located in any given location can trip the emergency switch of the emergency receiver to activate the alarm and turn off power from the load center to the mining equipment in that given location and oral communication exists between the operator and each location.



4,415,205

**TRIPLE BRANCH COMPLETION WITH SEPARATE DRILLING AND COMPLETION TEMPLATES**

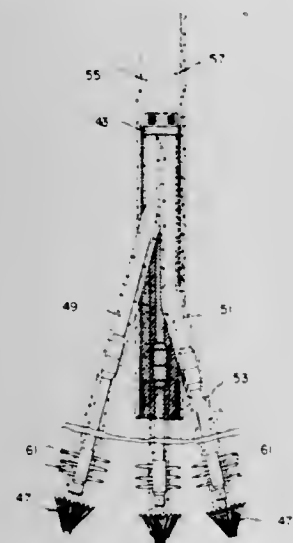
William A. Rehm, 12558 Westerly La.; Donald W. Dareing, 13914 Jaycreek Crt., both of Houston, Tex. 77070, and Edward T. Wood, 3415 Fawn Creek, Kingwood, Tex. 77339

Filed Jul. 10, 1981, Ser. No. 282,210

Int. Cl.<sup>3</sup> E21B 43/28, 29/06

U.S. Cl. 299—5

6 Claims



1. A method for forming multiple branch wells in the earth from a common main well hole comprising the steps of:
  - a. forming a main generally vertical hole in the earth;
  - b. inserting a casing into said main hole with the casing having at least two easily-penetrated section areas constituting windows at different vertical heights, said casing also having an internal indexing dog;
  - c. cementing said main casing in said main hole;
  - d. sequentially drilling each of the branch wells with at least two of said wells being drilled through said at least two windows through the lower window first as a drilling template engages the indexing dog to orient the drilling assembly;
  - e. inserting a multiple tube guide template with one branch casing for each of the branch holes into the main hole, said template engaging the indexing dog to orient the branch casings towards their respective branch holes; and
  - f. inserting all of the branch casing into their respective branch holes at about the same time and cementing the same.

4,415,206

**DRILL SECTION AND METHOD OF HYDRAULICALLY MINING MINERAL FORMATIONS**

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Feb. 9, 1981, Ser. No. 232,439

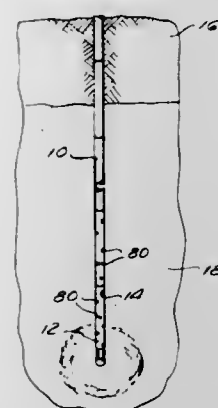
Int. Cl.<sup>3</sup> E21B 21/12

U.S. Cl. 299—17

9 Claims

1. An improved drill string for use in hydraulic mining applications comprising:
  - at least two drill sections interconnected in end-to-end orientation, each of said drill sections comprising:
    - a cylindrical casing having an outside diameter sized to be received within a bore hole and an inside diameter defining an interior region;
    - plural conduits extending axially within and mounted at non-concentric predetermined positions within said interior region;
    - complementary shaped threaded portions formed on opposite ends of said cylindrical casing adapted to permit said at least two drill sections to be threaded together; and
    - stop means formed on said threaded portions for limiting the relative rotational travel of said at least two drill sections along said threaded portions, said stop means located to

axially align each of said plural conduits of said at least two drill sections at said non-concentric predetermined



positions when said at least two drill sections are threaded together.

4,415,207

**UNDERSPOIL SLURRY HAULAGE**

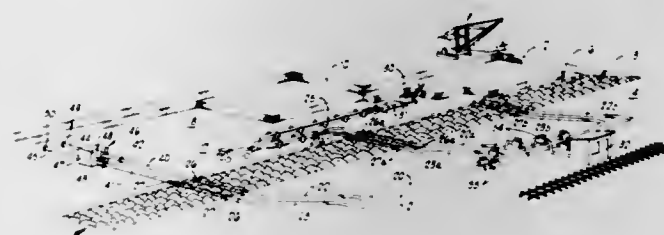
Richard E. Doerr, Morgantown, W. Va., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 103,319, Dec. 14, 1979, Pat. No. 4,286,822. This application Aug. 4, 1981, Ser. No. 289,882

Int. Cl.<sup>3</sup> E21C 41/04

U.S. Cl. 299—18

5 Claims



1. A method for underspoil haulage of mineral product from a contour surface mine where a mineral layer outcrops to the earth surface, comprising:
  - continuously, uni-directionally removing a strip of overburden exposing the outcropped mineral layer and mining the mineral product from said layer;
  - laying extensively a slurry pipe and a water pipe from a preparation facility along the mined strip;
  - slurrying said mined mineral product with water for introduction to said slurry pipe and transport to the preparation facility; and
  - continuously placing the removed overburden material behind the unidirectional advance and covering the slurry pipe and water pipe within the mined strip.

4,415,208

**CUTTER BIT ASSEMBLY**

Wynand M. Goyarts, Washington, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 31, 1981, Ser. No. 289,060

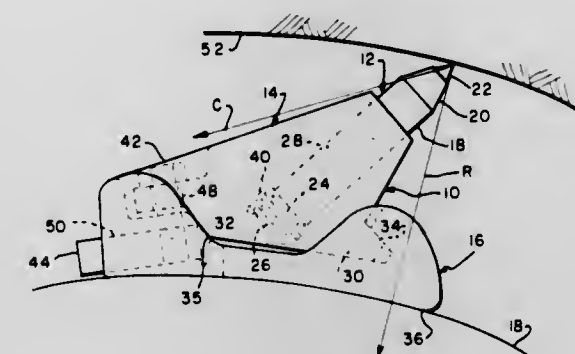
Int. Cl.<sup>3</sup> E21C 35/18

U.S. Cl. 299—91

12 Claims

1. A cutter bit assembly adapted to be mounted on a drum for cutting with rotation in a selected direction comprising:
  - (a) an elongated cutter bit;
  - (b) a bit holder having a tapered locking lip positioned at the end of the bit holder toward the direction of rotation of the cutter bit assembly and a tapered surface positioned near the end opposite to the direction of rotation and tapered in a selected direction;
  - (c) a first locking means for removably affixing the elongated cutter bit to the bit holder;

- (d) a bit block having an engaging section for contacting the tapered locking lip and an engaging surface for contacting the tapered surface at a selected angle whereby the force applied to the bit block during operation forces the engaging



- ing surface and the tapered surface to provide a locking action between the tapers; and
- (e) a second locking means for removably affixing the bit holder to the bit block.

4,415,209

**AN INTEGRAL WHEEL BRAKE CYLINDER AND PRESSURE REGULATING VALVE**

Bernd Schopper, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

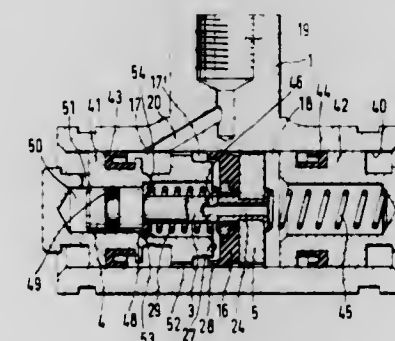
Filed Nov. 12, 1981, Ser. No. 320,394

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049079

Int. Cl.<sup>3</sup> B60T 8/26

U.S. Cl. 303—6 C

9 Claims



1. A pressure regulating valve for hydraulic brake systems for vehicles comprising:
  - a wheel brake cylinder housing having a first bore therein coaxial of a longitudinal axis;
  - at least a first wheel brake cylinder piston disposed in said first bore coaxial of said axis, said first piston and said first bore defining an inlet chamber connected to a master cylinder inlet;
  - a stepped pressure regulating piston having a smaller diameter section slidable in a second bore disposed in said first piston coaxial of said axis and a larger diameter section slidable in said first bore, a first surface of said larger diameter section remote from said smaller diameter section providing a first boundary for an outlet chamber, said larger diameter section having a third bore therein coaxial of said axis coupling said inlet chamber with said outlet chamber;
  - a valve arrangement to open and close said third bore including a sealing ring disposed on a second surface of said larger diameter section of said stepped piston parallel to said first surface adjacent said smaller diameter section of said stepped piston and an end surface of said first piston adjacent said sealing ring; and a first spring, acting on said stepped piston, disposed between said sealing ring and said first piston.

4,415,210

**ARRANGEMENT FOR CONTROLLING THE PRESSURE IN BRAKE ACTUATING CYLINDERS OF A VEHICLE**

Juan Belart, Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Dieter Kircher, Frankfurt am Main; Lutz Weise, Mainz, and Hans-Wilhelm Bleckmann, Obermoeren, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

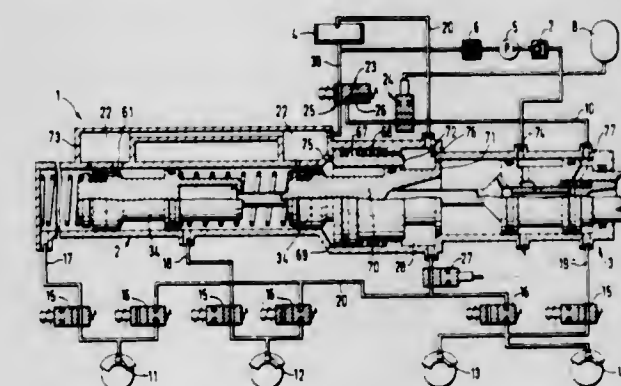
Filed Oct. 28, 1981, Ser. No. 315,819

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040561

Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 303—116

25 Claims



1. An arrangement for controlling the pressure of a hydraulic braking fluid in brake actuating cylinders incorporated in a hydraulic braking system, especially that of a motor vehicle, having antiskid control equipment and a supply reservoir, in dependence on the position of a brake operating member movable from a rest position into a plurality of operating positions, comprising

a master cylinder device including a housing component defining at least one bore and having at least one inlet port communicating with said bore, and at least one master piston received in said bore for movement axially thereof; means for replenishing the supply of hydraulic fluid in said bore, including an auxiliary source of pressurized hydraulic fluid, means defining at least one replenishment space communicating with said inlet port, and first and second connecting means for respectively connecting said replenishment space with said auxiliary source and with the reservoir;

means for establishing communication between said replenishment space and said first connecting means only during the control action of the antiskid control equipment; and means for interrupting communication between said replenishment space and said second connecting means at least during the control action.

4,415,211

**BRUSH HOLDER**

Tacko Alissandratos, P.O. Box 606, Tarpon Springs, Fla. 33589

Filed Nov. 12, 1981, Ser. No. 320,372

Int. Cl.<sup>3</sup> A47B 17/00; A47G 19/26

U.S. Cl. 312—206

3 Claims

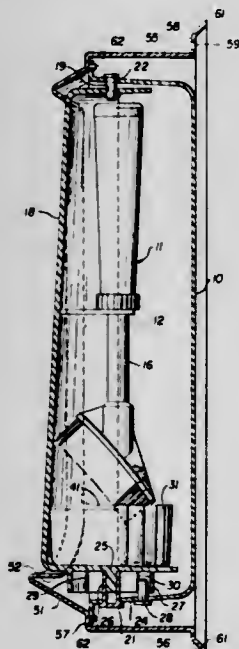
1. An improved wall mounted enclosure device for mounting at least one brush and the like to a wall surface comprising:
  - a back housing,
  - said back housing including a recessed cavity formed by side, bottom, and top walls, said side walls converging toward each other from said bottom walls toward said top wall, a flange extending outwardly from said top, bottom and side walls in the same vertical plane, said flange including mounting apertures therein;
  - a recessed brush holder enclosure door rotatably supported by said rear housing;
  - said enclosure door including top and bottom horizontally extending parallel flanges, said top flange including an aperture therein, said bottom flange including a down-



wardly extending first pivot pin for mounting said enclosure door to said back housing for pivotable motion therein, and spaced ribs extending downwardly from said bottom flange and equally spaced from said first pivot pin; a second pivot pin extending through said top wall of said rear housing into said aperture in said enclosure door and a bushing extending through said bottom wall of said rear housing for receiving said first pivot pin for pivotably mounting said enclosure door within said back housing and said front enclosure; and

an unexposed stop means extending upwardly from said bottom wall of said rear housing for cooperating with said spaced ribs on said enclosure door for positioning said enclosure door in either an open or closed position, at least one shelf rigidly supported by said enclosure door and extending across the recess therein for securing at least one brush on said recessed brush holder enclosure door; the improvement comprising:

an outer housing arranged relative to said back housing and said enclosure door,



said outer housing including a central opening formed by an outwardly extending wall on an angle relative to a vertical wall, and an inwardly extending wall extending toward a plane formed by said vertical wall, said central opening converging toward the top portion and partially enclosing said enclosure door;

said outer housing including top, bottom and side walls extending from said vertical wall, that surrounds said back housing;

said top, bottom and side walls including outwardly extending flanges for securing said outer housing to a wall surface; and

means for securing said back housing to said outer housing; whereby said back housing may be secured to said outer housing and said outer housing may be secured to a wall with said back housing unexposed wherein said outer housing encloses said rear housing and said at least one brush when said brush holder is in the closed position and exposes said at least one brush when said brush holder is in the open position.

4,415,212

# CONNECTOR RECEPTACLE FOR PRINTED CIRCUIT BOARDS

Lawrence V. DePillo, Waterbury, Conn., assignor to Mark Eyelet & Stamping, Inc., Wolcott, Conn.

Filed Sep. 21, 1981, Ser. No. 304,369

Int. Cl.<sup>3</sup> H01R 9/09, 13/11

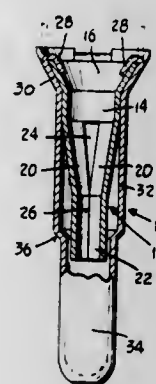
U.S. Cl. 339—17 C

10 Claims

1. A connector receptacle for insertion in an opening of a

printed circuit board to receive a contact pin of a cooperable connector, comprising in combination:

- (a) a tubular shell adapted to fit into said opening, said shell having at one end a leading portion of reduced diameter adapted to loosely fit into and enter the opening in a circuit board, and having at its opposite end an open mouth portion and external shoulder means at said mouth portion, constituting a stop which is engageable with the circuit board after the shell has been inserted therein,
- (b) a spring contactor constituting a piece separate from the shell, said contactor being disposed in said shell and adapted for engagement with said contact pin of the cooperable connector, and



- (c) an external resilient bowed spring retainer finger on the shell, extending lengthwise thereof along its exterior and toward the leading end portion thereof, for engagement with the circuit board to maintain the shell in the opening thereof against inadvertent dislodgement therefrom,
- (d) said retainer finger having a free end which terminates short of the extremity of said leading end portion of the shell and is adapted to enter the opening in the circuit board ahead of the rest of the finger, and being integral with the shell and movable independently of the shell, and further being integrally connected to the open mouth portion of the shell,
- (e) said free end being disposed at a location beyond the board when the receptacle is fully seated.

4,415,213

# HERMAPHRODITE ELECTRICAL CONNECTOR

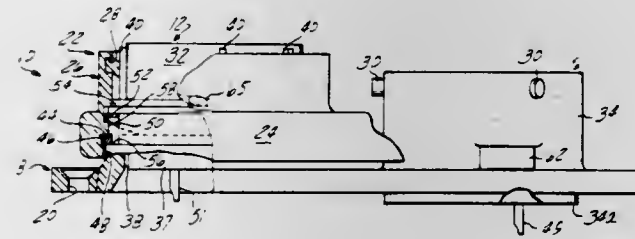
Stephen Punako, and David W. MacAvoy, both of Bainbridge, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 2, 1981, Ser. No. 317,210

Int. Cl.<sup>3</sup> H01R 13/625

U.S. Cl. 339—49 R

1 Claim



1. In combination with a hermaphrodite electrical connector of the type including a base plate and side-by-side socket and pin connectors, each of said socket and pin connectors including a generally cylindrical connector shell extending from said base plate; a coupling ring received over one of said connector shells, said coupling ring formed with a cam thread adapted to engage a projection carried by a connector carried by a mating hermaphrodite electrical connector; said engagement of said cam thread and said projection producing relative axial travel of said mating connectors on said mating hermaphrodite electrical connectors upon rotation of said coupling ring, to bring said mating connectors into engagement; each of said connector shell and said coupling ring having structure defining an

intervening annular recess; an annular wave washer disposed within said annular recess, said wave washer having a series of axially extending waves formed therein disposed engaging said structure of said coupling ring and said connector shell to create a frictional force acting on said coupling ring and said shell to enable frictional positioning of said coupling ring on said connector shell, characterized by a plurality of stops carried by said coupling ring and extending within said recess and interposed between the waves of said wave washer and limiting the relative axial travel to that less than the axial depth of said wave washer whereby over-stressing said wave washer is prevented.

4,415,214

# ELECTRICAL PLUG AND SOCKET CONNECTORS

Rudiger Obst, deceased, late of Detmold, Fed. Rep. of Germany (by Martha L. Obst, administrator), assignor to C. A. Weidmüller GmbH & Co. Postfach, Detmold, Fed. Rep. of Germany

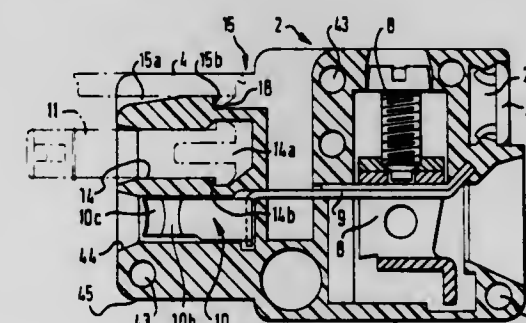
Filed Apr. 17, 1981, Ser. No. 255,089

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014804

Int. Cl.<sup>3</sup> H01R 23/62

U.S. Cl. 339—91 R

9 Claims



1. An electrical connector comprising a multi-pole plug assembly and a multi-pole socket assembly, inter-engageable plug contacts and socket contacts in said plug and socket assemblies, respectively, and latching means for releasably securing together said plug and socket assemblies, wherein:
  - (a) said plug assembly comprises a plurality of mechanically interconnected individual plug units, disposed side by side and containing respective plug contacts;
  - (b) said socket assembly comprises a corresponding plurality of mechanically interconnected individual socket units disposed side by side and containing respective socket contacts, to mate with respective corresponding plug units of said plug assembly;
  - (c) each said unit includes a housing containing the respective said contact and provided with two receptacles, said receptacles in each plug unit being disposed to be aligned with the respective receptacles in the respective corresponding mating socket unit when the units are mated;
  - (d) at least one latching and coding pin is provided which is adapted to be mounted selectively in said receptacles and which is adapted to make latching engagement with a corresponding aligned receptacle or to constitute a coding means controlling the mating of said assemblies, according to the disposition of the pin or pins in said receptacles; and
  - (e) each pair of units comprising a plug unit and the mating socket unit has a first pair of aligned receptacles comprising a first receptacle in a first of said units adapted to retain a said pin mounted therein and a second receptacle in the second of said units adapted for latching engagement by a said pin mounted in said first receptacle; and a second pair of aligned receptacles comprising a third receptacle in said first unit and a fourth receptacle in said second unit, each of said third and fourth receptacles being adapted to retain a pin mounted therein but not to make latching engagement with a pin mounted in the respective aligned receptacle, whereby pins selectively

mounted in said third and fourth receptacles can be used for coding said plug and socket assemblies.

4,415,215

# SOLDERLESS ELECTRICAL SPLICE

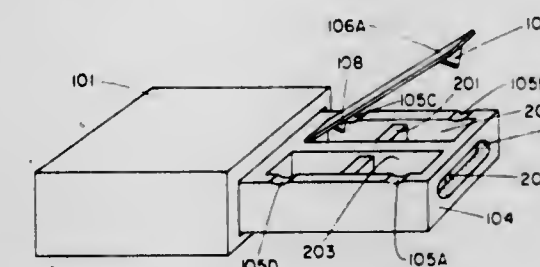
Calman Goozner, 415 Barlow Ave., Staten Island, N.Y. 10308

Filed Jun. 24, 1981, Ser. No. 276,883

Int. Cl.<sup>3</sup> H01R 9/08

U.S. Cl. 339—98

4 Claims



1. Apparatus for providing a rapid, secure and insulated electrical splice of the type in which a first and a second wire are electrically connected by solderless means, comprising:
  - (a) a body of insulating material, having a reference longitudinal axis and upper surface, the body also having a channel which passes through it in a direction substantially parallel to the longitudinal axis, the channel being exposed along the upper surface of the body, but not at the channel ends, the ends of the channel are exposed on surfaces other than the upper surface of the body by a first and a second opening designed to accept the first and second wires respectively into the lower portion of the channel away from the upper surface of the body;
  - (b) a generally flat, conductive interconnection bar extending substantially the width and length of the exposed portion of the channel in the upper surface of the body and oriented horizontally to present an upper and lower side, the bar being located in the upper portion of the channel with the underside of the bar facing downward into the channel, the bar having a first end adjacent the first opening and a second end adjacent the second opening;
  - (c) a first conductive prong, connected to and projecting downward from the lower side of the interconnection bar adjacent the first end, the tip of the first prong piercing the insulation of the first wire to make connection between the first wire and the bar and to secure the first wire within the channel;
  - (d) a second conductive prong connected to and projecting downward from the lower side of the interconnection bar adjacent the second end, the tip of the second prong piercing the insulation of the second wire to make connection between the second wire and the bar and thus to the first wire through the interconnecting bar;
  - (e) an insulating cover for the body which encompasses the body and extends over the exposed portion of the channel on the upper surface of the body to insulate the interconnection bar and secure it in place in the channel, the cover being slideably positioned about and off the body by movement generally in the direction of the longitudinal axis of the body;
  - (f) wherein said first and second prongs are formed of flat sheets oriented generally orthogonal to the reference longitudinal axis and each of said flat sheets contain an inverted "V" cut, forming a prong with two tips, the inside edges of the inverted "V" cut being sharp to pierce insulation and the inverted "V" cut accepting various wire sizes at the level in the "V" cut having a spacing between the inside "V" cut edges which corresponds to a particular wire diameter selected for connection and
  - (g) wherein said apparatus further comprises resilient material located in the lower portion of the channel to urge a wire inserted in the channel upwards into the inverted



"V" cut to pierce the insulation with the "V" cut inside edges and to make connection with the prong.

4,415,216

# CONNECTOR FOR MASS-GROUND TERMINATION OF MULTICONDUCTOR CABLE

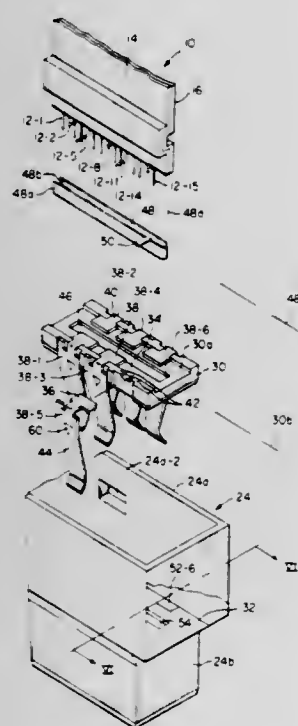
Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Mar. 3, 1981, Ser. No. 240,026

Int. Cl.<sup>3</sup> H01R 4/66, 13/58

U.S. Cl. 339—107

20 Claims



1. A connector for terminating bared ends of a multiconductor cable comprising housing means for receiving said cable and supporting said bared ends in first and second mutually non-aligned channels in said housing means, a plurality of electrical contact members supported in said housing means with bases of said contact members in registry with said first channel for connection with such bared ends therein, and with tails of said contact members accessible exteriorly of said housing means, a dual-walled conductive member supported in said housing means and defining a bounded portion of said second channel for connection with such bared ends therebetween, and interconnect means for connecting said electrically conductive means to at least one of said contact members.

4,415,217

# CABLE JOINING CONNECTOR AND METHOD

Robin J. T. Claburn, Menlo Park, and Rolf B. Stroessner, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 16, 1981, Ser. No. 283,843

Int. Cl.<sup>3</sup> H01R 21/00

U.S. Cl. 339—113 L

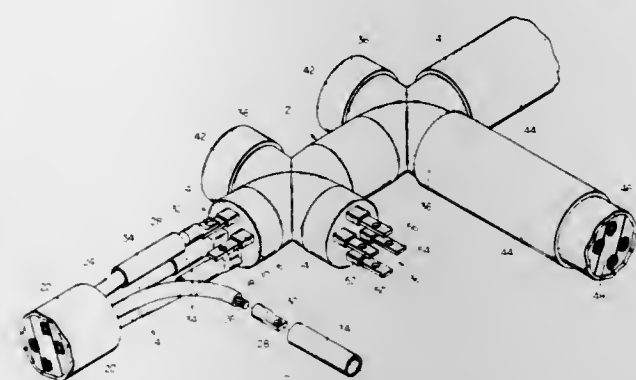
6 Claims

1. A re-entable cable joining connector for electrical power distribution network cables having cores, comprising:

(a) at least two current carrying elements, each having at least three connection portions to which the individual cable cores may be attached, the connection portions of one current carrying element positioned adjacent to corresponding connection portions of other current carrying elements to define respective connector outlets, one for each cable to be connected;

(b) an electrically insulating body substantially surrounding the current carrying elements and extending at least up to the connection portions, the insulating body electrically insulating the current carrying elements from one another and interfacially isolating the cables to be attached from one another; and

(c) a plurality of electrically insulating extension layers, one for each connection portion, each layer extending from



the insulating body and surrounding at least a portion of each connection portion.

4,415,218

# SPRING LOADED DIODE CONTACT APPARATUS

Robert W. McKenzie, Lewisville, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

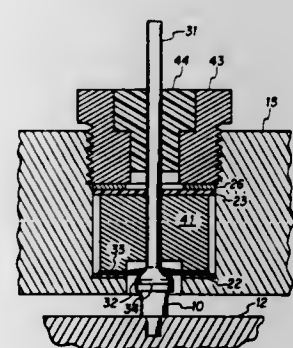
Continuation of Ser. No. 235,293, Feb. 17, 1981, abandoned.

This application Mar. 18, 1983, Ser. No. 476,890

Int. Cl.<sup>3</sup> H01R 13/66

U.S. Cl. 339—147 R

4 Claims



1. Apparatus for establishing a highly reliable and stable electrical connection with a conducting surface of a circuit component, suitable for radio frequency circuit operation, comprising:

a conductor element having a surface for making electrical contact with the surface of the component as the conductor element is pressed along an axis against the component surface, and said conductor element further having a portion slanted with respect to said axis;

means for establishing plural, stable points of contact with said slanted portion of the conductor element, including a biasing member formed of resilient sheet material with a first opening for receiving the conductor element there-through, and having additional open portions formed therein to define a plurality of resilient leaf projections extending toward said first opening; and

means for mounting said biasing member with the conductor element through said first opening thereof and with said biasing member disposed along said axis such that said leaf projections are deflected by and impart a force to said slanted portion of the conductor element, pressing said surfaces together.

4,415,219

# CONNECTOR WITH REMOVAL STRESS RELIEF CONSTRUCTION

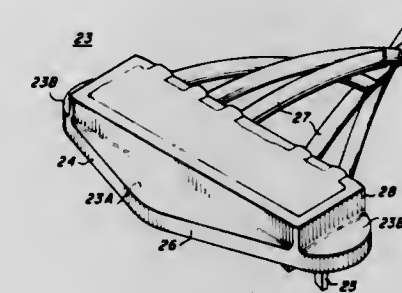
Virgil F. Kuhl, Tamarac, and Gary J. White, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1981, Ser. No. 292,305

Int. Cl.<sup>3</sup> H01R 33/74

U.S. Cl. 339—195 M

5 Claims



1. An electrical connector assembly for association with lead wires and for insertion into a mating socket, said electrical connector assembly comprising:

a connector body having a top portion, a bottom portion and at least a first, second and third side portions, said first side portion receiving the lead wires, conductive pins projecting from said bottom portion and having a certain characteristic yield strength, said second and third side portions disposed relative said first side portion to meet at a point approximately opposite the midpoint of said connector body first side portion to form a nose-like projection, said second and third side portions and said nose-like projection being disposed such that a force exerted on said connector body first side in response to a pull on the lead wires causes said connector body to first pivot about said nose-like projection and then cam against the mating socket along either said second or third side portions resulting in the removal of said conductive pins from the mating socket without said pins experiencing a lateral force which exceeds their yield strength.

4,415,220

# COMPLIANT CONTACT PIN

Rishi Kant, Budd Lake, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 29, 1981, Ser. No. 268,384

Int. Cl.<sup>3</sup> H01R 9/16

U.S. Cl. 339—221 R

7 Claims



1. An electrical terminal pin having at least one end for receiving electrically conductive elements, and a compliant portion extending from said one end adapted for insertion in, and making electrical contact with a plated-through hole of an electrical component,

said compliant portion comprising in the lateral direction a solid cylindrical stem and a pair of oppositely directed, substantially C-shaped arms comprising sectors of cylindrical shells extending from said stem to present a substantially S-shaped cross section, and comprising in the axial direction a fully developed section and

a transition section linking said fully developed section with said end evolving from said S-shaped cross section at said fully developed section to a substantially elliptical cross

section at said end, wherein the diameter of said solid cylindrical stem is a substantially constant, predetermined diameter throughout said fully developed section but which increases substantially linearly with respect to axial distance from said fully developed section, from said predetermined diameter at said fully developed section to a maximum diameter at said end, wherein the inner radius of each of said sectors is a substantially constant, predetermined radius throughout said fully developed section but which decreases substantially linearly with respect to axial distance from said fully developed section, from said predetermined radius at said fully developed section to a minimum radius of zero at said end, and wherein for any given cross section throughout said fully developed section and said transition section, the thickness of each of said sectors is not greater than the diameter of said solid cylindrical stem, whereby the compliance of said transition section decreases uniformly from a maximum at said fully developed section to a minimum at said end.

4,415,221

# FEMALE TYPE ELECTRICAL CONNECTOR

Nori Inoue, and Shogo Katsuki, both of Yokkaichi, Japan, assignors to Tokai Electric Wire Company Limited, Yokkaichi, Japan

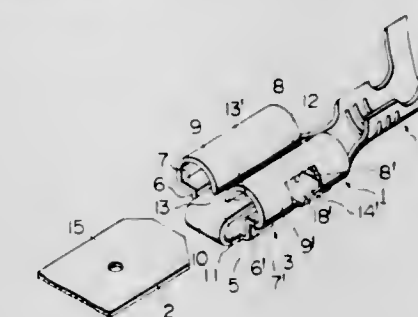
Filed Sep. 28, 1981, Ser. No. 306,499

Claims priority, application Japan, Oct. 1, 1980, 55-140611[U]

Int. Cl.<sup>3</sup> H01R 13/633

U.S. Cl. 339—258 F

3 Claims



1. A female type electrical connector produced by stamping and bending of thin sheet metal comprising a receptacle section and a wire connection connected to the rear end of said receptacle section, said receptacle section comprising a tongue extending from the front end of said receptacle section toward the rear end thereof and formed with a locking projection on its upper surface and being pivotable on its front end to resiliently move downwardly, and two side walls each having a curved wall, the respective curved walls of said side walls extending from outside the opposite side edges of the tongue and curved upwardly to extend above the tongue and terminating at free ends which extend longitudinally and are juxtaposed to the upper surface of the tongue, said locking projection being adapted to engage a projection receiving portion of a male type electrical connector to lock the latter in place when the male type electrical connector is inserted between the upper surface of the tongue and the free ends of the two side walls and held therebetween, wherein the improvement comprises:

a pair of lugs projecting from the opposite sides of the tongue for moving the tongue downwardly, said lugs extending outwardly through windows formed in the two side walls respectively; and

guide wall means for supporting the undersurface of the male type electrical connector when the latter is inserted in the receptacle section so that the underside of the male electrical connector may not move the tongue downwardly more than is necessary.



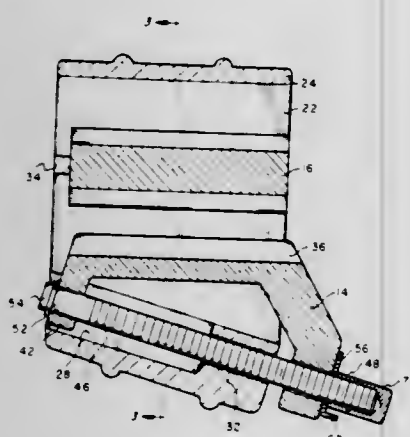
4,415,222

**ELECTRICAL CONNECTOR**

Mario Polidori, 1840 W. River Dr., Pennsauken, N.J. 08110  
Filed Jan. 19, 1981, Ser. No. 225,833  
Int. Cl.<sup>3</sup> H01R 11/10

U.S. Cl. 339—270 R

14 Claims



1. An electrical connector particularly adapted to electrically and mechanically connect an electrical transmission conductor to a distribution conductor comprising:

a substantially C-shaped body member having a substantially flat rear wall and curved top and bottom walls, said top wall being adapted to fit partially around a transmission conductor;

a wedge movably secured to the inside of said body member adjacent said bottom wall, said wedge including an elongated upper surface thereon parallel to said top wall; screw means for moving said wedge parallel to said bottom wall, said screw means being capable of moving said wedge into the interior of said C-shaped body and in the reverse direction so as to withdraw the same therefrom, the upper surface of said wedge being moved toward said top wall when said wedge is moved toward the interior of said body and away from said top wall when said wedge is withdrawn therefrom;

an elongated recess formed in the upper surface of said wedge, said recess being adapted to cooperate with the bottom surface of a distribution conductor; and

a removable elongated conductor interface insert within said C-shaped body, said insert having an upper surface adapted to contact the lower surface of said transmission conductor and having a lower surface adapted to cooperate with the upper surface of said distribution conductor.

4,415,223

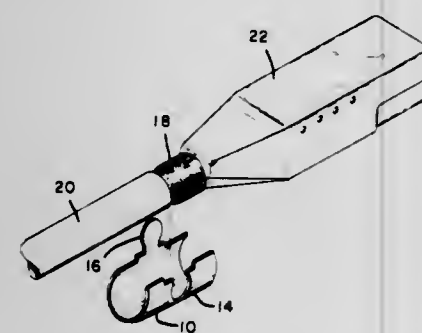
**INTERLOCKING CRIMP SLEEVE AND METHOD OF SECURING TO CONNECTOR**

John C. Asick, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 3, 1981, Ser. No. 270,036  
Int. Cl.<sup>3</sup> H01R 4/20, 43/04

U.S. Cl. 339—276 R

6 Claims



1. In combination with an electrical connector having a housing of insulative material with a plurality of terminal

passages extending therethrough, a like plurality of electrical terminals each mounted in a respective passage, a multi-conductor cable having each conductor thereof secured to a respective terminal, and a crimp sleeve capable of being applied to the cable other than axially from a free end and of being crimped to secure said cable to said connector, said crimp sleeve characterized by:

an elongated strip of soft metal having interlocking profiles on the opposite ends thereof whereby said strip is applied to a previously terminated cable by folding it about said cable, interlocking said end profiles to form a substantially closed cylindrical crimp sleeve coaxially on said cable and crimping said sleeve to reduce the diameter thereof placing said interlocked ends under tension and said cable and connector under compression securing said cable to said connector.

5. The method of securing a cable to a connector which has been preterminated by the cable comprising the steps of: forming a strip of relatively soft metal with interengaging profiles on the opposite ends thereof; folding said strip about said cable bringing said opposite ends into interlocking engagement to form substantially a closed cylindrical sleeve; and crimping said sleeve so as to apply tensile force to said interlocked ends and compressive force to said cable against said connector.

4,415,224

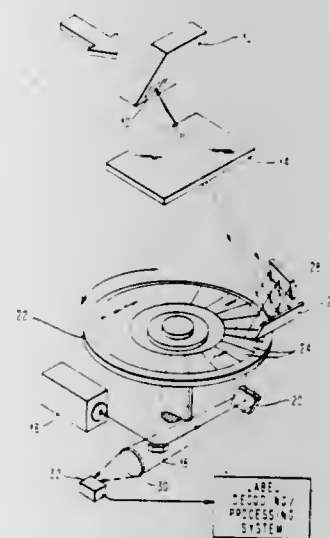
**HOLOGRAPHIC SCANNER DISC WITH DIFFERENT FACET AREAS**

LeRoy D. Dickson, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,344  
Int. Cl.<sup>3</sup> G02B 5/32

U.S. Cl. 350—3,71

10 Claims



1. In a retroreflective optical scanner of the type having a coherent light beam source, a multifaceted, rotating holographic optical element for deflecting the coherent beam along predetermined scan lines and a photosensitive detector for detecting the level of light retroreflected from an object through a facet, the improvement which comprises making the facets have different areas to reduce the variations in light collection efficiency from one facet to the next.

4,415,225

**METHODS OF MAKING HOLOGRAPHIC IMAGES**

Stephen A. Benton, Lincoln, Mass.; William R. Houde-Walter, Rochester, N.Y., and Herbert S. Mingace, Jr., Manomet, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 10, 1980, Ser. No. 205,758  
Int. Cl.<sup>3</sup> G03H 1/24

U.S. Cl. 350—3,84

20 Claims

1. A process of making holographic images comprising the

steps of recording a hologram of a parallax limited aerial image formed by a lens on a first side of a recording surface with a reference beam directed toward the surface from a source on said first side of said surface at an angle of incidence to the

beyond the subregions in at least one selected output direction and for responding thereto.

4,415,227

**TRANSITION BETWEEN TWO SINGLE MODE OPTICAL WAVEGUIDES**

Hans-Georg Unger, Braunschweig, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

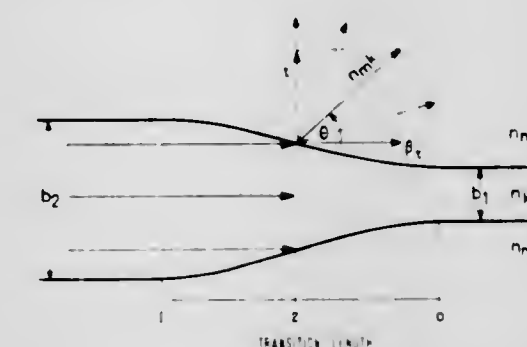
Filed Apr. 1, 1981, Ser. No. 249,890

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012775

Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.15

5 Claims



recording surface equal and opposite to the angle of incidence of the optical axis of the lens to the recording surface, and illuminating the hologram with a nonconverging beam of light directed toward the hologram from a source on a second side of said surface opposite said first side.

4,415,226

**APPARATUS FOR CONTROLLING LIGHT IN ELECTROOPTIC WAVEGUIDES WITH INDIVIDUALLY ADDRESSABLE ELECTRODES**

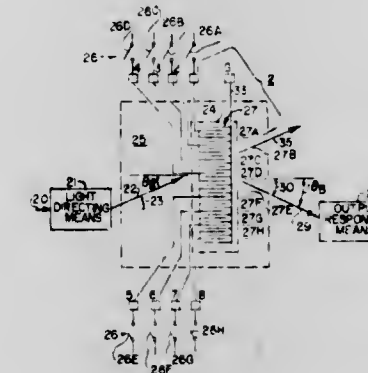
Carl M. Verber, Columbus, and Richard P. Kenan, Upper Arlington, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 31, 1980, Ser. No. 221,956

Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.14

58 Claims



1. A connection piece connected for propagating light between two single mode optical waveguides having respectively different cross sections, said piece being in the form of a transition from one cross section to the other, the waveguides and said piece being composed of a transparent core member forming a light propagating path from one waveguide to the other via the transition, and a cladding material surrounding the core member, the core member part of said piece being formed to vary gradually and continuously in cross section in the direction of light propagation, and said piece having a length which is two to four times the free space wavelength of the light to be propagated divided by the difference between the index of refraction of the core member and the index of refraction of the cladding material.

4,415,228

**OPTICAL FIBER SWITCH APPARATUS**

Frank L. Stanley, Lancaster, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,521

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20

8 Claims



1. Apparatus for receiving light entering therein and controlling the directions in which portions of the light travel therethrough, comprising

input means for directing portions of the entering light in a predetermined input direction into a processing region in a waveguide,

control means for temporarily and separately changing the index of refraction in each of a plurality of subregions in the processing region by providing an electrical field in each subregion at selected times between a plurality of individually addressable interdigital electrodes therein, to modulate the light travelling thereto in approximately the predetermined input direction differently from any light travelling thereto in other input directions,

successive subregions being in close proximity and all of the digits in all of the electrodes therein being parallel, alternate digits throughout the processing region being connected together to form one common electrode shared by all subregions, the other digits in each subregion being connected together to form another electrode for that subregion only, and being insulated from all other electrodes, and

output means for receiving portions of the light travelling

1. Optical fiber switch apparatus comprising a plurality of fixed first optical fibers having circularly arranged ends, an actuating member having circularly disposed bearing surfaces arranged to correspond to said circularly arranged fiber ends, said member being mounted to be tiltable about points around



its periphery, a second optical fiber fixedly extending substantially centrally through said actuating member, said second fiber having a free end extending toward said ends of said first fibers substantially centrally thereof, a plurality of piezoelectric bimorph beams having ends circularly disposed respectively outside and under the periphery of said bearing surfaces of said actuating member, said beams being selectively energizable to deflect one of said beams under one of said bearing surfaces, and a piezoelectric bimorph plate fixedly mounted about its periphery and operable on said actuating member, said plate being energizable to cup said plate thereby to tilt said actuating member about a fulcrum presented by said one of said beams to swing said free end of said second fiber into alignment and abutment with the end of a selected one of said plurality of first fibers.

4,415,229

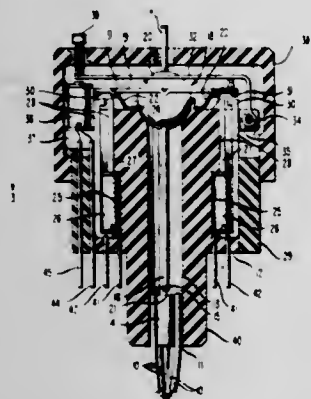
## OPTICAL FIBER SWITCH APPARATUS

Harold E. McCullough, Blacklick, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,555

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20



1. Optical fiber switch apparatus comprising a plurality of fixed first optical fibers having circularly arranged ends, a magnetically responsive actuating member having circularly disposed bearing surfaces arranged to correspond to said circularly arranged fiber ends, said member being mounted to be tiltable about predetermined axes, a second optical fiber fixedly extending through said actuating member substantially at the intersection of said axes, said second fiber having a free end extending toward said ends of said first fibers substantially centrally thereof, and a plurality of first electromagnets having pole-pieces associated respectively with said circularly disposed bearing surfaces, said electromagnets being selectively energizable to tilt said actuating member about one of said axes thereby to swing said free end of said second fiber into alignment with the end of a selected one of said plurality of first fibers.

4,415,230

## POLARIZATION RETAINING SINGLE-MODE OPTICAL WAVEGUIDE

Donald B. Keck, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 30, 1981, Ser. No. 248,947

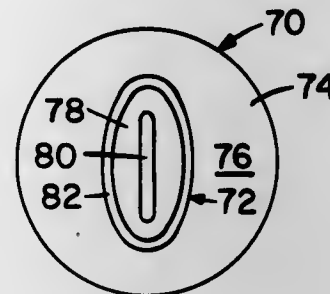
Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.33

9 Claims

1. A polarization retaining single mode optical waveguide fiber comprising a core of transparent glass, said core having an oblong cross-sectional configuration, an oblong inner cladding layer disposed on the surface of said core, said inner cladding including an optical cladding layer of high purity glass surrounded by a layer of lower purity glass, the refractive index of said core glass

being greater than that of said high purity and said lower purity cladding glasses, and an outer layer of stress cladding glass surrounding said inner



cladding, said stress cladding glass having a thermal coefficient of expansion different from that of said inner cladding glass, the outer surface of said outer layer being substantially circular in cross-section.

4,415,231

## RADIATION SHUTTER, ESPECIALLY FOR A LASER

Friedrich Kaczinsky, Putzbrunn; Walter Kroy, Ottobrunn, and Günter Reithmeier, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

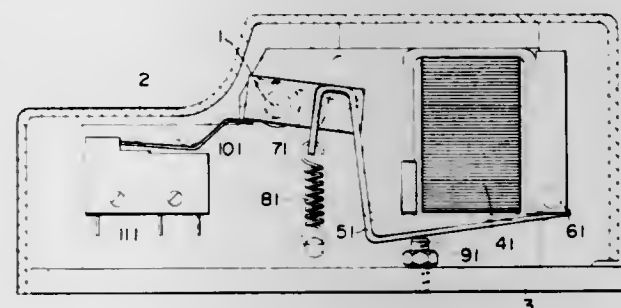
Filed Aug. 17, 1981, Ser. No. 293,658

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031908

Int. Cl.<sup>3</sup> G05D 25/02

U.S. Cl. 350—269

12 Claims



11. A radiation shutter for substantially preventing a particle or radiation beam from passing from a source through a defined beam path, comprising housing means through which said defined beam path extends, first and second shutter means movably arranged in said housing in series as viewed in the direction of said beam path, first and second actuator means operatively connected to the respective shutter means for moving the shutter means into and out of said beam path, first and second position sensor means operatively arranged for sensing the position of the respective shutter means, and electrical circuit means operatively interconnecting said sensor means and said actuator means in such a manner that the position of the first shutter means causes the operation of the second actuator means and vice versa, and support means for movably supporting said first and second shutter means, said first and second position sensor means comprising first and second pressure responsive switches positioned to be actuated by a certain position of said first and second shutter means.

4,415,232

## OPTICAL WAVEGUIDE SPLICE

Bernard G. Caron, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,454

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.21

6 Claims

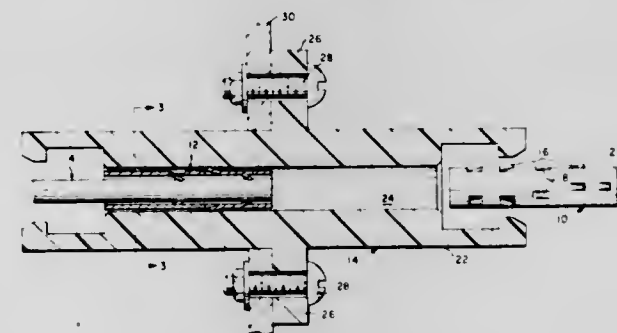
1. A retention member for retaining an end of a fiber optic

transmission member covered with cladding material within a bore of a receptacle member, comprising:

a sleeve member having a first series of inwardly-projecting tines angularly spaced around said sleeve member and a second series of outwardly-projecting tines angularly spaced around said sleeve member;

said inwardly-projecting tines extending in a forward direction to enable an end of a fiber optic transmission member to be inserted into said sleeve member with said inwardly-projecting tines resiliently biased against the cladding material, said inwardly-projecting tines penetrating the cladding material upon exertion of an axial force on the fiber optic transmission member in a rearward direction, thereby securing the end of the fiber optic transmission member in said sleeve member;

said outwardly-projecting tines extending in a rearward direction to enable the sleeve member to be inserted in a bore of a receptacle member with said outwardly-projecting tines resiliently engaging the bore surface, said outwardly-projecting tines plowing into the bore surface



upon exertion of an axial force on the fiber optic transmission member in a rearward direction thereby securing said sleeve member in said bore.

3. A fiber optic connector for connecting ends of fiber optic transmission members covered with cladding material, comprising:

receptacle means having bore means extending there-through;

sleeve means secured onto the cladding material of the ends of fiber optic transmission members;

a first series of inwardly-projecting tines angularly spaced around said sleeve means, said inwardly-projecting tines extending in a forward direction in engagement with the cladding material thereby securing the ends of the fiber optic transmission members in said sleeve means;

a second series of outwardly-projecting tines angularly spaced around said sleeve means, said outwardly-projecting tines extending in a rearward direction in engagement with a surface defining said bore means thereby securing the ends of the fiber optic transmission members in said receptacle means in axial alignment.

4,415,233

## ACHROMATIZED BEAM SPLITTER OF LOW POLARIZATION

Susumu Itoh, Tokyo, and Mitsuharu Sawamura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,659

Claims priority, application Japan, Feb. 5, 1981, 56/16221

Int. Cl.<sup>3</sup> G02B 27/10, 5/28, 5/04

U.S. Cl. 350—173

5 Claims

1. An achromatized beam splitter of low polarization comprising:

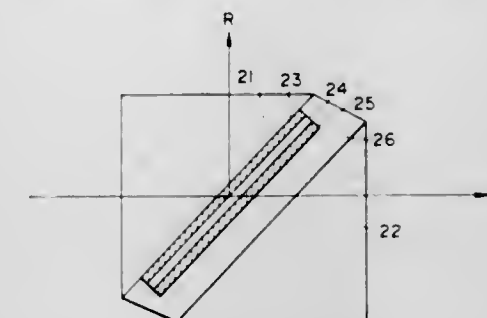
a transparent first prism;

a transparent second prism; and

a thin film group provided between said first prism and said second prism, said thin film group including, in succession from the first prism to the second prism,

a first dielectric material thin film layer being provided on the

inclined surface of said first prism, said first layer being a mixture of titanium oxide and zirconium oxide; a metal thin film layer provided on said first dielectric material thin film layer which consists of silver; and



a second dielectric material thin film layer provided on said metal thin film layer, said second layer being a mixture of titanium oxide and zirconium oxide, said second layer having a film thickness substantially equal to that of said first dielectric material thin film layer.

4,415,234

## PASSIVE COOLING OF MIRRORS

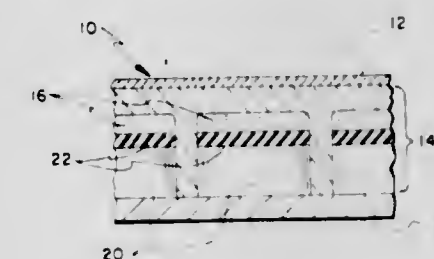
John J. Meyers, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,476

Int. Cl.<sup>3</sup> G02B 5/08, 7/18

U.S. Cl. 350—310

4 Claims



1. A mirror for high thermal energy application comprising: (a) a substrate including means defining a chamber therein; (b) gallium contained in said chamber; and (c) an optical coating of high reflectivity supported by said substrate.

4,415,235

## SIGHT GLASS/LENS MOUNTING ASSEMBLY

James H. Coates, 2125 2nd St., Douglas, Ark. 99824

Filed Jun. 12, 1981, Ser. No. 273,013

Int. Cl.<sup>3</sup> G02B 7/02

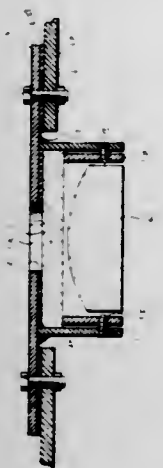
U.S. Cl. 350—319

2 Claims

1. A window and lens mounting assembly comprised of a face plate defining an aperture, a retaining ring holder secured to said face plate about said aperture, a window element within said retaining ring holder separated from said face plate by a compression gasket surrounding said aperture, a retaining ring within said retaining ring holder, means for securing said re-



aining ring to said retaining ring holder and pressing said retaining ring against said window element so as to compress



said compression gasket, and means for securing a lens within said retaining ring.

4,415,236

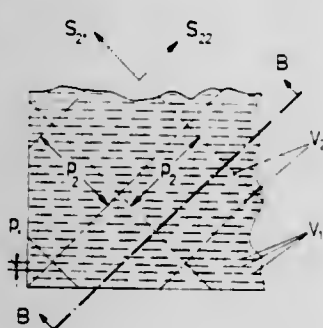
#### LIGHT DIFFUSING REFLECTOR FOR ELECTRO-OPTICAL DISPLAYS AND PROCESS FOR PRODUCING THEREOF

Alain Perregaux, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland  
Continuation of Ser. No. 925,762, Jul. 18, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,698  
Claims priority, application Switzerland, Aug. 30, 1977, 10539/77

Int. Cl.<sup>3</sup> G02F 1/13

U.S. Cl. 350—338

4 Claims



1. A reflector for liquid crystal displays formed of a foil with diffuse reflecting surface, comprising:

first parallel furrow-shaped grooves aligned in a first direction, said first parallel grooves having a spacing between 2 and 20  $\mu\text{m}$  and a maximal depth of 5  $\mu\text{m}$ ; and at least second and third parallel furrow-shaped grooves aligned in a second and in a third direction, said at least second and third parallel grooves crossing said first parallel grooves and also each other, said second and third parallel grooves having a spacing between 150 and 500  $\mu\text{m}$  and a maximum depth of 10  $\mu\text{m}$ .

3. A process for producing a reflector for liquid crystal displays formed of a foil with a diffuse reflecting surface, comprising:

producing a first regular surface structure of first parallel furrow-shaped grooves on said foil by placing two foils each having a rough surface opposite one another with their rough surfaces facing each other, and then rolling said foils in a first direction, such that the so-formed first grooves have a spacing between 2 and 20  $\mu\text{m}$  and a maximal depth of 5  $\mu\text{m}$ , and

superimposing a second regular surface structure of at least second and third furrow-shaped grooves, which cross each other, on the foil with said first regular surface structure, by embossing said second structure by means of rolls, such that said second and third grooves cross said first

grooves and have a spacing between 150 and 500  $\mu\text{m}$  and a maximal depth of 10  $\mu\text{m}$ .

4,415,237

#### RADIATION DOSIMETER

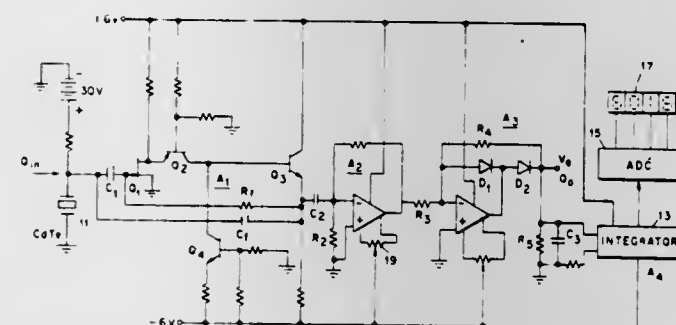
Richard J. Fox, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Wash., D.C.

Filed Sep. 1, 1981, Ser. No. 298,448

Int. Cl.<sup>3</sup> G01T 1/22

U.S. Cl. 250—370

5 Claims



1. A radiation dosimeter, comprising: an ionizing radiation detector which produces output signals at an output thereof in response to the charge collected due to the occurrence of ionizing events within the sensitive region of said detector; a charge amplifier means for detecting and amplifying said signals at said output of said detector which are proportional to said collected charge; a charge storage capacitor connected to the output of said amplifier means; a resistor connected in parallel with said capacitor for controlling the discharge rate of said capacitor at a selected value; and an integrator means connected to the output of said charge amplifier means for time averaging the discharge current of said capacitor to generate an output signal at an output thereof proportional to the radiation dose-rate detected by said detector.

4,415,238

#### SINGLE LENS HAVING ONE SPHERICAL AND ONE ASPHERICAL REFRACTIVE SURFACE

Josephus J. M. Braat, Jan Haisma, and Gijsbert Prast, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

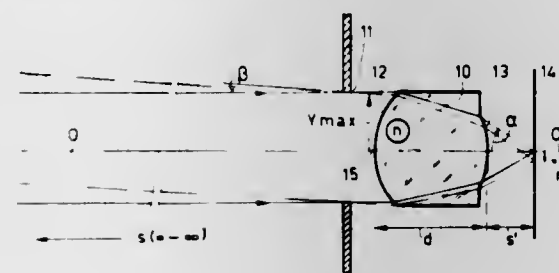
Filed Oct. 2, 1981, Ser. No. 307,717

Claims priority, application Netherlands, Jul. 13, 1981, 8103323

Int. Cl.<sup>3</sup> G02B 13/18

U.S. Cl. 350—432

1 Claim



1. A single lens having one spherical and one aspherical refractive surface, characterized in that the spherical refractive surface and the aspherical refractive surface are in a relationship with each other which is represented by a set of straight lines

$$\frac{c_2}{c_1} = a \left[ \frac{d}{(n-1)f} \right] + b \text{ for } 1.00 \leq \frac{d}{(n-1)f} \leq 1.35$$

in which the expressions for a and b are:

$$a = 4.85 (NA) - 0.32 n - 2.39$$

$$b = -4.10 (NA) + 1.20 n + 0.46$$

where  $c_1$  is the curvature of the aspherical surface at its intersection with the optical axis,  $c_2$  is the curvature of the spherical surface,  $d$  is the thickness of the lens,  $n$  is the refractive index,  $f$  is the focal length and NA is the numerical aperture, while  $0.3 \leq NA \leq 0.5$ ;  $1.5 \leq n \leq 2.0$  and the magnification  $V \leq 0.1$ .

4,415,239

#### REFLECTION REJECTION SPHERICAL OPTICAL TRAIN COMPOSED OF TIPPED LENS ELEMENTS

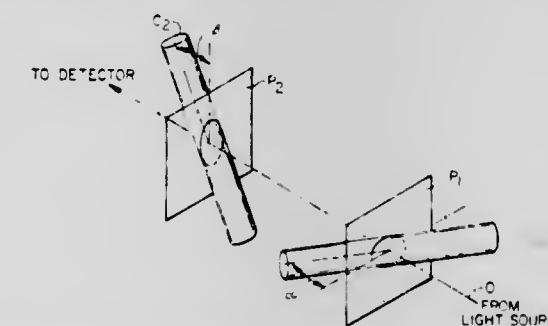
William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Oct. 31, 1980, Ser. No. 202,534

Int. Cl.<sup>3</sup> G02B 13/08, 3/06

U.S. Cl. 350—433

8 Claims



1. A reflection rejecting focusing optical train, comprising: at least two optical elements, each of said optical elements being a cylindrical lens; said optical elements disposed along an optical axis; the optical elements being crossed one with respect to another so that the total and combined optical power output of all said elements along said axis is equivalent to that of an overall spherical lens; each of said optical elements tilted with respect to a plane normal to the optical axis, said tilt disposing the near point of each optical element to one end of said optical train at equal angular intervals about said optical axis with respect to the near point of all the rest of said optical elements, whereby light is reflected out of the optical path of said optical element.

4,415,240

#### ILLUMINATION OPTICAL SYSTEM FOR AN ENDOSCOPE

Kimihiro Nishioka, and Nobuo Yamashita, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 171,759

Claims priority, application Japan, Jul. 27, 1979, 54/95720

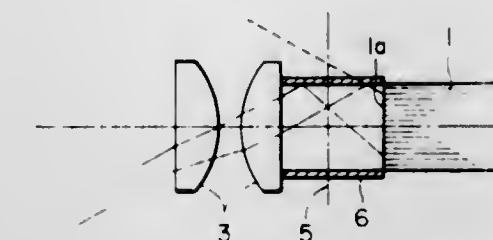
Int. Cl.<sup>3</sup> G02B 5/14, 23/00

U.S. Cl. 350—442

13 Claims

1. An illumination optical system for an endoscope comprising a light guide comprising a fiber bundle formed by bundling up a number of optical fibers each of which can transmit the light at the same time, a positive lens system disposed in front of said light guide, and a cylindrical reflection member comprising a mono-fiber arranged between the said lens system and an exit end face of the said light guide and having substantially the same diameter as the said light guide, an end face of the said mono-fiber at the lens side being a curved surface, and in

which the radius of curvature R of the said curved surface satisfies the following formula:



$$|R| \geq \frac{0.6 D_c}{2 \sin \left( \sin^{-1} \frac{1}{n} - \alpha_1 \right)}$$

where

$D_c$  is the diameter of the mono-fiber  
 $n$  is the refractive index of the mono-fiber, and  
 $\alpha_1$  is the angle formed by the ray having the widest angle of view with the axis of the mono-fiber, respectively.

4,415,241

#### TESSOR TYPE LENS SYSTEMS FOR FACSIMILE

Hiroichi Shinohara, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

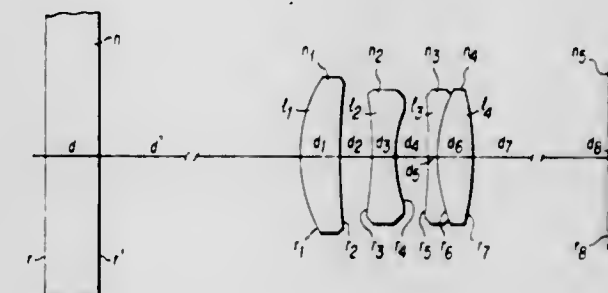
Filed Sep. 22, 1980, Ser. No. 189,947

Claims priority, application Japan, Sep. 21, 1979, 54-121717

Int. Cl.<sup>3</sup> G02B 9/20

U.S. Cl. 350—476

1 Claim



1. A tessor type lens system comprising a first positive meniscus lens element, a second biconcave lens element and a third cemented doublet element consisting of a negative lens element and positive lens element, said lens system having the following numerical data:

$\gamma_1 = \infty$	$d = 13.158$	$n = 1.51633$	$\nu = 64.1$
$\gamma_2 = \infty$	$d^1 = 1039.145$		
$\gamma_1 = 39.474$	$d_1 = 9.211$	$n_1 = 1.77250$	$\nu_1 = 49.6$
$\gamma_2 = 394.832$	$d_2 = 6.711$		
$\gamma_3 = -97.368$	$d_3 = 5.395$	$n_2 = 1.71736$	$\nu_2 = 29.5$
$\gamma_4 = 34.697$	$d_4 = 7.369$		
$\gamma_5 = -788.105$	$d_5 = 2.632$	$n_3 = 1.58144$	$\nu_3 = 40.7$
$\gamma_6 = 47.368$	$d_6 = 8.158$	$n_4 = 1.83481$	$\nu_4 = 42.7$
$\gamma_7 = -66.426$	$d_7 = 84.174$		
$\gamma_8 = \infty$	$d_8 = 1.316$	$n_5 = 1.77250$	$\nu_5 = 49.6$
$\gamma_9 = \infty$			
$f = 100, F/4.5$			

wherein:

$\gamma_i$  represents the radius of curvature of the  $i$ -th refractive surface counted from the object side;  
 $d_i$  represents the  $i$ -th axial distance (i.e., airspace or lens thickness) counted from the object side;  
 $n_i$  represents the refractive index with respect to d-line of the  $i$ -th glass material counted from the object side;

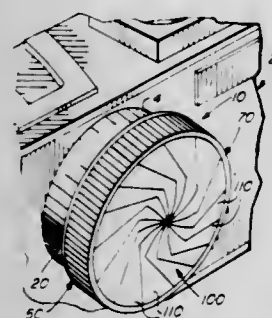


$v_i$  represents the Abbe number of the  $i$ -th glass material counted from the object side;  
 $f$  represents the focal length of the whole lens system.

4,415,242

**CAMERA LENS COVER AND SUNSHADE APPARATUS**  
 Frederick A. Major, 1725 E. Ellis Dr., Tempe, Ariz. 85282  
 Continuation-in-part of Ser. No. 112,731, Jan. 17, 1980,  
 abandoned. This application Jan. 29, 1981, Ser. No. 229,454  
 Int. Cl.<sup>3</sup> G02B 11/04

U.S. Cl. 350—581



1. Cover and shade apparatus for a camera lens, comprising:  
 in combination:  
 first ring means adapted to be secured to a camera;  
 second ring means disposed on the first ring means and  
 movable relative thereto, and including cam means;  
 third ring means secured to the first ring means and disposed  
 adjacent the second ring means, including  
 a petal ring,  
 petal means, including a plurality of petals secured to the  
 petal ring and movable from a closed, cover position to  
 an open, shade position, and  
 means in each petal of the plurality of petals for engaging  
 the cam means of the second ring means for moving the  
 petals in response to movement of the second ring  
 means.

4,415,243

**OPTICAL TEST CHART FOR TESTING BINOCULAR  
 READING ABILITY**

Heinz Gottlob, Königsbrunn, and Horst Falk, Aalen, both of  
 Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Hei-  
 denheim, Fed. Rep. of Germany

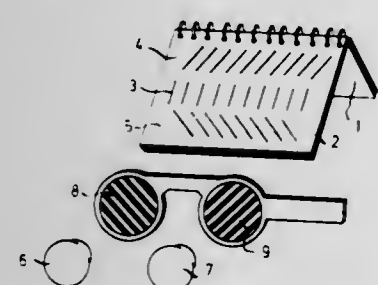
Filed Dec. 18, 1981, Ser. No. 331,909

Claims priority, application Fed. Rep. of Germany, Feb. 20,  
 1981, 8104761[U]

Int. Cl.<sup>3</sup> A61B 3/08, 3/02

U.S. Cl. 351—201

7 Claims



1. An optical test chart for testing binocular reading ability  
 for the viewing of which polarization filters with oppositely  
 crossed directions of vibration are arranged in front of the eyes  
 of a test subject, characterized by the fact that a plurality of  
 sheets (2) bearing lines of letters of different size are arranged  
 interchangeably on a support (1); that at least one line (4, 5)  
 formed of polarizing letters is arranged on each sheet (2) above  
 and below a first line (3) formed of non-polarizing letters; and  
 that the directions of polarization in the lines (4, 5) lying above

and below the first line (3) are crossed with respect to each  
 other.

4,415,244

**AUTOMATIC FOCUSING SYSTEM**

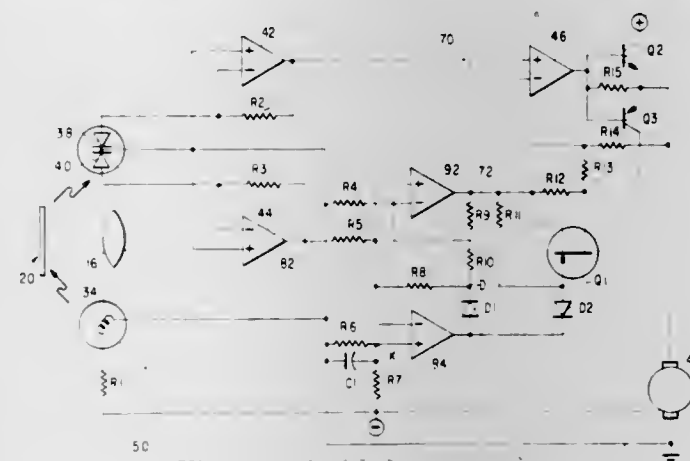
William T. Daly, Rochester; Boris Gelman, Fairport, and Wil-  
 liam R. Sanderson, Rochester, all of N.Y., assignors to Telex  
 Communications, Inc., Minneapolis, Minn.

Filed Mar. 22, 1982, Ser. No. 360,258

Int. Cl.<sup>3</sup> G03B 3/00

U.S. Cl. 353—101

6 Claims



1. In a projector including a projection lens with a focal  
 plane located a predetermined distance therebehind, said pro-  
 jector being adapted to project a series of slides, each of which  
 comprises a film held in a mount defining an image area to be  
 projected along the projection axis of said lens, and wherein  
 the image area of said slide establishes an image plane when  
 said slide is positioned at a projection station for projection  
 thereof, the projector further including a base, a carriage  
 mounted on said base for movement relative thereto, means for  
 adjustably mounting said lens for movement with said carriage  
 and for relative movement with respect to said carriage to  
 establish a preferred condition of coincidence of said image  
 and focal planes so that the projection of the image area  
 through said projection lens onto a viewing surface is optically  
 focused for viewing thereof, and reversible drive means opera-  
 bly connected to move said carriage relative to said base and  
 said image plane in a direction substantially parallel to said  
 projection axis, an automatic focusing system comprising:

a source of radiant energy;  
 means for directing radiant energy from said source to said  
 image plane;  
 a radiant energy detector including first and second radiant  
 energy sensitive elements adapted to receive radiant en-  
 ergy reflected from said image area at said image plane,  
 during said preferred condition of coincidence of said  
 focal and image planes said first radiant energy sensitive  
 element receiving more radiant energy than said second  
 radiant energy sensitive element when an open film slide is  
 positioned at said projector station and said second radiant  
 energy sensitive element receiving more radiant energy  
 than said first radiant energy sensitive element when a  
 glass covered film slide is positioned at said projection  
 station, more radiant energy being reflected by a glass  
 covered film slide than by an open film slide, and each of  
 said radiant energy sensitive elements providing respec-  
 tive output signals related to the amount of radiant energy  
 individually received thereby;  
 means for coupling at least one of said radiant energy source  
 and said radiant energy detector to said carriage for move-  
 ment therewith; and  
 non-linear energizing means for receiving said output signals  
 and effective to energize said reversible drive means in  
 response to both the absolute and relative levels of said  
 output signals so as to move said carriage to establish said  
 preferred condition of coincidence of said focal and image

planes independent of whether an open film slide or a glass  
 covered film slide is positioned at said projection station.

4,415,245

**MOVABLE INFRARED FILTER FOR AN AUTO  
 RANGING CAMERA**

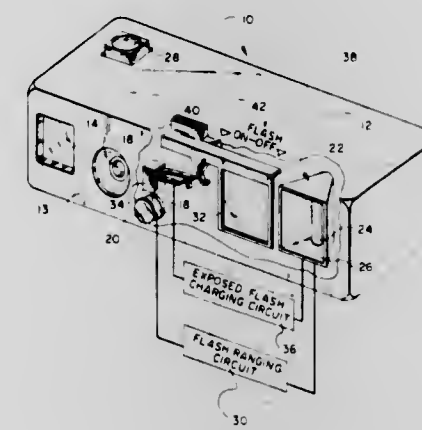
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak  
 Company, Rochester, N.Y.

Filed May 17, 1982, Ser. No. 378,670

Int. Cl.<sup>3</sup> G03B 3/00, 15/03

U.S. Cl. 354—25

4 Claims



1. In a photographic camera including:  
 an electronic flash device;  
 a first circuit for firing the flash device for distance-measur-  
 ing only;  
 a second circuit means for firing the flash device for produc-  
 ing a flash exposure; and  
 an infrared filter;  
 means providing relative movement between the filter and  
 flash device for allowing said filter and said flash device to  
 be selectively located in and out of alignment with one  
 another, the improvement comprising:  
 switch means responsive to said relative movement for ena-  
 bling the second circuit means when the filter and the  
 flash device are out of alignment and for disabling the  
 second circuit means when the filter means and the flash  
 device are in optical alignment.

4,415,246

**FOCUS DETECTING DEVICE**

Toshihiko Karasaki, Sakai; Takayuki Gotoh; Yasuhiro Namba,  
 both of Osaka, and Eiji Yamakawa, Sakai, all of Japan, as-  
 signors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

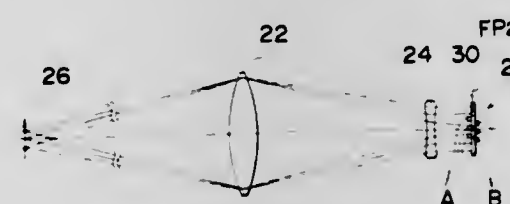
Filed Jun. 10, 1982, Ser. No. 387,201

Claims priority, application Japan, Jun. 11, 1981, 56-90351

Int. Cl.<sup>3</sup> G03B 3/10; G01J 1/44

U.S. Cl. 354—25

10 Claims



1. A focus detecting device for detecting a focusing condi-  
 tion of an objective lens on a predetermined focal plane by  
 means of detecting a contrast of an image formed by said  
 objective lens comprising:  
 an elongated cylindrical lens element having an axis extending  
 in the elongated direction of said cylindrical lens, said cylin-  
 drical lens located between said objective lens and said  
 predetermined focal plane such that said axis of said cylindri-

cal lens is extending perpendicularly to an optical axis of said  
 objective lens;  
 a light receiving unit comprising at least first, second, third and  
 fourth photodiode arrays, and means for supporting said first  
 to fourth photodiode arrays;  
 said first photodiodes array having a plurality of first photodi-  
 odes located on a first plane parallel to said predetermined  
 focal plane, said first photodiodes being arranged, closely  
 adjacent to each other, along a predetermined direction  
 perpendicular to said axis of said cylindrical lens;  
 said second photodiode array having a plurality of second  
 photodiodes located on a second plane parallel to, but apart  
 from said first plane, said second photodiodes being ar-  
 ranged, closely adjacent to each other, along said predeter-  
 mined direction;  
 said third photodiode array having a plurality of third photodi-  
 odes located on said first plane, said third photodiodes being  
 arranged, closely adjacent to each other, along said predeter-  
 mined direction;  
 said fourth photodiode array having a plurality of fourth pho-  
 todiodes located on said second plane, said fourth photodi-  
 odes being arranged, closely adjacent to each other, along  
 said predetermined direction;  
 said first to fourth photodiode arrays being located alternately  
 along a direction parallel to said axis of said cylindrical lens;  
 and  
 means for detecting current flowing through said first to fourth  
 photodiodes so as to detect said contrast.

4,415,247

**ELECTRIC FLASH APPARATUS**

Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koei  
 Corporation, Tokyo, Japan

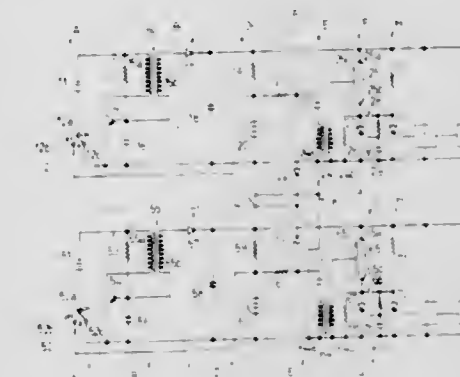
Filed Jul. 23, 1981, Ser. No. 285,958

Claims priority, application Japan, Jul. 24, 1980, 55-101641

Int. Cl.<sup>3</sup> G03B 7/16

U.S. Cl. 354—33

18 Claims



1. In an electric flash apparatus comprising a first flash unit  
 incorporated in a housing of a camera, a second flash unit  
 adapted to be mounted externally of said housing, light quan-  
 tity control means for controlling respective quantities of light  
 produced by said first and second flash units such that a light  
 quantity of said first flash unit is less than the light quantity of  
 said second flash unit, said first and second flash units including  
 respective triggering and flash timing circuits for energizing  
 said respective first and second flash units, and means for  
 controlling the flash duration of the first and second flash units  
 so that durations of respective flashes of said first and second  
 flash units are approximately the same, said electric flash appa-  
 ratus further including flash driving circuit means for supply-  
 ing driving signals to said first and second triggering circuits,  
 and flash operation selecting means for selecting and energiz-  
 ing one or both of said first and second flash units.



4,415,248

**EXPOSURE CONTROL APPARATUS**

Ryoichi Suzuki, Kawasaki, and Takashi Uchiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 231,782, Feb. 5, 1981. This application Jun. 9, 1982, Ser. No. 386,766

Claims priority, application Japan, Feb. 8, 1980, 55-15090

Int. Cl.<sup>3</sup> G03B 7/08

U.S. Cl. 354-43

9 Claims



1. An exposure control apparatus for a photographic camera having a shutter and an electrically operated optical diaphragm arranged to have the aperture thereof controlled, said apparatus comprising:

light measuring means which is arranged to produce, during each exposure control cycle of the camera, an electrical signal corresponding to the brightness of an object to be photographed and instantaneously varying in accordance with the variations of the brightness of the object to be photographed during each exposure control cycle of the camera; and

control means coupled to the light measuring means and to said electrically operated optical diaphragm, said control means arranged to instantaneously make the aperture smaller when a light level of an object becomes brighter during an exposure control cycle of the camera and to instantaneously make the aperture larger when the light level becomes darker.

4,415,249

**MOTOR DRIVE CIRCUIT FOR CAMERA**

Hiroyoshi Tsuzuki, Yokohama, and Ryuji Tokuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

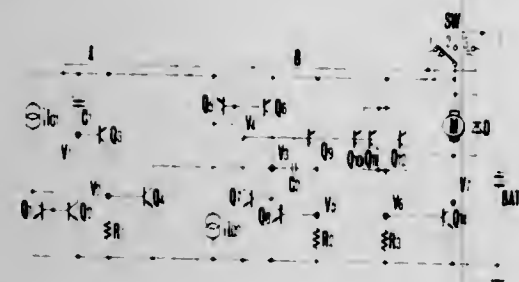
Filed Apr. 28, 1982, Ser. No. 372,792

Claims priority, application Japan, May 8, 1981, 56-69908

Int. Cl.<sup>3</sup> G03B 1/18; G05F 1/58; H02P 7/00

U.S. Cl. 354-173

6 Claims



1. A motor drive circuit having a battery as its first power source, comprising:

- (a) a first transistor to control current flowing to a motor;
- (b) second transistors to supply base current to said first transistor;
- (c) a third transistor being so arranged as having a common base with said second transistors;

- (d) a resistance to convert current flowing to said third transistor to a voltage;
- (e) a fourth transistor to detect an output voltage of said resistance, said fourth transistor for comparing said output voltage of the resistance with a voltage across the base and the emitter thereof;
- (f) a current source to supply current to the fourth transistor; and
- (g) a fifth transistor to invert an output of said fourth transistor and supply the thus inverted output to the base of the third transistor and the second transistors.

4,415,250

**FOCUSING SYSTEM FOR LONG FOCAL LENGTH OBJECTIVES**

Dieter Rossmann, Aalen; Volker Donn, Königsbrunn, and Christian Ludwig, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

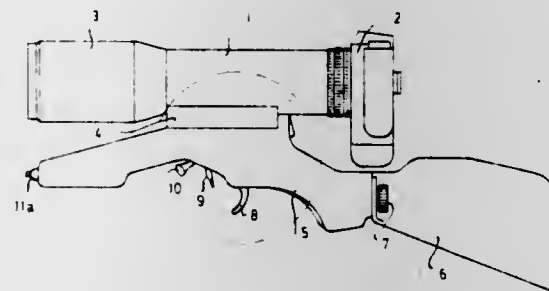
Filed Jun. 4, 1982, Ser. No. 385,240

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123084

Int. Cl.<sup>3</sup> G03B 3/00

U.S. Cl. 354-195

13 Claims



1. A focusing system for long focal length objectives of the type connected to a camera by an intermediate tube containing a displaceable part movable to effect focusing of the objective, said focusing system comprising the combination with said tube of a first housing and a second housing, and means for interchangeably mounting either of said housings on said tube, each housing containing a focusing arm which, when the housing is mounted on the tube, engages said displaceable part of the tube to effect focusing of the objective, said first housing being in the form of a rapid setting grip having a hand operated member positioned for actuation by a finger of a hand grasping the grip, said member operating the focusing arm of said first housing, said second housing having fine adjustment mechanism for operating the focusing arm of the second housing.

4,415,251

**CAMERA SHUTTER HAVING BOBBIN DRIVEN BLADES**

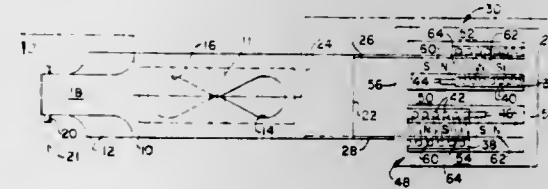
Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 21, 1982, Ser. No. 341,555

Int. Cl.<sup>3</sup> G03B 9/08, 9/30

U.S. Cl. 354-230

15 Claims



1. A light controlling blade and drive system for photographic apparatus, said system comprising: a pair of apertured opaque blades defined by linear flights of a belt having a central bight portion trained about a fixed axis;

4,415,253

**SYSTEM FOR SETTING SHEET-FORM TYPE**

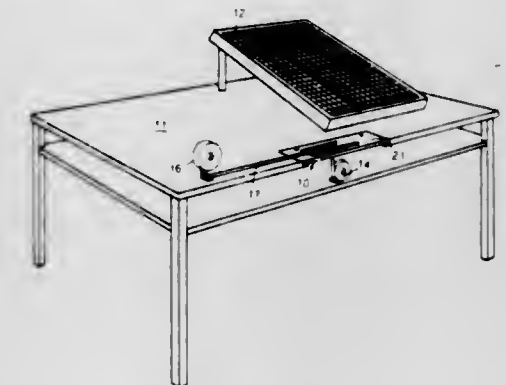
David S. Shew, 1402 Powell St., San Francisco, Calif. 94133

Filed Apr. 19, 1982, Ser. No. 369,349

Int. Cl.<sup>3</sup> G03B 15/00

U.S. Cl. 354-292

2 Claims



4,415,252

**ELECTROMAGNETICALLY OPERATED SHUTTER**

Michio Hirohata, Inagi, and Yukio Ogawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

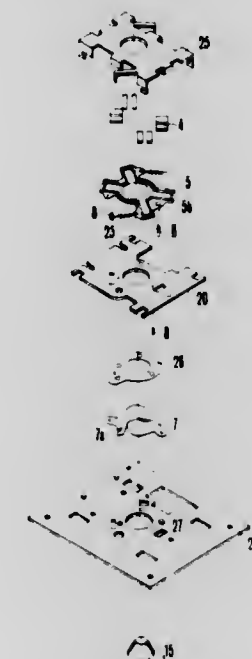
Continuation of Ser. No. 114,497, Jan. 23, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,507

Claims priority, application Japan, Jan. 31, 1979, 54-9909; Jan. 31, 1979, 54-9910; Jan. 31, 1979, 54-9911

Int. Cl.<sup>3</sup> G03B 9/22

U.S. Cl. 354-234

8 Claims



1. An electromagnetically controlled shutter comprising: a rotor for causing at least one shutter blade to open or close a photographic optical path by rotation through a predetermined angle, said rotor having a rotational axis and having two arms extending in radial directions with respect to the rotational axis of the rotor and being substantially symmetrically arranged with respect to the rotational axis of the rotor;

a conductor secured to the rotor and including a plurality of components extending radially with respect to the rotational axis of the rotor, said radial components being concentrated on respective arms of the rotor extending in the radial direction relative to the rotational axis;

a return spring for biasing the rotor in a direction to close the shutter and for increasing its return force by rotation of the rotor as the shutter aperture increases;

permanent magnets for forming a magnetic field in the direction of the rotational axis of the rotor and acting on the radial components of said conductive member, the polarity of said permanent magnets being arranged such that said magnetic fields and Lorentz forces produced by currents flowing in the radial directions of said conductive member act in the same direction relative to said rotor, said permanent magnets and the radial components being arranged relative to each other so that as a shutter blade opens the optical path, the overall length of said radial components in the magnetic field of the permanent magnet gradually increases and the Lorentz force on the rotor increases corresponding to the opening of the shutter blade.

1. In a system of setting type in a medium suitable for photographing, the type elements being of generally rectilinear outline with a common width and having on at least one surface thereof a character visible for photographing, the type elements being formed from sheet material, the apparatus comprising, means for holding a supply of tape having on at least one surface a pressure-sensitive adhesive for securing type elements on the tape, take-up means for receiving tape having mounted thereon type elements adhesively secured thereto in a selected order for subsequent placement as camera ready copy, a base intermediate said tape support and said tape take-up means and serving to support a span of tape for placement of the type elements when the tape extends between said tape supply and take-up means, parallel guide means on said base serving to retain the tape laterally during placement of type elements thereon, said base having intermediate said guide means a tape receiving slot having a length substantially greater than the tape's thickness permitting the tape to be shifted longitudinally within the slot for manipulation and placement of the type element upon said tape, deflectable bridge means extending laterally of said guide means and arranged above said slot a distance so that deflection of said bridge means urges the sheet-like type elements into adhesive attraction with said tape, the edge of said bridge and the confronting sides of said parallel guide means defining a type loading station spaced from said slot so that a type element may be placed in the loading station and urged beneath said bridge into engagement with the adhesive tape surface for securing the type element to the tape in a flat, lineal order.

4,415,254

**ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH TRANSFER BIAS VOLTAGE STABILIZER**

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 305,840

Claims priority, application Japan, Oct. 3, 1980, 55-137721

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355-3 TR

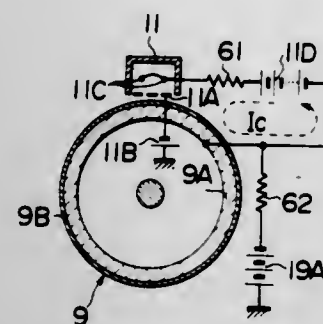
2 Claims

1. An electrophotographic copying apparatus in which an electrostatic latent image is formed on a charge retaining member carried by a conductive member and is developed with toner to provide a toner image, which image is transferred onto a record sheet by transfer means connected to a transfer bias source which has its terminal of the same polarity as the polarity to which the toner is charged connected to the conductive member, comprising:

a corona charger disposed in opposing relationship with the charge retaining member, a high tension source to cause a corona discharge from the corona charger, the high tension source having a first terminal connected to the conductive member and a second terminal connected to a corona dis-



charge wire of the corona charger, said transfer bias source connected between said first terminal and the ground, said



arrangement causing a corona current from the corona charger to flow between said conductive member and said first terminal and to bypass said transfer bias source.

4,415,255

## OPTICAL COPYING ARRANGEMENT

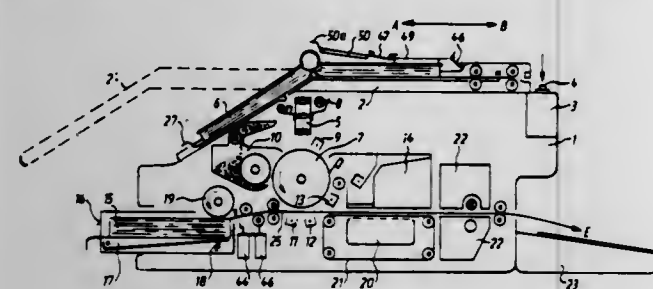
Hans-Peter Huber, Munich; Erich Burger, Unterhaching, and Horst Bickl, Pullach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany  
Filed Jan. 25, 1982, Ser. No. 342,171

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102293

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 R

16 Claims



1. An optical copying arrangement, particularly an electrostatic copying arrangement, comprising a carriage provided with a supporting plate having an essentially transparent portion for an original having long and short sides, and being movable in a substantially horizontal direction, parallel to the short sides; means for moving an image carrier onto which an image is to be copied from the original, simultaneously with said carriage, a scanning system arranged to scan the original supported on said supporting plate by successive strips and form a copy on the image carrier, said supporting plate having a further part which in initial position of said carriage is located prior to a first strip, as considered in direction of movement of said carriage, and is bent downwardly relative to said transparent portion of said supporting plate in direction of movement for providing support for a portion of the original which is not copied so as to avoid displacement of the original on the transparent portion upon movement of said carriage.

4,415,256

## APPARATUS FOR TRANSFERRING IMAGES

Takahiro Inoue; Yusaku Takada, both of Yokohama, and Takao Aoki, Abiko, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,468

Claims priority, application Japan, Jun. 1, 1981, 56-84198

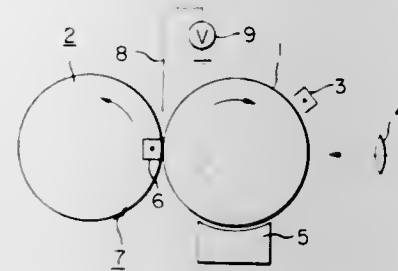
Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 TR

16 Claims

1. Apparatus for transferring a developed image on an image bearing member onto a transfer material supported on transfer material bearing means, said transfer apparatus being characterized by the provision of transfer corona discharge means disposed opposed to the transfer position of the image bearing

member; transfer material bearing means having a dielectric transfer material bearing surface and disposed to move the transfer material passing between said image bearing member and said transfer corona discharge means; and transfer material



4,415,257

## PRESSURE DEVICE FOR A WEB-LIKE IMAGE-RECEIVING MATERIAL

Walter Kopp, Taufkirchen; Hubert Mugrauer, Poering, and Anton Stuerzer, Grafing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

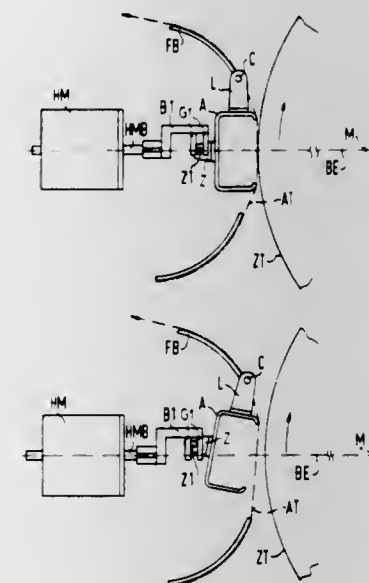
Filed Jul. 2, 1982, Ser. No. 394,501

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128983

Int. Cl.<sup>3</sup> G03G 15/16

U.S. Cl. 355—3 TR

7 Claims



1. A device for use in a transfer station of a non-mechanical printer or copier for moving a continuous web-like image-receiving material toward and away from an intermediate image carrier comprising:

- a C-shaped pressure bar extending over the width of said image-receiving material and having an open side adjacent to said image-receiving material,
- said pressure bar being pivotally connected to said guide plate at a point above said pressure bar, and having a means mounted on a rear of said pressure bar carrying a pin thereon;
- a plunger-type solenoid; and
- a linkage rigidly connected to the plunger of said solenoid and having a pair of parallel guides disposed perpendicular to the direction of displacement of said plunger of said solenoid, said guides defining a slot in which said pin is received permitting movement of said pin within said slot, whereby said open side of said pressure bar is urged against

said image-receiving material when said solenoid is in a rest condition, and whereby said pressure bar is pivoted about said pivot point upon actuation of said solenoid and retraction of said plunger such that said pressure bar is moved away from said image-receiving material.

4,415,258

## LINEAR LENS ARRAY IMAGING SYSTEM FOR FORMING REDUCED OR ENLARGED IMAGES AT AN IMAGE PLANE

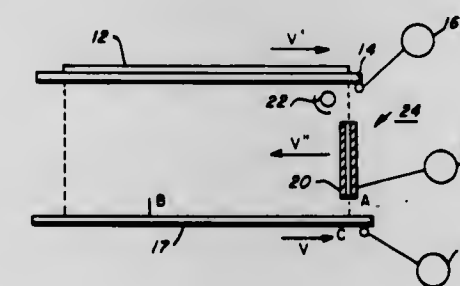
James D. Rees, Pittsford, and John A. Durbin, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1982, Ser. No. 373,462

Int. Cl.<sup>3</sup> G03G 15/28

U.S. Cl. 355—8

7 Claims



1. An imaging system for projecting an erect image of a document lying in an object plane onto a photoreceptor lying in an image plane parallel to said object plane at at least one magnification  $m$  other than unity, said system including:

- an imaging assembly positioned between said object plane and photoreceptor,
- first drive means for driving said photoreceptor at a first velocity  $v$ ,
- second drive means for driving said document at a second velocity  $v'$ , and
- third drive means for driving said imaging assembly at a third velocity  $v''$ , said first, second and third velocities being related by the expression

$$v'' = \frac{v}{m} + v' \frac{(1-m)}{m}$$

4,415,259

## VARIABLE MAGNIFICATION AND RECIPROCAL EXPOSURE COPYING METHOD

Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 19, 1981, Ser. No. 294,141

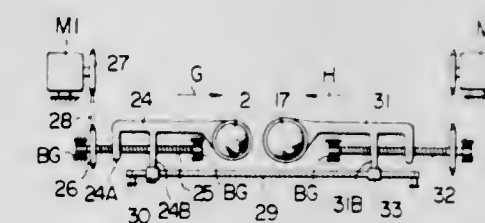
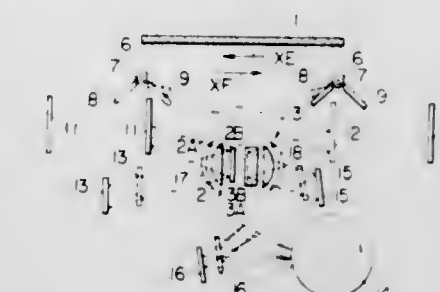
Claims priority, application Japan, Feb. 8, 1980, 55-114541

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—11

20 Claims

1. In a copying machine having scanning means adapted to be reciprocated back and forth relative an original for producing a light image of the original and directing said light image to a photoconductor through an inverting optical system during movement of said scanning means in one direction, and directing said light image to said photoconductor through an erecting optical system during movement of said scanning means in the other direction, means including an auxiliary lens movable along the optic path extending from the said original, through each said lens system and to said photoconductor for varying the magnification of the image directed to said photoconductor, and means for guiding a transfer sheet into engagement with said photoconductor by aligning a side edge of said transfer sheet with a reference position; the improvement including means associated with the movement of said auxiliary lens for shifting the inverting optical system in a direction



transfer sheet brought into engagement with said photoconductor.

4,415,260

## DUPLICATING SYSTEM COMPRISING ELECTROPHOTOGRAPHIC COPIER AND OPTION DEVICE

Muneo Kasuga; Kiyoshi Miyashita, and Masaji Nishikawa, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

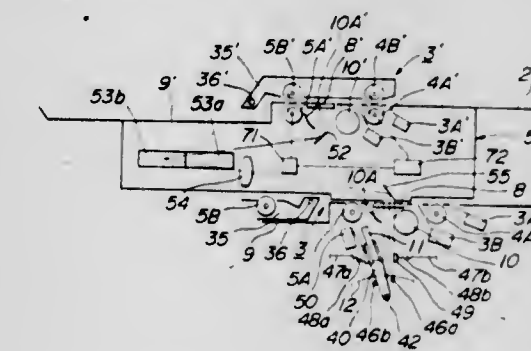
Filed Mar. 22, 1982, Ser. No. 360,444

Claims priority, application Japan, Mar. 24, 1981, 56-41641

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 SH

19 Claims



1. A duplicating system comprising an electrophotographic copying apparatus which includes first document detecting means for detecting a first document to be copied to produce a first document detection signal, first optical scanning means for making a slit exposure, first document feeding means for feeding the first document at a first speed with respect to said first optical scanning means in response to said first document detection signal, photosensitive means for forming an electrostatic latent image corresponding to the image of the document, and means for forming a duplicated copy with the aid of said latent image;

an option device which includes means for detachably mounting the option device onto the copying apparatus, second document detecting means for detecting a second document to be copied to produce a second document detection signal, second optical scanning means for making a slit exposure, second document feeding means for feeding said second document at a second speed with respect to said second optical scanning means in response to said second document detection signal, and optical



means for projecting the image of the second document onto said photosensitive means of the copying machine; and  
control means connected to said first and second document detecting means for inhibiting a document feeding operation of one of the first and second document feeding means in response to one of said first and second document detection signals for a given time period after the other of said first and second document detection signals is produced.

4,415,261

## AN IMPROVED PLATEN COVER FOR A COPYING MACHINE

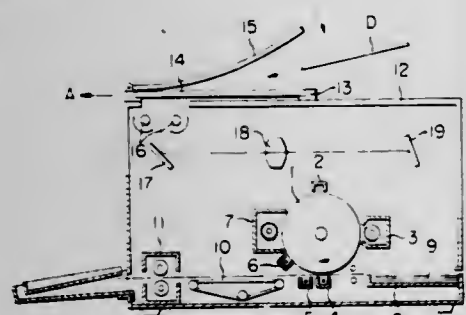
Koji Yukawa; Takashi Murahashi, and Isao Sakurai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,587

Claims priority, application Japan, Sep. 26, 1980, 55-134979  
Int. Cl.<sup>3</sup> G03B 27/62

U.S. Cl. 355-75

5 Claims



1. In a copying machine having a housing, a transparent plate on which an original to be copied is placed, and means for illuminated imaging of the original through the transparent plate and for reflecting an image of the original onto a photosensitive member, an improved platen cover for overlaying the original placed on the transparent plate, the improvement comprising markings on the surface of said platen cover facing the transparent plate and formed of a fluorescent-based material so that when scanning illumination impinging upon those of said markings disposed about the periphery of the overlaid original causes said markings to be reflected onto the photosensitive member, development of the reflected image of the fluorescent-based markings is avoided due to the high reflection characteristics of the fluorescent-based material and copy image integrity is accordingly maintained.

4,415,262

## PHOTOMASK

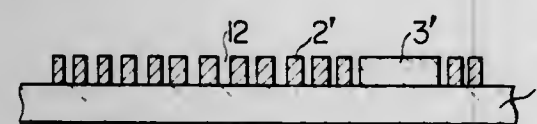
Naoki Koyama, Kokubunji; Youji Maruyama, Hamuramachi; Hiroshi Umezaki, Mitaka; Norikazu Tsumita, Kodaira, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 340,215

Claims priority, application Japan, Jan. 21, 1981, 56-6404  
Int. Cl.<sup>3</sup> G03B 27/28

U.S. Cl. 355-125

24 Claims



1. A photomask comprising:  
a plurality of mask portions of different light transmissivity for forming a plurality of photoresist pattern portions different in thickness through one exposure, said mask portions including at least one opaque pattern formed on a transparent substrate and having a predetermined form and at least one semi-transparent pattern, said at least one semi-transparent pattern being formed on

said transparent substrate and having a predetermined form, said at least one semi-transparent pattern being formed of a finely apertured opaque film.

4,415,263

## ELECTROPHOTOGRAPHIC COPIER APPARATUS

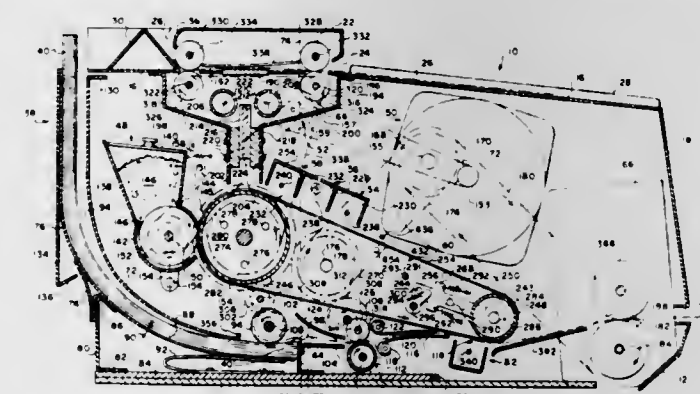
Lionel B. Hoffman, Wyckoff, N.J., assignor to Tetras S.A., Paris, France

Filed Oct. 22, 1981, Ser. No. 313,948

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355-3 SH

49 Claims



1. A table top electrophotographic copying machine comprising:  
A. a housing for the machine having a top wall, a base, a front end wall, a rear end wall opposite the front end wall and opposite side walls,  
B. an imaging system within the housing and comprising a flexible electrophotographic belt, rollers supporting the belt in a primarily horizontally extending elongate tensioned oval loop providing an upper and a lower reach, driving means for rotating at least one of the rollers for moving the belt in its loop, an exposure station adjacent the upper reach where a narrow strip-like pattern of light is adapted to be applied across the belt progressively to form a latent image across the belt and along the belt as it moves past the exposure station in a predetermined direction, a charging station including means for charging the belt surface across its width located adjacent the exposure station and upstream thereof whereby to charge the belt surface progressively just before the belt passes through the exposure station,  
C. means for moving a patterned original member progressively along said top wall and means for projecting the illuminated pattern of said original member from said top wall into the interior of the housing and to said exposure station in synchronism with the movement of the belt whereby the illuminated pattern provide said narrow strip-like pattern of light selectively to discharge the charged surface progressively to form said latent image,  
D. a toning station downstream of the exposure station and adjacent one of the said rollers having means for toning the latent image to develop the same on the belt surface progressively as the belt carries the latent image around said one roller and onto the lower reach of the belt,  
E. an image transfer station adjacent the lower reach of the belt for transferring the developed image carried to the lower reach onto a sheet of carrier medium,  
F. said rear end wall comprising an arcuate magazine arranged to hold a supply of carrier medium sheets, said magazine including an interior arcuate chamber for the supply of sheets and having a top entrance located generally at the juncture of the magazine with the top wall and presenting a vertical passageway into said chamber for receiving said supply, said magazine having a discharge port close to said base and spaced inwardly toward the front end wall away from a vertical plane which is substantially tangent to the magazine adjacent the top entrance, the discharge port providing a horizontal passage-

way for egress of sheets of carrier medium from said magazine, the chamber being smoothly curved from vertical to horizontal and arranged to hold said supply in a curved disposition,

G. means for stripping a single sheet from the supply of carrier medium sheets in the magazine at the discharge port and feeding the same to the image transfer station in synchronism with the movement of the belt and in timed relation to the developed image arriving from the toning station and

H. means for moving the sheet after it has passed through the transfer station out of the housing past the front end wall.

4,415,264

## SPECTROPHOTOMETER GAS CONTROL SYSTEM

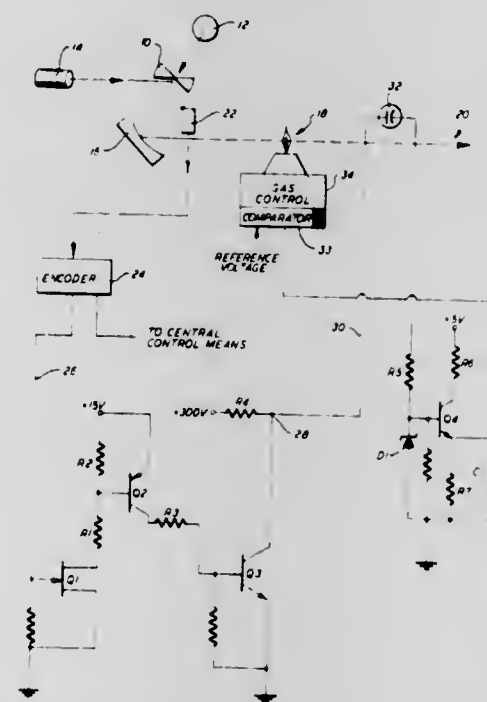
Charles M. Wiltmer, Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 25, 1981, Ser. No. 277,351

Int. Cl.<sup>3</sup> F23N 5/08; G01N 21/72

U.S. Cl. 356-315

6 Claims



1. A spectrophotometer comprising, in combination:  
a burner for burning a gaseous fuel and for atomizing a sample to be analyzed in a burner compartment;  
means for periodically passing a beam of light through the burner compartment;  
a detector;  
means for energizing said detector during the period of absence of said beam of light through said burner compartment;  
said detector being adapted when energized to produce an electronic signal representative of the presence or absence of a flame in said burner; and  
means responsive to said electronic signal, for controlling the feeding of the fuel to said burner.

4,415,265

## METHOD AND APPARATUS FOR AEROSOL PARTICLE ABSORPTION SPECTROSCOPY

Anthony J. Campillo, Nesconset, and Horn-Bond Lin, Manorville, both of N.Y., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 25, 1981, Ser. No. 277,442

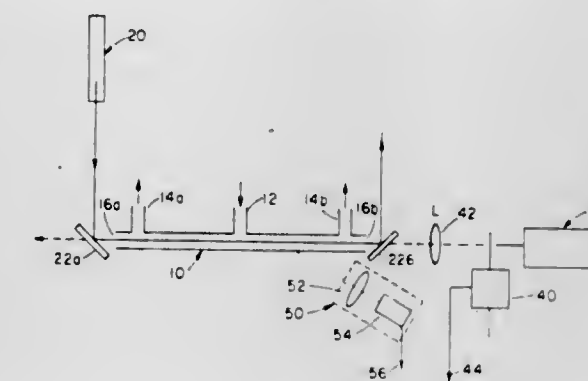
Int. Cl.<sup>3</sup> G01N 21/39

U.S. Cl. 356-338

15 Claims

1. An absorption spectrometer apparatus comprising:  
(a) a source providing a beam of light, said beam passing through a preselected region,  
(b) a source providing a variable wavelength heating beam,

said heating beam also passing through said region and said heating beam having a known spectrum,  
(c) means for modulating said heating beam; and,



(d) means for detecting the intensity of light scattered from particles within said region, whereby the presence of particles having absorption bands within the spectrum of said heating beam may be detected by observation of the intensity of said scattered light.

4,415,266

## PHASE-LOCKED LOOP LASER GYROSCOPE SYSTEM

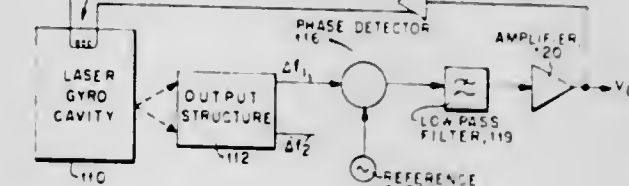
James B. Matthews, Wayland, and Reno A. DeLuzio, Milford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 894,267, Apr. 7, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,672

Int. Cl.<sup>3</sup> G01C 19/64

U.S. Cl. 356-350

24 Claims



1. In combination:  
means for providing a closed-loop path for sustaining propagation of at least two circularly polarized counter-rotating electromagnetic waves of different frequencies;  
means for providing a predetermined frequency difference between said two counter-rotating waves when said path is at rest;  
means for producing an electrical signal having a frequency equal to the difference in frequency between said two counter-rotating waves;  
phase detecting means for producing a signal as a function of the difference in phase between said electrical signal and a reference signal; and  
means, coupled to the output of said phase detecting means, for providing an indication of the rotation rate of said closed-loop path.

4,415,267

## APPARATUS FOR MIXING AND APPLICATION OF PAVING COMPOSITIONS

Francis K. Hill, P.O. Box 2059, Wickenburg, Ariz. 85358

Filed Jun. 3, 1982, Ser. No. 384,577

Int. Cl.<sup>3</sup> B28C 5/00, 5/38

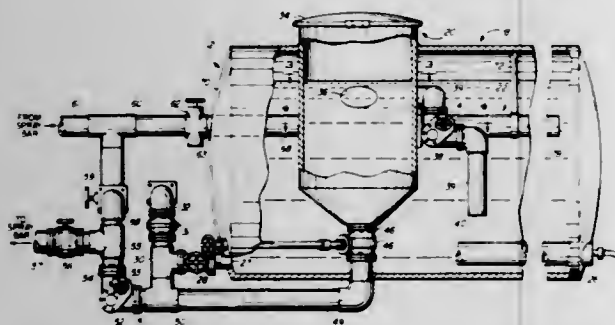
U.S. Cl. 366-14

16 Claims

1. Apparatus for mixing an additive with molten paving material and for application of the resultant paving composition comprising:



- (a) an application vehicle having a heated materials tank and an applicator means;
- (b) means for admitting a quantity of the molten paving material to the interior of said heated materials tank from an external source;
- (c) mixing means associated in heat transfer relationship with said heated materials tank and including:
- I. molten paving material input means for admitting molten paving material from the interior of said materials tank into said mixing means.
  - II. additive input means for admitting the additive from an external source into said mixing means.



- III. means in said mixing means for mixing the received molten paving material and the additive to produce the resultant paving composition.
- IV. flow means for causing the received molten paving material and the additive to continuously flow through said mixing means during the mixing thereof and directing the resulting paving composition to the interior of said materials tank; and
- (d) means coupled between said materials tank and said applicator means for selectively supplying the resultant paving composition thereto.

4,415,268

## TWIN SCREW EXTRUDERS

Heinz Brinkmann, Bennigsen, and Siegfried Chszaniecki, Hanover, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

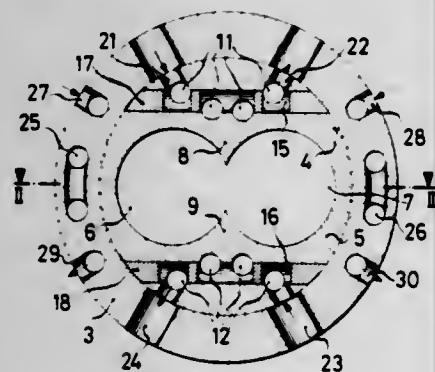
Filed Jun. 10, 1981, Ser. No. 272,348

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023393

Int. Cl.<sup>3</sup> B29B 1/10

U.S. Cl. 366—85

3 Claims



1. A screw casing for a twin screw extruder for processing and shearing plastics, comprising:
- (a) a cylindrical supporting member having an internal bore circular in cross section,
  - (b) a wear resistant liner positioned within and supported and reinforced by said supporting member, said liner having an external surface circular in cross section and fitting tightly within said bore of said supporting member, said liner being formed with two parallel longitudinal bores which overlap and form a combined spectacle shaped bore surface having two generally wedge shaped

- projections directed radially inwardly, said parallel bores being adapted to receive twin extruder screws for shearing and extruding plastic material,
- (c) axially extending tempering passages formed in said wedge shaped projections, each of said tempering passages being disposed at approximately the same distance from the bore surface of the spectacle shaped bore so as to provide even tempering of such material, and
- (d) additional axially extending tempering passages formed in said cylindrical supporting member at opposite sides thereof and laterally of the spectacle shaped bore, said additional tempering passage being independent of the first mentioned tempering passages and disposed at approximately the same distance from the bore surface of spectacle shaped bore so as to provide, together with said first mentioned tempering passages, even tempering of the material.

4,415,269

## DEVICE FOR PROVIDING A REINFORCED FOAM LINING FOR WELL BORE HOLES

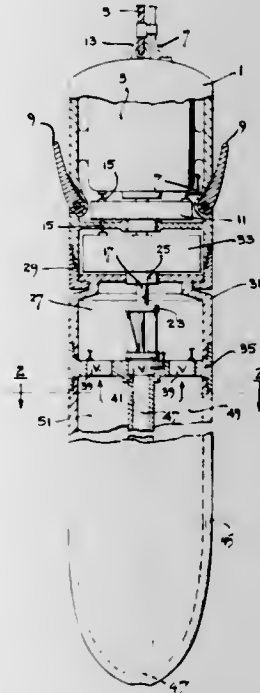
Ward M. Fraser, P.O. Box 217, Harbor City, Calif. 90710

Filed Apr. 28, 1981, Ser. No. 245,067

Int. Cl.<sup>3</sup> B01F 3/08, 15/02

U.S. Cl. 366—132

2 Claims



1. A device for mixing and dispensing foam components such as polyurethane foam components under pressure comprising:

- an elongated cylindrical enclosure having at least three housings detachably arranged in coaxial end-to-end relationship and having an overall configuration capable of being lowered into a well bore;
- a selected one of said housings disposed between the other two housings of said enclosure includes a mixing chamber containing an operable mixer;
- one of said housings of said other two housings constituting a pair of pressure vessels enclosing a pair of pressurized storage chambers for storing fluids therein under pressure;
- two operable valves, one located between the first of said pair of storage chambers and said mixing chamber and the other located between the second of said pair of storage chambers and said mixing chamber and each of said valves so oriented that fluid can flow from the adjacent storage chamber into said mixing chamber when the operable valve is in the open position;
- said pressure vessel housing having a bore extending from said mixing chamber to the exterior of said enclosure at the extreme end of said pressure vessel housing;
- operable valve means allowing mixed components to flow

- from said mixing chamber exteriorly of said enclosure via said bore;
- said other or remaining housing of said three housings mounting an electric power source operably coupled to said mixer;
- switching and control means coupled to said electric power source, said fluid valve means and said mixer component valve means for operably controlling in a predetermined sequence; and
- actuating means initiating the operation of said switching and control means when desired.

4,415,270

## PAINT MIXER CONTAINER CLAMPING DEVICE WITH INERTIALLY DRIVEN CAN ROTATING FUNCTION

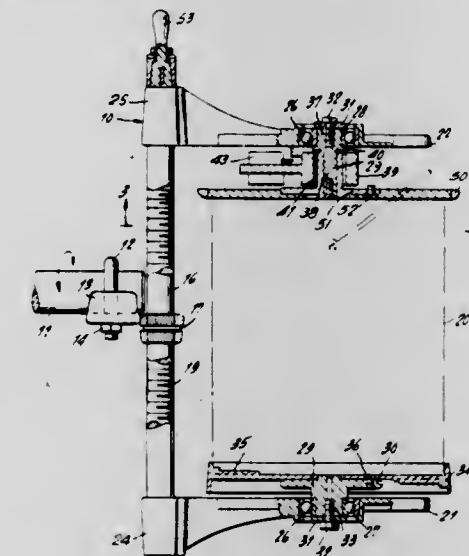
Robert P. Helnis, Totowa Boro, and Eric Vass, Clark, both of N.J., assignors to Red Devil Inc., Union, N.J.

Filed Oct. 18, 1982, Ser. No. 434,741

Int. Cl.<sup>3</sup> B01F 11/00

U.S. Cl. 366—216

9 Claims



1. A container clamping and rotating apparatus for a liquid mixing machine having an oscillating power output source, comprising a clamp coupled to the oscillating power source, spaced container grasping jaws on said clamp, a first and a second container support plate freely journaled on the spaced jaws, inertial drive means carried by the clamp and operatively coupled to at least one of the container support plates to rotate the container within the jaws as the clamp is being oscillated and means to move the jaws toward and away from each other to grasp and release the container.

4,415,271

## COMPACT ELECTRONIC DEVICE HAVING CALENDAR FUNCTION

Hiromitsu Mori, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,796

Claims priority, application Japan, Jun. 6, 1980, 55-76330; Jun. 6, 1980, 55-76331; Jun. 6, 1980, 55-76332

Int. Cl.<sup>3</sup> G09G 3/00; G04F 8/00; G04B 47/00

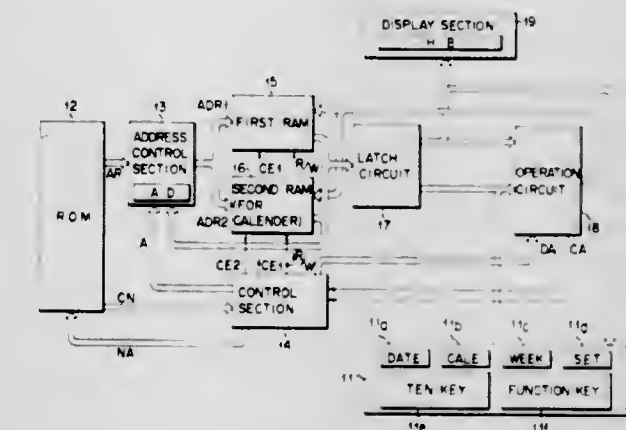
U.S. Cl. 368—41

8 Claims

1. A compact electronic device having a calendar function comprising:

- key input means having keys for setting initial data as a reference for setting a plurality of specified dates, keys for inputting setting data for setting a plurality of specified dates based on said initial data, and at least one key for setting a plurality of dates according to said initial data and said setting data;
- temporary memory means coupled to said key input means for storing said initial data and said setting data input by said key input means;
- judging means for judging the form of the initial data and the

- setting data stored in said temporary memory means and for issuing a corresponding judging signal;
- specified date calculating means for calculating a specified date according to the judging signal of said judging means;



- date memory means coupled to said specified date calculating means for storing a plurality of dates calculated by said specified date calculating means; and
- visual display means for displaying a plurality of dates stored in said date memory means.

4,415,272

## ELECTRICAL TIMEPIECE WITH HOUR-HAND ADJUSTMENT

Hans Heinzelmann, Schramberg, Fed. Rep. of Germany, assignor to Kieninger & Obergfell Fabrik Für Technische Laufwerke und Apparate, St. Georgen/Black Forest, Fed. Rep. of Germany

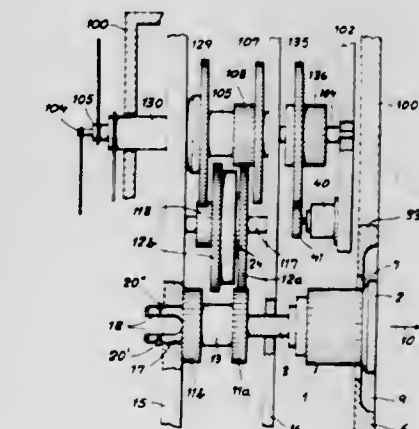
Filed Oct. 30, 1981, Ser. No. 316,738

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3041040

Int. Cl.<sup>3</sup> G04C 17/00; G04B 17/12

U.S. Cl. 368—69

12 Claims



1. A timepiece comprising:
- a housing having a front wall and a rear wall;
- a clockwork in said housing including a tubular hour shaft and a minute shaft coaxially projecting from said front wall;
- a minute hand and an hour hand respectively carried on projecting extremities of said minute and hour shafts;
- battery-operated drive means coupled with said clockwork for rotating said minute shaft, said clockwork including transmission means communicating the rotation of said minute shaft with a 1:12 step-down ratio to said hour shaft, said transmission means comprising a first gear positively coupled with said minute shaft, a second gear positively coupled with said hour shaft and yieldable detent means interconnecting said gears for joint rotation in any of a plurality of relative angular positions whose peripheral



spacing corresponds to a 30° travel of said hour hand with a given setting of said minute hand; a manually rotatable setting member mounted in said housing for displacement in an axial direction parallel to said shafts between a first and a second terminal position; and pinion means on said setting member meshing with said first gear in said first terminal position and with said second gear in said second terminal position for enabling adjustment of both said hands in said first terminal position and of said hour hand alone in said second terminal position, said detent means being effective in said first terminal position to entrain said hour shaft but being ineffective to transmit manual rotation of said second gear in said second terminal position to said first gear against the resistance of said drive means.

4,415,273

# MICROPROCESSOR DRIVEN DIGITAL DISPLAY ALARM CLOCK

Harald Hoffman, Konigstein; Lothar Pacher, Mainz, both of Fed. Rep. of Germany; Peter Busch, Fenin, Switzerland, and Dan C. Raducanu, Bad Soden, Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

PCT No. PCT/DE80/00076, § 371 Date Jan. 27, 1981, § 102(e) Date Jan. 27, 1981, PCT Pub. No. WO80/02753, PCT Pub. Date Dec. 11, 1980

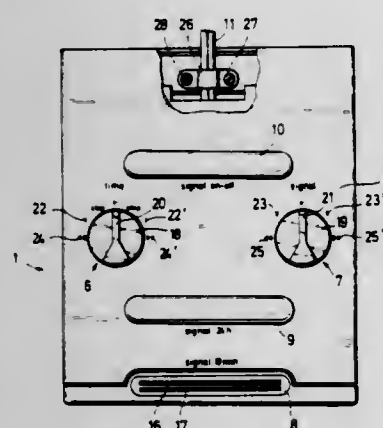
PCT Filed May 29, 1980, Ser. No. 233,617

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922621

Int. Cl.<sup>3</sup> G04B 23/02, 1/00; G04C 3/00

U.S. Cl. 368—74

10 Claims



1. In an electronic clock provided with an alarm mechanism and capable of simultaneously displaying by electro-optical display means both a current time setting and an alarm time setting, that improvement which comprises:

first adjustment knob means for electronically adjusting said current time setting selectively either forward or backward at a selective plurality of predetermined rates by actuating said first adjustment knob means to one of a provided plurality of current time setting positions; and second adjustment knob means for electronically adjusting said alarm time setting selectively either forward or backward at a selective plurality of predetermined rates by actuating said second adjustment knob means to one of a provided plurality of alarm time setting positions; whereby a single knob provides convenient and rapid one-handed setting said current time and a single knob provides convenient and rapid one handed setting of said alarm time.

4,415,274  
STEP MOTOR

Akio Matsumoto, Neyagawa; Koichi Inazumi, Amagasaki, and Kazuhiro Araki, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

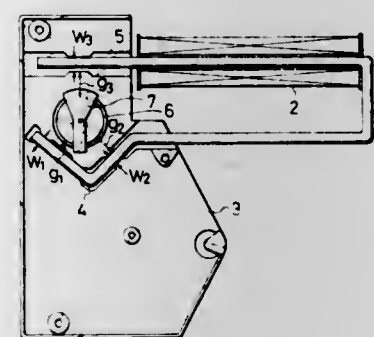
Filed Aug. 31, 1981, Ser. No. 297,621

Claims priority, application Japan, Sep. 12, 1980, 55-126807

Int. Cl.<sup>3</sup> G04F 5/00

U.S. Cl. 368—160

22 Claims



1. A step motor comprising a stator made by bending a bar-shaped material of a high magnetic permeability substantially into a U-shape, one leg of which being straight, a coil arranged on said straight leg of said stator and a rotor arranged between the straight leg and the other leg of the stator, said other leg being curved so that the closest part forming a gap between said rotor and said curved leg of the stator is angularly positioned spaced from a line extending normal from the rotary axis of the rotor to the closest part of the straight leg, and wherein the minimum distance forming the gap between the straight leg of the stator and the rotor being larger than the minimum distance forming the gap between the curved leg and the rotor.

4,415,275

# SWIRL MIXING DEVICE

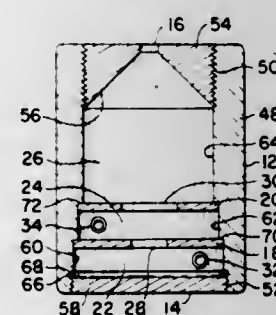
David E. Dietrich, 8450-101 Via Sonoma, La Jolla, Calif. 92037

Filed Dec. 21, 1981, Ser. No. 332,949

Int. Cl.<sup>3</sup> B01F 5/00, 15/02

U.S. Cl. 366—165

24 Claims



1. A device for mixing fluids comprising a container having a closed end and an exhaust; at least two fluid injection chambers within said container, a first one of said chambers being located between said closed end and the second one of said chambers; first passage means for fluid flow from said first to said second chamber; second passage means for fluid flow from said second chamber to said exhaust; first means for injecting a first fluid into said first injection chamber with a given angular momentum; and second means for injecting a second fluid into said second injection chamber with an angular momentum in the opposite direction to that of said first fluid.

4,415,276

# ELECTRONIC TIMEPIECE

Yukio Ikehata, and Kenichi Ono, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

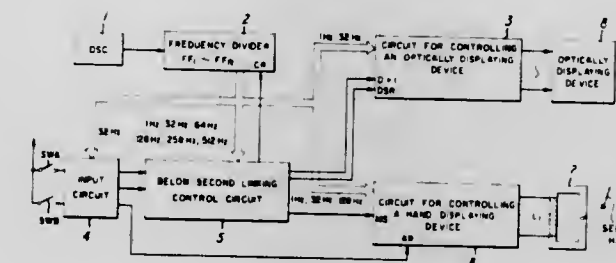
Filed Aug. 21, 1981, Ser. No. 295,010

Claims priority, application Japan, Aug. 25, 1980, 55-116737

Int. Cl.<sup>3</sup> G04C 9/00

U.S. Cl. 368—187

12 Claims



1. An electronic timepiece comprising: a time standard generator for generating a time standard output signal; a frequency divider for receiving the output signal from said time standard generator and having a resettable means and for producing a 1 Hz signal; first control means connected to said frequency divider to receive therefrom the 1 Hz signal for controlling an optically displaying device; second control means connected to said frequency divider to receive therefrom the 1 Hz signal for controlling a hand displaying device having a second hand; third control means connected to the resettable means of said frequency divider and including means for detecting the time of 10<sup>-1</sup> seconds unit of said frequency divider and controlling said first control means and second control means in response to the content of said frequency divider; and input circuit means connected to said third control means and having switching means including at least one of a first switch for resetting the seconds indication of said optically displaying device to "00" seconds and a second switch for releasing the resetting state of said hand displaying device such that the content of said frequency divider is reset when one of the first switch and the second switch is operated and the seconds indication of said optically displaying device is linked to the seconds indication of said hand displaying device after one of the first switch and the second switch is operated.

4,415,277

TIME ADJUSTING MECHANISM FOR AN ELECTRONIC WRISTWATCH WITH A MANUAL ADJUSTING STEM  
Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Gebrüder Junghans GmbH, Schramberg, Fed. Rep. of Germany

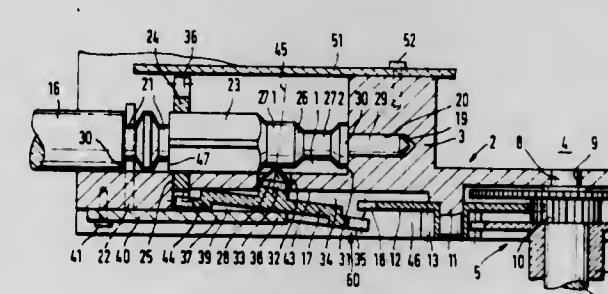
Filed Mar. 23, 1982, Ser. No. 360,922

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113019

Int. Cl.<sup>3</sup> G04B 27/02

U.S. Cl. 368—190

9 Claims



1. In an electronic wristwatch in which a rotatable correction wheel is moved into and from operative geared connection with a hands mechanism by means of an axially slidable setting shaft to determine the positioning of said correction wheel as a function of the axial placement of said shaft, the improvement comprising means mounting said correction

wheel for tilting movement such that the axis of rotation of said wheel is inclined in a manner moving a force transmission portion of said wheel into and out of said geared connection with the hands mechanism in a direction generally parallel to the hands axis.

4,415,278

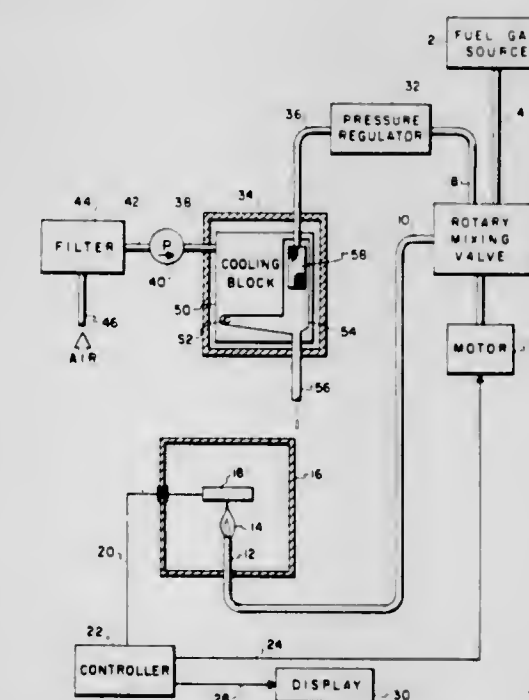
METHOD FOR OPERATING A GAS ANALYZING SYSTEM AND APPARATUS UTILIZING THE SAME  
Eugene L. Szonntag, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 8, 1982, Ser. No. 346,814

Int. Cl.<sup>3</sup> G01N 25/22

U.S. Cl. 374—37

7 Claims



1. A gas analyzing apparatus comprising a source of a fuel gas, a source of combustion air, ratio control means for producing a mixture of fuel gas and air in a selectively variable ratio, said means having a first and a second inlet and an outlet, means connecting said fuel gas source to said first inlet of said ratio control means, dehumidifying means connecting said source of air to said second inlet of said ratio control means to minimize water vapor entrained in the air from said source, said dehumidifying means including a cooling block having an internal labyrinth air path, a cooling means including a thermoelectric cooler having a cold plate in thermal contact with said cooling block and a power supply for energizing said cooler and arranged to cool said cooling block below the dew point of air within said labyrinth air path, but above the freezing point of water and a drain from said labyrinth air path to remove condensed water from said cooling block, combustion means connected to said outlet from said ratio control means for producing a combustion of said mixture of fuel gas and air, sensor means for sensing combustion products from said combustion means to produce an output signal representative of the combustion state and controller means arranged to respond to an output from said sensor means for controlling said ratio control means to produce substantially stoichiometric combustion of said mixture of fuel gas and air.



# 4,415,279 METHOD AND A METER FOR MEASURING QUANTITIES OF HEAT

Robert H. J. Beuse, Zevenaar; Han R. van Iersson, Oosterbeek; Jan W. Jansen, Brummen, and Petrus H. M. Wichern, Wijchen, all of Netherlands, assignors to N.V. Tot Keuring van Elektrotechnische Materialen, Arnhem, Netherlands  
PCT No. PCT/NL80/00008, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO80/02072, PCT Pub. Date Oct. 2, 1980

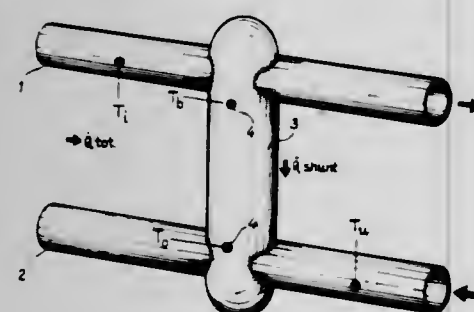
PCT Filed Mar. 21, 1980, Ser. No. 224,562

Claims priority, application Netherlands, Mar. 23, 1979, 79 02313

Int. Cl.<sup>3</sup> G01F 1/68; G01K 17/08

U.S. Cl. 374—204

16 Claims



1. A method for measuring the quantity of heat abstracted from a circulating flow of liquid by a consumption unit of the type including the steps of indirectly measuring the volume flow rate of the liquid while maintaining a subsidiary heat flow with respect to the main heat flow transported by the flow of liquid, measuring the temperature at some points by means of temperature sensors, and computing said quantity of heat from said temperature measurements, characterized in that said determining volume flow rate of the liquid is made on the basis of the flow rate dependent heat transfer in the boundary layer of the flow of liquid at the location of the subsidiary heat flow and includes the steps of:

measuring the temperature differential ( $\Delta T_{b,o}$ ) across a fixed heat resistance in a part of the path of the subsidiary heat flow outside the boundary layer thus establishing the subsidiary heat flow;  
measuring the temperature differential ( $\Delta T_{i,b}$ ) across the boundary layer; establishing indicia of the quotient ( $\Delta T_{i,b}/\Delta T_{b,o}$ ) of the two temperature differentials;  
measuring the absolute supply temperature ( $T_i$ ) of the flow of liquid for correcting the temperature dependency of the material constants of the liquid;  
measuring the temperature differential ( $\Delta T_{i,u}$ ) of the flow of liquid across the consumption unit; and  
determining said quantity of abstracted heat from said quotient ( $\Delta T_{i,b}/\Delta T_{b,o}$ ), said absolute supply temperature ( $T_i$ ) and the temperature differential ( $\Delta T_{i,u}$ ) of the flow of liquid across the consumption unit.

# 4,415,280 HYDRODYNAMIC FLUID FILM BEARING

Giridhari L. Agrawal, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,314

Int. Cl.<sup>3</sup> F16C 32/06

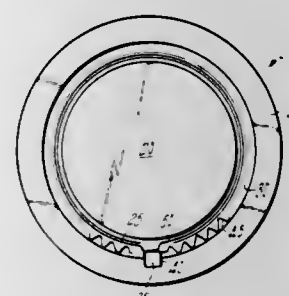
U.S. Cl. 384—103

10 Claims

1. A hydrodynamic fluid film journal bearing comprising a stationary retaining member, a rotatable journal defining with said stationary member, an annular spacing therebetween, a first smooth, generally cylindrical foil element disposed within said spacing, said journal being supported on a pressurized fluid film layer maintained by relative rotary movement between said journal and said first foil element, said journal bearing further comprising a generally cylindrical resilient backing member being disposed in said spacing generally concentric to, and radially outwardly from said first foil element, said resilient backing member accommodating deflection of

said foil element due to pressurization thereof by said fluid film layer and excursions of said journal due to loading and imbalances thereof, said hydrodynamic fluid film bearing being characterized by:

said first foil element and said resilient backing member being fixed to said retaining member and extending therearound in opposite circumferential directions, and  
a second smooth, generally cylindrical foil element fixed to said retaining member and disposed in said spacing, radi-



ally inwardly of said resilient backing member and concentric to said first foil element and said resilient backing member,

whereby enhanced coulomb damping is effected by rubbing contact between said first foil element and resilient backing member in said opposite circumferential directions of extension thereof and by rubbing contact between said second smooth foil element and at least one of said first foil element and said resilient backing member in opposite circumferential directions of extension thereof.

# 4,415,281 HYDRODYNAMIC FLUID FILM BEARING

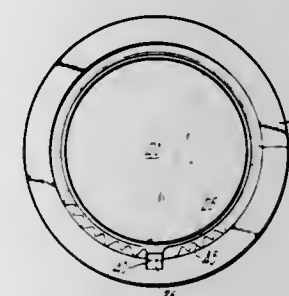
Giridhari L. Agrawal, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,315

Int. Cl.<sup>3</sup> F16C 32/06, 27/00

U.S. Cl. 384—103

6 Claims



1. A hydrodynamic fluid film bearing comprising a stationary retaining member, a rotating member defining with said retaining member a spacing therebetween, a smooth foil element disposed within said spacing, said rotating member being supported on a pressurized fluid film layer maintained by the relative movement between said rotating member and said foil element, said fluid bearing further comprising a single resilient backing member accommodating deflections of said foil elements due to the pressurization thereof by said fluid film layer, said bearing being characterized by:

said single resilient backing member being of one piece unitary structure and having a bilinear spring rate including a first, lower spring rate for accommodating deflections of said foil element and excursions of said rotating member from lesser relative loading thereof for enhanced stability and damping, and minimal power loss and a second, higher spring rate for resisting deflections of said foil element and excursions of said rotating member from greater relative loading thereof for enhanced load capacity.

# 4,415,282 SLIDE MOUNT DATA PRINTER

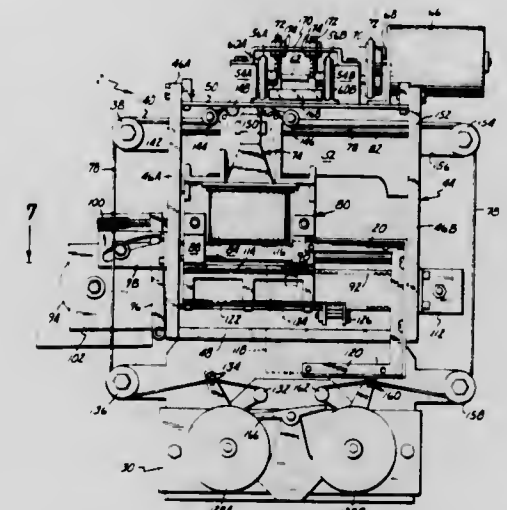
Charles L. Euteneuer, St. Michael, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jan. 21, 1982, Ser. No. 341,299

Int. Cl.<sup>3</sup> B41F 17/00

U.S. Cl. 400—30

20 Claims



1. Apparatus for printing alphanumeric information on photographic slide mounts, the apparatus comprising:

a generally horizontal slide track along which the photographic slide mounts are intermittently advanced, the slide track having an entrance end and an exit end and including a printing station between the entrance end and exit end;  
a pair of generally parallel conveyor belts positioned above and adjacent opposite sides of the slide track, the conveyor belts extending from the printing station toward the exit end of the slide track so that the conveyor belts engage a top surface of a slide mount to hold the slide mount in position between the belts and the slide track for printing at the printing station;  
a carriage track aligned in a plane parallel to and below a plane defined by the slide track and running in a generally transverse direction to the slide track;  
a carriage movable on the carriage track below the slide track;  
a print head carried by the carriage for printing alphanumeric characters on a bottom side of a slide mount when the slide mount is positioned in the slide track at the printing station;  
platen means positioned above the slide track and between the conveyor belts at the printing station for engaging the top surface of the slide mount when the print head is printing on the bottom surface of the slide mount;  
carriage drive means for moving the carriage on the carriage track; and  
control means for controlling the print head and the carriage drive means to print selected alphanumeric information on the slide mount positioned at the printing station.

# 4,415,283 SHORTHAND MACHINE HAVING ACTIVE TACTILE FEEDBACK

Michael A. Smith, Slidell, La., assignor to Baron Data Systems, San Leandro, Calif.

Filed Jul. 27, 1982, Ser. No. 402,401

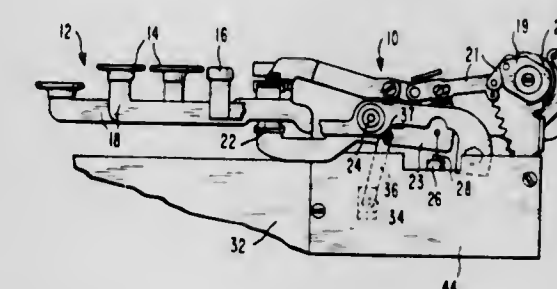
Int. Cl.<sup>3</sup> B41J 3/26

U.S. Cl. 400—94

9 Claims

1. A shorthand machine comprising a platen adapted for supporting paper; support means adapted for supporting an inked ribbon adjacent said platen; a plurality of print hammers; a plurality of keys, each key having a keystem mechanically coupling its associated key to an associated print hammer, each key normally assuming a rest position and movable to an actuated position to cause its associated print hammer to impact

against an inked ribbon support by said support means to bring the linked ribbon into contact with paper supported on said platen to print a character on such paper; a universal bar extending beneath said plurality of keystems, said universal bar normally assuming a reset position adjacent said keystems when said keys are in their rest position and responsive to movement of said keys toward the actuated position to move to a second position; means to enable the machine operator to sense when the previously actuated keys are sufficiently returned toward the key rest position so that a succeeding key actuation will result in printing of characters properly posi-



tioned relative to the characters printed in response to the previous key actuation, said means to enable including electrically actuated means responsive to initiation of the return of said keys from the actuated position to the key rest position for moving said universal bar toward said universal bar rest position, thereby urging said keys to return to said key rest position, termination of the actuation of said electrically actuated means resulting in a sensation indicating to the machine operator that another key stroke may be made; and means responsive to movement of said universal bar toward one of the second position and the universal bar rest position for rotating said platen to feed paper over said platen.

# 4,415,284 THERMAL DIE-CUTTING MACHINE FOR DIE-CUTTING LETTERS, NUMERALS AND OTHER CHARACTERS FROM PLASTIC TAPE

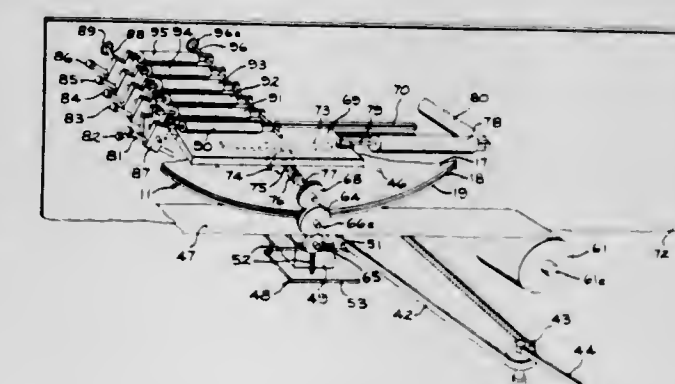
James N. Floyd, Lexington, Ky., assignor to James W. Moss, Louisville, Ky.

Filed Oct. 27, 1981, Ser. No. 315,289

Int. Cl.<sup>3</sup> B41J 1/22

U.S. Cl. 400—134

16 Claims



1. In an improved machine for heating and die cutting a printing tape with raised characters to form a reproduction of said characters in said tape, the improvements comprising a frame,  
a rotatable print plate disposed in said frame and defining a plurality of raised characters spaced in a circle on and around one broad surface thereof, said print plate comprising a central hub,  
a backing plate formed of a thermally conductive material attached to said hub,  
means for effectively isolating said backing plate from said



hub thermally wherein said backing plate forms a heat reservoir, and  
 a thermally conductive printing ring attached to said backing plate, said raised characters being attached to said printing ring, said heating means being disposed between said printing ring and backing plate,  
 means attached to said print plate for heating said raised characters,  
 print pedestal means attached to said frame and disposed opposite said broad surface and containing a print pad movable upon command against any desired one of said raised characters depending upon the rotational alignment of said print plate relative to said pad,  
 means mounted in said frame for selectively advancing a printing tape across said pad by at least one predetermined distance between each successive heating and die cutting operation on said tape, and  
 locking means attached to said frame and engagable with said print plate upon command for locking and maintaining any desired one of said raised characters in precise alignment opposite said pad during each heating and die cutting operation on said tape.

16. In an improved machine for heating and die cutting a printing tape with raised characters to form a reproduction of said characters in said tape, the improvements comprising a frame,

a rotatable print plate disposed in said frame and defining a plurality of raised characters spaced in a circle on and around one broad surface thereof,

means attached to said print plate for heating said raised characters,

print pedestal means attached to said frame and disposed opposite said broad surface and containing a print pad movable upon command against any desired one of said raised characters depending upon the rotational alignment of said print plate relative to said pad,

means mounted in said frame for selectively advancing a printing tape across said pad by at least one predetermined distance between each successive heating and die cutting operation on said tape, said advancing means comprising a tape index plate movably attached to said frame,

gear train means responsively connected to said plate for rotational operation in response to the movement of said tape index plate in one direction,

tape roller means responsively connected to said gear train means for advancing said tape across said pad in response to the movement of said tape index plate in said one direction,

means for advancing and retracting said tape index plate relative to said frame upon command, and

stop means aligned in interfering relation with said tape index plate for limiting the advancement of said tape index plate to a precise distance, the distance of advance of said tape across said pad being proportional to said precise distance, and

locking means attached to said frame and engagable with said print plate upon command for locking and maintaining any desired one of said raised characters in precise alignment opposite said pad during each heating and die cutting operation on said tape.

4,415,285

## UNIFILLED TAPE CASSETTE

John E. Bury, Eltham, England, assignor to Grafton Limited, London, England

Filed Apr. 26, 1982, Ser. No. 371,887

Claims priority, application United Kingdom, Jul. 23, 1981, 8122779; Jul. 30, 1981, 8123330

Int. Cl.<sup>3</sup> B41J 32/02

U.S. Cl. 400—196.1

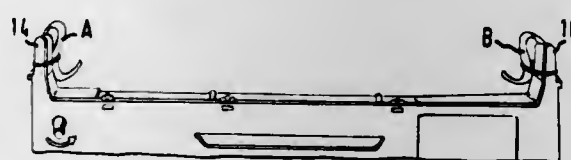
3 Claims

1. A method of making a cassette filled with an inked ribbon, said method comprising the steps of:  
 providing a cassette body having means defining a ribbon space to be packed with an inked ribbon in serpentine

manner, said body including means defining a ribbon inlet leading to said space, means defining a ribbon outlet leading from said space, and means for transporting ribbon through said cassette body;

threading a short length of noninked messenger ribbon between the said ribbon inlet and the said ribbon outlet along the intended ribbon path through said ribbon space and past said ribbon transport means with portions of said noninked messenger ribbon protruding outwardly from both the ribbon inlet and the ribbon outlet of the cassette body;

assembling a lid to the cassette body to form an assembled and sealed cassette with portions of said noninked messenger ribbon maintained protruding from both the ribbon inlet and the ribbon outlet;



attaching inked ribbon to the portion of said noninked messenger ribbon protruding from said ribbon inlet;

transporting ribbon through said cassette until the inked ribbon that was joined to the portion of noninked messenger ribbon protruding from the ribbon inlet has appeared at the ribbon outlet and the noninked messenger ribbon has been completely withdrawn from said cassette;

thereafter transporting the inked ribbon into the cassette until the ribbon space is filled with inked ribbon;

detaching said non-inked messenger ribbon from said inked ribbon; and

joining exposed portions of the inked ribbon now protruding from the ribbon inlet and the ribbon outlet of the cassette to form an endless loop of inked ribbon.

4,415,286

## VARIABLE PRINT DENSITY ENCODER SYSTEM

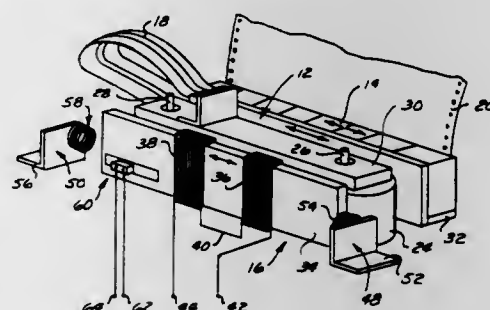
Alan K. Jennings, Orange, Calif., assignor to Printronix, Inc., Irvine, Calif.

Filed Sep. 17, 1981, Ser. No. 303,081

Int. Cl.<sup>3</sup> B41J 19/32

U.S. Cl. 400—279

8 Claims



1. In a printer system in which a shuttle assembly having print elements mounted thereon undergoes generally linear motion along a path relative to a printable medium, an arrangement for providing variable density printing comprising means for generating a first succession of pulses as the shuttle assembly passes through a succession of different positions along the path, means for generating a second succession of pulses separated by selected time intervals, the second succession of pulses being applied to actuate selected ones of the print elements, means for storing values indicating the desired time intervals between selected ones of the first succession of pulses and selected ones of the second succession of pulses, means for measuring the actual time intervals between generation of selected ones of the first succession of pulses and generation of selected ones of the second succession of pulses, means for

comparing the stored values with the measured actual time intervals to provide error signals and means for varying the occurrence of the second succession of pulses in accordance with the error signals.

4,415,287

## PRINTING DEVICE FOR PRINTING CHARACTERS IN ROWS ON DATA CARRIERS

Tommy Vincent, Tiverton, R.I., assignor to Westrex Company, Asia, Fall River, Mass.

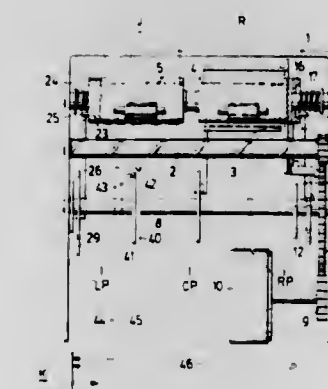
Filed Mar. 20, 1981, Ser. No. 245,812

Claims priority, application Sweden, Mar. 24, 1980, 80022494

Int. Cl.<sup>3</sup> B41J 19/00

U.S. Cl. 400—322

1 Claim



1. A printing device comprising print head means and a plurality of data carriers:

said print head means for printing data on at least one of said plurality of data carriers;

motor means for moving said print head means along said data carriers;

said print head means being adapted to rest at one of a plurality of home positions when said print head means is not in movement;

said motor means being reversible to change the direction of movement of said print head means;

switch means coupled to and controllable by said motor means;

said switch means being controlled by said motor means to assume a plurality of states, each of said states corresponding to the location of said print head means at a particular one of said plurality of print head home positions; and printing control means for selecting which of said plurality of data carriers is to receive data printed thereon by said print head;

said printing control means being electrically coupled to said switch means and to said motor means;

said printing control means also acting in response to the state of said switch means to select the direction of movement of said motor means and, consequently, that of said print head means as well as the printing of data by said print head means; whereby,

said print head means is moved from a previous home position to the particular one or more of said plurality of data carriers which are to receive data to be printed thereon by said print head means thereby bypassing any intervening data carriers on which data is not intended to be printed thereon during a given cycle of said printing device, said motor coming to rest under control of said printing control means at the conclusion of each cycle.

4,415,288

## LIQUID DISPENSING DEVICE WITH CARTRIDGE-RUPTURING MEMBER

Marvin Gordon, East Windsor, and Joseph Lichtenstein, Colonia, both of N.J., assignors to Whitman Medical Corporation, Clark, N.J.

Continuation-in-part of Ser. No. 241,486, Mar. 9, 1981, abandoned. This application Aug. 31, 1981, Ser. No. 298,246

Int. Cl.<sup>3</sup> A61L 13/17; A61M 35/00

U.S. Cl. 401—132

3 Claims



1. A liquid dispensing device comprising:

an elongated member having a hollow tubular handle portion and first and second ends, said first end being open to said tubular handle portion, said second end being configured as a paddle-like member formed integrally to said tubular handle portion and being transversely flexible relative to said tubular handle portion;

an absorbent sponge-like member disposed about said paddle-like member;

an elongated fluid-containing cartridge adapted for longitudinal slidability in said tubular handle portion of said elongated member, said cartridge having a rupturable forward end by which it is inserted into said open end of said elongated member;

flow passage means for providing flow communication from within said tubular handle portion to said sponge-like member along opposite sides of said paddle-like member; and

a cartridge-rupturing member positioned in said tubular handle portion proximate said second end and including a projection portion within said tubular handle portion to rupture said forward end of said cartridge in response to a predetermined slidable insertion of said cartridge into said tubular handle portion;

wherein said tubular handle portion includes a generally cylindrical interior surface along which said elongated cartridge is longitudinally slidable, said tubular handle portion further comprising an annular stop member projecting radially inward from said internal surface for resiliently engaging said forward end of said cartridge at a location wherein the cartridge is spaced from said projecting portion of said cartridge-rupturing member, the resilient engagement of said forward end by said annular stop member being overcome by force exerted longitudinally on said cartridge in the direction of said projecting portion to permit passage of said forward end of said cartridge into rupturable engagement with said projecting portion.

4,415,289

## SELF-LOCKING NYLON POST

Joseph Barba, Jackson Heights, and Gerd L. Hochrain, Seaford, both of N.Y., assignors to Boorum & Pease Company, Brooklyn, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,671

Int. Cl.<sup>3</sup> B42F 13/02

U.S. Cl. 402—17

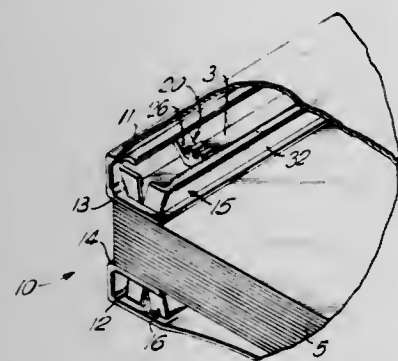
6 Claims

1. Fastening means for a loose leaf binder comprising:  
 (a) a binding element comprising a channel with a longitudinal axis having a floor with an opening therethrough, and side walls, the internal angle between the floor and the



side walls being obtuse, each side wall having an inwardly extending flange;

- (b) a post having a head portion, an intermediate portion and an end portion, the head portion being larger than the opening in the floor of the binding element, the intermediate and end portions being able to pass through said opening; the head portion of the post having a relatively thin flexible tongue that extends outwardly a distance such that, when the post is mounted in the binding element by



inserting the intermediate and end portions through the opening and turned so that the tongue is oriented substantially perpendicular to the longitudinal axis of the channel, the tongue engages one of the side walls and flexes upwardly, the tongue having a width such that, when the post is mounted in the binding element and turned so that the tongue is oriented parallel the longitudinal axis of the channel, the tongue does not engage either of the side walls.

4,415,290

**BINDER ASSEMBLY OF THE RING TYPE**

Kiyoshi Ohminato, Tokyo, Japan, assignor to King Jim Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,305

Claims priority, application Japan, Jan. 27, 1981, 56-009231[U]

Int. Cl.<sup>3</sup> B42F 13/12

U.S. Cl. 402-26

4 Claims



1. A binder assembly of the ring type including a bottom plate, vertical rods fixed thereto, a pivot plate combined with said bottom plate by a spring, vertical pivot rods fixed to said pivot plate, a pivot arm mounted pivotally at one end thereof on said bottom plate and comprising an upper member and a lower member between which are clamped said bottom and pivot plates, said upper member being diagonally cut away at the pivot end of said arm to permit pivotal movement of said pivot plate when said arm is pivoted, and a stopper means formed at the pivot end of said arm by bending an extension of said lower member.

4,415,291

**BALL AND SOCKET JOINTS**

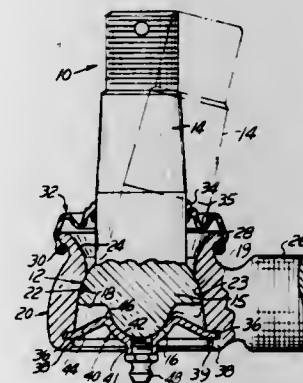
Joseph E. Smith, Birmingham, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation-in-part of Ser. No. 61,644, Jul. 30, 1979, Pat. No. 4,347,014. This application Apr. 6, 1981, Ser. No. 251,254

Int. Cl.<sup>3</sup> F16C 11/00

U.S. Cl. 403-36

35 Claims



1. A ball and socket joint comprising a ball and a socket in mutual swivelling sliding engagement with each other, said ball having a stud integrally formed at an end thereof and projecting outwardly through one end of said socket, a peripheral spherical surface on said ball, said socket having a concave spherical bore surface engaged with a portion of the peripheral spherical surface of said ball proximate the stud, a substantially elliptical frusto-conical bore at said one end of said socket, a disk-shaped retainer member disposed at the other end of said socket, said disk-shaped retainer member having a partially spherical recess concentric to and engaged with a portion of said peripheral spherical surface of said ball farthest away from said stud, biasing means co-operating with said retainer member for urging said concentric spherical surfaces in mutual swivelling sliding engagement, and means holding both said biasing means and retainer member at said other end of said socket, said means comprising an annular step in said socket proximate said other end, said other end forming a rim beyond said annular step bent over for forming a lip holding the periphery of said disk-shaped retainer member against said annular step.

4,415,292

**FRAME CONNECTOR STRUCTURE**

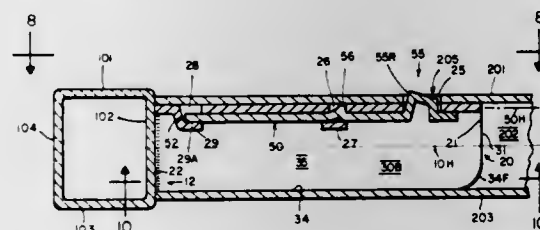
Paul Alperton, 305 Heavenly Dr., Omaha, Nebr. 68154

Filed Oct. 11, 1979, Ser. No. 83,849

Int. Cl.<sup>3</sup> B25G 3/00; F16B 9/00

U.S. Cl. 403-246

5 Claims



1. A hollow, unit handled, self locking connector structure adapted to be closely telescopically received within a hollow frame member having a registering-aperture to form a rigid joint therewith, said frame connector structure comprising:
  - A. a longitudinally extending rigid hollow body component that is substantially U-shaped in transverse cross-section and having two upright body-ends including a fore-end and a rear-end, said body including an apertured wall extending longitudinally between the body-ends and including an inner surface and an outer surface, said wall between the apertured portion thereof and body rear-end being at least once transversely struck therethrough

whereby the wall is provided with a transversely extending fore-slot and wall structural material is depressed below said fore-slot to provide a transversely extending underlying strap recessed inwardly the wall inner surface, transversely extending shelf means recessed inwardly the wall inner surface and located between the fore-slot and the body component rear-end, said apertured wall inner surface being in intervening relationship to transversely separated flanking-walls for said body and providing a regular transverse finite-width between the flanking-walls; and

- B. a substantially flat spring metal strip component longitudinally extending from forward-end to rearward-end thereof and having broad upper and lower surfaces, the spring forward portion immediately rearwardly its forward-end being provided with an upwardly extending locking projection surrounded by the body wall aperture, said spring forward portion being further provided with an upwardly extending shoulder located rearwardly said locking projection and in co-elevational registry with the wall fore-slot to prevent the spring from slidably moving longitudinally forwardly, the spring forward portion being transversely wider than the spring rearward portion and abutting the said body transverse strap, the transverse-width of the spring forward portion exceeding nine-tenths the finite-width of the apertured wall inner surface, and said spring rearward-end being supported atop said shelf means and said spring being surrounded by said body inwardly recessed strap whereby the spring is mounted inside the body component in cantilever fashion so as to normally maintain the locking projection elevated above the apertured wall outer surface and for receiving the registering-aperture of the hollow frame member to be removably connected.

4,415,293

**OFFSHORE PLATFORM FREE OF MARINE GROWTH AND METHOD OF REDUCING PLATFORM LOADING AND OVERTURN**

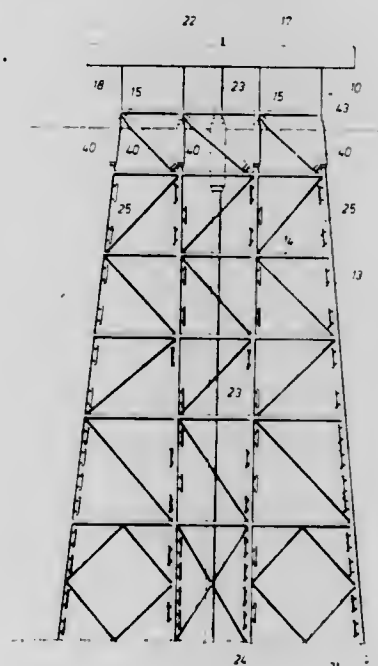
Robert F. Engel, Kingwood; Thomas E. Long, Houston, and Ralph M. Warrington, Humble, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 5, 1982, Ser. No. 365,223

Int. Cl.<sup>3</sup> E02B 17/00

U.S. Cl. 405-216

12 Claims



1. An offshore platform having a multileg steel structure adapted to extend from a point above the surface of a body of water to a substantial distance therebelow, said platform substructure comprising
  - a plurality of upwardly-extending tubular members in the form of legs to support a platform deck thereon, each of

said tubular members traversing the surface of a body of water,

- a plurality of additional tubular members in the form of bracing and well conductors connected to said platform,
- a sheath element concentrically mounted to surround each of a selected number of the tubular members of said substructure, each sheath element being in concentric spaced relation therewith extending from a point about adjacent the surface of the water downwardly for a distance sufficient to cover the area subject to the accumulation of at least the major portion of fouling marine growth,
- said sheath element including a substance for generating in sea water a source of marine growth-inhibiting agent in an amount sufficient, when positioned in sea water, to eliminate substantially the growth and attachment of marine growth on a tubular member covered with said sheath element, and
- insulating connector means fixedly securing said sheath element to said tubular member for substantially electrically insulating said sheath element from said tubular member.

4,415,294

**SUPPORT MEANS AND SYSTEM FOR SUPPORTING MINE ROOFS**

Thomas Ringe, P.O. Box 303, Phoenixville, Pa. 19460

Filed Aug. 20, 1981, Ser. No. 294,735

Int. Cl.<sup>3</sup> E21D 21/00

U.S. Cl. 405-259

10 Claims



1. A mine roof bolt adapted for insertion in a vertical hole in a said roof, said bolt comprising a U-shaped body member with laterally spaced front edges, said front edges having a stepped curvilinear configuration defining first cam surfaces, a slide member coactive with said body member and having a similar mateable stepped curvilinear configuration defining second cam surfaces, said members being coactive upon relative opposite rectilinear displacement of said mating stepped cam surfaces from low to high portion contact thereof to laterally space said members and create lateral oppositely directed forces against contacted side portions of the hole, and protrusion means on said slide member extending into, and coacting with the interior of said U-shaped body member to prevent substantial lateral movement therebetween and maintain said cam surfaces in confronting contacting engagement.



4,415,295

## MINERAL MINING INSTALLATIONS

Georg Werner, and Paul Wisniewski, both of Lunen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Lunen, Fed. Rep. of Germany

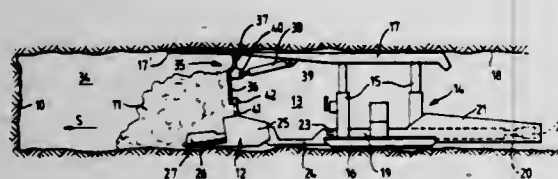
Filed Dec. 18, 1981, Ser. No. 331,997

Claims priority, application South Africa, Dec. 30, 1980, 80/8106

Int. Cl.<sup>3</sup> E21D 23/00

U.S. Cl. 405—291

12 Claims



1. In a mineral mining installation suitable for winning material by explosive blasting; said installation comprising a conveyor extending alongside a mineral face, roof supports disposed alongside the conveyor remote from the mineral face, said roof supports having roof-engageable structures supported by hydraulic props, hydraulic shifting rams operably connected between the conveyor and the supports and means for selectively screening off the winning and conveying region of the working from the access region; the improvement comprising the screening means includes wall components pivotally connected to the roof-engageable structures of the supports and capable of adopting an operating position depending from the roof-engageable structures or an inoperative stowed position and the conveyor has further wall components forming part of the screening means and acting as an abutment against which the wall components engage when set in their operating position.

4,415,296

## MATERIALS TRANSFER SYSTEM AND METHODOLOGY

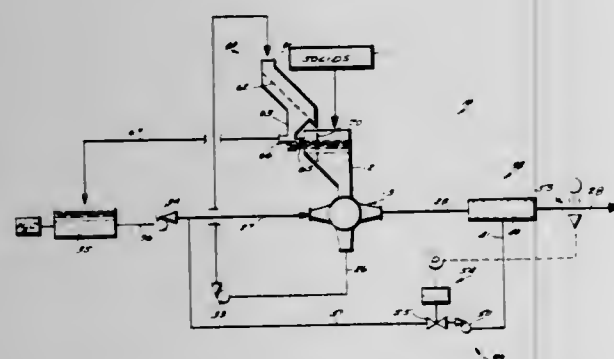
Erwin D. Funk, Glens Falls, N.Y., assignor to Kamy, Inc., Glens Falls, N.Y.

Filed Sep. 14, 1981, Ser. No. 302,081

Int. Cl.<sup>3</sup> B65G 53/66

U.S. Cl. 406—19

25 Claims



1. A method of continuously conveying hard particulate material of non-uniform size, such as coal, utilizing a high pressure device including a pocketed rotor containing a pair of diametrically through-going pockets perpendicular to each other, a housing enclosing the rotor and having four ports equally spaced around the periphery thereof for registry with inlets and outlets to and from the through-going pockets in the rotor, at least one screen associated with the housing and rotor for allowing passage of liquid and fine particles therethrough, but preventing passage of particles larger than a predetermined size therethrough, and high and low pressure feed lines and discharge lines leading to and from the rotor ports; the method comprising the steps of

(a) continuously feeding liquid, containing the hard particulate material, under low pressure in a low pressure feed line into

a first of the housing ports for entry into a through-going pocket of the rotor;

(b) rotating the rotor in a given direction of rotation, so that the pocket openings therein progressively rotate past each of the housing ports;

(c) providing low pressure withdrawal of liquid introduced through the first port from through-going pockets of the rotor through a third port of the housing into a low pressure discharge line, opposite the first port, and screening the particulate material above a predetermined size out of the liquid passing through the third port with the at least one screen;

(d) pumping liquid under high pressure in a high pressure feed line toward the rotor through a fourth port of the housing, the fourth port being located before the first port in the direction of rotation of the rotor, and between the first and third ports;

(e) providing withdrawal of liquid and material through a second port, located opposite the fourth port, into a high pressure discharge line;

(f) withdrawing a portion of the liquid, while under high pressure, from the high pressure discharge line to increase the solids concentration in the high pressure discharge line; and

(g) returning liquid withdrawn in step (f) to the high pressure feed line, boosting the pressure thereof so that it corresponds generally to the pressure of the liquid in the high pressure feed line.

4,415,297

## VACUUM MATERIAL TRANSPORTING SYSTEM

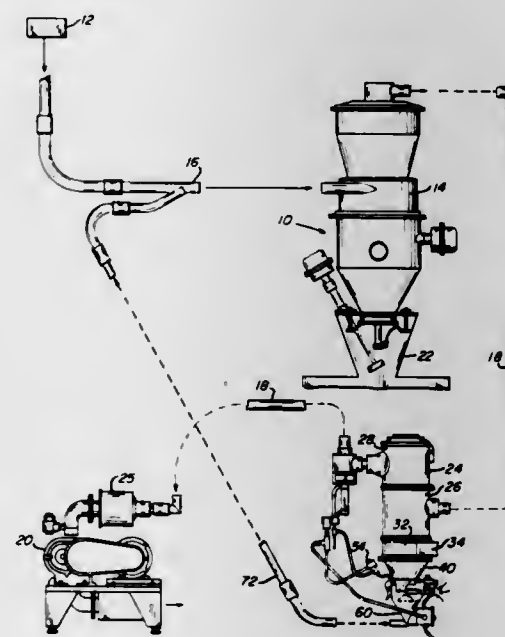
Douglas J. Boring, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed May 14, 1979, Ser. No. 38,391

Int. Cl.<sup>3</sup> B65G 53/60

U.S. Cl. 406—168

7 Claims



1. In a particulate material conveying system wherein particulate material is conveyed from a source of such particulate material for spaced periods of time with respect to selected particulate receiving means of a plurality of particulate receiving means by entraining the particulate material in an airstream created by a selectively actuatable vacuum pump connected to the downstream end of a vacuum line cooperable with such a source and each of said particulate receiving means and during which periods lightweight fines of the particulate material flow through the vacuum line, the improvement comprising: continuously removing, during each period said particulate material is being conveyed, such lightweight fines from the section of said vacuum line extending between said vacuum pump and of the one of said particulate receiving means closest to said vacuum pump in terms of said particulate material flow

while simultaneously accumulating the removed lightweight fines at a first location subject to the vacuum in said vacuum line; discontinuing the vacuum in said vacuum line at the end of each period particulate material is being conveyed; discharging said accumulated light-weight fines from said first location to a second location in material flow communication with said first location only during periods said vacuum in said vacuum line is discontinued and retaining such discharged lightweight fines at said second location, and subsequently recirculating said lightweight fines retained at said second location to said vacuum line when a vacuum exists therein.

4,415,298

## FREIGHT LASHING AND LOCKING MECHANISM

Werner Voigt, Wehlheim, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

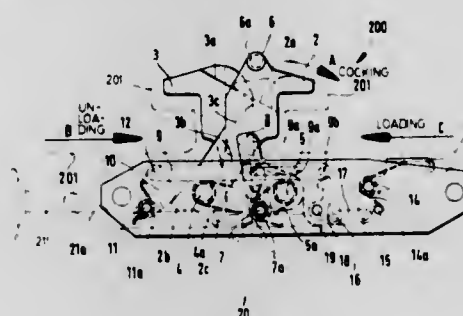
Continuation-in-part of Ser. No. 125,184, Feb. 27, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,329

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027160

Int. Cl.<sup>3</sup> B60P 7/08; B64D 9/00

U.S. Cl. 410—69

5 Claims



1. A freight lashing and locking mechanism, especially for a loading space in an aircraft, comprising two outer frame side walls arranged in parallel to each other and defining a space of given width between said side walls, an inner bracing member (1') extending in parallel to and between said two outer frame side walls for dividing said space into a larger space along one side wall and into a smaller space along the other side wall, crosswise extending means operatively interconnecting said side walls and bracing member to form a frame, operating components including first and second freight lashing claws (2, 3) and respective first and second journal means (4, 5) in said larger space for tilting substantially in unison in one or the opposite direction, each of said freight locking members having a respective slanting wedging surface (2a, 3a) for cooperation with each other to lock the lashing claws (2, 3) into an upright freight lashing position, first and second torque springs (4a, 5a) operatively installed in said frame for holding the respective freight lashing claw in the freight lashing position, a foot lever (6) and cam means (6a) operatively secured to one of said lashing claws which cooperate for cocking the lashing claws (2, 3) in unison into a recessed position in said larger space prior to a loading operation, cocking release means (8) journaled (at 7) in said frame, first connecting means (8a, 9, 9a, 9b, 10, 12) operatively connecting said cocking release means (8) to said first freight lashing claw (at 2b), said release means (8) extending in a working position above a top edge of an adjacent one of said frame side walls for actuation by a freight item and below the top edge of said adjacent frame side wall in a standby position, a foot pedal (13) journaled (at 14) and biased (at 14a) in said frame, second connecting means (16, 17, 18, 19) operatively connecting said foot pedal (13) to the first connecting means (at 9b) for returning said release means (8) from said standby position into said working position, said foot lever (6), said release means (8), said foot pedal (13) and said first and second, connecting means being operatively mounted in said smaller space substantially alongside said first and second lashing claws (2, 3) for easy access by an operator,

whereby all of said operating components are operable manually, semiautomatically and automatically without any structural changes.

4,415,299

## ANCHORING RETAINER FOR THREADED FASTENERS

Jon D. Smith, Fenton, and Glenn T. Parker, Ortonville, both of Mich., assignors to Dry Dock Industries, Inc., Fenton, Mich.

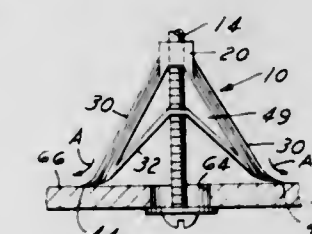
Continuation of Ser. No. 929,689, Jul. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 803,806, Jun. 6, 1977, Pat. No. 4,143,581. This application Jul. 17, 1980, Ser. No.

169,576

Int. Cl.<sup>3</sup> F16B 13/04

U.S. Cl. 411—340

8 Claims



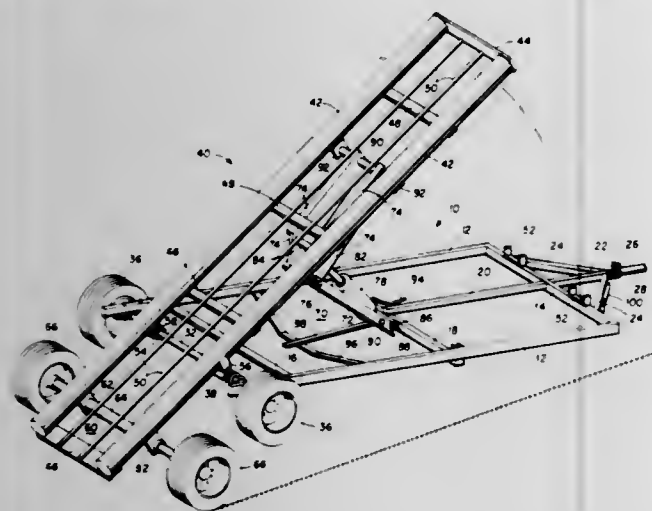
1. A retainer for mounting at one side of a supporting structure having an opening therein, said retainer being bendable and inserted from the other side of the supporting structure through said opening and thereafter returning to its initial shape due to its design and the resiliency of the material thus to engage the one side of the supporting structure, said retainer being adapted to be used with a threaded element which extends from the other side of the supporting structure through the opening into the retainer, said retainer comprising a flexible unitary one-piece body made from a plastic material, said body having an axis which is adapted to extend through the opening in the supporting structure, said body being of generally triangular configuration and having at the apex thereof a sleeve provided with a sleeve opening surrounding said axis, said sleeve being of rectangular cross section and having two pairs of opposing edges, said sleeve at one pair of opposing edges being provided with a pair of integrally formed outwardly diverging elongated flexible legs, the outer ends of said legs being adapted to engage the one side of the supporting structure, each of said legs having a width generally equal to the distance between the other pair of opposing edges of said sleeve, and an elongated flexible control strut spaced axially from said sleeve and located entirely between said legs, said strut having the ends thereof integrally connected to the outer ends of said outwardly diverging elongated flexible legs for limiting the spread of said legs, said control strut being of V-shape and including a central strut portion located axially beneath and spaced from said sleeve and a pair of outwardly diverging strut portions, each of said outwardly diverging strut portions being integrally connected to said central strut portion and to one of the flexible legs near the outer end thereof, said central strut portion having a central aperture axially aligned with and spaced from said sleeve opening and through which the threaded element is adapted to extend, said control strut being adapted to be moved away from said sleeve and towards the one side of the supporting structure and to be placed in tension thereby bending said outwardly diverging flexible legs and placing same in compression upon the threading of the threaded element into the opening in said sleeve, the outer ends of said legs being provided with relatively thin flexible tips which are adapted to engage the one side of the supporting structure for frictional contact and to direct easy movement of the legs.



**4,415,300**  
**TRANSPORTER-UNLOADER FOR LARGE**  
**CYLINDRICAL HAY BALES**

Mark J. Boddicker, R.R. #2, Box 124, Walker, Iowa 52352  
Filed Sep. 22, 1981, Ser. No. 304,343  
Int. Cl.<sup>3</sup> A01D 87/12; B60P 1/18  
U.S. Cl. 414—24.5

5 Claims



1. A transporter-unloader for large, generally cylindrical hay bales of the kind described comprising: a longitudinally extending and rigid main frame having front and rear ends, the front end being adapted for connection to tractor means; a longitudinally extending load frame for carrying said bales having front and rear ends, a forward portion of the load frame longitudinally overlying and supported by the main frame, an after portion of the load frame extending aft of the rear end of the main frame, the load frame being pivotally connected to the main frame about an axis transverse with respect to both frames, said axis being disposed adjacent the rear end of the main frame and between said forward and after portions of the load frame effective so that the load frame may be raised from a bale transport position to selected inclined bale unloading positions relative to the main frame; means to raise the load frame to and maintain the same in said unloading positions; a first pair of wheels disposed laterally outboard of the load frame and adjacent and supporting the rear end of the load frame off the ground when the load frame is in its unloading position; and a second pair of wheels disposed laterally outboard of the main and load frames and adjacent the rear end of the main frame, one pair of said wheels being disposed off the ground when the transporter-unloader is unloaded and in its bale transport position, the other pair of said wheels engaging the ground when the transporter-unloader is loaded or unloaded and in its bale transport position, the load frame being adapted to receive and position the hay bales sequentially therealong with their axes disposed generally lengthwise of the load frame and to permit the hay bales to slide sequentially off the rear end of the load frame onto the ground when in its bale unloading position as the transporter-unloader is moved forwardly.

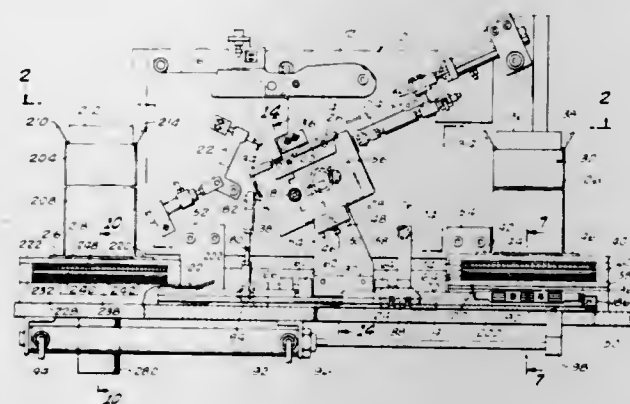
**4,415,301**  
**CASSETTE HANDLING DEVICE**

Darrell W. Zielke, Valencia, Calif., assignor to West American Sound, Inc., North Hollywood, Calif.  
Filed May 19, 1980, Ser. No. 151,326  
Int. Cl.<sup>3</sup> B65G 57/30, 60/00

20 Claims

18. A cassette handling device comprising a station for receiving individual cassettes in a first horizontal orientation; a magazine positioned above said station and designed and constructed to retain a stack of cassettes in horizontal orientations rotated from said first orientation; a stationary gate between said station and said magazine for

passage of cassettes therethrough, said stationary gate being aligned with said station; and a pivotally mounted gate positioned between said magazine



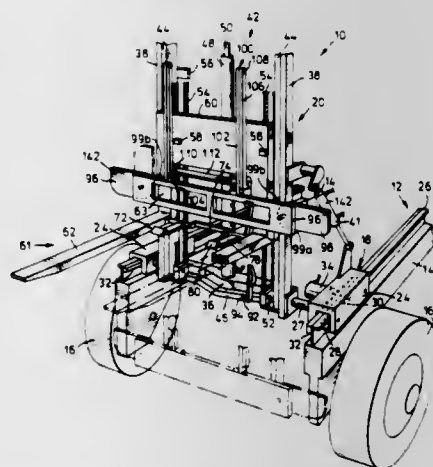
and said stationary gate for passage of cassettes therethrough, said pivotally mounted gate being selectively alignable with said stationary gate and with the cassettes in said magazine.

**4,415,302**  
**PALLET RETRIEVING MECHANISM FOR FORKLIFT**  
**VEHICLE**

Gerardus J. Brouwer, Keswick, and William T. Arnold, Sutton West, both of Canada, assignors to Brouwer Turf Equipment Limited, Toronto, Canada  
Filed Aug. 27, 1981, Ser. No. 296,921  
Int. Cl.<sup>3</sup> B66F 9/10, 9/19

U.S. Cl. 414—417

4 Claims



1. A vehicle comprising:

- (a) a pair of forks facing in a predetermined direction for supporting a pallet,
- (b) a frame,
- (c) a fork carriage,
- (d) means mounting said fork carriage on said frame for movement back and forth in said direction between an extended outer position and a retracted inner position,
- (e) means mounting said forks in said fork carriage and for raising and lowering said forks,
- (f) stop means mounted on said frame in a position such that when said forks are in said extended position a pallet supported thereon is located outwardly of said stop means and such that said forks may be withdrawn inwardly of said stop means,
- (g) a gate;
- (h) and means for supporting said gate outwardly of said stop means and extending across said forks, so that when said gate is located between the contents of a pallet on said forks and said stop means and then said fork carriage is withdrawn inwardly, movement of said gate inwardly will be prevented by said stop means and said gate will act to discharge the contents of said pallet onto the ground,

(i) said means (h) comprising:

- (i) link means pivotally connected to said forks and to said gate and extensible between a first folded position in which said gate is supported by said link means over the rear of said forks and a second extended position in which said gate is supported by said link means over the fronts of said forks,
- (ii) and means biasing said link means to said first position,
- (j) said link means comprising: two pairs of links, each said pair having a first link pivotally connected to said forks and a second link pivotally connected to said gate, said first and second links each extending substantially vertically when said link means is in said first position, the upper ends of said first and second links being pivotally connected together,
- (k) said vehicle including a cross shaft connected between said forks at the rear thereof, said first links being fixed to said cross shaft, said biasing means including spring means within said cross shaft.

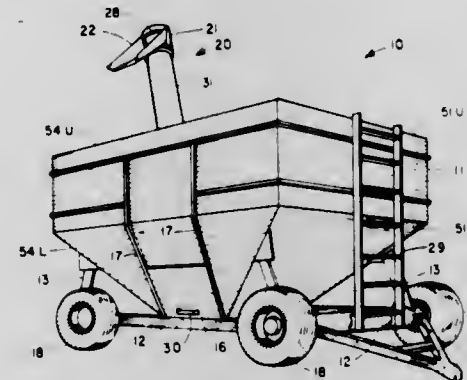
**4,415,303**  
**AUGER WAGON**

Neal W. Westendorf, and Joseph W. Langenfeld, both of Onawa, Iowa, assignors to Westendorf Manufacturing Company, Onawa, Iowa

Filed May 14, 1981, Ser. No. 263,403  
Int. Cl.<sup>3</sup> B60P 1/40

U.S. Cl. 414—519

9 Claims



1. An auger wagon comprising:

- a wheel mounted frame,
- a container box operably mounted on said frame wherein said container box comprises an open top, inwardly sloping lateral walls, and a box floor attached at its periphery to said lateral walls, and
- a single auger means mounted on the floor of said container box for transporting particulate matter,
- said auger means comprising an auger housing and an auger screw operably mounted within said auger housing,
- said auger means comprising a top end and a bottom end and wherein said bottom end of said auger means is pivotally connected to said box floor, the distance between the top and bottom of said auger means being greater than the distance between said point of pivotal attachment and any point on the walls of said box,
- said auger floor comprising an auger well positioned at the point of auger means attachment adapted to allow inclination of said auger means against the walls of said box,
- said auger means comprising an auger head, for directing the outflow of particulate material, pivotally mounted at the top of said auger means wherein the pivot axis of said auger head is coaxial with the longitudinal axis of said auger screw,
- said auger means comprising an auger housing openings positioned in said housing near the bottom of said auger means for allowing the inflow of particulate matter into said auger means, said auger means comprising an auger cover positioned at the bottom of said auger means in enclosing relationship with said housing openings for

selectively covering and uncovering said housing openings,

said auger means comprising a first motor means operably attached to said auger screw for turning said auger screw,

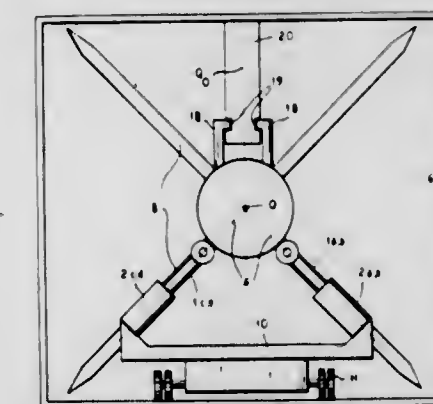
said auger means comprising a second motor means operably attached to said auger head for selectively rotating said auger head,

said auger means comprising an elongate cover handle operably attached to said auger cover and mounted on the bottom exterior surface of said box floor for selectively rotating said auger cover with respect to said housing openings.

**4,415,304**  
**SYSTEM FOR FLOATINGLY SUPPORTING A LOAD**  
Antonino Tripoli; Bruno Baldi, and Bruno Piacentini, all of Rome, Italy, assignors to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy  
Filed Jan. 25, 1982, Ser. No. 342,392  
Claims priority, application Italy, Jan. 26, 1981, 47638 A/81  
Int. Cl.<sup>3</sup> B66F 5/00

U.S. Cl. 414—589

5 Claims



1. A system for floatingly supporting an elongate load in a recumbent position to enable manual alignment thereof with a predetermined horizontal reference line, comprising a first and a second pair of hydraulic jacks disposed in respective vertical planes perpendicular to said reference line, the jacks of each pair lying below the level of said reference line on opposite sides of another vertical plane including said reference line and having inclined axes intersecting in the vicinity of said reference line, each of said jacks being provided with a single-acting piston movable along the axis thereof for engagement with a load whose center of gravity lies substantially midway between respective vertical planes, said jacks being connected to a source of hydraulic fluid under a pressure substantially balancing the weight component of the engaged load acting upon the respective piston.

**4,415,305**  
**HANDLING APPARATUS**  
Mitsuro Tsubuku, and Tadanobu Yoshihiro, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan  
Continuation-in-part of Ser. No. 103,840, Dec. 12, 1979, abandoned. This application Mar. 3, 1982, Ser. No. 354,270  
Claims priority, application Japan, Dec. 12, 1978, 53-154365; Fed. Rep. of Germany, Dec. 11, 1979, 2949745  
Int. Cl.<sup>3</sup> B65G 57/03

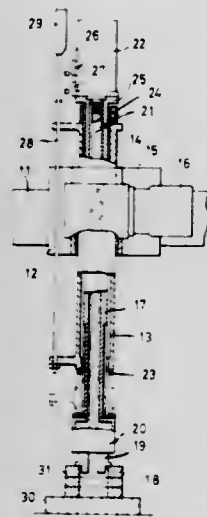
U.S. Cl. 414—753

4 Claims

1. A handling apparatus, comprising: a guide rail (11), a frame (12) laterally movable along said guide rail, a hollow cylindrical arm (13) movable in a vertical direction, an operating rod (21) passing through said hollow cylindrical arm, an inner cylinder (17) positioned within said cylindrical arm and around said operating rod, a spring (23) disposed between ends of said inner cylinder and said cylindrical arm for biasing said inner cylinder downwardly, stop means for said spring, clamp-



ing means (20) coupled to a lower end of said inner cylinder for clamping a top one of stacked workpieces (31), a controller (22) having a frame coupled to an upper end of said inner cylinder and being operationally coupled to said operating rod for operating said clamping means, a contact portion of said clamping means for contacting and sensing the uppermost surface of the workpiece whereby when the contact portion



abuts against the uppermost surface of the workpiece only said cylindrical arm may be further lowered, switch means (26, 27) mechanically coupled to said controller for controlling movements of said cylindrical arm, and dog means (29) coupled at one end portion to said cylindrical arm and having a second end portion positioned adjacent said switch means for operating said switch means in accordance with the relative vertical positions of said cylindrical arm and said inner cylinder.

#### 4,415,306 TURBINE

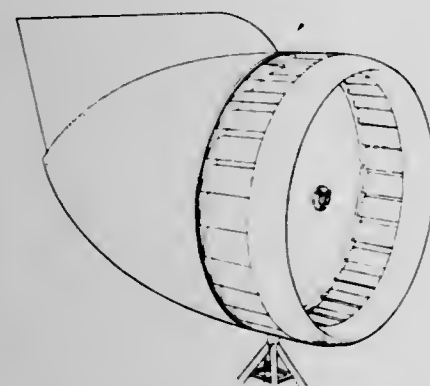
Kenneth J. Cobden, Flat 1, 369 Deakin Ave., Mildura, Victoria 3500, Australia

Filed Apr. 20, 1982, Ser. No. 370,283

Int. Cl.<sup>3</sup> F03D 1/04

U.S. Cl. 415—2 A

14 Claims



1. A fluid turbine unit to deliver power extracted from a moving fluid, the turbine having a turbine wheel mounted for rotation about an axis parallel to the fluid flow, a plurality of cantilever vanes mounted on said turbine wheel and extending to forward vane ends, an inlet fairing mounted for rotation adjacent the forward vane ends of said vanes, said inlet fairing having a cross-section which provides an aero-foil section such that fluid flowing over the outside of the inlet fairing is accelerated relative to the fluid flowing into the turbine, said vanes being situated in a passage through the aero-foil section at a position corresponding generally to the center of lift of the aero-foil section whereby the fluid flows through the passage to the lower pressure area of the aero-foil section to act on the turbine vanes.

#### 4,415,307 TEMPERATURE REGULATION OF AIR CYCLE REFRIGERATION SYSTEMS

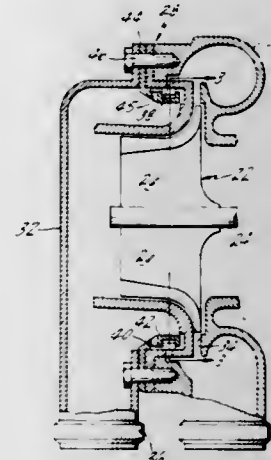
William E. Fortmann, West Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 9, 1980, Ser. No. 157,774

Int. Cl.<sup>3</sup> F01D 17/00

U.S. Cl. 415—12

3 Claims



1. A turbine for an air cycle refrigeration system said turbine comprising a rotor provided with a plurality of blades and a stator, said stator receiving air through an inlet thereof, said air being expanded and cooled in said turbine and delivered from said turbine through an outlet thereof, said turbine being characterized by said stator having a plurality of bypass ports therewithin, said bypass ports communicating with said inlet and outlet and accommodating airflow from said inlet to said outlet, bypassing said rotor, said stator further including therewithin an annular, bimetallic valve element disposed adjacent said bypass ports in selective sealing relation thereto, said bimetallic valve member being responsive to the temperature of airflow through said turbine by variations in the diameter of said valve member for adjusting the effective area of said bypass ports thereby adjusting the amount of airflow there-through, and selectively varying the amount of heat removed from said air by said turbine.

#### 4,415,308 PUMP FOR SUPPLYING KEROSENE TO COMBUSTION APPARATUS

Teruo Maruyama, Neyagawa; Hiroo Ohshima, Nara; Fumio Iwai, and Yoshikazu Abe, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

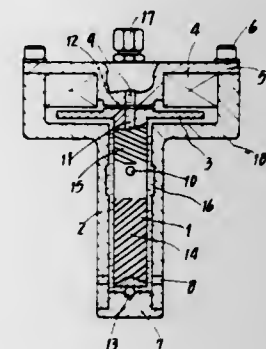
Filed Apr. 9, 1981, Ser. No. 252,595

Claims priority, application Japan, Apr. 15, 1980, 55-49708

Int. Cl.<sup>3</sup> F01D 5/00, 11/00

U.S. Cl. 415—72

8 Claims



1. A pump for supplying kerosene to a combustion apparatus comprising: housing means provided therein with a passage and having an inlet and outlet,

rotor means entirely accommodated within said housing means and including a shaft disposed in said passage of said housing means, said shaft and said passage having radially opposed surfaces, stator means carried by said housing means for electromagnetically rotating said rotor means relative to said housing means,

pumping groove means formed in one of said radially opposed surfaces of said shaft and said passage for forcing the kerosene along said groove means by the rotation of said shaft and for forming a fluid bearing between the shaft surface and the passage surface by the kerosene, said pumping groove means comprising a helical groove formed in said surface of said shaft on a first axial portion of said shaft at one end thereof, said rotor means is provided at the other end of said shaft, and a sealing helical groove is formed on a second axial portion of said shaft adjacent to said rotor means, said sealing helical groove being inclined in a direction opposite to the inclination of said pumping helical groove, an axial channel provided in said shaft and communicating with said outlet of said housing means, and a port provided in said shaft intermediate said first and second axial portions thereof and extending between said channel and said surface of said shaft, said port being adapted to conduct kerosene from said pumping groove means to said axial channel, wherein said pumping groove means has a groove depth  $h_0$  defined by

$$0.00558q\mu < h_0 < 250\mu$$

where  $q$  is the heat output of the combustion apparatus in kcal/h.

#### 4,415,309 GAS TURBINE ENGINE SEAL

Leslie G. Atterbury, Herts, England, assignor to Rolls-Royce Limited, London, England

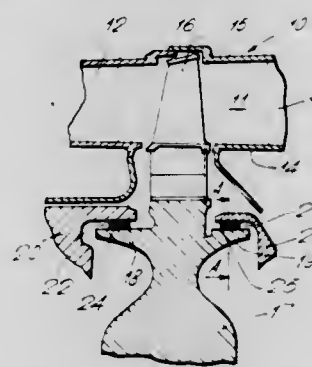
Filed Feb. 12, 1981, Ser. No. 235,158

Claims priority, application United Kingdom, Mar. 1, 1980, 8007039

Int. Cl.<sup>3</sup> F04D 29/08; F02F 11/00

U.S. Cl. 415—170 R

8 Claims



1. A gas turbine engine provided with a seal for providing a gas seal between first and second relatively rotatable annular gas turbine engine components, said seal comprising an annular element attached to the first of said components and consisting of a woven fabric having metallic warp filaments, metallic weft filaments and metallic warp pile filaments, said warp pile filaments having free ends extending from one surface of said woven fabric and which are non-looped and looped ends forming part of another surface of said woven fabric, and means directly attaching said another surface of said woven fabric of said annular seal element including said warp filaments, said weft filaments and said looped ends of said warp pile filaments directly to said first engine component so that the non-looped free ends of said metallic warp pile filaments extending from the one surface of said woven fabric abut said second engine component in sealing engagement, said means including form-

ing at least some of said metallic filaments from a brazing alloy to permit the at least some of said filaments formed of the brazing alloy to be directly brazed to said first engine component thereby preventing capillary flow of the brazing alloy into the warp pile filaments.

#### 4,415,310 SYSTEM FOR COOLING A GAS TURBINE BY BLEEDING AIR FROM THE COMPRESSOR

Jean G. Boullier, Brunoy; Francois E. G. Crozet, Yerres, and Marcel R. Soligny, Chevilly-Larue, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

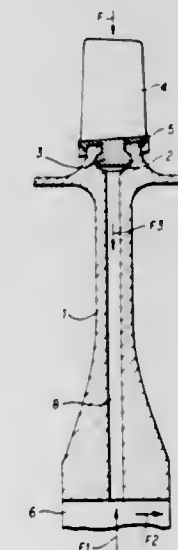
Filed Oct. 6, 1981, Ser. No. 309,210

Claims priority, application France, Oct. 8, 1980, 80 21454

Int. Cl.<sup>3</sup> F01D 5/08

U.S. Cl. 416—95

5 Claims



1. A system of bleeding air from a compressor for cooling a gas turbine element having at least one compressor blade bearing disc, said system comprising: at least one radial duct in each said disc, each said duct extending in the plane of a respective at least one said disc to the radially outer periphery thereof; platforms associated with said compressor blades and covering at least a portion of the radially outer periphery of each said disc; and ports formed in said platforms for each said at least one radial duct, wherein said ports are elliptical in cross section, the large axis of each said elliptical shape being perpendicular to the overall flow of fluid in said turbine, whereby air is channeled through said ports and said radial ducts into the center of said gas turbine towards said turbine element.

#### 4,415,311 VERTICAL SHAFT WINDMILL

David C. Grana, Hampton, and Spencer V. Inge, Jr., Poquoson, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 28, 1982, Ser. No. 383,063

Int. Cl.<sup>3</sup> F03D 7/06

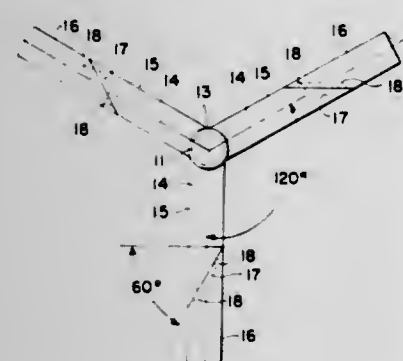
U.S. Cl. 416—117

3 Claims

1. An improved windmill design comprising: a vertical shaft mounted for rotation; several straight elongated horizontal flat surface blades attached to said vertical shaft and radiating therefrom with the centerline of each blade from end to end is on a straight line that passes through the center of said shaft; each of said blades separated into an inboard section attached to said vertical shaft with its flat surface up and an outboard section said inboard section and outboard sec-



tion separated along a straight line making an angle of greater than zero and less than 90° with a line perpendicular to the centerline of said blade;  
hinge means for hinging said outboard section to said inboard section along said straight line making an angle greater than zero and less than 90° with a perpendicular to the centerline of said blade; and  
said hinge means including means for restricting the motion of said hinge means between a position where the combined outboard section and inboard section form a flat surface and the position where the outboard section sur-



face is at a 90° angle with the inboard section surface when the weight of said outboard section hinges it downward; whereby whenever said windmill is at rest all of said outboard sections will be perpendicular to said inboard sections and then when the wind begins to blow at least one of said outboard sections will be forced against its corresponding inboard sections creating a torque on said shaft causing it to rotate and whenever the velocity of the wind increases to a certain level the centrifugal force will cause all inboard sections to be hinged to their flat positions resulting in no increased torque on the shaft with further increases in wind velocity.

4,415,312

## TRANSVERSE AXIS FLUID TURBINE

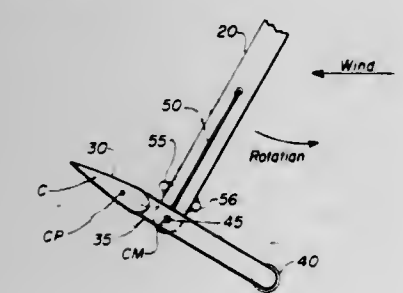
Ben Brennehan, Lynchburg, Va., assignor to Wixlin, Inc., Lynchburg, Va.

Filed Mar. 11, 1982, Ser. No. 356,944

Int. Cl.<sup>3</sup> F03D 7/06

U.S. Cl. 416—119

12 Claims



1. A fluid turbine having a predetermined maximum permissible rotational speed comprising  
a rotation axis transverse to the direction of fluid flow,  
at least two blade assemblies spaced from and mounted for balanced rotation about the rotation axis,  
each blade assembly including an elongated blade having a streamlined cross-section and a span parallel to the rotation axis,  
each blade assembly being pivotable about a pivot axis which is parallel to and spaced from the rotation axis,  
each blade assembly being so constructed and positioned that the chord of its blade lies along a line which intersects the assembly's pivot axis and is perpendicular to a radius from the rotation axis to the pivot axis when the assembly is undisturbed,  
the pivot axis of each blade assembly being located circum-

ferentially ahead of the center of pressure of the blade with respect to the direction of turbine rotation, and  
each blade assembly being so constructed that its center of mass is located at its pivot axis,

characterized in that

each blade assembly includes elastic means which tend to return the assembly to its undisturbed position whenever fluid or inertial forces cause it to pivot away from such position,

the elastic means having stiffness characteristics such that reverse flow of fluid over the blade creates a predetermined minimum fluid velocity at which turbine rotation is to begin,

the blade assembly having a predetermined mass moment of inertia which in combination with said stiffness characteristics of said elastic means imparts to said blade assembly a natural frequency about its pivot axis in cycles per second equal to said predetermined maximum permissible rotational speed of the turbine in revolutions per second.

4,415,313

## HYDRAULIC GENERATOR WITH FREE-PISTON ENGINE

Pierre Bouthors, Croissy sur Seine, and Olivier Breting, Cormeilles en Parisis, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

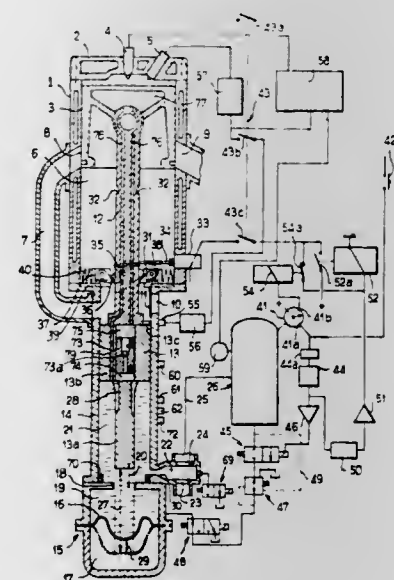
Filed Aug. 5, 1981, Ser. No. 290,319

Claims priority, application France, Aug. 5, 1980, 80 17288

Int. Cl.<sup>3</sup> F04B 17/00

U.S. Cl. 417—38

17 Claims



1. A hydraulic pressure generator comprising:  
an internal combustion engine having a cylinder and a free piston;  
a hydraulic pump housing;  
at least one hydraulic fluid pumping piston in said hydraulic pump housing and movable with said free piston, each said pumping piston having a reduced diameter portion;  
hydraulic fluid in a pumping chamber of said housing defined by said pumping piston for being pumped by movement of said pumping piston;  
a hydropneumatic return cushion in fluid communication with said chamber of said housing via an aperture, wherein said reduced diameter portion of said pumping piston closes said aperture during the stroke of said free piston;  
means for locking said free piston in a bottom dead center position;  
control means for controlling said means for locking;  
a hydraulic accumulator in fluid communication with said fluid in said chamber of said housing;  
sensor means for detecting the fluid pressure in said accumulator; and

manual means for actuating said means for locking, wherein said control means is operative to actuate said means for locking when said sensor means detect a first high pressure, and operative to deactivate said means for locking when said sensor means detect a second low pressure.

4,415,314

## METERING PUMP

Anthony G. Chappell, Mosman, Australia, assignor to Wellcome Australia Limited, Sydney, Australia

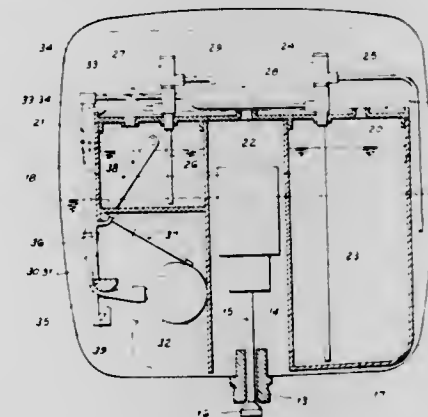
Continuation of Ser. No. 144,320, Apr. 28, 1980. This application Jul. 12, 1982, Ser. No. 397,203

Claims priority, application Australia, May 4, 1979, PD8634

Int. Cl.<sup>3</sup> F04F 1/02; F04B 35/02, 43/08; E03D 9/02

U.S. Cl. 417—131

5 Claims



1. A pump positioned in a first liquid reservoir operable by the rise and fall of liquid within the reservoir, said pump comprising a pump chamber having intake and discharge ports and normally closed intake and discharge valves in said ports, a tube formed of resiliently deformable material, said tube having a closed first end and an open second end, said open second end being in communication with the pump chamber, a float device coupled to the tube adjacent the first closed end, the float device, together with the closed first end of the tube, being movable upwardly and downwardly with the rise and fall of liquid within the reservoir, means defining an abutment surface which is engageable by a wall portion of the tube intermediate the first and second ends of the tube, the abutment surface being disposed such that the tube is caused, by engagement with the abutment surface with movement of the liquid in one direction within the reservoir, to be constricted and is caused to expand with movement of the liquid in a direction away from the abutment surface to thus alternately increase the pressure in the pump chamber and decrease the pressure in the pump chamber to thus alternately simultaneously open the intake valve and close the discharge valve and simultaneously close the intake valve and open the discharge valve.

4,415,315

## SWASH-PLATE TYPE COMPRESSOR HAVING AN IMPROVED LUBRICANT OIL FEEDING ARRANGEMENT

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,229

Claims priority, application Japan, Nov. 6, 1980, 55-156903

Int. Cl.<sup>3</sup> F04B 1/16, 1/18

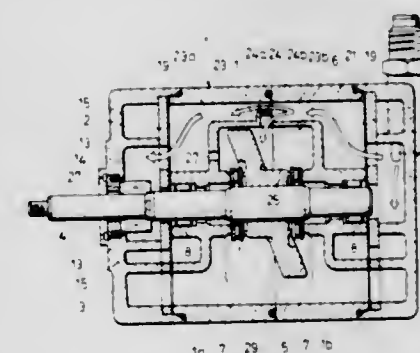
U.S. Cl. 417—269

9 Claims

1. In a swash-plate type compressor of the type having a pair of cylindrical members joined together in axial alignment and forming a cylinder block; a pair of cylinder heads secured to opposite ends of said cylinder block, said cylinder heads having first and second low pressure chambers defined therein, respectively, said first low pressure chamber having a refrigerant gas suction port opening therein; a pair of valve plates interposed between said cylinder block and said cylinder

heads; means defining a suction passageway extending through said cylinder block and said valve plates at a radially outer location in said cylinder block for guiding suction refrigerant gas containing lubricant oil from said first low pressure chamber to said second low pressure chamber; and means defining a swash plate chamber at a substantially central location in said cylinder block, said swash plate chamber accommodating a swash plate secured on a drive shaft and engaging pistons slidably received within cylinder bores of said cylinder block for causing reciprocating motions of said pistons; said suction passageway defining means and said swash plate chamber defining means including a partition wall separating said suction passageway from said swash plate chamber and having an axially extending lateral wall portion and opposite radially extending end wall portions,

the improvement comprising  
means defining a refrigerant gas inlet opening in said lateral



wall portion of said partition wall and communicating said suction passageway with said swash plate chamber, said refrigerant gas inlet opening having one end thereof opening in said suction passageway and directed upstream in a refrigerant gas flow in said suction passageway, at least one of said opposite end wall portions of said partition wall being formed with at least one refrigerant gas outlet opening communicating said swash plate chamber with said suction passageway;

said refrigerant gas inlet opening defining means comprising a guide wall having a radial wall portion extending into said suction passageway at a predetermined angle to the direction of said refrigerant gas flow in said suction passageway, and an axial wall portion axially extending integrally from said radial wall portion and directed upstream in said refrigerant gas flow, said refrigerant gas inlet opening being defined along said axial wall portion and said radial wall portion.

4,415,316

## DOWN HOLE MOTOR

Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Apr. 27, 1981, Ser. No. 258,143

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019308

Int. Cl.<sup>3</sup> F01C 1/107, 5/02; F03C 2/08

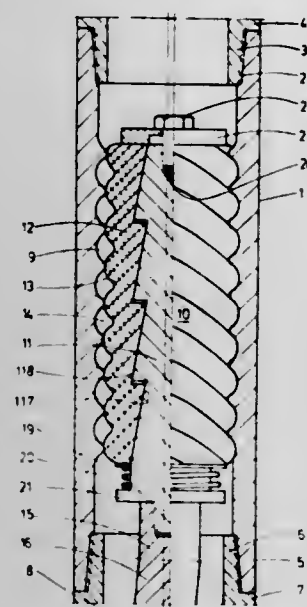
U.S. Cl. 418—48

5 Claims

1. Cutting tool direct drive moineau motor for deep-hole boring tools, consisting of a housing which a fluid can stream through in an axial primary direction from an inlet end to an outlet end and a shaft located in the housing which is rotatable and, to a limited extent, radially displaceable; the shaft and housing having molded surfaces turned toward each other which engage one another at contacting surfaces in the manner of helical gearing and mutually defining a cavity for a liquid or gaseous working (energizing) medium, which, during a passage through the cavity, traces a current path which approximates a helical path which is at least single-threaded and at least single stage; one of the two molded surfaces being formed into a molded body made of an elastically deformable material



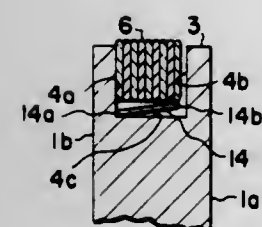
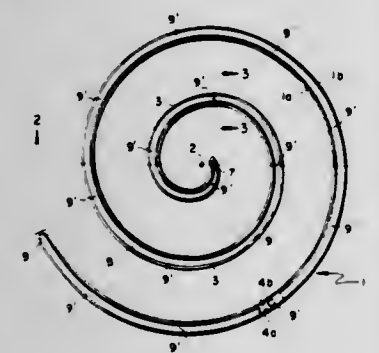
and being supported internally by a support member; characterized by the fact that the molded body and the support are displaceable when fluid pressure acts upon the motor; and that



the contact surfaces of the elastically deformable molded body and the support member are sloped in a direction whereby the molded body is expanded thereby adjusting the seating action of the motor to the pressure of the energizing fluid.

**4,415,317**  
**WRAP ELEMENT AND TIP SEAL FOR USE IN FLUID APPARATUS OF THE SCROLL TYPE**  
Arthur L. Butterworth, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.  
Filed Feb. 9, 1981, Ser. No. 232,526  
Int. Cl.<sup>3</sup> F01C 1/02, 19/08; F16J 15/34  
U.S. Cl. 418-55

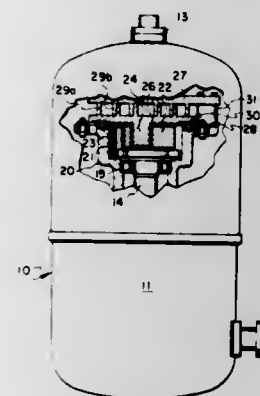
39 Claims



1. A tip seal for use in fluid apparatus of the scroll type comprising a plurality of strips of material arranged in side-by-side relationship and extending along longitudinal axes in generally spiroidal configuration about an axis, each said strip having a width measured in a generally radial direction with respect to said axis and a height measured in an axial direction, said strips being relatively flexible about an axis extending generally parallel to their height, and relatively inflexible about an axis extending generally parallel to their width.

**4,415,318**  
**ROLLING THRUST BEARING FOR USE IN A SCROLL MACHINE**  
Arthur L. Butterworth, and David H. Eber, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.  
Filed Dec. 10, 1981, Ser. No. 329,148  
Int. Cl.<sup>3</sup> F01C 1/02, 21/02; F16C 33/38, 41/02  
U.S. Cl. 418-55

16 Claims



1. In a positive fluid displacement apparatus of the scroll type, including an orbiting scroll plate having an attached involute wrap element, a thrust bearing comprising  
a. a supporting frame;  
b. a first and second bearing race, disposed respectively on the supporting frame and on a side of the orbiting scroll plate opposite the wrap element, each bearing race being of generally angular shape, having substantially flat, parallel surfaces facing toward each other, said facing surfaces moving in planar orbital motion relative to each other;  
c. a bearing cage of generally annular shape disposed between the first and second bearing races and confined within an annular formation having at least one sidewall adjacent one of the first and second bearing races, said bearing cage being free to rotate about a central axis within said annular formation, and including a plurality of spaced cavities having their centers on a circle about the axis and opening onto the adjacent facing surfaces of the first and second bearing races; and  
d. a plurality of ball bearings disposed within said cavities, describing orbital paths while in rolling contact with the first and second bearing races and thereby operative to transmit an axial force from the supporting frame as the first and second bearing races orbit relative to each other, said bearing cage being operative to rotate about its axis due to frictional forces resulting from the bearing cage at least intermittently coming into contact with a sidewall of the annular formation in which it is confined so that the ball bearings disposed in the cavities contact the first and second bearing races over a distributed surface area thereof, thereby extending the operational life of the thrust bearing.

**4,415,319**  
**PUMP UNIT**  
Naosuke Masuda; Takeshi Ohe, and Tadaaki Fujii, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

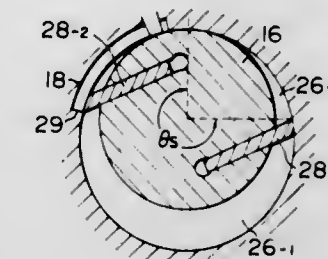
Filed Aug. 11, 1981, Ser. No. 291,874  
Int. Cl.<sup>3</sup> F01C 11/00, 19/08

U.S. Cl. 418-135

3 Claims

1. A vane-type pump unit, comprising:  
a housing having a circular opening therein with a first section having a first diameter and a second section having a second diameter greater than said first diameter so that a step is formed therebetween;  
first and second axially spaced pump sections received in said opening, one of said pump sections having a diameter conforming to one of said first and second diameters, the other of said pump sections having a diameter conforming

to the other of said first and second diameters, said pump sections together having three axially spaced sideplates, one of said sideplates being oriented between said pump sections and defining a common sideplate, said common sideplate having a stepped peripheral surface thereon conforming to each said first and second diameters, said step between the peripheral surfaces on said common sideplate engaging said step in said opening in said housing, said first pump section conforming to said first diameter of said housing and having a first cam ring with a first cam surface thereon, and includes a first sideplate and a first side portion of said common sideplate straddling said first cam ring, said second pump section conforming to said second diameter of said housing and having a second cam ring with a second cam surface thereon, and includes said second sideplate and a second side portion of said common sideplate straddling said second cam ring;  
a shaft having a pair of axially spaced rotors thereon radially aligned with a respective one of said first and second cam rings and said cam surfaces thereon, each said cam surface having a central axis radially offset from the axis of said shaft and said rotors mounted thereon, each said rotor having plural vanes reciprocally mounted thereon and slidably engaging said respective cam surface;

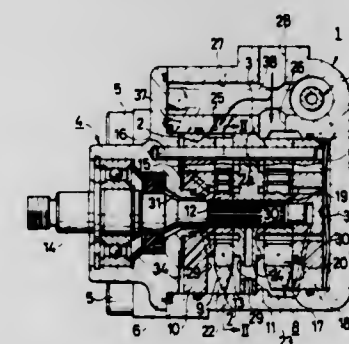


$$0.025\theta_s/\sqrt{V_0} < 0.080$$

where,  $\bar{a}$  is a value given by the following equation of:

$$\bar{a} = \frac{\int_0^{\theta_s} \theta^2 a(\theta) d\theta}{\int_0^{\theta_s} \theta^2 d\theta}$$

$\theta$  represents the angle (radian) formed around the center of rotation of said rotor between the end of said vane closer to said cylinder and the cylinder top where the distance between the inner peripheral surface of said cylinder and the outer peripheral surface of said rotor is smallest;  
 $\theta_s$  represents said rotation angle  $\theta$  (radian) at the instant of completion of the suction stroke;  
 $V_0$  represents the volume (cc) of said vane chamber when said rotation angle  $\theta$  is  $\theta_s$ ; and  
 $a(\theta)$  represents the effective area (cm<sup>2</sup>) of the suction passage between an evaporator and said vane chamber.



first means defining an inlet for supplying fluid to a first region between a selected number of vanes of each pump section;  
second means defining an outlet from a second region between a selected number of other vanes of each pump section for facilitating the outflow of pressurized fluid therefrom, said second means including a passageway communicating with (1) a first space between a first axially facing surface on said first sideplate and a first opposing surface on said housing and (2) a second space between a second axially facing surface on said second sideplate and a second opposing surface on said housing; and  
first resilient means in said first space and second resilient means in said second space, said second resilient means being stronger than said first resilient means whereby it is effected that said first and second sideplates and associated first and second cam rings are urged toward said common sideplate and into tight engagement with each other, and said common sideplate is urged into engagement with and maintained in engagement with said step in said opening in said housing and, in addition, said pressurized fluid is supplied to said first and second spaced to further assist said first and second resilient means.

**4,415,320**  
**SLIDING VANE TYPE ROTARY COMPRESSOR**  
Teruo Maruyama, Neyagawa; Shinya Yamauchi, Katano; Shiro Yamamura, Kyoto, and Yoshiyuki Morikawa, Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1981, Ser. No. 283,041  
Claims priority, application Japan, Sep. 25, 1980, 55-13048  
Int. Cl.<sup>3</sup> F04C 29/08

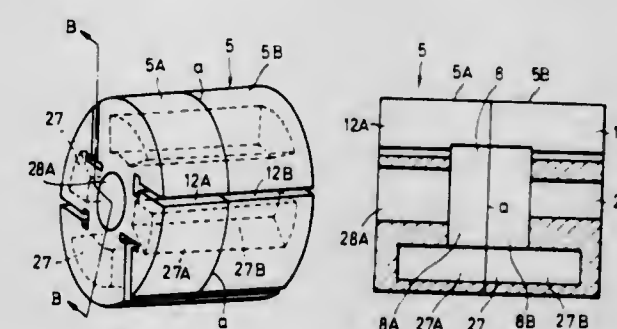
U.S. Cl. 418-150

3 Claims

1. In a sliding vane type rotary compressor having a rotor, at least one vane slidably mounted on said rotor and said vane,

**4,415,321**  
**VANE COMPRESSOR HAVING A LIGHTWEIGHT ROTOR**  
Michio Okazaki, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan  
Filed Mar. 17, 1981, Ser. No. 244,804  
Claims priority, application Japan, Mar. 25, 1980, 55-36855  
Int. Cl.<sup>3</sup> F04C 2/344  
U.S. Cl. 418-179

3 Claims



1. A vane compressor comprising:  
a rotary shaft;  
a rotor secured on said rotary shaft for rotation in unison therewith, said rotor comprising a first rotor element and a second rotor element having end faces thereof abutting against each other and integrally joined at an axially central portion of said rotor, said first and second rotor elements comprising generally cylindrical bodies having configurations substantially similar to each other, said first and second rotor elements each having a central through bore forming space extending from an outer end thereof along an axis thereof and through which said rotary shaft



extends, a plurality of axial slit forming spaces formed in an outer peripheral surface thereof in a circumferentially spaced arrangement and extending along a whole length thereof, a back pressure chamber forming space intersecting with said central through bore forming space and opening in an inner or joining end face thereof, said back pressure chamber forming space having a diameter larger than that of said central through bore forming space, said plurality of axial slit forming spaces having axially central portions thereof communicating with said back pressure chamber forming space, and a plurality of cavity forming spaces formed between adjacent ones of said axial slit forming spaces and opening in an inner end face thereof, said plurality of cavity forming spaces communicating with said back pressure chamber forming space;

a plurality of vanes movably received in said axial slit forming spaces; and

a housing within which said rotor and said vanes are arranged, said housing cooperating with said rotor and said vanes to define pump working chambers therebetween; said first and second rotor elements each being formed of a sintered alloy compact and being integrally joined in axial alignment by means of brazing with at least one brazing member applied on said first and second rotor elements at a joining portion thereof.

4,415,322

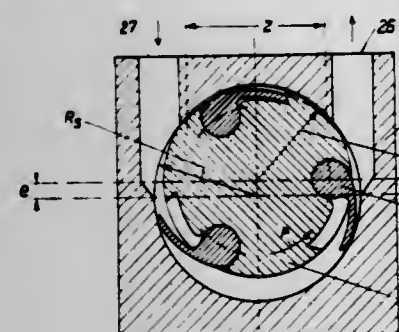
# ROTARY MACHINE WITH CONTROLLED RETRACTABLE ELEMENTS

Lucien Baudin, Paris, France, assignor to IDRAM Engineering Company EST., Vaduz, Liechtenstein  
Continuation of Ser. No. 944,646, Sep. 21, 1978, abandoned. This application Sep. 10, 1980, Ser. No. 185,951  
Claims priority, application Switzerland, Feb. 10, 1978, 1523/78

Int. Cl.<sup>3</sup> F04C 29/10

U.S. Cl. 418—260

5 Claims



1. A rotary machine, comprising:
  - a stator having a rotor chamber, two lateral parts, an outer casing, a fluid inlet to said rotor chamber and a fluid outlet from said rotor chamber; said rotor chamber comprising a first part-cylindrical recess and a second part-cylindrical recess which intersects said first part-cylindrical recess and has a radius greater than that of said first part-cylindrical recess; the axis of said first part-cylindrical recess being substantially parallel to and spaced from the axis of said second part-cylindrical recess, the sum of the radius of said first part-cylindrical recess and the distance between the axes of said first and second part-cylindrical recesses being greater than the radius of said second part-cylindrical recess; said fluid inlet being adjacent one extremity of said first part-cylindrical recess and said fluid outlet being adjacent the other extremity of said first part-cylindrical recess;
  - a cylindrical rotor rotatably secured in said rotor chamber, having a radius substantially equal to that of said first part-cylindrical recess, the axis of said rotor substantially coinciding with the axis of said first part-cylindrical recess;

a plurality of cavities in the surface of said rotor;

a plurality of blades pivotably mounted in the cavities of said rotor, having a length so as to be able to extend a distance from the rotor surface at least equal to the sum of: the difference between the radii of said first and second part-cylindrical recesses, and the distance between the axes of said first and second part-cylindrical recesses; the depth of said cavities being at least equal to the thickness of said blades; the depth of said cavities at the tips of said blades being at least as great as the difference between: the sum of the radius of said rotor and the distance between the axes of said first and second part-cylindrical recesses, and the radius of said second part-cylindrical recess;

smooth, continuous, control means attached to said blades for controlling the pivotal movement of said blades with respect to the rotor so that the tips of said blades travel in a circular path having a radius equal to that of said second part-cylindrical recess and having an axis coinciding with that of said second part-cylindrical recess;

fluid-tight moving compartments defined by said blades and said second part-cylindrical recess, said blades dividing the space between said second part-cylindrical recess and said rotor into said moving compartments with no significant dead space;

the surface of said rotor contacting said first part-cylindrical recess to provide a zone of fluid tightness along said first part-cylindrical recess, the tips of said blades being spaced from said first part-cylindrical recess.

4,415,323

# PASTA-MAKING KITCHEN APPLIANCE WITH A DRYING ARRANGEMENT

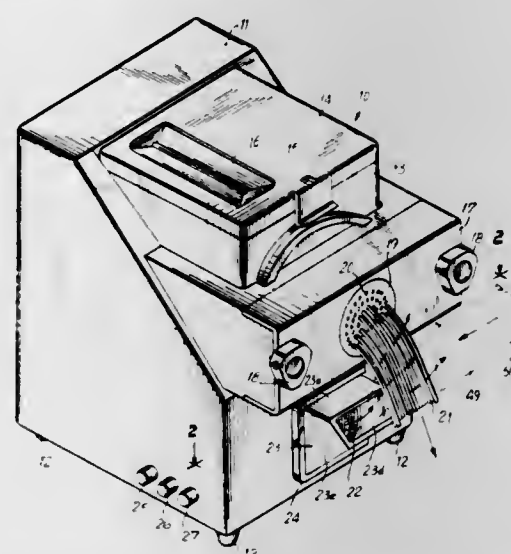
Harold Osrow, Dix Hills, and Elliott Shulman, East Northport, both of N.Y., assignors to Osrow Products Corporation, Old Bethpage, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,536

Int. Cl.<sup>3</sup> A21C 3/04, 11/16

U.S. Cl. 425—72 S

18 Claims



1. In a kitchen appliance for producing elongated products from farinaceous materials, a combination comprising:
  - (a) housing means having a support base and an internal chamber for accommodating a quantity of the respective farinaceous material and including an external wall substantially perpendicular to the support base;
  - (b) an extrusion die having a die plate mounted on said wall and substantially parallel to said external wall and having at least one opening communicating between said internal chamber and the exterior of said housing means;
  - (c) means for expelling said material through said opening in the form of the respective elongated products;
  - (d) means for driving said expelling means; and
  - (e) means for directing a stream of air against and in direct contact with the elongated product at an open-air, uncon-

finned circumambient region of the latter adjacent to the point of the emergence thereof from said opening of said extrusion die plate for drying at least the surface of such elongated product and reducing its tackiness, said means for directing being such as to direct said airstream in an upward direction toward such elongated product from below the product for preventing surface adhesion of such elongated product with nearby surfaces.

4,415,324

# APPARATUS FOR PRODUCING A MAT OF DIRECTIONALLY ORIENTED LIGNOCELLULOSIC PARTICLES HAVING CROSS-MACHINE ORIENTATION

David J. Henckel, and Thomas E. Peters, both of Boise, Id., assignors to Morrison-Knudsen Forest Products, Inc., Boise, Id.

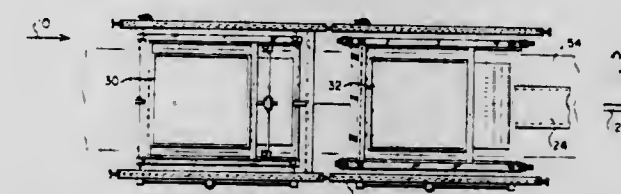
Division of Ser. No. 230,691, Feb. 2, 1981, Pat. No. 4,347,202.

This application Feb. 10, 1982, Ser. No. 347,375

Int. Cl.<sup>3</sup> B29B 5/02

U.S. Cl. 425—83.1

15 Claims



1. An apparatus for electrostatically forming a continuous mat of directionally oriented lignocellulosic particles and depositing them on a movable mat-receiving surface in a direction substantially transverse to the length dimension of the mat-receiving surface, comprising:
  - an orienting zone having means establishing a first directional electric field substantially transverse to the length dimension of the movable mat-receiving surface for electrostatically orienting a multitude of lignocellulosic particles passing therethrough in the direction of the electrical field, the means configured to minimize the basis weight distribution of the lignocellulosic material deposited on the mat-receiving surface; and
  - a mat-receiving surface positioned beneath the orienting zone receiving the aligned lignocellulosic particles thereon to form a mat.

4,415,325

# FOLDING OF FLAT SHEET TO EXACT INTERIOR HEIGHT

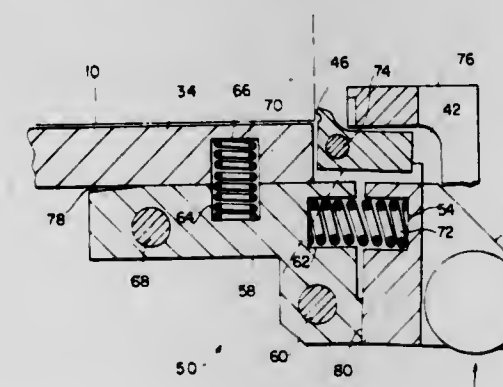
Gilbert Fuchs; Norman Crowley, and Randall Wink, all of Evansville, Ind., assignors to Evana Tool & Engineering Inc., Evansville, Ind.

Filed Jun. 5, 1981, Ser. No. 270,873

Int. Cl.<sup>3</sup> B29C 24/00

U.S. Cl. 425—397

19 Claims



1. An apparatus for making a fold in a flat sheet with the folded sheet having an exact interior height comprising:
  - a flat shim with a folding edge, said folding edge being

rounded in vertical cross section and having a thickness equal to the desired interior height;

a position means for positioning said shim on the flat sheet with said folding edge adjacent to the place where the fold is made;

a bend means for tangentially bending a portion of the flat sheet approximately 90° on said folding edge;

a die having a facing edge, said facing edge having a mating shape with respect to said folding edge; and

a push means for pushing said facing edge of said die against said folding edge of said shim such that the 90° folded portion of the sheet is further folded to approximately 180° and an exact interior height adjacent the fold is provided.

4. An apparatus for forming a flat jacket having an exact interior height by folding an elongate flat sheet having a plurality of side wings comprising:
  - a flat plate on which the flat sheet is located;
  - a flat shim having a transverse folding edge and a plurality of side folding edges corresponding to the number of side wings, said folding edges being rounded in vertical cross section and having a thickness equal to the desired interior height;
  - a position means for positioning said shim on the flat sheet with said folding edges adjacent to the places on the flat sheet where the folds are made;
  - a transverse bend means for tangentially bending a substantial portion of the sheet along a transverse line of the sheet approximately 90° on said transverse folding edge;
  - a transverse die having a facing edge, said facing edge having a mating surface with respect to said transverse folding edge;
  - a transverse push means for pushing said facing edge of said transverse die against said transverse folding edge of said shim such that the 90° folded substantial portion of the sheet is further folded to approximately 180° so that the substantial portion covers at least most of the remainder of the sheet except for the side wings and such that an exact interior height adjacent the transverse fold is provided;
  - a plurality of side bends means operatively associated with a respective one of said side folding edges for tangentially bending a respective one of the side wings about a respective one of said folding edges approximately 90°;
  - a plurality of side dies operatively associated with a respective one of said side folding edges, each said side die having a facing edge with each facing edge having a mating surface with respect to the associated side folding edge;
  - a plurality of side push means operatively associated with a respective one of said side dies for pushing a respective facing edge of a respective side die against a respective side folding edge of said shim such that the respective 90° folded side wing is further folded to approximately 180° so that each side wing overlaps a portion of the substantial portion of the sheet previously folded and such that an exact interior height adjacent each fold is provided; and
  - an attaching means for attaching said side wings to the underlying portions of the substantial portion of the sheet such that the flat jacket is provided.

4,415,326

# TACTILE SENSIBILITY TESTING EQUIPMENT

Saburo Nagata, Tokyo, and Ken Nara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,161

Claims priority, application Japan, Oct. 16, 1980, 55-147616

Int. Cl.<sup>3</sup> G09B 21/00

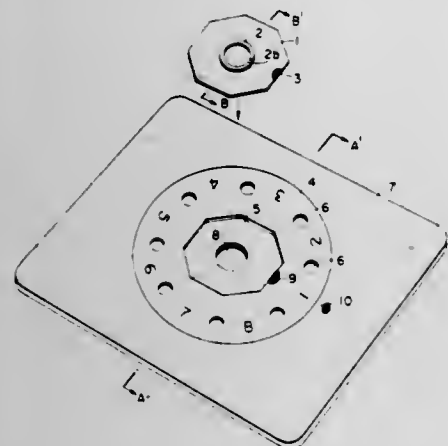
U.S. Cl. 434—113

10 Claims

1. Tactile sensibility testing equipment comprising:
  - tangible means having a pattern formed thereon to be discriminated through tactile sensation;
  - mounting means for mounting said tangible means; and



means for rotatably supporting said mounting means, and for making said mounting means stationary at any one of a



plurality of predetermined positions in its rotational direction.

4,415,327

**SPARE BOWLING COMPUTER FOR SPOT BOWLERS**  
Floyd H. Green, Forest Park, Ill., assignor to Floyd H. Green, Forest Park, Ill.

Filed Jun. 28, 1982, Ser. No. 393,191  
Int. Cl.<sup>3</sup> G09B 9/00

U.S. Cl. 434-249

5 Claims



1. A two-member bowling computer to assist a spot bowler to locate his or her feet and to project a bowling ball in a direction to hit a selected pin or group of pins, the combination comprising:

- a rectangular base member having the same ratio of length to width as that of a regulation bowling lane;
- a representation of a bowling lane obversely visible on the base member, said bowling lane representation including ten bowling pin location spots deployed in a triangular array,
- a transverse line indicating a foul line that divides a bowling lane into an approach section and an alley section, seven target indicators deployed in a V-shaped array in the alley section;
- an optically transparent cover member that is spatially coextensive with the base member and that has a bowling ball indicator that is concentric with the location spot of the five-pin when the base member and the cover member are aligned.

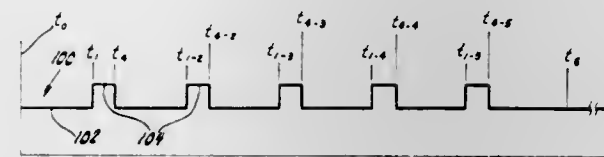
4,415,328

**FUEL AND IGNITION CONTROL**  
Michael T. Grunden, and William J. Roberts, both of Toledo, Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 28, 1981, Ser. No. 306,568  
Int. Cl.<sup>3</sup> F23C 11/04

U.S. Cl. 431-1

3 Claims



1. A fuel and ignition control for a fuel burner disposed in a combustion chamber for igniting fuel supplied to said fuel burner in response to a thermostat control signal to cause a flame, said fuel burner being operably connected to means for supplying a fluid fuel to said fuel burner, including:

- probe means for supplying a spark for igniting said fuel and for detecting said flame;
- spark generating means for supplying spark energy to said probe means;
- valve means for stepwise controlling the flow of said fuel;
- detector means responsive to said probe means for providing a first signal indicative of the presence of said flame;
- said detector means including phase shift means for phase shifting said first signal slightly less than one hundred eighty electrical degrees, and first threshold means responsive to said phase-shifted first signal for providing a second signal indicative of the presence of said flame and for controlling said valve means;
- first storage means for storing energy to control the operation of said valve means for a first predetermined time;
- second storage means for storing energy to operate said valve means;
- second threshold means for causing a third threshold means to become conductive to supply energy from said second storage means to said valve means, said second threshold means being responsive to said third threshold means for rendering said third threshold means nonconductive to pulsewise deplete said first storage means and to pulsewise provide energy from said second storage means to said valve means for said first predetermined time;
- said first threshold means pulsewise intermittently providing energy from said second storage means to said valve means when said flame is present;
- purge means for purging said combustion chamber;
- first digital timer means operatively coupled to said purge means for operating said purge means for at least a second predetermined time period, said first digital timer means being operatively connected to said spark generating means to permit said spark generating means to begin to supply said spark energy at a third predetermined time subsequent to said second predetermined time period, said first digital timer means being operably connected to said second threshold means to allow said second threshold means to cause said third threshold means to become conductive to operate said valve means during said third predetermined time, said first digital timer means further being operatively connected to said spark generating means to cause said spark generating means to stop supplying said spark energy at a fourth predetermined time, said first digital timer means being further operatively connected to said second threshold means to prevent said second threshold means from causing said third threshold means to become conductive to operate said fuel valve means at a fifth predetermined time, said fourth predetermined time and said fifth predetermined time being subsequent to said second predetermined time period;
- first digital counting means operably connected to said first digital timer means for controlling said first digital timer

to cause said first digital timer to operate said purge means, said spark generating means, and said second threshold means for a first predetermined number of repetitions;

whereby said ignition system, in response to said thermostat control signal repetitively sequentially purges said combustion chamber, and then operates said fuel valve means and said spark generating means for a predetermined number of repetitions unless the presence of said flame is sensed and thereafter maintains said fuel valve means in an energized condition.

4,415,329

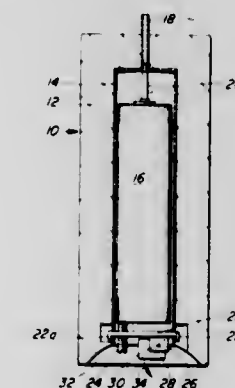
**WAX-ENCASED BUTANE SAFETY CANDLE**

Murray B. Dodd, 5 Brookbanks Dr., #1502, Don Mills, Ontario, Canada M3A 2S8

Filed May 3, 1982, Ser. No. 374,495  
Int. Cl.<sup>3</sup> F23N 5/24

U.S. Cl. 431-125

3 Claims



1. A candle having an interior, cylindrical metal casing open at its bottom and having a unitary, central, upwardly extending tube;

- a wax shell surrounding said casing, said tube extending through said shell;
- said casing having a pair of diametrically opposed slots near its bottom, one of said slots opening at one end to the bottom of said casing;
- said slots being adapted to retain a removable control plate having a finger mounted for pivotal movement on its underside, near one side thereof, said finger extending below the bottom of said wax shell, when pivoted to its down position;
- a set screw in said control plate on the side opposite said finger;
- said casing being adapted to contain a butane cylinder having a nozzle-valve at its top center adapted to be received in said tube and to be retained in said cylinder by said control plate;
- whereby, when said finger is in its down position and the

candle is placed on a flat surface the weight of said candle on said finger will urge said control bar and its set screw, and thus said butane cylinder, upwardly therein to open said nozzle-valve.

4,415,330

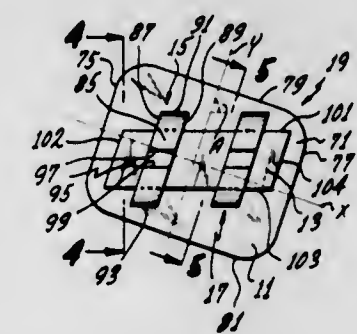
**ORTHODONTIC BRACKET ASSEMBLY**

Richard J. Daisley, Ontario, and Lawrence S. Ring, Glendora, both of Calif., assignors to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 36,258, May 4, 1979, abandoned. This application Aug. 31, 1981, Ser. No. 343,605  
Int. Cl.<sup>3</sup> A61C 3/00

U.S. Cl. 433-16

1 Claim



1. An orthodontic bracket assembly for use with an archwire to impart corrective forces on a tooth, including:

- a base pad for attachment to the tooth,
- a distal tie wing fixed to said base pad and including a gingival tip and an occlusal tip defining between them an archwire slot,
- a mesial tie wing fixed to said base pad and including a gingival tip and an occlusal tip defining between them an archwire slot, each of said distal and mesial tie wings having parallel distal and mesial sides,
- said archwire slots being in mutual alignment and providing a reference line for orientation parallel to the occlusal plane of a patient,
- said sides of said tie wings are inclined at an oblique angle to said reference line, whereby said tie wings can be generally vertically disposed parallel to the tooth long axis and still be inclined at an oblique angle to said reference line,
- said gingival tips and said occlusal tips of said tie wings having respectively top and bottom surfaces which are in mutual alignment parallel to said reference line and substantially equidistant therefrom,
- whereby said tie wings together form a rhomboidal configuration and the axis of said archwire slots bisects said tie wings so that said gingival tips and said occlusal tips are of equal size.



## CHEMICAL

### 4,415,331 PROCESS FOR CHEMICALLY SCULPTURING WOOL PILE FABRICS

Joseph H. Dusenbury, and Daniel T. McBride, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 11, 1982, Ser. No. 357,008  
Int. Cl.<sup>3</sup> D06Q 1/02

U.S. Cl. 8—114.6

3 Claims

1. A process for sculpturing a pile fabric having pile fibers made from wool, or wool-nylon blends, which comprises: treating said wool by oxidizing its disulfide bonds accompanied by acid hydrolysis; contacting the pile surface of said fabric with a fiber degrading composition, said composition comprising a fiber degrading agent in a concentration sufficient to reduce the tensile strength of the fibers of the pile in the selected areas so that said pile fibers may be removed by mechanical action; said fiber degrading agent being an aromatic sulfonic acid having a  $pK_a$  value of less than about 2; said fiber degrading composition further containing a diluent for said fiber degrading agent, heating said pile fabric to a temperature sufficient to cause the tensile strength of said fibers of said pile in the selected areas to be reduced sufficiently so that said fibers may be removed by mechanical means, but said temperature being low enough so as not to result in complete destruction of the fiber integrity prior to removal by mechanical means; and removing said degraded portion of said pile fibers by mechanical means to provide a sculptured pile fabric.

### 4,415,332 DEVELOPMENT OF COLOR IN A POLYAMIDE TEXTILE MATERIAL WITH AMINO BENZENESULFONYL AZIDES

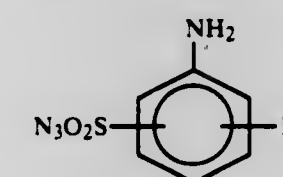
Ronald S. Lenox, and Charles E. Hoyle, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 30, 1982, Ser. No. 429,333  
Int. Cl.<sup>3</sup> D06P 5/20

U.S. Cl. 8—444

8 Claims

1. A method of photolytically developing color on a polyamide material, which comprises treating the material by contacting it with an aminobenzenesulfonyl azide of the formula



wherein R is H, a  $C_1$ - $C_4$  alkoxy group or a  $C_1$ - $C_4$  alkyl group, or a salt thereof, and exposing the treated material to a UV light source to thereby develop color on the material.

### 4,415,333 SOLID COMPOSITIONS OF WATER-SOLUBLE FIBER-REACTIVE DYESTUFFS AND DIALKYLNAPHTHALENE SULFONIC ACID AND FORMALDEHYDE CONDENSATE

Ludwig Schläfer, Kelkheim, and Heinz Uhrig, Steinbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,401  
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111488

Int. Cl.<sup>3</sup> C09B 67/24; D06P 1/38

U.S. Cl. 8—524

18 Claims

1. A solid composition of fiber-reactive dyestuffs, which contains a condensation product formed from a dialkylnaphthalenesulfonic acid, or a mixture thereof, and formaldehyde.

### 4,415,334 THERMAL DEVELOPMENT OF COLOR IN A POLYAMIDE TEXTILE MATERIAL WITH AMINO BENZENESULFONYL AZIDES

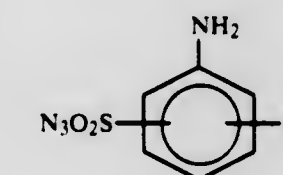
Charles E. Hoyle, and Ronald S. Lenox, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 29, 1982, Ser. No. 427,516  
Int. Cl.<sup>3</sup> C09B 29/00

U.S. Cl. 8—694

8 Claims

1. A method of thermally developing color on a polyamide material, which comprises treating the material by contacting it with an aminobenzenesulfonyl azide of the formula



wherein R is H, a  $C_1$ - $C_4$  alkoxy group or a  $C_1$ - $C_4$  alkyl group, or a salt thereof, and heating the treated material at a temperature ranging from 80° C. to the melting point of the polyamide material to thereby develop color on the material.

### 4,415,335 COAL PREPARATION

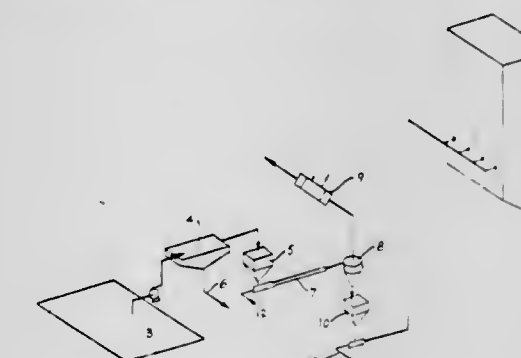
David E. Mainwaring, and Charles U. Jones, both of Melbourne, Australia, assignors to B. P. Australia Ltd. and The Broken Hill Proprietary Company Ltd., both of Melbourne, Australia

PCT No. PCT/AU81/00055, § 371 Date Jan. 7, 1982, § 102(e) Date Jan. 7, 1982, PCT Pub. No. WO81/03337, PCT Pub. Date Nov. 26, 1981

PCT Filed May 12, 1981, Ser. No. 341,981  
Claims priority, application Australia, May 13, 1981, PE 3515  
Int. Cl.<sup>3</sup> C10L 9/08, 9/00

U.S. Cl. 44—1 C

2 Claims



1. A method of separating an agglomerated mixture of finely divided coal particles and a liquid hydrocarbon to recover the hydrocarbon liquid and the coal as finely divided particles comprising:

providing a conduit having a first end and a second end; introducing agglomerates of said coal particles and liquid hydrocarbon into said conduit adjacent said first end; contacting said agglomerates with steam at temperatures in excess of 200° C. to separate the liquid hydrocarbon from its association with said coal particles and to disintegrate said agglomerates into finely divided particles suspended in said steam and entrained liquid hydrocarbon; passing said separated coal particles and hydrocarbon liquid out of said second end of said conduit within 5 seconds of the steam contacting said agglomerates; and separating sequentially said coal particles and liquid hydrocarbon from said steam.

2. A method as in claim 1 wherein:  
all of said agglomerates are above 1 mm. in size;  
at least 70 percent of the coal particles comprise particles less than 0.3 mm. in size; and  
the final product oil content is less than 2.5 percent.







said air stream at said filtration and absorption station in said collector to form an essentially pollutant-free effluent, said collector comprising an assembly of layers of refractory microfiber mats, metal screens, and vapor adsorbents, one of said refractory microfiber mats being on the exposed surface of said collector adjacent to said burner and being capable of withstanding temperatures of at least 600° C. produced by said burner, the microfibers having diameters in the range of 0.1 to 40 m and said microfiber mats having a thickness in the range of 2.5 to 25 mm and a bulk density in the range of 4 to 40 mg/cc, and one of said vapor adsorbent layers which is capable of withstanding temperatures up to 450° C. being on the inner surface of said collector, said collector having a pressure drop of less than 300 mm of water,

- c. burning said collected particulate matter and simultaneously desorbing said collected organic vapors, at said combustion and desorption station in said collector, to form a concentrated stream comprising combustion products of particulate material and desorbed vapors,
- d. oxidizing the desorbed vapors of the concentrated stream in an oxidizing means in said apparatus to form an essentially pollution-free oxidized stream comprising both particulate material combustion products and vapor combustion products, and
- e. exhausting, separately, the essentially pollutant-free effluent of step b. and the essentially pollutant-free oxidized stream of step d.

4,415,343

## SEALING SYSTEMS FOR FILTER BAGS

Adolf Margraf, Am Schleplingsbach 46, D-3060 Stadthagen, Fed. Rep. of Germany

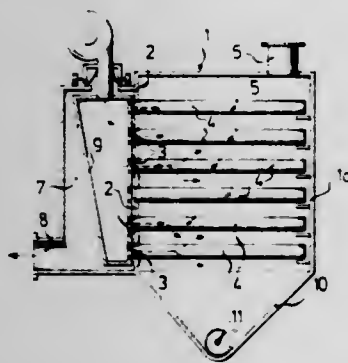
Filed Jul. 9, 1982, Ser. No. 396,787

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127926

Int. Cl.<sup>3</sup> B01D 46/02

U.S. Cl. 55—379

1 Claim



1. In a sealing system for the aperture rims of cross-sectionally shallowly oval filter bags which are to be cleansed by counterflow scavenging and/or shaking, situated at the clean gas side of a partition subdividing the casing of a bag filter into a dedusting space and a pure gas space and provided with shallowly oval transversely overbridged clamping frame springily encircling the filter bag aperture rim between itself and the partition, the bridging element of which bears the thrust of the spring system which on the other hand bears under loading against said dust gas side of said partition, said filter bags inserted into said dedusting space via said perforations and each supported at its free end and having a rigid internal spacing element terminating before said partition, and which is supported in front of said partition by parts of said clamping frame, the invention which consists in that a spindle passes through an aperture in said bridging element of each said clamping frame in rotatable and longitudinally displaceable manner said spindle being firmly joined at said dust gas side of said bridging element with a clamping strap the length of which is greater than the lateral width of said shallowly oval partition perforation and is surrounded at said clean gas side by

a compression spring which is situated between said bridging element and a spindle stop, said clamping strap being placeable under stress by axial displacement of said spindle.

4,415,344

## DIESEL PARTICULATE FILTERS FOR USE WITH SMALLER DIESEL ENGINES

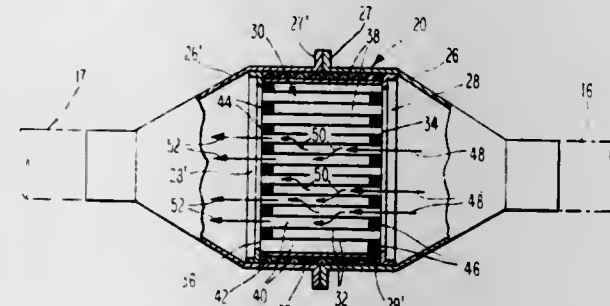
Rodney I. Frost, Corning, and Max R. Montierth, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,803

Int. Cl.<sup>3</sup> B01D 39/20

U.S. Cl. 55—523

17 Claims



1. In an exhaust system for use with a light duty vehicle diesel engine emitting particulates at a rate of less than about 0.45 gm./mile in a normal driving cycle and comprising conduit means for carrying engine exhaust gases away from the engine for disposal into the atmosphere, a solid particulate filter positioned within the conduit means across the exhaust gas path comprising:

a multiplicity of thin, interconnected walls defining at least one open inlet end face in communication with the exhaust gas upstream from the filter and at least one open outlet end face in communication with exhaust gas downstream from the filter and a multiplicity of cells each extending through the matrix from at least one of said open end faces;

the thin walls having internal interconnected open porosity of a volume and mean pore diameter sufficient to enable the fluid to flow through the thin walls and to restrain at least a significant portion of the particulates from passing completely through the thin walls in any direction;

an inlet group of the cells each open only at at least one of the inlet end faces;

an outlet group of the cells each open only at at least one of the outlet end faces and closed proximal to each inlet end face; and

the volume of the internal open porosity of the thin walls and the mean diameter of the pores forming the open porosity further lying within the area defined by the boundary lines connecting the points A-B-C-D in FIG. 5.

4,415,345

## PROCESS TO SEPARATE NITROGEN FROM NATURAL GAS

Brian R. Swallow, Media, Pa., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 26, 1982, Ser. No. 362,048

Int. Cl.<sup>3</sup> F25J 3/02

U.S. Cl. 62—28

13 Claims

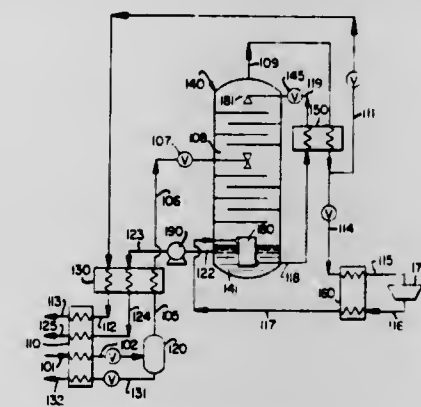
1. A process for separating nitrogen from natural gases comprising:

(a) providing a natural gas feed stream having a nitrogen concentration, which varies over time, of from 1 to 35 percent;

(b) introducing said nitrogen-containing natural gas stream into a fractionation column operating at a pressure of from 15 to 125 psia;

(c) separating by rectification said nitrogen-containing natu-

- ral gas stream into a nitrogen-enriched vapor portion A and a methane-enriched liquid portion B;
- (d) providing a nitrogen-containing vapor stream C;
- (e) warming said nitrogen-containing vapor stream C;
- (f) compressing the warming nitrogen-containing vapor stream C to a pressure of from about 50 to 470 psia;
- (g) cooling the compressed nitrogen-containing stream C by indirect heat exchange with the warming nitrogen-containing stream of step (e);
- (h) condensing the cooled compressed nitrogen-containing



stream C by indirect heat exchange with said methane-enriched liquid portion B, thereby providing vapor reflux to the fractionation column;

- (i) throttling the condensed nitrogen-containing liquid stream C to about the pressure of the fractionation column;
- (j) employing the throttled nitrogen-containing liquid stream C to provide liquid reflux for the fractionation column; and
- (k) recovering at least a portion of said methane-enriched portion B as product natural gases.

4,415,346

## CARBON DIOXIDE SNOW HORN FOR DRY ICE PRODUCTION

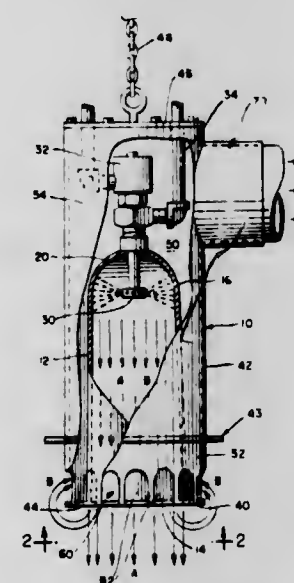
James H. Love, 3909 Woodland Ave., Western Springs, Ill. 60558

Filed Oct. 11, 1978, Ser. No. 950,513

Int. Cl.<sup>3</sup> F25J 1/02

U.S. Cl. 62—35

11 Claims



1. A snow horn device for producing solid CO<sub>2</sub> particles from CO<sub>2</sub> in its liquid form, comprising:
  - (a) a downwardly directed skirt having a truncated, conically tapering shape which is open at its lower, larger diameter end;
  - (b) a hemispherically-shaped head mounted at the top, smaller diameter end of said skirt; and
  - (c) nozzle means located effectively at the radial center of said hemispherically-shaped head, said nozzle means having

orifices formed therein which are generally outwardly directed from the longitudinal axis of said skirt for allowing the expansion of said liquid CO<sub>2</sub> from said nozzle means whereby the solid CO<sub>2</sub> particles thereby formed will impinge against the inner surfaces of said head and skirt and be deflected substantially downwardly by said surfaces at a reduced velocity, thereby avoiding turbulence in the area of said head.

7. In a snow horn device for producing solid CO<sub>2</sub> particles and gas from CO<sub>2</sub> in its liquid form at ambient temperature and pressure, wherein the snow horn has a nozzle means mounted in a head which is mounted at the top of a skirt which has an open lower end, the improvement comprising:

- (a) an outwardly directed annular flange mounted about the lower end of said skirt;
- (b) a concentric hood mounted at its lower edge to said annular flange so as to form an enclosed chamber about said head and skirt;
- (c) a port means opening into said enclosed chamber about the lower edge of said hood; and
- (d) an exhaust means opening into said enclosed chamber at its upper end for drawing said CO<sub>2</sub> gas through said port means and out of said enclosed chamber, whereby the direction of flow of said gas is abruptly rotated through 270 degrees from the direction of gas flow downwardly through said skirt.

8. A snow horn device as claimed in claim 1, further comprising:

- an outwardly directed annular flange mounted about the lower end of said skirt;
- a concentric hood mounted at its lower edge to said annular flange so as to form an enclosed chamber about said head and skirt;
- a port means opening into said enclosed chamber about the lower edge of said hood; and
- an exhaust means opening into said enclosed chamber at its upper end for drawing said CO<sub>2</sub> gas through said port means and out of said enclosed chamber, whereby the direction of flow of said gas is abruptly rotated through 270° from the direction of gas flow downwardly through said skirt.

9. A snow horn device as claimed in claim 1, further comprising:

- an outwardly directed annular flange mounted about the lower end of said skirt;
- a concentric hood mounted at its lower edge to said annular flange so as to form an enclosed chamber about said head and skirt;
- a port means opening into said enclosed chamber about the lower edge of said hood; and
- an exhaust means opening into said enclosed chamber at its upper end for drawing said CO<sub>2</sub> gas through said port means and out of said enclosed chamber, whereby the direction of flow of said gas is abruptly rotated through 270° from the direction of gas flow downwardly through said skirt.

10. A snow horn device as claimed in claim 1, further comprising:

- an outwardly directed annular flange mounted about the lower end of said skirt;
- a concentric hood mounted at its lower edge to said annular flange so as to form an enclosed chamber about said head and skirt;
- a port means opening into said enclosed chamber about the lower edge of said hood; and
- an exhaust means opening into said enclosed chamber at its upper end for drawing said CO<sub>2</sub> gas through said port means and out of said enclosed chamber, whereby the direction of flow of said gas is abruptly rotated through 270° from the direction of gas flow downwardly through said skirt.

4,415,347

## DEVICE AND METHOD FOR PREPARING MULTI-FIBER OPTICAL CABLES FOR BUTT-JOINTING

Jean L. Malinge, Marie C. Soster, and Dominique Lamarche, all of Paris, France, assignors to Socapex, Suresnes, France

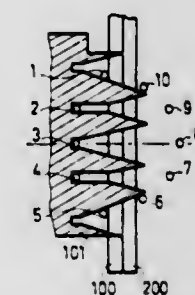
PCT No. PCT/FR81/00115, § 371 Date Dec. 15, 1981, § 102(e) Date Dec. 15, 1981

PCT Filed Sep. 4, 1981, Ser. No. 333,862

Claims priority, application France, Sep. 5, 1980, 80 19255 Int. Cl.<sup>3</sup> C03B 37/10, 37/14

U.S. Cl. 65—4.21

17 Claims



12. A method of preparing a multi-fiber optical cable, of the type wherein the individual fibers are circularly arranged, for butt-jointing the ends of the fibers with the ends of other fibers of a multi-fiber optical cable, said method comprising the steps of:

- (a) moving a comb-like structure defining alternating plural teeth and plural recesses in an approaching direction relative a first grouping of individual fibers of the cable to



dispose individual ones of the teeth between adjacent ones of the individual fibers of the first grouping; and  
(b) allowing the individual fibers of the first grouping to be received in respective ones of the recesses so as to linearly dispose the ends of the individual fibers of the first grouping.

4,415,348

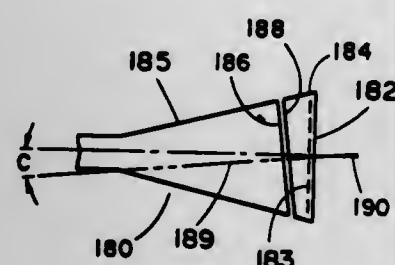
# METHOD OF MANUFACTURE FOR PROJECTION TELEVISION SYSTEM

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.  
Division of Ser. No. 154,197, May 29, 1980, Pat. No. 4,393,329, which is a continuation-in-part of Ser. No. 110,413, Jan. 8, 1980, Pat. No. 4,274,110. This application Jun. 1, 1982, Ser. No. 383,860

Int. Cl.<sup>3</sup> C03B 23/217

U.S. Cl. 65—58

1 Claim



1. For use in the manufacture of a projection television system having at least one cathode ray picture tube whose projection optical axis is displaced from the axis of a remotely located viewing screen by an angle A, and with a cathodoluminescent imaging screen whose axis is substantially coincident with said projection optical axis and normally coincident with the electron-optical axis of said tube, said imaging screen providing an electron-formed visible image for projection on said viewing screen, said cathode ray picture tube having a conjoinable face panel and funnel which mate along interfacing edges, a method for compensating for the non-linear magnification distortion of the projected image caused by the location of said tube off the viewing screen axis, comprising:

forming the seal edge of said funnel to define a plane whose normal makes an angle with respect to the funnel axis substantially equal to one-half said angle A;  
forming the seal edge of said face panel to define a plane whose normal makes an angle with respect to the imaging screen axis substantially equal to one-half said angle A;  
aligning said funnel with respect to said face panel to tilt said electron-optical axis with respect to said projection optical axis by an angle B substantially equal to said angle A; and

conjoining said seal edges;

such that the value of said angle B and the orientation of said electron-optical axis causes said electron-formed visible image to have an orientation and non-linear magnification distortion effective to substantially compensate for the off-axis-induced, non-linear magnification distortion of the light image projected thereby on said viewing screen.

4,415,349

# METHOD AND APPARATUS FOR COOLING GLASS FURNACE FOREHEARTH

John H. Engstrom, and Robert W. Ellis, both of Vineland, N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio  
Filed Apr. 15, 1982, Ser. No. 368,605

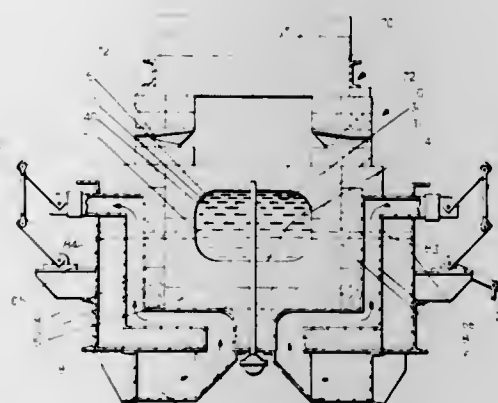
Int. Cl.<sup>3</sup> C03B 5/23

U.S. Cl. 65—137

7 Claims

1. A glass furnace forehearth comprising a firebrick hearth that is generally rectangular in cross section and has a central interior cavity for cooling and fining molten glass as the glass travels within the cavity from the entrance to the exit of the

forehearth, the central cavity being defined by generally parallel top and bottom interior wall surfaces and generally parallel side surfaces that are generally elliptical in shape, the forehearth comprising a furnace bottom below the hearth, a furnace sidewall located on each side of the hearth and spaced apart generally parallel along the longitudinal axis of the forehearth, a firebox located over the top of the hearth, insulation located between the bottom of the hearth and the bottom of the furnace, sidewall insulation located on each side of the hearth between the hearth side and the furnace sidewall, there being provided cooling means for cooling the hearth sidewalls and hearth bottom including a plurality of air ducts located in the bottom insulation and the sidewall insulation, the air ducts being spaced generally along the longitudinal axis of the forehearth, each air duct disposed generally in a direction perpendicular to the longitudinal axis of the forehearth, each duct being so constructed and arranged that it has a contacting side that contacts its adjacent associated forehearth bottom and the



adjacent sidewall substantially the length of the contacting side, the area of the contacting sides being at least about 30% of the area of the forehearth bottom and the sidewalls, the cooling means including means for forcing air through the air ducts, and there being provided means for heating and cooling the top of the hearth in the firebox to thereby provide for cooling on the top, bottom and both sides of the hearth.

6. A method of cooling a molten stream of glass flowing in a firebrick hearth from an entrance end to an exit end of a glass furnace forehearth, the method comprising the steps of: providing an air duct adjacent the forehearth bottom having contacting sides that contact the bottom over at least about 30% of the area of the bottom; cooling the bottom of the hearth which cools the molten glass by forcing air through the ducts in the hearth bottom insulation; providing contacting sides of air ducts that contact the forehearth sidewalls over at least about 30% of their area; cooling each side of the hearth which cools the molten glass by forcing air through the ducts along the side of the hearth.

4,415,350

# AUXIN COMPOSITIONS OF PHENYL THIOESTERS OF INDOLE-3-ALKANOIC ACIDS AND THEIR USE AS AUXIN GROWTH REGULATORS

David A. Boyles; Jack R. Gaines, both of Rapid City, S. Dak., and Bruce E. Haissig, Rhinelander, Wis., assignors to The United States of America as represented by the Department of Agriculture, Washington, D.C.

Filed Apr. 12, 1982, Ser. No. 367,638

Int. Cl.<sup>3</sup> A01N 43/38; C07D 209/18

U.S. Cl. 71—77

4 Claims

1. A synthetic auxin composition for stimulating adventitious root formation in difficult-to-root cuttings, comprising an amount sufficient to stimulate adventitious root formation of a compound or mixture of compounds selected from the group consisting of phenyl indole-3-thiol lower alkylene esters

wherein the alkylene ester group has up to 4 carbons; and a volatile or inert non-toxic carrier.

4. A method of stimulating adventitious root formation of plant cuttings comprising contacting the stem of a plant cutting with a phenyl indole-3-thiol lower alkylene ester wherein the alkylene ester group has up to 4 carbons or a mixture thereof; and maintaining said cutting in an environment for developing roots on the stem of said cutting until the roots develop to an extent that said cutting is suitable for transplanting.

4,415,351

# METHOD OF INCREASING THE YIELD OF LEGUMES UTILIZING O,O-DIALKYL DITHIOPHOSPHORYL ACETYL-N-ALKYL GLYCINE AMIDES

Llewellyn W. Fancher, New Castle; Francis H. Walker, Mill Valley, and Lawrence L. Buren, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

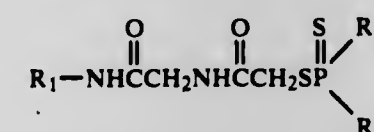
Filed Aug. 26, 1981, Ser. No. 296,287

Int. Cl.<sup>3</sup> A01N 57/12

U.S. Cl. 71—87

5 Claims

1. A method of increasing the yield of legumes comprising applying thereto a yield-increasing amount of a compound having the formula



wherein R<sub>1</sub> is selected from the group consisting of —CH<sub>3</sub>, —C<sub>2</sub>H<sub>5</sub>, —C<sub>3</sub>H<sub>7</sub> and —C<sub>4</sub>H<sub>9</sub>, and R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of —OCH<sub>3</sub>, —OC<sub>2</sub>H<sub>5</sub> and —OC<sub>3</sub>H<sub>7</sub>.

4,415,352

# HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 196,518, Oct. 14, 1980, abandoned, which is a division of Ser. No. 930,967, Aug. 4, 1978, Pat. No. 4,269,618, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application Apr. 16, 1982, Ser. No. 369,322

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.<sup>3</sup> A01N 43/00, 37/00

U.S. Cl. 71—88

15 Claims

1. A herbicidal composition comprising an active thiolcarbamate herbicide and a non-phytotoxic antidotal effective amount of an N-furylmethyl or an N-tetrahydrofurylmethyl alkyl substituted amide of dichloroacetic acid, said amide being antidotal active with said thiolcarbamate herbicide.

4,415,353

# HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 369,322, Apr. 16, 1982, which is a division of Ser. No. 196,518, Oct. 14, 1980, abandoned, which is a division of Ser. No. 930,967, Aug. 4, 1978, Pat. No. 4,269,618, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application Nov. 15, 1982, Ser. No. 441,963

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.<sup>3</sup> A01N 37/00, 37/18

U.S. Cl. 71—100

8 Claims

1. A herbicide composition comprising an active thiolcarbamate herbicide and a non-phytotoxic, antidotal effective amount of an amide of dichloroacetic acid, said amide of dichloroacetic acid being antidotal active with said thiolcarbamate herbicide, provided that said amide is other than a N,N-dihydro or a N-hydro, N-halophenyl amide of dichloroacetic acid.

4,415,354

# HERBICIDAL

4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS  
Horst O. Bayer, Levittown; Colin Swlthenbank, Perkaskie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

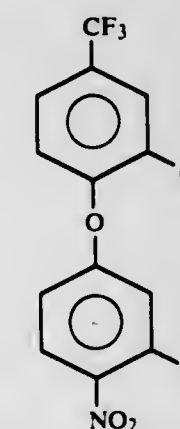
Division of Ser. No. 111,560, Jan. 14, 1980, Pat. No. 4,330,324, which is a division of Ser. No. 881,227, Feb. 22, 1978, Pat. No. 4,220,468, which is a division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929, and Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, said Ser. No. 617,560, is a continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276, said Ser. No. 617,562, is a division of Ser. No. 331,719, This application Sep. 16, 1981, Ser. No. 302,896

Int. Cl.<sup>3</sup> A01N 37/38, 41/04, 33/16; C07C 143/68

U.S. Cl. 71—103

10 Claims

1. A compound of the formula



wherein Z is a group of the formula (1) —OSO<sub>2</sub>CH<sub>3</sub>, (2) —OCH(CH<sub>3</sub>)CO<sub>2</sub>CH<sub>2</sub>CH=CH<sub>2</sub>, or (3) —OCH(CH<sub>3</sub>)C(NOH)CH<sub>3</sub>.

7. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim 1 in an amount sufficient to control the growth of the weeds.

4,415,355

# DINITROANILINE HERBICIDAL COMPOSITIONS CONTAINING FREEZING POINT DEPRESSANT ADDITIVES

Ronald L. Cassell, New Palestine, Ind., and Thomas N. Hall, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 1, 1981, Ser. No. 298,648

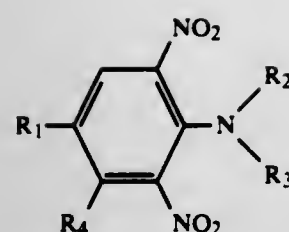
Int. Cl.<sup>3</sup> A01N 25/22

U.S. Cl. 71—121

6 Claims

1. A herbicidal composition comprising  
A. a dinitroaniline compound having the following structural formula





wherein R<sub>1</sub> is a radical selected from the group consisting of methyl and trifluoromethyl; R<sub>2</sub> is a radical selected from the group consisting of hydrogen, cycloalkyl and lower alkyl radicals, either straight chain or branched, having 1 to 5 carbon atoms; and R<sub>3</sub> is a radical selected from the group consisting of lower alkyl, lower chloroalkyl, and lower cyanoalkyl radicals said radicals being either straight chain or branched and having 1 to 5 carbon atoms; and R<sub>4</sub> is a radical selected from the group consisting of methyl and hydrogen; and

B. a freezing point depressant compound selected from the group consisting of butyrolactone, N,N-dimethyl-formamide, and mixtures thereof.

4,415,356

**PROCESS FOR AUTOGENOUS OXYGEN SMELTING OF SULFIDE MATERIALS CONTAINING BASE METALS**  
Grigori S. Victorovich, and Malcolm C. Bell, both of Toronto, Canada, assignors to Inco Limited, Toronto, Canada  
Filed Oct. 13, 1981, Ser. No. 310,524

Claims priority, application United Kingdom, Oct. 1, 1980, 8035134; Nov. 4, 1980, 8035417

Int. Cl.<sup>3</sup> C22B 1/02

U.S. Cl. 75—21

16 Claims

1. A smelting process in which a sulfide material containing metal sulfide values and iron sulfide is combusted autogenously with an oxygen-containing gas comprising roasting a portion of the sulfide material to be smelted, blending the thus roasted portion with unroasted sulfide material, and autogenously smelting the resulting blend of roasted and unroasted material with oxygen in a bounded space and in the presence of a flux for iron oxides to produce a molten metal product, a molten silicious slag and a strong sulfur dioxide off-gas, whereby the grade of said molten metal product is higher than it would have been had only said unroasted sulfide material been fed to said autogenous smelting.

4,415,357

**SOLID WASTE TREATMENT IN REDUCTION OF IRON ORE**

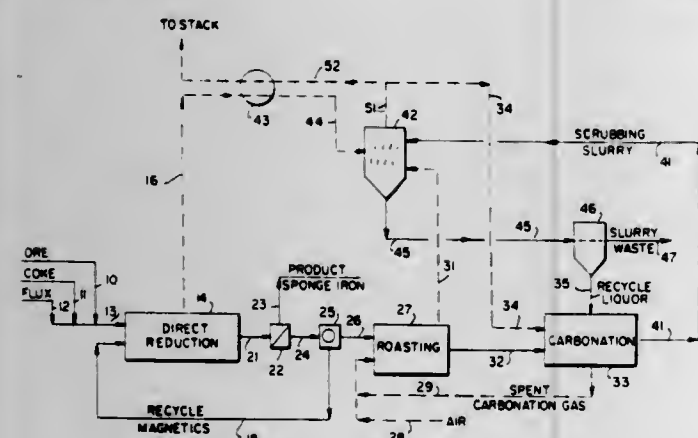
William V. Bauer, New York, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jun. 14, 1982, Ser. No. 387,800

Int. Cl.<sup>3</sup> C21B 13/08

U.S. Cl. 75—29

12 Claims



1. In a process for reducing iron ore to iron in the presence of a carbonaceous reductant and flux wherein a solid mixture of carbonaceous reductant and spent flux containing calcium

oxide and calcium sulfide is recovered from the reducing and subjected to roasting to reduce the sulfide content thereof, the improvement comprising:

carbonating as an aqueous slurry solids recovered from said roasting to further reduce the sulfide content and convert oxide to carbonate and thereby stabilize said solids.

4,415,358

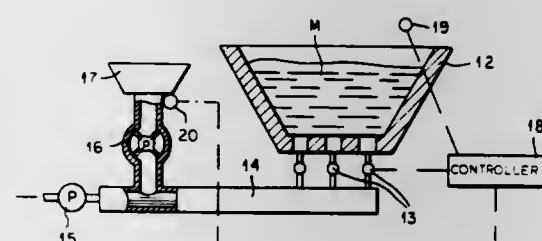
**METHOD OF DESULFURIZING A FERROUS MELT**  
Paul Metz, Luxembourg; Francois Schleimer, Esch/Alzette; Edouard Legille, Luxembourg; Jean Goedert, Esch/Alzette, and Antoine Weiner, Luxembourg, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg  
Filed Apr. 23, 1982, Ser. No. 371,439

Claims priority, application Luxembourg, Apr. 24, 1981, 83314

Int. Cl.<sup>3</sup> C21C 7/02

U.S. Cl. 75—58

10 Claims



1. A method of desulfurizing a deoxidized ferrous metal melt having a covering of slag, said method comprising the steps of: containing said melt in a vessel having below the level of said melt a refractory gas-pervious wall portion provided with channels impenetrable by liquid metal of the melt; removing the slag from said melt; suspending finely divided desulfurizing treatment solids in a gas; and introducing the suspension through said wall portion via said channels into said melt and reacting said melt with said solids after the removal of the slag.

4,415,359

**MULTI-STEP STEELMAKING REFINING METHOD**  
Mitsuhiko Nishimura, and Morikatsu Sakurada, both of Kamai-shi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

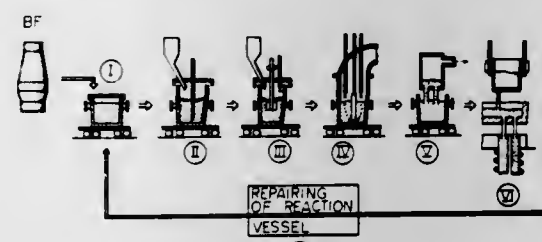
Filed Mar. 25, 1982, Ser. No. 361,615

Claims priority, application Japan, Mar. 30, 1981, 56/47023

Int. Cl.<sup>3</sup> C21C 7/00

U.S. Cl. 75—60

10 Claims



1. A multi-step steelmaking refining method, comprising: (a) tapping molten pig iron from a blast furnace into a reaction vessel; (b) in said vessel, desiliconizing and dephosphorizing said molten pig iron; (c) in said vessel, decarburizing the desiliconized and dephosphorized molten pig iron, by: (i) soft top-blowing oxygen onto the upper surface of such molten pig iron through a plurality of apertures which are

so diversely aimed as to more widely disperse the oxygen impacting the surface of such molten pig iron, and to form a cavity of lesser depth therein, than would result from top-blowing the same amount of oxygen per unit time onto said surface through a single aperture; while (ii) stirring such molten pig iron by blowing a stirring fluid thereinto from beneath said upper surface at a stirring rate, at least in an initial stage of this decarburizing step (c), of at least 400 watts per ton of such molten pig iron; (d) sometime between conducting steps (a) and (c), desulfurizing said molten pig iron; and (e) casting resulting molten steel from said vessel.

4,415,360

**METHOD FOR WORKING-UP METAL-CONTAINING WASTE PRODUCTS**

Johan S. Leirnes, Skelleftehamn, and Malkolm S. Lundström, Skellefteå, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Jul. 19, 1982, Ser. No. 399,841

Claims priority, application Sweden, Jul. 22, 1981, 8104490

Int. Cl.<sup>3</sup> C22B 7/00

U.S. Cl. 75—65 R

11 Claims



1. A method for converting metal-containing waste products having a substantial organic content to a reacted product from which metal can be readily recovered, comprising the method steps of introducing the waste products to a reactor vessel having a closed bottom and a longitudinal axis and arranged for rotation about its longitudinal axis; intermittently unloading reacted product and subsequently loading a refill of said waste product through a common charge and discharge opening at a top end of the reactor vessel; maintaining the products at a controlled temperature range sufficiently high to maintain an expulsion process to expel organic constituents in the form of a combustible gas, said temperature being maintained while rotating the reactor vessel at a predetermined controlled speed with said axis inclined to the horizontal at an angle of less than 90° for as long as such a gas continues to be generated; continuously combusting the combustible gas at a location external of the reactor vessel; and unloading the reacted product from the reactor vessel in a molten and/or non-molten state.

4,415,361

**IRON BASED ALLOY**  
Pantcho Tomas, Randwick, Australia, assignor to British Gas Corporation, London, England

Filed Oct. 22, 1982, Ser. No. 435,945

Claims priority, application United Kingdom, Nov. 2, 1981, 8132912

Int. Cl.<sup>3</sup> C22C 38/06

U.S. Cl. 75—124

3 Claims

1. An iron-based alloy consisting essentially of between 7

and 20% by weight niobium and between 5 and 10% by weight aluminium the balance being iron and incidental impurities.

4,415,362

**NODULAR IRON MAKING AND/OR STORING**  
Ake Archenholtz, Västerås, Sweden, assignor to ASEA AB, Västerås, Sweden

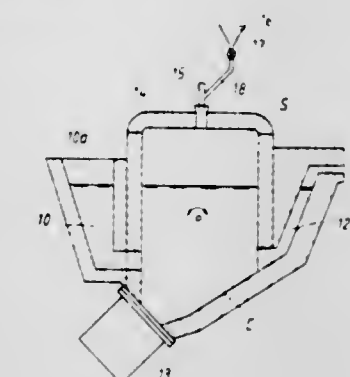
Filed Dec. 9, 1982, Ser. No. 448,348

Claims priority, application Sweden, Dec. 15, 1981, 8107489

Int. Cl.<sup>3</sup> C22C 33/08

U.S. Cl. 75—130 B

3 Claims



1. A furnace for making and/or storing a molten magnesium-containing nodular iron melt, said furnace comprising an enclosure adapted to be partially filled with a molten iron melt at a temperature above the vaporizing temperature of magnesium and to enclose a space above the melt so that the space is heated by the melt to a temperature above said vaporizing temperature, said space being adapted to confine a gas that is non-reactive with magnesium, controllable feeding means for feeding magnesium or magnesium-containing particles into said space without substantial escape of pressure from the space, and means responsive to pressure in said space for automatically controlling said feeding means so as to maintain said pressure at a predetermined value by vaporization of said particles in said space, said furnace having heating means for adding heat to said melt while in said enclosure.

4,415,363

**SINTERED IRON BASE FRICTION MATERIAL**  
Keith E. Sanftleben, and Walter R. Tarr, both of Troy, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 3, 1982, Ser. No. 374,225

Int. Cl.<sup>3</sup> B22F 1/00; C22C 33/02; F16D 69/02

U.S. Cl. 75—229

10 Claims

SINTERED FRICTION MATERIAL COMPOSITION																
INGREDIENTS	W	X	A	B	C	D	E	F	G	H	I	J	K	L	M	N
IRON	53	79	72	85	81	80	77	75	84	73	78	79	77	76	74	68
COPPER	3	14	3	0	7	7	7	7	7	7	7	7	7	7	7	7
GRAPHITE	18	3	14	3	0	7	7	7	7	7	7	7	7	7	7	7
COKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOIST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REACTANT	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WATER	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WATER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WATER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1. A sintered iron base friction material consisting of: 72-85% by weight of a base material selected from a group consisting of iron, and a mixture of iron and copper powders; 3-14% by weight of graphite; 2-12% by weight of coke; 0-3% by weight of friction modifiers; and 3-10% by weight of low melting material selected from a group consisting of zinc, bismuth, lead and tin, said low melting material alloying with said base material to de-







4,415,373

**LASER PROCESS FOR GETTERING DEFECTS IN SEMICONDUCTOR DEVICES**

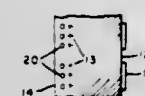
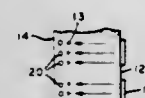
Robert J. Pressley, Cupertino, Calif., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 17, 1981, Ser. No. 322,123

Int. Cl.<sup>3</sup> H01L 21/265; B23K 27/00

U.S. Cl. 148—1.5

10 Claims



1. A process for gettering defects in a semiconductor wafer comprising the steps of:

- providing a dopant material at a major surface of the wafer, that surface being opposite to a second surface of the wafer in which a semiconductor device is formed;
- generating a laser beam at a wavelength that is absorbed by the major surface;
- directing the beam onto the major surface to melt the area of incidence and to diffuse the dopant into the wafer; and
- heating the wafer at a temperature and for a time sufficient to drive defects to traps formed by the dopant in the wafer.

4,415,374

**FINE GRAINED METAL COMPOSITION**

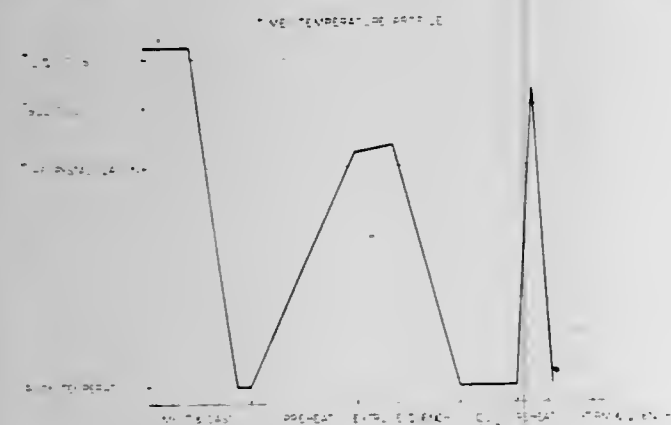
Kenneth P. Young, Ballwin; Curtis P. Kyonka, Maryland Heights, and James A. Courtois, Florissant, all of Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,622

Int. Cl.<sup>3</sup> C22F 1/04, 1/08

U.S. Cl. 148—2

24 Claims



1. A process for the preparation of a metal composition suitable for forming in a partially solid, partially liquid condition, said process comprising producing a solid metal composition having an essentially directional grain structure, heating said directional grain composition to a temperature above the solidus and below the liquidus to produce a partially solid, partially liquid mixture containing at least 0.05 volume fraction liquid, said composition prior to heating having a strain level introduced such that upon heating, the mixture comprises uniform discrete spheroidal particles contained within a matrix composition having a lower melting point than said particles, solidifying said heated composition, said solidified composition having a uniform, fine grained microstructure comprising uniform discrete spheroidal particles contained within a lower melting matrix.

dal particles contained within a matrix composition having a lower melting point than said particles, solidifying said heated composition, said solidified composition having a uniform, fine grained microstructure comprising uniform discrete spheroidal particles contained within a lower melting matrix.

4,415,375

**TRANSIENT TITANIUM ALLOYS**

Richard J. Lederich, University City, and Shankar M. Sastry, St. Louis, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 10, 1982, Ser. No. 387,153

Int. Cl.<sup>3</sup> C22F 1/18

U.S. Cl. 148—11.5 F

21 Claims

1. The method of superplastically forming of titanium and titanium alloys comprising treating a stock piece of titanium or titanium alloy in a hydrogen containing atmosphere causing absorption of hydrogen into the matrix of the stock part in an amount effective to improve forming, and forming the treated stock in a die.

4,415,376

**FORMABLE HIGH STRENGTH LOW ALLOY STEEL SHEET**

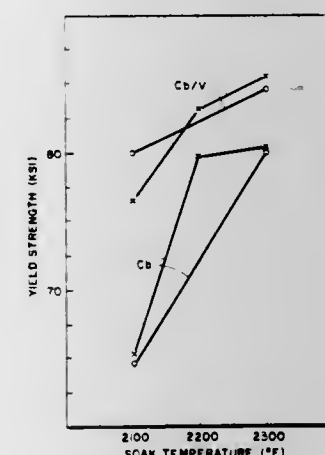
Bruce L. Bramfitt; Steven S. Hansen, both of Bethlehem; Donald L. Harper, Easton, and Roger R. Pradhan, Nazareth, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 174,321, Aug. 1, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,097

Int. Cl.<sup>3</sup> C21D 8/02; C22C 38/12

U.S. Cl. 148—12 F

6 Claims



1. A hot-rolled high strength steel sheet having an essentially refined ferritic grain size and a balanced chemical composition in which the elements thereof contributing to the strength of the steel through grain refinement and precipitation hardening are limited in quantity to that which will go completely into solution at a temperature above 2100° F., said chemistry consisting essentially of, by weight, 0.06 to 0.09% carbon, 1.0 to 1.6% manganese, 0.5% maximum silicon, 0.03 to 0.05 columbium, 0.07 to 0.09% vanadium, 0.010 to 0.025% nitrogen, 0.004% maximum sulfur, 0.02% maximum phosphorus, 0.02 to 0.08% aluminum, the balance iron with residual impurities and incidental elements, where said steel sheet is characterized by the mechanical properties of a yield strength of at least 80 ksi, a transverse bendability of 1T or less, and improved sheared edge stretchability as measured by hole expansion of at least 58%, and by a microstructure comprising fine grained ferrite containing VN precipitates of less than 5 nm.

4. A method of producing a high strength, hot-rolled steel sheet having a thickness in a range between about 0.07 to 0.25 inches, comprising the steps of (1) preparing a steel whose chemistry is balanced within the following limits, by weight,

0.06 to 0.09% carbon, 1.0 to 1.6% manganese, 0.5% maximum silicon, 0.03 to 0.05% columbium, 0.07 to 0.09% vanadium, 0.010 to 0.025% nitrogen, 0.004% maximum sulfur, 0.02% maximum phosphorus, 0.02 to 0.08% aluminum, the balance iron with residual impurities and incidental elements, (2) forming said steel into slab form having a thickness in a range between about 6 to 10 inches, (3) soaking said slab at a temperature between about 2100° to 2250° F., (4) reducing the thickness of said slab to final sheet thickness at a temperature above about 1550° F., (5) cooling the reduced sheet to a temperature between about 950° to 1200° F. and forming said sheet into a coil, whereby to produce a steel sheet characterized by the mechanical properties of a yield strength of at least 80 ksi, a transverse bendability of 1T or less, and improved sheared edge stretchability as measured by hole expansion of at least 58%, and by a microstructure comprising fine grained ferrite containing VN precipitates of less than 5 nm.

4,415,377

**DUPLEX ROLLING PROCESS AND APPARATUS**

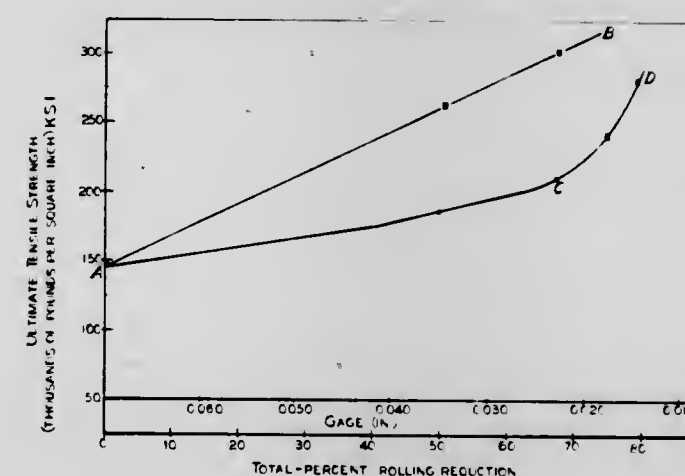
Michael J. Pryor, Woodbridge, and William L. Brennehan, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 28, 1982, Ser. No. 392,908

Int. Cl.<sup>3</sup> C21D 7/14

U.S. Cl. 148—12 R

14 Claims



1. A process for working a metal or alloy subject to the formation of strain induced martensite comprising: working said metal or alloy to reduce its thickness in a first stage of processing at a metal temperature at or above a first desired temperature at which the formation of said strain induced martensite is substantially suppressed or eliminated; and working said metal or alloy following said first stage of processing in a second stage of processing to further reduce its thickness, said second stage working being carried out at or below a second desired temperature which is substantially lower than said first temperature and is selected such that the formation of strain induced martensite during said second stage working is promoted; whereby said working can be carried out more efficiently.

4,415,378

**CASE HARDENING METHOD FOR STEEL PARTS**

Joe R. McKinney, and Roy G. Swagger, both of Douglasville, Pa., assignors to Dana Corporation, Toledo, Ohio

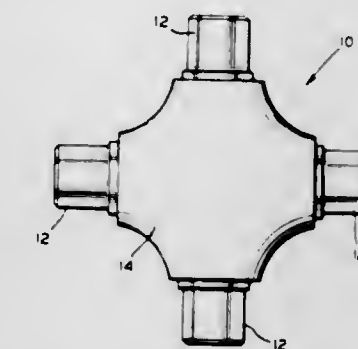
Filed Apr. 22, 1982, Ser. No. 370,719

Int. Cl.<sup>3</sup> C21A 1/00

U.S. Cl. 148—12.1

13 Claims

1. A method of forming a case hardened surface on a steel part made of a carburizing grade of steel, comprising the steps of: (a) completing all metal removal operations on said surface, including finish machining, (b) carburizing said surface to a surface carbon concentration in the range of 0.9 to 1.3%, (c) direct quenching said surface in oil by means resulting in retention of 10 to 30 percent austenite in said surface, (d) time tempering said surface in a controlled furnace environment at constant temperature, and (e) work hardening said surface to transform said retained austenite to at least 5 to 20 percent untempered martensite, and to induce compressive stresses into the case hardened surface.



transform said retained austenite to at least 5 to 20 percent untempered martensite, and to induce compressive stresses into the case hardened surface.

4,415,379

**HEAT TREATMENT PROCESSES**

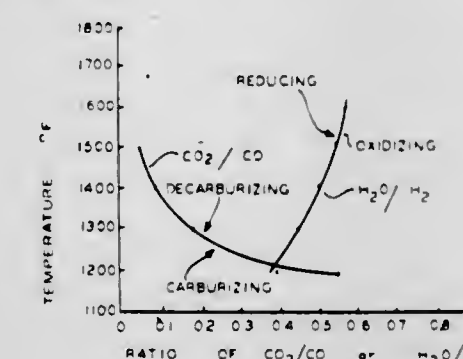
Mircea-Stefan Stancu, Bridgewater, and William T. Fitzgerald, Whitehouse Station, both of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Sep. 15, 1981, Ser. No. 302,336

Int. Cl.<sup>3</sup> C21D 1/48

U.S. Cl. 148—16

4 Claims



1. A process for annealing ferrous material in a continuous furnace having charge and discharge vestibules and a hot zone therebetween and into which furnace inward leakage of ambient oxidants occurs, comprising the steps of: heating said hot zone, which has a plurality of zones therein, to a temperature above 1250° F.; introducing a mixture consisting essentially of some but not more than 10% methane, some but not more than 3% propane, balance nitrogen into one or more zones of said hot zone wherein said propane reacts with a portion of said oxidants to form relatively active methane which together with said introduced methane effectively precludes decarburization of said material; introducing a mixture consisting essentially of nitrogen and methane into a further zone of said hot zone; and introducing essentially only nitrogen into still further zones of said hot zone.

4,415,380

**METHOD FOR MAKING A HIGH REMANENCE FE-MO-NI MAGNETIC ELEMENT**

Sungho Jin, Gillette, and Thomas H. Tiefel, Rockaway, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 178,832, Aug. 18, 1980, Pat. No. 4,340,434.

This application Apr. 1, 1982, Ser. No. 364,624

Int. Cl.<sup>3</sup> H01F 1/02

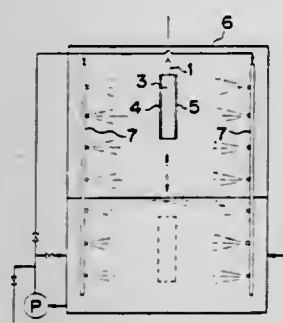
U.S. Cl. 148—101

4 Claims

1. Method for making a magnetic element consisting of a



body of a metallic alloy having a magnetic squareness ratio which is greater than or equal to 0.9 and having remanent magnetic induction which is greater than or equal to 13000 gauss, said alloy comprising an amount of at least 99.5 weight percent Fe, Mo, and Ni, Mo being in the range of 2-26 weight percent of said amount and Ni being in the range of 0.5-15



weight percent of said amount, said method comprising the steps of (1) annealing said body by heating at a temperature in a range of 900-1200 degrees C., (2) rapidly cooling the annealed body, (3) deforming the rapidly cooled body, and (4) aging the deformed body at a temperature in the range of 500-800 degrees C.

4,415,381

#### METHOD FOR FORCEDLY COOLING A HEATED METAL PLATE

Saburo Tani; Mitsuru Yamawaki; Yukifumi Ogawa, and Kenji Hirabe, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

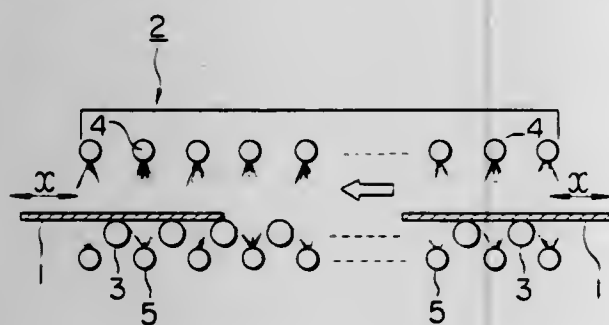
Filed Jul. 17, 1981, Ser. No. 284,376

Claims priority, application Japan, Jul. 25, 1980, 55-101246

Int. Cl.<sup>3</sup> C21D 9/46

U.S. Cl. 148-153

2 Claims



1. In a method for forcedly cooling a heated metal plate uniformly in the longitudinal direction of the metal plate, which comprises:

moving a heated metal plate horizontally in the longitudinal direction thereof at a prescribed speed through a cooling apparatus comprising a plurality of rows of nozzles arranged at prescribed intervals in the width direction of said metal plate above and below said metal plate; and, spraying a cooling liquid from said nozzles onto the upper and the lower surfaces of said metal plate during moving of said metal plate through said cooling apparatus to cool said metal plate to a prescribed temperature;

the improvement comprising:

starting said spraying of said cooling liquid from said nozzles when a prescribed length of the trailing end portion of said metal plate during moving of said metal plate still remains outside of said cooling apparatus; discontinuing said spraying of said cooling liquid from said nozzles when a given length of the leading end portion of said metal plate during moving of said metal plate projects outside of said cooling apparatus by an amount such that said given length equals said prescribed length; said prescribed length of the trailing end portion of said metal plate being determined by the following equation:

$$x = S \tau_c (1 - K)$$

where,

x: said prescribed length;

S: moving speed of said metal plate in said cooling apparatus;

$\tau_c$ : forced cooling period of time for the portion of said metal plate other than said trailing end portion of said metal plate which remains outside of said cooling apparatus by said prescribed length and said leading end portion of said metal plate which projects outside of said cooling apparatus by said given length which equals said prescribed length; and

K: constant dependent on the material and the size of said metal plate;

whereby said metal plate is cooled uniformly in the longitudinal direction thereof.

4,415,382

#### CONTINUOUS ANNEALING APPARATUS AND METHOD

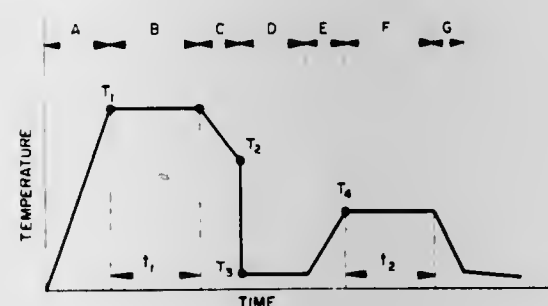
Kenneth M. Gaskey, South Holland, Ill.; Indra Gupta, Munster, Ind., and Richard S. Cline, Crete, Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed Oct. 13, 1981, Ser. No. 310,780

Int. Cl.<sup>3</sup> C21D 1/00

U.S. Cl. 148-153

13 Claims



1. In a continuous annealing apparatus for metal strip having a heating zone wherein the strip is heated to an elevated temperature, a soak zone wherein the heated strip is maintained at an elevated temperature, a water quench zone wherein the heated strip is quenched, and means for moving the strip successively through said zones;

the improvement wherein a pre-quench zone is interposed between said soak zone and said water quench zone, said pre-quench zone comprising:

an enclosure means;

means for directing the strip through said enclosure means in a plurality of passes;

gas jet cooling means disposed in said enclosure means along the path of movement of the strip and arranged to impinge cooling gas against opposite sides of the moving strip for effecting controlled cooling of the strip to a desired quench temperature; and

a plurality of gas-fired radiant tube heaters or electrical resistance heaters disposed in said enclosure means along the path of movement of the strip, said heaters being operable to retard the cooling rate of the strip below the natural cooling rate prevailing when said cooling means is not in use, without reducing the speed of the strip through said enclosure means.

4,415,383

#### METHOD OF FABRICATING SEMICONDUCTOR DEVICES USING LASER ANNEALING

Abdalla A. H. Naem, Ottawa; Iain D. Calder, Nepean, and Hussein M. Naguib, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 10, 1982, Ser. No. 376,687

Int. Cl.<sup>3</sup> H01L 21/268, 21/28

U.S. Cl. 148-187

11 Claims



1. In a method of making silicon integrated circuits, the steps of depositing a layer of polysilicon on an insulating layer, covering a region of the polysilicon with an antireflective coating, directing laser radiation at the polysilicon layer to recrystallize only an area under the antireflective coating, and etching the polysilicon layer using etch conditions ensuring preferential etching of unrecrystallized polysilicon in comparison to recrystallized polysilicon.

4,415,385

#### DIFFUSION OF IMPURITIES INTO SEMICONDUCTOR USING SEMI-CLOSED INNER DIFFUSION VESSEL

Osamu Saito; Hideo Homma, both of Hitachi; Hirokazu Inoue, Ibaraki, and Naohiro Momma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

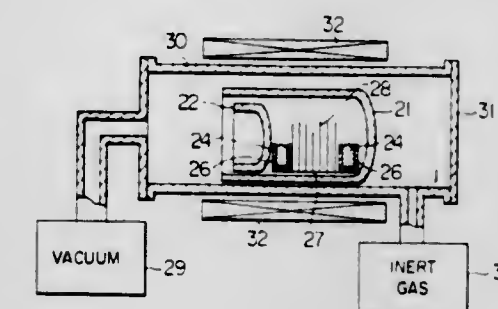
Filed Aug. 7, 1981, Ser. No. 291,042

Claims priority, application Japan, Aug. 15, 1980, 55-111653; Oct. 9, 1980, 55-140444

Int. Cl.<sup>3</sup> H01L 21/223

U.S. Cl. 148-189

20 Claims



1. A method of diffusing impurities into a semiconductor body utilizing a diffusion system which comprises a semi-closed diffusion chamber including a diffusion vessel with an opening and a removable baffle member for partially blocking the opening of said vessel to form the semi-closed diffusion chamber having a limited opening, and an evacuable enclosure having an openable end member for accommodating said diffusion chamber therein, the diffusion vessel being adapted to accommodate said semiconductor body and a diffusion source through said opening, and the semi-closed diffusion chamber being capable of exhausting the atmosphere inside the chamber by evacuating the outside, the method comprising the steps of: loading the diffusion source and the semi-conductor body in said diffusion vessel through said opening;

disposing said baffle member at said opening to form the semi-closed diffusion chamber having the limited opening, wherein said limited opening has a conductance for the vapor molecules of diffusion impurity, which is equal to the conductance of an imaginary opening having an open area  $S_0$  and an infinitely thin thickness, based on the molecular flow condition, said diffusion source has a free surface area of  $S$ , and the value of  $S_0/S$  is not larger than about  $1 \times 10^{-1}$  at a diffusion temperature;

evacuating the inside of the enclosure which contains said semi-closed diffusion chamber, thereby also evacuating the inside of said diffusion chamber through said limited opening;

heating said semi-closed diffusion chamber to subject the diffusion chamber to a heat treatment at a temperature not lower than 450° C. at which substantial diffusion does not take place, while evacuating the inside of said enclosure, for desorbing and exhausting adsorbed molecules from said diffusion chamber, wherein said semi-closed diffusion chamber has a volume  $V$ , said limited opening has a conductance  $C$  for water molecules based on the molecular flow condition, and the value of  $V/C$  in said heat treatment is not larger than about two seconds; further heating said semi-closed diffusion chamber to a diffusion temperature at which said diffusion source vaporizes and diffuses into said semiconductor body; cooling the diffusion chamber; and removing said baffle member and unloading the semiconductor body from the diffusion chamber.

4,415,384

#### METHOD FOR MANUFACTURING A SEMICONDUCTIVE DEVICE

Masayuki Hashimoto, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

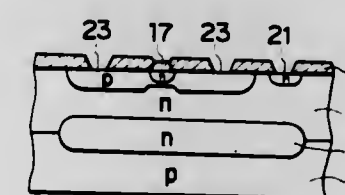
Filed May 26, 1982, Ser. No. 382,325

Claims priority, application Japan, May 27, 1981, 56-79172

Int. Cl.<sup>3</sup> H01L 21/223, 21/265

U.S. Cl. 148-187

6 Claims



1. A method for manufacturing a semiconductive device comprising:

exposing a part of the surface of a first conductive-type semiconductive substrate and providing the other part with a first film;

partially forming a second film on said exposed part of the surface of the first conductive-type semiconductive substrate;

doping second conductive-type impurities through said exposed part and said second film to thereby selectively form a second conductive-type semiconductive region within said first conductive-type semiconductive substrate; and

doping first conductive-type impurities through said second film to thereby selectively form a first conductive-type semiconductive region.



4,415,386

**METHOD AND APPARATUS FOR ASSEMBLING AND ATTACHING ZIPPER CLOSURE STRIPS TO SACKS**

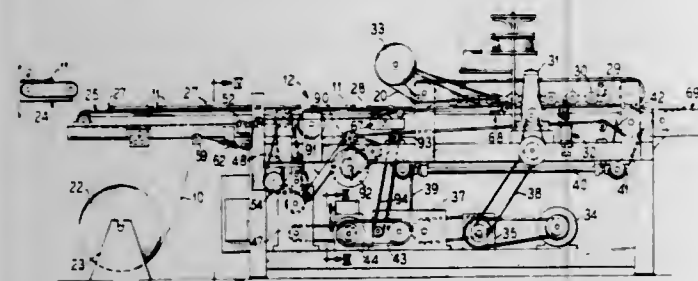
Robert A. Ferrell, Shelbyville, Ind., and James A. Robinette, Bristol, Tenn., assignors to KCL Corporation, Shelbyville, Ind. and Strong-Robinette Company, Inc., Bristol, Tenn.

Filed Feb. 12, 1982, Ser. No. 348,210

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—64

14 Claims



1. Apparatus adapted for assembling and attaching, in an attachment station thereof, zipper closure means in strip form to the open ends of folded flat sacks, and wherein consecutive sections of said closure means, each having a zipper slider and slider stop means, must be in proper registration with said sack ends in said attachment station and with said slider stop means generally aligned with the sides of said open ends, and comprising:

- means for feeding said sections seriatim through said attachment station;
- means for delivering said zipper closure means along a path and section-by-section into assembly with said open ends of said sacks in said attachment station;
- and monitoring means located along said path for sensing said slider stop means and for detecting and automatically correcting deviations from said proper registration.

4,415,387

**METHOD OF FORMING AN ANNULAR SEAM BETWEEN TWO CONTAINER BODY HALVES**

Fred C. Newman, La Grange Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

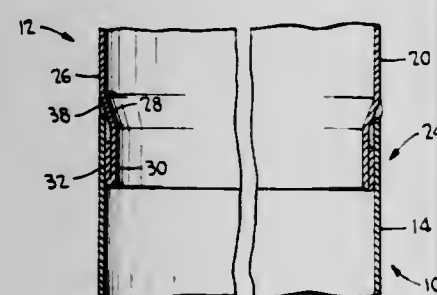
Division of Ser. No. 215,602, Dec. 12, 1980, Pat. No. 4,372,459.

This application Sep. 22, 1982, Ser. No. 421,189

Int. Cl.<sup>3</sup> B23P 11/02; B29C 27/00

U.S. Cl. 156—69

2 Claims



1. A method of joining open ends of cup members to form a container, said method comprising the steps of radially displacing in a selected direction a terminal portion of an open end of one of said cup members and reversely folding a terminal part of said terminal portion in an opposite radial direction to define a hem of a radial dimension to receive in sliding telescoped engagement an open end portion of the other of said cup members and wherein an annular chamber is provided at a free end of said hem, filling said annular chamber generally to overflowing with an adhesive, telescoping open ends of said cup members with a free end of said other cup member engaging said adhesive and displacing a portion of said adhesive in a shearing action to trap part of said adhesive between said cup members axially adjacent said hem free end and in sealing

engagement with said hem free end and to cover in sealing engagement the free end of said other cup member.

4,415,388

**METHOD OF MAKING ABSORBENT BEARING PRODUCTS**

Ralf Korpman, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 274,232, Jun. 22, 1981, which is a continuation-in-part of Ser. No. 248,387, Jun. 27, 1981, and Ser. No. 181,289, Aug. 25, 1980, abandoned. This application Aug. 5, 1981, Ser. No. 288,864

Int. Cl.<sup>3</sup> B32B 31/30, 5/20

U.S. Cl. 156—78

4 Claims

1. A process for producing an absorbent bearing foam product comprising:

- (1) feeding into a cold extruder the components of a liquid foam-forming composition comprising a particulate water-insoluble, water-swellaible absorbent polymer having a gel capacity of at least 10, a liquid polyhydroxy organic compound, and a blowing agent, wherein the amounts of the components are from about 25 to about 125 parts by weight of the absorbent polymer and from about 2 to about 30 parts by weight of blowing agent for every 100 parts by weight of liquid polyhydroxy organic compound;
- (2) passing the components through an extruder barrel at ambient temperature to intimately mix the components;
- (3) forcing the resulting mixture into a die maintained at temperatures in the range of about 200° to 400° F. to cause foam formation;
- (4) expelling the foam through the orifice of the heated die onto a temporary or permanent substrate; and
- (5) allowing the foam to solidify into an absorbent bearing solidified structure.

4,415,389

**METHOD OF MAKING A HOSE CONSTRUCTION**

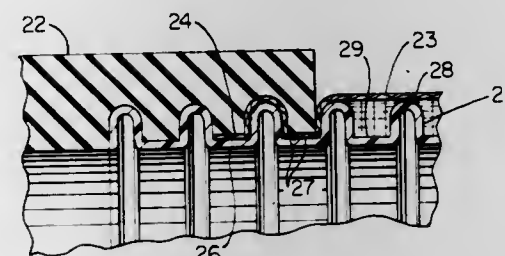
Richard D. Medford, and Jerry W. Cooper, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed May 5, 1980, Ser. No. 146,556

Int. Cl.<sup>3</sup> B32B 7/04

U.S. Cl. 156—91

11 Claims



1. In a method of making a hose construction comprising the steps of forming a flexible corrugated hose of a polymeric material and having a plurality of outwardly convex projections with recesses therebetween and extending from one end thereof to the other end thereof, fixing a pair of hose connectors to opposite ends of said hose, and disposing a sleeve which has opposite end portions around said hose, the improvement comprising the step of fastening said sleeve to said projections of said hose only at its opposite end portions by sandwiching each opposite end portion between said hose and its respective hose connector so that each hose connector holds its respective end portion of said sleeve in sandwiched relation against at least one projection of said hose and against at least one recess of said hose that is adjacent to said one projection and with said sleeve making only substantially circular line contact with said projections between said end portions and being substantially taut between said end portions and substantially free of sags

between said projections and over said recesses between said end portions whereby said sleeve serves to improve the fluid pressure resistance and external wear resistance of said hose while keeping its flexibility substantially intact.

4,415,390

**INTERNAL WRAPPING METHOD AND APPARATUS**

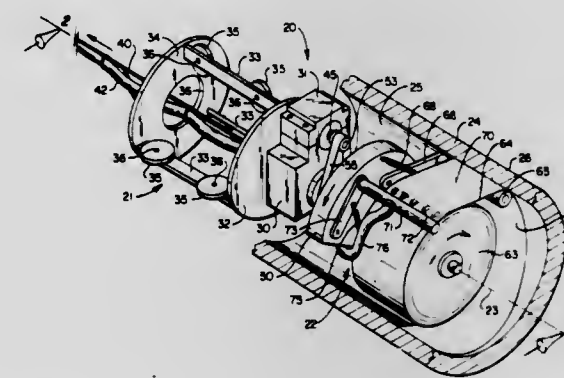
Robert B. Smith, Columbus, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Nov. 12, 1981, Ser. No. 320,228

Int. Cl.<sup>3</sup> B65H 81/00

U.S. Cl. 156—187

9 Claims



1. A method of coating and sealing the interior wall of a stationary conduit comprising:

- applying motive means positioned within the conduit to spirally unwind a sealing membrane from a roll within the conduit,
- applying by motive means within the conduit, an adhesive material between the membrane and the inner circumferential wall of the conduit,
- followed by pressing and adhering the membrane against the sealing material and against the interior circumferential wall of the conduit,
- while moving the roll of the membrane longitudinally within the conduit by means attached to the motive means, actuated and controlled from a position external to the conduit.

4,415,391

**REINFORCED MOLDED RUBBER MUFFLER HANGER AND METHOD OF MAKING OF SAME**

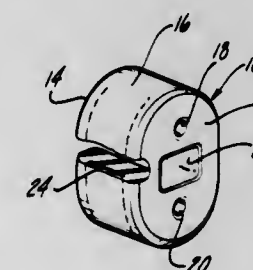
Glenn J. Reid, 2270 Chestnut, Bloomfield Hills, Mich. 48084

Filed Apr. 6, 1982, Ser. No. 366,029

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—187

7 Claims



1. The method of manufacturing a load-bearing reinforced elastic article comprising the steps of:

- preparing a preform of uncured elastic material approximating the shape of the finished article;
- preparing a wrapping loop made up of a reinforcing material coated with said uncured elastic material; the loop size accurately conforming substantially to an exterior circumferential dimension of the finished article but being slightly greater than the same circumferential dimension of the preform;

the combined mass of the preform and loop accurately conforming to the mass of the finished article; placing the loop on the preform so as to contact and circumscribe the said circumferential dimension; and compression molding the combination of preform and loop to cure and physically unify same and to expand the circumferential dimension of the preform to fill the loop.

4,415,392

**METHOD FOR PRODUCING FOAMED PLASTIC SHEET**

Tetsuo Komori, Utsunomiya, Japan, assignor to Japan Styrene Paper Corporation, Tokyo, Japan

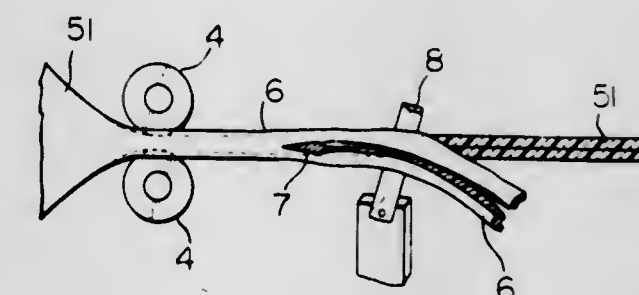
Filed Nov. 16, 1979, Ser. No. 94,888

Claims priority, application Japan, Nov. 20, 1978, 53-142311; Nov. 22, 1978, 53-143539

Int. Cl.<sup>3</sup> B29D 23/04; B32B 31/18

U.S. Cl. 156—244.13

5 Claims



1. A method for producing a foamed plastic sheet which comprises heating and kneading a thermoplastic synthetic resin composition containing a blowing agent in an extruder, extruding the resulting product through a circular die to form a tubular member, compressing and flattening the foamed tubular extrudate while in the softened state to cause the inside walls thereof to self-adhere and form a sheet, the extent of said compressing, in terms of the width of said sheet, being at least 5% smaller than the width of said tubular member in the flattened state, thereby forming on the outer perimeters of said flattened and compressed sheet longitudinal and substantially tubular portions open to the atmosphere to vent resulting gases, and thereafter longitudinally cutting from the sheet thus formed said longitudinal, tubular portions to produce a continuous sheet of foamed plastic material.

4,415,393

**METHOD OF MAKING A FRANGIBLE PORT PROTECTOR**

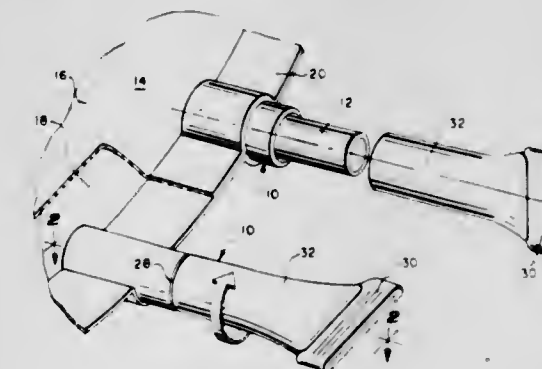
Robert G. Grimes, Vernon Hills, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 22, 1981, Ser. No. 313,568

Int. Cl.<sup>3</sup> B29D 23/04; B32B 31/18

U.S. Cl. 156—244.13

5 Claims



1. The method of manufacturing a tear-off port protector carried on a container which comprises placing extruded plastic tubing on a mandrel that fills the bore of said tubing and



stretches the tubing; spacing a cutting blade a predetermined distance of less than the tubing wall thickness from the mandrel and rotating said mandrel and tubing carried thereon, causing the cutting blade to form an annular cut about the tubing while maintaining the predetermined distance; removing the tubing from the mandrel, closing one end of the tubing, and sealing the outside surface of the other end of the tubing to said container with an access port positioned in telescoping relation inside of said tubing, said tubing sealed to the access port through a spacer bushing positioned within said tubing, whereby tearing open of said tubing along the annular cut exposes the access port.

4,415,394

# METHOD AND APPARATUS FOR UNIFORM CORONA DISCHARGE BONDING

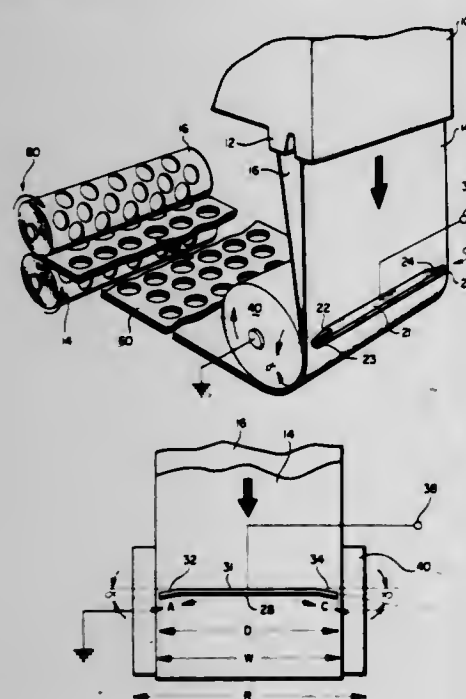
Sidney Cholmar, Stamford, Conn., assignor to National Can Corporation, Chicago, Ill.

Filed Nov. 18, 1981, Ser. No. 322,514

Int. Cl.<sup>3</sup> B32B 31/28; B05D 3/14

U.S. Cl. 156—379.8

9 Claims



1. An apparatus for bonding together two or more layers of material generally uniformly across their common width, said apparatus comprising a ground means adapted to be positioned across the width of said layers of material on one side of said layers of material to be bonded and an electrode means adapted to produce a corona discharge positioned on the opposite side of said material from said ground means, said electrode means being of a length to extend substantially across said common width for producing an effectively uniform corona energy field across said common width of said layers of material, said electrode means having end portions adapted to be subject to an increased corona field strength, said end portions being configured to substantially compensate for said increased corona field strength to produce a generally uniform corona field across said common width whereby said layers of material are substantially uniformly bonded across their common width.

4,415,395

# APPARATUS FOR APPLYING A PRINTING OR CUTTING FORCE TO A LAMINATED TAPE

Michael W. Paque, Scottsdale, Ariz., assignor to Kroy Inc., St. Paul, Minn.

Filed Jan. 15, 1982, Ser. No. 339,482

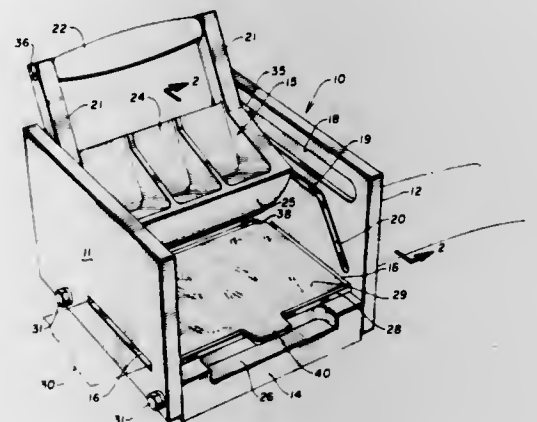
Int. Cl.<sup>3</sup> B30B 15/02, 15/04

U.S. Cl. 156—384

24 Claims

1. An apparatus for applying a printing or cutting force to an elongated strip of tape comprising:

a base;  
means associated with said base including a generally flat printing or cutting surface for defining a printing or cutting station;  
a pair of generally parallel side walls extending upwardly from said base, each of said side walls including a tape receiving opening in alignment with said printing or cutting station to define the path of travel of said elongated strip through said apparatus;  
a printing or cutting member positionable in printing or cutting alignment with said printing or cutting station between said side walls; and



force exerting means for exerting a printing or cutting force on said printing or cutting member including a force exerting member disposed between said side walls and having a curved force exerting surface with its center of curvature lying on an axis generally parallel to the path of travel of said elongated strip through said apparatus and perpendicular to said side walls and support and guide means for supporting and guiding said curved force exerting surface in movement between a first position and a second position with at least a portion of said movement being generally rolling and force exerting movement with respect to said printing station.

4,415,396

# APPARATUS FOR MAKING FILAMENT REINFORCED PLASTIC SCREEN

Walter R. Wagner, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.

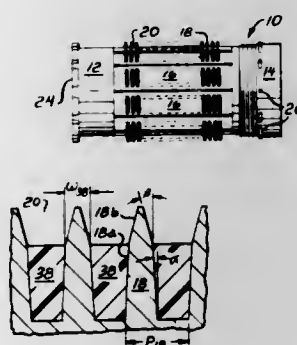
Division of Ser. No. 334,105, Dec. 24, 1981, Pat. No. 4,381,820.

This application Sep. 27, 1982, Ser. No. 423,776

Int. Cl.<sup>3</sup> B31C 3/00

U.S. Cl. 156—425

5 Claims



1. In a screen winding apparatus of the collapsible, plural segment, helically finned mandrel type used for forming a strand of resin-coated reinforcing filaments into a helically wound screen surface defining wire, the improvement comprising providing fins on the mandrel segments which are formed so that the major portion of the radial length of their sides, when viewed in an axial plane of the mandrel, starting at their base, is tapered in an outwardly converging direction at a

relatively small angle and the remaining minor portion of their radial length is tapered at a relatively larger angle, said minor portion being adapted to be engaged along lesser or greater portions of its radial extent by lesser or greater thicknesses of resin coated reinforcing filaments, depending upon the width of screen slot desired between adjacent helically wound screen wires formed between adjacent fins on the mandrel, whereby said major portion of the fin radial length will produce a relatively narrow width, slightly tapered support base portion on said screen wires while said minor portion of the fin radial length will produce a substantially wider wear surface.

4,415,397

# APPARATUS FOR MAKING TOOTHED BELT

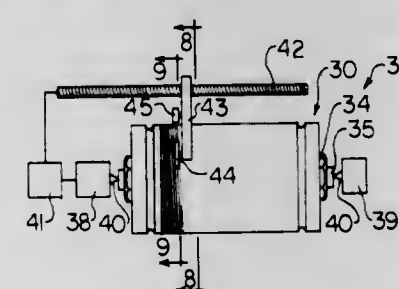
Robert E. Wetzel, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 110,032, Jan. 7, 1980, abandoned, which is a division of Ser. No. 217,261, Dec. 16, 1980, Pat. No. 4,343,666, which is a division of Ser. No. 957,280, Nov. 2, 1978, Pat. No. 4,235,119. This application May 17, 1982, Ser. No. 378,978

Int. Cl.<sup>3</sup> B29H 7/22

U.S. Cl. 156—446

5 Claims



1. An apparatus for making positive drive transmission belts having a plurality of alternating grooves and elastomeric teeth comprising:

frame means;  
means for rotatably and detachably mounting a cylindrical belt building mold thereon, said mold having a plurality of axially extending spaced grooves in its outer circumference;  
means for rotating said mold;  
cord winding means including a laydown arm means having a cord laydown wheel means mounted thereon and means for moving said arm means in a direction parallel to the rotational axis of said mold;  
heating means for heating the belt components assembled on said mold; and  
forcing wheel means carried by said arm means for forcing the heated belt components into said grooves in said mold in advance of said cord laydown wheel means.

4,415,398

# CUSHIONING DUNNAGE APPARATUS

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Division of Ser. No. 75,662, Sep. 14, 1979, Pat. No. 4,314,865.

This application Sep. 30, 1981, Ser. No. 307,008

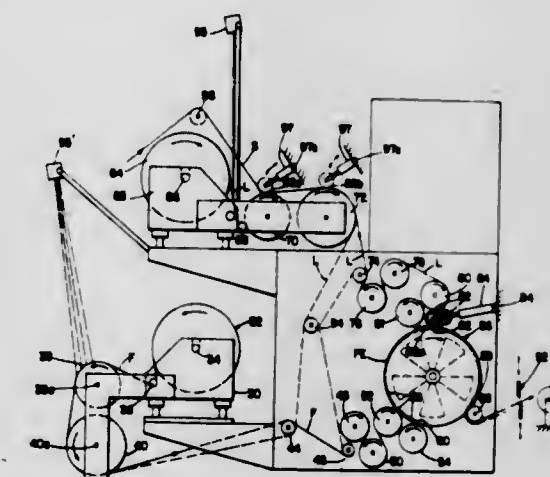
Int. Cl.<sup>3</sup> B31F 1/00; B32B 31/08

U.S. Cl. 156—470

16 Claims

1. In an apparatus for producing the cell cushioning dunnage from flexible thermoplastic sheet stock, each sheet of which comprises a composite of an intermediate stratum of high density high melting point thermoplastic material generally impervious to the passage of air therethrough, and exterior strata formed of low density, low melting point thermoplastic material, with said intermediate stratum being of a higher density, higher melting point material as compared to that of the exterior strata, comprising a rotatable forming drum having a plurality of recesses formed therein for vacuum forming the air cells in a first sheet of the thermoplastic material fed

onto the drum, said drum including means for cooling the drum to a predetermined temperature, and a series of spaced rollers spaced with respect to said forming drum, said series of rollers having means providing for heating the first sheet prior to its being fed onto said drum, to a temperature above the melting point of the exterior strata of the first sheet but below the melting point temperature of the intermediate stratum, and a second series of rollers spaced from said first series and having means adapted to heat a second sheet of the thermoplastic stock material to a temperature above the melting point of the exterior strata of the second sheet but below the



melting point of the intermediate stratum of the second sheet, and means coacting with said second series for applying the second sheet to the first sheet on said drum during rotation of the latter to seal the air cells, with said first series and said second series of rollers and said applying means being so arranged with respect to the circumference of said drum that said applying means is spaced from the point of application of the first sheet to the drum sufficiently that said drum during rotation thereof can cool the first sheet to a temperature approaching the softening point temperature of the exterior stratum of the first sheet prior to application of the second sheet thereto.

4,415,399

# HANDLE APPLICATOR

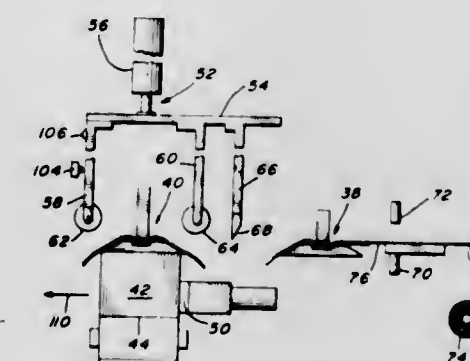
Wolfgang Gelsinger, 352 Rosemere Blvd., Rosemere, Quebec, Canada J7A 2T5

Filed May 19, 1982, Ser. No. 380,017

Int. Cl.<sup>3</sup> B32B 1/00

U.S. Cl. 156—475

6 Claims



1. A handle applicator comprising; a first and a second gripping means, means to reciprocate each of said gripping means to alternately move each said gripping means to and from a pick-up station and an application station, each of said gripping means including an anvil member and a clamping member adapted to cooperate with said anvil member and hold a handle on said anvil member, means to deliver articles to said application station and means to apply a handle supported by one of said anvil members in said application station to said



article, means to move articles with handles applied thereto from each application station.

4,415,400

# DEVICE FOR JOINING TWO SINGLE ADHESIVE TAPES TO FORM A DOUBLE ADHESIVE TAPE

Paul Rammelmeyer, Friedhofstr. 12, 8352 Grafenau, Fed. Rep. of Germany

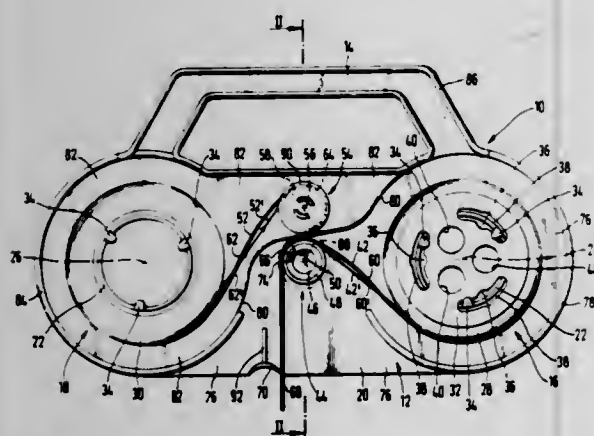
Filed Mar. 19, 1982, Ser. No. 359,854

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111748

Int. Cl.<sup>3</sup> B32B 51/00

U.S. Cl. 156—555

12 Claims



1. A device for joining two adhesive tapes each having one adhesive side into a centrally overlapping double adhesive tape with the adhesive sides on either side of the overlapping area facing in opposite directions comprising:

- two supports for each rotatably mounting one supply roll of rolled-up single adhesive tape around a rotary core;
- a frame mounting and connecting the rotary cores with their axes displaced from one another in mutually corresponding radial planes and having a handle portion; and
- means located between said supports for joining said tape including first and second adhesive tape control cylindrical rolls, one of the single adhesive tapes being unrolled from one supply roll around one of said rolls, and then steered into position about the other of said rolls with its adhesive side in contact with the adhesive side of the other single adhesive tape in such a way that a double adhesive tape is formed which is partially adhesive on both sides, and drawn out with a glued together overlap area through an area bounded by stops on either side, the cylindrical surface of said other roll extending beyond a tangential contact line at which said tape is drawn from said other roll so that said tape can be pulled off said cylindrical surface in a direction which can be varied between said stops.

4,415,401

# CONTROL OF ATMOSPHERE SURROUNDING CRYSTAL GROWTH ZONE

Fritz Wald, Wayland, and Juris P. Kalejs, Wellesley, both of Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 129,075, Mar. 10, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,300

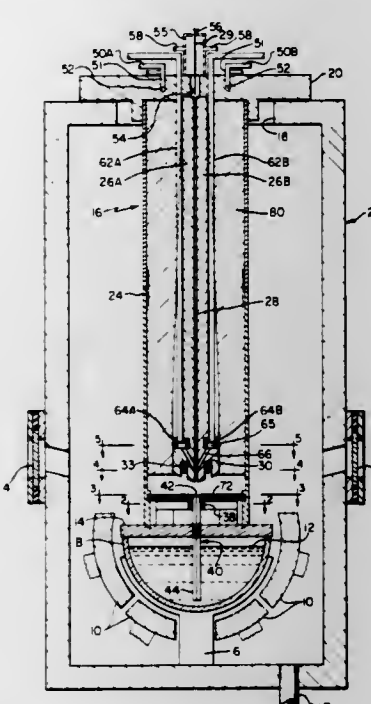
Int. Cl.<sup>3</sup> C30B 15/34

U.S. Cl. 156—608

24 Claims

1. In a method of growing a crystallized body of silicon from a silicon melt where a stationary graphite shaping member is used in the growth zone and the liquid/solid growth interface is characterized by a meniscus between the shaping member and the growing body, the improvement comprising continuously enveloping the growth zone with a moving mixture of an

inert gas and a carbon-containing gas, said carbon-containing gas constituting a relatively small proportion of said mixture so



as to beneficially affect the electronic quality of the grown silicon body.

4,415,402

# END-POINT DETECTION IN PLASMA ETCHING OR PHOSPHOSILICATE GLASS

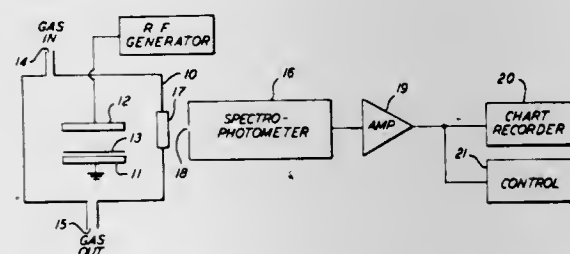
Barry Gelernt, Bridgeport, and C. Wallace Wang, Wilton, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 2, 1981, Ser. No. 250,375

Int. Cl.<sup>3</sup> H01L 21/306; C03C 15/00

U.S. Cl. 156—626

3 Claims



1. A method for detecting end-point in the plasma etching of a phosphorous doped silicon dioxide layer coated on a substrate of single crystal silicon comprising the steps of; etching the phosphorous doped silicon dioxide from the substrate within an etching chamber with gas from the fluorinated hydrocarbon family, spectroscopically observing the gases in the etching chamber over a time interval covering the beginning and end of the etching process and within a predetermined wavelength interval, observing the presence of the phosphorous atomic line straddled by two argon atomic lines at the beginning of the etching process, observing the disappearance of said phosphorous atomic line from between said two argon atomic lines as an indication of the end of the etching process.

4,415,403

# METHOD OF FABRICATING AN ELECTROSTATIC PRINT HEAD

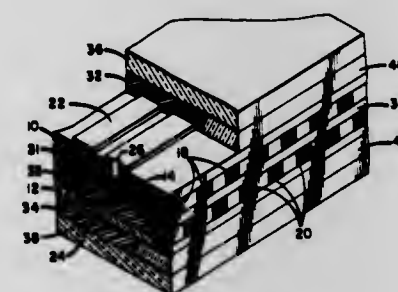
Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 962,193, Nov. 20, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 214,463

Int. Cl.<sup>3</sup> C23F 1/02; B44C 1/22; G01D 15/06

U.S. Cl. 156—634

10 Claims



1. The method of fabricating an electrostatic print head comprising the steps of: etching holes through a glass or ceramic substrate at predetermined positions; vacuum depositing a first metal layer on both surfaces of the substrate and onto the surfaces of the holes previously etched through the substrate to produce a uniform conductive layer intimately adhered directly to the substrate and having the same smooth surface characteristics as the substrate surface; electroplating a second metal layer on the surfaces of the first metal layer to produce a planar structure of uniform composition and thickness; forming a photoresist pattern on one surface of the second metal layer defining a high resolution array of electrode lines extending along a first direction, with the ends of the electrode lines lying along an edge of the substrate and defining a high resolution array of writing styli, and a pad area on each electrode line surrounding a respective one of the holes through the substrate; forming a photoresist pattern on the opposite surface of the second metal layer to define a high resolution array of buss lines extending along a transverse direction to the first direction, with a connector area on each of the buss lines and a pad area on each of the buss lines in registration with a pad area of a respective electrode line and surrounding a respective hole through the substrate; plating a third metal layer on all exposed surfaces of said second metal layer defined by the photoresist patterns to produce a multilayered metal structure of uniform thickness and conductivity; plating the styli of the electrode lines to intended precisely configured cross-sectional shape and size; removing the photoresist material from both surfaces of the substrate; and selectively etching the exposed first and second metal layers to leave the third metal electrode line and buss line patterns on respective substrate surfaces, the electrode lines and buss lines having high resolution and uniform composition without breaks or cracks.

4,415,404

# PROCESS OF ETCHING GLASS SURFACES, PARTICULARLY IN THE MANUFACTURE OF OPTICAL WAVEGUIDES

Ivan Riegl, Grafenau, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

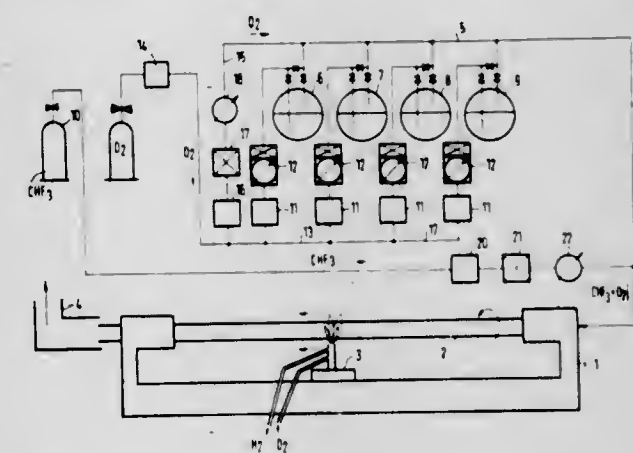
Filed Dec. 31, 1980, Ser. No. 221,587

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3000954

Int. Cl.<sup>3</sup> C03C 15/00

U.S. Cl. 156—635

11 Claims



1. A process of treating surfaces of silica glass or silicate glass, particularly in the course of preparing an internal surface of a tubular substrate for subsequent coating during the manufacture of optical waveguides, comprising the steps of introducing to the surface to be treated a gaseous medium containing at least one component from which hydrogen fluoride is formed when the temperature of the gaseous medium exceeds a predetermined level; raising the temperature of an etching zone extending only over a portion of the surface to at least the predetermined level to form hydrogen fluoride in the gaseous medium and have the same etch the surface only at the etching zone; and effecting relative movement between the etching zone and the surface until all portions of the latter have been etched.

4,415,405

# METHOD FOR ENGRAVING A GRID PATTERN ON MICROSCOPE SLIDES AND SLIPS

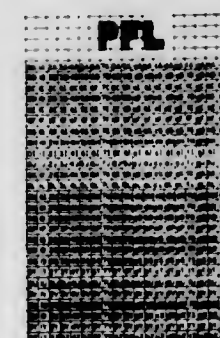
Frank H. Ruddle, New Haven, and Pin-Fang Lin, Branford, both of Conn., assignors to Yale University, New Haven, Conn.

Filed Aug. 19, 1981, Ser. No. 294,153

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—645

12 Claims



1. A method for engraving a closely-spaced grid pattern onto a glass microscope slide or cover slip, which comprises: applying a positive photoresist to a glass surface of the slide or slip to produce a substantially uniform, dry, positive photoresist coating thereon; baking the coated slide at a temperature of from about 50° C.



to about 150° C. for about 10 to 120 minutes, to produce a slide with a baked coating;  
 exposing the baked coating to light transmitted through a photographic transparency of the grid pattern to produce a photochemical reaction in the exposed portions of the coating;  
 removing the exposed portion of the coating with positive photoresist developer to produce a coated slide with a replicated image of the grid pattern in the coating;  
 rebaking the coated slide with the grid pattern image in the coating at a temperature of from about 50° C. to about 150° C. for about 10 to 120 minutes to produce a rebaked slide;  
 etching the portions of the glass surface of the slide which are exposed by the grid pattern in the coating thereon, with aqueous hydrofluoric acid, aqueous ammonium fluoride or a mixture thereof, to form an engraved grid pattern in the glass; and  
 removing the remaining coating from the glass slide.

4,415,406

# CHEMICAL ETCHING OF POLYMERS FOR METALLIZING

Wayne T. Wiggins, Aurora, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Mar. 7, 1980, Ser. No. 128,327

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> B29C 17/08

U.S. Cl. 156—668

14 Claims

1. A method for preparing the surface of a nitrile containing polymer article for metallizing comprising etching said surface with a mixture of (a) an acid having a pH at 0.1 N of less than 2, and (b) a monocarboxylic or halogenated monocarboxylic acid in the absence of chromic acid or precursor thereof.

4,415,407

# DOWNFLOW EVAPORATOR

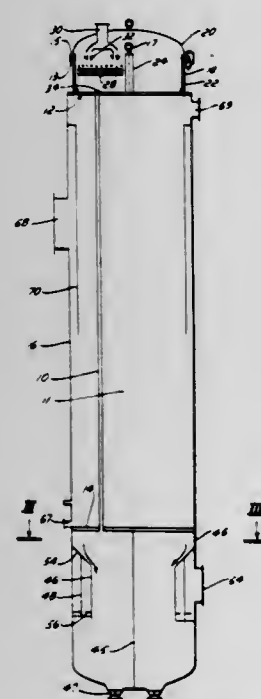
Andre Longuet, Bethune, France, assignor to Fives-Cail Babcock, Paris, France

Continuation-in-part of Ser. No. 203,048, Nov. 3, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,993 Claims priority, application France, Nov. 23, 1979, 79 28881

Int. Cl.<sup>3</sup> B01D 1/10, 1/22, 1/30

U.S. Cl. 159—13 A

15 Claims



1. An evaporator for concentrating a descending stream of liquid containing solids, which comprises  
 (a) a bundle of downflow tubes having open upper and lower ends, the tubes being arranged in rows to receive

the stream of liquid through the upper ends and to discharge it through the lower ends,  
 (b) an upper tube sheet holding the upper ends of the tubes,  
 (c) a lower tube sheet holding the lower ends of the tubes,  
 (d) means including several strata of elongated horizontal members spaced from each other above the upper tube sheet for causing the liquid to cascade over the entire surface of the upper tube sheet whereby the liquid is distributed thereover and over the open upper ends of the downflow tubes,  
 (1) each horizontal member of each stratum being disposed above a respective one of the rows of downflow tubes, the members of each stratum being parallel to each other and the angular orientation of the horizontal members of each stratum differing from that of the members of the other strata and  
 (e) a covering placed over the upper end of each downflow tube and spaced therefrom so as to prevent the liquid from dripping into the central portion of the tube whereby the stream of liquid descends peripherally along the inner surface of the tube.

4,415,408

# APPARATUS, AND METHOD FOR CONTROLLING CONSISTENCY

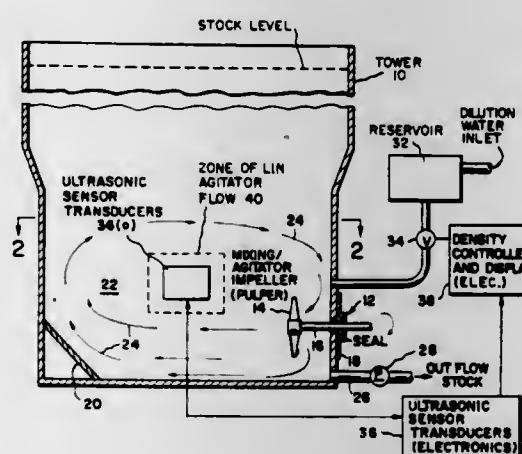
David N. Greey, Toronto, Canada, assignor to General Signal Corporation, Rochester, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,354

Int. Cl.<sup>3</sup> D21F 1/08

U.S. Cl. 162—198

16 Claims



1. Apparatus for controlling the consistency of a slurry contained in a tank which comprises an agitator for producing a flow of said slurry in said tank, liquid velocity sensor means for sensing said flow, said sensor being located adjacent to a surface of the tank at a region where said slurry flow is linear, means for providing an output corresponding to the sensed flow, and means responsive to said output for varying the dilution of said slurry to control the consistency thereof.

15. The method for measurement of consistency of a slurry in a tank which comprises the steps of agitating said slurry with an impeller to produce a circulating flow of said slurry in a said tank, then detecting the velocity at which said slurry flows adjacent to a surface of the tank at a region where said flow is linear, and deriving a measurement of consistency from said velocity.

4,415,409

# PROCESS FOR THE SEPARATION OF HIGH BOILING OXYGENATED COMPOUNDS FROM MIXTURES WITH PHENOL AND/OR CRESOL

David Zudkevitch, Denville, and Stephen E. Belsky, Morris Plains, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 22, 1983, Ser. No. 468,242

Int. Cl.<sup>3</sup> B01D 3/40; C07C 37/80

U.S. Cl. 203—51

11 Claims

1. A process for the separation of a mixture comprised of a first component consisting of at least one member selected from the group consisting of phenol and cresol and a second component having a boiling point of at least about 175° C. consisting of at least one member selected from the group consisting of alkanols, alkanones, cycloalkanones, cycloalkanol, aryl alcohols and aryl ketones; wherein said process comprises distilling said mixture in the presence of at least one extractive solvent selected from the group consisting of substituted phenols and cresols having 6 to 25 carbon atoms and a boiling point between about 195° C. and about 400° C. to produce a vapor overhead stream consisting essentially of said first component and a liquid bottoms stream consisting essentially of said second component and said extractive solvent; wherein said mixture may not be separated by simple fractional distillation procedures; wherein said extractive solvent has a boiling point at least about 20° C. above the boiling point of said second component.

4,415,410

# FORMING OF TETRABASIC LEAD SULFATE BATTERY ELECTRODES

Gregory N. Reich, Norristown, Pa., assignor to Allied Corporation, Norristown, N.J.

Filed Feb. 28, 1983, Ser. No. 470,346

Int. Cl.<sup>3</sup> H01M 10/12, 10/44

U.S. Cl. 204—2.1

7 Claims

1. A process for the fabrication of lead acid batteries including a container for containing negative electrodes and positive electrodes, including the step of coating at least one said electrode with a paste containing tetrabasic lead sulfate, lead dioxide and water, curing said plates, placing said plates and an acid electrolyte in said container, and forming said plates in said container.

4,415,411

# ANODE COATED WITH $\beta$ -LEAD DIOXIDE AND METHOD OF PRODUCING SAME

Hideo Kanai, Akihiro Shinagawa, both of Maebashi; Takahiro Yamazaki, Shibukawa, and Relichi Itai, Maebashi, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

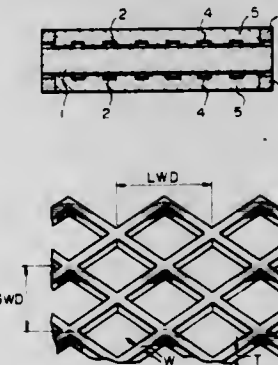
Filed Feb. 23, 1981, Ser. No. 236,908

Claims priority, application Japan, Mar. 4, 1980, 55-26182

Int. Cl.<sup>3</sup> C25B 11/16

U.S. Cl. 204—29

13 Claims



1. An anode coated with  $\beta$ -lead dioxide which comprises:  
 (a) a titanium substrate having opposed sides;  
 (b) titanium expanded metal which is laid on and fits closely to

at least one of said opposed sides of said titanium substrate and is at least partially welded thereto, said titanium expanded metal having the following dimensions: an LWD in the range of from about 0.5 mm to about 5 mm, an SWD in the range of from about 0.5 mm to about 2.5 mm, a strand width in the range of from about 0.1 mm to about 1 mm, and a titanium thickness in the range of from about 0.05 mm to about 0.6 mm;

(c) titanium reinforcing bars which are set on the peripheries of said titanium expanded metal and are at least partially welded to both said titanium expanded metal and said titanium substrate;

(d) at least one intermediate layer on said titanium substrate and said titanium expanded metal, said intermediate layer being selected from the group consisting of an alloy and an oxide of platinum group metals; and  
 (e) a  $\beta$ -lead dioxide coating layer on said intermediate layer.

7. A method for the production of the anode set forth in claim 1 which comprises the following steps:

(a) roughening the surface of at least one side of a titanium substrate having opposed sides;

(b) placing and welding titanium expanded metal onto said titanium substrate;

(c) setting and welding titanium reinforcing bars onto both said titanium expanded metal and said titanium substrate to form an anode structure;

(d) washing said structure with an organic solvent, and degreasing by immersing in alkali metal hydroxide solution for 3 hours;

(e) immersing said structure in a hydrofluoric acid solution; (f) covering the surface of said structure with a true solution which upon heating will form an alloy or an oxide of platinum group metals;

(g) heating said structure in an oven at a temperature of from about 450° to about 600° C. to deposit said alloy or said oxide on said structure and form an intermediate layer coating said reinforcing bars, said expanded metal and the surface of the substrate to which they are attached; and  
 (h) electrodepositing  $\beta$ -lead dioxide on said intermediate layer from a lead nitrate bath.

4,415,412

# PRODUCTION OF ANHYDROUS ALUMINUM CHLORIDE COMPOSITION AND PROCESS FOR ELECTROLYSIS THEREOF

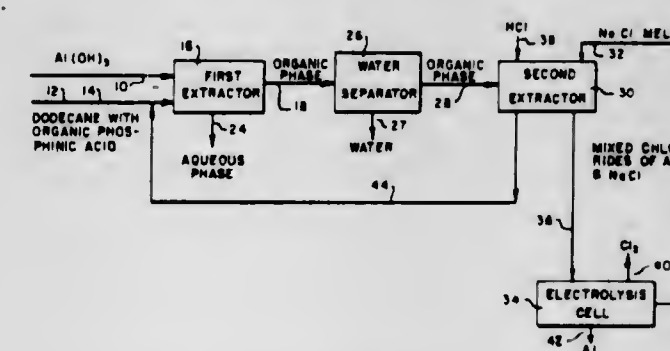
George F. Vandegrift, Bolingbrook; Michael Krumpelt, Naperville, and E. Phillip Horwitz, Hinsdale, all of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 8, 1981, Ser. No. 309,655

Int. Cl.<sup>3</sup> C25C 3/06; C01F 7/58, 7/60

U.S. Cl. 204—67

14 Claims



1. A process for producing an anhydrous aluminum chloride composition from an aluminum material in an aqueous phase comprising the steps of:

mixing in a first stage the material and an organic liquid substantially immiscible in water and containing an acidic extractant capable of extracting the aluminum from the



aqueous phase to form a dehydrated aluminum composition in the organic liquid, the mixing step forming an organic phase containing the organic liquid and the dehydrated aluminum composition;

removing the organic phase from the aqueous phase;

and

mixing in a subsequent stage the organic phase and at least one alkali metal chloride at an elevated temperature and in amounts sufficient to convert the dehydrated aluminum composition in the organic phase in anhydrous aluminum chloride in a mixture with the alkali metal chloride, the temperature being sufficient to form the mixture of chlorides as a melt.

3. The process of claim 1 which includes the steps of: feeding the mixture of alkali metal and aluminum chlorides to an electrolysis cell containing a bath composed of at least one alkali metal chloride and aluminum chloride; operating the cell to form metallic aluminum from the aluminum chloride; and

recycling a portion of the bath to the second mixing stage as a source of the alkali metal chloride for extraction of additional aluminum chloride.

4,415,413

# METHOD OF CONCENTRATING ALKALI METAL HYDROXIDE IN A CASCADE OF HYBRID CELLS

Andre Veber, Orge, France, assignor to Occidental Research Corporation, Irvine, Calif.

PCT No. PCT/US81/00446, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/03035, PCT Pub. Date Oct. 29, 1981

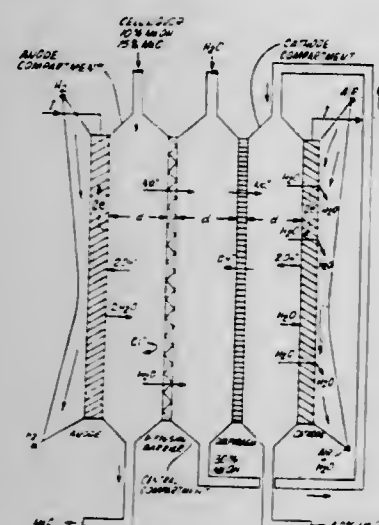
PCT Filed Apr. 7, 1981, Ser. No. 310,903

Claims priority, application France, Apr. 22, 1980, 80 09040

Int. Cl.<sup>3</sup> C25B 1/34

U.S. Cl. 204—98

16 Claims



1. A process for the production of alkali metal hydroxide and electrical energy by operating a plurality of three compartment hybrid cells in series, the plurality including a first hybrid cell at one end of the series and a last hybrid cell at the opposite end of the series, each hybrid cell comprising a gas diffusion anode having first and second surfaces, a diffusion barrier selectively permeable to cations and having first and second surfaces, a diaphragm permeable to both anions and cations and having first and second surfaces, and a gas diffusion cathode having first and second surfaces, the first surface of the anode and the first surface of the diffusion barrier defining an anode compartment, the second surface of the diffusion barrier and the first surface of the diaphragm defining a central compartment, and the first surface of the cathode and the second surface of the diaphragm defining a cathode compartment, the process comprising:

(a) introducing flow of an aqueous solution of at least one alkali metal hydroxide as anolyte to the anode compartment of said first hybrid cell at one end of the series;

(b) introducing flow of an aqueous fluid medium receptive to

alkali metal ions as catholyte to the central compartment of said last hybrid cell at the opposite end of the series;

(c) causing the anolyte to flow through the anode compartment in sequence from the first hybrid cell to the last hybrid cell of the series;

(d) causing the catholyte to flow from the central compartment to the cathode compartment in each hybrid cell;

(e) causing the catholyte to flow from the cathode compartment of one hybrid cell to the central compartment of another hybrid cell in sequence from the last hybrid cell to the first hybrid cell of the series, the flow of catholyte in each central compartment being cocurrent with the flow of anolyte in the same hybrid cell and the flow of catholyte in the cathode compartment being countercurrent with respect to anolyte flow in the same hybrid cell;

(f) causing, in each cell by a flow of current through an external load between the cathode and the anode, which current is generated by oxidation of hydrogen supplied to the second surface of the gas diffusion anode and generation of hydroxide ions by reduction of an oxygen-containing gas supplied to the second surface of the gas diffusion cathode, alkali metal ions to selectively pass from the anolyte through the diffusion barriers to the catholyte to form with cathode generated hydroxide ions an aqueous solution of alkali metal hydroxide;

(g) withdrawing catholyte, which is more concentrated in respect to alkali metal hydroxide than the aqueous fluid medium introduced to the central compartment of the last hybrid cell of the series, from the cathode compartment of the first hybrid cell of the series; and

(h) withdrawing anolyte, which is more depleted in respect to alkali metal hydroxide than the aqueous solution introduced to the anode compartment of the first hybrid cell of the series, from the anode compartment of the last hybrid cell of the series.

4,415,414

# ETCHING OF OPTICAL SURFACES

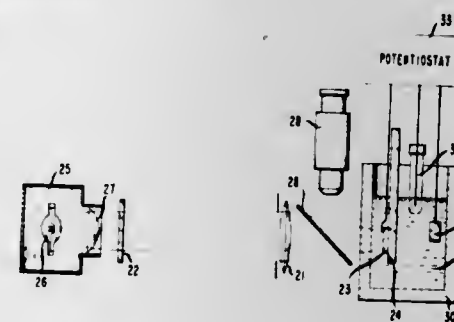
Randolph H. Burton, Somerset; Paul A. Kohl, and Frederick W. Ostermayer, Jr., both of Chatham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 10, 1982, Ser. No. 416,473

Int. Cl.<sup>3</sup> C25F 3/12, 3/14

U.S. Cl. 204—129.3

19 Claims



1. A process for fabricating a device comprising at least one intrinsic or n-type compound semiconductor comprising the step of etching at least part of the compound semiconductor to produce a compound semiconductor surface of optical quality characterized in that the etching procedure is an electrochemical photoetching procedure in which electric current is passed through the compound semiconductor, electrolytic solution with conductivity greater than 0.0001 mhos/cm and cathode in which the electrochemical photoetching procedure further comprises

a. applying a potential to the semiconducting compound which is between the maximum potential of the valence band of the semiconductor compound in the electrolytic solution and the minimum potential of the conduction band of the semiconductor compound in the electrolytic solution;

b. illuminating the part of the surface of the compound

semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band; and, c. the electrolytic solution comprises aqueous hydrofluoric acid.

4,415,415

# METHOD OF CONTROLLING OXIDE SCALE FORMATION AND DESCALING THEREOF FROM METAL ARTICLES

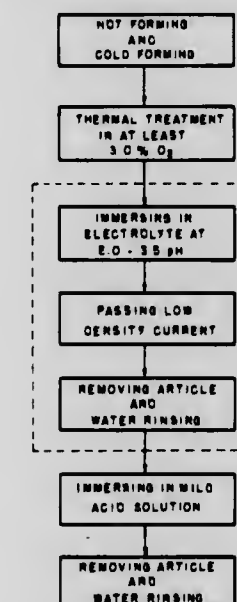
Donald R. Zaremski, Cheswick, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1982, Ser. No. 444,128

Int. Cl.<sup>3</sup> C25F 1/04, 1/06

U.S. Cl. 204—141.5

17 Claims



1. A process for the manufacture of a metal article comprising hot forming, cold forming and subsequently thermally treating in an oxidizing atmosphere, the process further comprising:

providing an oxygen content of the atmosphere of at least 3.0%, by volume, to control the oxide scale formed on the metal article;

immersing the article in an electrolyte of an aqueous solution of at least one neutral salt from the group consisting of the chloride, sulfate and nitrate of an alkali metal or ammonium, the pH of the electrolyte being adjusted and maintained from about 2.0 to 3.5;

passing a low density electric current through the article in the electrolyte to condition the scale for removal; and removing the article from the electrolyte.

4,415,416

# ELECTROCHEMICAL DEPYROPHORIZATION OF RANEY NICKEL ELECTRODES

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 30, 1982, Ser. No. 373,470

Int. Cl.<sup>3</sup> C23F 13/00; C25B 11/00

U.S. Cl. 204—147

9 Claims

1. In an electrolytic method for depyrophorizing a Raney nickel alloy electrode material, characterized by installing said electrode as an anode in an electrolytic cell and operating said cell to reduce the anodic polarization voltage so that it will not self-ignite, the improvement which comprises preparing as said electrode a monolithic Beta structured Raney nickel alloy structure having a Raney nickel alloy catalytic surface integral with a nickel alloy substrate containing from about 5 to about 20 percent by weight of an alloying metal selected from the group consisting of molybdenum, ruthenium, tantalum, titanium or mixtures thereof, and operating said cell at a current density of between about 10 and about 100 mA/cm<sup>2</sup> until the nominal negative anodic polarization voltage of said electrode is reduced by about 500 to about 700 mV below the nominal open circuit voltage for said cell.

4,415,417

# PHOTOPOLYMERIZATION USING COPPER IONS

Lee W. Bush, Chesterfield, Mo.; Marie S. Chan, Pittsburgh, Pa.; Gary P. Craun, Bridgeville, Pa.; William J. Erlanson, Pittsburgh, Pa.; Wood E. Hunter, Pittsburgh, Pa., and Wallace B. Ramsey, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 263,444, May 14, 1981, abandoned. This application Jul. 19, 1982, Ser. No. 399,578 Int. Cl.<sup>3</sup> C08F 2/50

U.S. Cl. 204—159.24

7 Claims

1. In the method of polymerization for preparing polymers and copolymers of ethylenically unsaturated monomers which includes the passage of visible light through a reaction mixture containing at least one monomer, a photoreducible dye and a reducing agent at a sufficient intensity and for sufficient time to accomplish polymerization;

the improvement comprising:

adding copper ions to the solution in the concentration range of 10 to 1,000 parts per billion, thereby obtaining a product weight average molecular weight in the range of from 5 million to 15 million and obtaining a monomer conversion above 47.9 percent.

4,415,418

# GEL ELECTROPHORESIS DEVICE AND METHOD

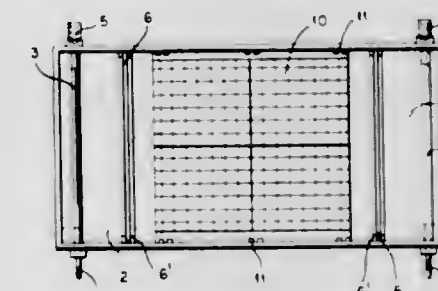
Gilles H. J. Turne, Paris; Michel Hours, Chateaufort, and Jacques R. Labrude, Palaiseau, all of France

Filed Dec. 21, 1981, Ser. No. 332,817

Claims priority, application France, Dec. 22, 1980, 80 27637 Int. Cl.<sup>3</sup> G01N 27/26, 27/28

U.S. Cl. 204—180 G

7 Claims



1. An apparatus for effecting migration of a substance in a gel medium by horizontal gel electrophoresis which comprises:

an upwardly open tray formed with a support surface for said gel medium;

a pair of electrodes fixed in said tray on opposite sides of said support surface; and

a pair of removable partitions received in said tray between said electrodes and said support surfaces whereby said medium, originally confined by said partitions, directly contacts an electrolyte in which each of said electrodes is immersed upon removal of said partitions, said support surface being formed as a platform in said tray between wells for said electrolyte and receiving said electrodes, said support being provided with a grid visible through said gel medium and inset from opposite walls of said tray whereby migration distances can be readily read from said grid, said electrodes being formed at least along their surface in contact with said electrode of a nonoxidizable nonprecious metal, each of said electrodes having an end passing through one of said walls and formed with a male plug for electrical connection, the other end of each electrode passing through the opposite wall of said tray and being formed with a female jack adapted to receive a corresponding plug of another similar tray whereby said trays can be assembled in side-by-side relationship and electrically connected.



#### 4,415,419 PROCESS FOR PRODUCING A CORROSION-RESISTANT SOLID LUBRICANT COATING

Paul Niederhauser; Michel Maillat, both of Neuchatel, and Hans E. Hintermann, Ins, all of Switzerland, assignors to Laboratoire Suisse de Recherches Horlogeres, Neuchatel, Switzerland

Filed Jun. 30, 1982, Ser. No. 393,708  
Claims priority, application Switzerland, Jun. 30, 1981,  
811/81; Oct. 12, 1981, 6509/81

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 C 19 Claims

1. A method of producing a corrosion-resistant solid lubricant coating on a corrosion-resistant surface consisting of a sulfide-forming metal, said method comprising subjecting the surface to an electric plasma in an atmosphere containing hydrogen sulfide so as to form a sulfide adhering to said surface and exposing the sulfided surface to simultaneous cathodic sputtering of at least one solid lubricant selected from the group consisting of the chalcogen compounds of layer structure and at least one hydrophobic solid polymer, so as to form a composite coating in which the particles of the chalcogen compound are protected by the hydrophobic polymer, the atmospheres in which the sulfiding and the depositing of the coating take place being devoid of free or combined oxygen.

#### 4,415,420 CUBIC BORON NITRIDE PREPARATION

Harry A. Beale, Columbus, Ohio, assignor to Applied Coatings International, Inc., Columbus, Ohio

Filed Feb. 7, 1983, Ser. No. 464,304

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 N 8 Claims

1. A method for depositing cubic boron nitride on a substrate, comprising the steps of:

- heating a supported substrate in a vacuum;
- supplying metal vapors into a zone between said substrate and a metals source, said source comprising a material selected from the group consisting of: boron, boron and a material selected from the group consisting of the elements chromium, nickel, cobalt, and manganese, and a metal alloy consisting essentially of from 0.1 weight percent to 5.0 weight percent of at least one of the elements chromium, nickel, cobalt, and manganese, the balance being boron;
- introducing ammonia gas into said zone; and
- generating an electrical field in said zone ionizing the metal vapors and gas atoms in the zone; whereby cubic boron nitride is deposited on the surface of said substrate.

#### 4,415,421 PROCESS FOR MANUFACTURING ORNAMENTAL PARTS AND ION PLATING APPARATUS TO BE USED THEREFOR

Yasutomo Sasanuma, Kawagoe, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,458

Claims priority, application Japan, Mar. 5, 1982, 57-33944  
Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 N 15 Claims

1. A process for manufacturing an ornamental part comprising: providing the ornamental part as a work to be treated, an electron beam melting vapor source for evaporating a titanium based metal, and one or more sputtering vapor sources for supplying at least a gold based metal vapor, within a vacuum chamber filled with a low-pressure gas atmosphere including a nitride gas; establishing an electric field between said ornamental part and said electron beam melting vapor source to produce a

plasma glow discharge therebetween; evaporating and ionizing said titanium based metal in the plasma glow discharge to coat a film mainly composed of titanium nitride on a surface of said ornamental part; at the final stage of this process, applying a negative voltage to one or more targets of said one or more sputtering vapor sources and at the same time, supplying a gold based metal vapor to form a transition layer including both titanium nitride and gold; and while continuing supplying the gold based metal vapor, stopping gradually the evaporation of said titanium based metal to coat a film of the gold based metal as a topcoat layer.

#### 4,415,422 APPARATUS FOR ELECTRO-DEPOSITING ALUMINUM

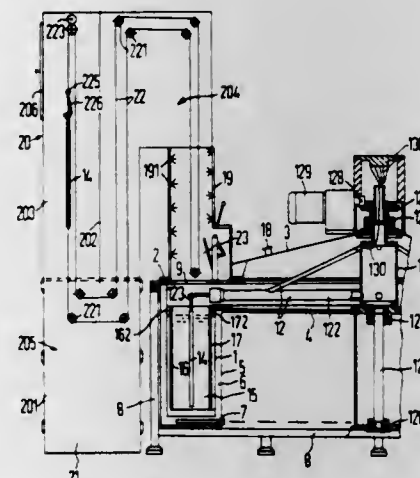
Siegried Birkle, Aisch; Johann Gehring, Spardorf, and Klaus Stöger, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,942

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3102021

Int. Cl.<sup>3</sup> C25D 17/02, 17/06, 17/28; C25C 3/00

U.S. Cl. 204—199 8 Claims



1. In a galvanizing apparatus for the galvanic precipitation of aluminum from an anhydrous, aprotic, and oxygen-free aluminum-organic electrolyte, said apparatus having an annularly shaped electrolyte trough for receiving an electrolyte, said trough having a plurality of anode plates arranged around a vertical axis of the trough and having cover means including cover segments for sealing the electrolyte in the trough from the atmosphere and for enabling charging of the trough with a protective gas to form a protective atmosphere, a rotatable contacting and holding device having a vertical rotational axis, said device being mounted for rotation in said trough with the rotational axis being on the vertical axis of the trough, the device having a plurality of support arms radiating outwardly from the rotational axis with goods carriers being able to be selectively attached to the support arms for passage around and through the electrolyte trough, a charging lock and a discharging lock, both of said locks being attached to the electrolyte trough and each including a preliminary chamber, a main chamber, a U-shaped fluid lock connecting said preliminary chamber to the main chamber and forming a gaseous seal, and an endless chain conveyor attached to and running continuously through the preliminary chamber, the main chamber and the fluid lock the improvement comprising a transport rod being attached to each anode plate and receivable by said support arms, and a lifting and displacement device being selectively attachable to one of the cover segments of the electrolyte trough and having a portion which is selectively engageable with an anode plate, so that while maintaining the protective atmosphere, an anode plate may be changed and replaced by being lifted by the lifting and displacement device from a place of suspension in the trough and placed on the support arm to be carried to the discharging lock for removal

from the trough and a different plate is conveyed through the chambers of the charging lock placed in the support arm for movement in the trough to the lifting and displacement device for insertion in the place of suspension.

#### 4,415,423 ELECTROFORMING APPARATUS FOR USE IN MATRIXING OF RECORD MOLDING PARTS

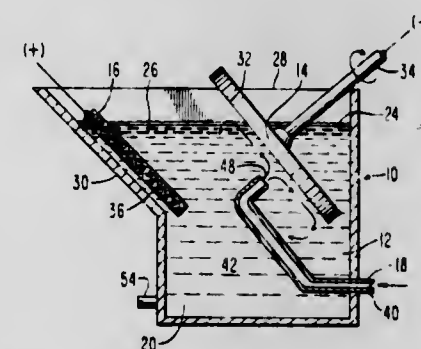
William C. Brooks, Brownsburg, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,241

Int. Cl.<sup>3</sup> C25D 17/10, 21/10

U.S. Cl. 204—212

4 Claims



1. An electroforming apparatus comprising in combination: a tank, a cathode, an anode, and means for circulating electrolyte; said tank having an electroforming section, a sump section and a weir separating said sections, said electroforming section able to hold a supply of electrolyte sufficient to permit the electroforming of said parts, said weir being positioned across an edge wall of the electroforming section so as to permit an overflow of electrolyte from the electroforming section into the sump section during the process of electroforming; said cathode including a revoluble disc shaped cathode head having means for securing a part to be replicated in position on the face of the cathode so that a replica can be electroformed on the part, said cathode head being positionable in the electroforming tank so as to at least be partially submerged in the electrolyte when the electroforming section is filled with an electrolyte, said cathode head being revoluble in a plane which is substantially normal to the overflow direction of the weir; said anode being positioned in said electroforming section in an opposing relationship to the cathode; said means for circulating electrolyte including inlet means for introducing electrolyte adjacent to the cathode head so as to induce a flow of electrolyte across the surface of a part mounted on the cathode head which is to be replicated and said circulating means further including means for removing electrolyte from the sump section and filtering and recirculating the electrolyte to said inlet means.

#### 4,415,424 DEVICE FOR SUPPLY AND DISCHARGE OF LIQUID ELECTROLYTE FOR AN ELECTROLYZER OF FILTERPRESS TYPE

Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Dec. 28, 1981, Ser. No. 334,601

Claims priority, application France, Jan. 16, 1981, 81 01102  
Int. Cl.<sup>3</sup> C25B 9/00, 15/08

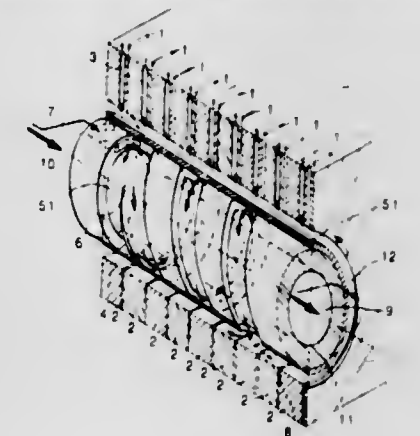
U.S. Cl. 204—257

8 Claims

1. A device for supply and discharge of electrolyte for an electrolyzer of filterpress type, including, for one and the same set of cells placed side by side:

- at least one electrolyte inlet circuit common to the said set, from which leave channels feeding separately each anodic compartment and each cathodic compartment;
- an anolyte outlet circuit common to the said set, at which terminate channels connected separately to each anodic compartment;
- a catholyte outlet circuit common to the said set, at which terminate channels connected separately to each cathodic compartment;

(d) one of said circuits comprising at least one tranquilization chamber (4) in which terminate all of said channels (3) associated with said circuit, said tranquilization chamber being of small cross-section and being connected to the general electrolyte inlet or outlet by a duct (51) exhibiting



at least one portion of narrow shape twisted so as to confer upon said portion of said duct a great length and a small cross-section, and created in the body of a cylinder (6) bounding the inside of said tranquilization chamber.

#### 4,415,425 CONDUCTOR ROLL CONTOUR

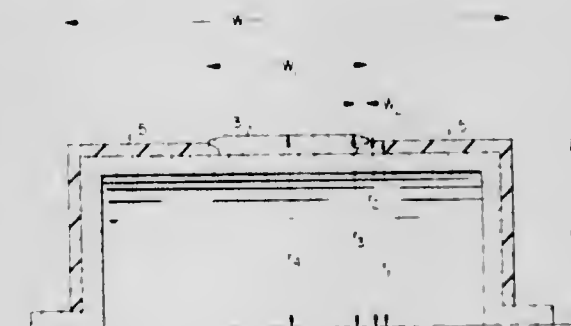
Charles A. Schacht, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1982, Ser. No. 358,078

Int. Cl.<sup>3</sup> C01B 21/30; C25D 17/00

U.S. Cl. 204—279

6 Claims



1. In a cylindrically-shaped conductor roll for the electro-treating of one face of metal strip while masking the other face thereof from the electro-treating solution, said roll comprised of:

- a generally cylindrical core, the outer circumferential surface of which is encircled by,
- a contact member in the form of
  - a metallic ring disposed approximately midway along the width of said cylindrical core and
  - metallic angular flange portions integrally joined to said ring along both edges thereof, said flange portions overlying a portion of
- elastomeric sealing members encircling the remaining portion of the outer circumferential surface of the core, wherein the radii of the outer circumferential surfaces of said roll, at different points along the width thereof, are defined as:
  - $r_0$  . . . the radius at the edge
  - $r_1$  . . . the radius of the sealing member at a line substantially perpendicular to the roll outer circumferential surface adjacent the flange portion edge furthestmost from the mid-width of the ring,
  - $r_2$  . . . the radius of the flange portion at said adjacency line,
  - $r_3$  . . . the radius where the flange portion is integrally joined to said contact ring, and
  - $r_4$  . . . the radius at the mid-width of the ring,
 the improvement wherein undesirable creases in the metal strip being treated are eliminated by utilizing an offset



such that  $r_2 \geq r_1$  at the ambient temperature under which such contour is provided to the roll, said ambient temperature being substantially below the 100° to 180° F. operating temperature range under which electro-treating will be accomplished, such offset being sufficient to compensate for the greater differential expansion of the elastomer over that occurring in said metal contact ring at said operating temperature, and

said flange portion being provided with a taper,  $r_3 > r_2$  at said ambient temperature, sufficient to compensate for the displacement of the flange caused by the expansion of the elastomer at said operating temperature, whereby  $r_3 \approx r_2 \approx r_1$  when the roll surface reaches a steady-state condition within said operating temperature range.

4,415,426

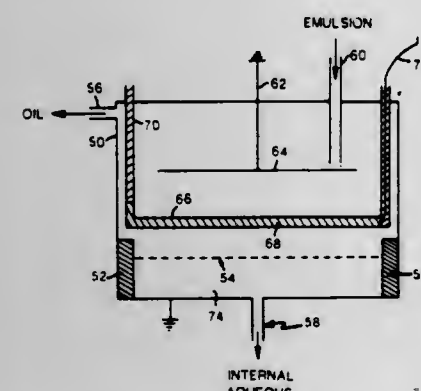
# ELECTRODES FOR ELECTRICAL COALESCENCE OF LIQUID EMULSIONS

Edward C. Hsu, Bridgewater; Norman N. Li, Edison, and Taras Hucal, Iselin, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 192,560, Sep. 30, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 286,875  
Int. Cl.<sup>3</sup> C25B 11/00; C10G 33/02

U.S. Cl. 204—290 R

5 Claims



4. An insulated electrode for use in coalescing water-in-oil emulsions comprising an electrically conductive material insulated with a solid dielectric having both a dielectric constant of at least about 4 and a hydrophobic surface.

4,415,427

# THIN FILM DEPOSITION BY SPUTTERING

Henry T. Hilder, Danvers; Lawrence L. Hope, Stow, and Ernest A. Davey, Peabody, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 431,957

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—298

9 Claims

1. A sputtering cathode apparatus for deposition of a doped thin film on a substrate which is moved relative to said apparatus, comprising:  
planar magnetron sputtering means including means defining a frame-shaped plasma area and having a host target material disposed in the magnetron plasma area,  
diode sputtering means disposed inside said framed area and out of the plasma sputtering area and comprising a dopant material,  
and means for electrically exciting said host target material and dopant material to provide co-deposition of said materials thereby forming the doped thin film on the substrate.

4,415,428

# SUPPORT FOR ELECTROPHORESIS AND METHOD OF PRODUCING SAME

Samuel Nochumson, Rockland, and Henry J. Witt, Rockport, both of Me., assignors to FMC Corporation, Philadelphia, Pa.  
Filed Jan. 27, 1982, Ser. No. 342,993

Int. Cl.<sup>3</sup> B01K 5/00

U.S. Cl. 204—299 R

16 Claims

1. A support for an electrophoretic medium comprising a base plate of an organoplastic sheet film and an adherent resin coating applied to at least one side of said base plate, said resin coating containing ethylenically unsaturated groups capable of undergoing copolymerization with acrylamide.

4,415,429

# PROCESS FOR THE PREPARATION OF HIGHLY AROMATIC PITCHLIKE HYDROCARBONS

Jürgen Stadelhofer, Dortmund; Heinz-Gerhard Franck, Bad Soden-Neuenhain, and Helmut Köhler, Mülheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Jul. 22, 1980, Ser. No. 171,203

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935039

Int. Cl.<sup>3</sup> C10G 1/06

U.S. Cl. 208—8 LE

7 Claims

1. In a process for the production of a highly aromatic pitchlike hydrocarbon by disintegration of comminuted coal or similar carbon-containing raw materials with hydrocarbon mixtures as solvents with the use of elevated temperatures and pressure conditions, the improvement comprising decomposing said coal or other carbonaceous raw materials in an amount of 10–50% of the reaction components with 10–50% aromatized residues from steam cracking of petroleum fractions in combination with 10–50% of a complementary solvent with is an aromatic mixture originating from coal with middle boiling point above 350° C.

4,415,430

# TWO-STAGE CENTRIFUGAL DEDUSTING PROCESS

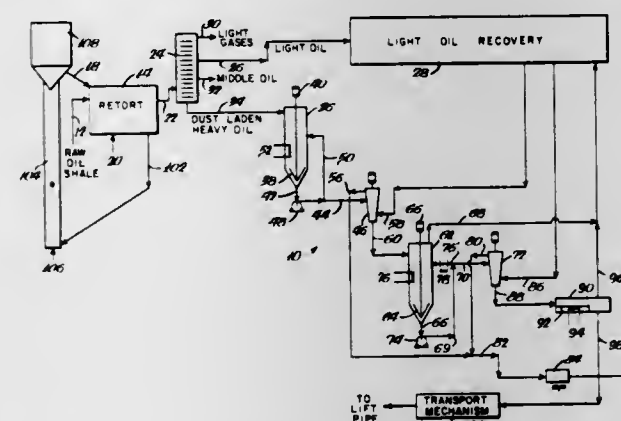
Earl D. York, Englewood, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 21, 1981, Ser. No. 285,454

Int. Cl.<sup>3</sup> C10G 1/00, 31/10

U.S. Cl. 208—8 R

36 Claims



1. A process for dedusting particulate laden heavy oil derived from solid hydrocarbon-containing material, comprising the steps of:  
introducing solid hydrocarbon-containing material into a retort;  
introducing solid heat carrier material into said retort;  
retorting said solid hydrocarbon-containing material by contacting said solid hydrocarbon-containing material with said solid heat carrier material at a retorting temperature to liberate a mixture of hydrocarbons and entrained particulates of dust ranging in size from less than one

micron to 1000 microns derived from said solid hydrocarbon-containing material;  
separating a heavy oil fraction laden with said particulates of dust from said mixture;  
heating said heavy oil fraction laden with said particulates of dust to a viscosity of less than 5 centistokes;  
feeding said heated fraction to a first centrifuge;  
centrifuging said heated fraction in said first centrifuge into a dedusted first stream of normally liquid heavy oil containing less than 1% by weight of said particulates and a first particulate laden residual stream containing a substantially higher concentration of said particulates than said oil fraction;  
injecting light oil derived from said solid hydrocarbon-containing material into said first centrifuge to enhance removal of said first particulate laden residual stream from said first centrifuge;  
feeding said first particulate laden residual stream injected with said light oil at a viscosity of less than 5 centistokes to a second centrifuge;  
centrifuging said first particulate laden residual stream injected with said light oil in said second centrifuge into a dedusted second stream of normally liquid oil including light oil containing less than 1% by weight of said particulates and a second particulate laden residual stream containing a substantially higher concentration of said particulates than said first particulate laden residual stream;  
heating said second particulate laden residual stream to vaporize said light oil and form a third particulate dust laden residual stream containing a higher concentration of said particulates than said second particulate dust laden residual stream;  
feeding said third particulate dust laden stream to a lift pipe;  
injecting air into said lift pipe to combust heavy oil contained in said third particulate dust laden stream and fluidize, entrain and propel said third particulate laden residual stream to a separation bin; and  
conveying said combusted third particulate laden residual stream to said retort to provide at least a portion of said solid heat carrier material.

(b) separating the first-stage gaseous products from solid residue;  
(c) reacting the hot first-stage gaseous products, as the primary heat source and heat transfer medium, with carbonaceous material in a second stage hydrolysis zone at a temperature from about 1000° F. to about 3500° F. and a pressure from about 250 psia to about 5000 psia; and  
(d) rapidly cooling the second-stage reaction and products such that the total high temperature exposure time of said products is from about 2 milliseconds to about 2 seconds, to produce gaseous and liquid hydrocarbons.

4,415,432

# HYDROCARBON RECOVERY METHOD AND APPARATUS

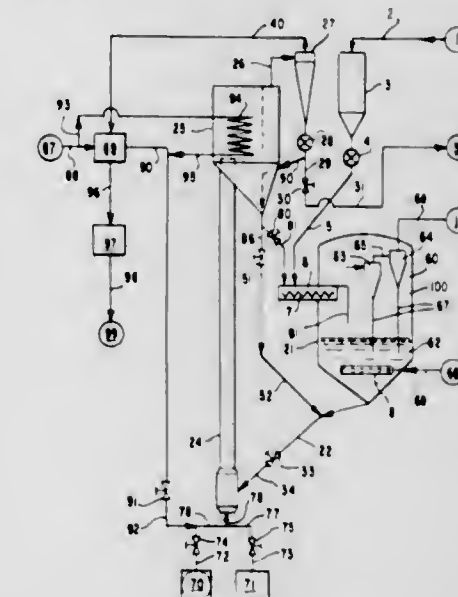
Earl D. York, Englewood, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1980, Ser. No. 208,165

Int. Cl.<sup>3</sup> C10G 1/00; C10B 49/10

U.S. Cl. 208—11 R

3 Claims



1. An improved method for recovering hydrocarbons from tar sands, oil shale and oil containing diatomaceous earth, comprising the steps of:

partially retorting raw, solid hydrocarbon-containing material selected from the group consisting of tar sands, oil shale and oil containing diatomaceous earth, in a retort defining a contacting zone by contacting said raw, solid hydrocarbon-containing material in said contacting zone with a heat transfer medium consisting essentially of spent solid hydrocarbon-containing material selected from the group consisting essentially of spent tar sands, spent oil shale and spent oil containing diatomaceous earth, at a sufficient temperature to liberate hydrocarbons comprising light hydrocarbon gases and oil selected from the group consisting of tar sands oil, shale oil, and oil derived from oil containing diatomaceous earth, from said raw, solid hydrocarbon-containing material;  
passing said partially retorted, solid hydrocarbon-containing material, said spent hydrocarbon-containing material, and said liberated hydrocarbons from said retort to a container defining a separation zone;  
substantially completing retorting of said partially retorted solid hydrocarbon-containing material in said separation zone;  
substantially separating said liberated hydrocarbons from said solid material in said separation zone, including passing said liberated hydrocarbons through at least one cyclone located within said separation zone;  
passing said solid material from said separation zone to a combustor including a lift pipe defining a combustion zone at a location spaced substantially away from said retort; and  
substantially combusting said solid material in said lift pipe at

4,415,431

# INTEGRATED OXYGASIFICATION AND HYDROLYSIS PROCESS FOR PRODUCING LIQUID AND GASEOUS HYDROCARBONS

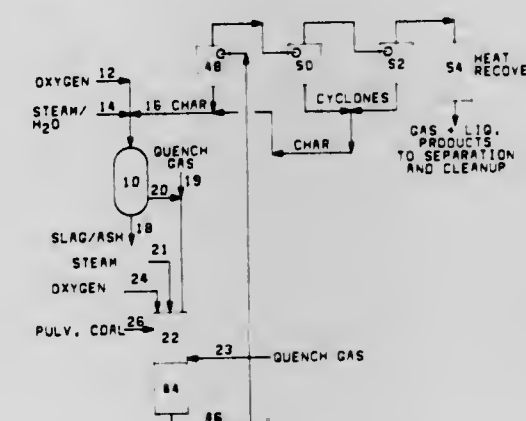
Richard S. Matyas, Broken Arrow, and John A. Hamshar, Owasso, both of Okla., assignors to Citiles Service Company, Tulsa, Okla.

Filed Jul. 14, 1982, Ser. No. 397,956

Int. Cl.<sup>3</sup> C10G 1/00

U.S. Cl. 208—8 R

10 Claims



1. A two-stage process for producing liquid and gaseous hydrocarbons from carbonaceous materials, comprising:  
(a) reacting oxygen and steam with partially gasified carbonaceous char in a first-stage gasification zone to obtain products which primarily include oxides of carbon, hydrogen, and water;



said location spaced away from said retort to form said sent material;  
withdrawing said liberated hydrocarbons from said separation zone; and  
feeding a preheated oxygen-containing gas injected with 25 mol% to 50 mol% steam into said combustion zone to enhance combustion of said solid material.

4,415,433

# FLUID BED RETORTING PROCESS WITH MULTIPLE FEED LINES

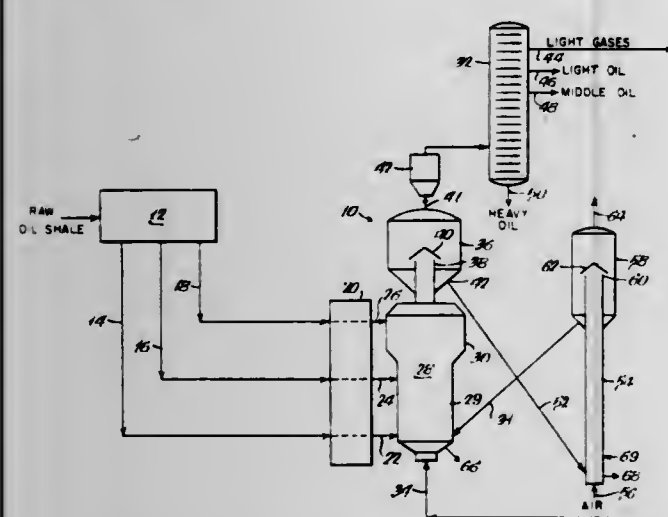
Gerald B. Hoekstra, deceased, late of South Holland, Ill. (by Edith Hoekstra, legal representative), assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1981, Ser. No. 322,943

Int. Cl.<sup>3</sup> C10G 1/00; C10B 49/10, 53/06

U.S. Cl. 208—11 R

14 Claims



1. A process for retorting solid hydrocarbon-containing material, comprising the steps of:

feeding a first stream of raw hydrocarbon-containing particles selected from the group consisting of oil shale, tar sands, coal, lignite, peat and untainted, into a lower portion of a fluid bed retort;

feeding solid heat carrier material consisting of spent hydrocarbon-containing particles derived from said first stream into said lower portion of said fluid bed retort;

injecting a lift gas containing less than a sufficient amount of molecular oxygen to support combustion, into said lower portion of said fluid bed retort to fluidize, mix and transport said first stream and said spent hydrocarbon-containing particles substantially upwardly through an upper portion of said fluid bed retort into an overhead solids-containing collection vessel positioned substantially vertically above said fluid bed retort;

moving said first stream and said solid heat carrier material downwardly in said overhead vessel under the influence of gravity into a lower portion of said overhead vessel;

feeding a second stream of said raw hydrocarbon-containing particles into said upper portion of said fluid bed retort, said raw hydrocarbon-containing particles in said second stream being larger than said raw hydrocarbon-containing particles in said first stream;

moving said second stream downwardly in said fluid bed retort under the influence of gravity through and in countercurrent flow relationship to said first stream, into said lower portion of said fluid bed retort;

liberating oil and light hydrocarbon gases from said raw hydrocarbon-containing particles in said first and second streams in said fluid bed retort by heating said first and second streams to a retorting temperature in said fluid-bed retort with said solid heat carrier material;

substantially completing retorting of said first stream in said overhead vessel above said retort to liberate more oil and light hydrocarbon gases by heating said first stream at a

retorting temperature with said solid heat carrier material in said overhead vessel;

withdrawing said second stream from the lower portion of said retort;

conveying said first stream and said solid heat carrier material by gravity flow from the lower portion of said overhead vessel to a combustor; and

combusting said first stream with said solid heat carrier material in said combustor.

4,415,434

# MULTIPLE STAGE DESALTING AND DEDUSTING PROCESS

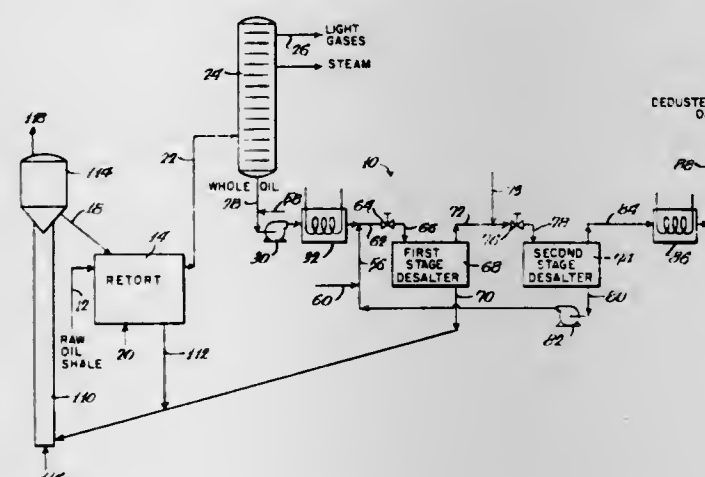
Jay T. Hargreaves, Bolingbrook, Ill., and Albert L. Hensley, Munster, Ind., assignors to Standard Oil Company (Ind.), Chicago, Ill.

Filed Jul. 21, 1981, Ser. No. 285,601

Int. Cl.<sup>3</sup> C10G 1/00, 31/08

U.S. Cl. 208—11 R

50 Claims



1. A process for producing and dedusting oil from solid hydrocarbon-containing material, comprising the steps of:

feeding solid hydrocarbon-containing material to a retort;

feeding solid heat carrier material to said retort;

retorting said solid hydrocarbon-containing material by mixing said solid hydrocarbon-containing material with said solid heat carrier material in said retort at a sufficient retorting temperature to liberate an effluent product stream of hydrocarbons and entrained particulates of dust derived from said solid hydrocarbon-containing material;

separating a fraction of normally liquid oil mixed with a substantial portion of said entrained particulates from said effluent product stream in a separator;

dispersing water into said fraction after said fraction has been removed from said separator to form an emulsion;

separating said emulsion in a desalter into a dedusted stream of normally liquid oil having a substantially lower concentration of particulates than said fraction and a particulate laden residual stream having a higher concentration of said particulates than said fraction; and

combusting said particulate laden residual stream after said particulate laden residual stream has been removed from said desalter to form a spent stream for use as at least part of said solid heat carrier material in said retort.

4,415,435

# CATALYTIC REFORMING PROCESS

William E. Lewis, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1982, Ser. No. 422,675

Int. Cl.<sup>3</sup> C10G 35/06

U.S. Cl. 208—65

3 Claims

1. In a process for reforming, with hydrogen, a naphtha in a cyclic reforming unit which contains a plurality of catalyst-containing on-stream reactors connected in series, and a catalyst-containing swing reactor which, due to an arrangement of

4,415,437

# HYDROCARBON CRACKING USING TRANSITION METAL OXIDE BRONSTED ACID CATALYSTS

Dane C. Grenoble, Plainfield, and Lawrence L. Murrell, South Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1981, Ser. No. 305,264

Int. Cl.<sup>3</sup> C10G 11/04

U.S. Cl. 208—120

20 Claims

process piping and valves comprising headers, can be substituted for any one of the on-stream reactors while the latter is off-stream from regeneration and reactivation of the catalyst, the catalyst is a platinum catalyst promoted with a hydrogenation-dehydrogenation component, or components, which increase the rate of hydrogenolysis as contrasted with an unpromoted platinum catalyst, the hydrogen and naphtha feed flows from one reactor of the series to another to contact the catalyst contained therein at reforming conditions, and prior to the introduction of the naphtha into said cyclic reforming unit the naphtha is passed through a hydrofiner and hydrofiner to remove a preponderance of the sulfur, and the product therefrom then passed through a guard chamber and contacted with a sulfur adsorbent to remove additional sulfur from said naphtha to render it a suitable reformer feed,

the improvement comprising maintaining during the major portion of the reforming operating cycle via use of said hydrofiner and guard chamber a reformer feed naphtha sulfur level ranging from about zero to about 2 ppm, and

by-passing the hydrofiner and guard chamber with unhydrofiner naphtha sufficient to provide a naphtha reformer feed having a sulfur concentration ranging from about 0.6 to about 10 ppm sulfur at the time of, or just prior to the time that a swing reactor containing an unsulfided catalyst is put back on oil, continuing to by-pass the hydrofiner and guard chamber until the catalyst is sufficiently sulfided, discontinuing the flow of by-pass feed, and then again passing the feed through the hydrofiner and guard chamber to the reformer unit.

4,415,438

# METHOD FOR CATALYTICALLY CONVERTING RESIDUAL OILS

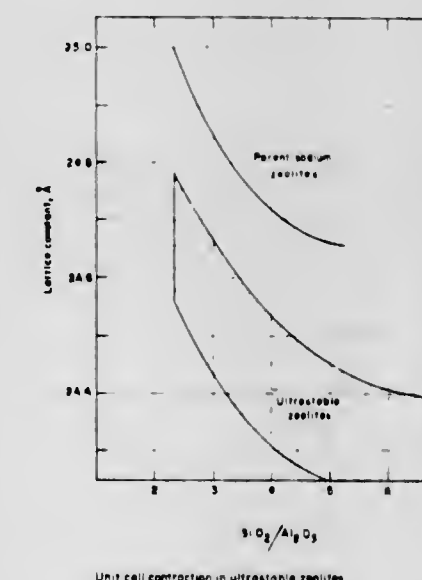
Robert R. Dean, #1 Columbine La., Littleton, Colo. 80123; Warren S. Letzsch, 6533 S. Kearney Cir., Englewood, Colo. 80111, and Jean L. Mauleon, 15656 E. Grand Ave., Aurora, Colo. 80112

Filed Nov. 24, 1981, Ser. No. 324,450

Int. Cl.<sup>3</sup> C10G 11/05

U.S. Cl. 208—120

17 Claims



4,415,436

# PROCESS FOR INCREASING THE CETANE INDEX OF DISTILLATE OBTAINED FROM THE HYDROPROCESSING OF RESIDUA

Philip J. Angevine, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,976

Int. Cl.<sup>3</sup> C10G 11/05, 65/12

U.S. Cl. 208—89

19 Claims

1. A process for increasing the cetane index of distillate obtained from the hydroprocessing of petroleum residua which comprises passing a mixture of hydrogen and a metal- and/or sulfur-contaminated charge stock containing residua at a hydrogen partial pressure of from about 1,000 to about 3,000 psia a temperature of from about 650° F. to about 875° F. and a space velocity of from about 0.1 to about 2.0 LHSV through trickle beds of catalyst disposed in three sequential reaction zones, said first reaction zone containing a bed of at least one hydrotreating catalyst comprising a hydrogenating component selected from the group consisting of Group VIb and Group VIII metals and combinations thereof on a refractory support, said second reaction zone containing a bed of hydrocracking catalyst comprising a nickel-tungsten impregnated rare earth exchanged zeolite X component in combination with a nickel-tungsten impregnated silica-alumina matrix, and said third reaction zone containing a bed of at least one hydrotreating catalyst, the same or different from the hydrotreating catalyst in said first zone, comprising a hydrogenating component selected from the group consisting of Group VIb and Group VIII metals and combinations thereof on a refractory support thereby providing a distillate having a cetane index of at least about 50.

1. A method for upgrading a residual oil portion of crude oil boiling above 600° F. comprising metallo-organic compounds which comprises contacting said residual portion of crude oil boiling above 600° F. with a catalyst consisting of from 20 to 80 wt. % of an ultrastable faujasite crystalline zeolite dispersed in a silica-clay matrix for a time at a temperature particularly selective for conversion of the residual portion of crude oil to products of gasoline, light cycle oil and gasoline forming gaseous components, and

recovering said products comprising gasoline and light cycle oil.

4,415,439

# CATALYTIC CRACKING CATALYST

Robert L. Chiang, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 298,671, Sep. 2, 1981, which is a continuation of Ser. No. 201,616, Oct. 28, 1980, abandoned. This application May 5, 1982, Ser. No. 375,235

Int. Cl.<sup>3</sup> C10G 11/05

U.S. Cl. 208—120

6 Claims

1. In a method for catalytically cracking hydrocarbons to obtain high octane gasoline fractions wherein said hydrocar-



bons are reacted under catalytic cracking conditions with a catalyst which comprises a zeolite mixed with an inorganic oxide matrix, the improvement comprising using a catalyst prepared by the process comprising:

- Exchanging a sodium type Y zeolite with an ammonium salt solution to lower the sodium content of said zeolite to below about 4 percent by weight  $\text{Na}_2\text{O}$ ;
- calcining the ammonium exchanged zeolite at a temperature of from about  $537^\circ$  to  $815^\circ\text{C}$ ;
- mixing said calcined zeolite with an inorganic oxide matrix and water;
- spray drying said mixture; and
- reacting said spray dried mixture with an acid aluminum salt solution having a pH of from about 2.0 to 3.7 to lower the sodium content to below about 1.0 percent by weight  $\text{Na}_2\text{O}$ .

4,415,440

#### CRACKING CATALYST IMPROVEMENT WITH GALLIUM COMPOUNDS

John S. Roberts; Dwight L. McKay, and Brent J. Bertus, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 259,390, May 1, 1981. This application Sep. 8, 1982, Ser. No. 415,953

Int. Cl.<sup>3</sup> C10G 11/04, 11/18

U.S. Cl. 208—120

21 Claims

18. In a catalyst cracking process wherein a zeolite-containing cracking catalyst is circulated in a cracking unit between a cracking zone and a regeneration zone in a cyclic fashion, said process comprising:

- introducing the cracking catalyst and a hydrocarbon feedstock into the cracking zone, said hydrocarbon feedstock containing contaminants selected from the group consisting of nickel, vanadium, and iron;
- contacting the cracking catalyst with the hydrocarbon feedstock in the cracking zone under cracking conditions including the absence of added hydrogen wherein at least a portion of the contaminants in the feedstock become deposited on the cracking catalyst;
- withdrawing an effluent of cracking catalyst and cracked hydrocarbon feedstock including a gasoline fraction from the cracking zone;
- separating the cracking catalyst from the effluent;
- introducing the cracking catalyst into a regeneration zone;
- regenerating the cracking catalyst under elevated temperatures and in the presence of free oxygen-containing gas wherein contaminants deposited on the catalyst from the feedstock prevent complete regeneration of the cracking catalyst; and
- recycling the cracking catalyst to the cracking zone; wherein an antimony-treated cracking catalyst is circulated in the cracking unit, said antimony-treated cracking catalyst having been contacted with an antimony-containing treating agent under conditions to deposit thereon a sufficient amount of antimony or an antimony-compound to at least partially passivate the at least one contaminant deposited on the catalyst from the feedstock; the improvement comprising contacting the cracking catalyst with a treating agent selected from the group consisting of gallium and a compound of gallium, whereby the portion of the cracked hydrocarbon feedstock forming the gasoline fraction is increased.

4,415,441

#### CATALYTIC REFORMING PROCESS

Gerald E. Markley, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 13, 1982, Ser. No. 417,218

Int. Cl.<sup>3</sup> C10G 35/08

U.S. Cl. 208—138

5 Claims

1. In a process for reforming, with hydrogen, a naphtha in a reforming reactor provided with a rhenium promoted platinum catalyst over which the naphtha is contacted and reacted at reforming conditions to produce a  $\text{C}_5^+$  liquid product of improved octane, the improvement comprising contacting said catalyst on initiation of the reforming reaction at a maximum rate of about 75 percent of the hydrogen required for maintaining the optimum  $\text{C}_5^+$  liquid yield over the length of the operating cycle, and thereafter increasing the hydrogen rate to that required to maintain said optimum  $\text{C}_5^+$  liquid yield not later than the time of line-out of the  $\text{C}_5^+$  liquid yield.

4,415,442

#### PROCESS FOR THE SEPARATION OF ENTRAINED ORGANIC FLUIDS FROM GASEOUS STREAMS IN A COAL DEASHING SYSTEM

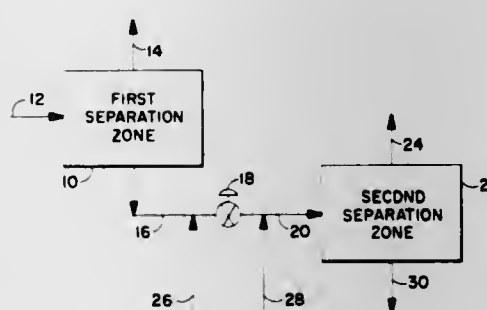
Donald E. Rhodes, Oklahoma, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 24, 1981, Ser. No. 305,102

Int. Cl.<sup>3</sup> C10G 31/00, 53/04

U.S. Cl. 208—177

2 Claims



1. In a process for separating a feed mixture comprising soluble coal products, insoluble coal products and a solvent in a first separation zone, said solvent comprising at least one substance having a critical temperature below  $800^\circ\text{F}$ . selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about  $310^\circ\text{F}$ ., cycloparaffin hydrocarbons having normal boiling points below about  $310^\circ\text{F}$ ., open chain mono-olefin hydrocarbons having normal boiling points below about  $310^\circ\text{F}$ ., open chain saturated hydrocarbons having normal boiling points below about  $310^\circ\text{F}$ ., mono-, di- and tri-open chain amines containing from about 2-8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6-9 carbon atoms and phenols containing from about 6-9 carbon atoms and their homologs, in which said feed mixture is maintained in said first separation zone at an elevated temperature and pressure to separate said feed mixture into a light fraction and a heavy fraction comprising insoluble coal products and some solvent including some soluble coal products dissolved therein and in which withdrawing said heavy fraction from said first separation zone and reducing the pressure level of said heavy fraction at least about 100 psig. results in the formation of a mixture of an ash concentrate and vaporous solvent together with entrained soluble coal products and separation of said vaporous solvent together with said entrained soluble coal products from said ash concentrate results in a deposition of said entrained soluble coal products upon the interior surface of a withdrawal conduit through which said separated vaporous solvent is passed, the improvement which comprises:

separating said mixture comprising ash concentrate and vaporous solvent together with said entrained soluble coal products in a fluidized bed comprising ash concentrate having an upper portion connected to said solvent withdrawal conduit, said mixture being introduced a sufficient depth below the top surface of said fluidized bed to cause said vaporous solvent to remain in contact with the ash concentrate particles in said fluidized bed for a sufficient time to coalesce or condense at least a portion of said entrained soluble coal products thereon and thereby separate the same from the vaporous solvent to prevent or substantially minimize deposition of said soluble coal products in said solvent withdrawal conduit.

4,415,443

#### DISTILLATION PROCESS

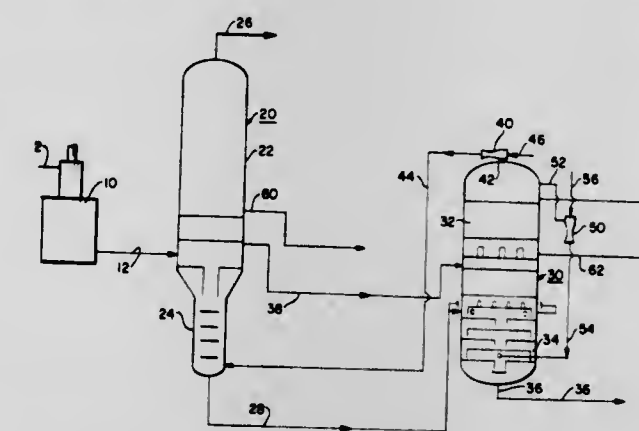
Martin A. Murphy, Bernardsville, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 10, 1981, Ser. No. 282,046

Int. Cl.<sup>3</sup> C10G 7/00; B01D 3/38

U.S. Cl. 208—355

9 Claims



1. A method for separating a feed into a distillate relatively rich in lower boiling components and a bottoms relatively rich in higher boiling components comprising:

- passing the feed into a first distillation zone having a first stripping zone and a first rectification zone, wherein the feed is separated into a first distillate removed from the rectification zone and a first bottoms removed from the stripping zone; and
- passing the first bottoms into a second distillation zone having a second rectification zone and a second stripping zone wherein the second distillation zone operates at a lower absolute pressure than the first distillation zone and wherein the bottoms from the first stripping zone are separated into a second distillate and a second bottoms, the rectification zone of the second column communicating with a fluid ejection means, whereby second distillate from the second rectification zone is transferred by the fluid ejection means into the first stripping zone without condensation.

4,415,444

#### AIR COOLING SYSTEM FOR A VIBRATORY SAND RECLAIMING APPARATUS

William G. Gupta, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Oct. 8, 1981, Ser. No. 309,560

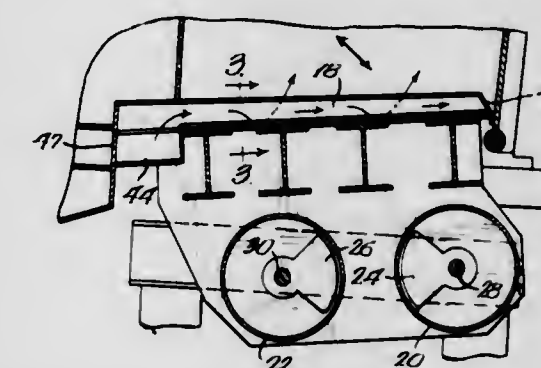
Int. Cl.<sup>3</sup> B07B 1/58

U.S. Cl. 209—3

6 Claims

1. In a vibratory material treatment device having a U-shaped hopper at least partially tipped to one side thereof and adapted to receive material to be treated along said side, a first eccentric weight and motor set located on one side of the center of gravity of the hopper and operable for applying a first vibratory force to said hopper in a direction such that the material will advance from said one side toward the base of the hopper; a second eccentric weight and motor set located on

the other side of the center of gravity of the hopper and operable for applying a second vibratory force to said hopper in a direction such that the resultant force from said first and second forces will advance material longitudinally from said base toward said side and out of said hopper; the improvement comprising a plurality of substantially hollow longitudinally extending conducting means situated adjacent the lower region



of said chamber, each defining in conjunction with the chamber a substantially closed conduit; means communicating air under pressure from an external supply to said conducting means and filling the conduits; and means associated with said conducting means for distributing air under pressure from the conduits into the chamber for cooling the heated sand as it is reduced from lumps to particles of sand.

4,415,445

#### PROCESS FOR THE AGGLOMERATION OF SOLIDS

Arie Van Hattem; Johan A. Prommel, and Augustinus W. M. Roes, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

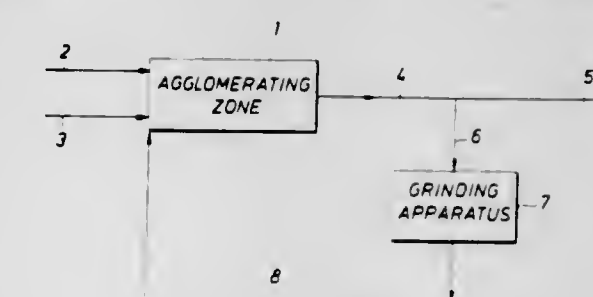
Filed Apr. 23, 1982, Ser. No. 371,105

Claims priority, application United Kingdom, Aug. 6, 1981, 8124112

Int. Cl.<sup>3</sup> B03B 1/00

U.S. Cl. 209—5

4 Claims



1. A process for agglomerating finely divided coal particles suspended in aqueous liquid comprising: flowing substantially continuous streams of an aqueous liquid suspension of fine coal particles having diameters less than 0.25 mm and an oily binder material into an agglomerating zone maintained under turbulent flow and concurrently continuously flowing into the agglomerating zone an aqueous liquid suspension of seed particles consisting essentially of coal or coal agglomerates having diameters which are substantially all between about 0.5 and 1 mm so that the proportion of the seed pellets within the agglomerating zone is maintained at about 10 to 30% of the solid particles within that zone and the agglomeration of the fine coal particles accomplished by layering rather than by coalescence.



4,415,446

**AUTOMATIC CHEMICAL SOLUTION MIXING UNIT**

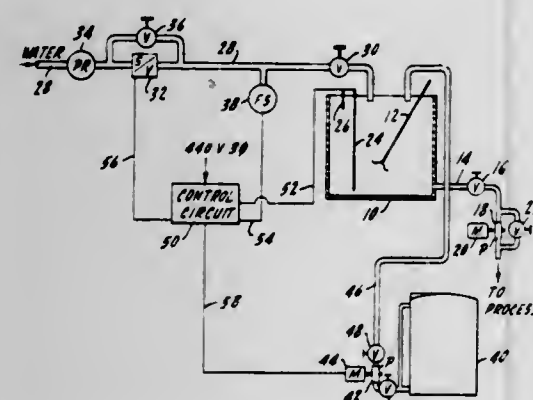
James A. Osborne, Kingsport, Tenn., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 4, 1982, Ser. No. 345,689

Int. Cl.<sup>3</sup> C02B 1/18

U.S. Cl. 210—101

5 Claims



1. In a water treatment facility, an automatic system for making up a chemical solution for use in the facility, comprising:

- a mixing tank having high and low liquid level switches disposed therein;
- a water supply line for supplying water to the mixing tank, the line including a remotely-controlled solenoid valve for controlling the flow of water to the mixing tank;
- a pressure regulator in the water supply line which maintains the water pressure between about 5 pounds per square inch and 125 pounds per square inch;
- a chemical supply tank and a line for supplying treatment chemical directly to the mixing tank; and
- an electrical control circuit responsive to the level switches in the mixing tank to operate the solenoid valve and the pump when needed so that the input of water and treatment chemical to the mixing tank is responsive to the liquid level in the mixing tank and a supply of chemical solution in the mixing tank is maintained.

4,415,447

**SEPARATORY APPARATUS COMPRISING MEANS FOR ANCHORING A SEMI-PERMEABLE MEMBRANE TO A SUPPORT MEMBER**

Jacques Fournier, Bron, and Georges Rodet, Communay, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 105,916, Dec. 21, 1979, abandoned.

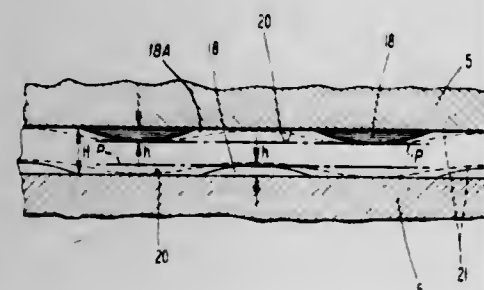
This application Sep. 14, 1981, Ser. No. 301,533

Claims priority, application France, Dec. 21, 1978, 78 37029

Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—321.1

19 Claims



1. Separatory apparatus especially adapted for ultrafiltration comprising a plurality of support plates of generally elongate shape and each defining a longitudinal axis, said plates secured together in a leaktight manner and spaced apart from one another at their peripheries, each support plate including two oppositely disposed faces in which are formed a plurality of longitudinally spaced fluid conducting orifices for conducting

fluid to be treated, each of said faces defining a cell, a semi-permeable membrane covering each cell, said plates being arranged such that a membrane covering the cell of one of said plates faces a membrane covering a cell of an adjacent plate and is spaced therefrom to define a fluid passage therebetween which passage communicates with said orifices to conduct fluid to be treated, each support plate including parallel ribs disposed in the respective cell and extending in a direction transverse relative to said longitudinal axis, each rib defining opposite ends and an outer edge extending in said transverse direction from one of said ends to the other said end, said ribs being spaced apart along said longitudinal axis to define grooves therebetween, a discharge channel disposed adjacent a peripheral edge of each said cell and communicating with said grooves of its associated cell to receive ultrafiltrate from such grooves, said outer edges of at least some of said ribs of each cell being of irregular profile and forming alternating portions which are raised and recessed relative to one another along the respective rib outer edge so as to contact the associated membrane and define membrane anchoring means therefor, said raised portions each defining an outermost section, a plurality of said outermost sections of a respective cell defining an imaginary plane extending parallel to the respective cell, said outermost sections of each of said mutually facing cells terminating short of the imaginary plane of the other of said mutually facing cells.

4,415,448

**FLUSH-BACK FILTER**

Rüdiger Lennartz, Pulheim, and Joachim Gutermuth, Gettorf, both of Fed. Rep. of Germany, assignors to Boll &amp; Kirch Filterbau GmbH, Kerpen, Fed. Rep. of Germany

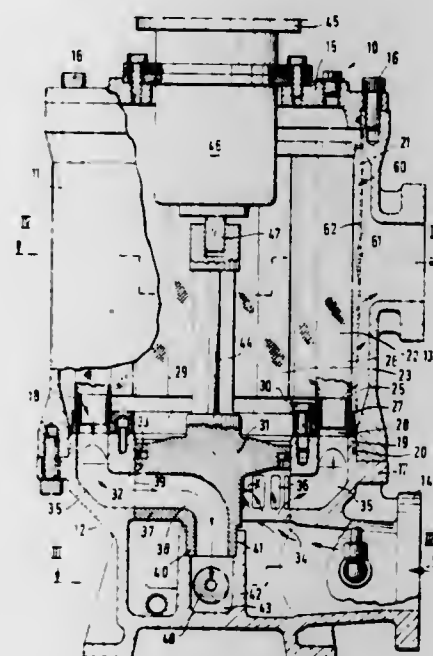
Filed Apr. 12, 1982, Ser. No. 367,349

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115716

Int. Cl.<sup>3</sup> B01D 23/24

U.S. Cl. 210—333.1

18 Claims



1. A flush-back filter having an axis comprising a filter housing, a filter inlet, a filter outlet, a group of filter elements, a sludge drain and a rotary flushing member, said filter elements being arranged in at least two concentric circles, ducts arranged in a circle around the filter axis communicating with said filter elements, each of said ducts opening out into an opening on a cylindrical distributor surface to which said flushing member faces with its peripheral surface and, said flushing member having a diameter which is smaller than the diameter of the inner circle of said filter elements and a flushing channel which opens into a connection opening on its cylindrical peripheral surface adapted to successively engage said cylindrical distributor surface openings.

4,415,449

**VACUUM FILTRATION BENCH**

Wolfgang Hein, Dassel, Fed. Rep. of Germany, assignor to Carl Schleicher &amp; Schuell GmbH &amp; Co. KG, Einbeck, Fed. Rep. of Germany

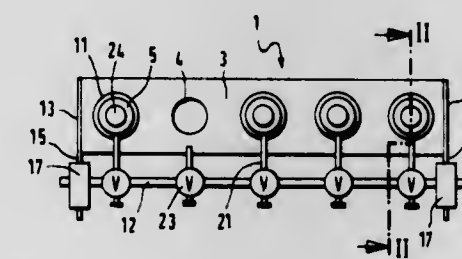
Filed Sep. 15, 1982, Ser. No. 418,131

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138256

Int. Cl.<sup>3</sup> B01D 23/26

U.S. Cl. 210—406

15 Claims



1. A bench for vacuum filtration of fluid samples comprising bench means in the form of a stand which is generally horizontally disposed, said stand having a closed bottom, aperture means on said stand defining a plurality of apertures overlying said bottom, a plurality of filtration means each comprising a filtration device and a suction flask, each of said suction flasks which may be of differing sizes being supported on said bottom of said stand and each being received close fitted in one of said apertures, a vacuum distribution conduit rigidly mounted on said stand, a connector on said vacuum distribution conduit for connection to a vacuum source, a plurality of vacuum branch conduits, each of said branch conduits extending between said vacuum distribution conduit and one of said suction flasks, each of said vacuum branch conduits being provided with an isolating valve between each of said suction flasks and said vacuum distribution conduit, and a plurality of vacuum connections, each of said vacuum connections being provided between each of said branch conduits and each of said suction flasks arranged so as to enable filtrate from any individual filtration means to be collected and worked up without interruption to the filtration process of all or any other of said filtration means.

4,415,450

**METHOD FOR TREATING WASTEWATER USING MICROORGANISMS AND VASCULAR AQUATIC PLANTS**

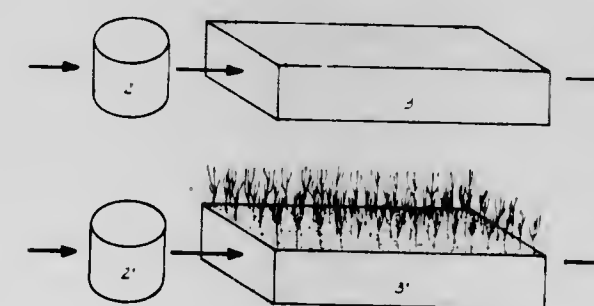
Billy C. Wolverton, Piquette, Miss., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 28, 1981, Ser. No. 335,036

Int. Cl.<sup>3</sup> C02F 3/30, 3/32

U.S. Cl. 210—602

17 Claims



1. A method for treating wastewater comprising the steps of subjecting the wastewater to an anaerobic settling step for at least 6 hours and passing the liquid effluent from the anaerobic settling step upwards through a filter bed, wherein the effluent is subjected first to the action of anaerobic and facultative

microorganisms disposed on a particulate media in a lower portion of said bed and then to the action of aerobic microorganisms disposed on a particulate media in an upper portion of said bed and the roots of at least one vascular aquatic plant.

4,415,451

**PROCESS FOR WASTE WATER DISPOSAL**

Hisashi Suzuki, Akishima, Japan, assignor to Iseki &amp; Co., Ltd., Matsuyama, Japan

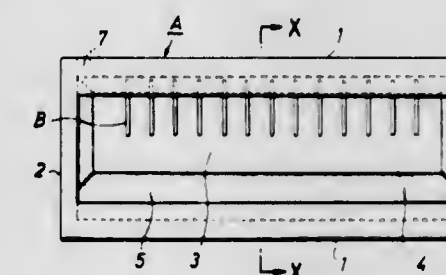
Continuation of Ser. No. 122,197, Feb. 19, 1980, abandoned.

This application Aug. 25, 1981, Ser. No. 296,127

Int. Cl.<sup>3</sup> C02F 3/08

U.S. Cl. 210—610

5 Claims



1. A process for waste water disposal wherein waste water of high BOD concentration of from 3,000 to 100,000 ppm is aerated in an aeration vessel having a BOD load of from 3 to 30 Kg/m<sup>3</sup> (of aeration vessel) per day so as to reduce the BOD concentration thereof, comprising a first step of implanting micro-organisms comprising alcohol fermentation organisms on coal particles (except peat, and pitch and smokeless coal having a carbon content of 84% or higher) of which at least 90% are of a particle size between 2 and 5 mm and not more than 50% are of particle size difference which is within the range of 0 to 0.5 mm by mixing said coal particles with a proteinaceous substance in the presence of moisture, and fermenting to implant said microorganisms on said coal particles outside of said aeration vessel, said coal particles being selected from the group consisting of brown coal and lignite, and then introducing and circulating said micro-organism implanted coal particles in an amount of 5 to 25 Kg/m<sup>3</sup> (of aeration vessel) within said aeration vessel in contact with said waste water, to treat said waste water, and introducing air into said aeration vessel containing said waste water in an amount sufficient to maintain between 2 and 7 ppm of dissolved oxygen in said waste water, to treat said waste water and greatly reduce the BOD concentration, and removing said treated waste water from said aeration vessel which contains said circulating micro-organism implanted coal particles.

4,415,452

**METHOD AND APPARATUS FOR TREATING ORGANIC WASTEWATER**

Richard W. Hell, 30 Arthur Ave., Clarendon Hills, Ill. 60514 and Thomas A. Rose, 351 South Waiola Ave., La Grange, Ill. 60525

Filed Mar. 18, 1982, Ser. No. 359,585

Int. Cl.<sup>3</sup> C02F 3/20

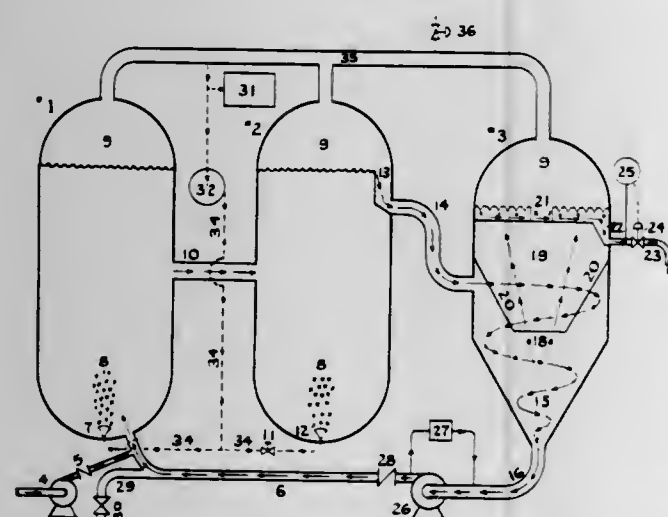
U.S. Cl. 210—614

10 Claims

1. The method of treating organic waste water with activated sludge comprising the steps of: establishing an enclosed continuous flow way for the organic waste water and the activated sludge in a mixed liquor form including several aeration chambers, and a separator chamber that are air pressurized to a predetermined pressure, that contain organic waste water and activated sludge, and that are consecutively connected in a continuous flow circuit through said aeration chambers, said separator chamber, and return flow to said one aeration chamber.



mixing activated sludge and fresh organic waste water in said return flow, passing the return flow into said one aeration chamber adjacent the lower end thereof, dosing the body of the liquor of said one aeration chamber with air in diffused bubble form for flocculating and air saturation of the sludge, passing continuously from said liquor body a flow of the liquor to a subsequent of said aeration chambers having a second liquor body while diffusing air into said second body from the lower end of same for providing a liquor flow in which the flocculated sludge has assimilated the organic waste in the liquor flow,



continuously passing in a gravity flow to said separator chamber the organic waste assimilated liquor flow, and establishing and maintaining in said separator chamber and in said organic waste assimilated liquor flow a cyclone separating action effecting centrifugal force and gravity induced settling out of the sludge flow thereof to provide said return flow, and a rising effluent centrate flow, continuously clarifying and discharging the centrate flow as tertiary quality effluent, and continuously pumping said return flow to effect said mixing and said first mentioned passing steps.

4,415,453

## ANAEROBIC TREATMENT

Enrique R. Witt; William J. Humphrey, and James P. Cave, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 198,909, Oct. 21, 1980, Pat. No. 4,366,059, which is a continuation of Ser. No. 150,829, May 19, 1980, Pat. No. 4,315,823, which is a continuation of Ser. No. 77,545, Jul. 13, 1979, abandoned, which is a continuation of Ser. No. 737,241, Oct. 29, 1976, abandoned. This application Jul. 26, 1982, Ser. No. 401,783

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

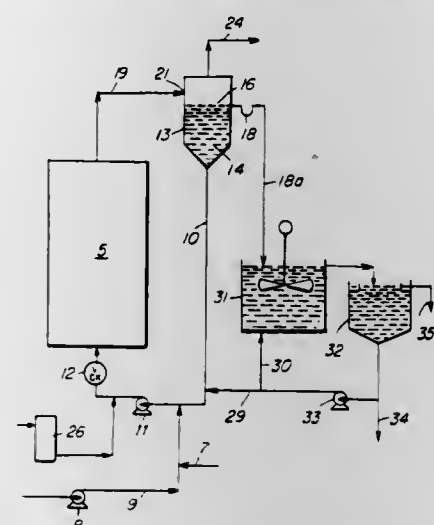
Int. Cl.<sup>3</sup> C02F 3/28

U.S. Cl. 210—615

2 Claims

1. Process for the treatment of aqueous organic waste streams in an anaerobic filter, with concomitant production of methane gas while supplying alkaline material to the filter to neutralize acids fed thereto and formed therein, to produce a liquid effluent stream containing said methane gas from said filter, said liquid effluent stream having a lower C.O.D. content than said waste stream and containing less than 600 mg per liter of volatile suspended solids, said process comprising separating said methane gas from said liquid effluent stream, separating said liquid stream into two liquid streams, hereafter termed a and stream b, withdrawing said liquid stream a while recycling said liquid stream b to said filter and blending said stream b together with fresh feed of said waste stream, the volumetric rate of said fresh feed being about the same as the volumetric rate of withdrawal of said liquid stream a, and the

ratio of said volumetric rate of feed to the volumetric rate of said recycle being in the range of about 1:1 to 1:20, in which process said fresh feed of said waste stream has a C.O.D. of at least about 5000 mg/l, the fresh feed is supplied at a rate which is at least about 0.5 lb C.O.D. per cubic foot of filter per day, the mixture of said liquid b and said fresh feed has a C.O.D. of at least about 500, said filter comprises packing of such con-



struction that the void volume is above 60%, the hydraulic feed rate in said filter is at least about 1 foot per hour, said acids including formic, acetic, or propionic acid, said supplied alkaline material comprising solid MgO, said MgO being converted by contact with said acids to form dissolved magnesium carboxylate salt, the CO<sub>2</sub> partial pressure in said filter being at least 1/5 atmosphere, the Mg concentration in the total feed to said filter being not above about 0.2 gram equivalent per liter.

4,415,454

## NITRIFICATION TREATMENT OF WASTEWATER

Uwe Fuchs, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

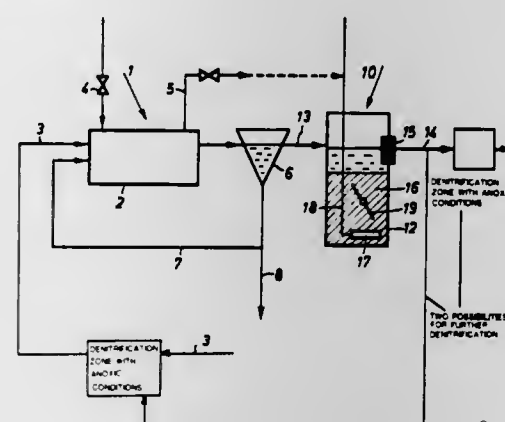
Filed Sep. 1, 1981, Ser. No. 298,430

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1980, 3032882

Int. Cl.<sup>3</sup> C02F 3/08

U.S. Cl. 210—616

10 Claims



1. In a process for the biological treatment of wastewaters in an activated sludge plant comprising two stages, where in the first stage the major proportion of the organic pollutants is decomposed and in the second stage the decomposition of the residual organic pollutants is conducted in conjunction with nitrification of nitrogen compounds in the presence of nitrogen bacteria, the improvement comprising conducting nitrification in a second stage reactor containing nitrifying bacteria fixed on a low-density, particulate, organic, macroporous carrier material, said low density being about 10-200 kg/m<sup>3</sup>, the pores of the carrier material being open macropores of about 0.1 to 5 mm in diameter, and the particles having a diameter of 0.5-50

mm, and wherein said second second stage is a thoroughly mixed activation tank with the nitrification being conducted in the second stage activation tank with a proportion by volume of the carrier material of 10 to 40% of the total volume of the second stage activation tank.

4,415,455

## REVERSE OSMOSIS MEMBRANES BASED ON HYDROXYALKYL METHACRYLATE AND METHACRYLIC ACID COPOLYMERS

Peter Osel-Gyimah, North Wales; Peter G. Cartier, Glenside, and Paul E. Ellis, Downingtown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

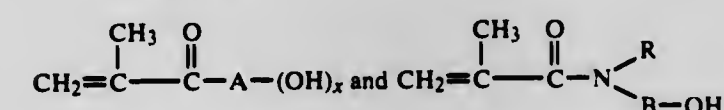
Filed Nov. 9, 1982, Ser. No. 440,417

Int. Cl.<sup>3</sup> B07C 9/00

U.S. Cl. 210—654

17 Claims

1. A composite material suitable for use as a reverse osmosis membrane comprising a microporous substrate and, supported thereon, a thin, water-permeable desalinating film, said desalinating film comprising a copolymer of methacrylic acid and a hydroxy-containing monomer selected from



wherein R is alkyl of 1 to 4 carbon atoms or BOH, A and B are alkylene having from 2 to about 4 carbon atoms, and x is 1 or 2, said film crosslinked by acid catalyzed ester formation.

4,415,456

## REMOVAL AND DESTRUCTION OF RESIDUAL NITRATE ESTERS IN WASTEWATER

Carl D. Chandler, Jr., Dublin, Va., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 24, 1982, Ser. No. 361,633

Int. Cl.<sup>3</sup> C02F 1/28

U.S. Cl. 210—673

17 Claims

1. A process for destroying amounts of an organic nitrate ester carried at low levels in a wastewater effluent, said process comprising:

intimately contacting an initial fraction of said wastewater effluent with a solid adsorbent to concentrate a first of said amounts as an initial adsorbate of said solid adsorbent that thereby becomes spent; intimately contacting said spent adsorbent with an aqueous regenerating fluid comprising a solvent for said nitrate ester and that displaces a portion of said adsorbate and decomposes said nitrate ester thereof;

washing residual amounts of decomposition products of said nitrate ester and said aqueous regenerating fluid from said spent adsorbent so contacted to provide a washed adsorbent;

intimately contacting a subsequent fraction of said wastewater effluent with said washed adsorbent to concentrate another of said amounts as a subsequent adsorbate of said solid adsorbent.

4,415,457

## PROCESS FOR TREATING LIQUID WASTE CONTAINING SOLID FINE PARTICLES

Kiyotaka Shirosaki; Yoshikazu Sugimoto, both of Hitachi, and Masaki Takeshima, Komae, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 243,069

Claims priority, application Japan, Mar. 13, 1980, 55-32492

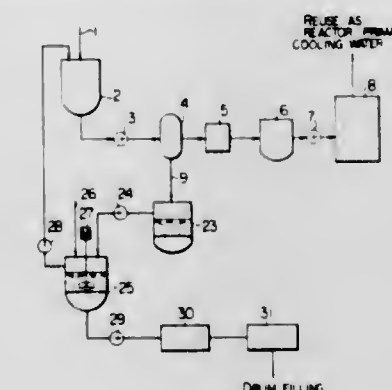
Int. Cl.<sup>3</sup> C02F 1/42; G21F 9/12

U.S. Cl. 210—682

7 Claims

1. A process for treating backwash water of a non-filter aid type filter used in filtering radioactive liquid waste discharged from the primary cooling water system of an atomic power plant for reuse, which comprises leading backwash water

containing suspended radioactive cruds comprised of radioactive iron oxide particles from the non-filter aid type filter to a waste resin settling tank for backwash water containing waste ion exchange resin powder from a filter-demineralizer of a condensation-purification system of the atomic power plant, mixing the backwash water from the non-filter aid type filter with an effective amount of the backwash water from the



filter-demineralizer in the tank, thereby allowing the cruds contained in the backwash water from the non-filter aid type filter to be adsorbed onto the waste ion exchange resin powder, and settling the crud-adsorbed waste ion exchange resin powder, thereby separating and removing the cruds from the backwash water from the non-filter aid type filter and recycling resultant supernatant from the waste resin settling tank to the non-filter aid type filter in the primary cooling system.

4,415,458

## FLOCCULATING REAGENTS

Pearl M. Klein, Rofario Dominicana, F.A. Avenue 27 De Febrero 220 Post Office Box 944, Santo Domingo, Dominican Republic

Filed Feb. 19, 1982, Ser. No. 350,372

Int. Cl.<sup>3</sup> C02F 1/54

U.S. Cl. 210—727

26 Claims

1. A method for flocculating aqueous suspensions of fine particles in relatively short periods of time, comprising the step of:

- admixing with said suspension, an effective amount of a flocculating reagent selected from the group consisting of:
  - orange peel extract,
  - corn husk extract, and
  - a mixture of orange peel extract and corn husk extract.

4,415,459

## WASTE DISPOSAL SYSTEMS AND METHODS

Moody L. Coffman, 1832 NW. 17th St., Oklahoma City, Okla. 73106, and Lawrence R. Bradshaw, Jr., P.O. Box 14231, Oklahoma City, Okla. 73113

Filed Jun. 8, 1981, Ser. No. 271,818

Int. Cl.<sup>3</sup> G21F 9/22

U.S. Cl. 210—747

45 Claims

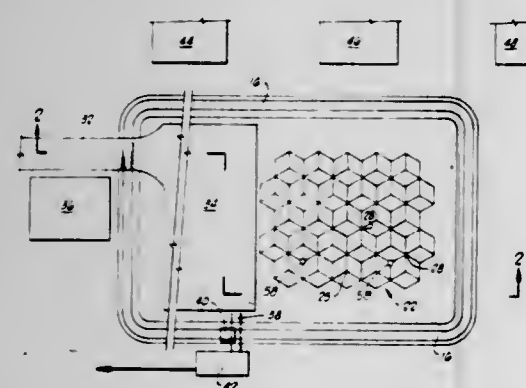
1. A system for disposing of wastes comprising:

- a disposal site including:
  - a base which is substantially liquid impermeable; and
  - a geometrically indexing support structure on said base and including an upper side geometrically configured to contact and support a plurality of contiguously placed waste containers of identical shape, said upper side having a configuration complementary and identical to the collective downwardly facing surfaces of a multiplicity of said containers when arrayed in horizontal alignment and in abutting contact with each other so that no lateral spaces or voids exist between said containers; and
- a plurality of identically shaped polyhedron waste containers stacked on said geometrically indexing support struc-



ture in an array to extend in horizontal alignment, in vertical tiers of horizontally aligned containers with said containers collectively occupying the minimum possible volume permitted by their solid geometry, the geometric shape of each of said containers being such that each of said containers has at least eight identical faces and each and every face of each container can be flatly abutted against an identically shaped face on a different container, and with all such abutting faces concurrently contacted during stacking of the containers above that first tier of horizontally aligned containers supported on the upper side of said support structure.

32. A method of storing and utilizing waste matter in an environmentally safe, space-conservative manner comprising: placing the waste matter in a plurality of stackable, identically shaped, polyhedron containers, each having at least eight identical sides and configured to register with contiguously positioned identical containers therearound to



thereby form a geometric solid containing solely voids constituted by the waste matter-containing hollow interior of the several containers;

selectively stacking the waste matter-containing containers on a supporting structure in vertical tiers, with each tier containing a plurality of horizontally aligned containers in contiguous abutting relationship, and with no space between containers within the stack, said supporting structure including as upper side geometrically configured to contact and support a plurality of said contiguously placed waste containers of identical shape, said upper side having a configuration complementary and identical to the collective downwardly facing surfaces of a multiplicity of said containers when arrayed in horizontal alignment and in abutting contact with each other so that no lateral spaces or voids exist between said containers; and indexing and registering the location of each container in the stack to facilitate future location and retrieval thereof to gain access to the waste material stored therein.

#### 4,415,460

#### OXIDATION OF ORGANICS IN AQUEOUS SALT SOLUTIONS

George D. Suci, Ridgewood, and John E. Paustian, Whippany, both of N.J., assignors to The Lummus Company, Del. Continuation of Ser. No. 157,117, Jun. 6, 1980, abandoned, which is a division of Ser. No. 61,743, Jul. 30, 1979, Pat. No. 4,240,885. This application Apr. 19, 1982, Ser. No. 369,352 Int. Cl.<sup>3</sup> C02F 1/76

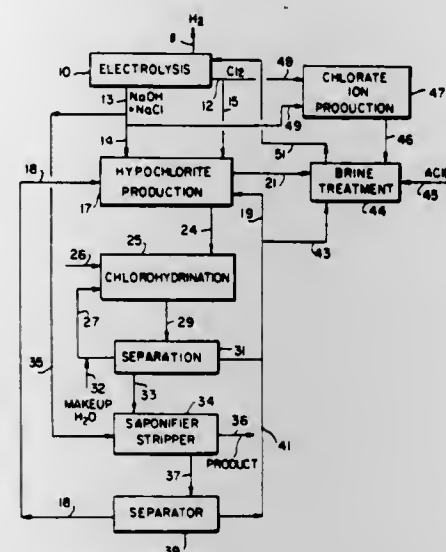
U.S. Cl. 210—754

19 Claims

1. A process for treating an aqueous salt solution containing organic impurities wherein said salt is selected from the group consisting of alkali and alkaline earth chlorides, and said organic impurities are comprised of a member selected from the group consisting of glycols, aldehydes, ethers, carboxylic acids, hydrocarboxylic acids, hydroxyketones, chloroketones, chloro-organic acids, ketoacids, and chloroalcohols, comprising:

oxidizing the organic impurities to convert the carbon atoms

of the organic impurities to substantially carbon dioxide, said oxidizing consisting essentially of treatment with



chlorate ions at a pH of no greater than 5.0 and a temperature of at least 130° C.

#### 4,415,461

#### PROCESS FOR TREATING RESIDUAL WATERS CONTAINING AROMATIC AMINES

Jean E. Mansel, Labeuvriere; Charlie M. P. Masson, Mons-en-Baroeul; Paul Bertaux, Saint Andre, and Andre M. J. Gros-maitre, Marquette Les Lille, all of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France Filed Jan. 3, 1983, Ser. No. 455,157

Claims priority, application France, Jan. 15, 1982, 82 00565 Int. Cl.<sup>3</sup> C02F 1/70, 1/72

U.S. Cl. 210—757

13 Claims

1. A process for destroying primary aromatic amines in residual waters which comprises treating the residual waters containing said amines at a temperature between 40° C. and 90° C. for a period longer than 5 minutes with a mixture of sulfuric acid and nitric acid, the final pH of the reaction medium being lower than 3.

#### 4,415,462

#### SELF-CLEANING SCREEN

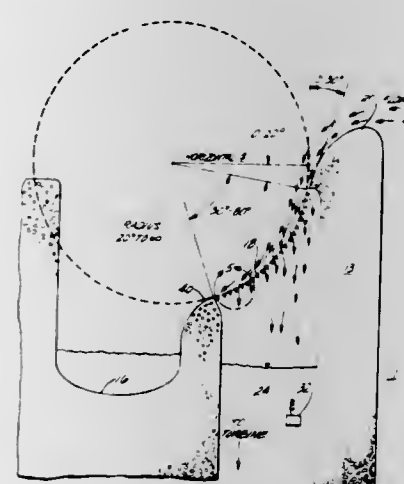
Harvey E. Finch, 121 Shooting Star Isle, Foster City, Calif. 94404, and James J. Strong, 440 Vidal, San Francisco, Calif. 94132

Filed Aug. 12, 1982, Ser. No. 407,467

Int. Cl.<sup>3</sup> B07B 1/06

U.S. Cl. 210—767

13 Claims



1. An apparatus for screening intake water for hydraulic turbine diversions from a river or the like, the apparatus comprising:

a check dam across the river for maintaining a first water level in the river;

a side channel weir on one bank of the river upstream of the check dam, the elevation of the weir being sufficiently lower than the check dam for diverting water to flow over the weir;

a first water channel having an inlet upstream of the weir and an outlet downstream of the check dam, the first water channel being spaced laterally from the weir at a lower elevation than the weir;

a stationary screen connected between the weir and the first water channel; and

a second water channel under the screen for supplying water passing through the screen to an intake of a hydraulic turbine.

#### 4,415,463

#### PREPARATION OF VISCOSIFIERS FOR ZINC SALT WORKOVER AND COMPLETION BRINES

Benjamin Mosler, Houston, Tex.; Jack L. McCrary, and Karl G. Guilbeau, both of Lafayette, La., assignors to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 51,157, Jun. 22, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 277,509

Int. Cl.<sup>3</sup> E21B 43/00

U.S. Cl. 252—8.55 R

13 Claims

1. The process of preparing a viscosifier for addition to clear water salt brines used as oil well workover and completion fluids, comprising:

(a) forming a treating solution comprising a basic nitrogen reagent dissolved in a solvent carrier, said reagent being selected from the class consisting of dimethyl dialiphatic quaternary ammonium salts, and dimethylol urea, said aliphatic groups containing from 8 to 22 carbons, said solvent carrier being selected from the class consisting of organic polar solvents in which said reagent is soluble and mixtures thereof with a minor proportion of water, said treating solution containing from 0.25 to 15% by weight of said reagent; and

(b) contacting said treating solution with a natural polysaccharide gum suitable for use in salt brine workover and completion fluids, said gum being in the form of a particulate solid, a sufficient amount of said treating solution being used to wet said particulate gum, said gum being maintained in essentially unswollen condition during said contacting.

#### 4,415,464

#### FARADAY ROTATION GLASS

Yoshiyuki Asahara, Higashiyamato, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

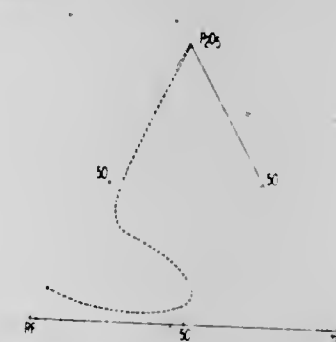
Continuation of Ser. No. 967,766, Dec. 8, 1978, abandoned, which is a continuation of Ser. No. 868,245, Jan. 10, 1978, abandoned. This application Mar. 12, 1982, Ser. No. 357,447

Claims priority, application Japan, Jan. 13, 1977, 52-2717

Int. Cl.<sup>3</sup> C03C 3/16, 3/18, 3/30

U.S. Cl. 252—62.51

2 Claims



1. A Faraday rotation glass consisting essentially of in mole %,

P <sub>2</sub> O <sub>5</sub>	5 to 30% where up to 5/6 on a molar basis of the P <sub>2</sub> O <sub>5</sub> can be replaced by B <sub>2</sub> O <sub>3</sub> ;
TbF <sub>3</sub>	11.4 to 45%;
AlF <sub>3</sub>	0 to 25%; and
RF	at least 40%

where RF includes at least 3% BaF<sub>2</sub>, 0 to 64% MgF<sub>2</sub>, 0 to 32% NaF, 0 to 40% SrF<sub>2</sub>, 0 to 26% CaF<sub>2</sub>, 0 to 20% LiF and 0 to 20% KF.

#### 4,415,465

#### HEAT-STORING COMPOSITION

Keiichi Koike, Matsudo, and Michio Yanadori, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of Tokyo, Japan

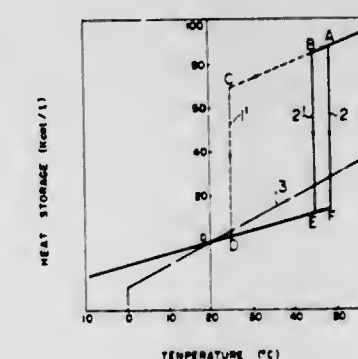
Filed Mar. 10, 1982, Ser. No. 356,737

Claims priority, application Japan, Mar. 13, 1981, 56-35193; Sep. 21, 1981, 56-149267; Nov. 6, 1981, 56-177221

Int. Cl.<sup>3</sup> C09K 3/18

U.S. Cl. 252—70

10 Claims



1. A heat-storing composition which comprises sodium thiosulfate pentahydrate and naphthalene as a nucleating agent.

#### 4,415,466

#### REVERSIBLE PHASE CHANGE COMPOSITIONS OF CALCIUM CHLORIDE HEXAHYDRATE WITH POTASSIUM CHLORIDE

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1982, Ser. No. 364,159

Claims priority, application Japan, Apr. 15, 1981, 56-055719

Int. Cl.<sup>3</sup> C09K 5/06

U.S. Cl. 252—70

40 Claims

19. In a reversible liquid/solid phase change composition comprising a mixture of CaCl<sub>2</sub>·6H<sub>2</sub>O/KCl/NaCl/SrCl<sub>2</sub>·6H<sub>2</sub>O and impurities in an amount of less than 3 weight percent of the total weight of the composition, the improvement comprising the addition of KCl and NaCl in amounts sufficient to obtain an effectively congruently melting mixture.

#### 4,415,467

#### AGENT FOR THE PURIFICATION OF WASTE WATERS AND PROCESS FOR ITS PRODUCTION

Ralf F. Piepho, Wennigsen, Fed. Rep. of Germany, assignor to Colloid Piepho, Wilmington, Del.

Continuation-in-part of Ser. No. 240,874, Mar. 5, 1981, Pat. No. 4,332,693, which is a continuation of Ser. No. 867,240, Jan. 6, 1978, abandoned. This application Jun. 1, 1982, Ser. No. 383,608 The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C02F 1/28, 5/10; B01J 20/12, 20/34

U.S. Cl. 252—181

16 Claims

1. A chemical composition for the treatment of contami-



nated waste waters, especially waste waters in the form of oily emulsions, the agent comprising activated bentonite; bentonite containing calcium aluminum silicate in an amount of at least 30% based on the dry weight of activated bentonite; lime (CaO or Ca(OH)<sub>2</sub>) in an amount of at least 50% based on the dry weight of bentonite containing calcium aluminum silicate; a contaminant coagulant; and an acid or acid salt.

4,415,468

## DEODORIZATION OF N-VINYL MONOMERS

Albert C. Chen, East Brunswick, and Frank A. Nagy, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1981, Ser. No. 260,572

Int. Cl.<sup>3</sup> A61L 9/01

U.S. Cl. 252—182

10 Claims

1. A deodorized composition at least one odoriferous N-vinyl monomer and a sufficient deodorizing amount of an alkali metal bisulfite.

4,415,469

## PHASE STABLE COMPOSITIONS CONTAINING A PARAFFINIC POLYOL AND AN ISOCYANATE REACTIVE PREPOLYMER

Chung-Chieh Tsai, South Salem, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 2, 1981, Ser. No. 317,102

Int. Cl.<sup>3</sup> C08G 63/42, 59/40; C08F 233/00; C08K 3/00

U.S. Cl. 252—182

19 Claims

1. A process for producing a phase-stable solution composition comprising an isocyanate reactive prepolymer containing hydroxy and epoxy groups and a paraffinic polyol chain extender which comprises heating the prepolymer and polyol in the presence of one another to yield said phase-stable solution composition.

11. A phase stable solution composition comprising an isocyanate reactive prepolymer containing hydroxy and epoxy groups and a paraffinic polyol chain extender, said composition being essentially free of a compatibilizing agent for said prepolymer and polyol.

4,415,470

## LIQUID CRYSTALLINE FLUORINE-CONTAINING CYCLOHEXYLBIPHENYLS AND DIELECTRICS AND ELECTRO-OPTICAL DISPLAY ELEMENTS BASED THEREON

Rudolf Eidenschink, Dieburg, and Ludwig Pohl, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 320,146

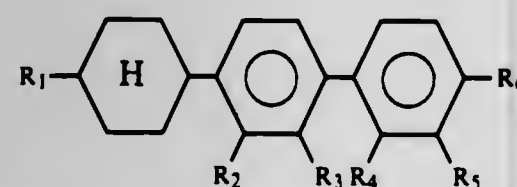
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1980, 3042391

Int. Cl.<sup>3</sup> C09K 3/34; G02F 1/133; C07C 121/64, 25/18, 43/225

U.S. Cl. 252—299.63

8 Claims

1. A cyclohexylbiphenyl of the formula



wherein R<sub>1</sub> is alkyl of 1-12 C atoms; R<sub>6</sub> is alkyl or alkoxy each of 1-12 C atoms, CN or fluorine; and R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> each is hydrogen or fluorine, with the proviso that at least one of R<sub>4</sub> and R<sub>5</sub> is fluorine, but not more than two of R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> are fluorine.

4,415,471

## X-RAY FLUORESCENT SCREENS

Heinz Degenhardt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

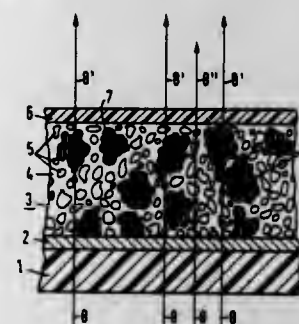
Filed Feb. 25, 1982, Ser. No. 352,327

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114438

Int. Cl.<sup>3</sup> C09K 11/06

U.S. Cl. 252—301.36

6 Claims



1. An x-ray fluorescent screen comprised of a fluorescent layer having a luminescent material bound in a lacquer binding system characterized by pronounced hydrophilic properties, said luminescent material comprising a rare earth luminescent material having oxyhalides and/or oxysulfides as a base, and said binding system comprising a urea-formaldehyde resin containing about 10 to 90% by weight of an additive selected from the group consisting of alkyd resins, epoxy resins, polyacrylate resins, nitrocellulose, vinyl chloride copolymers, polyvinyl butyral and mixtures thereof.

4,415,472

## MIXTURE OF ALKALI SALTS OF SULFO-SUCCINIC ACID DIALKYLESTERS AND HIGHER ALIPHATIC ALCOHOLS, USE THEREOF TO DEFOAM MINERAL ACID DECOMPOSITION MEDIA

Reinmar Peppmüller, Krefeld, Fed. Rep. of Germany, assignor to Chemische Fabrik Stockhausen GmbH, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,441

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018758

Int. Cl.<sup>3</sup> B01D 17/00

U.S. Cl. 252—321

20 Claims

1. A defoamer which is a mixture comprising (a) at least one alkali salt of at least one sulfosuccinic acid dialkylester wherein the alkyl groups are the same or different and are linear or branched alkyl groups containing 7 to 20 carbon atoms, and (b) at least one higher unbranched or branched aliphatic alcohol containing 6 to 20 carbon atoms, the weight ratio of component (a) to component (b) being  $\frac{1}{4}$  to 40/1.

4,415,473

## WATER GAS SHIFT REACTION EMPLOYING INTERCALATED METAL CARBONYL COMPLEX CATALYST COMPOSITION

James A. Hinnenkamp, Hamilton, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 207,166, Nov. 17, 1980, Pat. No. 4,324,695.

This application Nov. 25, 1981, Ser. No. 325,180

Int. Cl.<sup>3</sup> C01B 3/16

U.S. Cl. 252—373

5 Claims

1. In the catalyzed water gas shift reaction, the improvement which comprises using as catalyst a catalytically effective amount of an intercalate composition comprising graphite intercalated with a transition metal carbonyl.

4,415,474

## CATALYSTS USEFUL FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Kenneth C. Benton, Garfield Heights; Brian L. Cmolik, Parma, and Raymond J. Weinert, Garfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 16, 1982, Ser. No. 349,114

Int. Cl.<sup>3</sup> C08F 4/64

U.S. Cl. 502—117

5 Claims

1. A Ziegler-type transition metal complex catalyst comprising

- (1) a transition metal compound; and
- (2) a 1-phenyl-2-(dialkyl aluminio)-1-heptene activator.

4,415,475

## MIXED METAL OXIDE CATALYST CONTAINING TITANIUM, BORON AND MOLYBDENUM VALUES

Thomas S. Brima, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 280,172, Jul. 2, 1981, Pat. No. 4,358,601.

This application Jun. 18, 1982, Ser. No. 390,142

Int. Cl.<sup>3</sup> B01J 21/02

U.S. Cl. 502—206

10 Claims

1. A catalyst consisting essentially of a mixed metal oxide of titanium, boron and molybdenum values prepared by the process which comprises reacting titanium halide with ammonium heptamolybdate, and reacting the resulting product with boric acid or alkyl borate and thereafter calcining the recovered solid in an inert or oxygen-containing atmosphere.

4,415,476

## SILVER-BASED CATALYST CONTAINING CHLORINE AS AN ANIONIC COMPONENT FOR THE PRODUCTION OF ETHYLENE OXIDE

Akimi Ayame, Muroran; Naohiro Nojiri, and Yukio Sakai, both of Ami, all of Japan, assignors to Mitsubishi Petrochemical Co. Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,978

Claims priority, application Japan, Feb. 25, 1981, 56-25417

Int. Cl.<sup>3</sup> B01J 27/10

U.S. Cl. 502—224

8 Claims

1. A catalyst for the production of ethylene oxide by oxidation of ethylene, said catalyst comprising

- (A) silver,
- (B) (1) sodium in an amount of more than 1000 ppm (mg/kg of catalyst) based on the catalyst and (2) cesium as a cationic component, the amount of cesium being smaller than that of sodium and ranging from 10 ppm to 0.5% by weight based on the catalyst, and
- (C) chlorine as an anionic component the amount of chlorine being from 5 ppm to 0.1% by weight based on the catalyst.

4,415,477

## CATALYST FOR DEHYDROGENATION OXYGEN-CONTAINING DERIVATIVES OF THE CYCLOHEXANE SERIES INTO THE CORRESPONDING CYCLIC KETONES AND/OR PHENOLS

Alexandr Y. Rozovsky, Rublevskoe shosse, 97, korpus 3, kv. 25; Valentin D. Stytsenko, ulitsa Musy Dzhalilya, 34, korpus 2, kv. 18; Svetlana A. Nizova, ulitsa Volgina, 27, kv. 144; Petr S. Belov, ulitsa Vavilova, 52, korpus 3, kv. 163, and Alexandr J. Dyakonov, ulitsa Begovaya, 32, kv. 71, all of Moscow, U.S.S.R.

Filed Dec. 22, 1980, Ser. No. 219,170

Claims priority, application U.S.S.R., Dec. 27, 1979, 2852803

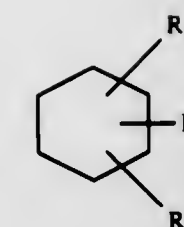
Dec. 27, 1979, 2852803

Int. Cl.<sup>3</sup> B01J 23/78, 23/74, 27/02, 27/08

U.S. Cl. 502—178

2 Claims

1. A catalyst for dehydrogenating oxygen-containing derivatives of the cyclohexane series having the following general formula



where

R<sub>1</sub> is a radical selected from the group, containing hydrogen and alkyls C<sub>1</sub>-C<sub>4</sub>,

R<sub>2</sub> and R<sub>3</sub> are radicals selected from the group, containing —H, —OH, and =O but R<sub>2</sub> and R<sub>3</sub> cannot both be hydrogen;

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> being linked to different carbon atoms of the ring, into the corresponding cyclic organic compounds selected from the group containing cyclic ketones and phenols, and mixtures thereof, said catalyst comprising an active component, -nickel, a promotor -tin, both as free metals, and an inert carrier selected from the group consisting of silica, diatomite, silicon carbide and magnesia, the amounts of said catalyst components being within the following limits as weight percent:

nickel—15 to 55

tin—0.2 to 1.95

inert carrier—84.8 to 43.05

and wherein the atomic ratio of nickel and tin lies within 26.6:1 and 410:1, respectively.

2. A catalyst as claimed in claim 1, also containing an alkali salt of a mineral acid in an amount of from 0.01 to 1.0 wt.-%.

4,415,478

## LOW HALIDE ACTIVATED AGGLOMERATED CARBON CATALYSTS

Robert M. Suggitt, Wappingers Falls; Joseph H. Coone, Jr., Fishkill, and Walter C. Gates, Jr., Carmel, all of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 754,394, Dec. 27, 1976, abandoned. This application Sep. 21, 1981, Ser. No. 304,231

Int. Cl.<sup>3</sup> B01J 21/18; C01B 31/08; B01J 20/20, 23/40

U.S. Cl. 502—181

8 Claims

1. The method of preparing a reduced ash carbon agglomerate which comprises

- leaching a high ash carbon agglomerate in contact with a hydrohalic acid thereby forming a reduced ash carbon agglomerate containing halide values;
- leaching said reduced ash carbon agglomerate in contact with a solution containing at least one composition selected from the group consisting of water-soluble organic carboxylic acid and ammonium salts thereof thereby forming a reduced ash carbon agglomerate containing decreased halide values; and
- recovering said reduced ash carbon agglomerate containing decreased halide values.

2. The method of preparing a reduced ash carbon agglomerate as claimed in claim 1 wherein said hydrohalic acid is hydrochloric acid.

3. The method of preparing a reduced ash carbon agglomerate as claimed in claim 1 wherein said hydrohalic acid is hydrofluoric acid.

4,415,479

## PALLADIUM ON CARBON CATALYST FOR PURIFICATION OF CRUDE TEREPHTHALIC ACID

Imre Puskas, Glen Ellyn, and David E. James, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 29, 1981, Ser. No. 316,336

Int. Cl.<sup>3</sup> B01J 23/44; C07C 51/42

U.S. Cl. 502—85

18 Claims

10. A catalyst composition for purification of terephthalic



acid which comprises crystallites of catalytically active palladium adsorbed upon a porous carbonaceous support material comprising activated carbon granules having a surface area of at least 600 m<sup>2</sup>/g wherein said palladium crystallites are predominantly less than 35 angstroms (Å) in longitudinal measurement and palladium content is less than 1.0 (wt)% of total catalyst weight, wherein said catalyst is prepared by adsorbing catalytically active palladium crystallites upon the surface of activated carbon granules by contacting said granules with an aqueous solution of an amine and a palladium salt in the presence of an organic carboxylic acid wherein concentration of said amine is sufficient to solubilize said palladium salt, and the mole ratio of said acid to amine is at least 0.75 wherein said palladium reacts with said carbon to produce said catalyst composition.

11. The composition of claim 10 wherein said palladium salt is selected from the group consisting of palladium chloride, palladium bromide, palladium iodide and palladium acetate.

12. The composition of claim 10 wherein said palladium salt is palladium chloride.

4,415,480

#### TRANSITION METAL OXIDE BRONSTED ACID CATALYSTS

Lawrence L. Murrell, South Plainfield, and Dane C. Grenoble, Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1981, Ser. No. 305,266

Int. Cl.<sup>3</sup> B01J 21/04, 23/20, 23/30

U.S. Cl. 502—242

17 Claims

1. A solid acid catalyst having primarily Bronsted acidity which comprises at least one catalytic metal oxide selected from the group consisting of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof supported on a support which comprises alumina.

4,415,481

#### PYRIDINE-MODIFIED NA X-TYPE OR LI X-TYPE ADSORBENT CHARACTERIZED BY ITS ABILITY TO SEPARATE PARA-XYLENE FROM C-8 AROMATIC HYDROCARBON MIXTURES

William Smolin, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 152,865, May 23, 1980, Pat. No. 4,351,981.

This application Jun. 14, 1982, Ser. No. 378,466

Int. Cl.<sup>3</sup> B01J 29/08

U.S. Cl. 502—62

3 Claims

1. An adsorbent, characterized by its ability to separate high purity para-xylene from feed mixtures containing C-8 aromatic hydrocarbon including para-xylene, which comprises a sodium X-type or a lithium X-type zeolite, modified with a pyridine.

4,415,482

#### OXIDATION AND AMMOXIDATION CATALYST

Jerry R. Ebner, St. Charles, Mo., assignor to Monsanto Company, Del.

Filed Nov. 12, 1981, Ser. No. 320,403

Int. Cl.<sup>3</sup> B01J 29/16, 21/02, 27/14, 27/02

U.S. Cl. 502—205

8 Claims

1. A catalyst for oxidation and amnoxidation of hydrocarbons consisting essentially of catalytic elements having the empirical formula



wherein a is from 0.5 to 2, b is from 0.01 to 0.12, c is from 0.01 to 10, d is from 0 to 0.5, and x is taken to satisfy the valence requirements of the other elements present and wherein M is one or more elements selected from Groups I-A, II-A, III-A, V-A, VI-A, I-B, IV-B, VI-B and VII-B of the Periodic Table, said catalyst being prepared by forming a mixture containing a

vanadium component, an antimony component, a hydrophilic bismuth molybdate component having the empirical formula.



wherein a is from 0.5 to 2, x is taken to satisfy the valence requirement of the other elements present and Y is a number such that the bound water is 5 to 40 weight percent of the total component forming said mixture into dry particles, and calcining at a temperature of from 500° to 850° C.

4,415,483

#### CLASS OF FRIEDEL-CRAFTS CATALYSTS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 191,855, Sep. 29, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,346

Int. Cl.<sup>3</sup> B01J 29/00, 21/02, 27/02, 27/20

U.S. Cl. 502—255

1 Claim

1. A catalyst for the aralkylation of aromatics to produce polybenzyls, manufacture of aromatic ketones, aromatic sulfones and aromatic esters wherein the catalyst is molybdenum silicide, having a particle size distribution of about 0.6 to 7.5 microns and a mean diameter of about 4.1 to 4.8 microns and a surface area of about 1.5 to 2 square meters per cubic centimeter.

4,415,484

#### AUTOTHERMAL REFORMING CATALYST

Herbert J. Setzer, Ellington; Roger R. Lesieur, Enfield, and Sam Karavolis, East Hampton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 26, 1982, Ser. No. 372,253

Int. Cl.<sup>3</sup> B01J 21/04, 23/58

U.S. Cl. 502—332

2 Claims

1. A high activity catalyst specifically adapted for substantially carbon-free use in an autothermal reformer comprising by weight about 0.01% to about 6% rhodium supported on an alumina substrate having deposited thereon about 10% to about 35% calcium oxide and in which the alumina substrate is promoted with magnesium oxide containing about 3% to about 15% magnesium.

4,415,485

#### PROCESS FOR THE INTERNAL COATING OF CONTACT TUBES

Carl Voigt, Rodenbach; Peter Kleinschmit, Hanau, and Reinhard Manner, Maintal, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,298

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034957

Int. Cl.<sup>3</sup> B01J 35/02

U.S. Cl. 502—100

12 Claims

1. A process for the internal coating of a contact tube with at least one catalyst comprising filling a substantially vertical contact tube with the catalyst material to be applied in flowable form, then simultaneously lowering the level of the liquid level in the contact tube and heating the liquid boundary surface in the tube.

4,415,486

#### RESISTIVE PASTE FOR A RESISTOR BODY

Alexander H. Boonstra; Cornelis A. H. A. Mutsaers, and Franciscus N. G. R. van der Kruijs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,365

Claims priority, application Netherlands, Jun. 11, 1981, 8102809

Int. Cl.<sup>3</sup> H01B 1/02

U.S. Cl. 252—514

4 Claims

1. A resistive material suitable for the production of a resistor body consisting of a mixture of glass powder and a silver-palladium composition selected from the group consisting of a silver palladium rhodite compound of the formula  $\text{Ag}_x\text{Pd}_{1-x}\text{RhO}_2$  wherein  $0.05 \leq x \leq 0.15$ , a mixture of alloys consisting of silver and palladium and said compound, and alloys consisting of silver and palladium the particles of which are coated with palladium rhodite of the formula  $\text{PdRhO}_2$ .

4,415,487

#### BIS-BETAINES, A PROCESS FOR THEIR PREPARATION, AND CLEANING AGENTS CONTAINING THESE COMPOUNDS

Günter Blaschke, Winhöring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 439,729

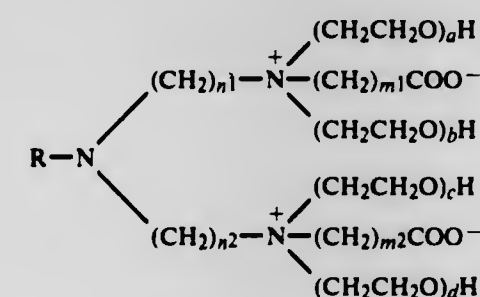
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145733

Int. Cl.<sup>3</sup> C07C 79/16; C11D 1/90, 7/32

U.S. Cl. 252—546

4 Claims

1. A bis-betaine of the formula



in which

R denotes a saturated or an olefinically unsaturated hydrocarbon radical which has 1 to 3 double bonds and 8 to 22 carbon atoms,  $n^1$  and  $n^2$  represent an integer from 2 to 3, and  $n^1$  and  $n^2$  can be identical or different,  $m^1$  and  $m^2$  represent an integer from 1 to 4, and  $m^1$  and  $m^2$  can be identical or different, and a, b, c and d, which are identical or different, each is a number from 1 to 5, with the proviso that the sum  $(a+b+c+d)$  should be at most 10.

4,415,488

#### TRIAMINE-TRIOXIDES, A PROCESS FOR THEIR PREPARATION, AND CLEANING AGENTS CONTAINING THESE COMPOUNDS

Günter Blaschke, Winhöring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 439,731

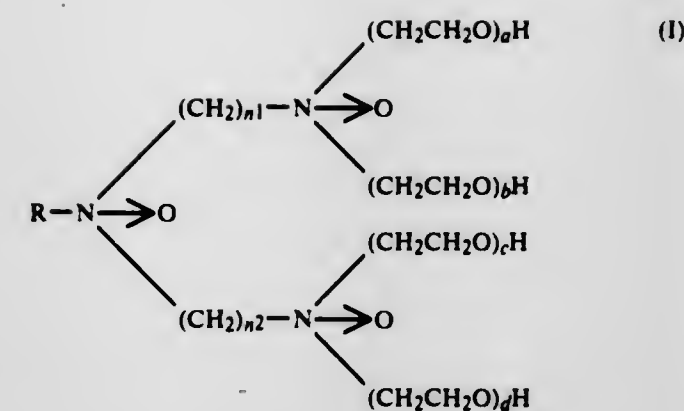
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145735

Int. Cl.<sup>3</sup> C07C 79/16; C11D 1/75, 7/32

U.S. Cl. 252—547

4 Claims

1. A triamine-trioxide of the formula



in which

R denotes a saturated or an olefinically unsaturated hydrocarbon radical which has 1 to 3 double bonds and 8 to 22 carbon atoms,  $n^1$  and  $n^2$  represent an integer from 2 to 3, and  $n^1$  and  $n^2$  can be identical or different, and a, b, c and d, which are identical or different, each is a number from 1 to 5, with the proviso that the sum  $(a+b+c+d)$  should be at most 10.

4,415,489

#### PROCESS FOR MAKING HIGH SOLIDS CONTENT ZEOLITE A-ALKYLBENZENE SULFONATE COMPOSITIONS SUITABLE FOR USE IN MAKING SPRAY DRIED DETERGENT COMPOSITIONS

Alexander P. Kiczek, Middletown; Leo A. Salmen, North Bergen, both of N.J., and Clark B. Tower, Oxford, N.Y., assignors to Colgate Palmolive Company, New York, N.Y.

Filed Apr. 6, 1979, Ser. No. 12,704

Int. Cl.<sup>3</sup> C11D 1/22, 3/12, 11/04, 17/06

U.S. Cl. 252—558

5 Claims

1. A process for making a high solids content crystalline zeolite Type A or amorphous aluminosilicate zeolite-alkylbenzene sulfonate composition suitable for use in making spray dried detergent compositions, which comprises: manufacturing said zeolite in an aqueous medium containing sodium hydroxide in solution therein; separating a substantial proportion of the aqueous medium from said zeolite so as to produce zeolite particles containing excess sodium hydroxide solution on the particle surfaces, said zeolite particles having an ultimate particle size of from about 0.1 to 12 microns; neutralizing said excess sodium hydroxide solution with aqueous linear higher alkylbenzene sulfonic acid in excess of the amount needed to neutralize said sodium hydroxide on the zeolite particle surfaces and occluded therein; and adding a second portion of sodium hydroxide in an amount sufficient to neutralize said excess amount of linear higher alkylbenzene sulfonic acid and produce additional sodium linear alkylbenzene sulfonate in the resulting composition.

4,415,490

#### NON-THROMBOGENIC MATERIAL

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1979, Ser. No. 60,054

Int. Cl.<sup>3</sup> C08L 5/10; C08B 37/10

U.S. Cl. 525—54.2

11 Claims

1. A non-thrombogenic material comprising an aldehyde group-containing polymer bonded directly with heparin in which at least one hydroxyl group of said heparin is covalently bonded to one aldehyde group of said polymer through only one acetal bond or hemiacetal bond at each bonding site between said heparin and said polymer.



4,415,491

## SYNTHETIC VACCINE PEPTIDE EPITOMES OF HEPATITIS B SURFACE ANTIGEN

Girish N. Vyas, Orinda, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 14, 1980, Ser. No. 112,054

Int. Cl.<sup>3</sup> A61K 37/02, 39/29; C07C 103/52; C07G 7/00

U.S. Cl. 260—112.5 R

9 Claims

1. An oligopeptide of the formula  
 H-TYR-PRO-SER-CYS-CYS-THR-LYS-PRO-THR-  
 ASP-GLY-ASN-OH; or  
 H-TYR-PRO-SER-CYS-CYS-THR-LYS-PRO-SER-  
 ASP-GLY-ASN-OH; or  
 H-PHE-PRO-SER-CYS-CYS-THR-LYS-PRO-THR-  
 ASP-GLY-ASN-OH; or  
 H-PHE-PRO-SER-CYS-CYS-THR-LYS-PRO-SER-  
 ASP-GLY-ASN-OH.

4,415,492

## LYSINE POLYMERS WHICH MAY BE USED AS SUPPORTS FOR THE PREPARATION OF PRODUCTS OF DIAGNOSIS AND PRODUCTS OBTAINED

Alain L. de Weck, Institut für klinische Immunologie, Bern, Switzerland (3010); Conrad H. Schneider, and Hans P. Rolli, both of Bern, Switzerland, assignors to Alain L. de Weck and Institut für Immunologie Inselspital, both of Bern, Switzerland

Filed Aug. 13, 1981, Ser. No. 292,358

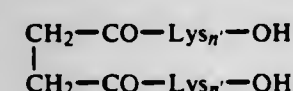
Claims priority, application France, Aug. 29, 1980, 80 18809

Int. Cl.<sup>3</sup> C07C 103/52

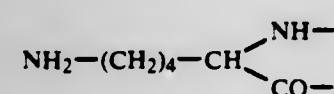
U.S. Cl. 260—112.5 R

2 Claims

1. A lysine polymer of the formula:



where each  $n$  is the same whole number, said number being between 4 and 10, and Lys has the formula:



4,415,493

## IMMUNE MODULATOR PEPTIDES

William O. Weigle, Del Mar, and Edward L. Morgan, San Diego, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 11, 1982, Ser. No. 377,223

Int. Cl.<sup>3</sup> C07C 103/52

U.S. Cl. 260—112.5 R

17 Claims

1. Compound having the formula H-Thr-Ile-Ser-Lys-Ala-Lys-Gly-Gln-Pro-Arg-Glu-Pro-Gln-Val-Tyr-Thr-Leu-Pro-Pro-Ser-Arg-Glu-Glu-Hse in which Hse is homoserine or homoserine lactone.

4,415,494

## WATER-INSOLUBLE MONOAZO DYESTUFFS, THEIR MANUFACTURE AND THEIR USE

Ulrich Bühler, Schönebeck; Rudolf Löwenfeld, Dreieich; Uwe Kosubek, Büttelborn, and Maria Kallay, Königstein, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,630

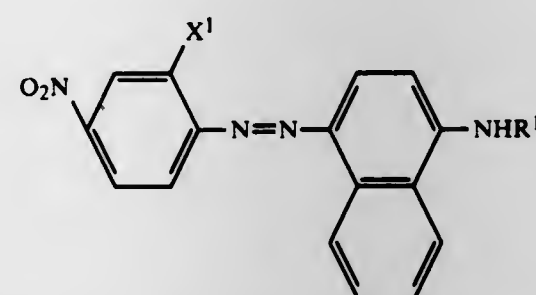
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011178

Int. Cl.<sup>3</sup> C07C 107/00, 107/06, 107/08; C09B 29/00

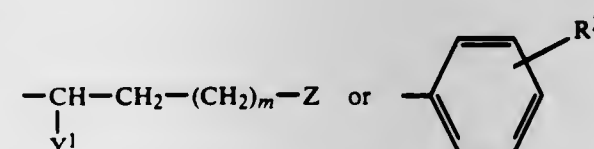
U.S. Cl. 260—196

7 Claims

1. Monoazo dyestuff free from moieties imparting solubility in water and having the formula



wherein  $X^1$  is nitro, cyano or methylsulphonyl and  $R^1$  is of the formula



- wherein  $Y^1$  is hydrogen, methyl or ethyl;  
 Z is phenyl, cyano, phenoxy, phenoxy substituted by alkyl having 1 to 4 carbon atoms, phenoxy substituted by alkoxy having 1 to 4 carbon atoms, halogen substituted phenoxy, alkoxy having 1 to 4 carbon atoms, cyano substituted alkoxy having 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms substituted by alkoxy having 1 to 4 carbon atoms,  $R^2$  is hydrogen, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms; and  
 m is a number from 0 to 2.

4,415,495

## 5,6,8,9-TETRAHYDRO-7H-DIBENZ(D,F)AZONINES

Gerhard Satzinger, Denzlingen; Manfred Herrmann; Edgar Fritsch, both of St. Peter; Heinrich Bahrmann, Kirschzarten; Volker Ganser, Freiburg; Bernd Wagner, Denzlingen, and Wolfgang Steinbrecher, Gundelfingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Freiburg, Fed. Rep. of Germany

Filed Feb. 24, 1981, Ser. No. 238,501

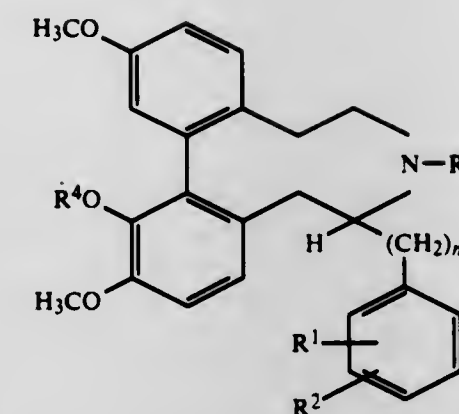
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3007710

Int. Cl.<sup>3</sup> C07D 225/08; A61K 31/355

U.S. Cl. 260—239 D

20 Claims

1. 5,6,8,9-Tetrahydro-7H-dibenz(d,f)-azonine compounds of the formula:



wherein  $R^1$  and  $R^2$ , which are the same or different, are hydrogen, halogen or lower alkyl or alkoxy wherein lower alkyl and alkoxy are straight chained or branched having 1 to 3 carbon atoms  $R^3$  is a hydrogen atom or a lower alkyl;  $R^4$  is a hydrogen atom or a lower alkyl or alkanoyl and n is 1 or 2; wherein lower alkyl, alkanoyl and alkoxy are straight chained or branched having 1 to 5 carbon atoms; and the pharmaceutically acceptable salts thereof with the proviso that  $R^1$ ,  $R^2$ ,  $R^4$  are not all hydrogen when n is 1 and  $R^3$  is methyl.

4,415,496

## BICYCLIC LACTAMS

Elbert E. Harris; Arthur A. Patchett, both of Westfield; Edward W. Tristram, Watchung; Eugene D. Thorsett, Fanwood, and Matthew J. Wyvrat, Jr., Mountainside, all of N.J., assignors to Merck &amp; Co., Inc., Rahway, N.J.

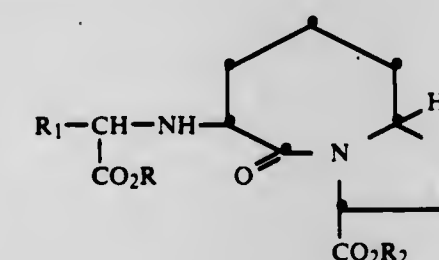
Continuation-in-part of Ser. No. 246,492, Mar. 23, 1981, abandoned. This application Feb. 19, 1982, Ser. No. 348,811

Int. Cl.<sup>3</sup> C07D 513/04

U.S. Cl. 260—239.3 B

29 Claims

1. A compound of the formula:



wherein:  
 R and  $R_2$  are independently hydrogen, loweralkyl, aryl, and aryl lower alkyl;

$R_1$  is  
 hydrogen;  
 alkyl, alkenyl, alkynyl, and unsubstituted cycloalkyl of from 1 to 12 carbon atoms;  
 substituted lower alkyl wherein the substituent can be halo, hydroxy, carboxy, lower alkylthio, lower alkoxy, lower alkoxy carbonyl, aryl lower alkoxy carbonyl, amino, lower alkylamino, diloweralkylamino, acetyl amino, or benzoylamino;  
 substituted lower alkyl having the formula  $R_4(\text{CH}_2)_n-\text{Q}-(\text{CH}_2)_m$  wherein n is 0-2, m is 1-3,  $R_4$  is aryl or heteroaryl optionally substituted by amino, diloweralkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, amino lower alkyl, trihaloloweralkyl, cyano, nitro, sulfonamido, benzoyl, 1-naphthoyl, lower alkyl, halo, dihalo, and lower alkoxy, and Q is O, S, N- $R_B$ , CONR<sub>C</sub>, NR<sub>C</sub>CO, CH=CH wherein  $R_B$  is hydrogen, lower alkyl, aryl, aryl lower alkyl, lower alkanoyl, benzoyl, or 1-naphthoyl, and  $R_C$  is hydrogen or lower alkyl;

aryl;  
 substituted aryl wherein the substituent is lower alkyl, amino

loweralkyl, loweralkoxy, aryloxy, benzoyl, or 1-naphthoyl, hydroxy, halo, or dihalo;  
 aryl lower alkyl or heteroaryl loweralkyl which include branched lower alkyl groups; substituted aryl lower alkyl or substituted heteroaryl loweralkyl which include branched lower alkyl groups wherein the lower alkyl groups can be substituted by amino, acetyl amino, benzoylamino, or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, benzoyl, 1-naphthoyl, arylthio, amino, amino lower alkyl, lower alkanoyl amino, benzoylamino, 1-naphthoylamino, diloweralkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, trihalo loweralkyl, nitro, cyano, or sulfonamido; and  
 the pharmaceutically acceptable salts thereof, wherein in said R,  $R_1$  and  $R_2$  groups, the aryl is selected from the group consisting of phenyl, naphthyl, or biphenyl; and, the heteroaryl is selected from the group consisting of indolyl, thienyl, imidazolyl, furyl, benzimidazolyl, pyridyl, quinolyl, isoquinolyl, and benzothienyl.

4,415,497

## PROCESS FOR PRODUCING AN ANTIBIOTIC

Masahito Nakayama, Higashi-Yamato; Shigeru Kimura, Tachikawa; Toshimi Mizoguchi, Higashi-Murayama; Sohei Tanabe, Higashi-Murayama, and Toshihito Mori, Higashi-Murayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Aug. 26, 1981, Ser. No. 296,306

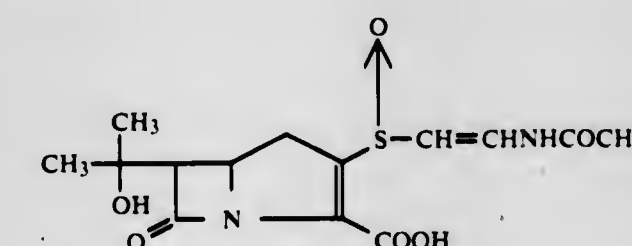
Claims priority, application Japan, Sep. 5, 1980, 55-123087

Int. Cl.<sup>3</sup> C07D 487/04

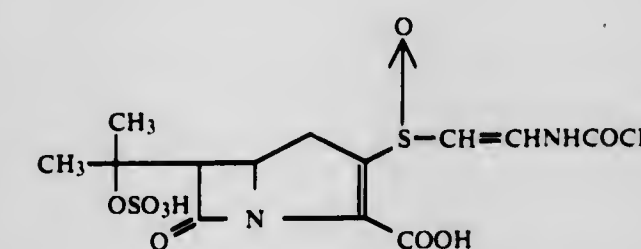
U.S. Cl. 260—245.2 T

1 Claim

1. A process for producing an antibiotic KA-6643-A or a pharmaceutically acceptable salt thereof represented by the formula (I):



which comprises hydrolyzing an antibiotic KA-6643-B represented by the formula (II):



wherein said hydrolysis is carried out in an aqueous buffer solution at a pH in the range of from 6.0 to 7.0, at a temperature in the range of from room temperature to 100° C. and for a time of from 1 to 10 hours.

4,415,498

## SYNTHESIS OF DAUNOMYCINONE AND THE DERIVATIVES THEREOF

Lakshminarayan Anathasubramanian, Brookline; T. Ross Kelly, Watertown, and Jacob Vaya, Brookline, all of Mass., assignors to Research Corporation, New York, N.Y.

Filed Nov. 7, 1979, Ser. No. 91,897

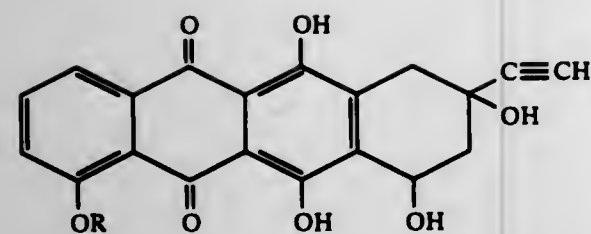
Int. Cl.<sup>3</sup> C07C 49/72, 49/73

U.S. Cl. 260—351.1

16 Claims

1. A compound of the formula:





wherein R is an alkyl group containing up to five carbon atoms.

4,415,499

**PROCESS FOR THE MANUFACTURE OF PALLADIUM(II) CATALYST AND FOR THE MANUFACTURE OF ALKENYL ESTERS OF CARBOXYLIC ACIDS EMPLOYING SAID CATALYST**  
Klaus Blum, and Rudolf Strasser, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 6, 1981, Ser. No. 309,006

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047347

Int. Cl.<sup>3</sup> C11C 3/02

U.S. Cl. 260—410.9 N

4 Claims

1. In a process for the manufacture of alkenyl esters of carboxylic acids, the improvement comprising: reacting a carboxylic acid with an alkenyl ester of a lower carboxylic acid, in the presence of a supported catalyst comprising a support material comprising activated carbon having an analytical SiO<sub>2</sub> content of from 0.5 to 8% by weight and a catalyst impregnated in said support material comprising a palladium(II) salt.

4,415,500

**CATALYST COMPRISING A COMPLEX OF AN ELONGATED ORGANIC MOIETY AND A METAL ION**  
Joost Manassen, Rehovot, and Yaakov Dror, Tel Aviv, both of Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Mar. 3, 1981, Ser. No. 240,116

Claims priority, application Israel, Mar. 14, 1980, 59647

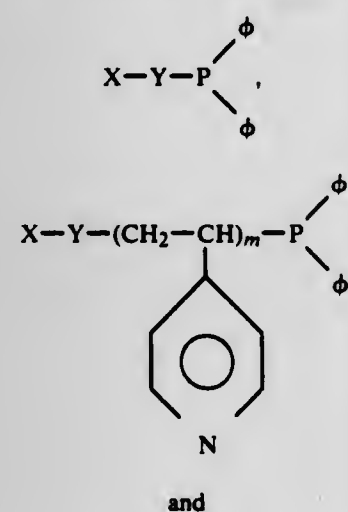
Int. Cl.<sup>3</sup> C07F 15/00

U.S. Cl. 260—429 R

5 Claims

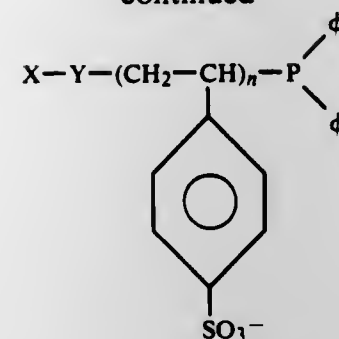
1. A catalyst for use in homogeneous catalysis at the interface of an aqueous phase and an organic phase, said catalyst having surface active properties and including means for maintaining the catalyst in said aqueous phase, said catalyst comprising

a complex of an elongated organic moiety and a metal ion, said elongated organic moiety having a structure selected from the group consisting of



and

-continued



wherein X is a polar moiety which comprises a hydrophilic group and Y is a backbone of at least 5 carbon atoms chain length,  $\phi$  is a phenyl radical and m and n are integers,

the ligand moiety of said elongated organic moiety forming a complex with said metal ion and which metal ion is selected from the group consisting of rhodium, ruthenium, iridium, platinum, palladium and cobalt.

4,415,501

**ALKENYLZIRCONIUM REAGENTS USEFUL FOR PROSTAGLANDIN ANALOG SYNTHESIS**

Charles V. Grudzinskas, Upper Nyack, N.Y., and Guenter W. Nachtigall, Georgetown, Conn., assignors to American Cyanamid Company, Stamford, Conn.

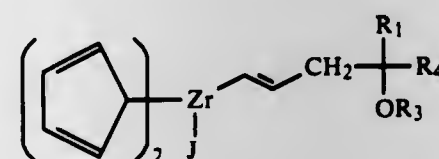
Filed Dec. 16, 1981, Ser. No. 331,373

Int. Cl.<sup>3</sup> C07F 7/00

U.S. Cl. 260—429.3

27 Claims

1. A compound of the formula:



wherein J is bromo or chloro, R<sub>1</sub> is methyl, ethyl, 1-propenyl, vinyl or cyclopropyl; R<sub>4</sub> is an alkyl radical of 2-7 carbon atoms and R<sub>3</sub> is a hydroxyl-protecting group.

4,415,502

**POLYCARBONATE TYPE NONIONIC SURFACTANTS**  
John F. Timberlake; Daniel W. Baugh, Jr., both of Baton Rouge, and Bobby Burkes, New Orleans, all of La., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 177,030, Aug. 11, 1980, Pat. No. 4,330,481, which is a division of Ser. No. 973,211, Dec. 26, 1978,

abandoned. This application Dec. 4, 1981, Ser. No. 327,375

Int. Cl.<sup>3</sup> C07C 69/96

U.S. Cl. 260—463

7 Claims

1. A process for the preparation of polycarbonate type surfactants comprising the steps of: (a) reacting ethylene carbonate and monohydroxy alcohol in the presence of an alkali metal salt catalyst at a temperature of about 130° C. to about 210° C. to form a reaction product, a (b) further reacting the reaction product of step (a) with ethylene oxide.

4,415,503

**METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE**  
Jeffrey D. Robbins, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 28, 1982, Ser. No. 424,941

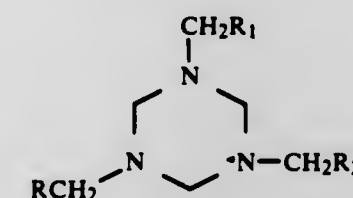
Int. Cl.<sup>3</sup> C07F 9/38

U.S. Cl. 260—502.5 F

8 Claims

1. A method for the preparation of N-phosphonomethylglycine which comprises the steps of:

(a) reacting 1,3,5-tri-(substituted methyl)hexahydro-s-triazine, a compound of the formula



wherein R, R<sub>1</sub> and R<sub>2</sub> are the same or different and are selected from the group consisting of cyano, alkoxy, carbonyl wherein the alkyl group contains from 2 to 18 carbon atoms, and aryloxy, carbonyl wherein the aryl group ranges from 6 to 12 carbon atoms, with a substituted phosphorus compound having the formula PXYZ wherein X is a halogen, Y and Z are each independently selected from the group consisting of halogen, alkoxy having from 1 to 10 carbon atoms and aryloxy, in the presence of a low molecular weight carboxylic acid solvent and a protic acid;

(b) treating the reaction mixture with water;  
(c) removing said solvent and hydrolyzing the residue to generate a salt of N-phosphonomethylglycine; and  
(d) neutralizing said salt to produce the end product, N-phosphonomethylglycine.

4,415,504

**P-HYDROXYPHENYLGLYCINE- $\alpha$ -PHENYLETHANESULFONATE, PROCESS FOR PRODUCTION THEREOF AND UTILIZATION THEREOF IN RESOLUTION OF P-HYDROXYPHENYLGLYCINE**

Ichiro Chibata, Saita; Shigeki Yamada, Toyonaka; Chikara Hongo, Osaka, and Ryuzo Yoshioka, Kaizuka, all of Japan, assignors to Tanabe Sanyaku Co., Ltd., Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,338

Claims priority, application Japan, Sep. 21, 1981, 56-150047; Sep. 21, 1981, 56-150048

Int. Cl.<sup>3</sup> C07C 143/26

U.S. Cl. 260—501.12

32 Claims

1. p-Hydroxyphenylglycine- $\alpha$ -phenylethanesulfonate.  
6. A process for producing the optically active p-hydroxyphenylglycine-optically active  $\alpha$ -phenylethanesulfonate which comprises reacting DL-p-hydroxyphenylglycine with optically active  $\alpha$ -phenylethanesulfonic acid to form two diastereomers of the optically active p-hydroxyphenylglycine-optically active  $\alpha$ -phenylethanesulfonate one of which being the easily soluble diastereomer and the other of which being the slightly soluble diastereomer, crystallizing the slightly soluble diastereomer and collecting the crystallized slightly soluble diastereomer.

4,415,505

**PROCESS FOR MAKING ALKYL OR ARYLTHIOPHOSPHONIC ACID**

Werner Krause, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,892

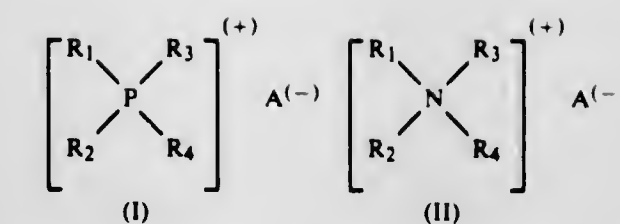
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131249

Int. Cl.<sup>3</sup> C07F 9/42

U.S. Cl. 260—543 P

7 Claims

1. In the process for making alkyl or arylthiophosphonic acid dichlorides by reacting alkyl or arylchlorophosphanes with at least stoichiometric proportions of sulfur at a temperature above the melting point of sulfur and in the presence of a catalyst, and separating the resulting alkyl or arylthiophosphonic acid dichloride from the reaction mixture after the reaction is terminated, the improvement which comprises: effecting the reaction at a temperature between the melting point of sulfur and the boiling point of the resulting alkyl or arylthiophosphonic acid dichloride and in the presence of a catalyst of the following general formula I or II



in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> stand for identical or different alkyl, aryl, alkaryl or aralkyl groups having from 1 to 22 carbon atoms and A stands for the anionic group of an organic or inorganic acid, the catalyst being used in a proportion of 0.01 up to 5 weight %, based on the quantity of the phosphane component; terminating the reaction and separating the alkyl or arylthiophosphonic acid dichloride from the reaction mixture; and using resulting catalyst-containing residue in further reactions of alkyl or arylchlorophosphanes with sulfur.

4,415,506

**TREATING THE RESIDUE FROM THE PRODUCTION OF PHOSPHOROCHLORIDOTHIONATES**

Mark S. Carron, Spring Valley; Ronald S. La Barbera, New City; Lester P. Van Brocklin, Thiells, all of N.Y., and Pawan K. Jain, Norwood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 193,247, Oct. 2, 1980, Pat. No. 4,356,130.

This application May 27, 1982, Ser. No. 382,832

Int. Cl.<sup>3</sup> C07F 9/20

U.S. Cl. 260—986

10 Claims

1. A method for treating the distillation residue from the production of dialkyl and diaryl phosphorochloridothionates comprising:

(a) mixing the hot residue with a sufficient amount of a separating solution having a specific gravity to cause a three phase mixture to form comprised of an organic phase, a separating solution phase and a sulfur phase,  
(b) recovering an organic phase which is of a lower specific gravity than the separating solution phase; and  
(c) drying and chlorinating the separated organic phase to recover additional phosphorochloridothionate product.

4,415,507

**MIXING VALVE FOR DUAL FUEL CARBURETOR AND METHOD OF DUAL CHARGE MIXING PERFORMED THEREBY**

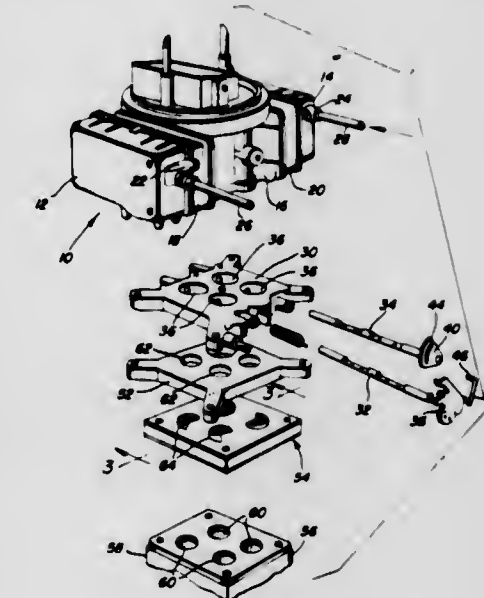
Elmer A. Vollva, P.O. Box 542, Midland, Tex. 79702

Filed Jan. 6, 1982, Ser. No. 337,477

Int. Cl.<sup>3</sup> F02M 43/00

U.S. Cl. 261—18 B

13 Claims



1. For use in conjunction with a dual charge forming appara-



tus of the type including a pair of charge flow passages having outlet ends for registry and communication with the inlet ends of a pair of combustion engine charge induction passages, a dual charge mixing apparatus defining a pair of flow paths extending therethrough and including inlet and outlet ends for registry and communication with said outlet ends of said charge flow passages and said inlet ends of said induction passages, respectively, said charge mixing apparatus including flow diverting means, intermediate said inlet and outlet ends of said flow paths, operable to divert generally the same proportion of the charge flowing through each of said flow paths into the other flow path for admixing with the non-diverted portion of the charge flowing therethrough.

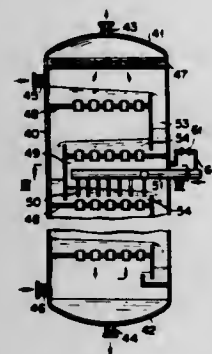
4,415,508

## APPARATUS FOR MIXING GASES

Kenji Aida, Yokosuka; Takeshi Yamamoto, Tokyo, and To-shibiko Kumazawa, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan  
Division of Ser. No. 953,568, Oct. 23, 1978, Pat. No. 4,256,604.  
This application Oct. 14, 1980, Ser. No. 196,935  
Claims priority, application Japan, Oct. 26, 1977, 52-127646  
Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261-114 R

12 Claims



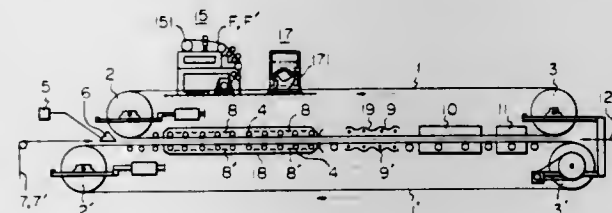
1. An apparatus for mixing a hydrocarbon-containing gas flow with a molecular oxygen-containing gas flow comprising a cylindrical main body;  
an exit and an inlet for the hydrocarbon-containing gas flow provided respectively to the upper and the lower portions of said cylindrical main body;  
an inlet and an exit for an aqueous medium provided respectively to the upper and the lower portions of said main body;  
at least one aqueous medium residence means provided on the inlet side of the hydrocarbon-containing gas flow in the main body and allowing said gas flow to pass there-through in connection with said aqueous medium;  
at least one shielding means for flame propagation provided on the discharge side of said hydrocarbon-containing gas flow in the main body and allowing said gas flow to pass therethrough; and  
an introduction means for the molecular oxygen-containing gas flow provided in a gas mixing chamber formed in a space defined by said residence means and said shielding means connected to a plurality of bundles of pipes each having at least one orifice at the end, the orifices of said bundles of pipes are immersed in the layer of the aqueous medium on the aqueous medium residence means.

4,415,509  
ACRYLIC LAMINATED DIFFUSER PANEL HAVING  
HIGH LIGHT-DIFFUSING PROPERTY AND PROCESS  
FOR PREPARING SAME

Yasuo Toyooka, Tokyo; Kunio Ohnishi, Toyama; Kozo Ida, Toyama, and Toyokazu Ego, Toyama, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan  
Filed Jul. 7, 1981, Ser. No. 281,111  
Int. Cl.<sup>3</sup> B29D 7/14

U.S. Cl. 264-1.3

15 Claims



1. A process for the preparation of acrylic laminated diffuser panels having a high light-diffusing property, which process comprises the successive steps of:

- (1) laminating an acrylic resin, particle-containing film having a high light-diffusing property onto the molding surface of at least one of a pair of casting mold parts, wherein said light diffusing particles are incorporated in an amount such that the parallel ray percent transmission of the finished acrylic diffuser panel is not greater than about 60%;
- (2) casting an acrylic monomer or its partially polymerized product into a space between said pair of casting mold parts, and then,
- (3) polymerizing said acrylic monomer of said partially polymerized product, thereby causing the acrylic resin film to become integrated with and laminated onto the resulting acrylic resin plate.

4,415,510  
PROCESS FOR MAKING OXIDE REFRACTORY  
MATERIAL HAVING FINE CRYSTAL STRUCTURE

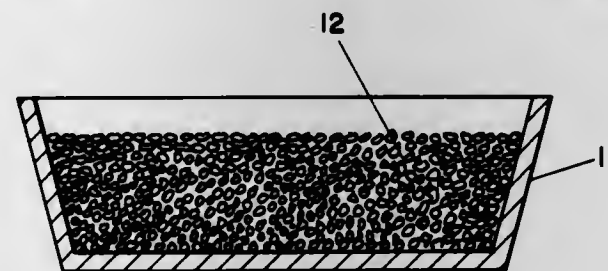
Wesley Q. Richmond, Stevensville, Canada, assignor to Ken-necott Corporation, Stamford, Conn.

Division of Ser. No. 153,302, Jun. 15, 1971, abandoned. This application Dec. 12, 1972, Ser. No. 314,319

U.S. Cl. 264-8

Int. Cl.<sup>3</sup> B22D 23/08

8 Claims



8. A process for making fusion cast metal oxides comprising pouring a molten mass of metal oxide into a mold containing metal cooling-spheres thereby causing the molten mass to rapidly cool and solidify in the interstices between the metal cooling-spheres.

4,415,511  
ROTARY ATOMIZING PROCESS

Romeo G. Bourdeau, Tequesta, Fla., assignor to United Technol-ogies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,190

Int. Cl.<sup>3</sup> B01J 2/02

U.S. Cl. 264-8

16 Claims

1. In the process of producing metal powder by pouring a liquid metal onto the surface of a spinning disk at a temperature at least 200° F. higher than its liquidus temperature, the steps of:

forming a coating on the disk of a compound C which is stable during the process and which comprises said metal if said metal is unalloyed and which, if said metal is an alloy, comprises the base metal of said alloy, wherein said compound has a melting point at least 50° F. higher than the pour temperature of the liquid metal, and wherein said liquid metal can coexist with said compound at the pour temperature of the liquid metal;

pouring a liquid stream of the said metal to be formed into a powder onto the coated, spinning disk at said pour temperature wherein coupling of said metal with the compound C occurs and a stable skull of said metal forms over the coating and fine liquid droplets of said metal are formed as said metal is flung off the disk;

cooling the liquid metal droplets after they leave the disk surface to solidify the droplets; and  
collecting the solidified droplets.

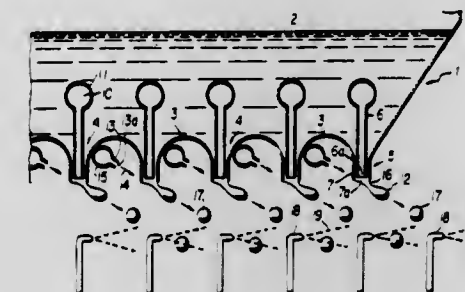
4,415,512  
METHOD AND APPARATUS FOR PRODUCING  
HOLLOW METAL MICROSPHERES AND  
MICROSPHEROIDS

Leonard B. Torobin, Materials Technology Corp., 4174 148th Ave. NE., Redmond, Wash. 98052

Continuation-in-part of Ser. No. 103,361, Dec. 13, 1979, Pat. No. 4,303,732, and Ser. No. 103,114, Dec. 13, 1979, Pat. No. 4,303,730, each is a division of Ser. No. 59,297, Jul. 20, 1979, abandoned. This application Mar. 18, 1981, Ser. No. 245,137  
Int. Cl.<sup>3</sup> C03B 19/10

U.S. Cl. 264-9

33 Claims



1. A method for making hollow metal microspheres from a film forming metal material which comprises heating said material, forming a liquid film of said material across an orifice, applying a blowing gas at a positive pressure on the inner surface of the liquid film to blow the film and form the micro-sphere, subjecting the microsphere during its formation to an external pulsating or fluctuating pressure field having periodic oscillations, said pulsating or fluctuating pressure field acting on said microsphere to assist in its formation and to assist in detaching the microsphere from said orifice.

4,415,513  
METHOD OF MANUFACTURING A COMPOSITE FOAM  
TAPE TRANSPORT CAPSTAN

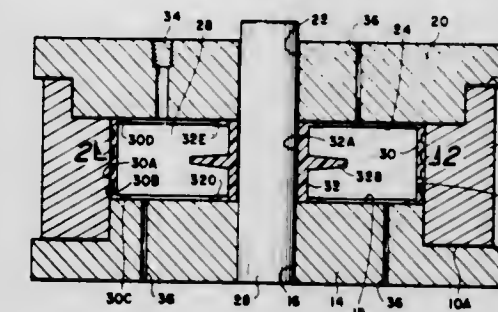
Ivo T. Plachy, San Mateo, Calif., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Division of Ser. No. 44,100, May 31, 1979, Pat. No. 4,280,646.  
This application Jan. 15, 1981, Ser. No. 225,262

Int. Cl.<sup>3</sup> B29D 27/00

U.S. Cl. 264-45.4

2 Claims



1. A method of manufacturing a tape transport capstan comprising:

positioning a tubular outer rim in a cylindrical cavity mold, the internal diameter of the mold being equal the exterior diameter of the rim, the mold having an end surface perpendicular the cavity axis and having a cylindrical shaft extending from the end surface axially of the mold cavity; inserting a hub having an axial opening therein onto said shaft and within the mold cavity, the hub having an internal radially extending non-circular portion, such portion being spaced intermediate the hub ends and extending towards said tubular outer rim;

closing the mold cavity with an end cap providing a second end surface parallel to and spaced from the mold cavity end surface;

filling the mold cavity having the rim and hub therein with foam plastic material;  
allowing the foam plastic material within the mold to solidify; and

removing the contents of the mold in which the hub, rim, and solidified foam plastic are bound into a unitary device.

4,415,514  
METHOD FOR THE PREPARATION OF RIGID  
POLYVINYL CHLORIDE FOAMS

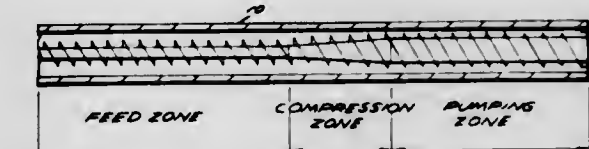
Antoon Dorrestijn, Grevenbicht; Pieter J. Lemstra, Brunssum, and Lambert H. T. van Unen, Heerlen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 22, 1981, Ser. No. 256,667  
Claims priority, application Netherlands, Apr. 26, 1980, 8002463; Apr. 26, 1980, 8002464

Int. Cl.<sup>3</sup> B29D 27/00

U.S. Cl. 264-53

8 Claims



1. Process for preparing polyvinyl chloride foams having densities below 200 kg/m<sup>3</sup> by foaming rigid PVC containing a melt-flow improver in the presence of a blowing agent in an extruder comprising the combination of steps of:

(a) preparing a pre-granulate by mixing rigid PVC with 0.1 parts by weight to 15 parts by weight per 100 parts by weight of PVC of a melt-flow improver, said improver consisting of one or more compounds selected from the group consisting of:

(i) copolymers obtained by copolymerizing 10 to 90% by



weight of styrene and/or derivatives of styrene with 90 to 10% by weight of acrylonitrile and/or methacrylonitrile;

- (ii) polystyrene or copolymers of styrene;
- (iii) graft copolymers obtained by polymerizing 50 to 80 parts by weight of a mixture of monomers consisting of 30 to 40 parts by weight of acrylonitrile and 60 to 80 parts by weight of styrene in the presence of 20 to 50 parts by weight of rubber;
- (iv) poly-ε-caprolactone;
- (v) polyvinylacetate which may be solvolyzed;
- (vi) homo- or copolymers of alkyl methacrylates having an alkyl group of 1 to 10 carbon atoms;
- (b) feeding said pre-granulate to an extruder;
- (c) extruding said pre-granulate to form a substantially homogeneous and substantially completely gelled granulate particles having an average diameter of 0.5 mm to 5 mm;
- (d) impregnating said granulate with a physical blowing agent by heating said granulate in the presence of about 25 parts by weight to about 400 parts by weight of said physical blowing agent per 100 parts by weight of PVC at a pressure of 0.5 MPa to 5 MPa at 300° K. to 450° K. for about 0.5 hour to 40 hours;
- (e) separating said impregnated granulate from the remaining blowing agent;
- (f) foam extruding said impregnated granulate to form a rigid PVC foam whereby during extrusion said granulate passes through a temperature profile comprising at least:
  - (i) a first zone having a temperature of 350° K. to 400° K.;
  - (ii) a second zone having a temperature of 400° K. to 460° K.; and
  - (iii) a third zone having a temperature of 340° K. to 400° K.

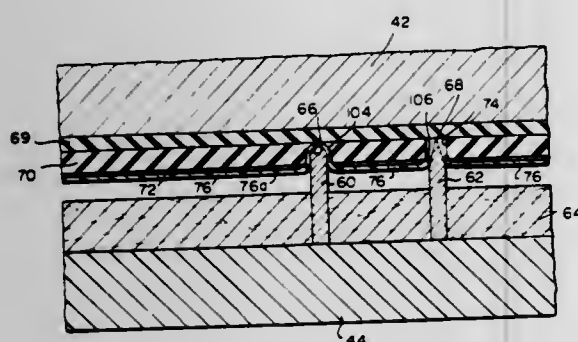
4,415,515

#### METHOD AND APPARATUS FOR SCORING PLASTIC SHEET MATERIAL

Benjamin Rosenberg, 2044 E. 13th St., Brooklyn, N.Y. 11229  
Filed Apr. 6, 1982, Ser. No. 366,058  
Int. Cl.<sup>3</sup> B29C 19/02

U.S. Cl. 264—68

19 Claims



1. A method for forming a container blank having cut edges and flexible score lines, comprising the steps of:
  - providing a thermoplastic sheet capable of being formed into said container blank,
  - providing at least one scoring tool member and an elastomeric make-ready member having a flat surface,
  - bringing said members to an inoperative position in which said members face each other and are spaced apart,
  - inserting said thermoplastic sheet between said members,
  - bringing said members together to an operative position in which said scoring tool member engages a face of said thermoplastic sheet and presses the engaged portion of said sheet against the flat surface of said make-ready member under substantial pressure, whereby said sheet adheres to said elastomeric make-ready member at the interface area with said scoring tool,
  - vibrating one of said members while maintaining the other member stationary to provide a rapid reciprocating movement between the scoring tool member and the engaged

interface portion of said thermoplastic sheet in a direction parallel to the face of said thermoplastic sheet, said reciprocating movement being sufficient to generate frictional heat of an intensity to soften said engaged sheet portion and cause the latter to penetrate deep into said elastomeric make-ready, whereby to form a flexible score line which is intended into one face of said sheet and projects from the opposite face thereof, and

separating said members to their inoperative position and allowing said sheet to cool while maintaining it in substantially flat condition.

4,415,516

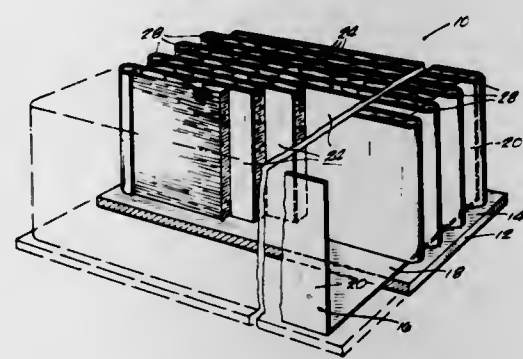
#### METHOD AND APPARATUS FOR MAKING ALIGNED FLAKE COMPOSITE WOOD MATERIAL INCLUDING INTEGRAL BAFFLES

Gordon P. Krueger, Hancock, and Anders E. Lund, Houghton, both of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Apr. 5, 1982, Ser. No. 365,634  
Int. Cl.<sup>3</sup> D04M 1/16

U.S. Cl. 264—112

12 Claims



1. An apparatus for forming a loosely felted mat of elongated wood flakes, the mat including a longitudinal axis and the wood flakes being aligned in mutually parallel relation and parallel to the longitudinal axis of the mat, the apparatus comprising:

means defining a caul plate adapted to support wood flakes thereon, said caul plate having spaced apart elongated sides,

means for restraining wood flakes deposited on said caul plate, said restraining means including sidewalls extending vertically upwardly from said sides,

means for causing elongated wood flakes being deposited on said caul plate to be aligned in mutually parallel relation and parallel to said side walls and to maintain said elongated wood flakes in such parallel relation as additional flakes are deposited and as said caul is moved to a press, said means for aligning including a plurality of baffles supported in closely spaced mutually parallel relation between said sidewalls, said baffles defining parallel vertical planes parallel to said sidewalls, and said baffles being adapted to form a portion of the loosely felted mat and to be removed with the mat when the caul is removed to a press, and

means for releasably supporting said opposite ends of said baffles.

4,415,517

#### METHOD AND APPARATUS FOR SHAPING FIBER MATS

Donny L. Timms, Cleburne, Tex., assignor to Manville Service Corporation, Denver, Colo.

Filed Jul. 31, 1981, Ser. No. 288,964  
Int. Cl.<sup>3</sup> D04H 1/16; B28B 7/14

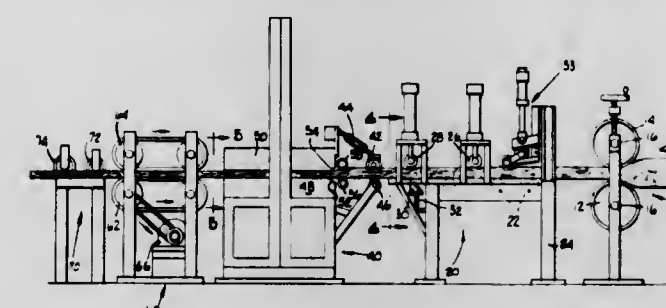
U.S. Cl. 264—118

10 Claims

1. A method of forming an uncured fibrous mat which con-

tains a thermosetting binder throughout into a desired shape, said mat having upper and lower face surfaces and intermediate edge surfaces, said method comprising the steps of:

- (a) subjecting the uncured mat of loose fibers to a first compressive force substantially along the entirety of both said upper and lower face surfaces while applying heat to said face surfaces to partially cure said thermosetting binder in the region of said face surfaces producing a mat of generally uniform cross section;
- (b) longitudinally slitting at least one of said partially cured face surfaces to cut fibers in said partially cured mat which extend generally transverse to said mat and to said slit;
- (c) subjecting the partially cured mat to a second compressive force substantially along the entirety of both said upper and lower face surfaces while applying additional heat to complete curing of the binder to complete the forming of said mat into the desired shape, said second compressive force having a greater magnitude in the vicinity of said at least one slit to reduce the mat thickness a greater amount in that region providing the mat with a



nonuniform cross section, said slit eliminating the adherence of the surface fibers caused by the partial cure, thereby reducing the tendency of the mat to return to said uniform cross section.

6. Apparatus for forming and shaping an uncured fibrous mat having upper and lower face surfaces and intermediate edge surfaces, said apparatus comprising a first means to compress said upper and lower face surfaces of the uncured mat of loose fibers, which contains a thermosetting binder throughout, while simultaneously heating said face surfaces to partially cure said binder in the region of said face surfaces; slitting means to longitudinally sever at least one of said partially cured face surfaces in at least one place to cut fibers therein extending generally transverse to said mat; a second means to compress and heat said upper and lower face surfaces to complete the curing of said thermosetting binder throughout the mat, said second means compressing the mat in the vicinity of said at least one slit a greater amount, said slit reducing the tendency of said mat in its vicinity to resist the additional compression.

4,415,518

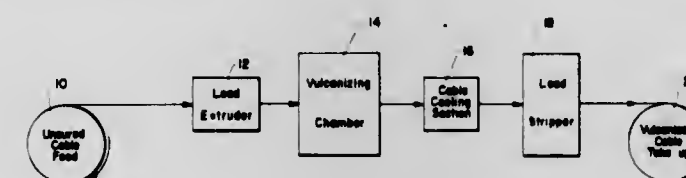
#### CONTINUOUS CURING OF CABLE

Gerald M. Pochurek, 711 Jersey St., W. Deal, N.J. 07712, and Ronald J. Kelly, 825 Martin Ave., Oradell, N.J. 07649

Filed Dec. 21, 1981, Ser. No. 332,538  
Int. Cl.<sup>3</sup> B29D 7/02

U.S. Cl. 264—166

7 Claims



1. Process for continuously curing an elastomeric jacket on a cable comprising continuously linearly passing a cable having an uncured elastomeric jacket thereon, encased within an outer layer

temporary mold of heat conductive metallic material of substantially minimum sufficient encasing layer thickness for protectively structurally confining and supporting therewithin the elastomeric jacket and cable thereat, through a vulcanizing zone maintained at substantially atmospheric pressure and provided with a heat transfer bath,

applying the bath to the cable at a selective bath temperature sufficient for vulcanizing the mold encased elastomeric jacket in situ during passage of the cable through the zone whereby to vulcanize the elastomeric jacket in situ substantially free from stress and in turn from damage to the integrity of and from disturbance of the disposition and volume of the elastomeric jacket, and

recovering from the zone the resultant cable having the mold encased vulcanized elastomeric jacket thereon.

4,415,519

#### METHOD OF MAKING POLYVINYLIDENE FLUORIDE-THERMOPLASTIC RESIN LAMINATES

Albert Strassel, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Division of Ser. No. 71,675, Aug. 31, 1979, Pat. No. 4,317,860.

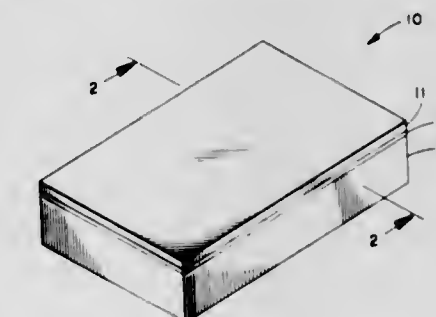
This application Jul. 30, 1981, Ser. No. 288,662

Claims priority, application France, Sep. 25, 1978, 78 27361; May 22, 1979, 79 12952

Int. Cl.<sup>3</sup> B29D 7/02; B32B 7/12

U.S. Cl. 264—171

5 Claims



1. The method of making a unitary shaped laminate comprising at least one external layer of a polyvinylidene fluoride resin, a layer of a thermoplastic resin incompatible with polyvinylidene fluoride, and a layer of polyalkyl methacrylate resin intermediate and firmly adhered to said polyvinylidene fluoride and thermoplastic resin layers; said layers being blended at their interfaces only, comprising the steps of bringing molten streams of said resins into intimate contact with each other to form the laminate shape desired and then cooling said laminate.

4,415,520

#### TIE LAYER FOR CO-EXTRUDED ACRYLONITRILE COPOLYMERS

Wayne T. Wiggins, Aurora, and Frank S. Gerry, Hudson, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 217,310, Dec. 17, 1980, Pat. No. 4,359,506.

This application May 14, 1982, Ser. No. 378,151

Int. Cl.<sup>3</sup> B29B 31/30

U.S. Cl. 264—171

18 Claims

1. A coextrusion process wherein there are adhered together in the molten phase at a temperature in the range of 300° F. to 450° F. and passed through a shaping die to form a laminate
  - (I) a first outer layer composed of a nitrile barrier resin,
  - (II) a tie layer comprising a mixture of
    - (1) a nitrile barrier resin, and
    - (2) a halogenated polyolefin, and
    - (3) a thermoplastic resin other than (1) and (2), and
  - (III) a second outer layer composed of a thermoplastic resin.



4,415,521

**PROCESS FOR ACHIEVING HIGHER ORIENTATION IN PARTIALLY ORIENTED YARNS**

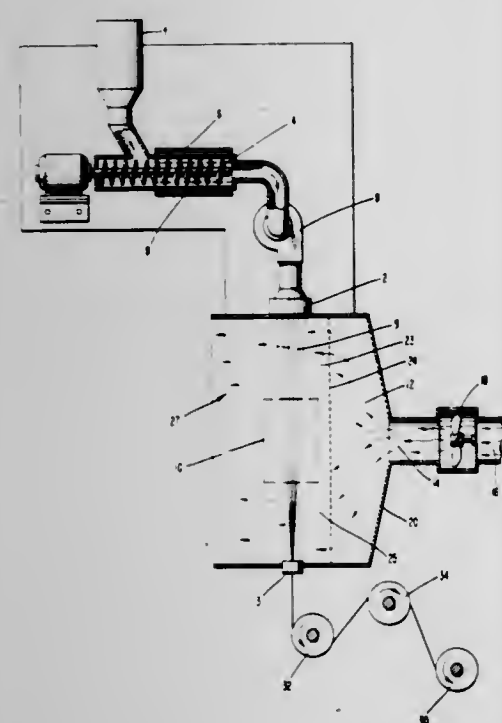
Robert M. Mininni, Maplewood; Sunil K. Garg, Westfield; Henry H. George, Jr., Berkeley Heights; Anne Holt, Westfield, and Steven B. Warner, Bernardsville, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,951

Int. Cl.<sup>3</sup> D01D 1/04

U.S. Cl. 264—176 F

23 Claims



1. A process for melt spinning a partially oriented yarn of increased birefringence for a given wind-up speed comprising extruding a molten fiber forming polyester through a shaped orifice to form a molten filamentary material, passing said molten filamentary material in the direction of its length into a quench zone, wherein the filamentary material is initially contacted with a first gaseous quenching medium at a temperature well below the melting temperature of the filamentary material, and wherein prior to solidification so that the filamentary material is still in a deformable state, the filamentary material is passed through a hot zone provided with an atmosphere having a temperature greater than the temperature of the first gaseous quenching medium and greater than the glass transition temperature of the polyester filamentary material, with the resulting filamentary material then being withdrawn from said hot zone and contacted with a second gaseous quenching medium at a temperature below the glass transition temperature until the filamentary material is no longer deformable, and then withdrawing the filamentary material from the quench zone; with the said processing of the polyester filamentary material following the extrusion being conducted at a substantially constant take-up speed.

4,415,522

**PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGH MODULUS FILAMENT OF POLYETHYLENE**

Giancarlo Capaccio, Leeds; Francis S. Smith, Harrogate, and Ian M. Ward, Bramhope, all of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 943,855, Sep. 19, 1978, Pat. No.

4,254,072, which is a continuation of Ser. No. 860,999, Dec. 15, 1977, abandoned, which is a continuation of Ser. No. 553,656,

Feb. 27, 1975, abandoned. This application Feb. 27, 1981, Ser. No. 238,852

Claims priority, application United Kingdom, Mar. 5, 1974, 09795/74

The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> D01D 5/12

U.S. Cl. 264—210.8

2 Claims

1. A process for the continuous production of a high modulus filament of polyethylene of Mw not greater than 200,000 and Mn not less than 5,000, which process comprises heating high density polyethylene to a temperature above its melting point, spinning a filament therefrom, quenching the filament at a rate of cooling in excess of 15° C. per minute and drawing the filament to a draw ratio of at least 17 to give a material having a 0.5% secant modulus greater than 158 g per dtex.

4,415,523

**HEAT-TREATING COATED POLYOLEFIN FILMS**

Peter J. Barham, Jeffrey A. Odell, both of Bristol, and Frank M. Willmouth, Royston, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 170,834, Oct. 13, 1981, Pat. No. 4,311,660.

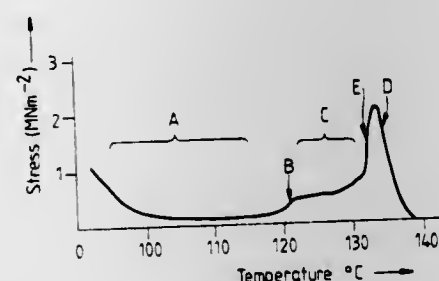
This application Oct. 13, 1981, Ser. No. 310,836

Claims priority, application United Kingdom, Aug. 7, 1979, 7927412

Int. Cl.<sup>3</sup> B29C 25/00

U.S. Cl. 264—342 R

6 Claims



1. A method of heat-treating a biaxially oriented polyolefin film comprising a polyolefin substrate having on at least one surface thereof a layer of polymeric heat-sealable material, a substantial proportion of which melts at a temperature below the melting temperature of the substrate polyolefin, the method comprising constraining the film against shrinkage, heating the constrained film to at least the minimum stress relaxation temperature of the polyolefin, and thereafter cooling the treated film to a temperature below the alpha-relaxation temperature of the polyolefin.

4,415,524

**APPARATUS FOR AND METHOD OF MONITORING FOR BREACHED FUEL ELEMENTS**

Kenny C. Gross, Lemont, and Robert V. Strain, Woodbridge, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 28, 1981, Ser. No. 258,351

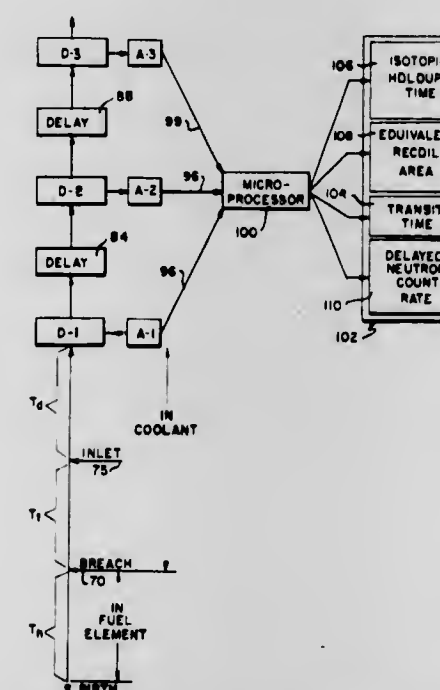
Int. Cl.<sup>3</sup> G21C 7/36

U.S. Cl. 376—216

8 Claims

1. In the operation of a nuclear power reactor having a core, clad fuel in the core, a coolant flowing through the core

over the clad fuel, and heat exchanger means to cool the coolant and obtain useful energy thereby, an improved safety control to detect if any fuel cladding has a breach that allows delayed-neutron emitters to enter the coolant, the combination comprising means for conveying the coolant from the core through a loop flow circuit and back to the core, at least three separate delayed-neutron detectors and means for mounting each detector proximate the flow circuit operable to count the delayed neutrons released by emitters in the coolant when passing the detector, the first detector being located downstream from the core a distance corresponding to coolant flow time therebetween of between fifteen and forty seconds and the second and third detectors being spaced apart and downstream from the first and second detectors, respectively, each



corresponding to coolant flow time therebetween of between 1 and 3 seconds, the delayed-neutron activity at the detectors being a function of the delay time after reaction in the fuel until the coolant carrying the delayed-neutron emitter passes the respective detector, where  $T_{TOTAL} = T_h + T_i + T_d$ , means for calibrating the detectors during calibration operation of the reactor to determine  $T_d$  and at least one of  $T_h$  and  $T_i$  with respect to measured delayed-neutron counts on the detectors for the calibration fuel, and means for monitoring the detectors during reactor operation and for making repeated comparisons for the best fit line by the method of regression approximation of the delayed-neutron counts measured at the respective detectors and the delayed-neutron counts approximated for each detector according to the equations:

$$A_{dn}^i = \frac{\lambda_{D'} \cdot P_{n'}^i}{F \cdot T_h} \left[ \frac{\lambda_{D'} \cdot S_{D'} \{ \exp[-\lambda_{D'}(T_i + T_d)] + \exp[-\lambda_{D'}(T_i + T_d)] \}}{(\lambda_{D'} - \lambda_{D'}) \left( \lambda_{D'} - \frac{1}{T_h} \right)} + \left( \frac{\lambda_{D'} \cdot S_{D'} + S_{D'}^i}{\lambda_{D'} + \frac{1}{T_h}} \right) \cdot \exp[-\lambda_{D'}(T_i + T_d)] \right] \quad (1)$$

$$A_{dn}^{TOTAL} = \sum_{i=1}^9 A_{dn}^i$$

where

$A_{dn}^i$  = Total delayed neutron activity at each detector attributable to isotope i, in counts/second/cm<sup>3</sup> of coolant;

$A_{dn}^{TOTAL}$  = Total count of delayed neutrons at any detector, in counts/cm<sup>3</sup> of coolant;

$\lambda_{D'}, \lambda_{D'}^i$  = Decay coefficient of parent and daughter isotopes of species i, in seconds<sup>-1</sup>;

$S_{D'}, S_{D'}^i$  = Fission production rates of parent and daughter isotopes of species i, in fissions/second;

$P_{n'}^i$  = Probability of emission of a delayed neutron for each daughter isotope, dimensionless; and

$F$  = Flow rate of primary coolant through the reactor core, in cm<sup>3</sup>/second;

$T_h$  = Isotopic holdup time of delayed-neutron emitter in moving from reaction in the fuel to the coolant, in seconds;

$T_i$  = Transit time of the delayed-neutron emitter in the coolant in flowing from breach to the inlet of the detector loop flow circuit, in seconds; and

$T_d$  = Transit time of the delayed-neutron emitter in the coolant in flowing from the inlet of the detector loop to the detector, in seconds.

4,415,525

**HETEROGENEOUS GAS CORE REACTOR**

Nils J. Diaz, and Edward T. Dugan, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

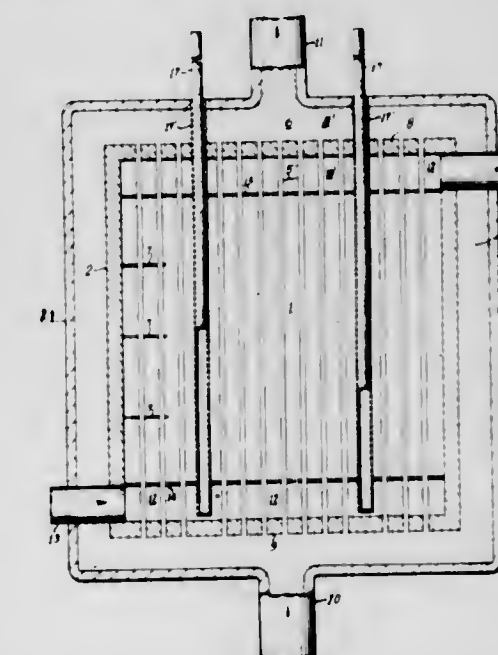
Continuation of Ser. No. 961,379, Nov. 16, 1978, abandoned.

This application Sep. 4, 1980, Ser. No. 184,134

Int. Cl.<sup>3</sup> G21C 1/10

U.S. Cl. 376—317

20 Claims



1. A nuclear heterogeneous gas core reactor comprising a core barrel containing a fissionable gaseous fuel mixture of UF<sub>6</sub> and helium free of moderator material, an array of parallel tubes in said barrel outwardly surrounded by said fuel mixture, said tubes being filled with a solid moderator selected from the group consisting of graphite, beryllium, and beryllium oxide, said moderator being free of said gaseous fuel mixture and containing an interior passageway for the circulation of a heat extraction fluid to cool said moderator.



4,415,526

**METAL PHTHALOCYANINE ON A SUBSTRATE**

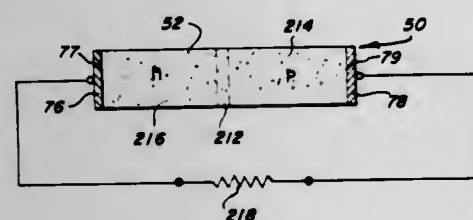
David L. Garrett, Cupertino, Calif., assignor to Metco Properties, Chicago, Ill.

Continuation-in-part of Ser. No. 801,636, May 31, 1977, which is a continuation-in-part of Ser. No. 535,218, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 166,687, Jul. 28, 1971, abandoned. This application Jan. 10, 1980, Ser. No. 111,079

Int. Cl.<sup>3</sup> G21C 3/02

U.S. Cl. 376-409

30 Claims



1. An improved semi-conductor which comprises a film of fissionable, semi-conductive metal phthalocyanine, said film being substantially free of phosphorus nitride and derivatives of the same and being supported on the external surface of a solid, rigid substrate, said substrate being substantially free of water.

4,415,527

**DESULFURIZATION PROCESS FOR FERROUS POWDER**

Orville W. Reen, New Kensington, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1980, Ser. No. 217,292

Int. Cl.<sup>3</sup> B22F 1/00; C21C 1/02; C22B 1/02

U.S. Cl. 419-31

13 Claims

1. A method of preparing ferrous powder melt stock containing a maximum of about 5 parts per million sulfur, comprising the steps of:

- forming a molten ferrous alloy into a powder having sulfur in reducible form and having an average particle size of less than about 0.09 inch,
- while maintaining an interconnected porosity of at least 10% for the powder, exposing the powder to a temperature of at least 2100° F. in a hydrogen containing atmosphere from a time of at least about 1 hour until the sulfur content of the powder is reduced to less than or equal to about 5 parts per million to form a sintered product, and
- cooling the desulfurized powder to ambient temperature in a nonoxidizing atmosphere.

4,415,528

**METHOD OF FORMING SHAPED METAL ALLOY PARTS FROM METAL OR COMPOUND PARTICLES OF THE METAL ALLOY COMPONENTS AND COMPOSITIONS**

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Witco Cayman Patents, Limited, Cayman Islands, Cayman Islands

Filed Mar. 20, 1981, Ser. No. 245,670

Int. Cl.<sup>3</sup> B22F 3/00

U.S. Cl. 419-46

18 Claims

1. A method of forming shaped metal alloy parts directly from either the individual metals or compounds containing the metal of the targeted alloy or both comprising the steps of:

- mixing together small particles taken from the class consisting of metals and metal compounds in an amount corresponding to the weight percentages of the individual metals present in the targeted alloy and an appropriate binder to form a homogeneous mixture of binder and particles,
- forming said mixture into a predetermined shape,
- removing said binder from said formed shape,
- placing said formed shape from (c) in a hydrogen atmosphere and at a temperature to maintain the dew point of said atmosphere on the reducing side of the dew point equilibrium curve for all of the metals forming the targeted alloy to convert all compounds to the metallic state, and
- sintering said formed shape from (d) in a reducing atmosphere and at a temperature to maintain the dew point of said atmosphere on the reducing side of the dew point equilibrium curve for all of the metals forming the targeted alloy in the sintering atmosphere.

4,415,529

**MN-BASED ALLOY OF NONEQUILIBRIUM AUSTENITE PHASE**

Tsuyoshi Masumoto; Akihisa Inoue, both of Sendai, and Hiroyuki Tomioka, Uji, all of Japan, assignors to Unittika Ltd., Amagasaki and Tsuyoshi Masumoto, Sendai, both of, Japan

Filed Sep. 29, 1982, Ser. No. 426,442

Int. Cl.<sup>3</sup> H01F 1/00; C22C 28/00

U.S. Cl. 420-434

7 Claims

1. An Mn-based alloy, comprising:
- 4 to 30 atomic % of at least one element selected from the group consisting of Al, Ni, and Cr;
- 1 to 15 atomic % of C;
- 30 atomic % or less of at least one element selected from the group consisting of Co, Mo, W, Ta, Nb, V, Ti, and Zr; and
- the balance of the alloy to make up 100 atomic % being comprised substantially of Mn, the alloy having a nonequilibrium austenite phase.

4,415,530

**NICKEL-BASE WELDING ALLOY**

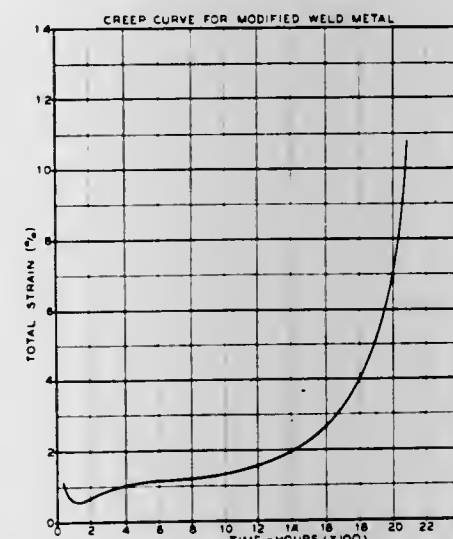
James P. Hunt, Huntington, W. Va., assignor to Huntington Alloys, Inc., Huntington, W. Va.

Filed Nov. 10, 1980, Ser. No. 205,616

Int. Cl.<sup>3</sup> C22C 19/05

U.S. Cl. 420-453

3 Claims



1. A welding alloy consisting essentially of from about 22% to about 24.5% chromium, from about 6% to about 7% tungsten, from about 3% to about 5% molybdenum, from about 1.5% to about 2.5% columbium, from about 1% to 3% manganese, up to about 5% iron, from about 0.05% to about 0.11% carbon, up to about 0.015% sulfur, up to about 0.75% silicon, up to about 0.5% copper, up to about 0.25% aluminum, up to about 0.6% titanium, up to 0.03% magnesium, up to about 0.5% cobalt, up to about 0.02% phosphorous, up to about 0.005% boron and the balance essentially nickel.

4,415,531

**SEMICONDUCTOR MATERIALS**

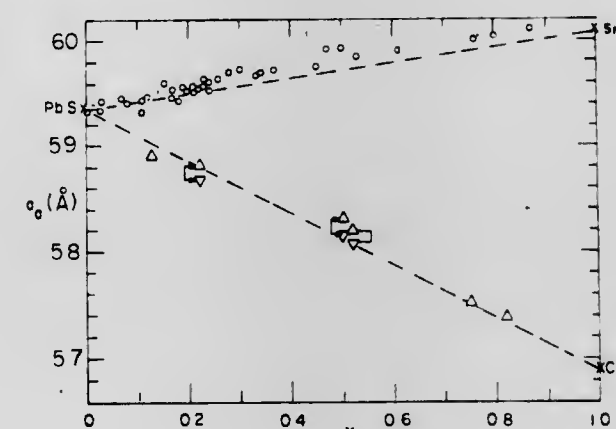
Henry Holloway, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 25, 1982, Ser. No. 392,190

Int. Cl.<sup>3</sup> C01C 15/00

U.S. Cl. 420-564

3 Claims



1. A semiconductor alloy having the chemical formula  $Pb_{1-x}M_xS$ , wherein the value of  $x$  is greater than 0 and less than 1 and  $M$  is selected from the group of elements consisting of Sr and Ca.

4,415,532

**COBALT SUPERALLOY**

Paul Crook, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Mar. 5, 1981, Ser. No. 240,642

Int. Cl.<sup>3</sup> C22C 30/00

U.S. Cl. 420-585

5 Claims

1. An alloy having an outstanding combination of properties including metal to metal (galling) resistance, hot hardness, toughness, cavitation erosion and corrosion resistance and consisting essentially of, in percent by weight: 0.2 to 0.6 carbon, 25 to 36 cobalt, 3.5 to 10 nickel, 24 to 30 chromium, 1 to 5 tungsten plus molybdenum, 2 to 9 niobium plus tantalum, 0.5 to 2.0 silicon, up to 2.0 manganese, 55 minimum cobalt plus chromium, the total content of aluminum plus copper plus titanium plus vanadium plus zirconium plus hafnium not over 2, phosphorous not over 0.01, sulfur not over 0.01, boron up to 0.2 and the balance iron plus normal impurities wherein the ratio of niobium-to-chromium is within the range between 1 to 3.5 and 1 to 6.5 to provide said outstanding combination of properties and wherein said tantalum is optional in the alloy and is not considered in said niobium-to-chromium ratio.

4,415,533

**PROCESS FOR TREATING EXHAUST GAS FROM ELECTROPHOTOGRAPHIC MACHINE AND APPARATUS THEREOF**

Tsuneo Kurotori, Tokyo; Manabu Mochizuki, Yokohama, and Susumu Tatsumi, Hino, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,320

Claims priority, application Japan, Jun. 18, 1980, 55-83374

Int. Cl.<sup>3</sup> A61L 9/00

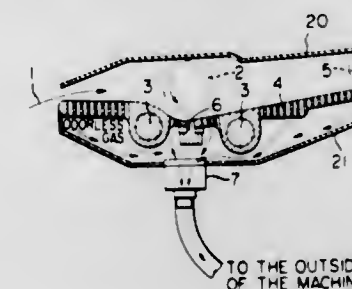
U.S. Cl. 422-4

14 Claims

1. A process for treating an odorous exhaust gas which is generated during an electrophotography process, which comprises: forwarding an electrophotographic copy material bearing developer thereon through a heating zone and therein heating said copy material by a heater to dry or fix said developer on said copy material; contacting said odorous exhaust gas in said heating zone with a heated oxidation catalyst effective for converting said odorous exhaust gas to a substantially odorless gas, and simultaneously directly heating said oxidation catalyst with at least a portion of the heat supplied by said

heater so that said heater is employed for both drying or fixing the developer and for heating said catalyst.

9. An apparatus for treating an odorous exhaust gas which is generated during an electrophotography process, which comprises: means defining an enclosed heating zone containing a bed of oxidation catalyst and a heater in direct heat exchange relationship with said oxidation catalyst bed, said oxidation



catalyst being effective, when heated, to convert said odorous exhaust gas to a substantially odorless gas, and means for forwarding an electrophotographic copy material bearing developer thereon through said heating zone so that said copy material is heated by said heater to dry or fix said developer on said copy material and said heater is simultaneously effective to directly heat said catalyst bed.

4,415,534

**APPARATUS FOR ANALYZING BIOLOGICAL LIQUIDS**

Finn C. Lundsgaard, Taastrup, and Willy Andersen, Espergerde, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

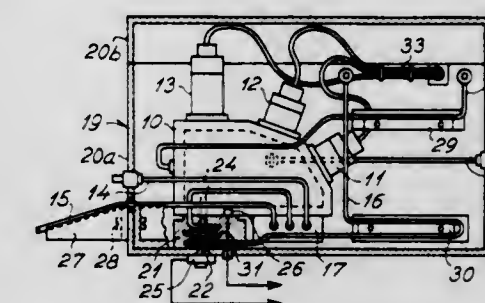
Filed Oct. 5, 1981, Ser. No. 308,775

Claims priority, application Denmark, Oct. 6, 1980, 4218/80

Int. Cl.<sup>3</sup> G01N 1/14

U.S. Cl. 422-58

23 Claims



1. An apparatus for analyzing biological liquids, said apparatus comprising:
  - a measuring body including measuring means for measuring characteristics of said liquid,
  - a thermally shielding housing enclosing said body in spaced relationship therewith, said housing being made from a material with good thermal conductivity, and the space defined between said body and said housing containing a medium with poor thermal conductivity,
  - heat conductive connecting means placing a minor part of said housing in direct heat conductive contact with said body,
  - temperature regulating means arranged in heat conductive contact with said housing, and
  - a temperature sensor arranged in heat conductive contact with said body for controlling the function of said heat regulating means so as to maintain the temperature of said body at a substantially constant predetermined value.



4,415,535

# APPARATUS FOR REFINING METAL CARBIDES CONTAINING FREE CARBON

Kunio Kato, Kiryu; Yoshiki Sugiyama, Gifu, and Ryo Enomoto, Ohgaki, all of Japan, assignors to Iriden Co., Ltd., Gifu, Japan

Division of Ser. No. 109,114, Jan. 2, 1980, Pat. No. 4,327,067.

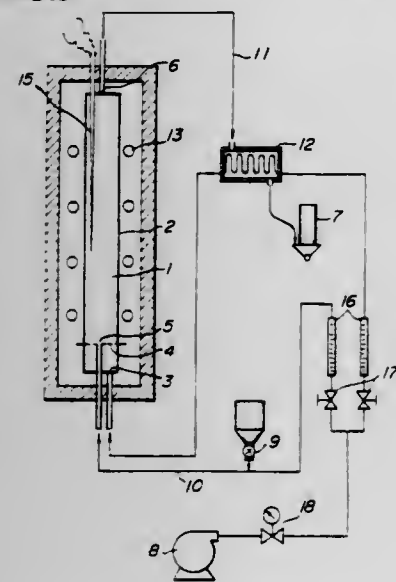
This application Dec. 28, 1981, Ser. No. 334,901

Claims priority, application Japan, Jan. 18, 1979, 54-3337

Int. Cl.<sup>3</sup> C01B 31/36, 31/30, 31/34; B01J 8/32

U.S. Cl. 422-143

2 Claims



1. An apparatus for refining metal carbide powders containing free carbon and having an average grain size of not more than 200 microns without substantial oxidation of the metal carbides, comprising a sealed vessel containing a fluidizing bed with a bed height at minimum fluidizing gas velocity within a range of 0.2-3.0 m consisting of heat-resistant particles having an average particle diameter of 150-500 $\mu$  fluidized by an oxidizing gas, an inlet for introducing the oxidizing gas arranged at the lower end of the sealed vessel, a gas distributor which is a plate of porous heat-resistant and oxidation-resistant material having uniformly spaced small holes each having a diameter of not more than 5 mm and an opening ratio of cross-sectional area of the small holes to cross-sectional area of the sealed vessel within a range of 0.1-10% for dispersing the oxidizing gas in the fluidizing bed arranged at a lower part of the fluidizing bed, an inlet for charging the metal carbide powders which discharges substantially upwardly in immediate proximity to the gas distributor and is so arranged as to ensure generally even distribution of the metal carbide powders in the fluidizing bed, a heating member for heating the fluidizing bed arranged in the refining apparatus to a temperature of 800°-1100° C. to burn and remove the free carbon from the metal carbide powders, an outlet for discharging a mixture of refined metal carbide powders and combustion gas from the fluidizing bed arranged above the fluidizing bed, and a separator for recovering the refined metal carbide powders from the mixture discharged from the outlet.

4,415,536

# APPARATUS FOR CONTACTING PARTICULATE MATERIAL WITH PROCESSING LIQUID

Paul A. Haas, Knoxville, and Allen D. Ryon, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 2, 1982, Ser. No. 394,560

Int. Cl.<sup>3</sup> G21C 21/00; B01J 8/12, 8/20

U.S. Cl. 422-159

7 Claims

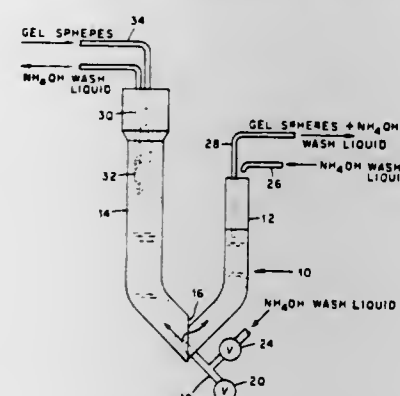
1. Apparatus for contacting particulate material with a liquid, comprising:

a pair of substantially cylindrical tubes having different diameters and each including a straight lower section

inclined relative to a horizontal plane and a straight, vertically extending upper section, said tubes being communicatively joined to each other at their lower ends and said particulate material being introduced into the upper section of the tube having the larger diameter; and means for introducing said liquid into the lower ends of said tubes.

2. The apparatus of claim 1 including means for removing said liquid from the upper sections of said tubes.

3. The apparatus of claim 2 wherein the lower section of



each of said tubes is inclined at an angle of about 45° relative to a horizontal plane.

4. The apparatus of claim 3 wherein said means for introducing said liquid into the lower ends of said tubes comprises a conduit which extends into the tube having the larger diameter.

5. The apparatus of claim 4 including means for introducing a second stream of said liquid into the upper section of the tube having the smaller diameter.

4,415,537

# CATALYTIC COMBUSTOR

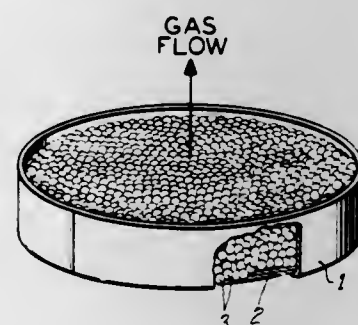
Raymond W. Vine, Avon; John C. Trociola, Glastonbury, and Herbert J. Setzer, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1982, Ser. No. 344,896

Int. Cl.<sup>3</sup> B01D 53/36

U.S. Cl. 422-180

4 Claims



1. A solid fuel burning stove comprising an air inlet section, a combustion section, a combusted and uncombusted gas exhaust section, and a catalytic combustor in the exhaust section, wherein the improvement comprises utilizing a sulfur tolerant catalytic combustor for wood or coal comprising a high temperature stable lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina substrate impregnated with a sulfur tolerant, high activity rhodium combustion catalyst, said sulfur tolerant catalyst permitting interchangeable use of wood or coal as the solid fuel in the stove.

4,415,538

# APPARATUS FOR CHLORINATION OF MOLTEN MAGNESIUM CHLORIDE SALTS

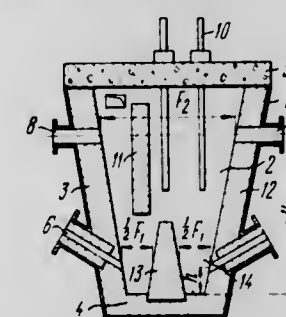
Andrei B. Ivanov, prospekt Smirnova, 59, kv. 151; Vladimir I. Schegolev, ulitsa Korablestroitelei, 29, korpus 4, kv. 252, both of Leningrad; Viktor A. Rudakov, ulitsa Puskina, 15, kv. 48, Ivano-Frankovskaya oblast, Kalush; Sergei P. Kosarev, Na-lichnaya ulitsa, 39, korpus 1, kv. 20; Elizaveta A. Grigorieva, ulitsa 3 Internatsionala, 68, kv. 53, both of Leningrad; Alex-andr T. Podanenko, ulitsa B. Khmel'nitskogo, 48, kv. 69, Ivano-Frankovskaya oblast, Kalush; Oleg N. Romanenko, prospekt Lenina, 6, kv. 46, Ivano-Frankovskaya oblast, Ka-lush; Leonid P. Stavrov, ulitsa 50-letia VLKSM, 8, kv. 84, Ivano-Frankovskaya oblast, Kalush; Anatoly B. Kondratenko, ulitsa V. Tereshkovi, 15, Ivano-Frankovskaya oblast, Kalush; Konstantin D. Muzhzhavlev, ulitsa Zheleznovodskaya, 48, kv. 30, Leningrad; Vladimir G. Ovcharenko, prospekt Lenina, 7'a", kv. 9, Ivano-Frankovskaya oblast, Kalush; Grigory P. Khristjuk, ulitsa Karpinskogo, 16, kv. 219, Leningrad; Alexei V. Vasiliev, ulitsa B. Khmel'nitskogo, 66, kv. 57, Ivano-Fran-kovskaya oblast, Kalush; Anatoly L. Garkavy, ulitsa 40-letia Oktyabrya, 49, kv. 52, Ivano-Frankovskaya oblast, Kalush, all of U.S.S.R.; Ivan G. Gachevov, deceased, late of Ivano-Fran-kovskaya oblast, Kalush, U.S.S.R., and Lidia T. Gachevova, administrator, ulitsa B. Khmel'nitskogo, 66, kv. 61, Ivano-Frankovskaya oblast, Kalush, U.S.S.R.

Filed Apr. 6, 1981, Ser. No. 251,173

Int. Cl.<sup>3</sup> B01F 13/02

U.S. Cl. 422-224

2 Claims



1. An apparatus for chlorination of molten magnesium chloride salts and the like, comprising a shell lined with a refractory material and having walls, a bottom and a cover, said walls, said bottom and said cover forming an interior of said shell, said interior being devoid of gas distribution grate means; melt feed inlet means for feeding the melt into said shell interior, said melt feed inlet means being mounted in the upper portion of one of said walls; chlorinated melt outlet means for removing the chlorinated melt from said shell interior, said chlorinated melt outlet means being mounted in the upper portion of another of said walls; chlorine inlet means mounted in the lower portion of said walls, and wherein said shell interior being tapered downwardly so that the clear opening at the height of said chlorine inlet means is not over 0.3 times the clear opening at the height of said melt feed inlet means and said melt outlet means, said shell interior further accommodating at least one parti-tion mounted in said bottom, tapering upward and divid-ing said shell interior into chambers intercommunicating only at their tops, said chlorine inlet means being mounted in said walls on both sides of said partition, and wherein said partition has a height exceeding the distance from said bottom to said chlorine inlet means by a factor of at least two, whereby by virtue of said tapered construction wherein the clear opening of the interior at the height of said chlorine inlet means is not over 0.3 times the clear opening at the height of said melt feed inlet means and said melt outlet means, said apparatus has a larger capacity than can be

reliably obtained in apparatus which include gas distribu-tion grate means.

4,415,539

# CONTAINER STERILIZER AND DISCHARGE SYSTEM

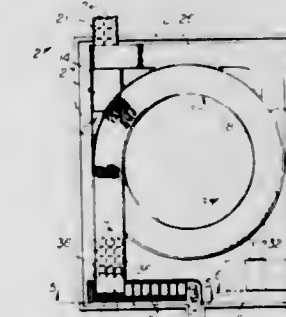
Daniel W. Pohorski, San Jose, Calif., assignor to James Dole Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 236,766, Feb. 23, 1981. This application Feb. 26, 1982, Ser. No. 352,993

Int. Cl.<sup>3</sup> A61L 2/06

U.S. Cl. 422-304

6 Claims



1. A hot air aseptic packaging system container sterilizer, comprising a casing, a conveyor within said casing, means for feeding empty containers onto said conveyor with their open tops uppermost in a plurality of side-by-side rows, means for discharging containers from said conveyor, heating means, said heating means comprising a heater for raising the tempera-ture of air to a sterilizing temperature, blowing means for blowing heated sterilizing air above atmospheric pressure, a first duct from said blowing means to said casing to distribute heated sterilizing air at a pressure throughout said casing to sterilize said containers as they pass on said conveyor through said casing, a second duct communicating with said first duct, a nozzle on said second duct having a flat bottom positioned over a portion of the path of travel of said containers along said conveyor, said bottom being elevated above the top of said conveyor, said bottom being apertured in a plurality of rows of apertures, each row presenting a plurality of apertures posi-tioned to direct hot sterile air into said containers at a position off center relative to said containers, thereby causing a swirling motion of air within said containers to direct hot sterile air into said containers.



4,415,540

## RECOVERY OF NON-FERROUS METALS BY THERMAL TREATMENT OF SOLUTIONS CONTAINING NON-FERROUS AND IRON SULPHATES

Igor A. E. Wilkomirsky; Roy S. Boorman, and Robert S. Salter, all of Fredericton, Canada, assignors to Provincial Holdings Ltd., Fredericton, Canada

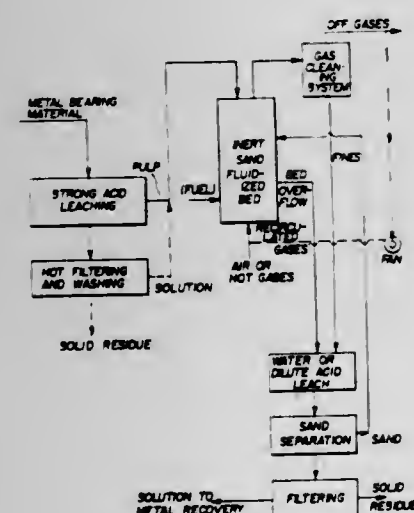
Continuation of Ser. No. 189,249, Sep. 22, 1980, Pat. No. 4,317,803, which is a continuation of Ser. No. 940,937, Nov. 11, 1978, Pat. No. 4,224,122. This application Feb. 8, 1982, Ser. No. 346,837

Claims priority, application Canada, May 5, 1978, 302719 The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C01G 9/06

U.S. Cl. 423—99

5 Claims



1. A method for recovering zinc from a strong sulphuric acid solution containing zinc and iron as sulphates or from zinc sulphide ores or concentrates, comprising:

- roasting said sulphate or zinc sulphide ore or concentrate in a subdivided form in an inert fluidized bed reactor at a temperature from 600 to 750° C. with 20–150% excess air for an average retention time of 1–12 hours resulting in an atmosphere comprising SO<sub>2</sub>, SO<sub>3</sub>, water vapour and remaining O<sub>2</sub> and N<sub>2</sub> from the air, to obtain a calcine containing ferrite and sulphates, oxysulphates and oxides of zinc, plus hematite;
- leaching said calcine with water or dilute sulphuric acid solution in such a manner that the sulphates, oxysulphates, and oxides of zinc are leached out in part from the calcine into the water or dilute sulphuric acid solution;
- subjecting the leach pulp resulting from step (b) to a liquid-solid separation step to yield a leach solution suitable for purification-metal recovery steps for zinc;
- leaching the solid residue resulting from step (c) with strong sulphuric acid solution in such a manner that the ferrite and unreacted sulphides of zinc are converted to the sulphates of iron and zinc;
- subjecting the pulp resulting from step (d) to a liquid-solid separation step to obtain a leach solution containing said sulphates of iron and zinc; and
- recycling said sulphate solution obtained in step (e) in a subdivided form into an inert fluidized bed in such a manner that the dry calcine contains zinc sulphate and iron sulphate and/or hematite, said inert fluidized bed being fueled by the off gas from roasting step (a).

4,415,541

## METHOD OF RECOVERING NICKEL FROM A SPENT FAT HARDENING CATALYST

Ake L. Melin, Oskarshamn, Sweden, assignor to SAB Nife AB, Landskrona, Sweden

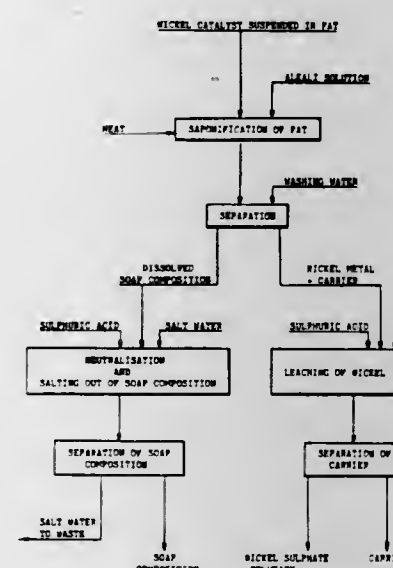
Filed Feb. 11, 1982, Ser. No. 348,139

Claims priority, application Sweden, Feb. 12, 1981, 8100983

Int. Cl.<sup>3</sup> C01G 53/04, 53/10; C11C 13/00; B01J 23/94

U.S. Cl. 423—140

2 Claims



1. A method of recovering nickel from a spent fat hardening catalyst consisting of finely divided nickel metal on a carrier material and suspended in fat, characterized in that the fat is saponified into a solution of soap composition by adding an alkaline aqueous solution consisting of the waste product of contaminated alkali hydroxide solution from the preparation of electrodes in the accumulator industry to the fat hardening catalyst, then separating the nickel metal and the carrier from the solution of soap composition, after which the nickel metal is leached out of the carrier by means of sulphuric acid, nickel being recovered in the form of nickel sulphate solution and the separated solution of soap composition is neutralized and salted out by means of sulphuric acid and a salt solution and the soap composition is separated from the solution as a product, the method being an improved industrial process using chemical waste materials as primary chemical reactants characterized in that the salt solution used consists of waste solution from the product of nickel mass in the accumulator industry which has been purified of heavy metals by means of ion exchangers and which mainly contains sodium sulphate dissolved in water.

2. A method as claimed in claim 1, characterized in that the nickel sulphate solution recovered is treated for the production of active nickel hydroxide mass for alkaline electrical accumulators.

4,415,542

## CONTROLLING SCALE COMPOSITION DURING ACID PRESSURE LEACHING OF LATERITE AND GARNIERITE ORE

Paul B. Queneau, Golden; Robert E. Doane, Lakewood; Mark H. Berggren, Golden, and Mark W. Cooperrider, Arvada, all of Colo., assignors to Compagnie Francaise D'Entreprises Minières, Metallurgiques et D'Investissements, Paris, France

Filed Jun. 21, 1982, Ser. No. 390,450

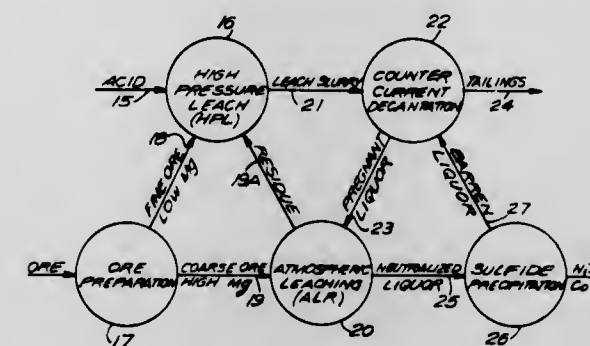
Int. Cl.<sup>3</sup> C01G 53/00, 49/00

U.S. Cl. 423—141

12 Claims

1. A method of controlling the scaling of autoclave and leaching equipment surfaces in the high-pressure sulfuric acid leaching of nickeliferous ores containing, in addition to nickel, oxides and silicates of aluminum, iron, and magnesium, wherein the high-pressure leach is carried out on an ore feed material charged to an autoclave while the autoclave is maintained at an elevated temperature in the range of about 180° C. to 300° C. at which scaling occurs which comprises:

controlling the magnesium content of at least a portion of the ore feed material to a relatively high level falling within the range of about 3% to 30% by weight and at a pulp density to provide a concentration of magnesium in the sulfuric acid solution during ore dissolution at a level





- (c) from about 1% to about 15% by weight of a second coat consisting essentially of from about 1% to about 10% by weight of a water-soluble film-forming substance selected from the group consisting of polyvinylpyrrolidone, polyvinyl alcohol, methylcellulose and hydroxypropyl methylcellulose, from about 1% to about 60% by weight of a water-insoluble film-forming substance consisting of ethylcellulose and from about 30% to about 98% by weight of a dusting powder selected from the group consisting of talc, silicon dioxide and titanium dioxide, which encapsulated pellets are blended and compressed into tablet form with
- (B) from about 15% to about 65% by weight of a compressible tableting mixture consisting essentially of from about 20% to about 40% by weight of a diluent selected from the group consisting of the monosaccharides and the disaccharides, from about 30% to about 50% by weight of a diluent-binder consisting of microcrystalline cellulose, from about 10% to about 30% by weight of a binder consisting of ethyl cellulose, and from about 5% to about 20% by weight of a hydrophobic lubricant selected from the group consisting of hydrogenated vegetable oil, stearic acid, magnesium stearate and calcium stearate.

4,415,548

## SPERMICIDALLY LUBRICATED PROPHYLACTICS AND METHOD FOR MAKING SAME

K. Prakash Reddy, Anderson, S.C., assignor to Schmid Laboratories, Inc., West Little Falls, N.J.

Continuation of Ser. No. 120,739, Feb. 12, 1980, abandoned.

This application Apr. 30, 1982, Ser. No. 373,654

Int. Cl.<sup>3</sup> A61F 5/00; A61K 9/70; A61L 31/00; B29C 13/00

U.S. Cl. 424—28 11 Claims

1. A method for manufacturing a lubricated spermicidal male contraceptive which comprises:
- dipping a phallic shaped mandrel of predetermined size into a warm bath consisting of latex rubber;
  - withdrawing said mandrel bearing a coating consisting essentially of latex rubber from the latex bath;
  - allowing the latex rubber coating on said mandrel to harden to form a sheath conforming to the shape of said mandrel;
  - unrolling the sheath from said mandrel to form a cup;
  - dispensing an effective contraceptive amount of a migratory pharmaceutical formulation comprising a liquid non-ionic surfactant spermicidal agent having an approximately neutral pH, and a polyethylene glycol lubricant composition into the latex cup whereby the pharmaceutical formulation migrates by capillary action substantially throughout the inner and outer surfaces of the latex sheath; and
  - sealing the latex sheath containing said spermicide and said lubricant in an airtight container.

4,415,549

## TOOTHPASTES WITH REDUCED SALINITY

Nutan B. Shah, New Rochelle, N.Y., and Marvin K. Cook, Port Charlotte, Fla., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed May 17, 1982, Ser. No. 378,889

Int. Cl.<sup>3</sup> A61K 9/16, 9/18

U.S. Cl. 424—52 9 Claims

1. A water-containing toothpaste comprising an effective amount of strontium disodium ethylenediamine tetraacetate for alleviating sensitivity of hyper-sensitive dentin, an effective anti-caries amount of sodium fluoride, sodium monofluorophosphate or mixtures thereof and at least 0.001 percent by weight, based on the total weight of the toothpaste, of monoammonium glycyrrhizinate, wherein said toothpaste is characterized by the substantial absence of substances which can replace strontium from said strontium disodium ethylenediamine tetraacetate.

4,415,550

## TREATMENT-AND-PROPHYLACTIC TOOTH PASTE POSSESSING ANTICARIOUS EFFECT

Gennady N. Pakhomov, Leninsky prospekt 123/1, kv. 529, Moscow; Anita Y. Luste, ulitsa Lachplesha 27, kv. 22; Galina I. Kadnikova, ulitsa Ya. Rudzutaka 60, kv. 10, both of Riga; Anny G. Kolesnik, ulitsa Shosseinaia, 58, korpus 2, kv. 59, Moscow; Lidia N. Lubotskaya, ulitsa Maskavas 108/110, kv. 4, Riga; Rita M. Playvnieste, "Plyavnieki", Rihzsky raion p/o "Katlakalns"; Jury A. Tarasenko, ulitsa Dzirtsima 43, kv. 9, Riga, all of U.S.S.R., and deceased Konstantinov, late of Riga, U.S.S.R. (by Aina R. Sils, administrator)

Filed Mar. 4, 1983, Ser. No. 472,227

Int. Cl.<sup>3</sup> A61K 7/18, 33/16, 35/32

U.S. Cl. 424—57 4 Claims

1. A treatment-and-prophylactic tooth paste possessing an abrasive agent, a gelating agent, a wetting agent, a surfactant, a flavouring agent, 0.5 to 2% by weight of a substance possessing anticaries effect comprising a product obtained by treatment of a bone tissue with a diluted mineral acid till a complete dissolution of mineral components and water-soluble proteins contained in the bone tissue, separation of the resulting solution, dilution thereof with water with the addition of citric acid or salts thereof as a stabilizing agent, followed by neutralization of the solution and drying and containing the following components, percent by weight:

calcium	2 to 6
sodium	19 to 23
potassium	0.04 to 0.18
mineral acid anion	6 to 10.6
orthophosphoric acid anion	1.5 to 5.0
water-soluble proteins	1.0 to 5.0
magnesium	0.05 to 0.2
a mixture of trace elements including fluorine, manganese, tin, zinc, iron	0.01 to 0.02
complex citrate compounds as calculated for citric acid anion	the balance.

4,415,551

## BIOERODIBLE DEODORANT

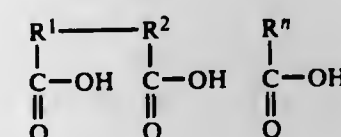
Florence S. Fang, Bethesda, Md., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 29, 1982, Ser. No. 344,089

Int. Cl.<sup>3</sup> A61K 7/32, 31/74, 31/14

U.S. Cl. 424—65 4 Claims

1. A sustained release bioerodible deodorant formulation for use on the human body consisting essentially of a cosmetically acceptable, non aqueous organic solvent solution containing 2 to 20% by weight of a mixture of a quaternary ammonium germicidal material and a carboxylic polymer having the general formula:



in which R<sup>1</sup>, R<sup>2</sup>, R<sup>n</sup> are organic radicals selected from the group consisting of hydrocarbon radicals and hetero-atom containing radicals, in which the R's are selected to provide an average of from 8 to 22 carbon atoms for each acidic carboxylic hydrogen and in which the value of n is selected to provide a molecular weight of about 10,000 to 800,000; the molar ratio of said carboxylic polymer to said germicidal material being from about 13:1 to 1:1.

4,415,552

## COMPOSITION FOR ESTABLISHING IMMUNOLOGICAL TOLERANCE

Erwin Diener, and Uriel Diner, both of Edmonton, Canada, assignors to The Governors of The University of Alberta, Edmonton, Canada

Continuation-in-part of Ser. No. 9,910, Feb. 6, 1979, abandoned.

This application Dec. 5, 1979, Ser. No. 100,346

Int. Cl.<sup>3</sup> A61K 39/35, 39/385, 39/39, 31/72, 31/73, 47/00

U.S. Cl. 424—91 16 Claims

1. A pharmaceutically acceptable injectable composition consisting essentially of a water soluble conjugate of:
- a substantially non-cross-linked water soluble carboxymethyl cellulose carrier, and
  - a plurality of allergen molecules, each chemically attached to a carboxyl group of the carboxymethyl cellulose carrier, said composition being capable upon injection in a mammal of inducing immunological tolerance to the allergen without evoking an allergic response to the allergen.
7. A method of converting an allergen molecule to a form immunologically acceptable for inducing an immunological tolerance in mammals to the allergen without evoking an allergic response thereto, comprising:

condensing each of a plurality of allergen molecules to a carboxyl group of a water soluble carboxymethyl cellulose carrier to form a water soluble carboxymethyl cellulose-allergen conjugate in which the carboxymethyl cellulose strands are substantially non-crosslinked; and recovering the resulting conjugate from the reaction mixture as a pharmaceutically acceptable injectable composition.

4,415,553

## COMPOSITIONS, PROCESSES FOR THEIR PREPARATION AND METHOD FOR TREATMENT OF NEOPLASMS

Harry P. Zhabilov, and Todor Y. Karavassileff, both of Razgrad, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Continuation-in-part of Ser. No. 861,072, Dec. 15, 1977,

abandoned, which is a continuation-in-part of Ser. No. 577,719,

May 15, 1975, abandoned, and Ser. No. 478,156, Jun. 10, 1974,

abandoned, which is a continuation-in-part of Ser. No. 364,654,

May 23, 1973, abandoned, which is a continuation of Ser. No. 51,094, Jan. 22, 1970, abandoned, which is a continuation-in-part

of Ser. No. 865,539, May 19, 1969, abandoned, which is a

continuation of Ser. No. 652,043, Jul. 10, 1967, abandoned,

which is a continuation-in-part of Ser. No. 572,236, Aug. 15,

1966, abandoned, and Ser. No. 533,037, May 26, 1966,

abandoned, said Ser. No. 572,236, is a continuation-in-part of

Ser. No. 533,037, , abandoned. This application Mar. 5, 1980,

Ser. No. 127,343

Claims priority, application Bulgaria, Aug. 6, 1973, 23841

Int. Cl.<sup>3</sup> A61K 37/10, 35/12, 39/00; C12P 21/00, 21/06; C12N

15/00, 5/00

U.S. Cl. 424—95 14 Claims

1. Process for preparing antigenic compositions adapted for the treatment of neoplastic diseases in mammals which comprises isolating from the cell nuclei from neoplastic animal tissue (1) a cancer-active single-strand DNA, (2) a cancer-active RNA, and (3) an arginine-rich histone fraction, deaggregating at least one other portion of said cell nuclei by enzymatic treatment with pepsin and isolating from the resulting deaggregated mixture (4) a lysine-rich histone fraction and thereafter recombining fractions (1), (2), and (4) in the presence of streptomycin-cysteine, and combining the product thereof with fraction (3) whereby said four components are reformed by selective recombination/hybridization into antigenic compositions, the components of which have properties and contain amounts of constituents relative to each other in the following ranges:

A. Single-strand DNA—Molecular weight,  $0.5 \times 10^6$  to about  $1.5 \times 10^6$

B. RNA sedimentation constant—4S to 8S

C. Lysine rich histone Fraction A-1 (LRF):

Molecular weight: 12,000 to 14,000

Lysine to arginine mole ratio: 0.5:1 to 4:1

DNA to LRF weight ratio: 0.5:1 to 4:1

D. Arginine rich histone fraction (ARF):

Molecular weight: 10,500 to 13,000

Lysine to arginine mole ratio 0.3:1 to 0.7:1

RNA to ARF weight ratio: 0.8:1 to 3.5:1

E. LRF to ARF weight ratio: 3:1 to 1:4

F. DNA to RNA weight ratio: 0.3:1 to 3:1

6. The antigenic composition prepared by the process of claim 1.

7. Antigenic compositions prepared according to the process of claim 1 and adapted for the treatment of neoplastic diseases in mammals, said compositions containing s-DNA, RNA, lysine rich histones and arginine rich histones isolated from cell nuclei of donor animal tumors in which the ratio of active cancer single-strand DNA to cancer active RNA in the animal tumor is present in about the same ratio of the cancer active single strand DNA to the cancer active RNA in said mammals.

4,415,554

## TREATMENT FOR MENSTRUAL DISORDERS

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Continuation-in-part of Ser. No. 89,293, Oct. 30, 1979, Pat. No.

4,302,477, which is a continuation-in-part of Ser. No. 4,924, Jan.

19, 1979, Pat. No. 4,373,763. This application Jun. 10, 1981, Ser.

No. 272,083

Claims priority, application United Kingdom, Jan. 23, 1978,

2642/78; Feb. 7, 1978, 4921/78; Apr. 19, 1978, 15481/78; Aug.

17, 1978, 33682/78; Oct. 24, 1978, 41761/78

Int. Cl.<sup>3</sup> A61K 33/30, 31/20, 31/23, 31/54

U.S. Cl. 424—145 14 Claims

1. A method of treating menstrual disorders comprising administering to a person suffering therefrom an effective amount of  $\gamma$ -linolenic acid or physiologically functional derivative thereof and/or dihomogamma-linolenic acid or physiologically functional derivative thereof, said menstrual disorders manifested by irregular menstrual cycle lengths or excessive duration or amount of blood loss or premenstrual syndrome of depression, pain and fluid retention.

4,415,555

## COMPOSITION AND METHOD FOR TREATING IRON DEFICIENCY SYNDROME

Hitoshi Anabuki, and Shigeo Miyata, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co. Ltd., Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,126

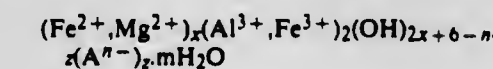
Claims priority, application Japan, Mar. 24, 1981, 56-41723

Int. Cl.<sup>3</sup> A61K 33/26; C01B 31/24; C07F 5/06; A61K 31/295

U.S. Cl. 424—147 18 Claims

1. A composition for increasing the iron level in hemoglobin and serum in a subject in need thereof comprising,

(1) an amount, effective for increasing said iron level, of a compound having a hydrotalcite-like crystal structure and represented by the following formula (1)



(1)

wherein A<sup>n-</sup> represents an anion having a valence of n, Mg<sup>2+</sup> is within the range of  $0 \leq \text{Mg}^{2+} < \infty$ , Fe<sup>3+</sup> is within the range of  $0 \leq \text{Fe}^{3+} < 2$ , x is a number represented by  $1 \leq x < 20$ , z is a number represented by  $0 < z < 3$ , and m is a number represented by  $0 \leq m < 8$ , and

(2) a pharmaceutically acceptable diluent or carrier.



4,415,556

**PROTECTIVE SOLUTION FOR HEART AND KIDNEY AND PROCESS FOR ITS PREPARATION**

Hans-Jürgen Bretschneider, Bovenden, Fed. Rep. of Germany, assignor to Dr. Franz Köhler Chemie GmbH, Alsbach-Bergstrasse, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,078

Claims priority, application Switzerland, Dec. 23, 1980, 9510/80

Int. Cl.<sup>3</sup> A61K 31/19, 31/40, 31/70, 33/06, 33/10, 33/14 U.S. Cl. 424—153 5 Claims

1. In a method for preventing ischemia damage to the heart, kidneys and other organs during operations and transplants thereof, wherein an ischemia damage preventing effective amount of a solution containing a buffer system composed of histidine, histidine chloride, and tryptophane and the conventional electrolytes for cardioplegic solutions is administered, the improvement which comprises said solution also containing an ischemia damage protecting amount of  $\alpha$ -ketoglutarate.

4,415,557

**ANTIBIOTIC COMPOUND, ITS PRODUCTION AND ITS MEDICINAL USE**

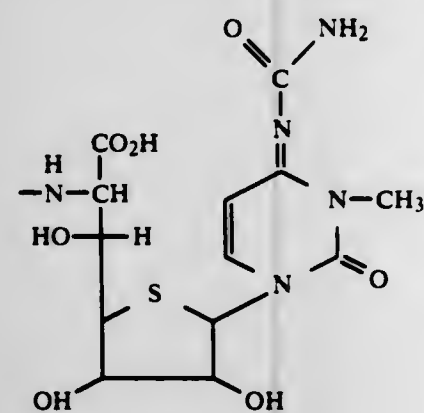
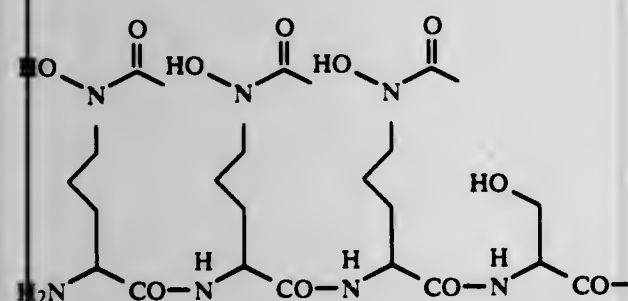
Karl G. Metzger; Jörg Pfitzner; Delf Schmidt, all of Wuppertal; Horst Weyland, Bremerhaven; Günter Benz, Velbert, and Theo Schröder, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,449

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102137

Int. Cl.<sup>3</sup> C07C 103/52; A61K 31/495 U.S. Cl. 424—172 6 Claims

1. An antibiotic compound which, in the iron-free form, is of the formula



4,415,558

**CRF AND ANALOGS**

Wylie W. Vale, Jr., La Jolla; Joachim Spiess, Encinitas; Catherine L. Rivier, and Jean E. F. Rivier, both of La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 271,624, Jun. 8, 1981, abandoned. This application May 17, 1982, Ser. No. 378,999

Int. Cl.<sup>3</sup> A61K 37/00; C07C 103/52 U.S. Cl. 424—177 31 Claims

1. A pharmaceutical composition for lowering the blood pressure of a mammal and/or for elevating the secretion of

ACTH and corticosteroids comprising CRF or analogs of CRF or the nontoxic addition salts thereof having the formula: Z-R<sub>1</sub>-Pro-Pro-Ile-Ser-R<sub>8</sub>-Asp-Leu-R<sub>11</sub>-R<sub>12</sub>-R<sub>13</sub>-Leu-Leu-Arg-R<sub>17</sub>-R<sub>18</sub>-R<sub>19</sub>-Glu-R<sub>21</sub>-R<sub>22</sub>-Lys-R<sub>24</sub>-R<sub>25</sub>-R<sub>26</sub>-R<sub>27</sub>-R<sub>28</sub>-Gln-Gln-Ala-R<sub>32</sub>-R<sub>33</sub>-Asn-Arg-R<sub>36</sub>-Leu-Leu-Asp-R<sub>40</sub>-R<sub>41</sub>-NH<sub>2</sub> wherein Z is an acyl group having 7 or less carbon atoms or hydrogen; R<sub>1</sub> is Ser-Gln-Glu or pGlu-Gly or Gln-Glu or Glu or D-Ser-Gln-Glu or D-pGlu-Gly or desR<sub>1</sub>; R<sub>8</sub>, R<sub>12</sub>, R<sub>19</sub>, R<sub>24</sub> and R<sub>40</sub> are selected from the group consisting of Leu, Ile, Ala, Gly, Val, Nle, Phe and Gln; R<sub>11</sub> is Thr or Ser; R<sub>13</sub> is His, Tyr or Glu; R<sub>17</sub> is Glu or Lys; R<sub>18</sub> is Val or Met; R<sub>21</sub> is Met, Met(O), Ile, Ala, Leu, Gly, Nle, Val, Phe or Gln; R<sub>22</sub> is Thr or Glu; R<sub>25</sub> is Asp or Glu; R<sub>26</sub> is Gln or Lys; R<sub>27</sub> is Leu, Ile, Ala, Gly, Val, Nle, Phe, Asp, Asn, Gln or Glu; R<sub>28</sub> is Ala or Lys; R<sub>32</sub> is His, Tyr or Ala; R<sub>33</sub> is Ser, Asn, Thr or Ala; R<sub>36</sub> is Lys or Leu; R<sub>41</sub> is Ala, Ile, Gly, Val, Leu, Nle, Phe, Gln or desR<sub>41</sub>, provided however that when R<sub>13</sub> is His, then R<sub>17</sub> is Glu, R<sub>18</sub> is Val, R<sub>22</sub> is Thr, R<sub>26</sub> is Gln, R<sub>28</sub> is Ala, and R<sub>36</sub> is Lys; and provided that when R<sub>13</sub> is Glu, R<sub>17</sub> is Lys, R<sub>18</sub> is Met, R<sub>22</sub> is Glu, R<sub>26</sub> is Lys, R<sub>28</sub> is Lys, R<sub>32</sub> is Ala and R<sub>36</sub> is Leu, then either R<sub>1</sub> is not pGlu-Gly or R<sub>8</sub> is not Ile or R<sub>11</sub> is Thr or R<sub>12</sub> is not Leu or R<sub>19</sub> is not Ile or R<sub>21</sub> is not Ile or R<sub>24</sub> is not Gln or R<sub>27</sub> is not Glu or R<sub>33</sub> is not Asn or R<sub>40</sub> is not Thr or R<sub>41</sub> is not Ile, and a pharmaceutically acceptable liquid or solid carrier therefor.

4,415,559

**ANTICOAGULANT**

Suguru Suzuki, Tokyo; Noritoshi Sano, Kawasaki, and Tetsuya Tajima, Nagareyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,834

Claims priority, application Japan, Feb. 12, 1981, 56-17994 Int. Cl.<sup>3</sup> A61K 31/725

U.S. Cl. 424—183 8 Claims

1. A method of treating a mammal to inhibit endogenous coagulation of the circulating blood which comprises administering to said mammal, by intravenous administration or intramuscular injection, a therapeutically effective amount of an anticoagulant composition consisting essentially of heparin having low antithrombin III affinity as an effective ingredient, in combination with a pharmacologically acceptable carrier, diluent or vehicle.

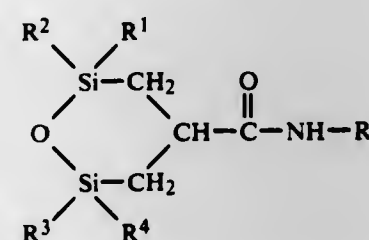
4,415,560

1-OXA-2,6-DISILACYCLOHEXANE-4-CARBOXAMIDES Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

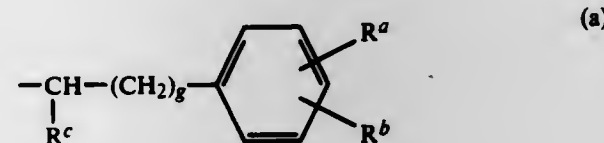
Filed Oct. 12, 1982, Ser. No. 433,464

Int. Cl.<sup>3</sup> C07F 7/08, 7/10 U.S. Cl. 424—184 15 Claims

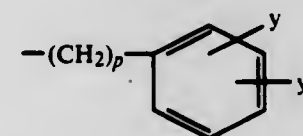
1. A compound of the formula:



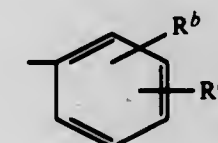
wherein each of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> is, independently, alkyl having from 1 to 4 carbon atoms; and R is of type (a) an aralkyl-type radical of the structure



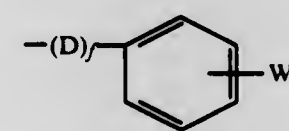
wherein g is 0, 1 or 2; R<sup>a</sup> is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl; R<sup>b</sup> is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and R<sup>c</sup> is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



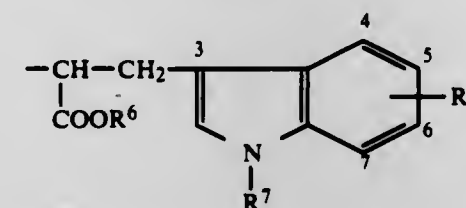
in which p is 0, 1 or 2, and y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and y' is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or subtype (iii) alkyl having from 1 to 8 carbon atoms; or R is of type (b) a phenyl-type radical of the structure



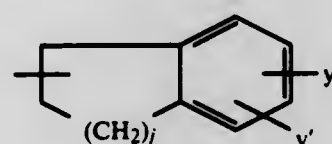
in which R<sup>b</sup> is as defined above, and R<sup>c</sup> is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or R<sup>c</sup> is a radical of the structure R<sup>c</sup>:



in which D is —CH<sub>2</sub>— or —O—; f is 0 or 1; and W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or R is of type (c) an indolyl radical of the structure:



wherein R<sup>6</sup> is as defined above; R<sup>6</sup> is alkyl having from 1 to 8 carbon atoms or benzyl; and R<sup>7</sup> is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or R is (d) a benzocycloalkyl nucleus of the structure:



wherein y and y' are as defined above; and

j is a whole integer of from 1 to 4.

4,415,561

SYNERGISTIC ARTHROPODICIDAL COMPOSITION Wolfgang Behrenz, Overath; Manfred Schütte, and Klaus Naumann, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,495

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109476

Int. Cl.<sup>3</sup> A01N 57/00, 37/00, 47/10 U.S. Cl. 424—219 7 Claims

1. An arthropodically active composition comprising an effective amount of (I) IR-(—)[(pentafluorophenyl)-methyl]-3S-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate and (II) O,O-dimethyl O-(2,2-dichlorovinyl) phosphate wherein the ratio of (I):(II) is from about 1:6 to 1:50.

4,415,562

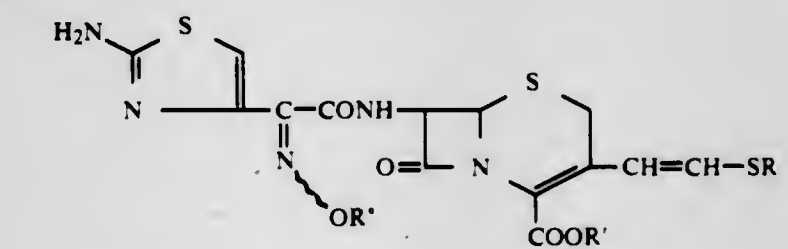
3-THIOVINYLCEPHALOSPORINS AND PHARMACEUTICAL COMPOSITIONS Daniel Farge; Pierre L. Roy, both of Thiais; Claude Moutonier, Le Plessis Robinson, and Jean-François Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 19, 1981, Ser. No. 322,901

Claims priority, application France, Nov. 20, 1980, 80 24633 The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/545; C07D 501/24 U.S. Cl. 424—246 16 Claims

1. A 3-thiovinylcephalosporin of the formula:

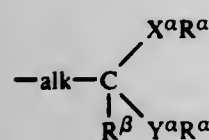


in which:  
a. the symbol R is chosen from amongst the following meanings:  
(1) alkyl, L-2-amino-2-carboxyethyl or phenyl,  
(2) pyrid-2-yl, pyrid-3-yl or pyrid-4-yl and their N-oxides,  
(3) pyrimidin-2-yl, pyridazin-3-yl substituted in the 6-position (by an alkyl, methoxy, amino or alkanoylamino radical) and optionally N-oxidised, or tetrazolo[4,5-b]pyridazin-6-yl,  
(4) 5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 4-position, or 1,3,4-triazol-5-yl or 2-alkoxycarbonyl-1,3,4-triazol-5-yl substituted in the 1-position, by  
(a) an alkyl radical which is unsubstituted or substituted by an alkoxy, alkylthio, phenyl, formyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, alkanoyl (containing 2 to 4 carbon atoms), alkoxycarbonyl or thiazolidin-2-yl radical,  
(b) an allyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl, 2-formyl-2-hydroxyethyl, 3-formyloxy-2-hydroxypropyl, 2,3-bis-formyloxypropyl or 1,3-bis-formyloxyprop-2-yl radical,  
(c) an alkyl radical containing 2 to 4 carbon atoms, which is substituted by a hydroxyl or carbamoyloxy radical, an alkanoyloxy radical (the alkanoyl part of which can be substituted by an amino, alkylamino or dialkylamino radical), an alkylsulphonyl, alkylsulphonyl, amino, alkylamino, dialkylamino, sulphonamino, alkylsulphonylamino or sulphonamoylamino radical, an alkanoylamino radical (the alkanoyl part of which is optionally substituted by hydroxyl, amino, alkylamino or dialkylamino) or an alkoxy-

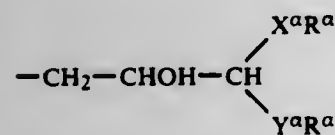


ycarbonylamino, ureido, alkylureido or dialkylureido radical,

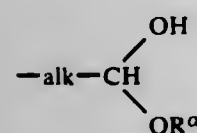
(d) a radical corresponding to one of the formulae:



or



or



in which alk is an alkylene radical containing 1 to 4 carbon atoms,  $\text{X}^{\alpha}$  and  $\text{Y}^{\alpha}$  are identical and represent oxygen or sulphur atoms and  $\text{R}^{\alpha}$  represents an alkyl radical, or alternatively  $\text{X}^{\alpha}$  and  $\text{Y}^{\alpha}$  are identical or different and represent oxygen or sulphur atoms and the radicals  $\text{R}^{\alpha}$  together form an alkylene radical containing 2 or 3 carbon atoms, and  $\text{R}^{\beta}$  represents a hydrogen atom or an alkyl radical containing 1 to 3 carbon atoms, or

(e) an alkyl radical containing 2 to 5 carbon atoms, which is substituted by an alkoxyimino or hydroxyimino radical,

(5) 1,4-dialkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl, 1-alkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl or 2-alkyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl.

(6) 1,3,4-triazol-5-yl, 1,2,3-triazol-5-yl or 1-alkyl-1,2,4-triazol-5-yl which is unsubstituted or substituted in the 3-position by alkoxy carbonyl,

(7) (a) 1,3,4-thiadiazol-5-yl which is unsubstituted or substituted by an alkyl, trifluoromethyl, alkoxy or alkylthio radical, a hydroxyalkylthio radical, the alkyl part of which contains 2 to 4 carbon atoms, or an alkylsulphonyl, hydroxyl, hydroxyalkyl, carboxyl, carboxyalkyl, amino, alkylamino, dialkylamino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkanoylamino or alkanoylaminoalkyl radical, or

(b) 1,2,4-thiadiazol-5-yl substituted by an alkyl or alkoxy radical,

(8) (a) 1,3,4-oxadiazol-5-yl which is unsubstituted or substituted by an alkyl, trifluoromethyl, phenyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl or alkanoylaminoalkyl radical, or

(b) oxazol-2-yl or 4-alkyloxazol-2-yl, and

(9) tetrazol-5-yl which is unsubstituted or substituted in the 1-position by

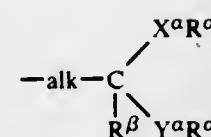
(a) an alkyl radical which is unsubstituted or substituted by alkoxy, sulphy, carboxyl, formyl or sulphamoyl,

(b) an alkyl radical containing 2 to 4 carbon atoms, which is substituted by hydroxyl, amino, alkylamino, dialkylamino, alkanoylamino, carboxyalkylamino, sulphamoylamino, sulphyamino, ureido, alkylureido or dialkylureido,

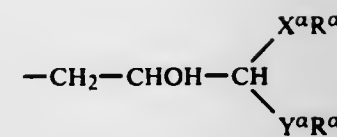
(c) an alkyl radical containing 2 to 5 carbon atoms, which is substituted by hydroxyimino or alkoxyimino,

(d) a phenyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl, 2-formyl-2-hydroxyethyl, 3-formyloxy-2-hydroxypropyl, 2,3-bis-formyloxypropyl or 1,3-bis-formyloxyprop-2-yl radical, or

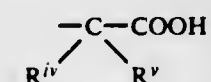
(e) a radical of the formulae:



or



in which  $\text{R}^{\beta}$  is a hydrogen atom and  $\text{X}^{\alpha}$ ,  $\text{Y}^{\alpha}$  and  $\text{R}^{\alpha}$  are defined as under (4d) above, and the symbol  $\text{R}^{\alpha}$  represents a carboxyalkyl radical of the formula:



in which the radicals  $\text{R}^{\alpha}$  and  $\text{R}^{\beta}$ , which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, or alternatively

$\beta$ . the symbol  $\text{R}$  is chosen from amongst:

1. 5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, 5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 2-position, or 1,2,4-triazol-5-yl or 3-alkoxycarbonyl-1,2,4-triazol-5-yl substituted in the 1-position, by

(a) an alkyl radical which is itself substituted by an alkoxy, alkylthio, phenyl, formyl, carbamoyl, alkylcarbamoyl or dialkylcarbamoyl radical, a hydroxyalkylcarbamoyl radical (the alkyl part of which contains 2 to 4 carbon atoms) or an alkanoyl (containing 2 to 4 carbon atoms), alkoxy-carbonyl or thiazolidin-2-yl radical,

(b) an allyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl, 2-formyl-2-hydroxyethyl, 3-formyloxy-2-hydroxypropyl, 2,3-bis-formyloxypropyl or 1,3-bis-formyloxyprop-2-yl radical,

(c) an alkyl radical containing 2 to 4 carbon atoms, which is substituted by a hydroxyl or carbamoyloxy radical, an alkanoyloxy radical (the alkanoyl part of which can be substituted by an amino, alkylamino or dialkylamino radical), an alkylsulphonyl, alkylsulphonyl, amino, alkylamino, dialkylamino, sulphyamino, alkylsulphonylamino or sulphamoylamino radical, an alkanoylamino radical (the alkanoyl part of which is optionally substituted by hydroxyl, amino, alkylamino or dialkylamino) or an alkoxy-carbonylamino, ureido, alkylureido or dialkylureido radical,

(d) a radical corresponding to one of the formulae mentioned above under (a, 4d), or

(e) an alkyl radical containing 2 to 5 carbon atoms, which is substituted by an alkoxyimino or hydroxyimino radical,

2. 5,6-dioxo-4-hydroxyalkylcarbamoylalkyl-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl, the hydroxyalkyl portion of which contains 2 to 4 carbon atoms, and

3. 1-alkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 4-position, 1-alkyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 2-position, 2-alkyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, or 4-alkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, by a formylalkyl radical or by a radical of the formula:

4,415,564

**PHARMACEUTICAL PREPARATION FOR TREATING GLAUCOMA AND OCULAR HYPERTENSION**  
Gianesare Gamba, Nyon, Switzerland, and Luciano Bonomi, Verona, Italy, assignors to Dispersa AG, Winterthur, Switzerland

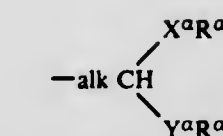
Filed Jun. 21, 1982, Ser. No. 390,110

Claims priority, application United Kingdom, Jun. 30, 1981, 8120141

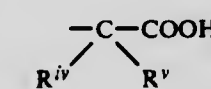
Int. Cl.<sup>3</sup> A61K 31/33

U.S. Cl. 424-244

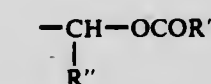
8 Claims



in which alk,  $\text{X}^{\alpha}$ ,  $\text{Y}^{\alpha}$  and  $\text{R}^{\alpha}$  are defined as above, and the symbol  $\text{R}^{\alpha}$  represents a hydrogen atom, an alkyl, vinyl or cyanomethyl radical or a radical of the formula:



as defined above, and the symbol  $\text{R}^{\alpha}$  represents a hydrogen atom or a radical which can easily be removed by an enzymatic method, of the formula:



in which  $\text{R}^{\alpha}$  represents a hydrogen atom or an alkyl radical and  $\text{R}^{\alpha}$  represents an alkyl radical or the cyclohexyl radical, it being understood that the alkyl or alkanoyl radicals and portions mentioned above are linear or branched (unless otherwise mentioned) and contain (unless otherwise mentioned) 1 to 4 carbon atoms, in its syn or anti forms and E or Z forms, and mixtures thereof, and also its addition salts with acids, its metal salts and its addition salts with nitrogen-containing bases.

15. A pharmaceutical antibacterial composition which comprises an antibacterial amount of a compound according to claim 1 in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,415,563

**VEHICLE COMPOSITION CONTAINING 1-SUBSTITUTED AZACYCLONONAN-2-ONES**

Vithal J. Rajadhyaksha, Mission Viejo, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

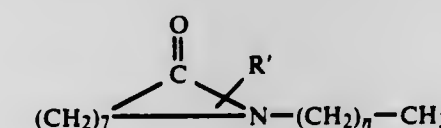
Division of Ser. No. 137,248, Apr. 4, 1980, Pat. No. 4,316,893, which is a division of Ser. No. 725,490, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,247, Jun. 19, 1975, Pat. No. 3,989,816. This application Dec. 7, 1981, Ser. No. 328,035

Int. Cl.<sup>3</sup> A61K 7/44, 11/56, 31/33, 31/70, 31/71, 31/165, 35/195, 31/505

U.S. Cl. 424-244

11 Claims

1. A composition useful for topically administering a physiologically active agent to a human or animal comprising an effective amount of a physiologically active agent and a non-toxic, effective penetrating amount of a compound having the structural formula



wherein n is 0-11 and  $\text{R}^{\alpha}$  is H or a lower alkyl group having 1-4 carbon atoms.

4,415,565

**SILVER METACHLORIDINE IN TREATMENT OF INFECTIONS**

Michael S. Wyss, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 135,059, Mar. 18, 1980, Pat. No. 4,384,117. This application Mar. 24, 1981, Ser. No. 246,984

Int. Cl.<sup>3</sup> A61K 31/555

U.S. Cl. 424-245

8 Claims

1. A method for treating topical or systemic infections caused by bacteria, fungi species, viruses, or protozoa comprising the step of administering topically, intravaginally, parentally, or orally to an infected animal an effective bactericidal, fungicidal, antiviral or protozoacidal amount of silver metachloridine.

4,415,566

**CEPHALOSPORIN DERIVATIVES**

Bernd Wetzel; Eberhard Woltun, both of Biberach; Wolfgang Reuter, Laupershausen; Roland Maier, Biberach; Uwe Lechner, Ummendorf, and Hanns Goeth, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 163,194, Jun. 26, 1980, abandoned. This application Sep. 26, 1980, Ser. No. 191,423. Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2938344

Int. Cl.<sup>3</sup> C07D 501/36; A61K 31/545

U.S. Cl. 424-246

6 Claims

4,415,567

**7 $\alpha$ -METHOXYCEPHALOSPORIN DERIVATIVES, AND ANTIBACTERIAL DRUGS CONTAINING THE SAME**

Yoshimasa Machida, Wako; Isao Saito, Aza-Sori; Seichiro Nomoto, Tokyo; Shigeto Negi, Kodaira; Hironori Ikuta, Tokyo, and Kyosuke Kitoh, Kawagoe, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 220,723, Dec. 29, 1980, Pat. No. 4,344,944. This application Feb. 18, 1982, Ser. No. 349,983

Claims priority, application Japan, Mar. 4, 1980, 55-26112; Jul. 8, 1980, 55-92199

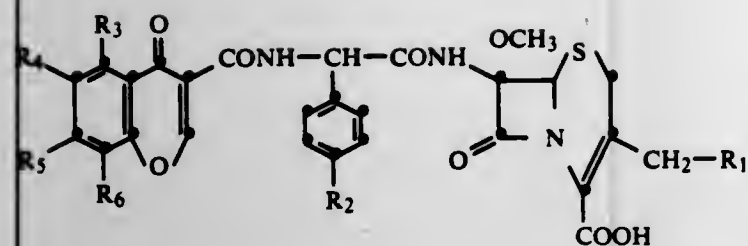
Int. Cl.<sup>3</sup> C07D 501/57; A61K 31/545

U.S. Cl. 424-246

5 Claims

1. A 7 $\alpha$ -methoxycephalosporin derivative represented by the formula



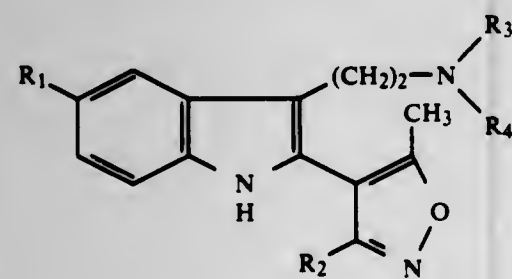


wherein R<sub>1</sub> represents lower alkanoyloxy; R<sub>2</sub> represents hydrogen or hydroxy; and R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> each represents a group selected from the class consisting of hydrogen, hydroxy, lower alkanoyloxy, methoxy, ethoxy, propoxy, methyl, ethyl, n-propyl, i-propyl, n-butyl, t-butyl, halogen, benzyloxy, phenyloxy, nitro, methoxycarbonyloxy, ethoxycarbonyloxy and 2,2,2-trichloroethoxycarbonyloxy or a pharmaceutically acceptable salt thereof.

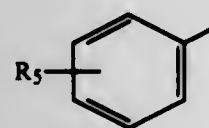
#### 4,415,568 ISOXAZOLYL INDOLAMINES FOR TREATING DIABETES

Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J. Division of Ser. No. 196,784, Oct. 14, 1980, Pat. No. 4,336,378, which is a continuation-in-part of Ser. No. 138,873, Apr. 10, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,187

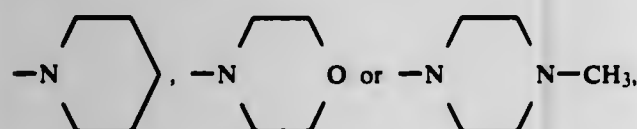
Int. Cl.<sup>3</sup> C07D 413/04, 413/14; A61K 31/42  
U.S. Cl. 424—248.4 17 Claims  
1. A pharmaceutical composition useful in treating diabetes comprising a compound of the formula



wherein  
R<sub>1</sub> represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms, and  
R<sub>2</sub> represents lower alkyl having 1 to 4 carbon atoms or



where R<sub>5</sub> represents hydrogen, fluoro, chloro, lower alkyl as defined above or lower alkoxy as defined above, and R<sub>3</sub> and R<sub>4</sub> each independently represent lower alkyl as defined above, or  
R<sub>3</sub> and R<sub>4</sub> together with N represent



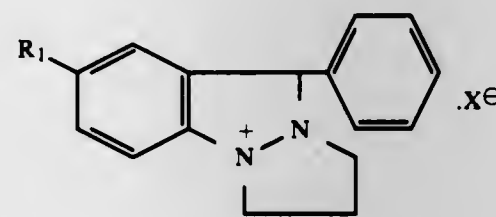
or a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier or diluent, said compound being present in an amount sufficient to provide a daily dose of 50 to 2000 milligrams of compound.

#### 4,415,569 PYRAZOLOINDAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

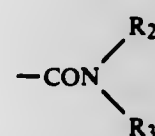
Fujimura Yasuo, Saitama; Tanaka Sadao; Matsunaga Isao, both of Tokyo; Yasuyuki Shiraki, Tokyo; Yugo Ikeda, Sayama; Tamotsu Yamazaki, Tokorozawa; Yasuhiro Ohba, Kawasaki; Kazushige Sakai, Tokyo; Shun-ichi Hata, Yokohama, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,896  
Claims priority, application Japan, Dec. 26, 1980, 55-184106  
Int. Cl.<sup>3</sup> A61K 31/415; C07D 487/04

U.S. Cl. 424—248.57 10 Claims  
1. A pyrazoloindazole derivative of the formula:

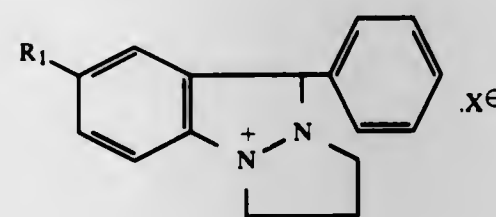


wherein R<sub>1</sub> is a cyano group, a carboxy group, a lower alkoxy-carbonyl group or a group

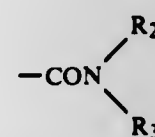


(wherein R<sub>2</sub> and R<sub>3</sub> are each a hydrogen atom, a lower alkyl group, a phenyl group which may have as a substituent a lower alkyl group having 1 to 4 carbon atoms, or when taken together with a nitrogen atom form a piperidino, piperazino, pyrrolidino or morpholino group); X<sup>⊖</sup> is a counter ion.

10. A pharmaceutical composition having bronchodilating activity comprising an amount sufficient to effect bronchodilation of a compound of the formula:

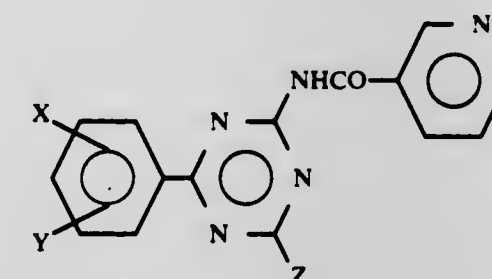


wherein R<sub>1</sub> is a cyano group, a carboxy group, a lower alkoxy-carbonyl group or a group



(wherein R<sub>2</sub> and R<sub>3</sub> are each a hydrogen atom, a lower alkyl group, a phenyl group which may have as a substituent a lower alkyl group having 1 to 4 carbon atoms, or when taken together with a nitrogen atom form a piperidino, piperazino, pyrrolidino or morpholino group); X<sup>⊖</sup> is a counter ion; and a pharmaceutically acceptable carrier.

4,415,570  
NICOTINIC ACID DERIVATIVES  
Hiroshi Enomoto, Nagaokakyō; Akira Nomura, Hirakata; Yoshiaki Aoyagi, Otsu, and Yoshihisa Shibata, Kameoka, all of Japan, assignors to Nippon Shinyaku Co. Ltd., Japan  
Filed Jun. 1, 1982, Ser. No. 383,703  
Claims priority, application Japan, Jun. 5, 1981, 56-87124  
Int. Cl.<sup>3</sup> A61K 31/53; C07D 401/12  
U.S. Cl. 424—249 7 Claims  
1. A compound of the formula



wherein

X is halogen, hydroxy, lower alkyl, lower alkenyl, lower alkoxy, nitro or amino;

Y is hydrogen, halogen, hydroxy, lower alkyl, lower alkenyl, lower alkoxy, nitro or amino; and

Z is mono-(lower alkyl)amino, di-(lower alkyl) amino, piperidino, piperazino, pyrrolidino, or morpholino.

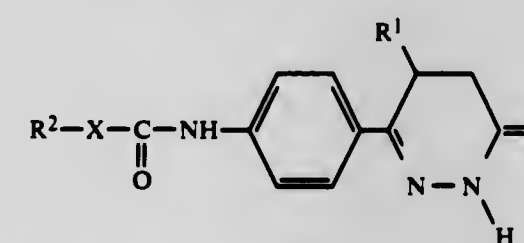
7. A method of treating a human or animal suffering from rheumatism or allergic nephritis, which comprises administering to the sufferer an effective amount of a compound or pharmaceutically acceptable salt thereof according to claim 1.

#### 4,415,571 CARBAMATE DIHYDROPYRIDAZINONES, THEIR PREPARATION AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Marco Thyges, Ludwigshafen; Albrecht Franke, Wachenheim; Horst Koenig; Dieter Lenke, both of Ludwigshafen; Hans D. Lehmann, Hirschberg-Leutershausen, and Josef Gries, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed Jun. 9, 1981, Ser. No. 272,016

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022177; Sep. 8, 1980, 3033702  
Int. Cl.<sup>3</sup> C07D 237/04; A61K 31/50

U.S. Cl. 424—250 4 Claims  
1. A compound of the formula I

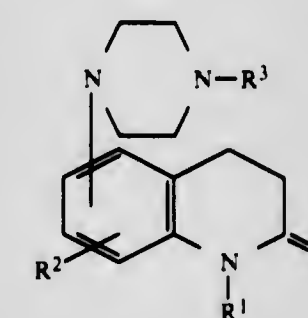


where X is oxygen or sulfur, R<sup>1</sup> is methyl and R<sup>2</sup> is alkyl of 1 to 4 carbon atoms which is unsubstituted or contains up to three chlorine, bromine or fluorine atoms, alkyl of 2 to 4 carbon atoms which is substituted by alkoxy of 1 to 3 carbon atoms which is separated from X by not less than two carbon atoms, alkyl of 1 to 3 carbon atoms which is substituted by cycloalkyl which has 3 to 6 carbon atoms in the ring and may or may not carry one or two alkyls of 1 to 3 carbon atoms, alkyl of 1 to 4 carbon atoms which is substituted by phenyl which itself is unsubstituted or substituted by one to three identical or different substituents chosen from alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halogen, trifluoromethyl and nitro, cycloalkyl of 3 to 6 carbon atoms in the ring, which is unsubstituted or substituted by one to four alkyls of 1 to 4 carbon atoms, alkenyl of 3 to 5 carbon atoms, alkynyl

of 3 to 5 carbon atoms or phenyl which is unsubstituted or substituted by one to three identical or different substituents chosen from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl, cyano and nitro.

2. A therapeutic agent for treating thrombotic diseases which comprises: a pharmaceutically acceptable carrier or diluent for oral administration and an effective amount of a compound of the formula I of claim 1.

4,415,572  
PIPERAZINYLCARBOSTYRIL COMPOUNDS  
Michiaki Tomimaga; Yung h. Yang; Hidenori Ogawa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan  
Filed Oct. 30, 1981, Ser. No. 316,572  
Claims priority, application Japan, Oct. 31, 1980, 55-154071  
Int. Cl.<sup>3</sup> C07D 401/00; A61K 31/495  
U.S. Cl. 424—250 27 Claims  
1. A carbostyryl compound of the formula (I)



wherein

R<sup>1</sup> represents a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, or a phenyl-lower alkyl group;

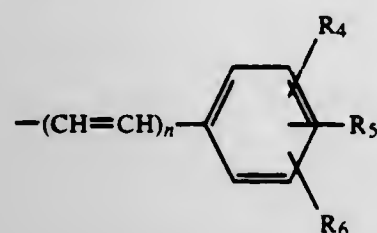
R<sup>2</sup> represents a hydrogen atom or a lower alkoxy group;

R<sup>3</sup> represents a hydrogen atom, a lower alkanoyl group, a furoyl group, a pyridylcarbonyl group, a lower alkanesulfonyl group, a lower alkoxy-carbonyl group, a lower alkoxy-carbonyl-lower alkyl group, a phenylsulfonyl group which may be substituted with a lower alkyl group on the benzene ring thereof, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a phenylcarbonyl group, a phenyl-lower alkyl group, or a phenyl-lower alkanoyl group where each of said phenylcarbonyl group, phenyl-lower alkyl group and phenyl-lower alkanoyl group may be substituted with 1 to 3 of a lower alkoxy group, a halogen atom, a lower alkyl group, a cyano group, a nitro group, an amino group, a hydroxy group, a lower alkanoylamino group, a lower alkylthio group and a lower alkanoyloxy group, or with a lower alkylenedioxy group on the benzene ring thereof; and the bonding between the 3- and 4-positions of the carbostyryl nucleus is a single bond or a double bond; or its pharmaceutically acceptable salt.

4,415,573  
NOVEL URACIL DERIVATIVES, PROCESS FOR PREPARING THE SAME AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME  
Kiyoshige Ochi, Kawagoe; Katsuhito Miyamoto, Tokyo; Hiroki Mitsui, Iruma; Yumiko Tsuruma; Isao Matsunaga, both of Tokyo; Takashi Matsuno, Omiya; Shigeru Takanashi, Asaka, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 10, 1981, Ser. No. 291,847  
Claims priority, application Japan, Aug. 19, 1980, 55-112993  
Int. Cl.<sup>3</sup> A61K 31/505; C07D 239/10  
U.S. Cl. 424—251 10 Claims  
1. An uracil derivative of the formula ,0390



wherein  $R_1$  is a hydrogen atom, an alkyl group of 1-14 carbons, a cycloalkyl group of 3-8 carbons or



(wherein  $n$  is 0 or 1;  $R_4$ ,  $R_5$  and  $R_6$  are the same or different and means a hydrogen atom, an alkyl group of 1-5 carbons, an alkoxy group of 1-6 carbons, an alkenyloxy group, a hydroxy group, an acyloxy group of 2-4 carbons, a halogen atom or a nitro group; and two of  $R_4$ ,  $R_5$  and  $R_6$  may be taken together to form an alkylene dioxy group);  $R_2$  is a hydrogen atom or an alkyl group of 1-5 carbons;  $R_3$  is a hydrogen atom, an acyl group of 1-5 carbons, an unsubstituted or alkyl-substituted phenylsulfonyl group or an alkylsulfonyl group; and  $X$  is a hydrogen atom, a halogen atom or an alkyl group of 1-4 carbons which may be substituted with one or more halogen atoms, provided that when  $X$  is an alkyl, all of  $R_1$ ,  $R_2$  and  $R_3$  are not a hydrogen atom simultaneously or two of said  $R_1$ ,  $R_2$  and  $R_3$  are not hydrogen while a third is methyl simultaneously; and pharmaceutically acceptable salts thereof.

6. A pharmaceutical anti-tumor composition comprising an anti-tumor effective amount of an uracil derivative or its pharmaceutically acceptable salt according to claim 1 and a pharmaceutically acceptable diluent.

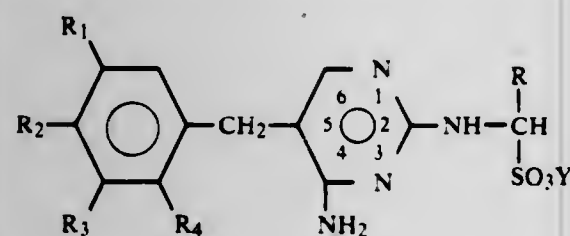
4,415,574

#### NOVEL SOLUBLE $N_2$ SUBSTITUTED DERIVATIVES OF 2,4-DIAMINO 5-BENZYL PYRIMIDINE. PROCESS FOR THEIR PREPARATION AND MEDICAMENTS CONTAINING THEM

Claude Laruelle, Villeneuve Loubet, and Marcel Lepant, Vence, both of France, assignors to S. A. Panmedica, Carros, France  
Filed Mar. 15, 1982, Ser. No. 358,260

Claims priority, application France, Mar. 20, 1981, 81 05592  
Int. Cl.<sup>3</sup> C07D 239/49, 401/12; A61K 31/505

U.S. Cl. 424-251 39 Claims  
1. Novel soluble  $N_2$  substituted derivative of 2,4-diamino 5-benzyl pyrimidine corresponding to the formula III.



in which:

$R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$  which may be identical or different, represent a hydrogen atom, a halogen atom or an alkyl, thioalkyl, alkoxy or benzyloxy, alkoxyalkoxy group;  
 $Y$  represents a hydrogen atom, an alkali metal or a pharmaceutically compatible organic base, and  
 $R$  represents a hydrogen atom or a linear or branched alkyl radical of 1 to 7 carbon atoms, a cycloalkyl radical of 5 to 8 carbon atoms, an aromatic nucleus possibly substituted by halogen, nitro-, hydroxyl, dialkylamino-, alkoxy-, alkyl from  $C_1$  to  $C_3$ , two adjacent substituents being able to constitute an alkyldioxy-ring or, a heterocyclic ring of furane, thiophene, or pyridine.

36. Medicament useful in human and/or veterinary medicine against bacteria, containing 50-1000 mg of at least one compound according to claim 1 in the pure state or in association with one or several other active principles and one or several

compatible and pharmaceutically acceptable adjuvants or diluents.

4,415,575

#### SUPPRESSION OF GASTRIC ACID SECRETION USING PYRIMIDYL CARBAMATES

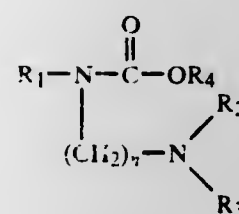
William A. Bolhofer, Frederick, and John D. Prugh, Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.  
Continuation of Ser. No. 137,061, Apr. 3, 1980, abandoned, which is a division of Ser. No. 20,147, Mar. 13, 1979, Pat. No. 4,226,871. This application Feb. 5, 1982, Ser. No. 345,957

Int. Cl.<sup>3</sup> A61K 31/505

U.S. Cl. 424-251

2 Claims

2. A composition for the suppression of gastric acid secretions which comprises a pharmaceutically inert carrier and an effective amount of a compound having the formula



wherein

$n$  is 2 to 4;

$R_1$  is pyrimidyl, which may optionally be substituted with one, two or three of loweralkyl, halogen, trifluoromethyl, loweralkoxy, loweralkylthio, loweralkylsulfonyl or mixtures thereof;

$R_2$  and  $R_3$  are loweralkyl; and

$R_4$  is loweralkyl or phenyl and the pharmaceutically acceptable acid addition salts thereof.

4,415,576

#### METHOD FOR PREVENTING BODY FAT DEPOSITION IN MAMMALS

Ronald T. Stanko, Pittsburgh, Pa., assignor to Montefiore Hospital, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 249,812, Apr. 1, 1981, Pat. No. 4,351,835. This application Feb. 9, 1982, Ser. No. 346,181

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/12, 31/19, 31/525

U.S. Cl. 424-252

6 Claims

1. A method for inhibiting body fat while increasing body protein concentration in a mammal, which comprises administering orally to said mammal effective amounts of a therapeutic mixture of pyruvate and dihydroxyacetone for a given diet.

4,415,577

#### BIS-SPARTEINE DERIVATIVES AND METHOD OF USING SAME IN THERAPY

Bernd Hachmeister, Wolfgang Kehrback, Ulrich Kuehl, and Gerd Buschmann, all of Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,207

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032219

Int. Cl.<sup>3</sup> A61K 31/435; C07D 471/22

U.S. Cl. 424-258

5 Claims

1. A dimeric sparteine derivative selected from the group consisting of 17S, 17'S-bissparteine of the Formula

4,415,579

#### PYRIDINE DERIVATIVES

Roger Crossley, Reading, England, assignor to John Wyeth and Brother Limited, Maidenhead, England  
Division of Ser. No. 232,451, Feb. 9, 1981, Pat. No. 4,337,259.  
This application Mar. 1, 1982, Ser. No. 353,556

Claims priority, application United Kingdom, Feb. 20, 1980, 8005669

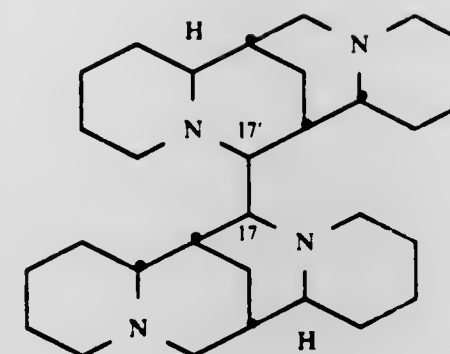
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/44; C07D 213/62, 213/28, 213/44

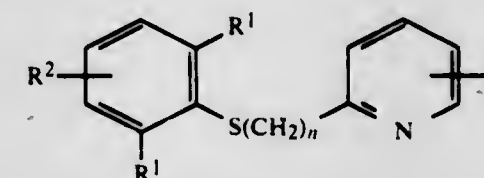
U.S. Cl. 424-263

3 Claims

1. A compound of formula II



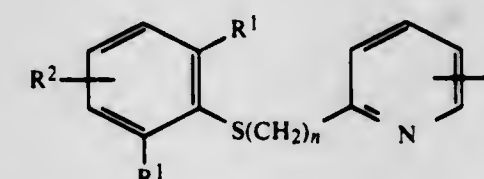
and its physiologically compatible acid addition salts.



(II)

wherein  $R$  represents phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl or aralkyl of 7 to 12 carbon atoms,  $R^1$  represents hydrogen or lower alkoxy,  $R^2$  represents hydrogen, chlorine or trifluoromethyl and  $n$  is 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

3. A method of treating ulcers or hypersecretion in a mammal, which method comprises orally administering to said mammal in need of such treatment an effective amount of a compound of formula I



(II)

wherein  $R$  represents phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl or aralkyl of 7 to 12 carbon atoms,  $R^1$  represents hydrogen or lower alkoxy,  $R^2$  represents hydrogen, chlorine or trifluoromethyl and  $n$  is 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

4,415,580

#### CERTAIN 2-(1H)-PYRIDINONES CARDIOTONIC COMPOSITIONS CONTAINING SAME AND METHOD OF USING SAME

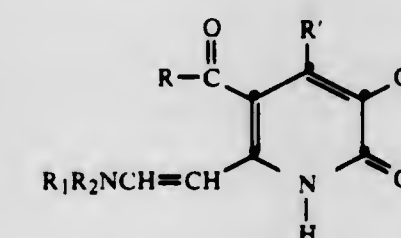
George Y. Leshner, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.  
Filed Aug. 2, 1982, Ser. No. 404,454

Int. Cl.<sup>3</sup> A61K 31/44; C07D 213/50

U.S. Cl. 424-263

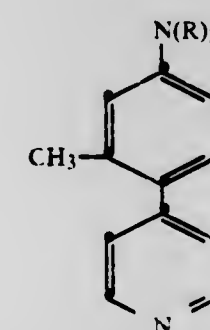
14 Claims

1. 3-Q'-4-R'-5-(RCO)-6-[2-(di-lower-alkylamino)ethenyl]-2(1H)-pyridinone having the formula



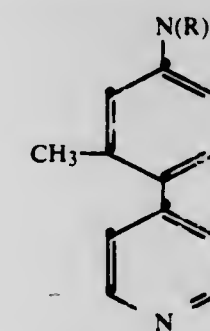
or acid-addition salt thereof, where  $Q'$  is hydrogen or cyano,  $R'$  is hydrogen or methyl, and  $R$ ,  $R_1$  and  $R_2$  are each lower-alkyl.

11. A method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotionically effective amount of the 3-Q'-4-R'-5-(RCO)-



where  $R$  is hydrogen or lower-alkyl or a pharmaceutically acceptable acid-addition salt thereof.

5. A cardiotionic composition for increasing cardiac contractility, said composition comprising a pharmaceutically acceptable inert carrier and, as the active component thereof, an effective amount of a compound having the formula:



where  $R$  is hydrogen or a pharmaceutically acceptable acid-addition salt thereof.



6-[2-(R<sub>1</sub>R<sub>2</sub>N)-ethenyl]-2(1H)-pyridinone of claim 1 or pharmaceutically acceptable acid-addition salt thereof, where R<sup>1</sup>, R<sup>2</sup>, R<sub>1</sub> and R<sub>2</sub> have the meanings given in claim 1 and Q<sup>1</sup> is hydrogen.

4,415,581

# 1-[3,6-FLUORO-1,2-BENZISOXAZOL-3-YL]PROPYL-4-HYDROXY-4-PHENYLPYPERIDINES TO TREAT PSYCHOSES

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 366,247, Apr. 9, 1982, Pat. No. 4,396,770.

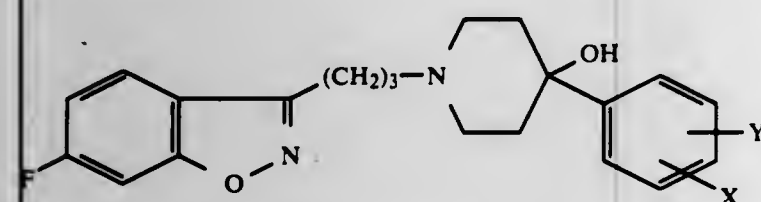
This application May 18, 1983, Ser. No. 495,905

Int. Cl.<sup>3</sup> A61K 31/445

U.S. Cl. 424—267

10 Claims

1. A method of treating psychoses comprising administering to a mammal in need of psychoses treatment a psychoses treating effective amount of a compound of the formula



wherein X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, halogen or trifluoromethyl; Y is hydrogen or trifluoromethyl with the proviso that Y is hydrogen when X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, or trifluoromethyl and Y is hydrogen or trifluoromethyl when X is halogen; the optical antipode thereof; or a pharmaceutically acceptable acid addition salt thereof.

4,415,582

# METHOD OF TREATING ULCERS OR HYPERSECRETION

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth and Brother Limited, Maidenhead, England

Division of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 351,837

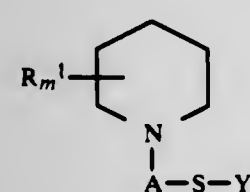
Claims priority, application United Kingdom, Dec. 16, 1978, 48813/78

Int. Cl.<sup>3</sup> A61K 31/445

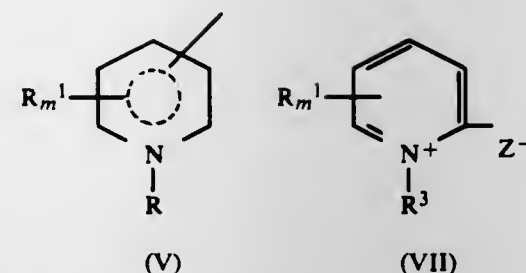
U.S. Cl. 424—267

2 Claims

1. A method of treating ulcers or hypersecretion in a mammal which comprises administering to said mammal an effective anti-ulcer amount of a compound of formula I



wherein Y is



wherein R is hydrogen or lower alkyl, R<sup>1</sup> is hydrogen, lower alkyl, hydroxylower alkyl, loweralkoxyloweralkyl, loweralkoxy, halogen, formyl, phenyl, phenylalkyl or CH(OR<sup>4</sup>)<sub>2</sub> where R<sup>4</sup> is lower alkyl or two R<sup>4</sup> radicals are joined to form a lower alkylene chain, m is 1 or 2, the dotted lines in formula V represent an optional double bond in one of the indicated positions, the nitrogen atom carrying a positive charge when a double bond is in the position adjacent thereto, A is an alkylene radical having from 1 to 6 carbon atoms, which may be substituted by lower alkyl of 1 to 6 carbon atoms, S is sulphur, R<sup>3</sup> is loweralkyl, phenyl or aralkyl of 7 to 12 carbon atoms, Z<sup>-</sup> is an anion, or a pharmaceutically acceptable acid addition salt thereof, with the proviso that when more than one R<sup>1</sup> radical is present in the molecule then the R<sup>1</sup> radicals may be the same or different.

4,415,583

# PROCESS FOR INDUCING HYPNOSIS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 134,596, Mar. 27, 1980, abandoned, which is a continuation of Ser. No. 26,937, Apr. 4, 1979,

abandoned, which is a continuation of Ser. No. 910,562, May 30, 1978, abandoned, which is a continuation of Ser. No. 821,591,

Aug. 4, 1977, abandoned, which is a continuation of Ser. No. 729,294, Oct. 4, 1976, abandoned, which is a continuation of Ser. No. 284,160, Aug. 28, 1972, abandoned. This application Mar.

25, 1981, Ser. No. 247,424

Int. Cl.<sup>3</sup> A61K 31/41

U.S. Cl. 424—269

4 Claims

1. A process for inducing sleep comprising the administration to a human or animal subject in need of said treatment, in unit dosage form, from about 0.007 mg. to about 0.5 mg./kg. body weight of 1-hydroxymethyl-6-(o-chlorophenyl)-4H-s-triazolo[4,3-a][1,4]benzodiazepine or the pharmacologically acceptable acid addition salt, acetate or hydrogen succinate ester, or (5) N-oxide thereof in association with a pharmaceutical carrier.

4,415,584

# 3-OXO-6-OXA-2-AZATRICYCLO 5.4.2. UNADECENE-4-CARBOXYLATE

Eric Hunt, Betchworth, England, assignor to Beecham Group Limited, England

Filed Jan. 25, 1979, Ser. No. 6,436

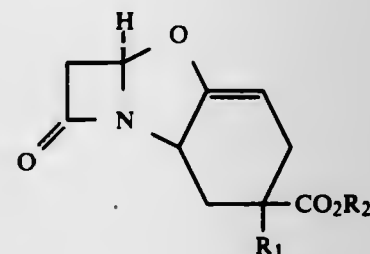
Claims priority, application United Kingdom, Feb. 2, 1978, 4152/78

Int. Cl.<sup>3</sup> C07D 498/04; A61K 31/42

U.S. Cl. 424—272

66 Claims

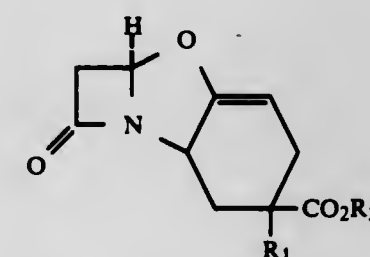
1. A compound of the formula (II):



(II)

wherein R<sub>1</sub> is hydrogen or alkyl of 1 to 4 carbon atoms and CO<sub>2</sub>R<sub>2</sub> is carboxyl or a pharmaceutically acceptable salt thereof.

26. A pharmaceutical composition useful for effecting  $\beta$ -lactamase inhibition in mammals including humans which comprises a  $\beta$ -lactamase inhibitory amount of a compound of the formula (II):



wherein R<sub>1</sub> is hydrogen or alkyl of 1 to 4 carbon atoms and CO<sub>2</sub>R<sub>2</sub> is carboxyl or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,415,585

# CONTRACEPTIVE METHOD

Cathy L. Joyce, Oak Park, and Lourens J. D. Zaneveld, Chicago, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

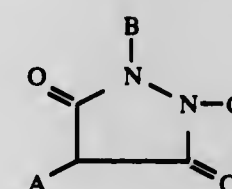
Filed Mar. 11, 1982, Ser. No. 357,160

Int. Cl.<sup>3</sup> A61K 31/53, 31/415

U.S. Cl. 424—273 P

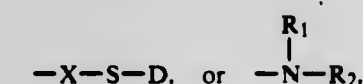
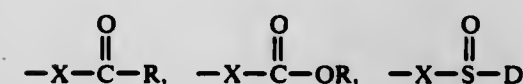
6 Claims

1. A method for inhibiting conception in a female mammal which comprises maintaining in the genital tract of said mammal an effective amount of a compound having the formula



wherein

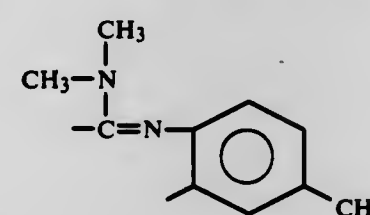
A is hydrogen, halo, trihalomethyl, lower alkyl, —X—OH,



X is a lower alkylene group,

R, R<sub>1</sub>, and R<sub>2</sub> are hydrogen, or the same or different lower alkyl groups, and

B, C, and D, which can be the same or different, are phenyl, hydroxyphenyl or lower alkylphenyl, further provided that B and C together can form the chain



# 4,415,586 COMBATING FUNGI WITH ACYLATED IMIDAZOLYL-GAMMA-FLUOROPINACOLYL DERIVATIVES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Jörg Stetter, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

(II) Continuation of Ser. No. 187,867, Sep. 17, 1980, abandoned. This application May 10, 1982, Ser. No. 376,802

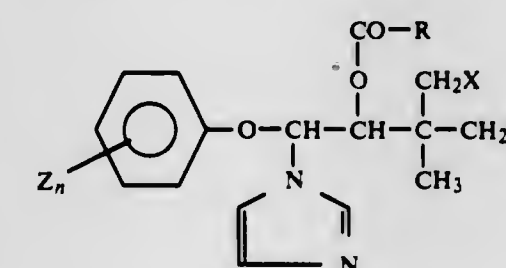
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1979, 2938575

Int. Cl.<sup>3</sup> A01N 43/50, 59/16; C07D 23/60; C07F 15/00

U.S. Cl. 424—273 R

8 Claims

1. A compound of the formula



in which

R represents straight-chain or branched alkyl with 1 to 8 carbon atoms, straight-chain or branched alkenyl or alkynyl with in either case 2 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, alkoxy with 1 to 4 carbon atoms, alkoxyalkyl with 1 to 4 carbon atoms in each alkyl part, cycloalkyl with 5 to 7 carbon atoms, optionally substituted phenyl or phenylalkyl or phenoxyalkyl which are optionally substituted in the phenyl part and have in each case up to 2 carbon atoms in the alkyl part, the substituents in the phenyl part in the last three cases being selected from halogen, cyano, nitro and alkyl and alkoxy with in either case 1 to 2 carbon atoms, or R represents alkylamino with 1 to 12 carbon atoms, dialkylamino with 1 to 4 carbon atoms in each alkyl part, halogenoalkylamino with up to 4 carbon atoms and up to 5 identical or different halogen atoms, alkoxy-carbonylamino with 1 to 4 carbon atoms in the alkyl part, alkoxyalkylamino with 1 to 4 carbon atoms in each alkyl part or optionally monosubstituted or polysubstituted phenylamino, the substituents being selected from halogen, nitro, cyano, straight-chain or branched alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with in either case 1 or 2 carbon atoms and up to 5 identical or different halogen atoms and alkoxy-carbonylalkenyl with 1 to 4 carbon atoms in the alkyl part and 2 to 4 carbon atoms in the alkenyl part,

X represents hydrogen or fluorine,

Z represents halogen, cyano, nitro, straight-chain or branched alkyl with up to 4 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, halogenoalkyl with up to 2 carbon atoms and up to 5 halogen atoms, alkoxy-carbonyl with a total of up to 5 carbon atoms, alkoxy or alkylthio with in either case up to 2 carbon atoms or optionally substituted phenyl or phenoxy, the substituents being selected from halogen, amino, cyano, nitro and alkyl with 1 to 2 carbon atoms, or Z represents optionally substituted phenylalkyl with 1 to 2 carbon atoms in the alkyl part, the substituent in the alkyl part being alkyl-carbonyloxy with a total of up to 3 carbon atoms, and each substituent in the phenyl part being halogen, nitro or cyano, and

n represents 0, 1, 2, 3, 4 or 5, or an acid addition salt with a hydrogen halide acid, phosphoric acid, nitric acid, sulphuric acid, a sulphonic acid or a monofunctional or bifunctional carboxylic or hydroxycarboxylic acid, or a complex thereof with a metal salt, of which the metal is copper, zinc, manganese, magnesium, tin, iron or nickel



and of which the anion is halide, nitrate, sulphate or phosphate.

6. A fungicidal composition containing as active ingredient a fungidically effective amount of a compound, salt or complex according to claim 1 in admixture with a diluent.

7. A method of combating fungi comprising applying to the fungi, or to a habitat thereof, a fungidically effective amount of a compound, salt or complex according to claim 1.

**4,415,587**  
**METHOD OF USE OF ANTIARRHYTHMIC**  
**1-ARYLCARBAMOYLALKYL IMIDAZOLE**  
**DERIVATIVES, COMPOSITION**

Julius Diamond, Mountain Lakes; Thomas K. Morgan, Jr., and Ronald A. Wohl, both of Morris Plains, all of N.J., assignors to Berlex Laboratories, Inc., Cedar Knolls, N.J.

Division of Ser. No. 275,172, Jun. 19, 1981, Pat. No. 4,353,921.

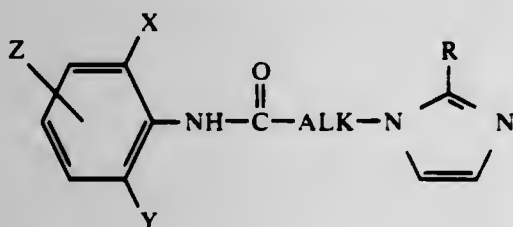
This application Aug. 12, 1982, Ser. No. 407,400

Int. Cl.<sup>3</sup> A61K 31/415

U.S. Cl. 424—273 R

2 Claims

1. The method for the suppression of cardiac arrhythmia in an animal which comprises administering to said animal an amount effective for the suppression of said arrhythmia of a compound according to the formula:



wherein

R = C<sub>1</sub>-C<sub>8</sub> alkyl, phenyl, substituted phenyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, C<sub>4</sub>-C<sub>8</sub> cycloalkylalkyl;

X = C<sub>1</sub>-C<sub>4</sub> alkyl, fluoro, chloro, bromo, trifluoromethyl;

Y = hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, fluoro, chloro, bromo;

Z = hydrogen, hydroxy, fluoro, chloro, bromo, methyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> acyloxy;

ALK = straight or branched chain alkylene having up to 8 carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

**4,415,588**  
**THERAPEUTICAL METHOD OF TREATING PATIENTS**  
**WITH IMPAIRED IMMUNE SYSTEM**

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jul. 8, 1982, Ser. No. 396,279

Claims priority, application Italy, Jul. 9, 1981, 48866 A/81

Int. Cl.<sup>3</sup> A61K 31/22, 31/205

U.S. Cl. 424—311

3 Claims

1. The method of stimulating the immune system of living animals by enhancing mitogenic stimulation, B- and T-lymphocyte cooperation, and cell chemotaxis which comprises orally or parenterally administering to an animal in need of such enhancement an effective amount of acetylcarnitine.

**4,415,589**  
**USE OF CARNITINE AND OF LOWER**  
**ACYL-CARNITINES IN THE THERAPEUTIC**  
**TREATMENT OF THE PATHOLOGY OF THE VEINS**

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Nov. 1, 1982, Ser. No. 438,012

Claims priority, application Italy, Nov. 6, 1981, 49655 A/81

Int. Cl.<sup>3</sup> A61K 31/22, 31/205

U.S. Cl. 424—311

3 Claims

1. A therapeutic method for the treatment of a patient affected by venous stasis which comprises orally or parenterally administering to said patient a therapeutically effective

amount of carnitine, a lower acyl-carnitine wherein the acyl radical contains from 2 to 4 carbon atoms or a pharmaceutically acceptable salt thereof.

**4,415,590**  
**HERPES TREATMENT**  
Koert Gerzon, Indianapolis, Ind., assignor to BetaMED Pharmaceuticals, Inc., Indianapolis, Ind.

Filed Apr. 26, 1982, Ser. No. 372,176

Int. Cl.<sup>3</sup> A61K 31/195

U.S. Cl. 424—319

7 Claims

1. A method for the control of herpes virus infections in man which comprises contacting the herpes lesions, topically or by injection, with a dose of L-lysine L-glutamate effective to control the said infections.

**4,415,591**  
**USE OF AMINOALKYL PHENYL SULFIDE**  
**DERIVATIVES FOR THE TREATMENT OF**  
**HYPERTENSION**

Sheldon W. May, Atlanta, Ga.; Robert S. Phillips, Gaithersburg, Md.; Heath H. Herman, Chamblee, and Patricia W. Mueller, Decatur, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

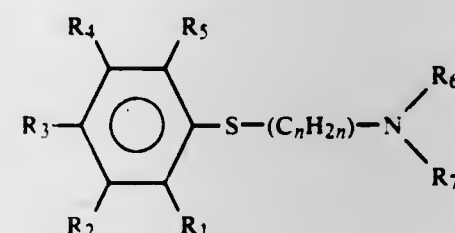
Filed Jun. 4, 1981, Ser. No. 270,247

Int. Cl.<sup>3</sup> A61K 31/10

U.S. Cl. 424—330

8 Claims

1. A method for treating hypertension in mammals comprising administering to said mammal an effective amount of an aminoalkyl phenyl sulfide having the formula:



wherein

(C<sub>n</sub>H<sub>2n</sub>) = a linear or branched alkyl chain of 10 carbons or less (n = 1-10);

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> = H, OH, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, F, Cl, Br, or I;

R<sub>6</sub>, R<sub>7</sub> = H, C<sub>1</sub>-C<sub>4</sub> alkyl;

or a pharmaceutically acceptable salt thereof.

**4,415,592**  
**15-DEOXY-16-HYDROXY PROSTAGLANDINS FOR**  
**PRODUCING BRONCHODILATION**

Harold C. Kluender; Warren D. Woessner, and William G. Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

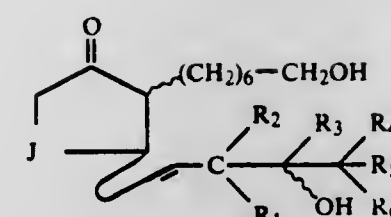
Division of Ser. No. 215,802, Dec. 12, 1980, Pat. No. 4,331,688, which is a division of Ser. No. 973,010, Dec. 26, 1978, Pat. No. 4,275,224, which is a division of Ser. No. 880,501, Feb. 23, 1978, Pat. No. 4,132,738. This application Mar. 12, 1982, Ser. No. 357,428

Int. Cl.<sup>3</sup> A61K 31/12

U.S. Cl. 424—331

14 Claims

1. A therapeutic method for producing bronchodilation in an individual for whom such therapy is indicated, comprising: administering to the individual an effective bronchodilating amount of a compound having the formula:

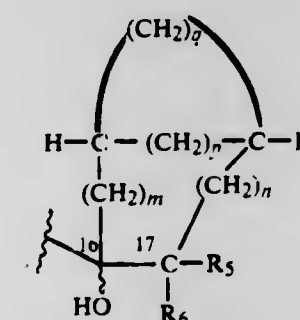


wherein:

J is selected from the group consisting of R-hydroxymethylene and S-hydroxymethylene;

R<sub>1</sub> and R<sub>2</sub> are hydrogen;

R<sub>3</sub> is selected from the group consisting of hydrogen and methyl, or together with R<sub>4</sub> is a methylene or a lower alkylated methylene chain of 2 to 5 carbon atoms such that a cycloalkyl or a lower alkylated cycloalkyl of 4 to 7 carbon atoms inclusive is formed, or together with R<sub>4</sub> is a bicycloalkyl or bicycloalkenyl moiety having the formula:



such that a bicycloalkyl or bicycloalkenyl compound is formed, wherein m and n are integers having a value of from 0 to 3, p is an integer having a value of from 0 to 4 and q is an integer having a value of from 1 to 3 and wherein the double bond of such bicycloalkenyl is in the m, n, p or q bridge;

R<sub>4</sub> together with R<sub>3</sub> forms a cycloalkyl or a lower alkylated cycloalkyl, bicycloalkyl or bicycloalkenyl as defined above, or together with R<sub>5</sub> is a methylene chain of 3 to 4 carbon atoms such that a cycloalkyl of 4 to 5 carbon atoms inclusive is formed;

R<sub>5</sub> is selected from the group consisting of hydrogen, straight-chain alkyl having from 1 to 3 carbon atoms or together with R<sub>4</sub> forms a cycloalkyl as defined above; and R<sub>6</sub> is selected from the group consisting of hydrogen or straight-chain alkyl having from 1 to 3 carbon atoms.

**4,415,593**  
**CHEWING GUM BASE**  
Michael Glass, Flushing; Edwin R. Koch, Garden City, and Vincent Corsello, Albertson, all of N.Y., assignors to Warner Lambert Company, Morris Plains, N.J.

Filed Apr. 28, 1982, Ser. No. 372,599

Int. Cl.<sup>3</sup> A23G 3/30

U.S. Cl. 426—4

5 Claims

1. A chewing gum base for use in producing chewing gum having improved non-stick chewing qualities comprising a natural polyisoprene rubber, inorganic fillers, plasticizers, non-toxic vinyl polymer, emulsifying agents and solvents for the rubber components wherein the improvement comprises the use of a polyisoprene rubber obtained from the guayule shrub.

**4,415,594**  
**MANUFACTURE OF CHEESE**  
Joseph Czulak, South Yarra, and Lealle A. Hammond, Beaumaris, both of Australia, assignors to Australian Dairy Corporation, Melbourne, Australia

Filed Dec. 30, 1981, Ser. No. 335,495

Claims priority, application Australia, Feb. 6, 1981, PE7502/81

Int. Cl.<sup>3</sup> A23C 19/032, 19/045, 19/072

U.S. Cl. 426—36

6 Claims

1. A process of making cheese comprising the steps of adding *Streptococcus thermophilus* together with one or more bacteria selected from the group consisting of *Streptococcus lactis*, *Streptococcus cremoris*, and *Streptococcus diacetylactis*, and rennet to milk to produce a coagulum, cutting the coagulum to produce a curd-whey mixture, stirring the curd-whey mixture and effecting a first cooking by raising the temperature gradually to about 38° C. over a period of 35 to 45 minutes and maintaining that temperature for about 25 minutes, draining off about one half of the whey and effecting a second cooking by raising the temperature of the residual whey and curd over a period of about 10 minutes to a temperature between 40° C. and 49° C. and maintaining that temperature for about 25 minutes, draining the residual whey from the curd and cheddaring the drained curd at a temperature between 40° C. and 49° C. for about 30 minutes, cutting the cheddared curd into large pieces and salting, stirring, and compressing the curd pieces into blocks.

**4,415,595**  
**MARSHMALLOW FROZEN CONFECTION**  
Toshio Takemori, Tokyo; Masateru Kato, Urawa, and Fumio Masuda, Showa, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,406

Claims priority, application Japan, Nov. 29, 1980, 55-167385

Int. Cl.<sup>3</sup> A23G 3/00, 9/00

U.S. Cl. 426—101

1 Claim

1. A food product comprising in combination a marshmallow exterior and a frozen confection interior said marshmallow having a multi-cellular structure retentive of shape, elasticity and softness when stored at a temperature below -15° C. and consisting essentially of 20 to 25 wt. % water, at least 60 wt. % sugar and the remainder gelatine, said frozen confection being selected from the group consisting of ice cream and sherbert, and wherein said frozen confection is embedded in and covered completely by said marshmallow exterior.

**4,415,596**  
**COATED CONFECTIONERY WITH A HIGH PROTEIN**  
**CONTENT AND PROCESS FOR PRODUCTION**  
**THEREOF**

Geert Andersen, and Manfred Lemke, both of Halle in Westfalen, Fed. Rep. of Germany, assignors to August Storck KG, Fed. Rep. of Germany

Continuation of Ser. No. 134,412, Mar. 27, 1980, abandoned.

This application Sep. 7, 1982, Ser. No. 415,694

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912412

Int. Cl.<sup>3</sup> A23G 00/00

U.S. Cl. 426—103

6 Claims

1. A partially coated confectionery having a protein content of from 10 to 50 percent by weight, comprising a core of a paste-like compound rich in protein, wherein the protein is in the form of hydrophobed protein particles, and a coating of a fat containing pliable, soft caramel compound partially coating and surrounding the core such that the coated confectionery is in disc-like configuration with the core thereof being optically contrasted with the coating.



4,415,597

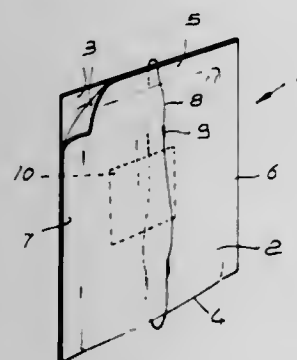
**FILTER-BAG FOR INFUSION PRODUCTS**

Andrea Romagnoli, S. Lazzare di Savena, Italy, assignor to Ima-Industria Macchine Automatiche-S.p.A., Emilia, Italy  
Continuation of Ser. No. 95,544, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 685,031, May 10, 1976, abandoned. This application Oct. 22, 1980, Ser. No. 199,682

Int. Cl.<sup>3</sup> B65B 29/04

U.S. Cl. 426—394

1 Claim



1. A method of making a bag for infusion products such as tea which comprises the steps of:

- (a) folding a rectangular blank of filter paper coated with a thermoplastic layer in half along a fold line so that two juxtaposed sections of said blank have their thermoplastic layers facing one another;
- (b) inserting one end of a natural-fiber string between edges of said sections opposite said fold line and winding said string around said fold line so that said string lies along the filter paper of one of said sections and extends only partly across the filter paper of the other of said sections;
- (c) heat sealing the opposite end of said string between layers of a folded tag free from attachment to said sections;
- (d) providing an infusion product between said sections and heat sealing said sections together along edges thereof to form a bag and secure said one end to said bag; and
- (e) at a plurality of locations on each of said sections thermally fusing thermoplastic material of said sections and bonding the thermally fused thermoplastic material through the respective filter paper to said string whereby said string is detachably held to said bag at said locations, a length of said string between said tag and the one of said locations proximal to said opposite end remaining free of attachment to said other of said sections whereby said length hangs loosely from the bag.

4,415,598

**METHOD OF PROCESSING DOUGH TO INCREASE ITS BAKED SPECIFIC VOLUME**

Rocky W. Chen, Brooklyn Park; Leah G. Evans, Minneapolis; Deena G. Hohle, St. Louis Park; Charles H. Turpin; Samuel H. Yong, both of Minneapolis; Barry S. Mikulski; David A. Kirk, both of Plymouth; Gerald T. Tracy, Wayzata, and Raymond W. Tucker, Bloomington, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,583

Int. Cl.<sup>3</sup> B65D 85/00, 81/20

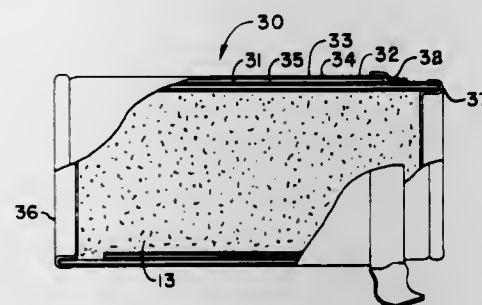
U.S. Cl. 426—394

3 Claims

1. A method of processing dough to increase its baked specific volume, said method comprising:

- forming a farinaceous dough which is at least partially chemically leavened and placing said dough in a container and allowing said dough to remain pressurized at a pressure of at least about 5 psi,
- storing said container and dough at a temperature of about 40° F.,
- opening said container to effect removal of the contained dough from the container,

and controlling the opening of the container such that the pressure of the dough is released at a rate of less than



about 10 psi per second with the said time of release of pressure being at least about 2 seconds.

4,415,599

**GRAVY OR SAUCE MIX**

Kari E. O. Bos, Valencia, Calif., assignor to Carnation Company, Los Angeles, Calif.

Filed May 13, 1982, Ser. No. 377,776

Int. Cl.<sup>3</sup> A23L 1/195, 1/40

U.S. Cl. 426—578

5 Claims

1. In a dry mix composition comprising a starch-containing thickening agent, flavoring, coloring and nutritional agents which upon addition to water reconstitutes to form a gravy or sauce, the improvement which consists essentially of including in the dry mix from 15% to 45% by weight of said thickening agent, and maltodextrin in an amount sufficient to provide a weight ratio of maltodextrin to thickening agent of at least 1:1, whereby the dry mix may be added to boiling water to form a gravy or sauce substantially free of lumps.

4,415,600

**SPRAY DRIED COFFEE WHITENERS WITH REDUCED MILK PROTEIN**

Donald E. Miller, Strongsville, and Charles E. Werstak, Medina, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,110

Int. Cl.<sup>3</sup> A23C 11/08

U.S. Cl. 426—613

8 Claims

1. A dried coffee whitener comprising on a dry weight basis about 25–50% of a vegetable oil which is normally solid at room temperature; about 2.5–5.5% of a casein-containing protein; a buffering agent in an amount effective to prohibit feathering; at least about 1% of an emulsifying agent for improved whitening; the remainder being essentially carbohydrate; said emulsifying agent being a blend consisting essentially of a partial glycerol ester which is normally hard or plastic at room temperature and an ionic emulsifier selected from the group consisting of sodium or calcium lactylated esters of fatty acids and sodium stearyl fumarate, said partial glycerol ester and ionic emulsifier being present in the amounts of about 0.7–3% and about 0.1–3%, respectively, based on the dry weight of the formulation.

4,415,601

**QUICK HARDENING ICING COMPOSITION**

John A. Eckel, 2286 Edythe Dr., Dunedin, Fla. 33528  
Continuation of Ser. No. 151,185, May 19, 1980, abandoned.

This application May 3, 1982, Ser. No. 374,115

Int. Cl.<sup>3</sup> A23G 3/00

U.S. Cl. 426—659

5 Claims

1. In a quick-hardening icing composition capable of application to still warm, baked, bakery goods and subsequent

4,415,603

**PROCESS FOR PAINTING WHICH CAN BE USED FOR MARKING ROADS**

Catherine Vallot, Compiègne; Francis Lemaire, Bagnols-sur-Ceze, and Gilbert Gaussens, Meudon, all of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed Aug. 19, 1981, Ser. No. 294,356

Claims priority, application France, Aug. 28, 1980, 80 18682  
Int. Cl.<sup>3</sup> B05D 3/06

U.S. Cl. 427—54.1

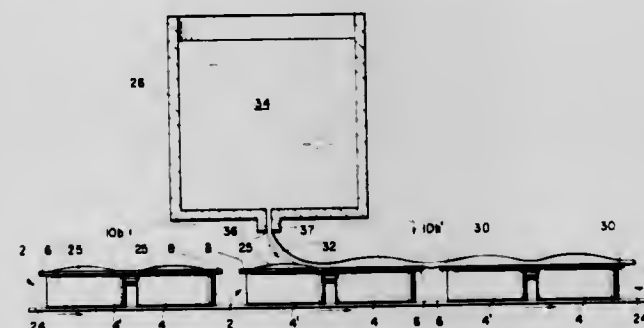
6 Claims

1. A process for painting a substrate which comprises applying to the substrate a coating of a paint containing

(a) a polymerizable binder comprising from about:

- 15 to 50% by weight of a reactive prepolymer selected from the group consisting of epoxy acrylate resins, urethaneacrylate resins, polyester-acrylate resins and unsaturated acrylic resins;
- 10 to 60% by weight of monounsaturated monomers;
- 5 to 50% by weight of polyunsaturated monomers;
- 0.1 to 10% by weight of at least one photoinitiator; and
- (b) from about 0.1 to 10% by weight, based on the binder, of a peroxide, and from about 0.1 to 10% by weight, based on the binder, of a metal salt selected from the group consisting of ferrous sulphate, stannous chloride and Mohr's salt; the metal salt and the peroxide being added to the binder at substantially the time of application of the coating of paint; and irradiating the thus applied coating with ultraviolet rays.

STRIP ICING APPLIED



said composition including between 8.6 and 16.9 wt % whey, between 9.8 and 14.5 wt % vegetable starch powder, between 3.3 and 5.9 wt % high melting point fat and between 37.8 and 44.9 wt % sugar, said wt % being based upon the entire quick hardening icing composition.

4,415,602

**REACTIVE PLATING METHOD AND PRODUCT**

Don E. Brodie, St. Agatha, Canada, and John H. Morgan, Munich, Fed. Rep. of Germany, assignors to Canadian Industrial Innovation Centre/Waterloo, Waterloo, Canada

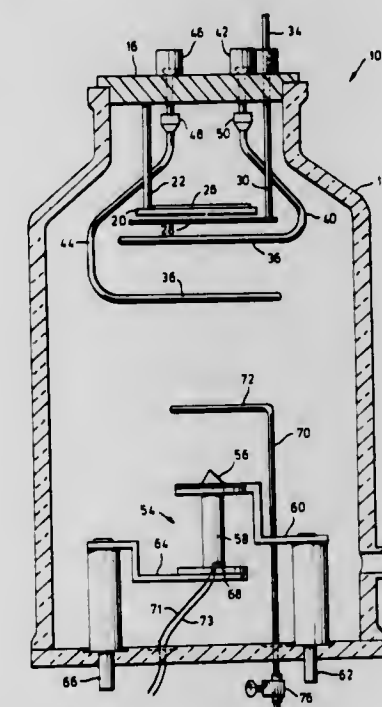
Filed Apr. 5, 1982, Ser. No. 365,116

Claims priority, application Canada, Jul. 24, 1981, 382527

Int. Cl.<sup>3</sup> B05D 1/34, 1/36

U.S. Cl. 427—39

26 Claims



1. A method of coating a substrate comprising: providing a vacuum chamber communicating with a surface of the substrate to be coated; producing a glow discharge in the vacuum chamber in contact with said substrate surface; vaporizing coating material in said chamber; and introducing a gas into the vacuum chamber to react with said vaporized coating material forming a compound to be deposited on the substrate by the glow discharge.

4,415,604

**CONFORMAL COATING AND POTTING SYSTEM**

Larry A. Nativi, Rocky Hill, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Nov. 12, 1982, Ser. No. 441,164

Int. Cl.<sup>3</sup> B05D 3/06

U.S. Cl. 427—54.1

18 Claims

1. A one-part coating composition, especially useful for conformal coating and potting, comprising:

- (1) At least one isocyanate-capped polyether diol and triol;
- (2) An acrylate or methacrylate reactive diluent; and
- (3) A polymerization initiator of the photo-initiator type.

14. A method of forming a uv curing polymerizable conformal coating or potting on a substrate wherein said substrate has one or more shadow areas, comprising the steps in sequence of:

- (1) providing a polymerizable coating composition which comprises at least one isocyanate-capped polyether diol and triol, an acrylate or methacrylate reactive diluent, and a polymerization initiator of the photo-initiator part;
- (2) applying said coating composition to said substrate;
- (3) exposing the coated substrate to uv light of wave length and intensity to effect uv cure of exposed areas of said coating; and
- (4) storing said coated substrate under conditions of temperature and humidity such as to promote curing of unexposed (shadow) areas of said coating through a built-in secondary cure mechanism.

4,415,605

**SCINTILLATOR SCREEN METHOD OF MANUFACTURE**

Vincent L. Davis, Milwaukee, and Raymond J. D. Smith, Peewaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 24, 1980, Ser. No. 200,408

Int. Cl.<sup>3</sup> G01J 1/58

U.S. Cl. 427—65

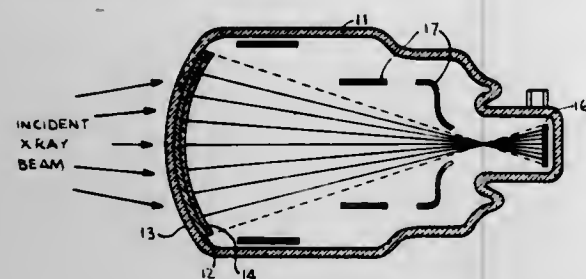
37 Claims

1. An improved method of depositing a phosphor material on a substrate to produce an image screen for receiving radiation and responsively emitting light comprising the steps of:

- (a) providing a planetary rotation apparatus on the central axis of and within the confines of a vacuum evaporator;
- (b) attaching at least one substrate to the rotation apparatus



such that the substrate is radially displaced from the central axis of an evaporator; and



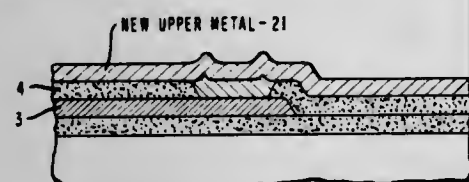
(c) evaporating phosphor while the substrate is rotated to thereby obtain an image screen having a thickness greater at its edge than at its center.

4,415,606

# METHOD OF REWORKING UPPER METAL IN MULTILAYER METAL INTEGRATED CIRCUITS

Thomas E. Cynkar, Centerville, and James G. House, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio  
Filed Jan. 10, 1983, Ser. No. 456,689

Int. Cl.<sup>3</sup> C23F 1/02; B44C 1/22; B05D 5/12; C03C 15/00  
U.S. Cl. 427—90 4 Claims



1. An upper level metal rework process for a multilevel metal integrated circuit wafer having multilevel metal conductors joined by vias through dielectric layers, comprising the steps of:  
forming a photoresist mask layer over each metal via, said mask having a dimension nominally greater than said via; etching the upper level metal with an etchant that does not materially etch the dielectric, until the etched region of the upper level metal just enters the recessed region of the via; removing the masking photoresist;  
sputter etching the wafer in an evacuated chamber; and depositing a new layer of upper level metal without exposing the sputter etched wafer to atmospheric ambients.

4,415,607

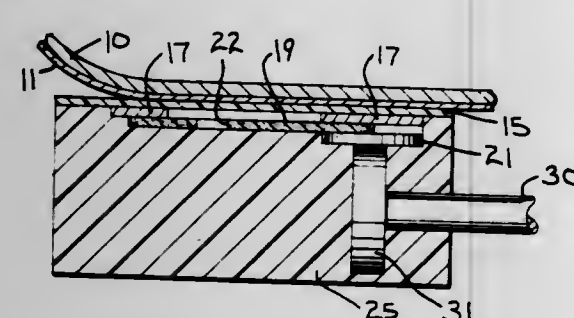
# METHOD OF MANUFACTURING PRINTED CIRCUIT NETWORK DEVICES

Oscar L. Denes, Greendale; Lynn R. Kiphart, Milwaukee, and Paul P. Szalewski, Grafton, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 13, 1982, Ser. No. 417,001  
Int. Cl.<sup>3</sup> H05K 3/20

U.S. Cl. 427—96

8 Claims



8. A method of manufacturing an electrical resistor network package comprising the sequential steps of:

providing a temporary support member having a release surface;  
printing indicia areas in reverse format on said release surface;  
depositing an insulating primary substrate layer over said indicia and on said release surface;  
depositing defined conductor areas of conductive material to the exposed surface of said primary substrate layer;  
depositing defined resistor areas of resistive material to the exposed surface of said primary substrate layer with portions of the resistor areas overlying respective conductor areas;  
depositing defined terminal contactor areas of conductive material overlying portions of said resistor areas;  
removing portions of said resistor areas to trim said areas to a predetermined resistive value;  
joining said temporary support member to a permanent support member with the said substrate layer and its afore-stated pre-applied areas in facing relationship with a supporting surface of said permanent support member; and releasing and removing said temporary support member from said primary substrate layer.

4,415,608

# CONTINUOUS PRODUCTION OF POLYMETHYLPENTENE MEMBRANES

Bonnie J. Epperson; Lowell J. Burnett, both of San Diego, Calif., and Verne D. Helm, Plains, Mont., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 15, 1982, Ser. No. 339,812  
Int. Cl.<sup>3</sup> B32B 5/16

U.S. Cl. 427—244

10 Claims

1. A process for the continuous production of a polymethylpentene membrane which comprises dissolving said polymethylpentene in an organic solvent, placing the resultant solution in a container, continuously passing a microporous support into said container and through and in direct contact with said solution, said support being in contact on one side thereof with a moving roller whereby only one side of said support is in contact with said solution, transferring polymethylpentene from said solution to said one side of the support, continuously withdrawing the resulting polymer-coated support from said container, evaporating said solvent and continuously recovering the resultant polymethylpentene membrane.

4,415,609

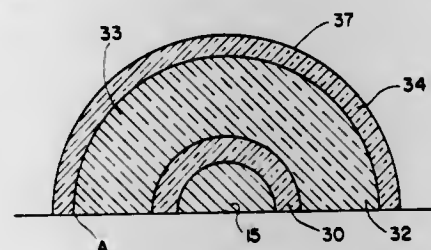
# METHOD OF APPLYING A CARBON-RICH SURFACE LAYER TO A SILICON CARBIDE FILAMENT

Harold E. Debolt, Boulder, Colo.; Raymond J. Suplinskas, Haverhill, Mass.; James A. Cornie, North Chelmsford, Mass.; Thomas W. Henze, Lawrence, Mass., and Albert W. Hauze, Chelmsford, Mass., assignors to Avco Corporation, Wilmington, Mass.

Division of Ser. No. 173,773, Jul. 30, 1980, Pat. No. 4,340,636.  
This application May 5, 1982, Ser. No. 374,992  
Int. Cl.<sup>3</sup> C23C 11/00, 13/00

U.S. Cl. 427—249

5 Claims



1. A method of applying a carbon-rich surface layer to a silicon carbide filament comprising:  
supplying an elongated reactor through which a filament

substrate moves, said reactor having an entrance port through which a hydrocarbon and silane mixture is supplied to vapor deposit stoichiometric silicon carbide on the substrate filament;  
an intermediate exit port for removing said mixture;  
a lower entrance port below said intermediate exit port through which a hydrocarbon and silane blend is supplied to flow counter to the movement of the filament to the exit port; and  
adjusting the vapor deposition rates of the hydrocarbon and silane blend so that the percentage of unreacted silane in the blend relative to unreacted hydrocarbon decreases as the blend moves from the lower entrance port to the exit port.

4,415,610

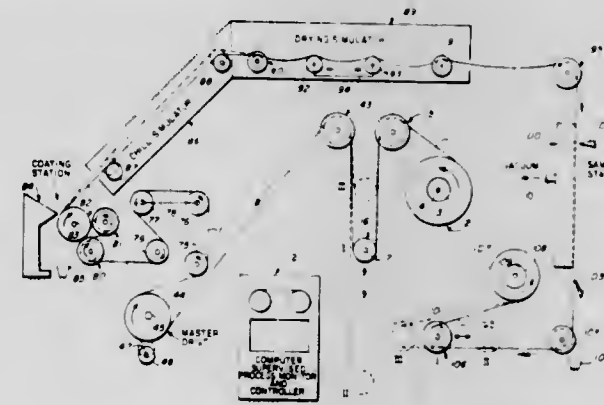
# PROCESS SIMULATOR

Edward J. Choinski, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 4, 1981, Ser. No. 260,331  
Int. Cl.<sup>3</sup> G03C 1/76

U.S. Cl. 427—372.2

7 Claims



1. The method of simulating the coating and drying of a continuously moving web, comprising the steps of moving an elongated strip of web at constant speed past a coating station while applying a uniform wet coating to said web, stopping said web, and sweeping a stream of drying air over the stationary web with an air velocity component lengthwise of the web to simulate the drying of a continuously moving web.

4,415,611

# ARTIFICIAL FUR HAVING GUARD HAIR FIBERS AND UNDER FUR FIBERS AND A METHOD FOR MANUFACTURING THE SAME

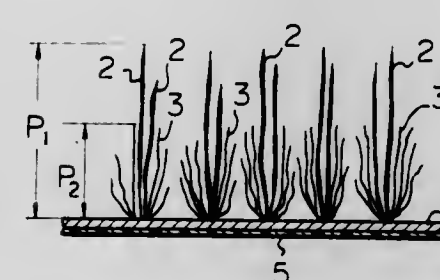
Seiichi Yamagata, and Masaaki Sakai, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 300,963

Claims priority, application Japan, Sep. 22, 1980, 55-130786  
Int. Cl.<sup>3</sup> A01N 1/00

U.S. Cl. 428—15

40 Claims



1. An artificial fur comprising;  
a ground construction and numerous units of pile fibers projected upward from said ground construction, said unit of pile fibers provided with a yarn-like bundle of a root

portion, at least a main part of said root portion firmly locked in said ground construction, said pile fibers of each unit being separated from each other from the position above said root portion, said pile fibers being made from fibrous materials and provided with varied lengths thereof in a range from almost zero to almost identical to the maximum length of said fibrous materials, each unit of pile fibers comprising a group of fibers having tapered top end portions and a group of fibers substantially shorter and thinner than the above-mentioned fiber group, the first group functioning as guard hairs and the second group functioning as under fur and in the pile fabric, the yarn for the ground construction of the pile fabric and the yarn for the pile fibers are different, and, in the pile fabric said root portion of the yarn for creating the pile fibers maintains its yarn structure in the ground construction thereof.

4,415,612

# DOUBLE ENGRAVED IDENTIFICATION CARD

John S. Hall, and Barry C. Phelps, both of Sacramento, Calif., assignors to California Interface and Software Limited Partnership, Sacramento, Calif.

Filed Jan. 11, 1982, Ser. No. 338,788  
Int. Cl.<sup>3</sup> B44F 1/10

U.S. Cl. 428—29

12 Claims



1. A double engraved identification card for use with an opaque masking member comprising:  
a first planar member having a first major surface with a first image engraved thereon and a second major surface opposite the first major surface;  
a translucent second planar member having a first major surface with a second image engraved thereon, and a second major surface opposite the first major surface, the second engraved image coinciding with the first engraved image when the second planar member is aligned with the first planar member; and  
means for affixing the first and second planar members together with the first and second engraved images in coincidence whereby a slot is provided between the first and second planar member transversely adjacent the first and second engraved images for removeably receiving the opaque planar member in the slot for masking one of the first and second engraved images from view.

4,415,613

# METHOD FOR MAKING STRENGTHENED POROUS PIPE AND RESULTING PRODUCT

Jonas Medney, 3504 Woodward St., Oceanside, N.Y. 11572  
Filed Aug. 24, 1981, Ser. No. 295,640

Int. Cl.<sup>3</sup> B32B 31/00

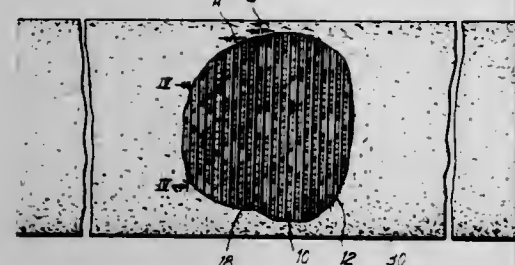
U.S. Cl. 428—36

14 Claims

1. A method of forming perforated pipe comprising winding, on a mandrel having multiple spaced protrusions thereon, fibers forming angularly related strips arranged between the said protrusions, said strips cooperatively defining openings through which said protrusions extend, and impregnating said fibres with a settable plastic which combined with the fibres forms a tube adequate to resist a pressure of the order of magnitude of at least about 600 p.s.i., the strips being arranged in two



sets, the strips of one set being angularly related to the strips of the other set, said plastic being selected from the group consisting of epoxy resin, polyesters and vinyl esters, the fibres being of fibre glass, 23-50% of the total combined weight of the plastic and fibres being constituted by the weight of the plastic, said method furthermore comprising arranging screening over



the openings, and forming at least part of the screening of grains which are stuck together with resin applied in an amount insufficient to fill all of the spaces between the grains, said method further comprising coiling a further strip around the tube beneath the screening thereon to prevent the screening from passing into the openings.

4,415,614

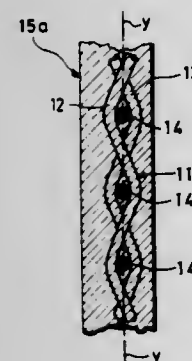
#### DECORATIVE HOLLOW VITREOUS ARTICLE AND METHOD OF MAKING SAME

Axel von Loewis of Menar, Bochum, Fed. Rep. of Germany, assignor to Herne Glas Bernd Hoffbauer, Herne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 164,531, Jul. 2, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,900 Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927112

Int. Cl.<sup>3</sup> C03B 23/20; B32B 17/12; B44F 1/06  
U.S. Cl. 428-38

5 Claims



1. A method of making a hollow vitreous article with a decorative pattern, comprising the steps of:

- providing a flexible woven fabric of glass fibers forming intersecting warp and weft threads;
- cutting said fabric to a size fitting into a given blow mold;
- placing the cut fabric in said blow mold;
- blowing a glass parison in said mold into contact with said fabric with at least partial penetration of the interstices of said fabric by the expanding glass mass whereby at least portions of said fibers are embedded in said mass;
- reheating said parison with the fabric adhering thereon into a blowable state;
- expanding the reheated parison and fabric by a further blow into a body of predetermined final shape; and
- allowing said body to cool.

5. An article made by the method of claim 1, 2, 3 or 4.

4,415,615

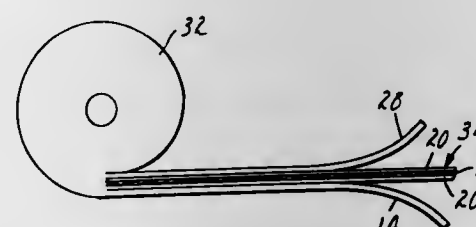
#### CELLULAR PRESSURE-SENSITIVE ADHESIVE PRODUCT AND METHOD OF MAKING

Donald L. Esmay, Coon Rapids; Gordon G. Johnson, Lake Elmo, both of Minn., and George F. Vesley, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation-in-part of Ser. No. 339,405, Jan. 15, 1982. This application Jun. 1, 1982, Ser. No. 383,582  
Int. Cl.<sup>3</sup> B32B 27/16, 7/06, 7/12, 31/28

U.S. Cl. 428-40

14 Claims



1. Pressure-sensitive adhesive product comprising a cellular pressure-sensitive adhesive membrane surrounding and thereby defining a multiplicity of small voids, constituting from 15% to 85% of the volume of said membrane, the cellular adhesive membrane, when compressed  $\frac{1}{2}$  of its void thickness and released after 30 seconds, being characterized by the feature that it experiences a recovery above the line 10 on FIG. 1 of the drawing within 60 seconds after release.

5. Pressure-sensitive adhesive product as defined in claim 1 wherein the backing is flexible and has a low-adhesion surface from which the cellular membrane is readily removable.

4,415,616

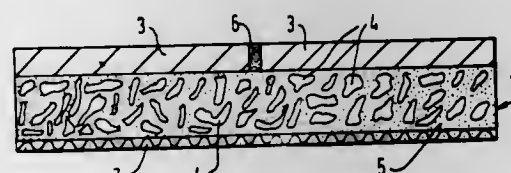
#### SLAB FOR FLOORING

Attilio Angioletti, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jul. 8, 1981, Ser. No. 281,694  
Claims priority, application Italy, Jul. 25, 1980, 23685 A/80  
Int. Cl.<sup>3</sup> B32B 3/14, 5/30

U.S. Cl. 428-48

11 Claims



1. A slab for making a flooring, comprising: a plurality of tiles;

a plate of synthetic resinous material, said resinous material having the form of a matrix, said plate having a first face and a second face, said faces being opposite each other, said plurality of tiles being bonded to said first face; a sound insulating material dispersed in said matrix of resinous material, said insulating material having the form of shavings; and

means for stiffening said slab, said means comprising a reinforcing fabric embedded in the second face of said plate, whereby said slab can be prepared prior to its placement on a floor, thereby reducing the laying time of the flooring.

4,415,617

#### BASE FABRIC FOR THE MANUFACTURE OF EMBROIDERY AND LACE AND METHOD OF ITS PREPARATION

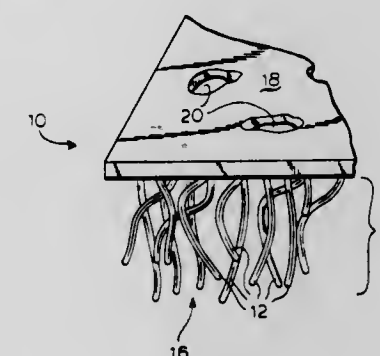
Conrad A. D'Elia, New Milford, Conn., assignor to Trustee for David Roth, New York, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,513

Int. Cl.<sup>3</sup> B32B 3/24, 5/28; D04H 1/54, 11/00

U.S. Cl. 428-86

5 Claims



1. A formed fabric, which comprises: a web having an upper and a lower surface and a body therebetween having a plurality of water-soluble, thermoplastic, synthetic polymeric resin staple fibers; said fibers being homogeneously distributed throughout said web and interlocked together; said lower surface having a plurality of exposed individual fibers and fiber ends and said upper surface comprising a gas permeable film, integral with underlying fibers and comprising thermoplasticized and rehardened, flattened fibers and portions of fibers.

5. A method of manufacturing an improved formed fabric, useful as a base cloth for the making of lace, which comprises: providing a planar web having upper and lower surfaces and a body made up of a plurality of water-soluble, thermoplastic, synthetic polymeric resin staple fibers, said fibers being homogeneously distributed throughout the web and mechanically interlocked together, said interlocking being of the character achieved with needled staple fibers; said web having a weight of from 2.0 to 3.0 oz./sq. yd; calendering the web under sufficient heat, pressure and humidity to thermoplasticize the fibers on the upper surface only of said web, whereby there is obtained a discontinuous, gas permeable film having a thickness of from about 3 to about 5 mils.

4,415,618

#### NON-SLIDABLE BOTTOM SURFACE LAYER FOR A FLOOR COVERING

Eugene F. McClung, Jr., 49 La Senda, South Laguna, Calif. 92677

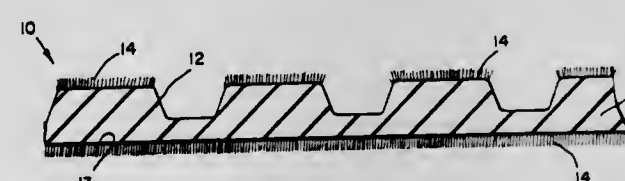
Continuation-in-part of Ser. No. 318,687, Nov. 5, 1981, Pat. No. 4,377,610. This application Jan. 6, 1983, Ser. No. 456,301

The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> B32B 33/00

U.S. Cl. 428-88

6 Claims



1. A bottom surface layer for a floor covering which includes a base and a top surface layer, said bottom surface layer comprising:

- a flat member having a first surface and a second surface, with said first surface being fixedly coupled to the base of

the floor covering wherein said flat member is formed out of a fabric material;

- a plurality of bristles which are electro-statically flocked onto said second surface of said flat member over the full surface of said flat member; and
- bonding means for permanently bonding said plurality of bristles to said second surface of said flat member, whereby said plurality of bristles lock into a carpet on a floor and prevent lateral sliding of the floor covering when the feet of a sitting person produce downward and lateral forces on the floor covering.

4,415,619

#### WORKPIECE PALETTE

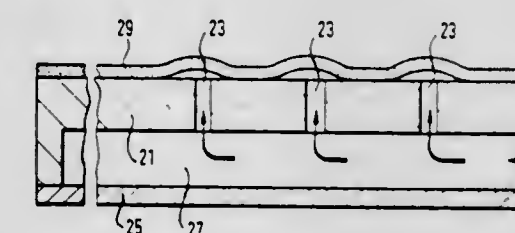
Egon Füglein, Aachen, Fed. Rep. of Germany, assignor to Sachs Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany  
Continuation of Ser. No. 58,206, Jul. 17, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,779

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831893; Jul. 20, 1978, 2831894

Int. Cl.<sup>3</sup> B65D 19/44; B32B 5/14

U.S. Cl. 428-131

5 Claims



1. A workpiece palette for transporting workpieces between work stations, comprising a palette plate having a plane surface for receiving the workpieces, said plate carrying a polyurethane adhesive coating, said coating being thicker than 0.35 mm wherein said adhesive coating directly contacts the surface of said palette plate, said adhesive coating having two surfaces, the surface of the coating which faces away from said palette plate having a lower adhesive strength than the other surface and wherein said palette plate forms a plurality of ducts which open into the surface carrying said adhesive coating and communicates with a fluid supply source.

4,415,620

#### MAT BASE PLATE

Ken Yamazaki, Hyogo; Yosuke Yamamoto, Osaka; Takehisa Kinoyama, Osaka, and Kinichi Sasagawa, Osaka, all of Japan, assignors to Duskon Franchise Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1980, Ser. No. 157,078

Claims priority, application Japan, Oct. 11, 1979, 54-140678[U]; Oct. 11, 1979, 54-140679[U]; Oct. 11, 1979, 54-140680[U]

Int. Cl.<sup>3</sup> A47L 23/22; B32B 7/06

U.S. Cl. 428-157

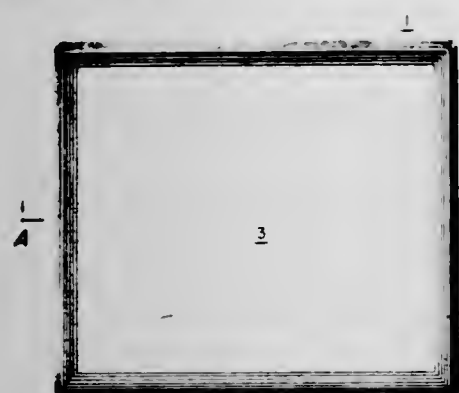
17 Claims

1. For underlying and bordering a door mat, a mat base plate, comprising:

- a generally flat plate portion having an upwardly-presented floor; and
  - a rim perimetally surrounding said flat plate portion, said rim having an apical ridge lying above said floor; said rim further including an inner slope portion extending downwardly and inwardly from said apical ridge to said floor;
- means defining a plurality of substantial generally concentric frame-like surface discontinuities arranged in a series on said inner slope portion, so that when a door mat with the same general shape in plan as said floor, but a larger size than said floor and a smaller size than said apical ridge, is



placed on said mat base plate, it will be noticeably framed at least by said apical ridge and, depending on its size, by



part of said inner slope portion preferably including at least one of said frame-like surface discontinuities.

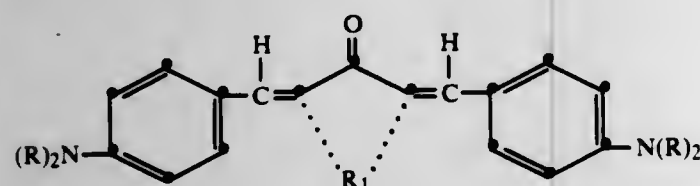
4,415,621

**USE OF  $\alpha,\alpha$ -BIS(DIALKYLAMINO)BENZYLIDENE) KETONE DYES IN OPTICAL RECORDING ELEMENTS**  
Donald P. Specht, and Harold T. Thomas, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Continuation-in-part of Ser. No. 124,382, Feb. 25, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,761  
Int. Cl.<sup>3</sup> B41M 5/24; G01D 15/34

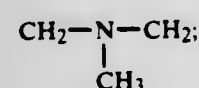
U.S. Cl. 428—172

10 Claims

1. A recording element comprising a support having coated thereon a layer of an amorphous composition comprising a binder and a dye, wherein:  
said amorphous composition has an absorption factor of at least 20 at 488 nm and  
said dye conforms to the structure:



wherein  
 $R_1$  is  $(CH_2)_n$  or



$n$  is an integer from 0-5 and each  $R$  is independently selected from the group consisting of straight- and branched-chain alkyl groups of about 1-6 carbon atoms.

4,415,622

**FUSIBLE INTERLINING OF IMPROVED BOND STRENGTH AND DRY CLEANING RESISTANCE**  
Dattatraya V. Kamat, Jenkintown, Pa., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Nov. 2, 1982, Ser. No. 438,595  
Int. Cl.<sup>3</sup> B32B 27/14

U.S. Cl. 428—198

12 Claims

1. A fusible interlining having enhanced bond strength with resistance to dry cleaning and comprising a support web and a heat activatable adhesive carried by said support web, said adhesive comprising polyethylene having a melt index of at least about 60, a density of at least about 0.91 and a relatively narrow molecular weight distribution, as expressed by having a MW:MN ratio of no more than about 4.

4,415,623

**DECORATION OF SHEET MATERIAL**

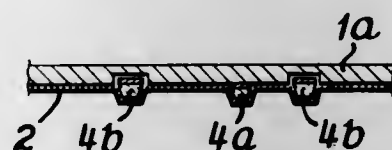
Robert J. Schlaepfer, St. Gallen, Switzerland, assignor to Jacob Schlaepfer & Co. AG, St. Gallen, Switzerland  
Continuation of Ser. No. 916,176, Jun. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 866,114, Dec. 30, 1977, abandoned, which is a continuation of Ser. No. 614,709, Sep. 18, 1975, Pat. No. 4,071,387. This application Sep. 29, 1980, Ser. No. 191,741

Claims priority, application United Kingdom, Sep. 19, 1974, 40872/74; Apr. 15, 1975, 15444/75

Int. Cl.<sup>3</sup> B32B 3/18; B41M 3/12; B44C 1/16

U.S. Cl. 428—200

4 Claims



1. A decorative article for application to a sheet material comprising:  
a rigid decorative shape selected from a group consisting of stones and metal shapes and having at least a first surface and a second surface,  
a layer of a heat activatable low-melting thermoplastic adhesive applied to said first surface of said shape, and  
a heat stable carrier sheet of non-heat-pressure sensitive release material adhesively releasably adhered to said second surface of said shape, said carrier sheet including a non-woven fabric of regenerated cellulose fibers bonded together by non-thermoplastic binders having a melting point greater than 200° C.,  
said article being adapted to be positioned with said first surface juxtaposed to said sheet material whereupon application of heat and pressure to said heat stable carrier sheet activates said low-melting thermoplastic adhesive and produces bonding of said article to said sheet material, the carrier sheet being removed after said bonding has occurred thereby maintaining registration of said article.

4,415,624

**AIR-FIREABLE THICK FILM INKS**

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 280,936, Jul. 6, 1981, abandoned. This application Jan. 3, 1983, Ser. No. 455,310

Int. Cl.<sup>3</sup> B32B 3/10; H01B 1/02

U.S. Cl. 428—209

24 Claims

1. In an air-fireable conductor or resistor ink suitable for forming a film on a porcelain-coated metal circuit board comprising from about 2 to about 90 percent by weight of a functional component, from about 1 to about 80 percent by weight of a glass frit and from about 8 to about 35 percent by weight of a suitable organic vehicle, wherein the functional component in the resistor ink is ruthenium dioxide and the functional component in the conductor ink is a precious metal in combination with bismuth oxide, wherein bismuth oxide is present in admixture with the precious metal or as a component of the glass;

the improvement wherein the glass frit consists of from about 40 to about 55 percent by weight of barium oxide, from about 10 to about 15 percent by weight of calcium oxide, from about 14 to about 25 percent by weight of boron trioxide, and from about 13 to about 23 percent by weight of silicon dioxide.

15. In an assembly comprising a porcelain-coated metal circuit board having on a portion of the surface thereof a coating of an air-fireable conductor or resistor ink comprising from about 2 to about 90 percent by weight of a functional

component, from about 1 to about 80 percent by weight of a glass frit and from about 8 to about 35 percent by weight of a suitable organic vehicle, wherein the functional component in the resistor ink is ruthenium dioxide and the functional component in the conductor ink is a precious metal in combination with bismuth oxide, wherein bismuth oxide is present in admixture with the precious metal or as a component of the glass, the improvement wherein the glass frit consists of from about 40 to about 55 percent by weight of barium oxide, from about 10 to about 15 percent by weight of calcium oxide, from about 14 to about 25 percent by weight of boron trioxide, and from about 13 to about 23 percent by weight of silicon dioxide.

21. In an electronic assembly comprising a porcelain-coated metal circuit board having a circuit thereon, said circuit containing a resistor film or conductor film formed by applying and firing in air a resistor or conductor ink comprising from about 2 to about 90 percent by weight of a functional component, from about 1 to about 80 percent by weight of a glass frit and from about 8 to about 35 percent by weight of a suitable organic vehicle, wherein the functional component in the resistor ink is ruthenium dioxide and the functional component in the conductor ink is a precious metal in combination with bismuth oxide, wherein bismuth oxide is present in admixture with the precious metal or as a component of the glass,

the improvement wherein said glass frit consists of from about 40 to about 55 percent by weight of barium oxide, from about 10 to about 15 percent by weight of calcium oxide, from about 14 to about 25 percent by weight of boron trioxide, and from about 13 to about 23 percent by weight of silicon dioxide.

4,415,625

**SPIRAL LINKAGE BELT AND METHOD OF MAKING SAME**

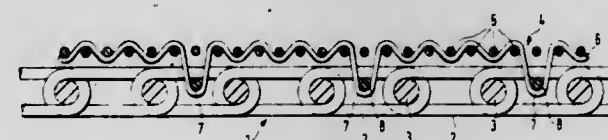
Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wagner GmbH & Co. KG, Fed. Rep. of Germany  
Filed Nov. 19, 1982, Ser. No. 443,054

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147115

Int. Cl.<sup>3</sup> D04H 3/02

U.S. Cl. 428—222

8 Claims



1. A spiral linkage belt comprising: a multiplicity of intermeshing plastic helices with the windings of each helix entering between the windings of an adjacent helix to form a passageway; and a pintle wire extending through each said passageway and connecting the helices forming that passageway; and said belt being characterized in that it further includes a fabric of interwoven structural warp wires and weft wires secured to said helices.

4,415,626

**ANTISTATIC COMPOSITION AND ELEMENTS AND PROCESSES UTILIZING SAME**

Charles R. Hasenauer, Rochester, and Donald N. Miller, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,401  
Int. Cl.<sup>3</sup> B32B 5/16, 27/36; G03C 1/82

U.S. Cl. 428—323

17 Claims

1. A substantially transparent electrographic image-receiving element comprising a substantially transparent polymeric support having on each side thereof a non-tacky, electrically conductive layer, each of said electrically conductive layers

comprising (a) a film-forming binder; (b) a hardener for said binder; (c) a substantially transparent matting agent having particles with a diameter in the range of from about 1 to about 50 microns; (d) a highly electrically conductive, noncrystallizable conductivity agent; and (e) a charge control agent.

4,415,627

**CHEMICALLY RESISTANT THERMOSENSITIVE RECORDING PAPER**

Masahiro Miyauchi, Tokyo; Sadao Morishita, Ibaraki; Fumio Okumura, Kunitachi, and Masahiro Higuchi, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,779

Claims priority, application Japan, Dec. 23, 1980, 55-182557; Jan. 7, 1981, 56-981

Int. Cl.<sup>3</sup> B41M 5/18

U.S. Cl. 428—332

4 Claims

1. A chemically resistant thermosensitive recording paper, consisting of (a) a dye precursor and (b) a color developer capable of coloring said dye precursor on heating as principal constituent elements, characterized in that an alginate overcoat layer is provided as the topmost layer thereof.

4,415,628

**MOISTURE VAPOR PERMEABLE SHEET MATERIALS**

Gheorge Cioca, Coatesville; George F. Feeley, Downingtown, both of Pa.; Joseph B. Brabson, Wilmington, Del., and Peter Barth, Neuwied, Fed. Rep. of Germany, assignors to Seton Company, Newark, N.J.

Filed Oct. 26, 1981, Ser. No. 314,536

Int. Cl.<sup>3</sup> B32B 27/08

U.S. Cl. 428—335

11 Claims

1. A moisture vapor permeable sheet material comprising: a homogeneous admixture of a synthetic polymeric material and a protein, said sheet material being moisture vapor permeable and nonpenetrable to liquid water and having a pressure sensitive adhesive coated on one side thereof; said pressure sensitive adhesive being comprised of a synthetic organic polymer adhesive, and said protein being selected from the group consisting of collagen and elastin and derivatives of collagen and elastin.

4. The sheet material of claim 1 wherein said pressure sensitive adhesive is present at a thickness of 0.5 to 1.5 mils.

4,415,629

**INSULATED CONDUCTOR**

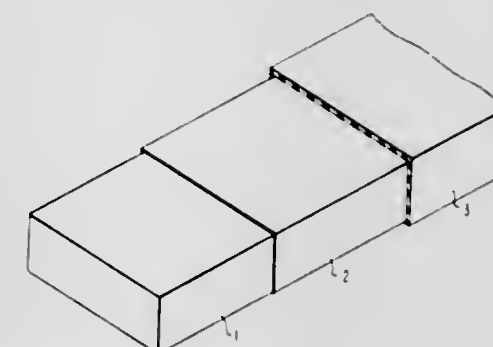
Anthony J. Palumbo, Hermitage; Henry A. Pearce, Jr., Stoneboro, and Curtis L. Moore, Hermitage, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 22, 1982, Ser. No. 360,737

Int. Cl.<sup>3</sup> D02G 3/00

U.S. Cl. 428—375

10 Claims



1. A method of making an insulated conductor comprising:  
(1) coating said conductor with a aryl-triazole; and  
(2) applying an insulating coating to said coated conductor.



6. An insulated conductor having a coating of a aryl-triazole in between a coating of insulation and said conductor.

4,415,630

# PROCESS OF MAKING MAGNETIC RECORDING MEDIUM

Yuichi Kubota; Masaharu Nishimatsu, and Kazushi Tanaka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

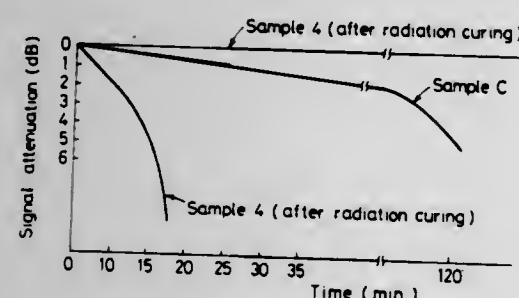
Continuation of Ser. No. 269,391, Jun. 1, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,180

Claims priority, application Japan, Jun. 10, 1980, 55-78223; Jun. 10, 1980, 55-78227

Int. Cl.<sup>3</sup> B32B 5/16; H01F 10/02

U.S. Cl. 428—403

11 Claims



1. A magnetic recording medium comprising a substrate and a magnetic recording layer formed thereon, characterized in that said magnetic recording layer is made of a magnetic coating material consisting essentially of a magnetic powder dispersed in a binder, said magnetic coating material containing a titanium coupling agent.

4,415,631

# POROUS INORGANIC SUPPORT MATERIAL COATED WITH AN ORGANIC STATIONARY PHASE, FOR USE IN CHROMATOGRAPHY, AND PROCESS FOR ITS PREPARATION

Jan A. J. Schutijser, Dieren, Netherlands, assignor to Akzo, Arnhem, Netherlands

Filed Jun. 29, 1981, Ser. No. 278,864

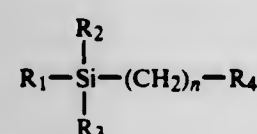
Claims priority, application Netherlands, Jun. 27, 1980, 8003727

Int. Cl.<sup>3</sup> B32B 5/16, 9/00; B01J 3/02

U.S. Cl. 428—405

17 Claims

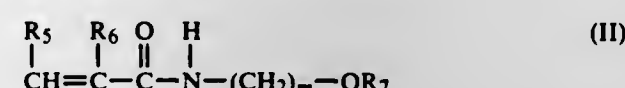
1. A support material, usable as such in chromatography or as a starting material which, upon linkage to it of compounds containing ionic groups, ligands or biomacromolecules, can be used as ion exchanger, as a medium in affinity chromatography or in enzymatic reactions, consisting of porous, inorganic silanized particles onto which there is covalently bonded an organic, stationary phase built up of (co)polymerized vinyl monomers and containing amide groups, characterized in that (a) a hydroxyl-containing inorganic material has been silanized with an organo silane of the formula I



wherein  $n=1-5$ ;  $R_1$  is halogen or alkoxy (1-10 C);  $R_2$  and  $R_3$  are each halogen, alkoxy (1-10 C), alkyl (1-3 C) or aryl (6-10 C), the halogen and alkoxy group in  $R_1$ ,  $R_2$  and  $R_3$  being capable of forming an —O—Si—bond between the silane and the inorganic material through its surface hydroxyl groups; and  $R_4$  is amino, substituted amino, mercapto, an ester group or glycidoxyl; and

(B) the organic stationary phase is a crosslinked (co)polymer obtained by addition polymerization and built up of 0.1 to

140  $\mu$ moles of vinyl monomers per  $m^2$  inorganic surface of the support material, said (co)polymer containing at least 0.1  $\mu$ moles amide groups per  $m^2$  inorganic surface of the support material, and said vinyl monomers consisting wholly or partly of bifunctional vinyl monomers containing amide groups and having the formula II



wherein  $R_5$  and  $R_6$  each are hydrogen or an organic group having up to 18 carbon atoms;  $R_7$  is hydrogen or an organic group up to 20 carbon atoms; and  $m$  is an integer from 1 to 20.

4,415,632

# SILICON CARBIDE BODY HAVING PORES FILLED WITH STEEL OR STEEL ALLOYS

Hartmut Lühleisch, Düren, and Francisco J. Dias, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Division of Ser. No. 233,474, Feb. 11, 1981. This application Mar. 7, 1983, Ser. No. 472,660

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005586

Int. Cl.<sup>3</sup> B32B 9/00, 15/04

U.S. Cl. 428—408

1 Claim

1. Armor plate resistant to bending, shear and crushing forces and consisting of composite material consisting of a porous silicon carbide body in a molded armor plate shape, having through-penetrating pores filled with a metallic material selected from the group consisting of steel and steel alloys, whereby the composite material has hardness and stiffness due to the silicon carbide and toughness due to the metallic material in a combination sufficiently stress-resistant to provide resistance to explosive impact.

4,415,633

# HEAT-SENSITIVE RECORDING MATERIAL

Sukenori Nakamura; Akira Igarashi, and Hiroharu Matsukawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1981, Ser. No. 291,153

Claims priority, application Japan, Aug. 12, 1980, 55/110942

Int. Cl.<sup>3</sup> B41M 5/18

U.S. Cl. 428—411

3 Claims

1. A heat-sensitive recording material comprising a heat-sensitive color forming layer on a base, said color forming layer containing an electron donating colorless dye and an organic acid to which a heat-fusible substance having a melting point in the range of from 60° C. to 150° C. and being miscible with said organic acid is fusion-bonded, said fusion-bonding being effected at a temperature lower than the melting point of the heat-fusible substance and in a water medium.

4,415,634

# MAGNETIC DISK SUBSTRATE WITH A CORE OF SYNTHETIC MATERIAL

Holger Hinkel, Boeblingen; Ulrich Kuenzel, Kusterdingen; Erhard Max, Sindelfingen, and Jochen Schneider, Gaertringen-Rohrau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1982, Ser. No. 381,246

Claims priority, application European Pat. Off., Jul. 23, 1981, 81105823.9

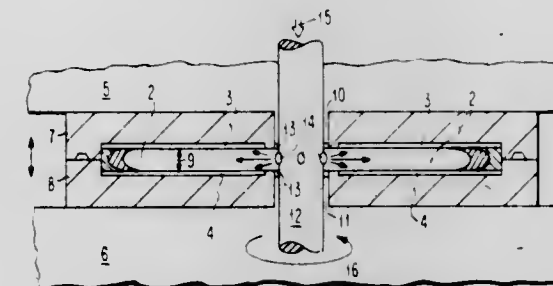
Int. Cl.<sup>3</sup> G11B 5/14

U.S. Cl. 428—579

3 Claims

1. A magnetic recording disk comprising an annular core of synthetic material, at least one thin metal foil bonded to a face of said core, the

outer surface of said foil forming a magnetic recording media-receiving surface, the inner surface of said foil which is bonded to said core being provided with a relatively soft layer of copper,



said copper layer being an electro-plated layer applied to said metal foil before said foil is bonded to said core, and a magnetic recording layer on said recording media-receiving surface.

4,415,635

# ELECTRIC BRUSH

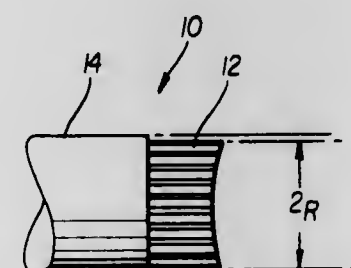
Doris Wilsdorf; Heinz G. F. Wilsdorf, and Charles M. Adkins, III, all of Charlottesville, Va., assignors to The University of Virginia, Charlottesville, Va.

Filed Apr. 9, 1980, Ser. No. 138,716

Int. Cl.<sup>3</sup> H01R 39/00

U.S. Cl. 428—611

33 Claims



1. An electrical brush for making an electrical connection to an object having a predetermined shape, comprising: an electrically conductive matrix material; plural metal fiber wires embedded in said matrix material and defining a longitudinal axis, said fiber wires having a diameter ( $d$ ), a length ( $l$ ) extending from said matrix material, and a packing density ( $f$ ) defined as the ratio of the total cross-sectional area of the fiber wires relative to the cross-sectional area of the matrix material in a plane cutting the longitudinal axis of said fiber wires, wherein

$$1 \mu m < d < 120 \mu m$$

$$(d/l) < 0.05$$

$$1\% < f < 25\%$$

4,415,636

# SECONDARY BATTERIES HAVING A ZINC NEGATIVE ELECTRODE

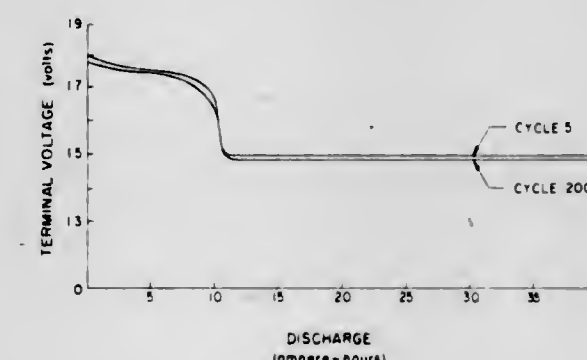
Allen Charkey, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Continuation of Ser. No. 165,458, Feb. 24, 1978, abandoned, which is a continuation of Ser. No. 759,127, Jan. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 606,866, Aug. 22, 1975, Pat. No. 4,022,953. This application May 7, 1981, Ser. No. 261,375

Int. Cl.<sup>3</sup> H01M 4/00

U.S. Cl. 429—27

12 Claims



1. A battery having a positive electrode including active material and a negative electrode including zinc material and cadmium particulate matter dispersed in said zinc material, said battery being constructed with such positive electrode active material and said zinc material in quantities such that said positive electrode active material is electrochemically depleted prior to electrochemical depletion of said zinc material in discharging of said battery, whereby said cadmium particulate matter is electrochemically inactive with respect to said positive electrode active material in such battery discharging, said negative electrode including: an electrically conductive support, a first layer overlying said conductive support and comprised of said cadmium particulate matter and a first binder therefor and a second layer overlying said first layer and comprised of said zinc material, said cadmium particulate matter and a second binder therefor.

4,415,637

# CATHODE ELECTRODE STRUCTURES FOR SODIUM SULPHUR CELLS AND THEIR MANUFACTURE

Graham Robinson, Tarvin; Raymond O. Ansell, Frodsham, and Michael McNamee, Wallasey, all of England, assignors to Chloride Silent Power Limited, London, England

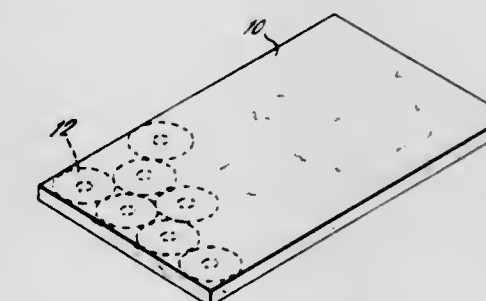
Filed Mar. 15, 1982, Ser. No. 358,417

Claims priority, application United Kingdom, Mar. 18, 1981, 8108541

Int. Cl.<sup>3</sup> H01M 4/58

U.S. Cl. 429—218

6 Claims



1. A method of forming a cathode structure for a sodium sulphur cell comprising the steps of impregnating, with sulphur, a sheet of fibrous electronically-conductive material having fibres extending in random directions parallel to the plane of the sheet and punching from the sheet one or more



elements each element having an aperture extending through the sheet normal to the plane thereof.

6. A cathode structure for a sodium sulphur cell comprising a plurality of elements formed by the method of claim 1.

4,415,638

## LEAD-ACID STORAGE BATTERY

Richard M. Meighan, Lansdale, and Harry R. Cash, Jr., Jeffersonville, both of Pa., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 214,735, Dec. 9, 1980, Pat. No. 4,359,508.

This application Sep. 13, 1982, Ser. No. 417,041

Int. Cl.<sup>3</sup> H01M 10/06

U.S. Cl. 429—225

3 Claims

1. In a dry charged lead-acid storage battery comprising a container for an electrolyte and electrically-connected battery elements including freshly-formed positive and negative plates disposed therein, the improvement of negative plates having an initial on charge polarization which has been reduced to not greater than zero and of positive plates having an initial on charge polarization which has been maintained sufficiently high that complete anodization of bare metal thereof is forced to occur when the battery is activated, first placed in float service and charged to the extent that the on charge polarization of the positive plates becomes greater than zero.

4,415,639

## MULTILAYERED PHOTOSENSITIVE DEVICE FOR ELECTROPHOTOGRAPHY

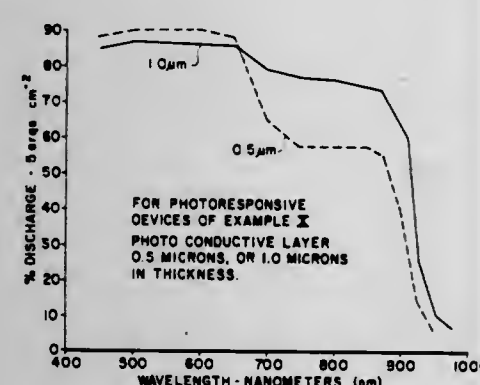
Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 7, 1982, Ser. No. 414,997

Int. Cl.<sup>3</sup> G03G 5/14

U.S. Cl. 430—57

30 Claims



1. An improved photoresponsive device comprised of a substrate, a hole blocking layer, an optional adhesive layer, an inorganic photogenerating layer, an organic photoconductive layer sensitive to infra-red radiation, and a top coating of a hole transport layer.

3. An improved photoresponsive device in accordance with claim 1 comprised in the order stated of the following layers: (1) a substrate, (2) metal oxide hole blocking layer, (3) an adhesive layer, (4) a photoconductive composition capable of enhancing or reducing the intrinsic properties of a photogenerating layer in the infra-red and/or visible region of the spectrum, which composition is selected from the group consisting of organic photoconductive compositions, charge transfer complex compositions, sensitizers, and mixtures thereof, (5) an inorganic photogenerating layer and, (6) a hole transport layer.

4,415,640  
ELECTROPHOTOGRAPHIC ELEMENT WITH FLUORENYLIDENE HYDRAZONE COMPOUNDS  
Satoshi Goto; Kiyoshi Sawada; Osamu Sasaki; Akira Kinoshita, all of Hino; Yoshiaki Takei, and Yoshihide Fujimaki, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 350,039

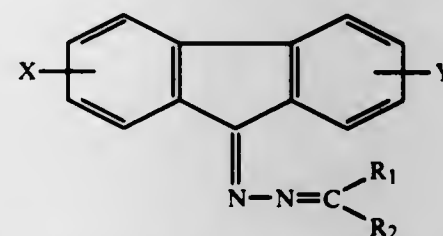
Claims priority, application Japan, Feb. 19, 1981, 56/24078

Int. Cl.<sup>3</sup> G03G 5/06, 5/14

U.S. Cl. 430—59

14 Claims

1. An electrophotographic light-sensitive element comprising a conductive support having thereon a light-sensitive layer comprising at least one hydrazone compound having the following formula:



wherein R<sub>1</sub> is selected from the group consisting of an aryl group and a substituted aryl group; R<sub>2</sub> is selected from the group consisting of a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group; and X and Y are each selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, a substituted alkyl group, an alkoxy group, a substituted alkoxy group, an amino group, a substituted amino group, a nitro group and a cyano group.

4,415,641

## ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Satoshi Goto; Akira Kinoshita, both of Hino; Yoshiaki Takei, and Yoshihide Fujimaki, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

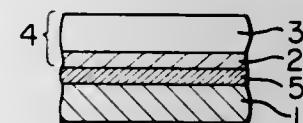
Filed Mar. 2, 1982, Ser. No. 353,934

Claims priority, application Japan, Mar. 11, 1981, 56-35069

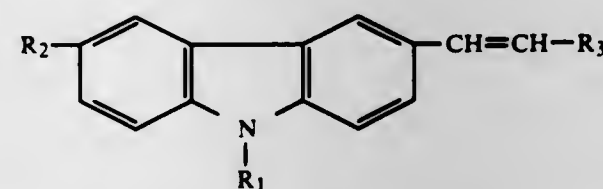
Int. Cl.<sup>3</sup> G03C 1/16; C07D 209/82

U.S. Cl. 430—59

14 Claims



1. An electrophotographic light-sensitive element comprising a conductive support which supports a light-sensitive layer containing a carbazole derivative of the formula:



wherein R<sub>1</sub> is an aryl group, R<sub>2</sub> is hydrogen, a halogen, an alkyl, an alkoxy, an amino or hydroxy group, and R<sub>3</sub> is an aryl, or a heterocyclic group.

4,415,642  
ELECTROPHOTOGRAPHIC MEMBER OF SE-TE-AS WITH HALOGEN

Kurt Elsäßer; Helmut Ebner, and Armin Baumgärtner, all of Nuremberg, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 382,916

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123608

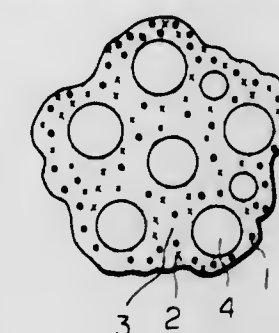
Int. Cl.<sup>3</sup> G03G 5/082, 5/09

U.S. Cl. 430—86

1 Claim

1. An electrophotographic member comprising: a metal substrate; and a photosensitive layer deposited on said substrate, said layer including an alloy of selenium and tellurium, said layer being about 15 percent tellurium, said layer also including between about 20–40 ppm of arsenic and between about 20–30 ppm of a halogen.

waxes, and being insoluble in cold toluene but soluble in hot toluene, said parting or fixing material (A) and said hard resin



(B) being present at an (A)/(B) weight ratio of from 95/5 to 55/45.

4,415,643  
PROCESS FOR PREPARING PHOTOCONDUCTIVE CADMIUM SULFIDE

Koji Goto, Kawasaki; Isamu Kajita, Kanagawa; Ichiro Nomura, and Hirokuni Kawashima, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,979

Claims priority, application Japan, Sep. 3, 1980, 55-122183; Sep. 10, 1980, 55-125509

Int. Cl.<sup>3</sup> G03G 5/08

U.S. Cl. 430—94

7 Claims

1. A process for preparing photoconductive cadmium sulfide comprising steps of:  
forming precipitated cadmium sulfide particles, primarily firing said cadmium sulfide particles, deionizing said cadmium sulfide particles, and secondarily firing said cadmium sulfide particles.

4,415,644  
ELECTROSTATIC IMAGE DEVELOPING TONER AND A METHOD FOR THE PRODUCTION THEREOF

Kiyoshi Tamaki; Hideki Murata; Sadatugu Terada; Tsuneo Wada, all of Hino; Akitoshi Matsubara, and Hiroyuki Takagiwa, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,067

Claims priority, application Japan, Aug. 26, 1980, 55-117918

Int. Cl.<sup>3</sup> G03G 9/08; G08J 3/20

U.S. Cl. 430—106.6

25 Claims

1. An electrostatic image developing toner comprising a colorant, and polymer particles produced by suspension polymerization of a polymerizable monomer in the presence of an emulsification-preventing agent, said particles being from 1 to 50 microns.

4,415,646  
NITROGEN CONTAINING POLYMERS AS CHARGE ENHANCING ADDITIVE FOR ELECTROPHOTOGRAPHIC TONER

Robert J. Gruber, Pittsford; Steven B. Bolte, and Doretta Agostine, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

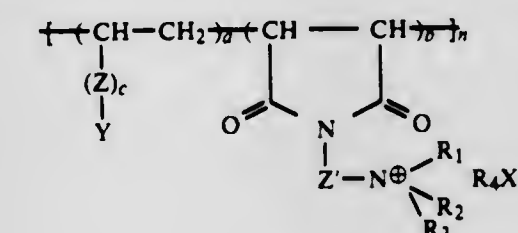
Filed Mar. 3, 1982, Ser. No. 354,472

Int. Cl.<sup>3</sup> G03G 9/00

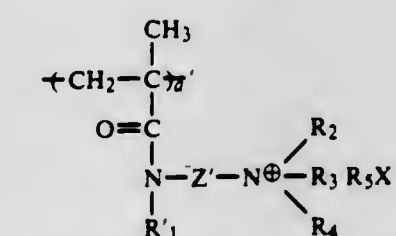
U.S. Cl. 430—110

35 Claims

1. A positively charged toner composition comprised of resin particles, and pigment particles, and from about 0.1 to about 10 percent by weight of the toner composition, a polymeric charge enhancing additive selected from the group consisting of those additives of the following formulas:



and



wherein a and b are percentage numbers equaling 100, a being from about 20 weight percent to about 99 weight percent, and b being from about 80 weight percent to about 1 weight percent, n is a repeating number ranging from about 3 to about 300, Z is an oxygen atom, c is the number zero or 1, Y is an alkyl or aromatic radical, Z' is selected from the group consisting of aliphatic, aromatic, and heterocyclic radicals, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently selected from alkyl radicals containing from about 1 to about 22 carbon atoms, X is an anion, a' is a number of from about 50 to about 500, R<sub>1</sub>' is hydrogen or an alkyl radical containing from 1 to about 22 carbon atoms.

4,415,645  
DEVELOPER FOR ELECTROPHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Toshihiro Kouchi, Hirakata, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Mar. 5, 1979, Ser. No. 17,804

Claims priority, application Japan, Mar. 10, 1978, 53/26518

Int. Cl.<sup>3</sup> G03G 9/06

U.S. Cl. 430—107

8 Claims

1. A particulate composite developer for electrophotography which has a dispersion structure comprising a continuous phase consisting of a homogeneous mixture of a hard resin and a pigment and a plurality of dispersed phases consisting of spherical particles of a soft parting or fixing material having an emulsion grade size and being dispersed in the continuous phase, said resin being soluble in cold toluene, said soft parting or fixing material being selected from the group consisting of low-molecular-weight polyethylene and polypropylene and



4,415,647

**POLYMERIC VEHICLE FOR DYE IMAGE-RECEIVING LAYER CONTAINING A POLY(VINYLMIDAZOLE) MORDANT**

Gerald W. Klein, Pittsford, and Wayne A. Bowman, Walworth, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,067  
Int. Cl.<sup>3</sup> G03C 1/40, 1/10, 5/54

U.S. Cl. 430—213

42 Claims

1. In a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, said support also having thereon a dye image-receiving layer comprising a poly(vinylimidazole) mordant in a nonmordanting, water-permeable polymeric vehicle,

the improvement wherein said vehicle comprises recurring units derived from a hydroxyalkyl acrylate ester, and/or an N-hydroxyalkylacrylamide, and/or an N-alkylacrylamide.

4,415,648

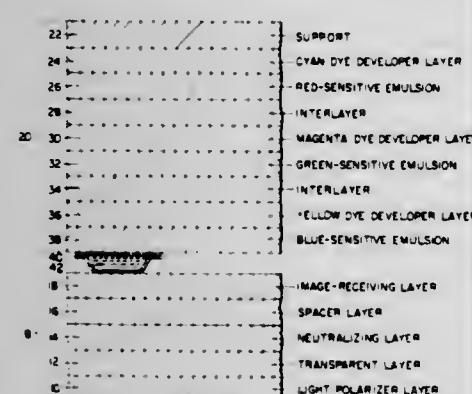
**VARIABLE DENSITY PHOTOGRAPHIC TRANSPARENCIES**

Ruth C. Bilofsky, and Ronald A. Sahatjian, both of Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 17, 1981, Ser. No. 234,687  
Int. Cl.<sup>3</sup> G03B 27/76

U.S. Cl. 430—220

2 Claims



1. A diffusion transfer photographic film unit designed for the provision of a transparency image, said diffusion transfer photographic film unit comprising

a photosensitive element including at least one photosensitized silver halide emulsion layer having an image-providing material associated therewith,

an image-receiving element adapted to be separated from said photosensitive element after transfer image formation,

and, a means for introducing an alkaline processing composition within said film unit;

said image-receiving element comprising a transparent sheet material supporting on one surface thereof an image-receiving layer, and including a light polarizer sheet forming an integral part of said image-receiving element; said light polarizer sheet being positioned adjacent the transparent support sheet of said image-receiving element.

4,415,649

**FLEXOGRAPHIC PRINTING PLATES CONTAINING BLENDED ADHESIVES**

Stanley H. Munger, Rumson; Michael R. Short, Freehold, and David W. Swatton, East Keansburg, all of N.J., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 237,861, Feb. 25, 1981, abandoned. This application Jun. 3, 1982, Ser. No. 384,558  
Int. Cl.<sup>3</sup> G03C 1/78

U.S. Cl. 430—271

19 Claims

1. A photosensitive flexographic element which consists essentially of

(A) a flexible support,

(B) a layer of a photosensitive, elastomeric composition which consists essentially of, based on the total weight of composition

(1) 55 to 90% by weight of a high molecular weight butadiene/acrylonitrile copolymer having a number average molecular weight of 20,000 to 75,000, an acrylonitrile content of 10 to 50% by weight and a carboxyl content of 0 to 15% by weight,

(2) 2 to 40% by weight of a nongaseous, ethylenically unsaturated compound containing at least one terminal ethylenic group, said compound being capable of forming a high polymer by free-radical initiated, chain-propagating addition polymerization and being compatible with polymer (1);

(3) 0.001 to 10% by weight of an organic, radiation-sensitive, free-radical generating system, activatable by actinic radiation which initiates polymerization of the unsaturated compound; and, optionally

(4) thermal addition polymerization inhibitor,

(5) antioxidant,

(6) antiozonant,

(7) immiscible, polymeric or nonpolymeric organic or inorganic fillers or reinforcing agents which are essentially transparent at the wavelengths used for exposure, and

(8) compatible plasticizer;

(C) optionally a thin, hard flexible solvent soluble layer, and

(D) optionally a removable cover sheet; and between layers (A) and (B) a layer of an adhesive composition which provides an adhesion value for the photosensitive layer (B) to the support (A) of at least 3 lbs./inch (53.57 kg/m) and consists essentially of a blend of at least two polymers taken from the group consisting of

(i) polyester resin which is a condensation polymer of ethylene glycol, terephthalic acid, isophthalic acid and azelaic acid in a molar ratio of about 6:2:1:3 the resin having a number average molecular weight of about 19,000 and a weight average molecular weight of about 37,000, 0 to 78% by weight based on the total weight of resin in the adhesive composition;

(ii) polyurethane resin which is a crystalline, thermoplastic resin having a Brookfield viscosity of 100–1200 using 5% by weight solids in methyl ethyl ketone and a Brookfield spindle #3 at 12 rpm, and an adhesive activation temperature in the range of 54° to 63° C., 0 to 78% by weight based on the total weight of resin in the adhesive composition,

(iii) polyamide which is a thermoplastic dimer acid polyamide resin having a Ball and Ring softening point of 132°–145° C., a viscosity at 210° C. of 40 to 60 poises, % elongation determined by ASTM D-1708 of 130 at –18° C., 560 at 24° C. and 100 at 60° C., tensile break determined by ASTM D-1708 of 4000 psi at –18° C., 450 psi at 24° C. and 170 psi at 60° C., 0 to 94% by weight based on the total weight of resin in the adhesive composition, and

(iv) polyamide which is a thermoplastic dimer acid polyamide resin having a Ball and Ring softening point of 150°–160° C., a viscosity at 210° C. of 28 to 38 poises, % elongation determined by ASTM D-1708 of 350 at

–18° C., 250 at 24° C. and 40 at 60° C., tensile break determined by ASTM D-1708 of 2200 psi at –18° C., 360 psi at 24° C. and 50 psi at 60° C., 0 to 97% by weight based on the total weight of resin in the adhesive composition with the proviso that when a blend of two polymers is present in the adhesive composition the percentage ranges are for the blend:

(i) 23% to 77% and (ii) 77% to 23%,  
(i) 7% to 77% and (iii) 93% to 23%,  
(i) 3% to 70% and (iv) 97% to 30%,  
(ii) 7% to 72% and (iii) 93% to 28%,  
(ii) 10% to 60% and (iv) 90% to 40%, and  
(iii) 25 to 75% and (iv) 75% to 25%.

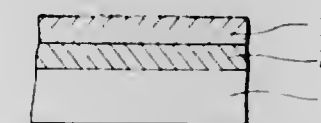
4,415,650

**RECORDING MATERIAL**

Keishiro Kido; Minoru Wada; Fumilaki Shinozaki, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1978, Ser. No. 915,689  
Claims priority, application Japan, Jun. 14, 1977, 52-70848;  
Jun. 15, 1977, 52-70851

Int. Cl.<sup>3</sup> G01D 15/34; G03F 7/00; G11B 3/70, 7/00, 7/24  
U.S. Cl. 430—273 24 Claims



1. A thermal recording material comprising a support having in sequence thereon a recording layer thermally deformable through exposure to high intensity radiation and a layer of one or more metals, a layer of one or more inorganic compounds or a layer of a mixture of said one or more metals and said one or more inorganic compounds on said recording layer, the recording layer comprising a vacuum deposited layer of at least one organic compound selected from a group consisting of organic carboxylic acids, salts of organic carboxylic acids, esters of organic carboxylic acids, aromatic sulfonic acids, organic acyclic sulfur compounds, nitrogen-containing heterocyclic compounds, sulfur-containing heterocyclic compounds, organic macromolecular compounds selected from the group consisting of polymethacrylic acid, polystyrene, polyamides, polyvinyl alcohol, polyethyleneoxide, methyl cellulose, polyvinyl butyral, polymethylmethacrylate, polyisobutylmethacrylate, polyethylene and rosin, dyes selected from the group consisting of azo dyes, anthraquinone dyes, indigoid dyes, soluble vat dyeing dyes, sulfur dyes, carbonium dyes, quinoneimine dyes, phthalocyanine dyes, cyanine dyes, quinoline dyes, nitro dyes and nitroso dyes and pigments selected from the group consisting of phthalocyanine pigments, anthraquinone pigments, and quinoline pigments, wherein said metal is magnesium, manganese, copper, zinc, aluminum, indium, tin or bismuth and

said inorganic compound is a metal sulfide selected from the group consisting of CrS, CrS<sub>2</sub>, Cr<sub>2</sub>S<sub>3</sub>, MoS<sub>2</sub>, FeS, Fe<sub>2</sub>S, CoS, NiS, Ni<sub>2</sub>S, Cu<sub>2</sub>S, Ag<sub>2</sub>S, ZnS, In<sub>2</sub>S<sub>3</sub>, In<sub>2</sub>S<sub>2</sub>, GeS<sub>x</sub> wherein x is a positive real number of 2.5 or less, SnS and SnS<sub>2</sub>; a metal fluoride selected from the group consists of MgF<sub>2</sub>, CaF<sub>2</sub> and RhF<sub>3</sub>; a metal oxide selected from the group consisting of MoO<sub>3</sub>, InO, In<sub>2</sub>O, In<sub>2</sub>O<sub>3</sub>, and GeO; or a halide selected from the group consisting of AgI, AgBr, AgCl, PbI<sub>2</sub>, PbBr<sub>2</sub>, PbCl<sub>2</sub>, PbF<sub>2</sub>, SnI<sub>2</sub>, SnCl<sub>2</sub>, CuI, CuBr, CuCl, KI and KCl.

2. A thermal recording material consisting essentially of a support having thereon a recording layer thermally deformable through exposure to high intensity radiation, the recording layer comprising a vacuum deposited layer of at least one organic compound selected from the group consisting of organic carboxylic acids, salts of organic carboxylic acids, esters of organic carboxylic acids, aromatic sulfonic acids, organic

acyclic sulfur compounds, nitrogen-containing heterocyclic compounds, sulfur-containing heterocyclic compounds, organic macromolecular compounds selected from the group consisting of polymethacrylic acid, polystyrene, polyamides, polyvinyl alcohol, polyethyleneoxide, methyl cellulose, polyvinyl butyral, polymethylmethacrylate, polyisobutylmethacrylate, polyethylene and rosin, dyes selected from the group consisting of azo dyes, anthraquinone dyes, indigoid dyes, soluble vat dyeing dyes, sulfur dyes, carbonium dyes, quinoneimine dyes, phthalocyanine dyes, cyanine dyes, quinoline dyes, nitro dyes and nitroso dyes and pigments selected from the group consisting of phthalocyanine pigments, anthraquinone pigment and quinoline pigments, wherein said vacuum deposited layer of said at least one organic compound comprises a vacuum codeposited layer of a mixture of (a) said at least one organic compound and (b) at least one inorganic material selected from the group consisting of one or more metals, one or more inorganic compounds, and mixtures thereof.

4,415,651

**AQUEOUS PROCESSABLE, POSITIVE-WORKING PHOTOPOLYMER COMPOSITIONS**

Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 271,411, Mar. 30, 1981, abandoned. This application Jan. 4, 1982, Ser. No. 335,051  
Int. Cl.<sup>3</sup> G03C 1/68

U.S. Cl. 430—277

27 Claims

1. A positive-working, monomer-free photosensitive composition comprising the following components:

(i) about 10 to 90 percent by total weight of components (i), (ii), and (iii), of a polyene having a number average molecular weight of about 1,000 to 1,000,000, said polyene containing about 20 to 1800 milliequivalents of reactive unsaturated carbon to carbon groups per 100 g of polyene;

(ii) about 1 to 70 percent by total weight of components (i), (ii), and (iii), of a reactive mercapto acid; and

(iii) about 0.001 to 50 percent by total weight of components (i), (ii), and (iii) of a radiation-sensitive, radical-generating system, activatable by actinic radiation to initiate addition of the mercapto acid to the polyene.

4,415,652

**AQUEOUS PROCESSABLE, POSITIVE-WORKING PHOTOPOLYMER COMPOSITIONS**

Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 335,051, Jan. 4, 1982, which is a continuation-in-part of Ser. No. 271,411, Mar. 30, 1981, abandoned. This application Jul. 27, 1982, Ser. No. 400,660  
Int. Cl.<sup>3</sup> G03C 1/68

U.S. Cl. 430—277

26 Claims

1. A photosensitive composition comprising the following components:

(i) about 10 to 90 percent by total weight of components (i), (ii), and (iii), of a polyene having a number average molecular weight of about 1,000 to 25,000, said polyene containing (a) about 20 to 1000 milliequivalents of reactive unsaturated carbon to carbon groups per 100 g of polyene, and (b) about 10 to 50 mole percent of N-alkenylmaleimide units in which the alkenyl group contains about 3 to 18 carbon atoms;

(ii) about 5 to 50 percent by total weight of components (i), (ii), and (iii), of a reactive mercapto acid; and

(iii) about 0.1 to 50 percent by total weight of components (i), (ii), and (iii) of a radiation-sensitive, radical-generating system, activatable by actinic radiation to initiate addition of the mercapto acid to the polyene.



4,415,653

## METHOD OF MAKING SENSITIVE POSITIVE ELECTRON BEAM RESISTS

Juey H. Lai, Burnsville; Richard Douglas, Crystal, both of Minn., and Lloyd Shepherd, Eau Claire, Wis., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 261,427, May 7, 1981, abandoned. This application Dec. 7, 1982, Ser. No. 447,579 Int. Cl.<sup>3</sup> G03C 5/00

U.S. Cl. 430—296

12 Claims

1. A method of producing a sensitive positive resist image comprising the steps of coating a substrate with a solution of a radiation sensitive copolymer comprising methacrylic acid and methacrylonitrile to form a thin polymeric film of said copolymer thereon; prebaking the coated substrate at a temperature below the decomposition temperature of said copolymer; exposing said polymeric film to ionizing radiation in a predetermined pattern to increase the solubility of the exposed areas thereof; and developing said polymeric film to remove said copolymer from said exposed areas.

4,415,654

## POST-EXPOSURE PROCESS

Rudolph L. Pohl, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 19, 1982, Ser. No. 409,699

Int. Cl.<sup>3</sup> G03C 5/14

U.S. Cl. 430—328

3 Claims

1. In the process of post-exposing to actinic radiation a relief printing plate prepared from a photosensitive polymeric composition, the improvement which comprises said relief printing plate being immersed during said post-exposing in a dilute aqueous solution of a persulfate salt and a sufficient amount of a water-soluble carboxylic acid to produce a pH of about 1.5 to about 2.5.

4,415,655

## ELECTROPHORETIC SEPARATION OF ISOENZYMES UTILIZING A STABLE POLYACRYLAMIDE SYSTEM

Aurora F. de Castro, Union, Mich., and Surendra K. Gupta, Elkhardt, Ind., assignors to TechAmerica Group, Inc., Elwood, Kans.

Filed May 17, 1982, Ser. No. 379,115

Int. Cl.<sup>3</sup> C12Q 1/50, 1/32; C12N 9/04, 9/12

U.S. Cl. 435—17

7 Claims

1. A method for separating isoenzymes which comprises the steps of applying an isoenzyme-containing sample to a support medium of polyacryl-amide gel containing acrylamide monomers in a buffer solution of a salt of 2-amino-2-methyl-1,3-propanediol at a pH of about 6.4 to 7.3 and an electrolyte buffer of 2-amino-2-methyl-1,3-propanediol taurine at a pH of about 8.0 to 10.0, subjecting the mixture to a differential electrical potential to produce migration of the isoenzymes and buffer ions and determining the presence of separated isoenzymes.

4,415,656

## INCREASING THE STABILITY OF AMYLOGUCOSIDASE

Ronald P. Rohrbach, Forest Lake, and Mary J. Maliarik, Lake Forest, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 21, 1982, Ser. No. 380,797

Int. Cl.<sup>3</sup> C12P 19/20; C12N 9/34

U.S. Cl. 435—96

4 Claims

1. A method of increasing the productivity in amyloglucosidase-catalyzed hydrolysis of a 1,4-linked carbohydrate comprising contacting a solution of said carbohydrate with amyloglucosidase at a pressure greater than about 500 psig.

4,415,657

PROCESS FOR PREPARATION OF AN OPTICALLY ACTIVE MONOALKYL ESTER OF  $\beta$ -(S)-AMINOGLUTARIC ACID

Hamao Umezawa, Tokyo; Masaji Ohno, Kamakura; Junzo Hasegawa; Shigeki Hamaguchi, both of Akashi; Masahiro Ogura, Ono; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Company, Limited, Osaka, Japan

Filed Dec. 8, 1981, Ser. No. 328,696

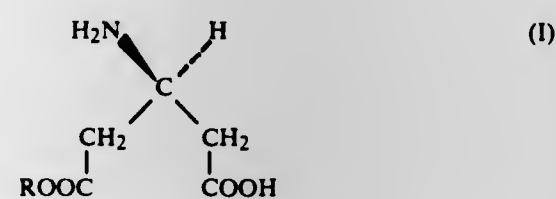
Claims priority, application Japan, Dec. 30, 1980, 55-186819; Feb. 6, 1981, 56-17214

Int. Cl.<sup>3</sup> C12P 13/04, 7/62; C07B 19/02

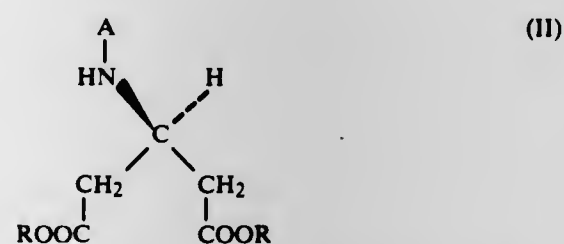
U.S. Cl. 435—106

15 Claims

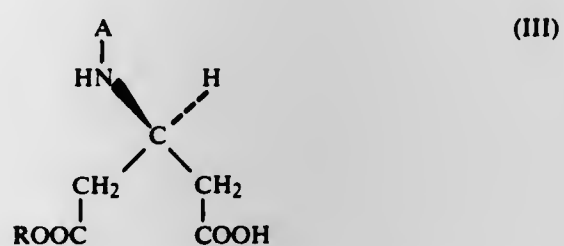
1. A process for preparation of an optically active monoalkyl ester of  $\beta$ -(S)-aminoglutaric acid represented by the formula (I):



wherein R represents an alkyl having 1-4 carbon atoms, which comprises subjecting a dialkyl ester of  $\beta$ -protected aminoglutaric acid represented by the formula (II):



wherein R represents the same as defined above and A represents an amino-protecting group removable by catalytic hydrogenolysis or mild hydrolysis, to the action of a culture broth, cells, or treated cells of a microorganism which is capable of stereoselectively hydrolyzing only one of the ester groups in said dialkyl ester of  $\beta$ -protected aminoglutaric acid (II) and which belongs to the genus *Candida*, *Pichia*, *Trichosporon*, *Geotrichum*, *Aspergillus*, *Absidia*, *Actinomucor*, *Hilicostylum*, *Mucor*, *Mortierella*, *Paecilomyces*, *Zygorhynchus*, *Fusarium*, *Cricinella*, *Cunninghamella*, *Rhizopus*, *Penicillium*, *Proteus*, *Nocardia*, *Micrococcus*, *Hafnia*, *Brevibacterium*, *Torulopsis*, *Debaryomyces*, *Endomyces*, *Saccharomycopsis*, *Cryptococcus*, *Pachysolen*, *Sporobolomyces*, *Syringospora*, *Corynebacterium*, *Pseudomonas*, *Arthrobacter*, *Bacillus*, *Staphylococcus*, or *Streptococcus*, to produce an optically active monoalkyl ester of  $\beta$ -protected (S)-aminoglutaric acid represented by the formula (III):



wherein R and A each represents the same as defined above, and then removing the amino-protecting group from the product (III).

4,415,658

## PROCESS FOR DECOMPOSING 2,4-DIHYDROXY-6-AMINO-S-TRIAZINE DERIVATIVES

Alasdair M. Cook, Wädenswil, and Ralf Hütter, Gockhausen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,440

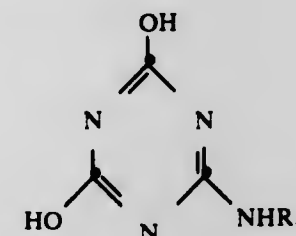
Claims priority, application Switzerland, Sep. 10, 1980, 6796/80

Int. Cl.<sup>3</sup> C12N 1/20; C12P 1/04, 17/12, 13/00; C12R 1/38

U.S. Cl. 435—122

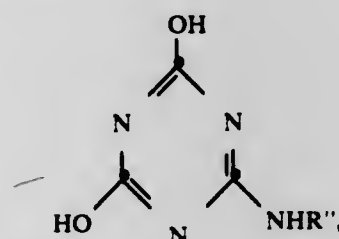
23 Claims

1. A process for decomposing 2,4-dihydroxy-6-amino-s-triazine derivatives of the formula I

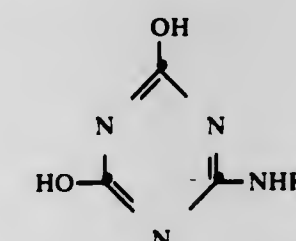


wherein R is an aliphatic or cycloaliphatic radical having 1 to 6 carbon atoms, in effluents containing said compounds, which process comprises bringing the effluents, under aerobic conditions, into contact with either of the strains *Pseudomonas* sp. NRRL B-12228 or *Pseudomonas* sp. NRRL B-12229 at temperatures of from 20° to 41° C.

9. A process for conversion of 2-hydroxy-4,6-diamino-s-triazine derivatives of formula II



wherein R is an aliphatic or cycloaliphatic radical having 1 to 6 carbon atoms, contained in effluents, into a 2,4-dihydroxy-6-amino-2-triazine of the formula I,



which process comprises bringing the effluents, under aerobic conditions, into contact with *Pseudomonas* sp. NRRL B-12227 at temperatures of from 20° to 41° C.

4,415,659

## METHOD FOR MASHING STARCH-RICH MATERIAL FOR ALCOHOL PRODUCTION

Pentti P. Ronkainen, Espoo; Olavi A. Leppänen; Kai J. Harju, both of Helsinki, and Pertti J. Eräpolku, Rajamäki, all of Finland, assignors to Oy Alko AB, Helsinki, Finland

Filed Jan. 22, 1982, Ser. No. 341,933

Claims priority, application Finland, Feb. 5, 1981, 810344

Int. Cl.<sup>3</sup> C12P 1/00, 7/06; C12C 7/04

U.S. Cl. 435—161

2 Claims

1. Method for mashing raw starch-rich material used in alcohol manufacture which comprises introducing whole or partially crushed raw starch-rich material into a reactor, reducing the pressure in the reactor to about 0.01 MPa, introducing heated water into the reactor followed by steam at about 0.7 MPa pressure and steaming the material in the reactor at

about 0.7 MPa pressure for about 5 minutes, the water to starch-rich material ratio being maintained during the whole mashing time below 2:1, withdrawing steam from the reactor until the temperature in said reactor has fallen to 90°-100° C., introducing pressurized air into said reactor until the pressure therein has risen to about 1.5 MPa, and explosively ejecting the starch material from said reactor whereby soft grains therein are broken down.

4,415,660

## METHOD OF MAKING A CLONING VECTOR

Richard N. Goldstein, Cambridge, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

(1) Division of Ser. No. 881,170, Feb. 27, 1978, Pat. No. 4,332,901. This application Mar. 12, 1982, Ser. No. 357,414

Int. Cl.<sup>3</sup> C12N 15/00

U.S. Cl. 435—172

5 Claims

1. A method of making a cloning vector which comprises mutagenizing bacteriophage  $\phi$ 4 wt or  $\phi$ 4 viri, then isolating the mutant having plaque forming units appearing, in a cesium chloride equilibrium density gradient at 24° C., in the density range from 1.42 to 1.35 g/ml and displaying a density profile of plaque forming units having three peaks at about 1.42, 1.39 and 1.35 g/ml respectively.

4,415,661

## MICROBIAL DEGRADATION OF PETROLEUM MATERIALS

Mandayam J. Thirumalachar, and Mandayam J. Narasimhan, Jr., both of P.O. Box 506, Locust St., Walnut Creek, Calif.

94596

Filed Jul. 30, 1981, Ser. No. 288,616

Int. Cl.<sup>3</sup> C12N 11/00, 1/26, 1/14; C10G 32/00

U.S. Cl. 435—174

33 Claims

30. A biologically pure culture of the fungus *Geotrichum marinum* Thirumalachar sp. nov., ATCC 20614, said culture being capable of effecting degradation of crude petroleum and petroleum products.

4,415,662

## MICROBIAL DEGRADATION OF PETROLEUM MATERIALS

(1) Mandayam J. Thirumalachar, and Mandayam J. Narasimhan, Jr., both of P.O. Box 506, Locust St., Walnut Creek, Calif.

94596

Filed Jul. 30, 1981, Ser. No. 288,615

Int. Cl.<sup>3</sup> C12N 11/14, 1/26, 1/14; C10G 32/00

U.S. Cl. 435—176

60 Claims

58. A biologically pure culture of the fungus *Actinomucor elegans* (Ediam) Benj. & Hasselt, Strain No. TC-405, ATCC 20613, said culture being capable of effecting degradation of crude petroleum and petroleum products in an environment.

4,415,663

## SUPPORT MATRIX FOR IMMOBILIZED ENZYMES

Ted Symon, Lombard, and Chester F. Barszcz, Chicago, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1982, Ser. No. 411,157

Int. Cl.<sup>3</sup> C12N 11/14, 11/08; B01J 31/02; B32B 17/10

U.S. Cl. 435—176

15 Claims

1. A support matrix comprising a porous support selected from the group consisting of alumina, silica, thoria, magnesia, porous glass, ceramics, and combinations thereof, impregnated with a polyamine selected from the group consisting of poly(ethyleneamines) and epiamines, substantially all of whose nitrogens bear a pendant epoxide group, wherein said epiamines are the reaction products of polyepichlorohydrin with an alkylendiamine containing from 2 to about 10 carbon atoms.

14. An immobilized enzyme system comprising the support matrix of claim 1 having an enzyme covalently bonded thereto.



4,415,664

## EPIAMINE-BASED SUPPORT MATRIX

Chester F. Barszcz, Chicago, and Ted Symon, Lombard, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1982, Ser. No. 411,158

Int. Cl.<sup>3</sup> C12N 11/14, 11/08; B01J 31/02; B32B 17/10  
U.S. Cl. 435—176 12 Claims

1. A support matrix comprising a porous inorganic support selected from the group consisting of alumina, silica, thoria, magnesia, porous glass, ceramics, and combinations thereof, impregnated with an epamine cross-linked with an excess of a dialdehyde selected from the group of dialdehydes with the formula  $\text{OHC}(\text{CH}_2)_p\text{CHO}$ , where p is an integer from 2 to about 10, and "phthalaldehyde, wherein the epamine is the reaction product of poly(epichlorohydrin) with an alkylenediamine containing from 2 to about 10 carbon atoms."

11. An immobilized enzyme system comprising the support matrix of claim 1 having an enzyme covalently bonded thereto.

4,415,665

## METHOD OF COVALENTLY BINDING BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES TO POLYMERIC SUBSTANCES

Klaus H. Mosbach, Furulund, and Kurt G. I. Nilsson, Lund, both of Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Dec. 1, 1981, Ser. No. 326,332

Claims priority, application Sweden, Dec. 12, 1980, 8008776

Int. Cl.<sup>3</sup> C12N 11/12, 11/10, 11/08

U.S. Cl. 435—179 13 Claims

1. A method of covalently binding  
(a) a biologically active organic substance that contains at least one substituent selected from the group consisting of primary and secondary amino groups, thiol groups, and aromatic hydroxy groups directly to a  
(b) polymeric substance (PM) containing at least one hydroxy group, comprising the steps of:  
(1) first forming a reactive derivative  $\text{PM-O-SO}_2\text{-R}$  by reacting  
(i) an organic sulfonyl halogenide of the formula  $\text{Hal-SO}_2\text{-R}$ , with  
(ii) a polymeric substance (PM) containing at least one hydroxy group, wherein R is an organic group and Hal is halogen, and wherein said at least one reacting hydroxy group is bonded to carbon atoms in the polymeric substance (PM), and then  
(2) reacting said reactive derivative  $\text{PM-O-SO}_2\text{-R}$  directly with the biologically active organic substance as set forth in (a).

4,415,666

## ENZYME ELECTRODE MEMBRANE

Paul A. D'Orazio, Mishawaka, Ind.; Arthur R. Eddy, Jr., Depew, N.Y.; Eric J. Fogt, Maple Grove, Minn.; James E. Jones, Elkhart, and Bruce J. Oberhardt, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 5, 1981, Ser. No. 318,626

Int. Cl.<sup>3</sup> C12N 11/12, 11/04; C12M 1/40; G01N 27/26  
U.S. Cl. 435—179 14 Claims

1. A method of making a 40 to 100 micron contiguous multi-layer membrane suitable for use with an electrochemical sensor in the measurement of an unknown which comprises:  
providing a first polymer dissolved in an inert organic solvent and casting said polymer in solution onto an inert support surface which is unreactive with said polymer and does not form a bond to said polymer,  
permitting said solution to form a 1 to 10 micron dense relatively nonporous film and thereby obtain a first layer, providing a second polymer dissolved in an inert organic solvent, mixing said second polymer dissolved in solvent with a nonsolvent for said polymer and with glucose oxidase to obtain a dispersion and thereafter casting said

dispersion onto said first layer, and thereafter permitting said second polymer to dry to form a second 40 to 80 micron highly porous layer less dense than the first layer, thereby forming said contiguous multilayer membrane, said layers of the membrane being fused together such that no clear distinction can be made between the layers at the boundary and the boundary between the layers is a diffusion zone.

4,415,667

## CARBOXYPEPTIDASE A GAMMA AND PROCESS FOR PREPARING SAME

Atsushi Koide, Funabashi, and Masayuki Yoshizawa, Kawagoe, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,810

Claims priority, application Japan, Mar. 12, 1981, 56-34523

Int. Cl.<sup>3</sup> C12N 9/48, 9/64

U.S. Cl. 435—212 4 Claims

1. A carboxypeptidase A $\gamma$  substance in which the  $\text{NH}_2$ -terminal sequence containing 25 amino acid residues is as follows:

Asn-Tyr-Ala-Thr-Tyr-His-Thr-Leu-Glu-Glu-Ile-  
Tyr-Asp-Phe-Met-Asp-Ile-Leu-Val-Ala-Glu-His-  
Pro-Gln-Leu-

said substance having the following properties:

- (a) physical state=needle crystals  
(b) molecular weight, according to gel permeation method=38,900  
(c) constituent amino acids=

TABLE 1

Amino acid	Number
Lysine	15
Histidine	10
Arginine	12
Aspartic acid and asparagine	36
Threonine	27
Serine	28
Glutamic acid and glutamine	32
Proline	16
Glycine	28
Alanine	24
Cystine	2
Valine	15
Methionine	4
Isoleucine	27
Leucine	25
Tyrosine	18
Phenylalanine	19
Tryptophan	9
Total	347

- (d) metal contained=one Zn atom per molecule  
(e) coefficient of sedimentation  $S_{20,w}=3.3$   
(f) isoelectric point, at an ionic strength of 0.3=4.3  
(g) specific substrates=Na-carbobenzoxylglycyl-L-phenylalanine and casein  
(h) Michaelis constant (Na-carbobenzoxylglycyl-L-phenylalanine as the substrate)=20 mM  
(i) pH of optimum activity=7 to 8.

4,415,668

## CELL CULTURE

Don L. Siegel, Brookline, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 20, 1981, Ser. No. 255,480

Int. Cl.<sup>3</sup> C12N 5/02, 11/08; C12M 3/02

U.S. Cl. 435—241 6 Claims

1. The method of growing anchorage-dependent cells in microcarrier cell culture and preparation for examination in a non-aqueous organic solvent environment comprising growing cells in aqueous environment on microcarriers comprising polymeric support material having reactive chemical moieties

4,415,670

## MOTIONLESS MIXER AS CELL CULTURE PROPAGATOR

Roy Grabner, Blue Bell, Pa., and Edward L. Paul, Chatham Township, Union County, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 166,641, Jul. 7, 1980, Pat. No. 4,296,204, which is a continuation-in-part of Ser. No. 872,289, Jan. 25, 1978, abandoned. This application Jun. 22, 1981, Ser. No. 276,418

Int. Cl.<sup>3</sup> C12M 3/00

U.S. Cl. 435—285 2 Claims

1. A motionless mixer element for propagating tissue culture cells, said mixer element being disposed within a housing and comprising an assembly of parallel sheets shaped to provide a plurality of channels which converge and diverge to form a plurality of mixing cells, each cell being formed and bounded by the juncture of two inlet channels which converge toward each other at about right angles in one plane, and two outlet channels which diverge from each other at about right angles in another plane, the planes being rotated about 90° with respect to each other, the cells being adapted to receive a fluid entering a cell in two separate inlet streams and to rearrange the fluid due to shearing and extensional forces and to direct the fluid exiting the cell into two outlet streams each of which leaves the cell in a direction different from either inlet stream, and tissue culture cells attached to the assembly of parallel sheets.

4,415,671

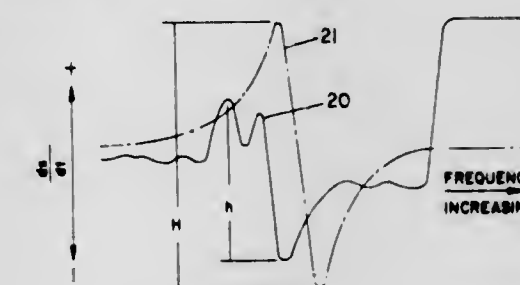
## METHOD FOR MODIFYING ELECTRON SPIN RESONANCE SIGNALS FROM HYDROCARBON CRUDE

Stephen W. Nickale, Brea, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 30, 1980, Ser. No. 202,102

Int. Cl.<sup>3</sup> G01N 24/10

U.S. Cl. 436—29 8 Claims



CRUDE OIL/ENHANCED CRUDE OIL

1. A method for enhancing electron spin resonance signals from crude petroleum comprising contacting said samples with a halogen or ferric chloride to affect the number of the population of free radical asphaltene in said crude petroleum while detecting said electron spin resonance signals.

4,415,672

## GLASS-CERAMIC COMPOSITIONS OF HIGH REFRACTORINESS

John J. Brennan, Portland, Conn.; Kenneth Chyung, and Mark P. Taylor, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 20, 1982, Ser. No. 380,464

Int. Cl.<sup>3</sup> C03C 3/22

U.S. Cl. 501—4 4 Claims

1. An opaque glass-ceramic body exhibiting high strength and use temperature up to 1200° C., wherein beta-spodumene and/or beta-quartz solid solution constitutes the predominant crystal phase, which body is essentially free from  $\text{TiO}_2$  and consists essentially, expressed in terms of weight percent on the oxide basis, of:

thereon selected from the group consisting of hydroxyl and amide moieties and having bonded thereto hydrophobic chemical moieties selected from the group consisting of hydroxyethyl, hydroxypropyl and hydroxyalkoxypropyl moieties and bonded thereto an amount of positively charged chemical moieties to provide an exchange capacity within the range of between about 0.1 and about 4.5 meq/gram of dry untreated polymeric support material,  
staining and transferring said microcarriers bearing said cells from said aqueous cell growth environment to a non-aqueous organic solvent environment without shrinkage of said microcarriers, and  
examining the unshrunk microcarriers bearing said cells previously subjected to staining.

4,415,669

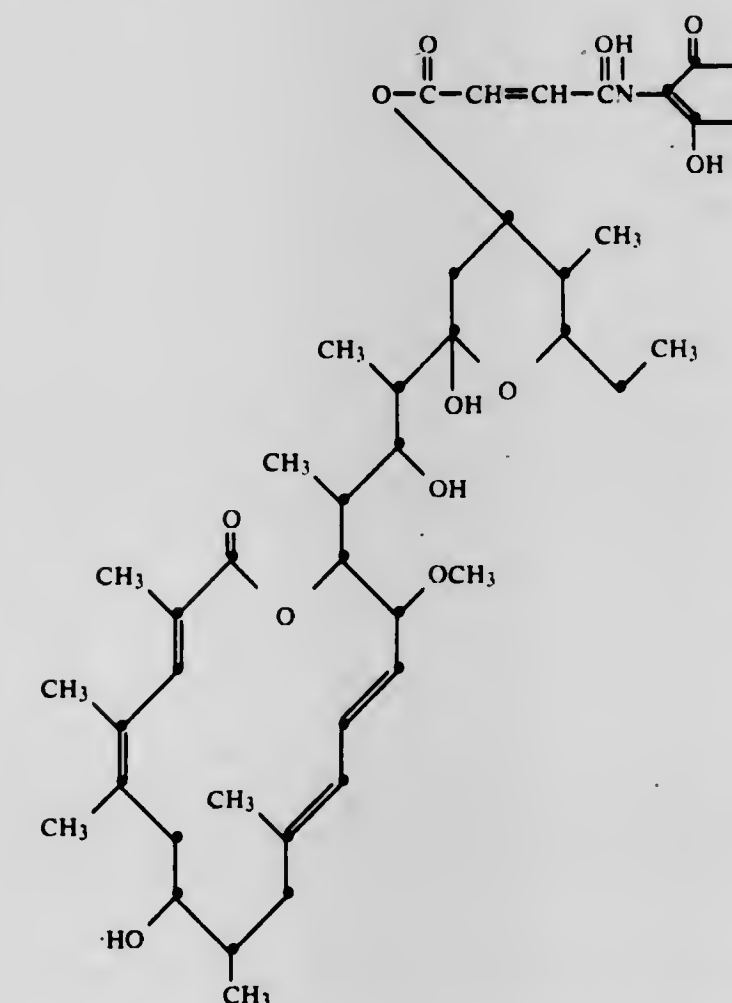
## SUBSTANCE AND PROCESS FOR ITS PRODUCTION

Sebastian Hernandez, Madrid, Spain, assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 7, 1981, Ser. No. 327,837

Int. Cl.<sup>3</sup> C12N 1/20; C12R 1/55; C12P 19/62, 17/08  
U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of the microorganism *Streptomyces hygroscopicus* MA-5285, ATCC-31955 and capable of producing a compound having the formula



in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts.











4,415,689

## SYNTHETIC RESIN COMPOSITIONS CONTAINING 2,2,6,6-TETRAMETHYL PIPERIDINYL TRIAZINES

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki, and Toshihiro Shibata, Omiya, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Sep. 7, 1982, Ser. No. 415,204

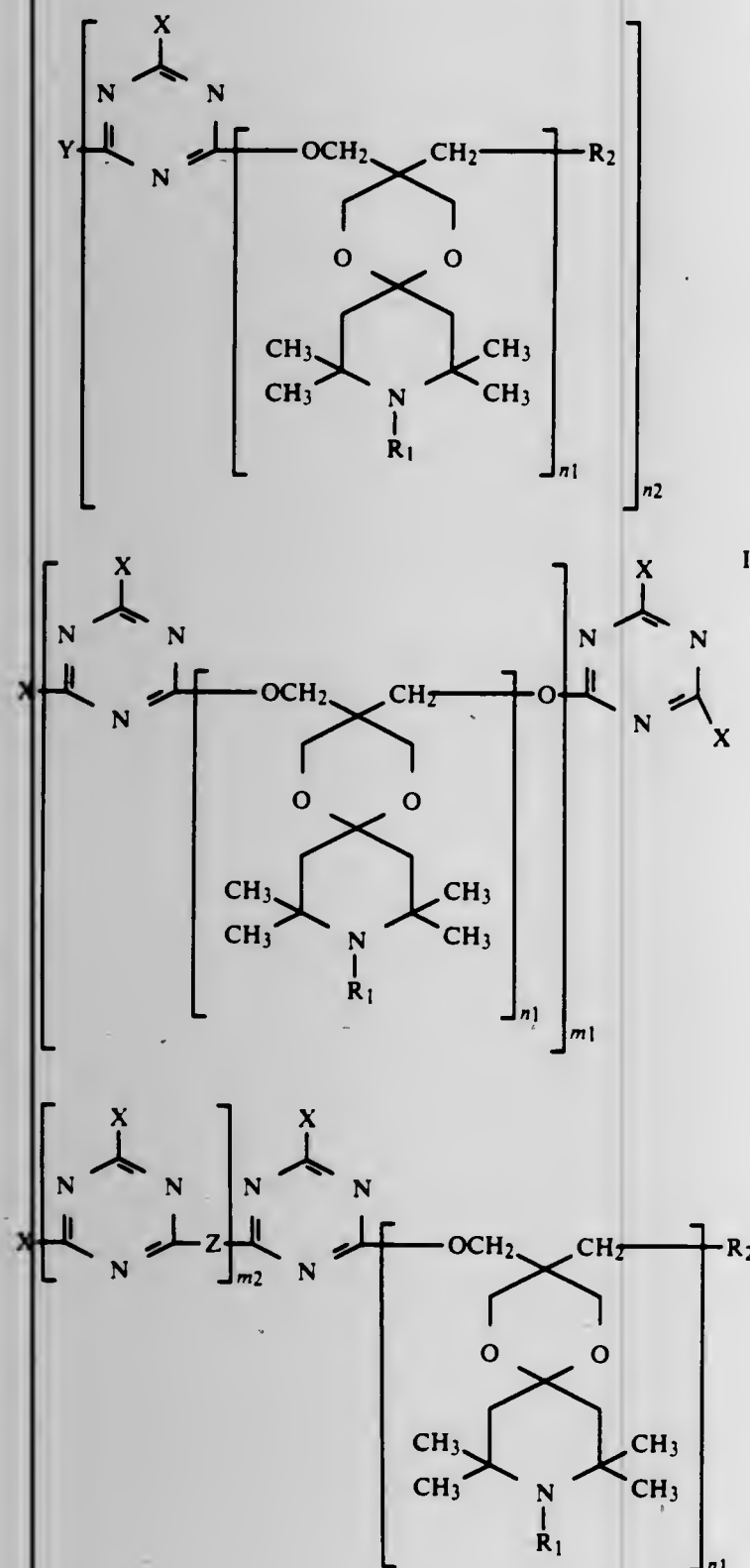
Claims priority, application Japan, Sep. 14, 1981, 81-145016

Int. Cl.<sup>3</sup> C08K 5/34; C07D 491/10

U.S. Cl. 524-103

30 Claims

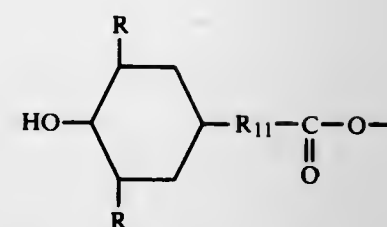
1. 2,2,6,6-Tetramethyl piperidiny triazines having one of the formulae (I), (II) and (III):



wherein:

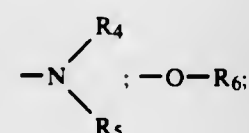
R<sub>1</sub> is selected from the group consisting of hydrogen, oxyl O, alkyl, alkenyl and hydroxyalkyl having from one to about twelve carbon atoms, phenalkyl having from seven to about twelve carbon atoms and acyloxyalkyl having from two to about twelve carbon atoms; and 2,3-epoxy-propyl;

R<sub>2</sub> is selected from the group consisting of hydrogen, lower alkyl having from one to about five carbon atoms,

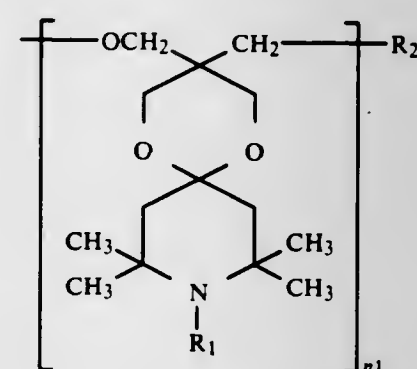


and —O—R<sub>3</sub> (wherein R is hydrogen or lower alkyl having from one to about five carbon atoms; and R<sub>3</sub> is hydrogen or acyl having from one to about twenty carbon atoms);

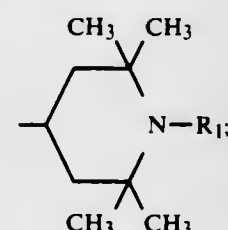
X is selected from the group consisting of



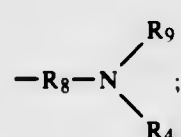
and



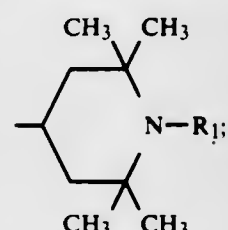
R<sub>4</sub> is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, aryl having from six to about fifteen carbon atoms, —(CH<sub>2</sub>)<sub>p</sub>—O—R<sub>3</sub> and



R<sub>5</sub> is selected from the group consisting of R<sub>4</sub> and



R<sub>6</sub> is selected from the group consisting of alkyl having from one to about eight carbon atoms, aryl having from six to about ten carbon atoms and



p is 1, 2 or 3;

R<sub>7</sub> is selected from the group consisting of hydrogen, alkyl

4,415,690

## SUCCINIC ANHYDRIDE DERIVATIVES AS A SCORCH INHIBITOR FOR CARBOXYLATED RUBBERS

Donald C. Grimm, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 17, 1982, Ser. No. 379,243

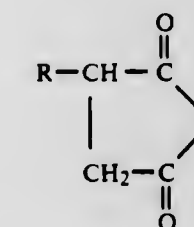
Int. Cl.<sup>3</sup> C08K 5/15

U.S. Cl. 524-112

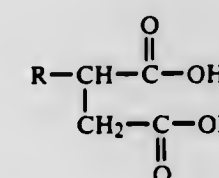
24 Claims

1. An improved scorch resistant carboxylic rubber composition comprising:

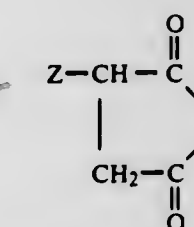
(a) a carboxylated rubber; and  
(b) at least one succinic anhydride selected from the group consisting of alkenyl succinic anhydrides having the structural formula:



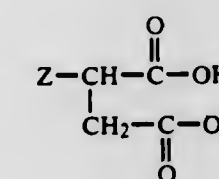
wherein R is an alkenyl moiety containing from 8 to 25 carbon atoms, inclusive; dicarboxylic acids having the structural formula:



wherein R is an alkenyl moiety containing from 8 to 25 carbon atoms, inclusive; alkyl succinic anhydrides having the structural formula:

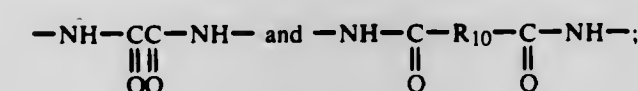


wherein Z is an alkyl moiety containing from 8 to 25 carbon atoms, inclusive; and dicarboxylic acids having the structural formula:



wherein Z is an alkyl moiety containing from 8 to 25 carbon atoms, inclusive; which is distributed throughout said carboxylated rubber composition as a scorch inhibitor.

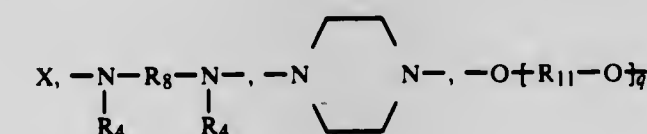
having from one to about eight carbon atoms and acyl having from about two to about five carbon atoms; R<sub>8</sub> is selected from the group consisting of direct linkage, alkylene having from about two to about twelve carbon atoms; arylene having from six to about ten carbon atoms;



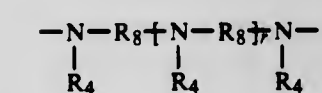
R<sub>9</sub> is selected from the group consisting of hydrogen, alkyl having from one to about eight carbon atoms, aryl having from six to about ten carbon atoms, and acyl having from about two to about ten carbon atoms;

R<sub>10</sub> is selected from the group consisting of alkylene having from one to twelve carbon atoms and arylene having from six to ten carbon atoms;

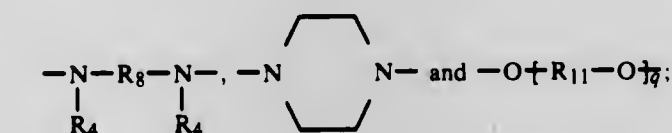
Y is selected from the group consisting of



and a more than three valent residue derived from a polyalcohol or a polyamine by elimination of active H atoms thereof, i.e.,



Z is selected from the group consisting of



q = 1 to 20;

R<sub>11</sub> is selected from the group consisting of alkylene having from two to about eight carbon atoms, alkylene cycloalkylene having from seven to about eighteen carbon atoms, and arylene having from six to about ten carbon atoms;

n<sub>1</sub> is 1, 2 or 3;

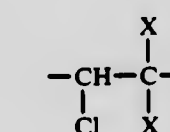
n<sub>2</sub> is a number from 1 to 50;

m<sub>1</sub> is a number from 1 to 20;

m<sub>2</sub> is a number from 2 to 20;

r is a number from 1 to 48.

21. A polyvinyl chloride resin composition having improved resistance to deterioration upon exposure to light comprising a polyvinyl chloride resin formed at least in part of the recurring group:



and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a compound in accordance with claim 1.



4,415,691

## ANTI-BLOCK ADDITIVES FOR OLEFIN POLYMERS

James A. Allen; George W. Knight, both of Lake Jackson, and Morris S. Edmondson, Alvin, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 191,594, Sep. 29, 1980, Pat. No. 4,327,009. This application Mar. 18, 1982, Ser. No. 359,636

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> C08K 5/15

U.S. Cl. 524—114

10 Claims

1. A composition comprising a linear, low density ethylene copolymer having incorporated therein an amount in the range of about 0.04 to about 4 weight percent of at least one block-reducing agent comprising a liquid organic having a molecular weight in the range of about 300 to about 5000, a Saybolt viscosity of at least 100 centistokes at 25° C., and a boiling point above about 285° C.

4,415,692

## STABILIZED THERMOPLASTIC MOULDING COMPOSITIONS

Karsten Idel; Hans-Josef Buysch, both of Krefeld; Horst Peters, Leverkusen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,365

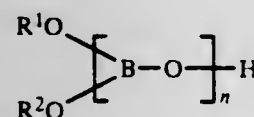
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021726

Int. Cl.<sup>3</sup> C08K 5/55

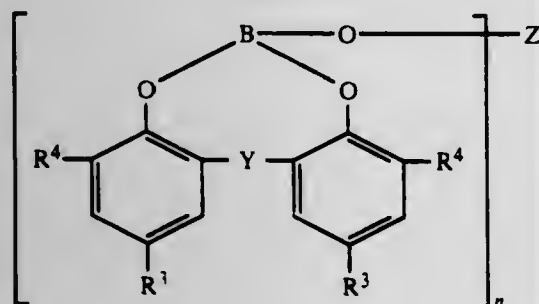
U.S. Cl. 524—183

3 Claims

1. A mixture consisting essentially of an aromatic carbonate, an ABS polymer and from 0.01 to 3.0% by weight, based on the weight of the mixture, of a stabilizer selected from the group consisting of



wherein n is 1 and R<sup>1</sup> and R<sup>2</sup> are each C<sub>1</sub>-C<sub>18</sub> alkyl, C<sub>5</sub>-C<sub>15</sub> cycloalkyl, C<sub>7</sub>-C<sub>24</sub> aralkyl or alkaryl or C<sub>6</sub>-C<sub>24</sub> aryl and



wherein n is an integer of from 1 to 4, Z is hydrogen or an aliphatic, cycloaliphatic or aromatic hydrocarbon group having 1-18 carbon atoms, R<sup>3</sup> and R<sup>4</sup> are each a C<sub>1</sub>-C<sub>9</sub> aliphatic hydrocarbon, a C<sub>5</sub>-C<sub>6</sub> cycloaliphatic hydrocarbon, or a C<sub>7</sub>-C<sub>9</sub> aralkyl or a C<sub>6</sub>-C<sub>10</sub> aryl group and Y is HCR<sup>5</sup> wherein R<sup>5</sup> is hydrogen, a C<sub>1</sub>-C<sub>6</sub> alkyl, a cyclohexenyl or a cyclohexyl group.

4,415,693

## STABILIZATION OF POLYESTERAMIDES WITH URETHANES

Augustin T. Chen, Cheshire; Robert G. Nelb, II, and Kemal Onder, both of New Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 9, 1982, Ser. No. 406,126

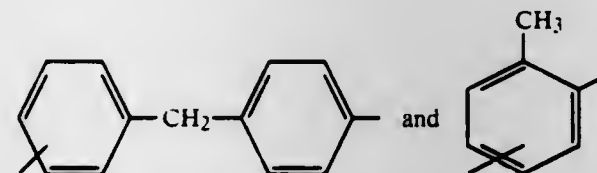
Int. Cl.<sup>3</sup> C08K 5/20; C08L 77/12

U.S. Cl. 524—198

17 Claims

1. A composition comprising a blend of at least about 75 percent by weight of a polyesteramide having recurring amide and ester linkages which are joined by divalent radicals selected from the group consisting of alkylene, arylene, cycloalkylene, blocks derived from polyester polymers which in turn are derived from a dicarboxylic acid or mixture of two or more such acids and an excess of a hydrocarbyl alkane diol having 2 to 8 carbon atoms or mixtures of two or more such diols, blocks derived from polyamide polymers, and mixtures thereof and the balance of the blend comprising a urethane containing ingredient.

4. A composition comprising a blend of (1) about 75 to about 98 percent by weight of a thermoplastic polyesteramide having the recurring unit  $\text{---}(\text{BCOOA}(\text{OOC})_n\text{---})_m\text{---}$  BCO $\text{---}$ NHRNHCO $\text{---}$ CO $\text{---}$ NHRNHCO $\text{---}$  wherein R is selected from the class consisting of arylene of the formulae



and mixtures thereof, A is the residue of a polymeric polyester diol HO $\text{---}$ A $\text{---}$ OH having a molecular weight from about 400 to about 4000, which diol is derived from a dicarboxylic acid or mixture of two or more such acids and an excess of hydrocarbyl alkane diol having 2 to 8 carbon atoms, or mixtures of two or more of the latter diols, B is the residue of a dicarboxylic acid HOOC $\text{---}$ B $\text{---}$ COOH wherein B is a divalent radical selected from the class consisting of alkylene having 4 to 12 carbon atoms, inclusive, 1,4-phenylene, and 1,3-phenylene, m has a mean value of less than 1 and greater than 0, D is the residue of a dicarboxylic acid HOOC $\text{---}$ D $\text{---}$ COOH such that the melt temperature of the hard segment is not greater than 280° C., and x is a number having an average value from zero to 10; and (2) about 2 to about 25 percent by weight of a thermoplastic polyurethane.

4,415,694

## CONTACT ENHANCING COMPOSITION

Russell A. Roiko, Rogers, and Richard J. Pokorny, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 283,286, Jul. 14, 1981, abandoned. This application May 18, 1982, Ser. No. 379,340

Int. Cl.<sup>3</sup> C08K 5/20

U.S. Cl. 524—200

25 Claims

1. A soft, deformable composition comprising an admixture of:

- an effective amount of an anhydride copolymer,
- an effective amount of a flexibilizing polymer selected from polyisobutylene, styrene olefin styrene block polymer, and polymers of ethylene copolymerized with vinyl acetate, vinyl acrylate, vinyl methacrylate, and alpha-olefins;
- an effective amount of a hydrophobic, compatible, fluoroaliphatic radical-containing composition,
- up to 5 weight percent of the composition of a mercaptan compound, and
- an effective amount of an antioxidant compound.

4,415,695

## METHOD FOR PREPARING COLOR-FREE, STABILIZED POLYMERS OF CONJUGATED DIENES OR VINYL AROMATIC HYDROCARBONS OR COPOLYMERS OF CONJUGATED DIENES AND VINYL AROMATIC HYDROCARBONS

Sunil B. Sarkar, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 25, 1982, Ser. No. 362,175

Int. Cl.<sup>3</sup> C08K 3/38

U.S. Cl. 524—405

15 Claims

1. A method of preparing an essentially color-free, stabilized polymer of a conjugated diene or vinyl aromatic hydrocarbon or a copolymer of a conjugated diene and a vinyl aromatic hydrocarbon comprising:

- preparing a living polymer of a conjugated diene or vinyl aromatic hydrocarbon or a copolymer of a conjugated diene and a vinyl aromatic hydrocarbon by anionically polymerizing the conjugated diene or vinyl aromatic hydrocarbon or anionically copolymerizing the conjugated diene and the vinyl aromatic hydrocarbon using a lithium-based catalyst and an inert hydrocarbon diluent;
- adding a terminating agent to said living polymer or copolymer;
- adding boric acid to the terminated polymer or copolymer in sufficient amount to prevent or substantially reduce the formation of color;
- adding stabilizing agents to said polymer or copolymer; and
- recovering an essentially color-free, stabilized polymer or copolymer.

4,415,696

AROMATIC POLYCARBONATE COMPOSITIONS CONTAINING A C<sub>16</sub>-C<sub>36</sub>ALKANE COMPOUND AS A MOLD RELEASE AGENT

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 7, 1981, Ser. No. 327,949

Int. Cl.<sup>3</sup> C08K 5/01

U.S. Cl. 524—490

13 Claims

1. A composition consisting essentially of an aromatic polycarbonate resin and a mold release effective amount of a single normal alkane having from about 16 to about 36 carbon atoms, inclusive.

4,415,697

## PAINT COMPOSITION COMPRISING HYDROXY FUNCTIONAL FILM FORMER AND CROSSLINKED DISPERSION FLOW CONTROL ADDITIVE

Stephen C. Peng, Utica, and John D. Nordstrom, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 199,394, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,395, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,761, Oct. 23, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,858

Int. Cl.<sup>3</sup> C08G 12/32; C08L 61/28; C08F 220/10, 2/14

U.S. Cl. 524—512

49 Claims

1. A coating composition comprising:

- a film forming component comprising hydroxy functional copolymer having a number average molecular weight (M<sub>n</sub>) of from greater than about 150 up to about 20,000 and a glass transition temperature (T<sub>g</sub>) ranging from between about -25° C. and about 70° C., said copolymer being formed from about 5 to about 50 weight percent of hydroxy functional monoethylenically unsaturated monomers and between about 95 and about 50 weight percent of other monoethylenically unsaturated monomers;
- crosslinking agent selected from amino compounds and isocyanate compounds; and
- III) A flow control additive in an amount ranging from about 0.5 to about 30 parts of resin solids in said flow

control additive per 100 parts of total resin solids in said composition, said flow control additive comprising a stable, crosslinked dispersion containing microgel particles, said dispersion being formed by addition polymerization of

(a) between about 1 and about 10 mole percent each of first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other and

(b) between about 98 and about 80 mole percent of at least one other monoethylenically unsaturated monomer in the presence of: (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer comprising the reaction product of ethylenically unsaturated monomers (A) and copolymer reactant (B),

said ethylenically unsaturated monomers (A) bearing functionality capable of condensation reaction with complementary functionality of said copolymer reactant (B) which comprises a random copolymer of

(i) between about 20 and about 45 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially insoluble in said organic liquid,

(ii) between 40 and about 75 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially soluble in said organic liquid; and

(iii) between about 2 and about 15 weight percent of ethylenically unsaturated monomers bearing said complementary functionality capable of condensation reaction with said ethylenically unsaturated monomers (A),

said ethylenically unsaturated monomers (A) being reacted with said copolymer reactant (B) in an amount sufficient to react with at least about 10 percent of said complementary functionality of said copolymer reactant (B), wherein said addition polymerization is carried out at elevated temperature such that the dispersion polymer is first formed and then crosslinked.

4,415,698

## METHOD OF PREPARING WATER-BORNE COLLOIDAL DISPERSIONS OF VINYL RESINS

You-Ling Fan, East Brunswick, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 104,070, Dec. 17, 1979, abandoned. This application Dec. 23, 1981, Ser. No. 333,892

The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C08F 27/06

U.S. Cl. 524—521

3 Claims

1. Method of preparing water-borne colloidal dispersions of vinyl resins selected from the group consisting of vinyl chloride, vinylidene chloride or vinyl chloride/vinylidene chloride copolymers having carboxylic or sulfonic acid groups contained therein which comprises:

- blending said resins with:
  - water;
  - water-miscible base;
  - at least one water-miscible organic solvent which is a good solvent for said resins and boils below about 160° C.;
  - an organic and water-miscible cosolvent which is a poor solvent for said resins but is miscible with the organic solvent (c); and
  - about 1 to about 49 parts by weight of a water-immiscible organic diluent per hundred parts by weight of organic solvent (c) until a colloidal dispersion forms;
- stripping off the colloidal dispersion until the total content of organic solvents (c) and (d) and diluent (e) of the colloidal dispersion is about 0.2 to about 20% by volume; and then
- mixing an effective amount of an acrylic internally cross-



linked rheology modifier with the colloidal dispersion from (B) until a stable, colloidal dispersion is obtained.

4,415,699

## EXTRUDED PROFILES

Eric Nield, Watton-At-Stone, and Martin K. Thompson, Biggleswade, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 23, 1981, Ser. No. 276,640

Claims priority, application United Kingdom, Jul. 14, 1980, 8022949

Int. Cl.<sup>3</sup> C08L 77/06, 67/02

U.S. Cl. 524—538

4 Claims

1. A method of extruding a profile section comprising intimately blending and extruding a blend of a linear polyamide, a linear polyester containing at least 80% by weight of ethylene terephthalate units and an inorganic fibrous filler, wherein the composition contains 5 to 60% by weight of the composition of the fibrous filler and the weight ratio of polyamide to polyester is between 2:1 and 19:1, said composition being extruded through a die of profiled section wherein the melt flow index of the composition is not greater than 2 measured according to ASTM-D1238 using a standard die of bore 2.096 mm, length 8 mm and a load of 2.16 kg at a temperature of 285° C. and the polyamide contains at least 20 g equivalents of terminal amino groups per 10<sup>6</sup> of polyamide in excess of the carboxyl groups.

4,415,700

## HYDROPHILIC LATEX PARTICLES AND USE THEREOF

Hans-Georg Batz, Tutzing; Paul Tanswell, Planegg; Manfred Baier, Pöcking-Possenhofen, all of Fed. Rep. of Germany; Karel Bouchal; Jaroslav Kalal, both of Prague; Frantisek Svec, Hrebek, and Eva Zerkova, Prague, all of Czechoslovakia, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany and Tschechoslowakische Akademie der Wissenschaften, Prague, Czechoslovakia

Filed Dec. 16, 1981, Ser. No. 331,114

Claims priority, application Czechoslovakia, Dec. 23, 1980, 9235-80; Fed. Rep. of Germany, Dec. 23, 1980, 3048883

Int. Cl.<sup>3</sup> C08L 33/00, 37/00; C08F 20/32; G01N 33/54

U.S. Cl. 524—548

30 Claims

1. Hydrophilic latex particles which are sparingly soluble in water consisting of a homo- or co-polymer of monomers containing at least one epoxy group and at least one polymerizable carbon-carbon double bond in the molecule.

4,415,701

## WATER SOLUBLE THICKENERS

Barry J. Bauer, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 12, 1982, Ser. No. 434,144

Int. Cl.<sup>3</sup> C08G 65/08, 4/00

U.S. Cl. 524—612

15 Claims

1. A water soluble thickening compound comprising a copolymer prepared by copolymerizing about 0.5% to about 20%, by weight, of a C<sub>10</sub>-C<sub>36</sub> monoepoxide with about 99.5% to about 80%, by weight, of a 1,3 dioxolane.

4,415,702

## RUBBERIZED ASPHALT COMPOSITION AND PROCESS FOR PRODUCING SAME

Katsuhiro Ono, Ichikawa, and Shigeki Sakimura, Tokyo, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 9, 1982, Ser. No. 347,259

Int. Cl.<sup>3</sup> C08L 95/00

U.S. Cl. 524—705

18 Claims

1. A rubberized asphalt composition which comprises moisture-curing diene polymer liquid rubber, asphalt and aggregates, said liquid rubber being in an amount of from 4 to 10 percent based on the total weight of said liquid rubber and said

asphalt; and said liquid rubber having a molecular weight of from 500 to 50,000 and having an isocyanate group as a functional group at the terminals of the molecule for cross-linking when contacted with water.

4,415,703

## AQUEOUS DISPERSION OF A CELLULOSE DERIVATIVE

Hirotsuka Toba, Ohimachi; Masatoshi Mikumo, Kamitabashi, and Masahiro Asami, Ohimachi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Jan. 6, 1982, Ser. No. 337,336

Claims priority, application Japan, Jan. 13, 1981, 56-3506; Jan. 13, 1981, 56-3507; Apr. 16, 1981, 56-57500; Aug. 28, 1981, 56-135939

Int. Cl.<sup>3</sup> C08L 1/08; C08G 59/02

U.S. Cl. 525—54.21

16 Claims

1. An aqueous dispersion of a polymer composition which dispersion has been prepared by emulsion polymerizing, under radical polymerization conditions, at least one radical-polymerizable, ethylenically unsaturated monomer A, in the presence of water, at least one cellulose derivative B which is dissolved in said monomer A and a water-soluble or water-dispersible dispersion stabilizer C, said dispersion stabilizer C being a high molecular weight polymeric product consisting essentially of

(1) a hydrophilic polymer chain portion made of at least one water-soluble polymer having a functional group in the molecule and having a number average molecular weight in the range of from 300 to 100,000, and

(2) an oleophilic polymer chain portion made of at least one water-insoluble polymer having a reactive group in the molecule and having a molecular weight in the range of from 300 to 200,000, said reactive group of said water-insoluble polymer being reacted with said functional group of said water-soluble polymer to form a bond which is not dissociated in water, said water-insoluble polymer being soluble in said monomer A and being miscible with the polymer of said monomer A,

so that said oleophilic polymer chain portion is fixed in the particles of the polymer of said monomer A in the dispersion, and said hydrophilic polymer chain portion is present in the aqueous phase of the dispersion.

5. An aqueous dispersion as claimed in claim 1 in which said water-soluble polymer is a polymer of at least one radical-polymerizable, ethylenically unsaturated monomer.

4,415,704

## ELASTOMERIC INTERPOLYMER BLENDS

Arthur H. Weinstein, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 155,878, Jun. 6, 1980,

abandoned. This application Sep. 21, 1981, Ser. No. 304,296

Int. Cl.<sup>3</sup> C08L 7/00, 9/00, 9/04, 9/06

U.S. Cl. 525—76

6 Claims

1. A blend of (A) a thermoplastic material comprising a mixture of polyvinyl chloride resin and acrylonitrile-butadiene/styrene resin or (B) a rubber material selected from the group consisting of styrene/butadiene rubber and a mixture of styrene/butadiene rubber and natural rubber with (C) an elastomeric interpolpolymer which is a polyhaloacrylate/butadiene interpolpolymer prepared by aqueous emulsion polymerization at a temperature in the range of about 5° C. to about 60° C., in the presence of a free radical generating catalyst selected from the group consisting of bis-azo isobutyronitrile, potassium persulfate, ammonium persulfate, benzoyl peroxide, p-menthane hydroperoxide, cumene hydroperoxide and mixtures thereof with a fatty acid soap, cationic, non-ionic and organic sulfate or sulfonate emulsifier, a monomer mixture of (1) 1,3-butadiene, (2) a monomer selected from the group consisting of pentachlorophenyl methacrylate, 2,4,6-tribromophenyl methacrylate, 2,4,6-tribromophenyl methacrylate, 2,3,4,6-tetrachlorophenyl acrylate, 2,4,6-trichlorophenyl acrylate, penta-

4,415,708

## THREE STAGE GRAFT POLYMERIZATION PROCESS FOR PREPARING NITRILE BASED RESINS

Shoichi Matsumura; Yoshihiko Hashimoto; Hiroyasu Furukawa, and Masaaki Azuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 108,472, Dec. 31, 1979, abandoned.

This application Sep. 16, 1981, Ser. No. 302,754

Claims priority, application Japan, Dec. 30, 1978, 53-163054

Int. Cl.<sup>3</sup> C08F 279/02, 279/04

U.S. Cl. 525—316

3 Claims

1. A nitrile based resin produced by graft polymerizing in a first polymerization step, in the presence of a rubber comprising at least 50 weight percent 1,3-conjugated diene, a first group of monomers, and in which first polymerization step said first group of monomers is substantially completely polymerized; then, in a second consecutive and separate polymerization step, grafting onto the product of said first polymerization step, a second group of monomers, until said second group of monomers is substantially completely polymerized; and finally, in a third consecutive and separate polymerization step, grafting onto the product of said second polymerization step, a third group of monomers until said third group of monomers is substantially completely polymerized; said resin thus produced by said three consecutive and separate steps of polymerization, consisting essentially of

(A) 5 to 25 parts by weight of said rubber consisting essentially of at least 50 weight percent 1,3-conjugated diene, remainder one or more monomers copolymerizable therewith; and

(B) 75 to 95 parts by weight of the following:

(I) 5 to 40 weight percent of said product of said first polymerization step consisting essentially of "X" weight percent first component selected from the group consisting of acrylonitrile, methacrylonitrile and mixtures thereof, and "100-X" weight percent second component consisting essentially of 20 to 100 weight percent aromatic vinyl compound selected from the group consisting of styrene, substituted styrene, alpha methyl styrene and substituted alpha methyl styrene, 0 to 80 weight percent of a monomer consisting essentially of 30 weight percent or more alkyl acrylate and/or alkyl methacrylate, and not more than 30 weight percent of vinyl monomers excluding said aromatic vinyl compound, said alkyl acrylate and said alkyl methacrylate;

(II) 2 to 35 weight percent of said product of said second polymerization step consisting essentially of "Y" weight percent third component selected from the group consisting of acrylonitrile, methacrylonitrile, and mixtures thereof, and "100-Y" weight percent fourth component consisting essentially of 20 to 100 weight percent aromatic vinyl compound selected from the group consisting essentially of styrene, substituted styrene, alpha methyl styrene, and substituted alpha methyl styrene, 0 to 80 weight percent of a monomer consisting essentially of 30 weight percent or more alkyl acrylate and/or alkyl methacrylate, and not more than 30 weight percent of vinyl monomers excluding said aromatic vinyl compound, said alkyl acrylate and said alkyl methacrylate; and

(III) 25 to 93 weight percent of said product of said third polymerization step consisting essentially of "Z" weight percent fifth component selected from the group consisting of acrylonitrile, methacrylonitrile and mixtures thereof, and "100-Z" weight percent sixth component consisting essentially of 20 to 100 weight percent aromatic vinyl compound selected from the group consisting of styrene, substituted styrene, alpha methyl styrene and substituted alpha methyl styrene, 0 to 80 weight percent of a monomer consisting essentially of 30 weight percent or more alkyl acrylate and/or alkyl methacrylate, and not more than 30 weight percent of

4,415,705

## ROSIN DERIVATIVES USED AS DISPERSANTS

G. Frederick Hutter, Upper Montclair, N.J., assignor to Inmont Corporation, Clifton, N.J.

Filed Jul. 19, 1982, Ser. No. 399,643

Int. Cl.<sup>3</sup> B01F 17/52; C08K 5/01, 5/02; C09D 11/02

U.S. Cl. 525—167.5

8 Claims

1. A dispersing agent formed by reacting a poly (lower alkylene) imine, having mol. wt. of 1,000 to 15,000 with a polyester containing free carboxylic acid groups, said polyester comprising the esterification product of hydroxy stearic acid, or its oligomer, with tall oil rosin.

4,415,706

## COMPATIBLE BLENDS OF POLYGLUTARIMIDES AND POLYAMIDES

William H. Staas, Churchville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 10, 1982, Ser. No. 440,672

Int. Cl.<sup>3</sup> C08L 77/10

U.S. Cl. 525—183

32 Claims

1. A compatible polymer blend comprising from about 1 to about 99 percent by weight of an imidized acrylic polymer, containing at least 5 percent by weight glutarimide units, and from about 99 to about 1 percent by weight of a polyamide or mixtures of polyamides.

4,415,707

## PROCESSING MODIFIER FOR POLYOLEFINS

Robert R. Blanchard, Brusly, and Tommy R. Bourne, Baton Rouge, both of La., assignors to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 284,419, Jul. 20, 1981, Pat. No. 4,342,848. This application Jul. 22, 1982, Ser. No. 401,052

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 23/04, 23/12, 23/06, 29/10

U.S. Cl. 525—231

4 Claims

1. A process for extruding polyolefin resins, comprising the steps of:

(a) heating above its melting point a mixture comprising about one hundred parts by weight of a polyolefin resin, and between about 0.03 and about 0.5 parts by weight of a polyvinyldecyl ether; and

(b) extruding the melt formed in step (a) thereby forming an extrudate.



vinyl monomers excluding said aromatic vinyl compound, said alkyl acrylate and said alkyl methacrylate; and wherein the amount of said first component, of said third component, and of said fifth component are governed by the following ranges:

$$30 \leq X < 60; 30 \leq X < Y < Z \leq 85; 60 < Z \leq 85.$$

4,415,709

### PROCESS FOR FORMING POWDERS FROM ION-CONTAINING POLYMERS

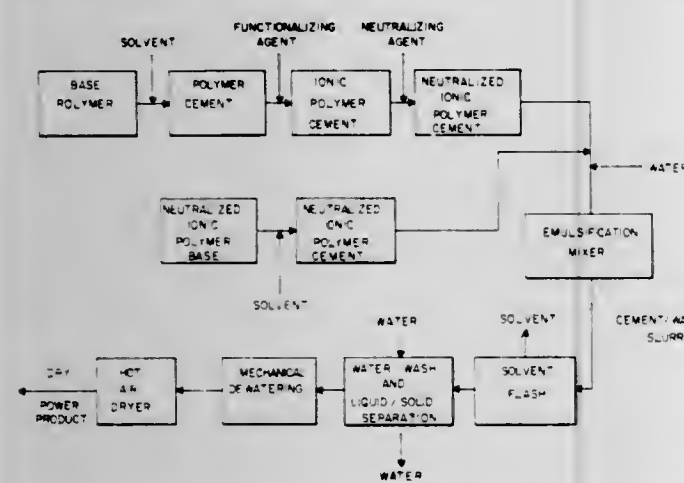
Robert R. Klein, Berkeley Heights, N.J., and Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia H. Makowski, executrix), assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 136,374, Apr. 1, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,583. The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08F 8/36, 8/44

U.S. Cl. 525—344

11 Claims



1. A process for forming a powder of a metal, ammonium or amine neutralized sulfonated polymer, wherein said neutralized sulfonated polymer is derived from an EPDM terpolymer. a Butyl rubber or polystyrene, said powder having a particle size distribution of about 500 to about 3000 microns and a volume density of about 10 lbs/ft<sup>3</sup> to about 25 lbs/ft<sup>3</sup>, which comprises the steps of:

- contacting a quenched cement of a polymer dissolved in a hydrocarbon solvent with a sulfonating agent to form an unneutralized sulfonated polymer;
- adding an amine or neutralizing agent which is a basic salt to said cement, wherein a counterion of said basic salt is selected from the group consisting of ammonium, antimony, iron, lead and Groups IA, IIA, IB and IIB of the Periodic Table of Elements;
- adding water to said cement to gel said cement, wherein the volume ratio of water to cement is about 60:1 to about 2:1;
- suspending said gel to form a slurry of cement particles of said neutralized sulfonated polymer;
- removing said solvent from said slurry;
- separating said particles of said powder from said water; and
- drying said particles of said powder.

### 4,415,710 CURABLE COMPOSITIONS, BASED ON ALKYLENE-ALKYL ACRYLATE COPOLYMERS, CONTAINING PREFORMED, REACTIVE ORGANO TITANATE CATALYSTS

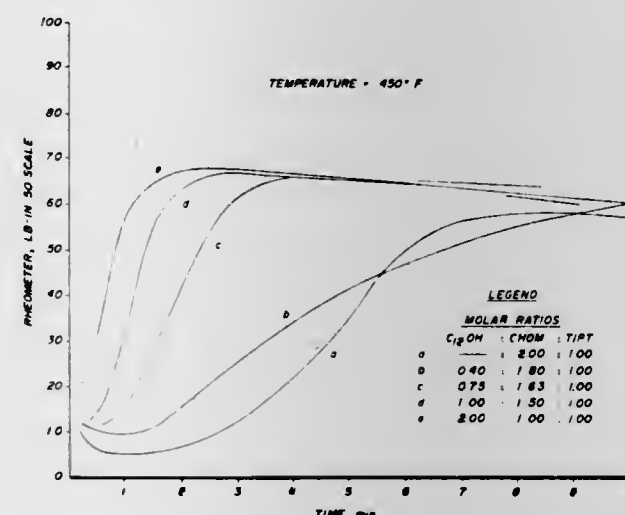
Austin E. Barnabeo, and Michael J. Keogh, both of Bridgewater, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 28, 1981, Ser. No. 334,673

Int. Cl.<sup>3</sup> C08J 3/24

U.S. Cl. 525—370

17 Claims



1. A curable composition comprising an alkylene-alkyl acrylate copolymer, and in an amount sufficient to cure said copolymer to a crosslinked product, a preformed, reactive catalyst which is the reaction product of an organo titanate, a diol having two primary hydroxy groups attached to non-adjacent carbon atoms and a monohydric alcohol.

4,415,711

### PROCESS FOR FORMING FILM FROM LOW STRAIN HARDENING POLYMERS

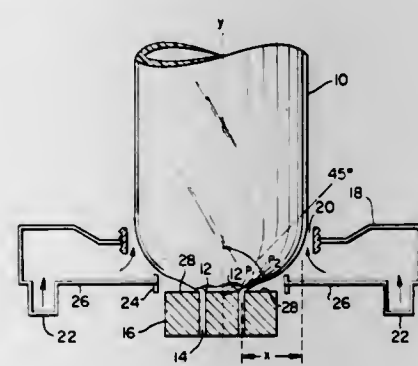
David N. Jones, Long Valley, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 2, 1982, Ser. No. 394,672

Int. Cl.<sup>3</sup> B29D 7/22; C08F 2/34

U.S. Cl. 526—88

63 Claims



1. A process for forming a blown film from a normally solid thermoplastic resin having an extensional viscosity index of less than about 6 which comprises extruding said resin through the die lips of a tubular film die to form a molten tube, expanding said molten tube radially at an angle of at least 45° as measured from the longitudinal axis of said expanding film bubble, said angle being substantially maintained at least 45° for a distance of at least one inch along the longitudinal cross-section taken through the longitudinal axis of said expanding film bubble and thereafter contacting said film bubble with a primary cooling stream.

62. Films produced according to the process of claim 1.

### 4,415,712 POLYMERIZING OLEFINS WITH CATALYSTS CONTAINING THE REACTION PRODUCT OF A TRANSITION METAL COMPOUND AND A BORON COMPOUND

Randall S. Shipley, Alvin, and Larry E. Freyer, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,266

Int. Cl.<sup>3</sup> C08F 4/02, 10/00

U.S. Cl. 526—122

31 Claims

1. A process for polymerizing one or more  $\alpha$ -olefins which comprises conducting the polymerization under Ziegler polymerization conditions in the presence of a catalyst composition containing:

(A) the catalytic reaction product of the catalytic reaction product of

(1) at least one transition metal compound represented by the formulae  $Tm(OR)_xX_y$  or  $Tm(OR)_{x-2}O$ , wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; each X is independently a halogen; x has a value equal to the valence of Tm and y has a value from 1 to the valence of Tm; and

(2) at least one boron compound represented by the empirical formula  $BX_3$

(B) a magnesium halide resulting from the reaction of (1) an organomagnesium compound represented by the empirical formula  $MgR'_2xMR''_y$ , wherein M is aluminum or zinc, each R' is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, x has a value from zero to 10 and y has a value corresponding to the valence of M; with

(2) a halide source selected from (a) an active non-metallic halide, said non-metallic halide corresponding to the formula  $R'X$  wherein R' is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen or

(b) a metallic halide corresponding to the formula  $MR_yX_a$  wherein M is a metal of Group IIB, IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl radical, X is halogen, y is a number corresponding to the valence of M and a is a number of 1 to y; and

(C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound represented by the empirical formula  $AlR'_xX'_y$  wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three;

and wherein the components are employed in quantities which provide an atomic ratio of the elements Mg:Tm of from about 1:1 to about 200:1; B:Tm at least about 0.1:1; Al:Tm of from about 0.1:1 to about 200:1 and an excess X:Al of from about 0.0005:1 to about 5:1.

### 4,415,713 HIGH ACTIVITY SUPPORTED CATALYTIC COMPONENTS AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF $\alpha$ -OLEFIN

Shoichi Tokunaga, Tokyo; Atsumi Kato, Hikari; Tatsuo Kimoto, and Keikichi Baba, both of Shinnanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan. Continuation of Ser. No. 189,334, Sep. 22, 1980, abandoned, which is a continuation of Ser. No. 954,764, Oct. 26, 1978, abandoned. This application Oct. 26, 1981, Ser. No. 315,064. Claims priority, application Japan, Nov. 4, 1977, 52-132201. Int. Cl.<sup>3</sup> C08F 4/02, 10/06

U.S. Cl. 526—125

4 Claims

1. A high activity supported catalytic component which is

prepared by pulverizing together an admixture of: (a) activated anhydrous magnesium chloride, the anhydrous magnesium chloride being activated by: (i) heating the anhydrous magnesium chloride to at least 100° C.; (ii) degassing the resulting heated anhydrous magnesium chloride under reduced pressure; and (iii) pulverizing the degassed anhydrous magnesium chloride under an inert gas atmosphere; (b) 0.5 to 10 parts by weight of a titanium compound, reported as titanium, per 100 parts by weight of the activated anhydrous magnesium chloride, said titanium compound being a combination or complex of a halogen-containing tetravalent titanium compound and 0.1 to 200 moles of an ester per 100 moles of the halogen-containing tetravalent titanium compound; (c) 0.1 to 10 weight % of a liquid aromatic hydrocarbon and/or a liquid aromatic hydrocarbon halide based on the total weight of the magnesium chloride, the halogen-containing tetravalent titanium compound and the ester; and (d) 5 to 95 parts, per 100 parts by weight of said (a), (b) and (c), of a solid diluent selected from the group consisting of boron oxide, titanium oxide, aluminum oxide, silicon oxide and magnesium oxide; said pulverization being carried out at a temperature which is within the range of 0° to 25° C. and at which said liquid aromatic hydrocarbon and/or said liquid aromatic hydrocarbon halide remains in a liquid state throughout the whole range of temperature during said pulverization.

4,415,714

### CATALYST AND METHOD FOR PREPARATION OF DRAG REDUCING SUBSTANCES

Mark P. Mack, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 606, Jan. 2, 1979, abandoned, and Ser. No. 7,125, Jan. 29, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,264

Int. Cl.<sup>3</sup> C08F 4/64, 10/00

U.S. Cl. 526—125

12 Claims

1. A method for the production of non-crystalline hydrocarbon soluble ultrahigh molecular weight drag reducing polymers comprising

(a) preparing under an inert atmosphere a catalyst comprising:

(1) titanium trichloride

(2) a co-catalyst comprising an organo-aluminum or organo-aluminum halide of the general formula  $AlR_nX_{3-n}$  where R is a hydrocarbon radical, X is a halogen or hydrogen and n is 2 or 3; and a

(3) a monoether compound of the general formula  $R_1OR_2$ , wherein R<sub>1</sub> and R<sub>2</sub> are, independently, aryl, alkyl, cycloalkyl, aralkyl or alkaryl each containing from 1 to 20 carbon atoms and placing the catalyst in contact with;

(b) C<sub>2</sub>-C<sub>30</sub>  $\alpha$ -monoolefinic hydrocarbons under temperature conditions suitable to form high molecular weight polymers, then

(c) ceasing polymerization at a polymer content level of 20% by weight or less, based on the total reaction mixture.

4,415,715

### CATALYSTS FOR RING-OPENING COPOLYMERIZATION OF CYCLOOLEFINS

Anthony J. Bell, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 272,635, Jun. 11, 1981. This application Jan. 10, 1983, Ser. No. 456,677

Int. Cl.<sup>3</sup> C08F 4/78, 232/08

U.S. Cl. 526—142

3 Claims

1. A method for copolymerizing a hexachlorocyclopentadiene-1,5-cyclooctadiene adduct (Hex COD) and a cycloolefin, other than cyclohexene, having from 4 to 12 carbon atoms and at least one non-conjugated double bond, comprising the steps of:

utilizing a catalyst consisting of (a) the reaction product of from 0.9 to about 1.5 moles of tungsten hexachloride and one mole of a 1,2- or 1,3-dioxy compound selected from



the group consisting of 2,4-pentadione, 2-formylphenol, 1,2-dihydroxybenzene, 1,3-diphenyl-1,3-propanedione, and (b) a compound having the formula  $R-AlCl_2$  wherein R is an alkyl group having from 2 to 5 carbon atoms, the molar ratio of (b) to (a) ranging from about 2 to about 6, by which a more favorable Hex COD/cycloolefin comonomer reactivity ratio is achieved, and carrying out said copolymerization at a temperature of from about minus 10° C. to about plus 40° C.

4,415,716

# PROCESS FOR THE POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Claes O. A. Lundin, Saltsjö-boo, and Berit I. Simonsson, Solna, both of Sweden, assignors to KenoGard AB, Stockholm, Sweden

Filed Jan. 27, 1981, Ser. No. 228,951

Claims priority, application Sweden, Jan. 28, 1980, 8000668 Int. Cl.<sup>3</sup> C08K 5/06

U.S. Cl. 526—209

10 Claims

1. A method in the polymerization of ethylenically unsaturated monomers in aqueous systems wherein a solid, monomer-soluble, free-radical forming compound is used as initiator and this is added to the polymerization system in the form of an aqueous dispersion, characterized in that the initiator dispersion comprises an emulsifier system consisting of (a) an ethoxylated nonionic emulsifier with an HLB-value above 15, which emulsifier does not contain cyclic inner ether bonds, and (b) a non-ethoxylated nonionic emulsifier with an HLB-value below 9, whereby the resulting HLB-value of the emulsifier blend is within the range of 11–17 and whereby the total amount of emulsifier is at least 1 percent by weight, based on the initiator.

4,415,717

# POLYMERIC CATIONIC SUBSTITUTED ACRYLAMIDE SURFACTANTS

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

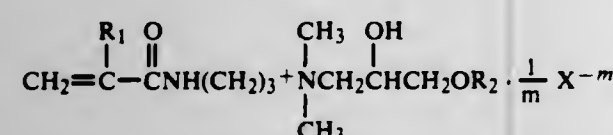
Filed Nov. 4, 1982, Ser. No. 439,093

Int. Cl.<sup>3</sup> C08F 220/60

U.S. Cl. 526—287

14 Claims

1. A copolymer which consists of:  
(A) a quaternary ammonium monomer of the general formula:



wherein  $R_1$  is a radical selected from the group consisting of hydrogen and methyl and  $R_2$  is a linear alkyl radical of from 8 to 20 carbon atoms, X is an anion or an organic or mineral acid having a valence of m; and  
(B) from 50 wt% to 97 wt% of acrylamide.

4,415,718

# TERPOLYMER PRODUCED FROM ETHYLENE, PROPYLENE AND BUTYLENE-1

Mituji Miyoshi, Kanagawa; Kazuo Matsuura, Kawasaki, and Yoshio Tajima, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Division of Ser. No. 184,238, Sep. 5, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,741

Claims priority, application Japan, Sep. 5, 1979, 54-112915

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08F 210/06

U.S. Cl. 526—348.6

3 Claims

1. An ethylene/propylene/1-butene terpolymer characterized by containing 75.2 to 91.5 mol% propylene, 7.5 to 14.9 mol% ethylene and 1.0 to 9.9 mol% 1-butene, having a melting

point based on DSC of 20° to 145° C., a haze value not larger than 40% when pressed to the thickness of 0.5 mm at 190° C. and measured according to JIS K 6714, a Shore C hardness based on JIS of 20 to 80 and a density of 0.86 to 0.91, and containing 0.01% to 5% by weight of boiling n-heptane insoluble portion.

4,415,719

# THERMOPLASTIC, BRANCHED AROMATIC POLYPHOSPHONATES, AND A PROCESS FOR THEIR PRODUCTION

Manfred Schmidt, New Martinsville, W. Va.; Ludwig Bottenbruch; Dieter Freitag, both of Krefeld, Fed. Rep. of Germany; Klaus Reinking, Wermelskirchen, Fed. Rep. of Germany; Harry Röhr, Frechen, Fed. Rep. of Germany, and Hans-Dieter Block, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany Division of Ser. No. 160,646, Jun. 18, 1980, Pat. No. 4,331,614. This application Dec. 7, 1981, Ser. No. 328,383

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925207

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08G 79/04

U.S. Cl. 528—167

9 Claims

1. A process for the production of a thermoplastic branched, aromatic polyphosphonate having a number average molecular weight of above 11,000 said process comprising transesterifying components (a) and (b) with (c) and (d) wherein component (a) is from 97 to 100 moles of at least one diaryl phosphonate and component (b) is up to 3 moles of at least one triaryl phosphate with the sum of the moles of (a) and (b) being 100, component (c) is from 90 to 99 moles of at least one aromatic dihydroxy compound and component (d) is up to 3 moles of at least one aromatic trihydroxy or tetrahydroxy compound with the proviso that at least one of the components (b) and (d) is present in a quantity of at least 0.001 mole and that the combined amount of (b) and (d) is at most 3 moles;

said transesterification being conducted in the melt at 90° C. to 340° C. in an oxygen-free atmosphere at atmospheric pressure or lower and in the presence of from 10<sup>-5</sup> to 5×10<sup>-2</sup> mole percent, based on 100 mole percent of aromatic dihydroxy compound, of at least one basic catalyst, with the volatile constituents produced in the course of transesterification being removed by distillation.

4,415,720

# PRODUCTION OF AROMATIC POLYSULPHONES

John B. Rose, Letchworth, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 22, 1981, Ser. No. 304,556

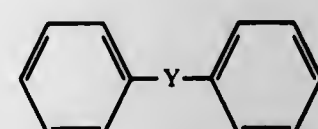
Claims priority, application United Kingdom, Oct. 1, 1980, 8031595; Oct. 1, 1980, 8031596; Jan. 8, 1981, 8100400; Apr. 29, 1981, 8113228; Apr. 29, 1981, 8113229; May 15, 1981, 8114967 Int. Cl.<sup>3</sup> C08G 75/23

U.S. Cl. 528—171

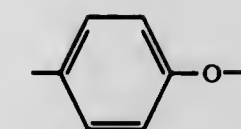
17 Claims

1. A process for the production of an aromatic polysulphone which comprises reacting under substantially anhydrous conditions in the presence of a fluoroalkane sulphonic acid the reactants selected from the following class:

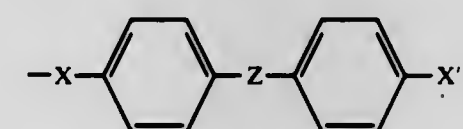
(a) at least one aromatic compound of formula



wherein —Y— is a direct link, —O—,

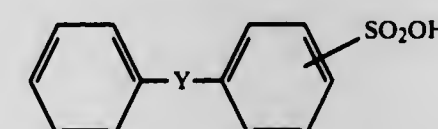


—CF<sub>2</sub>—, —CR<sub>1</sub>R<sub>2</sub>— where R<sub>1</sub> and R<sub>2</sub> which may be the same or different are fully fluorinated alkyl radicals, or



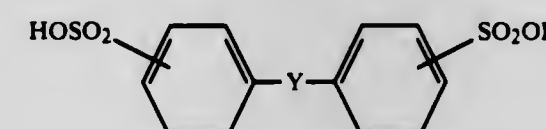
where —X— and —X'— which may be the same or different are each a direct link, —O—, —CF<sub>2</sub>—, or —CR<sub>1</sub>R<sub>2</sub>— where R<sub>1</sub> and R<sub>2</sub> are defined above, and —Z— is —CO—, —SO<sub>2</sub>—, —CF<sub>2</sub>—, or —CR<sub>1</sub>R<sub>2</sub>— where R<sub>1</sub> and R<sub>2</sub> are as defined above; or a nuclear-substituted derivative thereof in which any nuclear substituent does not deleteriously affect the polymerisation reaction or the properties of the polysulphone so produced and provided that the nuclear hydrogen atoms para to —Y— remain unsubstituted; and a sulphonating agent;

(b) at least one aryl monosulphonic acid of formula



wherein —Y— is as defined in (a); or a nuclear-substituted derivative thereof in which any nuclear substituent does not deleteriously affect the polymerisation reaction or the properties of the polysulphone so produced and provided that in the benzene ring linked to —Y— not having the sulphonic acid group at least the nuclear hydrogen atom para to —Y— remains unsubstituted;

(c) at least one aryl disulphonic acid of formula



wherein —Y— is as defined in (a); or a nuclear-substituted derivative thereof in which any nuclear substituent does not deleteriously affect the polymerisation reaction or the properties of the polysulphone so produced; and at least one aromatic compound as defined in (a).

4,415,721

# SEMI OR FULLY CONTINUOUS PROCESS FOR POLYESTER OF BISPHENOL AND DICARBOXYLIC ACID BY TRANSESTERIFICATION POLYMERIZATION AND PRODUCT THEREOF

George M. Kusanovich, Wilson, and Gideon Salee, Williams-ville, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 198,979, Oct. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,742, Mar. 10, 1980, Pat. No. 4,319,017. This application Feb. 9, 1981, Ser. No. 232,929

Int. Cl.<sup>3</sup> C08G 63/22

U.S. Cl. 528—176

47 Claims

1. In the process of preparing a linear aromatic polyester by transesterification melt polymerization of monomer reactants consisting essentially of a bisphenol and a diaryl ester of a dicarboxylic acid in a polymerization reaction zone which comprises reacting said bisphenol and said diaryl ester in a first

reaction stage of said zone to prepare a polyester oligomer, and thereafter continuing the reaction in a second reaction stage of said zone to produce the polyester product,

the improvement wherein the polymerization is carried out in the first reaction stage either batchwise or substantially continuously, and the polymerization is continued in the second reaction stage substantially continuously, with the provision that when the polymerization in the first reaction stage is carried out batchwise, the polymerization in the second stage comprises polymerization in a wiped film reaction zone followed by polymerization in a vented extrusion reaction zone.

4,415,722

# BRANCHED AROMATIC POLYCARBONATE FROM ALIPHATIC POLYOL

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 19, 1982, Ser. No. 360,045

Int. Cl.<sup>3</sup> C08G 63/62

U.S. Cl. 528—196

8 Claims

1. A high molecular weight randomly branched polycarbonate of an aromatic dihydric phenol; a polyol in which the hydroxyl groups are attached to saturated aliphatic carbon atoms in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; and a carbonate precursor selected from the group consisting of a carbonyl halide and a haloformate.

4,415,723

# RANDOMLY BRANCHED AROMATIC POLYCARBONATE FROM TRIPHENOL

Charles V. Hedges, Mt. Vernon, and Victor Mark, Evansville, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

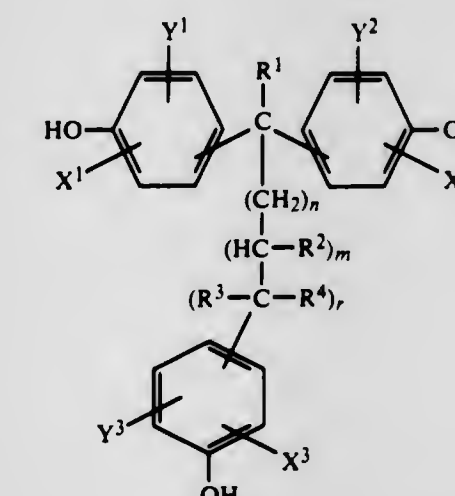
Filed Mar. 19, 1982, Ser. No. 359,987

Int. Cl.<sup>3</sup> C08G 63/62

U.S. Cl. 528—204

4 Claims

1. A composition comprising a high molecular weight, thermoplastic randomly branched polycarbonate derived from an aromatic dihydric phenol, a carbonate precursor, and a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; said randomly branched polycarbonate having an intrinsic viscosity of about 0–3 to 1.0 dl/g in methylene chloride at 25° C. wherein the branching component comprises one or more compounds of the formula



wherein X<sup>1</sup>, X<sup>2</sup>, X<sup>3</sup>, Y<sup>1</sup>, Y<sup>2</sup>, and Y<sup>3</sup> are independently selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl of from 1 to 6 carbon atoms; R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of hydrogen,



lower alkyl of from 1 to 6 carbon atoms; and  $n$  is an integer of 0, 1, 2, 3, 4, 5 and 6;  $m$  and  $r$  are integers of 0, 1 or 2 with the proviso that the sum of  $n+m+r$  is at least 1 and mixtures of said triphenolic compounds.

4,415,724

# BRANCHED AROMATIC POLYCARBONATE FROM TETRAPHENOL

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

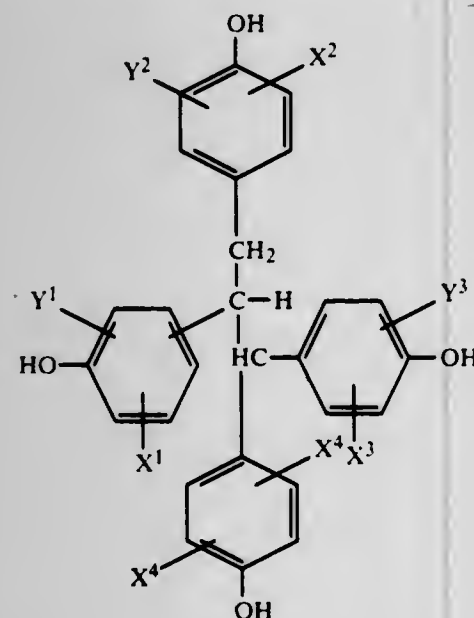
Filed Mar. 19, 1982, Ser. No. 360,042

Int. Cl.<sup>3</sup> C08G 63/62

U.S. Cl. 528—204

5 Claims

1. A high molecular weight, thermoplastic, randomly branched polycarbonate derived from aromatic phenol; a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; and a carbonate precursor, said randomly branched polycarbonate having an intrinsic viscosity of about 0.3 to 1.0 dl/g in methylene chloride at 25° C., wherein the branching component comprises one or more tetraphenolic compounds of the formula:



wherein  $X^1$ ,  $X^2$ ,  $X^3$ ,  $X^4$ ,  $Y^1$ ,  $Y^2$ ,  $Y^3$ , and  $Y^4$  are independently selected from hydrogen, chlorine, bromine, alkyl of from 1 to 6 carbon atoms or aryl.

4,415,725

# AROMATIC BRANCHED POLYCARBONATE FROM TETRAPHENOL

Charles V. Hedges, Mt. Vernon, and Victor Mark, Evansville, both of Ind., assignors to General Electric Co., Mt. Vernon, Ind.

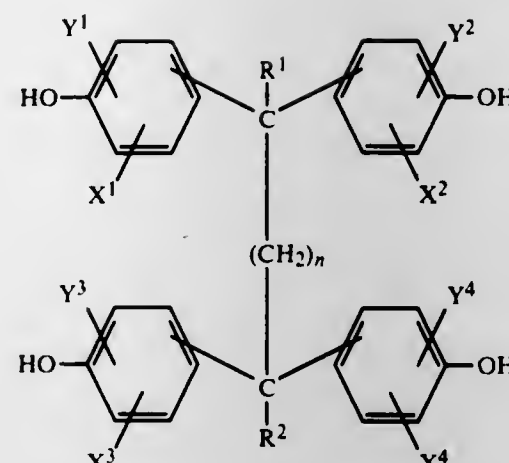
Filed Mar. 19, 1982, Ser. No. 360,044

Int. Cl.<sup>3</sup> C08G 63/62

U.S. Cl. 528—204

4 Claims

1. A high molecular weight, thermoplastic, randomly branched polycarbonate of: an aromatic dihydric phenol; a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; and a carbonate precursor selected from the group consisting of a carbonyl halide, a haloformate and a diaryl carbonate, said randomly branched polycarbonate having an intrinsic viscosity of about 0.30 to 1.0 dl/g in methylene chloride at 25° C., wherein the branching component comprises one or more tetraphenolic compounds of the formula:



wherein  $X^1$ ,  $X^2$ ,  $X^3$ ,  $X^4$ ,  $Y^1$ ,  $Y^2$ ,  $Y^3$  and  $Y^4$  are independently selected from hydrogen, chlorine, bromine, alkyl of from 1 to 6 carbon atoms or aryl;  $n$  is an integer of 0, 1, 2, 3, 4, 5 or 6; and  $R^1$  and  $R^2$  are independently selected from hydrogen or alkyl of from 1 to 6 carbon atoms.

4,415,726

# POLYESTER FIBER DYEABLE UNDER NORMAL PRESSURE AND PROCESS FOR THE PRODUCTION THEREOF

Hiroshi Tanji, Fuji; Michitaka Iwata, Minoo, and Hideo Sato, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 19, 1982, Ser. No. 340,895

Claims priority, application Japan, Jan. 19, 1981, 56-5131; Feb. 9, 1981, 56-16902

Int. Cl.<sup>3</sup> C08G 63/02, 63/70

U.S. Cl. 528—272

6 Claims

1. A fiber consisting essentially of polyethylene terephthalate capable of being dyed under normal pressure and having an initial modulus of more than about 50 g/d, a peak temperature ( $T_{max}$ ) at peak of dynamic mechanical loss tangent ( $\tan \delta$ ) measured with a frequency of 110 Hz of about 85° C. to about 110° C., a peak value of the dynamic mechanical loss tangent ( $\tan \delta$ ) of about 0.115 to about 0.135, and a local average refractive index distributed symmetrically around the center of the cross section of the fiber.

4,415,727

# MODIFIED POLYETHYLENE TEREPHTHALATE MOLDING MATERIAL

Yuzo Toga; Toshio Shimada, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 10, 1982, Ser. No. 416,746

Claims priority, application Japan, Sep. 11, 1981, 56-144214

Int. Cl.<sup>3</sup> C08G 63/02, 63/70

U.S. Cl. 528—272

9 Claims

1. A modified polyethylene terephthalate molding material containing terephthalic acid as a major dicarboxylic acid component and ethylene glycol as a major glycol component, which contains 0.1 to 15 mol %, based on the total amount of said glycol component present, of 2-methyl-1,3-propanediol as part of said glycol component.

4,415,728

# ε-CAPROLACTONE CO-POLYESTERS USEFUL FOR THE PREPARATION OF POLYURETHANE

Meude Tremblay, Charlesbourg, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Feb. 25, 1980, Ser. No. 123,948

Int. Cl.<sup>3</sup> C08G 63/14, 63/18, 63/34; C08L 67/02

U.S. Cl. 528—279

10 Claims

1. A process for the preparation of block or sequenced polyester diols of the structural formula I



which comprises simultaneously reacting ε-caprolactone in the presence of a catalyst with

(i) a diol of structural formula II



as co-catalyst for the reaction wherein  $R$  is an alkyl group containing 1 to 8 carbon atoms or an alkyl group containing 1-12 carbon atoms having a nitrogen atom in its backbone; and

(ii) a di-carboxylic acid of structural formula III



wherein  $m$  is an integer from 1 to 36,  $R_1$  is the residual structure of a diol of structural formula II,  $R_2$  is the residual structure of a diacid of structural formula III, and  $x$  and  $y$  are integers of about 1-10.

4,415,729

# RECOVERING GRANULAR POLY(ARYLENE SULFIDE) PARTICLES FROM A POLY(ARYLENE SULFIDE) REACTION MIXTURE

Lacey E. Scoggins, and Bradley L. Munro, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 4, 1982, Ser. No. 385,223

Int. Cl.<sup>3</sup> C08G 75/14

U.S. Cl. 528—388

25 Claims

1. A method for recovery of granular poly(arylene sulfide) from a polymerization reaction mixture comprising polar organic solvent, poly(arylene sulfide) and alkali metal halide by-product said reaction mixture at a temperature above that at which poly(arylene sulfide) is in molten phase said method comprising, in the presence of a sufficient amount of a separation agent that is soluble in said polar organic solvent and is not a solvent for poly(arylene sulfide) to cause a phase separation of said molten poly(arylene sulfide) from said polar organic solvent, reducing the temperature of said polymerization reaction mixture sufficiently to produce from said polymerization reaction mixture a slurry comprising particulate poly(arylene sulfide) in polar organic solvent.

4,415,730

# 19-DEFORMYL-DEOXY-DESMYCOSIN

Tatsuro Fujiwara, Shizuoka; Eichi Honda; Hideo Sakakibara, both of Mishima, and Takao Hirano, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 23, 1982, Ser. No. 391,284

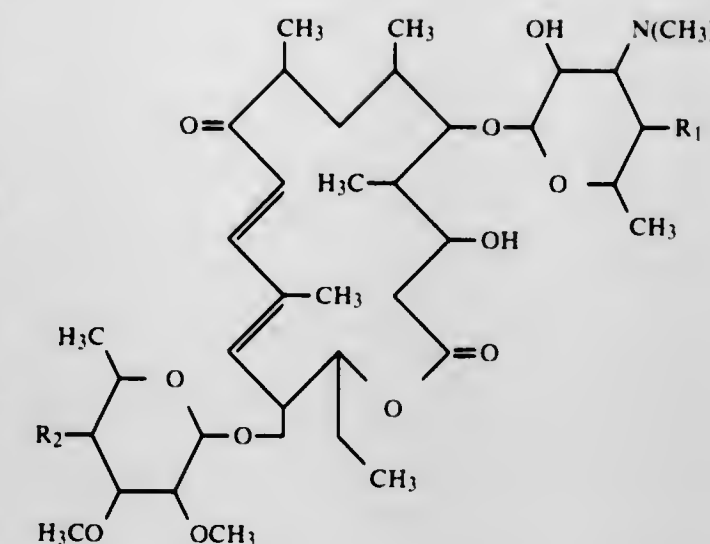
Claims priority, application Japan, Jun. 23, 1981, 56-98105; Dec. 28, 1981, 56-211648

Int. Cl.<sup>3</sup> A61K 31/71; C07H 17/08

U.S. Cl. 536—7.1

4 Claims

1. A compound of the formula



wherein  $R_1$  and  $R_2$  are hydrogen or hydroxyl and at least one of  $R_1$  and  $R_2$  is hydrogen, or a pharmaceutically acceptable salt thereof.

4,415,731

# PROCESS FOR THE PREPARATION OF METHYL 2,6-DIDEOXY-α-D-ARABINO-HEXOPYRANOSIDE

Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

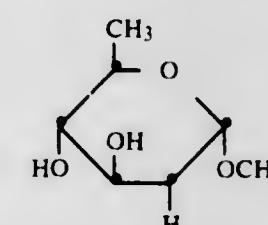
Filed Mar. 30, 1981, Ser. No. 248,175

Int. Cl.<sup>3</sup> C07H 5/02, 1/00

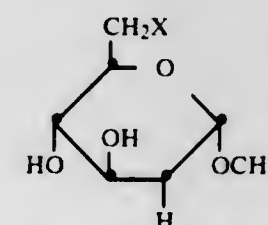
U.S. Cl. 536—18.4

2 Claims

1. A process for preparing methyl 2,6-dideoxy-α-D-arabino-hexopyranoside of the structure:



comprising the steps of: iodinating with an iodinating agent selected from: methyltri-phenoxyphosphonium iodide; iodotriphenoxyphosphonium iodide, triphenylphosphine-N-iodo-succinimide; triphenylphosphine-tetraiodomethane; triphenylphosphine-2,4,5-triiodimidazole; triphenylphosphine, iodine, and imidazole the substrate methyl 2-deoxy-α-D-glucopyranoside wherein hydroxyl groups are unprotected to yield:



followed by catalytic hydrogenolysis; wherein  $X$  is iodo.

4,415,732

# PHOSPHORAMIDITE COMPOUNDS AND PROCESSES

Marvin H. Caruthers, and Serge L. Beaucage, both of Boulder, Colo., assignors to University Patents, Inc., Norwalk, Conn.

Filed Mar. 27, 1981, Ser. No. 248,450

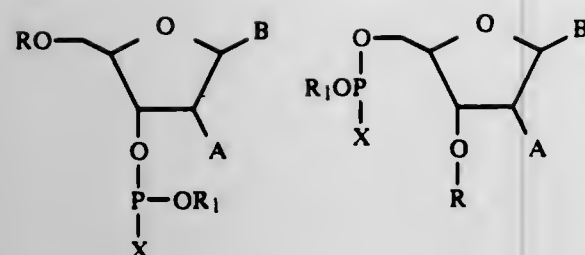
Int. Cl.<sup>3</sup> C07H 17/00

U.S. Cl. 536—27

20 Claims

1. A compound represented by one of the formulae:





wherein B is a nucleoside or deoxynucleoside base; A is H, OH or OR<sub>2</sub> in which R<sub>2</sub> is a blocking group; R is a blocking group; R<sub>1</sub> is a hydrocarbyl radical containing up to about 10 carbon atoms; and X is NR<sub>2</sub>R<sub>3</sub>, wherein R<sub>2</sub> and R<sub>3</sub> taken separately each represent alkyl, aryl, aralkyl, cycloalkyl and cycloalkylalkyl containing up to 10 carbon atoms; R<sub>2</sub> and R<sub>3</sub> when taken together form an alkylene chain containing up to 5 carbon atoms in the principal chain and a total of up to 10 carbon atoms with both terminal valence bonds of said chain being attached to the nitrogen atom to which R<sub>2</sub> and R<sub>3</sub> are attached; and R<sub>2</sub> and R<sub>3</sub> when taken together with the nitrogen atom to which they are attached form a saturated nitrogen heterocycle including at least one additional heteroatom from the group consisting of nitrogen, oxygen and sulfur.

4,415,733

#### GANGLIOSIDE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION

Jean-Louis Tayot, Lyon la Ducherie, France, assignor to Societe Anonyme dite: Institut Merieux, Lyons, France  
Filed Mar. 16, 1981, Ser. No. 244,312  
Claims priority, application France, Mar. 17, 1980, 80 05891  
Int. Cl.<sup>3</sup> C08B 37/00

U.S. Cl. 536—53

7 Claims

1. A partially deacylated derivative of a ganglioside or glycolipid having an N-acyl group and being selected from GD<sub>1a</sub>, GD<sub>1b</sub> and GT<sub>1</sub> gangliosides, said derivative exhibiting specific affinity properties when coupled to a solid support, wherein said derivative exhibits free amino groups that can be brought out by a positive reaction in the ninhydrin test, wherein also said derivative is mobile in chromatography on a thin silica gel layer in a 60:32:7 chloroform-methanol-water system, and wherein said derivative exhibits the specific affinity properties of the ganglioside or glycolipid from which it is derived, said derivative being capable of being coupled to a solid support by amino groups that have appeared during partial deacylation, without loss of said specific affinity properties.

4,415,734

#### PROCESS FOR PREPARATION OF CELLULOSE ACETATE

Hideo Yabune, and Manabu Uchida, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan  
Filed Jul. 12, 1982, Ser. No. 397,334  
Claims priority, application Japan, Jul. 10, 1981, 56-108672  
Int. Cl.<sup>3</sup> C08B 3/06, 3/24

U.S. Cl. 536—76

7 Claims

1. In a process for preparing cellulose acetate by acetylating a cellulosic raw material to produce primary cellulose acetate and then converting the same to secondary cellulose acetate, the improvement wherein the cellulose material is acetylated to produce the primary cellulose acetate and then the primary cellulose acetate is converted to the secondary cellulose acetate by alcoholysis using a lower aliphatic alcohol without separating the cellulose triacetate from the acetylation system, the alcoholysis system also containing acetic acid from the acetylating step.

4,415,735

#### 3-FORMYLMETHYL-CEPHALOSPORINS

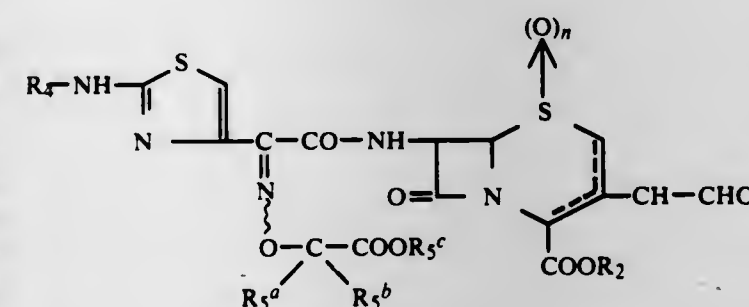
Daniel Farge, Pierre L. Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 19, 1981, Ser. No. 322,963  
Claims priority, application France, Nov. 20, 1980, 80 24636  
Int. Cl.<sup>3</sup> C07D 501/26

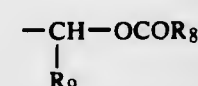
U.S. Cl. 544—22

4 Claims

1. A cephalosporin of the formula:



in the syn or anti form, in which formula n is 0 or 1, the radicals R<sub>5a</sub> and R<sub>5b</sub>, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, R<sub>5c</sub> represents a hydrogen atom or an acid-protecting radical selected from the group consisting of methoxymethyl, t-butyl, benzhydryl, benzyl, nitrobenzyl and p-methoxybenzyl, R<sub>5d</sub> represents an amine-protecting radical selected from the group consisting of t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, formyl, chloroacetyl, trichloroacetyl, trifluoroacetyl, trityl, benzyl, dibenzyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, and p-methoxybenzyloxycarbonyl and the symbol R<sub>2</sub> represents a radical which can easily be removed by an enzymatic method, of the formula:



(in which R<sub>8</sub> represents an alkyl radical or the cyclohexyl radical and R<sub>9</sub> represents a hydrogen atom or an alkyl radical), or an acid-protecting radical selected from the group consisting of methoxymethyl, t-butyl, benzhydryl, benzyl, nitrobenzyl and p-methoxybenzyl, the above-mentioned alkyl portions or radicals being linear or branched and containing 1 to 4 carbon atoms, and the compound being in the form of 3-oxoethyl-bicyclooct-2-ene or -bicyclooct-3-ene or a 3-oxoethylidenbicyclooctane, or a mixture thereof, if n=0, and in the form of a 3-oxoethylbicyclooct-2-ene or a 3-oxoethylidenbicyclooctane, or a mixture thereof, if n=1, and mixtures of the isomers in which the carboxyalkoxyimino group of the 7-acylamino radical is located in the syn or anti position.

4,415,736

#### CERTAIN TETRAHYDROPYRIDINE INTERMEDIATES

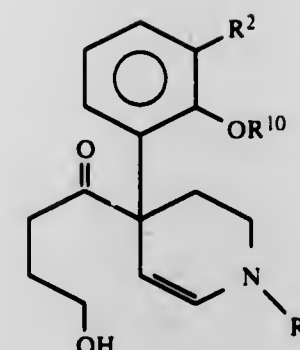
Engelbert Ciganek, Kennett Square, Pa., and Ashokkumar B. Shenvi, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 28, 1981, Ser. No. 334,838  
Int. Cl.<sup>3</sup> C07D 405/04, 213/50

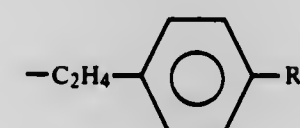
U.S. Cl. 546—283

1 Claim

1. A tetrahydropyridine compound having the following formula:



wherein

R<sup>1</sup> is C<sub>1-10</sub> alkyl, —CH<sub>2</sub>R<sup>6</sup> orR<sub>2</sub> is —H or C<sub>1-12</sub> alkoxy;R<sup>6</sup> is C<sub>3-6</sub> cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group;R<sup>7</sup> is —H or C<sub>1-3</sub> alkyl; andR<sup>10</sup> is C<sub>1-10</sub> alkyl.

4,415,737

#### THIAZOLIDINE-SUBSTITUTED PHENYL SULFONAMIDES

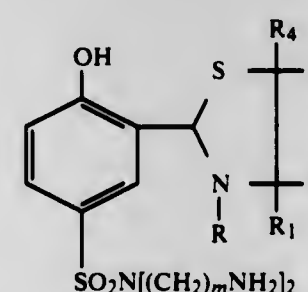
Stephen R. Herchen, Duxbury, and David Messersmith, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1982, Ser. No. 451,349  
Int. Cl.<sup>3</sup> C07D 277/04

U.S. Cl. 548—146

5 Claims

1. A compound of the formula



wherein R is selected from alkyl, aryl, aralkyl and alkaryl; R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> each are selected from hydrogen, alkyl, aryl, aralkyl and alkaryl; and m is 2 to 10.

4,415,738

#### PROCESS FOR THE PRODUCTION THIAZOLINES-(3)

Jürgen Martens, Alzenau; Paul Scherberich, Constance; Horst Bethge, and Axel Kleemann, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

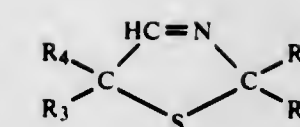
Filed Jul. 9, 1981, Ser. No. 281,858  
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026334

Int. Cl.<sup>3</sup> C07D 277/08

U.S. Cl. 548—147

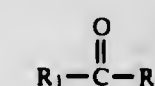
13 Claims

1. In a process for preparing a thiazoline-(3) compound of the formula



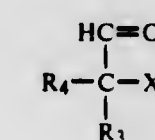
(I)

in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> individually are hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, or aralkyl or R<sub>1</sub> and R<sub>2</sub> are joined together or R<sub>3</sub> and R<sub>4</sub> are joined together and form which the carbon atom or atoms of the thiazoline ring to which they are connected a ring by reacting (1) an oxo compound of the formula



(II)

(2) a metal or ammonium hydrogen sulfide, (3) ammonia and (4) an oxo compound having a halogen atom on the carbon atom adjacent to the carbonyl group and having the formula



(III)

where X is chlorine or bromine, the improvement comprising having reactants (1), (2), and (3) present as a mixture and adding reactant (4) to said mixture.

4,415,739

PROCESS FOR PRODUCING 4-BENZOYLPYRAZOLES  
Takahiro Haga, Kusatsu; Tetsuji Nishikawa, Moriyama; Toshio Nakajima, Kusatsu; Kohji Minamide, Shiga, and Masaru Maeda, Hikone, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

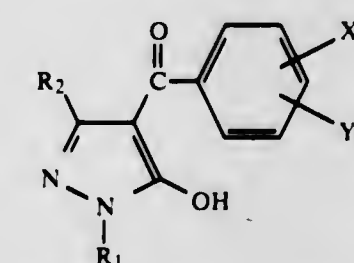
Filed Jul. 20, 1982, Ser. No. 400,025  
Claims priority, application Japan, Aug. 3, 1981, 56-121691; Jun. 11, 1982, 57-100434

Int. Cl.<sup>3</sup> C07D 23/20

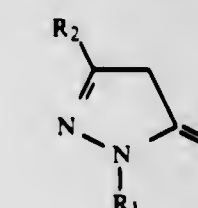
U.S. Cl. 548—367

10 Claims

1. A process for producing a 4-benzoyl-5-hydroxypyrazole represented by the formula (I):

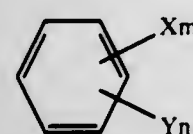


wherein R<sub>1</sub> is a hydrogen atom or an alkyl group, R<sub>2</sub> is an alkyl group, X is a halogen atom, Y is an alkyl group, m is an integer of 1 to 5, n is an integer of 0 to 2 with the proviso that m is not less than n, or basic salts formed by the hydroxy group of the pyrazoles which comprises a condensation reaction of a pyrazolone represented by the formula II:





wherein  $R_1$  and  $R_2$  are as defined above, tetrachloromethane and a benzene compound represented by the formula III:



wherein X, Y, m and n are as defined above, in the presence of an aluminum halide at a temperature of 0° C. to 100° C., followed by a hydrolysis reaction at a temperature of 0° C. to 150° C.

4,415,740

# METHOD FOR PREPARING A LACTONE REACTION PRODUCT

Benjamin J. Kaufman, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 14, 1982, Ser. No. 387,995

Int. Cl.<sup>3</sup> C07D 309/30, 307/32

U.S. Cl. 549—273

3 Claims

1. A process for preparing an alkenyl-substituted lactone reaction product in which the employed catalyst initiates the reaction, and at the end thereof, is substantially removed from the product, which comprises the steps of admixing an alkenyl succinic acid, said alkenyl radical having an average molecular weight ranging from about 300 to 3000, with an alpha carbon halogen substituted acetic acid having from 1 to 3 halogen substituents and a pKa of less than 3, to form a substantially anhydrous reaction mixture and reacting said mixture at an elevated temperature up to about 100° C. until infrared spectra at about 5.66 and 5.78 microns indicates a substantial conversion of said alkenyl-succinic acid to said lactone reaction product, and heating the reaction product further at a temperature of from 95° C. to about 105° C. for about 1 to 5 hours to distill off the alpha carbon halogen substituted acetic acid from the reaction product to leave remaining an alkenyl-substituted lactone reaction product that is substantially free of halogen substituted acetic acid.

4,415,741

# CHROMAN-4-ONES AND PROCESS FOR PREPARING SAME

Hans-Joachim Kabbe, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

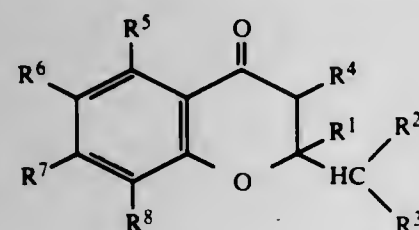
Continuation of Ser. No. 853,932, Nov. 22, 1977, abandoned, which is a continuation of Ser. No. 706,098, Jul. 16, 1976, abandoned. This application Jan. 7, 1982, Ser. No. 337,802 Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535338; Mar. 20, 1976, 2611910

Int. Cl.<sup>3</sup> C07D 311/22

U.S. Cl. 549—345

11 Claims

1. Process for preparing a chroman-4-one of the formula



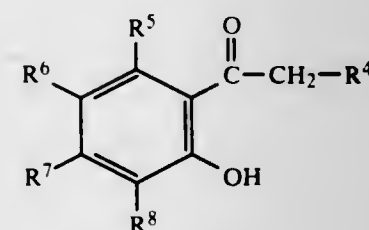
wherein

$R^1$  to  $R^3$  are identical or different and represent hydrogen, alkyl having up to 18 carbon atoms, alkenyl having up to 18 carbon atoms, cycloalkyl having 3 to 18 carbon atoms, cycloalkenyl having 3 to 18 carbon atoms, aryl having 6 to 14 carbon atoms, aralkyl having 7 to 18 carbon atoms with 1 to 8 carbon atoms in the aliphatic part, alkoxycarbonyl

having up to 4 carbon atoms in the alkyl part of carboxyl or  $C_2$  to  $C_6$  carboxyalkyl.

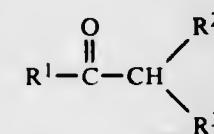
$R^1$  and  $R^2$  can be closed to form a 3-membered to 12-membered carbocyclic ring or a 5- to 12-membered heterocyclic ring in which the hetero atoms are nitrogen, oxygen or sulfur,  $R^4$  represents hydrogen,

$R^5$  to  $R^8$  are identical or different and represent hydrogen, halogen, hydroxyl, nitro, cyano, carboxyl, alkyl having up to 18 carbon atoms, cycloalkyl having 3 to 18 carbon atoms, aryl having 6 to 14 carbon atoms, aralkyl having 7 to 18 carbon atoms with 1 to 8 carbon atoms in the aliphatic part, alkoxy having up to 4 carbon atoms, alkoxy having 7 to 10 carbon atoms, aryloxy having 6 to 10 carbon atoms, alkoxycarbonyl having up to 4 carbon atoms in the alkyl part, and acylamino having up to 18 carbon atoms, and wherein each of said alkyl, cycloalkyl, aryl, aralkyl, alkoxy, aralkoxy or alkoxycarbonyl is substituted by substituents which are inert under the reaction conditions, which comprises reacting an o-hydroxy-arylcarboxyl compound of the formula



wherein

$R^4$  to  $R^8$  have the above-mentioned meaning, with carbonyl compound of the formula



wherein

$R^1$  and  $R^3$  have the above-mentioned meaning, in the presence of an amine of the formula



wherein

$R^9$  and  $R^{10}$  represent alkyl groups having up to 18 carbon atoms which, together with the N atom, can be linked to form a heterocyclic ring having 5 to 6 ring members.

4,415,742

# TETRAHYDRO-5-(1-HYDROXYETHYL)-2-HYDROXY-N(1-ARYLHYDROCARBYL)FURAN-4-CARBAMIC ACID ALKYL ESTERS

Milan R. Uskokovic, Upper Montclair, and Peter M. Wolkulich, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 326,731, Dec. 2, 1981, Pat. No. 4,376,207, which is a division of Ser. No. 179,126, Aug. 18, 1980, Pat. No. 4,324,726, which is a division of Ser. No. 60,261, Jul. 25, 1979, Pat. No. 4,252,964. This application Sep. 27, 1982, Ser. No. 423,927

Int. Cl.<sup>3</sup> C07D 307/22

U.S. Cl. 549—475

2 Claims

1. A compound of the formula:

4,415,745

# PROCESS FOR THE PREPARATION OF AROMATIC CARBAMATES AND ISOCYANATES

Ji-Yong Ryu, Ramsey, and Arthur M. Brownstein, Wycoff, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 290,005, Aug. 4, 1981, which is a continuation of Ser. No. 179,062, Aug. 18, 1980, abandoned.

This application Jan. 28, 1982, Ser. No. 343,583

Int. Cl.<sup>3</sup> C07C 125/06, 118/00

U.S. Cl. 560—25

8 Claims

1. A process for making an aromatic polycarbamate which comprises:

(a) reacting at least one compound represented by the structural formula:

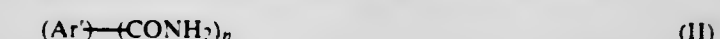


wherein Ar is a halogen substituted or unsubstituted aromatic hydrocarbyl group,  $R_1$  is an alkyl group having from about 1 to about 10 carbons, and n is a number which can vary from 1 to about 5; with ammonia and oxygen under conditions and in a manner sufficient to form at least one aromatic nitrile containing compound represented by the structural formula:



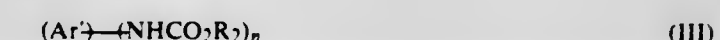
wherein Ar' is a substituted or unsubstituted aromatic hydrocarbyl group having from about 6 to about 14 carbons exclusive of substituents; said substituents on Ar' being selected from the group consisting of halogen, alkyl having from about 1 to about 10 carbons, and mixtures thereof; and n is as described in connection with structural formula I:

(b) hydrolyzing said aromatic nitrile containing compound in a manner and under conditions sufficient to form at least one amide represented by the structural formula:

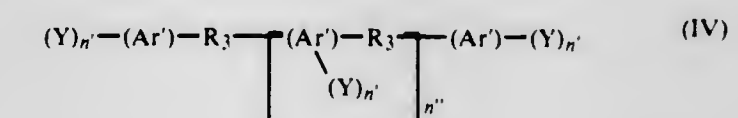


wherein Ar' and n are as described in connection with structural formula Ia above;

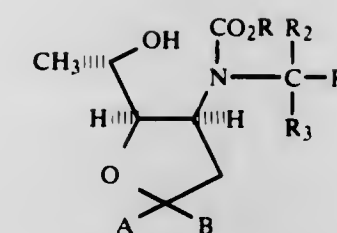
(c) converting at least one of said amide groups present on the compound of structural formula II to a carbamate group in a manner and under conditions sufficient to form at least one carbamate compound represented by the structural formula:



wherein  $R_2$  represents a hydrocarbyl group independently selected from alkyl having from about 1 to about 10 carbons, aryl having from about 6 to about 14 carbons, alkaryl and aralkyl wherein the alkyl and aryl groups thereof are as described immediately above, and cycloalkyl having from about 4 to about 10 carbons; and Ar' and n are as described in connection with structural formula Ia; and (d) condensing the carbamate with a carbonyl containing compound in a manner and under conditions sufficient to form at least one aromatic polycarbamate represented by the structural formula:



wherein: Y represents the group  $-NHCO_2R_2$ ,  $R_2$  being as described above;  $R_3$  is a hydrocarbyl group independently selected from alkylene having from about 1 to about 10 carbons, arylene having from 6 to about 14 carbons, aralkylene and alkylene wherein the alkyl and aryl portions thereof are as described above, and cycloalkylene



wherein A is OH; B is hydrogen; R is lower alkyl;  $R_2$  and  $R_4$  are hydrogen, aryl, alkyl, or lower alkyl and  $R_3$  is aryl, or enantiomeric or racemic mixtures thereof.

4,415,743

# FURANYL OXIMES

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

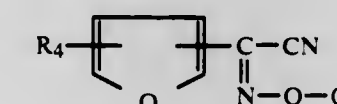
Division of Ser. No. 144,157, Apr. 28, 1980, which is a continuation of Ser. No. 939,096, Sep. 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 881,953, Feb. 27, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,073 Claims priority, application Switzerland, Mar. 2, 1977, 2606/77; Feb. 7, 1978, 1348/78

Int. Cl.<sup>3</sup> C07D 307/52

U.S. Cl. 549—491

3 Claims

1. A compound of the formula



wherein

$R_4$  is hydrogen, chlorine, nitro or methyl, and Q is  $C_1$ - $C_4$  alkyl,  $C_1$ - $C_4$  alkyl interrupted by oxygen,  $C_1$ - $C_4$  alkyl substituted by cyano, allyl, propynyl,  $C_1$ - $C_4$  alkanecarboxylic acid ester in which the ester moiety has from 1 to 4 carbon atoms, or  $C_1$ - $C_4$  alkanecarboxylic acid amide.

4,415,744

# VAPOR PHASE NITRATION OF AROMATIC COMPOUNDS

Ignatius Schumacher, Ballwin, and Kang-Bo Wang, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 21, 1981, Ser. No. 313,522

Int. Cl.<sup>3</sup> C07C 79/46

U.S. Cl. 560—20

45 Claims

1. In a process for the vapor phase nitration of aromatic compounds where the aromatic compound is contacted with a nitrating agent in the vapor phase to yield the corresponding nitroaromatic compound, the improvement comprising conducting the nitration in the presence of a nitration promoting catalyst which comprises the adduct of:

(a) an alumina-silica-metal oxide combination represented by the formula:



wherein M is a metal cation selected from the group consisting of the lanthanides of rare earths, Groups 1b, 2b, 5b, 6b, 7b, and 8 of the Periodic Table of the Elements, and mixtures thereof, and a, b, and c represent weight percent of the  $Al_2O_3$ ,  $SiO_2$ , and  $M_{2/n}O$  components, respectively, in the alumina-silica-metal oxide combination, with a being 0 to 100, b being 0 to 100, and c being 0 to 50, and n represents an integer from 1 to 7 of the valence of the metal cation, with the proviso that the sum of (a + b) must be greater than 0, and

(b) a catalytically effective amount of sulfur trioxide.



having from about 4 to about 10 carbons;  $n'$  is a number which can vary from about 1 to about 4;  $n''$  is a number which can vary from about 0 to about 5; and  $Ar'$  is as described in connection with structural formula III.

4,415,746

# 16-ARYLOXY-17,18,19,20-TETRAHYDROPROSTANOIC ACIDS AND DERIVATIVES

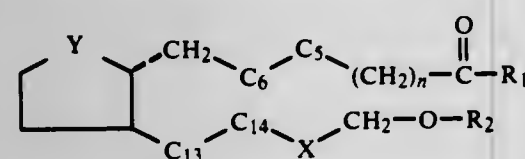
Charles V. Grudzinski, Garnerville, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 748,976, Dec. 9, 1976. This application Oct. 5, 1981, Ser. No. 308,658  
Int. Cl.<sup>3</sup> C07C 177/00

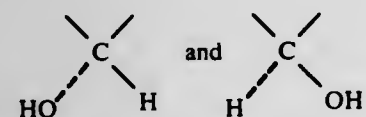
U.S. Cl. 560—61

57 Claims

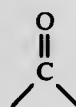
1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof; wherein  $R_1$  is hydroxy or alkoxy having from 1 to 12 carbon atoms;  $R_2$  is phenyl, naphthyl, 5,6,7,8-tetrahydronaphthyl, or 5,6,7,8-tetrahydronaphthyl substituted with one or two groups selected from the group consisting of halogen, lower alkyl, lower alkoxy and  $n$  is an integer from 2 to 4, inclusive;  $X$  is a divalent moiety selected from the group consisting of those of the formulae:



$Y$  is a divalent moiety of the formulae:



the moiety of  $-C_5-C_6-$  is ethylene or cis-vinylene and the moiety  $-C_{13}-C_{14}-$  is ethylene or trans-vinylene with the proviso that when  $-C_5-C_6-$  is cis-vinylene then  $-C_{13}-C_{14}-$  must be trans-vinylene; and the non-toxic cationic salts thereof when  $R_1$  is hydroxy.

4,415,747

# PROCESS FOR MAKING ETHYLENE GLYCOL DERIVATIVES

Leonard Kaplan, Dunbar, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

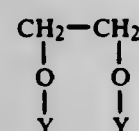
Filed Sep. 29, 1981, Ser. No. 307,074

Int. Cl.<sup>3</sup> C07C 69/76

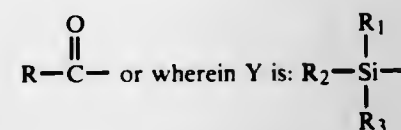
U.S. Cl. 560—112

18 Claims

1. The process for making ethylene glycol derivatives of the formula (I):



comprising reacting an  $\alpha$ -halo compound of the formula (II):



wherein  $R$ ,  $R_1$ ,  $R_2$  and  $R_3$  may each be a monovalent hydrocarbon of 1 to about 30 carbon atoms, and  $X$  is at least one of Cl, Br and I, by reacting said  $\alpha$ -halo compound in the presence of an iron compound having iron in the zero oxidation state at a temperature and pressure sufficient to form such ethylene glycol derivatives.

4,415,748

# INTERMEDIATES FOR INSECTICIDAL SYNTHETIC PYRETHROIDS

William G. Scharpf, Yardley, and Michael S. Glenn, Langhorne, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.  
Filed Aug. 6, 1981, Ser. No. 290,557

Int. Cl.<sup>3</sup> C07C 69/63

U.S. Cl. 560—227

1 Claim

1. The compound of the formula



4,415,749

# CATALYTIC PROCESS FOR THE SELECTIVE FORMATION OF ETHANOL AND METHYL ACETATE FROM METHANOL AND SYNTHESIS GAS

Duane C. Hargis, Pleasant Ridge, and Michael Dubeck, Birmingham, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 153,610, May 27, 1980, Pat. No. 4,309,314.

This application Sep. 15, 1981, Ser. No. 302,583

Int. Cl.<sup>3</sup> C07C 67/36, 69/14, 29/00, 31/08

U.S. Cl. 560—232

6 Claims

1. A process for selectively producing ethanol and methyl acetate which comprises reacting methanol with carbon monoxide and hydrogen in the presence of a heterogeneous catalyst comprising rhodium and iron each in the zero valent state deposited on a support of alumina impregnated with a minor amount of an alkaline metal selected from the alkaline metals of Groups I and II of the Periodic Table at reaction conditions of about 225° C. to about 300° C. and pressure within the range of from about 50 psig to about 250 psig.

4,415,750

# PROCESS FOR SEPARATION OF 2-HYDROXYNAPHTHALENE-3-CARBOXYLIC ACID FROM THE REACTION MIXTURES OF ALKALI METAL SALTS OF 2-HYDROXYNAPHTHALENE AND CARBON DIOXIDE

Heinrich Volk, Bad Vilbel, and Theodor Papenfahs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 264,826, May 18, 1981, abandoned, which is a continuation of Ser. No. 131,680, Mar. 19, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,314

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911667

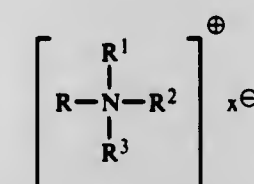
Int. Cl.<sup>3</sup> C07C 51/43

U.S. Cl. 562—467

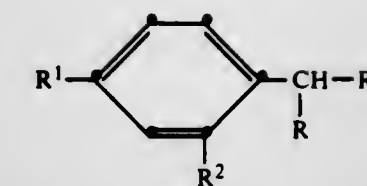
5 Claims

1. In a process for the separation and isolating of 2-hydroxynaphthalene-3-carboxylic acid from the reaction product of the sodium salt of 2-hydroxynaphthalene and carbon dioxide, which comprises

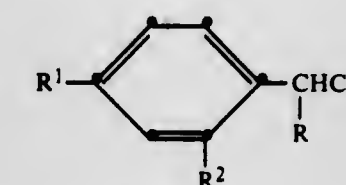
(a) diluting the resulting carboxylation melt with water and dissolving it,  
(b) adjusting the pH of the solution to a value of about 3.5 to 7 and separating undissolved or precipitated products, and  
(c) recovering and separating 2-hydroxynaphthalene-3-carboxylic acid by acidic precipitation and isolating it, the improvement comprises precipitating the alkali-soluble acid resins from the solution of the carboxylation melt by means of a cationic compound added to the solution between steps (b) and (c), said compound corresponding to the formula



in which  $R$ ,  $R^1$ ,  $R^2$  and  $R^3$  are identical or different from each other and each is an unsubstituted or substituted aliphatic radical, an aralkyl or aryl radical, or two or three of the aliphatic radicals form together with the nitrogen atom a heterocyclic ring selected from the group of pyridine, morpholine, imidazoline, benzimidazoline, imidazole, benzimidazole and oxazole, with the proviso that the sum of the carbon atoms of the substituents  $R$  through  $R^3$  are at least 8, and in which  $x^\ominus$  is the equivalent of an inorganic or organic acid.



wherein  $R^5$  is  $-NR^3R^4$  if an amine is present, and is  $-OH$  if an amine is not present; adding an alkali metal cyanide to the mixture; holding the mixture at from about 100° to about 150° until a compound of the formula



is formed; removing the solvent; adding aqueous alkali metal hydroxide; holding the mixture at about 75°-125° until the product is formed; making the mixture acid; cooling the mixture; extracting the mixture with an inert organic solvent; and isolating the acid from the organic solvent.

4,415,752

# PROCESS FOR PREPARING UNSATURATED ACIDS WITH MO, V, NB, FE-CONTAINING CATALYSTS

Harry J. Decker, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

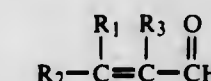
Continuation-in-part of Ser. No. 827,674, Aug. 25, 1977, abandoned, which is a continuation of Ser. No. 621,088, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,780, Sep. 13, 1974, abandoned, which is a

continuation-in-part of Ser. No. 408,419, Oct. 23, 1973, abandoned. This application Apr. 22, 1980, Ser. No. 142,706  
Int. Cl.<sup>3</sup> C07C 51/25, 57/055

U.S. Cl. 562—534

7 Claims

1. A process for the production of an unsaturated aliphatic carboxylic acid by the vapor phase catalytic oxidation with molecular oxygen of the corresponding unsaturated aliphatic aldehyde having the structure:

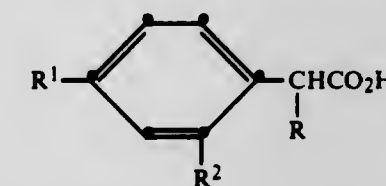


wherein  $R_1$  is hydrogen or a  $C_1$  to  $C_6$  alkyl radical and  $R_2$  and  $R_3$  are the same or different and are H or  $CH_3$ , which comprises contacting said molecular oxygen and unsaturated aldehyde in the presence of steam with an oxidation catalyst consisting essentially of the elements Mo, V, Nb, Fe and X, in combination with oxygen and having the empirical formula:

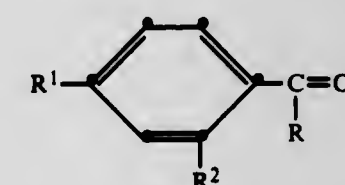


wherein

$X$  is selected from the group consisting of Cr and Mn,  
 $a$  is 12,  
 $b$  is 1 to 14,  
 $c$  is 0.1 to 12,  
 $d$  is a number greater than 0 and up to 3,  
 $e$  is 0 to 3 with the proviso that  $d+e$  is 3 or less; said catalyst having been prepared by drying an aqueous slurry or solution of salts of said elements followed by calcination.



wherein  $R$  is hydrogen or  $C_1$ - $C_3$  alkyl; one of  $R^1$  and  $R^2$  is hydrogen and the other is hydroxy; provided that  $R$  is hydrogen or methyl when  $R^2$  is hydroxy; comprising catalytically hydrogenating a compound of the formula



in the presence of an inert organic solvent, and optionally in the presence of an amine of the formula



wherein  $R^3$  is  $C_1$ - $C_3$  alkyl and  $R^4$  is hydrogen or  $C_1$ - $C_3$  alkyl, to prepare a compound of the formula



4,415,753

**PROCESS FOR PREPARING P-AMINOPHENOL AND ALKYL SUBSTITUTED P-AMINOPHENOL**

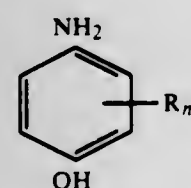
Douglas C. Caskey, O'Fallon, and Douglas W. Chapman, St. Louis, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jan. 29, 1982, Ser. No. 343,993  
Int. Cl.<sup>3</sup> C07C 85/11, 89/00

U.S. Cl. 564—418

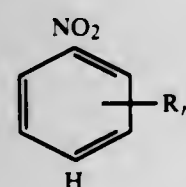
18 Claims

1. A process for production of substituted or unsubstituted p-aminophenol having the formula



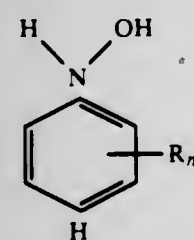
where R is lower alkyl and n is 0, 1 or 2, the process comprising the steps of:

preparing a charge mixture comprising a substrate selected from the group consisting of substituted and unsubstituted nitrobenzenes having the formula



where R and n are as defined above, a catalyst containing platinum, and a sulfur compound selected from the group consisting of divalent sulfur compounds in which sulfur is bonded to two other moieties and compounds reducible to such divalent sulfur compounds under catalytic hydrogenation conditions;

introducing hydrogen into said mixture while agitating the mixture at a temperature in the range of between about 0° and about 40° C., thereby reducing said substrate to a hydroxylamine having the formula



where R and n are as defined above; and thereafter heating said hydroxylamine to a temperature of at least about 70° C. and agitating it at at least about 70° C. in the presence of a highly dissociated acid, thereby effecting rearrangement of said hydroxylamine to the corresponding p-aminophenol.

4,415,754

**PROCESS FOR PREPARING ANILINE**

Frederick R. Lawrence, Claymont, Del., assignor to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

Filed Jan. 17, 1983, Ser. No. 458,659  
Int. Cl.<sup>3</sup> C07C 85/11

U.S. Cl. 564—423

6 Claims

1. A method for preparing aniline directly from acidic nitrobenzene containing about 10–30,000 ppm of polynitrophenol impurities, the method comprising

(a) removing substantially all the mineral acid from the nitrobenzene,

(b) catalytically hydrogenating the nitrobenzene resulting from step (a) to give aniline and tars, and then  
(c) separating the aniline and the tars.

4,415,755

**NITRILES AND PRIMARY AMINES FROM PRIMARY ALCOHOLS**

John M. Larkin, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 10, 1981, Ser. No. 319,846  
Int. Cl.<sup>3</sup> C07C 85/06, 120/00

U.S. Cl. 564—480

8 Claims

1. A method for the continuous production of nitriles and primary amines from primary alcohols by means of reductive amination comprising

reacting a primary alcohol having no amine substituents in the beta position, with ammonia and hydrogen, all in the vapor phase, in the presence of a copper chromite catalyst.

4,415,756

**PURE ENANTIOMERS OF BICYCLO[2.2.2]OCT-5-ENE-2-ONES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE**

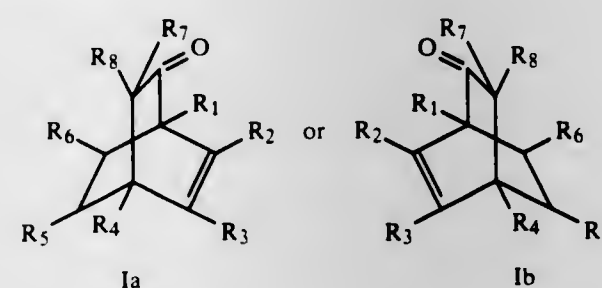
Martin Demuth, and Kurt Schaffner, both of Mülheim, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,644  
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046106Int. Cl.<sup>3</sup> C07C 45/00

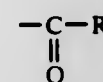
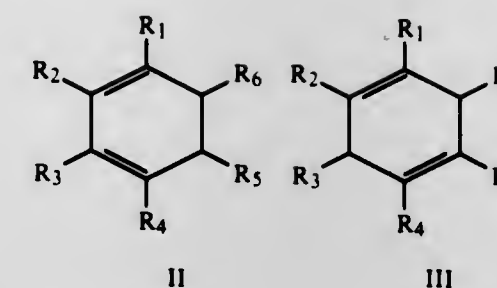
U.S. Cl. 568—365

8 Claims

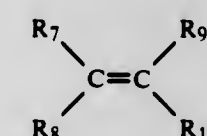
1. A process for the preparation of a pure enantiomer of one of the formulae below



wherein

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> may be H, C<sub>1</sub> to C<sub>8</sub> alkyl, C<sub>1</sub> to C<sub>8</sub> alkoxy, hydroxylated and/or carbonylated C<sub>1</sub> to C<sub>8</sub> alkyl groups which can contain one or more double and/or triple bonds and may also be —C≡N or —COOH and/or an ester thereof orwherein R may be H, C<sub>1</sub> to C<sub>8</sub> alkyl, C<sub>1</sub> to C<sub>8</sub> alkoxy and a hydroxylated and/or carbonylated C<sub>1</sub> to C<sub>8</sub> alkyl group which can contain one or more double bonds and/or triple bonds and, moreover, the carbonyl group can be acetalized or ketalized, andR<sub>7</sub> and R<sub>8</sub> may be H, C<sub>1</sub> to C<sub>8</sub> alkyl, C<sub>1</sub> to C<sub>8</sub> alkoxy and hydroxylated and/or carbonylated C<sub>1</sub> to C<sub>8</sub> alkyl groups which can contain one or more double bonds and/or triple bonds by effecting a Diels-Alder addition of a cyclohexadiene of the formula II or III below

wherein

R<sub>1</sub>–R<sub>6</sub> inclusive have the above-mentioned meanings with an ene of the formula

wherein

R<sub>7</sub> and R<sub>8</sub> are as defined above andR<sub>9</sub> and R<sub>10</sub> are hydrolyzable substituents which are hydrolyzed under ketalization conditions, the racemates of the bicyclo[2.2.2]oct-5-ene-2-ones obtained by Diels-Alder addition are either completely ketalized with pure enantiomers of diols selected from the group consisting of 1, 3-diols; 2, 4 diols and vicinal diols and the ketals are separated by chromatography or, in the case of only partial

ketalization, the enantiomeric bicyclo [2.2.2] oct-5-ene-2-one which has not been or has been less ketalized is separated from the ketalized enantiomer(s) by distillation and/or chromatography and the latter is also separated by chromatography.

4,415,757

**PRODUCTION OF SATURATED CARBONYL COMPOUNDS**

David R. Pyke, Clwyd, Wales, and Robert Reid, Warrington, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 15, 1982, Ser. No. 358,103

IV Claims priority, application United Kingdom, Mar. 19, 1981, 8108709

Int. Cl.<sup>3</sup> C07C 45/32

U.S. Cl. 568—475

8 Claims

1. A process for the production of a saturated carbonyl compound having 2 to 4 carbon atoms which comprises bringing into reaction at a temperature in the range of 250° to 475° C. in the gas phase an alkane having 2 to 4 carbon atoms with molecular oxygen and hydrogen chloride in the presence of a solid particulate catalyst composition comprising (1) metallic silver and/or an oxide, chloride or oxychloride thereof and (2) an oxide, chloride or oxychloride of at least one other metal, selected from manganese, cobalt, iron, nickel and the platinum group metals.



## ELECTRICAL

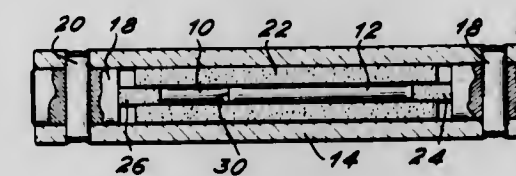
### 4,415,758 PROCESS FOR MAKING A JOINT BETWEEN TWO METAL WIRES AND A DIFFERENTIAL THERMOCOUPLE

Jean-Andre Lacoste, Paris; Jean-Pierre Leveque, Gif-sur-Yvette, and Robert Schley, Orly, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 4, 1980, Ser. No. 203,948  
Claims priority, application France, Nov. 7, 1979, 79 27454  
Int. Cl.<sup>3</sup> H01L 35/02

U.S. Cl. 136—233

8 Claims



1. A process for producing a joint between a first metal wire and a second metal wire, the joint having a length less than 10 microns, comprising the steps of forming a stack from a first metal wire and a second metal wire placed end to end and having an interface, placing the stack in a tube sealed at its two ends and made from a material whose thermal expansion coefficient is well below that of the metals forming the two wires, placing spacers made from a ceramic material between the tube and the stack in such a way that the free end of each wire is immobilised with respect to one of the ends of the tube and heating this assembly at a temperature less than the melting temperatures of the metals of which said first and second wires are made so that a diffusion weld is obtained at the contacting ends of the wires under substantially high pressure caused by the action of the difference in the elongations of the tube and the wires.

8. A process for producing a differential thermocouple, wherein a weld is produced by diffusion between one end of a first wire made from an alloy comprised of 64-89% nickel, 0-25% iron, and 10-20% chromium, and one end of a second wire from an alloy comprised of 94% nickel, 2.5% manganese, 2% aluminum, 1% silicon, and 0.5% iron, comprising the steps of formulating an assembly by embedding the wire, provided with the weld, and another wire made from either of said alloys in an insulating ceramic material surrounded by a sheath and subjecting said assembly to a drawing operation to give said assembly a suitable final external diameter for use as a differential thermocouple, said process including the steps of producing said diffusion weld comprising forming a stack from said first and second metal wires placed end to end and having an interface, placing the stack in a tube sealed at its two ends and made from a material whose thermal expansion coefficient is well below that of the metals forming the first and second wires, placing spacers made from a ceramic material between the tube and the stack in such a way that the free end of each wire is immobilised with respect to one of the ends of the tube and heating the assembly at a temperature less than the melting temperatures of the metals of which said first and second wires are made, so that a diffusion weld is obtained at the contacting ends of the first and second wires under substantially high pressure caused by the action of the difference in elongations of the tube and the first and second wires.

4,415,759  
SOLAR POWER SATELLITE  
Robert J. Copeland, Lakewood, Colo., and John D. Martin, Greenville, Tex., assignors to Vought Corporation, Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 310,012  
Int. Cl.<sup>3</sup> H01L 31/04

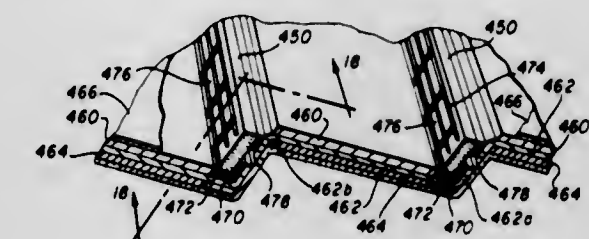
U.S. Cl. 136—246

57 Claims

1. A solar cell unit comprising:  
a plurality of spaced radiant energy converting cells having

an energy receiving surface responsive to radiant energy received thereon for generating electric energy, and a light reflective fin positioned between each adjacent pair of said converter cells, each fin being thermally and electrically connected to said pair of converter cells on either side thereof, the electrical connection on one side being to the energy receiving surface of the converter cell and on the opposite side to the surface of the adjacent cell opposite the energy receiving surface, said fins providing series electrical connection between the converter cells.

31. A solar collector comprising:



a collector frame structure having a downwardly facing concave first curved portion of decreasing radius of curvature from the first end to the second end thereof, and an upwardly facing concave second curved portion with the first end thereof adjacent the second end of said first curved portion, said second curved portion decreasing in radius of curvature from the first end to the second end thereof, and  
a solar cell unit mounted on the concave surfaces of each of said first and second curved portions, said solar cell units having an energy receiving surface responsive to radiant energy received thereon to generate electric energy.

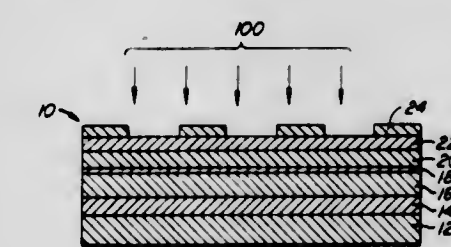
4,415,760  
AMORPHOUS SILICON SOLAR CELLS  
INCORPORATING AN INSULATING LAYER IN THE  
BODY OF AMORPHOUS SILICON AND A METHOD OF  
SUPPRESSING THE BACK DIFFUSION OF HOLES INTO  
AN N-TYPE REGION

Arun Madan, Moraga, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 12, 1982, Ser. No. 367,815  
Int. Cl.<sup>3</sup> H01L 31/06, 31/18

U.S. Cl. 136—258

16 Claims



1. In an hydrogenated amorphous silicon solar cell which comprises an electrically conductive substrate, a layer of hydrogenated amorphous silicon ohmically contacting said electrically conductive substrate and having regions of differing conductivity with at least one interface between an incident N-type or N+-type region of hydrogenated amorphous silicon and a photoactive region of intrinsic hydrogenated amorphous silicon, and means for electrically contacting said layer of hydrogenated amorphous silicon opposite to the side contacting said electrically conductive substrate, the improvement wherein the layer of hydrogenated amorphous silicon incorporates an insulator layer between said incident N-type or N+-type region and said photoactive intrinsic region wherein said insulator has a sufficient thickness to permit electrons to pass



therethrough while reflecting holes back into the photoactive intrinsic region.

4,415,761

## TAPED ELECTRIC CABLE

Paolo G. Priaroggia, and Elio Occhini, both of Milan, Italy, assignors to Societa Cavi Pirelli Societa per Azioni, Milan, Italy

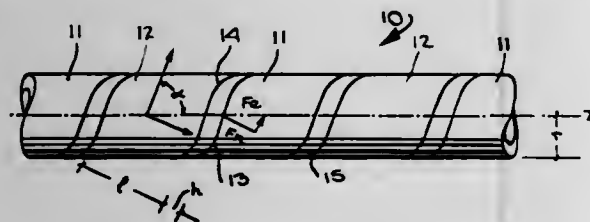
Filed Jul. 15, 1981, Ser. No. 283,556

Claims priority, application Italy, Jun. 6, 1980, 22595 A/80

Int. Cl.<sup>3</sup> H01B 7/02, 9/06

U.S. Cl. 174—25 R

4 Claims



1. An electric cable suitable for use at operating voltages of at least 1000 Kilovolts, said cable having a conductor and at least three insulating layers helically wound around the conductor, each layer being formed by tape impregnated with an insulating material and having surfaces without wrinkles, the tape of each layer being wound with a gap between the side edges of adjacent turns of the tape and with said gap between said side edges being offset with respect to the gap between the side edges of the turns of the tape of the next adjacent layer, whereby the said gap of one layer is covered by the tape of said next adjacent layer, and at least one of said layers comprising at least two tapes wound in side-by-side relation with their side edges in substantially parallel relation to provide multi-start helical tapes, said two tapes having their edges spaced apart in the direction of the length of the cable and the angle between the side edges of each tape and a plane extending axially of the cable being less than 75°.

4,415,762

## FLEXIBLE GAS-INSULATED ELECTRICAL CABLE HAVING NON-METALLIC FLEXIBLE INSERTS BETWEEN CENTRAL CONDUCTOR AND SUPPORT INSULATORS

Jonathan Z. Ponder, Hatfield, Pa., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Oct. 31, 1980, Ser. No. 202,570

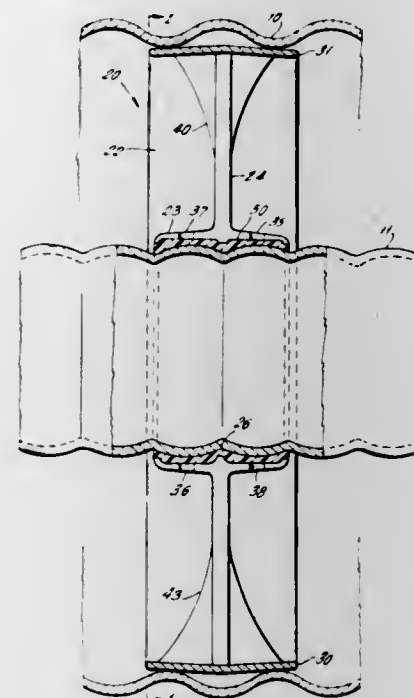
Int. Cl.<sup>3</sup> H01B 9/04; H02G 5/06

U.S. Cl. 174—28

5 Claims

1. A high voltage flexible cable comprising an elongated outer conductive housing, a central conductor having a corrugated outer conductor member, said central conductor extending coextensively with said outer housing, a plurality of support insulators spaced along the axis of said cable each having a central opening receiving and supporting said central conductor within said outer housing; a dielectric gas under positive pressure filling the interior of said outer housing; each of said support insulators formed of an injection-molded plastic insulation material which is harder than the exterior surface of the corrugated outer conductor member of said central conductor; said exterior surface of the corrugated outer conductor member of said central conductor being axially movable relative to said interior surfaces of said support insulators due to bending forces applied to said cable; wherein the improvement comprises a plurality of flexible material pads consisting of a silicone rubber, an individual one of said pads being compressed between the interior surface of the central opening of each support insulator and said exterior surface of the corrugated outer conductor member of said central conductor to prevent scratching of said exterior surface of the corrugated

outer conductor member of said central conductor by said interior surfaces of said support insulators due to relative axial



motion between said central conductor and said support insulators.

4,415,763

## GAS-INSULATED TRANSMISSION LINE HAVING IMPROVED OUTER ENCLOSURE

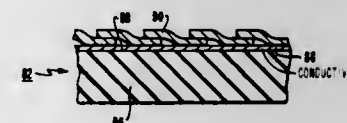
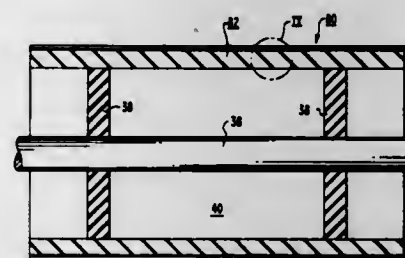
Alan H. Cookson, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 206,917, Nov. 14, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,568

Int. Cl.<sup>3</sup> H02G 5/06; H01B 9/06

U.S. Cl. 174—28

3 Claims



1. A gas-insulated transmission line comprising: a tubular hollow insulating outer sheath; an electrically conducting material layer disposed on the exterior surface of said outer sheath; an electrically conducting foil wrapped around the exterior surface of said outer sheath and said material layer; an inner conductor insulatably supported within said outer sheath; and an insulating gas disposed within said outer sheath.

4,415,764

## SUBMARINE ELECTRIC CABLE WITH TUBULAR STIFFENING MEANS AND METHOD OF APPLYING THE STIFFENING MEANS

Paolo G. Priaroggia; Giuseppe Bianchi, both of Milan, and Angelo Sala, Merate, all of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

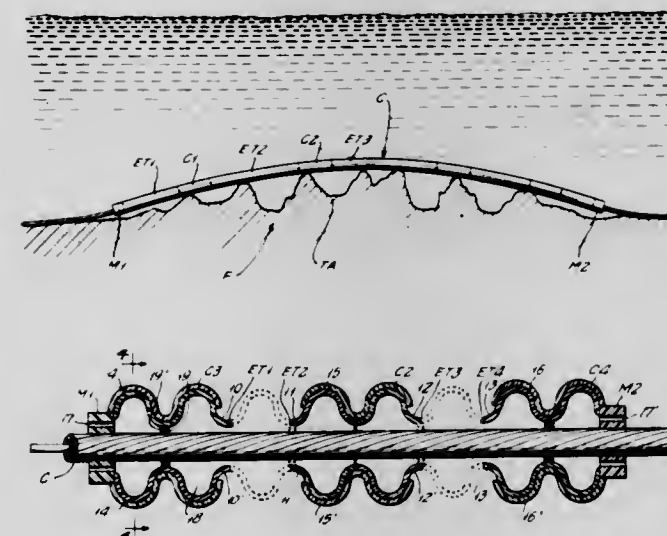
Filed Nov. 4, 1981, Ser. No. 318,258

Claims priority, application Italy, Nov. 12, 1980, 25928 A/80

Int. Cl.<sup>3</sup> H02G 9/02, 1/10; H01B 7/24

U.S. Cl. 174—37

17 Claims



1. Submarine electric cable installation on the bottom of a body of water, said bottom having both a relatively smooth tract and a relatively uneven tract, said cable comprising at least one conductor having a screen and insulation therearound and having an outer protective covering around said insulation and said cable having a portion thereof overlying said uneven tract, said installation comprising tubular stiffening means around said portion of said cable and preventing contact of said cable with said uneven tract, said tubular stiffening means having a rigidity greater than the rigidity of said cable and a length sufficient to prevent bending of said portion of said cable to a radius less than the minimum bending radius of said cable, and said tubular stiffening means having at least a portion of its inner wall spaced from said outer protective covering and having openings therein to permit water to flow into and out of and within said tubular stiffening means and thereby cool said cable, and said cable being without said tubular stiffening means therearound at a portion thereof which overlies said relatively smooth tract.

17. Method for disposing a tubular stiffening-means around a submarine electric cable having a protective covering during the laying of the cable from a ship on water, said ship having a cable capstan and said tubular stiffening-means being assembled around the cable portion between said capstan and the water during the laying of the cable in the water, characterized by the fact of comprising the following operations: locking, onto the protective covering of the cable, a first clamp that has its outer diameter at least equal to the outer diameter of said tubular stiffening-means; disposing around the cable a first and a second shell having C-shaped cross-sections and annular corrugations, for forming a first tubular element that is in contact with said first clamp; circumscribing with a first collar the extremity of said first tubular element that is adjacent said first clamp, said first collar comprising a first and a second semi-collar having C-shaped cross-sections and annular corrugations, said first and second semi-collars having corrugations that are similar to the corrugations of said first and second shells, and the inner projecting parts of said corrugations of said first and second semi-collars becoming inserted into the outer corre-

sponding depressions of the corrugations of said first and second shells;

disposing around the cable a third and a fourth shell having C-shaped cross-sections and annular corrugations, for forming a second tubular element in series to said first tubular element;

circumscribing with a second collar the adjacent extremities of said first and second tubular elements in series, said second collar comprising a third and a fourth semi-collar having C-shaped cross-sections and annular corrugations that are similar to the corrugations of said shells, the inner projecting parts of the corrugations of said second collar being placed in correspondence of the outer depressions of the adjacent terminal corrugations of said first and second contiguous tubular elements;

disposing, using the same steps, a plurality of additional tubular elements and collars around the cable, for forming a tubular stiffening-means of the desired length;

circumscribing with another collar the end of the last tubular element of said plurality; and

locking, on said protective covering of the cable, a second clamp that has its outer diameter at least equal to the outer diameter of said tubular stiffening-means.

4,415,765

## WIRE HARNESS

Tatsuya Iwasa; Takayuki Inoue, and Noriyuki Mizuta, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00272, § 371 Date Apr. 30, 1981, § 102(e) Date Apr. 30, 1981, PCT Pub. No. WO81/01343, PCT Pub. Date May 14, 1981

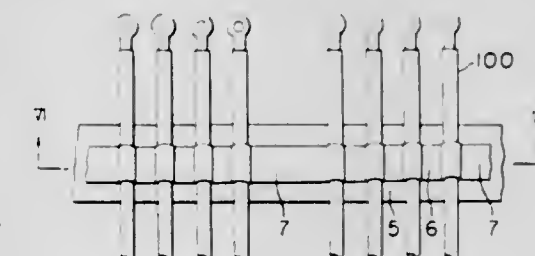
PCT Filed Oct. 31, 1980, Ser. No. 261,161

Claims priority, application Japan, Nov. 2, 1979, 54-142567; Nov. 8, 1979, 54-145208; Nov. 26, 1979, 54-153181

Int. Cl.<sup>3</sup> H01B 7/00

U.S. Cl. 174—72 A

2 Claims



1. A wire harness comprising: a plurality of connecting wires with each said wire being provided with terminals on each end and wherein said connecting wires are used for wiring electrical control devices; a paper tape on which each of said wires is placed side-by-side and independent of each other with a space therebetween; an adhesive tape adhering to said paper tape and covering the connecting wires on the side opposite said paper tape in order to hold said connecting wires on said paper tape, wherein said connecting wires are divided into a plurality of sections corresponding to a unit of wiring for each section wherein the spacing between sections is larger than the spacing between each of said wires in each section so that each unit of wiring may be easily separated manually from each of the other units by breaking said paper and adhesive tape between said sections and wherein the spacing between said wires is such that said harness is capable of being folded together for transportation; wherein data for each connecting wire is printed on the surface opposite said wires of said paper tape; and wherein said adhesive tape and said paper tape may be easily



separated manually in order to easily remove the respective connecting wires.

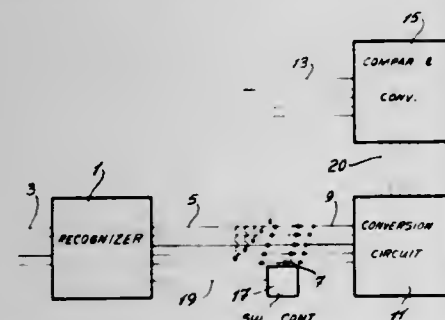
4,415,766

# RECOGNIZER/CONVERTER FOR ARABIC AND OTHER LANGUAGE CODES

Syed S. Hyder, Westmount, Canada, assignor to Alephtran Technology N.V., Curacao, Netherlands Antilles  
Filed Jun. 6, 1980, Ser. No. 157,296  
Int. Cl.<sup>3</sup> H04L 3/00

U.S. Cl. 178—30

4 Claims



4. A converter for converting code words of a first coding system, representing alphabetic characters of a language, to other code words of a second coding system, said language having special characters comprising combinations consisting of modifying symbols for respective ones of said characters together with said respective characters, said first coding system representing each said special character as two code words, a first code word for said character and a second code word for said modifying symbol;

said converter comprising:

means for recognizing the code words representative of said special characters by recognizing the code words representative of said modifying symbols;

means for converting any two code words determined to be representative of a respective one of the special characters to a single code word of the second coding system; and analyzing means to analyze a code word following the code word for a modifying symbol to determine if the following code word and the code word for the modifying symbol are together representative of a special character.

4,415,767

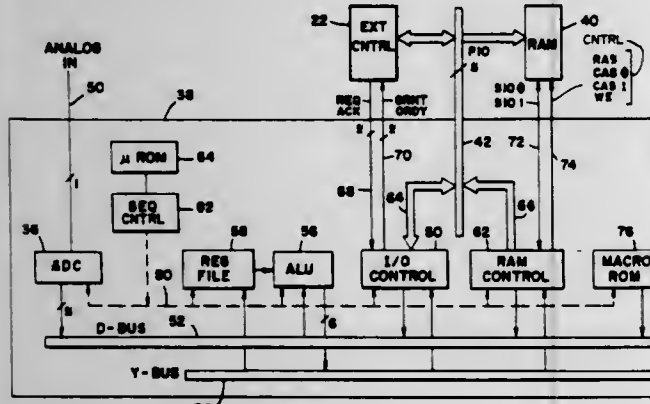
# METHOD AND APPARATUS FOR SPEECH RECOGNITION AND REPRODUCTION

Stephen P. Gill, Atherton; Lawrence F. Wagner, Berkeley; Gregory G. Frye, San Leandro, and Klaus-Peter A. Bantowsky, Hayward, all of Calif., assignors to Votan, Fremont, Calif.

Filed Oct. 19, 1981, Ser. No. 312,801  
Int. Cl.<sup>3</sup> G10L 1/00

U.S. Cl. 381—45

28 Claims



1. A method for providing a spectral analysis of an analog signal waveform comprising the steps of:

dividing the total incoming analog signal into time frames of equal duration;  
converting the analog signal to a sequence of discrete signal amplitudes at equally spaced time intervals in each frame;  
transforming the sequence of discrete signal amplitudes to a sequence of complex spectral amplitudes, each such spectral amplitude representing the magnitude and phase of a function  $V(n, k)$  defined as:

$$V(n, k) = \exp \left[ j\pi \left( \sum_{r=0}^p \sum_{t=0}^m n_{p-r} k_{r-t} 2^{-t} + \phi \right) \right]$$

wherein

k=time sequence index

n=frequency sequence index

r,t=integer summation indexes

m=time function parameter defining the number of retained bits

$\phi$ =phase adjustment function

and the subscripts (p-r) and (r-t) for n and k refer to bit locations in their binary representation with bit locations ranging from 0 to the maximum value p and subscript values outside this range representing vanishing values.

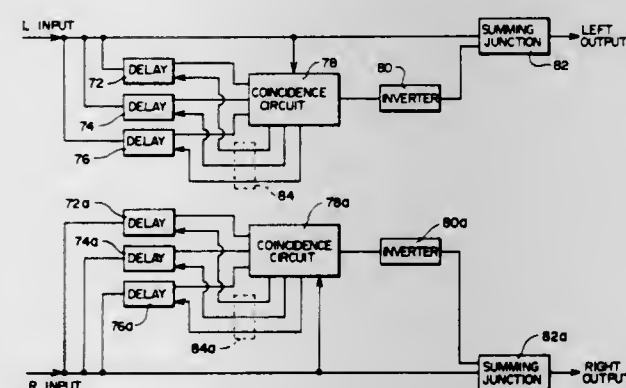
4,415,768

# TUNING APPARATUS AND METHOD

Robert W. Carver, 330 Avenue A, Snohomish, Wash. 98290  
Filed May 28, 1981, Ser. No. 268,084  
Int. Cl.<sup>3</sup> H04H 5/00

U.S. Cl. 381—10

5 Claims



1. An apparatus adapted to improve reproduction of a signal, such as an FM stereo signal, comprising:

a. first means to receive a signal input means and produce a first delayed signal output,

b. second means to receive said signal input means and said first delayed signal output and to compare these to produce a second delayed signal output corresponding to portions of said signal input means and said first delayed signal output that correspond to one another,

c. third means to invert said second delayed signal output and combine the same with said signal input means to produce an output signal,

d. control feedback means to control the delay of the first means to coincide more closely with the corresponding signal portion in the signal input means, and

e. said first means comprising a plurality of delay means to produce a plurality of first delayed signal output portions, each having different delayed increments.

4,415,769

# ELECTROMAGNETIC TELEPHONE COUPLING DEVICE

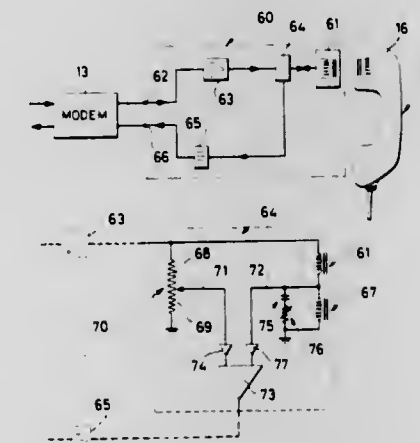
Antonio Gray, Segrate, Italy, assignor to C. I. S. E., SpA, Italy  
Filed Oct. 26, 1981, Ser. No. 315,075

Claims priority, application Italy, Oct. 27, 1980, 25596 A/80;  
Jan. 28, 1981, 19378 A/81

Int. Cl.<sup>3</sup> H04M 11/00, 9/08

U.S. Cl. 179—2 C

4 Claims



1. A device for the transmission and the receipt of electronic signals through a telephone line to which a telephone set is connected having inductive elements composed at least of the line transformer of the telephone set, the acoustical-electric transducer of the microphone of the telephone set, and the acoustical-electric transducer of the receiver of the telephone set comprising

a signal input and a signal output connected to electromagnetic interlinking means including a main coil and a secondary coil which are positioned in close proximity to at least one of the inductive elements of the telephone set, said electromagnetic interlinking means being adapted to transmit to the inductive element the signal coming from said signal input and to send to said signal output the signal received by the inductive element, said signal input and said signal output both being connected to said main coil through a signal separation circuit for the signal transmitted by said signal input to said main coil through a linear amplifier and for the signal sent by said main coil to said output through a band-pass filter, said main coil being positioned in the vicinity of one of the inductive elements of the telephone set,

said separator circuit including a balanced bridge circuit wherein two consecutive sides of said balanced bridge circuit are formed by said main coil and said secondary coil, said two sides being fed at the ends of said coils at which they are not connected to each other with the signal transmitted by said signal input, the signal which is present between impedances in the remaining two sides of said balanced bridge circuit being separately fed, each through a linear amplifier, to a differential amplifier having its output connected to the input of said band-pass filter.

4,415,770

# MALFUNCTION DETECTION SYSTEM FOR A MOBILE RADIO TELEPHONE SYSTEM

Tomokazu Kai, and Hidetoshi Nakahara, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 367,852

Claims priority, application Japan, Apr. 24, 1981, 56-62900

Int. Cl.<sup>3</sup> H04B 3/60, 17/00; H04Q 7/04

U.S. Cl. 179—2 EB

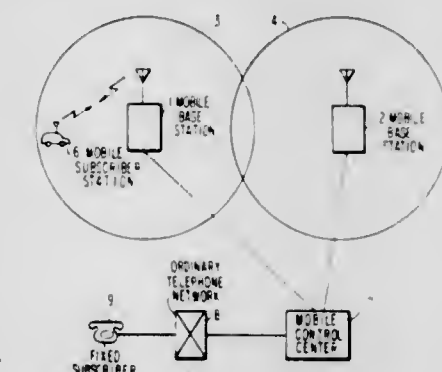
4 Claims

1. In a mobile radio telephone system of the type having mobile subscriber stations; mobile base stations, each mobile base station having a plurality of speech channel transmitter/

receivers to transmit and receive signals respectively through a plurality of speech channels and an access channel transmitter/receiver to control calls from said mobile subscriber stations through an access channel; and a mobile control center capable of enabling communication between said mobile subscriber stations and of connecting a telephone exchange network to said mobile subscriber stations by way of said mobile base stations, the improvement comprising:

detecting means connected to the output of said access channel receiver for detecting both a calling signal originated from said mobile subscriber stations and a test calling signal to provide a detection output;

test transmitter means responsive to a first control signal for transmitting said test calling signal to said access channel receiver through said access channel;



center controller means responsive to said test calling signal received by said access channel receiver for transmitting a first response signal to test receiver means through said access channel transmitter, said test receiver means receiving said first response signal transmitted from said access channel transmitter; and

controller means connected to said detecting means, test transmitter and receiver means and center controller means for generating said first control signal when said detection output is not generated within a first predetermined interval of time and supplying a first alarm signal to said center controller when the first response signal is not received within a second predetermined interval of time after the transmission of said test calling signal.

4,415,771

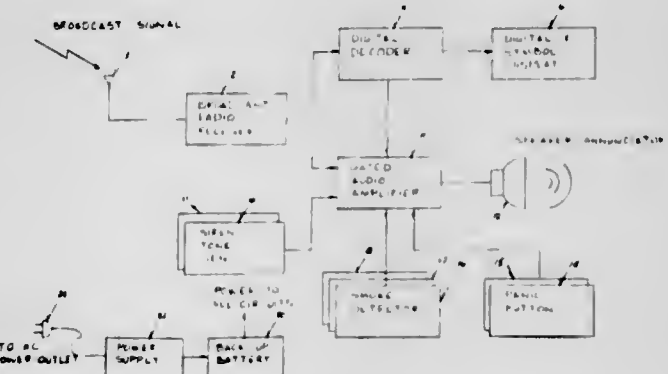
# PUBLIC ALERT AND ADVISORY SYSTEMS

Louis Martinez, 18939 Millmore Ave., Carson, Calif. 90746  
Filed Apr. 3, 1981, Ser. No. 250,779

Int. Cl.<sup>3</sup> H04B 7/00

U.S. Cl. 179—5 R

40 Claims



39. A public alert and advisory system comprising: a central transmitter station including first transmitter modulation means for modulating a signal to be transmitted with audio programming, using a first modulation technique, for transmission of the programming to manually controllable first receivers having first receiver demodula-



tion means responsive to signals modulated with said first modulation technique for the reception and demodulation of said modulated signal to allow selective perception of the programming by members of the public;

second modulation means coupled to said central transmitter station for modulation of the signal to be transmitted with public alert and advisory information utilizing a second modulation technique to which said first receiver demodulation means are not primarily responsive;

alert and advisory signal means coupled to said second modulation means for providing a signal responsive to alert and advisory information thereto which is at least partially a voice signal; and

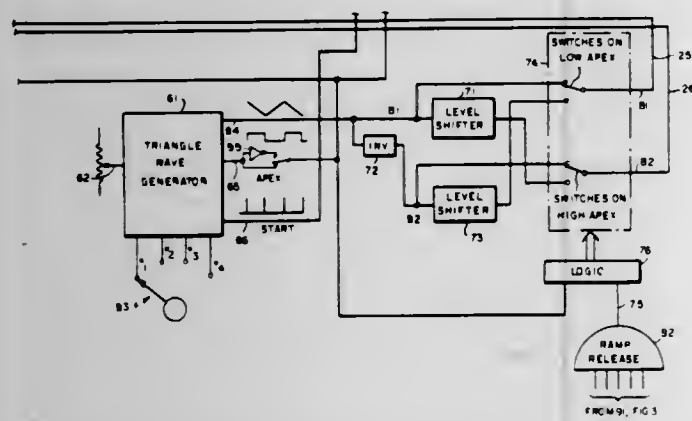
a plurality of remote second receivers, each of said second receivers having second receiver demodulation means responsive to signals modulated with said second modulation technique for the reception and demodulation of the transmitted signal to provide the public alert and advisory information at the respective remote location, said second receivers each also including presentation means for presenting said alert and advisory information in humanly perceivable form at the respective remote location.

**4,415,772**  
**GAPLESS SPLICING OF PITCH ALTERED WAVEFORMS**

William G. Eppler, Jr., Norwalk, Conn.; Michael A. Klasco, New York, N.Y.; Irwin H. Kornfeld, Brooklyn, N.Y., and Rex Nathanson, Little Neck, N.Y., assignors to The Variable Speech Control Company ("VSC"), San Francisco, Calif.  
Filed May 11, 1981, Ser. No. 262,046  
Int. Cl.<sup>3</sup> G10L 1/00

U.S. Cl. 369—60

19 Claims



1. A time compression/expansion system in which the playback speed for a recording is selected such that the frequencies of electric signals derived from playback of a recorded work are different than their original values and said electric signals are processed to change their frequency by periodic variable time delay to obtain a desired pitch change comprising:

dual variable time delay means each operable for variably delaying said playback signal in response to respective control signals;

control signal means coupled to supply said control signals to said dual delay means for periodically varying the time delay in respective said dual delay means inversely with alternate increasing the decreasing delay;

switching means operable for alternately selecting the output of the delay means having the desired pitch change during each period of delay variation; and

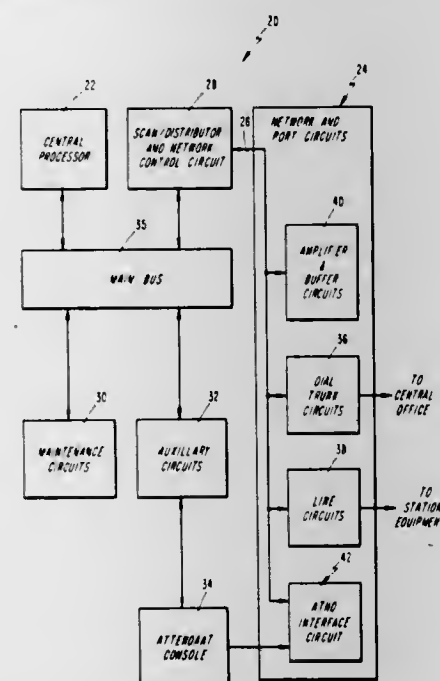
transition control means which includes means for extending the interval of delay variation of the selected delay means to continue said selected delay variation beyond the normal periodic switching point and means for operating said switching means during the extended interval after each variation period in response to detecting a signal level and slope match between the present values of the just ending and next ensuing pitch corrected signal outputs of said dual delay means.

**4,415,773**  
**METHODS OF ESTABLISHING A SWITCHING CONNECTION WITHIN A SWITCHING SYSTEM**  
Margaret L. Martin, Boulder, Colo., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,374  
Int. Cl.<sup>3</sup> H04Q 3/10, 3/54

U.S. Cl. 179—18 AD

3 Claims



3. A method of establishing a connection to a called subscriber station within a switching system wherein the system uses  $n+1$  digits to establish a connection, which comprises the steps of:

storing  $n$  dialed digits representing a called subscriber station number;

decoding the stored digits to determine if a connection to a subscriber station is to be established;

adding an additional digit to the stored  $n$  digits when it is determined that a connection to the subscriber station is to be established;

determining whether the additional digit is a valid station code;

removing the additional digit from the stored  $n+1$  digits;

utilizing the remaining stored  $n$  digits to identify the equipment location of the subscriber station; and

establishing a connection to the called subscriber station identified by the equipment location.

**4,415,774**  
**LINE POWERED MODEM AUTOMATIC ANSWER DEVICE POWERED FROM EQUIPMENT**

R. Byron Driver, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Filed Nov. 25, 1981, Ser. No. 324,842  
Int. Cl.<sup>3</sup> H04M 11/00

U.S. Cl. 179—2 DP

9 Claims

1. For use in a modem powered by the telephone line and connected to data equipment which sends a data equipment modem answer control signal having an answer state when ready to receive data and a no-answer state when not ready to receive data;

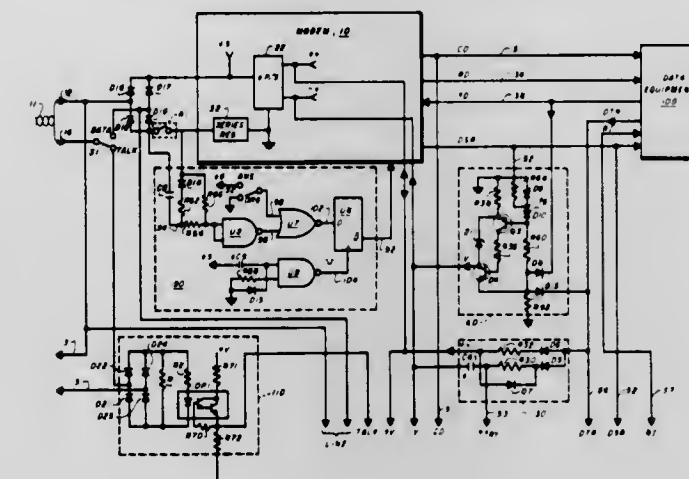
an automatic answer device operative upon receipt of a ring signal from said telephone line when said modem answer control signal is in said answer state to place said modem in the answer mode (off-hook) and to pass data received by said modem to said data equipment, said automatic answering device comprising:

a ring detector means generating a ring indicator signal when said ring signal appears on said telephone line;

an answer relay for connecting said modem to said telephone line according to a relay answer signal;

energy storage means for receiving and storing said modem answer control signal; and

an answer control means connecting said answer relay and said energy storage means for producing said relay answer



signal upon the receipt of said ring indicator signal when said modem answer signal is in said answer state for causing actuation of said answer relay from said storage means thereby connecting said telephone line to said modem.

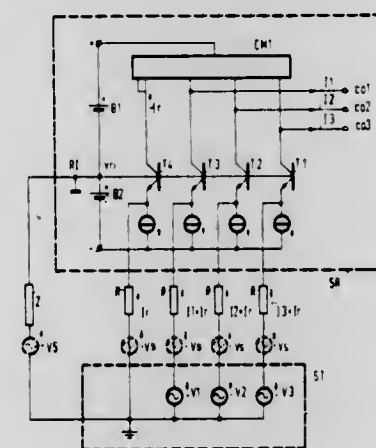
**4,415,775**  
**ARRANGEMENT FOR EXCHANGING SIGNALS BETWEEN SEPARATED CIRCUITS**

Aloysius J. Nijman, and Franciscus A. C. M. Schoofs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,945  
Claims priority, application Netherlands, Sep. 2, 1980, 8004970

Int. Cl.<sup>3</sup> H04B 3/02, 3/30  
U.S. Cl. 179—78 R

5 Claims



1. An arrangement for transmitting signals from a first circuit arrangement comprising a first voltage reference point and a plurality of signal sources each having one side connected to the first voltage reference point to a second circuit arrangement comprising a second voltage reference point and a plurality of signal sinks each having one side connected to the second voltage reference point, the two voltage reference points being separated by an impedance having an impedance value different from zero it being possible that a disturbing voltage is present between the said voltage reference points, characterized in that for the transmission of each one of the signals of the plurality of signal sources from the first to the second circuit arrangement one separate signal conductor which includes an impedance having a high impedance value, denoted high ohmic signal conductor, is provided between the relevant signal source of the first circuit arrangement and a separate signal sink of the second circuit arrangement, in that at least

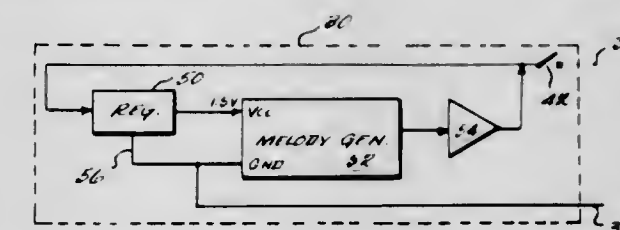
two of these high ohmic signal conductors are provided for the transmission of at least two independent signals and that a signal conductor which includes an impedance having a high impedance value, denoted high ohmic reference-signal conductor is provided between the first voltage reference point of the first circuit arrangement and a separate signal sink of the second circuit arrangement and that the second circuit arrangement includes means for linearly combining the currents flowing in the high ohmic signal conductors and the high ohmic reference-signal conductor for generating signal currents in the second circuit arrangement which are proportional to the signals transmitted by the first circuit arrangement to the second circuit arrangement and are substantially independent of the disturbing voltage which may be present between the voltage reference points of the two circuit arrangements.

**4,415,776**  
**TELEPHONE MUSIC-ON-HOLD DEVICE**  
Robin K. L. Tang, 13 D 514-3 Tung-hwa S. Rd., Taipei, Taiwan, and Donald C. L. Tang, 11120 Candlelight Ln., Potomac, Md. 20854

Filed Apr. 17, 1981, Ser. No. 255,272  
Int. Cl.<sup>3</sup> H04M 1/00

U.S. Cl. 179—81 R

14 Claims



1. A telephone music-on-hold device for generating music and coupling it onto a telephone line comprising:

a regulator adapted to be coupled to a telephone line, for drawing power from the telephone line and supplying regulated power;

a melody circuit powered by said regulator, for generating a multi-note musical melody; and

an amplifier for amplifying the musical melody and coupling it to the telephone line.

the regulator, melody circuit, and amplifier being constructed as a single unit of sufficiently small size to be inserted into a hollow portion of a telephone handset and having only two lead wires associated therewith for connection to terminals of the telephone handset.

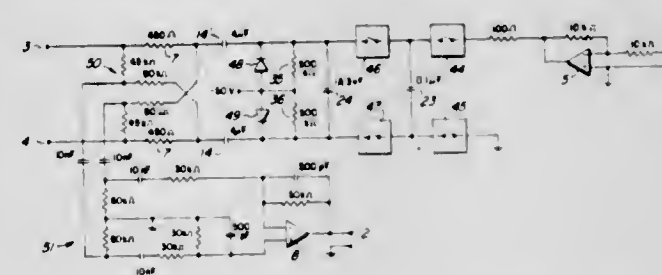
**4,415,777**  
**HYBRID CIRCUIT INCLUDING CAPACITIVE CHARGE-TRANSFER MEANS**

David G. Agnew, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 20, 1981, Ser. No. 323,541  
Int. Cl.<sup>3</sup> H04B 1/58

U.S. Cl. 179—170 NC

19 Claims



1. A hybrid circuit comprising transmit path means, for coupling signals from a two-wire line to a transmit path of a four-wire line, and receive path means, for coupling signals from a receive path of the four-wire line to the two-wire line,



wherein at least one of said transmit path means and said receive path means comprises capacitive charge-transfer means comprising a plurality of parallel capacitors, a plurality of series switches, and means for cyclically controlling said switches to transfer signals between two ports of said charge-transfer means whilst electrically isolating said ports from one another.

4,415,778

## SUBSCRIBER TELEPHONE TEST SET

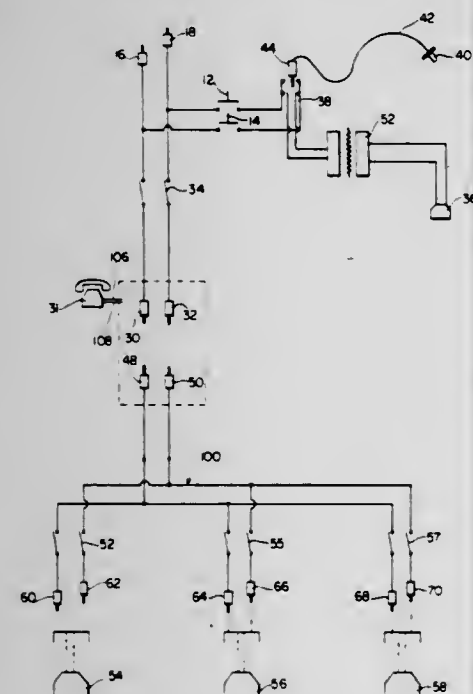
Robert L. Turner, P.O. Box 44, Tate, Ga. 30177

Filed Nov. 30, 1981, Ser. No. 325,808

Int. Cl.<sup>3</sup> H04B 17/00; H04M 1/24

U.S. Cl. 179—175.1 R

7 Claims



1. A telephone subscriber test set of the type enabling the subscriber to isolate trouble both in the household interior telephone equipment, including interior household lines and telephone receiver, and in the telephone company central office exterior lines, extending to the household lines, comprising:

- A. A normally "closed" interior household telephone line switch mounted in the household interior lines and adapted for passing the telephone company dial tone directly to the household telephone receiver, unless "opened" for test of the telephone company central office lines; and
- B. A central office exterior lines test circuit connected to the household interior lines between the telephone company central office lines and the interior household telephone line switch so as to isolate trouble in the central office lines, said central office lines test circuit including:
  - i. a normally "open" master test switch mounted in said test circuit;
  - ii. a transformer mounted in said test circuit having a first winding in series with said master test switch, and a second winding; and
  - iii. a dial tone speaker in shunt with said second winding, said test circuit adapted to amplify the dial tone emanating in the central office lines, as the master test switch is "closed".

4,415,779  
METHODS OF AND APPARATUS FOR TESTING  
TELEPHONE SUBSCRIBER LOOP TO LOCATE A  
FAULT RELATIVE TO A REFERENCE POINT

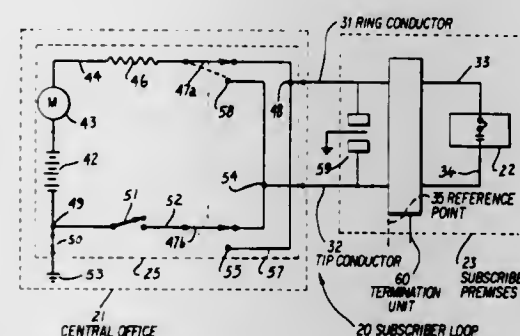
Howard C. Bowman, Winston-Salem, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 274,592

Int. Cl.<sup>3</sup> H04B 3/46

U.S. Cl. 179—175.3 F

10 Claims



1. A method of determining whether a fault in a telephone subscriber loop exists between a central office and a reference point or between the reference point and subscriber terminal equipment, said method comprising the steps of: applying a test voltage signal from a source capable of providing a continuous unidirectional test current in a sequence to a ring conductor of the subscriber loop and ground, to a tip conductor of the subscriber loop and ground, and between the ring and the tip conductors, each of the conductors having in parallel a voltage sensitive device and an associated energy storage device connected in series therewith; limiting the amplitude of the test current; connecting a measuring device to the loop to test for a fault current between the ring conductor and ground, between the tip conductor and ground, and between the ring and tip conductors; detecting a substantially constant current flow from the ring or the tip conductor to ground or from the ring to the tip conductor in response to a fault between the central office and the reference point; and periodically interrupting the current flow serially from the central office to ground and between the tip and the ring conductors to provide an oscillatory current reading on the measuring device in response to a fault between the reference point and the terminal equipment, said step of periodically interrupting the current flow being accomplished by charging one of the energy storage devices until an accumulated charge on the energy storage device exceeds a threshold voltage of the associated voltage sensitive device whereupon the voltage sensitive device is rendered conductive and causes the accumulated charge to be dissipated.

4,415,780

## KEYBOARD WITH EDGE VENT

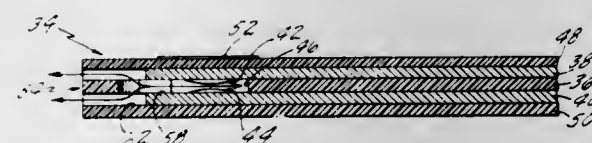
James B. Daugherty, and Frederick A. Balash, both of Mesa, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed May 28, 1981, Ser. No. 267,787

Int. Cl.<sup>3</sup> H01H 13/70

U.S. Cl. 200—5 A

10 Claims



1. An electrical switch assembly comprising: first circuitry layer means, said first circuitry layer means including a flexible non-conductive substrate having first

and second oppositely disposed surfaces, said first circuitry layer means having an electrically conductive pattern disposed upon its second surface; second circuitry layer means, said second circuitry layer means including a non-conductive substrate having first and second oppositely disposed surfaces, said second circuitry layer means having an electrically conductive pattern disposed upon its first surface, said first surface of said second circuitry layer means being positioned to face said second surface of said first circuitry layer means; spacer means, said spacer means being a layer of electrical insulating material positioned between said first and said second circuitry layer means, said spacer means cooperating with said first and said second circuitry layer means to define at least a first peripheral edge of the switch assembly, said spacer means being provided with at least one aperture which forms a cavity between said first and second circuitry layer means whereby said conductive patterns on said circuitry layer means may be moved into electrical contact with one another; and vent passage means for venting said cavity, said vent passage means extending from said switch assembly first peripheral edge to said cavity whereby gas may flow freely between said edge and said cavity, said vent passage means comprising interconnected passage segments in said spacer means and in at least one of said first and second circuitry layer means.

4,415,781

## MEMBRANE SWITCH

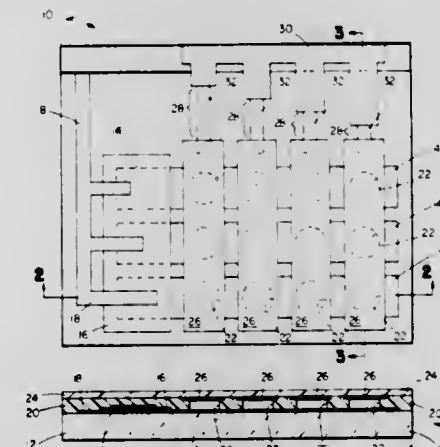
Norman J. Frame, Whitefish Bay; James P. Walber, Cedar Grove, and Jan M. Janick, Brookfield, all of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Nov. 20, 1981, Ser. No. 323,290

Int. Cl.<sup>3</sup> H01H 13/70; G06F 3/02

U.S. Cl. 200—5 A

10 Claims



1. A switch assembly comprising a flexible membrane supporting a first contact, a spacer layer positioned below said membrane for spacing it from a facing surface having a second contact aligned with said first contact, a capacitor and resistor electrically connected to said first and second contacts in series, and first and second electrical leads for connecting said contacts and said capacitor and resistor to external circuitry, whereby switch activation can be sensed by external circuitry connected to said leads by sensing a unique resistance and capacitance combination across said leads.

4,415,782

## SLIDING DISC TRANSDUCER ACTUATOR

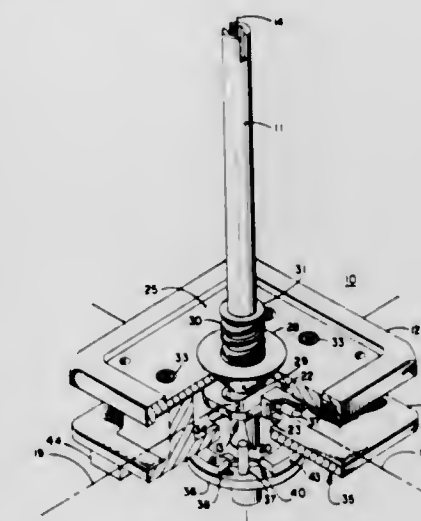
Dwayne R. Elmberg, Coon Rapids, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 2, 1981, Ser. No. 308,066

Int. Cl.<sup>3</sup> H01H 25/04

U.S. Cl. 200—6 A

20 Claims



1. An actuator mechanism for converting two axis pivoting motion to planar motion comprising: a shaft extending along a longitudinal axis and mounted by first support means for pivotal movement about two distinct axes transverse to the longitudinal axis at a pivot point thereon; a disc member connected to said shaft at a location spaced from the pivot point; said disc member comprising a flexible central web at least partially surrounded by a peripheral rim; and second support means for supporting said disc member generally in a plane transverse to the longitudinal axis and confining said peripheral rim of said disc member to movement in the plane.

4,415,783

## MULTIPOLE DATA SWITCH

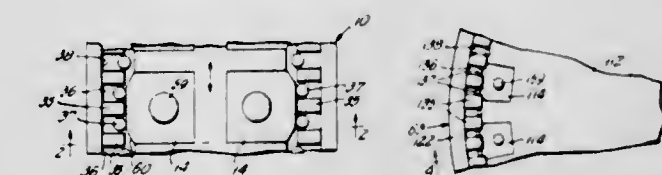
Peter C. Hung, Stony Brook, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,322

Int. Cl.<sup>3</sup> H01H 19/54

U.S. Cl. 200—11 A

2 Claims



1. A multipole switch comprising a base element and a sliding element arranged coaxially for relative incremental movement; said base element including a contact supporting area defining a plurality of parallel bores, a plurality of elongated totally rectilinear wire-like flexible contacts, each of said contacts having a portion thereof inserted in one of said bores and having a free end spaced from said portions; a plurality of septums associated with said base element in the area of said free ends of said contacts, and defining interstices therebetween within which said free ends are laterally deflectable; said sliding element being arranged for relative movement on said base element and having a plurality of contact means projecting therefrom to overlie said flexible contacts to selectively bridge adjacent pairs thereof; said base element including a lower wall containing said bores, a pair of side walls extending upwardly from said lower wall, and a cover member overlying.



free upper edge surfaces of said side walls to define an elongated cavity, said sliding element being disposed within said cavity; said septums being mounted upon an inner surface of said cover and serving to position said cover member relative to said side walls by contact therewith.

4,415,784

## TIMER WITH DELAYED START CAPABILITY

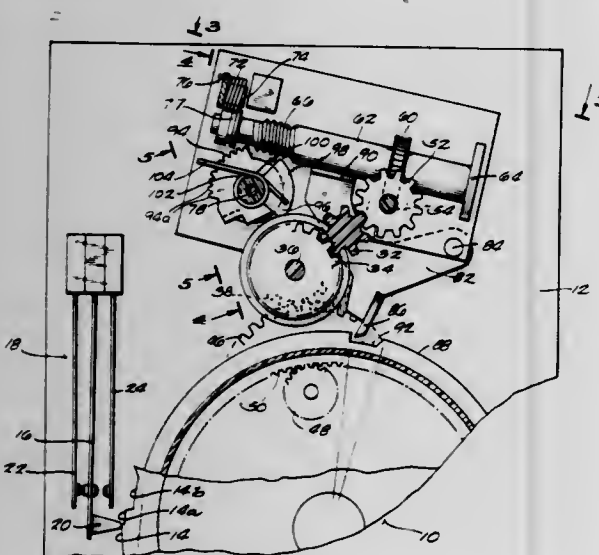
James M. Thornbery, Vernon Hills; George Obermann, Niles, and Edward J. Mateja, Hillside, all of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Sep. 11, 1981, Ser. No. 301,142

Int. Cl.<sup>3</sup> H01H 43/00

U.S. Cl. 200—35 R

12 Claims



12. A program timer of the type having a motor driving a timing cam to actuate switches according to a desired sequence from the start to end of a program, the improvement being provision for delaying the start of a program for a selected period, comprising,

a clutch in the drive between the motor and the timing cam, gear means driven by the motor from a point between the motor and the clutch input, said gear means including a worm gear, a ratchet segment mounted on a rotatable shaft for movement from a zero delay position in which it is not engaged with said worm gear to various positions in which one or more ratchet teeth are engaged with the worm gear, manual means for rotating the shaft, means responsive to rotation of the shaft from the zero delay position to operate said clutch to interrupt the drive to the timing cam and to re-engage the clutch on return to the zero delay position, said worm gear being operative to drive the segment back towards the zero delay position, a spring biasing the segment to the zero delay position, said worm gear being movable between an active position in which it can engage said segment and an inactive position in which it cannot engage the segment, means responsive to the position of the timing cam to move said worm gear between said active and inactive positions and operative to position the worm gear in its active position only when the timing cam is in its start position, said segment returning to the zero delay position under influence of the spring bias if the timing cam is moved out of its start position while the segment is engaged with the worm gear.

4,415,785

## TIMER SWITCH

Kuniaki Uno; Saichi Katumata; Toshio Tanaka, all of Susono, and Hiroshi Omata, Gotenba, all of Japan, assignors to Kabushiki Kaisha Higashifuji Seisakusho, Tokyo, Japan

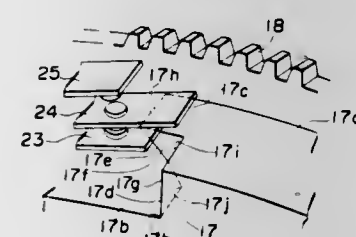
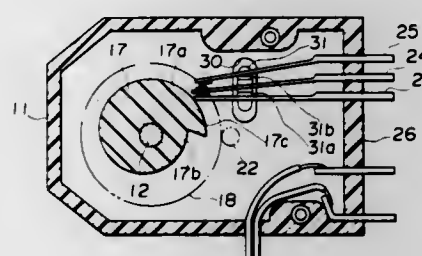
Filed Jun. 8, 1981, Ser. No. 271,616

Claims priority, application Japan, Jun. 23, 1980, 55-84767

Int. Cl.<sup>3</sup> H01H 43/10

U.S. Cl. 200—38 B

8 Claims



1. A timer switch which comprises:

- a casing;
- an electric motor mounted on said casing;
- a cam member of a generally disc-shape having a cam surface at its periphery, said cam surface being stepped to provide a depressed portion and a shoulder portion adjacent thereto, said cam member being operatively connected to said motor for rotation at a constant speed;
- a shaft mounted on said casing for rotation about its axis, said cam member being fixedly mounted on said shaft for rotation therewith, said shaft extending exteriorly of said casing; and
- an electrical switching means including a pair of first and second contact plates of resilient material fixedly mounted on said casing at their one ends in juxtaposed relation; said second contact plate being biased normally into engagement with said first contact plate for energizing said motor through an associated circuit having a power source, said first contact plate being biased into sliding engagement with said cam surface, whereby upon depression of said first contact plate into said depressed portion, said first contact plate is disengaged from said second contact plate to de-energize said motor while said second contact plate is biased into sliding engagement with said shoulder portion, the improvement wherein said cam surface has a notch formed in said shoulder, said notch opening to one side of the cam member; said shaft being operable to be displaced together with said cam member along an axis thereof relative to said casing, whereby upon axial displacement of said shaft in a direction opposite to the one side of said cam member when said second contact plate is in engagement with said shoulder portion, said second contact plate is moved into said depressed portion through said notch so that said second contact plate is again biased into engagement with said first contact plate to reset and timer switch.

4,415,786

## APPARATUS FOR DETECTING THE NEUTRAL POSITION OF A MANUAL TRANSMISSION FOR MOTOR VEHICLES

Toshiaki Takada, Yokohama, and Kazuyoshi Hiraiwa, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

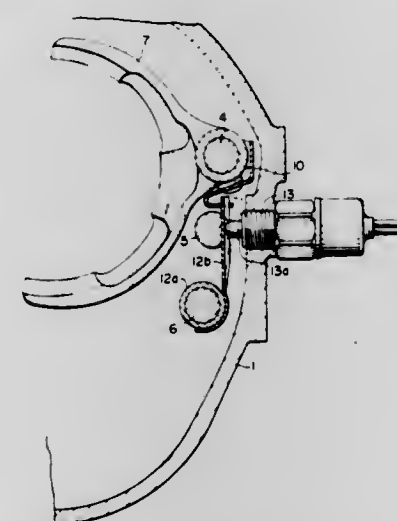
Filed Mar. 24, 1982, Ser. No. 361,261

Claims priority, application Japan, Mar. 25, 1981, 56-42406

Int. Cl.<sup>3</sup> H01H 3/16

U.S. Cl. 200—61.91

2 Claims



1. In combination with a remote control type manual transmission for motor vehicles, including a first, a second and a third shift rod, apparatus for detecting the neutral state of the transmission comprising:

- a bracket fixedly mounted on said first shift rod, said bracket having a first recess;
- said second shift rod having a second recess;
- a swingable arm member comprising a hollow shaft portion and an arm secured thereto, said swingable arm member being swingable mounted on said third shift rod, with said hollow shaft portion thereof loosely fitted thereover and restrained from axial displacement, said arm of said swingable arm member disposed in engagement with said first and second recesses only when said first and second shift rods are at their neutral position; and
- a first switch means adapted to be actuated by said swingable arm member when said arm is disposed in engagement with said first and second recesses.

4,415,787

## VACUUM INTERRUPTER

Takashi Yamanaka, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

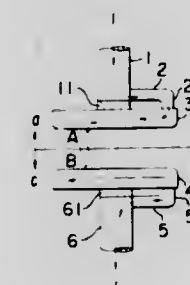
Filed Mar. 23, 1981, Ser. No. 246,639

Claims priority, application Japan, Dec. 22, 1980, 55-182216; Dec. 23, 1980, 55-183117

Int. Cl.<sup>3</sup> H01H 9/32

U.S. Cl. 200—144 B

15 Claims



1. An electric circuit interrupter, comprising:  
a pair of conductive rods;

a pair of opposed separable electrodes, each said electrode mechanically connected to a respective rod;  
said pair of conductive rods movable relative to each other from a position in which said pair of electrodes are in contact with each other to a position in which said pair of electrodes are out of contact with each other whereby an arc is formed between said pair of electrodes;  
a current conductor connecting electrically at least one of said conductive rods to a respective electrode at a point deviated from the center thereof; and,  
at least one of said electrodes having at least one groove cut therethrough, said at least one groove having one end cutting through a peripheral part of the electrode and another end extending towards another peripheral part of the electrode to form a current passage in the form of at least one coil turn passing through the electrode partially partitioned by the groove,  
whereby a magnetic field is formed in parallel to the arc between said pair of electrodes;  
each said electrode connected to a respective conductive rod through a reinforcing material for reinforcing the mechanical connection therebetween and for preventing an eddy current in each said electrode.

4,415,788

## INDUCTION CARTRIDGE

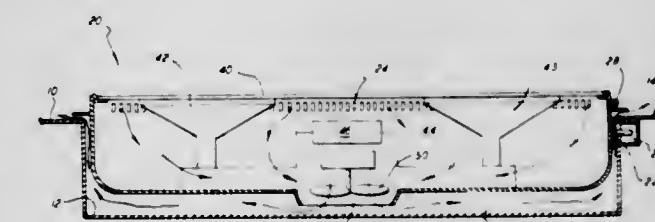
Thomas R. Field, Noblesville, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.

Filed Jun. 8, 1981, Ser. No. 271,462

Int. Cl.<sup>3</sup> H05B 9/02

U.S. Cl. 219—10.49 R

9 Claims



1. A cooking stove or range for selectively receiving cooking cartridge means comprising:

- housing means having at least one pan-like member forming a recess;
- cooking cartridge means having a top, bottom and sides defining a first cavity containing induction heating means and fan means and adapted to be operatively received in said recess;
- flange means extending around the sides of said cartridge means and dividing said cartridge means into an upper and a lower portion;
- spacer means secured to said cartridge means beneath said flange means and adapted to coact with said housing means to support said cartridge means so that said lower portion is received in said recess and spaced from said pan-like member to define a second cavity therebetween when said cartridge means is operatively connected, said spacer means further forming a gap between said flange means and said housing means to define an air outlet from said second cavity;
- a plurality of ports on at least one side of said cartridge means and located in said upper portion for defining an air inlet to said first cavity within said cartridge means;
- said cartridge means bottom defining an opening providing airflow communication between said first and second cavities, said fan means being operable for drawing air into said first cavity through said plurality of air inlet ports and passing it over and thereby cooling said induction heating means and directing the air through said opening into said second cavity formed between said cartridge means and said pan-like member and exhausting it through said air outlet gap.







being connected to the second input of said second OR circuit; another output connected to the second input of the first OR circuit.

4,415,794

# **LASER SCANNING METHOD FOR ANNEALING, GLASS FLOW AND RELATED PROCESSES**

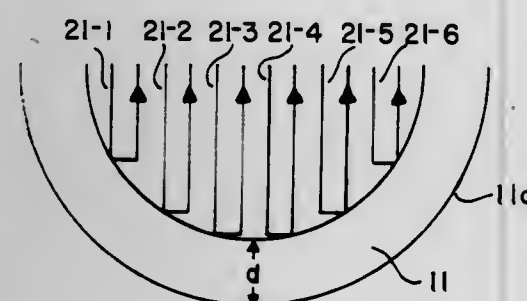
Michelangelo Delfino, Mountain View, and Timothy Reifsteck, Cupertino, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 16, 1981, Ser. No. 244,395

Int. Cl.<sup>3</sup> B23K 27/00

U.S. Cl. 219—121 LM

5 Claims



1. The method of laser scanning a semiconductor wafer which comprises the steps of:  
directing the beam from the laser across the top surface of the wafer in a selected pattern while at the same time preventing the laser beam from coming within a selected distance, d, of the edge of the wafer.

4,415,795

# **TORCH SUPPORT AND HEIGHT SENSOR APPARATUS FOR SHAPE CUTTING MACHINES**

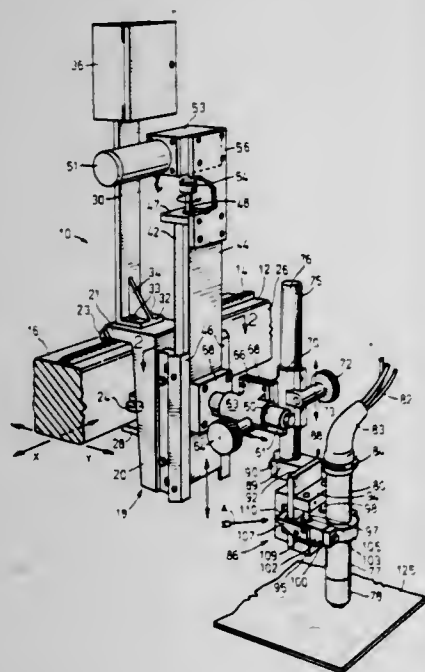
John W. Ross, and Pertti T. Raty, both of Toronto, Canada, assignors to Union Carbide Canada Limited, Toronto, Canada

Filed May 12, 1981, Ser. No. 262,835

Int. Cl.<sup>3</sup> B23K 9/00

U.S. Cl. 219—121 PH

11 Claims



1. In a cutting apparatus having a torch-support member, a plate sensing member supported from said torch-support member, a first means for moving the torch-support member towards and away from an underlying metal plate, a second means for moving the torch-support member horizontally so that a torch supported from said torch-support member can make a desired cut in the metal plate, the improvement which comprises in combination:

(a) mounting means mounting the plate-sensing member to

the torch-support member in a manner which allows relative movement between the plate-sensing member and the support member,

(b) means for establishing a first position of the plate-sensing member with respect to the torch-support member and wherein said plate sensing member comprises the cutting torch itself,

(c) detecting means for generating a signal upon detecting a predetermined degree of relative movement of the plate-sensing member from said first position said detecting means comprising an electrical switch which is triggered by relative movement between the frame and the carriage,

(d) and means for communicating said signal to said first means for reversing the direction of movement of said torch support member.

4,415,796

# **ELECTRIC IRON WITH UNITARY THERMOSTAT AND OVERTEMPERATURE CONTROL ASSEMBLY**

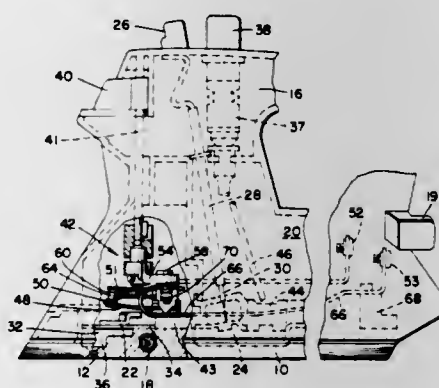
Charles A. Balchunas, Bethany, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,321

Int. Cl.<sup>3</sup> H05B 1/02; H01H 37/76; G03D 23/08

U.S. Cl. 219—253

10 Claims



1. In an adjustable stacked thermostat assembly including a lower heat deformable blade, a conductive intermediate stiff spring blade connected to one electric terminal, a conductive upper less stiff spring blade connected to a separate terminal, with all blades supported, secured, and spaced apart at one end by interposed insulators, and electrical contacts on said conductive blades with means transmitting movement between the heat deformable blade to said upper blade to make and break an electric circuit and control heat to a medium sensed by said thermostat, the improvement of an overtemperature control means as part of and adjacent said stacked assembly comprising,

a downwardly biased horizontally extending conductive bus bar parallel and adjacent to said heat deformable blade in said assembly and secured to said one electric terminal, a conducting finger connected to said separate terminal through said electrical contacts and projecting from said adjacent stack substantially at right angles to and overlapping the bus bar,

an insulator between and separating the finger and bar, a fusible pellet carried by the insulator and cooperating with said finger and said bar to establish an electric circuit therebetween and,

stop means on said insulator disposed to limit downward bar movement,

whereby on melting of the pellet, the downwardly biased bar drops and abuts said insulator stop means breaking the circuit established between said bar and finger for fast heat response.

4,415,797

# **APPARATUS FOR DISPENSING A MATERIAL INTO THE ATMOSPHERE**

Nikitas Choustoulakis, 181 Imittou St., Athens 502, Greece

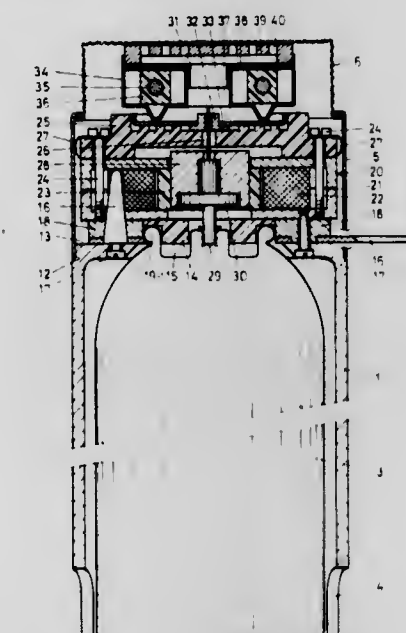
Filed Apr. 15, 1981, Ser. No. 254,564

Claims priority, application Greece, Apr. 19, 1980, 61716

Int. Cl.<sup>3</sup> B05B 1/24

U.S. Cl. 219—273

12 Claims



1. An apparatus for electrically dispensing a material to the atmosphere by evaporation of said material, comprising a case for receiving a container holding said material, locking means for releasably securing said container in said case, an electrically controlled actuator assembly in said case adapted to be releasably coupled to said container for causing a quantity of said material to emerge from said container at selectable time intervals and during preset periods, said actuator assembly comprising a ring-shaped solenoid surrounding a plunger connectable to an outlet of said container, and electrical control means connected to said solenoid of said actuator assembly for supplying energizing current to said solenoid including means for selecting said time intervals and means for presetting said periods, characterized in that said plunger (28) has an axial bore receiving a shaft tube (29), one end of which is provided with a nozzle tube (31), and in that there is provided an electrical heating assembly (34, 39) comprising an electrically heated body (34) having a bore (37) coaxially aligned with said nozzle tube (31), a heating surface substantially perpendicular to said bore (37) at the side of said body (34) away from said nozzle tube (31), and a plate (39) releasably resting on said heating surface in thermal contact therewith and at least partially covering said bore (37), said plate (39) having a plurality of holes (40) therein.

4,415,798

# **PLATE FOR RADIANT HEATING OR SIMILAR EFFECTS**

Horst Knappe, Nuremberg, Fed. Rep. of Germany, assignor to Ilona Knappe, Walldorf, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,681

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937498; Sep. 2, 1980, 3032968

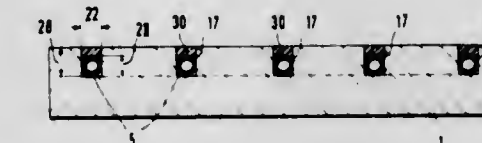
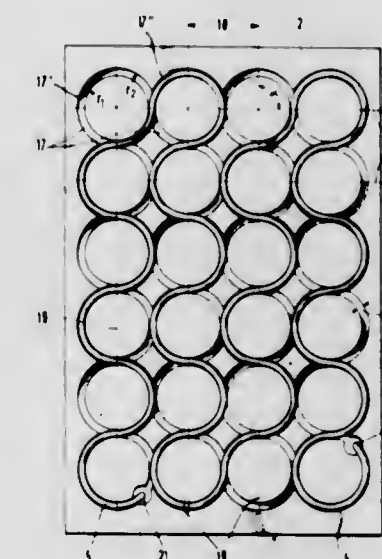
Int. Cl.<sup>3</sup> H05B 3/26

U.S. Cl. 219—345

8 Claims

1. A radiant heater comprising a plate of natural occurring stone as distinguished from cast or man-made compositions such as concrete, groove means machined into an outer surface of said stone plate, said groove means comprising a plurality of 360 degree endless circular groove elements machined into said outer surface of said stone plate, said plurality of 360 degree groove elements each having at least one circular portion thereof coincident with another circular portion of a juxtaposed 360 degree groove element such that said coinci-

dent circular portion interconnects said juxtaposed 360 degree groove elements, each of said 360 degree groove elements thereby having a coincident circular portion and a non-coincident circular portion, and heating element means disposed in and extending alternatively from a non-coincident portion to a coincident portion such that at least a section of the heating element extends along a non-coincident portion of one 360 degree groove element to a coincident portion between said



one 360 degree groove element and a second 360 degree groove element to the non-coincident portion of said second 360 degree groove element to a coincident portion between said second 360 degree groove element and a third 360 degree groove element to the non-coincident portion of said third 360 degree groove element in an undulating and non-linear manner, whereby said heating element means heats said stone to form the radiant heater.

4,415,799

# **MULTI-FUNCTION OVEN WITH CONTROL CIRCUIT FOR OPERATION DURING FERMENTATION OF YEAST CONTAINING PRODUCT**

Junzo Tanaka, Fujidaira; Toshio Kai, and Yoshitomo Fujitani, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP80/00166, § 371 Date Feb. 11, 1981, § 102(e)

Date Feb. 11, 1981, PCT Pub. No. WO81/00341, PCT Pub.

Date Feb. 19, 1981

PCT Filed Jul. 22, 1980, Ser. No. 237,159

Claims priority, application Japan, Jul. 27, 1979, 54-96499;

Jul. 31, 1979, 54-98224

Int. Cl.<sup>3</sup> A21C 13/00; H05B 6/80

U.S. Cl. 219—400

4 Claims

1. A multi-function oven for carrying out yeast fermentation, comprising:  
an oven body having a heating chamber therein for receiving articles to be cooked;  
an electric resistance type heater outside said heating chamber



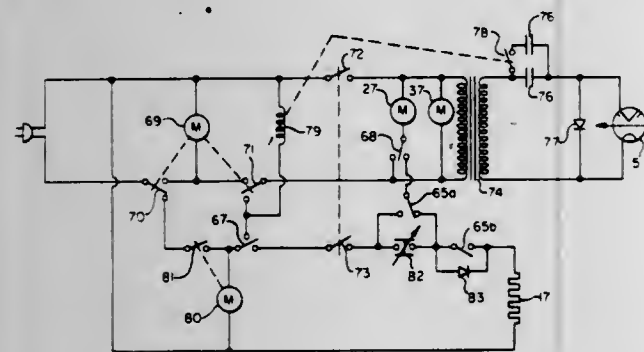
for increasing the temperature in said heating chamber, a partition separating said heating chamber from the space where said heater is located, said partition plate having a plurality of ventilating holes therein;

fan means for circulating the air from said heating chamber over said heater and back into said heating chamber;

means for supplying electric power to said heater and to said fan means;

temperature detecting means in said heating chamber; and

temperature control means to which said temperature detecting means is connected and which is in turn connected to said electric power supply means and including temperature setting means settable to a fermentation temperature for setting said temperature control means to a first control condition and settable to a temperature other than a fermentation temperature for setting said temperature control means to a second control condition, said temperature con-



trol means having means for, when set to said first control condition, controlling the electric power supply to said heater and to said fan means in response to a yeast fermentation temperature in said heating chamber for intermittently supplying power to said heater and to said fan means for keeping the temperature in the heating chamber at yeast fermentation temperature for fermentation of yeast in articles in said heating chamber, and when set to said second control condition, controlling the electric power supply to said heater and to said fan means in response to the temperature in said heating chamber for intermittently supplying power only to said heater and supplying constant power to said fan means for keeping the temperature in said heating chamber at the temperature other than that suitable for yeast fermentation, said control means further having means for, when said control means is in said first control condition, causing said fan means to continue running for a predetermined period of time after deenergization of said heater.

4,415,800

# METHOD AND APPARATUS FOR MONITORING AND CONTROLLING HEATED FUSERS FOR COPIERS

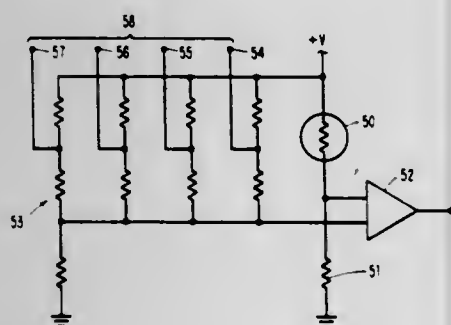
John H. Dodge, Thornton, and Larry M. Ernst, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,435

Int. Cl.<sup>3</sup> H05B 1/02

U.S. Cl. 219-497

4 Claims



1. In a copier having means for providing signals indicative

of the temperature of the fuser rollers, the process for minimizing warm-up time for the copier following application of operating power of regularly occurring cycles to the copier comprising the steps of:

comparing the temperature indicative signals against a reference level for a plurality of predetermined, sequential time intervals each of which has a duration corresponding to the time span of a multiplicity of said regularly occurring cycles of power and wherein the said reference level employed for each successive time interval after the initial time interval is lower than the said reference level employed during the immediately preceding said time interval; and

responding to a comparing step wherein said temperature indicative signal is equal to or greater than the said reference level during any said time interval by enabling said copier to perform normal copy processing.

4,415,801

# PRINTER COUNTWHEEL MECHANISM

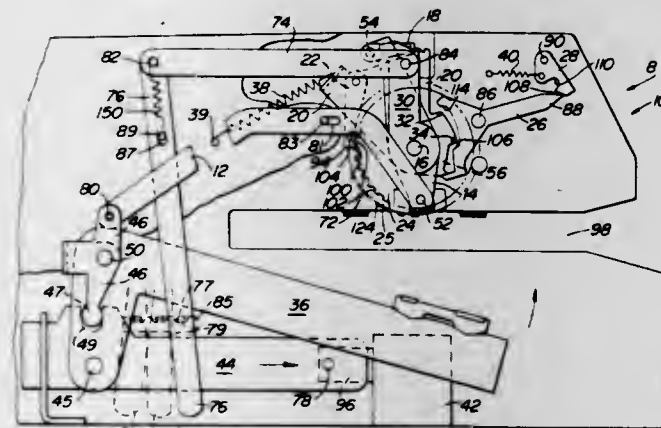
George Franke, Amherst, N.H., assignor to Simplex Time Recorder Co., Gardner, Mass.

Filed Apr. 8, 1981, Ser. No. 252,499

Int. Cl.<sup>3</sup> G07G 1/00

U.S. Cl. 235-101

11 Claims



1. Apparatus for maintaining a count of print operations performed by a printing mechanism and for printing the count, comprising:

- counting means having indicia representative of consecutive numbers, said counting means being displaceable with respect to a preselected position at which at least one of said indicia is impacted by the printing mechanism;
- means for displacing said counting means after a selectable number of said print operations such that consecutive indicia move into alignment with said preselected position after said selectable number of print operations is completed;
- means operatively associated with said means for displacing said counting means for preselecting said number of print operations;
- means for causing the printing mechanism to impact the indicia aligned at the preselected position during each print operation.

4,415,802

# CROSS IDENTIFICATION SYSTEM AND LOCK

George R. Long, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 289,116, Aug. 3, 1981, abandoned. This application Jan. 27, 1983, Ser. No. 461,478

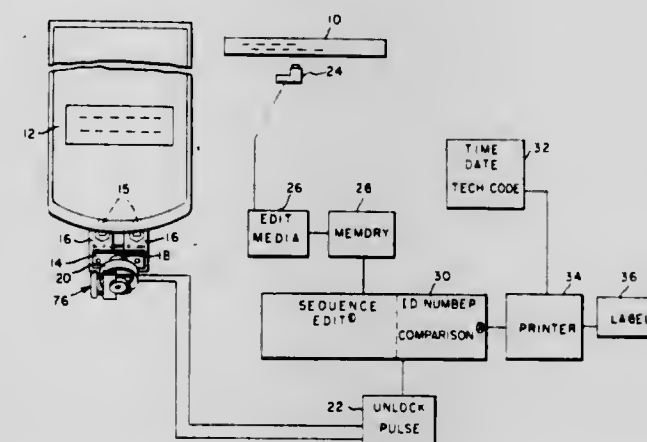
Int. Cl.<sup>3</sup> G06K 5/00

U.S. Cl. 235-382

13 Claims

1. In a system for insuring the positive cross identification between medicaments and patient, said patient having a first identification member with identification characters imprinted thereon that are both man and machine readable, medicaments

having a second identification member with identification characters imprinted thereon that are both man and machine readable, and an optical character reader for scanning both of the identification members, the improvement comprising, a lockable container for said medicaments, a lock for said container,



a comparator coupled to said optical character reader for comparing the identification characters on the first and second members, and releasing means responsive to said comparator for releasing said lock when the identification characters correspond.

4,415,803

# OPTICAL RECEIVER WITH IMPROVED DYNAMIC RANGE

Tran V. Muoi, Ocean, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

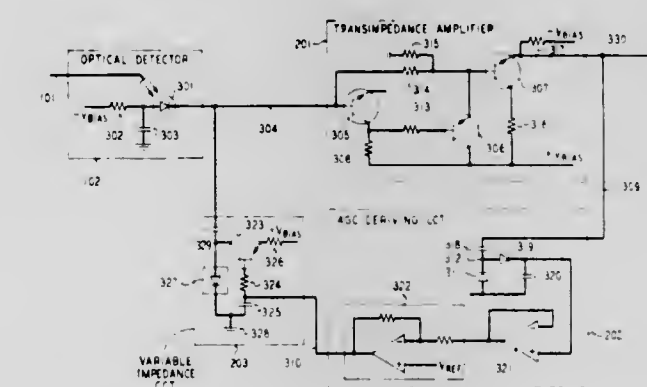
Continuation of Ser. No. 199,558, Oct. 22, 1980, abandoned.

This application Nov. 18, 1982, Ser. No. 442,570

Int. Cl.<sup>3</sup> H01J 40/14

U.S. Cl. 250-214 A

6 Claims



1. An optical receiver circuit for an incoming optical signal having a variable power level and a modulation bandwidth, said circuit comprising

- an optical detector for receiving said optical signal and generating a current therefrom on a substantially resistance-free path, said current varying with the optical signal power level,
- a transimpedance amplifier having an input impedance and an input terminal continuously at virtual ground which is connected to said path, said amplifier transforming said current to an output voltage,
- means for generating a control signal which varies in response to said amplifier output voltage,
- second means connected between said input terminal and a reference potential for maintaining said amplifier output voltage at a predetermined amplitude over said modulation bandwidth by producing an impedance which varies in response to said control signal, the impedance of said second means being substantially greater than that of said amplifier when said amplifier output voltage is less than a

preselected threshold so that said second means is effectively removed from said receiver circuit, said second means shunting a portion of said current away from said amplifier when said amplifier output voltage is greater than said threshold.

4,415,804

# ANNIHILATION RADIATION ANALYSIS

Brian D. Sowerby, Kareela, Australia, assignor to Australian Atomic Energy Commission, Lucas Heights, Australia

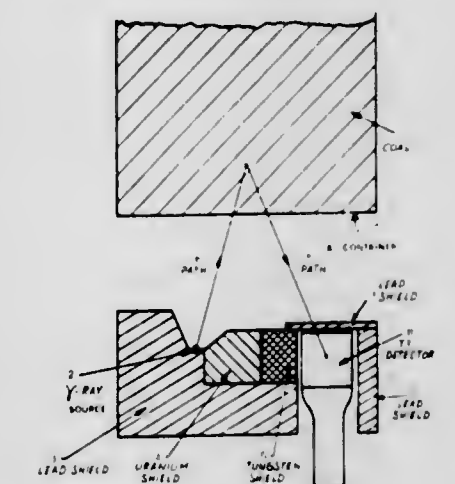
Filed Dec. 4, 1980, Ser. No. 213,149

Claims priority, application Australia, Dec. 20, 1979, PE1797

Int. Cl.<sup>3</sup> G01V 5/00; G01N 23/06

U.S. Cl. 250-255

21 Claims



1. Apparatus for quantitatively measuring the concentration of at least a first element, selected from an elemental group consisting of elements having substantially similar atomic numbers, in a matrix comprising other elements having substantially different atomic numbers to those of said elemental group, which apparatus comprises

- a source yielding  $\gamma$ -rays, of sufficient energy for pair production;
- detecting means being associated with said source for detecting 0.511 MeV annihilation radiation;
- first measuring means for making a measurement indicative of bulk density;
- shielding means interposed between said source and said detecting means thereby reducing the intensity of direct source  $\gamma$ -rays impinging on said detecting means; and
- calculating means associated with the outputs of said detecting means and said measuring means to calculate said concentration; and wherein said first measuring means is located so as to make said measurement indicative of bulk density over substantially the same volume of said matrix as that in which said annihilation radiation originates.

4,415,805

# METHOD AND APPARATUS FOR EVALUATING MULTIPLE STAGE FRACTURING OR EARTH FORMATIONS SURROUNDING A BOREHOLE

Walter H. Fertl, and Donald W. Olliver, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 18, 1981, Ser. No. 274,960

Int. Cl.<sup>3</sup> G01V 5/00

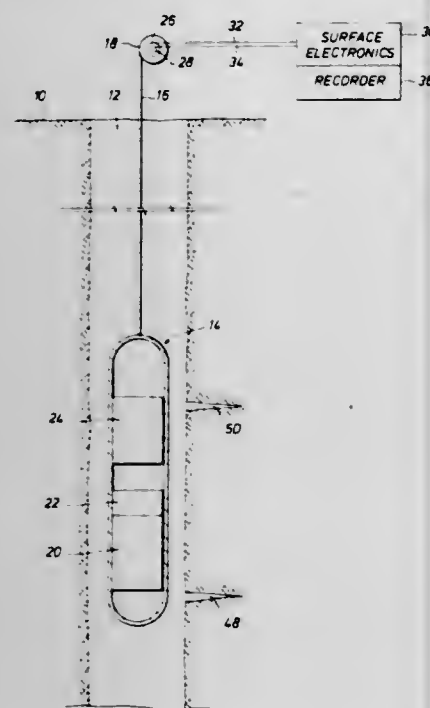
U.S. Cl. 250-260

8 Claims

1. A method for evaluating the artificial fracturing of earth formations traversed by a borehole, comprising the steps of: successively delivering into said borehole a fracture fluid, each successive delivery containing a radioactive tracer element having a unique gamma radiation energy characteristic;



traversing said borehole with a gamma ray detector system; and



selectively measuring radiations having energies characteristic of each of said tracer elements, said measurements indicating the profile of said artificial fracturing.

4,415,806

#### RADIATION DETECTOR FOR A FLAME ALARM

Domokis Tar, Stäfa, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

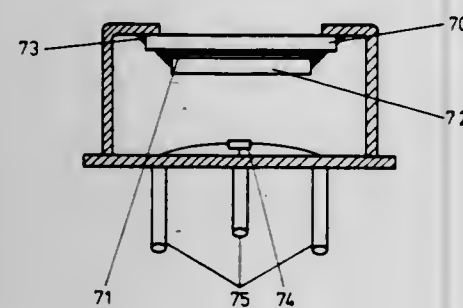
Division of Ser. No. 31,431, Apr. 19, 1979, Pat. No. 4,280,058. This application Mar. 30, 1981, Ser. No. 249,111

Claims priority, application Switzerland, Apr. 25, 1978, 466/78

Int. Cl.<sup>3</sup> G01J 1/00

U.S. Cl. 250—339

10 Claims



1. A radiation detector for a flame alarm comprising: a sensor element; a filter arranged forwardly of said sensor element; and said filter comprising a quartz filter element and a germanium filter element.

4,415,807

#### CROSS-SLICE DATA ACQUISITION SYSTEM FOR PET SCANNER

Walter S. Friauf; Rodney A. Brooks, both of Bethesda; Horace E. Cascio, Olney, and Victor Sank, Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 3, 1981, Ser. No. 250,840

Int. Cl.<sup>3</sup> G01T 1/20

U.S. Cl. 250—363 S

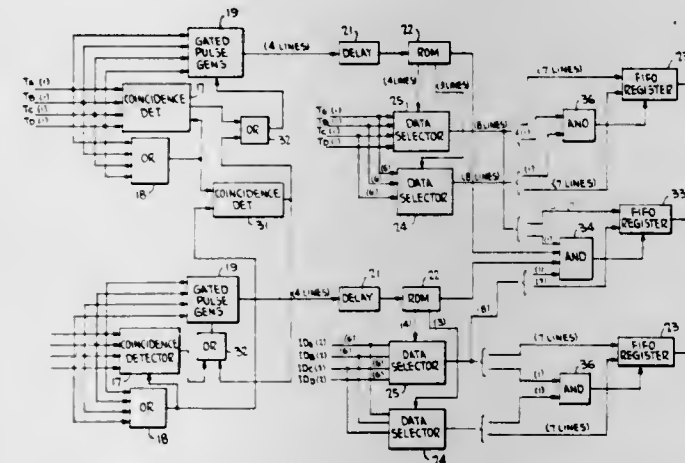
7 Claims

1. A positron emission tomography scanner of a type wherein at least two planar arrays of photon detectors are each subdivided into sections of sequential detectors, and wherein

reception of a photon by a receiving detector results in generation of a timing pulse designating the section in which the receiving detector is located and an identification signal coded to identify that receiving detector, the improvement comprising:

first coincidence detection means for each array for providing a first signal in response to substantially time-coincident generation of two of said timing pulses resulting from reception of photons at two respective receiving detectors designating different sections of one array of said two arrays;

second coincidence detection means in common to said two arrays for providing a second signal in response to sub-



stantially time-coincident generation of two of said timing pulses designating sections in said two arrays;

first, second and third register means;

first array processing means responsive to said first signal from one of said arrays for storing the identification signal for the two receiving detectors of said one array in said first register means;

second array means responsive to said first signal from the other array of said two arrays for storing the identification signal for the two receiving detectors of said other array in said second register means; and

means responsive to said second signal for storing the identification signal from the two receiving detectors of said two arrays in said third register means.

4,415,808

#### SCINTILLATION DETECTOR ARRAY EMPLOYING ZIG-ZAG PLATES

Dominic A. Cusano, Schenectady, N.Y., and Frank A. DiBianca, Mukwonago, Wis., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 219,671, Dec. 24, 1980, abandoned.

This application Feb. 9, 1983, Ser. No. 465,086

Int. Cl.<sup>3</sup> G01T 1/20

U.S. Cl. 250—367

12 Claims

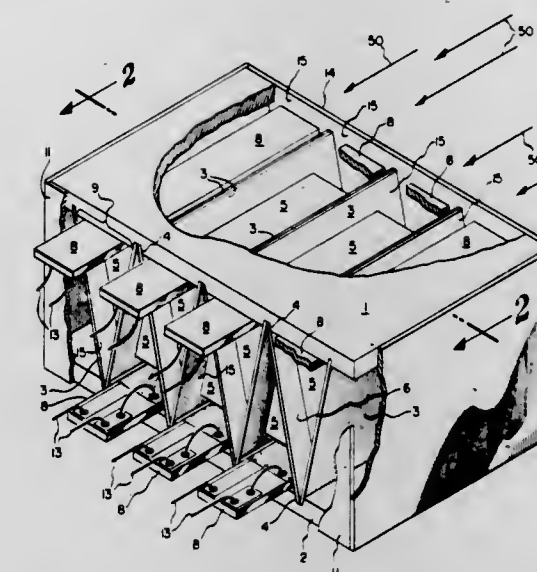
1. A scintillation detector array for use in computerized tomography apparatus comprising:

a housing having a front wall section substantially transparent to x-ray radiation and a rear wall section;

a plurality of adjacent triangular prism shaped chambers disposed within said housing such that said chambers are defined, at least in part, by a plurality of side wall members which are disposed orthogonally to said x-ray transparent front wall section and which are opaque to x-ray radiation, said chambers having alternate, oppositely disposed bases, a plurality of said chambers containing a scintillation medium; and

a photodetector positioned on the base of each of said cham-

bers to detect optical wavelength photons generated by x-rays exciting said scintillation medium after passing



through said substantially x-ray transparent front wall section.

4,415,809

#### ELECTRO-OPTICAL ANALYZER FOR MEASURING PERCENTAGE BY WEIGHT OF FAT, PROTEIN AND LACTOSE IN MILK

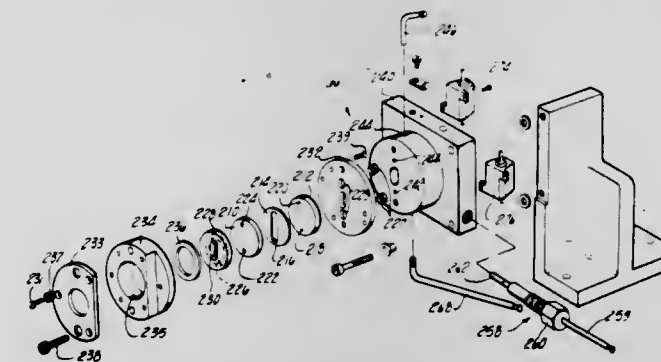
John Shields, 23 North La., Wheldrake Nr. York, England Division of Ser. No. 84,662, Oct. 15, 1979, Pat. No. 4,310,763.

This application Aug. 3, 1981, Ser. No. 289,155

Int. Cl.<sup>3</sup> G01N 21/01

U.S. Cl. 250—432 R

9 Claims



1. A sample cell for use in optically analyzing fluids comprising a pair of flat parallel optical windows and means spacing said windows from each other to provide a generally planar sample zone, fluid inlet and outlet ports including openings extending through one of said windows and spaced from each other such that fluid entering said inlet port traverses said zone between said windows before exiting said outlet port, a fluid passage extending past said inlet port and connecting with said inlet port through an opening in a side wall of said passage, and a filter medium carried within said passage against said passage side wall across said opening such that fluid which enters said zone through said inlet port is filtered by said filter medium while fluid passing through said passage past said inlet port tends to wash said filter medium.

4,415,810

#### DEVICE FOR IMAGING PENETRATING RADIATION

Robert L. Brown, Sr., 4805 Rutledge Dr. NW, Huntsville, Ala. 35805

Filed Jul. 5, 1979, Ser. No. 54,777

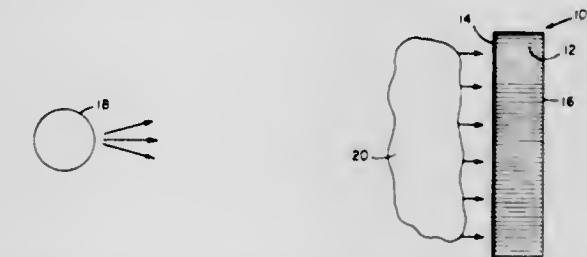
Int. Cl.<sup>3</sup> H05B 33/00; G01T 1/20

U.S. Cl. 250—484.1

7 Claims

1. A device for imaging penetrating radiation comprising fiber optic tube means including an inner core material composed of scintillating material capable of converting radiation

to light rays; a cladding transparent material, about said inner core and reflecting light back into said inner core; an outer most radial light absorbing layer that has a highly colored material suspended therein which absorbs unwanted light that cannot be guided to an exit end of said inner core material; a multiplicity of said fiber optic tube means that are made of the same materials being contiguously disposed relative to each other and secured together to define a disk with an input end face on one side of said disk and an output end face on the other



side of said disk; and said input end face being a polished surface and having attached thereto a thin, corrosion resistant, metallic, mirror coat being attached such as by being deposited thereon chemically or by vacuum techniques to provide a thin mirror coat of a thickness that is from about 1 to about 20 millionths of an inch thick that is opaque to stray light outside said fiber optic tube means, and that is reflective to light quanta from scintillations within said fiber optic tube means and thereby improve light output capability of each of said fiber optic tube means.

4,415,811

#### OPTICAL SCANNING APPARATUS

Jürgen Beck, Cologne, and Herbert Röhrig, Berg-Gladbach, both of Fed. Rep. of Germany, assignors to Dr. Madaus & Co., Cologne, Fed. Rep. of Germany

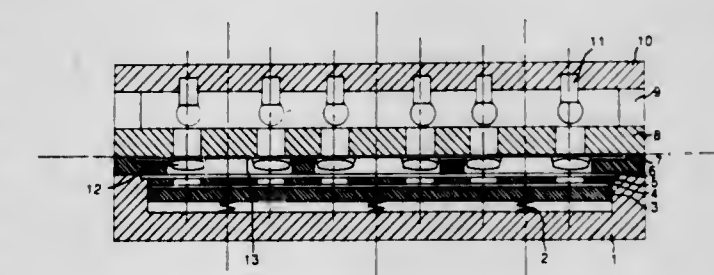
Filed Aug. 25, 1981, Ser. No. 296,045

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032334

Int. Cl.<sup>3</sup> G01B 11/02; G01N 21/86

U.S. Cl. 250—560

9 Claims



1. In an apparatus for the optical scanning of objects in which the light from at least one light source may fall on at least one light-sensitive sensor and the objects to be scanned are disposed between the light source and the sensor, the improvement comprising an aperture mask having an aperture for each object to be scanned conforming to the contours the objects should have and disposed between the sensor and the objects to be scanned, the sensor comprising at least one large-area solar cell having an area at least as large as one of the apertures.



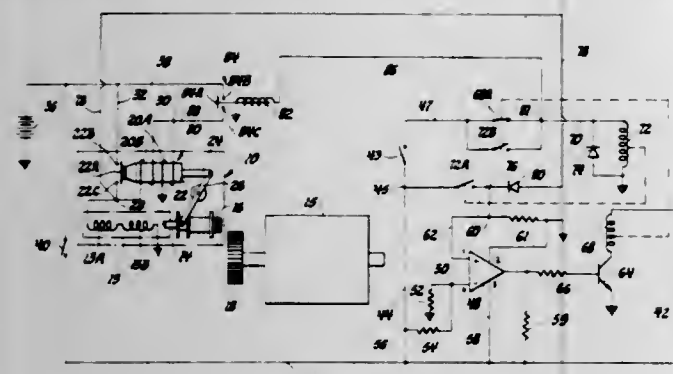
4,415,812

**ELECTRIC STARTING SYSTEM**

Donald B. Griffith, Markleville, and Timothy C. Alexander, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1982, Ser. No. 338,639

Int. Cl.<sup>3</sup> B23K 9/10; B60K 15/00; H02P 9/04; F02N 11/08  
U.S. Cl. 290—38 R 5 Claims



1. An electric starting system for cranking an engine comprising, an electric cranking motor, a voltage source, a start switch, cranking motor control means including a switching means operative in a first state to permit initial energization of the cranking motor from the voltage source when the start switch is initially closed and operative in a second state to prevent subsequent energization of the cranking motor from the voltage source when the start switch is subsequently opened and then reclosed, voltage responsive means coupled to said switching means for controlling its state of operation, means responsive to initial closure of said start switch for energizing said cranking motor and for applying a voltage to said voltage responsive means from said voltage source of such a magnitude as to cause said voltage responsive means to actuate said switching means from said first state to said second state, means disconnecting said cranking motor and voltage source when said start switch is subsequently opened, and means for applying the voltage generated in said cranking motor to said voltage responsive means when said cranking motor is disconnected from said voltage source, the magnitude of the generated voltage being such as to cause the voltage responsive means to maintain the switching means in said second state to prevent energization of the cranking motor until said generated voltage decreases to a predetermined value.

4,415,813

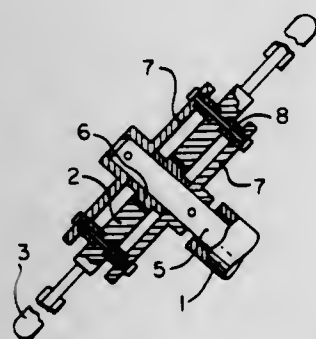
**AEROGENERATOR HAVING A CONTROLLED AXIS OF ORIENTATION**

Anne M. Carme, Castres, France, assignor to AEROPOWER Sarl, Montgiscard, France

Filed Jan. 16, 1981, Ser. No. 225,806

Claims priority, application France, Jan. 16, 1980, 80 01160

Int. Cl.<sup>3</sup> F01D 7/02; F03D 7/04; H02P 9/04  
U.S. Cl. 290—44 16 Claims



1. An aerogenerator comprising:  
(a) a rotor having at least one blade;

- (b) a cap in which said rotor is journaled;  
(c) hydraulic shock absorbers cooperating with said cap and positioned along opposite sides of an axis on which said rotor is journaled, said axis having a variable orientation;  
(d) a swivel joint positioned between said rotor and said axis;  
(e) two circular walls positioned on opposite sides of said rotor and being connected by said hydraulic shock absorbers;  
(f) a deformable quadrilateral structure attached to said axis, said quadrilateral structure comprising a first connecting rod, a second connecting rod having a length different than the length of said first connecting rod, a lower plate adapted to rotate about a vertical line, and an upper plate adapted to carry said rotor and said generator.

4,415,814

**SYSTEM FOR THE GENERATION OF ELECTRICAL ENERGY BY UTILIZING AND CONTROLLING WIND ENERGY**

José Martinez Parra, Calle Salitre 33-1°, Edificio Juan XXIII, Cartagena (Murcia), Spain

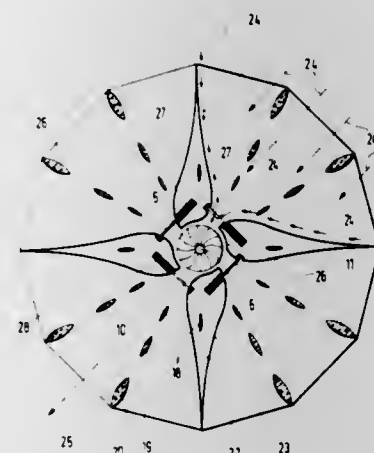
Filed Jul. 23, 1981, Ser. No. 286,188

Claims priority, application Spain, Sep. 25, 1980, 495343

Int. Cl.<sup>3</sup> F03D 7/06

U.S. Cl. 290—55

3 Claims



1. A system for the generation of electrical energy by utilizing and controlling wind energy, which comprises a domed building (3) on which an impeller (5) is mounted, the axis of said impeller penetrating the domed building at its highest point and transmitting the motion of the impeller to an installation for converting the kinetic energy of the impeller into electrical energy, a superstructure located around and above the domed building and the impeller, the superstructure consists of pillars (18, 19, 20), a roof construction (21) and supports (22), the supports are straight in a vertical sense and, divide the superstructure into several sectors, represent at the outer circumference of the superstructure a single wall which towards the center of the superstructure divides into two walls which reunite in front of the impeller located in the center of the superstructure, thus defining a central chamber in which the impeller is located, the vertical walls of the supports are differently curved so that they lead and concentrate the wind onto the concave surfaces of the impeller, and closing means for the aperture between the surface of the domed building, the opposing vertical walls (23) of two supports and the roof construction being located at the access to the chamber in which the impeller is located, said closing means consisting of sliding gates movable in the horizontal direction and the supports are provided with slots, said gates sliding into said slots when they are opened.

4,415,815

**ELECTRONIC SWITCH**

Eise C. Dijkmans, and Rudy J. Van de Plassche, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 135,967, Mar. 31, 1980, abandoned.

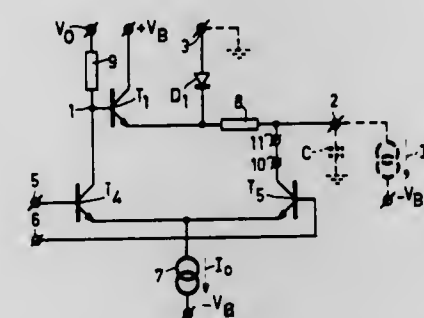
This application Feb. 23, 1982, Ser. No. 351,573

Claims priority, application Netherlands, Apr. 4, 1979, 7902633

Int. Cl.<sup>3</sup> H03K 17/60

U.S. Cl. 307—243

7 Claims



1. An electronic switch comprising a signal input, a signal output and a switching input, a first transistor having an emitter electrode connected to the signal input, a base electrode coupled to the switching input for selectively turning the first transistor on and off, and a collector electrode connected to a current sink, a switching element comprising a rectifying semiconductor junction connected between the signal input and the signal output for conducting a current applied to the signal input when the first transistor is cut off, means coupling the switching element to a point of constant potential so that, during conduction of said switching element in response to turn-off of the first transistor, a first predetermined potential appears at the emitter electrode of the first transistor, whereas during non-conduction of said switching element in response to turn-on of the first transistor, a second predetermined potential appears at the emitter electrode of the first transistor, means connecting a first resistor between the signal input and a connecting point of the emitter electrode of the first transistor and the switching element, means connecting the signal input to a current source switched in synchronism with the first transistor so that the source supplies an additional current during conduction of the first transistor which flows via the first resistor and the first transistor to the signal input, said current producing a voltage drop across the first resistor that substantially compensates for the difference between said first and second potentials.

4,415,816

**MONOLITHICALLY INTEGRATED CIRCUIT FOR THE PRODUCTION OF LONG PULSES**

Ruediger Mueller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,556

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 26419158

Int. Cl.<sup>3</sup> H03K 3/017, 5/04

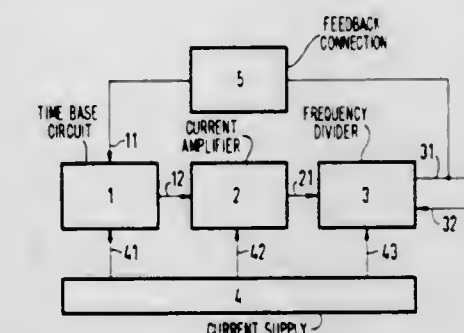
U.S. Cl. 307—265

2 Claims

1. A monolithically integrated circuit for the production of pulses, comprising:

- a time base circuit comprising a ring oscillator and means responsive to electromagnetic radiation to supply current to said time base circuit;
- a current amplifier;
- a first line connecting said time base circuit to said current amplifier;
- a frequency divider having an output for emitting pulses;
- said time base circuit, said current amplifier and said frequency divider each constructed in the  $I^2L$  technique and

comprising  $I^2L$  circuits including  $I^2L$  inverters and  $I^2L$  gates;  
a second line connecting said current amplifier to said frequency divider;  
a current supply;



a third line connecting said current supply to said current amplifier; and  
a fourth line connecting said current supply to said frequency divider.

4,415,817

**BIPOLAR LOGIC GATE INCLUDING CIRCUITRY TO PREVENT TURN-OFF AND DEEP SATURATION OF PULL-DOWN TRANSISTOR**

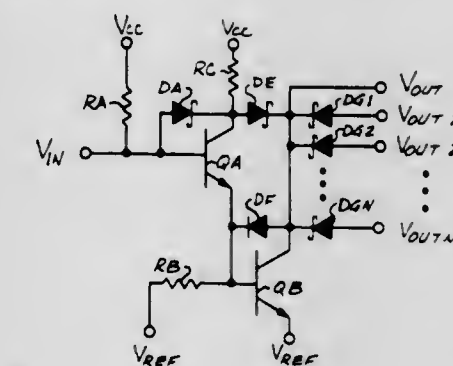
Thomas D. Fletcher, Provo, Utah, assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 8, 1981, Ser. No. 309,756

Int. Cl.<sup>3</sup> H03K 17/04, 17/62, 19/088, 19/084

U.S. Cl. 307—454

18 Claims



1. A logic circuit having: a first bipolar transistor having a base for receiving an input signal, an emitter, and a collector coupled to a voltage/current source; and a second bipolar transistor having a base coupled to the emitter of the first transistor, an emitter coupled to a constant voltage source, and a collector coupled to the voltage/current source for supplying an output signal; characterized by plural means for preventing the second transistor from either turning substantially off or normally going into deep saturation.

4,415,818

**PROGRAMMABLE SEQUENTIAL LOGIC CIRCUIT DEVICES**

Katsuhiko Ogawa, Yokohama, and Shinju Horiguchi, Yokosuka, both of Japan, assignors to Nippon Telegraph & Telephone Corp., Japan

Filed Jan. 7, 1980, Ser. No. 110,030

Claims priority, application Japan, Jan. 16, 1979, 54/3597; Feb. 6, 1979, 54/12461

Int. Cl.<sup>3</sup> H03K 19/177

U.S. Cl. 307—465

5 Claims

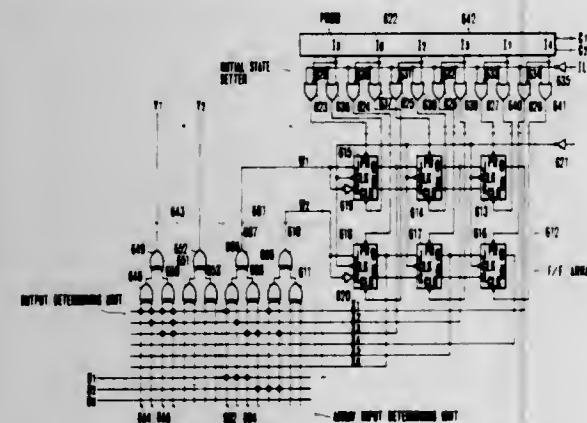
1. A programmable sequential logic circuit device comprising:

- a first logic array for producing product terms of a first and second plurality of input signals;
- a second logic array having inputs coupled to said first logic array for producing sum terms of the outputs of said first



logic array, said second logic array including output terminal means for manifesting sequential signals to an associated circuit;

a two-dimensional array of flip-flop circuits having a plurality of rows of stages, each stage including a plurality of serially connected flip-flop circuits, said array of flip-flop circuits further including a first input terminal group connected to outputs of said second logic array for supplying sum term signals to the inputs of respective rows of stages, a second input terminal group connected to inputs of the respective stages other than said row inputs for receiving an external control signal for setting an internal



state of the array of flip-flop circuits, and output terminals connected to said first logic array for supplying state signals thereto as said first plurality of input signals; and setting means connected to said second input terminal group for generating said external control signals for setting the initial internal state of said array of flip-flop circuits and for changing said internal state for permitting an interruption during the operation of said array of flip-flop circuits, whereby said device generates said sequential signals for said associated circuit in accordance with the second plurality of input signals applied to said first logic array and the present internal state of said array of flip-flop circuits.

4,415,819

**DYNAMIC MOS-LOGIC IN INTERLACE-TECHNIQUES**  
Egon Mathes, Elmshorn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

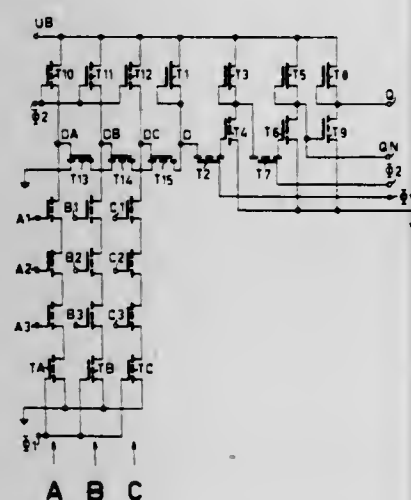
Filed Jan. 8, 1981, Ser. No. 223,198

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001389

Int. Cl.<sup>3</sup> H03K 19/017, 19/096, 19/20

U.S. Cl. 307—481

1 Claim



1. An integrated digital circuit arrangement with MOS field-effect transistors, which arrangement comprises a combinatorial circuit for applying a logic operation to a plurality of input signals, which combinatorial circuit comprises a plurality

of branches, there being provided means for applying said input signals as well as an output, which is coupled to a first node of the arrangement, whose potential at a specific instant is representative of the result of the logic operation and depends on whether the capacitance of the first node is charged or not, characterized in that:

each branch is provided with a pre-charging transistor while for isolating the individual branches from each other there is provided a transistor arranged as a transfer gate for each branch, whose gate-electrode is connected to the relevant branch, the source and drain electrodes of said transistors arranged as a transfer gate being included in series between a common reference point and the first node, wherein the charging time of said first node capacitance is essentially independent of the number of transistors in said transfer gate and said charging time occurs prior to said specific instant.

4,415,820

**TRANSISTOR DIFFERENTIAL CIRCUIT WITH EXPONENTIAL TRANSFER CHARACTERISTIC**  
Urs Zogg, Rümlang, Switzerland, assignor to Willi Studer, Fabrik fuer elektronische Apparate, Regensdorf, Switzerland

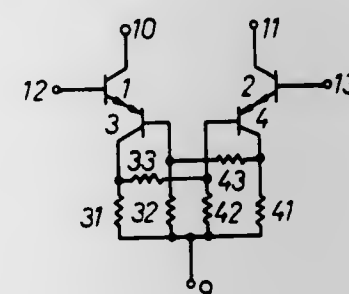
Filed Feb. 23, 1981, Ser. No. 237,105

Claims priority, application Switzerland, Mar. 19, 1980, 2171/80

Int. Cl.<sup>3</sup> H03K 5/08, 17/00, 3/26

U.S. Cl. 307—491

8 Claims



1. Transistor differential circuit having two cross-connected transistors, said transistors being characterized by having a base-voltage-difference to collector current relationship which is exponential, comprising

two branches, each branch including a first transistor (1, 2; 5, 6) of a first conductivity type (NPN) and, serially connected with the collector-emitter path thereof, a second transistor (3, 4; 7, 8) of opposite conductivity type (PNP), and passive resistive network means (31, 32, 33; 41, 42, 43; 71, 81) connected to one of said transistors in each branch, said circuit means being dimensioned to compensate for voltage drops resulting from inherent or bulk resistances of the semiconductor material of the first and second transistors arising in the respective branches.

4,415,821

**DYNAMIC MAGNETIC PRELOAD BEARING STRUCTURE FOR A LINEAR MOTOR**  
Leonard N. Wedman, Radford, Va., and Joseph A. Bourque, Saratoga, Calif., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed May 10, 1982, Ser. No. 376,655

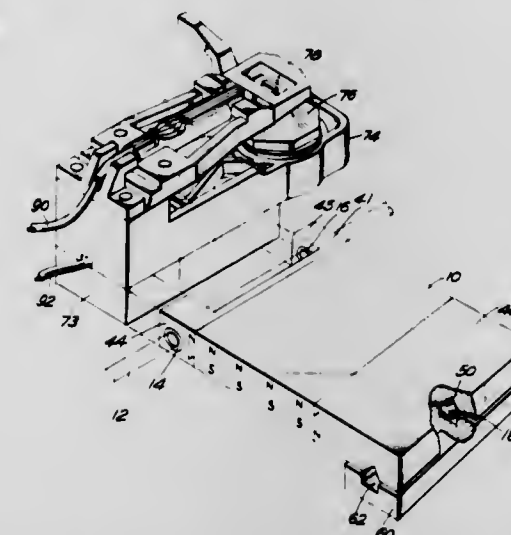
Int. Cl.<sup>3</sup> H02K 41/00

U.S. Cl. 310—12

11 Claims

1. In a linear motor the combination of:  
an electromagnetic stator winding;  
a permanent magnet linearly movable in accordance with energization of said stator winding;  
a linearly movable carriage, said permanent magnet being attached thereto;

a guide rod and cooperating linear bearing attached to said carriage to confine movement of said carriage along a linear path;



a ball bearing disposed to prevent rotation of said carriage about said guide rod; and  
said permanent magnet being so located that said carriage is urged towards said ball bearing.

4,415,822

**STATORS OF DYNAMOELECTRIC MACHINES**  
Toshiyuki Aiba, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

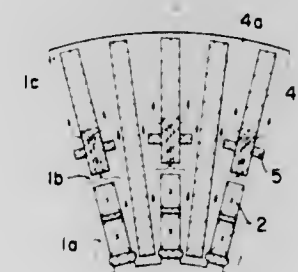
Filed Sep. 23, 1981, Ser. No. 304,906

Claims priority, application Japan, Oct. 3, 1980, 55-140495[U]

Int. Cl.<sup>3</sup> H02K 1/20, 9/02

U.S. Cl. 310—59

1 Claim



1. In a stator of a dynamoelectric machine of the type comprising an iron core formed by laminating iron sheets, armature coils received in slots of said iron core, a plurality of spacer blocks extending radially in contact with an end surface of said iron core, said spacer blocks including long spacer blocks extending between an outer periphery of the iron core and teeth portions thereof and short spacer blocks extending between said outer periphery and the bottom portions of said slots, and clamping end plates for axially clamping said iron core, the improvement in which each of said short spacer blocks is provided with a radially extending channel formed on the side surface facing toward the end surface of said iron core, said channel having a gas outlet and an end opening on the side facing to said slot bottom to form an inlet for a cooling gas, each of said short spacer blocks being provided with a groove formed at an intermediate portion thereof and provided with end openings opened to the spaces between said short and long spacer blocks, said channel being terminated at and connected with said groove, and in which buffer boards are provided between the long and short spacer blocks to form a narrow space between said long and short spacer blocks to change gas-flow speed for effectively guiding cooling gas into said inlet and cooling said slot bottom, said buffer boards being disposed between said groove and the end opening of said channel.

4,415,823

**GENERATOR FOR THE PRODUCTION OF ELECTRICAL ENERGY**  
Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

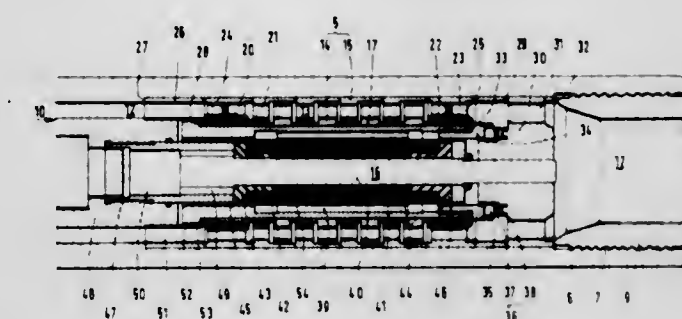
Filed Aug. 3, 1981, Ser. No. 289,683

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1980, 3029523

Int. Cl.<sup>3</sup> H02K 5/10

U.S. Cl. 310—87

9 Claims



1. Generator for production of electrical energy to supply consumers located inside a bore hole, in particular, consumers for detection, transmission and remote control, where the generator is located in a flushing space inside of a drill string through which flushing liquid flows, which includes a stator and a rotor having a radial space arranged coaxially to the stator said rotor being coupled to a motor which is energized by the flushing liquid, said stator containing a generator armature and said rotor containing an exciter equipped with permanent magnet means, characterized by the fact that said space between stator and rotor is connected with said flushing space, a connecting path is directed counter-current to the direction of the flushing current on the intake side, and that said rotor is supported by means of unsealed, erosion and abrasion-resistant radial and axial bearings.

4,415,824

**STATOR CASING FOR AIR-COOLED ELECTRICAL MACHINES**

Albert Meier, Waltenschwil, Switzerland, assignor to Zschokke Wartmann AG, Switzerland

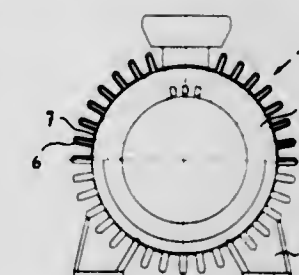
PCT No. PCT/CH79/00063, § 371 Date Jan. 3, 1980, § 102(e) Date Jan. 2, 1980, PCT Pub. No. WO79/01024, PCT Pub. Date Nov. 29, 1979

PCT Filed May 1, 1979, Ser. No. 192,593

Claims priority, application Switzerland, Jul. 3, 1978, 4860/78 Int. Cl.<sup>3</sup> H02K 5/00

U.S. Cl. 310—89

5 Claims



1. A stator assembly comprising:  
an initially axially convex sheet metal jacket having an inside diameter near its center which is initially smaller than an inside diameter near the jacket ends, said jacket formed of a plurality of shaped, axially extending, radially projecting and peripherally spaced cooling ribs;  
reinforcement means at said jacket ends for preventing an enlargement of diameter of said jacket ends; and  
a stator core having an outside diameter substantially the same as said jacket inside diameter at said jacket ends.



press-fit into said jacket and against the center of said jacket to move said center radially outwardly so that said stator core is firmly engaged with said jacket and supported thereon;  
said reinforcement means comprising an outer thrust ring and an inner thrust ring connected to each of said jacket ends by welds.

4,415,825

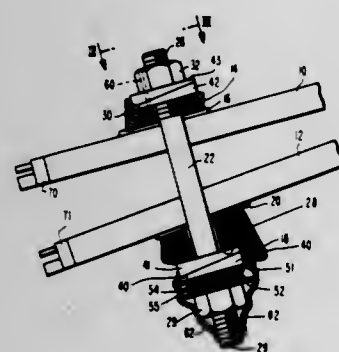
# END TURN BRACING WITH LOCKING AND ALIGNMENT DEVICE

George F. Dailey, Plum Borough, and Charles E. Kauric, Manor Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1982, Ser. No. 343,074  
Int. Cl.<sup>3</sup> H02K 3/46

U.S. Cl. 310—270

14 Claims



1. A fastening device for securing end turns of an electric generator, comprising:  
a cylindrical rod threaded at at least one end;  
two annular spacers, each of said spacers having two non-parallel planar surfaces with a central hole therethrough, said annular spacers being arranged in a coplanar association with said cylindrical rod extending through the holes of said spacers;  
a member with a generally flat surface, said member being disposed in coplanar association with a first external planar surface of one of said two associated annular spacers;  
an annular member having a central bore therethrough, said bore being threaded,  
said annular member being in threaded association with a threaded end of said cylindrical member, said annular member having a planar surface in coplanar association with a second external planar surface of one of said two associated annular spacers; and  
whereby said annular threaded member exerts a force on said second external planar surface and said generally flat surface of said member exerts a force on said first external planar surface, said two annular spacers being compressed between said annular member and said generally flat surface of said member, said two annular spacers being rotatable about said cylindrical member.

4,415,826

# SUPPORT AND CONNECTION DEVICE FOR A DISC-SHAPED PIEZOELECTRIC RESONATOR

Hans Kreutzew, and Werner Mattuschka, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,031

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 8120939[U]

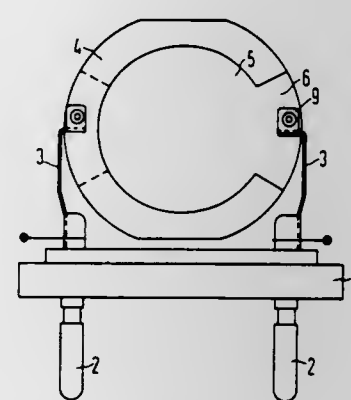
Int. Cl.<sup>3</sup> H01L 41/00

U.S. Cl. 310—354

1 Claim

1. In combination, a resonator and a support and connection device, comprising  
a disc-shaped resonator body;  
a pair of excitation electrodes carried on opposite surfaces of

said body, each of said excitation electrodes having a diameter which is less than that of said body;  
a pair of terminal electrodes, each integral with a respective excitation electrode and each extending up to the edge of said body at a location diametrically opposite to that of the other terminal electrode;  
a pair of radially-extending slots in said body, each of said slots being in the area of a respective terminal electrode and opening radially outwardly through the edge of said body;  
a support plate;  
a pair of spaced-apart terminal pins extending through said support plate;



a pair of support elements each comprising electrically conductive spring material, each connected to a respective terminal pin, and each further comprising  
a bent section received in a respective slot and including a passageway therethrough, and  
a pair of spaced tongues extending away from said plate forming a pocket and clampingly receiving said body in the area of a respective terminal electrode, each of said tongues including an inwardly directed dimple including a passageway therethrough; and  
a conductive adhesive in the interstices formed by said body, said pockets and said passageways.

4,415,827

# MICRORESONATOR OF TUNING FORK CONFIGURATION OPERATING AT ITS SECOND OVERTONE FREQUENCY

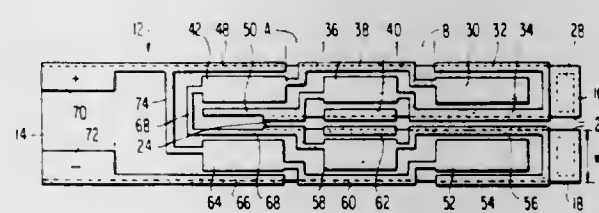
Shih Chuang, Irvine, Calif., assignor to Statek Corporation, Orange, Calif.

Filed May 27, 1981, Ser. No. 267,814

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—370

24 Claims



1. An improved, flexural-mode piezoelectric tuning fork, comprising:  
a stem portion;  
a pair of tines extending from said stem;  
a slot between said tines, said slot having a crotch where said tines join said stem; and  
electrode means mounted on said tines for causing said fork to oscillate preferentially at its second overtone frequency when oscillating electrical fields are applied to said electrode means and for suppressing fundamental and first overtone components in the oscillations of said fork.

4,415,828

# SPARKPLUG WITH ANTIFOULING COATING ON DISCHARGE END OF INSULATOR

Hisao Mizuno; Shunichi Takagi; Kichio Nakahara, and Takahito Yamamoto, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 20, 1981, Ser. No. 285,242

Claims priority, application Japan, Jul. 22, 1980, 55-100143; Jul. 29, 1980, 55-107097[U]

Int. Cl.<sup>3</sup> H01T 13/20

U.S. Cl. 313—118

8 Claims



1. In a sparkplug having good antifouling properties wherein a porcelain insulator for supporting a central electrode is fixed in a metal casing, the improvement wherein a coating of silicone and paraffin is provided on at least a firing surface of said porcelain insulator surrounded by an inner surface of a combustion chamber side of said metal casing, thereby preventing a decrease in electrical resistance.

4,415,829

# DIRECT CURRENT OPERABLE ARC LAMP

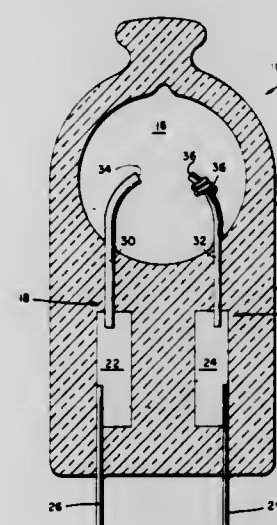
Harold L. Rothwell, Jr., Rowley; George J. English, Reading, and William M. Keefe, Rockport, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,373

Int. Cl.<sup>3</sup> H01J 61/06

U.S. Cl. 313—621

5 Claims



1. A miniature, single-ended, low-wattage D.C. operable, arc discharge lamp comprising: a glass body having one end formed as a press seal and another end formed to provide an arc chamber; an anode electrode and a cathode electrode each having intermediate portions sealed in said press seal, said electrodes having first ends extending exteriorly of said body and second ends extending into and terminating within said arc chamber, said electrodes being substantially parallel to one another for a major portion of their length and having their terminal ends inclined toward each other to define therebetween an arc gap; said cathode electrode only having, substantially adjacent its terminal end, electrical field modifying means.

4,415,830

# INLEAD CONSTRUCTION FOR ELECTRIC LAMP

John W. Pugh, Gates Mills; Francis W. Pikus, Cleveland Heights; James A. Graves, Highland Heights; John E. McMillan, Kirtland, all of Ohio, and John L. Walter, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,073

Int. Cl.<sup>3</sup> H01J 5/50

U.S. Cl. 313—331

10 Claims



1. An inlead material for an electric lamp which comprises an iron alloy containing silicon in an amount from slightly more than about 2 weight percent up to about 4.5 weight percent to avoid allotropic transformation to the gamma austenite phase at lamp operating temperatures.

4,415,831

# ELECTROMAGNETIC DEFLECTION TYPE PICTURE TUBE DEVICE

Osamu Konosu, Nagaokakyo, Japan, assignor to Matsushita Electronics Corporation, Tokyo, Japan

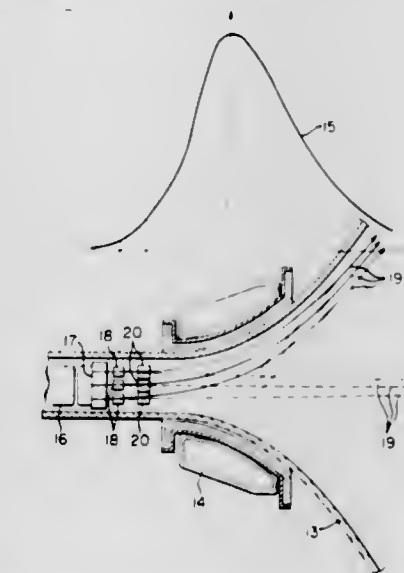
Filed Jul. 29, 1981, Ser. No. 288,052

Claims priority, application Japan, Aug. 19, 1980, 55-114501

Int. Cl.<sup>3</sup> H01J 29/76

U.S. Cl. 313—413

2 Claims



1. An electromagnetic deflection type picture tube device characterized by the provision of  
(a) a first field-control element which is disposed between the electron-beam emission end of an electron gun and a deflection yoke,



comprising a pair of magnetic pieces which are disposed on the opposite sides of the path of an electron beam, and being adapted to produce a local field distortion (a barrel or pincushion distortion) which is opposite to a main distortion (a pincushion or barrel distortion) of the deflection field by introducing the rise portion of the deflection field; and

(b) a second field-control element which is disposed between the electron-beam emission end of the electron gun and said first field-control element, comprising a pair of magnetic pieces which are disposed on the opposite sides of the path of the electron beam, and being adapted to produce a local field distortion (a pincushion or barrel distortion) which is opposite to said local field distortion produced by said first field-control element by introducing the rise portion of said deflection field.

4,415,832

# **ELECTRON MULTIPLIER HAVING AN IMPROVED PLANAR ULTIMATE DYNODE AND PLANAR ANODE STRUCTURE FOR A PHOTOMULTIPLIER TUBE**

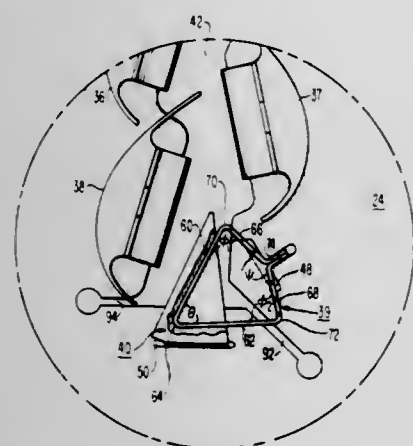
Richard D. Faulkner, Lancaster; Dale V. Henry, Willow Street, and David L. Muth, East Petersburg, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,260

Int. Cl.<sup>3</sup> H01J 40/00

U.S. Cl. 313—533

8 Claims



1. In a photomultiplier tube having an electron multiplier assembly including insulative support means, a plurality of elements including an ultimate dynode and an anode, said elements being affixed to said support means, the improvement wherein

said ultimate dynode comprises a relatively inflexible multi-lateral hollow member having two plane-face surfaces lying at an acute angle to one another and terminating at a lower transverse edge, said ultimate dynode including integral dynode mounting means extending from opposing ends thereof for affixing said ultimate dynode to said support means,

said anode including a substantially flat electron permeable mesh portion spaced from one of said plane-face surfaces of said ultimate dynode, said anode having integral anode mounting means extending from opposing ends thereof for affixing said anode to said support means, and electrical leakage isolation means formed in said support means for increasing the electrical leakage path length across said support means between said ultimate dynode and said anode.

4,415,833

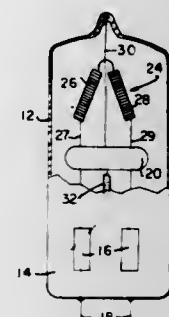
# **TUNGSTEN HALOGEN LAMP WITH COILED GETTER** James E. Oetken, Winchester, and Jeffrey P. Buschmann, Lexington, both of Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 29, 1981, Ser. No. 306,793

Int. Cl.<sup>3</sup> H01K 1/54

U.S. Cl. 313—559

8 Claims



1. In a low wattage tungsten halogen lamp including a hermetically-sealed, light-transmitting envelope, an inert fill and halogen disposed within said envelope, an insulative support bridge located within said envelope, a coiled tungsten filament located within said envelope and supported from said insulative support bridge, a filament support wire secured to and extending from said insulative support bridge for supporting said tungsten filament, and means for gettering impurities within said envelope, the improvement wherein said filament support wire includes an end portion extending from said insulative support bridge on a side opposite said coiled tungsten filament and said means for gettering said impurities within said envelope is in coil form to provide increased surface area for getter absorption, said coil getter secured to said end portion of said filament support wire such that said insulative support bridge is positioned between said coil getter and said tungsten filament.

4,415,834

# **TUNGSTEN HALOGEN LAMP CONTAINING CYANOGEN**

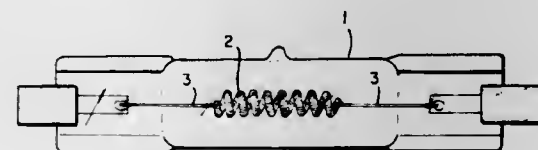
James P. Keenan, Reading, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1979, Ser. No. 46,897

Int. Cl.<sup>3</sup> H01K 0/00

U.S. Cl. 313—578

1 Claim



1. An incandescent lamp comprising a tungsten filament disposed within a lamp envelope, the lamp envelope containing a gaseous filling including cyanogen and a halogen or halide.

4,415,835

# **ELECTRON EMISSIVE COATINGS FOR ELECTRIC DISCHARGE DEVICES**

Amarendra Mishra, Lyndhurst; Dimitri M. Speros, Painesville, and Roger M. Eastin, South Euclid, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,834

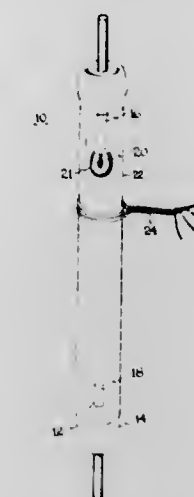
Int. Cl.<sup>3</sup> H01J 61/06, 61/16

U.S. Cl. 313—627

15 Claims

1. A cathode member for an electric discharge device which comprises a refractory metal substrate having sintered thereto

an open porous coating of refractory metal particles at a thickness up to about 1 millimeter and with electron emissive mate-



rial being disposed in the pores of the sintered refractory metal coating.

4,415,836

# **LAMP WITH IMPROVED FUSE WIRE**

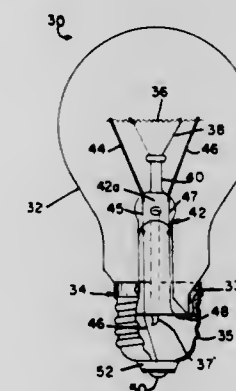
Robert J. M. De Cuester, Diest; Louis J. M. Hoebe, Hasselt, both of Belgium, and Clair Wood, Brewer, Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,406

Int. Cl.<sup>3</sup> H01J 7/44, 17/34, 19/78, 29/96, 1/12

U.S. Cl. 315—50

12 Claims



1. In an electric lamp having an hermetically sealed, light-transmitting envelope containing an energizable source of light and having a sealed portion at one end, a base having terminal means and within which said sealed end portion of the envelope is secured, and a plurality of lead-in wires extending through the sealed end portion of said envelope and electrically connecting said light source to the terminal means of said base, the improvement comprising a fuse wire included as at least a portion of one of said lead-in wires, which fuse comprises material selected from the group consisting of a first alloy of 15% to 25% Cr, 70% to 80% Fe and 4.5% to 5% Al and a second alloy of 20% to 25% Cr, 20% to 30% Ni and 45% to 55% Fe.

4,415,837

# **STARTING CIRCUIT FOR GASEOUS DISCHARGE LAMPS**

Gregory L. Sodini, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 318,466, Nov. 5, 1981, abandoned. This application Jan. 18, 1982, Ser. No. 340,192

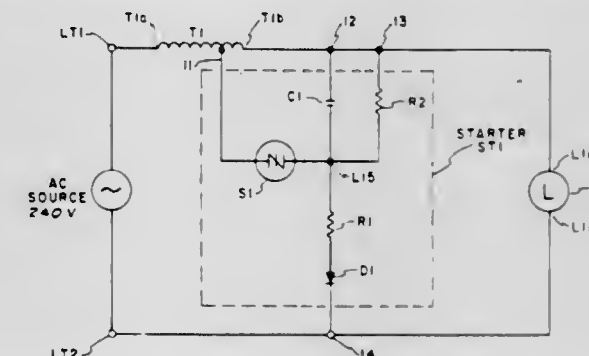
Int. Cl.<sup>3</sup> H05B 37/00

U.S. Cl. 315—177

7 Claims

1. A circuit for starting and operating a high intensity discharge lamp having at least two electrodes from a source of alternating current, means coupling said lamp across said

source, said coupling means comprising a transformer with its output winding in series with the lamp and a starting network connected at the output end of the transformer output winding, said starting network including a series circuit comprising a capacitive member and a resistance member in series with one another with a junction terminal therebetween, said series circuit connected across the lamp, a voltage sensitive symmetrical switch connected from said junction terminal to an intermediate tap in said transformer output winding to discharge



said capacitive member through the switch and the transformer section between the tap into said transformer output winding and the output end thereof to generate a high voltage charge to said lamp when the voltage across the switch rises above a predetermined threshold starting level for the lamp, and a diode in series with the members of said series circuit for limiting the charging of said capacitive member to unidirectional current flow during alternate half cycles of said alternating current whereby to limit the starting power applied to said lamp.

4,415,838

# **FREQUENCY CONVERTER FOR SUPPLYING AN ELECTRODELESS DISCHARGE LAMP**

Henk Houkes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

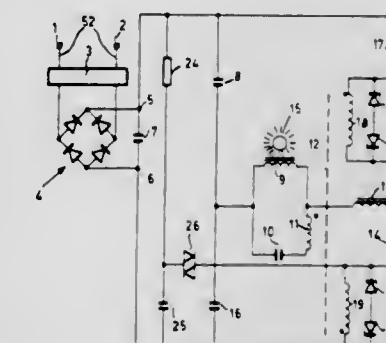
Filed Jul. 15, 1981, Ser. No. 283,398

Claims priority, application Netherlands, Jul. 21, 1980, 8004175

Int. Cl.<sup>3</sup> H05B 41/24

U.S. Cl. 315—248

7 Claims



1. A frequency converter for energizing an electrodeless discharge lamp at a frequency of at least 0.5 MHz comprising, two input terminals adapted to be connected to a direct voltage source, means connecting the two input terminals to a first series arrangement of a power MOS-FET semiconductor switching element having a control electrode, a first coil, and a parallel arrangement of at least a first branch comprising a second coil and a branch comprising at least a capacitor, the second coil being coupled to the discharge path of the lamp in the operating condition of the lamp, a transformer having a primary and a secondary winding, means connecting said secondary winding to the control electrode and to a main electrode of the controlled semiconductor switching element, means connecting the primary winding of the transformer so







the stator of said motor, speed detection means for determining rotational speed of said rotor, computation means, means for applying a reference speed signal to said computation means, means interconnecting said position means to said computation means, means connecting said speed detection means to said computation means, means responsive to said computation means for controlling said switch means in response to angular position of said rotor, and means responsive to rotational speed of said rotor for linearly controlling magnitude of current applied through each phase of said motor.

4,415,845

## ELECTRIC MOTOR CONTROL DEVICE

Claude Oudet, Besancon, France, assignor to Portescap, La-Chaux-de-Fonds, Switzerland

PCT No. PCT/CH81/00011, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02207, PCT Pub. Date Aug. 6, 1981

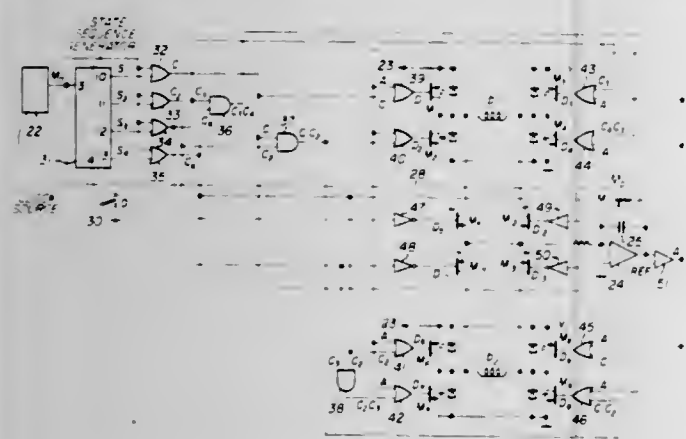
PCT Filed Jan. 30, 1981, Ser. No. 305,626

Claims priority, application Switzerland, Jan. 30, 1980, 732/80

Int. Cl.<sup>3</sup> G05B 19/40

U.S. Cl. 318—696

2 Claims



1. A control device for a two-phase stepper motor of the type comprising a permanent magnet rotor and at least two separate magnetic stator circuits each coupled with at least one electric coil, this control device comprising an electric power source, a source of clock signals, a logic control circuit including a state-sequence generator, a level comparator and logic circuitry, the control device further comprising a resettable integrator circuit and a controllable switching circuit, said switching circuit being adapted to connect said electric coil or coils associated with either one of the motor phases to the electric power source or to the input of said integrator circuit, in accordance with control signals delivered to the switching circuit by said logic control circuit, said integrator circuit having its output connected to one input of said level comparator the other input of which is connected to a predetermined position reference voltage, said state sequence generator being connected by its input to said source of clock signals and said logic circuitry being connected to combine outputs of said state sequence generator, of said clock-signal source and of said level comparator and to provide said control signals for the switching circuit to the effect that for rotation of the motor in a given direction driving pulses are alternatively delivered to the coils associated with either phase of the motor, that at least one of the coils associated with the phase not supplied by a driving pulse is temporarily connected to the integrator circuit and that each driving pulse is cut-off when the rotor reaches a predetermined position between two consecutive stable equilibrium positions.

# 4,415,846

## WOUND ROTOR MOTOR APPARATUS

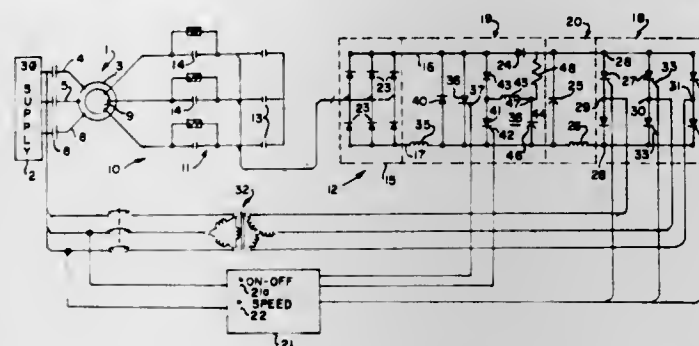
Shashi B. Dewan, Toronto, Canada, assignor to Marathon Electric, Wausau, Wis.

Filed Mar. 9, 1981, Ser. No. 241,756

Int. Cl.<sup>3</sup> A02P 5/40

U.S. Cl. 318—732

15 Claims



1. A wound rotor motor control apparatus for a wound rotor motor having a stator adapted to be connected to an alternating current supply means and a rotor, comprising a rectifying means adapted to be connected to the rotor to establish a direct current output, a phase controlled inverter means connected to said rectifying means and having output means adapted to be connected to said alternating current supply means to return the power to the supply means, and voltage control means including a voltage chopping circuit means connected to the rectifying means and said inverter means to establish a predetermined essentially constant voltage to said inverter means for all motor speeds and to return power to said supply means at essentially unity power factor.

4,415,847

# METHOD AND APPARATUS FOR SUPPLYING COOLING LIQUID TO A STORAGE BATTERY

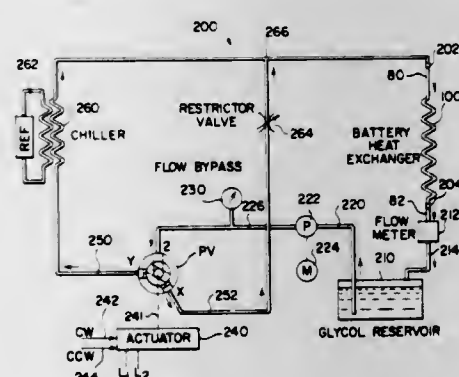
James H. Galloway, New Baltimore, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Aug. 7, 1981, Ser. No. 291,029

Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 320—2

39 Claims



1. A method of charging an electric storage battery by an actuatable, electrical supply located in or near a charging unit, said battery having a heat responsive characteristic to be controlled in accordance with a time-based temperature relationship at a given area of said battery by circulating a liquid through said battery and at said area and controlling the temperature of said liquid in accordance with said time-based relationship, said battery being mounted on an electric powered motor vehicle for driving said vehicle and having charging terminals, said method comprising the steps of:

- (a) connecting said power supply across said charging terminals of said battery;
- (b) providing a battery heat exchanger in said battery at said given area, said heat exchanger having an inlet portion for receiving a liquid, an outlet portion for discharging said liquid and an intermediate heat exchanging element for cooling said given area of said battery;

- liquid and an intermediate heat exchanger element for cooling said given area of said battery;
- (c) connecting said inlet and outlet portions into a fluid circuit in said charging unit;
- (d) pumping liquid through said battery heat exchanger at a known flow rate whereby said discharged liquid is at a temperature higher than the temperature of said liquid flowing into said battery heat exchanger;
- (e) dividing said discharged liquid into a first and second portion;
- (f) cooling said first portion in said charging unit;
- (g) combining said cooled first portion and second portion into said liquid flowing into said battery heat exchanger; and,
- (h) adjusting the ratio of the combining flow rates of said first and second portions in accordance with said time-based relationship.

27. An apparatus for charging an electric storage battery by an actuatable, electrical power supply located in or near a charging unit, said battery having a heat responsive characteristic to be controlled in accordance with a time-based temperature relationship at a given area of said battery by circulating a liquid through said battery and at said area and controlling the temperature of said liquid in accordance with said time-based relationship, said battery being mounted on an electric powered motor vehicle for driving said vehicle and having charging terminals, said apparatus comprising the following:

- (a) means for connecting said power supply across said charging terminals of said battery;
- (b) means for providing a battery heat exchanger in said battery at said given area, said heat exchanger having an inlet portion for receiving a liquid, an outlet portion for discharging said liquid and an intermediate heat exchanging element for cooling said given area of said battery;
- (c) means for connecting said inlet and outlet portions into a fluid circuit in said charging unit;
- (d) means for pumping liquid through said battery heat exchanger at a known flow rate whereby said discharged liquid from said heat exchanger is at a temperature higher than the temperature of said liquid flowing into said battery heat exchanger;
- (e) means for dividing said discharged liquid into a first and second portion;
- (f) means for cooling said first portion in said charging unit;
- (g) means for combining said cooled first portion and second portion into said liquid flowing into said battery heat exchanger; and,
- (h) means for adjusting the ratio of the combining flow rates of said first and second portions in accordance with said time-based relationship.

4,415,848

# ALTERNATING CURRENT POWER SOURCE APPARATUS FOR CAR

Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

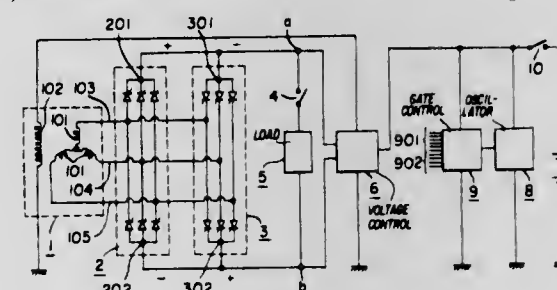
Continuation of Ser. No. 73,132, Sep. 6, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,237

Claims priority, application Japan, Sep. 15, 1978, 53-127508

Int. Cl.<sup>3</sup> H02J 7/14; H02P 9/14, 9/42

U.S. Cl. 322—32

3 Claims



1. An alternating current power source apparatus which

comprises an AC generator outputting a three-phase signal having a field coil which is driven by an engine;

- a battery for supplying a field current to the field coil of said AC generator;
- a first rectifier having three gated thyristors, each one of which is associated with one of said three phases of said generator output, which rectify the AC output of said AC generator;
- a second rectifier having three gated thyristors, each one of which is associated with one of said phases of said generator output, which is connected in parallel to said first rectifier and said AC output of said generator and is connected to give an output having a polarity reverse to the polarity of the output of said first rectifier;
- a load driven by single phase AC power connected to said first and second rectifier;
- a voltage control device responsive to said outputs of said first and second rectifiers for controlling the output voltage of said generator to a predetermined value by controlling a field current passing from said battery through said field coil;
- an oscillator for oscillating at a desired frequency; and
- a gate signal generating circuit which is controlled by said oscillator so as to feed a turn-on signal alternately to the gate of the thyristors of said first rectifier and the gate of the thyristors of said second rectifier.

4,415,849

# ALTERNATOR PROTECTION SYSTEM

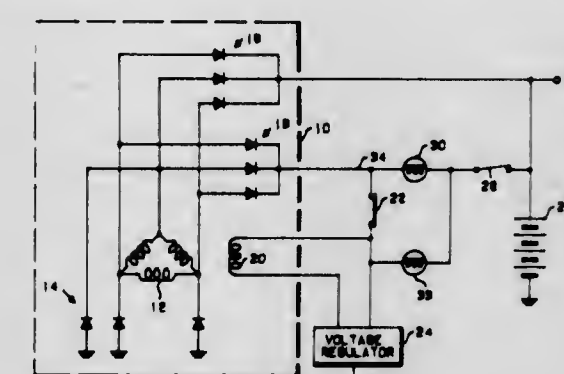
Kirk A. Sievers, Roselle, and Dean C. Santis, Winfield, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1982, Ser. No. 361,715

Int. Cl.<sup>3</sup> H02J 7/14; H02H 7/06; H02K 11/00

U.S. Cl. 322—99

6 Claims



1. An alternator protection system comprising:
  - first terminal means for supplying to a load a first rectified alternator output current at a predetermined voltage;
  - second terminal means for supplying to a load a second rectified alternator output current at the predetermined voltage;
  - first indicator means coupled to the second terminal means;
  - thermal switching means coupled to the second terminal means;
  - field coil means coupled to the thermal switching means;
  - regulator means coupled to the thermal switching means and the field coil means for regulating the voltage in the field coil means;
  - second switching means coupled between the first indicator means and the first terminal means; and
  - second indicator means coupled across the series combination of the first indicator means and the thermal switching means.



4,415,850

## GROUND CONDUCTOR MONITORING SYSTEM

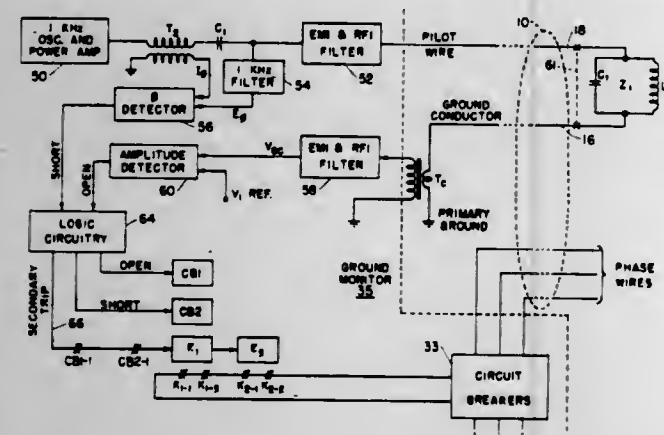
John R. Sherwood, Arlington, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 12, 1981, Ser. No. 233,819

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—51

6 Claims



1. The method of monitoring the condition of the ground conductor of an electrical power cable that also includes a plurality of power or phase wires and at least one other wire, all of which extend from one end to the opposite end of the cable, said method comprising the steps:
  - a) earth grounding said ground conductor only at said one end,
  - b) coupling an a.c. test signal between said one end of the ground conductor and the corresponding end of said other wire,
  - c) terminating the ground conductor and the other wire at said opposite end of the cable in an impedance that presents at least a predetermined capacitive reactance at the test signal frequency when monitored at said one end of the cable,
  - d) monitoring the reactance of said terminating impedance and producing a fault signal when the reactance of the cable as monitored at said one end changes from said predetermined capacitive reactance,
  - e) sampling the test signal current flowing in said ground conductor at said one end of the cable, and
  - f) producing a fault signal when the sampled test signal current is below a predetermined magnitude.

4,415,851

## SYSTEM FOR CONTACTLESS TESTING OF MULTI-LAYER CERAMICS

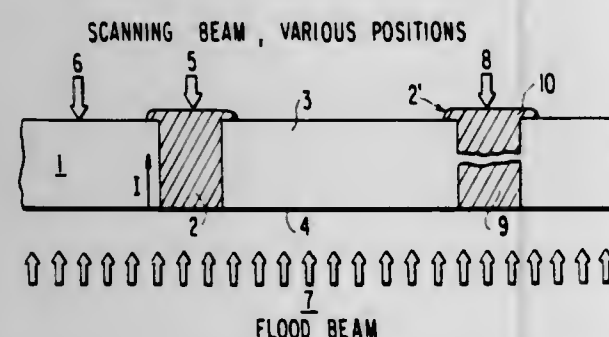
Guenther O. Langner, Hopewell Junction, N.Y., and Hans C. Pfeiffer, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,118

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—51

17 Claims



1. A method of testing electrical connections disposed through an insulating material without physical contact comprising the steps of:
  - a) irradiating one side of said insulating material with a first

electron beam to charge said material and said electrical connections to a given potential;  
 generating a second electron beam on an opposite side of said material to cause secondary electron emission from connections which are at said given potential; and  
 detecting the presence of connections not at a given potential.

4,415,852

## SINGLE HYBRID JUNCTION FREQUENCY DISCRIMINATOR

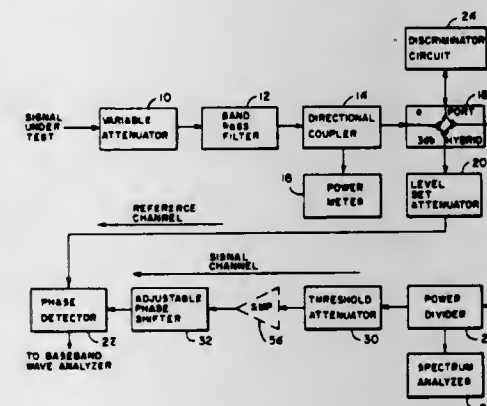
James R. Ashley, Tampa, Fla.; Thomas A. Barley, and Gustaf J. Rast, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 26, 1981, Ser. No. 315,328

Int. Cl.<sup>3</sup> G01R 27/04; H01P 7/04

U.S. Cl. 324—57 N

8 Claims



1. A discriminator for measuring input frequency modulation noise signals comprising:
  - a) a bandpass filter having an input and an output, said input being adapted to receive input signals;
  - b) signal routing means having a plurality of input-output ports, a first port of said ports being coupled to the output of said bandpass filter for receiving noise signals therefrom;
  - c) a discriminator circuit means having an input-output port coupled to a second port of said signal routing means ports for receiving signals from said second port and directing signals back thereto;
  - d) a first signal channel having an input and an output, said input being coupled to a third port of said signal routing means for receiving said signals from said discriminator circuit means coupled to said signal routing means second port;
  - e) quadrature detection means having first and second inputs and an output, said first input being coupled to the output of said first channel, and the output being adapted for coupling output measurement signals therefrom; and
  - f) a second signal channel having an input and an output, said input being coupled to a fourth port of said signal routing means, and said output being coupled to said second input of said quadrature detection means for providing a reference channel input, to said quadrature detection means.

4,415,853

## MONITORING DEVICE AND METHOD FOR ACCURATELY DETERMINING AND RECORDING PRESENT DEMAND OF ELECTRICAL ENERGY

Berish M. Fisher, 629 Ave. M, Brooklyn, N.Y. 11210

Continuation-in-part of Ser. No. 940,458, Sep. 8, 1978, abandoned. This application Oct. 21, 1980, Ser. No. 199,386

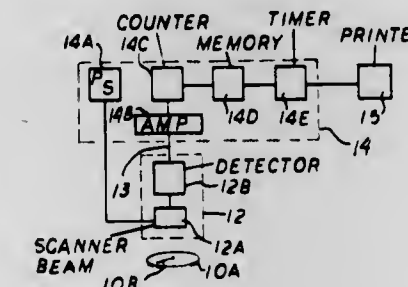
Int. Cl.<sup>3</sup> G01R 35/04, 11/64

U.S. Cl. 324—74

12 Claims

1. A device for monitoring peak demand electric usage from an electric usage meter having a rotating disc and a peak demand meter integrated therewith, said peak demand meter being mechanically activated and designed to be reset if said

peak demand electric usage is not maintained for a predetermined continuous time interval, said device comprising means for sensing rotation of said disc, timing means, and a printing calculator containing counting, memory and printing means, said counting means being adapted to receive signals from said sensor and to count rotations of said disc, and said memory means retaining a cumulated total of said counted rotations and wherein said printing means is adapted to print said cumulated



total of rotations after a period of time no longer than said predetermined continuous time interval of said peak demand meter, whereby the number of rotations during said period of time can be ascertained; and said printing means being adapted to be activated by said timing means to print out the time together with said cumulated total of rotations whereby electric usage for said time period can be ascertained and wherein determination of electric usage during said period of time by said device determines the accuracy of the peak demand meter.

4,415,854

## MICROWAVE SPECTRUM ANALYZER WITH A SYNTHESIZED LOCAL OSCILLATOR

Joël Remy, Paris, France, assignor to Adret Electronique, France

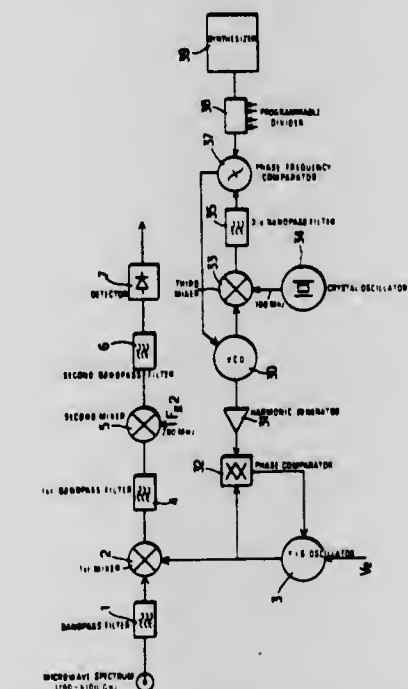
Filed May 18, 1981, Ser. No. 264,372

Claims priority, application France, May 23, 1980, 80 11564

Int. Cl.<sup>3</sup> G01R 23/14

U.S. Cl. 324—79 R

1 Claim



1. A microwave spectrum analyzer comprising: a first mixer having a first input to which is applied the spectrum to be analyzed, a second input and an output; a YIG oscillator having an output connected to the second input of the first mixer, said YIG oscillator further having a frequency control input; a first band-pass filter keyed to a fixed frequency which is outside the frequency range of the spectrum to be analyzed, said first filter having an input connected to the output of the first mixer and an output; a second mixer having an output, a first input connected to the output of the said filter, a second input receiving a fixed transposition frequency; a second band-pass filter having an input connected to the output of the second

4,415,855

## COMBINATION ANALOG-DIGITAL INDICATOR

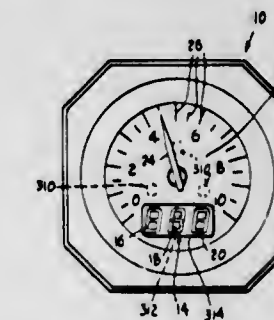
Thomas A. Dubauskas, Waterbury, Conn., assignor to The Lewis Engineering Company, Naugatuck, Conn.

Continuation-in-part of Ser. No. 29,569, Apr. 12, 1979, Pat. No. 4,258,317. This application Feb. 2, 1981, Ser. No. 230,557

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> G01R 1/00, 1/08

U.S. Cl. 324—114

15 Claims



1. An electrical indicator device for providing continuous and simultaneous analog and digital readings of a particular single electrical parameter which is to be continuously monitored, comprising in combination:
  - (a) an electro-responsive device,
  - (b) a meter scale plate having a useful indicating area provided with calibrating indicia,
  - (c) a pointer connected to said electro-responsive device and movable over said useful indicating area,
  - (d) said indicator device having an input circuit adapted to be connected to the source of the parameter being monitored,
  - (e) a liquid crystal digital display, and
  - (f) a digital voltmeter having its input connected to the input circuit of the device, and having an output connected to drive the liquid crystal display,
  - (g) said display comprising multiple digits, each digit having a backplane and multiple segments which are selectively energized to produce numerical designations,
  - (h) said segments being disposed closely adjacent said useful indicating area but lying completely outside of the same, and being disposed outside of the useful range of movement of the pointer so as to be not interfered with by the latter whereby all of said segments are always completely visible in a single glance from the front of the indicator device simultaneously with the viewing of said useful indicating area and regardless of the position of the pointer on said area,



- (i) said meter scale plate being substantially circular and having a central opening providing clearance for the pointer support,
- (j) said multiple segments of the digital voltmeter being located below the central opening of the scale plate,
- (k) said electro-responsive device and liquid crystal display being connected to continuously respond to the single, same electrical parameter being monitored,
- (l) means for electrically illuminating the pointer along its length, and
- (m) a light mask for shielding light from said pointer-illuminating means, forwardly of the pointer.

4,415,856

# ROTATABLE MAGNETIC FIELD-SENSING SOLID-STATE SWITCH APPARATUS

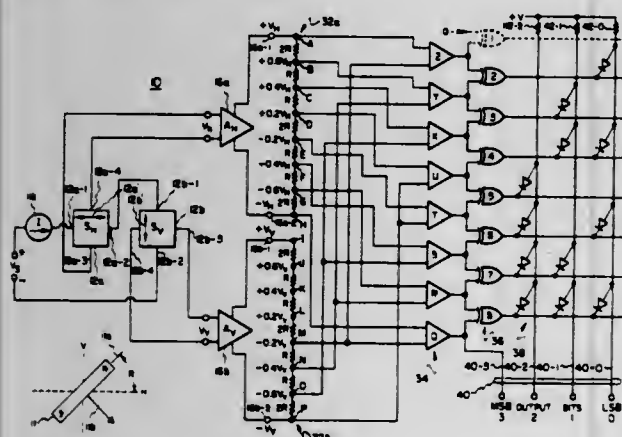
Kenneth B. Welles, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 19, 1981, Ser. No. 225,885

Int. Cl.<sup>3</sup> G01B 7/14; H01L 43/08

U.S. Cl. 324—208

9 Claims



1. A solid-state rotary switch apparatus, comprising: a magnetic member rotatable in a plane; first and second magnetic field sensors each having a sensor axis disposed substantially perpendicular to one another and in another plane adjacent to the plane of magnetic member rotation; each sensor providing an output signal of magnitude proportional to the angle of said magnetic member with respect to the sensor axis thereof; and means responsive to the outputs of said sensors for providing digital data indicating that one of a preselected plurality P of angular rotational positions of said magnetic member, with respect to a rotational reference, to which a selected pole of said member is presently rotated, said digital data providing means including: first and second differential-input, differential-output amplifiers each receiving the output signal of one of said sensors; a resistance element chain connected between the differential outputs of each of said amplifiers; a plurality of two-input comparators, the inputs of each comparator being connected to terminals of said resistance chain in preselected manner to cause each comparator output to be enabled when said selected pole of said magnetic member is at different ones of  $\pi$  radians of rotation from said reference line; a plurality of two-input exclusive-OR-gates, each gate having each input thereof connected to a different one of two adjacent ones of said comparators for enabling a gate output only when said magnetic member is positioned at diametrically-opposed different ones of the plurality of possible rotational positions of said magnetic member; a plurality N of data output lines, where the number P of possible rotational positions of said member, and therefore of said switch apparatus, is given by  $P=2^N$ ; and a diode array for connecting the outputs of said gates to the (N-1) least significant output lines, with the output of a selected one of said comparators being connected directly to the most significant bit data output line, to provide an N-bit digital-

ly-coded output of that one of  $2^N$  positions of said magnetic member with respect to said reference line.

4,415,857

# NON-POLARIZING ELECTRODE SYSTEM FOR GEOPHYSICAL PROSPECTING AND THE LIKE

Ralph L. Cordell, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

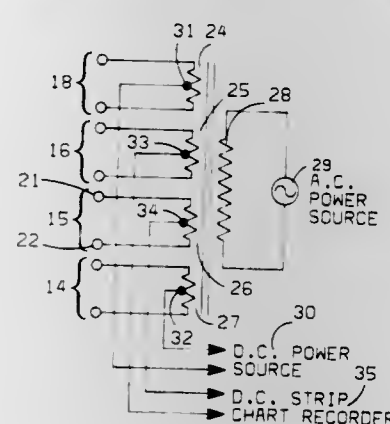
Continuation of Ser. No. 933,005, Aug. 11, 1978, abandoned.

This application Sep. 2, 1980, Ser. No. 183,477

Int. Cl.<sup>3</sup> G01V 3/20

U.S. Cl. 324—357

14 Claims



1. A combined non-polarizing electrode system for geophysical prospecting, well logging, and the like, comprising: a first adjacent pair of electrodes connected to opposite ends of a first secondary winding of an alternating current transformer; second, third, and fourth adjacent pairs of electrodes connected, in a manner similar to the connection of said first pair of electrodes, to second, third, and fourth secondary windings, respectively, of said alternating current transformer; a depolarizing alternating current source connected to the primary winding of said alternating current transformer; a direct current power source connected between said first and fourth secondary windings for generating a measuring current in the earth between said first pair of electrodes and said fourth pair of electrodes, said first and fourth pair of electrodes being spaced a distance L apart; a direct current measuring device connected in series with said direct current power source for measuring said measuring current; and a direct voltage measuring device connected between said second and third secondary windings for measuring a potential difference in the earth caused by the flow of said measuring current between said second pair of electrodes and said third pair of electrodes, said second and third pairs of electrodes being spaced intermediate said first and fourth pairs of electrodes, whereby said direct voltage measurement in combination with said direct current measurement provides an indication of the resistivity of the earth between said second and said third electrode pairs, and said depolarizing alternating current source causes a depolarizing alternating current to flow between said adjacent pairs of electrodes.

4,415,858

# PH METER PROBE ASSEMBLY

Charles J. Hale, San Jose, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 273,154

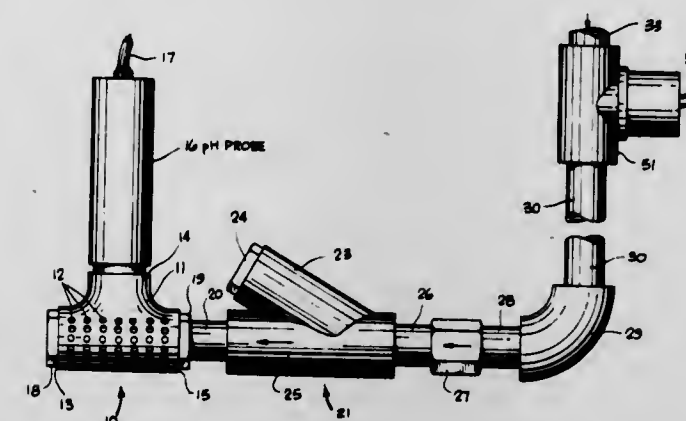
Int. Cl.<sup>3</sup> G01N 27/56

U.S. Cl. 324—438

13 Claims

1. A pH probe assembly for measuring the pH in effluents, such as in sanitary and storm sewers, said assembly comprising a perforated housing having a pH probe mounted therein and containing a filter media which surrounds at least a portion of

said pH probe for preventing contamination of said pH probe, and means connected to said perforated housing for periodically flushing said filter media for removing contaminants therefrom.



4,415,859

# PARAFFIN MONITOR

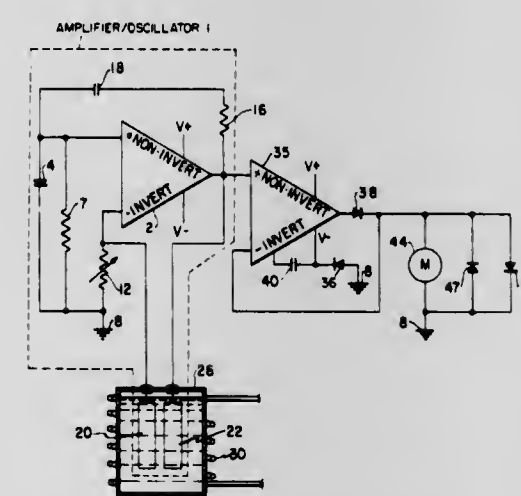
Carlton M. Slough, Spring, and Edwin L. Colling, Jr., Sugarland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 194,697, Oct. 6, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,358

Int. Cl.<sup>3</sup> G01N 27/00, 33/28

U.S. Cl. 324—442

8 Claims



1. A paraffin monitor which comprises: amplifier/oscillator means connected to ground, including a pair of probes immersed in a medium containing paraffin, the amplifier/oscillator means being means for providing an output signal corresponding to the quantity of paraffin on the probes while introducing a small anti-polarizing current in the medium between the probes; and indicating means connected to ground and to the amplifier/oscillator means, the indicating means being means for providing an indication of the change in the amount of paraffin on the probes in accordance with the output signal from the amplifier/oscillator means.

4,415,860

# SINE WAVE TO TRIANGLE WAVE CONVERTOR

Kwok S. Lo, San Diego, Calif., assignor to Wavetek, San Diego, Calif.

Filed Mar. 20, 1981, Ser. No. 245,995

Int. Cl.<sup>3</sup> H03K 5/00, 4/10

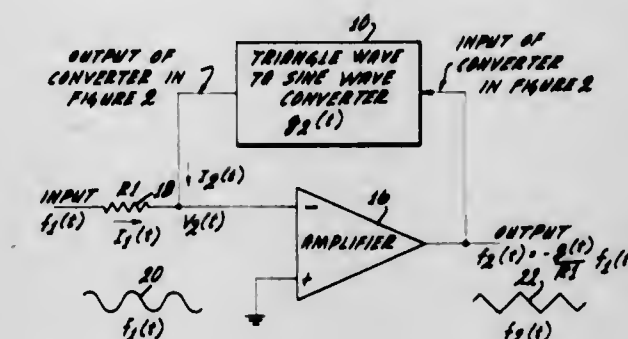
U.S. Cl. 328—22

10 Claims

1. A sine wave to triangle wave convertor including an amplifier having an input terminal and an output terminal, a sine convertor having an input terminal and an output terminal and for producing a sine wave at the output

terminal in accordance with the application of a triangle wave at the input terminal and with each cycle of the triangle wave producing a corresponding cycle of the sine wave and with each sloping portion of each cycle of the triangle wave producing a corresponding sine wave portion of the sine wave,

the output terminal of the amplifier coupled to the input terminal of the sine convertor and the output terminal of



the sine convertor coupled to the input terminal of the amplifier, and means coupled to the input terminal of the amplifier for coupling an input sine wave to the amplifier to produce an output triangle wave at the output terminal of the amplifier and with each cycle of the sine wave producing a corresponding cycle of the triangle wave and with each sine wave portion of the sine wave producing a corresponding sloping portion of the triangle wave.

4,415,861

# PROGRAMMABLE PULSE GENERATOR

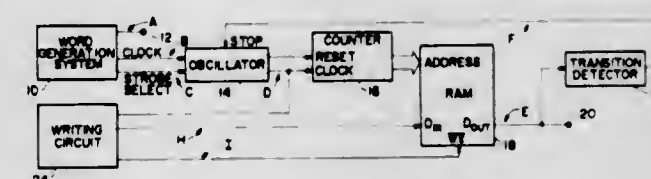
Steven R. Palmquist, Beaverton, and Ronald D. Gaiser, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 8, 1981, Ser. No. 271,729

Int. Cl.<sup>3</sup> H03K 5/26, 3/017

U.S. Cl. 328—58

6 Claims



1. A programmable pulse generator, comprising: an oscillator for generating a pulse in response to a trigger signal; a counter for counting the pulse from said oscillator to generate an address signal; a memory circuit for generating a pulse having predetermined leading and trailing edges in accordance with the address signal from said counter; and a transition detector for detecting the trailing edge of the pulse from said memory circuit to stop the oscillation of said oscillator, said transition detector comprising a first D-type flip-flop to receive the output from said memory circuit at a D input terminal thereof and the pulse from said oscillator at a clock terminal thereof, a second D-type flip-flop to receive the Q output from said first D-type flip-flop at a D input terminal thereof and the pulse from said oscillator at a clock terminal thereof, and an AND gate to receive the Q output from said first D-type flip-flop and the Q output from said second D-type flip-flop, the output from said AND gate stopping the oscillation of said oscillator.



4,415,862

**PULSE WIDTH MODULATION AMPLIFIER**

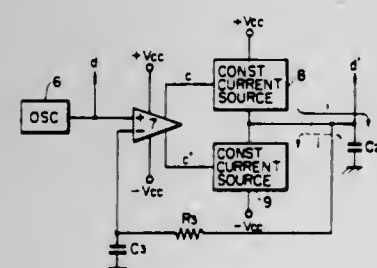
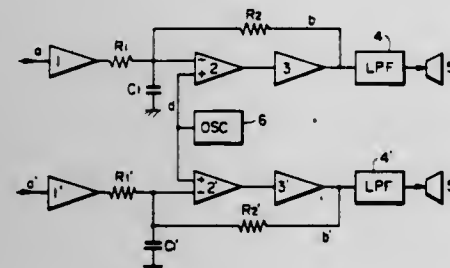
Yoshiro Kanugi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,036

Claims priority, application Japan, Mar. 28, 1980, 55-39023

Int. Cl.<sup>3</sup> H03F 3/38

U.S. Cl. 330—10



1. A pulse width modulation amplifier for a plurality of channels comprising: first and second channel amplifiers each comprising a pulse width modulation comparator, said first and second channel amplifiers providing separate uncombined output representing different input signals; and means for applying ramp carrier signals having a phase difference therebetween of substantially 90° to respective ones of said pulse width modulation comparators wherein rise and fall times of output rectangular pulses of said comparators occur at different times between said first and second channel amplifiers.

4,415,863

**PULSE WIDTH MODULATION AMPLIFIER**

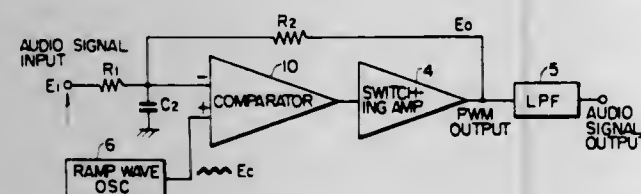
Akio Tokumo, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,033

Int. Cl.<sup>3</sup> H03F 3/38

U.S. Cl. 330—10

7 Claims



1. A pulse width modulation amplifier comprising: a comparator, an inverting input terminal of said comparator being coupled to an input signal source through a first resistor; a ramp wave oscillator having an output coupled to a non-inverting input of said comparator; a switching amplifier having an input coupled to an output of said comparator; a low-pass filter having an input coupled to an output of said switching amplifier; a second resistor coupled between said output of said switching amplifier and said inverting input terminal of said comparator; and a capacitor coupled between said inverting input terminal of said comparator and ground.

4,415,864

**VARIABLE-GAIN AMPLIFIER STAGE EQUIPPED WITH FIELD-EFFECT TRANSISTORS**

Wouter M. Boeke, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

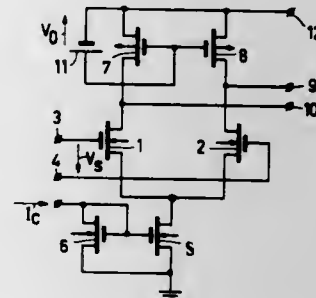
Filed Jan. 26, 1981, Ser. No. 228,528

Claims priority, application Netherlands, Feb. 25, 1980, 8001117

U.S. Cl. 330—253

Int. Cl.<sup>3</sup> H03F 3/45

8 Claims



1. A variable gain amplifier stage comprising first and second field-effect transistors of a first conductivity type whose gate electrodes constitute the input of the amplifier stage and whose source electrodes are jointly connected to a controllable current source for controlling the slope of the first and the second field-effect transistors, third and fourth field-effect transistors, means connecting said third and fourth transistors as loads in the drain circuits of the first and second transistors, an output signal being available between the drain electrodes of the first and second field effect transistors, and means for operating the third and fourth transistors in the triode region.

4,415,865

**CIRCUIT ARRANGEMENT FOR CONTROLLING THE QUIESCENT CURRENT IN A CLASS AB AMPLIFIER STAGE**

Rolf E. O. Gustafsson, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

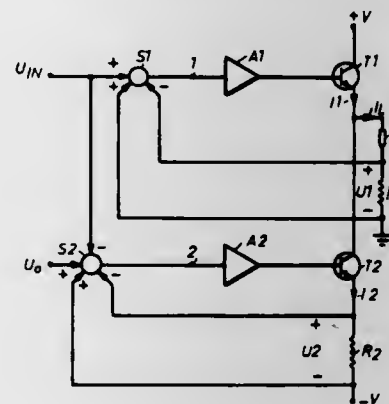
Filed Mar. 23, 1981, Ser. No. 246,910

Claims priority, application Sweden, Apr. 1, 1980, 8002484

Int. Cl.<sup>3</sup> H03F 1/34, 3/26

U.S. Cl. 330—271

5 Claims



1. A quiescent controlled class AB amplifier comprising a supply voltage source having first and second terminals, first and second amplifiers each having input, output and common terminals, means for connecting the common terminal of said first amplifier to the first terminal of said supply voltage source, first impedance means for connecting the output terminal of said second amplifier to the second terminal of said supply voltage source, means for connecting the output terminal of said first amplifier to the common terminal of said second amplifier, a reference potential source, a load having one terminal connected to the output terminal of said first amplifier and another terminal, second impedance means connecting the

other terminal of said load to said reference voltage source, a source of an input signal to be amplified, first signal processing means for subtracting a voltage developed across said first impedance means from the input signal to provide a difference signal, first connecting means for connecting the output of said first signal processing means to the input terminal of said first amplifier, a source of constant quiescent voltage, a second signal processing means for adding to the inverse of said input signal to the constant quiescent voltage and subtracting therefrom a voltage developed across said second impedance means, and second connecting means for connecting the output of said second signal processing means to the input terminal of said second amplifier.

4,415,866

**CIRCUIT FOR DYNAMIC COMPRESSION AND/OR EXPANSION**

Jürgen Wermuth, Peine-Stedderdorf, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

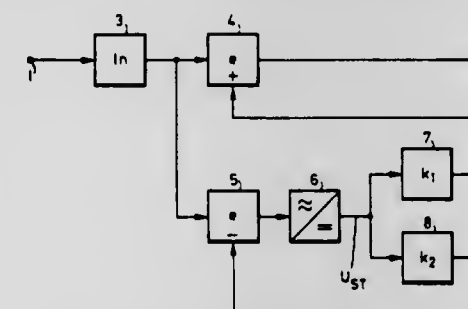
Filed Nov. 24, 1981, Ser. No. 324,661

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044661

Int. Cl.<sup>3</sup> H03G 3/30; G06G 7/24

U.S. Cl. 330—278

10 Claims



1. In a circuit for the automatic dynamic compression or expansion of a signal between the input and output of the circuit, the circuit presenting a useful signal path connected between its input and output, and containing a first variable gain member which has a control input and which is electronically controllable in response to a first control signal at its control input for varying the transmission factor between the circuit input and output, the circuit also presenting a branch path having an input point connected to the useful signal path and containing a control voltage generator for generating a control voltage from the signal at such point in the useful signal path, a second variable gain member which is connected in the branch path and which has a control input and which is electronically controllable in response to a second control signal at its control input for varying the transmission factor exhibited by the branch path, and means connecting the output of the control voltage generator to the variable gain members supplying respective first and second control signals thereto for causing the transmission factor of the useful signal path to have a value dependent on the value of the control voltage and for effecting a counterregulation of the transmission factor of the branch path relative to the transmission factor variation imparted to the useful signal path, the improvement wherein: said useful signal path includes means causing the signal at one point along said path to have a value proportional to the logarithm of the signal at said circuit input; said branch path has its input point connected to said one point of said useful signal path; each of said variable gain members constitutes means having a transmission factor which is antilogarithmic and which varies as an exponential function of the control voltage; and said means connecting the output of the control voltage generator serve to cause the first and second control signals to have respectively different values.

4,415,867

**HYBRID COUPLED MICROSTRIP AMPLIFIER**

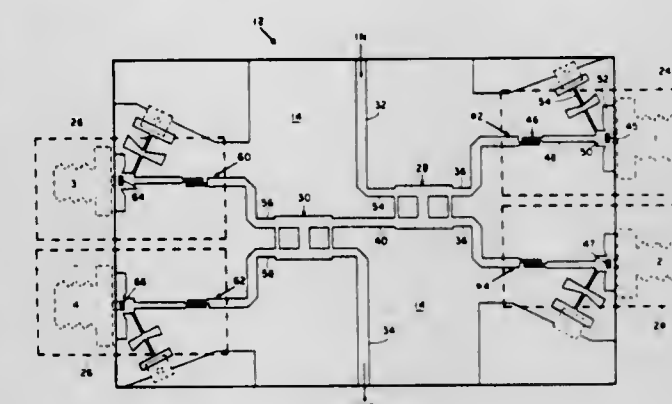
David Rubin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1981, Ser. No. 266,229

Int. Cl.<sup>3</sup> H03F 3/60

U.S. Cl. 330—287

10 Claims



1. A microstrip amplifier comprising: a dielectric substrate having a top surface and a bottom surface; a 3 db microstrip quadrature coupler disposed on said dielectric substrate top surface, said 3 db quadrature coupler having first, second, third and fourth ports, said first port comprising an input port and said second port comprising an output port; a first reflection amplifier connected to said third port; a second reflection amplifier connected to said fourth port, said second reflection amplifier being substantially identical to said first reflection amplifier; said first reflection amplifier being connected to said third port by a first microstrip DC filter; said second reflection amplifier being connected to said fourth port by a second microstrip DC filter; first and second microstrip transformer sections each connecting one of said first and second microstrip DC filters to its respective reflection amplifier; and first and second microstrip stub sections, each being connected to one of said first and second microstrip transformer sections.

4,415,868

**ONE AND ONE HALF POLE AUDIO POWER AMPLIFIER FREQUENCY COMPENSATION**

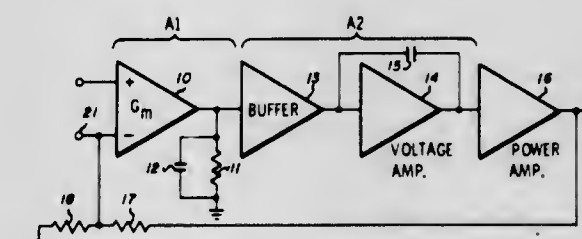
William H. Gross, Tokyo, Japan, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 27, 1981, Ser. No. 287,386

Int. Cl.<sup>3</sup> H03F 1/34, 3/183

U.S. Cl. 330—294

5 Claims



1. An operational amplifier for providing substantial gain of audio frequencies and having very low response at frequencies within the AM standard radio broadcast band, said amplifier comprising: first amplifying means having a gain characteristic in which the response is flat at low frequencies and rolls off at a 6 db per octave to a unity gain value at a frequency in the vicinity of the low end of said AM standard radio broadcast band;



second amplifying means having a gain characteristic higher than that of said first amplifying means and a gain characteristic in which the response falls off at a 6 db per octave rate within said audio frequencies to a unity gain value near the same frequency as said first amplifying means; means for coupling said first and said second amplifying means in a cascaded configuration; and gain controlling negative feedback means around both said first and said second amplifying means for determining the overall amplifier gain at a level above that of said first amplifying means.

4,415,869

# SAWTOOTH GENERATOR SWITCHABLE BETWEEN A FREE-RUNNING STATE OR A SYNCHRONIZABLE STATE

Peter A. Duijkers, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

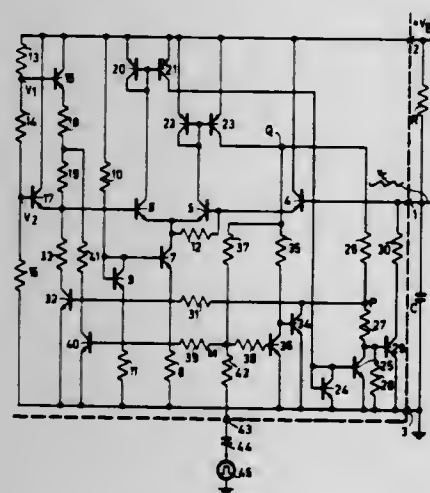
Continuation of Ser. No. 89,006, Oct. 29, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,355

Claims priority, application Netherlands, Nov. 27, 1978, 7811597

Int. Cl.<sup>3</sup> H03K 3/26

U.S. Cl. 331-111

16 Claims



1. A circuit arrangement for generating a sawtooth shaped voltage across a capacitor, comprising charging current means for charging said capacitor until a first threshold voltage is reached and discharging current means for subsequently discharging said capacitor until a second threshold voltage is reached, means for measuring and controlling the capacitor voltage, and means for switching said charging and discharging current means respectively, the free-running frequency of the sawtooth voltage thus generated being determined by the difference between said first and second threshold voltages and by the intensity of said charging and discharging currents respectively, the circuit arrangement further comprising a synchronizing signal detector connected to said circuit arrangement for establishing the presence of a source of synchronizing pulses connected to said synchronizing signal detector, said synchronizing pulses having a substantially constant nominal repetition frequency, said signal detector switching the circuit arrangement between a first state in the absence of said synchronizing pulses wherein the free-running frequency of the sawtooth voltage is substantially equal to the nominal repetition frequency of said synchronizing pulses and a second state in the presence of said synchronizing pulses wherein the free-running frequency of said sawtooth voltage is lower than said nominal repetition frequency, the circuit arrangement being thus in its second state synchronizable by said synchronizing pulses.

## 4,415,870 OSCILLATOR CIRCUIT WITH DIGITAL TEMPERATURE COMPENSATION

Alphonse Zumsteg, Solothurn, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services SA, Bienne, Switzerland

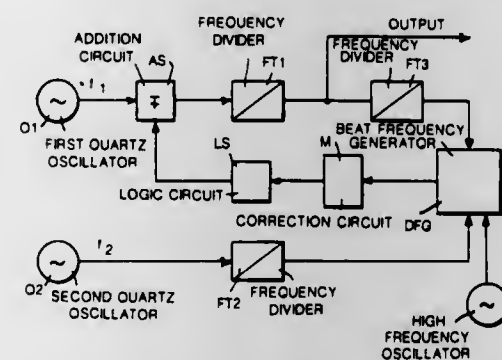
Filed Dec. 19, 1980, Ser. No. 218,405

Claims priority, application Switzerland, Jan. 10, 1980, 157/80

Int. Cl.<sup>3</sup> H03B 5/04, 5/32; H03L 1/02

U.S. Cl. 331-176

5 Claims



1. An oscillator circuit with digital temperature compensation comprising:  
(a) a first low-frequency oscillator;  
(b) a second low-frequency oscillator; and  
(c) a temperature compensation circuit cooperating with the first and second low-frequency oscillators and having:  
(i) a beat frequency generator controlled by an independent high-frequency oscillator connected thereto, for receiving frequency signals generated by said low frequency oscillators, and for generating a difference frequency representing the difference between the frequencies generated by said low frequency oscillators;  
(ii) a correction circuit connected to the beat frequency generator for receiving the difference frequency and generating a correction signal, said correction circuit having a PROM for storing correction functions, and  
(iii) means for varying the frequency signals of the first low-frequency oscillator, said means connected to the correction circuit and varying the first low-frequency oscillator signal in response to the signal generated by the correction circuit.

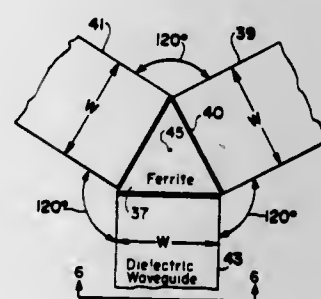
4,415,871  
DIELECTRIC WAVEGUIDE CIRCULATOR  
Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 13, 1981, Ser. No. 310,542

Int. Cl.<sup>3</sup> H01P 1/383

U.S. Cl. 333-1.1

13 Claims



8. A Y-junction circulator comprising a dc magnetized triangular right prism having non-reciprocal properties and rectangular lateral faces, three millimeter wavelength dielectric waveguides having rectangular ends bonded to the respective

lateral faces of said prism, the waveguide ends being congruent with the lateral faces of said prism.

4,415,872

## ADAPTIVE EQUALIZER

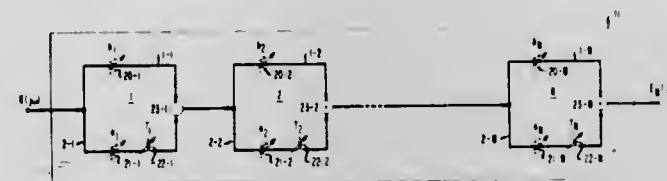
Peter D. Karabinis, Atkinson, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 17, 1981, Ser. No. 293,463

Int. Cl.<sup>3</sup> H04B 3/14; H03H 7/03

U.S. Cl. 333-18

6 Claims



1. An equalizer (11) comprising a plurality of feed-forward stages (1, 2, ..., N) connected in cascade:  
each stage comprising:  
a first parallel wavepath (1-1, 1-2, ..., 1-N) including a first variable attenuator (20-1, 20-2, ..., 20-N);  
a second parallel wavepath (2-1, 2-2, ..., 2-N) including a second variable attenuator (21-1, 21-2, ..., 21-N), and delay means (22-1, 22-2, ..., 22-N);  
means (23-1, 23-2, ..., 23-(N-1)) for combining the signals in the parallel wavepaths of each of the first (N-1) stages and for coupling the combined signals to the next stage of said equalizer;  
and means (23-N) for combining the signals in the parallel wavepaths of the N<sup>th</sup> equalizer stage and for coupling the combined signals to the equalizer output terminal.

## 4,415,873 VARIABLE INDUCTOR HAVING REDUCED ARCING TENDENCY

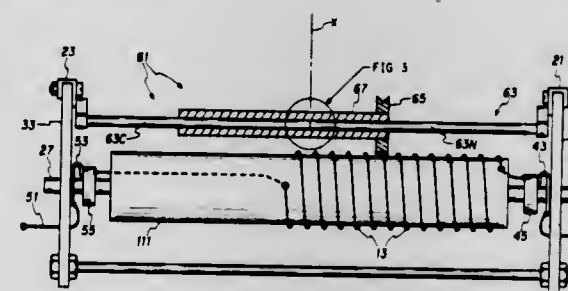
Jack C. Thornton, Satellite Beach, Fla., and Randy G. Russell, Arlington Heights, Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1982, Ser. No. 364,292

Int. Cl.<sup>3</sup> H01F 29/06

U.S. Cl. 336-139

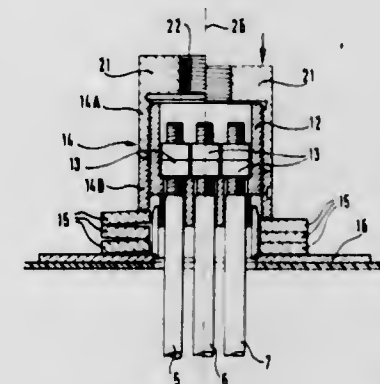
5 Claims



1. A variable inductor comprising:  
a coil comprising multiple turns of electrical conductor wound to substantially follow a helical path, said coil being rotatable and having first and second ends;  
a moveable, electrically conductive, contactor first means, located exteriorly of said coil, for continuously electrically contacting said coil one turn at a time and for traveling along a path substantially parallel to the side of the coil as the coil is rotated;  
guide second means for guiding said first means along the first means path of travel, said second means being stationary, being elongated, and being oriented substantially parallel to the side of the coil, said second means having a first portion located in the vicinity of the first end, and having a second portion located in the vicinity of the second end, said second means also being at least partly non-conductive so that, when the first means is located in

the vicinity of the second end, the second portion is electrically isolated from the first portion;  
voltage access station third means, located further from the first end than the second end, for sharing any voltage potential present on said first means and for providing access to any voltage potential present on said first means, said third means being stationary, being electrically conductive, being suitable for being electrically connected to said first means, and being located and configured such that, when the first means is located in the vicinity of the second end, said third means is electrically isolated from the second means first portion;  
moveable electrical connection fourth means for electrically interconnecting the moveable first means to the stationary third means, said fourth means being mechanically coupled to said first means so as to move simultaneously therewith and so that as the first means travels away from the first end said fourth means also moves away from the first end, said first, second, third, and fourth means cooperating such that, when said first means has thereon a voltage potential V<sub>1</sub>, the spatial location of V<sub>1</sub> moves away from said first end as said first means moves away from said first end.

4,415,874  
ELECTRIC SHUNT INDUCTANCE WINDING FOR AN ELECTRICITY POWER TRANSPORT LINE  
Gerard Messe, Maule, and Michel Faure, Houilles, both of France, assignors to Societe Anonyme dite: Alstom-Atlantique, Paris, France  
Filed Jul. 2, 1981, Ser. No. 279,648  
Claims priority, application France, Jul. 4, 1980, 80 14918  
Int. Cl.<sup>3</sup> H01F 27/26  
U.S. Cl. 336-178  
4 Claims



1. An electric shunt inductance winding for an electric power transport line, said inductance winding including a magnetic core, an electric winding surrounding said core, a magnetic barrel surrounding the electric winding to close the magnetic circuit, said magnetic barrel having two vertical legs, an upper cross bar and a lower cross bar connecting said legs together at opposite ends thereof, said magnetic core having a central hole and being constituted by a vertical stack of laminated iron core members separated from one another by spacers made of non-magnetic material, the improvement wherein the upper cross bar and the lower cross bar are clamped against the magnetic core and said vertical legs by means of a plurality of tie rods made of non-magnetic material passed through said central hole and through said cross-bars and spacing washers placed at regular intervals along the tie rods so as to prevent them from vibrating.



4,415,875

## CIRCUIT BREAKER

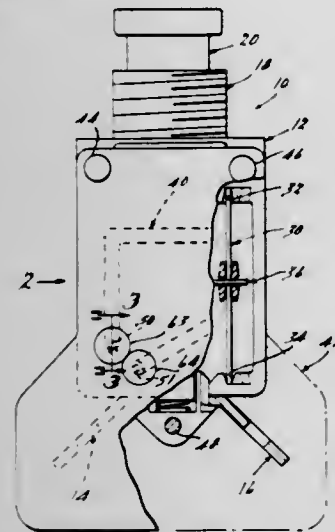
Joseph F. Kirkup, Parma, and Randall A. Horning, Jackson, both of Mich., assignors to Mechanical Products, Inc., Jackson, Mich.

Filed May 18, 1982, Ser. No. 379,283

Int. Cl.<sup>3</sup> H01H 71/16

U.S. Cl. 337—62

3 Claims



1. An electrical circuit breaker comprising:
  - a housing;
  - a pair of external terminals supported by said housing for connection to a source of electrical current;
  - an internal fixed contact supported by said housing connected to one of said terminals;
  - a contact carrier having a movable contact thereon which is movable with respect to said housing to a closed position wherein said movable contact is engaged with said internal contact;
  - current responsive means supported internally of said housing and electrically connected to said terminals when said movable contact is engaged with said fixed contact and responsive to current flow therethrough to effect separation of said contacts upon the occurrence of a predetermined electrical condition and,
  - a fusible element disposed externally of said housing and electrically connected in series with said contacts and operable to effect interruption of the electrical circuit through said circuit breaker upon failure of said current responsive means.

4,415,876

## GAS SENSOR

Eturo Yasuda; Mitsuru Asano, and Minoru Ohta, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

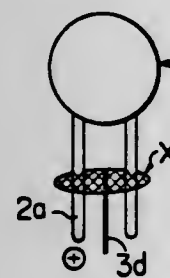
Filed Jan. 23, 1981, Ser. No. 227,780

Claims priority, application Japan, Jan. 25, 1980, 55-8200

Int. Cl.<sup>3</sup> G01N 27/12; H01C 1/02

U.S. Cl. 338—34

4 Claims



1. A gas sensor comprising: a gas sensing element of which electrical resistance changes in accordance with gas components contained in sensing gas; a pair of lead members attached to said gas sensing element for reading an electrical resistance of said gas sensing element; a ceramic member in a tubular metallic body that is connected to ground, said gas sensing

element being held at one end of said ceramic member which has a pair of throughholes for allowing said pair of lead members to pass therethrough; and a conductive member provided at said one end of said ceramic member and near said gas sensing element between the pair of said lead members, said conductive member being connected to ground, whereby when a deposit of conductive material builds up on said one end of said ceramic member and across said pair of lead members, the electrical resistance of said gas sensing element can be measured correctly.

4,415,877

## GAS SENSING ELEMENT

Akio Takami; Tsutomu Saito; Toshifumi Sekiya, and Hideo Kudo, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

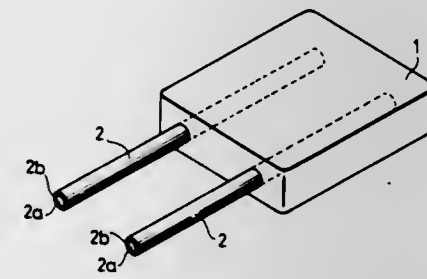
Filed Apr. 23, 1982, Ser. No. 371,343

Claims priority, application Japan, Apr. 25, 1981, 56/63175

Int. Cl.<sup>3</sup> H01L 7/00

U.S. Cl. 338—34

7 Claims



1. A gas sensing element, comprising:
  - a semiconductor formed of a sintered metal oxide and having an electrical resistance varying with a gas component to be sensed;
  - a pair of lead electrodes embedded in said semiconductor, each of said electrodes comprising a nickel wire core and a cover layer surrounding said core, said cover layer comprising an alloy essentially containing platinum metal and including at least one low catalytic metal in a range of from 1 to 10% by weight.

4,415,878

## PARTIAL PRESSURE OF OXYGEN SENSOR-III

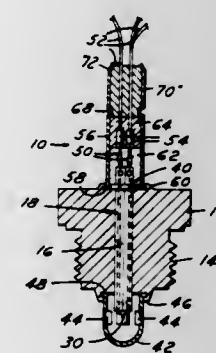
Robert F. Novak, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,412

Int. Cl.<sup>3</sup> H01L 7/00

U.S. Cl. 338—34

5 Claims



1. A partial pressure of oxygen sensor for insertion into an exhaust system of a hydrocarbon fuel burning device, comprising in combination:
  - a mounting body formed of a metallic material threaded on one end for securement to the exhaust system and having a cylindrical configured bore of a first diameter extending along a central axis thereof;

4,415,879

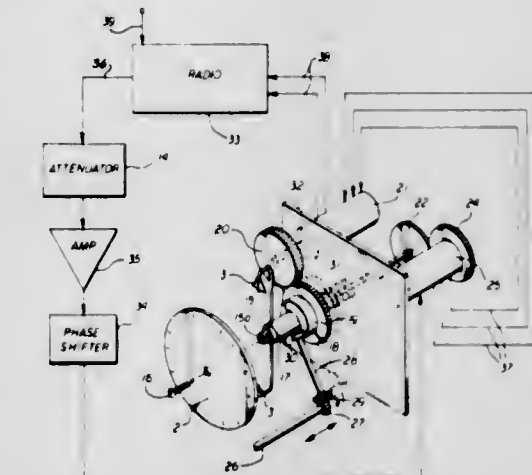
AIRCRAFT FLIGHT INSTRUMENT DISPLAY SYSTEM  
Robert H. Brady, Houston; Michael L. Beaumont, Deer Park, and Arthur C. Pettis, Houston, all of Tex., assignors to Aviation Instrument Manufacturing Corporation, Austin, Tex.

Filed Mar. 2, 1981, Ser. No. 239,422

Int. Cl.<sup>3</sup> G08G 5/00; B64D 45/04

U.S. Cl. 340—27 NA

22 Claims



a heated sensing element including: a ceramic support of generally circular cross section having a pair of openings extending therethrough, a sensing element supporting wire having (a) a pair of leg portions extending through said pair of openings of said ceramic support, and (b) a support portion intermediate said leg portions thereof in juxtaposition to a free end of said ceramic support, a titania dioxide sensing element mounted upon said support portion of said sensing element supporting wire, a resistance heater element wrapped around said ceramic support so that said resistance heater element heats said sensing element to a required temperature when a preselected voltage is applied across said resistance heater element, and a locating ring bonded to a rear portion of said heated sensing element, said heated sensing element having a diameter slightly less than said first diameter of said cylindrical configured bore of said mounting body so that said heated sensing element may be received within said cylindrical configured bore with said locating ring locating said heated sensing element in a manner such that said titania dioxide sensing element thereof extends beyond said cylindrical bore of said threaded end of said mounting body;

- a first protection tube secured to said threaded end of said mounting body for protecting said titania dioxide heating element, said first protection tube having openings therein for permitting exhaust gases to pass therethrough and come into contact with said titania dioxide sensing element;
- a plurality of fine electrical lead lines, a pair of said fine lead lines being bonded to and extending from said resistance heater element and a pair of said fine lead lines being bonded to and extending from said sensing element supporting wire;
- a plurality of electrical lead lines equal in number to said fine electrical lead lines;
- a plurality of crimped bands, each of said crimped bands for interconnecting paired ones of said electrical lead lines and said fine electrical lead lines;
- a ceramic insulator body having a plurality of passageways therein equal in number to said plurality of said crimped bands, said passageways being so constructed and arranged that each of said passageways have an associated pair of said interconnected leads passing therethrough with said crimped band interconnecting the same coming into locating engagement with the side walls defining said associated passageway;
- a second protection tube means having one end secured to an end of said mounting body not having said threads thereon for enclosing and protecting said ceramic insulator body and elements received therein and passing therethrough;
- a ceramic cement occupying a volume between said ceramic insulator body and a rear portion of said heated sensing element received in said cylindrical configured bore of said mounting body;
- a high temperature resistant sealant material occupying a volume between said ceramic insulator body and a free end of said second protection tube means; and
- electrical terminal means connected to said plurality of electrical lead lines for independently connecting said lead lines as required to a source of voltage and to a sensing current.

1. An aircraft indicator apparatus for providing heading and course information integrated in one instrument comprising:
  - (a) a gyro for providing heading information,
  - (b) a compass card,
  - (c) a direct drive means connecting said gyro and said compass card,
  - (d) compass setting means for independently setting said compass card and erecting and caging said gyro,
  - (e) course selector means clutch coupled to said compass card for adjusting the desired course without caging said gyro, independently of said compass card and gyro.

4,415,880

## CHARACTER RECOGNITION METHOD AND APPARATUS

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 28, 1980, Ser. No. 115,986

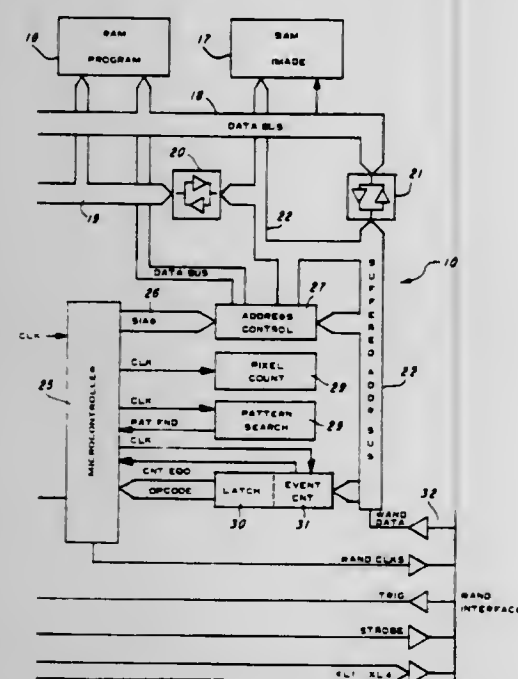
Int. Cl.<sup>3</sup> G06K 9/46

U.S. Cl. 382—27

17 Claims

1. A method of character recognition of a character from a memory means arranged in columns and rows of pixels, comprising the steps of:
  - (a) forming a window around an unknown character, the window being defined by the memory addresses of at least two of the corners;
  - (b) assigning a weight number to each pixel within the window;
  - (c) penetrating the window by counting pixels inwardly from each side for predetermining rows, and from top and bottom of the window for predetermining columns until a transition from white (0) to black (1) occurs;
  - (d) summing the white pixel weight numbers for each penetration until the transition occurs to form a sum for the total number of penetrations from each side and from top and bottom of the window;
  - (e) combining the sums;
  - (f) categorizing the combination;



[illegible]

## 4,415,881 -ANALOG CONVERTER

Int. Cl.<sup>3</sup> H03K 13/02  
U.S. Cl. 340—347 AD

### 3 Claims

(b) a selector unit having a plurality of signal inputs, each input being connected to a respective one of said filter capacitors, and an output for delivering a sampling signal

wherein said grounded network is designed such that it is capable of both storing a sampling signal during the corresponding sampling interval, and simulating a common resistance consecutively associated with a respective one of the filter capacitors to form an individually dedicated resistor-capacitor filter circuit during each of the sampling intervals.

## 4.415.882

## ANALOG TO DIGITAL CONVERTER

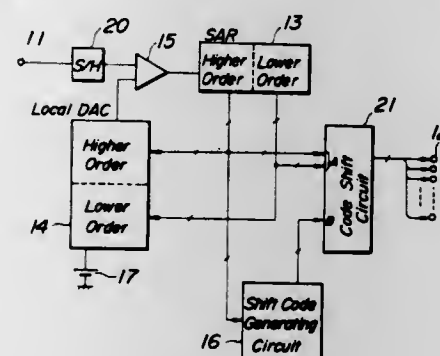
Filed Sep. 3, 1981, Ser. No. 299,121

Claims priority, application Japan, Jul. 31, 1981, 56-108136

Int. Cl.<sup>3</sup> H03K 13/02

U.S. Cl. 340—347 AD

## 8 Claims



a second digital to analog converter for generating a full scale output as an output of lower order bits which is always larger than every quantizing level of said first

a code shift circuit coupled to said successive approximation register and said code shift generating circuit for digitally shifting said higher and lower order portions of said digital code from said successive approximation register in accordance with said shift code from said shift code generating circuit to generate an analog to digital conversion output signal.

## 4.415.883

**CIRCUIT ARRANGEMENT FOR CONVERTING DIGITAL  
SIGNALS IN PARTICULAR PCM SIGNALS, INTO  
CORRESPONDING ANALOG SIGNALS WITH A R-2R  
CHAIN NETWORK**

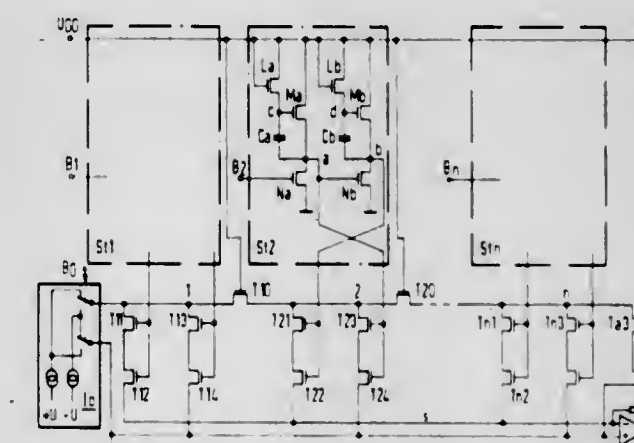
**Int. Cl.<sup>3</sup> H03K 13/02**

U.S. Cl. 340—347 DA

## 2 Claims

1. In a circuit arrangement for converting multibit digital signals into analog signals, of the type in which a R-2R ladder network includes series resistors each having a resistance value

the shunt resistors divided into first and second pairs on each side of a series resistor; a sum line connected to a first shunt resistor of each pair at the ends opposite to those ends connected to a series resistor and said reference terminal connected to the second shunt resistor of each pair at the end which is not connected to a series resistor, said sum line and said reference terminal providing an analog signal output;



said transistors of said series resistors including gates connected to an operating voltage for providing constant conduction and the transistors of said shunt resistors connected to receive signals representing the digital signals to be converted.

4.415.884

# DIAGNOSTIC CIRCUIT FOR PROGRAMMABLE LOGIC SAFETY CONTROL SYSTEMS

Filed Oct. 7, 1981, Ser. No. 309,287

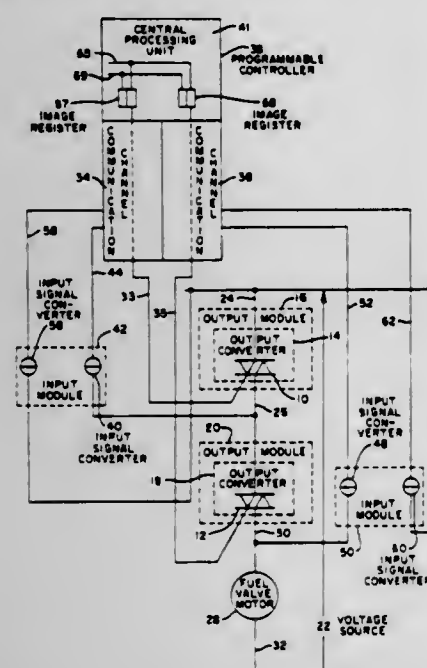
Int. Cl.<sup>3</sup> G08B 23/00

of U.S. Cl. 340—500 18 Claims

1. In a programmable controller based logic system having an alarm system for alarming malfunctions, an alternating current voltage source, first and second image registers, electronic input and output modules, said output modules containing solid state switches capable of switching the output module load power, and first and second output module solid state switches connected in series to energize and deenergize an energize-to-start, deenergize-to-stop field device, a method of operating a programmable controller based logic system comprising:



- a. monitoring said first image register, said second image register and the integrity of the series combination of said first and second solid state switches;
- b. independently of and simultaneously with step (a), monitoring said first image register and the integrity of said first solid state switch;



- c. independently of steps (a) and (b), monitoring intermittently said second image register and the integrity of said second solid state switch; and
- d. alarming an unsafe condition whenever said monitoring indicates the failure of said first image register, and second image register, said first solid state switch, said second solid state switch or the series combination of said first solid state switch and said second solid state switch.

#### 4,415,885 INTRUSION DETECTOR

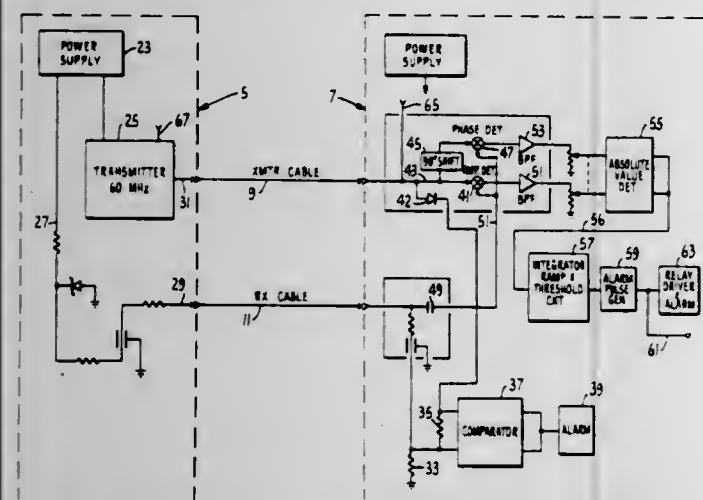
Ronald W. Mongeon, San Jose, Calif., assignor to Stellar Systems, Inc., San Jose, Calif.

Filed May 21, 1981, Ser. No. 265,903

Int. Cl.<sup>3</sup> G08B 13/24

U.S. Cl. 340—552

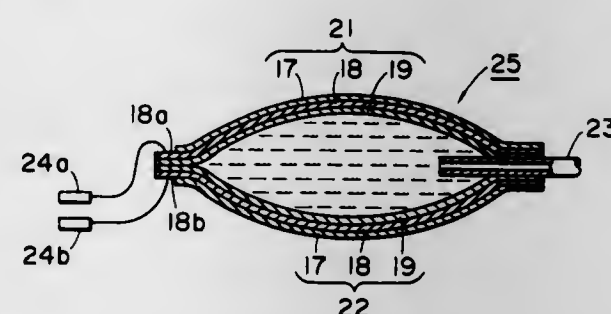
7 Claims



1. An intrusion alarm system comprising in combination:
- a. RF generator and means for feeding an unmodulated output from said generator to a leaky transmission line,
- b. a leaky receiving line roughly paralleling said transmission line and leading to a receiver,
- c. means for feeding a DC voltage through said receiving line,
- d. rectifying means for developing a DC voltage from the RF on said transmission line,
- e. first alarm means comprising a comparator for comparing

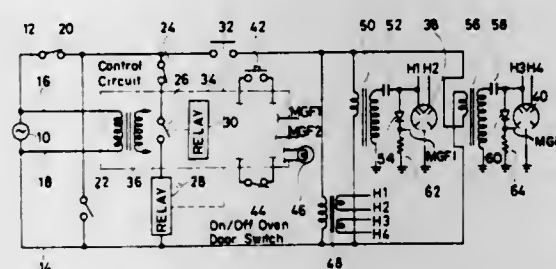
- the DC voltages from (c) and (d) and sounding an alarm if the voltages differ substantially from a target value,
- f. second alarm means comprising:
- (i) means for feeding the RF output from the receiving line to an inphase detector,
- (ii) means for shifting the phase of the RF output 90° and feeding the phase shifted output to a quadrature detector,
- (iii) feeding the output of the inphase and quadrature detectors to an absolute value detector which acts as an OR gate whereby
- (iv) said second alarm means actuated by a perturbation in either the inphase or quadrature detectors.

4,415,886  
RESIDUAL INK DETECTION MECHANISM  
Hiroshi Kyogoku, Yokohama; Shigemitsu Tazaki, Matsudo; Koji Terasawa, Mitaka, and Shigeru Okamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 6, 1981, Ser. No. 290,505  
Claims priority, application Japan, Aug. 12, 1980, 55-109805  
Int. Cl.<sup>3</sup> G08B 21/00  
U.S. Cl. 340—618  
5 Claims



1. A residual ink detection mechanism, comprising: an ink housing case made of a flexible material and being formed into a closed bag which deforms in accordance with the amount of ink therein, said ink housing case having at least two electrodes with each one provided at opposite portions of said ink housing case; a pair of contacts each one of said pair of contacts connected to a different electrode; and means connected to said pair of contacts, for detecting the amount of ink in said ink housing case by detection of the electrostatic capacity between said electrodes.

4,415,887  
MAGNETRON FAULT ALARM IN A MICROWAVE OVEN  
Yoshitaka Kawase, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan  
Filed Apr. 14, 1981, Ser. No. 254,172  
Claims priority, application Japan, Apr. 17, 1980, 55-51276  
Int. Cl.<sup>3</sup> G08B 21/00; H05B 6/64  
U.S. Cl. 340—635  
5 Claims

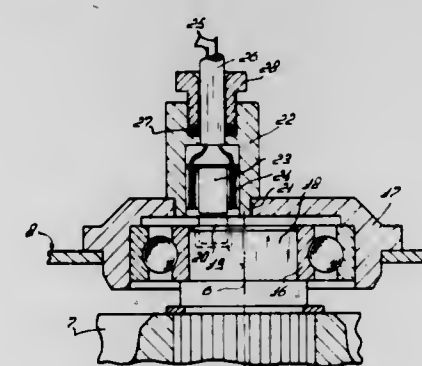


1. A fault condition alarm system in a microwave oven which includes an oven door, a plurality of magnetrons and a plurality of detection means associated with each of said plurality of magnetrons for developing a detection signal when

the magnetron is placed in a fault condition, said fault condition alarm system comprising:

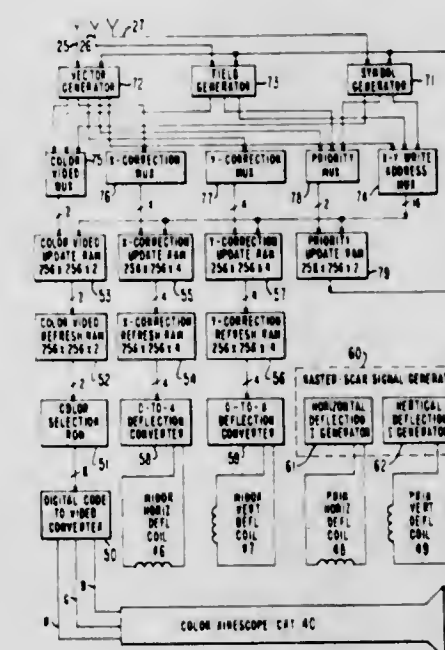
- first determination means for developing a first determination signal when a said detection signal is not developed from any of said plurality of detection means, said first means developing a second determination signal when at least one detection signal is developed from one of said plurality of detection means;
- door condition monitoring means for monitoring whether said oven door is open or closed;
- second determination means responsive to said first determination means and said door condition monitoring means for developing a control signal when said second determination signal is developed and said door is determined to be closed; and
- display means responsive to said control signal derived from said second determination means.

4,415,888  
MONITORING DEVICE FOR MACHINE PARTS  
Cornelis van der Lely, 7, Briischenrain, Zug, Switzerland  
Continuation of Ser. No. 4,539, Jan. 18, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 221,032  
Claims priority, application Netherlands, Jan. 20, 1978, 7800715  
Int. Cl.<sup>3</sup> G08B 21/00  
U.S. Cl. 340—684  
11 Claims



1. A ground working machine comprising a frame, a portion of said frame mounting a plurality of soil working tools, driving means connected to rotate said tools about respective upwardly extending axes defined by corresponding shafts for said tools, monitoring means adjacent said driving means and said monitoring means including an electrical generating device in a circuit, said device independently generating electrical current to a signal element in said circuit responsive to the rotational movement of a said shaft of at least one of said tools, said shaft having an upper end journaled in a bearing supported by a bearing housing at the upper side of said frame portion, said device comprising two parts including an inductance part and a permanent magnet part, said magnet part being held in a bore in said upper shaft end and positioned off center with respect to the said axis of said shaft's rotation, said inductance part being mounted in the top of said bearing housing, located adjacent and above said upper shaft end, said inductance part being positioned off center with respect to the shaft axis of rotation whereby the rotational movement of said shaft relative to said inductance part generates a current during the normal rotation of said tool shaft and said signal element is actuated.

4,415,889  
RASTER-SCANNED CRT DISPLAY SYSTEM WITH IMPROVED POSITIONAL RESOLUTION FOR DIGITALLY ENCODED GRAPHICS  
William J. Davis, Thousand Oaks, Calif., assignor to RCA Corporation, New York, N.Y.  
Filed Dec. 18, 1980, Ser. No. 217,843  
Int. Cl.<sup>3</sup> G09G 9/16  
U.S. Cl. 340—728  
13 Claims



1. A raster-scanned display system with improved positional resolution comprising:
- a cathode ray tube provided with an electroluminescent screen and with a first electron gun connected for responding to a first video signal to project a first electron beam of varying intensity towards its screen;
- a raster scanning signal generator means for generating recurrent first and second deflection current signals varying at respective sweep rates that are relatively slow and relatively fast respective to each other;
- a first principal deflection winding connected to conduct said first deflection current signal and arranged for responding to said first deflection current signal to deflect each electron beam of said cathode ray tube to sweep its screen in directions parallel to a first axis;
- a second principal deflection winding connected to conduct said second deflection current signal and arranged for responding to said second deflection current signal to deflect each electron beam of said cathode ray tube to sweep its screen in directions parallel to a second axis orthogonal to the first;
- means for generating a stream of individual pixel information as digital code words;
- means for applying said first video signal to said cathode ray tube responsive to a first portion of each digital code word;
- means responsive to a second portion of each digital code word for generating a first minor deflection signal capable of varying at video rate; and
- first auxiliary deflection means for responding to said first minor deflection signal to deflect each electron beam of said cathode ray tube in directions parallel to said first axis across its screen by amounts smaller than the sweeps parallel to said first axis afforded by said first principal winding in the interval between successive sweeps in said second direction.



4,415,890

**CHARACTER GENERATOR CAPABLE OF STORING CHARACTER PATTERNS AT DIFFERENT ADDRESSES**  
 Sadao Iwakura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

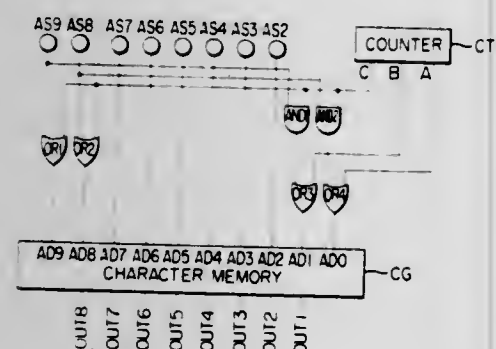
Filed May 23, 1980, Ser. No. 152,734

Claims priority, application Japan, May 31, 1979, 54-73664[U]

Int. Cl.<sup>3</sup> G09G 1/16

U.S. Cl. 340—749

5 Claims



1. A character generator capable of storing character patterns at different addresses, comprising:

- memory means for storing character patterns corresponding to characters, each of said character patterns including a plurality of elements, an element of each plurality of elements comprising one of said character patterns being stored at a location in said memory means separate and spaced from the location of storage in said memory means of the remainder of said plurality of elements comprising said one of said character patterns;
- signal generating means for generating signals corresponding to the number of said plurality of elements;
- address signal generating means for generating address signals for obtaining access to each of said character patterns stored in said memory; and
- address conversion means for gaining access to each element of each of said character patterns stored in said memory means in accordance with said address signals generated by said address signal generating means and the signals generated by said signal generating means.

4,415,891

**PROGRAMMABLE SCAN CONTROL CIRCUIT FOR PROVIDING BAR GRAPH DISPLAY PANEL WITH SELECTED SCALES AND MARKER BARS**

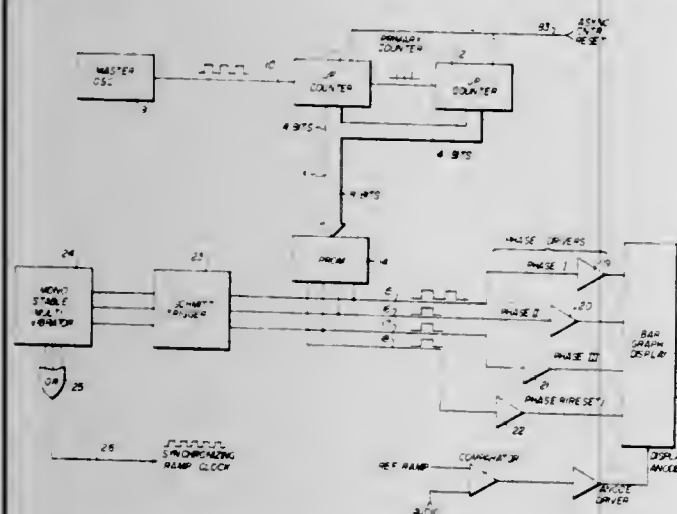
Thomas M. Hay, III, Fort Lauderdale, Fla., assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,599

Int. Cl.<sup>3</sup> G09G 3/06

U.S. Cl. 340—753

8 Claims



1. A programmable display device comprising a bar graph

display panel having an anode and a series of spaced cathodes connected in groups defining phases and a reset cathode at one end of said series; and a scan control circuit for said panel including a first programmable memory means having an output for providing a clocking waveform including a plurality of phase pulses and a reset pulse, clocking means for addressing said first programmable memory means to develop said plurality of phase pulses and said reset pulse in a repeating cathode scanning cycle, means including second programmable memory means operated synchronously with said phase pulses for generating an analog ramp voltage of a slope and dynamic range determined by said second programmable memory means, comparator means for comparing said ramp voltage to a d.c. voltage representing an audio program level to provide an output voltage for energizing said anode in each said cathode scanning cycle for an interval thereof in which said d.c. voltage exceeds said ramp voltage, and means for applying said phase pulses and said reset pulse to said series of cathodes in each said cathode scanning cycle to provide a glow in said bar graph display panel during the energization of said anode with the length of such glow being representative of said d.c. voltage.

4,415,892

**ADVANCED WAVEFORM TECHNIQUES FOR PLASMA DISPLAY PANELS**

Michael J. Marentic, Orange, Calif., assignor to Interstate Electronics Corporation, Anaheim, Calif.

Filed Jun. 12, 1981, Ser. No. 273,094

Int. Cl.<sup>3</sup> G09G 3/28

U.S. Cl. 340—767

28 Claims



1. A brightness control circuit for an AC plasma panel system, comprising:

- means for generating a plurality of partial waveforms;
- means for assembling groups of said partial waveforms sequentially to generate complex waveforms for driving a cell of said panel; and
- means for controlling said assembly means to select and combine partial waveforms into said complex waveforms to provide different levels of light emission.

4,415,893

DOOR CONTROL SYSTEM

Manfred W. Roland, Mountain View, and Max G. Roland, Redwood City, both of Calif., assignors to All-Lock Electronics, Inc., New Brunswick, N.J.

Continuation of Ser. No. 919,703, Jun. 27, 1978, abandoned.

This application Mar. 16, 1981, Ser. No. 243,739

Int. Cl.<sup>3</sup> H04Q 9/00

U.S. Cl. 340—825.31

12 Claims

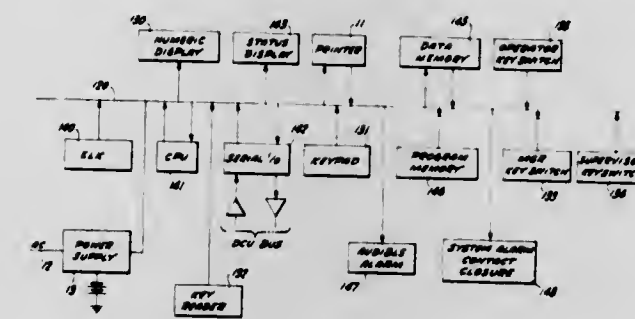
1. A door control system for selectively controlling the locking and unlocking of a plurality of doors, comprising:

- a door locking means at each of said doors for locking or unlocking that door,
- a door control means located at each of said doors for operating the door locking means at that door to unlock that door,

each said door control means including:

- a microprocessor having means for storing a plurality of key codes, any one of which is capable of permitting unlocking of the door locking means at that door,
- key receiving means for receiving a key having a predetermined code thereon, key reading means for sensing that code and comparing means for comparing

that code to the said code or codes stored in the microprocessor of that door, said sensing and comparing means being operable by referring to the microprocessor of that door control means, whereby upon matching of a key code and a code stored in that microprocessor, a signal is generated to unlock the door locking means, (3) a battery means for operating its respective microprocessor, to generate a signal, in the absence of external power, (4) said key receiving means including means for operating the unlocking means to unlock the door, by manual movement of the key, while still in the key receiving means, after said signal has been generated, and a master control means located at a master station remote from said doors, means for providing two way electrical communication between the master control means and all of said door control means, said two way communication



including means for transmitting from each door control means to the master control unit (a) a return signal verifying the code stored at that door control means and (b) an information signal concerning a condition in the vicinity of that door control means, said master control means having means for reading the code of a key which has a predetermined key code thereon, and said master control means further having:

- (1) means for causing a first predetermined key code to be stored in any one door control means of the system,
- (2) means for causing one or more additional predetermined key codes to be stored in a group of door control means of the system, and
- (3) means for cancelling any predetermined key code from the memory of a single door control means, from the memories of any group of door control means or from the memories of all said door control means.

4,415,894

**SWITCHING CIRCUITRY FOR LOAD CONTROL UTILIZING MOS-FETS**

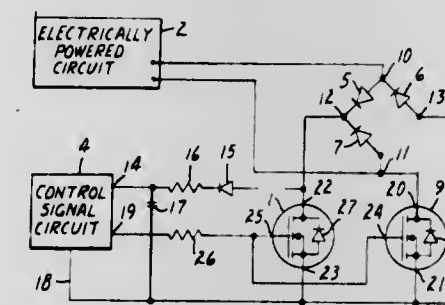
Daryl D. Dressler, and Jimmy L. Flaia, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 27, 1982, Ser. No. 453,276

Int. Cl.<sup>3</sup> H04Q 9/00; H03K 17/00

U.S. Cl. 340—825.57

2 Claims



1. An improved switching circuit for supplying d.c. power from an electrically powered circuit to a control circuit, the control signal circuit having an output providing logic 1 or logic 0 signals, the switching circuit including a full-wave rectifier having four diodes with the input of the full-wave

rectifier connectable for energization from the electrically powered circuit, the output of the full-wave rectifier connectable to the control signal circuit via a power storage circuit portion and a switch means connected to the full-wave rectifier, the switch means having a control electrode connectable to the output of the control signal circuit, said switch means operable in response to the presence of a logic 1 signal presented to the control electrode for establishing a low impedance path across the input of the full-wave rectifier, the improvement including two power metal-oxide-semiconductor field-effect transistors connected for providing the function of the switch means plus that of at least one of the four diodes of the full-wave rectifier, each of said power metal-oxide-semiconductor field-effect transistors having a drain electrode, a source electrode, a gate electrode, the source electrodes of said metal-oxide-semiconductor field-effect transistors connected together to provide one output connection for the full-wave rectifier with at least one of the drain electrodes connected to the full-wave rectifier to connect one of said two power metal-oxide-semiconductor field-effect transistors for providing a diode function in the full-wave rectifier, and said gate electrodes connectable to the output of the control signal circuit providing logic 1 or logic 0 signals, said power metal-oxide-semiconductor field-effect transistors responsive to a logic signal from the control signal circuit to establish the low impedance path across the input to the full-wave rectifier.

4,415,895

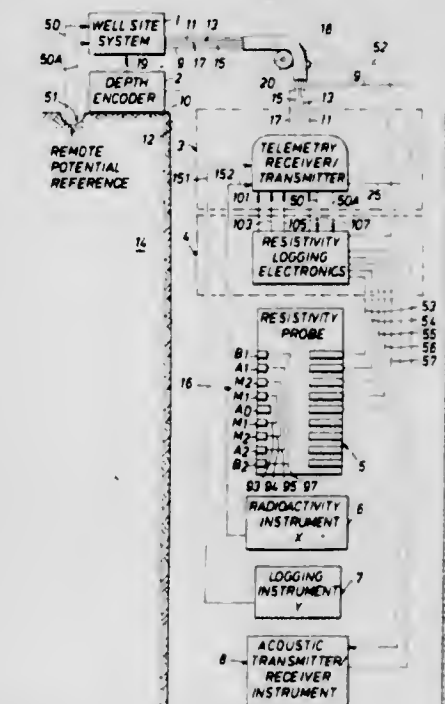
**WELL LOGGING DATA TRANSMISSION SYSTEM**  
 Jack J. Flagg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 11, 1981, Ser. No. 233,355

Int. Cl.<sup>3</sup> G01V 1/40, 3/13; E21B 29/02

U.S. Cl. 340—856

19 Claims



1. Apparatus for investigating the subsurface earth materials traversed by a logging sonde along a borehole, comprising a logging sonde,

surface telemetry means for generating and receiving logging information signals, said surface telemetry means comprised of first generator means for generating first pulsed acoustic logic logging information signals at said surface and first pulse receiver means for receiving second pulsed logging information signals from said sonde, subsurface telemetry means disposed within said sonde for said generating and receiving logging information signals, said subsurface telemetry means comprised of second pulse generator means for generating digital pulse code modulated signal as said second signals at said sonde,



second pulse receiver means for receiving said first signals, and  
transmission means comprised of first conductor means electrically connected between said surface and subsurface telemetry means for transmitting pulsed signals correlative to said first and second signals between said surface telemetry means and said subsurface telemetry means, and second conductor means for simultaneously transmitting a low level analog potential signal as a third logging signal between said surface telemetry means and said subsurface telemetry means.

4,415,896

## COMPUTER CONTROLLED ENERGY MONITORING SYSTEM

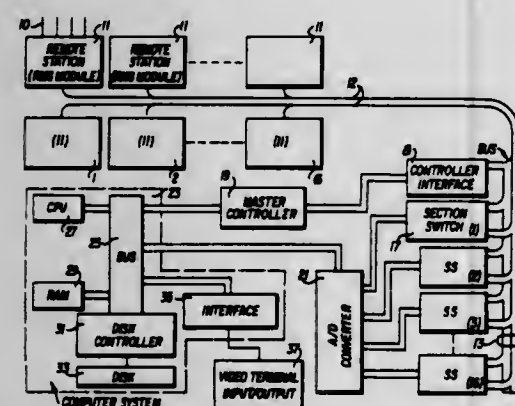
Marvin D. Allgood, Oxon Hill, Md., assignor to ADEC, Inc., Oxon Hill, Md.

Filed Jun. 9, 1981, Ser. No. 272,011

Int. Cl.<sup>3</sup> G08C 19/00, 19/04, 19/10; G08B 21/00

U.S. Cl. 340—870.03

84 Claims



1. A data communications system comprising:  
at least one communications channel;  
at least one group of remote stations connected to a respective communications channel, each remote station comprising a plurality of information channels and tone addressable means for selectively connecting one of said plurality of information channels to a respective communications channel, said tone addressable means comprising a tone detector for detecting clock tones on a respective communications channel, counting means for counting the number of clock tones detected, means for connecting one of said information channels to the respective communications channel in accordance with the number of clock tones which are counted, and means for enabling said connecting means only when the number of clock tones detected falls within a predetermined numerical range;
- a central station connected to each said communications channel and comprising means for sequentially supplying clock tones in common to each said communications channel to cause sequential connection of the information channels at said remote stations to a respective communications channel associated therewith, and means for transmitting a signal to or receiving a signal from an information channel which is connected to a respective communications channel.

4,415,897

## PRECISION CONTROL OF RF ATTENUATORS FOR STC APPLICATIONS

Henry R. Kennedy, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 21, 1981, Ser. No. 265,957

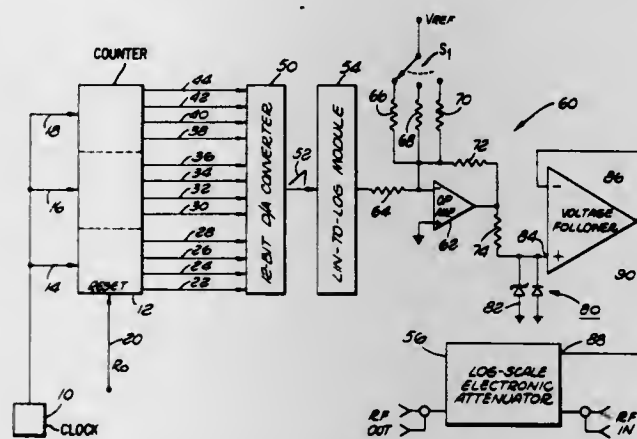
Int. Cl.<sup>3</sup> G01S 7/34

U.S. Cl. 343—5 SM

19 Claims

17. A radar system which transmits pulsed radio frequency signals and receives radio frequency echo signals following said transmitted pulses in time, including a sensitivity-time

control device operative on said received radio frequency signals to apply a varying attenuation within the receiving time period following each of said transmitted pulses, comprising:  
first means responsive to a reset signal marking the beginning of each receiving period following each corresponding transmitter pulse and to a source of clock pulses for generating a digital word of progressively changing value during at least a portion of said receiving time period;



- second means responsive to said first means digital word for generating an analog signal which is a logarithmic function of said progressive values of said digital word and including means for varying the rate of change of said analog signal; and  
third means in series with the radio frequency path conducting said received radio frequency signals, said third means being controllable to produce an RF attenuation which is a logarithmic function of said second means analog signal.

4,415,898

## METHOD OF DETERMINING THE MATERIAL COMPOSITION OF A DIELECTRICALLY COATED RADAR TARGET/OBSTACLE

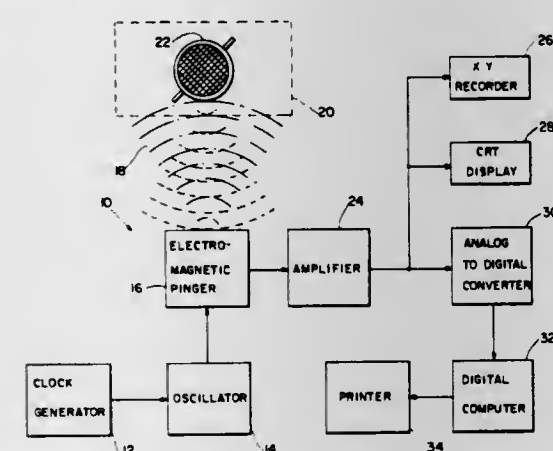
Guillermo C. Gaunard, Rockville, Md., and Herbert Überall, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1981, Ser. No. 278,294

Int. Cl.<sup>3</sup> G01S 13/00

U.S. Cl. 343—5 SA

4 Claims



1. A method of determining the material properties of a target/obstacle comprising the steps of:  
directing electromagnetic energy in the form of incident wave pulses having a known frequency spectrum at said target/obstacle creating thereon, electromagnetic oscillations including a set of modal resonances superposed thereon;  
receiving a portion of said incident wave pulses backscat-

tered from said target/obstacle and conditioning it into representative electrical signals;  
converting said electrical signals into an echo pattern ("radar cross-section") of said target/obstacle, said echo pattern being a plot of squared scattering amplitudes versus normalized frequency;  
subdividing said echo pattern into its partial-wave resonance components, each corresponding to a particular resonance mode;  
determining the background components of said partial-wave resonance components, said background components being the resonance response of a perfectly conducting scatterer of the same size of said target/obstacle, and said background components being obtained from said partial-wave components by setting the modal impedances ( $Z_n$ ) and admittances ( $Y_n$ ) equal to zero (0) and infinity ( $\infty$ ), respectively;  
subtracting each of said background components from each of said partial-wave resonance components of the same particular resonance mode, thereby isolating the resonances in the frequency spectrum which are the fundamental frequency and its overtones for each modal contribution; and  
measuring the asymptotic spacings between any two consecutive modal overtones and the asymptotic widths of any two consecutive modal overtones, said asymptotic spacings and said asymptotic widths being used to obtain the dielectric constant and the thickness of the coating layer covering the conducting core of said target/obstacle.

4,415,899

## MONITOR FOR AN INSTRUMENT-LANDING SYSTEM

Horst Vogel, Kornthal; Horst Idler, Stuttgart, and Arno H. Taruttis, Ludwigsburg, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

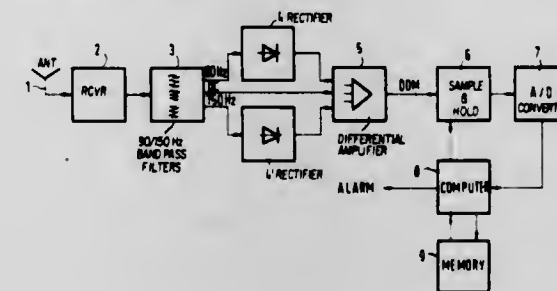
Continuation of Ser. No. 98,807, Nov. 30, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,216

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852506

Int. Cl.<sup>3</sup> G01S 1/16

U.S. Cl. 343—413

3 Claims



1. A monitor for a localizer of an instrument landing system, said localizer being of the type which radiates a pair of beams, one modulated at a first low frequency and the other at a second low frequency, the relative depths of modulation of each of said low frequencies detected in a receiver aboard an aircraft on landing approach providing a measure of the deviation of said aircraft from a desired landing course, said monitor comprising:

first means for receiving the radiations of said localizer and for developing a signal which is a continuous function of the difference in depth of modulation of said first and second low frequencies on said received radiations;  
second means for repetitively sampling and differentiating said continuous function to produce a frequency spectrum function  $S(\omega)$ ;  
third means responsive to the second means sampled values to identify differences of depth of said modulation in excess of a predetermined threshold;  
and fourth means activated by a signal corresponding to an over threshold signal from said third means for determin-

ing the absolute maximum of said  $S(\omega)$  in the range  $0 \leq \omega \leq \pi$  and for generating an equipment error alarm when said absolute maximum occurs at  $\omega = 0$ .

4,415,900

## CAVITY/MICROSTRIP MULTI-MODE ANTENNA

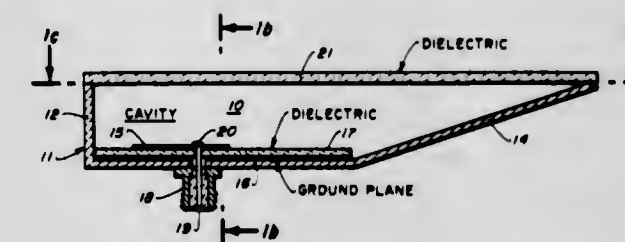
Cyril M. Kalol, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1981, Ser. No. 335,308

Int. Cl.<sup>3</sup> H01Q 1/38

U.S. Cl. 343—700 MS

17 Claims



1. A waveguide cavity and microstrip multi-mode antenna system for providing control over and for producing complex and improved radiation patterns, comprising:  
a. a section of rectangular waveguide being closed at each end and having an opening in one broad surface thereof to form a cavity therein;  
b. a microstrip radiating element being formed above a ground plane at the bottom of said waveguide cavity; said microstrip radiating element being spaced from said ground plane by a dielectric substrate;  
c. said microstrip radiating element being fed from a single coaxial-to-microstrip adapter the center pin of which passes through the bottom of said waveguide to the radiating element feedpoint;  
d. said microstrip radiating element being excited by microwave energy via said coaxial-to-microstrip adapter and in turn said microstrip radiating element exciting said waveguide cavity in a predetermined manner;  
e. the forward end of said waveguide cavity being closed with a ramp formation which acts to aid propagation of radiating waves in a forward direction, thereby reducing reflection from an abrupt continuity due to a square end closure.

4,415,901

## LOW POWER BEAM SWITCHABLE ANTENNA ARRANGEMENT

Michael J. Gans, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 21, 1981, Ser. No. 303,837

Int. Cl.<sup>3</sup> H01Q 19/06, 19/17

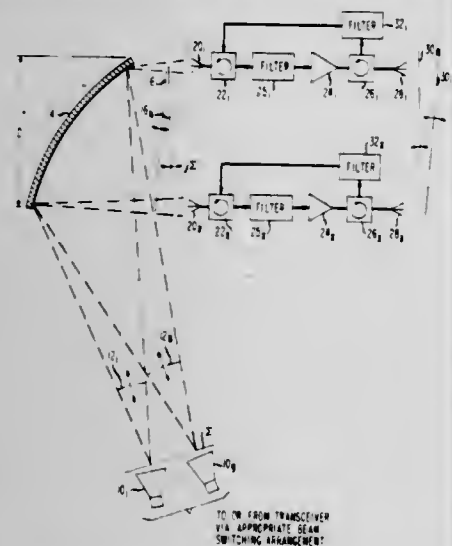
U.S. Cl. 343—754

2 Claims

1. A low power, beam switchable, antenna arrangement comprising:  
a focusing reflector (14) comprising a predetermined aperture and being capable of converting a spherical wavefront into a planar wavefront at the aperture thereof; and a plurality of feedhorns (10<sub>1</sub>-10<sub>N</sub>), each feedhorn being capable of radiating a spherical wavefront (12) in a beam of electromagnetic energy for reflection by the focusing reflector into a planar wavefront (16) at the aperture thereof  
characterized in that  
the plurality of feedhorns are disposed beside each other on a surface ( $\Sigma$ ) adjacent to but not forming part of a focal surface of the focusing reflector, and the beams of electromagnetic energy capable of being radiated by the plurality of feedhorns are each of a low power level, the antenna arrangement further comprising:  
an amplifying array comprising:



- a plurality of first feed elements (20<sub>1</sub>-20<sub>x</sub>) forming a first planar array disposed to cover the aperture of, and be directed at, the focusing reflector on a fourier transform surface ( $\Sigma'$ ) of the surface on which the plurality of feed-horns are disposed for receiving a planar wavefront reflected by the focusing reflector;
- a plurality of second feed elements (28<sub>1</sub>-28<sub>x</sub>) forming a second planar array corresponding in configuration to the first planar array and disposed to cover the aperture of, and directed away from, the focusing reflector; and



- a plurality of amplifying means (24<sub>1</sub>-24<sub>x</sub>), each amplifying means interconnecting a separate corresponding feed element of the first and second planar arrays and being capable of amplifying a low power signal with its associated phase shift as received at the associated first feed element to a predetermined high power level for radiation by the associated second feed element of the second planar array to a remote destination receiver.

4,415,902

# ARRAY FOR REDUCING THE NUMBER OF ANTENNA ELEMENTS FOR RADIATING INSTRUMENT LANDING SYSTEM LOCALIZER SIGNALS

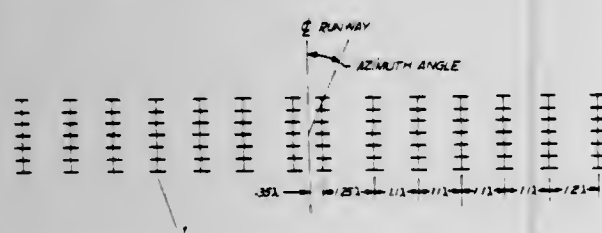
Robert W. Redlich, Athens, Ohio, assignor to The Government of the United States, Washington, D.C.

Filed Apr. 29, 1981, Ser. No. 258,793

Int. Cl.<sup>3</sup> H01Q 21/06

U.S. Cl. 343-844

1 Claim



1. A linear array of antennas for the purpose of radiating Instrument Landing System Localizer signals at a wavelength  $\lambda$ , said array being characterized by the combination of;
- (a) a course sideband radiation pattern having peaks at angles  $\pm\theta_0$  from a line perpendicular to the line of said array,  $\theta_0$  being typically between three and five degrees,
- (b) average spacing  $S$  between antennas such that  $S$  exceeds  $\lambda$ , with the consequence that spurious interferometer lobes appear in the course sideband array factor of said array at angles  $\pm\psi$  from a line perpendicular to the line of said array,  $\psi$  being determined from the formula

$$\psi = \sin^{-1}(\lambda/S - \sin \theta_0),$$

- (c) endfire antennas whose radiation pattern in a direction perpendicular to the line of said array is at least 12 decibels higher than the radiation from said antennas in a direction

at said angle  $\psi$  from a line perpendicular to the line of said array.

4,415,903

# ELECTRIC INK TRANSFER RECORDING METHOD

Toshiyuki Kawanishi, and Yukio Tabata, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

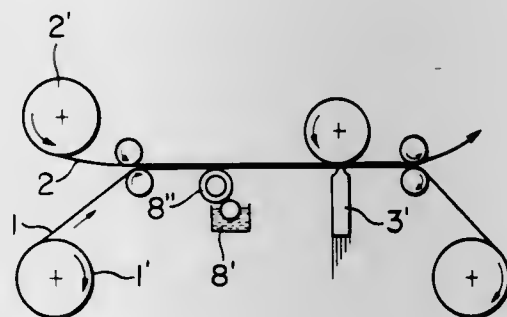
Filed Apr. 8, 1982, Ser. No. 366,812

Claims priority, application Japan, Apr. 16, 1981, 56-57514

Int. Cl.<sup>3</sup> G01D 9/00, 15/10

U.S. Cl. 346-1.1

6 Claims



1. An electric ink transfer recording method for obtaining a recorded matter which comprises putting together a sheet to be recorded and an ink sheet generating Joule's heat when electrified and having a thermo-melting ink layer; applying electricity to said ink sheet by contacting a return circuit electrode with the ink sheet and a recording electrode needle with the surface of the ink sheet and impressing pulse voltage thereupon; and transferring the ink from the ink sheet to the sheet to be recorded, characterized in that an insulating liquid is interposed between the ink sheet and the recording electrode needle when obtaining the recorded matter.

4,415,904

# THERMAL HEAD DRIVING METHOD

Toshiharu Inui, and Haruhiko Moriguchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1982, Ser. No. 372,353

Claims priority, application Japan, Apr. 30, 1981, 56/65488

Int. Cl.<sup>3</sup> G01D 9/00, 15/10

U.S. Cl. 346-1.1

7 Claims



1. In a method of driving a thermal head of a heat-sensitive recording device by applying driving energy at a first of two discrete energy levels, said thermal head being utilized to perform heat-sensitive recording of picture signals in a printing line onto a recording sheet which is in contact with said thermal head, the improvement comprising; detecting an occurrence of one or more non-print lines wherein no printing is to be carried out, and increasing said driving energy supplied to said thermal head from said first level to a second level for a plurality of printing lines to be printed immediately following said one or more non-print printing lines.

4,415,905

# ELECTROLYTIC PRINTING PROCESS WITH WEAR RESISTANT ELECTRODE

Joseph W. Mitchell, Montrose; Merrill W. Shafer, Yorktown Heights, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

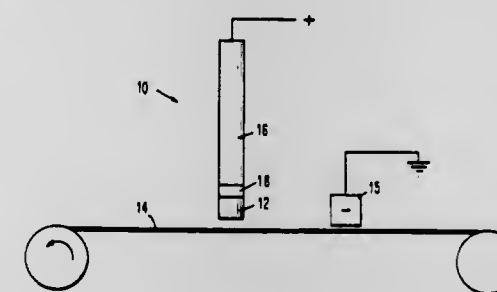
Continuation of Ser. No. 164,388, Jun. 30, 1980. This application

Feb. 10, 1983, Ser. No. 465,236

Int. Cl.<sup>3</sup> C25B 11/10, 11/08

U.S. Cl. 346-1.1

7 Claims



1. In a process for electrolytic printing on a printing medium, the improvement comprising: using an electrode having a region which is an oxide of metal from the group of Ru, Ir, Rh, Pt or an alloy thereof, said oxide region being at an extremity of the electrode which during printing is in close proximity to the printing medium.

4,415,906

# MAGNETIC RECORDING HEADS

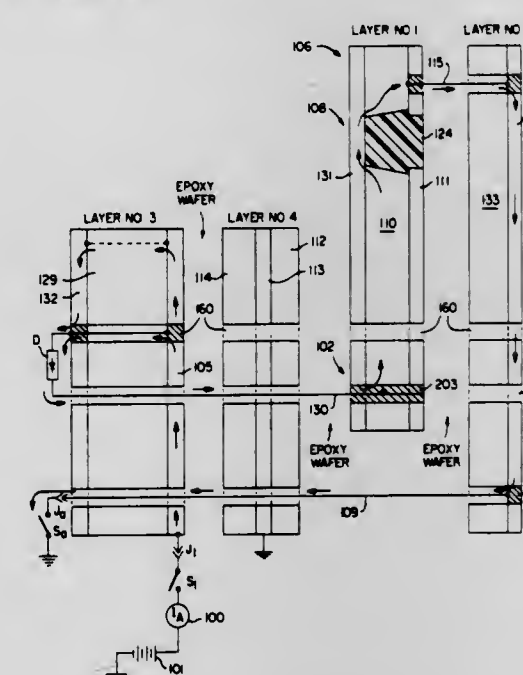
Houshang Rasekhi, Convent Station, N.J.; Alfred M. Nelson, Redondo Beach, Calif.; James P. Johnston, Wharton, N.J.; Frederick A. Rupinski, Lyndhurst, N.J., and Walter B. Hatfield, Jr., Fair Haven, N.J., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jul. 17, 1981, Ser. No. 284,045

Int. Cl.<sup>3</sup> G01D 15/12

U.S. Cl. 346-74.5

35 Claims



1. In a recording system having recording circuitry, the integral structure comprising a first member defining a multiplicity of recording elements arranged substantially in parallel with one another, each recording element having a defined recording zone of minute size forming a part of a first surface of said first member, with the recording zones of said recording elements being predeterminably arranged relative to one another; and a second member having a first surface which is contiguous at least in part with said first member, said second member also having a ground plane on a second surface

thereof with said ground plane positioned to substantially reduce inductance in the recording circuitry, and wherein the electrical resistance and inductance within said integral structure is substantially the same for each recording element.

4,415,907

# PRINTING PULSE CONTROL CIRCUIT FOR THERMAL PRINTING HEAD

Noboru Suemori, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

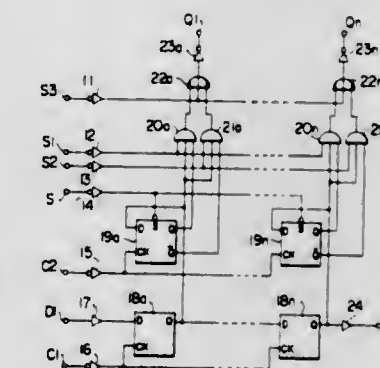
Filed Nov. 5, 1981, Ser. No. 318,394

Claims priority, application Japan, Nov. 7, 1980, 55-155952; Jun. 19, 1981, 56-93847

Int. Cl.<sup>3</sup> G01D 15/10

U.S. Cl. 346-76 PH

4 Claims



1. A printing pulse control circuit for a thermal printing head comprising:

n-bit latch circuits adapted to serially store an input data; latch circuits with set terminals adapted to store each bit information of said latch circuits as parallel information; a combination of first and second AND circuits which delivers out a first strobe signal of a larger pulse width when both the serial information stored in said latch circuits and said parallel information stored in said latch circuits with set terminals represent a first bit information and selects, in respect of each bit, a second strobe signal of a smaller pulse width than that of said first strobe signal when the serial information and the parallel information represent first and second bit informations, respectively;

OR circuits each connected to make the logical sum of the corresponding one of the outputs of said first and second AND circuits and a third strobe signal applied as a pre-heat pulse; and

inverter drive circuits each connected to the corresponding one of the outputs of said OR circuits, said latch circuits, latch circuits with set terminals, first and second AND circuits, OR circuits and inverter drive circuits being integrally formed on a single silicon chip.

4,415,908

# THERMAL PRINTER

Kenitiro Sugiura, Funabashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 269,884, Jun. 3, 1981, abandoned. This application Jul. 2, 1982, Ser. No. 394,790

Claims priority, application Japan, Jun. 13, 1980, 55-78964

Int. Cl.<sup>3</sup> G01D 15/10

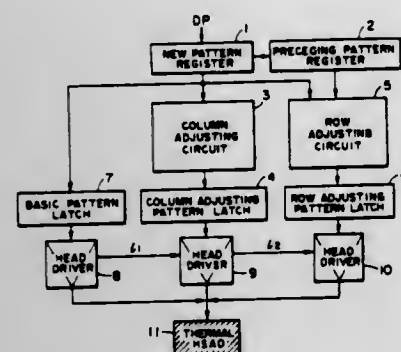
U.S. Cl. 346-76 PH

10 Claims

1. Thermal printer comprising:
- (a) a thermal head having a plurality of heat generating sections to record a pattern on a recording sheet;
- (b) a pattern memory for recording pattern information to selectively drive said plurality of heat generating sections in said thermal head;
- (c) adjusting means connected to said pattern memory, to discriminate said pattern informations for selectively driving at least three adjacent heat generating sections out of



said plurality of heat generating sections in said thermal head, and to generate adjusting pattern information which drive two heat generating sections out of said three heat generating sections; and



(d) means connected to said memory and said adjusting pattern means for supplying said pattern information stored in said pattern memory and said adjusting pattern informations to said thermal head.

4,415,909

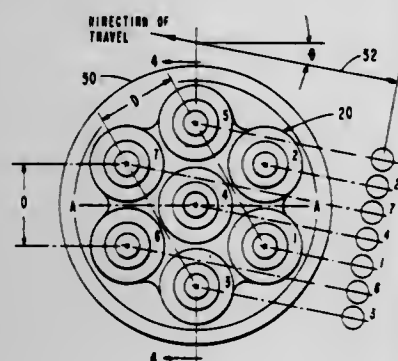
## MULTIPLE NOZZLE INK JET PRINT HEAD

Victor J. Italiano, Ithaca, and Steven P. Sayko, Dryden, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 26, 1981, Ser. No. 314,913

Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346-140 R



1. An ink jet print head comprising a housing and a plurality of print actuators arranged in a generally circular symmetrical pattern and including tubular members having nozzles axially parallel therewith and equally spaced whereby time of actuation of the respective actuators is time delayed to enable serial printing and equal dot spacing of dot matrix characters in columnar manner on record media spaced from said nozzles during travel of the print head in one direction.

4,415,910

## INK JET TRANSDUCER

John W. Reece, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 25, 1982, Ser. No. 342,256

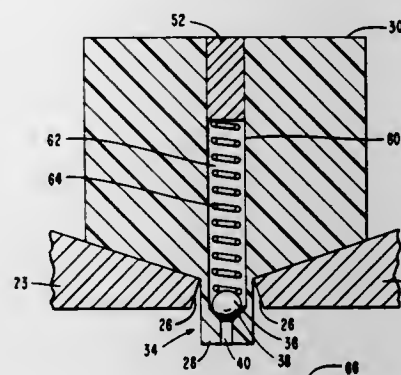
Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346-140 R

7 Claims

1. An ink jet printing element comprising a housing having a nozzle at one end thereof, means for supplying ink into said housing, valve means including a sloping seat portion formed at one end of the nozzle and a valve member operably associated with the seat portion, and

electromagnetic means including opposed magnetic pole portions positioned for actuating said valve member to



open said valve means and allow ejection of droplets of ink from said nozzle.

4,415,911

## RECORDING APPARATUS

Shigemitsu Tazaki, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 154,906, May 30, 1980, abandoned.

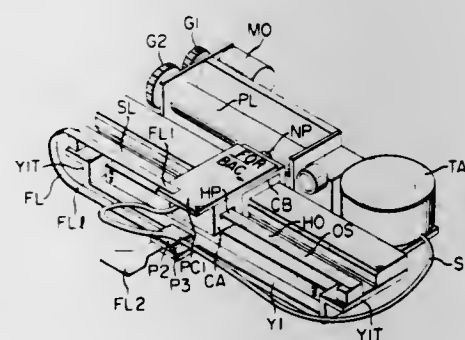
This application Jul. 29, 1982, Ser. No. 403,014

Claims priority, application Japan, Jun. 8, 1979, 54-72614

Int. Cl.<sup>3</sup> G01D 15/24

U.S. Cl. 346-140 R

6 Claims



1. A high speed recording apparatus comprising: linear motor means; a carriage driven reciprocally by said linear motor means and having a printing head thereon; a graduation plate connected to said linear motor means and positioned along the reciprocal movement path of said carriage; a graduation detecting means provided on said carriage for generating signals indicative of the position and advancing speed of said carriage along said graduation plate; and control means for controlling the movement of said carriage, which control means includes means for sensing the position and the advancing speed of said carriage from the signals generated by said graduation detecting means, means for regulating the advancing speed in accordance with the sensing means when said carriage is advanced in a predetermined direction, and means for disabling the regulating means when the advancement of said carriage is in a direction other than the predetermined direction.

4,415,912

## RECORDING METHOD AND RECORDING APPARATUS TO RECORD, ON A GREY SCALE, REPRESENTATIONS OF IMAGES UNDER CONTROL OF ELECTRICAL COMMAND SIGNALS

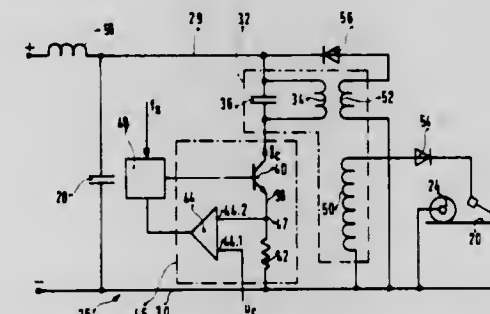
Stefan Kudelski, Le Mont-sur-Lausanne, and Jean-Claude Schlup, Cheseaux-sur-Lausanne, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 6, 1981, Ser. No. 223,000

Int. Cl.<sup>3</sup> G01D 15/08; H04N 1/22

U.S. Cl. 346-154

20 Claims



8. Apparatus for recording images in grey-scale representation of a variable command signal ( $U_c$ ) on a recording medium (16) having an insulating substrate (19) and a metallized coating (20) thereon, said apparatus including a recording electrode (22), means (18) passing said recording carrier beneath the recording electrode with the metallized coating in contact therewith, an electrical pulse generator (26) connected to said electrode (22) to form a writing circuit therewith and applying burn-out pulses to the electrode to burn out a portion of the metallized coating contacted by the electrode, and modulating means to modulate the burn-out pulses as a function of the desired burn-out surface of the zone being burned out beneath the electrode, comprising a storage means (32) storing electrical pulses from the pulse generator (26) and coupled to the electrode (22), said storage means including a voltage generating means (32) for providing pulses to said electrode, and thus providing electrical energy to the electrode under control of and as a function of said command signal, said storage means storing and providing said pulses at a level which enables the energy to be released at a voltage level which is at least as high as that required for vaporization or sublimation of metal beneath the electrode; and a control unit (46) connected to said command signals and to said storage means and controlling the energy being stored in the storage means (32) as a function of said command signal.

4,415,913

## GRAY TONE RECORDER

Paul A. Diddens, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 8, 1981, Ser. No. 271,169

Int. Cl.<sup>3</sup> G01D 15/06; H04N 1/22

U.S. Cl. 346-154

16 Claims



12. A recorder comprising an electrode means for recording on a recording medium, recording medium transport means for transporting a re-

ording medium past said electrode means at a predetermined speed, electrode drive means connected to said electrode means for energizing said electrode to produce said recording in response to a control signal, input signal means for storing an input signal and control signal means connected to said input signal means for developing said control signal to have a duration representative of said input signal whereby said electrode drive means is actuated during said control signal to energize said electrode means to produce a corresponding length of a recording by said electrode means along the direction of movement of the recording medium during the movement of the recording medium past said electrode means by said transport means.

4,415,914

## GRAY SCALE ELECTROSTATIC RECORDING SYSTEM AND A STYLUS DRIVER THEREFOR

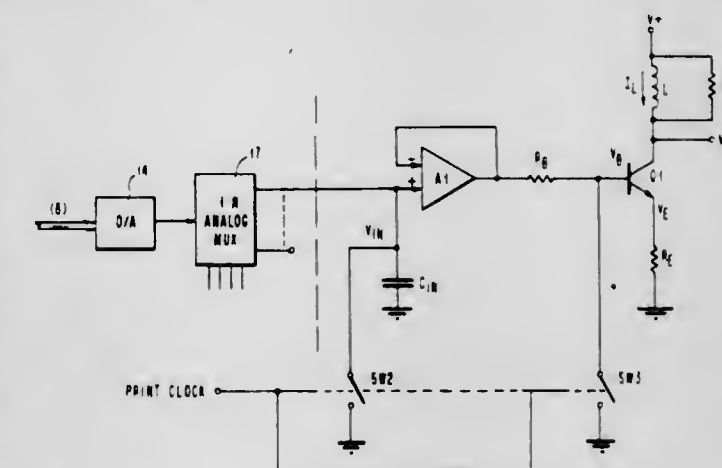
Francis P. Giordano, Scarsdale, and Robert J. Henshaw, New City, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 278,965

Int. Cl.<sup>3</sup> G01D 15/06; H04N 1/22

U.S. Cl. 346-154

12 Claims



1. An electrostatic gray scale printing system comprising means for moving a dielectric recording medium past a recording station, said recording station including a plurality of conductive printing styli disposed to establish a scan line transverse to the direction of motion of said recording medium, a conductive platen located adjacent to said styli, said conductive platen and said styli being effective when suitably actuated to establish a charging path for placing an electrostatic charge on discrete areas of said recording medium immediately adjacent to selected styli, inductive pulse forming means selectively connectable to said styli for producing variable high voltage gray scale pulses for forming electrostatic images of a variable magnitude on said recording medium from a low voltage power supply, said pulse forming means further including transistor means operable with said low voltage power supply to establish a current through an inductor included in said inductive pulse forming means proportional to variable input signals supplied thereto and means for interrupting the current flow through said transistor to produce an inductively generated output pulse across said inductor proportional to the current flowing therethrough.







light sensor means generating a photometer signal in response to illumination from the video display; comparator means comparing the photometer signal to the video drive signal for generating an error signal indicative of the error in intensity adjustment of the video display, said comparator means comprising differential amplifier means having an output signal proportional to a difference between the video drive signal and the photometer signal; digital to analog converter means having a digital control signal input and an analog output generating the video drive signal in response to the logic states on the digital control signal input, and having a response time at least as short as the low frequency response time of the video display to the video drive signal; and digital sampling means for intermittently sampling and storing a digital representation of the comparator means output signal, and having a sampling response time at least as short as the low-frequency response time of the video display to the video drive signal,

so that the difference between sampled and stored comparator output signals in response to alternating logic states on the digital control signal input indicates the error in the contrast adjustment of the video display, and the sum of the sampled and stored comparator output signals in response to alternating logic states on the digital control signal input indicates the error in the brightness adjustment of the video display.

4,415,922

## CARTOGRAPHIC INDICATOR

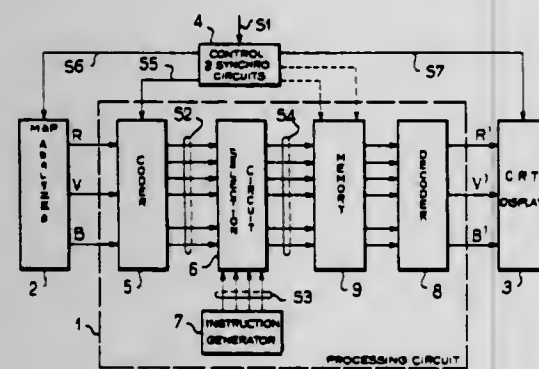
Jean C. Raymond, and Maurice Gontier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 1, 1980, Ser. No. 174,693

Claims priority, application France, Aug. 7, 1979, 79 20229  
Int. Cl.<sup>3</sup> H04N 9/535

U.S. Cl. 358—22

4 Claims



1. A cartographic indicator for aerial navigation, comprising:

- a support for a carrier of a map showing details of overflowed terrain in a limited number of distinctive colors;
- scanning means confronting said support for analyzing the map point by point and feeding respective analog input signals to three video channels, said input signals representing intensity levels of corresponding color components;
- coding means connected to said video channels for digitizing said input signals;
- memory means connected to said coding means for receiving the digitized signals therefrom;
- operator-controlled selection means directly coupled to said memory means independently of said coding means for emitting instructions suppressing digital information pertaining to undesired color components, said memory means reading out a stored data word in response to unsuppressed data received for any scanned point of the map from said coding means;
- decoding means connected to said memory means for reconvert the read-out data word into three analog output signals determining the chromatic composition of an image of the scanned point; and
- CRT display means connected to said decoding means for

visualizing a point-by-point image of a scanned map portion on a screen under the control of said output signals.

4,415,923

## SIGNAL PROCESSING CIRCUIT

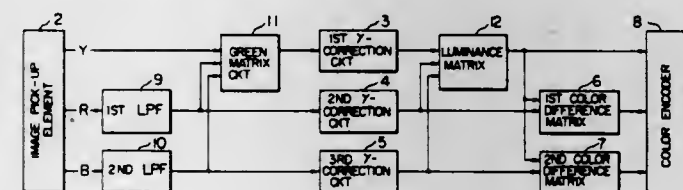
Masaru Noda, Fujisawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,058

Claims priority, application Japan, Aug. 25, 1980, 55-115957  
Int. Cl.<sup>3</sup> H04N 9/04, 9/07

U.S. Cl. 358—41

10 Claims



1. A signal processing circuit for a color video camera, comprising:

- photoelectric conversion means for producing a luminance signal, a red color signal and a blue color signal from incoming light signal;
- first and second low-pass filters for allowing said red color signal and said blue color signal to pass therethrough, respectively;
- a first arithmetic operation circuit for combining the output signal from said first low-pass filter, the output signal from said second low-pass filter and said luminance signal to thereby produce a pseudo-green color signal having a low frequency component which corresponds to that of a green color signal;
- first, second and third gamma-correction circuits for processing said pseudo-green color signal, the output signal from said first low-pass filter and the output signal from said second low-pass filter, respectively; and
- a second arithmetic operation circuit for combining the output signals from said first, second and third gamma-correction circuits, respectively, thereby to produce a gamma-corrected luminance signal.

4,415,924

## PHOTOELECTRIC TRANSDUCER DEVICE

Takashi Kawabata, Kamakura; Takao Kinoshita, Tokyo; Nobuhiko Shinoda, Tokyo; Shinji Sakai, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,349

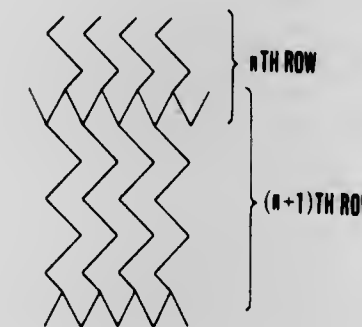
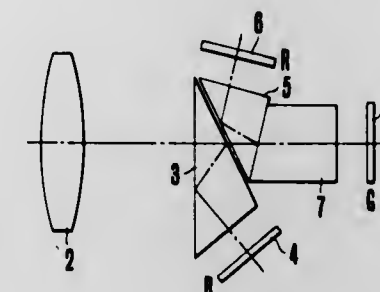
Claims priority, application Japan, Mar. 22, 1980, 55-36765  
Int. Cl.<sup>3</sup> H04N 9/04

U.S. Cl. 358—50

4 Claims

- 1. An image pick-up device comprising:
  - (a) a color separation optical system which separates an incident light beam into a plurality of light beams having different colors; and
  - (b) a plurality of solid state image pick-up devices each arranged so as to receive the light beams separated by the color separation optical system, and each having a plurality of photoelectric elements arranged in a matrix pattern

in rows and columns, each photoelectric element having a light receiving surface, whereby light receiving surface of



adjacent photoelectric elements form an overlapping zone at least in one direction along the row or the column.

4,415,925

## COLOR ORIGINAL READOUT APPARATUS

Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

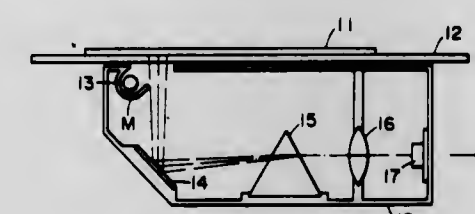
Filed Jan. 26, 1982, Ser. No. 342,766

Claims priority, application Japan, Feb. 5, 1981, 56-16215;  
Feb. 6, 1981, 56-16408

Int. Cl.<sup>3</sup> H04N 1/46

U.S. Cl. 358—75

11 Claims



- 1. A color original readout apparatus comprising:
  - radiating means for radiating an original with light of different spectra;
  - an image sensor for reading out an image of the original produced by light reflected theretoward from the original;
  - means for causing relative movement between the original and said image sensor while the image is being read out; and
  - spectroscope means for making optical paths of the light reflected from the original toward said image sensor different according to the spectra of the reflected light so that light of different spectra reflected from any one position on the original during said relative movement with respect to said image sensor is incident on said image sensor.

4,415,926

## INSPECTION OF ELONGATED MATERIAL

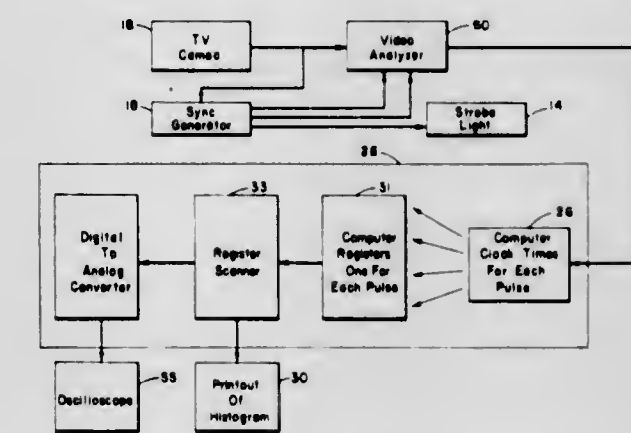
James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1982, Ser. No. 382,990

Int. Cl.<sup>3</sup> H04N 7/18

U.S. Cl. 358—107

4 Claims



- 1. Method of characterizing crimped tow for subsequent identification or quality control comprising the steps of
  - (a) obtaining length measurements of the individual crimps in a sample of said tow,
  - (b) graphically representing the measurement distribution of a sufficient quantity of said tow until a pattern is established,
  - (c) using the pattern established in step (b) as a standard against which other tow is compared.

4,415,927

## CALIBRATION REFERENCE SIGNAL GENERATOR

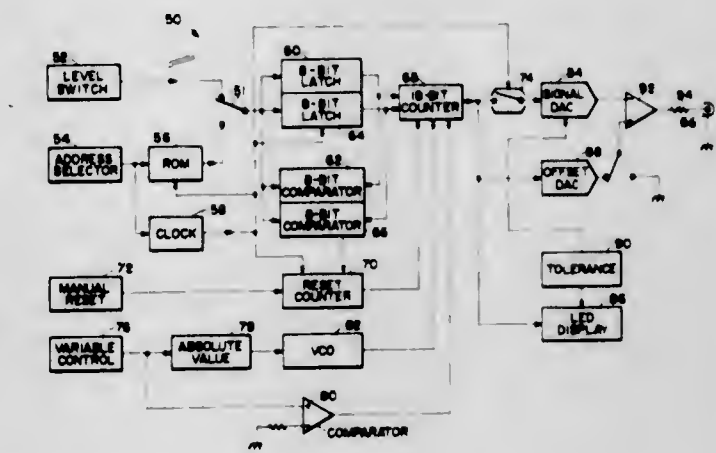
Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 13, 1981, Ser. No. 310,957

Int. Cl.<sup>3</sup> H04N 7/02

U.S. Cl. 358—139

8 Claims



- 1. A signal generator, comprising
  - means for generating amplitude data in the form of a multibit digital signal,
  - means for generating a rectangular waveform signal having a reference level and a second level derived from said digital signal,
  - means for converting at least the most significant bit of said digital signal to a corresponding analog signal, and
  - means for offsetting said rectangular waveform signal an amount corresponding to the value of said analog signal.
- 2. Apparatus for calibrating a video test signal generator, comprising a signal generator according to claim 1, and a waveform monitor having first and second inputs and operable in a differential input mode, said signal generator having an output at which the offset rectangular waveform is provided



and which is connected to said first input of the waveform monitor, so that when a test signal generated by the test signal generator is applied to the second input of the waveform monitor the waveform monitor provides a first display of the waveform of the test signal which is offset by an amount corresponding to the value of said analog signal and a second display of the waveform of the test signal which is spaced from the first display by an amount corresponding to the amplitude of said rectangular waveform signal.

4,415,928

# CALCULATION OF RADIAL COORDINATES OF POLAR-COORDINATE RASTER SCAN

Christopher H. Strolle, Philadelphia, Pa.; Terrence R. Smith, Clementon, and Glenn A. Reitmeier, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

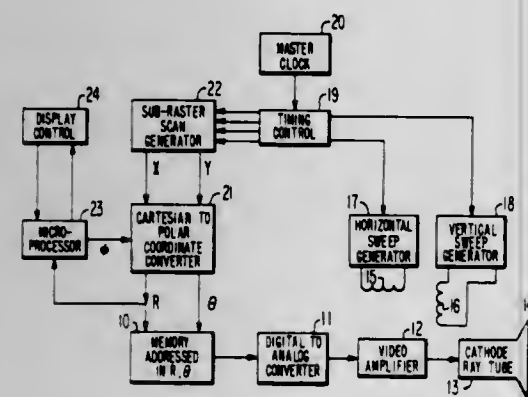
Filed Aug. 31, 1981, Ser. No. 298,092

Claims priority, application United Kingdom, Jan. 26, 1981, 8102281

Int. Cl.<sup>3</sup> H04N 5/02, 5/14; G09G 1/16

U.S. Cl. 358—140

21 Claims



10. In combination: means for supplying a stream of x, y Cartesian coordinates; means responsive to said stream of x, y Cartesian coordinates for calculating the sums of their squares; and a read-only memory conducted to respond to the sums of their squares greater than a limit value corresponding to a sum of the squares of substantial values of x and y, for supplying a function related to the radial coordinates that are the square roots of those sums.

4,415,929

# VIDEO CLAMP CIRCUIT

Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

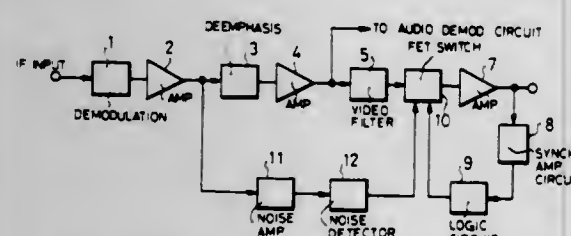
Filed Oct. 13, 1981, Ser. No. 311,064

Claims priority, application Japan, Oct. 15, 1980, 55/144202

Int. Cl.<sup>3</sup> H04N 5/19

U.S. Cl. 358—171

2 Claims



1. In a video signal processing circuit for removing an energy diffusion signal from a broadcasting satellite signal superposed with said energy diffusion signal, means including a video clamp circuit including a switching circuit for establishing the level of a clamping signal for removing said energy diffusion signal, means including a noise detection circuit for detecting the level of noise contained in said satellite signal, and means receiving the output from said noise detection circuit for reducing the level of the clamping signal of said

switching circuit when the level of noise in said satellite signal exceeds a predetermined level.

4,415,930

# ADJUSTABLE POTENTIOMETER ASSEMBLY FOR TUNING MULTI-BAND TELEVISION RECEIVERS

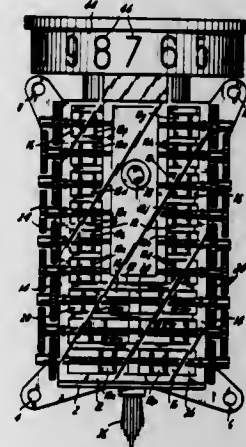
Hans Schmidt, Wood Dale, and Robert A. Wolff, Lombard, both of Ill., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 6, 1982, Ser. No. 337,488

Int. Cl.<sup>3</sup> H04N 5/44

U.S. Cl. 358—191.1

10 Claims



1. In a television receiver, including a television tuner having varactor diodes responsive to predetermined tuning voltages selectively applied thereto for tuning the television receiver to a desired television channel, an adjustable potentiometer assembly for establishing tuning voltages for selection of television channels, comprising: a housing, a substrate mounted in said housing, a plurality of distributed resistive elements equal in number to the number of channels to be selected formed on said substrate in at least one row, each of said resistive elements being arranged with a tuning area to permit a predetermined tuning voltage to be selectively coupled from said tuning area of said resistive elements to the varactor diodes in the television receiver for selecting a desired television channel, and a plurality of voltage pickup members adjustably contacting said distributed resistive elements for selectively coupling the tuning voltages to the varactor diodes, said resistive elements being positioned on said substrate such that all of said tuning areas are aligned so that said voltage pickup members can be readily adjusted to provide appropriate tuning voltages for selection of each channel.

4,415,931

# TELEVISION DISPLAY WITH DOUBLED HORIZONTAL LINES

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,612

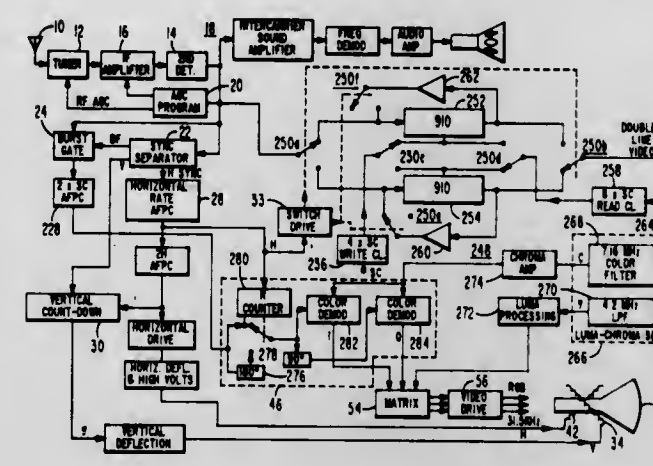
Int. Cl.<sup>3</sup> H04N 5/68

U.S. Cl. 358—242

7 Claims

1. A television raster display apparatus arranged for reducing visibility of the line scans, comprising: a source of composite line-scan television signals, said line-scan signals recurring at a first rate and including synchronizing signals and image information; doubling means coupled to said source of television signals for generating two substantially identical sequential line-scan signals from each line-scan signal from said source, said doubling means thereby doubling the frequency of said image information and also doubling the recurrence rate to form said two identical line-scan signals at a second recurrence rate; and display means coupled to said doubling means for displaying

the output signal therefrom at said second recurrence rate thereby displaying each line-scan of signals from said



source twice whereby the visibility of said line-scans is reduced.

4,415,932

# CRT MOUNTING AND IMPLOSION-PROTECTION MEANS AND METHOD

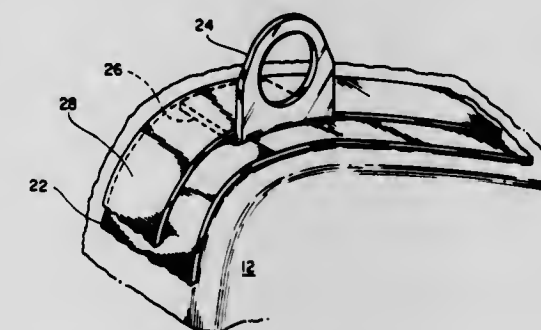
Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed May 21, 1982, Ser. No. 380,510

Int. Cl.<sup>3</sup> H01J 61/50; H04N 5/645

U.S. Cl. 358—246

17 Claims



1. In a cathode ray tube having a substantially rectangular glass face panel with a rearwardly extending skirt, said tube having improved mounting and implosion-protection means comprising:

a first tension band having a predetermined relatively wide width for compressively inwardly loading said panel at a tension level completely effective to protect against implosion; four mounting brackets, one at each corner of said panel for mounting said tube, each bracket having a rearwardly extending foot; a second tension band substantially narrower than said first band for circumscribing and overlaying said first band, and tensioned at a level 55 to 78 percent of the tension level of said first band for capturing and compressively holding each bracket foot against said first band; such that the tension level of said second band is effective to retain said mounting brackets, but ineffective to deleteriously interfere with the implosion protective tension exerted on said panel by said first band.

4,415,933

# CARRIER WAVE RECOVERY CIRCUIT

Tomio Murayama; Fumio Miyao, both of Kanagawa; Shigefumi Takeuchi, and Kazumi Tsukioaka, both of Nagano, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

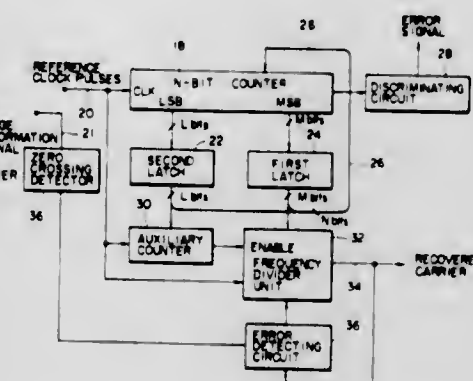
Filed Dec. 15, 1980, Ser. No. 216,704

Claims priority, application Japan, Dec. 18, 1979, 54-163594; Dec. 18, 1979, 54-163595

Int. Cl.<sup>3</sup> H03K 5/13; H03L 7/00; H04N 1/36

U.S. Cl. 358—281

11 Claims



1. A carrier signal recovery circuit comprising: N-bit counter means for counting reference clock pulses for a period corresponding to  $2^N$  cycle periods of a received carrier signal, where N and L are integers; a first latch circuit operatively connected to first outputs of said N-bit counter for holding an upper M most significant bits of a count produced by said N-bit counter means; a second latch circuit operatively connected to second outputs of said N-bit counter means for holding a lower N-M least significant bits of said count produced by said N-bit counter means; frequency divider means operatively connected to said first latch circuit and having a frequency dividing ratio corresponding to one cycle period of said received carrier signal, said frequency dividing ratio being initially set by outputs of said first latch circuit; and second counter means operatively connected between said second latch means and said frequency divider, said second counter means providing an output to said frequency divider means for correcting said frequency dividing ratio, a recovered carrier signal being outputted from said frequency divider.

4,415,934

# IMAGE READING APPARATUS

Motofumi Konishi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

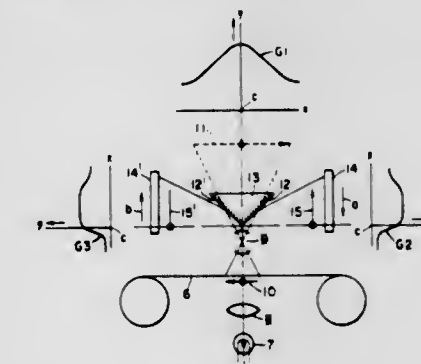
Filed Nov. 10, 1981, Ser. No. 319,880

Claims priority, application Japan, Nov. 19, 1980, 55-162980; Feb. 16, 1981, 56-21132; Feb. 16, 1981, 56-21133

Int. Cl.<sup>3</sup> H04N 1/04, 1/18

U.S. Cl. 358—294

14 Claims



1. An image reading apparatus for reading linearly by photo-



electric converting means an image of an original which is divided into at least two parts relative to a main scanning direction, said apparatus comprising:

- optical means for focusing the image of the original on a focusing plane;
- optical path dividing means for dividing, along the main scanning direction, a projecting optical path of the image of the original into at least two optical paths, the optical path dividing means having at least one reflecting surface disposed in association with a part of the main scanning region of the original, wherein the diverging part of the optical paths divided by said reflecting surface extends in a direction intersecting the main scanning direction;
- said photoelectric converting means including at least two line sensors for scanning the original in the main scanning direction, wherein a line sensor is disposed at each of the focusing planes of the divided optical paths; and
- means for moving the original and said line sensors, relative to each other, in an auxiliary scanning direction which is perpendicular to the main scanning direction, for scanning the original in the auxiliary direction.

4,415,935

#### TANGENTIAL SERVO CONTROL SIGNAL GENERATING DEVICE FOR RECORDED DATA REPRODUCING DEVICE

Koichi Suzuki, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

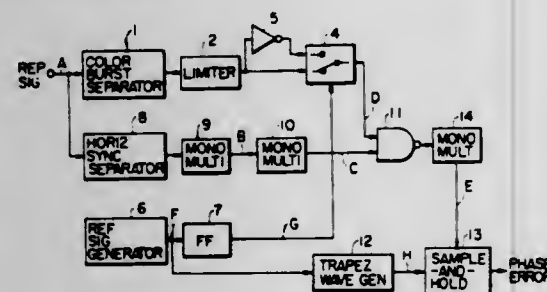
Filed Jul. 10, 1980, Ser. No. 168,231

Claims priority, application, Japan, Jul. 12, 1979, 54-88848; Dec. 12, 1979, 54-161195

Int. Cl.<sup>3</sup> H04N 9/44

U.S. Cl. 358—320

9 Claims



1. A tangential servo control signal generating device for generating a tangential servo control signal for correcting time base variations in a regenerative color signal reproduced from recorded data in a recorded data reproducing device comprising:

- means for providing a regenerative horizontal synchronizing signal from said regenerative color signal;
- means for providing a regenerative color burst signal from said color signal for each period of said regenerative horizontal synchronizing signal;
- color burst signal generating means for providing a color burst output signal by phase inverting said regenerative color burst signal every other period of said regenerative horizontal synchronizing signal and passing said regenerative color burst signal directly for periods of the regenerative horizontal synchronizing signal other than said every other period of said regenerative horizontal synchronizing signal;
- means operating in response to said color burst output signal for providing a detection signal a predetermined time after the start of each burst of said color burst output signal;
- means for providing a reference signal synchronized with said regenerative horizontal synchronizing signal; and
- means for comparing relative phases of said detection signal and said reference signal for producing an error signal indicative of a phase difference between said detection signal and said reference signal, said error signal forming said tangential servo control signal.

4,415,936

#### JITTER COMPENSATION SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

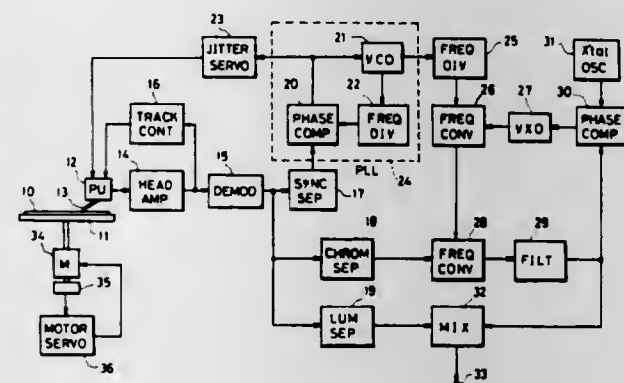
Filed Aug. 26, 1981, Ser. No. 296,490

Claims priority, application Japan, Aug. 28, 1980, 55-117785

Int. Cl.<sup>3</sup> H04N 9/44

U.S. Cl. 358—322

4 Claims



1. A jitter compensation system in a reproducing apparatus having a reproducing transducer including a reproducing element for reproducing a color video signal from a rotary recording medium, said color video signal having a carrier chrominance signal which has been converted into a low frequency range, said jitter compensation system comprising:

- separation means for separating a horizontal synchronizing signal from the color video signal which is reproduced by said reproducing transducer;
- carrier chrominance signal separation means for separating a carrier chrominance signal from the color video signal reproduced by said reproducing transducer;
- first voltage controlled oscillator means;
- first phase comparator means and said voltage controlled oscillator means constituting a phase locked loop;
- said first phase comparator being jointly responsive to said separation means and to said oscillator means for comparing phases of the separated horizontal synchronizing signal and the output signal of said voltage controlled oscillator means for supplying an output error signal to said voltage controlled oscillator means in order to control the oscillation frequency thereof;
- displacing means responsive to the output error signal of said phase comparator means, for displacing the reproducing element of said reproducing transducer toward a relative scanning direction with respect to said rotary recording medium;
- first frequency converter means responsive to said carrier chrominance signal separating means for frequency-converting the frequency of said separated carrier chrominance signal back to the original frequency; and
- means responsive to the outputs of said voltage controlled oscillator means and said first frequency converter means for producing a signal for frequency conversion which is to be supplied to said frequency converter;
- said first frequency converter means producing a signal having a frequency which is equal to the difference in frequencies from said signal for frequency conversion and said separated carrier chrominance signal, as a carrier chrominance signal having the original frequency,
- said means for producing a signal for frequency conversion comprising second frequency converter means responsive to the output oscillation signal of said first voltage controlled oscillator means, reference signal oscillator means, second phase comparator means jointly responsive to said first frequency converter means and to said reference signal oscillator means for comparing phases of output signals of said first frequency converter means and said reference signal oscillator means, and a second voltage

controlled oscillator means responsive to said second phase comparator means for controlling the oscillation frequency thereof and for supplying an output oscillation signal to said second frequency converter means as a signal for frequency conversion, said output signal of said second frequency converter means being supplied to said first frequency converter means as the signal for frequency conversion.

4,415,937

#### SOLID-STATE IMAGE STORAGE DEVICE

Jun-ichi Nishizawa, Sendai, and Masahiro Konishi, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co. Ltd., Japan

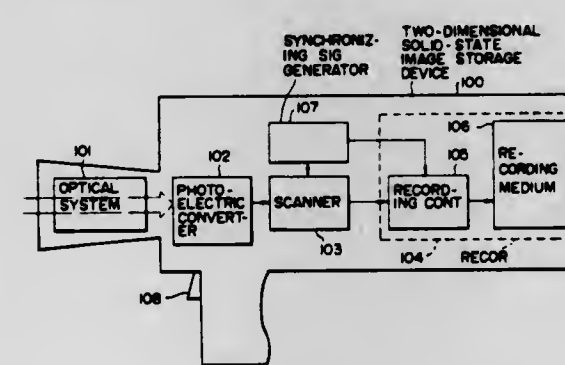
Filed Dec. 2, 1981, Ser. No. 326,879

Claims priority, application Japan, Dec. 5, 1980, 55-171901

Int. Cl.<sup>3</sup> G11B 5/00; H04N 5/76

U.S. Cl. 358—335

8 Claims



1. A solid-state image storage device comprising:
  - a photoelectric converter having a plurality of non-destructive readout image sensor cells arranged in one of a line and a matrix for receiving an image;
  - a scanner for scanning the photoelectric converter to read out image information of the plurality of image sensor cells; and
  - a recorder having a recording medium for recording the image information read out by the scanner from the plurality of image sensor cells;
 wherein the scanner has means so that the operation of reading out the image information of all of the plurality of image sensor cells by the scanner is carried out a plurality of times to obtain a plurality of image informations on the same image formed on the photoelectric converter, and the plurality of image informations thus read out are respectively recorded at different positions on the recording medium of the recorder.

4,415,938

#### METHOD AND SYSTEM FOR ERROR CORRECTION IN DIGITAL VIDEO SIGNAL RECORDING

Jürgen Heltmann, Seehelm, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,786

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045226

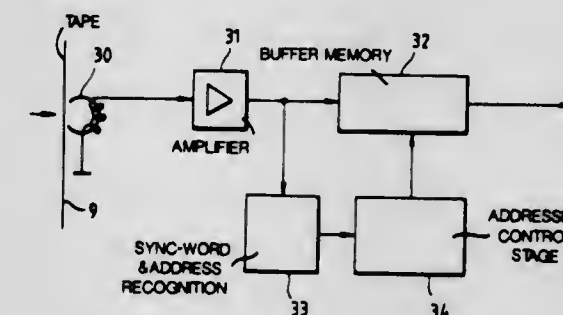
Int. Cl.<sup>3</sup> G11B 5/09, 27/36

U.S. Cl. 360—53

7 Claims

1. Method of correcting digitally coded video signals which are erroneously recorded on a magnetic recording medium (9) and wherein the data are applied in the form of a stream of data words, in which the stream of words is subdivided into a group or train of words with gaps or intervals defined by retrace gaps of the video signals between said groups or trains of words, wherein the data are recorded on magnetic tape by a rotating head wheel (1) carrying a recording transducer head (2) and a reading-out and reproduction transducer head (4), which is spatially offset ( $\Delta\alpha$ ) with respect to the re-

cording transducer head (2) which effects said recording of the data; comprising the steps of applying the data to a first channel including the recording transducer head and recording the data on the tape (9); immediately after recording the data on the tape, reading-out said data from the tape independently of the recording of the data to obtain reproduced data by deriving data from the spatially offset reproduction transducer head (4); applying the data to a second channel; time-delaying the data in the second channel by the time



period of delay between recording and reading-out or reproducing said recorded data by a time period of delay ( $\Delta T$ ) which corresponds to the quotient of circumferential offset ( $\Delta\alpha$ ) of the reproducing head (4) and of the recording head (2) with respect to the circumferential speed of the head wheel (1); comparing the time-delayed signals in the second channel with the read-out reproduced data; and, if the comparison indicates inconsistencies, storing the time-delayed data and re-recording said data on the tape during the gaps or intervals of succeeding groups or trains of words.

4,415,939

#### HEAD POSITIONING SERVO FOR DISK DRIVE

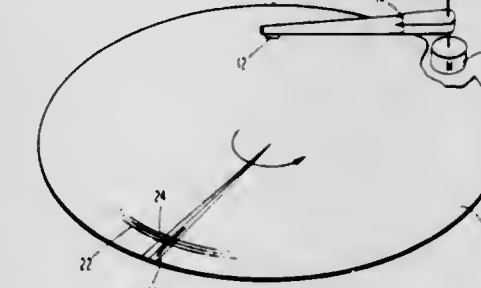
Douglas F. Ballard, South Ogden, Utah, assignor to Iomega Corporation, Ogden, Utah

Filed Apr. 27, 1981, Ser. No. 257,608

Int. Cl.<sup>3</sup> G11B 21/02, 21/10

U.S. Cl. 360—75

2 Claims



1. Apparatus for the control of the position of a read/write head with respect to a magnetic recording disk, said disk having recorded thereon at regular intervals first and second position signals of identical polarity, said apparatus comprising:
  - servo motor means for moving said head with respect to said disk;
  - a first summing means for adding successive ones of said first and second position signals, and for controlling variable amplification of said signals in accordance with the value of said sum; and
  - comparator means for comparing the values of successive ones of said first and second signals and for generating a servo signal applied to said motor as a result of said com-



parison, such that said first and second signals tend to be equalized.

4,415,940

# DEVICE FOR INSERTING AND EJECTING A DISKETTE CARTRIDGE INTO OR FROM A DRIVE MECHANISM

Gerhard Becker, Neunkirchen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

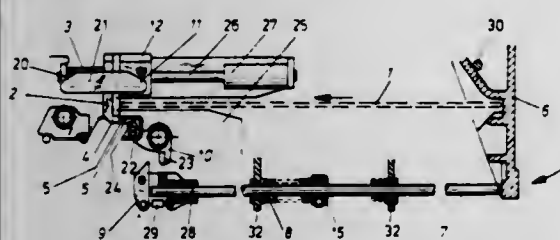
Filed May 8, 1981, Ser. No. 262,256

Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3017970

Int. Cl.<sup>3</sup> G11B 5/16, 5/48

U.S. Cl. 360—99

8 Claims



1. A diskette drive mechanism comprising a closure pivotally mounted on a housing, for closing a receiving slot for a cartridge accommodating a magnetic diskette, a magnetic head liftable off and engageable with a received diskette, a movable head lever on which the head is arranged, the lever extending radially relative to the axis of rotation of the diskette, and an ejection slide which, by inserting the diskette cartridge, is movable along a first path into a latched position against a force of a first spring associated with the housing and, by opening the closure, is unlatched to eject the diskette cartridge, characterized in that the ejection slide is associated with a lever arm (21) having a longitudinal axis which corresponds to the direction of movement of the ejection slide (2), the arm extending parallel to the head lever (13) and, on each end, being provided with an inclined surface (11,20) which, during inserting or ejecting of the diskette cartridge (1), cooperates with a cross arm (12) arranged on the head lever (13) to lift or lower the magnetic head (14).

4,415,941

# LINEAR ACTUATOR FOR MEMORY STORAGE DEVICE

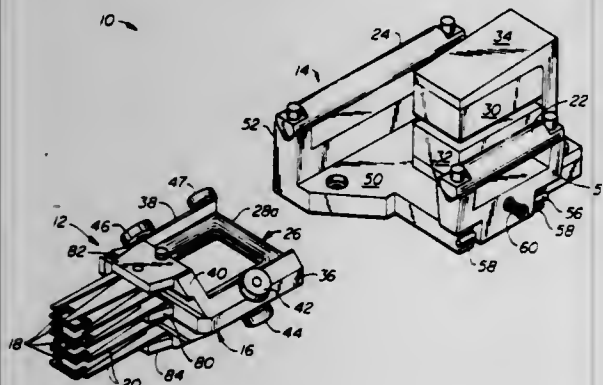
Frank C. Gibeau, Los Altos, and Paul L. Farmer, San Martin, both of Calif., assignors to Atasi Corporation, San Jose, Calif.

Filed Jun. 29, 1981, Ser. No. 278,867

Int. Cl.<sup>3</sup> G11B 5/55, 21/08, 5/012

U.S. Cl. 360—106

11 Claims



1. A linear actuator for moving a transducer back and forth along a linear path of travel relative to media such as a rotating disk media, the actuator comprising: first and second cylindrical guide members, means for mounting the guide members in spaced relationship parallel to the media, a carriage, means for mounting the transducer to one end of said carriage, an essentially rectangular flat coil member mounted to said carriage and including a flat effective winding section and a second winding section, each extending transversely of the direction

of travel of the carriage, roller means mounted to said carriage in rolling engagement against the cylindrical guide members for guiding the carriage back and forth along the guide members, said roller means including pairs of displaced rollers at each side of the carriage for engagement against the associated guide member, said pairs of rollers and said coil member being mounted upon the carriage so that the flat effective winding section of said coil member is parallel to the direction of travel and is spaced between the rollers of each pair of rollers, and a pair of spaced permanent magnets fixedly mounted relative to the carriage and having a gap therebetween in alignment with the path of travel through said gap of the flat effective winding section of the coil member, said magnets being laterally outward from said media and said second transverse winding section being outside said gap during the travel of said carriage.

4,415,942

# MAGNETIC DISK SUBSTRATE OF FIBER-REINFORCED PLASTIC

Albert Frosch, Herrenberg; Holger Hinkel, Boeblingen, and Georg Kraus, Wildberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

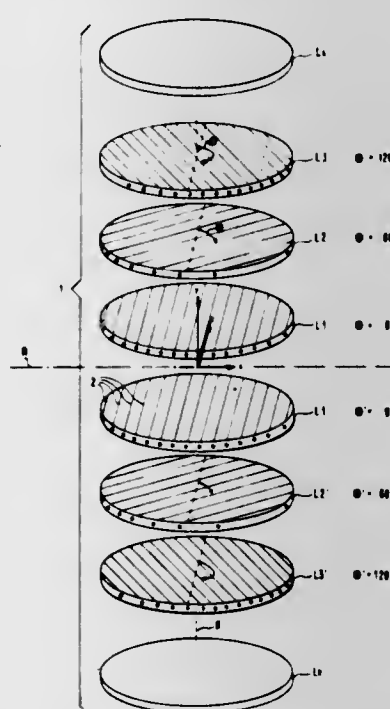
Filed Jul. 28, 1981, Ser. No. 287,674

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 80105339

Int. Cl.<sup>3</sup> G11B 5/62

U.S. Cl. 360—135

10 Claims



1. A magnetic disk substrate of plastic containing fibers, characterized in that said substrate is pressed in the form of a laminate from a plurality of thin lamellae of fiber-reinforced plastic, said lamellae being arranged on top of each other at equal angular spacings,  $\theta = \pi/n$ ,  $n$ , an integer,  $\geq 3$ .

4,415,943

# EQUIPMENT PROTECTOR AND ENERGY SAVING APPARATUS

Donald W. Wortman, Central Islip, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.

Filed Apr. 21, 1982, Ser. No. 370,337

Int. Cl.<sup>3</sup> H02H 3/13, 7/09

U.S. Cl. 361—22

23 Claims

1. An equipment protector and energy saving apparatus comprising:

(a) a pair of input terminals and a pair of output terminals, said

4,415,944

# ELECTRICAL APPARATUS

Robert A. Walker, Loughborough, England, assignor to The Boots Company PLC, England

Continuation of Ser. No. 917,411, Jun. 21, 1978, abandoned.

This application Sep. 23, 1980, Ser. No. 189,910

Claims priority, application United Kingdom, Jun. 23, 1977, 26328/77

Int. Cl.<sup>3</sup> H02H 3/16

U.S. Cl. 361—42

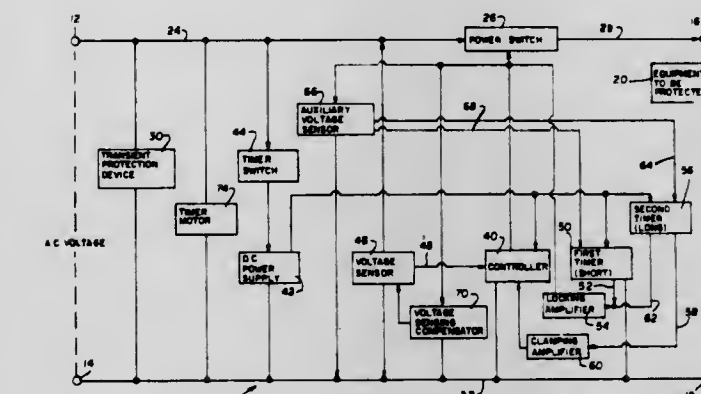
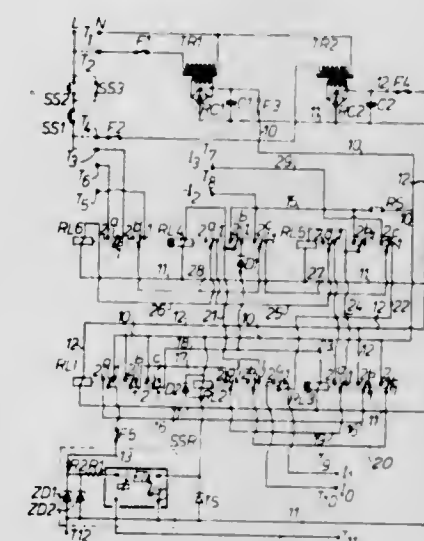
7 Claims

pair of input terminals being adapted to be connected to an AC source of voltage, said pair of output terminals being adapted to be connected to an equipment load, said AC voltage source being provided with a continuous electrically conducting path from one of said pair of input terminals to one of said pair of output terminals;

(b) power switching means coupled from the other of said pair of input terminals to the other of said pair of output terminals, said power switching means being in a normally opened position interrupting the electrically conducting path from the other of said pair of input terminals to the other of said pair of output terminals;

(c) control means coupled to said power switching means for changing said normally open position of said power switching means to a closed position to complete said other electrically conducting path;

(d) voltage sensing means connected across said pair of input terminals for sensing the magnitude of the AC voltage connected thereto and providing a first signal voltage, said first signal voltage being coupled to said control means for causing said control means to change from a normally high impedance state to a low impedance state and causing said power switching means to change to a closed position when said AC voltage exceeds a predetermined magnitude, said control means providing a second signal voltage;



1. An earth proving circuit whereby the existence of a desired earth connection for electrically powered apparatus can be established and positively indicated prior to the supply of power level voltage and current from a power supply connectable to the electrically-powered apparatus, the circuit comprising a non-inductive solid state relay unit having no inductive reactance and capable of allowing passage of only a low current of the order of a few milliamperes therethrough at a low voltage of the order of 12 volts under conditions where an earth connection for the non-inductive solid state relay unit is established, circuit means for supplying a low current/low voltage electric signal to said non-inductive solid state relay unit and capable of operating said solid state relay unit in the presence of a good ground connection, indicator means for indicating the condition of the earth connection to the non-inductive solid state relay unit in response to energization by said low current/low voltage electric signal, ground connection means for connecting the earth connection of said non-inductive solid state relay unit to the ground connection for the electrically powered apparatus to be tested for the existence of a good ground connection in advance of the supply of power level voltage and current thereto, and fourth logic circuit means for locking-out operation of said electrically powered apparatus by preventing the supply of power level current and voltage thereto in the event of a ground or circuit fault during operation of the apparatus and continued operation of a manually operable start switch means, and manually operable reset switch means for resetting said fourth logic circuit means to allow supply of power level current and voltage to the apparatus operable only after correction of the fault and re-establishment and proof of the existence of a suitable ground connection for the electrically powered apparatus.

(e) first relatively short timing means coupled to said control means for receiving said second signal voltage, said first timing means providing a third signal voltage for a predetermined time after said control means provides said second signal voltage;

(f) locking means coupled in parallel with said control means for holding said power switching means in said closed position responsive to said third signal voltage until said first timing means times out;

(g) differentiation means for differentiating said third signal voltage;

(h) second relatively long timing means, coupled to said first timing means for receiving said differentiated third signal voltage, said second timing means providing a fourth signal voltage for a predetermined time after receiving said differentiated third signal voltage only if said input AC voltage is below said predetermined magnitude;

(i) clamping means coupled to said control means for clamping said control means in its relatively high impedance state responsive to said fourth signal voltage causing said power switching means to be in its normally open position; and

(j) DC power supply means coupled to said control means, said power switching means and said first and said second timer means for providing a DC operating voltage therefor from said AC voltage source.



4,415,945

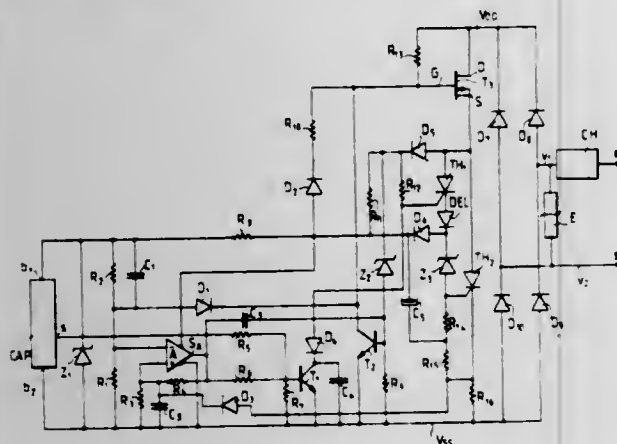
**DETECTOR APPARATUS OF THE TWO-TERMINAL TYPE SUPPLIED WITH RECTIFIED A.C. POWER THE VOLTAGE OF WHICH CAN VARY IN A WIDE RANGE, WITH LOAD CONTROL BY SWITCHING THYRISTORS**  
Jean-Marie Periot, Isle d'Espagnac, France, assignor to La Telemecanique Electrique, France

Filed Dec. 17, 1981, Ser. No. 331,718

Claims priority, application France, Dec. 31, 1980, 80 27871  
Int. Cl.<sup>3</sup> H02H 3/08

U.S. Cl. 361—100

8 Claims



1. A detector apparatus for controlling the flow of current through a load in dependence with information provided by a sensor, said detector apparatus comprising:

- (i) signal generating means (CAP) for generating an output signal from the said information, said signal generating means having first (b<sub>1</sub>) and second (b<sub>2</sub>) power supply inputs and a signal output (s);
- (ii) first and second power supply terminals (e<sub>1</sub>e<sub>2</sub>), the detector apparatus having first and second terminals, the first terminal of the apparatus being connected to the first power supply terminal (e<sub>1</sub>) through the load and the second terminal of the apparatus being connected to the second power supply terminal (e<sub>2</sub>);
- (iii) rectifier means (D<sub>7</sub>-D<sub>10</sub>) having a pair of input terminals connected across the first and second terminals of the apparatus and a pair of output terminals and first (V<sub>DD</sub>) and second (V<sub>SS</sub>) power supply lines connecting the respective output terminals of the rectifier means to the respective power supply inputs (b<sub>1</sub>b<sub>2</sub>) of the signal generating means;
- (iv) a high gain solid state component (T<sub>3</sub>) having a source (S), a drain (D) and a gate (G), said drain being connected to the first power supply line (V<sub>DD</sub>) and said gate being connected to the first power supply (V<sub>DD</sub>) of the rectifier means through a biasing resistor (R<sub>13</sub>);
- (v) circuit means, including a first thyristor (TH<sub>1</sub>) having a gate and a Zener diode (Z<sub>3</sub>) connected in series and in opposition, said circuit means connecting the source (S) of the said high gain solid state component (T<sub>3</sub>) to the second power supply line (V<sub>SS</sub>), said Zener diode (Z<sub>3</sub>) having an anode and a cathode;
- (vi) a transistor (T<sub>1</sub>) having an input electrode, and output electrode which is connected to the said second power supply line (V<sub>SS</sub>) and a control electrode; and means (D<sub>4</sub>) for connecting the gate of the said first thyristor (TH<sub>1</sub>) to the said input electrode;
- (vii) differential amplifier means (A) having first and second inputs and an output, the output of the said differential amplifier means being connected to the control electrode of the said transistor (T<sub>1</sub>), a resistor bridge (R<sub>1</sub>R<sub>2</sub>) connecting the power supply inputs (b<sub>1</sub>-b<sub>2</sub>) of the signal generating means to the first input of the differential amplifier means, and first resistance means (R<sub>3</sub>) connecting the second power supply line (V<sub>SS</sub>) to the second input of the differential amplifier means;
- (viii) a first capacitor (C<sub>5</sub>); means (D<sub>6</sub>) for connecting said capacitor to the cathode of the Zener diode (Z<sub>3</sub>), means

(R<sub>14</sub>) for connecting said first capacitor to the anode of the Zener diode (Z<sub>3</sub>), and means (R<sub>8</sub>) connecting the capacitor to the first power supply input (b<sub>1</sub>) of the signal generating means;

(ix) means (R<sub>14</sub>R<sub>15</sub>R<sub>16</sub>D<sub>3</sub>), connecting the anode of the Zener diode (Z<sub>3</sub>) to the second input of the differential amplifier means,

whereby the said transistor (T<sub>1</sub>) which is normally blocked whenever the signal generating means provide an output signal, becomes saturated upon occurrence of an overload or short through the load, and consequently, the said first thyristor (TH<sub>1</sub>) is blocked.

4,415,946

**ANTISTATIC CHAIRMAT**

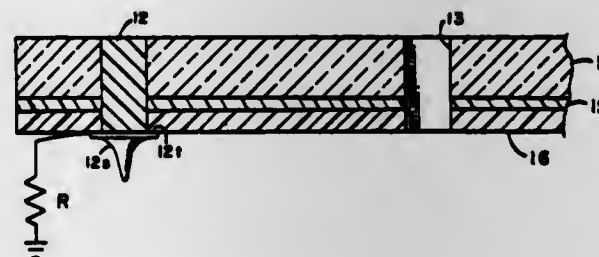
Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 8, 1982, Ser. No. 346,716

Int. Cl.<sup>3</sup> H05F 3/00

U.S. Cl. 361—212

21 Claims



1. A charge dissipating floor mat comprising:

- a dielectric panel comprised of a transparent polymeric material, containing a plurality of channels between upper and lower surfaces;
- a semiconductive base layer at the lower surface of said dielectric panel containing a plurality of channels corresponding to the channels in said dielectric panel;
- a plurality of inserts fitted within the channels in said dielectric panel and semiconductive base layer, said inserts being comprised of a material selected from the group electrically conductive and semiconductive materials; and an electric ground for said inserts.

4,415,947

**METHOD AND APPARATUS FOR ELECTROSTATICALLY CHARGING A DIELECTRIC LAYER**

Kurt Dryczynski, Hofheim; Günther Schädlich, and Roland Moraw, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 92,276, Nov. 8, 1979, Pat. No. 4,353,970.

This application Apr. 16, 1981, Ser. No. 254,981

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1978, 2849222

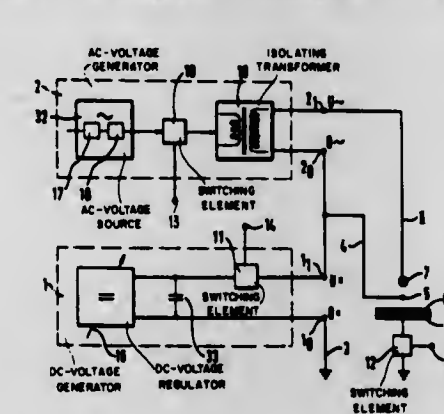
Int. Cl.<sup>3</sup> H05F 3/00

U.S. Cl. 361—235

29 Claims

1. An apparatus for electrostatically charging a dielectric layer to a predetermined potential, said apparatus comprising: AC voltage generating means for providing an AC voltage U<sub>AC</sub>, said means having a hot output terminal and a cold output terminal;
- DC voltage generating means for providing a DC voltage U<sub>DC</sub>, said means having a hot output terminal and a cold output terminal;
- AC electrode means connected to the hot output terminal of said AC voltage generating means and located at a distance from said dielectric layer, said AC electrode means in combination with said AC voltage generating means providing

means for generating charge carriers at a distance from said dielectric layer;  
DC electrode means connected to the hot output terminal of said DC voltage generating means and located in a path between said AC electrode means and said dielectric layer, said DC electrode means in combination with said DC voltage



age generating means providing means for directing said charge carriers to said dielectric layer; and switching element means for modulating said DC voltage generating means, said switching element means including a connection means for inputting a voltage for modulating the DC voltage U<sub>DC</sub>.

4,415,948

**ELECTROSTATIC BONDED, SILICON CAPACITIVE PRESSURE TRANSDUCER**

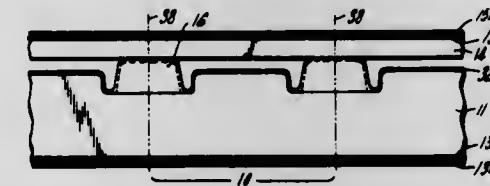
Daniel H. Grantham, Glastonbury, and James L. Swindal, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1981, Ser. No. 310,597

Int. Cl.<sup>3</sup> H01G 7/00

U.S. Cl. 361—283

2 Claims



1. A method of forming a capacitive pressure sensor by field-assisted bonding of two pieces of silicon separated by borosilicate glass, to provide a pressure tight chamber including two closely-spaced surfaces having operative portions forming the respective plates of a pressure-variable capacitor, in which the improvement comprises depositing a thin layer of borosilicate glass on substantially the entire operative portion of the surface of one of said plates prior to application of the electrostatic field, thereby to avoid arcing between the plates and the commensurate short circuiting of the electrostatic field during the bonding process.

4,415,949

**AIR TRIMMER CAPACITOR**

Martin J. Blickstein, Austell, Ga., assignor to Murata Corporation of America, Rockmart, Ga.

Filed Aug. 24, 1981, Ser. No. 295,716

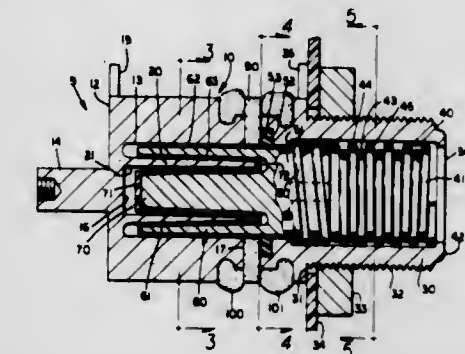
Int. Cl.<sup>3</sup> H01G 5/14

U.S. Cl. 361—296

7 Claims

1. In a variable coaxial air trimmer capacitor including at least one stationary electrode and at least one movable electrode adapted to be moved with respect to said stationary electrode so as to vary the capacitance, dielectric means for separating said movable electrode from said stationary electrode, a housing containing said stationary electrode at one end and said movable electrode at the opposite end, the improvement comprising: a rotor mounted for rotation about an axis within said hous-

ing and including said movable electrode affixed at one end;  
means defining a thread upon at least a portion of the outer surface of said rotor; and



coil multi-turn resilient spring means confined within said housing for engaging said thread as said rotor rotates about said axis.

4,415,950

**CAPACITORS**

Ronald D. Weeks, Brixham, and David J. Croney, Paignton, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

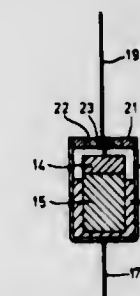
Filed Jun. 18, 1980, Ser. No. 160,524

Claims priority, application United Kingdom, Jul. 3, 1979, 7923112

Int. Cl.<sup>3</sup> H01G 9/00

U.S. Cl. 361—433

2 Claims



1. An electrical component comprising, in contact and electrical connection with one another, a tin-containing solder alloy body and a conductive coating layer having both silver particles and copper particles interspersed therein and formed by a paint containing, by weight, 10 to 40% of the silver particles, 50 to 10% of the copper particles, 2 to 12% of a polymeric binder, 30 to 60% of a solvent, and 0.01 to 1% of a wetting agent.

4,415,951

**LAMPCHANGER**

Marion L. Recane, Houston; William V. Burns, Austin; Charles E. McMillen, and Dan G. Luce, both of Houston, all of Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Jun. 16, 1982, Ser. No. 388,843

Int. Cl.<sup>3</sup> F21V 19/04

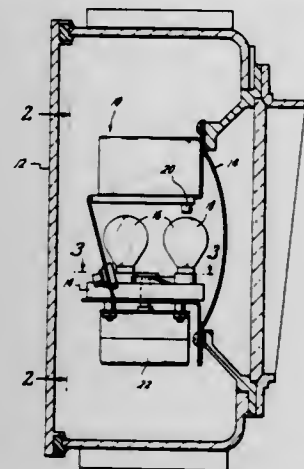
U.S. Cl. 362—20

3 Claims

1. A lampchanger for use in a signal lantern having a focusing lens comprising, a horizontally rotatable turret adapted to support a plurality of lamps for indexing one of the lamps to the focal point of the lens, said turret including a plurality of bayonet sockets for holding a lamp, said sockets having resilient sides which taper inwardly away from the turret body for accurately securing the lamp in position,



said turret including a contact insulator having a radially extending slot adjacent each of the sockets, a power contact positioned in each of the slots, said power contact adapted to engage the bottom of a lamp positioned in a socket for making good contact with the lamp, a power brush engaging the insulator and positioned to engage the power contact of the lamp positioned in the focal point of the lens and engaging the slot of the power contact of the positioned lamp for mechanically holding a



turret in position with a lamp in the focal point of the lens, and a light detector means directed at the lamp in position in the focal point of the lens for detecting whether the lamp is lighted, motor means connected to the turret for rotating the turret, and a control circuit connected to the light detector and to the motor means for actuating the motor means when the light detector detects a burned out lamp.

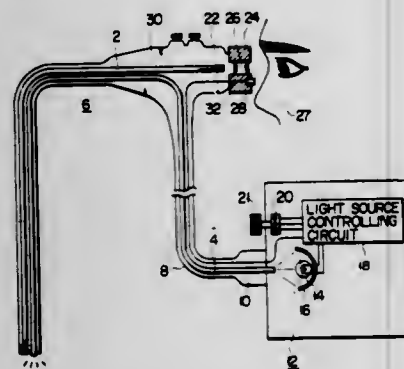
4,415,952

**LIGHT SOURCE UNIT FOR AN OPTICAL APPARATUS**  
Shinichiro Hattori, Tokyo, and Yasuo Inoue, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Jun. 19, 1981, Ser. No. 275,519

Claims priority, application Japan, Jun. 30, 1980, 55-88635  
Int. Cl.<sup>3</sup> F21V 7/04

U.S. Cl. 362—32

14 Claims



1. A light source unit for an optical apparatus having an eyepiece section comprising:  
a light source for transmitting illuminating light for illuminating an area to be observed;  
a power source for supplying electrical power to said light source;  
sensing means for sensing the presence of an operator at said optical apparatus for observing said area and for emitting an output signal indicating said presence or absence of an operator at said optical apparatus;  
a judging circuit coupled to said sensing means and responsive to said output signal from said sensing means indicating that the operator is absent from said optical apparatus,

for producing a light emitting signal for limiting said illuminating light; and limiting means coupled to said judging circuit and being responsive to said light limiting signal for limiting the illuminating light transmitted from said light source to said area as a function of said light limiting signal.

4,415,953

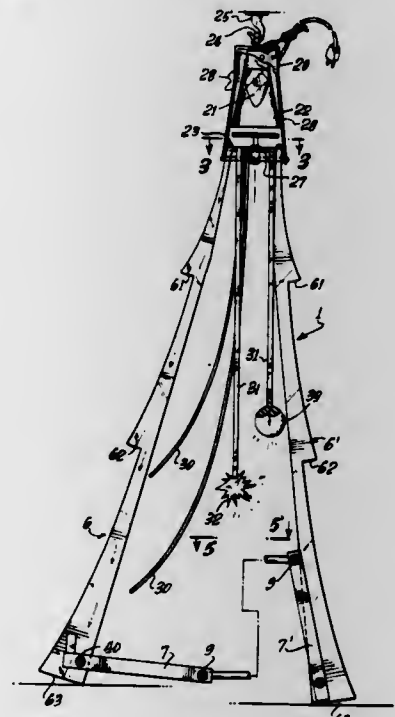
**TREE-LIKE DECORATIVE DEVICE**

William C. Shepherd, 725 Palomares Ave., San Dimas, Calif. 91773

Filed Jul. 13, 1981, Ser. No. 282,397  
Int. Cl.<sup>3</sup> F21V 7/04

U.S. Cl. 362—32

26 Claims



1. A tree-simulating illuminated decorative device which comprises:  
an upper frame member, a plurality of light-conducting elements each having a first axial extremity connected with said upper frame member, lamp means mounted proximate to said upper frame member for illuminating said first axial extremities of said elements, certain of said light-conducting elements defining notches in at least one edge thereof to glow with light conducted by the elements, and means pivotally connected to lower end portions of the elements for retraction of the elements to provide a folded configuration of the decorative device.

4,415,954

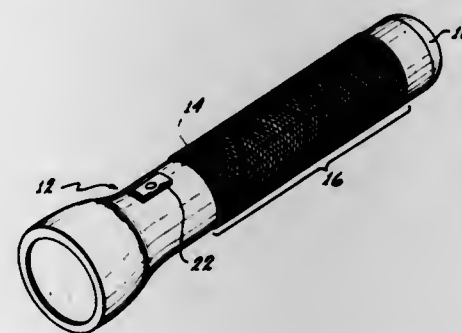
**GRIP SHIELD**

Roger W. Schaefer, San Luis Obispo, Calif., assignor to Centurion Safety Products, Inc., San Luis Obispo, Calif.

Filed Apr. 23, 1982, Ser. No. 370,932  
Int. Cl.<sup>3</sup> F21L 7/00

U.S. Cl. 362—202

3 Claims



1. A flashlight having an improved hand grip, comprising:

a barrel portion of the flashlight having an elongated cylindrical shape;  
a sleeve of a resilient non-abrasive slip-resistant material, having an inside diameter in its relaxed state less than the outside diameter of said barrel portion, said sleeve extending over the surface of said barrel portion and squeezing said barrel by virtue of said sleeve being stretched from its relaxed state to fit over said barrel portion, said sleeve being open at both of its ends so as not to enclose either end of the flashlight; and,  
a coating of dried lubricant between said sleeve and said barrel portion bonding said sleeve to said barrel portion so that said sleeve can not be non-destructively removed from said barrel portion.

4,415,955

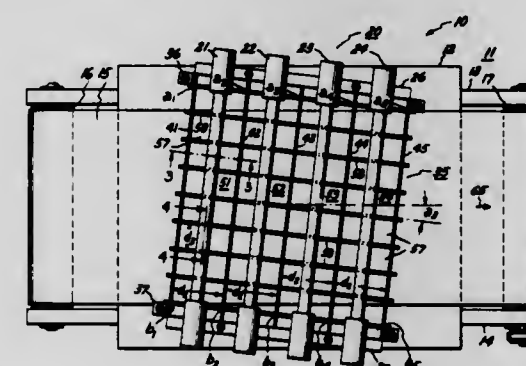
**IRRADIATION APPARATUS UTILIZING LINEAR RADIATION SOURCES**

Bruce F. Griffing; Peter D. Johnson, both of Schenectady, and Roger N. Johnson, Hagaman, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,137  
Int. Cl.<sup>3</sup> F21S 3/00

U.S. Cl. 362—225

14 Claims



1. In combination, means for providing a planar surface, means for irradiating an area of said surface, said area being of generally quadrangular outline and being bounded by a pair of generally parallel long sides and a pair of generally parallel short sides, said irradiation means comprising:  
a source of radiation of generally cylindrical outline having a length large in relation to the diameter thereof, the central axis of said source of radiation being located at first predetermined distance above said area and spaced parallel to the long sides thereof,  
a pair of radiation first absorbent surfaces, each having a lower edge adjacent a respective long side of said area along the length thereof and each having an upper edge adjacent said source of radiation, the lower edges of said pair of first radiation absorbent surfaces spaced apart by a second predetermined distance,  
a plurality of pairs of second radiation absorbent surfaces, each second radiation absorbent surface being orthogonal to said planar surface and located between said pair of first radiation absorbent surfaces,  
each of said second radiation absorbent surfaces having a lower edge adjacent said area and an upper edge adjacent said source of radiation, the lower edges of said pair of second radiation absorbent surfaces spaced apart by a third predetermined distance,  
each pair of second radiation absorbent surfaces forming with portions of the surfaces of the first pair of radiation absorbent surfaces included therebetween a respective cell, each cell overlying a respective portion of said area, each cell subtending a respective segment of said source of radiation.

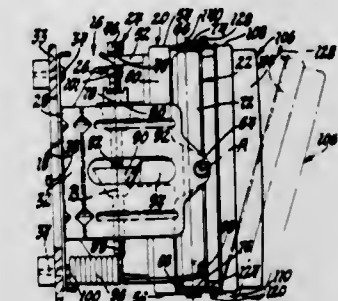
4,415,956

**RETAINER MEMBER FOR A VEHICLE HEADLAMP**  
David R. McMahan, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,659  
Int. Cl.<sup>3</sup> F21V 21/26

U.S. Cl. 362—269

3 Claims



1. A retainer member for maintaining a headlamp within a support housing formed with locator surfaces, said retainer member including a frame adapted to surround the front peripheral portion of said headlamp, cooperating hook and slot means formed on one portion of said frame and on said support housing for removably connecting said one portion of said frame to said support housing for pivotal movement about an axis substantially perpendicular to the optical axis of said headlamp, cooperating flange and manually operable spring clip means carried by another portion of said frame and by said support housing for locking said retainer member to said support housing when said hook and slot means are interconnected, said frame being formed with a radially inwardly extending rim which is inclined towards the rear of said support housing so when said retainer member is locked to said support housing by said cooperating flange and spring clip means said rim engages the lens of said headlamp and serves as a spring to bias said headlamp inwardly towards said locator surfaces.

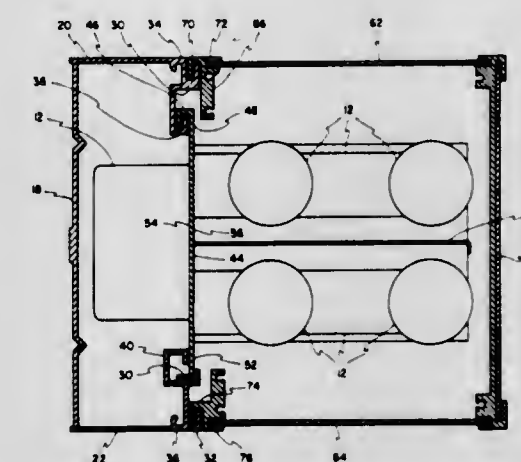
4,415,957

**PATIENT LIGHT WITH HANGER AND HINGE ARRANGEMENT FOR REMOVAL WITHOUT TOOLS**  
Wesley W. Schwartz, Oshkosh, Wis., assignor to Square D Company, Palatine, Ill.

Filed Feb. 13, 1981, Ser. No. 234,075  
Int. Cl.<sup>3</sup> F21V 21/08

U.S. Cl. 362—297

16 Claims



1. A light fixture having electrical lighting components comprising:  
a base with electrical components for attachment to a source of electrical power, said base having top and bottom outer attachment means and top and bottom inner attachment means;  
where said top and bottom inner attachment means comprise a top support hanger and a bottom support hinge;  
a support section for supporting the electrical lighting components



nents having top and bottom attachment means for interlocking with said top and bottom inner attachment means of said base;

a cover with light emitting portions having top and bottom attachment means for interlocking with said top and bottom outer attachment means of said base;

means for electrically connecting said electrical components of said base to said electrical lighting components of said support section; and,

wherein said support section and said cover can be assembled and disassembled from said base without the use of any tools and also wherein said support section can be held in place on said base in two different positions, said bottom inner attachment means on said base and said bottom attachment means on said support section being capable of interlocking in two different positions.

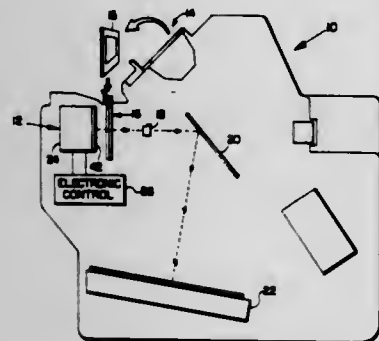
4,415,958

**DEVICE FOR ILLUMINATING TRANSPARENCIES**  
John M. Guerra, Brighton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 21, 1981, Ser. No. 266,082  
Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362—301

5 Claims



1. A lighting device for illuminating transparencies, said lighting device comprising:

an open-ended, rectangular parallelepiped-shaped housing having a base opposite said open-end thereof and four sides extending uprightly from said base, all of the interior surfaces thereof being specularly reflective;

a partially reflecting/diffusing opal glass screen located in parallel overlying relationship to said housing open-end; and

an elongated source of artificial illumination mounted in said housing so that its longitudinal axis is parallel to the plane containing said housing open-end and either two opposing ones of said upright sides and spaced away from said housing base by a distance which is closer to said housing base than to said housing open-end;

said lighting device being structured so that said specularly reflective interior surfaces of said housing in combination with said partially reflecting/diffusing opal glass screen interior surface cause multiple internal reflections of said artificial light source within said housing whereby a plurality of images of said artificial light source are formed on the interior surface of said opal glass screen and are diffused by said opal glass screen to provide a substantially uniform illumination across the exterior surface of said opal glass screen.

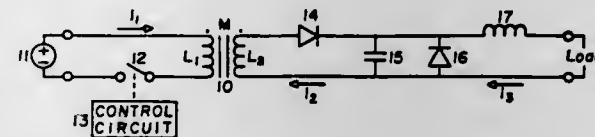
#### 4,415,959 FORWARD CONVERTER SWITCHING AT ZERO CURRENT

Patrizio Vinciarelli, Skillman, N.J., assignor to Vicor Corporation, Westford, Mass.

Filed Mar. 20, 1981, Ser. No. 246,120  
Int. Cl.<sup>3</sup> H02P 13/22

U.S. Cl. 363—21

13 Claims



1. A single-ended, zero current switching forward converter circuit comprising:

a voltage source;

a power transformer including a primary winding and a secondary winding, said power transformer being constructed to have an effective secondary leakage inductance  $L_{2e}$ ;

a switching device to selectively couple said voltage source across the primary winding of said power transformer;

a first unidirectional conducting device connected in series with said secondary winding and oriented to conduct during conduction by said switching device;

a capacitor of capacitance  $C$  connected in series with said secondary winding and said unidirectional conducting device;

control means for selectively closing and opening said switching device to transfer energy from said voltage source via the effective leakage inductance of said transformer to charge said capacitance during an energy transfer cycle having a characteristic time scale of  $\pi\sqrt{L_{2e}C}$ .

4,415,960

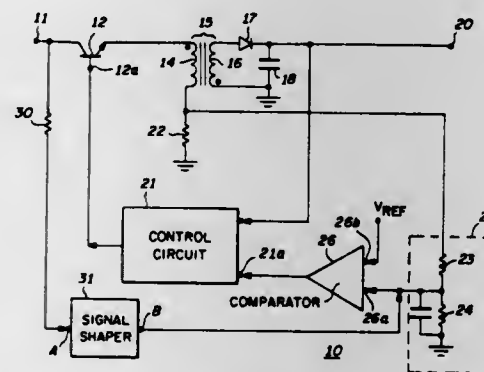
#### LINE VARIABLE OVERCURRENT PROTECTION FOR A VOLTAGE CONVERSION CIRCUIT

Charles A. Clark, Jr., Chatsworth, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,941  
Int. Cl.<sup>3</sup> H02M 3/335

U.S. Cl. 363—21

3 Claims



1. An improved voltage converter of the type responsive to an input d.c. voltage on an input line for providing an output voltage to a load, said converter including a transformer having a primary and a secondary winding, sensor means comprising a resistor coupled in series with said primary winding for providing a voltage analog of current in said primary winding, switching means coupled in series with said primary winding, control circuit means coupled to said sensor means for opening said switching means in response to signals received from said primary winding, and low pass filter means coupled between said control circuit means and said sensor means, wherein the improvement comprises:

means, comprising a resistor coupled to said primary wind-

ing, coupled to said input line for sampling said input d.c. voltage; and

means, coupled to said input d.c. voltage sampling means, for augmenting said voltage analog with said input d.c. voltage sample, said augmenting means including means, comprising a passive non-linear signal shaping network, for shaping said input d.c. voltage.

4,415,961

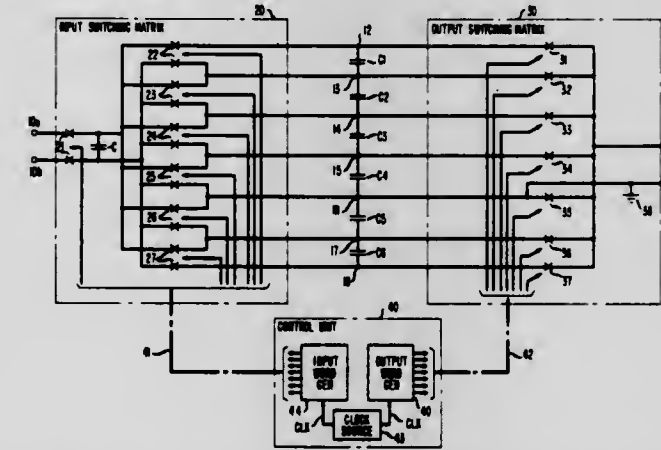
#### TELEPHONE RINGING SIGNAL GENERATOR

William R. Harmon, Jr., Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 26, 1981, Ser. No. 296,307  
Int. Cl.<sup>3</sup> H03K 3/51

U.S. Cl. 363—43

6 Claims



1. A waveform generator (FIG. 1) for converting a supplied direct current signal (10a, 10b) into an alternating current signal (11a, 11b), the generator being characterized by,

means (40) for generating first (41) and second (42) control signals,

a plurality of means (C1 through C6), each having at least two terminals (12 through 18) connected in a fixed circuit configuration for storing an amplitude representation of a signal applied thereto,

means (20) responsive to the first control signal for selectively steering the supplied direct control signal to the plurality of storage means,

means responsive to the first control signal for controllably isolating said steering means from the supplied direct current signal, and

selection means (30) responsive to the second control signal for transferring a stored amplitude representation from selected terminals to generate the alternating current signal.

4,415,962

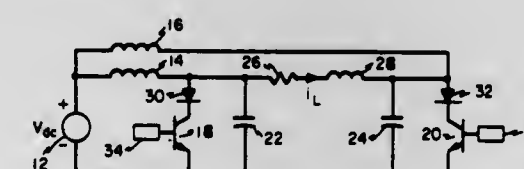
#### CURRENT MODE SINE WAVE INVERTER

John G. Kassakian, Newton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 15, 1981, Ser. No. 274,006  
Int. Cl.<sup>3</sup> H02M 7/537

U.S. Cl. 363—131

9 Claims



1. An inverter comprising:

(a) first and second means each producing a substantially constant dc current;

(b) first and second switching means connected in parallel

with the first and second dc current producing means, respectively;

(c) first and second capacitance means connected in parallel with the first and second switching means, respectively;

(d) load means connected to said first and second current producing means;

(e) inductance means coupled to said load means; and

(f) means for controlling the operation of said first and second switching means so that said switching means operate sequentially, whereby current through the load means executes a sinusoidal cycle when the first switching means is opened and a complementary sinusoidal cycle when the second switching means is opened.

4,415,963

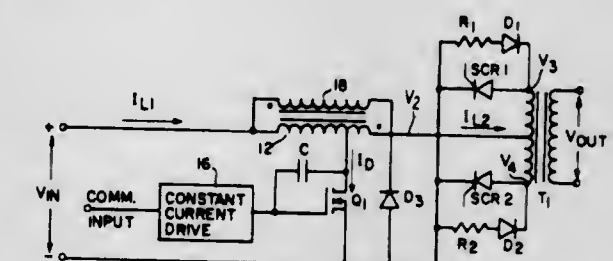
#### FET COMMUTATED CURRENT-FED INVERTER

Wally E. Rippel, Altadena, and Dean B. Edwards, Monrovia, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 24, 1981, Ser. No. 257,478  
Int. Cl.<sup>3</sup> H02M 7/515

U.S. Cl. 363—135

8 Claims



1. In a current-fed inverter an improvement comprised of a tapped inductor for connecting a dc source of power to said inverter and a field-effect transistor having source, drain and gate electrodes connected with its source and drain electrodes to bypass output current from said inductor to said dc source while a switch in said inverter is being turned off and another switch is being turned on, wherein said inverter switches are thyristors and said field-effect transistor is connected to said tap in said inductor, thereby providing an autotransformer for back biasing said thyristors while said field-effect transistor is commutating said thyristors, and wherein an external capacitor is connected between said drain and gate electrodes of said field-effect transistor, and where turn on and turn off drive to said field-effect transistor is provided by a gated constant current source connected to said gate electrode.

4,415,964

#### POWER SUPPLY

James A. Scharfe, Jr., 344 Camino Del Cielo, South Pasadena, Calif. 91030

Filed Dec. 28, 1981, Ser. No. 335,059  
Int. Cl.<sup>3</sup> H02M 1/10

U.S. Cl. 363—142

30 Claims



1. A method for automatically producing an output voltage which is within a first range of voltages from an input voltage which is within the first range of voltages or within a second range of voltages comprising: automatically sensing the input voltage to determine if its magnitude is within said first or second range of voltages; automatically connecting a plurality of electrical loads in parallel with the input voltage whenever the sensed input voltage has a magnitude within said first range of voltages; or automatically connecting said plurality of electrical loads in series with said input voltage whenever the







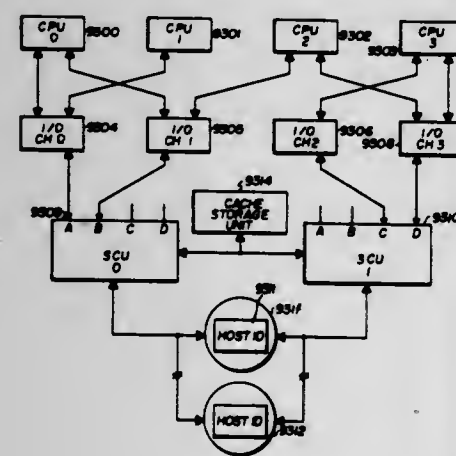
processors with a plurality of disk drive devices, said host processors generating commands and addressing information, including a disk drive device number and a relative word address, said system including:

at least two storage control units each said storage control unit being connected to said host processors and said disk drive devices;

a cache memory unit connected to said storage control units, said cache memory unit including cache storage means, segment descriptor storage means and random access storage means for storing a command queue header and a plurality of command queues, all accessible to each of said storage control units;

there being a command queue for each of said disk drive devices with each command queue having a plurality of entries each representing a command waiting to be executed by its associated disk drive device;

each said storage control unit including, means responsive to certain commands from said host processors for generating and loading an entry into the command queue associated with the disk drive device designated by said device number;



means operative during idle periods of the storage control unit for detecting command queues requiring servicing and seek complete signals from disk drives which are ready for data transfers;

first means responsive to said detecting means for servicing a command queue requiring service and issuing a seek signal to the associated disk drive device; and second means responsive to said detecting means for formulating device end status and transmitting it to the host processor which issued the command;

said host processors including means for reissuing a command upon receipt of said device end status to the storage control unit which transmitted said status; and,

means in each said storage control unit for accepting a reissued command if it transmitted the device end status to the host processor reissuing it; and,

means in each said storage control unit, responsive to an accepted reissued command, for controlling the transfer of data from the disk drive device to the host processor reissuing the command,

whereby any storage control unit may process a seek complete signal even though it did not issue the seek signal.

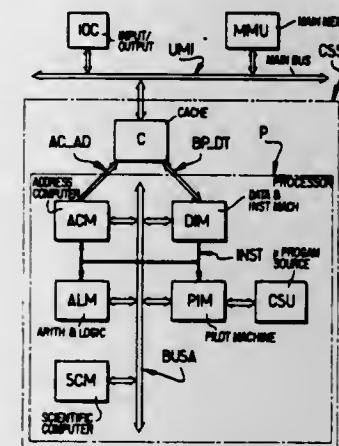
#### 4,415,971 APPARATUS FOR MANAGING THE DATA TRANSFERS BETWEEN A MEMORY UNIT AND THE DIFFERENT PROCESSING UNITS OF A DIGITAL DATA PROCESSING SYSTEM

Michel J. Guillemet, Palaiseau, and Michel Isert, Paris, both of France, assignors to CII Honeywell Bull, Paris, France  
Filed Mar. 31, 1981, Ser. No. 249,409

Claims priority, application France, Apr. 1, 1980, 80 07288  
Int. Cl.<sup>3</sup> G06F 13/00, 15/16

U.S. Cl. 364—200

4 Claims



1. Apparatus for managing data transfers between a memory array and different processing units of a digital data processing system while a task of the system is being implemented, the memory array being included in at least one of the processing units, the memory array including a cache memory, and a main memory unit, the at least one processing unit further including an input-output unit, a sub-system and computer means; the memory array, input-output unit and sub-system being connected to the other processing units by a main bus, the at least one processing unit including a source of microinstructions, the at least one processing unit including internal bus means interconnecting the microinstruction source, the computer means, the memory array and the sub-system, the apparatus comprising an interface unit in the sub-system, the interface unit being connected with the memory array and the main bus so signals are transferred between the interface unit and the processing units via the main bus, the interface unit including a write buffer, a read buffer and a program buffer; the microinstruction source including: (a) a pointer BP for identification of the next byte to be exchanged between the main bus and the interface unit, (b) a pointer MP for identification of the next byte to be exchanged between the memory array and the interface unit; and (c) a pointer AMP for identification of the first word of the next transfer request to be exchanged between the memory array and the interface unit, a first memory counter AMC for storing an indication of the number of bytes remaining to be transferred between the memory array and the interface unit when a currently executed transfer request is completed, a second memory counter BC for storing an indication of the number of bytes remaining to be transferred between the interface unit and the processing units of the system via the main bus, and means responsive to the microinstruction source for interconnecting the main bus, the internal bus, the memory array, the first and second memory counters and the program, read and write buffers for: loading the read buffer with information items relating to data transmitted from the memory array to the processing units via the main bus, loading the write buffer with information items relating to data transmitted from the processing units to the memory array via the main bus, controlling the program, read and write buffers in response to the count in the first counter and the pointers, and controlling the read and write buffers in response to the same count in the second counter, the buffers being controlled so that there are: automatic transfers of information items relating to first instructions between the memory array and the inter-

face unit prior to the first instructions being performed, automatic transfers of first data from the memory array to the interface unit prior to the first data being used by the processing units, and automatic transfers of data from the processing units to the memory array, the automatic transfers being independent of microprograms performed in response to the microinstructions.

#### 4,415,972 DUAL PORT MEMORY INTERLOCK

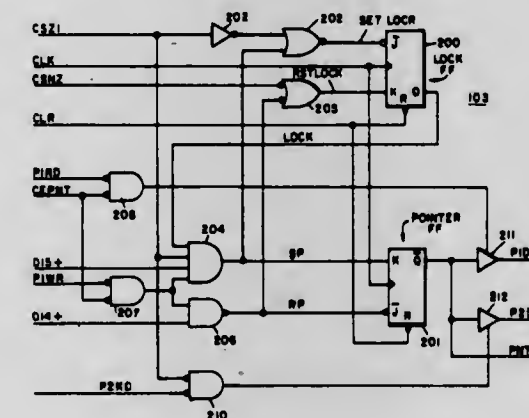
Ralph L. Adcock, Irvine, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,300

Int. Cl.<sup>3</sup> G06F 15/16, 13/00

U.S. Cl. 364—200

5 Claims



1. A computing system comprising first (P1) processor means, second (P2) processor means, switching means (101),

first bus means (DB1) connected to selectively transfer signals between said first processor means and said switching means,

second bus means (DB2) connected to selectively transfer signals between said second processor means and said switching means,

memory means (100) connected to receive signals from said switching means, and

interlock means (103) connected to said switching means to determine which one of said first and second processor means is to be connected to said memory means via said switching means and assuring that only one processor means is so connected at any time,

said interlock means operative to normally maintain a priority status for said second processor means but selectively permitting either of said signal processor means to be connected to said switching means for consecutive operations thereof at the direction of said first and second processor means,

said interlock means produces a signal (P2D7) wherein said second processor means has said priority status and is normally connected to said memory means via said switching means in response to a control signal (CSZ1) from said second processor means and wherein said first processor means is connected to said memory means via said switching means only when said second processor is not so connected,

said interlock means includes first and second bistable means,

said first bistable means (200) connected to receive signals from said second processor means to produce signals representative of the status of said second processor means and to selectively prevent said first processor means from being connected to said switching means,

said second bistable means (201) connected to receive signals from said first and second processor means and to supply signals (PNTR) to said switching means to control which of said first and second processor means is connected to

said memory means as well as to supply signals (P1D7, P2D7) to said first and second processor means to indicate whether the connection of the respective processor means has been permitted,

said second bistable means further connected to receive signals from said first bistable means to thereby produce signals which selectively preclude one of said first and second processor means from being connected to said memory means via said switching means,

said second bistable means connected to receive an inquiry signal from said first processor means when said first processor means attempts to be connected to said memory means via said switching means and to produce an output signal in response to said inquiry signal which output signal informs said first processor means if it has obtained control.

#### 4,415,973 ARRAY PROCESSOR WITH STAND-BY FOR REPLACING FAILED SECTION

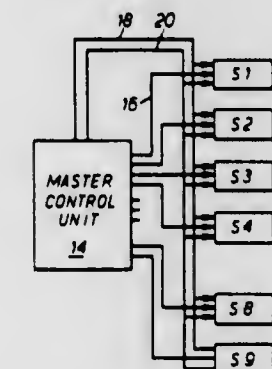
Colin Evans, Stevenage, England, assignor to International Computers Limited, London, England  
Filed Mar. 16, 1981, Ser. No. 243,999

Claims priority, application United Kingdom, Mar. 28, 1980, 8010575

Int. Cl.<sup>3</sup> G06F 15/16

U.S. Cl. 364—200

3 Claims



1. An array processor having a plurality of sections of processing elements, and means for allocating a unique address to each section in a continuous sequence, comprising:

(a) at least three sections, each section comprising a plurality of processing elements connected together in a predetermined pattern,

(b) connection means coupled to said sections, for connecting said sections together in series,

(c) by-pass means coupled to said sections and operable to by-pass any selected one of said sections by directly interconnecting the sections on opposite sides of said selected section, thereby isolating said selected section from the other said sections, said by-pass means being operable only upon selection of said selected section, and

(d) means for variably allocating a continuous sequence of addresses to respective ones of said sections other than said selected one of said sections, at least some of said addresses being reallocated in said continuous sequence upon selection of said selected one of said sections whereby the sequence of said unique addresses in said continuous sequence is not altered upon the bypass of said selected section.



4,415,974

**AIRSPPEED DISPLAY SCALE WITH INTEGRAL TREND INDICATION**

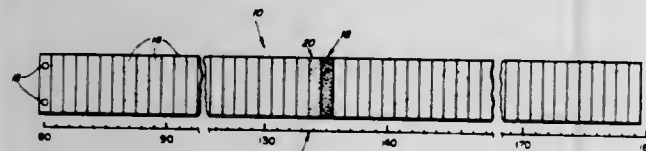
Owen B. Laug, Barnesville; Charles C. Gordon, Bethesda, and Robert O. Stone, Gaithersburg, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 11, 1981, Ser. No. 272,624

Int. Cl.<sup>3</sup> G06F 15/50

U.S. Cl. 364—426

6 Claims



1. A linear digitally activated airspeed/trend indicator for indicating and displaying the airspeed of a landing aircraft and for indicating the airspeed trend as either increasing or decreasing in response to a linear analog voltage representative of the airspeed, which comprises:

- a linear scale for indicating the airspeed and the airspeed trend in a predetermined airspeed range of 80 to 179 knots and including a corresponding mark for each airspeed knot within the range;
- a plurality of juxtaposed display cubicles in alignment and cooperation with said linear scale for indicating and displaying the airspeed and airspeed trend as increasing or decreasing in the predetermined airspeed range, said plurality of juxtaposed display cubicles having frosted front surfaces for diffusing light and distributing it evenly so as to eliminate point sources of light;
- a plurality of lamp pairs, each pair being connected in parallel, and each pair being disposed in one of said plurality of juxtaposed display cubicles; and
- digital/electronic circuitry for lighting the appropriate one of said plurality of lamp pairs to indicate and display in response to the linear analog voltage representative of a corresponding particular airspeed in the predetermined airspeed range, and for lighting at a lower intensity, an adjacent one of said plurality of lamp pairs to the left or right of the appropriate one of said plurality of lamp pairs to indicate and display the trend of the particular airspeed as increasing or decreasing, respectively.

4,415,975

**APPARATUS AND METHOD FOR ROUGH POSITIONING A VEHICLE AT A STORAGE BIN IN AN AUTOMATIC STORAGE AND RETRIEVAL SYSTEM**

Harold S. Burt, Kansas City, Kans., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Dec. 31, 1980, Ser. No. 221,791

Int. Cl.<sup>3</sup> G06F 15/50; G05B 11/18

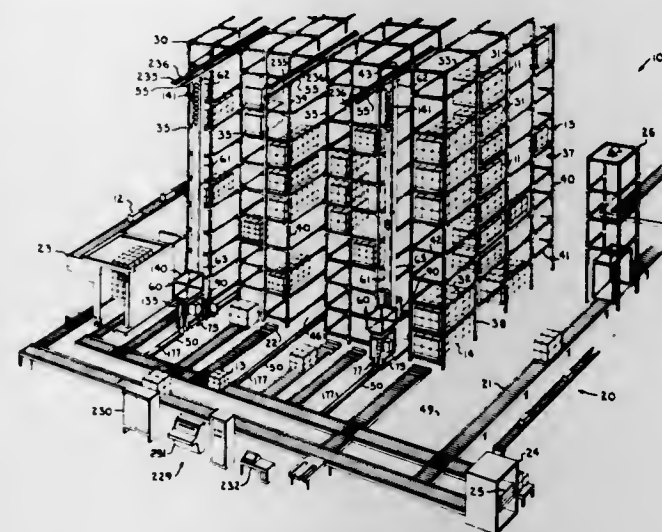
U.S. Cl. 364—444

19 Claims

1. A rough positioning method whereby a vehicle located at start address is positioned in a rough position zone including destination address, which comprises the steps of:

- (a) generating a signal having a first non-ambiguous binary value corresponding to said start address;
- (b) communicating said signal having said first value to control means for said vehicle;
- (c) receiving in said control means a second nonambiguous binary value corresponding to said destination address;
- (d) comparing in said control means said first and second values;
- (e) expanding said second value to a range of nonambiguous binary values corresponding to said rough position zone;

- (f) causing with said control means said vehicle to travel from said start address to said rough position zone;
- (g) generating a signal having a value within said range; and



- (h) communicating said signal having said value within said range to said control means whereby said vehicle is designated as being located in said rough position zone.

4,415,976

**METHOD AND APPARATUS FOR AUTOMATIC MILL ZERO CORRECTION FOR STRIP WIDTH**

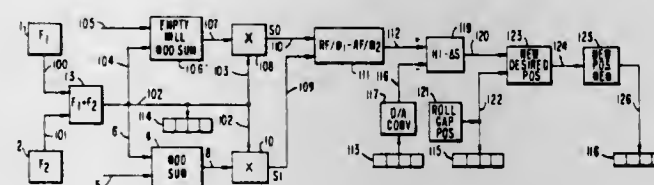
John W. Cook, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1981, Ser. No. 258,342

Int. Cl.<sup>3</sup> G06F 15/46; B21B 37/00

U.S. Cl. 364—472

19 Claims



1. A method of presetting the roll stands of a rolling mill comprising the steps of:
- closing the roll gap of a roll stand until a desired roll force RF is developed between the rolls;
  - determining the actual mill stretch  $RF/M_1$  of the empty mill modulus for said desired roll force at said stand;
  - determining for said desired roll force the actual mill stretch  $RF/M_2$  of the mill modulus at said stand if loaded with a strip of material of a given width;
  - calculating the quantity  $\Delta S = (RF/M_1 - RF/M_2)$ ;
  - determining for a desired strip thickness DT a desired roll gap opening  $H_1$  by the relation  $H_1 = DT - (S_1 - S_0)$ , where  $S_0$  is the separation of the rolls when the mill is empty and  $S_1$  is the separation of the rolls when the mill is loaded; and
  - opening the roll gap of said stand by an amount sufficient to reach said desired roll gap opening.

4,415,977

**METHOD OF CONSTANT PERIPHERAL SPEED CONTROL**

Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

PCT No. PCT/JP80/00150, § 371 Date Mar. 2, 1981, § 102(e) Date Feb. 20, 1981, PCT Pub. No. WO81/00073, PCT Pub. Date Jan. 22, 1981

PCT Filed Jun. 30, 1980, Ser. No. 243,928

Claims priority, application Japan, Jun. 30, 1979, 54-82779

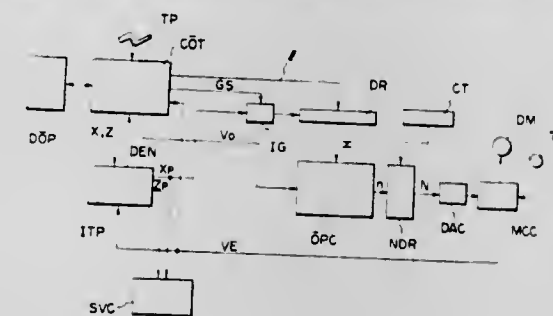
Int. Cl.<sup>3</sup> B23Q 15/10; G05B 19/18; G06F 15/46

U.S. Cl. 364—474

6 Claims

1. An improved method of constant peripheral speed control

for a workpiece supported on a spindle, of the type wherein a distance value corresponding to the distance between the spindle axis and a tool for cutting the workpiece is stored in a memory means, the stored content is revised in response to movement of the tool, and a signal for rotating the spindle at an RPM which imparts a constant peripheral speed to the workpiece is determined based on a commanded peripheral speed and the content stored in the memory means, wherein the



improvement comprises: inhibiting the revision of said stored content when the tool is moved on the basis of a rapid-advance command; storing in said memory means a numerical value corresponding to the distance between a position at which the tool starts moving at a speed other than the rapid-advance speed and the axis of the spindle; determining the RPM for the spindle based on said numerical value and the commanded peripheral speed, and driving the spindle to rotate it at said RPM before the tool reaches said position.

4,415,978

**CUT-TO-MARK CUT-OFF CONTROL AUTOMATED FOR SPLICE AND ORDER CHANGE**

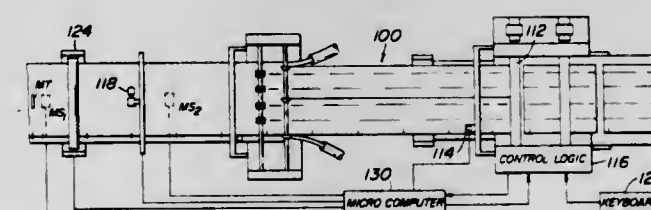
Robert H. Craemer, Cherry Hill, and A. Brent Woolston, Palmyra, both of N.J., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Apr. 14, 1981, Ser. No. 254,226

Int. Cl.<sup>3</sup> B26D 5/36; G06F 15/20

U.S. Cl. 364—475

12 Claims



1. A method for automatic control of a cut-off machine at the transition of a splice in a web comprising:

- (a) cutting a moving web at index marks thereon by a cut-off machine;
- (b) applying a target capable of being sensed to an idle web adjacent an initial index mark thereon, splicing the idle web to the moving web;
- (c) sensing said target when it appears at a first location upstream from the cut-off machine and generating a signal; thereafter, severing the web transversely in response to the signal and creating a gap between leading and trailing portions of the web;
- (d) sensing said target when it appears at a second location upstream of the cut-off machine; thereafter, sensing displacement of the trailing portion of the web and generating a series of signals representative of extrapolated positions of the target upstream of said cut-off machine based on sensing the target at the second location and sensing displacement of the trailing position of the web;
- (e) synchronizing the cut-off machine with the index marks on the trailing portion of the web while the cut-off machine is in said gap in response to said series of signals;
- (f) whereby said cut-off machine cuts said trailing portion of the web at said index marks beginning with said initial

index mark and operator intervention to make an upstream or downstream adjustment is eliminated.

4,415,979

**METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF AN ANIMATE BODY IN AN INANIMATE MOBILE STRUCTURE**

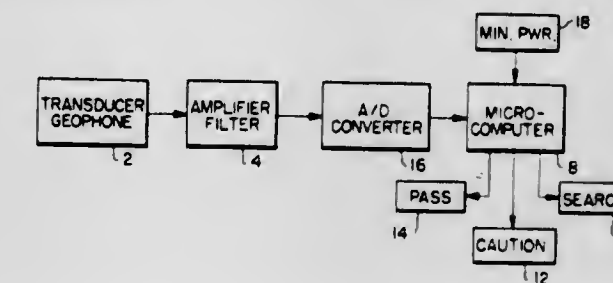
Walter C. Hernandez, Potomac, Md., assignor to Enasco, Inc., Springfield, Va.

Filed Mar. 25, 1981, Ser. No. 247,242

Int. Cl.<sup>3</sup> G08B 13/00

U.S. Cl. 364—508

14 Claims



1. A time domain power evaluation method for detecting the presence of an animate body in an inanimate mobile structure which includes:

- a. sensing the mechanical vibrations emanating from a mobile structure and deriving therefrom an electrical signal which is a function of such vibrations;
- b. sampling said electrical signal during a plurality of equal time periods and obtaining the power level of said sampled electrical signal during said equal time periods;
- c. determining whether an accumulation of power levels of a selected magnitude exists within a selected power range of power levels close to but above the lowest power level obtained during said sampled time periods;
- d. determining whether said lowest power level is above a predetermined minimum power level;
- e. and providing an output indication in the presence of an accumulation of power levels at or in excess of said selected magnitude in said selected power range when said lowest power level is above said predetermined minimum power level.

4,415,980

**AUTOMATED RADIOGRAPHIC INSPECTION SYSTEM**

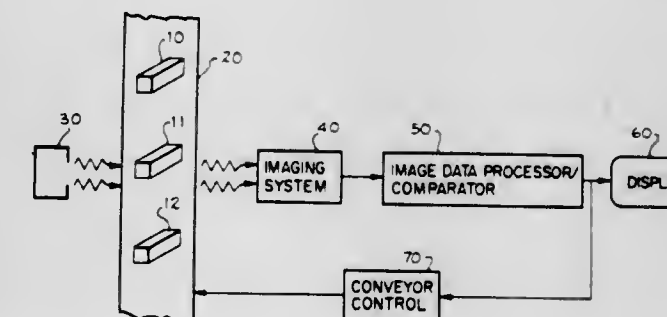
Robert A. Buchanan, Palo Alto, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Mar. 2, 1981, Ser. No. 239,611

Int. Cl.<sup>3</sup> G06F 15/46; H04N 5/32

U.S. Cl. 378—58

11 Claims



1. A method of determining structural conformity of a test object to a reference object for quality control of manufactured objects, said method comprising the steps of:

- (a) transmitting X-ray radiation through said reference object to phosphor means for generating an optical signal,



which is converted to an electronic image of said reference object;

(b) transmitting x-ray radiation through said test object to phosphor means for generating an optical signal, which is converted to an electronic image of said test object; and

(c) subtracting one of the aforesaid electronic images from the other to produce a subtractive image in which any significant structural difference between said test object and said reference object appears in sharp detail.

4,415,961

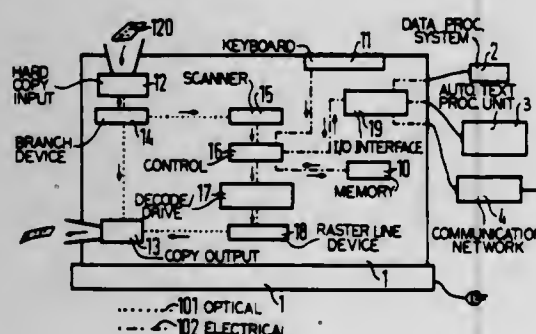
# MULTI-PURPOSE TERMINAL DEVICE HAVING AN INPUT AND CONTROL KEYBOARD FOR CONNECTION TO A DATA PROCESSING SYSTEM AND/OR TO AN AUTOMATIC TEXT PROCESSING UNIT

David Cutter, and Hans Unterberger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
 Filed Apr. 3, 1981, Ser. No. 250,536  
 Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019480

Int. Cl.<sup>3</sup> G06F 15/20

U.S. Cl. 364—518

25 Claims



1. A multi-purpose terminal device for connection of external devices including a data processing system, an automatic text processing unit and a communication network, comprising:

- a hard copy input device for receiving and optically scanning an original to produce optical information and transmit the same over a first optical path;
- a branching device in the first optical path for passing a first portion of the optical energy along the first optical path and branching a second portion of the optical energy along a second optical path;
- a copy output device coupled to the first optical path and operable in response to the first portion of the optical energy to produce a hard copy of the original;
- a keyboard operable to produce a plurality of command signals; and
- interface means for coupling the external devices to said branching device over the second optical path and to said copy output device over a third optical path, said interface means including an interface device for connection to the external devices, an electrical signal generator coupled to the second optical path, an optical signal generator coupled to the third optical path and operable in response to input signals to transmit optical energy to operate said copy output device, and a memory for storing information, said interface means further including control means responsive to command signals to selectively interconnect via said interface device, the external devices with said electrical signal generator for transmitting outgoing information and with said optical signal generator for receiving incoming information and to selectively connect the external devices and said electrical signal generator to said memory for temporary storage of the respective incoming and outgoing information.

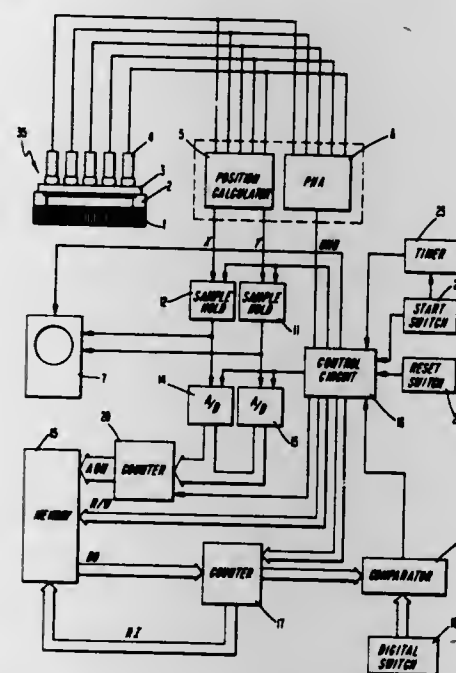
4,415,962

# SCINTILLATION CAMERA

Mineki Nishikawa, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
 Filed Jan. 27, 1981, Ser. No. 229,002  
 Claims priority, application Japan, Jan. 31, 1980, 55-10244  
 Int. Cl.<sup>3</sup> H04N 5/66

U.S. Cl. 364—527

5 Claims



1. A scintillation camera apparatus including a camera head for detecting, in a matrix of points, radiation emitted from radioactive materials distributed in a subject and generating electric signals corresponding with said emitted radiation, said camera including a collimator, a scintillator, and a plurality of photomultipliers, position-calculating apparatus for calculating the radiation incidence position of an electric signal from said camera head, a pulse-height analyzer for generating an unblanking signal only when the emitted radiation exceeds background noise and display apparatus for reflecting the electric signals generated by the camera head, the improvement comprising:

- a memory having a plurality of addresses corresponding to the points of the matrix detected by said camera head;
- an address-designating apparatus supplied with the radiation incidence position from the position-calculating apparatus for issuing a signal designating the address in said memory corresponding to each radiation incidence position signal received and for driving the memory position to a successive position;
- control apparatus;
- means for transmitting said unblanking signal to said control apparatus;
- means triggered by the receipt of said unblanking signal by said control apparatus for comparing the content at the address designated by the address-designating apparatus with a predetermined minimum of acceptable radiation, said comparing means generating a first signal representing that said content of the memory at the designated address is less than said predetermined minimum value and a second signal representing that said content is at least equal to said predetermined minimum value;
- means for transmitting said first and second signals from said comparing means to said control apparatus, said control apparatus, (1) upon receipt of said first signal, adding one, representing said received designation signal, to said content and returning the increased content to the designated address, and, (2) upon the receipt of the second signal, issuing the unblanking signal to said display apparatus at the corresponding point of the display apparatus; and
- timing means for shutting off access of said unblanking signals to said display apparatus at a predetermined time, whereby said display apparatus reflects only radiation at

least equal to said predetermined minimum at said predetermined time.

4,415,983

# SYSTEM AND METHOD FOR ALIGNING A DISPLAY DEVICE

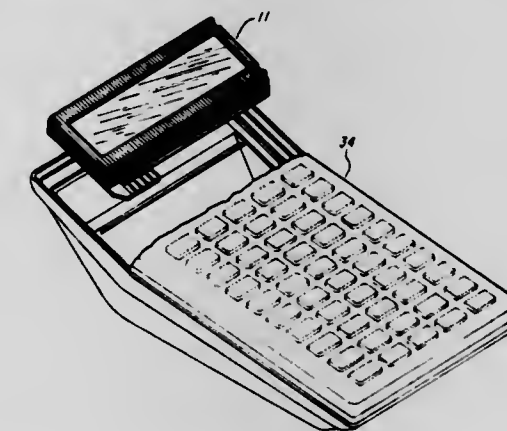
Leonard P. Lachmann, and Cesario S. Garza, Jr., both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 4, 1980, Ser. No. 127,021

Int. Cl.<sup>3</sup> G06F 1/00; H05K 1/14

U.S. Cl. 364—708

23 Claims



1. A system for aligning an electrically-responsive display device having a plurality of electrically conductive terminals with respect to a substrate member to effectuate electrical interconnection between said display device and an electrical circuit member mounted on said substrate member, said system comprising:

- (a) an insulative substrate member having a plurality of electrical conductors formed thereon, each of said electrical conductors being electrically connected to said electrical circuit, said substrate member further including a plurality of openings extending therethrough;
- (b) spacer material having a pattern of electrical conductors on a surface thereof, said spacer member being disposed adjacent to said substrate member with said electrical conductors on said surface thereof in electrical contact with respective ones of said plurality of electrical conductors of said substrate member; and
- (c) a base member for retaining said display device in a fixed position between said base member and said insulative substrate member, said base member including a plurality of alignment posts extending outwardly therefrom for mating with respective openings of said substrate member, said base member being mechanically biased toward said substrate member thereby biasing said display device toward said spacer material and said spacer material toward said substrate member for electrically connecting said electrically conductive terminals to said electrical conductors of said spacer material thereby electrically connecting said electrically conductive terminals to respective ones of said electrical conductors of said substrate member and for mechanically holding said display device, said base member further including a flexible spring member for exerting biasing pressure on said display device in a direction perpendicular to said biasing of said display device toward said substrate member to maintain said display device in a fixed position with respect to a predetermined reference position on said base member thereby facilitating alignment of said display device with said substrate member.

4,415,984

# SYNCHRONOUS CLOCK REGENERATOR FOR BINARY SERIAL DATA SIGNALS

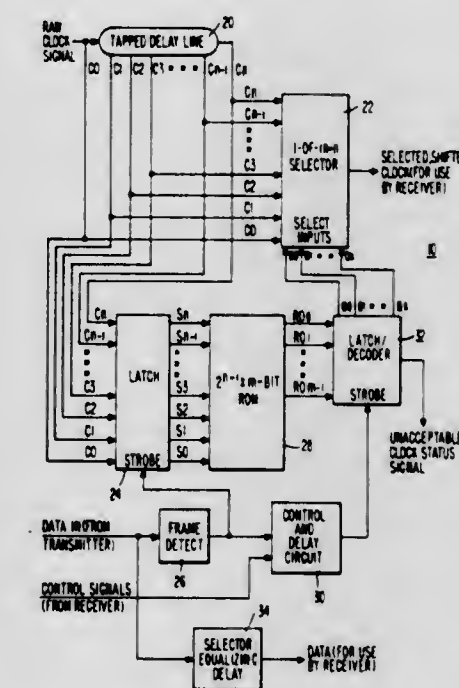
Dana A. Gryger, Downingtown, and Daniel P. Drogichen, West Chester, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 25, 1980, Ser. No. 162,806

Int. Cl.<sup>3</sup> G06F 7/28, 5/06

U.S. Cl. 364—900

12 Claims



1. A synchronous clock regenerator for generating a clock signal for strobing a sequence of binary serial data, the beginning of said sequence of binary serial data including a framing pattern, said sequence of binary serial data have associated with it a raw clock signal of the same frequency as said binary serial data, said clock regenerator comprising:

- delay means to delay said raw clock signal for generating a plurality of delayed versions of said raw clock signal;
- address generating means, initiated by the occurrence of said framing pattern, for generating a set of signals from said generated plurality of delayed versions of said raw clock signal, said set of signals representing a generated address;
- storage means, responsive to said generated address, for supplying stored data specifying one of said versions of said raw clock signal including said raw clock signal at the clock signal to be generated; and
- selection means coupled to both said delay means and said storage means, for gating as said generated clock signal the one of said generated plurality of delayed versions of said raw clock signal as specified by said stored data.

4,415,985

# DRIVING CIRCUIT FOR CATHODE RAY TUBE

George H. McDaniel, Northville, and Thomas W. Hartford, Livonia, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 28, 1980, Ser. No. 182,202

Int. Cl.<sup>3</sup> G06F 3/153

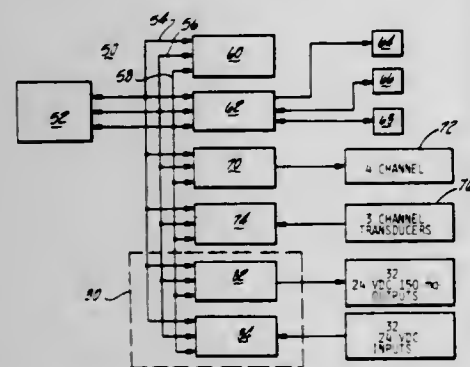
U.S. Cl. 364—900

3 Claims

1. A character display system of the type including interactive display data means for displaying and entering character data within the system; central control means for generating character data signals to be displayed to an operator via the interactive display data means, for generating command signals, for storing address information and for communicating the address information to the interactive display data means via a bus structure, said central control means further including means for transferring data to said interactive display data means, the interactive display data means including display controller means for requesting and receiving character data



from said central control means and for generating line control command and timing signals to cause a dot matrix of characters to be written on a display means such as a cathode ray tube; memory means responsive to control signals for storing a predetermined dot matrix of characters to be generated and for outputting said dot matrix of characters in response to modified line control signals characterized in that the system includes decoder means responsive to each received line control signal for generating modified line control signals wherein said decoder means comprises a PROM having its address locations



divided into at least two portions, the first portion of said PROM addressable to produce each modified line control signal in direct correlation with the received line control signal for causing said memory means to output a particular line of dot characters of the dot matrix in a single line mode, and the second portion of said PROM addressable to generate two modified line control signals for each received line control signal for causing said memory means to output a particular line of dot characters of the dot matrix twice in a double line mode.

4,415,986

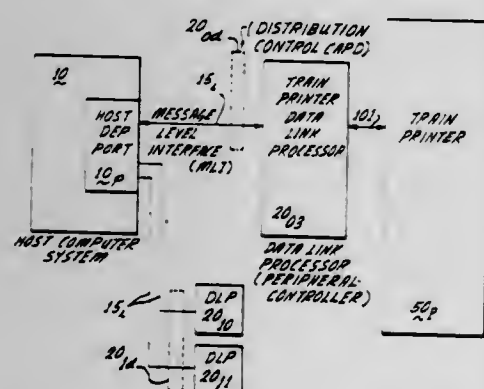
## DATA FLOW CONTROL SYSTEM

David P. Chadra, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 147,508, May 7, 1980, Pat. No. 4,357,681. This application Aug. 4, 1982, Ser. No. 405,045 Int. Cl.<sup>3</sup> G06F 3/12, 11/10

U.S. Cl. 364—900

7 Claims



1. In a network wherein a main host computer communicates to a train printer peripheral unit via an I/O subsystem having a plurality of peripheral-controllers housed in a base module, said base module having a backplane connection means for slide-in connection of cards holding a plurality of peripheral-controllers and a maintenance card checking means, and foreplane connection means, wherein each of said peripheral-controllers is made of a common-front-end circuit card and a peripheral dependent board card linked by said foreplane connection means, the combination comprising:

- (a) a distribution control circuit card connected to said backplane connection means of said base module, said distribution control circuit card including:
  - (a1) bus connection means to said main host computer;
  - (a2) logic means, responsive to said main host computer or

one of said peripheral controllers, to connect or disconnect said main host computer with a selected peripheral-controller;

- (b) a train-printer peripheral-controller connected to said backplane connection means, and providing print-control signals to said train-printer peripheral unit, said train printer peripheral-controller including:
  - (b1) means for enabling data flow between said peripheral-controller and said main host computer or between said peripheral-controller and said maintenance card means, said means selecting direction of flow according to control signals initiated by said peripheral-controller;
  - (b2) maintenance bus means connecting said maintenance card means, via said backplane connection means, to a memory storage means in said train-printer peripheral-controller;
  - (b3) data bus line connection means between said distribution control circuit card and said memory storage means in said train-printer peripheral-controller;
  - (b4) memory storage means for storing data to be transferred and data for operation and control of said train-printer peripheral unit, said memory storage means being connected to:
    - (i) said data bus line connection means for receipt of data and for output of data;
    - (ii) said maintenance bus means for receipt of data and for output of data.

4,415,987

## MAGNETIC BUBBLE PASSIVE REPLICATOR

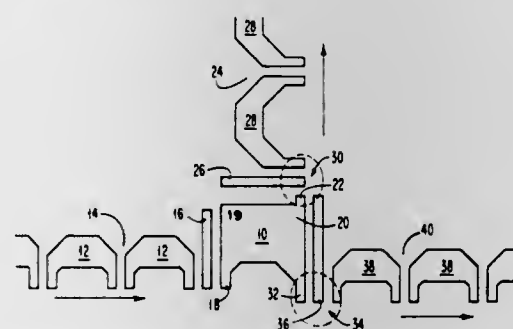
Thomas W. Collins, Saratoga, and Lung-jo Tao, Cupertino, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,816

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365—12

7 Claims



- 1. A passive magnetic bubble replicator for use with first, second and third propagation channels comprising:
  - a replicator element of a magnetizable material having first, second, third and fourth peripheral corner areas in spaced relation, said first corner area being an input leg portion associated with said first propagation channel, said second corner area for bubble replication associated with said second propagation channel, said third corner area being an output leg portion associated with said third propagation channel, said second corner area separated from said first corner area along the periphery in one direction by said fourth corner area, wherein upon the application of a rotating in-plane magnetic field a first bubble passes from said first propagation channel to said first corner area and then through said fourth corner area to said second corner area where the first bubble is split into second and third bubbles, and said second bubble passing into said second propagation channel, said third bubble passing to said third corner area and then into said third propagation channel.

4,415,988

## MAGNETIC BUBBLE MEMORY DEVICE

Kazunari Komenou, Tsutomu Miyashita, both of Kawasaki, and Makoto Ohashi, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

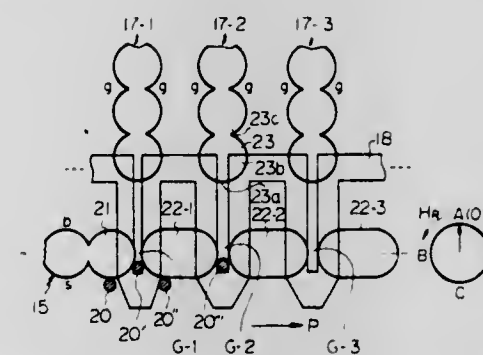
Filed Jul. 14, 1981, Ser. No. 283,182

Claims priority, application Japan, Jul. 15, 1980, 55-97341; Feb. 19, 1981, 56-22207; Feb. 20, 1981, 56-22959; Feb. 20, 1981, 56-22960; Feb. 20, 1981, 56-22961

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365—16

22 Claims



- 1. A magnetic bubble memory device comprising:
  - a magnetic layer having a first region in which the easy axis of magnetization extends in a first direction and a second region surrounding said first region in which the easy axis of magnetization is substantially perpendicular to said first direction, said first and second regions defining a major loop pattern for propagation of information bubbles and a plurality of minor loop patterns for storage of information bubbles, each said minor loop pattern having a first portion in the vicinity of a respective part of said major loop pattern, said major loop pattern having a gap in each said respective part thereof; and
  - an electrical conductor pattern on said magnetic layer, with an insulating layer therebetween, to form a hairpin-shaped pattern extending between said first portion of each said minor loop pattern and the respective gap in said major loop, wherein transfer gates are thusly provided for transfer of information bubbles between the major loop pattern and the minor loop patterns.

4,415,989

## DUAL CONDUCTOR CURRENT ACCESS MAGNETIC BUBBLE MEMORY

Koji Sakamoto, Yatabemachi, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

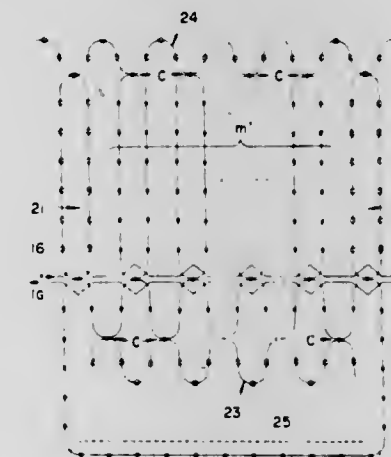
Filed Mar. 31, 1981, Ser. No. 249,465

Claims priority, application Japan, Jun. 2, 1980, 55-74095

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365—19

8 Claims



- 1. A dual-conductor type current-access magnetic bubble memory having first and second conductors, which comprises:
  - a major loop constituted by a linear propagation path,

formed by a serial train of paired apertures bored in the first and second conductors and zigzag propagation path formed of a serial train of paired apertures bored in the first and second conductors,

a plurality of minor loops each constituted by a serial train of paired apertures bored in said first and second conductors, a plurality of transfer gates each defined by a pair of apertures and arranged so as to connect the respective minor loops with the major loop on the zigzag propagation path thereof, and

a gate control conductor capable of imparting a magnetic field to the transfer gates consisting of paired apertures, said zigzag propagation path being provided with at least three aperture patterns for propagating bubbles between the adjacent transfer gates, whereby a series of bubbles can be transferred between the major loop and the respective minor loops by applying gate current pulses to said gate control conductor while a current pulse sequence is applied to each of said first and second conductors.

4,415,990

## COMPLEMENTARY BI-LEVEL MAGNETIC BUBBLE PROPAGATION CIRCUIT

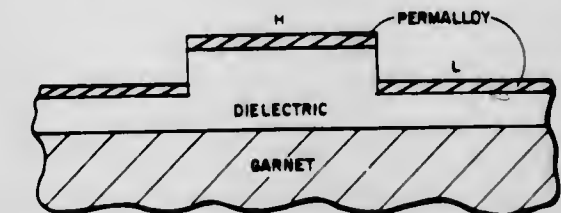
Isor S. Gergis, Yorba Linda, and Wai-Tak P. Lee, Santa Ana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 71,449, Aug. 31, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 276,408

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365—41

16 Claims



- 1. A magnetic bubble domain device comprising:
  - a planar layer of magnetic material in which magnetic bubble domains can be propagated;
  - a bubble domain guide structure coupled to said layer for defining a bubble propagation path for guiding the movement of said bubbles in said layer in response to a cyclical change in the orientation of a reorienting magnetic field within the plane of said layer;
  - said structure comprising a two-level composite structure including a first pattern of elements responsive to a magnetic field formed as an upper first layer of said structure, and a second pattern of elements responsive to a magnetic field forming a lower second layer of said structure, said first and said second patterns being complementary to each other, said first and second layers being separated by a substantially vertical gap;
  - said first and second second pattern of elements being operative in response to a rotating field so as to form a potential energy well in said layer of magnetic material in which magnetic bubble domains can be propagated underneath said layers of said guide structure so that as the magnetic field reorients in the plane of the layer, the potential well is translated in said layer of magnetic material in a direction along a path corresponding to the path in the plane of said guide structure of the vertical gap between said upper first layer and said lower second layer.



4,415,991

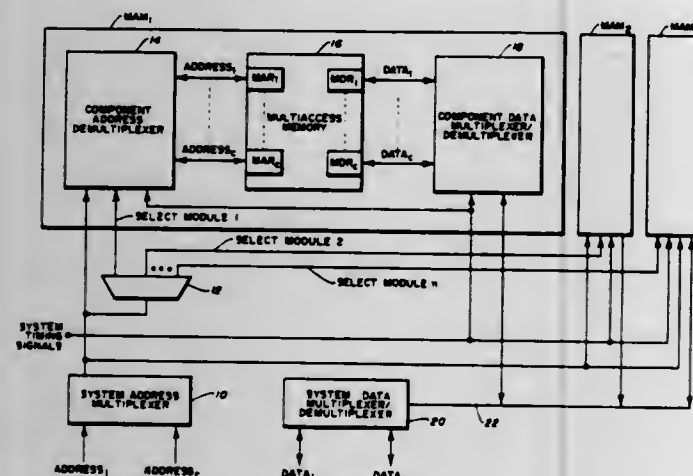
## MULTIPLEXED MOS MULTIACCESS MEMORY SYSTEM

Wesley W. Chu, Pacific Palisades, and David G. Hibbits, Culver City, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,439  
Int. Cl.<sup>3</sup> G11C 13/00

U.S. Cl. 365—77

2 Claims



1. Multiplexed, multiaccess memory system for use with a digital data computer system of a type having a memory formed of a plurality of memory modules each containing data bit storage cells, the computer system further including a digital data processor providing address instructions to memory address multiplexers, the outputs of which are applied to decoders functioning responsively to said instructions to activate particular storage cells of a particular module and permit the logic state of said particular cell to be altered to reflect an instruction, the memory system comprising:

- a system address multiplexer having a plurality of inputs for receiving multiple addresses simultaneously from one or more processing units and having one or more addressing outputs
- a component address demultiplexer having an input coupled to said system address multiplexer and having a plurality of outputs,
- a multiaccess memory having a plurality of memory address registers, each being connected to one of said plurality of outputs of said component address demultiplexer and having a plurality of memory data registers,
- a system data multiplexer/demultiplexer having a plurality of terminals for receiving and transmitting data from and to said multiaccess memory according to corresponding specified addresses, and
- a component data multiplexer/demultiplexer coupled to said data registers and operating as a multiplexer when reading data from said memory data registers and operating as a demultiplexer when writing data into said memory data registers.

4,415,992

## MEMORY SYSTEM HAVING MEMORY CELLS CAPABLE OF STORING MORE THAN TWO STATES

Richard H. Adlhoeh, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

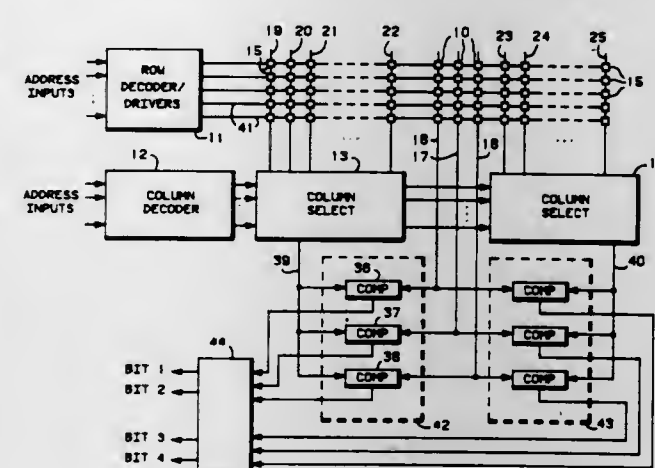
Filed Feb. 25, 1981, Ser. No. 238,177  
Int. Cl.<sup>3</sup> G11C 11/40

U.S. Cl. 365—94

11 Claims

10. A memory array having a plurality of rows and columns of memory cells wherein the columns are divided up into groups having an equal number of columns, the memory cells each being capable of storing more than two states; a plurality of columns of reference cells located between adjacent groups of columns of memory cells, the reference cells being substan-

tially identical in physical size to the memory cells; comparator means for receiving memory cell data comparing such data to



one of the reference cells; and a translator for translating an output from the comparator means to binary data.

4,415,993

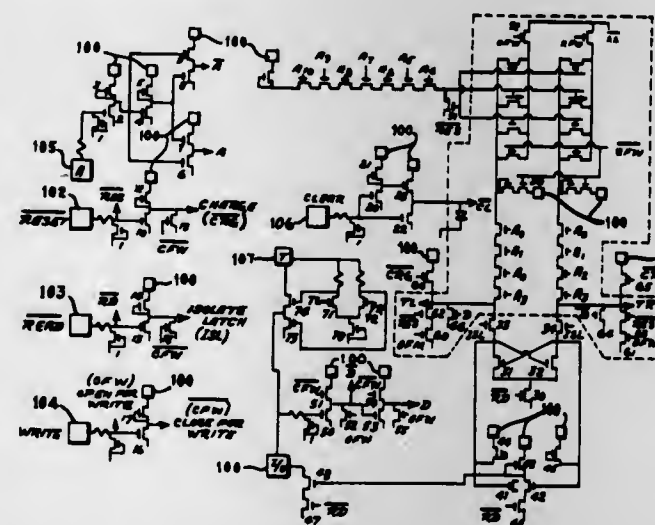
## FAST ACCESS NON-VOLATILE MEMORY

Philip C. Smith, Columbia, and John L. Fagan, Pasadena, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1981, Ser. No. 324,349  
Int. Cl.<sup>3</sup> G11C 13/00

U.S. Cl. 365—184

6 Claims



1. A fast access non-volatile memory apparatus comprising in combination:

- a memory means to store a digital bit,
- a row decode means operatively connected to said memory means,
- a column decode means operatively connected to said memory means, said row decode means and said column decode means cooperating with each other to write and read data into and from said memory means,
- a data input means to receive input data, said data input means providing data signals to said row decode means and said column decode means,
- a latch means connected to said column decode means to activate said column decode means,
- a reset means to receive a reset signal, said reset means providing said reset signal to said memory means and said row decode means,
- a read means to receive a read signal, said read means providing said read signal to said latch means, said read means generating an isolate latch signal, said read means applying said isolate latch signal to said latch means,
- a write means to receive a write signal, said write means generating a first and second write signal, said write

4,415,995

## READ AMPLIFIER FOR A BIPOLAR MEMORY MODULE

Hans Glock, Höfa, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

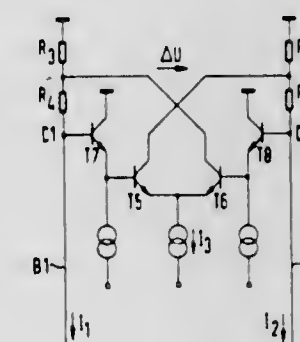
Filed Aug. 21, 1981, Ser. No. 295,115

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033174

Int. Cl.<sup>3</sup> G11C 7/00

U.S. Cl. 365—190

6 Claims



4,415,994

## RANDOM ACCESS MEMORY ARRANGEMENTS

John G. S. Ive, London, and Alan C. Thirlwall, Winchester, both of England, assignors to Sony Corporation, Tokyo, Japan

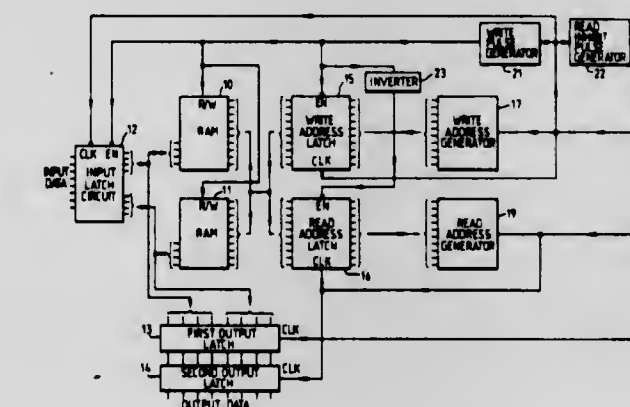
Filed Sep. 14, 1981, Ser. No. 302,107

Claims priority, application United Kingdom, Sep. 19, 1980, 8030300

Int. Cl.<sup>3</sup> G11C 13/00

U.S. Cl. 365—189

7 Claims



1. A random access memory arrangement comprising:
  - a random access memory having common read and write data terminals;
  - means for supplying input data to said read and write data terminals for writing in said random access memory;
  - a first output latch circuit connected to said read and write data terminals;
  - a second output latch circuit connected to said first output latch circuit and having an output;
  - means responsive to a write pulse signal having write pulses, for supplying control signals to said random access memory to enable said random access memory to write said input data therein at given addresses in synchronism with said write pulses of said write pulse signal;
  - means responsive to a read pulse signal having read pulses, for supplying control signals to said random access memory to enable said random access memory to read output data from given addresses therein in synchronism with said read pulses of said read pulse signal, said read pulse signal being asynchronous with said write pulse signal;
  - means responsive to said write pulse signal for supplying signals to control said first output latch circuit to hold and to supply to said second output latch circuit data supplied to said first output latch circuit immediately prior to each said write pulse, and to pass therethrough to said second output latch circuit data supplied to said first output latch circuit at all other times; and
  - means for supplying said read pulse signal to said second output latch circuit for causing the latter to hold the data supplied to said second output latch circuit by said first output latch circuit immediately prior to the beginning of each said read pulse and to supply the data so held to said output of said second output latch circuit.

4,415,996

## NONWAVELENGTH-LIMITED HOLOGRAPHIC SOUND FIELD RECONSTRUCTION

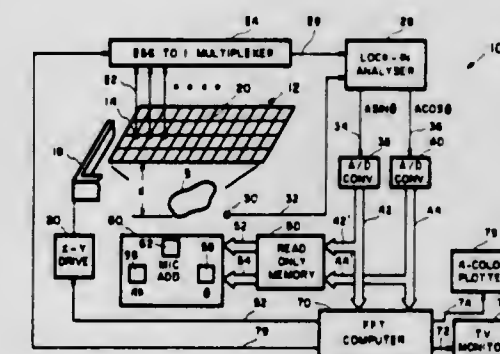
Julian D. Maynard, Boalsburg, and Earl G. Williams, State College, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1981, Ser. No. 271,871

Int. Cl.<sup>3</sup> G03H 3/00

U.S. Cl. 367—8

13 Claims



1. A system for measuring characteristics of a sound source disposed substantially in a first predetermined plane and operative to radiate sonic energy with a propagation wavelength  $\lambda$  out of said plane, said system comprising:
  - receiving means, presenting an array of receiving points to said source, for receiving said sonic energy at said points and generating electrical signals representative of the acoustic energy received at each of said points, said receiving means having a dynamic range D, and said array lying substantially in a second predetermined plane at a predetermined distance d from said first predetermined plane;
  - multiplexer means, responsive to said electrical signals, for sampling said signals from each of said points and generating a serialized output representative thereof;



reference means, for providing an electrical reference signal representative of said sonic energy in said first plane; computer means, responsive to said serialized output and to said reference signal, for performing an inverse Fourier transform thereon; and said predetermined distance being less than about 0.04λ, whereby said receiving means is responsive to evanescent waves of said sonic energy and said computer means provides output signals representative of a holographic reconstruction of a predetermined characteristic of said sound source with a resolution  $R=20\pi/D\ln 10$  d.

4,415,997

### METHOD FOR DETERMINING SOURCE AND RECEIVER STATICS IN MARINE SEISMIC EXPLORATION

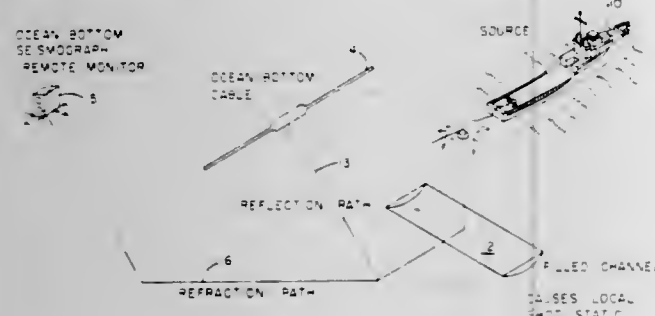
Jack L. Wilson, Slidell, La., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,286

Int. Cl.<sup>3</sup> G01V 1/38, 1/28

U.S. Cl. 367-15

3 Claims



1. A method for seismic exploration at a marine exploration site having an anomalous near surface low velocity layer below the water bottom, comprising the steps of:
  - (a) deploying a marine seismic detector cable along a seismic exploration line for which seismic reflection signals traveling to said seismic detector cable pass through a near surface low velocity layer,
  - (d) deploying a marine seismic monitor at a distance remote from said seismic detector cable such that the first energy received at said monitor consists of seismic refraction signals which have passed through said near surface low velocity layer, and
  - (c) generating first seismic energy at an offset distance from said seismic detector cable so as to produce a first seismic signal which travels downward into the earth, is refracted through the earth, and travels upward through said near surface low velocity layer to intersect said seismic detector cable in a generally orthogonal direction, whereby said first seismic signal, as received by said detector cable, includes a receiver statics component attributable to said near surface low velocity layer,
  - (d) generating second seismic energy so as to produce a second seismic signal which travels downward through said near surface low velocity layer into the earth, is (i) refracted through the earth and detected by said remote seismic monitor, said refracted second seismic signal including a source statics component attributable to said near surface low velocity layer and (ii) reflected from the earth and detected by said seismic detector cable at the same time said refracted second seismic signal is detected by said remote seismic monitor.

### 4,415,998 SEGMENTED ACOUSTIC TRANSMITTER FOR BROAD FREQUENCY INVESTIGATION OF A BOREHOLE

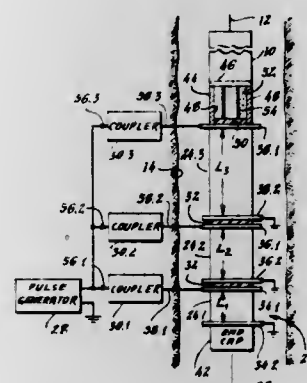
Robert B. Blizard, Littleton, Colo., assignor to Schlumberger Technology Corp., New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 131,241

Int. Cl.<sup>3</sup> G01V 1/40

U.S. Cl. 367-25

7 Claims



1. A segmented acoustic transmitter for generating an acoustic pulse for use in an acoustic investigation of a borehole penetrating an earth formation with a multiple sonic receiver tool comprising
  - a plurality of individually energizable cylindrical acoustic transmitter segments having active surfaces from which acoustic energy radiates, said acoustic transmitter segments being generally coaxially aligned along a common axis with their acoustically active surfaces radiating acoustic energy in a generally common direction, said acoustic transmitter segments being located axially in proximity to each other to enable generation of a composite acoustic impulse in said common direction when said acoustic transmitter segments are electrically energized, with said transmitter segment surfaces as measured along said common axis, being of successively different and larger lengths and with the respective lengths selected in accordance with a predetermined relationship with each other wherein the lengths of said segment surfaces are whole multiples of the shortest surface length employed for one of said acoustic transmitter segments and with said whole multiples being at least two and three to impart to said composite acoustic pulse with a desired frequency bandwidth, with the segment having the largest length being located nearest to sonic receivers on said tool;
  - means for driving said segments with a common electrical pulse, said driving means including:
    - a pulse generator, a plurality of differently sized inductances respectively in series between a segment and said pulse generator, the inductances being selected to operate said segments in respective resonances.

4,415,999

### METHOD OF CONFIRMING SEISMIC DATA INTERPRETATION

George P. Moeckel, Houston, and George C. Wallick, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,288

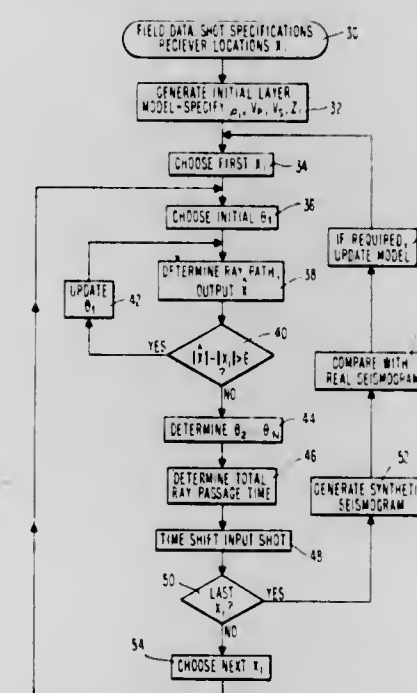
Int. Cl.<sup>3</sup> G01V 1/30

U.S. Cl. 367-73

9 Claims

1. Method for exploring the subterranean structure of the earth comprising the steps of:
  - imparting acoustic energy to the earth at a first shot point location;
  - detecting return of said energy at a plurality of detector locations;
  - generating a real seismogram using the outputs of said detectors;
  - generating a model of the subterranean structure of the earth

based on said real seismogram, said model including definition of rock layers as to thickness and the velocity of acoustic waves therein; determining the paths of plural model acoustic rays corresponding to said acoustic energy through said model structure with ray path terminations defined to be located at points chosen to correspond to said detector locations; determining the time required for a ray to pass along the determined paths of said model acoustic rays;



time-shifting said model rays in accordance with said determinations of time; producing a synthetic seismogram exhibiting the results of said time-shifted operations; and comparing said synthetic seismogram and said real seismogram to yield a result indicative of the accuracy of said model.

4,416,000

### SYSTEM FOR EMPLOYING HIGH TEMPERATURE BATTERIES FOR MAKING MEASUREMENTS IN A BOREHOLE

Serge A. Scherbatsky, Tulsa, Okla.

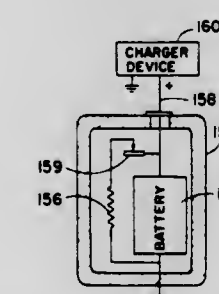
Division of Ser. No. 121,804, Feb. 15, 1980, abandoned, which is a continuation of Ser. No. 857,677, Dec. 5, 1977, abandoned.

This application Apr. 12, 1982, Ser. No. 367,265

Int. Cl.<sup>3</sup> G01V 1/40

U.S. Cl. 367-81

15 Claims



1. A system for making measurements in an earth borehole having an improved power source, comprising:
  - downhole apparatus including means for sensing the magnitudes of one or more downhole parameters and generating signals representing the magnitudes of such parameters;
  - equipment at the earth's surface for detecting said signals and translating said detected signals into indications representative of the magnitudes of said downhole parameters;
  - a battery within said downhole apparatus of a type that is

operable only at temperatures substantially higher than those encountered in above-ground ambient air; a heat source for maintaining the temperature of said battery within its operable range; and a thermostat responsive to the battery temperature, said heat source and thermostat being connected to said battery whereby voltage supplied by said battery at least in part provides heat necessary to maintain said battery at operating temperatures during low ambient temperature conditions, said thermostat operating to remove battery voltage from said heat source when the ambient temperature is above a level which maintains said battery within its operable temperature range.

4,416,001

### METHOD AND APPARATUS FOR OPTICALLY READING DIGITAL DATA INSCRIBED IN AN ARCuate PATTERN ON A DATA CARRIER

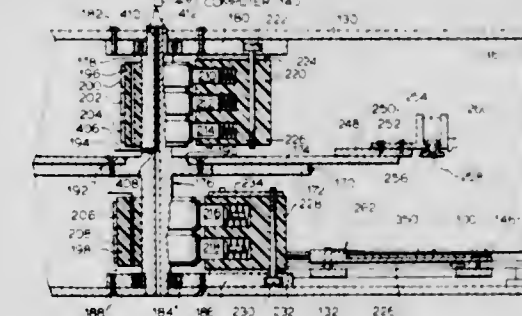
Richard C. Ackerman, Glenview, Ill.; Alan A. Jewer, and Donovan W. Hurlbut, both of Whitewater, Wis., assignors to News Log International, Inc., Ft. Atkinson, Wis.

Filed Nov. 26, 1980, Ser. No. 210,847

Int. Cl.<sup>3</sup> G11B 7/00, 21/10

U.S. Cl. 369-44

76 Claims



1. Apparatus for reading a data record on which the data is inscribed in an arcuate pattern of equal-radii circular segment spaced lines on a data carrier, comprising:
  - a data carrier support for receiving and holding a data carrier;
  - a light source operable to emit a beam of light; beam directing means for receiving and directing the beam of light toward the supported data carrier, including sweep means for repetitively sweeping the light beam across the data carrier in an arc corresponding to a line of the arcuate pattern;
  - a carriage mounting said data carrier support for movement radially of the arcuate pattern;
  - incrementing means connected to said carriage and operable between sweeps of the light beam to step said support a distance equal to the line spacing so that the light beam scans one line after another; and
  - receiving means mounted to receive the light beam after the same strikes the data carrier.

4,416,002

### METHOD AND APPARATUS FOR HIGH-DENSITY RECORDING AND REPRODUCTION

Masanori Ogino; Tooru Fujishima, both of Yokohama, and Jun Matsumoto, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 28,706, Apr. 10, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 363,147

Claims priority, application Japan, Apr. 10, 1978, 53-41178; Dec. 22, 1978, 53-157462

Int. Cl.<sup>3</sup> G11B 21/10, 27/28

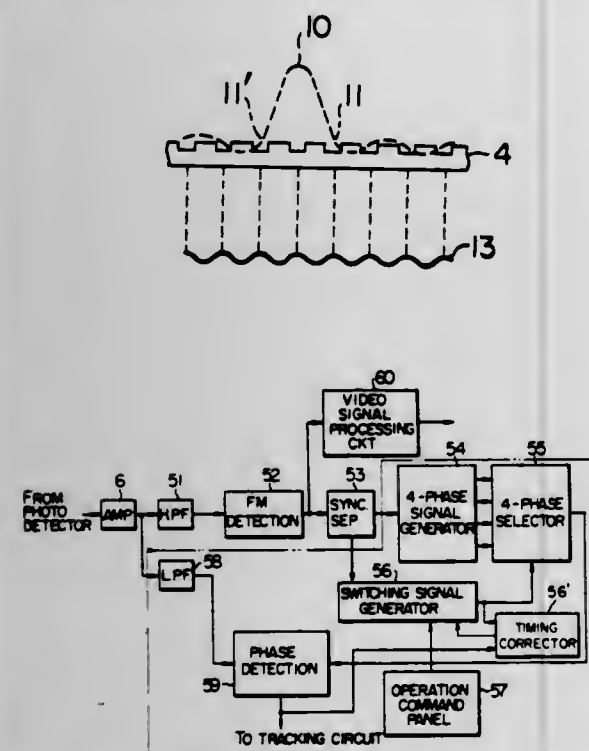
U.S. Cl. 369-44

8 Claims

1. A high density system comprising means for recording a high frequency signal modulated with an information signal as



a pit array on a recording medium in time sequence along a multiplicity of tracks adjacent to each other, the pit arrays of the tracks being arranged so that the track pitch of the pit arrays is less than an information reproducing element width thereby providing high density recording on the recording medium, said information signal including a synchronizing signal, said recording means recording said modulated high frequency signal by superimposing a discrimination signal on



said modulated high frequency signal to modulate the duty factor of each pit in the array in accordance with said discrimination signal, said recording means including means for generating said discrimination signal having a frequency spectrum lower than that of said modulated high frequency signal and having a predetermined phase difference between the adjacent tracks, said discrimination signal frequency having a predetermined relation with respect to the frequency of said synchronizing signal.

4,416,003

## BOTH SIDE RECORD PLAYER

Hiroyuki Suzuki, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1981, Ser. No. 291,805

Claims priority, application Japan, Aug. 13, 1981, 56-2812; Aug. 13, 1981, 56-2813; Aug. 13, 1981, 56-2814; Aug. 13, 1981, 56-2815; Aug. 13, 1981, 56-2816; Aug. 13, 1981, 56-2817

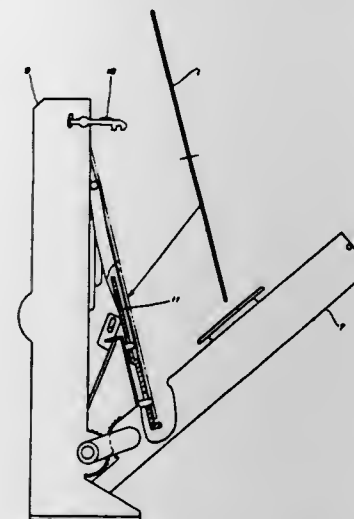
Int. Cl.<sup>3</sup> G11B 17/04, 3/62

U.S. Cl. 369—75.2

10 Claims

1. A record player for selectively playing either side of a disc record comprising:
  - a player body;
  - a turntable including a turntable shaft being operatively mounted in a vertical direction within said player body;
  - a first vertical linear tracking type record reproduction assembly operatively mounted in said player body;
  - a record mount for initially receiving a disc record being pivotally mounted to said player body for rotating said disc record into engagement with said turntable shaft;
  - a lid pivotally mounted to said player body;
  - a second vertical linear tracking type record reproduction assembly operatively mounted in said lid;
  - common drive means for selectively imparting linear motion to said first and second vertical linear tracking type record reproduction assemblies from a preselected point on said record disc to a central point on said record disc; and
  - plunger means for selectively imparting motion to either said first vertical linear tracking type record reproduction

assembly or said second vertical linear tracking type record reproduction assembly from a non-engaging position to a position in engagement with said disc record; wherein rotation of said lid to a closed position relative to said player body rotates said record mount to engage said



disc record with said turntable shaft and disengage said record mount from said disc record thereafter said plunger means and said common drive means may be actuated to selectively play a recording from either side of said disc record.

4,416,004

## ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A LID MEMBER GUIDING MECHANISM

Takashi Saito, Ayase, and Takashi Kumaki, Sagami-hara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

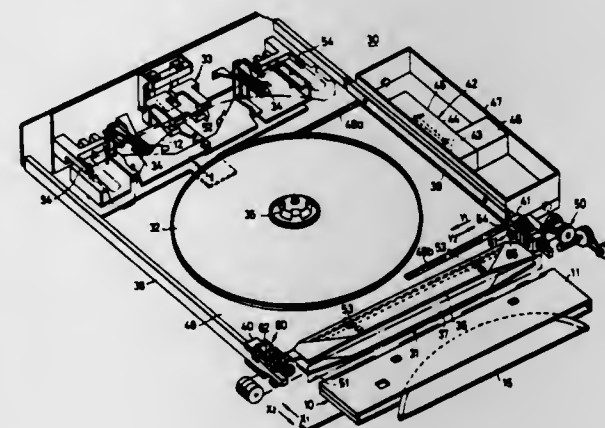
Filed Aug. 19, 1981, Ser. No. 294,304

Claims priority, application Japan, Aug. 20, 1980, 55-117738[U]

Int. Cl.<sup>3</sup> G11B 25/04

U.S. Cl. 369—77.2

5 Claims



1. Apparatus for reproducing information signals from a rotary recording medium accommodated within a case, said case having a jacket with a space for accommodating said rotary recording medium and an opening through which said rotary recording medium can enter and leave said jacket, and a lid member inserted through said opening of said jacket for closing said opening, said lid member having a locking edge and a pair of ends remote from said edge, said reproducing apparatus comprising:
  - means for defining an inserting opening through which said case or an empty jacket is inserted;
  - turntable means for rotating said rotary recording medium after it is left within said reproducing apparatus when an operation is performed in which said case is inserted into

said reproducing apparatus and then said jacket is pulled from said reproducing apparatus;

lid member locking means located at an innermost part of said reproducing apparatus for locking and retaining said lid member within said reproducing apparatus when an operation is performed in which said case is inserted into said reproducing apparatus and then pulled out from said reproducing apparatus; and

lid member guiding means for guiding said lid member locked by said lid member locking means and retained within said reproducing apparatus and for correcting the position of said lid member so that said lid member opposes the opening of said jacket at an intermediate point during an insertion of an empty jacket into said reproducing apparatus to recover said rotary recording medium within said reproducing apparatus into said jacket,

said lid member guiding means comprising a pair of guide pieces each having an upper and a lower guide member for putting both ends of the locked lid member between said guide members and restricting upward and downward displacement of said lid member, by reason of said guide pieces moving and approaching the locked lid member from a vicinity of said inserting opening, in response to an operation in which the empty jacket is inserted into said reproducing apparatus through said inserting opening.

4,416,006

## RECORD DISC PLAYING APPARATUS HAVING THE FUNCTION FOR CORRECTING ROTATIONAL IRREGULARITIES DUE TO RECORD DISC ECCENTRICITY

Masatsugu Kitamura, 1046-15, Tomuro, Atsugi-City, Kanagawa-Ken; Hideo Onoe, Dorumi Tsuruma 708, 2-11-28 Nishit-suruma, Yamato-City, Kanagawa-Ken; Fumiaki Ohno, 2-10-502 Zengyoh-Danchi, 3768-3, Fujisawa, Fujisawa-City, Kanagawa-Ken; Tsuyoshi Ono, 2-14-12, Nishit-suruma, Yamato-City, Kanagawa-Ken; Yukihiko Kishima, 4097-18, Kamina-gaya-Cho, Konan-Ku, and Yutaka Morita, No.413, Sakuragaoka, Hodogaya-Ku, both of Yokohama-City, Kanagawa-ken, all of Japan

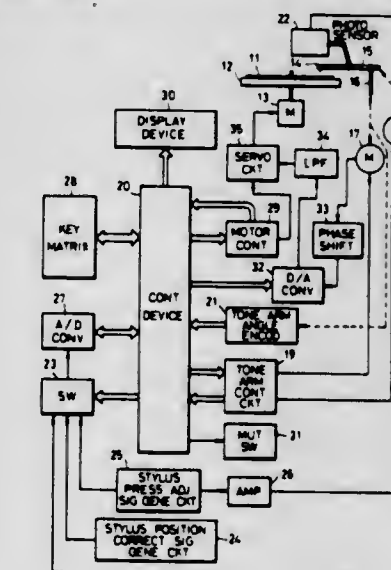
Continuation of Ser. No. 170,972, Jul. 18, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,022

Claims priority, application Japan, Jul. 21, 1979, 54-92989

Int. Cl.<sup>3</sup> G11B 17/00, 19/24

U.S. Cl. 369—240

6 Claims



4,416,005

## STYLUS FOR TRACKING A STEREOPHONIC OR QUADRAPHONIC SOUND GROOVE

Aalt-Jouk van den Hul, Hertog-Goverkade 10, Delft, Netherlands

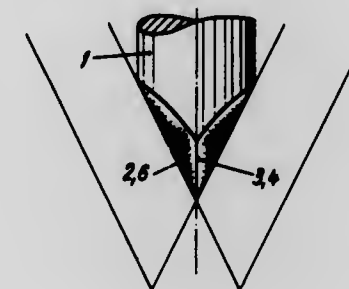
Continuation of Ser. No. 41,666, May 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 818,903, Jul. 25, 1977, abandoned. This application Jul. 28, 1981, Ser. No. 287,592

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> G11B 3/44

U.S. Cl. 369—173

16 Claims



1. A stylus for tracking the sound groove of a stereophonic or quadraphonic record, said stylus having a longitudinal axis and having a mounting part and a taper, said taper being formed by a pair of convex curved continuous surfaces intersecting along a continuous arc disposed in both surfaces and having a substantially constant angle of intersection along said arc, said surfaces being symmetrical about a plane that includes said arc and said axis, said intersection of said surfaces being slightly rounded in the direction normal to said arc, said arc being tangent at a midpoint thereof to a plane normal to said axis.

1. A record disc playing apparatus comprising:
  - (a) a tone arm having a reproducing stylus for tracing a sound groove of a record disc said tone arm being mounted for rotation on a shaft;
  - (b) digital address signal generating means comprising address means bearing a plurality of digital addresses and address reader means disposed in facing relationship to said address means and configured to selectively read one of the digital addresses, the selection of such an address to be read depending on the relative angular position of said reader means with respect to said address means, one of said address means or said reader means being mechanically coupled to the shaft of said tone arm, so that said digital address signal generating means produces as an output a set of unique digital address signals, each such address signal corresponding to a unique horizontal rotational angular position of said tone arm;
  - (c) means for generating a rotational angular velocity signal which is independent of said digital address signal generating means, said rotational angular velocity signal corresponding to the horizontal rotational angular velocity of the tone arm independent of the angular positions of the tone arm, said rotational angular velocity signal corresponding to the quantity of any eccentricity of said record disc;
  - (d) means for controlling the rotation of a motor driving a turntable on which the record disc is mounted;
  - (e) a control device supplied with said digital address signals and having a memory device from which is read out information corresponding to the desired attenuation quantities indicated by said digital address signals, said control device producing output signals based on said information thus read out;
  - (f) attenuation means supplied with said rotational angular velocity signal and operating with an attenuation quantity,



with respect to said rotational angular velocity signal, which quantity is varied by a signal from said control device; and

(g) said attenuation means supplying an output signal to said means for controlling the rotation of a motor, the rotation of said motor being so controlled that a rotational irregularity due to any eccentricity of said record disc is corrected for.

4,416,007

# DIGITAL CONFERRING METHOD AND ARRANGEMENT

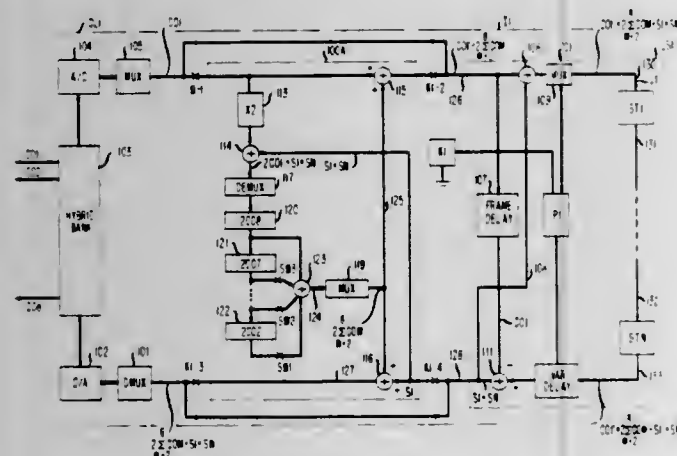
Donald D. Huizinga, and Paul W. Thompson, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,416

Int. Cl.<sup>3</sup> H04M 3/56

U.S. Cl. 370-62

20 Claims



9. In a time division multiplex (TDM) communication system having at least N binary signal communication time slots, a method of forming a signal during each time slot of a preselected group of N time slots representing the sum of the binary signals of the N-1 remaining time slots of said preselected group of said method characterized by the steps of serially inputting a binary signal into a N-1 binary signal storing means during each time slot of said preselected group and serially generating during each time slot of said preselected group a sum of the N-1 previously stored binary signals during the serial inputting of a binary signal into said N-1 binary signal storing means.

4,416,008

DUAL LOOP TYPE DATA HIGHWAY SYSTEM  
Masahiro Takahashi, Takuji Hamada, and Hitoshi Fushimi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Dec. 12, 1980, Ser. No. 215,842

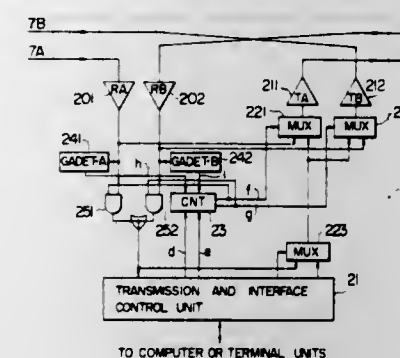
Claims priority, application Japan, Dec. 20, 1979, 54-164828  
Int. Cl.<sup>3</sup> H04J 3/08

U.S. Cl. 370-88

5 Claims

1. A dual loop type data highway system comprising: a data highway including at least two loops for data transmission and reception; a plurality of data transmitting/receiving stations serially connected to said data highway; and a control station serially connected to said data highway; said data transmitting/receiving stations each having, for each of said loops, means for detecting the beginning of a transmission cycle, said control station having, for each of said loops, means for

detecting the end of the transmission cycle and means for permitting the transmission/reception of data between a



specified two of said data transmitting/receiving stations on one of said two loops during the transmission cycle.

4,416,009

# SYNCHRONOUS COUPLING OF FRAMED DATA IN DIGITAL TRANSMISSION

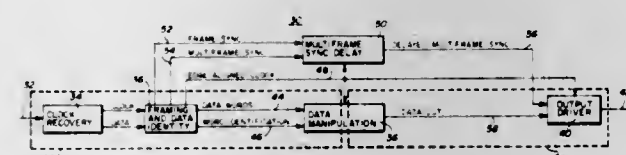
Charles E. Huffman, and Stephen R. Southerland, both of Plano, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1980, Ser. No. 206,937

Int. Cl.<sup>3</sup> H04J 13/00

U.S. Cl. 370-100

10 Claims



1. A synchronization system for data coupling apparatus in a digital transmission system carrying data in a given framing format on a transmission medium, comprising:

input means for receiving from said transmission medium a data stream in said framing format and outputting said data of the data stream, said input means further including means for extracting clock signals from the data stream, for aligning said clock signals and the data of the data stream, and for outputting the aligned clock signals, and means for deriving framing identification signals from the data stream and separately outputting the derived signals;

data manipulation means for processing data from said input means to perform a given function on it, said data manipulation means responding to said clock signals to maintain free alignment of the data;

synchronization delay means responsive to said input means for delaying said framing identification signals by a predetermined increment such that a framing identification signal synchronously aligns with its appropriate frame in data processed by said manipulation means; and

output means responsive to said clock signals and said delayed framing identification signals, for delivering data from the manipulation means to said transmission medium in accordance with said frame alignment maintained by said manipulation means.

4,416,010

# DOUBLE ERROR CORRECTING SYSTEM IN DIGITAL SIGNAL REPRODUCING APPARATUS

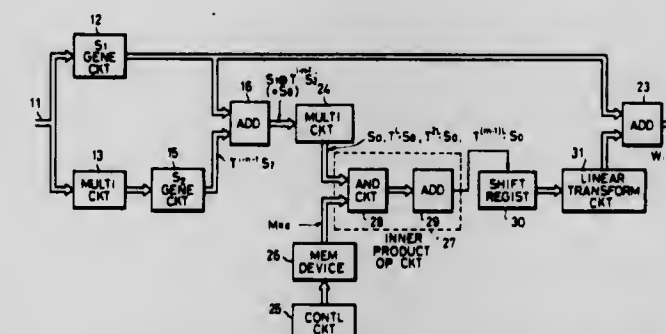
Chitoshi Hibino; Harukuni Kobari; Susumu Suzuki, all of Yokohama, and Yasuhiro Yamada, Fujisawa, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan  
Filed Apr. 14, 1981, Ser. No. 254,053

Claims priority, application Japan, Apr. 14, 1980, 55-49004; Apr. 18, 1980, 55-51413

Int. Cl.<sup>3</sup> G06F 11/10

U.S. Cl. 371-37

9 Claims



1. A double error correcting system in a digital signal reproducing apparatus, which transmits information in units of blocks where one block consists of a total of (n+2) vectors, said total of (n+2) vectors being formed from n (n is an integer greater than zero) information vectors  $W_1$  through  $W_n$ , each having m (m is an integer greater than zero) elements in  $GF(2)$ , where  $GF(2)$  represents a finite field consisting of two elements, and two error correcting column vectors P and Q produced by use of said information vectors  $W_1$  through  $W_n$  and an m by m regular linear transformation matrix T which is linearly independent of a unit matrix I, and said correcting system performing a correcting operation when two erroneous vectors  $W_i$  and  $W_j$  are detected within one block by use of error pointers which indicate which vectors are in error upon reception of the transmitted information, where it is defined that an m number of m by m matrices  $T^{L_1}, T^{L_2}, \dots, T^{L_m}$  are linearly independent of each other with respect to said transformation matrix T and m integers  $L_1, L_2, \dots, L_m$  which constitute an arithmetical progression, and that  $M_k$  is an m by m matrix  $(I \oplus T^{L_k})^{-1}$  or  $(T^{L_k} - G_i \oplus T^{L_k} - H_j)^{-1}$  where symbols " $\oplus$ " represent vector addition on  $GF(2)$  and k described by an equation  $k = f(i, j)$  can assume a plurality of values according to the combination of the values of i and j, and further, that said matrix  $M_k$  has m row matrices  $M_{k1}$  through  $M_{km}$  respectively having m elements, said double error correcting system comprising:

an input terminal for receiving said information vectors  $W_1$  through  $W_n$  and said error correcting vectors P and Q; memory means for storing a plurality of row matrices  $M_{kd}$  which are formed from certain predetermined row matrices of said row matrices  $M_{k1}$  through  $M_{km}$  according to each value of k, for selectively reading out said row matrices  $M_{kd}$  according to the value of k;

generating circuit means responsive to said information vectors  $W_1$  through  $W_n$  and said error correcting vectors P and Q received at said input terminal, said generating circuit means generating a column vector  $S_0$  which is used for correcting where  $S_0 = S_1 \oplus T^{L_1} S_2$  or  $T^{-G_i} S_1 \oplus T^{-H_j} S_2$ , said correction producing partial syndromes  $S_1$  and  $S_2$  from said information vectors  $W_1$  through  $W_n$  and said error correcting vectors P and Q by use of predetermined producing equations, to obtain  $W_j = M_k (S_1 \oplus T^{L_1} S_2)$  or  $W_j = M_k (T^{-G_i} S_1 \oplus T^{-H_j} S_2)$ ;

multiplying circuit means responsive to the column vector  $S_0$  generating from said generating circuit means, for successively multiplying  $T^{L_1} S_0, T^{L_2} S_0, \dots, T^{L_m} S_0$  to transform column vectors  $T^{L_1} S_0, T^{L_2} S_0, \dots, T^{L_m} S_0$ ;

operation circuit means responsive to the output of said memory means and said multiplying circuit, for successively performing a mathematical operation described by

$M_{kd} T^{L_1} S_0, M_{kd} T^{L_2} S_0, \dots, M_{kd} T^{L_m} S_0$ , to serially produce vectors having m elements; and storage circuit means responsive to the serial output of said operation circuit means, for temporarily storing said vectors having m elements which are supplied from said operation circuit means, to perform an m by m linear transformation on said vectors received from said operation circuit means.

4,416,011

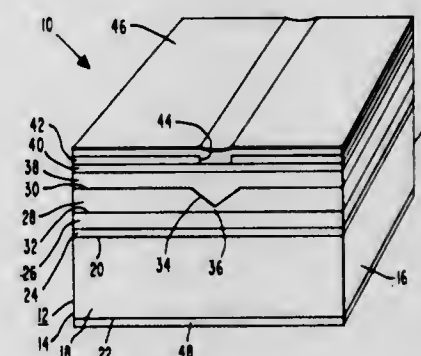
SEMICONDUCTOR LIGHT EMITTING DEVICE  
Gregory H. Olsen, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,476

Int. Cl.<sup>3</sup> H01S 3/19

U.S. Cl. 372-45

7 Claims



1. A light emitting device comprising:

a semiconductor body having two end faces, at least one of which is partially transmissive of light, a pair of substantially parallel side faces between said end faces, said body comprising:

a substrate;  
a first confinement layer overlying a first surface of said substrate and having a flat surface;  
an active layer overlying said first confinement layer and having a vee-shaped groove therein extending from a surface thereof towards said flat surface of said first confinement layer and extending between said end faces;  
a second confinement layer overlying said active layer and filling said groove;  
a first electrically conducting layer overlying at least a portion of the surface of the second confinement layer; and  
a second electrically conducting layer overlying a portion of a second surface of the substrate;  
the substrate and the first confinement layer are of one conductivity type and the second confinement layer is of the opposite conductivity type and the index of refraction of the active layer at the wavelength of a light beam emitted from the device is greater than that of the first and second confinement layers.

4,416,012

W-GUIDE BURIED HETEROSTRUCTURE LASER  
Dan Botez, Mount Holly, and Michael Ettenberg, Freehold, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 323,058

Int. Cl.<sup>3</sup> H01S 3/19

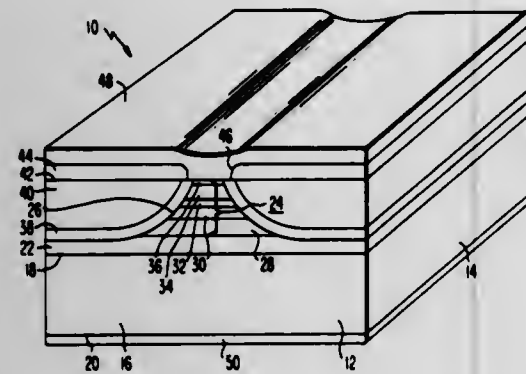
U.S. Cl. 372-45

9 Claims

1. In a buried heterostructure laser which emits light at a particular wavelength comprising a substrate having two opposed major surfaces, a mesa having side walls and overlying a portion of said first major surface, a cladding layer overlying the side walls of said mesa and the remainder of said first surface of said substrate, and a burying region overlying said cladding layer wherein said mesa comprises a first confinement layer overlying a portion of said surface of said substrate, an active layer overlying said first confinement layer and a second confinement layer overlying said active layer and wherein



electrical contacts overlie said second confinement layer and a portion of said second major surface of said substrate; the improvement comprising said cladding layer having a refractive index at said wavelength which is less than the



effective refractive index of the fundamental transverse mode in said mesa and wherein the refractive index of said burying region is greater than or equal to the effective refractive index of said mode in said mesa.

4,416,013

# DISTRIBUTED FEEDBACK LASER EMPLOYING THE STARK EFFECT

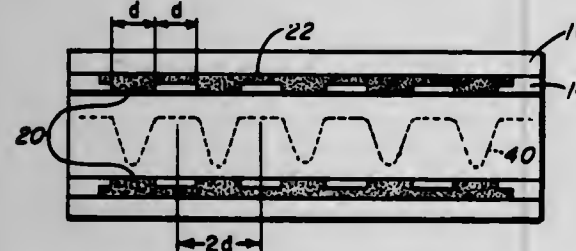
Mary S. Tobin, Tacoma Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 325,623

Int. Cl.<sup>3</sup> H01S 3/08

U.S. Cl. 372-96

9 Claims



1. A distributed feedback (DFB) laser comprising: an amplification medium for amplifying light at the lasing frequency, said amplification medium being of the type which exhibits the Stark effect; means for pumping said medium to generate a population inversion therein, and means for producing a spatially varying electric field in said amplification medium of sufficient intensity that an induced Stark effect will produce laser feedback.

4,416,014

# COMPOSITE ELECTRODE FOR ARC FURNACE

Grady R. Hogg, Jr., Elizabethton, and Nathan S. Tanner, Johnson City, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,829

Int. Cl.<sup>3</sup> H05B 7/08

U.S. Cl. 373-93

3 Claims

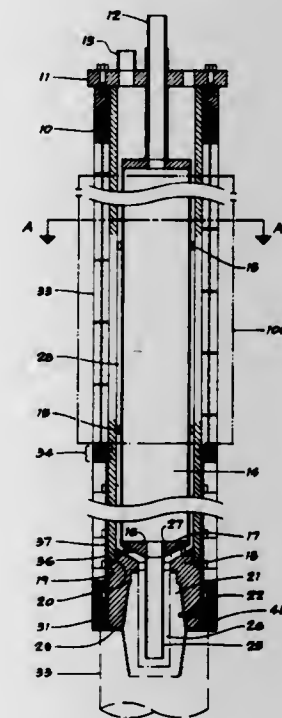
2. An electrode for an electric arc smelting furnace comprising an upper liquid cooled section, a hollow threaded connecting nipple, and a graphite lower section,

(a) said upper section comprising:

1. a cylindrical main structure formed from metal tubing;
2. its upper end comprising a head plate having a cooling liquid inlet and cooling liquid outlets;
3. said inlet comprising tubing connected to an exterior liquid supply, passing through said head plate, connected to the top plate of a metal internal cylinder

concentric with said main structure and occupying a majority of the internal volume of said main structure;

4. said internal cylinder serving as a liquid reservoir, heat sink, and passageway for cooling liquid;
5. said internal cylinder having a bottom plate connected with liquid outlet tubing extending to the interior cavity of said nipple;
6. said liquid inlet, internal cylinder, and outlet tubing forming liquid inflow means for cooling said nipple;
7. said nipple being threaded in place in a metal female socket comprising the lower end of said main structure;
8. a first annulus between said outlet tubing and said nipple communicating with a second annulus between the upper end of said socket and the bottom face of said bottom plate defined by spacers;
9. said second annulus communicating with a third annulus defined by the inside wall of said main structure and the outside wall of said internal cylinder;
10. said third annulus connected with cooling liquid outlets on said upper main top plate;
11. said annuli forming cooling liquid outflow means;



12. the exterior of the electrical contact area comprising the upper portion of said main structure having a cylindrical covering formed from a plurality of rectangular tiles of graphite of a thickness effective to conduct the electrode current;
13. said tiles having grooves in the edges thereof parallel to the vertical axis of said main structure;
14. said tiles being held in place by vertical T-shaped ribs attached to said main structure having a complementary configuration to said grooves in said tiles;
15. the lower portion of said main structure being insulated with a series of refractory rings having an inside diameter slightly larger than the outside diameter of said main structure, notched at the lower inside radius to match the dimension of a metal retaining ring;
16. the annulus between said refractory rings and said main structure occupied by refractory fiber insulation covered with radiation reflective insulation;
- (b) said nipple being hollow, metal, and threaded, defining a cavity having its upper end open and lower end closed;
- (c) said lower section being a column comprising one or more graphite electrode sections.

4,416,015

# TIMING ACQUISITION IN VOICEBAND DATA SETS

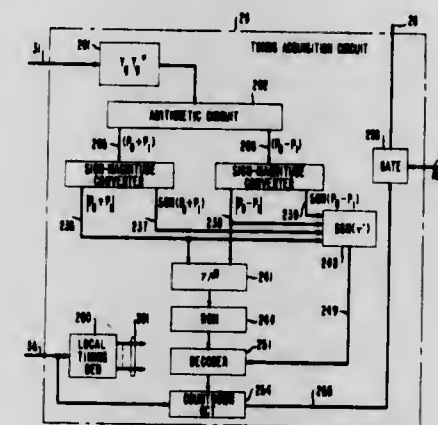
Richard D. Gitlin, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1981, Ser. No. 335,730

Int. Cl.<sup>3</sup> H03H 15/00; H04B 3/19; H04L 7/02

U.S. Cl. 375-14

34 Claims



1. A receiver adapted to receive a complex data signal which includes a predetermined timing acquisition signal, said receiver comprising

equalizer means including means for forming line samples of said data signal and means for filtering said line samples with a predetermined complex filter characteristic to form a plurality of complex equalizer outputs, said equalizer outputs being optimally free of intersymbol interference when said line samples are formed at optimum sampling points, said sample forming means forming line samples of said timing acquisition signal at sampling points displaced from the optimum sampling points thereof by a time  $\tau$  and said filtering means forming a plurality of timing acquisition equalizer outputs in response to said timing acquisition signal line samples, and

timing acquisition means for determining the value of  $\tau$  in response to at least a first timing acquisition envelope sample and for adjusting the phase of said line sample forming means by the value of  $\tau$  thus determined, each timing acquisition envelope sample being a function of the product of a respective timing acquisition equalizer output with its complex conjugate.

4,416,016

# DIFFERENTIAL PHASE SHIFT KEYED RECEIVER

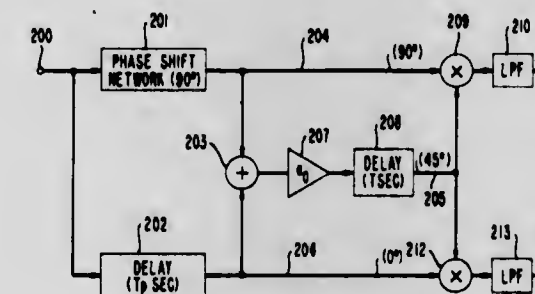
Jeffrey A. Iapicco, Little Ferry, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1981, Ser. No. 272,480

Int. Cl.<sup>3</sup> H04L 27/22

U.S. Cl. 375-85

8 Claims



6. A receiver for demodulating a differential phase shift keyed (DPSK) signal having phase changes every T seconds wherein products are formed between signals of T second differential delay and polarities of said products uniquely determine phase shifts of the DPSK signal, including means for phase shifting the DPSK signal by 90°,

characterized by:  
means for additively combining the DPSK signal and the 90° phase shifted signal to form a 45° phase shifted signal;  
means for delaying said 45° phase shifted signal by T seconds;  
means responsive to said DPSK signal and to said 45° phase shifted signal for forming a first product therebetween; and  
means responsive to the 90° phase shifted signal and to the 45° phase shifted signal for forming a second product therebetween.

4,416,017

# APPARATUS AND METHOD FOR ATTENUATING INTERFERING SIGNALS

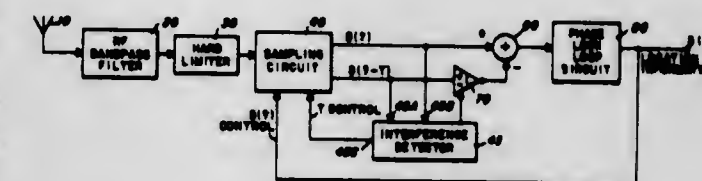
Steven C. Jasper, Schaumburg; Robert V. Janc, Palos Heights; David S. Robins, Buffalo Grove, and Michael H. Retzer, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1981, Ser. No. 222,459

Int. Cl.<sup>3</sup> H04B 15/00

U.S. Cl. 375-99

6 Claims



1. An apparatus for substantially cancelling an undesired signal interfering with a Loran C signal comprising: receiving means for receiving signals which include a Loran C signal and an undesired interfering signal; sampling means, coupled to said receiving means, for sampling the pulses of said Loran C signal at a PTR thereof and for sampling said interfering signals at selected points in time; autocorrelation function determining means, coupled to said sampling means, for determining a peak of the autocorrelation function of the interfering signal with respect to the PTR samples of the Loran C pulses, said selected points in time being defined to occur substantially at said peak, and combining means, coupled to said sampling means for combining the samples of said interfering signals with the corresponding samples of said Loran C signals so as to substantially cancel said interfering signal.

4,416,018

# DEVICE FOR FORMING IMAGES OF LAYERS OF A THREE-DIMENSIONAL OBJECT BY SUPERPOSITION ZONOGRAMS

Claus P. Curth, Wilhelmshausen; Ulf Tiemens, Friedorf, and Erhard Klotz, Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,302

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006828

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378-2

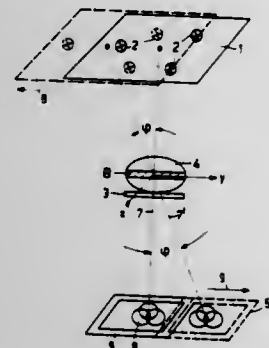
12 Claims

1. A device for imaging layers of a three-dimensional object, said device comprising:

radiation source means arranged on first support means on one side of the object to irradiate the object with penetrating radiation from each of a plurality of source positions, said source positions being distributed in a radiation source plane; and  
a record carrier for recording an encoded composite image of the object, said composite image consisting of a plurality of perspective images, said record carrier being arranged on second support means on a side of the object opposite the radiation source means;



characterized in that the radiation source means and the record carrier are each slidably mounted on their respective support means, said radiation source means and record carrier being constrained to slide in opposite directions in parallel slide planes on opposite sides of the stationary object, said sliding motions being further constrained such that every straight line connecting a radia-



tion source position to the center of the record carrier will always pass through one of a set of fixed points in the object for all positions of the radiation source means, each fixed point being associated with one line originating from a radiation source position, said fixed points being in a single plane in the object; and characterized in that the device further comprises means for sliding the radiation source means and the record carrier.

4,416,019

#### DEVICE FOR PRODUCING IMAGES OF A LAYER OF AN OBJECT FROM MULTIPLE SHADOW IMAGES WITH VARYING DEGREES OF OVERLAP

Hermann Weiss, Duvendst; Rolf Linde, Haseldorf; Wilfried Mauser, Hamburg, and Erhard Klotz, Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 196,416, Oct. 14, 1980, abandoned.

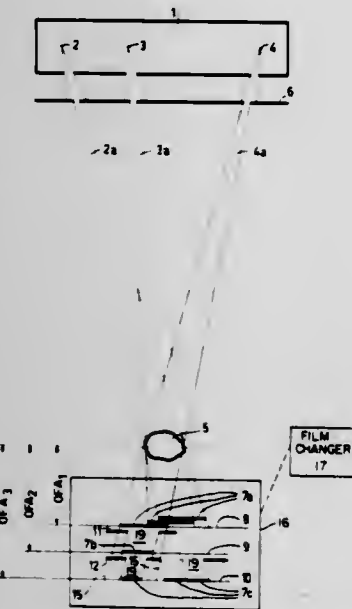
This application Apr. 7, 1982, Ser. No. 366,126

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941395

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—2

18 Claims



1. A device for producing images of a layer of a three-dimensional object comprising a plurality of radiation sources arranged in a radiation source plane for irradiating the object with beams of penetrating rays from different directions to generate a plurality of shadow images and a plurality of planar recording layers, arranged parallel to one another at exposure positions, for recording all shadow images thereby generated, characterized in that the device further comprises a plurality of diaphragm means which define apertures disposed between

each recording layer and the source plane for masking the beams of rays, wherein the apertures decrease in size as a function of the distance between the associated diaphragm means and the radiation sources.

4,416,020

#### SIZE SENSING X-RAY CASSETTE TRAY FOR X-RAY EQUIPMENT

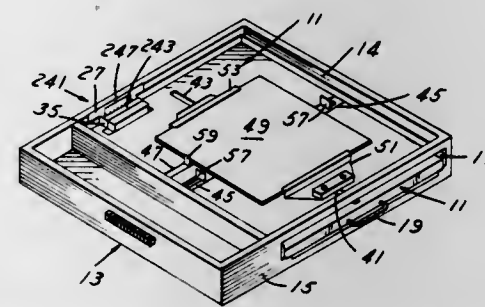
James C. Wagner, Ft. Thomas; James E. Barnard, Sparta, both of Ky., and Robert J. Woerner, Cincinnati, Ohio, assignors to Material Control, Inc., Aurora, Ill.

Filed Nov. 4, 1981, Ser. No. 318,086

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—181

22 Claims



1. A size sensing X-ray cassette tray adapted for selective nesting within horizontal X-ray tables or vertical holders comprising longitudinally spaced opposed front and rear cassette engaging clamps slidably mounted upon said tray longitudinally thereof, for centering and holding a cassette upon said tray;

link means on said tray interconnecting said clamps for movement in unison towards and away from each other; an elongated first linear potentiometer upon said tray adjacent one of said clamps and parallel to its direction of movement, having leads connected into an electrical circuit;

a wiper arm connected to said one of said clamps having contacts slidably engageable with said first potentiometer; a side sensing finger slidably mounted upon said tray for movement at right angles to said clamp movements engageable with one side of said cassette;

an elongated second linear potentiometer upon said tray adjacent said side sensing finger and parallel to its direction of movement, having leads connected into said electrical circuit;

and a wiper arm connected to said finger having contacts slidably engageable with said second potentiometer, the positioning of said contacts upon said potentiometers establishing electrical potentials in said circuit proportional to the length and width of said cassette, respectively.

4,416,021

#### X-RAY EXAMINATION APPARATUS

Steven J. Plummer, Middlefield, and James E. Wieloch, Southington, both of Conn., assignors to Siemens Corporation, Iselin, N.J.

Filed Feb. 18, 1982, Ser. No. 349,761

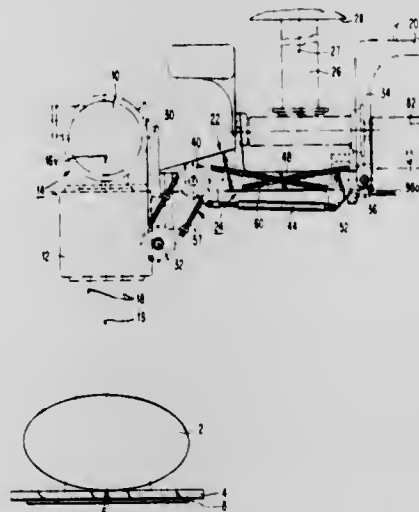
Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—181

8 Claims

1. In an X-ray apparatus containing:  
an X-ray tube;  
a support for said tube; means for moving said X-ray tube between  
a first position in which said X-ray tube is adapted to emit a beam of X-rays in a first direction, and  
a second position in which said X-ray tube is adapted to emit a beam of X-rays in a second direction substantially normal to said first direction;

a film cassette tray having a plane in an exposure position to receive said beam of X-rays from said X-ray tube when said X-ray tube is in its second position; and sprocket and chain means operationally connected to said X-ray tube support for positioning said film cassette tray



in a waiting position outside said beam of X-rays when said X-ray tube is in its first position and for transferring said film cassette tray from said waiting position to said exposure position when said X-ray tube is moved from its first position to its second position.

4,416,022

#### PRISM LIGHT-LINE SYSTEM

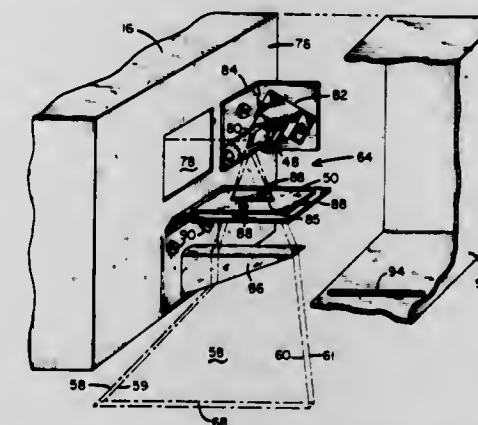
James W. Cutter, Hollister, Calif., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Mar. 29, 1982, Ser. No. 362,807

Int. Cl.<sup>3</sup> A61B 6/08

U.S. Cl. 378—206

12 Claims



1. A light-line system for visual alignment of an X-ray source with an object to receive X-rays preparatory to radiography comprising:

a source of visible light;  
a visible light aperture means having a slit-type aperture therein for transmitting a beam of light therethrough; and visible light collimating means receiving and collimating said beam of visible light by directing said beam within a central plane such that two sides of said beam are substantially parallel to said central plane to produce a narrow width light-line having a useful length greatly in excess of said width.

4,416,023

#### STRONG AND WEAK SIGNAL PREAMPLIFICATION SYSTEM

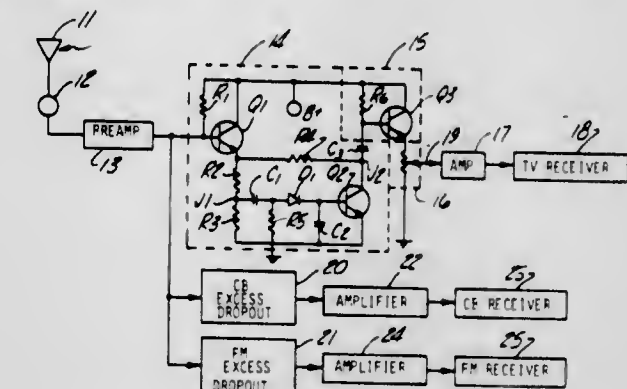
John C. Michoff, 8999 Field Rd., Algonac, Mich. 48001

Filed Jan. 17, 1980, Ser. No. 112,944

Int. Cl.<sup>3</sup> H04B 1/16

U.S. Cl. 455—291

20 Claims



1. A preamplifier connectable between an antenna producing an output signal in response to signals received from local and distant transmitting stations and an input to a receiver capable of producing an undistorted output in response to receiving input signals between predetermined input signal levels of said receiver, said preamplifier comprising:  
preamplification means for amplifying the level of said output signal of the antenna in response to the signals received from said local and distant transmitting stations to generate an amplified signal;  
signal level responsive means responsive to the amplitude of said amplified signal for limiting the amplitude of said amplified signal to less than a predetermined maximum amplitude to generate a limited signal; and  
signal attenuator means for attenuating the amplitude of said limited signal to generate an input signal for said receiver having a signal level within the predetermined input signal levels of said receiver.

4,416,024

#### DISTORTION REDUCING CIRCUIT IN FM RECEIVER

Takenori Ugari, Hirakata, and Yoichi Yano, Higashiosaka, both of Japan, assignors to Sanyo Electric Co., Inc., Moriguchi, Japan

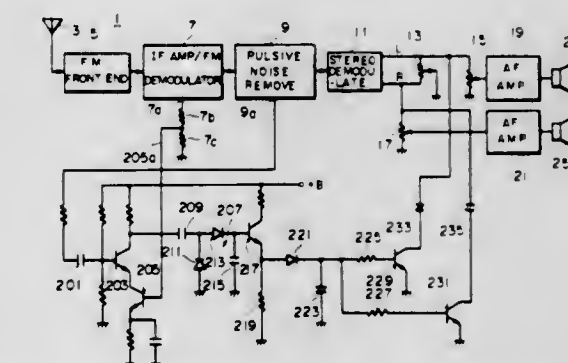
Filed Nov. 26, 1980, Ser. No. 210,378

Claims priority, application Japan, Dec. 17, 1979, 54-164297; Dec. 21, 1979, 54-167027; Dec. 27, 1979, 54-182738[U]; Oct. 14, 1980, 55-146691[U]

Int. Cl.<sup>3</sup> H04B 1/16

U.S. Cl. 455—303

21 Claims



1. A distortion reducing circuit in an FM receiver, said FM receiver comprising:  
front end means for receiving an FM signal containing information corresponding to a range of frequencies and providing an intermediate frequency output signal;  
circuit means for receiving and demodulating said interme-



diate frequency output signal to produce a demodulating signal which includes a component corresponding to distortion in the FM signal received by said front end means;

utilization means responsive to said demodulated signal for reproducing information contained in said FM signal;

means responsive to the demodulated output signal of said demodulating circuit means for detecting said distortion component; and

distortion reducing means responsive to said detected distortion component of said distortion detecting means for reducing a high frequency component of the range of

frequencies included in said demodulated output signal which is applied to said utilization means while permitting relatively unaffected passage of a low frequency component of a range of frequencies included in said demodulated output signal to said utilization means,

said distortion reducing means being rapidly responsive to cause reduction upon the received FM signal going from a state of no distortion to one with distortion and less rapidly responsive upon the FM signal going from a state with distortion to one without distortion.

## DESIGNS

NOVEMBER 15, 1983

271,344

## TWO COLOR CHEWING GUM

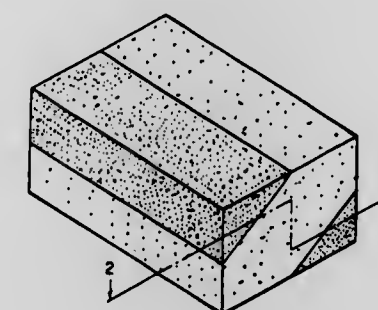
Steven M. Faust, Massapequa, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 12, 1980, Ser. No. 215,983

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—12



271,345

## VEST OR SIMILAR ARTICLE

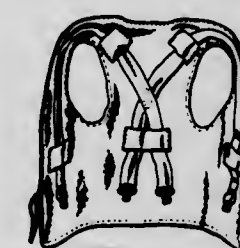
John E. Banks, 2598 Dixon Dr., Santa Clara, Calif. 95051

Filed Mar. 23, 1981, Ser. No. 246,378

Term of patent 14 years

Int. Cl. D2—02

U.S. Cl. D2—184



271,346

## HELMET

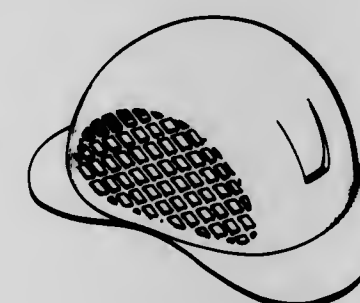
Paul R. Hein, 10445 Canoga Ave., Apt. #114, Chatsworth, Calif. 91311

Filed Jul. 30, 1981, Ser. No. 288,668

Term of patent 14 years

Int. Cl. D02—03

U.S. Cl. D2—231



271,347

## HELMET

Rene Bourque, Duvernay, Canada, assignor to Gamebridge Inc., St. Jerome, Canada

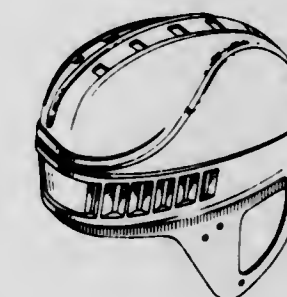
Filed Mar. 8, 1982, Ser. No. 355,386

Claims priority, application Canada, Jan. 29, 1982, 29-01-82-10

Term of patent 14 years

Int. Cl. D02—03

U.S. Cl. D2—232



271,348

## SOCK

James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677

Filed May 13, 1981, Ser. No. 263,114

Term of patent 14 years

Int. Cl. D2—04

U.S. Cl. D2—331





271,349

## CASE FOR A VIDEO CASSETTE

Hartmut Thiele, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Bayerwerk-Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,145

Term of patent 14 years

Int. Cl. D3—02

U.S. Cl. D3—15



271,350

## COMBINED KEY HOLDER AND COIN PURSE

Thomas R. Robbins, 1919 Heliotrope, Santa Ana, Calif. 92705

Filed Dec. 21, 1981, Ser. No. 333,047

Term of patent 14 years

Int. Cl. D3—01

U.S. Cl. D3—62



271,351

## CRIB

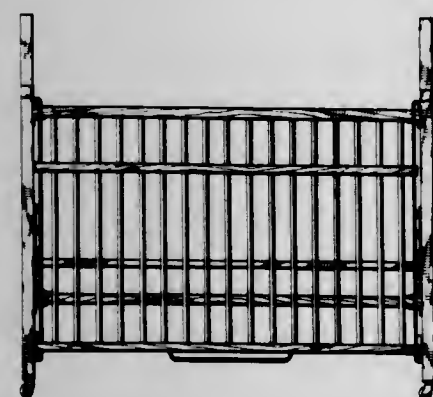
Henry W. Mower, Stevens Point, Wis.; Allen Seymour, Clayton, Ohio; Jerome P. Koziatek, Hinckley, Ohio, and Joseph G. Lendvay, Ravenna, Ohio, assignors to Questor Corporation, Tampa, Fla.

Filed Sep. 14, 1981, Ser. No. 302,307

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—16



271,352

## STOOL

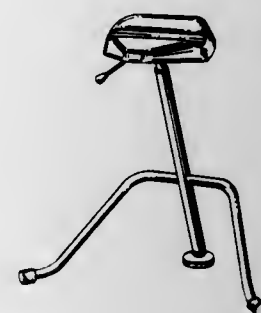
Peter De Boer, Amsterdam, Netherlands, assignor to Glapen and Staalmeubel B.V., Stationsingel, Netherlands

Filed Oct. 2, 1981, Ser. No. 308,030

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—29



271,353

## BATHROOM CABINET

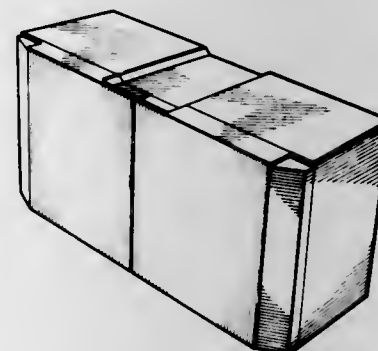
Zeev Raz, 17 Keren Hayessod St., Beersheva, Israel

Filed Sep. 5, 1980, Ser. No. 184,260

Term of patent 14 years

Int. Cl. D6—04; D23—02

U.S. Cl. D6—104



271,354

## TABLE

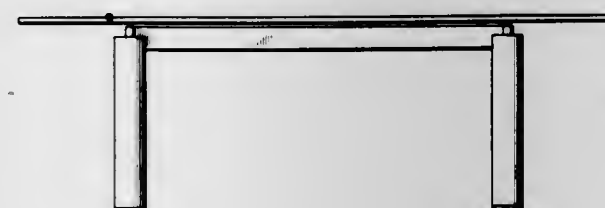
Ralph Lerner, 9 Ericsson St., Belmont, Mass. 02178, and Mark Cigolle, 94 Mercer St., New York, N.Y. 10012

Filed Oct. 26, 1981, Ser. No. 315,170

Term of patent 14 years

Int. Cl. D6—03

U.S. Cl. D6—175



271,355

## ROTATABLE PLANTER

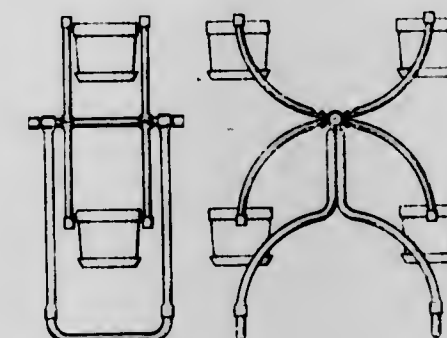
Frank Altman, 1615 S. 14th Ave., Hollywood, Fla. 33020

Filed Jun. 1, 1981, Ser. No. 269,275

Term of patent 14 years

Int. Cl. D6—06; D11—02

U.S. Cl. D6—183



271,357

## CRIB FOOTBOARD

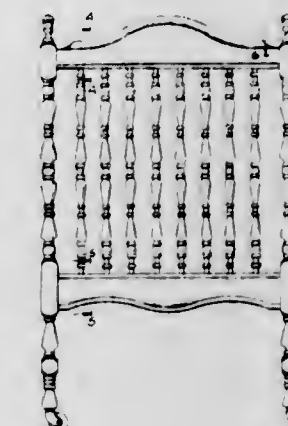
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Aug. 7, 1981, Ser. No. 290,992

Term of patent 14 years

Int. Cl. D6—06

U.S. Cl. D6—198



271,358

## PICTURE FRAME

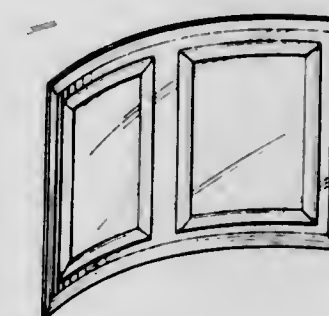
Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331

Filed Mar. 22, 1982, Ser. No. 360,329

Term of patent 14 years

Int. Cl. D6—07

U.S. Cl. D6—234



271,356

## MAGNETIC TAPE REEL STORAGE RACK

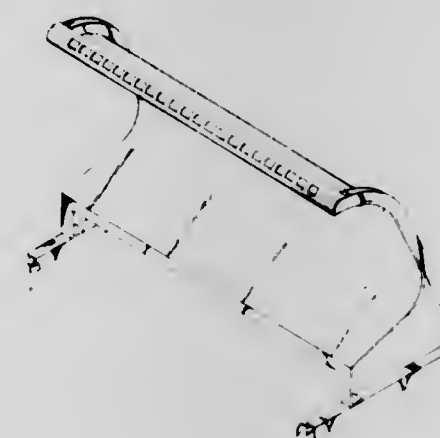
Helmut H. Henneberg, Canton, and John F. Graham, Sudbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 16, 1981, Ser. No. 244,502

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—188



271,359

## PICTURE FRAME

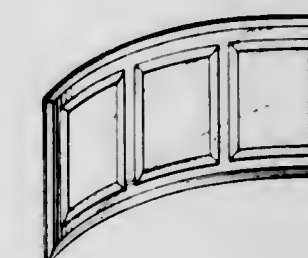
Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331

Filed Mar. 22, 1982, Ser. No. 360,330

Term of patent 14 years

Int. Cl. D6—07

U.S. Cl. D6—234

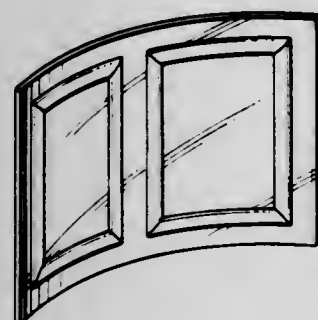




271,360  
PICTURE FRAME

Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331  
Filed Mar. 22, 1982, Ser. No. 360,331  
Term of patent 14 years  
Int. Cl. D6—07

U.S. Cl. D6—234



271,362  
COLLAPSIBLE INSULATING CONTAINER

David I. Heweston, 163 Crown St., East Sydney, New South Wales, 2010, Australia  
Filed Apr. 20, 1981, Ser. No. 255,534  
Claims priority, application Australia, Oct. 24, 1980, 82,429  
Term of patent 14 years  
Int. Cl. D07—99

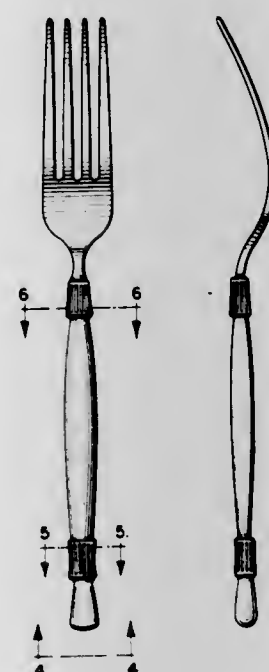
U.S. Cl. D7—70



271,363  
FORK OR SIMILAR ARTICLE

Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.  
Filed Sep. 25, 1981, Ser. No. 305,552  
Term of patent 14 years  
Int. Cl. D07—03

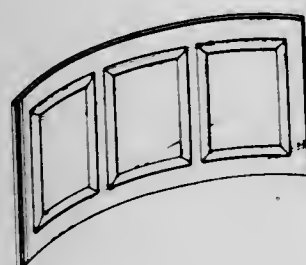
U.S. Cl. D7—137



271,361  
PICTURE FRAME

Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331  
Filed Mar. 22, 1982, Ser. No. 360,594  
Term of patent 14 years  
Int. Cl. D6—07

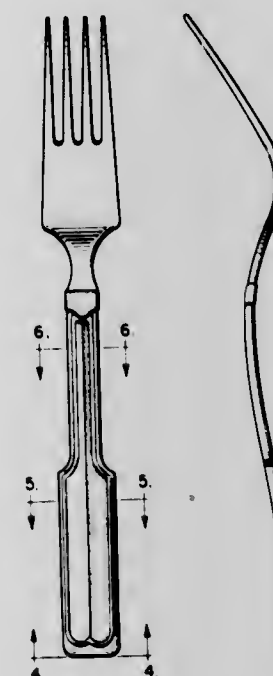
U.S. Cl. D6—234



271,364  
FORK OR SIMILAR ARTICLE

Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.  
Filed Sep. 25, 1981, Ser. No. 305,606  
Term of patent 14 years  
Int. Cl. D07—03

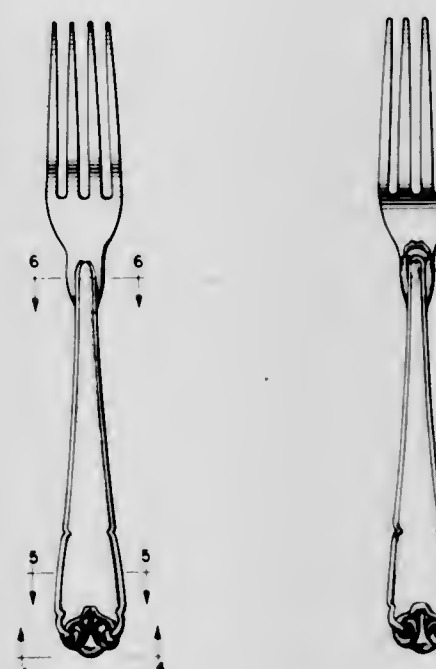
U.S. Cl. D7—137



271,366  
FORK OR SIMILAR ARTICLE

Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.  
Filed Sep. 25, 1981, Ser. No. 305,613  
Term of patent 14 years  
Int. Cl. D07—03

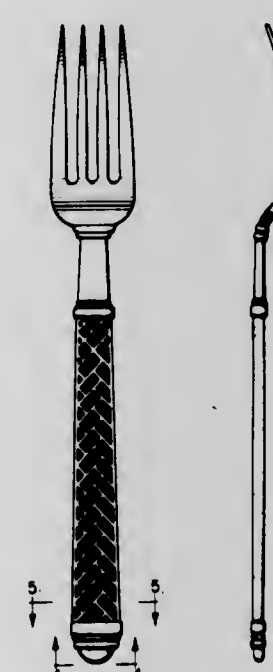
U.S. Cl. D7—137



271,365  
FORK OR SIMILAR ARTICLE

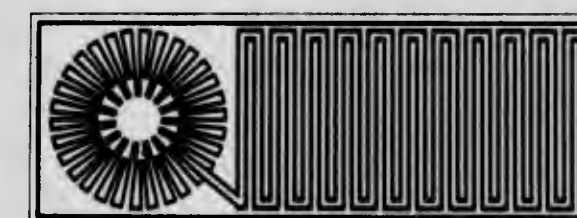
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.  
Filed Sep. 25, 1981, Ser. No. 305,610  
Term of patent 14 years  
Int. Cl. D07—03

U.S. Cl. D7—137



271,367  
ELECTRIC HEATING PLATE FOR A FOOD WARMER  
Malcolm A. Goldworthy, Whorlton, England, assignor to Schott Industrial Glass Limited, Newton Aycliffe, England  
Filed May 28, 1981, Ser. No. 270,307  
Claims priority, application United Kingdom, Apr. 21, 1981, 997806

Term of patent 14 years  
Int. Cl. D7—02  
U.S. Cl. D7—363





271,368

**BEVERAGE DISPENSING VALVE**

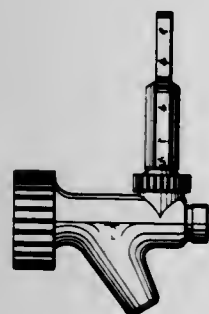
Terrance G. Belland, Maple Grove; William B. MacKrell, New Brighton, and Walter E. Ranna, Blaine, all of Minn., assignors to The Cornelius Company, Anoka, Minn.

Filed Feb. 5, 1982, Ser. No. 345,980

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D7-398



271,369

**SNOW SCOOP**

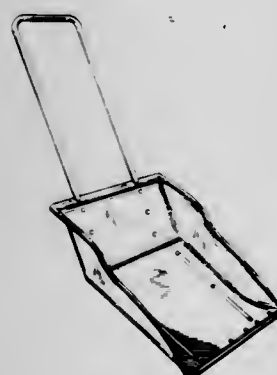
John E. Gesner, Meriden, Conn., assignor to JEG, Inc., Meriden, Conn.

Filed Jul. 6, 1982, Ser. No. 395,669

Term of patent 14 years

Int. Cl. D08-01

U.S. Cl. D8-10



271,370

**CERAMIC CLEAN-UP TRIM TOOL**

Louis San Antonio, 114 Smithfield Ave., Pawtucket, R.I. 02860

Filed May 26, 1981, Ser. No. 267,432

Term of patent 14 years

Int. Cl. D8-03

U.S. Cl. D8-14



271,371

**SOLDER REMOVING TOOL OR THE LIKE**

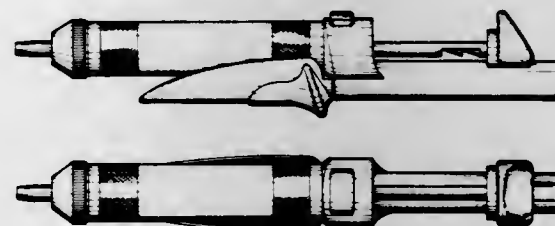
William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265

Filed Jan. 8, 1981, Ser. No. 223,499

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-51



271,372

**PIN STRAIGHTENING AND PRYING TOOL OR THE LIKE**

William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265

Filed Jan. 8, 1981, Ser. No. 223,500

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-88



271,373

**COMBINED LIGHT DIMMER KNOB AND ESCUTCHEON THEREFOR**

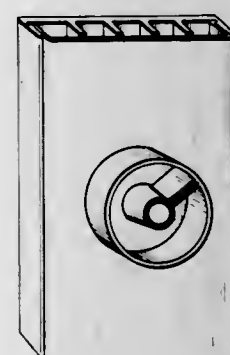
Joel S. Spira, Coopersburg, and Noel Mayo, Philadelphia, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Feb. 20, 1981, Ser. No. 236,274

Term of patent 14 years

Int. Cl. D8-06, 09; D13-03

U.S. Cl. D8-302



271,374

**KNOB ESCUTCHEON**

Lawrence D. Butts, Charlotte, N.C., assignor to Scovill Inc., Waterbury, Conn.

Filed Oct. 5, 1981, Ser. No. 308,819

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-353



271,377

**BOTTLE**

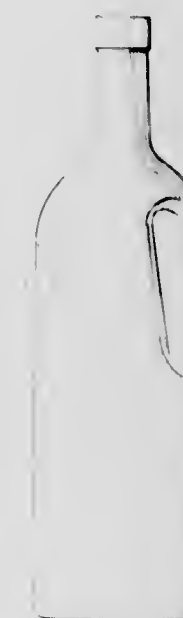
Matthew J. Klim, New Hartford, Conn., assignor to C.V.B.G., Bordeaux, France

Filed Mar. 4, 1981, Ser. No. 240,292

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-378



271,375

**COUPLER FOR STRUCTURAL TUBES OR THE LIKE**

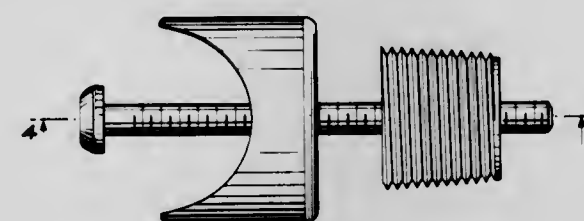
Terrance A. Baroody, 2127 Foxwood Dr., Orange Park, Fla. 32073

Filed Jun. 18, 1981, Ser. No. 275,133

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-382



271,376

**COUPLER SADDLE FOR STRUCTURAL TUBES OR THE LIKE**

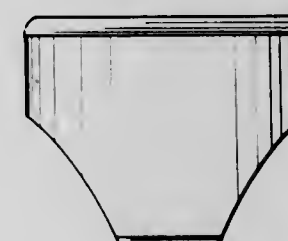
Terrance A. Baroody, 2127 Foxwood Dr., Orange Park, Fla. 32073

Filed Jun. 18, 1981, Ser. No. 275,140

Term of patent 14 years

Int. Cl. D8-081

U.S. Cl. D8-382



271,378

**TRANSPARENT BOX**

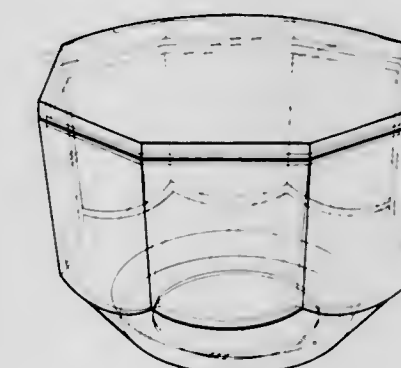
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002

Filed Jul. 6, 1981, Ser. No. 280,875

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-424

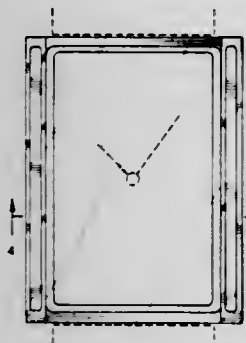




271,379  
WATCHCASE

Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T. Jerome E. Stein, P.O. Box 6314, San Diego, Calif. 92106  
Dupont, Paris, France  
Filed Jun. 16, 1980, Ser. No. 159,896  
Claims priority, application France, Mar. 31, 1980, 80 1023  
Term of patent 14 years  
Int. Cl. D10—02

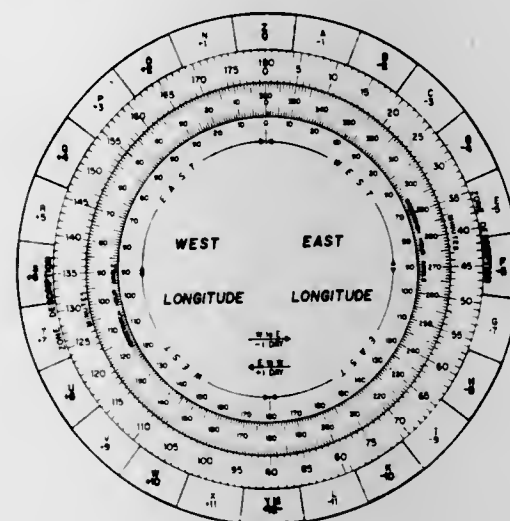
U.S. Cl. D10—38



271,382  
CIRCULAR NAVIGATIONAL RULE AID

Filed Sep. 11, 1981, Ser. No. 301,194  
Term of patent 14 years  
Int. Cl. D10—04

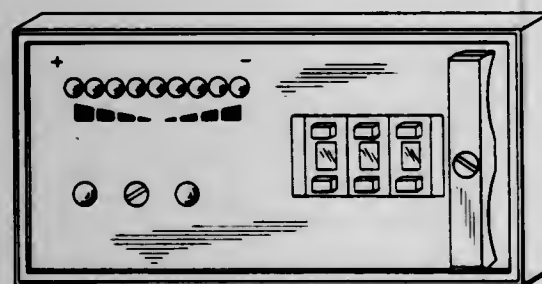
U.S. Cl. D10—65



271,380  
ELECTRONIC THERMOSTAT INDICATOR OR SIMILAR ARTICLE

Pietro Zanazzo, Novara; Guilio Mainardi, Bellusco, and Rodolfo Giorgetti, Milan, all of Italy, assignors to ERO Electronic s.r.l., Milan, Italy  
Filed May 26, 1981, Ser. No. 267,026  
Term of patent 14 years  
Int. Cl. D10—04

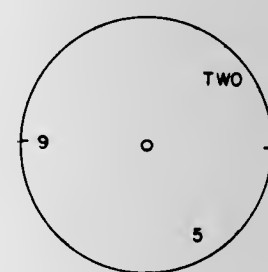
U.S. Cl. D10—49



271,383  
WATCH FACE

Luke P. Cuccia, 511 Puddingstone Dr., San Dimas, Calif. 91773  
Filed Jul. 27, 1981, Ser. No. 287,196  
Term of patent 14 years  
Int. Cl. D10—07

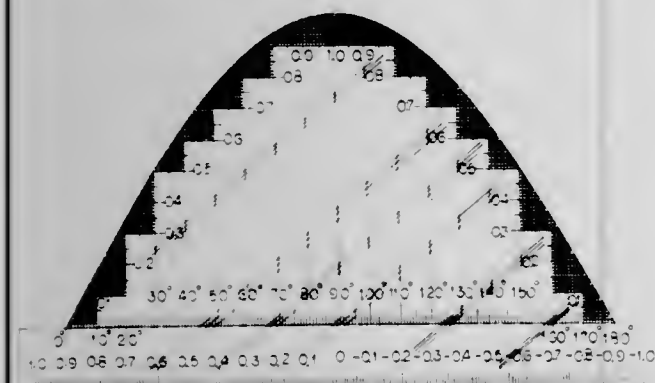
U.S. Cl. D10—126



271,381  
SINE TEMPLATE

Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405  
Filed May 22, 1981, Ser. No. 266,502  
Term of patent 14 years  
Int. Cl. D10—04

U.S. Cl. D10—62



271,384  
PENDANT OR THE LIKE

Jessie L. D. Frye, Meadowbrook Mobile Home Park, Rte. #19, Lot #5, Johnson City, Tenn. 37601  
Filed Oct. 30, 1981, Ser. No. 316,833  
Term of patent 14 years  
Int. Cl. D11—07

U.S. Cl. D11—76



271,385  
SCULPTURE OR THE LIKE

Gyora Novak, One W. 72nd St., New York, N.Y. 10023  
Filed Oct. 16, 1980, Ser. No. 197,419  
Term of patent 14 years  
Int. Cl. D11—02

U.S. Cl. D11—131



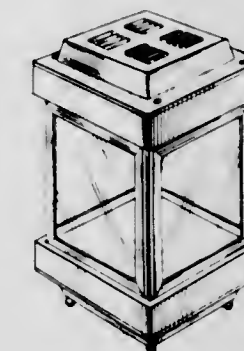
271,387  
MINIATURE GREENHOUSE

William L. Lentz, Chattanooga, Tenn.; Richard A. Siegel, Monroe, and Colin Healy, Stratford, both of Conn., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 2, 1981, Ser. No. 317,247  
Term of patent 14 years

Int. Cl. D11—02; D6—04; D30—02

U.S. Cl. D11—145



271,388  
CAMPING TRAILER

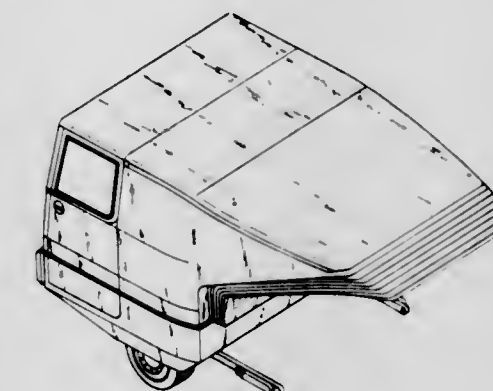
Robert E. Bourke, Westport, Conn., assignor to NBS Incorporated, Lakeview, Ohio

Filed Feb. 6, 1981, Ser. No. 232,019

Term of patent 14 years

Int. Cl. D12—10

U.S. Cl. D12—104



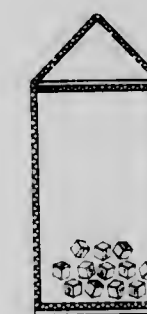
271,386  
WALL HANGING

Amelia A. Sharp, 337 Sunrise Ct., Benicia, Calif. 94510  
Filed Jun. 24, 1982, Ser. No. 391,526

Term of patent 14 years

Int. Cl. D11—02

U.S. Cl. D11—133



271,389  
LUGGAGE CARRIER

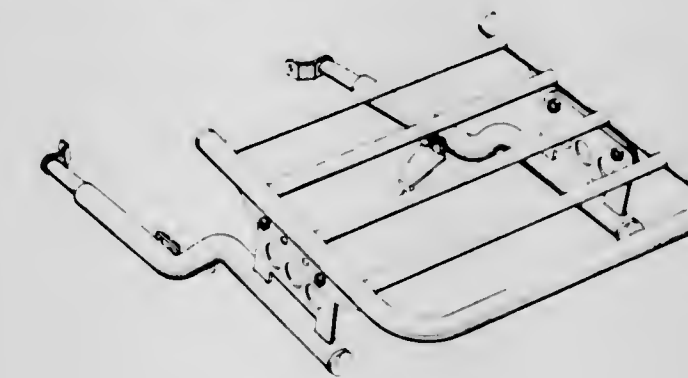
Mark Turkington, and Philip Turkington, both of Willimantic, Conn., assignors to Connecticut Cycle Accessories, Inc., Willimantic, Conn.

Filed Jul. 20, 1981, Ser. No. 285,150

Term of patent 14 years

Int. Cl. D12—11

U.S. Cl. D12—158



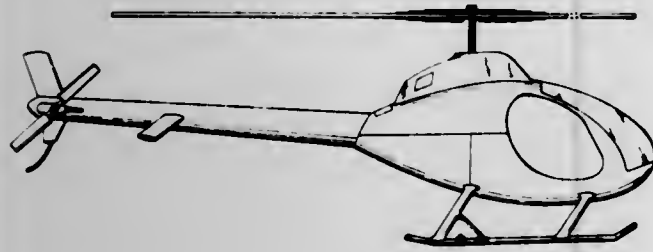


271,390

## HELICOPTER

Buford J. Schramm, 1330 E. Fremont Dr., Tempe, Ariz. 85281  
 Filed Apr. 28, 1980, Ser. No. 146,621  
 Term of patent 14 years  
 Int. Cl. D12-07

U.S. Cl. D12-327

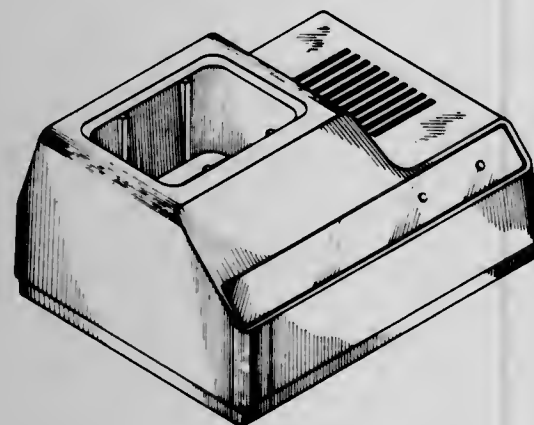


271,391

## BATTERY CHARGING UNIT FOR A PORTABLE RADIO OR SIMILAR ARTICLE

William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.  
 Filed Jun. 1, 1981, Ser. No. 269,144  
 Term of patent 14 years  
 Int. Cl. D13-02

U.S. Cl. D13-5

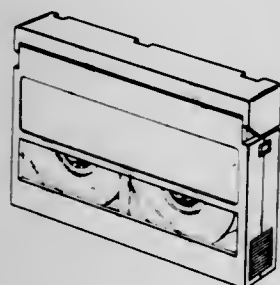


271,392

## CASSETTE FOR VIDEO TAPE RECORDER

Hidemichi Sumisha, Kadoma, and Seikou Minamide, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
 Filed Jul. 29, 1981, Ser. No. 287,976  
 Claims priority, application Japan, Jan. 30, 1981, 56-3440  
 Term of patent 14 years  
 Int. Cl. D14-01

U.S. Cl. D14-11



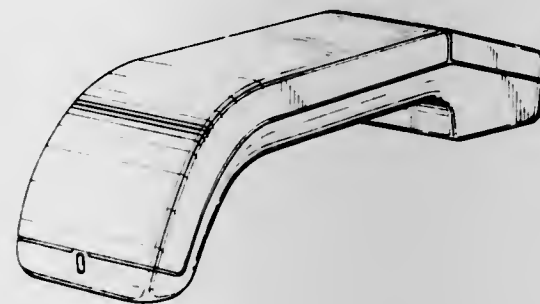
271,393

## TELEPHONE HANDSET

Peter B. Carr, Harpenden, England, assignor to International Standard Electric Corporation, New York, N.Y.  
 Filed Mar. 2, 1981, Ser. No. 239,735  
 Claims priority, application United Kingdom, Aug. 28, 1980, 996341

Term of patent 14 years  
 Int. Cl. D14-03

U.S. Cl. D14-63



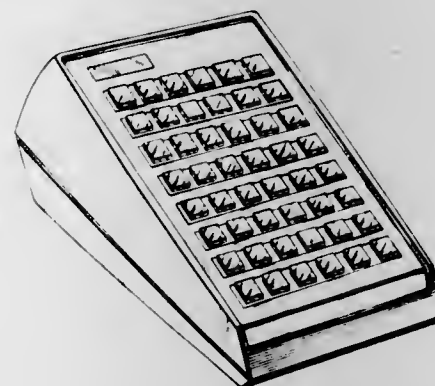
271,394

## DIRECT STATION SELECTION CONSOLE

Wilbert C. Brown, Fairfield, and Roman F. Pomponi, Norwalk, both of Conn., assignors to TIE/communications, Inc., Shelton, Conn.

Filed Jan. 21, 1980, Ser. No. 113,998  
 Term of patent 14 years  
 Int. Cl. D14-03

U.S. Cl. D14-66



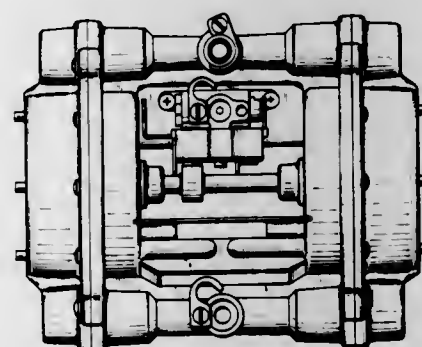
271,395

## PUMP

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.  
 Filed Nov. 12, 1981, Ser. No. 320,585

Term of patent 14 years  
 Int. Cl. D15-02

U.S. Cl. D15-7



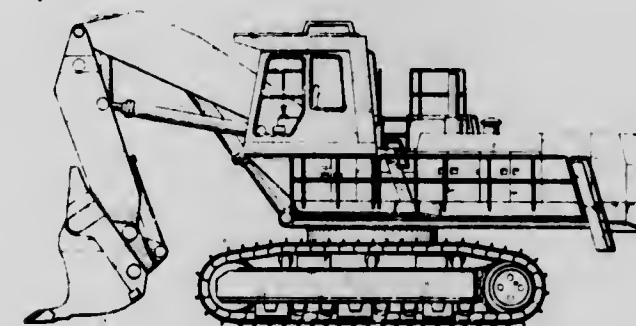
271,396

## LOADING SHOVEL

Takayasu Inui, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan  
 Filed Jun. 23, 1981, Ser. No. 276,664  
 Claims priority, application Japan, Jan. 23, 1981, 56-1857

Term of patent 14 years  
 Int. Cl. D15-03

U.S. Cl. D15-24



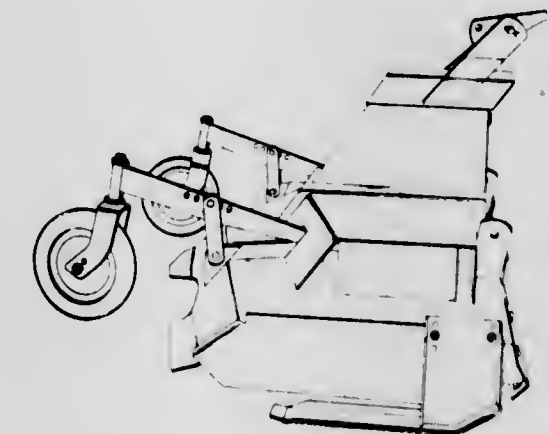
271,398

## REAR MOUNTED MOWER FOR TRACTORS

James E. McCause, Ogle County; George E. Draege, Oregon, both of Ill.; Richard J. Robbins, Derby, Kans.; Timothy A. Sevik, Oregon, Ill., and Richard E. Ten Eyck, Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 21, 1980, Ser. No. 142,438  
 Term of patent 14 years  
 Int. Cl. D15-03

U.S. Cl. D15-27



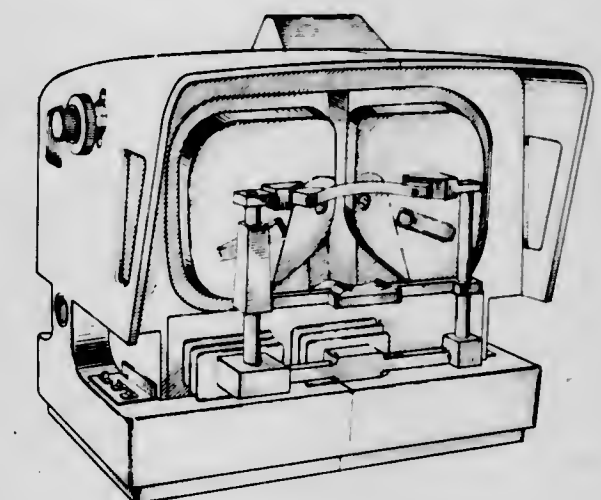
271,399

## OPHTHALMIC INSTRUMENT

Paul A. Jordan, Oneida, and Edwin A. Speaker, Brockport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,599  
 Term of patent 14 years  
 Int. Cl. D16-06

U.S. Cl. D16-130



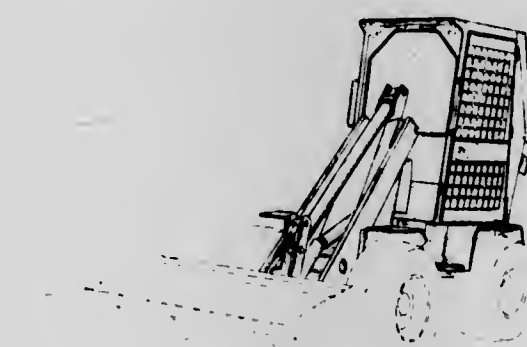
271,397

## ARTICULATED LOADER VEHICLE BODY

Patrick Kuhn; Thomas M. Sagaser, and Oryn B. Wagner, all of Bismarck, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed May 28, 1981, Ser. No. 268,041  
 Term of patent 14 years  
 Int. Cl. D15-03

U.S. Cl. D15-25





271,400  
VIOLIN

Chester Knighten, P.O. Box 62, Foreman, Ark. 71830  
Filed Jul. 10, 1981, Ser. No. 282,009  
Term of patent 14 years  
Int. Cl. D17-03

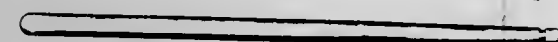
U.S. Cl. D17-17



271,401  
DRUMSTICK

Bruce N. Hardy, Elkhart, Ind., assignor to Silver Street Incorporated, Elkhart, Ind.  
Filed Aug. 3, 1981, Ser. No. 289,291  
Term of patent 14 years  
Int. Cl. D17-04

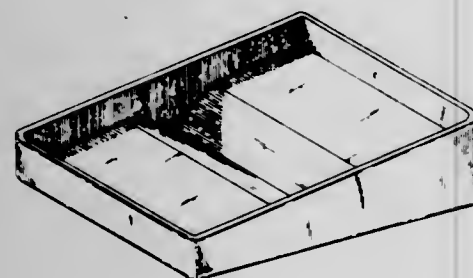
U.S. Cl. D17-22



271,402  
NOTE PAPER RETRIEVAL TRAY

Jerry L. Sharber, 2334 Middlesex Dr., Toledo, Ohio 43606  
Filed Jun. 8, 1981, Ser. No. 271,708  
Term of patent 14 years  
Int. Cl. D19-02

U.S. Cl. D19-92

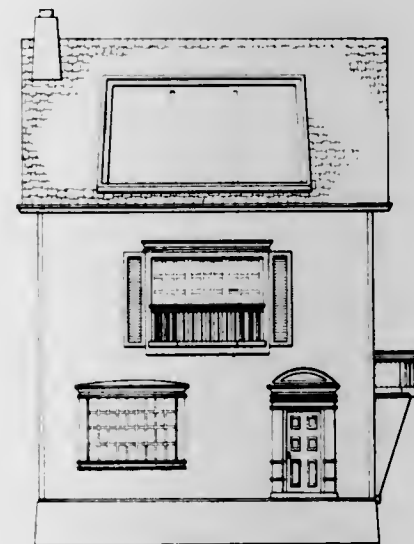


271,403  
TOY DOLL HOUSE

Richard W. M. Kimbrough, Lancaster, Pa., and Craig J. McElhaney, West Falls, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 24, 1981, Ser. No. 247,203  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-114



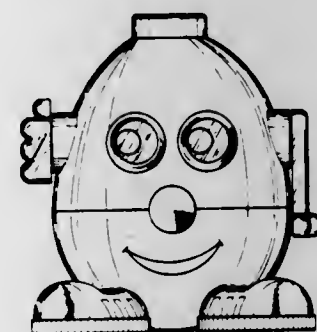
271,404  
TOY FIGURE

Helen C. Chan, Kowloon, Hong Kong, assignor to Alfred Ell Simmons and Kui-Yan Lung, both of Kowloon, Hong Kong

Filed Oct. 28, 1981, Ser. No. 315,900  
Claims priority, application United Kingdom, Jul. 3, 1981, 1001309

Term of patent 14 years  
Int. Cl. D21-01

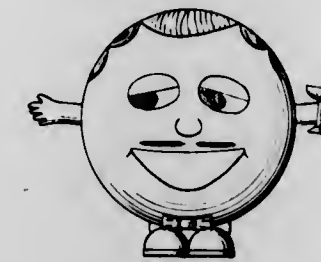
U.S. Cl. D21-150



271,405  
DOLL

Charles H. Helein, 11752 Dry River Ct., Reston, Va. 22090  
Filed Jan. 27, 1982, Ser. No. 343,103  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-166

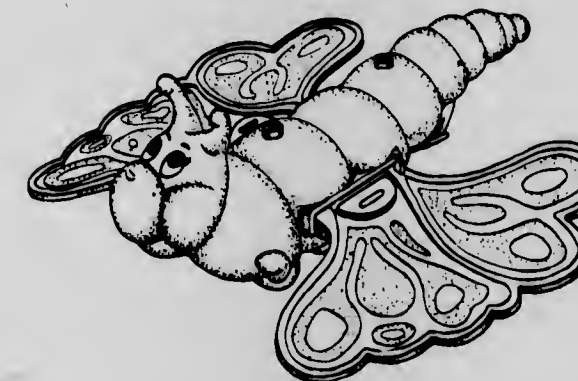


271,406  
TOY BUTTERFLY

Thomas P. Osborne, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.

Filed Oct. 19, 1981, Ser. No. 312,567  
Term of patent 14 years  
Int. Cl. D21-01

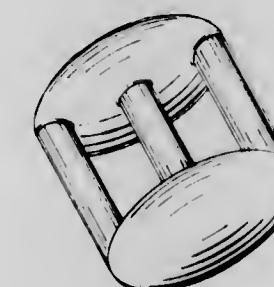
U.S. Cl. D21-185



271,407  
DUMBBELL

Forrest S. Wright, 533 Hill, Rochester, Mich. 48063  
Filed Dec. 11, 1981, Ser. No. 329,638  
Term of patent 14 years  
Int. Cl. D21-02

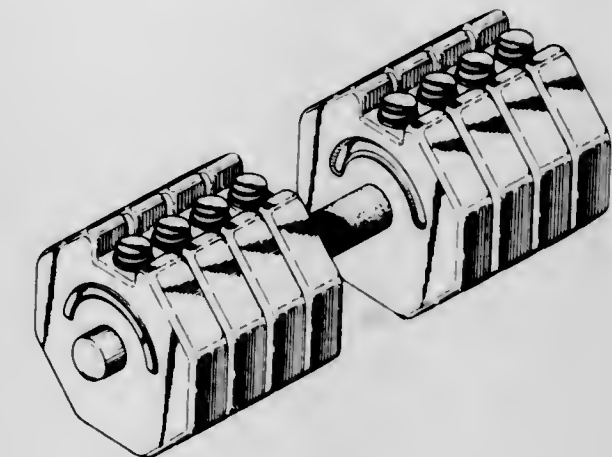
U.S. Cl. D21-197



271,408  
BARBELL

Robert J. Bauer, 3138 Chapel Down Dr., Dallas, Tex. 75229  
Filed Dec. 14, 1981, Ser. No. 330,224  
Term of patent 14 years  
Int. Cl. D21-02

U.S. Cl. D21-197

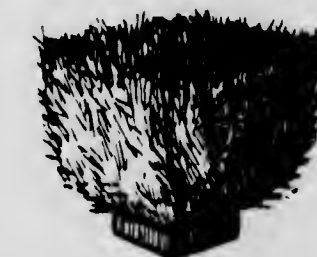


271,409  
GAME PROJECTILE

Daniel Lukach, Rochester, N.Y., assignor to Ideas Materialized, Inc., Rochester, N.Y.

Filed Oct. 27, 1980, Ser. No. 201,200  
Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-207

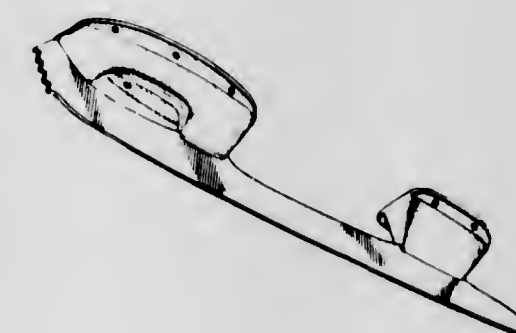


271,410  
FIGURE SKATE BLADE

Icaro Olivieri, Montebelluna, Italy, assignor to Warrington Inc., Canada

Filed Nov. 21, 1980, Ser. No. 209,285  
Claims priority, application Canada, May 21, 1980, 21-05-80-3  
Term of patent 14 years  
Int. Cl. D21-02

U.S. Cl. D21-225





271,411

## MINIATURE BOW

Glenn H. Adkins, Whittier, Calif., assignor to Minibow, Inc., Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804

Filed Oct. 19, 1981, Ser. No. 312,859

Term of patent 14 years

Int. Cl. D21-02; D22-02

U.S. Cl. D22-5



271,414

## COUNTING SWATTER

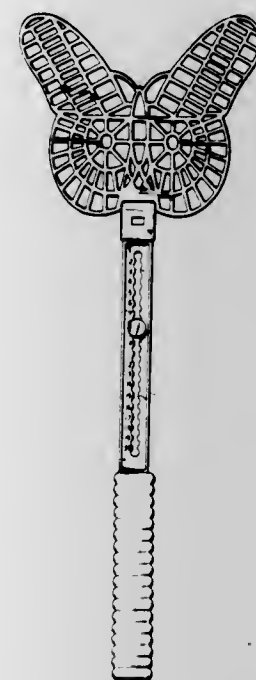
Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804

Filed Oct. 26, 1981, Ser. No. 314,880

Term of patent 14 years

Int. Cl. D22-06

U.S. Cl. D22-20



271,412

## TELESCOPIC SIGHT MOUNT FOR PISTOL

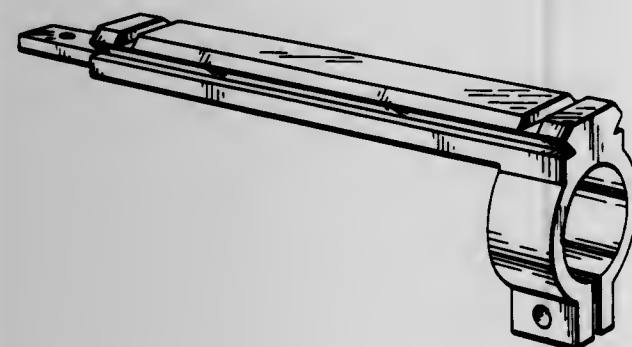
Paul D. Long, 1606 Bristol, Kansas City, Mo. 64126

Filed Oct. 26, 1981, Ser. No. 315,000

Term of patent 14 years

Int. Cl. D22-01

U.S. Cl. D22-7



271,413

## BELT ATTACHED FISHING ROD HOLDER

Thomas Munroe, P.O. Box 538, Far Hills Station, Dayton, Ohio 45419

Filed Mar. 4, 1983, Ser. No. 472,406

Term of patent 14 years

Int. Cl. D22-04

U.S. Cl. D22-14



271,415

## FISH LURE

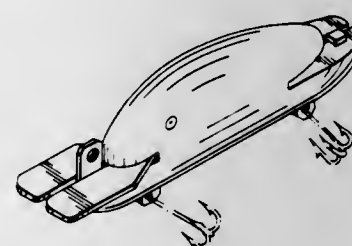
Thurman H. Mumma, 10510 Brosius Rd., Garrettsville, Ohio 44231

Filed Nov. 19, 1981, Ser. No. 322,778

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-27



271,416

## FILTER CARTRIDGE FRAME

Gerald J. Mayer, 4027 Folkstone Dr., Toledo, Ohio 43614

Filed Mar. 16, 1981, Ser. No. 244,040

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-4



271,419

## MONOPOLAR ELECTROSURGICAL DEVICE WITH DUAL 360° HAND SWITCH

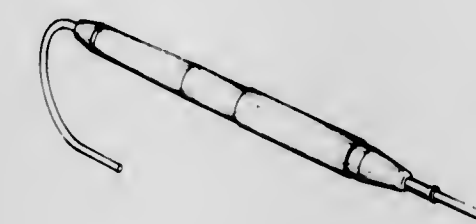
Patrick E. Hoff, Boulder, Colo., assignor to Technology Applications Group, Inc., Boulder, Colo.

Filed Apr. 6, 1979, Ser. No. 27,764

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-28



271,417

## COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE

Rud Thygesen, Rungsted Kyst, and Johnny Sorensen, Elsinore, both of Denmark, assignors to Dansk Pressalit A/S, Arhus, Denmark

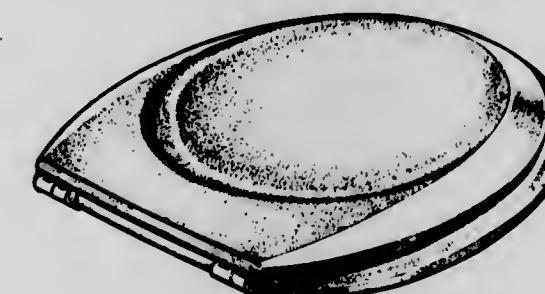
Filed Jul. 22, 1981, Ser. No. 285,709

Claims priority, application Denmark, Feb. 9, 1981, 193/1981

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-71



271,420

## FOOT MASSAGER AND LEG EXERCISER

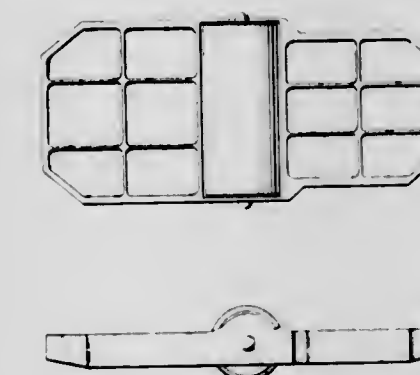
Oscar A. Sierra, 238 Moonstone, San Antonio, Tex. 78233

Filed May 26, 1981, Ser. No. 266,889

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D24-36



271,418

## SURGICAL STAPLING INSTRUMENT

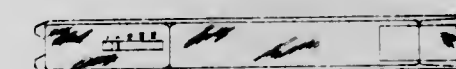
Jay E. Campbell, Upper Black Eddy; Richard H. Reichmann, Churchville, both of Pa., and Lehmann K. Li, Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 27, 1980, Ser. No. 153,227

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-26



271,421

## MEDICAL VALVE

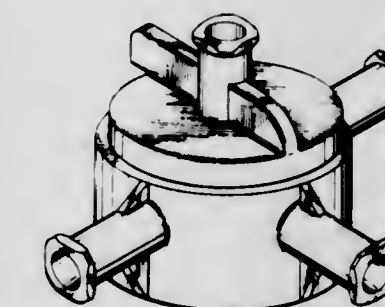
James W. Fetterman, 445 Franklin St., Apt. 24, Athens, Ga. 30601

Filed Jun. 12, 1981, Ser. No. 272,898

Term of patent 14 years

Int. Cl. D24-99; D23-01

U.S. Cl. D24-53





271,422

## KIT FOR A WOUND DRAINAGE SYSTEM

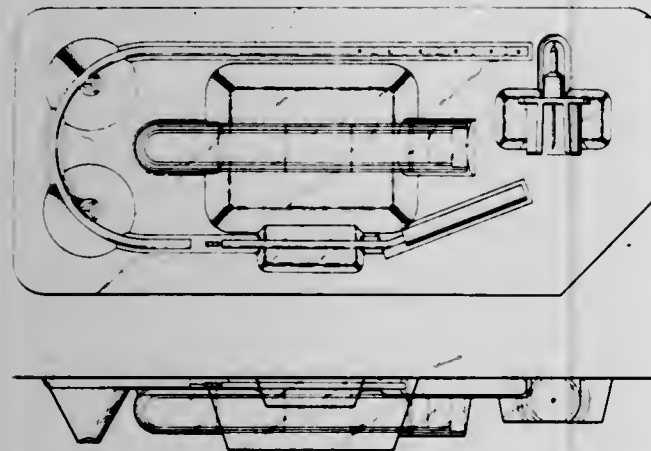
Thomas L. Breland, Atlanta, Ga., assignor to Glasrock Products, Inc., Fairburn, Ga.

Filed Jul. 11, 1980, Ser. No. 167,693

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—56



271,424

## COMPACT FLUORESCENT LAMP UNIT

Robert G. Young, Nutley; Edward W. Morton, Teaneck; Henry Skwirut, Verona, and Thomas E. Dooley, Clifton, all of N.J., assignors to North American Philips Electric Corp., New York, N.Y.

Filed Nov. 13, 1980, Ser. No. 206,501

Term of patent 14 years

Int. Cl. D26—05, 04

U.S. Cl. D26—26



271,423

## BEAM

Björn K. Sundebj, Hålsavägen 16, Moheda, Sweden (S-340 36), and Per A. Ljungberg, Borgmästaregatan 2, Växjö, Sweden

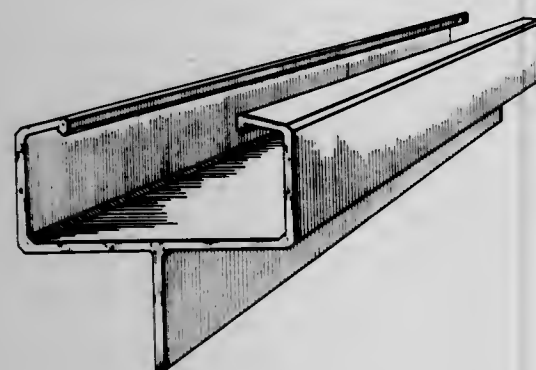
Filed Sep. 9, 1981, Ser. No. 300,524

Claims priority, application Sweden, Mar. 11, 1981, 81-0619

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—77



271,425

## COMBINED FLUORESCENT AND INCANDESCENT LAMP ADAPTER

Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

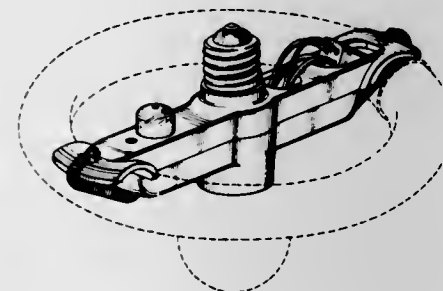
Filed Aug. 4, 1981, Ser. No. 289,923

Claims priority, application Japan, Feb. 27, 1981, 56-7918

Term of patent 14 years

Int. Cl. D26—05

U.S. Cl. D26—26



271,426

## FOG LIGHT

Hisao Yabata, Tamamura, Japan, assignor to Ichikawa Press Industry Co., Ltd., Takasaki, Japan

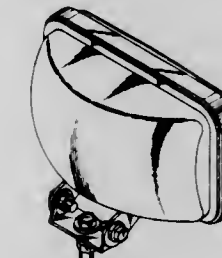
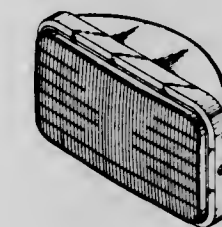
Filed Aug. 27, 1981, Ser. No. 296,926

Claims priority, application Japan, May 27, 1981, 56-22634

Term of patent 14 years

Int. Cl. D26—06

U.S. Cl. D26—29



271,428

## LIGHTING FIXTURE

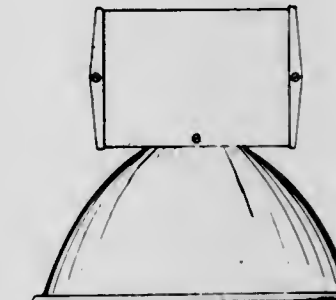
Hendrik A. J. de Vos; Elzear R. Labouliere, both of Swansea, Mass., and Gary M. Altman, Salem, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 19, 1981, Ser. No. 294,256

Term of patent 14 years

Int. Cl. D26—05

U.S. Cl. D26—85



271,429

## LAMP

Freddie J. Andersen, Copenhagen, Denmark, assignor to Woodchuck of Halton Hills Inc., Acton, Canada

Filed Nov. 30, 1981, Ser. No. 325,632

Term of patent 14 years

Int. Cl. D26—05

U.S. Cl. D26—104



271,427

## LIGHTING FIXTURE

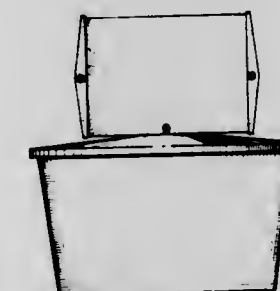
Hendrik A. J. de Vos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 19, 1981, Ser. No. 294,255

Term of patent 14 years

Int. Cl. D26—05

U.S. Cl. D26—85





271,430

**BLOW DRYER**

Frank Antonacci, 276 Indian Trail, Mountainside, N.J. 07092, and Ronald Carluccio, 242 Washington St., Berkeley Heights, N.J. 07922

Filed Oct. 5, 1981, Ser. No. 308,523

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-13



271,431

**DENTAL FLOSS CONTAINER**

Barry G. Seelig, Tuxedo Park, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,252

Term of patent 14 years

Int. Cl. D28-99

U.S. Cl. D28-64



271,432

**DUST FILTERING RESPIRATOR**

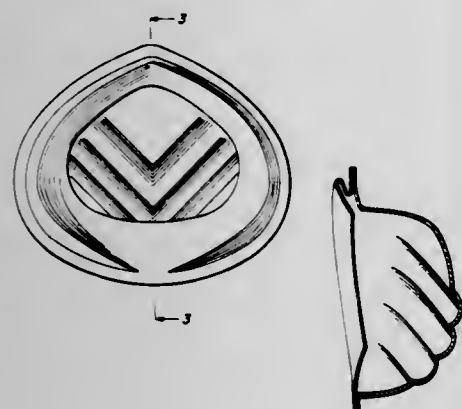
Sheng-Chung Liao, Murrysville, and John W. Neidhart, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 24, 1981, Ser. No. 277,062

Term of patent 14 years

Int. Cl. D29-02

U.S. Cl. D29-7



271,433

**FOLDABLE LIVESTOCK FEEDER**

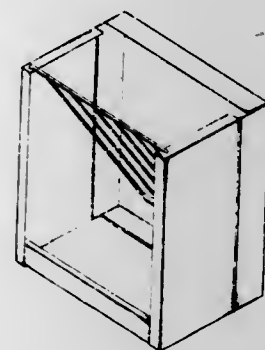
Jackie D. Holland, 4831 Peakview, Erie, Colo. 80516

Filed Jan. 8, 1981, Ser. No. 223,251

Term of patent 14 years

Int. Cl. D30-03

U.S. Cl. D30-13



271,434

**BIRD FEEDER**

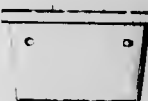
Hugh E. Love, 2931 Birch Pl., Fullerton, Calif. 92635

Filed Dec. 28, 1981, Ser. No. 335,073

Term of patent 14 years

Int. Cl. D30-03

U.S. Cl. D30-13



271,435

**TOILET ADAPTER FOR PET ANIMALS**

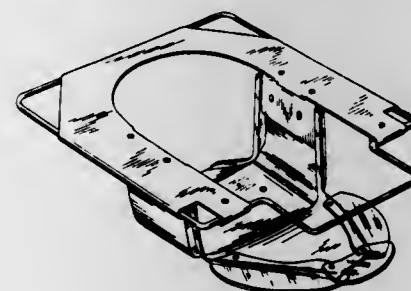
Jan G. L. S. Kullenbäck, P.O. Box 6011, 400 60 Göteborg 6, Sweden

Filed Jan. 14, 1981, Ser. No. 224,935

Term of patent 14 years

Int. Cl. D30-99

U.S. Cl. D30-99



271,436

**SEWER CLEANING MACHINE**

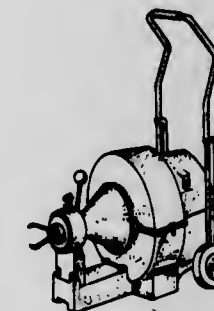
Larry F. Babb, LaGrange; Walter J. Noveske, Elyria; Arthur J. Pulos, Fayetteville, all of Ohio, and Paul B. Sweeney, Syracuse, N.Y., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 26, 1981, Ser. No. 277,883

Term of patent 14 years

Int. Cl. D15-05

U.S. Cl. D32-14



271,437

**LAUNDRY ROOM CLOTHES HANGER**

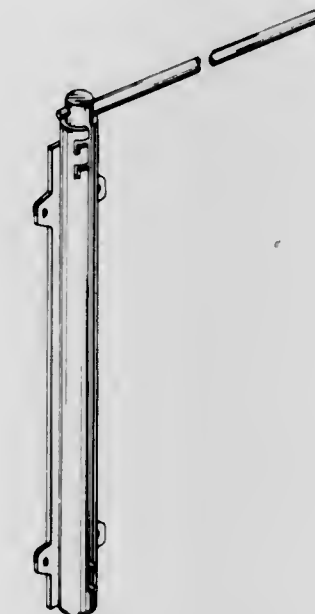
Richard E. Thiot, 4981 Cedar Bay St., Orlando, Fla. 32808

Filed Sep. 4, 1981, Ser. No. 299,566

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D32-58



271,438

**BOX**

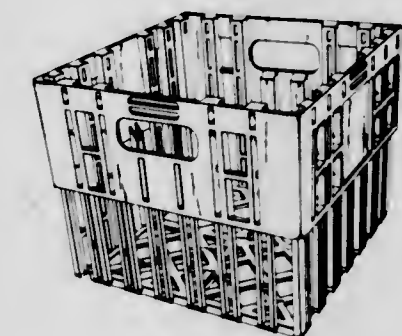
Daniel R. Miller, Cincinnati, Ohio, assignor to Nestler Corporation, Cincinnati, Ohio

Filed Apr. 17, 1981, Ser. No. 255,341

Term of patent 14 years

Int. Cl. D9-04

U.S. Cl. D34-43





## REEXAMINATIONS

NOVEMBER 15, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 3,962,136 (134th)**  
**CATALYST FOR PRODUCTION OF ETHYLENE OXIDE**  
 Robert P. Nielsen, Houston, Tex., and John H. La Rochelle, Baton Rouge, La., assignors to Shell Oil Company, Houston, Tex.

Reexamination Request No. 90/000,275, Oct. 18, 1982.  
 Reexamination Certificate for Patent No. 3,962,136, issued Jun. 8, 1976, Ser. No. 621,270, Oct. 10, 1975.

Continuation-in-part of Ser. No. 471,398, May 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,349, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 216,188, Jan. 7, 1972, abandoned.

Int. Cl.<sup>3</sup> B01J 21/04, 21/08, 23/04, 23/50  
 U.S. Cl. 252—454

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 9 and 10, having been finally determined to be unpatentable, are cancelled.

Claims 1-4, 11, 18, 20, and 22-25 are determined to be patentable as amended:

Claims 5-8, 12-17, 19, 21, 26, and 27 dependent on amended claims, are determined to be patentable.

1. A catalyst article for production of ethylene oxide comprising: a porous refractory support having deposited on its exterior and pore surfaces from about 2% by weight to about 20% by weight of silver and, coincidentally deposited with silver, a total of from about  $4.0 \times 10^{-3}$  grew per kilogram of total catalyst to about  $8.0 \times 10^{-3}$  grew per kilogram of total catalyst of higher alkali metal present in final form on the support in the form of an oxide in which the said oxide consists of an oxide of cesium, or rubidium, or mixtures thereof optionally combined with a minor proportion of the oxide of potassium relative to said rubidium and cesium, *the combination of silver and an alkali metal oxide on the support affording higher ethylene oxidation selectivities to ethylene oxide at a given ethylene conversion in the partial oxidation of ethylene to ethylene oxide than is obtained with the same combination of silver and support not containing said higher alkali metal.*

**B1 4,174,332 (135th)**  
**SELF-CROSSLINKING RESIN EMULSIONS FOR CATHODICALLY DEPOSITABLE COATING COMPOSITIONS**

Helmut Hönig, and Georgios Pampouchidis, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria  
 Reexamination Request No. 90/000,260, Sep. 29, 1982.  
 Reexamination Certificate for Patent No. 4,174,332, issued Nov. 13, 1979, Ser. No. 874,565, Feb. 2, 1978.

Claims priority, application Austria, Feb. 7, 1977, 758/77; Dec. 15, 1977, 8955/77

Int. Cl.<sup>3</sup> C08L 63/00  
 U.S. Cl. 523—404

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 7 are determined to be patentable as amended:

Claims 2-6, 8, and 9, dependent on amended claims, are determined to be patentable.

New claims 10-19 are added and determined to be patentable.

1. Emulsions of binders which are cathodically depositable in an electrodeposition system comprising (A) 98 to 50 percent by weight of a water-soluble self-crosslinking cationic resin water-dilutable upon partial or total neutralization with an inorganic or organic acid, said resin containing on an average at least 0.5 basic nitrogen atoms in 1000 molecular weight units and a double bond number of at least 0.5; and (B) 2 to 50 percent by weight of a water-insoluble self-crosslinking polymeric resin having a double bond number of at least 0.8, *said double bond number being the number of chain end and side chain double bonds in 1000 molecular weight units.*

**B1 4,358,573 (136th)**  
**WAXY MALEIC ANHYDRIDE ALPHA OLEFIN TERPOLYMERS**

Calvin J. Verbrugge, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Reexamination Request No. 90/000,361, Apr. 21, 1983.  
 Reexamination Certificate for Patent No. 4,358,573, issued Nov. 9, 1982, Ser. No. 268,432, May 29, 1981.

Int. Cl.<sup>3</sup> C08F 220/08  
 U.S. Cl. 526—272

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 6 having been finally determined to be unpatentable, is cancelled.

Claim 1 is determined to be patentable as amended:

Claims 2-5 and 7, dependent on amended claims, are determined to be patentable.

New claims 8-14 are added and determined to be patentable:

1. A terpolymer of from about 49-60 mole percent maleic anhydride, from about 10-40 mole percent of at least a lower 1-alkene, having from 4-16 carbon atoms, and from about 40-10 mole percent of at least a higher 1-alkene, having at least [18] 30 carbon atoms.



# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. Betong AB: *See*—  
Thim, Stig, 4,415,120., Cl. 238-8.000.
- A. F. Trenchers Limited: *See*—  
Fulford, Dennis R., 4,415,053., Cl. 180-74.000.
- Abbott Laboratories: *See*—  
Haas, Tommy B., 4,415,098., Cl. 221-202.000.
- Abe, Yoshikazu: *See*—  
Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308., Cl. 415-72.000.
- Ace Orthopedic Manufacturing, Inc.: *See*—  
Stednitz, Denis F., 4,414,966., Cl. 128-92.00B.
- Ackeret, Peter, to Licinvest AG. Holder for photographic prints. 4,415,079., Cl. 206-45.340.
- Ackerman, Richard C.; Jewer, Alan A.; and Hurlbut, Donovan W., to News Log International, Inc. Method and apparatus for optically reading digital data inscribed in an arcuate pattern on a data carrier. 4,416,001., Cl. 369-44.000.
- Adcock, Gerald L. Downhole case driving apparatus for impact drills. 4,415,047., Cl. 175-305.000.
- Adcock, Ralph L., to Sperry Corporation. Dual port memory interlock. 4,415,972., Cl. 364-200.000.
- ADEC, Inc.: *See*—  
Allgood, Marvin D., 4,415,896., Cl. 340-870.030.
- Adeka Argus Chemical Co., Ltd.: *See*—  
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,415,688., Cl. 524-102.000.
- Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,415,689., Cl. 524-103.000.
- Adkins, Charles M., III: *See*—  
Wilsdorf, Doris; Wilsdorf, Heinz G. F.; and Adkins, Charles M., III, 4,415,635., Cl. 428-611.000.
- Adlhoeh, Richard H., to Motorola, Inc. Memory system having memory cells capable of storing more than two states. 4,415,992., Cl. 365-94.000.
- Adret Electronique: *See*—  
Remy, Joel, 4,415,854., Cl. 324-79.00R.
- AEROPower Sarl: *See*—  
Carme, Anne M., 4,415,813., Cl. 290-44.000.
- Agency of Industrial Science and Technology: *See*—  
Sakamoto, Koji, 4,415,989., Cl. 365-19.000.
- AGFA-Gevaert AG: *See*—  
Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, 4,415,255., Cl. 355-3.00R.
- Agnew, David G., to Northern Telecom Limited. Hybrid circuit including capacitive charge-transfer means. 4,415,777., Cl. 179-170.0NC.
- Agostine, Doretta: *See*—  
Gruber, Robert J.; Bolte, Steven B.; and Agostine, Doretta, 4,415,646., Cl. 430-110.000.
- Agrawal, Giridhari L., to United Technologies Corporation. Hydrodynamic fluid film bearing. 4,415,280., Cl. 384-103.000.
- Agrawal, Giridhari L., to United Technologies Corporation. Hydrodynamic fluid film bearing. 4,415,281., Cl. 384-103.000.
- Ahn, Min H. Tracked vehicle. 4,415,055., Cl. 180-198.000.
- Aiba, Toshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Stators of dynamoelectric machines. 4,415,822., Cl. 310-59.000.
- Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Apparatus for mixing gases. 4,415,508., Cl. 261-114.00R.
- Aiman, William R.; and Gregg, David W. Solar coal gasification reactor with pyrolysis gas recycle. 4,415,339., Cl. 48-62.00R.
- Air Products and Chemicals, Inc.: *See*—  
McWhorter, Thomas E., 4,414,823., Cl. 62-266.000.
- Aisin Seiki Kabushiki Kaisha: *See*—  
Iwasaki, Shinichiro, 4,414,855., Cl. 73-862.360.
- Aizawa, Tatsuo: *See*—  
Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,415,645., Cl. 430-107.000.
- Ajima, Takashi: *See*—  
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372., Cl. 148-1.500.
- Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, to Nippon Telegraph & Telephone Public Corporation. Analog to digital converter. 4,415,882., Cl. 340-347.0AD.
- Aktiebolaget Bofors: *See*—  
Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, 4,414,764., Cl. 37-141.00T.
- Akzo: *See*—  
Schutjser, Jan A. J., 4,415,631., Cl. 428-405.000.
- Alekhin, Vladimir V.: *See*—  
Brazhnikov, Vadim V.; Skorniyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodinsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.
- Alephtran Technology N.V.: *See*—  
Hyder, Syed S., 4,415,766., Cl. 178-30.000.
- Alexander, Louis; and Brown, Willie, Jr. Rope splicer. 4,414,799., Cl. 57-22.000.
- Alexander, Timothy C.: *See*—  
Griffith, Donald B.; and Alexander, Timothy C., 4,415,812., Cl. 290-38.00R.
- Algire, Charles W. Burglar alarm. 4,414,912., Cl. 116-5.000.
- Alissandratos, Tacko. Brush holder. 4,415,211., Cl. 312-206.000.
- All-Lock Electronics, Inc.: *See*—  
Roland, Manfred W.; and Roland, Max G., 4,415,893., Cl. 340-825.310.
- Allegheny Ludlum Steel Corporation: *See*—  
Reen, Orville W., 4,415,527., Cl. 419-31.000.
- Zaremski, Donald R., 4,415,415., Cl. 204-141.500.
- Allen-Bradley Company: *See*—  
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., 4,415,607., Cl. 427-96.000.
- Allen, James A.; Knight, George W.; and Edmondson, Morris S., to Dow Chemical Company, The. Anti-block additives for olefin polymers. 4,415,691., Cl. 524-114.000.
- Allgood, Marvin D., to ADEC, Inc. Computer controlled energy monitoring system. 4,415,896., Cl. 340-870.030.
- Alliance Manufacturing Company, Inc.: *See*—  
Carli, Alvin J., 4,414,778., Cl. 49-199.000.
- Allied Corporation: *See*—  
Grunden, Michael T.; and Roberts, William J., 4,415,328., Cl. 431-1.000.
- Meighan, Richard M.; and Cash, Harry R., Jr., 4,415,638., Cl. 429-225.000.
- Nijman, John P., 4,414,740., Cl. 29-751.000.
- Pressley, Robert J., 4,415,373., Cl. 148-1.500.
- Reich, Gregory N., 4,415,410., Cl. 204-2.100.
- Zudkevitch, David; and Belsky, Stephen E., 4,415,409., Cl. 203-51.000.
- Allmendinger, James M.; and Thornton, James O. Injection tank for cleaning boilers and heat exchangers. 4,415,369., Cl. 134-22.120.
- Alperson, Paul. Frame connector structure. 4,415,292., Cl. 403-246.000.
- Alps Electric Co., Ltd.: *See*—  
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- Yoshisato, Akiyuki, 4,415,929., Cl. 358-171.000.
- American Cyanamid Company: *See*—  
Grudzinskas, Charles V.; and Nachtigall, Guenter W., 4,415,501., Cl. 260-429.300.
- Grudzinskas, Charles V.; and Weiss, Martin J., 4,415,746., Cl. 560-61.000.
- American Hoechst Corporation: *See*—  
Simpson, Carroll; and Schierl, Ludwig, 4,414,756., Cl. 34-23.000.
- American Optical Corporation: *See*—  
Bard, George D.; and Dusza, Robert J., 4,414,872., Cl. 83-171.000.
- Amey, Edward: *See*—  
Young, David M.; Mitchell, Donald F.; and Amey, Edward, 4,414,972., Cl. 128-200.230.
- AMF Incorporated: *See*—  
Sherwood, John R., 4,415,850., Cl. 324-51.000.
- Amin, Shailesh R. Surgical drape. 4,414,968., Cl. 128-132.00D.
- AMP Incorporated: *See*—  
Asick, John C., 4,415,223., Cl. 339-276.00R.
- Caron, Bernard G., 4,415,232., Cl. 350-96.210.
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- Anabuki, Hitoshi; and Miyata, Shigeo, to Kyowa Chemical Industry Co. Ltd. Composition and method for treating iron deficiency syndrome. 4,415,555., Cl. 424-147.000.
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- Ancra Corporation: *See*—  
Prete, Ernest, Jr., 4,414,713., Cl. 24-193.000.
- Andersen, Geert; and Lemke, Manfred, to August Storck KG. Coated confectionery with a high protein content and process for production thereof. 4,415,596., Cl. 426-103.000.
- Andersen, Willy: *See*—  
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- Angevine, Philip J., to Mobil Oil Corporation. Process for increasing the cetane index of distillate obtained from the hydroprocessing of residua. 4,415,436., Cl. 208-89.000.



Angioletti, Attilio, to Industrie Pirelli S.p.A. Slab for flooring. 4,415,616, Cl. 428-48.000.

Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., to Murray Corporation. Wire grip hose clamp. 4,414,715, Cl. 24-283.000.

Ansell, Raymond O.: See—  
Robinson, Graham; Ansell, Raymond O.; and McNamee, Michael, 4,415,637, Cl. 429-218.000.

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Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, 4,415,256, Cl. 355-3.0TR.

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Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570, Cl. 424-249.000.

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Bonafous, Maurice, 4,415,170, Cl. 277-163.000.

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Araki, Kazuhiro: See—  
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Furukawa, Akira; Araki, Minoru; and Genma, Hideyuki, 4,415,195, Cl. 296-146.000.

Arata, Ryoze: See—  
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Arbed S.A.: See—  
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358, Cl. 75-58.000.

Archenholtz, Ake, to ASEA AB. Nodular iron making and/or storing. 4,415,362, Cl. 75-130.00B.

Archer, Gene R. Gardening tool. 4,414,797, Cl. 56-400.190.

Armstrong World Industries, Inc.: See—  
Graybeal, Harold N., 4,414,915, Cl. 118-213.000.

Hoyle, Charles E.; and Lenox, Ronald S., 4,415,334, Cl. 8-694.000.

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Arneklev, Duane R.: See—  
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,352, Cl. 71-88.000.

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Brouwer, Gerardus J.; and Arnold, William T., 4,415,302, Cl. 414-417.000.

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Douglas, Jack E., 4,414,706, Cl. 16-370.000.

Asahara, Yoshiyuki; and Izumitani, Tetsuro, to Hoya Corporation. Faraday rotation glass. 4,415,464, Cl. 252-62.510.

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Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, 4,415,726, Cl. 528-272.000.

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Toba, Hirotsugu; Mikumo, Masatoshi; and Asami, Masahiro, 4,415,703, Cl. 525-54.210.

Asano, Mitsuru: See—  
Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, 4,415,876, Cl. 338-34.000.

ASEA AB: See—  
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Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., to United States of America, Army. Single hybrid junction frequency discriminator. 4,415,852, Cl. 324-57.00N.

Asick, John C., to AMP Incorporated. Interlocking crimp sleeve and method of securing to connector. 4,415,223, Cl. 339-276.00R.

Aso, Shin'ichi: See—  
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958, Cl. 126-450.000.

Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere: See—  
Loigerot, Jean, 4,414,876, Cl. 83-830.000.

Atasi Corporation: See—  
Gibeau, Frank C.; and Farmer, Paul L., 4,415,941, Cl. 360-106.000.

Atkinson, Gerald O., to Hughes Tool Company. Triad for rock bit assembly. 4,414,734, Cl. 29-464.000.

Atlantic Richfield Company: See—  
Kutta, Helmut W.; and Wunderlich, Donald K., 4,415,337, Cl. 44-24.000.

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Audi NSU Auto Union AG: See—  
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148, Cl. 267-122.000.

Augat Inc.: See—  
Hoh, Richard C., 4,414,741, Cl. 29-837.000.

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Andersen, Geert; and Lemke, Manfred, 4,415,596, Cl. 426-103.000.

Augustine, Paul M. Counterbore boring and refacing tool. 4,414,869, Cl. 82-4.00R.

Aument, Patrick E.: See—  
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., 4,414,987, Cl. 131-296.000.

Australian Atomic Energy Commission: See—  
Sowerby, Brian D., 4,415,804, Cl. 250-255.000.

Australian Dairy Corporation: See—  
Czulak, Joseph; and Hammond, Leslie A., 4,415,594, Cl. 426-36.000.

Automation Industries, Inc.: See—  
Russell, Robinson C., 4,415,967, Cl. 364-168.000.

Automobiles Citroen: See—  
Menard, Christian; Marouby, Daniel; and Chollet, Alain, 4,414,804, Cl. 60-39.141.

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Avar, Lajos; Kalt, Evelyn; and Reinshagen, Hellmuth, to Sandoz Ltd. Organic compounds. 4,415,687, Cl. 524-102.000.

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Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609, Cl. 427-249.000.

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Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., 4,415,879, Cl. 340-27.0NA.

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Rawal, Bharat, 4,414,844, Cl. 73-104.000.

Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, to Mitsubishi Petrochemical Co. Ltd. Silver-based catalyst containing chlorine as an anionic component for the production of ethylene oxide. 4,415,476, Cl. 502-224.000.

Azuma, Masaaki: See—  
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708, Cl. 525-316.000.

B. F. Goodrich Company, The: See—  
Barnes, Thomas E.; and Landsness, Clifford A., 4,414,874, Cl. 83-488.000.

Chasar, Dwight W., 4,415,686, Cl. 524-101.000.

Lai, John T.; and Son, Pyong N., 4,415,684, Cl. 524-92.000.

B. P. Australia Ltd.: See—  
Mainwaring, David E.; and Jones, Charles U., 4,415,335, Cl. 44-1.00C.

B.S.P. Packaging Systems Di Patarozzi D. & C. S.A.S.: See—  
Patarozzi, Domenico, 4,414,789, Cl. 53-566.000.

Baba, Keikichi: See—  
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713, Cl. 526-125.000.

Baba, Yasuo: See—  
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370, Cl. 148-1.500.

Babbitt, Richard W.: See—  
Stern, Richard A.; and Babbitt, Richard W., 4,415,871, Cl. 333-1.100.

Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., to Coca-Cola Company, The. Display panel for vending machines. 4,414,768, Cl. 40-584.000.

Bahrman, Heinrich: See—  
Satzinger, Gerhard; Herrmann, Manfred; Fritsch, Edgar; Bahrman, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495, Cl. 260-239.00D.

Baier, Manfred: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700, Cl. 524-548.000.

Bailly, Emile, to Compagnie Internationale pour l'Informatique Cij-Honeywell Bull. Screen printing apparatus. 4,414,894, Cl. 101-123.000.

Baker International Corporation: See—  
Brooks, Robert T., 4,415,037, Cl. 166-331.000.

Kim, Yung J., 4,415,169, Cl. 277-125.000.

Schmuck, Phillip W., 4,415,038, Cl. 166-373.000.

Baker Oil Tools, Inc.: See—  
Carmody, Michael A.; and Cognevich, Michael L., 4,415,036, Cl. 166-324.000.

Baker, Robert L., to Joy Manufacturing Company. Heat exchanger assembly. 4,415,024, Cl. 165-160.000.

Bakewell, Joseph J., to Dynamics Research Corporation. Method of fabricating an electrostatic print head. 4,415,403, Cl. 156-634.000.

Balash, Frederick A.: See—  
Daugherty, James B.; and Balash, Frederick A., 4,415,780, Cl. 200-5.00A.

Balchunas, Charles A., to General Electric Company. Electric iron with unitary thermostat and overtemperature control assembly. 4,415,796, Cl. 219-253.000.

Baldi, Bruno: See—  
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, 4,415,304, Cl. 414-589.000.

Ball, Harry J. Fibrous web for planting seeds, method of using same, apparatus for producing same. 4,414,776, Cl. 47-56.000.

Ballard, Douglas F., to Iomega Corporation. Head positioning servo for disk drive. 4,415,939, Cl. 360-75.000.

Balling, Egbert: See—  
Baum, Hans; and Balling, Egbert, 4,415,196, Cl. 296-201.000.

Bandura, James: See—  
Nelson Holland, Henry A.; and Bandura, James, 4,414,918, Cl. 118-306.000.

Bantowsky, Klaus-Peter A.: See—  
Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767, Cl. 381-45.000.

Bar, Alfredo, to Necchi, S.p.A. Muffler for compressors. 4,415,060, Cl. 181-272.000.

Barba, Joseph; and Hochrain, Gerd L., to Boorum & Pease Company. Self-locking nylon post. 4,415,289, Cl. 402-17.000.

Barbieri, Joseph C., to W. H. Brady Co. Marker sleeves. 4,415,006, Cl. 138-115.000.

Barcza, Sandor, to Sandoz, Inc. 1-Oxa-2,6-disilacyclohexane-4-carboxamides. 4,415,560, Cl. 424-184.000.

Bard, George D.; and Dusza, Robert J., to American Optical Corporation. Lens tape cutter. 4,414,872, Cl. 83-171.000.

Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., to Imperial Chemical Industries PLC. Heat-treating coated polyolefin films. 4,415,523, Cl. 264-342.00R.

Barley, Thomas A.: See—  
Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., 4,415,852, Cl. 324-57.00N.

Barmag Barmer Maschinenfabrik AG: See—  
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, 4,414,803, Cl. 57-340.000.

Barnabeo, Austin E.; and Keogh, Michael J., to Union Carbide Corporation. Curable compositions, based on alkylene-alkyl acrylate copolymers, containing preformed, reactive organo titanate catalysts. 4,415,710, Cl. 525-370.000.

Wagner, James C.; Barnard, James E.; and Woerner, Robert J., 4,416,020, Cl. 378-181.000.

Barnes, Thomas E.; and Landsness, Clifford A., to B. F. Goodrich Company, The. Fabric cutting. 4,414,874, Cl. 83-488.000.

Baron Data Systems: See—  
Smith, Michael A., 4,415,283, Cl. 400-94.000.

Baron, Walter J.; and Cleaver, Laird C., to Water Services of America, Inc. Mounting for heat exchanger tube cleaner capturing devices. 4,415,022, Cl. 165-95.000.

Barszcz, Chester F.; and Symon, Ted, to UOP Inc. Epiamine-based support matrix. 4,415,664, Cl. 435-176.000.

Barszcz, Chester F.: See—  
Symon, Ted; and Barszcz, Chester F., 4,415,663, Cl. 435-176.000.

Barth, Peter: See—  
Cioca, George; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628, Cl. 428-335.000.

Bartky, Scott: See—  
Mulvanny, Patrick; and Bartky, Scott, 4,415,921, Cl. 358-139.000.

BASF Aktiengesellschaft: See—  
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571, Cl. 424-230.000.

BASF Wyandotte Corporation: See—  
Cassell, Ronald L.; and Hall, Thomas N., 4,415,355, Cl. 71-121.000.

Basta, Michael I. Continuous flushing device. 4,414,999, Cl. 137-240.000.

Battelle Memorial Institute: See—  
Throner, Guy C., 4,414,880, Cl. 89-193.000.

Verber, Carl M.; and Kenan, Richard P., 4,415,226, Cl. 350-96.140.

Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, to Boehringer Mannheim GmbH; and Tschechoslowakische Akademie der Wissenschaften. Hydrophilic latex particles and use thereof. 4,415,700, Cl. 524-548.000.

Baudin, Lucien, to IDRAM Engineering Company EST. Rotary machine with controlled retractable elements. 4,415,322, Cl. 418-260.000.

Bauer, Barry J., to Celanese Corporation. Water soluble thickeners. 4,415,701, Cl. 524-612.000.

Bauer, Karl: See—  
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, 4,414,803, Cl. 57-340.000.

Bauer, Steven W., to General Motors Corporation. Vehicle hatchback closure. 4,415,194, Cl. 296-76.000.

Bauer, William V., to Lummus Company, The. Solid waste treatment in reduction of iron ore. 4,415,357, Cl. 75-29.000.

Baugh, Daniel W., Jr.: See—  
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,415,502, Cl. 260-463.000.

Baum, Hans; and Balling, Egbert, to Saint-Gobain Vitrage. Glass with conductive strips for supplying windshield wiper. 4,415,196, Cl. 296-201.000.

Bauman, William C.: See—  
Lee, John M.; and Bauman, William C., 4,415,677, Cl. 521-28.000.

Lee, John M.; and Bauman, William C., 4,415,678, Cl. 521-28.000.

Baumeister, Hans P. A., to Eastman Kodak Company. Combined flash tube and quench tube apparatus. 4,415,840, Cl. 315-323.000.

Baumgartner, Armin: See—  
Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, 4,415,642, Cl. 430-86.000.

Bavnsfelt, Hans, to Mogens Rued Nielsen ApS. Safety cap. 4,415,094, Cl. 215-252.000.

Baxter, Douglas G.: See—  
Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., 4,414,802, Cl. 57-293.000.

Baxter Travenol Laboratories, Inc.: See—  
Feldman, Gary, 4,415,843, Cl. 318-139.000.

Grimes, Robert G., 4,415,393, Cl. 156-244.130.

Bayer Aktiengesellschaft: See—  
Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, 4,415,561, Cl. 424-219.000.

Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, 4,415,692, Cl. 524-183.000.

Kabbe, Hans-Joachim, 4,415,741, Cl. 549-345.000.

Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586, Cl. 424-273.00R.

Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557, Cl. 424-172.000.

Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719, Cl. 528-167.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,415,354, Cl. 71-103.000.

Bayless, John R.; Hargrove, Homer G.; and Thompson, Edwin G., to Westinghouse Electric Corp. Positioning a thin wall round wrapper within a heavy wall out-of-round shell of a heat exchanger. 4,415,021, Cl. 165-76.000.

Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, to Intel Corporation. Macroinstruction translator unit for use in a microprocessor. 4,415,969, Cl. 364-200.000.

BBC Aktiengesellschaft, Brown, Boveri & Cie.: See—  
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952, Cl. 123-559.000.

BBC Brown, Boveri & Company, Limited: See—  
Perregaux, Alain, 4,415,236, Cl. 350-338.000.

Beale, Harry A., to Applied Coatings International, Inc. Cubic boron nitride preparation. 4,415,420, Cl. 204-192.00N.

Beaucage, Serge L.: See—  
Caruthers, Marvin H.; and Beaucage, Serge L., 4,415,732, Cl. 536-27.000.

Beaumont, Michael L.: See—  
Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., 4,415,879, Cl. 340-27.0NA.

Beck, Jürgen; and Rohrig, Herbert, to Dr. Madaus & Co. Optical scanning apparatus. 4,415,811, Cl. 250-560.000.

Becker, Gerhard, to U.S. Philips Corporation. Device for inserting and ejecting a diskette cartridge into or from a drive mechanism. 4,415,940, Cl. 360-99.000.

Becker, Wilhelm, to Hoechst Aktiengesellschaft. Stable aqueous epoxide resin dispersion, a process for its preparation, and its use. 4,415,682, Cl. 523-403.000.

Beecham Group Limited: See—  
Hunt, Eric, 4,415,584, Cl. 424-272.000.

Beggins, Paul T. Line fastening device. 4,414,712, Cl. 24-129.00R.

Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, to Bayer Aktiengesellschaft. Synergistic arthropodocidal composition. 4,415,561, Cl. 424-219.000.

Beia, Thomas S., to Cadillac Rubber & Plastics, Inc. Bearing seal assembly with dual annular support rings. 4,415,166, Cl. 277-51.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, to ITT Industries, Inc. Arrangement for controlling the pressure in brake actuating cylinders of a vehicle. 4,415,210, Cl. 303-116.000.

Belinsky, Sidney I. Berth for mooring supply ship to an offshore platform and for transferring personnel between them. 4,414,911, Cl. 114-219.000.

Bell, Anthony J., to Goodyear Tire & Rubber Company, The. Catalysts for ring-opening copolymerization of cycloolefins. 4,415,715, Cl. 526-142.000.

Bell, Malcolm C.: See—  
Victorovich, Grigori S.; and Bell, Malcolm C., 4,415,356, Cl. 75-21.000.

Bell Telephone Laboratories, Incorporated: See—  
Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,415,414, Cl. 204-129.300.

Gans, Michael J., 4,415,901, Cl. 343-754.000.

Gitlin, Richard D., 4,416,015, Cl. 375-14.000.

Harmon, William R., Jr., 4,415,961, Cl. 363-43.000.

Huizinga, Donald D.; and Thompson, Paul W., 4,416,007, Cl. 370-62.000.

Iapicco, Jeffrey A., 4,416,016, Cl. 375-85.000.

Jin, Sungho; and Tiefel, Thomas H., 4,415,380, Cl. 148-101.000.

Kant, Rishi, 4,415,220, Cl. 339-221.00R.

Karabinis, Peter D., 4,415,872, Cl. 333-18.000.

McCullough, Harold E., 4,415,229, Cl. 350-96.200.

Muoi, Tran V., 4,415,803, Cl. 250-214.00A.

Stanley, Frank L., 4,415,228, Cl. 350-96.200.

Belov, Petr S.: See—  
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477, Cl. 502-178.000.

Belsky, Stephen E.: See—  
Zudkevitch, David; and Belsky, Stephen E., 4,415,409, Cl. 203-51.000.

Bendix Corporation, The: See—  
Gaiser, Robert F., 4,414,811, Cl. 60-589.000.

Gumkowski, Bert A.; and Limberg, John F., 4,415,068, Cl. 188-72.300.

McDaniel, George H.; and Hartford, Thomas W., 4,415,985, Cl. 364-900.000.

Punako, Stephen; and MacAvoy, David W., 4,415,213, Cl. 339-49.00R.

Sanfleben, Keith E.; and Tarr, Walter R., 4,415,363, Cl. 75-229.000.

Taig, Alistair G., 4,415,002, Cl. 137-625.230.



- Benham, Albert A., to Champion International Corporation. Multi-pocket pad retaining folder and blank therefor. 4,415,183, Cl. 281-31.000.
- Bennett, John T., Jr. Inoculum tray. 4,415,086, Cl. 206-564.000.
- Benson, Terrence M., to Oil & Sales Limited Partnership. Hydraulic actuator for well pumps. 4,414,808, Cl. 60-372.000.
- Bente, Alfred, to Messrs. Adidas Sportschuhfabriken Adi Dassler KG. Sole for a sports shoe or boot. 4,414,763, Cl. 36-134.000.
- Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, to Industrial Cleaning and Coating, Inc. System for selectively treating cables and the like. 4,414,917, Cl. 118-695.000.
- Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., to Standard Oil Company. The Catalysts useful for the polymerization of alpha-olefins. 4,415,474, Cl. 502-117.000.
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Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542, Cl. 423-141.000.
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Knoblauch, Karl; and Heimbach, Heinrich, 4,415,340, Cl. 55-25.000.
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Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,415,587, Cl. 424-273.00R.
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Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodinsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857, Cl. 73-863.110.
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Rezewski, Joe; and Bernes, Wayne, 4,415,026, Cl. 166-97.000.
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Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, 4,414,837, Cl. 73-1.00B.
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Borking, Lars-Olof; and Bernstein, Ragnar, 4,415,119, Cl. 237-19.000.
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Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Gros-maitre, Andre M. J., 4,415,461, Cl. 210-757.000.
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Bertelsen, William R.; and Bertelsen, William D., 4,415,131, Cl. 244-13.000.
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Bertelsen, William R.; and Bertelsen, William D., 4,415,131, Cl. 244-13.000.
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Gerzon, Koert, 4,415,590, Cl. 424-319.000.
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Martens, Jurgin; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738, Cl. 548-147.000.
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Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., 4,415,376, Cl. 148-12.00F.
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Priaroggia, Paolo G.; Bianchi, Giuseppe; and Sala, Angelo, 4,415,764, Cl. 174-37.000.
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Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, 4,415,255, Cl. 355-3.00R.
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Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,415,592, Cl. 424-331.000.
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Langenberg, Anthony J., 4,414,782, Cl. 51-170.0MT.
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James J.
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Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210, Cl. 303-116.000.
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Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719, Cl. 528-167.000.
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- Board of Trustees, a Constitutional corporation operating Michigan State University: See—  
Dille, David R.; Lee, Julian J. L.; and Saltveit, Mikal E., Jr., 4,414,839, Cl. 73-23.000.
- BOC Group, Inc.: See—  
Stanesco, Mircea-Stefan; and Fitzgerald, William T., 4,415,379, Cl. 148-16.000.
- Boddicker, Mark J. Transporter-unloader for large cylindrical hay bales. 4,415,300, Cl. 414-24.500.
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- Boehringer Mannheim GmbH: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700, Cl. 524-548.000.
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Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148, Cl. 267-122.000.
- Bolen, George F. Textile carding machine feed assembly and method. 4,414,710, Cl. 19-105.000.
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Leirnes, Johan S.; and Lundstrom, Malkolm S., 4,415,360, Cl. 75-65.00R.
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Lennartz, Rudiger; and Gutermuth, Joachim, 4,415,448, Cl. 210-333.100.
- Bolte, Steven B.: See—  
Gruber, Robert J.; Bolte, Steven B.; and Agostine, Doretta, 4,415,646, Cl. 430-110.000.
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van der Lely, Ary; and Bom, Cornelis J. G., 4,415,039, Cl. 172-47.000.
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- Bonfiglioli, Giampaolo: See—  
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,415,185, Cl. 285-114.000.
- Bomin, Jean-Claude, to CAV RotoDiesel. Dual-range mechanical governor for fuel injection pumps. 4,414,945, Cl. 123-368.000.

- Bonomi, Luciano: See—  
Gamba, Giancesare; and Bonomi, Luciano, 4,415,564, Cl. 424-244.000.
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Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,415,540, Cl. 423-99.000.
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Barba, Joseph; and Hochrain, Gerd L., 4,415,289, Cl. 402-17.000.
- Boots Company PLC: See—  
Walker, Robert A., 4,415,944, Cl. 361-42.000.
- Borel, Georg, to Hermann Wangner GmbH & Co. KG. Spiral linkage belt and method of making same. 4,415,625, Cl. 428-222.000.
- Borg-Warner Ltd.: See—  
Turbard, Alan M.; and Foley, Peter N., 4,414,818, Cl. 62-176.100.
- Boring, Douglas J., to Conair, Inc. Vacuum material transporting system. 4,415,297, Cl. 406-168.000.
- Borking, Lars-Olof; and Bernstein, Ragnar, to Fagersta AB. Boiler. 4,415,119, Cl. 237-19.000.
- Bos, Karl E. O., to Carnation Company. Gravy or sauce mix. 4,415,599, Cl. 426-578.000.
- Bose, Herbert. Rucksack assembly. 4,415,012, Cl. 150-51.000.
- Bossard, Max: See—  
Keller, Hans-Peter; and Bossard, Max, 4,415,008, Cl. 139-370.200.
- Botez, Dan; and Ettenberg, Michael, to RCA Corporation. W-Guide buried heterostructure laser. 4,416,012, Cl. 372-45.000.
- Botlicher, Henry: See—  
Klotz, Peter; and Botlicher, Henry, 4,415,144, Cl. 266-228.000.
- Bottenbruch, Ludwig: See—  
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719, Cl. 528-167.000.
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Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700, Cl. 524-548.000.
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- Bourne, Carol. Combination infant seat and swing. 4,415,200, Cl. 297-174.000.
- Bourne, Tommy R.: See—  
Blanchard, Robert R.; and Bourne, Tommy R., 4,415,707, Cl. 525-231.000.
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Wedman, Leonard N.; and Bourque, Joseph A., 4,415,821, Cl. 310-12.000.
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Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., 4,415,336, Cl. 44-13.000.
- Bowman, Wayne A.: See—  
Klein, Gerald W.; and Bowman, Wayne A., 4,415,647, Cl. 430-213.000.
- Boyer, Bernard: See—  
Contal, Francois; and Boyer, Bernard, 4,414,819, Cl. 62-222.000.
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- Brabson, Joseph B.: See—  
Cioca, George; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628, Cl. 428-333.000.
- Bradshaw, Lawrence R., Jr.: See—  
Coffman, Moody L.; and Bradshaw, Lawrence R., Jr., 4,415,459, Cl. 210-747.000.
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- Brand, Leonard J.; and Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl indolamines for treating diabetes. 4,415,568, Cl. 424-248.400.
- Brandes, Wilhelm: See—  
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586, Cl. 424-273.00R.
- Braun Aktiengesellschaft: See—  
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273, Cl. 368-74.000.
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- Brenneman, William L.: See—  
Pryor, Michael J.; and Brenneman, William L., 4,415,377, Cl. 148-12.00R.
- Breting, Olivier: See—  
Bouthors, Pierre; and Breting, Olivier, 4,415,313, Cl. 417-38.000.
- Bretschneider, Hans-Jürgen, to Dr. Franz Kohler Chemie GmbH. Protective solution for heart and kidney and process for its preparation. 4,415,556, Cl. 424-153.000.
- Briggs & Stratton Corporation: See—  
Pribnow, Gary P., 4,414,933, Cl. 123-182.000.
- Vogl, Norbert M.; Gaulke, Ronald R.; and Harkness, Joseph R., 4,414,934, Cl. 123-192.00B.
- Brima, Thomas S.: See—  
Kwiatk, Jack; and Brima, Thomas S., 4,415,475, Cl. 502-206.000.
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Tomas, Pantecho, 4,415,361, Cl. 75-124.000.
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- Brody, Samuel S. Optical devices for use in moisture laden atmosphere. 4,414,693, Cl. 2-435.000.
- Broken Hill Proprietary Company Ltd., The: See—  
Mainwaring, David E.; and Jones, Charles U., 4,415,335, Cl. 44-1.00C.
- Brokke, Mervin E.: See—  
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,352, Cl. 71-88.000.
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Brooks, Paul; and Brooks, John P., 4,414,865, Cl. 81-3.10R.
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Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807, Cl. 250-363.00S.
- Brooks, William C., to RCA Corporation. Electroforming apparatus for use in matrixing of record molding parts. 4,415,423, Cl. 204-212.000.
- Brother Kogyo Kabushiki Kaisha: See—  
Sugita, Yoshimori, 4,414,827, Cl. 66-60.00H.
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Brouwer, Gerardus J.; and Arnold, William T., 4,415,302, Cl. 414-417.000.
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Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, 4,414,917, Cl. 118-695.000.
- Brown, Victor R. R.: See—  
Stephenson, Edgar O.; and Brown, Victor R. R., 4,415,184, Cl. 285-47.000.
- Brown & Williamson Tobacco Corporation: See—  
Porenski, Harry S., Jr.; and Kohnhorst, Earl E., 4,414,841, Cl. 73-61.00R.
- Brown, Willie, Jr.: See—  
Alexander, Louis; and Brown, Willie, Jr., 4,414,799, Cl. 57-22.000.



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Ryu, Ji-Yong; and Brownstein, Arthur M., 4,415,745., Cl. 560-25.000.
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Kent, Preben, 4,415,001., Cl. 137-497.000.  
Neufeld, Henry L., 4,415,129., Cl. 242-84.20A.
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- Buchanan, Robert A., to Lockheed Missiles & Space Co., Inc. Automated radiographic inspection system. 4,415,980., Cl. 378-58.000.
- Buchel, Karl H.: See—  
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.
- Buckert, Michael D.: See—  
Mendenhall, Charles E.; and Buckert, Michael D., 4,415,844., Cl. 318-254.000.
- Buckley, Douglas I.: See—  
Janakiraman, Ramachandran; Buckley, Douglas I.; Yamashiro, Donald H.; and Hagman, James R., 4,415,546., Cl. 424-1.100.
- Buehler Ltd.: See—  
Vincent, Donald P., 4,414,783., Cl. 51-267.000.
- Buckers, Josef: See—  
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buckers, Josef, 4,415,692., Cl. 524-183.000.
- Buerger, Magdalene: See—  
Reinartz, Hans-Dieter; and Buerger, Magdalene, 4,414,810., Cl. 60-535.000.
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- Buren, Lawrence L.: See—  
Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., 4,415,351., Cl. 71-87.000.
- Burgdorf, Jochen: See—  
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210., Cl. 303-116.000.
- Burger, Erich: See—  
Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, 4,415,255., Cl. 355-3.00R.
- Burkes, Bobby: See—  
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,415,502., Cl. 260-463.000.
- Burnett, Lowell J.: See—  
Epperson, Bonnie J.; Burnett, Lowell J.; and Heim, Verne D., 4,415,608., Cl. 427-244.000.
- Burns, Fredrick B., to EZ Paints Corporation. Device for preparing a surface for painting. 4,414,700., Cl. 15-105.000.
- Burns, William V.: See—  
Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., 4,415,951., Cl. 362-20.000.
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- Burroughs Corporation: See—  
Chadra, David P., 4,415,986., Cl. 364-900.000.  
Gryger, Dana A.; and Drogichen, Daniel P., 4,415,984., Cl. 364-900.000.
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- Bury, John E., to Grafton Limited. Unfilled tape cassette. 4,415,285., Cl. 400-196.100.
- Busch, Peter: See—  
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273., Cl. 368-74.000.
- Buschmann, Gerd: See—  
Hachmeister, Bernd; Kehrback, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577., Cl. 424-258.000.
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Oetken, James E.; and Buschmann, Jeffrey P., 4,415,833., Cl. 313-559.000.
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Brodie, Don E.; and Morgan, John H., 4,415,602., Cl. 427-39.000.
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Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643., Cl. 430-94.000.
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Hein, Wolfgang, 4,415,449., Cl. 210-406.000.
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Gottlob, Heinz; and Falk, Horst, 4,415,243., Cl. 351-201.000.
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Gratzer, Nelson R.; and Wright, William E., 4,414,834., Cl. 72-58.000.
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Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., 4,415,455., Cl. 210-654.000.
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Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807., Cl. 250-363.00S.
- Case, Donald B.: See—  
McHarrie, John C.; Hopcroft, Peter W.; and Case, Donald B., 4,415,111., Cl. 227-19.000.
- Cash, Harry R., Jr.: See—  
Meighan, Richard M.; and Cash, Harry R., Jr., 4,415,638., Cl. 429-225.000.
- Casio Computer Co., Ltd.: See—  
Mitarai, Tsuyoshi; and Yamaguchi, Takeshi, 4,414,878., Cl. 84-1.190.
- Mori, Hiroimitsu, 4,415,271., Cl. 368-41.000.
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- Cassar, Luigi: See—  
Iqbal, Abul; and Cassar, Luigi, 4,415,685., Cl. 524-92.000.
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Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,415,494., Cl. 260-196.000.
- Casteel, Jerry F.: See—  
Chan, Albert F.; and Casteel, Jerry F., 4,415,033., Cl. 166-274.000.
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Bonin, Jean-Claude, 4,414,945., Cl. 123-368.000.
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Witt, Enrique R.; Humphrey, William J.; and Cave, James P., 4,415,453., Cl. 210-615.000.
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Schaefer, Roger W., 4,415,954., Cl. 362-202.000.
- Cerberus AG: See—  
Tar, Domokis, 4,415,806., Cl. 250-339.000.
- Ceskoslovenska akademie ved: See—  
Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905., Cl. 110-245.000.
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Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., 4,414,870., Cl. 82-36.00R.
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Benham, Albert A., 4,415,183., Cl. 281-31.000.
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Maiocco, Giuseppe A., 4,414,830., Cl. 70-252.000.
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- Chan, Marie S.: See—  
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.
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Caskey, Douglas C.; and Chapman, Douglas W., 4,415,753., Cl. 564-418.000.
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De Fazio, Thomas L., 4,414,750., Cl. 33-185.00R.
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Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832., Cl. 72-8.000.
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Peppmoller, Reinmar, 4,415,472., Cl. 252-321.000.
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Madan, Arun, 4,415,760., Cl. 136-258.000.
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Robinson, Graham; Ansell, Raymond O.; and McNamee, Michael, 4,415,637., Cl. 429-218.000.
- Choinaki, Edward J., to Polaroid Corporation. Process simulator. 4,415,610., Cl. 427-372.000.
- Chollet, Alain: See—  
Menard, Christian; Marouby, Daniel; and Chollet, Alain, 4,414,804., Cl. 60-39.141.
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Jurgens, Rainer, 4,415,316., Cl. 418-48.000.
- Jurgens, Rainer, 4,415,823., Cl. 310-87.000.
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Hadler, Howard D.; and Kreftmeyer, James R., 4,415,043., Cl. 172-776.000.
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Brinkmann, Heinz; and Chazanek, Siegfried, 4,415,268., Cl. 366-85.000.
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Shibata, Akira, 4,414,742., Cl. 29-882.000.
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Ochi, Kiyoshige; Miyamoto, Katuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.



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Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,415,672, Cl. 501-4.000.
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Cook, Alasdair M.; and Hutter, Ralf, 4,415,658, Cl. 435-122.000.  
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Martin, Henry, 4,415,743, Cl. 549-491.000.
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Guillemet, Michel J.; and Isert, Michel, 4,415,971, Cl. 364-200.000.  
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- Cities Service Company: See—  
Bouck, Larry S., 4,415,034, Cl. 166-302.000.  
Matyas, Richard S.; and Hamshar, John A., 4,415,431, Cl. 208-8.00R.
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Sasanuma, Yasutomo, 4,415,421, Cl. 204-192.00N.
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Kunz, Raymond W., 4,414,963, Cl. 128-60.000.
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Hashimoto, Masayuki, 4,415,384, Cl. 148-187.000.
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Willis, Donald H.; and Clayburn, Randall C., 4,415,841, Cl. 315-400.000.
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- Cleaver, Laird C.: See—  
Baron, Walter J.; and Cleaver, Laird C., 4,415,022, Cl. 165-95.000.
- Cline, Richard S.: See—  
Gasky, Kenneth M.; Gupta, Indra; and Cline, Richard S., 4,415,382, Cl. 148-153.000.
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Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., 4,415,474, Cl. 502-117.000.
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Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 4,414,768, Cl. 40-584.000.
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Carmody, Michael A.; and Cognevich, Michael L., 4,415,036, Cl. 166-324.000.
- Colevris, Nick: See—  
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,415,155, Cl. 273-26.00E.
- Colgate Palmolive Company: See—  
Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., 4,415,489, Cl. 252-558.000.
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Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969, Cl. 364-200.000.
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Slough, Carlton M.; and Colling, Edwin L., Jr., 4,415,859, Cl. 324-442.000.
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- Colloid Piepho: See—  
Piepho, Ralf F., 4,415,467, Cl. 252-181.000.
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Delin, Michael A.; and Schuss, Jack A., 4,415,884, Cl. 340-500.000.  
Johnson, Walter R., 4,415,674, Cl. 501-104.000.
- Commissariat à l'Energie Atomique: See—  
Lacoste, Jean-André; Leveque, Jaqn-Pierre; and Schley, Robert, 4,415,758, Cl. 136-233.000.  
Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, 4,415,603, Cl. 427-54.100.
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Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542, Cl. 423-141.000.
- Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: See—  
Bailly, Emile, 4,414,894, Cl. 101-123.000.
- Conair, Inc.: See—  
Boring, Douglas J., 4,415,297, Cl. 406-168.000.
- Connell, Michael J.; and Swanson, Ronald L. Map holder. 4,415,106, Cl. 224-221.000.
- Conoco Inc.: See—  
Doerr, Richard E., 4,415,207, Cl. 299-18.000.  
Echtler, J. Paul, 4,415,341, Cl. 55-53.000.  
Mack, Mark P., 4,415,714, Cl. 526-125.000.
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Hart, Joseph J., 4,415,078, Cl. 206-45.140.
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Newman, Fred C., 4,415,387, Cl. 156-69.000.
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- Cook, John W., to Westinghouse Electric Corp. Method and apparatus for automatic mill zero correction for strip width. 4,415,976, Cl. 364-472.000.
- Cook, Marvin K.: See—  
Shah, Nutan B.; and Cook, Marvin K., 4,415,549, Cl. 424-52.000.
- Cookson, Alan H., to Westinghouse Electric Corp. Gas-insulated transmission line having improved outer enclosure. 4,415,763, Cl. 174-28.000.
- Coone, Joseph H., Jr.: See—  
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,415,478, Cl. 502-181.000.
- Cooper, Jerry W.: See—  
Medford, Richard D.; and Cooper, Jerry W., 4,415,389, Cl. 156-91.000.
- Cooperrider, Mark W.: See—  
Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542, Cl. 423-141.000.
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- Cornie, James A.: See—  
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609, Cl. 427-249.000.
- Corning Glass Works: See—  
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,415,672, Cl. 501-4.000.  
Frost, Rodney I.; and Montierth, Max R., 4,415,344, Cl. 55-523.000.  
Keck, Donald B., 4,415,230, Cl. 350-96.330.
- Corsello, Vincent: See—  
Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, 4,415,593, Cl. 426-4.000.
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McKinney, Joe R.; and Swagger, Roy G., 4,415,378, Cl. 148-12.100.
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Rehm, William A.; Dareing, Donald W.; and Wood, Edward T., 4,415,205, Cl. 299-5.000.
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Nagel, Gerhard; and Dasting, Klaus, 4,414,864, Cl. 81-3.00R.
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Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., 4,415,427, Cl. 204-298.000.
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Payne, Rex E., Jr., 4,415,180, Cl. 280-650.000.
- Dayco Corporation: See—  
Medford, Richard D.; and Cooper, Jerry W., 4,415,389, Cl. 156-91.000.  
Wetzel, Robert E., 4,415,397, Cl. 156-446.000.
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Gauer, Larry C., 4,415,052, Cl. 180-69.00R.  
Heino, Dean L., 4,414,863, Cl. 74-866.000.  
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Martens, Jürgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738, Cl. 548-147.000.  
Voigt, Carl; Kleinschmit, Peter; and Manner, Reinhard, 4,415,485, Cl. 502-100.000.
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Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., 4,414,981, Cl. 128-712.000.
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Csathy, Denis G.; and Krowech, Robert J., 4,414,923, Cl. 122-7.00R.
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Matthews, James B.; and DeLuzio, Reno A., 4,415,266, Cl. 356-350.000.
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Ward, Frederick D.; and Denis, Claude, 4,414,838, Cl. 73-1.00B.
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Pitts, Warren R., 4,415,946, Cl. 361-212.000.
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Knoll, Peter R., 4,415,136, Cl. 248-181.000.
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Steele, Ronald, 4,414,727, Cl. 29-401.100.
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Schick, Martin J.; and Knitter, Kathy A., 4,415,338, Cl. 44-51.000.



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Luhleisch, Hartmut; and Dias, Francisco J., 4,415,632, Cl. 428-408.000.
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Cusano, Dominic A.; and DiBianca, Frank A., 4,415,808, Cl. 250-367.000.
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Crossley, Roger; and Dickinson, Kay H., 4,415,582, Cl. 424-267.000.
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Nakamura, Hisashi, 4,414,947, Cl. 123-446.000.  
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Diener, Erwin; and Diner, Uriel, 4,415,552, Cl. 424-91.000.
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Jarsen, Manfred H., 4,415,138, Cl. 249-114.00R.
- Dispersa AG: See—  
Gamba, Giancesare; and Bonomi, Luciano, 4,415,564, Cl. 424-244.000.
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Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperider, Mark W., 4,415,542, Cl. 423-141.000.
- Dobrozemsky, Jaroslav: See—  
Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905, Cl. 110-245.000.
- Dr. Franz Kohler Chemie GmbH: See—  
Bretschneider, Hans-Jürgen, 4,415,556, Cl. 424-153.000.
- Dr. Madaus & Co.: See—  
Beck, Jürgen; and Rohrig, Herbert, 4,415,811, Cl. 250-560.000.
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Herdickehoff, Rainer, 4,415,145, Cl. 266-253.000.
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- Donn, Volker: See—  
Rossmann, Dieter; Donn, Volker; and Ludwig, Christian, 4,415,250, Cl. 354-195.000.
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Hull, Maury L.; and Dorius, Lee, 4,415,176, Cl. 280-612.000.
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- Douglas, Richard: See—  
Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, 4,415,653, Cl. 430-296.000.
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Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,415,691, Cl. 524-114.000.
- Blanchard, Robert R.; and Bourne, Tommy R., 4,415,707, Cl. 525-231.000.
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Fertl, Walter H.; and Oliver, Donald W., 4,415,805, Cl. 250-260.000.
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Gryger, Dana A.; and Drogichen, Daniel P., 4,415,984, Cl. 364-900.000.
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Manassen, Joost; and Dror, Yaakov, 4,415,500, Cl. 260-429.00R.
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Smith, Jon D.; and Parker, Glenn T., 4,415,299, Cl. 411-340.000.
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Zhabilov, Harry P.; and Karavassileff, Todor Y., 4,415,553, Cl. 424-95.000.
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- Dubeck, Michael: See—  
Hargis, Duane C.; and Dubeck, Michael, 4,415,749, Cl. 560-232.000.
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Diaz, Nils J.; and Dugan, Edward T., 4,415,525, Cl. 376-317.000.
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- Du Pont de Nemours, E. I., and Company: See—  
Ciganek, Engelbert; and Shenvi, Ashokkumar B., 4,415,736, Cl. 546-283.000.
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- Long, George R., 4,415,802, Cl. 235-382.000.
- Martin, Jose V., 4,414,916, Cl. 118-612.000.
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- Proskow, Stephen, 4,415,651, Cl. 430-277.000.
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- Durbin, John A.: See—  
Rees, James D.; and Durbin, John A., 4,415,258, Cl. 355-8.000.
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Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichii, 4,415,620, Cl. 428-157.000.
- Dusza, Robert J.: See—  
Bard, George D.; and Dusza, Robert J., 4,414,872, Cl. 83-171.000.
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Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477, Cl. 502-178.000.
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Bakewell, Joseph J., 4,415,403, Cl. 156-634.000.
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Dzierson, Mark A.; and Dzierson, William V., Sr., 4,414,692, Cl. 2-160.000.
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Besemann, Alfred; and Rehwal, Willi, 4,414,873, Cl. 83-311.000.
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Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., 4,415,835, Cl. 313-627.000.
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Baumeister, Hans P. A., 4,415,840, Cl. 315-323.000.
- Harvey, Donald M., 4,415,245, Cl. 354-25.000.
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- Eber, David H.: See—  
Butterworth, Arthur L.; and Eber, David H., 4,415,318, Cl. 418-55.000.
- Ebisu, Kouji: See—  
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958, Cl. 126-450.000.
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Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, 4,415,642, Cl. 430-86.000.
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- Eddy, Arthur R., Jr.: See—  
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666, Cl. 435-179.000.
- Edmondson, Morris S.: See—  
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,415,691, Cl. 524-114.000.
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Rippel, Wally E.; and Edwards, Dean B., 4,415,963, Cl. 363-135.000.
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- EG & G Sealol, Inc.: See—  
Johnson, Norman E., 4,415,164, Cl. 277-1.000.
- Egami, Tsuneyuki: See—  
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- Eichhorn, Franz, to Fritz Pollems Kommanditgesellschaft. Deep vibrator apparatus and method of use. 4,415,046, Cl. 175-56.000.
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- Eisai Co., Ltd.: See—  
Koide, Atsushi; and Yoshizawa, Masayuki, 4,415,667, Cl. 435-212.000.
- Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567, Cl. 424-246.000.
- Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, 4,415,559, Cl. 424-183.000.
- Eisemann, Kurt, to U.S. Philips Corporation. Braking device for the cover of a chamber in a recording and/or reproducing apparatus. 4,415,069, Cl. 188-82.840.
- Electric Power Research Institute: See—  
Ponder, Jonathan Z., 4,415,762, Cl. 174-28.000.
- Electric Power Research Institute, Inc.: See—  
Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., 4,415,629, Cl. 428-375.000.
- Eli Lilly and Company: See—  
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- Greene, James M., 4,415,751, Cl. 562-478.000.
- Ellis, Paul E.: See—  
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- Ellis, Robert W.: See—  
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- Elmberg, Dwayne R., to Sundstrand Corporation. Sliding disc transducer actuator. 4,415,782, Cl. 200-6.00A.
- Elmer Little & Sons, Inc.: See—  
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- Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, to International Standard Electric Corporation. Electrophotographic member of Se-Te-As with halogen. 4,415,642, Cl. 430-86.000.
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- Endo, Takuya, to Nissan Motor Co., Ltd. Vehicle cabin spot heater. 4,415,118, Cl. 237-12.30A.
- Energy Development Associates, Inc.: See—  
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- Energy Research Corporation: See—  
Charkey, Allen, 4,415,636, Cl. 429-27.000.
- Engel, Douglas A., to General Symmetries, Inc. Puzzle. 4,415,158, Cl. 273-153.00S.
- Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., to Shell Oil Company. Offshore platform free of marine growth and method of reducing platform loading and overturn. 4,415,293, Cl. 405-216.000.
- Engelhardt, Gerald J. Ball and target. 4,415,154, Cl. 273-26.00A.
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- English, George J.: See—  
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- Enomoto, Ryo: See—  
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,415,535, Cl. 422-143.000.
- Enso, Inc.: See—  
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- Epperson, Bonnie J.; Burnett, Lowell J.; and Helm, Verne D., to UOP Inc. Continuous production of polymethylpentene membranes. 4,415,608, Cl. 427-244.000.
- Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, to Variable Speech Control Company ("VSC"). The Gapless splicing of pitch altered waveforms. 4,415,772, Cl. 369-60.000.
- Epstein, Harry, to Kastar, Inc. Automobile fuse puller and combination circuit tester. 4,414,698, Cl. 7-170.000.
- Erapolku, Pertti J.: See—  
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- Ericsson, Sylve J. D., to Svevia Silkscreen Maskiner AB. Drying device intended for drying material bearing print issuing from a printing machine. 4,414,755, Cl. 34-4.000.
- Erlanson, William J.: See—  
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417, Cl. 204-159.240.
- Ernst, Larry M.: See—  
Dodge, John H.; and Ernst, Larry M., 4,415,800, Cl. 219-497.000.
- Escher Wyss Limited: See—  
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- Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., to Minnesota Mining and Manufacturing Co. Cellular pressure-sensitive adhesive product and method of making. 4,415,615, Cl. 428-40.000.
- Esselte Pendatflex Corporation: See—  
Nagel, Gerhard; and Dasting, Klaus, 4,414,864, Cl. 81-3.00R.
- Essex Chemical Corporation: See—  
Laauwe, Robert H., 4,415,122, Cl. 239-327.000.
- Estruch, Jose, to Fabrilma, Inc. Reversible bathing garment. 4,414,691, Cl. 2-67.000.
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Salomon, Georges P. J.; and Leveque, Alain, 4,414,762, Cl. 36-117.000.
- Ethyl Corporation: See—  
Hargis, Duane C.; and Dubeck, Michael, 4,415,749, Cl. 560-232.000.
- Ethyl Products Company: See—  
Ostrowsky, Efrim M., 4,414,705, Cl. 16-225.000.
- Ettenberg, Michael: See—  
Botez, Dan; and Ettenberg, Michael, 4,416,012, Cl. 372-45.000.
- Euteneuer, Charles L., to Pako Corporation. Slide mount data printer. 4,415,282, Cl. 400-30.000.
- Evana Tool & Engineering Inc.: See—  
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- Evans, Colin, to International Computers Limited. Array processor with stand-by for replacing failed section. 4,415,973, Cl. 364-200.000.
- Evans, David: See—  
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- Evans, Jeffrey L., to Ting Enterprises, Inc. Fireplace and stove apparatus. 4,414,957, Cl. 126-121.000.
- Evans, John M.; and Gilroy, Keith, to Evans, John M.; and Smiths Industries Public Limited Company. Medico-surgical instruments. 4,414,983, Cl. 128-747.000.
- Evans, Leah G.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Evans, Robert J.: See—  
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979, Cl. 128-419.00F.
- Ex-Cell-O Corporation: See—  
Ridley, Robert R., 4,414,729, Cl. 29-159.200.
- Exxon Research and Engineering Co.: See—  
Grenoble, Dane C.; and Murrell, Lawrence L., 4,415,437, Cl. 208-120.000.



- Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,415,426, Cl. 204-290.00R.  
 Klein, Robert R.; and Makowski, Henry S., deceased, 4,415,709, Cl. 525-344.000.  
 Lewis, William E., 4,415,435, Cl. 208-65.000.  
 Markley, Gerald E.; and Winter, William E., 4,415,441, Cl. 208-138.000.  
 Murphy, Martin A., 4,415,443, Cl. 208-355.000.  
 Murrell, Lawrence L.; and Grenoble, Dane C., 4,415,480, Cl. 502-242.000.  
 Ryu, Ji-Yong; and Brownstein, Arthur M., 4,415,745, Cl. 560-25.000.  
 EZ Paint Corporation: See—  
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 Fabrilma, Inc.: See—  
 Estruch, Jose, 4,414,691, Cl. 2-67.000.  
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 Face, Samuel A., III: See—  
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 Fackler, Charles K., to M & W Gear Company. Minimum till rotary hoe, 4,415,041, Cl. 172-551.000.  
 Fagan, John L.: See—  
 Smith, Philip C.; and Fagan, John L., 4,415,993, Cl. 365-184.000.  
 Fagersta AB: See—  
 Borking, Lars-Olof; and Bernstein, Ragnar, 4,415,119, Cl. 237-19.000.  
 Faiella, James, to Kaepa, Inc. Air-cushion insole, 4,414,760, Cl. 36-29.000.  
 Fair, Rickey F.; and Wilcox, John R., to Top Shelf Company, Inc. Shelf for a range, 4,414,959, Cl. 126-332.000.  
 Fairchild Camera and Instrument Corporation: See—  
 Delfino, Michelangelo; and Reifsteck, Timothy, 4,415,794, Cl. 219-121.0LM.  
 Falk Corporation, The: See—  
 Witt, Ronald A., 4,414,861, Cl. 74-606.00A.  
 Falk, Horst: See—  
 Gottlob, Heinz; and Falk, Horst, 4,415,243, Cl. 351-201.000.  
 Falk, Kastelic, Frank M., Jr., 4,415,189, Cl. 292-196.000.  
 Fan, You-Ling, to Union Carbide Corporation. Method of preparing water-borne colloidal dispersions of vinyl resins, 4,415,698, Cl. 524-521.000.  
 Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., to Stauffer Chemical Company. Method of increasing the yield of legumes utilizing O,O-dialkyl dithiophosphoryl acetyl-N-alkyl glycine amides, 4,415,351, Cl. 71-87.000.  
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 Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. 3-Thiovinylcephalosporins and pharmaceutical compositions, 4,415,562, Cl. 424-246.000.  
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 Gibeau, Frank C.; and Farmer, Paul L., 4,415,941, Cl. 360-106.000.  
 Farmland Foods, Inc.: See—  
 Sauvago, Phillip J., 4,414,708, Cl. 17-1.00R.  
 Fasse, Mark E.; and Giesmann, Herbert C., to Pathfinder Systems, Inc. Automatic guidance mechanism, 4,414,903, Cl. 104-244.100.  
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 Faure, Michel: See—  
 Messe, Gerard; and Faure, Michel, 4,415,874, Cl. 336-178.000.  
 Fay, Robert F.: See—  
 Anjos, Theodore R.; Fay, Robert F.; Sebal, Robert H.; and Van Edmond, Henry T., 4,414,715, Cl. 24-283.000.  
 Feagin, Roy C., to Remet Corporation. Refractory material, 4,415,673, Cl. 501-102.000.  
 Feeley, George F.: See—  
 Cioca, George; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628, Cl. 428-335.000.  
 Feldman, Gary, to Baxter Travenol Laboratories, Inc. Voltage regulator, 4,415,843, Cl. 318-139.000.  
 Ferrell, Robert A.; and Robinette, James A., to KCL Corporation; and Strong-Robinette Company, Inc. Method and apparatus for assembling and attaching zipper closure strips to sacks, 4,415,386, Cl. 156-64.000.  
 Ferri, Walter H.; and Oliver, Donald W., to Dresser Industries, Inc. Method and apparatus for evaluating multiple stage fracturing or earth formations surrounding a borehole, 4,415,805, Cl. 250-260.000.  
 Fiala, Jimmy L.: See—  
 Dressler, Daryl D.; and Fiala, Jimmy L., 4,415,894, Cl. 340-825.570.  
 Fiber Industries, Inc.: See—  
 Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,414,801, Cl. 57-288.000.  
 Fibinger, Vratislav: See—  
 Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905, Cl. 110-245.000.  
 Fieberg, Donald E.: See—  
 Fieberg, Russell F.; and Fieberg, Donald E., 4,414,736, Cl. 29-747.000.  
 Fieberg, Russell F.; and Fieberg, Donald E., to Russtech Engineering Company, Inc. Insertion and extraction tool for connector terminals, 4,414,736, Cl. 29-747.000.  
 Field, Thomas R., to Jenn-Air Corporation. Induction cartridge, 4,415,788, Cl. 219-10.49R.  
 Fields, Ellis K., to Standard Oil Company (Indiana). Class of Friedel-Crafts catalysts, 4,415,483, Cl. 502-255.000.  
 Finch, Harvey E.; and Strong, James J. Self-cleaning screen, 4,415,462, Cl. 210-767.000.  
 Finck, Frederick P., Jr.; and Ely, Timothy B., to Highfield Mfg. Company, Div. of Clarkson Industries, Inc. Lockable ring assembly for electric meter, 4,415,190, Cl. 292-256.600.  
 Firestone Tire & Rubber Company, The: See—  
 Sarkar, Sunil B., 4,415,695, Cl. 524-405.000.  
 Firm Tente-Rollen Gesellschaft mit beschränkter Haftung Compagnie: See—  
 Neumann, Manfred, 4,414,702, Cl. 16-35.00R.  
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 Fisher, Berish M. Monitoring device and method for accurately determining and recording present demand of electrical energy, 4,415,853, Cl. 324-74.000.  
 Fisons Limited: See—  
 Young, David M.; Mitchell, Donald F.; and Amey, Edward, 4,414,972, Cl. 128-200.230.  
 Fitch, John L.: See—  
 Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., 4,415,035, Cl. 166-308.000.  
 Fitzgerald, William T.: See—  
 Stanesco, Mircea-Stefan; and Fitzgerald, William T., 4,415,379, Cl. 148-16.000.  
 Fives-Cail Babcock: See—  
 Longuet, Andre, 4,415,407, Cl. 159-13.00A.  
 Flagg, Jack J., to Dresser Industries, Inc. Well logging data transmission system, 4,415,895, Cl. 340-856.000.  
 Fletcher, Thomas D., to Signetics Corporation. Bipolar logic gate including circuitry to prevent turn-off and deep saturation of pull-down transistor, 4,415,817, Cl. 307-454.000.  
 Flores, Lawrence N.: See—  
 Sprague, Robert A.; and Flores, Lawrence N., 4,415,915, Cl. 346-160.000.  
 Floyd, James N., to Moss, James W. Thermal die-cutting machine for die-cutting letters, numerals and other characters from plastic tape, 4,415,284, Cl. 400-134.000.  
 FMC Corporation: See—  
 Nochumson, Samuel; and Witt, Henry J., 4,415,428, Cl. 204-299.00R.  
 Scharpf, William G.; and Glenn, Michael S., 4,415,748, Cl. 560-227.000.  
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 Fogarty, A. Edward; and Fogarty, Bonnie R., 4,414,774, Cl. 46-22.000.  
 Fogt, Eric J.: See—  
 D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666, Cl. 435-179.000.  
 Foley, Peter N.: See—  
 Turbard, Alan M.; and Foley, Peter N., 4,414,818, Cl. 62-176.100.  
 Force Control Industries, Inc.: See—  
 Cory, Halsey W., 4,415,067, Cl. 188-71.500.  
 Ford, Charles R.; and Gatsos, Stephen L., to Indus Wheel Company. Wheel rim apparatus and method, 4,414,728, Cl. 29-159.100.  
 Ford Motor Company: See—  
 Holloway, Henry, 4,415,531, Cl. 420-564.000.  
 Horvath, Stanley K., 4,415,681, Cl. 523-334.000.  
 Janotik, Adam M.; and Kazyak, Lawrence P., 4,414,733, Cl. 29-568.000.  
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 Peng, Stephen C.; and Nordstrom, John D., 4,415,697, Cl. 524-512.000.  
 Strasser, Robert A.; and Goch, Stephen W., 4,414,902, Cl. 102-531.000.  
 Svab, Eugen, 4,414,862, Cl. 74-788.000.  
 Fortmann, William E., to United Technologies Corporation. Temperature regulation of air cycle refrigeration systems, 4,415,307, Cl. 415-12.000.  
 Foss, George D., to Minnesota Mining and Manufacturing Company. Air pollution control process, 4,415,342, Cl. 55-96.000.  
 Foster, Glenn M. Waste-burning furnace, 4,414,904, Cl. 110-102.000.  
 Fourcas, Jacques; and Rodet, Georges, to Rhone-Poulenc Industries. Separatory apparatus comprising means for anchoring a semi-permeable membrane to a support member, 4,415,447, Cl. 210-321.100.  
 Fox, Richard J. Radiation dosimeter, 4,415,237, Cl. 250-370.000.  
 Foxboro Company, The: See—  
 Bryzek, Janusz, 4,414,853, Cl. 73-766.000.  
 Frahm, Carl E. Heat insulating module for high temperature chambers, 4,414,786, Cl. 52-506.000.  
 Frame, Norman J.; Walber, James P.; and Janick, Jan M., to W. H. Brady Co. Membrane switch, 4,415,781, Cl. 200-5.00A.

- Franck, Heinz-Gerhard: See—  
 Stadelhofer, Jürgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,415,429, Cl. 208-8.0LE.  
 Franke, Albrecht: See—  
 Thyges, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571, Cl. 424-250.000.  
 Franke, George, to Simplex Time Recorder Co. Printer countwheel mechanism, 4,415,801, Cl. 235-101.000.  
 Fraser, Ward M. Device for providing a reinforced foam lining for well bore holes, 4,415,269, Cl. 366-132.000.  
 Freeze, Eugene A. Riding saddle, 4,414,791, Cl. 54-44.000.  
 Frei, Willi, to VAT Aktiengesellschaft für Vakuum-Apparate-Technik. Pneumatic drive for switching elements and control elements, 4,414,882, Cl. 91-442.000.  
 Freitag, Dieter: See—  
 Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719, Cl. 528-167.000.  
 French, John A. W., to WIPAC Group Sales Limited. Support devices for swivel chairs, 4,415,135, Cl. 248-161.000.  
 Freyer, Larry E.: See—  
 Shipley, Randall S.; and Freyer, Larry E., 4,415,712, Cl. 526-122.000.  
 Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, to United States of America, Health and Human Services. Cross-slice data acquisition system for pet scanner, 4,415,807, Cl. 250-363.00S.  
 Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, to BBC Aktiengesellschaft, Brown, Boveri & Cie.; and Knorr-Bremse GmbH. Actuator for an air valve placed in the boost air duct of an IC engine, 4,414,952, Cl. 123-559.000.  
 Fritsch, Edgar: See—  
 Satzinger, Gerhard; Herrmann, Manfred; Fritsch, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495, Cl. 260-239.00D.  
 Fritts, Rex E.: See—  
 Diesch, Bradford J.; and Fritts, Rex E., 4,415,790, Cl. 219-10.55B.  
 Fritz Pollems Kommanditgesellschaft: See—  
 Eichkorn, Franz, 4,415,046, Cl. 175-56.000.  
 Frohberger, Paul-Ernst: See—  
 Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586, Cl. 424-273.00R.  
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 Frye, Gregory G.: See—  
 Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767, Cl. 381-45.000.  
 Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, to Evana Tool & Engineering Inc. Folding of flat sheet to exact interior height, 4,415,325, Cl. 425-397.000.  
 Fuchs, Uwe, to Linde Aktiengesellschaft. Nitrification treatment of wastewater, 4,415,454, Cl. 210-616.000.  
 Fuglein, Egon, to Sachs Systemtechnik GmbH. Workpiece palette, 4,415,619, Cl. 428-131.000.  
 Fuji Electric Co., Ltd.: See—  
 Tsubuku, Mitsuro; and Yoshihiro, Tadanobu, 4,415,305, Cl. 414-753.000.  
 Fuji Koei Corporation: See—  
 Takematsu, Yoshiyuki, 4,415,247, Cl. 354-33.000.  
 Fuji Photo Film Co., Ltd.: See—  
 Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650, Cl. 430-273.000.  
 Nakamura, Sukenori; Igarashi, Akira; and Matsukawa, Hiroharu, 4,415,633, Cl. 428-411.000.  
 Nishizawa, Jun-ichi; and Konishi, Masahiro, 4,415,937, Cl. 358-335.000.  
 Fuji Xerox Co., Ltd.: See—  
 Inui, Toshiharu; and Moriguchi, Haruhiko, 4,415,904, Cl. 346-1.100.  
 Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioaka, Kazumi, 4,415,933, Cl. 358-281.000.  
 Fujii, Tadaaki: See—  
 Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, 4,415,319, Cl. 418-135.000.  
 Fujimaki, Yoshihide: See—  
 Goto, Satoshi; Sawada, Kiyoshi; Sakai, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640, Cl. 430-59.000.  
 Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641, Cl. 430-59.000.  
 Fujishima, Tooru: See—  
 Ogino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, 4,416,002, Cl. 369-44.000.  
 Fujitani, Yoshitomo: See—  
 Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, 4,415,799, Cl. 219-400.000.  
 Fujitsu Fanuc Limited: See—  
 Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,415,965, Cl. 364-136.000.  
 Fujitsu Limited: See—  
 Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370, Cl. 148-1.500.  
 Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, 4,415,988, Cl. 365-16.000.  
 Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,414,850, Cl. 73-599.000.  
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 Fukuoka, Tatsuhiko: See—  
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 Seragnoli, Enzo, 4,415,127, Cl. 242-58.100.  
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Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, 4,415,603, Cl. 427-54.100.
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Pratt, Donna K.; and Terrell, Jamie B., 4,415,029, Cl. 166-212.000.
- Gebruder Junghans GmbH: See—  
Ganter, Wolfgang, 4,415,277, Cl. 368-190.000.
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Daly, William T.; Gelman, Boris; and Sanderson, William R., 4,415,244, Cl. 353-101.000.
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Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., 4,414,974, Cl. 128-305.000.
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Hartouni, Edward, 4,414,906, Cl. 110-293.000.
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Guptail, William G., 4,415,444, Cl. 209-3.000.
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Bauer, Steven W., 4,415,194, Cl. 296-76.000.
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Greedy, David N., 4,415,408, Cl. 162-198.000.
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Swenson, Robert E.; Sasser, Lawrence D.; and George, Benjamin T., 4,415,970, Cl. 364-200.000.
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Zadera, Lumir, 4,415,015, Cl. 164-37.000.
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Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., 4,414,981, Cl. 128-712.000.
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Wiggins, Wayne T.; and Gerry, Frank S., 4,415,520, Cl. 264-171.000.
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Maeda, Koji; and Goda, Tadahi, 4,415,968, Cl. 364-178.000.
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Odmann, Gert O., 4,415,000, Cl. 137-318.000.
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McNeill, Thomas J., 4,414,852, Cl. 73-765.000.
- Goyarts, Wynand M., to Ingersoll-Rand Company. Cutter bit assembly. 4,415,208, Cl. 299-91.000.
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Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, 4,414,837, Cl. 73-1.00B.
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Betts, E. Douglas, 4,414,709, Cl. 17-71.000.
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Murrell, Lawrence L.; and Grenoble, Dane C., 4,415,480, Cl. 502-242.000.
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Paris, Rafael R., 4,415,099, Cl. 222-94.000.
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De Custer, Robert J. M.; Hoebe, Louis J. M.; and Wood, Clair, 4,415,836, Cl. 315-50.000.
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Smith, Joseph E., 4,415,291, Cl. 403-36.000.
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Gaskey, Kenneth M.; Gupta, Indra; and Cline, Richard S., 4,415,382, Cl. 148-153.000.
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Lennartz, Rudiger; and Gutermuth, Joachim, 4,415,448, Cl. 210-333.100.
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- Haas, Paul A.; and Ryon, Allen D. Apparatus for contacting particulate material with processing liquid. 4,415,536, Cl. 422-159.000.
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- Hadler, Howard D.; and Kreftmeyer, James R., to Chromalloy American Corporation. Toolbar with wings foldable substantially 180 degrees. 4,415,043, Cl. 172-776.000.
- Haeg, Steven R., to MTS Systems Corporation. Rotary actuator assembly. 4,414,854, Cl. 73-847.000.
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- Haisma, Jan: See—  
Braat, Josephus J. M.; Haisma, Jan; and Prast, Gijbert, 4,415,238, Cl. 350-432.000.
- Haissig, Bruce E.: See—  
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- Hale, Charles J. pH Meter probe assembly, 4,415,858, Cl. 324-438.000.
- Hale, Thomas K.; and Kavaloski, Peter P., to Lockheed Corporation. Folding wheelchair, 4,415,177, Cl. 280-650.000.
- Hall, John S.; and Phelps, Barry C., to California Interface and Software Limited Partnership. Double engraved identification card, 4,415,612, Cl. 428-29.000.
- Hall, Thomas N.: See—  
Cassell, Ronald L.; and Hall, Thomas N., 4,415,355, Cl. 71-121.000.
- Hallenbeck, Emerson J. Purge gas unit with cones, 4,415,114, Cl. 228-57.000.
- Halls, Lawrence M., to Sperry Corporation. Flexible crop harvesting header, 4,414,793, Cl. 56-14.400.
- Hamada, Takuji: See—  
Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, 4,416,008, Cl. 370-88.000.
- Hamaguchi, Shigeki: See—  
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- Hamilton, Harry J.: See—  
Richards, Peter K.; and Hamilton, Harry J., 4,414,920, Cl. 119-29.000.
- Hammond, Leslie A.: See—  
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- Hamshar, John A.: See—  
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- Hansen, Steven S.: See—  
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- Hanyu, Susumu: See—  
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- Hargis, Duane C.; and Dubeck, Michael, to Ethyl Corporation. Catalytic process for the selective formation of ethanol and methyl acetate from methanol and synthesis gas, 4,415,749, Cl. 560-232.000.
- Hargreaves, Jay T.; and Hensley, Albert L., to Standard Oil Company (Ind.). Multiple stage desalting and dedusting process, 4,415,434, Cl. 208-11.00R.
- Hargrove, Homer G.: See—  
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- Harju, Kai J.: See—  
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapokku, Pertti J., 4,415,659, Cl. 435-161.000.
- Harkness, Joseph R.: See—  
Vogl, Norbert M.; Gaulke, Ronald R.; and Harkness, Joseph R., 4,414,934, Cl. 123-192.00B.
- Harmon, William R., Jr., to Bell Telephone Laboratories, Incorporated. Telephone ringing signal generator, 4,415,961, Cl. 363-43.000.
- Harper, Donald L.: See—  
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- Harren, Hugh H. Air jet unit, 4,414,924, Cl. 123-25.00E.
- Harris, Dale C.: See—  
Clarke, John W.; and Harris, Dale C., 4,415,085, Cl. 206-526.000.
- Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvrat, Matthew J., Jr., to Merck & Co., Inc. Bicyclic lactams, 4,415,496, Cl. 260-239.30B.
- Hart, James F. Hydrojet, 4,414,695, Cl. 4-542.000.
- Hart, Joseph J., to Container Corporation of America. Display carton, 4,415,078, Cl. 206-45.140.
- Hartford, Thomas W.: See—  
McDaniel, George H.; and Hartford, Thomas W., 4,415,985, Cl. 364-900.000.
- Hartley, James T., to International Telephone and Telegraph Corporation. Tool for fiber optic cable clamp, 4,414,697, Cl. 7-107.000.
- Hartouni, Edward, to General Dynamics, Pomona Division. Fuel cartridge and burner, 4,414,906, Cl. 110-293.000.
- Harvey, Donald M., to Eastman Kodak Company. Movable infrared filter for an auto ranging camera, 4,415,245, Cl. 354-25.000.
- Hasegawa, Junzo: See—  
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657, Cl. 435-106.000.
- Hasegawa, Shumpei: See—  
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,414,950, Cl. 123-479.000.
- Hasenauer, Charles R.; and Miller, Donald N., to Eastman Kodak Company. Antistatic composition and elements and processes utilizing same, 4,415,626, Cl. 428-323.000.
- Hashimoto, Masayuki, to Clarion Co., Ltd. Method for manufacturing a semiconductor device, 4,415,384, Cl. 148-187.000.
- Hashimoto, Yoshihiko: See—  
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708, Cl. 525-316.000.
- Haskel, Incorporated: See—  
Kelly, John W., 4,414,739, Cl. 29-727.000.
- Hata, Shun-ichi: See—  
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569, Cl. 424-248.570.
- Hatfield, Walter B., Jr.: See—  
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906, Cl. 346-74.500.
- Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, to Honda Giken Kogyo Kabushiki Kaisha. Suspension for motor vehicles, 4,415,178, Cl. 280-664.000.
- Hattori, Shinichiro; and Inoue, Yasuo, to Olympus Optical Co., Ltd. Light source unit for an optical apparatus, 4,415,952, Cl. 362-32.000.
- Hattori, Tadashi: See—  
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- Hauser, Ivo J.; and Lutz, Bruno, to Nestle Company, Inc., The. Blister package, 4,415,084, Cl. 206-461.000.
- Hauze, Albert W.: See—  
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609, Cl. 427-249.000.
- Hay, Thomas M., III, to Sony Corporation. Programmable scan control circuit for providing bar graph display panel with selected scales and marker bars, 4,415,891, Cl. 340-753.000.
- Hayashi, Yoshimasa, to Nissan Motor Company. Muffler, 4,415,059, Cl. 181-250.000.
- Hedges, Charles V.; and Mark, Victor, to General Electric Company. Randomly branched aromatic polycarbonate from triphenol, 4,415,723, Cl. 528-204.000.
- Hedges, Charles V.; and Mark, Victor, to General Electric Co. Aromatic branched polycarbonate from tetraphenol, 4,415,725, Cl. 528-204.000.
- Hedges, Charles V.: See—  
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- Hegemann, Karl-Rudolf; Weissert, Helmut; and Hinsen, Kurt, to Gottfried Bischoff Bau Koml. Gasreinigungs- und Wasserruckkulanlagen GmbH & Co. KG. Apparatus for handling converter gas, 4,415,142, Cl. 266-89.000.
- Heil, Richard W.; and Rose, Thomas A. Method and apparatus for treating organic wastewater, 4,415,452, Cl. 210-614.000.
- Heimbach, Heinrich: See—  
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- Hein, Wolfgang, to Carl Schleicher & Schuell GmbH & Co. KG. Vacuum filtration bench, 4,415,449, Cl. 210-406.000.
- Heinis, Robert P.; and Vass, Eric, to Red Devil Inc. Paint mixer container clamping device with inertially driven can rotating function, 4,415,270, Cl. 366-216.000.
- Heino, Dean L., to Deere & Company. Automatic electronic control for a power shift transmission, 4,414,863, Cl. 74-866.000.
- Heinzelmann, Hans, to Kieninger & Obergfell Fabrik FuTechnische Laufwerke und Apparate. Electrical timepiece with hour-hand adjustment, 4,415,272, Cl. 368-69.000.
- Heitmann, Jurgen, to Robert Bosch GmbH. Method and system for error correction in digital video signal recording, 4,415,938, Cl. 360-53.000.
- Heller, Rudolf: See—  
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952, Cl. 123-559.000.
- Helm, Verne D.: See—  
Epperson, Bonnie J.; Burnett, Lowell J.; and Helm, Verne D., 4,415,608, Cl. 427-244.000.
- Henckel, David J.; and Peters, Thomas E., to Morrison-Knudsen Forest Products, Inc. Apparatus for producing a mat of directionally oriented lignocellulosic particles having cross-machine orientation, 4,415,324, Cl. 425-83.100.
- Henkel Kommanditgesellschaft Auf Aktien: See—  
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124, Cl. 241-28.000.
- Henry, Dale V.: See—  
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,415,832, Cl. 313-533.000.
- Henry, James W., to Eastman Kodak Company. Inspection of elongated material, 4,415,926, Cl. 358-107.000.
- Henshaw, Robert J.: See—  
Giordano, Francis P.; and Henshaw, Robert J., 4,415,914, Cl. 346-154.000.
- Hensley, Albert L.: See—  
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- Henze, Thomas W.: See—  
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- Herbert Kannegiesser GmbH & Co.: See—  
Kreinberg, Manfred; and Petzold, Lothar, 4,414,765, Cl. 38-54.000.
- Herchen, Stephen R.; and Messersmith, David, to Polaroid Corporation. Thiazolidine-substituted phenyl sulfonamides, 4,415,737, Cl. 548-146.000.
- Hercules Incorporated: See—  
Chandler, Carl D., Jr., 4,415,456, Cl. 210-673.000.

- Pohl, Rudolph L., 4,415,654, Cl. 430-328.000.
- Herdieckerhoff, Rainer, to Dr. Werner Herdieckerhoff, Firma. Metal charge treatment apparatus, 4,415,145, Cl. 266-253.000.
- Herman, Heath H.: See—  
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591, Cl. 424-330.000.
- Hermann Berstorff Maschinenbau GmbH: See—  
Brinkmann, Heinz; and Chszaniecki, Siegfried, 4,415,268, Cl. 366-85.000.
- Hermann Wagner GmbH & Co. KG: See—  
Borel, Georg, 4,415,625, Cl. 428-222.000.
- Hernandez, Sebastian, to Merck & Co., Inc. Substance and process for its production, 4,415,669, Cl. 435-253.000.
- Hernandez, Walter C., to Ensco, Inc. Method and apparatus for detecting the presence of an animate body in an inanimate mobile structure, 4,415,979, Cl. 364-508.000.
- Herner Glas Bernd Hoffbauer: See—  
von Loewis of Menar, Axel, 4,415,614, Cl. 428-38.000.
- Herrmann, Manfred: See—  
Satzinger, Gerhard; Herrmann, Manfred; Fritsch, Edgar; Bahrman, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495, Cl. 260-239.00D.
- Herzog, Rudolf, to Sulzer Brothers Limited. Control circuit for a controller and a method of operating the same, 4,415,966, Cl. 364-162.000.
- Hess, W. John. Flowdown rearing pond, 4,414,919, Cl. 119-3.000.
- Hester, Jackson B., Jr., to Upjohn Company. The. Process for inducing hypnosis, 4,415,583, Cl. 424-269.000.
- Heyman, Arnold M. Wrist restraint, 4,414,969, Cl. 128-133.000.
- Heymanns, Willi, to Jagenberg Werke AG. Rider rolls in support-roll winding machines, 4,415,128, Cl. 242-66.000.
- Hibbits, David G.: See—  
Chu, Wesley W.; and Hibbits, David G., 4,415,991, Cl. 365-77.000.
- Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, to Victor Company of Japan, Ltd. Double error correcting system in digital signal reproducing apparatus, 4,416,010, Cl. 371-37.000.
- Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., to GTE Products Corporation. Thin film deposition by sputtering, 4,415,427, Cl. 204-298.000.
- Highfield Mfg. Company, Div. of Clarkson Industries, Inc.: See—  
Finck, Frederick P., Jr.; and Ely, Timothy B., 4,415,190, Cl. 292-256.600.
- Higuchi, Masahiro: See—  
Miyachi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627, Cl. 428-332.000.
- Hill, Forrest G., to Marsh Stencil Machine Company. Ink roller assembly attachment, 4,414,899, Cl. 101-331.000.
- Hill, Francis K. Apparatus for mixing and application of paving compositions, 4,415,267, Cl. 366-14.000.
- Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, to International Business Machines Corporation. Magnetic disk substrate with a core of synthetic material, 4,415,634, Cl. 428-579.000.
- Hinkel, Holger: See—  
Frosch, Albert; Hinkel, Holger; and Kraus, Georg, 4,415,942, Cl. 360-135.000.
- Hinnenkamp, James A., to National Distillers and Chemical Corporation. Water gas shift reaction employing intercalated metal carbonyl complex catalyst composition, 4,415,473, Cl. 252-373.000.
- Hinsen, Kurt: See—  
Hegemann, Karl-Rudolf; Weissert, Helmut; and Hinsen, Kurt, 4,415,142, Cl. 266-89.000.
- Hintermann, Hans E.: See—  
Niederhauser, Paul; Maillat, Michel; and Hintermann, Hans E., 4,415,419, Cl. 204-192.00C.
- Hirabe, Kenji: See—  
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381, Cl. 148-153.000.
- Hiraiwa, Kazuyoshi: See—  
Takada, Toshiaki; and Hiraiwa, Kazuyoshi, 4,415,786, Cl. 200-61.910.
- Hirano, Takao: See—  
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730, Cl. 536-7.100.
- Hirohata, Michio; and Ogawa, Yukio, to Canon Kabushiki Kaisha. Electromagnetically operated shutter, 4,415,252, Cl. 354-234.000.
- Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., to Teletronics Pty. Ltd. Monitorable bone growth stimulator, 4,414,979, Cl. 128-419.00F.
- Hirt, Max, to Ing. Alfred Schmidt GmbH. Mechanical sweeper for attachment to a carrier vehicle, 4,414,699, Cl. 15-87.000.
- Hitachi, Ltd.: See—  
Koike, Keiichi; and Yanadori, Michio, 4,415,465, Cl. 252-70.000.
- Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262, Cl. 355-125.000.
- Noda, Masaru, 4,415,923, Cl. 358-41.000.
- Oguino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, 4,416,002, Cl. 369-44.000.
- Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385, Cl. 148-189.000.
- Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, 4,415,457, Cl. 210-682.000.
- Suemori, Noboru, 4,415,907, Cl. 346-76.00PH.
- Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, 4,416,008, Cl. 370-88.000.
- Hitachi Plant Engineering and Construction Co., Ltd.: See—  
Koike, Keiichi; and Yanadori, Michio, 4,415,465, Cl. 252-70.000.
- Hochrain, Gerd L.: See—  
Barba, Joseph; and Hochrain, Gerd L., 4,415,289, Cl. 402-17.000.
- Hodges, Everett L. Drill section and method of hydraulically mining mineral formations, 4,415,206, Cl. 299-17.000.
- Hoeben, Louis J. M.: See—  
De Cuester, Robert J. M.; Hoeben, Louis J. M.; and Wood, Clair, 4,415,836, Cl. 315-50.000.
- Hoechst Aktiengesellschaft: See—  
Becker, Wilhelm, 4,415,682, Cl. 523-403.000.
- Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,487, Cl. 252-546.000.
- Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,488, Cl. 252-547.000.
- Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, 4,415,947, Cl. 361-235.000.
- Krause, Werner, 4,415,505, Cl. 260-543.00P.
- Schlafer, Ludwig; and Uhrig, Heinz, 4,415,333, Cl. 8-524.000.
- Volk, Heinrich; and Papenfahs, Theodor, 4,415,750, Cl. 562-467.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—  
Davis, Larry; and Klein, Joseph T., 4,415,581, Cl. 424-267.000.
- Hoekstra, Edith, legal representative: See—  
Hoekstra, Gerald B., deceased, 4,415,433, Cl. 208-11.00R.
- Hoekstra, Gerald B., deceased (by Hoekstra, Edith, legal representative), to Standard Oil Company (Indiana). Fluid bed retorting process with multiple feed lines, 4,415,433, Cl. 208-11.00R.
- Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., to Braun Aktiengesellschaft. Microprocessor driven digital display alarm clock, 4,415,273, Cl. 368-74.000.
- Hoffman, Lionel B., to Tetras S.A. Electrophotographic copier apparatus, 4,415,263, Cl. 355-3.05H.
- Hoffmann-La Roche Inc.: See—  
Uskovic, Milan R.; and Wovkulich, Peter M., 4,415,742, Cl. 549-475.000.
- Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle, particularly for diesel engines, 4,414,845, Cl. 73-119.00A.
- Hogan, Roderick D. Earthquake fire safety system, 4,414,994, Cl. 137-38.000.
- Hogg, Grady R., Jr.; and Tanner, Nathan S., to Great Lakes Carbon Corporation. Composite electrode for arc furnace, 4,416,014, Cl. 373-93.000.
- Hohle, Deena G.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Hollerweger, Heinz: See—  
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148, Cl. 267-122.000.
- Holloway, Henry, to Ford Motor Company. Semiconductor materials, 4,415,531, Cl. 420-564.000.
- Holt, Anne: See—  
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521, Cl. 264-176.00F.
- Holt, Richard C., to Augat Inc. Process for interconnecting components on a PCB, 4,414,741, Cl. 29-837.000.
- Holthoff, Helmut, to Kocks Technik GmbH & Company. Bevel gear differential drives and methods for adjusting their tooth engagement, 4,414,859, Cl. 74-417.000.
- Holzbaun, Siegfried, to Robert Bosch GmbH. Apparatus for forming the operating mixture, in particular for mixture compressing internal combustion engines having externally supplied ignition, 4,414,948, Cl. 123-452.000.
- Homma, Hideo: See—  
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385, Cl. 148-189.000.
- Honda, Eiichi: See—  
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730, Cl. 536-7.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, 4,415,178, Cl. 280-664.000.
- Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,414,950, Cl. 123-479.000.
- Yamaguchi, Ken, 4,415,057, Cl. 180-227.000.
- Honeywell Inc.: See—  
Diddens, Paul A., 4,415,913, Cl. 346-154.000.
- Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, 4,415,653, Cl. 430-296.000.
- Szonntag, Eugene L., 4,415,278, Cl. 374-37.000.
- Hongo, Chikara: See—  
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504, Cl. 260-501.120.
- Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, to Robert Bosch GmbH. Apparatus for the control of repetitive events dependent on operating parameters of internal combustion engines, 4,414,949, Cl. 123-479.000.
- Hopcroft, Peter W.: See—  
McHarrie, John C.; Hopcroft, Peter W.; and Case, Donald B., 4,415,111, Cl. 227-19.000.
- Hope, Lawrence L.: See—  
Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., 4,415,427, Cl. 204-298.000.



- Horaguchi, Masao: See—  
Takami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, 4,414,828, Cl. 70-84.000.
- Horgan, Anthony M., to Xerox Corporation. Multilayered photoreceptive device for electrophotography. 4,415,639, Cl. 430-57.000.
- Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, to Alps Electric Co., Ltd. Serial printer. 4,414,893, Cl. 101-93.150.
- Horiguchi, Shinju: See—  
Ogawa, Katsuhiko; and Horiguchi, Shinju, 4,415,818, Cl. 307-465.000.
- Horino, Shigeo: See—  
Ohmura, Hideo; and Horino, Shigeo, 4,414,730, Cl. 29-426.300.
- Horning, Randall A.: See—  
Kirkup, Joseph F.; and Horning, Randall A., 4,415,875, Cl. 337-62.000.
- Horrobin, David F., to Efamol Limited. Treatment for menstrual disorders. 4,415,554, Cl. 424-145.000.
- Horvath, Joseph L., to International Business Machines Corporation. Thermal conduction element for semiconductor devices. 4,415,025, Cl. 165-185.000.
- Horvath, Stanley K., to Ford Motor Company. Stabilized crosslinked dispersion. 4,415,681, Cl. 523-334.000.
- Horwitz, E. Philip: See—  
Vandegrift, George F.; Krumpelt, Michael; and Horwitz, E. Philip, 4,415,412, Cl. 204-67.000.
- Hosoe, Kazuya: See—  
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924, Cl. 358-50.000.
- Houde-Walter, William R.: See—  
Benton, Stephen A.; Houde-Walter, William R.; and Mingace, Herbert S., Jr., 4,415,225, Cl. 350-3.840.
- Houkes, Henk, to U.S. Philips Corporation. Frequency converter for supplying an electrodeless discharge lamp. 4,415,838, Cl. 315-248.000.
- Hours, Michel: See—  
Turre, Gilles H. J.; Hours, Michel; and Labrude, Jacques R., 4,415,418, Cl. 204-180.000.
- House, James G.: See—  
Cynkar, Thomas E.; and House, James G., 4,415,606, Cl. 427-90.000.
- Houser, David E.; Kohn, Harold; and Williams, Gordon L., to International Business Machines Corporation. Impact pinner apparatus. 4,415,113, Cl. 227-130.000.
- Howell, Venice T. Construction framing anchor. 4,414,785, Cl. 52-169.100.
- Hoya Corporation: See—  
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- Hoyle, Charles E.; and Lenox, Ronald S., to Armstrong World Industries, Inc. Thermal development of color in a polyamide textile material with aminobenzenesulfonyl azides. 4,415,334, Cl. 8-694.000.
- Hoyle, Charles E.: See—  
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- Hoyt, Richard E.: See—  
Nielsen, Anker J., Jr.; and Hoyt, Richard E., 4,414,829, Cl. 70-160.000.
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- Hubner, Heimo: See—  
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952, Cl. 123-559.000.
- Hucal, Taras: See—  
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- Huff, Craig W. Check valve cylinder deactivation. 4,414,936, Cl. 123-198.00F.
- Huffman, Charles E.; and Southerland, Stephen R., to Rockwell International Corporation. Synchronous coupling of framed data in digital transmission. 4,416,009, Cl. 370-100.000.
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- Hughes Aircraft Company: See—  
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- Hughes Tool Company: See—  
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- Hume, Douglas W. Kinetic engine control. 4,414,930, Cl. 123-78.00E.
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Humphrey, William E., 4,415,239, Cl. 350-433.000.
- Humphrey, William E., to Humphrey Instruments, Inc. Reflection rejection spherical optical train composed of tipped lens elements. 4,415,239, Cl. 350-433.000.
- Humphrey, William J.: See—  
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- Hung, Peter C., to Porta Systems Comp. Multipole data switch. 4,415,783, Cl. 200-11.00A.
- Hunt, Eric, to Beecham Group Limited. 3-Oxo-6-oxa-2-azatricyclo 5.4.2. unadecene-4-carboxylate. 4,415,584, Cl. 424-272.000.
- Hunt, James P., to Huntington Alloys, Inc. Nickel-base welding alloy. 4,415,530, Cl. 420-453.000.
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- Hunter, C. LaMont. LP Gas-operated impact tool. 4,415,110, Cl. 227-10.000.
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- Huntington Alloys, Inc.: See—  
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- Hunzicker, Dean L., to Hunzicker-Riley, Inc. Heat exchange ventilating unit. 4,415,019, Cl. 165-47.000.
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- Hutchison, James. Still device. 4,415,063, Cl. 182-230.000.
- Hutter, G. Frederick, to Inmont Corporation. Rosin derivatives used as dispersants. 4,415,705, Cl. 525-167.500.
- Hutter, Ralf: See—  
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- Hyde, Donald B., Jr., to Hyde's Incorporated. Bird feeder. 4,414,922, Cl. 119-51.00R.
- Hyder, Syed S., to Alephtran Technology N.V. Recognizer/converter for arabic and other language codes. 4,415,766, Cl. 178-30.000.
- Hyde's Incorporated: See—  
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- Iapicco, Jeffrey A., to Bell Telephone Laboratories, Incorporated. Differential phase shift keyed receiver. 4,416,016, Cl. 375-85.000.
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- Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerated display case with colliding band air defrost. 4,414,822, Cl. 62-256.000.
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Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509, Cl. 264-1.300.
- Ideal Toy Corporation: See—  
Lahr, Robert G., 4,415,157, Cl. 273-86.00B.
- Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, to Bayer Aktiengesellschaft. Stabilized thermoplastic moulding compositions. 4,415,692, Cl. 524-183.000.
- Idemitsu Kosan Company Limited: See—  
Ono, Katsuhiko; and Sakimura, Shigeki, 4,415,702, Cl. 524-705.000.
- Idler, Horst: See—  
Vogel, Horst; Idler, Horst; and Taruttis, Arno H., 4,415,899, Cl. 343-413.000.
- IDRAM Engineering Company EST.: See—  
Baudin, Lucien, 4,415,322, Cl. 418-260.000.
- Iezza, Franco S., to Scherling, J. Daniel. Portable knock-down parallel bar exercise fixture. 4,415,150, Cl. 272-63.000.
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- Ikeda, Yugo: See—  
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- Ikeuchi, Hiroshi, to H. Ikeuchi & Co., Ltd. Atomizer nozzle assembly. 4,415,123, Cl. 239-425.000.
- Ikuta, Hironori: See—  
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- Ima-Industria Machine Automatiche-S.p.A.: See—  
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Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976, Cl. 128-334.00R.
- Imperial Chemical Industries PLC: See—  
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,415,523, Cl. 264-342.00R.

- Nield, Eric; and Thompson, Martin K., 4,415,699, Cl. 524-538.000.
- Pyke, David R.; and Reid, Robert, 4,415,757, Cl. 568-475.000.
- Rose, John B., 4,415,720, Cl. 528-171.000.
- Inazumi, Koichi: See—  
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- Inco Limited: See—  
Victorovich, Grigori S.; and Bell, Malcolm C., 4,415,356, Cl. 75-21.000.
- Indus Wheel Company: See—  
Ford, Charles R.; and Gatsos, Stephen L., 4,414,728, Cl. 29-159.100.
- Industrial Cleaning and Coating, Inc.: See—  
Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, 4,414,917, Cl. 118-695.000.
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Angioletti, Attilio, 4,415,616, Cl. 428-48.000.
- Ing. Alfred Schmidt GmbH: See—  
Hirt, Max, 4,414,699, Cl. 15-87.000.
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Grana, David C.; and Inge, Spencer V., Jr., 4,415,311, Cl. 416-117.000.
- Ingersoll-Rand Company: See—  
Goyarts, Wynand M., 4,415,208, Cl. 299-91.000.
- Inland Steel Company: See—  
Gaskey, Kenneth M.; Gupta, Indra; and Cline, Richard S., 4,415,382, Cl. 148-153.000.
- Inmont Corporation: See—  
Hutter, G. Frederick, 4,415,705, Cl. 525-167.500.
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Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529, Cl. 420-434.000.
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- Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, to Canon Kabushiki Kaisha. Apparatus for transferring images. 4,415,256, Cl. 355-3.07R.
- Inoue, Takayuki: See—  
Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, 4,415,765, Cl. 174-72.00A.
- Inoue, Yasuo: See—  
Hattori, Shinichiro; and Inoue, Yasuo, 4,415,952, Cl. 362-32.000.
- Insolar, Inc.: See—  
Wasserman, Kurt J., 4,414,960, Cl. 126-426.000.
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de Weck, Alain L.; Schneider, Conrad H.; and Rolli, Hans P., 4,415,492, Cl. 260-112.50R.
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Werb, John A., 4,415,049, Cl. 180-6.500.
- Intel Corporation: See—  
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969, Cl. 364-200.000.
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Collins, Thomas W.; and Tao, Lung-jo, 4,415,987, Cl. 365-12.000.
- Dickson, LeRoy D., 4,415,224, Cl. 350-3.710.
- Dodge, John H.; and Ernst, Larry M., 4,415,800, Cl. 219-497.000.
- Frosch, Albert; Hinkel, Holger; and Kraus, Georg, 4,415,942, Cl. 360-135.000.
- Giordano, Francis P.; and Henshaw, Robert J., 4,415,914, Cl. 346-154.000.
- Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634, Cl. 428-579.000.
- Horvath, Joseph L., 4,415,025, Cl. 165-185.000.
- Houser, David E.; Kohn, Harold; and Williams, Gordon L., 4,415,113, Cl. 227-130.000.
- Langner, Guenther O.; and Pfeiffer, Hans C., 4,415,851, Cl. 324-51.000.
- Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., 4,415,905, Cl. 346-1.100.
- International Computers Limited: See—  
Evans, Colin, 4,415,973, Cl. 364-200.000.
- International Harvester Co.: See—  
Salva, Henri E., 4,415,040, Cl. 172-225.000.
- International Standard Electric Corporation: See—  
Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, 4,415,642, Cl. 430-86.000.
- Riegl, Ivan, 4,415,404, Cl. 156-635.000.
- Vogel, Horst; Idler, Horst; and Taruttis, Arno H., 4,415,899, Cl. 343-413.000.
- Weeks, Ronald D.; and Croney, David J., 4,415,950, Cl. 361-433.000.
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Hartley, James T., 4,414,697, Cl. 7-107.000.
- Kennedy, Henry R., 4,415,897, Cl. 343-5.05M.
- Sodini, Gregory L., 4,415,837, Cl. 315-177.000.
- Young, Kenneth P.; Kyonka, Curtis P.; and Courtois, James A., 4,415,374, Cl. 148-2.000.
- Interstate Electronics Corporation: See—  
Marentic, Michael J., 4,415,892, Cl. 340-767.000.
- Inui, Toshiharu; and Moriguchi, Haruhiko, to Fuji Xerox Co., Ltd. Thermal head driving method. 4,415,904, Cl. 346-1.100.
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Burandt, Corliss O., 4,414,931, Cl. 123-90.160.
- Omega Corporation: See—  
Ballard, Douglas F., 4,415,939, Cl. 360-75.000.
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- Isao, Matsunaga: See—  
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569, Cl. 424-248.570.
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Grant, Douglas M., 4,415,011, Cl. 141-284.000.
- Iseki & Co., Ltd.: See—  
Suzuki, Hisashi, 4,415,451, Cl. 210-610.000.
- Iser, Michel: See—  
Guillemet, Michel J.; and Iser, Michel, 4,415,971, Cl. 364-200.000.
- Ishihara Sangyo Kaisha Ltd.: See—  
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739, Cl. 548-367.000.
- Ishihara, Shunichi: See—  
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920, Cl. 358-37.000.
- Ishii, Kinichi, to Kabushiki Kaisha Johnan Seisakusho. Window regulator for an automotive vehicle. 4,414,779, Cl. 49-351.000.
- Isobe, Shinichi: See—  
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,415,977, Cl. 364-474.000.
- Itai, Reiichi: See—  
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,415,411, Cl. 204-29.000.
- Italiano, Victor J.; and Sayko, Steven P., to NCR Corporation. Multiple nozzle ink jet print head. 4,415,909, Cl. 346-140.00R.
- Itoh, Hiroshi; and Watanabe, Haruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Idling speed control device of an internal combustion engine. 4,414,942, Cl. 123-339.000.
- Itoh, Susumu; and Sawamura, Mitsuharu, to Canon Kabushiki Kaisha. Achromatized beam splitter of low polarization. 4,415,233, Cl. 350-173.000.
- ITT Industries, Inc.: See—  
Belart, Juan; Burdord, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210, Cl. 303-116.000.
- Reinartz, Hans-Dieter; and Buerger, Magdalene, 4,414,810, Cl. 60-535.000.
- Schopper, Bernd, 4,415,209, Cl. 303-6.00C.
- Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorjeva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G.; deceased; and Gachegova, Lidia T., administrator. Apparatus for chlorination of molten magnesium chloride salts. 4,415,538, Cl. 422-224.000.
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Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, 4,415,680, Cl. 521-56.000.
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Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308, Cl. 415-72.000.
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Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, 4,415,882, Cl. 340-347.00AD.
- Iwata, Michitaka: See—  
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Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,415,464, Cl. 252-62.510.
- J. M. Voith GmbH: See—  
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- Jackson, W. Shaun. Article carrier apparatus. 4,415,105, Cl. 224-41.000.
- Jacob Schlaepfer & Co. AG: See—  
Schlaepfer, Robert J., 4,415,623, Cl. 428-200.000.
- Jacobson, Jeff A.; and Valle, Louis G. Siphon. 4,414,997, Cl. 137-151.000.
- Jacoby, Richard P.: See—  
Farino, Frank G.; and Jacoby, Richard P., 4,414,964, Cl. 128-81.00R.
- Jagenberg Werke AG: See—  
Heymanns, Willi, 4,415,128, Cl. 242-66.000.
- Jahoda, Stanislav, to Ustav Pro Vyzkum Motorovych Vozidel. Method of and apparatus for preparing a fuel mixture for an internal combustion engine. 4,414,939, Cl. 123-274.000.



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Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506, Cl. 260-986.000.

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Puskas, Imre; and James, David E., 4,415,479, Cl. 502-85.000.

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Janick, Jan M.: See—  
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,415,781, Cl. 200-5.00A.

Janome Sewing Machine Co. Ltd.: See—  
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,415,908, Cl. 112-169.000.

Janotik, Adam M.; and Kazzyak, Lawrence P., to Ford Motor Company. Machine tool insert dispenser. 4,414,733, Cl. 29-568.000.

Jansen, Jan W.: See—  
Beuse, Robert H. J.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279, Cl. 374-204.000.

Janzen, Harlo W. Pipe thread protector device. 4,415,005, Cl. 138-96.00T.

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Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reichi, 4,415,411, Cl. 204-29.000.

Japan Styrene Paper Corporation: See—  
Komori, Tetsuo, 4,415,392, Cl. 156-244.130.

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Field, Thomas R., 4,415,788, Cl. 219-10.49R.

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Jensen, Flemming E. Magnetic kinetic amusement device. 4,414,775, Cl. 46-241.000.

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Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, 4,415,319, Cl. 418-135.000.

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Yu, Andrew B. C.; and John, Phillip M., 4,415,547, Cl. 424-19.000.

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Crossley, Roger, 4,415,579, Cl. 424-263.000.

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Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., 4,415,615, Cl. 428-40.000.

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Korpman, Ralf, 4,415,388, Cl. 156-78.000.

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Yost, Kevin G., 4,414,990, Cl. 132-91.000.

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Griffing, Bruce F.; Johnson, Peter D.; and Johnson, Roger N., 4,415,955, Cl. 362-225.000.

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Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906, Cl. 346-74.500.

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Jones, David N., to Union Carbide Corporation. Process for forming film from low strain hardening polymers. 4,415,711, Cl. 526-88.000.

Jones, James E.: See—  
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666, Cl. 435-179.000.

Jones, Richard E., III: See—  
Mauldin, Donald M.; and Jones, Richard E., III, 4,414,965, Cl. 128-87.00R.

Jordan, Ernst G., to OBO Bettermann OHG. Electrical stud welding device for welding studs of different diameters without pre-testing adjusting welds. 4,415,792, Cl. 219-98.000.

Jorgensen, Arne R. Gear burnishing and honing machine. 4,414,780, Cl. 51-26.000.

Jorgensen, Theodore P. Matched set of golf clubs. 4,415,156, Cl. 273-77.00A.

Joy Manufacturing Company: See—  
Baker, Robert L., 4,415,024, Cl. 165-160.000.

Joyce, Cathy L.; and Zaneveld, Lourens J. D., to University of Illinois Foundation. Contraceptive method. 4,415,585, Cl. 424-273.00P.

Jurgens, Rainer, to Christensen, Inc. Down hole motor. 4,415,316, Cl. 418-48.000.

Jurgens, Rainer, to Christensen, Inc. Generator for the production of electrical energy. 4,415,823, Cl. 310-87.000.

K-Line Industries, Inc.: See—  
Kammeraad, James A.; and Tiger, Ronald L., 4,414,723, Cl. 29-26.00A.

Kaatz, James P.: See—  
Johnstone, Theodore R.; and Kaatz, James P., 4,414,795, Cl. 56-328.0TS.

Kabbe, Hans-Joachim, to Bayer Aktiengesellschaft. Chroman-4-ones and process for preparing same. 4,415,741, Cl. 549-345.000.

Kabushiki Kaisha Advance Kaihatsu Kenkyujo: See—  
Yagi, Michiko, 4,414,988, Cl. 131-334.000.

Kabushiki Kaisha Daini Seikoshu: See—  
Ikehata, Yukio; and Ono, Kenichi, 4,415,276, Cl. 368-187.000.

Kabushiki Kaisha Higashifujii Seisakusho: See—  
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785, Cl. 200-38.00B.

Kabushiki Kaisha Johnan Seisakusho: See—  
Ishii, Kinichi, 4,414,779, Cl. 49-351.000.

Kabushiki Kaisha Orii Jidoki Seisakusho: See—  
Orii, Takeshi, 4,414,887, Cl. 100-45.000.

Kabushiki Kaisha Tokyo Kikai Seisakusho: See—  
Sato, Masayoshi; and Suzuki, Kunio, 4,414,897, Cl. 101-216.000.

Kaczynsky, Friedrich; Kroy, Walter; and Reithmeier, Gunter, to Messerschmitt-Boelkow-Blohm GmbH. Radiation shutter, especially for a laser. 4,415,231, Cl. 350-269.000.

Kadija, Igor V., to Olin Corporation. Electrochemical depyrophorization of rane nickel electrodes. 4,415,416, Cl. 204-147.000.

Kadnikova, Galina I.: See—  
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Anny G.; Lubotskaya, Lidia N.; Playvniets, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550, Cl. 424-57.000.

Kaepa, Inc.: See—  
Faiella, James, 4,414,760, Cl. 36-29.000.

Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, to Fujitsu Limited. Method of beryllium implantation in germanium substrate. 4,415,370, Cl. 148-1.500.

Kai, Tomokazu; and Nakahara, Hidetoshi, to Nippon Electric Co., Ltd. Malfunction detection system for a mobile radio telephone system. 4,415,770, Cl. 179-2.0EB.

Kai, Toshio: See—  
Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, 4,415,799, Cl. 219-400.000.

Kainer, Carl E., to Deere & Company. Coupler latch mechanism with a self-opening feature. 4,415,175, Cl. 280-460.00A.

Kajimoto, Takeshi: See—  
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryochi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050, Cl. 180-6.480.

Kajita, Isamu: See—  
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643, Cl. 430-94.000.

Kajita, Koji: See—  
Nakayama, Takashi; Yamagata, Seiichi; and Kajita, Koji, 4,414,800, Cl. 57-236.000.

Kalal, Jaroslav: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700, Cl. 524-548.000.

Kalejs, Juris P.: See—  
Wald, Fritz; and Kalejs, Juris P., 4,415,401, Cl. 156-608.000.

Kaleskas, Edward W.: See—  
Paradis, Joseph R.; and Kaleskas, Edward W., 4,415,003, Cl. 137-843.000.

Kali-Chemie Pharma GmbH: See—  
Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577, Cl. 424-258.000.

Kallay, Maria: See—  
Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,415,494, Cl. 260-196.000.

Kaloi, Cyril M., to United States of America, Navy. Cavity/microstrip multi-mode antenna. 4,415,900, Cl. 343-700.0MS.

Kalt, Evelyn: See—  
Avar, Lajos; Kalt, Evelyn; and Reinshagen, Hellmuth, 4,415,687, Cl. 524-102.000.

Kamat, Dattatraya V., to Kayser-Roth Corporation. Fusible interlining of improved bond strength and dry cleaning resistance. 4,415,622, Cl. 428-198.000.

Kammeraad, James A.; and Tiger, Ronald L., to K-Line Industries, Inc. Adjustable cylinder head holder. 4,414,723, Cl. 29-26.00A.

Kamyr, Inc.: See—  
Funk, Erwin D., 4,415,296, Cl. 406-19.000.

Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reichi, to Japan Carlit Co., Ltd. The. Anode coated with  $\beta$ -lead dioxide and method of producing same. 4,415,411, Cl. 204-29.000.

Kaneda, Takao: See—  
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370, Cl. 148-1.500.

Kanegafuchi Chemical Industry Company, Limited: See—  
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657, Cl. 435-106.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—  
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708, Cl. 525-316.000.

Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, 4,415,680, Cl. 521-56.000.

Kant, Rishi, to Bell Telephone Laboratories, Incorporated. Compliant contact pin. 4,415,220, Cl. 339-221.00R.

Kaplan, Leonard, to Union Carbide Corporation. Process for making ethylene glycol derivatives. 4,415,747, Cl. 560-112.000.

Kappen, Burkhard. Roof truss assemblies for hipped roofs, and method of manufacturing same. 4,414,787, Cl. 52-643.000.

Karabinis, Peter D., to Bell Telephone Laboratories, Incorporated. Adaptive equalizer. 4,415,872, Cl. 333-18.000.

Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Elji, to Minolta Camera Kabushiki Kaisha. Focus detecting device. 4,415,246, Cl. 354-25.000.

Karavassileff, Todor Y.: See—  
Zhabilov, Harry P.; and Karavassileff, Todor Y., 4,415,553, Cl. 424-95.000.

Karavolis, Sam: See—  
Setzer, Herbert J.; Lesieur, Roger R.; and Karavolis, Sam, 4,415,484, Cl. 502-332.000.

Karl Mayer Textilmaschinenfabrik, GmbH: See—  
Mista, Kresimir; and Englert, Norbert, 4,414,826, Cl. 66-207.000.

Karwan, Mitchell S.: See—  
Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., 4,414,981, Cl. 128-712.000.

Kasai, Shin: See—  
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126, Cl. 242-43.00R.

Kassakian, John G., to Massachusetts Institute of Technology. Current mode sine wave inverter. 4,415,962, Cl. 363-131.000.

Kastar, Inc.: See—  
Epstein, Harry, 4,414,698, Cl. 7-170.000.

Kastelic, Frank M., Jr., to Falk, Kastelic, Heartwell, Inc. Lock system for removable automobile roofs. 4,415,189, Cl. 292-196.000.

Kasuga, Munio; Miyashita, Kiyoshi; and Nishikawa, Masaji, to Olympus Optical Company Limited. Duplicating system comprising electrophotographic copier and option device. 4,415,260, Cl. 355-14.0SH.

Kato, Atsumi: See—  
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keiichi, 4,415,713, Cl. 526-125.000.

Kato Hatsujo Kaisha, Ltd.: See—  
Kodama, Yutaka; and Miyoshi, Masakazu, 4,415,192, Cl. 292-347.000.

Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, to Ilden Co., Ltd. Apparatus for refining metal carbides containing free carbon. 4,415,535, Cl. 422-143.000.

Kato, Masateru: See—  
Takemori, Toshio; Kato, Masateru; and Masuda, Fumio, 4,415,595, Cl. 426-101.000.

Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, to Canon Kabushiki Kaisha. Image signal processing unit. 4,415,920, Cl. 358-37.000.

Katoh, Heizaburo, to Sankyo Manufacturing Company, Ltd. Roll feed apparatus. 4,415,108, Cl. 226-138.000.

Katsuki, Shogo: See—  
Inoue, Nori; and Katsuki, Shogo, 4,415,221, Cl. 339-258.00F.

Katsumata, Saichi: See—  
Uno, Kuniaki; Katsumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785, Cl. 200-38.00B.

Kaufman, Benjamin J., to Texaco Inc. Method for preparing a lactone reaction product. 4,415,740, Cl. 549-273.000.

Kauric, Charles E.: See—  
Dailey, George F.; and Kauric, Charles E., 4,415,825, Cl. 310-270.000.

Kavaloski, Peter P.: See—  
Hale, Thomas K.; and Kavaloski, Peter P., 4,415,177, Cl. 280-650.000.

Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Photoelectric transducer device. 4,415,924, Cl. 358-50.000.

Kawaguchi, Yutaka: See—  
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126, Cl. 242-43.00R.

Kawaharada, Hajime: See—  
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657, Cl. 435-106.000.

Kawai, Hisasi: See—  
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847, Cl. 73-204.000.

Kawamura, Naoto: See—  
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920, Cl. 358-37.000.

Kawanishi, Toshiyuki; and Tabata, Yukio, to Ricoh Co., Ltd. Electric ink transfer recording method. 4,415,903, Cl. 346-1.100.

Kawasaki Steel Corporation: See—  
Ebata, Sadao, 4,415,143, Cl. 266-112.000.

Kawase, Yoshitaka, to Sharp Kabushiki Kaisha. Magnetron fault alarm in a microwave oven. 4,415,887, Cl. 340-635.000.

Kawashima, Hirokuni: See—  
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643, Cl. 430-94.000.

Kaydee Engineering, Inc.: See—  
Rosenberger, Leonard S., 4,415,018, Cl. 165-41.000.

Kayser-Roth Corporation: See—  
Kamat, Dattatraya V., 4,415,622, Cl. 428-198.000.

Kazyak, Lawrence P.: See—  
Janotik, Adam M.; and Kazyak, Lawrence P., 4,414,733, Cl. 29-568.000.

KCL Corporation: See—  
Ferrell, Robert A.; and Robinette, James A., 4,415,386, Cl. 156-64.000.

Keck, Donald B., to Corning Glass Works. Polarization retaining single-mode optical waveguide. 4,415,230, Cl. 350-96.330.

Keeffe, William M.: See—  
Rothwell, Harold L., Jr.; English, George J.; and Keeffe, William M., 4,415,829, Cl. 313-621.000.

Keenan, James P., to GTE Products Corporation. Tungsten halogen lamp containing cyanogen. 4,415,834, Cl. 313-578.000.

Kehrbach, Wolfgang: See—  
Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577, Cl. 424-258.000.

Keilly, Ronald J.: See—  
Pochurek, Gerald M.; and Keilly, Ronald J., 4,415,518, Cl. 264-166.000.

Keller, Hans-Peter; and Bossard, Max, to Loepfe Brothers Limited. Device for monitoring the weft thread travel on an air jet weaving machine. 4,415,008, Cl. 139-370.200.

Kelly, Harry C. Flavor injector. 4,414,885, Cl. 99-494.000.

Kelly, John W., to Haskel, Incorporated. Apparatus for hydraulically forming joints between tubes and tube sheets. 4,414,739, Cl. 29-727.000.

Kelly, T. Ross: See—  
Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, 4,415,498, Cl. 260-351.100.

Kemkers, Pieter, to U.S. Philips Corporation. Packing for a stack of electrical and/or electronic parts. 4,415,083, Cl. 206-334.000.

Kenan, Richard P.: See—  
Verber, Carl M.; and Kenan, Richard P., 4,415,226, Cl. 350-96.140.

Kennecott Corporation: See—  
Richmond, Wesley Q., 4,415,510, Cl. 264-8.000.

Kennedy, Henry R., to International Telephone and Telegraph Corporation. Precision control of RF attenuators for STC applications. 4,415,897, Cl. 343-5.0SM.

KenoGard AB: See—  
Lundin, Claes O. A.; and Simonsson, Berit I., 4,415,716, Cl. 526-209.000.

Kent, Preben, to Brunswick Corporation. Pressure rise rate limiter valve. 4,415,001, Cl. 137-497.000.

Keogh, Michael J.: See—  
Barnabeo, Austin E.; and Keogh, Michael J., 4,415,710, Cl. 525-370.000.

Kerber, George L.: See—  
Jelka, Edward C.; Kerber, George L.; and Wilcox, Howard A., 4,414,738, Cl. 29-579.000.

Kernforschungsanlage Julich GmbH: See—  
Luhle, Hartmut; and Dias, Francisco J., 4,415,632, Cl. 428-408.000.

Protic, Davor; and Riepe, Georg, 4,415,916, Cl. 357-29.000.

Kernstock, John M., to Dow Chemical Company. The. Hydroxyethyl hydroxypropyl cellulose ether thickeners for aqueous coating compositions. 4,415,683, Cl. 524-43.000.

Kerr-McGee Corporation: See—  
Rhodes, Donald E., 4,415,442, Cl. 208-177.000.

Kerr, Walter B., to United Technologies Corporation. Method and apparatus for controlling a gas turbine engine. 4,414,807, Cl. 60-204.000.



- Khrstjuk, Grigory P.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorjeva, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khrstjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538, Cl. 422-224.000.
- Kichijyo, Hiroshi: Cap remover, 4,414,866, Cl. 81-3.46R.
- Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., to Colgate Palmolive Company: Process for making high solids content zeolite A-alkylbenzene sulfonate compositions suitable for use in making spray dried detergent compositions, 4,415,489, Cl. 252-558.000.
- Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd.: Recording material, 4,415,650, Cl. 430-273.000.
- Kiencke, Uwe: See—  
Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, 4,414,949, Cl. 123-479.000.
- Kieninger & Obergfell Fabrik FuTechnische Laufwerke und Apparate: See—  
Heinzelmann, Hans, 4,415,272, Cl. 368-69.000.
- Kikuchi, Toshiaki: See—  
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126, Cl. 242-43.00R.
- Kim, Yung J., to Baker International Corporation: Seal for concentric tubular member, 4,415,169, Cl. 277-125.000.
- Kimoto, Tatsuo: See—  
Tokunaga, Shioichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713, Cl. 526-125.000.
- Kimura, Shigeru: See—  
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497, Cl. 260-245.20T.
- King Jim Co., Ltd.: See—  
Ohnino, Kiyoshi, 4,415,290, Cl. 402-26.000.
- King, Patrick D.: See—  
Shaplund, Earl P.; and King, Patrick D., 4,415,103, Cl. 222-590.000.
- Kinoshita, Akira: See—  
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640, Cl. 430-59.000.
- Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641, Cl. 430-59.000.
- Kinoshita, Takao: See—  
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924, Cl. 358-50.000.
- Kinoshita, Yoshio: See—  
Shoji, Masao; and Kinoshita, Yoshio, 4,415,072, Cl. 192-45.000.
- Kinoyama, Takehisa: See—  
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620, Cl. 428-157.000.
- Kiphart, Lynn R.: See—  
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., 4,415,607, Cl. 427-96.000.
- Kircher, Dieter: See—  
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210, Cl. 303-116.000.
- Kirk, David A.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Kirkup, Joseph F.; and Horning, Randall A., to Mechanical Products, Inc.: Circuit breaker, 4,415,875, Cl. 337-62.000.
- Kishima, Yukihiro: See—  
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka, 4,416,006, Cl. 369-240.000.
- Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka: Record disc playing apparatus having the function for correcting rotational irregularities due to record disc eccentricity, 4,416,006, Cl. 369-240.000.
- Kitoh, Kyosuke: See—  
Machida, Yoshimasa; Saito, Isao; Nomoto, Seichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567, Cl. 424-246.000.
- Kitzman, Donald G.: Crushing apparatus, 4,414,891, Cl. 100-245.000.
- Klasco, Michael A.: See—  
Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772, Cl. 369-60.000.
- Kleemann, Axel: See—  
Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738, Cl. 548-147.000.
- Klein, Gerald W.; and Bowman, Wayne A., to Eastman Kodak Company: Polymeric vehicle for dye image-receiving layer containing a poly(vinylimidazole) mordant, 4,415,647, Cl. 430-213.000.
- Klein, Joseph T.: See—  
Davis, Larry; and Klein, Joseph T., 4,415,581, Cl. 424-267.000.
- Klein, Pearl M.: Flocculating reagents, 4,415,458, Cl. 210-727.000.
- Klein, Robert R.; and Makowski, Henry S., deceased (by Makowski, Patricia H., executrix), to Exxon Research and Engineering Co.: Process for forming powders from ion containing polymers, 4,415,709, Cl. 525-344.000.
- Kleiner, Walter, to Staebli Ltd.: Apparatus for effecting back-and-forth movement of a guide synchronously with the intermittent rotary movement of a shaft, 4,415,007, Cl. 139-329.000.
- Kleinschmit, Peter: See—  
Voigt, Carl; Kleinschmit, Peter; and Manner, Reinhard, 4,415,485, Cl. 502-100.000.
- Klepa, Peter P., to UOP Inc.: System for automatically dispensing liquid chemicals into an intermittently flowing liquid stream, 4,414,996, Cl. 137-101.270.
- Klockner-Humboldt-Deutz AG: See—  
Gittelbauer, Joachim, 4,414,825, Cl. 62-374.000.
- Klotz, Erhard: See—  
Curth, Claus P.; Tiemens, Ulf; and Klotz, Erhard, 4,416,018, Cl. 378-2.000.
- Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, 4,416,019, Cl. 378-2.000.
- Klotz, Peter; and Bottcher, Henry, to Preussag-Boliden-Blei GmbH: Process and apparatus for removing a layer of fluid on top of a bath, 4,415,144, Cl. 266-228.000.
- Klotzner, Winfried: See—  
Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, 4,414,946, Cl. 123-417.000.
- Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., to Miles Laboratories, Inc.: 15-Deoxy-16-hydroxy prostaglandins for producing bronchodilation, 4,415,592, Cl. 424-331.000.
- Knappe, Hans J.: Power generator system, 4,414,813, Cl. 60-655.000.
- Knappe, Horst; to Knappe, Ilona: Plate for radiant heating or similar effects, 4,415,798, Cl. 219-345.000.
- Knappe, Ilona: See—  
Knappe, Horst, 4,415,798, Cl. 219-345.000.
- Knight, George W.: See—  
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,415,691, Cl. 524-114.000.
- Knitter, Kathy A.: See—  
Schick, Martin J.; and Knitter, Kathy A., 4,415,338, Cl. 44-51.000.
- Knoblauch, Karl; and Heimbach, Heinrich, to Bergwerksverband GmbH: Adsorptive separation of gases, 4,415,340, Cl. 55-25.000.
- Knoll, Peter R., to Dentrionix Systems, Inc.: Pedestal for consoles, 4,415,136, Cl. 248-181.000.
- Knorr-Bremse GmbH: See—  
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952, Cl. 123-559.000.
- Kobari, Harukuni: See—  
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010, Cl. 371-37.000.
- Koch, Edwin R.: See—  
Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, 4,415,593, Cl. 426-4.000.
- Kocks Technik GmbH & Company: See—  
Holthoff, Helmut, 4,414,859, Cl. 74-417.000.
- Kodama, Yutaka; and Miyoshi, Masakazu, to Nissan Motor Co. Ltd.; and Kato Hatsujo Kaisha, Ltd.: Door locking knob for vehicle, 4,415,192, Cl. 292-347.000.
- Koehn, Gary: Multiple implement towing apparatus, 4,415,174, Cl. 280-411.000.
- Koenig, Horst: See—  
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571, Cl. 424-250.000.
- Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, to Nippon Soken, Inc.: Gas flow measuring apparatus, 4,414,847, Cl. 73-204.000.
- Kohl, Paul A.: See—  
Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,415,414, Cl. 204-129.300.
- Kohler, Helmut: See—  
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,415,429, Cl. 208-8.0LE.
- Kohn, Harold: See—  
Houser, David E.; Kohn, Harold; and Williams, Gordon L., 4,415,113, Cl. 227-130.000.
- Kohnhorst, Earl E.: See—  
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Nishizawa, Jun-ichi; and Konishi, Masahiro, 4,415,937, Cl. 358-335.000.
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Frosch, Albert; Hinkel, Holger; and Kraus, Georg, 4,415,942, Cl. 360-135.000.
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Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969, Cl. 364-200.000.
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Cathy, Denis G.; and Krowech, Robert J., 4,414,923, Cl. 122-7.00R.
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Paque, Michael W., 4,415,395, Cl. 156-384.000.
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Kaczynski, Friedrich; Kroy, Walter; and Reithmeier, Gunter, 4,415,231, Cl. 350-269.000.
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Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877, Cl. 338-34.000.
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Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634, Cl. 428-379.000.
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Saito, Takashi; and Kumaki, Takashi, 4,416,004, Cl. 369-77.200.
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Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,415,508, Cl. 261-114.00R.
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Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,415,965, Cl. 364-136.000.
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Nobue, Tomotaka; and Kusunoki, Shigeru, 4,415,789, Cl. 219-10.55B.
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Young, Kenneth P.; Kyonka, Curtis P.; and Courtois, James A., 4,415,374, Cl. 148-2.000.
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Anabuki, Hitoshi; and Miyata, Shigeo, 4,415,555, Cl. 424-147.000.
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Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004, Cl. 137-884.000.
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Niederhauser, Paul; Maillat, Michel; and Hintermann, Hans E., 4,415,419, Cl. 204-192.00C.
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Turre, Gilles H. J.; Hours, Michel; and Labrude, Jacques R., 4,415,418, Cl. 204-180.00G.
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Contal, Francois; and Boyer, Bernard, 4,414,819, Cl. 62-222.000.
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Lapeyre, James M., 4,414,754, Cl. 33-363.00K.
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Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, 4,415,347, Cl. 65-4.210.
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Barnes, Thomas E.; and Landsness, Clifford A., 4,414,874, Cl. 83-488.000.
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Westendorf, Neal W.; and Langenfeld, Joseph W., 4,415,303, Cl. 414-519.000.
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Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, 4,414,764, Cl. 37-141.00T.
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Gergis, Ioris S.; and Lee, Wai-Tak P., 4,415,990, Cl. 365-41.000.
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Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753, Cl. 33-356.000.
- Leggett & Platt, Incorporated: See—  
Bustos, Rafael T., 4,415,090, Cl. 211-49.00S.
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Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358, Cl. 75-58.000.
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Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571, Cl. 424-250.000.
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Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, 4,415,603, Cl. 427-54.100.
- Lemke, Manfred: See—  
Andersen, Geert; and Lemke, Manfred, 4,415,596, Cl. 426-103.000.
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Dorrestijn, Antoon; Lemstra, Pieter J.; and van Unen, Lambert H. T., 4,415,514, Cl. 264-53.000.
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Nicolas, Jacques; and Lenglet, Paul, 4,414,833, Cl. 72-13.000.
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Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571, Cl. 424-250.000.
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Hoyle, Charles E.; and Lenox, Ronald S., 4,415,334, Cl. 8-694.000.
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Laruelle, Claude; and Lepant, Marcel, 4,415,574, Cl. 424-251.000.
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Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., 4,415,659, Cl. 435-161.000.
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Seitzer, Herbert J.; Lesieur, Roger R.; and Karavolis, Sam, 4,415,484, Cl. 502-332.000.
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Dean, Robert R.; Letzsch, Warren S.; and Mauleon, Jean L., 4,415,438, Cl. 208-120.000.
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Salomon, Georges P. J.; and Leveque, Alain, 4,414,762, Cl. 36-117.000.
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Lacoste, Jean-Andre; Leveque, Jean-Pierre; and Schley, Robert, 4,415,758, Cl. 136-233.000.
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Dubauskas, Thomas A., 4,415,855, Cl. 324-114.000.
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Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,415,426, Cl. 204-290.00R.
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Unger, Hans-Georg, 4,415,227, Cl. 350-96.150.
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- Lichtenstein, Joseph: See—  
Gordon, Marvin; and Lichtenstein, Joseph, 4,415,288, Cl. 401-132.000.
- Licinvest AG: See—  
Ackeret, Peter, 4,415,079, Cl. 206-45.340.
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Gumkowski, Bert A.; and Limberg, John F., 4,415,068, Cl. 188-72.300.
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Campillo, Anthony J.; and Lin, Horn-Bond, 4,415,265, Cl. 356-338.000.
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Ruddle, Frank H.; and Lin, Pin-Fang, 4,415,405, Cl. 156-645.000.
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Fuchs, Uwe, 4,415,454, Cl. 210-616.000.
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Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, 4,416,019, Cl. 378-2.000.
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Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976, Cl. 128-334.00R.

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Walkow, Arnold M.; and Linyaev, Eugene J., 4,415,030, Cl. 166-241.000.
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Cutter, James W., 4,416,022, Cl. 378-206.000.
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Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976, Cl. 128-334.00R.
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Hale, Thomas K.; and Kavaloski, Peter P., 4,415,177, Cl. 280-650.000.
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Buchanan, Robert A., 4,415,980, Cl. 378-58.000.
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Nativi, Larry A., 4,415,604, Cl. 427-54.100.
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Keller, Hans-Peter; and Bossard, Max, 4,415,008, Cl. 139-370.200.
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Gonzales, Louis P.; and Long, Dennis M., 4,414,886, Cl. 99-495.000.
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- Suciu, George D.; and Paustian, John E., 4,415,460, Cl. 210-754.000.
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- Kraus, Josef; and Wech, Erich, 4,414,900, Cl. 101-363.000.
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- Maglic, Rastko C., to Motorola, Inc. Gauge pressure sensor. 4,414,851, Cl. 73-706.000.
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- Marinelli, Joseph A. Axle and air bag suspension. 4,415,179, Cl. 280-713.000.
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- Mark, Victor, to General Electric Company. Aromatic polycarbonate compositions containing a  $C_{16}$ - $C_{30}$ alkane compound as a mold release agent. 4,415,696, Cl. 524-490.000.
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Hill, Forrest G., 4,414,899. Cl. 101-331.000.
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Thornberry, James M.; Obermann, George; and Mateja, Edward J., 4,415,784. Cl. 200-35.00R.
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Wagner, James C.; Barnard, James E.; and Woerner, Robert J., 4,416,020. Cl. 378-181.000.
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Matheny, Paul; and Matheny, Frances V., 4,415,159. Cl. 273-187.00A.
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- Mathes, Egon, to U.S. Philips Corporation. Dynamic MOS-logic in interlace-techniques. 4,415,819. Cl. 307-481.000.
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Herchen, Stephen R.; and Messersmith, David, 4,415,737. Cl. 548-146.000.
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- Meyer, Raymond J., to Deere & Company. Hinged hatch roof assembly for a vehicle cab. 4,415,197. Cl. 296-216.000.
- Meyers, John J., to Eastman Kodak Company. Passive cooling of mirrors. 4,415,234. Cl. 350-310.000.
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- Michoff, John C. Strong and weak signal preamplification system. 4,416,023. Cl. 455-291.000.
- Micro Dent Industries, Inc.: See—  
Puro, Nicholas S., 4,414,868. Cl. 81-416.000.
- Mid-West Conveyor Company, Inc.: See—  
Burt, Harold S., 4,415,975. Cl. 364-444.000.
- Mikulski, Barry S.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598. Cl. 426-394.000.
- Mikumo, Masatoshi: See—  
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- Mileos, George: See—  
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- Miles Laboratories, Inc.: See—  
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- Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,415,592. Cl. 424-331.000.
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- Miller, Donald N.: See—  
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- Miller, Theodore E., Jr.: See—  
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- Miliken Research Corporation: See—  
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- Weitzel, Edward W., 4,414,696. Cl. 5-475.000.
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Taylor, Jerry F., 4,415,051. Cl. 180-65.00R.
- Mingace, Herbert S., Jr.: See—  
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- Minnesota Mining and Manufacturing Company: See—  
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- Eamay, Donald L.; Johnson, Gordon G.; and Vesley, George F., 4,415,615. Cl. 428-40.000.
- Foss, George D., 4,415,342. Cl. 55-96.000.
- Roiko, Russell A.; and Pokorny, Richard J., 4,415,694. Cl. 524-200.000.
- Shapiro, Jules S., 4,414,967. Cl. 128-92.00B.
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- Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., to General Electric Company. Electron emissive coatings for electric discharge devices. 4,415,835. Cl. 313-627.000.



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Mitarai, Tsuyoshi; and Yamaguchi, Takeshi, to Casio Computer Co., Ltd. Tone data compressing and expanding system for digital electronic musical instrument. 4,414,878, Cl. 84-1.190.

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Young, David M.; Mitchell, Donald F.; and Amey, Edward, 4,414,972, Cl. 128-200.230.

Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., to International Business Machines Corporation. Electrolytic printing process with wear resistant electrode. 4,415,905, Cl. 346-1.100.

Mitchell, Ronald W. Harness and attachment method. 4,414,790, Cl. 54-2.000.

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Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, 4,415,765, Cl. 174-72.00A.

Maeda, Koji; and Goda, Tadahiro, 4,415,968, Cl. 364-178.000.

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Yamanaka, Takashi, 4,415,787, Cl. 200-144.00B.

Mitsubishi Paper Mills, Ltd.: See—  
Miyachi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627, Cl. 428-332.000.

Mitsubishi Petrochemical Co. Ltd.: See—  
Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, 4,415,476, Cl. 302-224.000.

Mitsubishi Rayon Company, Ltd.: See—  
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509, Cl. 264-1.300.

Mitsui, Hiroki: See—  
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573, Cl. 424-251.000.

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Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, 4,415,178, Cl. 280-664.000.

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Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933, Cl. 358-281.000.

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Kasuga, Munee; Miyashita, Kiyoshi; and Nishikawa, Masaji, 4,415,260, Cl. 355-14.05H.

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Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, 4,415,988, Cl. 365-16.000.

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Anabuki, Hitoshi; and Miyata, Shigeo, 4,415,555, Cl. 424-147.000.

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Miyoshi, Masakazu: See—  
Kodama, Yutaka; and Miyoshi, Masakazu, 4,415,192, Cl. 292-347.000.

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Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, 4,415,178, Cl. 280-664.000.

Mizoguchi, Toshimi: See—  
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497, Cl. 260-245.20T.

Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamoto, Takahito, to NGK Spark Plug Co., Ltd. Sparkplug with antifouling coating on discharge end of insulator. 4,415,828, Cl. 313-118.000.

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Naito, Hiroyuki; Maruya, Takashi; and Sugawara, Masaaki, 4,415,364, Cl. 106-74.000.

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Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, 4,415,765, Cl. 174-72.00A.

Mobil Oil Corporation: See—  
Angevine, Philip J., 4,415,436, Cl. 208-89.000.

Chen, Albert C.; and Nagy, Frank A., 4,415,468, Cl. 252-182.000.

Clayton, William J.; and Outhouse, William G., 4,415,087, Cl. 206-632.000.

Hunt, William C., III, 4,415,031, Cl. 166-261.000.

Kokotailo, George T.; Rohman, Albert C., Jr.; and Sawruk, Stephen, 4,415,544, Cl. 423-328.000.

Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., 4,415,035, Cl. 166-308.000.

Moeckel, George P.; and Wallick, George C., 4,415,999, Cl. 367-73.000.

Shu, Winston R., 4,415,032, Cl. 166-273.000.

Wilson, Jack L., 4,415,997, Cl. 367-15.000.

Mobil Solar Energy Corporation: See—  
Wald, Fritz; and Kalejs, Juris P., 4,415,401, Cl. 156-608.000.

Mochizuki, Manabu: See—  
Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, 4,415,533, Cl. 422-4.000.

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Leininger, John T., 4,415,074, Cl. 193-37.000.

Moeckel, George P.; and Wallick, George C., to Mobil Oil Corporation. Method of confirming seismic data interpretation. 4,415,999, Cl. 367-73.000.

Mogens Rued Nielsen ApS: See—  
Bavnsfelt, Hans, 4,415,094, Cl. 215-252.000.

Molins Machine Company, Inc.: See—  
Craemer, Robert H.; and Woolston, A. Brent, 4,415,978, Cl. 364-475.000.

Momma, Naohiro: See—  
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385, Cl. 148-189.000.

Money, David K.: See—  
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979, Cl. 128-419.00F.

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Monkowski, Joseph R.; and Tressler, Richard E. Solid film growth via preferential etching of liquid solutions. 4,415,545, Cl. 423-348.000.

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Ebner, Jerry R., 4,415,482, Cl. 502-205.000.

Schumacher, Ignatius; and Wang, Kang-Bo, 4,415,744, Cl. 560-20.000.

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Stanko, Ronald T., 4,415,576, Cl. 424-252.000.

Montieth, Max R.: See—  
Frost, Rodney I.; and Montieth, Max R., 4,415,344, Cl. 55-523.000.

Moon, Edward T.: See—  
Johnstone, Theodore R.; and Kaatz, James P., 4,414,795, Cl. 56-328.07S.

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Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., 4,415,629, Cl. 428-375.000.

Moragrega, Miguel S. Impact filter for tipped cigarettes. 4,414,989, Cl. 131-339.000.

Moraw, Roland: See—  
Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, 4,415,947, Cl. 361-235.000.

Morgan, Annis R., Jr.: See—  
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 4,414,768, Cl. 40-584.000.

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Weigle, William O.; and Morgan, Edward L., 4,415,493, Cl. 260-112.50R.

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Brodie, Don E.; and Morgan, John H., 4,415,602, Cl. 427-39.000.

Morgan, R. Dean; Mauldin, Donald M.; and Taylor, Thomas L. Orthopedic shoe. 4,414,759, Cl. 36-11.500.

Morgan, Thomas K., Jr.: See—  
Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,415,587, Cl. 424-273.00R.

Mori, Hiromitsu, to Casio Computer Co., Ltd. Compact electronic device having calendar function. 4,415,271, Cl. 368-41.000.

Mori, Toshihito: See—  
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497, Cl. 260-245.20T.

Moriguchi, Haruhiko: See—  
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,415,904, Cl. 346-1.100.

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Morita, Yutaka: See—  
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiko; and Morita, Yutaka, 4,416,006, Cl. 369-240.000.

Morris, George E., to General Electric Company. Electrical circuit and method of controlling such. 4,414,820, Cl. 62-226.000.

Morrison-Knudsen Forest Products, Inc.: See—  
Henckel, David J.; and Peters, Thomas E., 4,415,324, Cl. 425-83.100.

Mosbach, Klaus H.; and Nilsson, Kurt G. I., to Pharmacia Fine Chemicals AB. Method of covalently binding biologically active organic substances to polymeric substances. 4,415,665, Cl. 435-179.000.

Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., to Dow Chemical Co., The. Preparation of viscosifiers for zinc salt workover and completion brines. 4,415,463, Cl. 252-8.55R.

Moss, James W.: See—  
Floyd, James N., 4,415,284, Cl. 400-134.000.

Motorola, Inc.: See—  
Adlhoeh, Richard H., 4,415,992, Cl. 365-94.000.

James, Kristi L., 4,415,115, Cl. 228-170.000.

Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017, Cl. 375-99.000.

Kuhl, Virgil F.; and White, Gary J., 4,415,219, Cl. 339-195.00M.

Maglic, Rastko C., 4,414,851, Cl. 73-706.000.

Sievers, Kirk A.; and Santis, Dean C., 4,415,849, Cl. 322-99.000.

Mott, Godfrey T., to National Research Development Corporation. Blood flow monitor apparatus. 4,414,980, Cl. 128-664.000.

Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, to Crouzet. Process for compensating the magnetic disturbances in the determination of a magnetic heading, and devices for carrying out this process. 4,414,753, Cl. 33-356.000.

Moutonnier, Claude: See—  
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562, Cl. 424-246.000.

Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,735, Cl. 544-22.000.

Mowe, Wayne T.: See—  
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,414,801, Cl. 57-288.000.

Moyers, Thomas L. Safety device for animal trap. 4,414,773, Cl. 43-97.000.

MTS Systems Corporation: See—  
Haeg, Steven R., 4,414,854, Cl. 73-847.000.

Mueller, Patricia W.: See—  
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591, Cl. 424-330.000.

Mueller, Ruediger, to Siemens Aktiengesellschaft. Monolithically integrated circuit for the production of long pulses. 4,415,816, Cl. 307-265.000.

Mueschke, Herman W. Ambidextrous safety for guns. 4,414,769, Cl. 42-70.00R.

Mugrauer, Hubert: See—  
Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, 4,415,257, Cl. 355-3.07R.

Mulvanny, Patrick; and Bartky, Scott, to Nicolet Instrument Corporation. Automatic calibration system for video displays in vision testing. 4,415,921, Cl. 358-139.000.

Munger, Stanley H.; Short, Michael R.; and Swatton, David W., to Du Pont de Nemours, E. I., and Company. Flexographic printing plates containing blended adhesives. 4,415,649, Cl. 430-271.000.

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Scoggins, Lacey E.; and Munro, Bradley L., 4,415,729, Cl. 528-388.000.

Muoi, Tran V., to Bell Telephone Laboratories, Incorporated. Optical receiver with improved dynamic range. 4,415,803, Cl. 250-214.00A.

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Yukawa, Koji; Murahashi, Takashi; and Sakurai, Isao, 4,415,261, Cl. 355-75.000.

Murakami, Keiichi: See—  
Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,414,850, Cl. 73-599.000.

Murata Corporation of America: See—  
Blickstein, Martin J., 4,415,949, Cl. 361-296.000.

Murata, Hideki: See—  
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644, Cl. 430-106.600.

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Matsui, Isamu; and Mima, Hiroshi, 4,414,798, Cl. 57-22.000.

Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, to Fuji Xerox Co., Ltd. Carrier wave recovery circuit. 4,415,933, Cl. 358-281.000.

Muraldo, Gastonge: See—  
Peter, Fritz; and Muraldo, Gastonge, 4,414,758, Cl. 34-233.000.

Murphy, Martin A., to Exxon Research and Engineering Co. Distillation process. 4,415,443, Cl. 208-355.000.

Murphy, Thomas V. Modular merchandise display tower. 4,415,077, Cl. 206-44.00R.

Murray Corporation: See—  
Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715, Cl. 24-283.000.

Murrell, Lawrence L.; and Grenoble, Dane C., to Exxon Research and Engineering Co. Transition metal oxide Bronsted acid catalysts. 4,415,480, Cl. 502-242.000.

Murrell, Lawrence L.: See—  
Grenoble, Dane C.; and Murrell, Lawrence L., 4,415,437, Cl. 208-120.000.

Muth, David L.: See—  
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,415,832, Cl. 313-533.000.

Mutsaers, Cornelis A. H. A.: See—  
Boonstra, Alexander H. A.; Mutsaers, Cornelis A. H. A.; and van der Kruis, Franciscus N. G. R., 4,415,486, Cl. 252-514.000.

Muzhzhavlev, Konstantin D.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir

G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538, Cl. 422-224.000.

Myer, Jon H., to Hughes Aircraft Company. Ophthalmic clip. 4,414,985, Cl. 128-782.000.

N. V. Weefautomaten Picanol: See—  
Shaw, Henry A., 4,415,009, Cl. 139-435.000.

Nachtigall, Guenter W.: See—  
Grudzinskas, Charles V.; and Nachtigall, Guenter W., 4,415,501, Cl. 260-429.300.

Nadelson, Jeffrey: See—  
Brand, Leonard J.; and Nadelson, Jeffrey, 4,415,568, Cl. 424-248.400.

Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., to Northern Telecom Limited. Method of fabricating semiconductor devices using laser annealing. 4,415,383, Cl. 148-187.000.

Nagase, Masaomi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the air intake of an internal combustion engine. 4,414,943, Cl. 123-339.000.

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Nagel, Gerhard; and Dasting, Klaus, to Esselte Pendaflex Corporation. Means for accommodating an ink roller. 4,414,864, Cl. 81-3.00R.

Naguib, Hussein M.: See—  
Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., 4,415,383, Cl. 148-187.000.

Nagy, Frank A.: See—  
Chen, Albert C.; and Nagy, Frank A., 4,415,468, Cl. 252-182.000.

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Nakada, Hiroyasu, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Port scavenging type two-cycle internal combustion engine. 4,414,928, Cl. 123-73.00P.

Nakagawa, Kazuyuki: See—  
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572, Cl. 424-250.000.

Nakahara, Hidetoshi: See—  
Kai, Tomokazu; and Nakahara, Hidetoshi, 4,415,770, Cl. 179-2.0EB.

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Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamoto, Takahito, 4,415,828, Cl. 313-118.000.

Nakahara, Yutaka: See—  
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,415,688, Cl. 524-102.000.

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Nakajima, Toshio: See—  
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739, Cl. 548-367.000.

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Imazeki, Ryoji; Kusumi, Katsuki; and Nakajima, Yoshihiro, 4,415,965, Cl. 364-136.000.

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Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, 4,414,732, Cl. 29-568.000.

Nakatsui, Hisashi: See—  
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920, Cl. 358-37.000.

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Nakayama, Takashi; Yamagata, Seichi; and Kajita, Koji, to Toray Industries, Inc. Twisted yarn and method of producing the same. 4,414,800, Cl. 57-236.000.

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Nalco Chemical Company: See—  
Osborne, James A., 4,415,446, Cl. 210-101.000.

Namba, Yasuhiro: See—  
Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Eiji, 4,415,246, Cl. 354-25.000.

Nara, Ken: See—  
Nagata, Saburo; and Nara, Ken, 4,415,326, Cl. 434-113.000.

Narasaka, Shin: See—  
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,414,950, Cl. 123-479.000.

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Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr., 4,415,661, Cl. 435-174.000.

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- Narozny, Ronald S., to Thomas & Betts Corporation. Connector for mass-ground termination of multiconductor cable. 4,415,216. Cl. 339-107.000.
- Nasu, Hitoo: See—  
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050. Cl. 180-6.480.
- Nathanson, Rex: See—  
Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772. Cl. 369-60.000.
- National Can Corporation: See—  
Cholmar, Sidney, 4,415,394. Cl. 156-379.800.
- National Distillers and Chemical Corporation: See—  
Hinnenkamp, James A., 4,415,473. Cl. 252-373.000.
- Niatek, Jack; and Brima, Thomas S., 4,415,475. Cl. 502-206.000.
- National Research Development Corporation: See—  
Capaccio, Giancarlo; Smith, Francis S.; and Ward, Ian M., 4,415,522. Cl. 264-210.800.
- Mott, Godfrey T., 4,414,980. Cl. 128-664.000.
- National Semiconductor Corporation: See—  
Gross, William H., 4,415,868. Cl. 330-294.000.
- National Steel Corporation: See—  
Saunders, William T., 4,414,836. Cl. 72-349.000.
- Nativi, Larry A., to Lotcite Corporation. Conformal coating and potting system. 4,415,604. Cl. 427-54.100.
- Naumann, Klaus: See—  
Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, 4,415,561. Cl. 424-219.000.
- NCR Corporation: See—  
Cynkar, Thomas E.; and House, James G., 4,415,606. Cl. 427-90.000.
- Italiano, Victor J.; and Sayko, Steven P., 4,415,909. Cl. 346-140.000.
- Reece, John W., 4,415,910. Cl. 346-140.000.
- Necchi, S.P.A.: See—  
Bar, Alfredo, 4,415,060. Cl. 181-272.000.
- Negi, Shigeto: See—  
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichi; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567. Cl. 424-246.000.
- Nelb, Robert G., II: See—  
Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, 4,415,693. Cl. 524-198.000.
- Nelson, Alfred M.: See—  
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906. Cl. 346-74.500.
- Nelson, David: See—  
Breitweiser, Steve; and Nelson, David, 4,414,725. Cl. 29-156.40R.
- Nelson, Erik B., to Dow Chemical Company. The Pumpable thixotropic cement slurries for use in cementing pipes in a well. 4,415,367. Cl. 106-60.000.
- Nelson Holland, Henry A.; and Bandura, James, to Raymond International Builders, Inc. Distributor head for a pipe lining machine. 4,414,918. Cl. 118-306.000.
- Nelson Research & Development Company: See—  
Rajadhyaksha, Vithal J., 4,415,563. Cl. 424-244.000.
- Nemoto, Reishi: See—  
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,414,908. Cl. 112-169.000.
- Nestle Company, Inc.: See—  
Hauser, Ivo J.; and Lutz, Bruno, 4,415,084. Cl. 206-461.000.
- Neufeld, Henry L., to Brunswick Corporation. Thumb stop retention and anti-rattle spring. 4,415,129. Cl. 242-84.20A.
- Neumann, Manfred, to Firm Tente-Rollen Gesellschaft mit beschränkter Haftung Compagnie. Castor locking device for arresting the rotation and the swivelling of the castor. 4,414,702. Cl. 16-35.00R.
- Newman, Fred C., to Continental Group, Inc., The. Method of forming an annular seam between two container body halves. 4,415,387. Cl. 156-69.000.
- News Log International, Inc.: See—  
Ackerman, Richard C.; Jewer, Alan A.; and Hurlbut, Donovan W., 4,416,001. Cl. 369-44.000.
- NGK Spark Plug Co., Ltd.: See—  
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamoto, Takahito, 4,415,828. Cl. 313-118.000.
- Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877. Cl. 338-34.000.
- Nicholas, Michel: See—  
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004. Cl. 137-884.000.
- Nicksic, Stephen W., to Chevron Research Company. Method for modifying electron spin resonance signals from hydrocarbon crude. 4,415,671. Cl. 436-29.000.
- Nicolas, Jacques; and Lenglet, Paul, to Societe Anonyme dite: Stein Industrie. Method and apparatus for bending a long metal member. 4,414,833. Cl. 72-13.000.
- Nicolet Instrument Corporation: See—  
Mulvanny, Patrick; and Bartky, Scott, 4,415,921. Cl. 358-139.000.
- Niederhaeuser, Paul; Maillat, Michel; and Hintermann, Hans E., to Laboratoire Suisse de Recherches Horlogeres. Process for producing a corrosion-resistant solid lubricant coating. 4,415,419. Cl. 204-192.00C.
- Nieh, Edward C. Y., to Texaco Inc. Polymeric cationic substituted acrylamide surfactants. 4,415,717. Cl. 526-287.000.
- Nield, Eric; and Thompson, Martin K., to Imperial Chemical Industries PLC. Extruded profiles. 4,415,699. Cl. 524-538.000.
- Nielsen, Anker J., Jr.; and Hoyt, Richard E., to Nissan Motor Co., Ltd. Locking device for an electric meter box. 4,414,829. Cl. 70-160.000.
- Nijman, Aloysius J.; and Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. Arrangement for exchanging signals between separated circuits. 4,415,775. Cl. 179-78.00R.
- Nijman, John P., to Allied Corporation. Insulation-pierce and crimp termination tool. 4,414,740. Cl. 29-751.000.
- Nilsson, Kurt G. I.: See—  
Mosbach, Klaus H.; and Nilsson, Kurt G. I., 4,415,665. Cl. 435-179.000.
- Nilsson, Ove: See—  
Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, 4,414,764. Cl. 37-141.00T.
- Nintendo Co., Ltd.: See—  
Yokoi, Gunpei, 4,415,153. Cl. 273-1.0GC.
- Nippon Electric Co., Ltd.: See—  
Chiba, Hiroshi; and Ogura, Shoichi, 4,415,917. Cl. 357-70.000.
- Kai, Tomokazu; and Nakahara, Hidetoshi, 4,415,770. Cl. 179-2.0EB.
- Nippon Kokan Kabushiki Kaisha: See—  
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381. Cl. 148-153.000.
- Nippon Oil Company, Ltd.: See—  
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, 4,415,718. Cl. 526-348.600.
- Nippon Shinyaku Co., Ltd.: See—  
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570. Cl. 424-249.000.
- Nippon Shokubai Kagaku Kogyo Co., Ltd.: See—  
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,415,508. Cl. 261-114.00R.
- Nippon Soken, Inc.: See—  
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847. Cl. 73-204.000.
- Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,414,840. Cl. 73-35.000.
- Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, 4,415,876. Cl. 338-34.000.
- Nippon Steel Corporation: See—  
Nishimura, Mitsuhiro; and Sakurada, Morikatsu, 4,415,359. Cl. 75-60.000.
- Nippon Telegraph & Telephone Corp.: See—  
Ogawa, Katsuhiko; and Horiguchi, Shinju, 4,415,818. Cl. 307-465.000.
- Nippon Telegraph & Telephone Public Corporation: See—  
Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, 4,415,882. Cl. 340-347.0AD.
- Nippon Zeon Co., Ltd.: See—  
Joh, Yasushi, 4,415,490. Cl. 525-54.200.
- Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, to Kubota, Ltd. Drive pump arrangement for working vehicle. 4,415,050. Cl. 180-6.480.
- Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying apparatus with transfer bias voltage stabilizer. 4,415,254. Cl. 355-3.0TR.
- Nishikawa, Masaji: See—  
Kasuga, Munee; Miyashita, Kiyoshi; and Nishikawa, Masaji, 4,415,260. Cl. 355-14.0SH.
- Nishikawa, Mineki, to Tokyo Shibaura Denki Kabushiki Kaisha. Scintillation camera. 4,415,982. Cl. 364-527.000.
- Nishikawa, Tetsuji: See—  
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739. Cl. 548-367.000.
- Nishimatsu, Masaharu: See—  
Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, 4,415,630. Cl. 428-403.000.
- Nishimura, Mitsuhiro; and Sakurada, Morikatsu, to Nippon Steel Corporation. Multi-step steelmaking refining method. 4,415,359. Cl. 75-60.000.
- Nishioka, Kimihiko; and Yamashita, Nobuo, to Olympus Optical Co., Ltd. Illumination optical system for an endoscope. 4,415,240. Cl. 350-442.000.
- Nishizawa, Jun-ichi; and Konishi, Masahiro, to Fuji Photo Film Co. Ltd. Solid-state image storage device. 4,415,937. Cl. 358-335.000.
- Nissan Motor Company: See—  
Hayashi, Yoshimasa, 4,415,059. Cl. 181-250.000.
- Nissan Motor Co., Ltd.: See—  
Endo, Takuya, 4,415,118. Cl. 237-12.30A.
- Kodama, Yutaka; and Miyoshi, Masakazu, 4,415,192. Cl. 292-347.000.
- Nielsen, Anker J., Jr.; and Hoyt, Richard E., 4,414,829. Cl. 70-160.000.
- Suzuki, Kunihiro, 4,415,058. Cl. 180-247.000.
- Takada, Toshiaki; and Hiraiwa, Kazuyoshi, 4,415,786. Cl. 200-61.910.
- Nitto Boseki Co., Ltd.: See—  
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126. Cl. 242-43.00R.
- Nizova, Svetlana A.: See—  
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477. Cl. 502-178.000.
- Noba, Masahiko: See—  
Ueda, Masahiro; and Noba, Masahiko, 4,414,937. Cl. 123-198.00D.

- Nobue, Tomotaka; and Kusunoki, Shigeru, to Matsushita Electric Industrial Co. Ltd. Microwave oven having controllable frequency microwave power source. 4,415,789. Cl. 219-10.55B.
- Nochumson, Samuel; and Witt, Henry J., to FMC Corporation. Support for electrophoresis and method of producing same. 4,415,428. Cl. 204-299.00R.
- Noda, Masaru, to Hitachi, Ltd. Signal processing circuit. 4,415,923. Cl. 358-41.000.
- Nojiri, Naohiro: See—  
Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, 4,415,476. Cl. 502-224.000.
- Nomoto, Seiichi: See—  
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichi; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567. Cl. 424-246.000.
- Nomura, Akira: See—  
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570. Cl. 424-249.000.
- Nomura, Ichiro: See—  
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643. Cl. 430-94.000.
- Nordstrom, John D.: See—  
Peng, Stephen C.; and Nordstrom, John D., 4,415,697. Cl. 524-512.000.
- Northern Telecom Limited: See—  
Agnew, David G., 4,415,777. Cl. 179-170.0NC.
- Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., 4,414,802. Cl. 57-293.000.
- Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., 4,415,383. Cl. 148-187.000.
- Norton, W. Jack, to PPG Industries, Inc. Soldering tool with resilient hold-down attachment and method of using same. 4,415,116. Cl. 228-180.00A.
- Novak, Robert F., to Ford Motor Company. Partial pressure of oxygen sensor-III. 4,415,878. Cl. 338-34.000.
- NSK-Warner K. K.: See—  
Shoji, Masao; and Kinoshita, Yoshio, 4,415,072. Cl. 192-45.000.
- Nuovo Pignone S.p.A.: See—  
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,415,185. Cl. 285-114.000.
- N.V. Tot Keuring van Elektrotechnische Materialen: See—  
Beuse, Robert H. J.; van Iersson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279. Cl. 374-204.000.
- Nypco Inc.: See—  
Paradis, Joseph R.; and Kaleskas, Edward W., 4,415,003. Cl. 137-84.000.
- Obayashi, Hideki: See—  
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847. Cl. 73-204.000.
- Oberhardt, Bruce J.: See—  
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666. Cl. 435-179.000.
- Obermann, George: See—  
Thornberry, James M.; Obermann, George; and Mateja, Edward J., 4,415,784. Cl. 200-35.00R.
- OBO Bettermann OHG: See—  
Jordan, Ernst G., 4,415,792. Cl. 219-98.000.
- Obst, Martha L., administrator: See—  
Obst, Rudiger, deceased, 4,415,214. Cl. 339-91.00R.
- Obst, Rudiger, deceased (by Obst, Martha L., administrator), to C. A. Weidmuller GmbH & Co. Postfach. Electrical plug and socket connectors. 4,415,214. Cl. 339-91.00R.
- Occhini, Elio: See—  
Priaroggia, Paolo G.; and Occhini, Elio, 4,415,761. Cl. 174-25.00R.
- Occidental Chemical Corporation: See—  
Kosonovich, George M.; and Salee, Gideon, 4,415,721. Cl. 528-176.000.
- Occidental Research Corporation: See—  
Veber, Andre, 4,415,413. Cl. 204-98.000.
- Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yukiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Novel uracil derivatives, process for preparing the same and a pharmaceutical composition containing the same. 4,415,573. Cl. 424-251.000.
- Odell, Jeffrey A.: See—  
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,415,523. Cl. 264-342.00R.
- Odmann, Gert O., to Gotaverken Motor U.S. Inc. T-Joint fitting. 4,415,000. Cl. 137-318.000.
- Oellig, Franklin A.: See—  
Campbell, Willis R.; and Oellig, Franklin A., 4,414,888. Cl. 100-88.000.
- Oetken, James E.; and Buschmann, Jeffrey P., to GTE Products Corporation. Tungsten halogen lamp with coiled getter. 4,415,833. Cl. 313-559.000.
- Ogawa, Hidenori: See—  
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572. Cl. 424-250.000.
- Ogawa, Katsuhiko; and Horiguchi, Shinju, to Nippon Telegraph & Telephone Corp. Programmable sequential logic circuit devices. 4,415,818. Cl. 307-465.000.
- Ogawa, Yukifumi: See—  
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381. Cl. 148-153.000.
- Ogawa, Yukio: See—  
Hirohata, Michio; and Ogawa, Yukio, 4,415,252. Cl. 354-234.000.
- Oguino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, to Hitachi, Ltd. Method and apparatus for high-density recording and reproduction. 4,416,002. Cl. 369-44.000.
- Ogura, Masahiro: See—  
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawahara, Hajime; and Watanabe, Kiyoshi, 4,415,657. Cl. 435-106.000.
- Ogura, Shoichi: See—  
Chiba, Hiroshi; and Ogura, Shoichi, 4,415,917. Cl. 357-70.000.
- Ogurtsov, Vladimir V.: See—  
Brazhnikov, Vadim V.; Skorniyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodinsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857. Cl. 73-863.110.
- Ohashi, Makoto: See—  
Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, 4,415,988. Cl. 365-16.000.
- Ohba, Yasuhiro: See—  
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569. Cl. 424-248.570.
- Ohe, Takeshi: See—  
Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, 4,415,319. Cl. 418-135.000.
- Ohmi, Hidehiko, to Toyo Seikan Kaisha, Ltd. Container closure having an improved liner. 4,415,096. Cl. 215-343.000.
- Ohnato, Kiyoshi, to King Jim Co., Ltd. Binder assembly of the ring type. 4,415,290. Cl. 402-26.000.
- Ohmura, Hideo; and Horino, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for processing paper sheets of banded paper sheet bundles and a processing machine therefor. 4,414,730. Cl. 29-426.300.
- Ohnishi, Kunio: See—  
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509. Cl. 264-1.300.
- Ohno, Fumiaki: See—  
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiko; and Morita, Yutaka, 4,416,006. Cl. 369-240.000.
- Ohno, Masaji: See—  
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawahara, Hajime; and Watanabe, Kiyoshi, 4,415,657. Cl. 435-106.000.
- Ohshima, Hiroo: See—  
Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308. Cl. 415-72.000.
- Ohshima, Jiro: See—  
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372. Cl. 148-1.500.
- Ohta, Minoru: See—  
Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, 4,415,876. Cl. 338-34.000.
- Oil & Sales Limited Partnership: See—  
Benson, Terrence M., 4,414,808. Cl. 60-372.000.
- Okamoto, Ichiro: See—  
Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, 4,415,727. Cl. 528-272.000.
- Okamura, Shigeru: See—  
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886. Cl. 340-618.000.
- Okazaki, Michio, to Diesel Kiki Co., Ltd. Vane compressor having a lightweight rotor. 4,415,321. Cl. 418-179.000.
- Okita, Yoshishiro: See—  
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050. Cl. 180-6.480.
- Okumura, Fumio: See—  
Miyachi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627. Cl. 428-332.000.
- Oliemuller, Casey. Speedometer cable lubrication tool. 4,415,064. Cl. 184-15.00R.
- Olin Corporation: See—  
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832. Cl. 72-8.000.
- Kadija, Igor V., 4,415,416. Cl. 204-147.000.
- Pryor, Michael J.; and Brenneman, William L., 4,415,377. Cl. 148-12.00R.
- Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,415,017. Cl. 164-453.000.
- Oliver, Donald W.: See—  
Fertl, Walter H.; and Oliver, Donald W., 4,415,805. Cl. 250-260.000.
- Olofsson Corporation, The: See—  
Garnett, Donald W., 4,414,724. Cl. 29-39.000.
- Olsen, Gregory H., to RCA Corporation. Semiconductor light emitting device. 4,416,011. Cl. 372-45.000.
- Olympus Optical Co., Ltd.: See—  
Hattori, Shinichiro; and Inoue, Yasuo, 4,415,952. Cl. 362-32.000.
- Kasuga, Munee; Miyashita, Kiyoshi; and Nishikawa, Masaji, 4,415,260. Cl. 355-14.0SH.
- Nishikawa, Masaji, 4,415,254. Cl. 355-3.0TR.
- Nishioka, Kimihiko; and Yamashita, Nobuo, 4,415,240. Cl. 350-442.000.
- Omata, Hiroshi: See—  
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785. Cl. 200-38.00B.



- Onder, Kemal: See—  
Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, 4,415,693, Cl. 524-198.000.
- Ono, Katsuhiko; and Sakimura, Shigeki, to Idemitsu Kosan Company Limited. Rubberized asphalt composition and process for producing same. 4,415,702, Cl. 524-705.000.
- Ono, Kenichi: See—  
Ikehata, Yukio; and Ono, Kenichi, 4,415,276, Cl. 368-187.000.
- Ono, Tsuyoshi: See—  
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiko; and Morita, Yutaka, 4,416,006, Cl. 369-240.000.
- Onoe, Hideo: See—  
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiko; and Morita, Yutaka, 4,416,006, Cl. 369-240.000.
- Ootsuka, Yoshinori: See—  
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,414,840, Cl. 73-35.000.
- Optimetrix Corporation: See—  
Johannesmeier, Karl-Heinz, 4,414,749, Cl. 33-180.00R.
- Orii, Takeshi, to Kabushiki Kaisha Orii Jidoki Seisakusho. Press secondary machining line control device. 4,414,887, Cl. 100-45.000.
- Osborne, James A., to Nalco Chemical Company. Automatic chemical solution mixing unit. 4,415,446, Cl. 210-101.000.
- Oscar Mayer & Co., Inc.: See—  
Koken, Ernest E., 4,414,707, Cl. 17-1.00F.
- Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., to Rohm and Haas Company. Reverse osmosis membranes based on hydroxyalkyl methacrylate and methacrylic acid copolymers. 4,415,455, Cl. 210-654.000.
- Osrow, Harold; and Shulman, Elliott, to Osrow Products Corporation. Pasta-making kitchen appliance with a drying arrangement. 4,415,323, Cl. 425-72.00S.
- Osrow Products Corporation: See—  
Osrow, Harold; and Shulman, Elliott, 4,415,323, Cl. 425-72.00S.
- Ostermayer, Frederick W., Jr.: See—  
Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,415,414, Cl. 204-129.300.
- Ostrowsky, Efrem M., to Ethyl Products Company. Overcenter hinge. 4,414,705, Cl. 16-225.000.
- Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Fail safe device for air/fuel ratio feedback control system. 4,414,950, Cl. 123-479.000.
- Otsuka Pharmaceutical Co., Ltd.: See—  
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572, Cl. 424-250.000.
- Ottaviano, Gary W., to Ranpak Corp. Cushioning dunnage apparatus. 4,415,398, Cl. 156-470.000.
- Oudet, Claude, to Portescap. Electric motor control device. 4,415,845, Cl. 318-696.000.
- Outhouse, William G.: See—  
Clayton, William J.; and Outhouse, William G., 4,415,087, Cl. 206-632.000.
- Ovcharenko, Vladimir G.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538, Cl. 422-224.000.
- Overbeek, Robert B.: See—  
Campbell, Chris A.; and Overbeek, Robert B., 4,415,073, Cl. 192-54.000.
- Overly, Incorporated: See—  
Whipple, Rodger E., 4,414,757, Cl. 34-155.000.
- Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., to Black & Decker Inc. Turbine sander. 4,414,781, Cl. 51-170.0MT.
- Owen, Wickersham & Erickson: See—  
Lindberg, John E., 4,414,932, Cl. 123-142.50R.
- Owens-Illinois, Inc.: See—  
Engstrom, John H.; and Ellis, Robert W., 4,415,349, Cl. 65-137.000.
- Oy Alko AB: See—  
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., 4,415,659, Cl. 435-161.000.
- Pabel, Hans: See—  
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124, Cl. 241-28.000.
- Pacher, Lothar: See—  
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273, Cl. 368-74.000.
- Paik, Stephen R.: See—  
Schweigert, Lothar L.; and Paik, Stephen R., 4,415,095, Cl. 215-329.000.
- Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Anly G.; Lubotskaya, Lidia N.; Playvnetse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A. Treatment-and-prophylactic tooth paste possessing anticariogenic effect. 4,415,550, Cl. 424-57.000.
- Pako Corporation: See—  
Euteneuer, Charles L., 4,415,282, Cl. 400-30.000.
- Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,415,352, Cl. 71-88.000.
- Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,415,353, Cl. 71-100.000.
- Palmieri, Beniamino. Apparatus for intraoperative diagnosis. 4,415,107, Cl. 225-93.500.
- Palmquist, Steven R.; and Gaiser, Ronald D., to Tektronix, Inc. Programmable pulse generator. 4,415,861, Cl. 328-58.000.
- Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., to Electric Power Research Institute, Inc. Insulated conductor. 4,415,629, Cl. 428-375.000.
- Papenfahs, Theodor: See—  
Volk, Heinrich; and Papenfahs, Theodor, 4,415,750, Cl. 562-467.000.
- Paque, Michael W., to Kroy Inc. Apparatus for applying a printing or cutting force to a laminated tape. 4,415,395, Cl. 156-384.000.
- Paradis, Joseph R.; and Kaleskas, Edward W., to Nypro Inc. Control of fluid flow using a flexible disc. 4,415,003, Cl. 137-843.000.
- Pardes, Greg: See—  
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,415,121, Cl. 239-229.000.
- Paris, Rafael R., to Grow Group, Inc. Apparatus for maintaining free movement of a mixing object in a pressurized container. 4,415,099, Cl. 222-94.000.
- Parker, Glenn T.: See—  
Smith, Jon D.; and Parker, Glenn T., 4,415,299, Cl. 411-340.000.
- Parry, John F. W., to R & D Associates. Hot air solar engine. 4,414,812, Cl. 60-641.140.
- Pasieka, Donald F.: See—  
Gauler, Allen L.; and Pasieka, Donald F., 4,414,748, Cl. 33-174.00Q.
- Patchett, Arthur A.: See—  
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvrat, Matthew J., Jr., 4,415,496, Cl. 260-239.30B.
- Pathfinder Systems, Inc.: See—  
Fasse, Mark E.; and Glesmann, Herbert C., 4,414,903, Cl. 104-244.100.
- Pattarozzi, Domenico, to B.S.P. Packaging Systems Di Pattarozzi D. & C. S.A.S. Apparatus for transforming blanks into corresponding containers by parallelepiped shape. 4,414,789, Cl. 53-566.000.
- Paul, Edward L.: See—  
Grabner, Roy; and Paul, Edward L., 4,415,670, Cl. 435-285.000.
- Paul, Volker: See—  
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586, Cl. 424-273.00R.
- Paulson, Roger A.: See—  
Dickhudt, Eugene A.; and Paulson, Roger A., 4,414,986, Cl. 128-785.000.
- Paustian, John E.: See—  
Suci, George D.; and Paustian, John E., 4,415,460, Cl. 210-754.000.
- Payne, David W. Closure clip for snack food bags and the like. 4,414,717, Cl. 24-30.50R.
- Payne, Rex E., Jr., to Dawn Designs, Inc. Stroller latch. 4,415,180, Cl. 280-650.000.
- PCUK Produits Chimiques Ugine Kuhlmann: See—  
Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Gros-maitre, Andre M. J., 4,415,461, Cl. 210-757.000.
- Pearce, Henry A., Jr.: See—  
Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., 4,415,629, Cl. 428-375.000.
- Pearson, H. C., to Portland Iron Works. Gang saw apparatus. 4,414,875, Cl. 83-508.300.
- Peng, Stephen C.; and Nordstrom, John D., to Ford Motor Company. Paint composition comprising hydroxy functional film former and crosslinked dispersion flow control additive. 4,415,697, Cl. 524-512.000.
- Penney, Bruce J., to Tektronix, Inc. Calibration reference signal generator. 4,415,927, Cl. 358-139.000.
- Pensenstadler, David F.: See—  
Peterson, Steven H.; and Pensenstadler, David F., 4,414,858, Cl. 73-863.330.
- Peppmoller, Reinmar, to Chemische Fabrik Stockhausen GmbH. Mixture of alkali salts of sulfo-succinic acid dialkylesters and higher aliphatic alcohols, use thereof to defoam mineral acid decomposition media. 4,415,472, Cl. 252-321.000.
- Pere, Gerard, to Creusot-Loire. Device for supply and discharge of liquid electrolyte for an electrolyzer of filterpress type. 4,415,424, Cl. 204-257.000.
- Périot, Jean-Marie, to La Telemecanique Electrique. Detector apparatus of the two-terminal type supplied with rectified A.C. power the voltage of which can vary in a wide range, with load control by switching thyristors. 4,415,945, Cl. 361-100.000.
- Perkin-Elmer Corporation, The: See—  
Gelernt, Barry; and Wang, C. Wallace, 4,415,402, Cl. 156-626.000.
- Wittmer, Charles M., 4,415,264, Cl. 356-315.000.
- Perkut, B. R. Key-operated lock. 4,414,831, Cl. 70-276.000.
- Perregaux, Alain, to BBC Brown, Boveri & Company, Limited. Light diffusing reflector for electro-optical displays and process for producing thereof. 4,415,236, Cl. 350-338.000.

- Peter, Fritz; and Murialdo, Gastonge. Conveyor for cooling and removal of objects from an in-line sectional production machine. 4,414,758, Cl. 34-233.000.
- Peters, Horst: See—  
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, 4,415,692, Cl. 524-183.000.
- Peters, Thomas E.: See—  
Henckel, David J.; and Peters, Thomas E., 4,415,324, Cl. 425-83.100.
- Petersen, Christian C., to Polaroid Corporation. Camera shutter having bobbin driven blades. 4,415,251, Cl. 354-230.000.
- Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., to Peterson Tool Company. Cutting tool. 4,414,870, Cl. 82-36.00R.
- Peterson, Steven H.; and Pensenstadler, David F., to Westinghouse Electric Corp. Steam turbine fluid sampling apparatus. 4,414,858, Cl. 73-863.330.
- Peterson Tool Company: See—  
Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., 4,414,870, Cl. 82-36.00R.
- Petrinaux, Eric: See—  
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004, Cl. 137-884.000.
- Pettis, Arthur C.: See—  
Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., 4,415,879, Cl. 340-27.0NA.
- Petzold, Lothar: See—  
Kreinberg, Manfred; and Petzold, Lothar, 4,414,765, Cl. 38-54.000.
- Pew, Melvin E. Wheelchair elevating apparatus enabling a user to lift himself from the floor to a wheelchair seat. 4,415,202, Cl. 297-217.000.
- Peyronel, Jean-Francois: See—  
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562, Cl. 424-246.000.
- Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,735, Cl. 544-22.000.
- Pfeiffer, Hans C.: See—  
Langner, Guenther O.; and Pfeiffer, Hans C., 4,415,851, Cl. 324-51.000.
- Pfister, Joseph, to H. Berthold, AG. Apparatus for the transport of a light sensitive material in a phototypesetting machine. 4,415,109, Cl. 226-181.000.
- Pfitzer, Jorg: See—  
Metzger, Karl G.; Pfitzer, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557, Cl. 424-172.000.
- Phares, Lindsey J., to Raymond International Builders, Inc. Offshore drilling of large diameter holes in rock formations. 4,415,045, Cl. 175-9.000.
- Pharmacia Fine Chemicals AB: See—  
Mosbach, Klaus H.; and Nilsson, Kurt G. I., 4,415,665, Cl. 435-179.000.
- Phelps, Barry C.: See—  
Hall, John S.; and Phelps, Barry C., 4,415,612, Cl. 428-29.000.
- Philip Morris Incorporated: See—  
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., 4,414,987, Cl. 131-296.000.
- Phillips Petroleum Company: See—  
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,415,440, Cl. 208-120.000.
- Scoggins, Lacey E.; and Munro, Bradley L., 4,415,729, Cl. 528-388.000.
- Phillips, Robert S.: See—  
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591, Cl. 424-330.000.
- Phillips, William H., to United States of America, National Aeronautics and Space Administration. Solar powered aircraft. 4,415,133, Cl. 244-53.00R.
- Piacentini, Bruno: See—  
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, 4,415,304, Cl. 414-589.000.
- Pickering, John F.; and Evans, David, to Lucas Industries Limited. Hose connector. 4,415,070, Cl. 188-264.00F.
- Piepho, Ralf F., to Colloid Piepho. Agent for the purification of waste waters and process for its production. 4,415,467, Cl. 252-181.000.
- Pikus, Francis W.: See—  
Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830, Cl. 313-331.000.
- Pillsbury Company, The: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Pioch, Peter P.; and Schober, Annette, to Black & Decker Inc. Circular saw. 4,414,743, Cl. 30-124.000.
- Pioneer Electronic Corporation: See—  
Kunugi, Yoshiro, 4,415,862, Cl. 330-10.000.
- Tokumo, Akio, 4,415,863, Cl. 330-10.000.
- Pitts, Warren R., to Dennison Manufacturing Company. Antistatic chairmat. 4,415,946, Cl. 361-212.000.
- Plachy, Ivo T., to Telex Computer Products, Inc. Method of manufacturing a composite foam tape transport capstan. 4,415,513, Cl. 264-45.400.
- Playvnetse, Rita M.: See—  
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Anly G.; Lubotskaya, Lidia N.; Playvnetse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550, Cl. 424-57.000.
- Plevy, Arthur L.: See—  
Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, 4,414,837, Cl. 73-1.00B.
- Plummer, Steven J.; and Wieloch, James E., to Siemens Corporation. X-Ray examination apparatus. 4,416,021, Cl. 378-181.000.
- Pochurek, Gerald M.; and Keilly, Ronald J. Continuous curing of cable. 4,415,518, Cl. 264-166.000.
- Podanenko, Alexandr T.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538, Cl. 422-224.000.
- Podola, Nikolai V.; Kuchuk-Yatsenko, Sergei I.; Krivonos, Vadim P.; and Grabchev, Boris L., to AN USSR Institut Elektrovarki imeni E.O. Patona. Welder for continuous resistance flash-butt welding. 4,415,793, Cl. 219-110.000.
- Pohl, Ludwig: See—  
Eidenschink, Rudolf; and Pohl, Ludwig, 4,415,470, Cl. 252-299.630.
- Pohl, Rudolph L., to Hercules Incorporated. Post-exposure process. 4,415,654, Cl. 430-328.000.
- Pohorski, Daniel W., to James Dole Corporation. Container sterilizer and discharge system. 4,415,539, Cl. 422-304.000.
- Pokorny, Richard J.: See—  
Roiko, Russell A.; and Pokorny, Richard J., 4,415,694, Cl. 524-200.000.
- Polaroid Corporation: See—  
Benton, Stephen A.; Houde-Walter, William R.; and Mingace, Herbert S., Jr., 4,415,225, Cl. 350-3.840.
- Bilofsky, Ruth C.; and Sahatjian, Ronald A., 4,415,648, Cl. 430-220.000.
- Choinski, Edward J., 4,415,610, Cl. 427-372.200.
- Guerra, John M., 4,415,958, Cl. 362-301.000.
- Herchen, Stephen R.; and Messersmith, David, 4,415,737, Cl. 548-146.000.
- Petersen, Christian C., 4,415,251, Cl. 354-230.000.
- Polidori, Mario. Electrical connector. 4,415,222, Cl. 339-270.00R.
- Pollard, William T., to Westvaco Corporation. Container with self locking bottom. 4,415,117, Cl. 229-39.00R.
- Ponder, Jonathan Z., to Electric Power Research Institute. Flexible gas-insulated electrical cable having non-metallic flexible inserts between central conductor and support insulators. 4,415,762, Cl. 174-28.000.
- Porenski, Harry S., Jr.; and Kohnhorst, Earl E., to Brown & Williamson Tobacco Corporation. Method and apparatus for determining percent solids in a slurry. 4,414,841, Cl. 73-61.00R.
- Porta Systems Comp.: See—  
Hung, Peter C., 4,415,783, Cl. 200-11.00A.
- Portescap: See—  
Oudet, Claude, 4,415,845, Cl. 318-696.000.
- Portland Iron Works: See—  
Pearson, H. C., 4,414,875, Cl. 83-508.300.
- Poshemansky, Vladimir M.: See—  
Brazhnikov, Vadim V.; Skorniyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodinsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857, Cl. 73-863.110.
- Potts, P. Keith, to Eastman Kodak Company. Automatic sliding gate valve. 4,415,139, Cl. 251-62.000.
- Powell, Arthur: See—  
Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., 4,414,781, Cl. 51-170.0MT.
- PPG Industries, Inc.: See—  
Norton, W. Jack, 4,415,116, Cl. 228-180.00A.
- Prabhu, Ashok N.; and Hang, Kenneth W., to RCA Corporation. Air-fireable thick film inks. 4,415,624, Cl. 428-209.000.
- Pradhan, Roger R.: See—  
Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., 4,415,376, Cl. 148-12.00F.
- Prast, Gijsbert: See—  
Braat, Josephus J. M.; Haisma, Jan; and Prast, Gijsbert, 4,415,238, Cl. 350-432.000.
- Pratt, Donna K.; and Terrell, Jamie B., to Gearhart Industries, Inc. Downhole well tool and anchoring assembly. 4,415,029, Cl. 166-212.000.
- President and Fellows of Harvard College: See—  
Goldstein, Richard N., 4,415,660, Cl. 435-172.000.
- Siegel, Don L., 4,415,668, Cl. 435-241.000.
- Press Machinery Corporation of Illinois: See—  
Schwartz, Michael A.; and Yamagata, Toshio, 4,414,895, Cl. 101-177.000.
- Presset, Rene: See—  
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753, Cl. 33-356.000.
- Pressley, Robert J., to Allied Corporation. Laser process for getting defects in semiconductor devices. 4,415,373, Cl. 148-1.500.
- Prete, Ernest, Jr., to Ankra Corporation. Quick-release strap buckle. 4,414,713, Cl. 24-193.000.
- Preussag-Boliden-Blei GmbH: See—  
Klotz, Peter; and Bottcher, Henry, 4,415,144, Cl. 266-228.000.



- Priam: See—  
Mendenhall, Charles E.; and Buckert, Michael D., 4,415,844, Cl. 318-254.000.
- Priaroggia, Paolo G.; and Occhini, Elio, to Societa Cavi Pirelli Societa per Azioni. Taped electric cable. 4,415,761, Cl. 174-25.00R.
- Priaroggia, Paolo G.; Bianchi, Giuseppe; and Sala, Angelo, to Societa Cavi Pirelli S.p.A. Submarine electric cable with tubular stiffening means and method of applying the stiffening means. 4,415,764, Cl. 174-37.000.
- Pribnow, Gary P., to Briggs & Stratton Corporation. Compression release mechanism using a bimetallic disc. 4,414,933, Cl. 123-182.000.
- Printronic, Inc.: See—  
Jennings, Alan K., 4,415,286, Cl. 400-279.000.
- Produits Chimiques Ugine Kuhlmann: See—  
Strassel, Albert, 4,415,519, Cl. 264-171.000.
- Prommel, Johan A.: See—  
Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., 4,415,445, Cl. 209-5.000.
- Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Aqueous processable, positive-working photopolymer compositions. 4,415,651, Cl. 430-277.000.
- Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Aqueous processable, positive-working photopolymer compositions. 4,415,652, Cl. 430-277.000.
- Protic, Davor; and Riepe, Georg, to Kernforschungsanlage Julich GmbH. Germanium semiconducting radiation detector with phosphorus implanted  $n^+$  contact. 4,415,916, Cl. 357-29.000.
- Provincial Holdings Ltd.: See—  
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,415,540, Cl. 423-99.000.
- Prudhomme, Pierre: See—  
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004, Cl. 137-884.000.
- Prugh, John D.: See—  
Bohofer, William A.; and Prugh, John D., 4,415,575, Cl. 424-251.000.
- Pryor, Michael J.; and Brennenman, William L., to Olin Corporation. Duplex rolling process and apparatus. 4,415,377, Cl. 148-12.00R.
- Pryor, Michael J.: See—  
Brennenman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832, Cl. 72-8.000.
- Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., to General Electric Company. Inlead construction for electric lamp. 4,415,830, Cl. 313-331.000.
- Punako, Stephen; and MacAvoy, David W., to Bendix Corporation. The Hermaphrodite electrical connector. 4,415,213, Cl. 339-49.00R.
- Puro, Nicholas S., to Micro Dent Industries, Inc. Box joint for a plier-type tool with removable securing plate. 4,414,868, Cl. 81-416.000.
- Puskas, Imre; and James, David E., to Standard Oil Company (Indiana). Palladium on carbon catalyst for purification of crude terephthalic acid. 4,415,479, Cl. 502-85.000.
- Pyke, David R.; and Reid, Robert, to Imperial Chemical Industries PLC. Production of saturated carbonyl compounds. 4,415,757, Cl. 568-475.000.
- Quack, Jochen M.: See—  
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,487, Cl. 252-546.000.
- Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,488, Cl. 252-547.000.
- Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooper-rider, Mark W., to Compagnie Francaise D'Entreprises Minières, Metallurgiques et D'Investissements. Controlling scale composition during acid pressure leaching of laterite and garnierite ore. 4,415,542, Cl. 423-141.000.
- R & D Associates: See—  
Parry, John F. W., 4,414,812, Cl. 60-641.140.
- Rader, Edward F.: See—  
Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., 4,415,336, Cl. 44-13.000.
- Rader, Robert R.: See—  
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016, Cl. 164-429.000.
- Radiometer A/S: See—  
Lundsgaard, Finn C.; and Andersen, Willy, 4,415,534, Cl. 422-58.000.
- Raducanu, Dan C.: See—  
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273, Cl. 368-74.000.
- Rahse, Wilfried: See—  
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124, Cl. 241-28.000.
- Rajadhyaksha, Vithal J., to Nelson Research & Development Company. Vehicle composition containing 1-substituted azacyclononan-2-ones. 4,415,563, Cl. 424-244.000.
- Rammelmeyer, Paul. Device for joining two single adhesive tapes to form a double adhesive tape. 4,415,400, Cl. 156-555.000.
- Ramsey, Wallace B.: See—  
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417, Cl. 204-159.240.
- Ranpak Corp.: See—  
Ottaviano, Gary W., 4,415,398, Cl. 156-470.000.
- Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., to Wang Laboratories, Inc. Magnetic recording heads. 4,415,906, Cl. 346-74.500.
- Rast, Gustaf J., Jr.: See—  
Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., 4,415,852, Cl. 324-57.00N.
- Raty, Pertti T.: See—  
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- Raychem Corporation: See—  
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- Raymond International Builders, Inc.: See—  
Nelson Holland, Henry A.; and Bandura, James, 4,414,918, Cl. 118-306.000.
- Phares, Lindsey J., 4,415,045, Cl. 175-9.000.
- Raytheon Company: See—  
Diesch, Bradford J.; and Fritts, Rex E., 4,415,790, Cl. 219-10.55B.
- Matthews, James B.; and DeLuzio, Reno A., 4,415,266, Cl. 356-350.000.
- RCA Corporation: See—  
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- Brooks, William C., 4,415,423, Cl. 204-212.000.
- Davis, William J., 4,415,889, Cl. 340-728.000.
- Discheri, Robert A., 4,415,931, Cl. 358-242.000.
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- Lewis, Henry G., Jr., 4,415,918, Cl. 358-23.000.
- Olsen, Gregory H., 4,416,011, Cl. 372-45.000.
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- Strolle, Christopher H.; Smith, Terrence R.; and Reitmeier, Glenn A., 4,415,928, Cl. 358-140.000.
- Willis, Donald H.; and Clayburn, Randall C., 4,415,841, Cl. 315-400.000.
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- Red Devil Inc.: See—  
Heinis, Robert P.; and Vass, Eric, 4,415,270, Cl. 366-216.000.
- Reddy, K. Prakash, to Schmid Laboratories, Inc. Spermicidally lubricated prophylactics and method for making same. 4,415,548, Cl. 424-28.000.
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- Reece, John W., to NCR Corporation. Ink jet transducer. 4,415,910, Cl. 346-140.00R.
- Reen, Orville W., to Allegheny Ludlum Steel Corporation. Desulfurization process for ferrous powder. 4,415,527, Cl. 419-31.000.
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- Rehwald, Willi: See—  
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- Reich, Gregory N., to Allied Corporation. Forming of tetrabasic lead sulfate battery electrodes. 4,415,410, Cl. 204-2.100.
- Reid, Glenn J. Reinforced molded rubber muffler hanger and method of making of same. 4,415,391, Cl. 156-187.000.
- Reid, Robert: See—  
Pyke, David R.; and Reid, Robert, 4,415,757, Cl. 568-475.000.
- Reifsteck, Timothy: See—  
Delfino, Michelangelo; and Reifsteck, Timothy, 4,415,794, Cl. 219-121.0LM.
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- Reinking, Klaus: See—  
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719, Cl. 528-167.000.
- Reinshagen, Hellmuth: See—  
Avar, Lajos; Kalt, Evelyn; and Reinshagen, Hellmuth, 4,415,687, Cl. 524-102.000.
- Reithmeier, Gunter: See—  
Kaczynsky, Friedrich; Kroy, Walter; and Reithmeier, Gunter, 4,415,231, Cl. 350-269.000.
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Strolle, Christopher H.; Smith, Terrence R.; and Reitmeier, Glenn A., 4,415,928, Cl. 358-140.000.
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Feagin, Roy C., 4,415,673, Cl. 501-102.000.
- Remy, Joel, to Adret Electronique. Microwave spectrum analyzer with a synthesized local oscillator. 4,415,854, Cl. 324-79.00R.
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Curtis, Nikolaus A.; and Renshaw, Carroll M., 4,414,935, Cl. 123-198.00F.
- Renton, Julian, to RWO (Marine Equipment) Limited. Assembly of turnable member and mounting therefor. 4,414,910, Cl. 114-218.000.
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Riemer, Wolfgang J., 4,414,731, Cl. 29-453.000.
- Resal Corporation of America, The: See—  
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,415,121, Cl. 239-229.000.
- Research Corporation: See—  
Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, 4,415,498, Cl. 260-351.100.
- Retzer, Michael H.: See—  
Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017, Cl. 375-99.000.
- Reuter, Edward J., to Reuter, Inc. Hinge for container cover. 4,414,704, Cl. 16-223.000.
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Reuter, Edward J., 4,414,704, Cl. 16-223.000.
- Reuter, Wolfgang: See—  
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566, Cl. 424-246.000.
- Reymond, Jean C.; and Gontier, Maurice, to Thomson-CSF. Cartographic indicator. 4,415,922, Cl. 358-22.000.
- Rezakhany, Saeed, to Wisconsin Alumni Research Foundation. Nasal dilator. 4,414,977, Cl. 128-342.000.
- Rezewski, Joe; and Bernes, Wayne. Roller guide for oil-well pump. 4,415,026, Cl. 166-97.000.
- Rheem Manufacturing Company: See—  
Daugirda, Paul G., 4,415,020, Cl. 165-76.000.
- Rhodes, Donald E., to Kerr-McGee Corporation. Process for the separation of entrained organic fluids from gaseous streams in a coal deashing system. 4,415,442, Cl. 208-177.000.
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Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562, Cl. 424-246.000.
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- Foucras, Jacques; and Rodet, Georges, 4,415,447, Cl. 210-321.100.
- Rice, E. Dale: See—  
McNesky, Guy P.; and Rice, E. Dale, 4,415,075, Cl. 202-177.000.
- Richards, Peter K.; and Hamilton, Harry J. Block for supporting the poles of equestrian fences. 4,414,920, Cl. 119-29.000.
- Richardson-Vicks Inc.: See—  
Shah, Nutan B.; and Cook, Marvin K., 4,415,549, Cl. 424-52.000.
- Richardson, William S.: See—  
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969, Cl. 364-200.000.
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Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., 4,414,974, Cl. 128-305.000.
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- Ricoh Co., Ltd.: See—  
Kawanishi, Toshiyuki; and Tabata, Yukio, 4,415,903, Cl. 346-1.100.
- Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, 4,415,533, Cl. 422-4.000.
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Protic, Davor; and Riepe, Georg, 4,415,916, Cl. 357-29.000.
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Schwengeler, Peter, 4,415,125, Cl. 242-18.0DD.
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Daisley, Richard J.; and Ring, Lawrence S., 4,415,330, Cl. 433-16.000.
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Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., 4,414,802, Cl. 57-293.000.
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Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, 4,414,946, Cl. 123-417.000.
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- Hofmann, Karl, 4,414,845, Cl. 73-119.00A.
- Holzbaier, Siegfried, 4,414,948, Cl. 123-452.000.
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Grunden, Michael T.; and Roberts, William J., 4,415,328, Cl. 431-1.000.
- Robinette, James A.: See—  
Ferrell, Robert A.; and Robinette, James A., 4,415,386, Cl. 156-64.000.
- Robins, David S.: See—  
Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017, Cl. 375-99.000.
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Gergis, Isoris S.; and Lee, Wai-Tak P., 4,415,990, Cl. 365-41.000.
- Huffman, Charles E.; and Southerland, Stephen R., 4,416,009, Cl. 370-100.000.
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- Thornton, Jack C.; and Russell, Randy G., 4,415,873, Cl. 336-139.000.
- Rodet, Georges: See—  
Foucras, Jacques; and Rodet, Georges, 4,415,447, Cl. 210-321.100.
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Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., 4,414,781, Cl. 51-170.0MT.
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Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., 4,415,445, Cl. 209-5.000.
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Daugherty, James B.; and Balash, Frederick A., 4,415,780, Cl. 200-5.00A.
- Rogers, Melvin F., to Zenith Radio Corporation. CRT Mounting and implosion-protection means and method. 4,415,922, Cl. 358-246.000.
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Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,415,354, Cl. 71-103.000.
- Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., 4,415,455, Cl. 210-654.000.
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Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719, Cl. 528-167.000.
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Beck, Jurgen; and Rohrig, Herbert, 4,415,811, Cl. 250-560.000.
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Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,415,344, Cl. 423-328.000.
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Roland, Manfred W.; and Roland, Max G., 4,415,893, Cl. 340-825.310.
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Atterbury, Leslie G., 4,415,309, Cl. 415-170.00R.
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- Romanenko, Oleg N.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G.; deceased; and Gachegova, Lidia T., administrator, 4,415,538, Cl. 422-224.000.
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Heil, Richard W.; and Rose, Thomas A., 4,415,452., Cl. 210-614.000.
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Lane, George A.; and Rossow, Harold E., 4,415,466., Cl. 252-70.000.
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Farge, Daniel; Roy, Pierre L.; Moutonier, Claude; and Peyronel, Jean-Francois, 4,415,735., Cl. 424-246.000.  
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Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
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Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906., Cl. 346-74.500.
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Thornton, Jack C.; and Russell, Randy G., 4,415,873., Cl. 336-139.000.
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Fieberg, Russell F.; and Fieberg, Donald E., 4,414,736., Cl. 29-747.000.
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Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,415,429., Cl. 208-8.0LE.
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Renton, Julian; 4,414,910., Cl. 114-218.000.
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Ryder, Francis E.; and Thomas, Michael D., 4,414,975., Cl. 128-314.000.
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Haas, Paul A.; and Ryon, Allen D., 4,415,536., Cl. 422-159.000.
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Laruelle, Claude; and Lepant, Marcel, 4,415,574., Cl. 424-251.000.
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Melin, Ake L., 4,415,541., Cl. 423-140.000.
- Sachs Systemtechnik GmbH: See—  
Fugleim, Egon, 4,415,619., Cl. 428-131.000.
- Sadao, Tanaka: See—  
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
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Wilson, H. James, 4,415,134., Cl. 246-34.0CT.
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Bilofsky, Ruth C.; and Sahatjian, Ronald A., 4,415,648., Cl. 430-220.000.
- Saint-Gobain Vitrage: See—  
Baum, Hans; and Balling, Egbert, 4,415,196., Cl. 296-201.000.
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Maestrami, Marino, 4,415,186., Cl. 285-142.000.
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Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hiideki, 4,415,877., Cl. 338-34.000.
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Menjo, Atsuhiko; and Saitoh, Shinji, 4,414,737., Cl. 29-578.000.
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Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
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Yamagata, Seiichi; and Sakai, Masaaki, 4,415,611., Cl. 428-15.000.
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Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924., Cl. 358-50.000.
- Sakai, Yukio: See—  
Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, 4,415,476., Cl. 502-224.000.
- Sakakibara, Hideo: See—  
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730., Cl. 536-7.100.
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Yamada, Shigeo; Takawashi, Tamio; and Sakakibara, Toshimitsu, 4,415,791., Cl. 219-69.00G.
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Ono, Katsuhiko; and Sakimura, Shigeki, 4,415,702., Cl. 524-705.000.
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Brazhnikov, Vadim V.; Skorniyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodinsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.
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Nishimura, Mitsuhiko; and Sakurada, Morikatsu, 4,415,359., Cl. 75-60.000.
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Yukawa, Koji; Murahashi, Takashi; and Sakurai, Isao, 4,415,261., Cl. 355-75.000.
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- Salee, Gideon: See—  
Kosanovich, George M.; and Salee, Gideon, 4,415,721., Cl. 528-176.000.
- Salk Institute for Biological Studies, The: See—  
Vale, Wylie W., Jr.; Spiess, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., 4,415,558., Cl. 424-177.000.
- Salmen, Leo A.: See—  
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- Salomon, Georges P. J.; and Leveque, Alain, to Etablissements Francois Salomon & Fils. Slipper for a ski boot, and process for its manufacture. 4,414,762., Cl. 36-117.000.
- Salter, Robert S.: See—  
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- Saltveit, Mikal E., Jr.: See—  
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- Salva, Henri E., to International Harvester Co. Fully mounted variable width plow. 4,415,040., Cl. 172-225.000.
- Sambucetti, Carlos J.: See—  
Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., 4,415,905., Cl. 346-1.100.
- Sanderson, William R.: See—  
Daly, William T.; Gelman, Boris; and Sanderson, William R., 4,415,244., Cl. 353-101.000.
- Sandoz, Inc.: See—  
Barcza, Sandor, 4,415,560., Cl. 424-184.000.
- Brand, Leonard J.; and Nadelson, Jeffrey, 4,415,568., Cl. 424-248.400.
- Sandoz Ltd.: See—  
Avar, Lajos; Kalt, Evelyn; and Reinshagen, Hellmuth, 4,415,687., Cl. 524-102.000.
- Sandstedt, Gary O. Restaurant or retail vending facility. 4,415,065., Cl. 186-39.000.
- Saneto, Frank. Vehicle fuel conditioning apparatus. 4,414,951., Cl. 123-538.000.

- Sanfiteben, Keith E.; and Tarr, Walter R., to Bendix Corporation, The. Sintered iron base friction material. 4,415,363., Cl. 75-229.000.
- Sank, Victor: See—  
Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807., Cl. 250-363.00S.
- Sankyo Manufacturing Company, Ltd.: See—  
Katoh, Heizaburo, 4,415,108., Cl. 226-138.000.
- Sano, Noritoshi: See—  
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- Sano, Yoshikazu: See—  
Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, 4,414,732., Cl. 29-568.000.
- Sanshin Kogyo Kabushiki Kaisha: See—  
Nakada, Hiroyasu, 4,414,928., Cl. 123-73.0PP.
- Sakurai, Yoshihiro, 4,414,929., Cl. 123-73.00R.
- Santis, Dean C.: See—  
Siewers, Kirk A.; and Santis, Dean C., 4,415,849., Cl. 322-99.000.
- Santucci, Lawrence E.: See—  
Spars, Byron G.; and Santucci, Lawrence E., 4,415,365., Cl. 106-85.000.
- Sanyo Electric Co., Inc.: See—  
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- Sarda, Jean L. Thermo-engraving machine for printing in relief. 4,414,913., Cl. 118-46.000.
- Sarkar, Sunil B., to Firestone Tire & Rubber Company, The. Method for preparing color-free, stabilized polymers of conjugated dienes or vinyl aromatic hydrocarbons or copolymers of conjugated dienes and vinyl aromatic hydrocarbons. 4,415,695., Cl. 524-405.000.
- Sasagawa, Kinichi: See—  
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620., Cl. 428-157.000.
- Sasaki, Osamu: See—  
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- Sasanuma, Yasutomo, to Citizen Watch Co., Ltd. Process for manufacturing ornamental parts and ion plating apparatus to be used therefor. 4,415,421., Cl. 204-192.00N.
- Sasscer, Lawrence D.: See—  
Swenson, Robert E.; Sasscer, Lawrence D.; and George, Benjamin T., 4,415,970., Cl. 364-200.000.
- Sastry, Shankar M.: See—  
Lederich, Richard J.; and Sastry, Shankar M., 4,415,375., Cl. 148-11.50F.
- Sato, Hideo: See—  
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, 4,415,726., Cl. 528-272.000.
- Sato, Masayoshi; and Suzuki, Kunio, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Inking mechanism in a rotary press. 4,414,897., Cl. 101-216.000.
- Sato, Michio: See—  
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- Sato, Yasushi: See—  
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- Satomi, Toyokazu, to Ricoh Company, Ltd. Variable magnification and reciprocal exposure copying method. 4,415,259., Cl. 355-11.000.
- Satzinger, Gerhard; Herrmann, Manfred; Fritsch, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, to Godecke Aktiengesellschaft. 5,6,8,9-Tetrahydro-7H-dibenz(d,f)azepines. 4,415,495., Cl. 260-239.00D.
- Saunders, William T., to National Steel Corporation. Method of and apparatus for deep drawing metal containers. 4,414,836., Cl. 72-349.000.
- Sauvago, Phillip J., to Farmland Foods, Inc. Automatic livestock head splitter. 4,414,708., Cl. 17-1.00R.
- Sawada, Kiyoshi: See—  
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
- Sawamura, Mitsuharu: See—  
Itoh, Susumu; and Sawamura, Mitsuharu, 4,415,233., Cl. 350-173.000.
- Sawruk, Stephen: See—  
Kokotailo, George T.; Rohman, Albert C., Jr.; and Sawruk, Stephen, 4,415,544., Cl. 423-328.000.
- Sayko, Steven P.: See—  
Italiano, Victor J.; and Sayko, Steven P., 4,415,909., Cl. 346-140.00R.
- Schacht, Charles A., to United States Steel Corporation. Conductor roll contour. 4,415,425., Cl. 204-279.000.
- Schadlich, Gunther: See—  
Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, 4,415,947., Cl. 361-235.000.
- Schaefer, Roger W., to Centurion Safety Products, Inc. Grip shield. 4,415,954., Cl. 362-202.000.
- Schafer, Otto: See—  
Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozyk, Rudolf-Helmut, 4,414,944., Cl. 123-339.000.
- Schaffner, Kurt: See—  
Demuth, Martin; and Schaffner, Kurt, 4,415,756., Cl. 568-365.000.
- Scharf, James A., Jr. Power supply. 4,415,964., Cl. 363-142.000.
- Scharpf, William G.; and Glenn, Michael S., to FMC Corporation. Intermediates for insecticidal synthetic pyrethroids. 4,415,748., Cl. 560-227.000.
- Schegolev, Vladimir I.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
- Schenk, Manfred: See—  
Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, 4,414,946., Cl. 123-417.000.
- Schenk, Raymond L.: See—  
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016., Cl. 164-429.000.
- Scherbatsky, Serge A. System for employing high temperature batteries for making measurements in a borehole. 4,416,000., Cl. 367-81.000.
- Scherberich, Paul: See—  
Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738., Cl. 548-147.000.
- Scherling, J. Daniel: See—  
Iezza, Franco S., 4,415,150., Cl. 272-63.000.
- Schick, Martin J.; and Knitter, Kathy A., to Diamond Shamrock Corporation. Aqueous carbonaceous slurries. 4,415,338., Cl. 44-51.000.
- Schiel, Christian; and Wolf, Robert, to J. M. Voith GmbH. Press roll with adjustable flexion. 4,414,890., Cl. 100-162.00B.
- Schierl, Ludwig: See—  
Simpson, Carroll; and Schierl, Ludwig, 4,414,756., Cl. 34-23.000.
- Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG. Needle selection device for a knitting machine. 4,414,806., Cl. 66-75.200.
- Schindler, Rudolf: See—  
Brunsch, Klaus; and Schindler, Rudolf, 4,414,860., Cl. 74-579.00E.
- Schippers, Heinz: See—  
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, 4,414,803., Cl. 57-340.000.
- Schlaepfer, Robert J., to Jacob Schlaepfer & Co. AG. Decoration of sheet material. 4,415,623., Cl. 428-200.000.
- Schlafer, Ludwig; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Solid compositions of water-soluble fiber-reactive dyestuffs and dialkylphthalene sulfonic acid and formaldehyde condensate. 4,415,333., Cl. 8-524.000.
- Schlage Lock Company: See—  
Schnarr, Raymond H.; and Zunkel, Richard L., 4,414,703., Cl. 16-52.000.
- Schleimer, Francois: See—  
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358., Cl. 75-58.000.
- Schley, Robert: See—  
Lacoste, Jean-Andre; Leveque, Jean-Pierre; and Schley, Robert, 4,415,758., Cl. 136-233.000.
- Schlumberger Technology Corp.: See—  
Blizard, Robert B., 4,415,998., Cl. 367-25.000.
- Schlup, Jean-Claude: See—  
Kudelski, Stefan; and Schlup, Jean-Claude, 4,415,912., Cl. 346-154.000.
- Schmid Laboratories, Inc.: See—  
Reddy, K. Prakash, 4,415,548., Cl. 424-28.000.
- Schmidt, Delf: See—  
Metzger, Karl G.; Pfizner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.
- Schmidt, Hans; and Wolff, Robert A., to Matsushita Electric Industrial Co., Ltd. Adjustable potentiometer assembly for tuning multi-band television receivers. 4,415,930., Cl. 358-191.100.
- Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, to Bayer Aktiengesellschaft. Thermoplastic, branched aromatic polyphosphonates, and a process for their production. 4,415,719., Cl. 528-167.000.
- Schmitz, Gerd, to Sulzer Brothers Limited. Retractor apparatus for a weft-inserting projectile in a weaving machine. 4,415,010., Cl. 139-439.000.
- Schmuck, Phillip W., to Baker International Corporation. Formation protection valve apparatus and method. 4,415,038., Cl. 166-373.000.
- Schnarr, Raymond H.; and Zunkel, Richard L., to Schlage Lock Company. Door closer and holder. 4,414,703., Cl. 16-52.000.
- Schneider, Conrad H.: See—  
de Weck, Alain L.; Schneider, Conrad H.; and Rolli, Hans P., 4,415,492., Cl. 260-112.50R.
- Schneider, Jochen: See—  
Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634., Cl. 428-579.000.
- Schober, Annette: See—  
Pioch, Peter P.; and Schober, Annette, 4,414,743., Cl. 30-124.000.
- Schoenig, Darrell A. Portable volleyball apparatus. 4,415,163., Cl. 273-411.000.
- Schoofs, Franciscus A. C. M.: See—  
Nijman, Aloysius J.; and Schoofs, Franciscus A. C. M., 4,415,775., Cl. 179-78.00R.
- Schopper, Bernd, to ITT Industries, Inc. An integral wheel brake cylinder and pressure regulating valve. 4,415,209., Cl. 303-6.00C.
- Schrenkel, Jack: See—  
Dublin, Wilbur L., Jr.; and Schrenkel, Jack, 4,414,846., Cl. 73-151.000.



- Schroder, Theo: See—  
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557, Cl. 424-172.000.
- Schulz, Alfred: See—  
Honig, Gunter; Kiencke, Uwe; and Schulz, Alfred, 4,414,949, Cl. 123-479.000.
- Schumacher, Ignatius; and Wang, Kang-Bo, to Monsanto Company. Vapor phase nitration of aromatic compounds, 4,415,744, Cl. 560-20.000.
- Schur, Inc.: See—  
Collins, Walter W., 4,414,744, Cl. 30-151.000.
- Schuss, Jack A.: See—  
Delin, Michael A.; and Schuss, Jack A., 4,415,884, Cl. 340-500.000.
- Schutjser, Jan A. J., to Akzo. Porous inorganic support material coated with an organic stationary phase, for use in chromatography, and process for its preparation, 4,415,631, Cl. 428-405.000.
- Schutte, Manfred: See—  
Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, 4,415,561, Cl. 424-219.000.
- Schwartz, Michael A.; and Yamagata, Toshio, to Press Machinery Corporation of Illinois. Method and apparatus for conversion of a printing press to offset printing, 4,414,895, Cl. 101-177.000.
- Schwartz, Wesley W., to Square D Company. Patient light with hanger and hinge arrangement for removal without tools, 4,415,957, Cl. 362-297.000.
- Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, to Immuno Aktiengesellschaft fur chemischmedizinische Produkte. Tissue adhesive, 4,414,976, Cl. 128-334.00R.
- Schweigert, Lothar L.; and Paik, Stephen R. Lid and seal for jar, 4,415,095, Cl. 215-329.000.
- Schwengeler, Peter, to Rieter Machine Works Limited. Apparatus for winding a thread, 4,415,125, Cl. 242-18.0DD.
- Schwob, Pierre, to SEB S.A. Steam iron sole plate design, 4,414,766, Cl. 38-77.830.
- SCM Corporation: See—  
Miller, Donald E.; and Werstak, Charles E., 4,415,600, Cl. 426-613.000.
- Scoggins, Lacey E.; and Munro, Bradley L., to Phillips Petroleum Company. Recovering granular poly(arylene sulfide) particles from a poly(arylene sulfide) reaction mixture, 4,415,729, Cl. 528-388.000.
- Scott, Waller M., Jr., to Scovill Inc. Musical door chime preferably also combined with a clock for announcing the time, 4,414,877, Cl. 84-1.130.
- Scott, Warner C., to Texas Instruments Incorporated. Character recognition method and apparatus, 4,415,880, Cl. 382-27.000.
- Scovill Inc.: See—  
Scott, Waller M., Jr., 4,414,877, Cl. 84-1.130.
- Scripps Clinic and Research Foundation: See—  
Weigle, William O.; and Morgan, Edward L., 4,415,493, Cl. 260-112.50R.
- SEB S.A.: See—  
Schwob, Pierre, 4,414,766, Cl. 38-77.830.
- Sebald, Robert H.: See—  
Anjos, Theodore R.; Fay, Robert J.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715, Cl. 24-283.000.
- Seelich, Thomas: See—  
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976, Cl. 128-334.00R.
- Seelye, William F.: See—  
McCall, Charles F.; and Seelye, William F., 4,415,181, Cl. 280-700.000.
- Seienia, Industrie Elettrotecnica Associate, S.p.A.: See—  
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, 4,415,304, Cl. 414-589.000.
- Seirei Industry Company Limited: See—  
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088, Cl. 209-687.000.
- Sekiya, Toshifumi: See—  
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877, Cl. 338-34.000.
- Sellwood, Raymond E., to M.L. Aviation Company Limited. Explosive device including an ignition circuit monitor, 4,414,901, Cl. 102-206.000.
- Senda, Kenichi: See—  
Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, 4,415,680, Cl. 521-56.000.
- Seragnoli, Enzo, to G. D. Societa' per Azioni. Method and device for replacing a first, nearly empty reel of strip material with a second, new reel, 4,415,127, Cl. 242-58.100.
- Seton Company: See—  
Cioca, George; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628, Cl. 428-335.000.
- Setzer, Herbert J.; Lesieur, Roger R.; and Karavalis, Sam, to United Technologies Corporation. Autothermal reforming catalyst, 4,415,484, Cl. 502-332.000.
- Setzer, Herbert J.: See—  
Vine, Raymond W.; Trocciola, John C.; and Setzer, Herbert J., 4,415,537, Cl. 422-180.000.
- Shafer, Merrill W.: See—  
Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., 4,415,905, Cl. 346-1.100.
- Shah, Nutan B.; and Cook, Marvin K., to Richardson-Vicks Inc. Toothpastes with reduced salinity, 4,415,549, Cl. 424-52.000.
- Shapiro, Jules S., to Minnesota Mining and Manufacturing Company. Internal fixation of bone, tendon, and ligaments, 4,414,967, Cl. 128-92.00B.
- Shapiro, Justin J.; and MacDermott, Bruce R. Incremental liquid dispensing device, 4,415,101, Cl. 222-288.000.
- Shapland, Earl P.; and King, Patrick D., to USS Engineers and Consultants, Inc. Full throttle valve and method of tube and gate change, 4,415,103, Cl. 222-590.000.
- Sharon Manufacturing Company: See—  
Hudson, Sharon J., Jr., 4,415,187, Cl. 285-173.000.
- Sharp Kabushiki Kaisha: See—  
Kawase, Yoshitaka, 4,415,887, Cl. 340-635.000.
- Suzuki, Hiroyuki, 4,416,003, Cl. 369-75.200.
- Shaw, Henry A., to N. V. Weefautomaten Picanol. Weft inserting device for pneumatic weaving looms, 4,415,009, Cl. 139-435.000.
- Shaw, Jonathan L., to Western Electric Company, Incorporated. Ladder foot, 4,415,062, Cl. 182-109.000.
- Shell Oil Company: See—  
Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., 4,415,293, Cl. 405-216.000.
- Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,415,675, Cl. 518-715.000.
- Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,415,676, Cl. 518-715.000.
- Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., 4,415,445, Cl. 209-5.000.
- Shenvi, Ashokkumar B.: See—  
Ciganek, Engelbert; and Shenvi, Ashokkumar B., 4,415,736, Cl. 546-283.000.
- Shepherd, Lloyd: See—  
Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, 4,415,653, Cl. 430-296.000.
- Shepherd, William C. Tree-like decorative device, 4,415,953, Cl. 362-32.000.
- Sheppard, David P. Dart target system, 4,415,162, Cl. 273-371.000.
- Sherwood, John R., to AMF Incorporated. Ground conductor monitoring system, 4,415,850, Cl. 324-51.000.
- Shew, David S. System for setting sheet-form type, 4,415,253, Cl. 354-292.000.
- Shibata, Akira, to Chugai Denki Kogyo K.K. Method of making composite electrical contact, 4,414,742, Cl. 29-882.000.
- Shibata, Toshihiro: See—  
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryoza, 4,415,688, Cl. 524-102.000.
- Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,415,689, Cl. 524-103.000.
- Shibata, Yoshihisa: See—  
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570, Cl. 424-249.000.
- Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor having an improved lubricant oil feeding arrangement, 4,415,315, Cl. 417-269.000.
- Shields, John. Electro-optical analyzer for measuring percentage by weight of fat, protein and lactose in milk, 4,415,809, Cl. 250-432.00R.
- Shimada, Toshio: See—  
Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, 4,415,727, Cl. 528-272.000.
- Shimazaki, Kanzo: See—  
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088, Cl. 209-687.000.
- Shimura, Takaki: See—  
Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,414,850, Cl. 73-599.000.
- Shinagawa, Akihiro: See—  
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,415,411, Cl. 204-29.000.
- Shindo, Minoru: See—  
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takashi, Shigeru; and Shindo, Minoru, 4,415,573, Cl. 424-251.000.
- Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569, Cl. 424-248.570.
- Shinoda, Nobuhiko: See—  
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924, Cl. 358-50.000.
- Shinohara, Hiroichi, to Ricoh Co., Ltd. Tessor type lens systems for facsimile, 4,415,241, Cl. 350-476.000.
- Shinozaki, Fumiaki: See—  
Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650, Cl. 430-273.000.
- Shipley, Randall S.; and Freyer, Larry E., to Dow Chemical Company. The Polymerizing olefins with catalysts containing the reaction product of a transition metal compound and a boron compound, 4,415,712, Cl. 526-122.000.
- Shirai, Tatsunori: See—  
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370, Cl. 148-1.500.
- Shiraki, Yasuyuki: See—  
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569, Cl. 424-248.570.
- Shirk, Michael H., to United States of America, Air Force. Aircraft having variable incidence forward-swept wing, 4,415,132, Cl. 244-48.000.

- Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, to Hitachi, Ltd. Process for treating liquid waste containing solid fine particles, 4,415,457, Cl. 210-682.000.
- Shoji, Masao; and Kinoshita, Yoshio, to NSK-Warner K. K. One-way clutch, 4,415,072, Cl. 192-45.000.
- Short, Michael R.: See—  
Munger, Stanley H.; Short, Michael R.; and Swatton, David W., 4,415,649, Cl. 430-271.000.
- Shu, Winston R., to Mobil Oil Corporation. Carbonated waterflooding for viscous oil recovery using a CO<sub>2</sub> solubility promoter and demoter, 4,415,032, Cl. 166-273.000.
- Shulman, Elliott: See—  
Osrow, Harold; and Shulman, Elliott, 4,415,323, Cl. 425-72.00S.
- Shutt, Sidney G., to Rockwell International Corporation. Three-axis accelerometer, 4,414,848, Cl. 73-497.000.
- Siegel, Don L., to President and Fellows of Harvard College. Cell culture, 4,415,668, Cl. 435-241.000.
- Siemens AG: See—  
Lechner, Robert; and Wintzer, Klaus, 4,415,881, Cl. 340-347.0AD.
- Siemens Aktiengesellschaft: See—  
Birkle, Siegfried; Gehring, Johann; and Stoger, Klaus, 4,415,422, Cl. 204-199.000.
- Cutter, David; and Unterberger, Hans, 4,415,981, Cl. 364-518.000.
- Degenhardt, Heinz, 4,415,471, Cl. 252-301.360.
- Glock, Hans, 4,415,995, Cl. 365-190.000.
- Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, 4,415,257, Cl. 355-3.0TR.
- Kreutzew, Hans; and Mattuschka, Werner, 4,415,826, Cl. 310-354.000.
- Mueller, Ruediger, 4,415,816, Cl. 307-265.000.
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Franke, George, 4,415,801, Cl. 235-101.000.
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- Tullman, Edward J., 4,414,907, Cl. 112-158.00B.
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Caratsch, Hans P., 4,414,914, Cl. 118-63.000.
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Evans, John M.; and Gilroy, Keith, 4,414,983, Cl. 128-747.000.
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Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,415,185, Cl. 285-114.000.
- Socapex: See—  
Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, 4,415,347, Cl. 65-4.210.
- Societa Cavi Pirelli Societa per Azioni: See—  
Priaroggia, Paolo G.; and Occhini, Elio, 4,415,761, Cl. 174-25.00R.
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Messe, Gerard; and Faure, Michel, 4,415,874, Cl. 336-178.000.
- Societe Anonyme dite: Institut Merieux: See—  
Tayot, Jean-Louis, 4,415,733, Cl. 536-53.000.
- Societe Anonyme dite: Stein Industrie: See—  
Nicolas, Jacques; and Lenglet, Paul, 4,414,833, Cl. 72-13.000.
- Societe d'Applications des Machines Motrices: See—  
Devaud, Gerard L., 4,414,881, Cl. 91-216.00R.
- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": See—  
Bouiller, Jean G.; Crozet, Francois E. G.; and Soligny, Marcel R., 4,415,310, Cl. 416-95.000.
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Zumsteg, Alphonse, 4,415,870, Cl. 331-176.000.
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Lai, John T.; and Son, Pyong N., 4,415,684, Cl. 524-92.000.
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Hay, Thomas M., III, 4,415,891, Cl. 340-753.000.
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Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, 4,415,347, Cl. 65-4.210.
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Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,415,155, Cl. 273-26.00E.
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Huffman, Charles E.; and Southerland, Stephen R., 4,416,009, Cl. 370-100.000.
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- Spencer, Larry K. Three-way hydraulic controller, 4,414,995, Cl. 137-77.000.
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Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., 4,415,835, Cl. 313-627.000.
- Sperry Corporation: See—  
Adcock, Ralph L., 4,415,972, Cl. 364-200.000.
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- Clark, Charles A., Jr., 4,415,960, Cl. 363-21.000.
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- Spies, Joachim: See—  
Vale, Wylie W., Jr.; Spies, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., 4,415,558, Cl. 424-177.000.



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Wibben, Eddie K. Sr.; and Spigolon, Silvio J., 4,415,543., Cl. 423-175,000.
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Kunkel, Kenneth L.; Miller, Loren K.; Spriguel, Kenneth A.; and Williams, Stephen L., 4,414,843., Cl. 73-66,000.
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Schwartz, Wesley W., 4,415,957., Cl. 362-297,000.
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- Stahlin, John H., to Westinghouse Electric Corp. Missile system with acceleration induced operational energy. 4,415,130., Cl. 244-3,150.
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Kleiner, Walter, 4,415,007., Cl. 139-329,000.
- Stamcarbon B.V.: See—  
Dorrestijn, Antoon; Lemstra, Pieter J.; and van Unen, Lambert H. T., 4,415,514., Cl. 264-53,000.
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Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., 4,415,474., Cl. 502-117,000.
- Chan, Albert F.; and Casteel, Jerry F., 4,415,033., Cl. 166-274,000.
- Cordell, Ralph L., 4,415,857., Cl. 324-357,000.
- Wiggins, Wayne T., 4,415,406., Cl. 156-668,000.
- Wiggins, Wayne T.; and Gerry, Frank S., 4,415,520., Cl. 264-171,000.
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Hargreaves, Jay T.; and Hensley, Albert L., 4,415,434., Cl. 208-11,00R.
- Standard Oil Company (Indiana): See—  
Fields, Ellis K., 4,415,483., Cl. 502-255,000.
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- Puskas, Imre; and James, David E., 4,415,479., Cl. 502-85,000.
- Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., 4,415,336., Cl. 44-13,000.
- York, Earl D., 4,415,430., Cl. 208-8,00R.
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- Stanko, Ronald T., to Montefiore Hospital. Method for preventing body fat deposition in mammals. 4,415,576., Cl. 424-252,000.
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Chuang, Shih, 4,415,827., Cl. 310-370,000.
- Staton, Eric. Room decoration. 4,414,767., Cl. 40-429,000.
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Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506., Cl. 260-986,000.
- Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., 4,415,351., Cl. 71-87,000.
- Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,352., Cl. 71-88,000.
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- Robbins, Jeffrey D., 4,415,503., Cl. 260-502,50F.
- Tsai, Chung-Chieh, 4,415,469., Cl. 252-182,000.
- Stavrov, Leonid P.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorova, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegov, Lidia T., administrator, 4,415,538., Cl. 422-224,000.
- Stednitz, Denis P., to Ace Orthopedic Manufacturing, Inc. Fixation pin. 4,414,966., Cl. 128-92,00B.
- Steele, Ronald, to Development & Finance Limited. Kit for converting a bed into a four-poster. 4,414,727., Cl. 29-401,100.
- Steinbrecher, Wolfgang: See—  
Satzinger, Gerhard; Herrmann, Manfred; Fritsch, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495., Cl. 260-239,00D.
- Stellar Systems, Inc.: See—  
Mongeon, Ronald W., 4,415,885., Cl. 340-552,000.
- Stephenson, Edgar O.; and Brown, Victor R. R., to General Electric Company. High temperature insulated casing. 4,415,184., Cl. 285-47,000.
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Leshner, George Y.; and Singh, Baldev, 4,415,578., Cl. 424-263,000.
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- Stetter, Jorg: See—  
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- Stevenson, Christopher T. S., to Litton Industrial Products, Inc. Friction welding machine having an expanding mandrel backstop assembly. 4,415,172., Cl. 279-33,000.
- Stoger, Klaus: See—  
Birkle, Siegfried; Gehring, Johann; and Stoger, Klaus, 4,415,422., Cl. 204-199,000.
- Stone, Robert O.: See—  
Laug, Owen B.; Gordon, Charles C.; and Stone, Robert O., 4,415,974., Cl. 364-426,000.
- Straffello, Nicholas. Offset printing. 4,414,892., Cl. 101-44,000.
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Gross, Kenny C.; and Strain, Robert V., 4,415,524., Cl. 376-216,000.
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- Strasser, Robert A.; and Goch, Stephen W., to Ford Motor Company. Container for gas generating propellant. 4,414,902., Cl. 102-531,000.
- Strasser, Rudolf: See—  
Blum, Klaus; and Strasser, Rudolf, 4,415,499., Cl. 260-410,90N.
- Strock, William J.: See—  
Craig, Harold M.; Wagner, Walter B.; and Strock, William J., 4,414,816., Cl. 60-757,000.
- Stroessner, Rolf B.: See—  
Claburn, Robin J. T.; and Stroessner, Rolf B., 4,415,217., Cl. 339-113,00L.
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- Strong, James J.: See—  
Finch, Harvey E.; and Strong, James J., 4,415,462., Cl. 210-767,000.
- Strong-Robinette Company, Inc.: See—  
Ferrell, Robert A.; and Robinette, James A., 4,415,386., Cl. 156-64,000.
- Strozyk, Rudolf-Helmut: See—  
Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozyk, Rudolf-Helmut, 4,414,944., Cl. 123-339,000.
- Strubhar, Earl D.: See—  
Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., 4,415,035., Cl. 166-308,000.
- Studiengesellschaft Kohle mbH: See—  
Demuth, Martin; and Schaffner, Kurt, 4,415,756., Cl. 568-365,000.
- Stuerzer, Anton: See—  
Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, 4,415,257., Cl. 355-3,0TR.
- Stytsenko, Valentin D.: See—  
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477., Cl. 502-178,000.
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- Suemori, Noboru, to Hitachi, Ltd. Printing pulse control circuit for thermal printing head. 4,415,907., Cl. 346-76,0PH.
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Naito, Hiroyuki; Maruya, Takashi; and Sugawara, Masaaki, 4,415,364., Cl. 106-74,000.
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- Sugimoto, Takashi: See—  
Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, 4,415,919., Cl. 358-26,000.
- Sugimoto, Yoshikazu: See—  
Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, 4,415,457., Cl. 210-682,000.
- Sugita, Yoshimori, to Brother Kogyo Kabushiki Kaisha. Collapsible knitting machine. 4,414,827., Cl. 66-60,00H.
- Sugita, Yutaka: See—  
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262., Cl. 355-125,000.
- Sugiura, Kenitiro, to Canon Kabushiki Kaisha. Thermal printer. 4,415,908., Cl. 346-76,0PH.
- Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Jitter compensation system in a rotary recording medium reproducing apparatus. 4,415,936., Cl. 358-322,000.
- Sugiyama, Keiichi: See—  
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,414,953., Cl. 123-571,000.
- Sugiyama, Yoshiki: See—  
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,415,535., Cl. 422-143,000.
- Sultanovich, Jury A.: See—  
Brazhnikov, Vadim V.; Skorniyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodinsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863,110.
- Sulzer Brothers Limited: See—  
Herzog, Rudolf, 4,415,966., Cl. 364-162,000.
- Schmitz, Gerd, 4,415,010., Cl. 139-439,000.
- Sumitomo Metal Mining Company Limited: See—  
Chiba, Hiroshi; and Ogura, Shoichi, 4,415,917., Cl. 357-70,000.

- Sundstrand Corporation: See—  
Elmberg, Dwayne R., 4,415,782., Cl. 200-6,00A.
- Suplinskas, Raymond J.: See—  
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609., Cl. 427-249,000.
- Suzuki, Hiroyuki, to Sharp Kabushiki Kaisha. Both side record player. 4,416,003., Cl. 369-75,200.
- Suzuki, Hisashi, to Iseki & Co., Ltd. Process for waste water disposal. 4,415,451., Cl. 210-610,000.
- Suzuki, Keizo: See—  
Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, 4,414,828., Cl. 70-84,000.
- Suzuki, Koichi, to Universal Pioneer Corporation. Tangential servo control signal generating device for recorded data reproducing device. 4,415,935., Cl. 358-320,000.
- Suzuki, Kunihiko, to Nissan Motor Company, Limited. Four-wheel drive system for a wheeled vehicle. 4,415,058., Cl. 180-247,000.
- Suzuki, Kunio: See—  
Sato, Masayoshi; and Suzuki, Kunio, 4,414,897., Cl. 101-216,000.
- Suzuki Motor Company Limited: See—  
Furukawa, Akira; Araki, Minoru; and Genma, Hideyuki, 4,415,195., Cl. 296-146,000.
- Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Exposure control apparatus. 4,415,248., Cl. 354-43,000.
- Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, to Eisai Co., Ltd. Anticoagulant. 4,415,559., Cl. 424-183,000.
- Suzuki, Susumu: See—  
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010., Cl. 371-37,000.
- Svab, Eugen, to Ford Motor Company. Planetary gear arrangement for a continuously variable transmission. 4,414,862., Cl. 74-788,000.
- Svec, Frantisek: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700., Cl. 524-548,000.
- Svecia Silkscreen Maskiner AB: See—  
Ericsson, Sylve J. D., 4,414,755., Cl. 34-4,000.
- Swagger, Roy G.: See—  
McKinney, Joe R.; and Swagger, Roy G., 4,415,378., Cl. 148-12,100.
- Swallow, Brian R., to Union Carbide Corporation. Process to separate nitrogen from natural gas. 4,415,345., Cl. 62-28,000.
- Swanson, Ronald L.: See—  
Connell, Michael J.; and Swanson, Ronald L., 4,415,106., Cl. 224-221,000.
- Swatton, David W.: See—  
Munger, Stanley H.; Short, Michael R.; and Swatton, David W., 4,415,649., Cl. 430-271,000.
- Swenson, Robert E.; Sasser, Lawrence D.; and George, Benjamin T., to Sperry Corporation. Cache/disk subsystem with load equalization. 4,415,970., Cl. 364-200,000.
- Swift, Stephen J.: See—  
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979., Cl. 128-419,00F.
- Swindal, James L.: See—  
Grantham, Daniel H.; and Swindal, James L., 4,415,948., Cl. 361-283,000.
- Swithenbank, Colin: See—  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,415,354., Cl. 71-103,000.
- Sybron Corporation: See—  
Daisley, Richard J.; and Ring, Lawrence S., 4,415,330., Cl. 433-16,000.
- Symon, Ted; and Barszcz, Chester F., to UOP Inc. Support matrix for immobilized enzymes. 4,415,663., Cl. 435-176,000.
- Symon, Ted: See—  
Barszcz, Chester F.; and Symon, Ted, 4,415,664., Cl. 435-176,000.
- Szalewski, Paul P.: See—  
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., 4,415,607., Cl. 427-96,000.
- Szoboszlai, Akos I.: See—  
Bettencourt, Darryl G.; and Szoboszlai, Akos I., 4,414,792., Cl. 56-10,200.
- Szonntag, Eugene L., to Honeywell Inc. Method for operating a gas analyzing system and apparatus utilizing the same. 4,415,278., Cl. 374-37,000.
- Tabata, Yukio: See—  
Kawanishi, Toshiyuki; and Tabata, Yukio, 4,415,903., Cl. 346-1,100.
- Tagashira, Minoru: See—  
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958., Cl. 126-450,000.
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- Taiho Kogyo Co., Ltd.: See—  
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,415,168., Cl. 277-96,100.
- Tajima, Tetsuya: See—  
Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, 4,415,559., Cl. 424-183,000.
- Tajima, Yoshio: See—  
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, 4,415,718., Cl. 526-348,600.
- Takada, Toshiaki; and Hiraiwa, Kazuyoshi, to Nissan Motor Co., Ltd. Apparatus for detecting the neutral position of a manual transmission for motor vehicles. 4,415,786., Cl. 200-61,910.
- Takada, Yusaku: See—  
Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, 4,415,256., Cl. 355-3,0TR.
- Takagi, Shunichi: See—  
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamoto, Takahito, 4,415,828., Cl. 313-118,000.
- Takagiwa, Hiroyuki: See—  
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106,600.
- Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, to Hitachi, Ltd. Dual loop type data highway system. 4,416,008., Cl. 370-88,000.
- Takahashi, Masayoshi: See—  
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,414,908., Cl. 112-169,000.
- Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, to NGK Spark Plug Co., Ltd. Gas sensing element. 4,415,877., Cl. 338-34,000.
- Takanashi, Shigeru: See—  
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251,000.
- Takawashi, Tamio: See—  
Yamada, Shigeo; Takawashi, Tamio; and Sakakibara, Toshimitsu, 4,415,791., Cl. 219-69,00G.
- Takei, Yoshiaki: See—  
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59,000.
- Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641., Cl. 430-59,000.
- Takematsu, Yoshiyuki, to Fuji Koki Corporation. Electric flash apparatus. 4,415,247., Cl. 354-33,000.
- Takemori, Toshio; Kato, Masateru; and Masuda, Fumio, to Lotte Co., Ltd. Marshmallow frozen confection. 4,415,595., Cl. 426-101,000.
- Takenaka, Akira; and Fukuoka, Tatsuhiko, to Taiho Kogyo Co., Ltd. Mechanical seal. 4,415,168., Cl. 277-96,100.
- Takeshima, Masaki: See—  
Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, 4,415,457., Cl. 210-682,000.
- Takeuchi, Shigefumi: See—  
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933., Cl. 358-281,000.
- Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, to Toyota Jidosha Kogyo Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Locking apparatus for compartment door operated by a key. 4,414,828., Cl. 70-84,000.
- Takizawa, Kinji, to Mitutoyo Mfg. Co., Ltd. Linear scale type measuring instrument. 4,414,746., Cl. 33-125,00C.
- Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Electrostatic image developing toner and a method for the production thereof. 4,415,644., Cl. 430-106,600.
- Tamukai, Tadao: See—  
Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, 4,414,893., Cl. 101-93,150.
- Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Color original readout apparatus. 4,415,925., Cl. 358-75,000.
- Tanabe Seiyaku Co., Ltd.: See—  
Chibata, Ichiro; Yamada, Shigeaki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504., Cl. 260-501,120.
- Tanabe, Sohei: See—  
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497., Cl. 260-245,20T.
- Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, to Matsushita Electric Industrial Co., Ltd. Multi-function oven with control circuit for operation during fermentation of yeast containing product. 4,415,799., Cl. 219-400,000.
- Tanaka, Kazushi: See—  
Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, 4,415,630., Cl. 428-403,000.
- Tanaka, Nobuyoshi: See—  
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920., Cl. 358-37,000.
- Tanaka, Ryoichi: See—  
Nishida, Chikashi; Okita, Yoshihiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,030., Cl. 180-6,480.
- Tanaka, Toru: See—  
Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, 4,415,919., Cl. 358-26,000.
- Tanaka, Toshio: See—  
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785., Cl. 200-38,00B.
- Tang, Donald C. L.: See—  
Tang, Robin K. L.; and Tang, Donald C. L., 4,415,776., Cl. 179-81,00R.
- Tang, Robin K. L.; and Tang, Donald C. L. Telephone music-on-hold device. 4,415,776., Cl. 179-81,00R.
- Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, to Nippon Kokan Kabushiki Kaisha. Method for forcedly cooling a heated metal plate. 4,415,381., Cl. 148-153,000.
- Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester fiber dyeable under normal



- pressure and process for the production thereof. 4,415,726, Cl. 528-272.000.
- Tanner, Nathan S.: See—  
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,416,014, Cl. 373-93.000.
- Tanswell, Paul: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700, Cl. 524-548.000.
- Tao, Lung-jo: See—  
Collins, Thomas W.; and Tao, Lung-jo, 4,415,987, Cl. 365-12.000.
- Tar, Domokis, to Cerberus AG. Radiation detector for a flame alarm. 4,415,806, Cl. 250-339.000.
- Tarasenko, Jury A.: See—  
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analý G.; Lubotskaya, Lidia N.; Playvniets, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550, Cl. 424-57.000.
- Tarr, Walter R.: See—  
Sanfleben, Keith E.; and Tarr, Walter R., 4,415,363, Cl. 75-229.000.
- Taruttis, Arno H.: See—  
Vogel, Horst; Idler, Horst; and Taruttis, Arno H., 4,415,899, Cl. 343-413.000.
- Tatsumi, Susumu: See—  
Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, 4,415,533, Cl. 422-4.000.
- Taylor, Jerry F., to Mine Equipment Company. Multiple personnel transporter vehicle for low vein mines. 4,415,051, Cl. 180-65.00R.
- Taylor, Mark P.: See—  
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,415,672, Cl. 501-4.000.
- Taylor, Rodney S.: See—  
Biscoe, Thomas S.; and Taylor, Rodney S., 4,415,147, Cl. 267-111.000.
- Taylor, Thomas L.: See—  
Morgan, R. Dean; Mauldin, Donald M.; and Taylor, Thomas L., 4,414,753, Cl. 36-11.500.
- Tayot, Jean-Louis, to Societe Anonyme dite: Institut Merieux. Ganglioside derivatives, their preparation and their application. 4,415,733, Cl. 536-53.000.
- Tazaki, Shigemitsu, to Canon Kabushiki Kaisha. Recording apparatus. 4,415,911, Cl. 346-140.00R.
- Tazaki, Shigemitsu: See—  
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886, Cl. 340-618.000.
- TDK Electronics Co., Ltd.: See—  
Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, 4,415,630, Cl. 428-403.000.
- TechAmerica Group, Inc.: See—  
de Castro, Aurora F.; and Gupta, Surendra K., 4,415,655, Cl. 435-17.000.
- Tektronix, Inc.: See—  
Palquist, Steven R.; and Gaiser, Ronald D., 4,415,861, Cl. 328-58.000.
- Penney, Bruce J., 4,415,927, Cl. 358-139.000.
- Teletronics Pty. Ltd.: See—  
Church, Victor E., 4,414,978, Cl. 128-419.0PG.
- Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979, Cl. 128-419.00F.
- Telefonaktiebolaget L. M. Ericsson: See—  
Gustafsson, Rolf E. O., 4,415,865, Cl. 330-271.000.
- Telex Communications, Inc.: See—  
Daly, William T.; Gelman, Boris; and Sanderson, William R., 4,415,244, Cl. 353-101.000.
- Telex Computer Products, Inc.: See—  
Plachy, Ivo T., 4,415,513, Cl. 264-45.400.
- Tenebruso, Jerry C. Wheeled corner members for luggage. 4,415,173, Cl. 280-47.13R.
- Terada, Sadatugu: See—  
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644, Cl. 430-106.600.
- Teraoka, Kazuharu. Weight measuring, price computing and packing apparatus. 4,415,048, Cl. 177-5.000.
- Terasawa, Koji: See—  
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886, Cl. 340-618.000.
- Terrell, Jamie B.: See—  
Pratt, Donna K.; and Terrell, Jamie B., 4,415,029, Cl. 166-212.000.
- Teaske, Lothar. Device for emptying a round bulk-material silo. 4,415,102, Cl. 222-411.000.
- Tetras S.A.: See—  
Hoffman, Lionel B., 4,415,263, Cl. 355-3.0SH.
- Texaco Inc.: See—  
Canup, Robert E., 4,414,954, Cl. 123-606.000.
- Kaufman, Benjamin J., 4,415,740, Cl. 549-273.000.
- Larkin, John M., 4,415,755, Cl. 564-480.000.
- Nieh, Edward C. Y., 4,415,717, Cl. 526-287.000.
- Slough, Carlton M.; and Colling, Edwin L., Jr., 4,415,859, Cl. 324-442.000.
- Smolin, William, 4,415,481, Cl. 502-62.000.
- Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,415,478, Cl. 502-181.000.
- Texas Instruments Incorporated: See—  
Lachmann, Leonard P.; and Garza, Cesario S., Jr., 4,415,983, Cl. 364-708.000.
- Scott, Warner C., 4,415,880, Cl. 382-27.000.
- Thim, Stig, to A. Betong AB. Device for sleepers for railway tracks. 4,415,120, Cl. 238-8.000.
- Thirlwall, Alan C.: See—  
Ive, John G. S.; and Thirlwall, Alan C., 4,415,994, Cl. 365-189.000.
- Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr. Microbial degradation of petroleum materials. 4,415,661, Cl. 435-174.000.
- Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr. Microbial degradation of petroleum materials. 4,415,662, Cl. 435-176.000.
- Thomas & Betts Corporation: See—  
Narozny, Ronald S., 4,415,216, Cl. 339-107.000.
- Thomas, Harold T.: See—  
Specht, Donald P.; and Thomas, Harold T., 4,415,621, Cl. 428-172.000.
- Thomas, Michael D.: See—  
Ryder, Francis E.; and Thomas, Michael D., 4,414,975, Cl. 128-314.000.
- Thompson, Edwin G.: See—  
Bayless, John R.; Hargrove, Homer G.; and Thompson, Edwin G., 4,415,021, Cl. 165-76.000.
- Thompson, Martin K.: See—  
Nield, Eric; and Thompson, Martin K., 4,415,699, Cl. 524-538.000.
- Thompson, Paul W.: See—  
Huizinga, Donald D.; and Thompson, Paul W., 4,416,007, Cl. 370-62.000.
- Thomson-CSF: See—  
Reymond, Jean C.; and Gontier, Maurice, 4,415,922, Cl. 358-22.000.
- Thornbery, James M.; Obermann, George; and Mateja, Edward J., to Singer Company. The Timer with delayed start capability. 4,415,784, Cl. 200-35.00R.
- Thornton, Jack C.; and Russell, Randy G., to Rockwell International Corporation. Variable inductor having reduced arcing tendency. 4,415,873, Cl. 336-139.000.
- Thornton, James O.: See—  
Allmendinger, James M.; and Thornton, James O., 4,415,369, Cl. 134-22.120.
- Thorp, James B. Door locking mechanism. 4,415,191, Cl. 292-346.000.
- Thorsett, Eugene D.: See—  
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvrat, Matthew J., Jr., 4,415,496, Cl. 260-239.30B.
- Thorsteinson, Erlind M.: See—  
Decker, Harry J.; and Thorsteinson, Erlind M., 4,415,752, Cl. 562-534.000.
- Throner, Guy C., to Battelle Memorial Institute. Gas regulated compensating valve mechanism for firearms. 4,414,880, Cl. 89-193.000.
- Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, to BASF Aktiengesellschaft. Carbamate dihydropyridazinones, their preparation and therapeutic agents containing these compounds. 4,415,571, Cl. 424-250.000.
- Tideland Signal Corporation: See—  
Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., 4,415,951, Cl. 362-20.000.
- Tiefel, Thomas H.: See—  
Jin, Sungho; and Tiefel, Thomas H., 4,415,380, Cl. 148-101.000.
- Tiemens, Ulf: See—  
Curth, Claus P.; Tiemens, Ulf; and Klotz, Erhard, 4,416,018, Cl. 378-2.000.
- Tiger, Ronald L.: See—  
Kammeraad, James A.; and Tiger, Ronald L., 4,414,723, Cl. 29-26.00A.
- TII Industries, Inc.: See—  
Wortman, Donald W., 4,415,943, Cl. 361-22.000.
- Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, to Dow Chemical Co., The. Polycarbonate type nonionic surfactants. 4,415,502, Cl. 260-463.000.
- Timex Corporation: See—  
Capolupo, David F., 4,414,719, Cl. 24-265.0WS.
- Kostanecki, Andrew T.; and Mileos, George, 4,414,714, Cl. 24-265.0WS.
- Timms, Donny L., to Manville Service Corporation. Method and apparatus for shaping fiber mats. 4,415,517, Cl. 264-118.000.
- Ting Enterprises, Inc.: See—  
Evans, Jeffrey L., 4,414,957, Cl. 126-121.000.
- Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, to Daicel Chemical Industries, Ltd. Aqueous dispersion of a cellulose derivative. 4,415,703, Cl. 525-54.210.
- Tobin, Mary S., to United States of America, Navy. Distributed feedback laser employing the stark effect. 4,416,013, Cl. 372-96.000.
- Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, to Daicel Chemical Industries, Ltd. Modified polyethylene terephthalate molding material. 4,415,727, Cl. 528-272.000.
- Tokai Electric Wire Company Limited: See—  
Inoue, Nori; and Katsuki, Shogo, 4,415,221, Cl. 339-258.00F.
- Tokuda, Ryuji: See—  
Tsuzuki, Hiroyoshi; and Tokuda, Ryuji, 4,415,249, Cl. 354-173.000.
- Tokumo, Akio, to Pioneer Electronic Corporation. Pulse width modulation amplifier. 4,415,863, Cl. 330-10.000.
- Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, to Toyo Stauffer Chemical Co., Ltd. High activity supported cata-

- lytic components and method for homo- or co-polymerization of  $\alpha$ -olefin. 4,415,713, Cl. 526-125.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—  
Aiba, Toshiyuki, 4,415,822, Cl. 310-59.000.
- Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372, Cl. 148-1.500.
- Menjo, Atsuhiko; and Saitoh, Shinji, 4,414,737, Cl. 29-578.000.
- Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, 4,415,919, Cl. 358-26.000.
- Nishikawa, Mineki, 4,415,982, Cl. 364-527.000.
- Ohmura, Hideo; and Horino, Shigeo, 4,414,730, Cl. 29-426.300.
- Tomas, Pantcho, to British Gas Corporation. Iron based alloy. 4,415,361, Cl. 75-124.000.
- Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Piperazinylcarbostyryl compounds. 4,415,572, Cl. 424-250.000.
- Tomioka, Hiroyuki: See—  
Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529, Cl. 420-434.000.
- Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, to Toyota Koki Kabushiki Kaisha. Machine tool with automatic tool change function. 4,414,732, Cl. 29-568.000.
- Top Shelf Company, Inc.: See—  
Fair, Rickey F.; and Wilcox, John R., 4,414,959, Cl. 126-332.000.
- Toray Industries, Inc.: See—  
Nakayama, Takashi; Yamagata, Seiichi; and Kajita, Koji, 4,414,800, Cl. 57-236.000.
- Yamagata, Seiichi; and Sakai, Masaaki, 4,415,611, Cl. 428-15.000.
- Torobin, Leonard B. Method and apparatus for producing hollow metal microspheres and microspheroids. 4,415,512, Cl. 264-9.000.
- Tower, Clark B.: See—  
Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., 4,415,489, Cl. 252-558.000.
- Toyo Jozo Kabushiki Kaisha: See—  
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730, Cl. 536-7.100.
- Toyo Seikan Kaisha, Ltd.: See—  
Ohmi, Hidehiko, 4,415,096, Cl. 215-343.000.
- Toyo Stauffer Chemical Co., Ltd.: See—  
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713, Cl. 526-125.000.
- Toyoda Koki Kabushiki Kaisha: See—  
Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, 4,414,732, Cl. 29-568.000.
- Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, to Mitsubishi Rayon Company, Ltd. Acrylic laminated diffuser panel having high light-diffusing property and process for preparing same. 4,415,509, Cl. 264-1.300.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Itoh, Hiroshi; and Watanabe, Haruo, 4,414,942, Cl. 123-339.000.
- Nagase, Masaomi, 4,414,943, Cl. 123-339.000.
- Nakanishi, Tatsusaki, 4,414,941, Cl. 123-326.000.
- Ueda, Masahiro; and Noba, Masahiko, 4,414,937, Cl. 123-198.00D.
- Toyota Jidosha Kogyo Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: See—  
Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, 4,414,828, Cl. 70-84.000.
- Tracy, Gerald T.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Trane Company, The: See—  
Butterworth, Arthur L., 4,415,317, Cl. 418-55.000.
- Butterworth, Arthur L.; and Eber, David H., 4,415,318, Cl. 418-55.000.
- Tremblay, Meude, to Canada, Her Majesty the Queen in right of.  $\epsilon$ -Caprolactone co-polyesters useful for the preparation of polyurethane. 4,415,728, Cl. 528-279.000.
- Trenka, Herb M.: See—  
Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., 4,414,974, Cl. 128-305.000.
- Tressler, Richard E.: See—  
Monkowski, Joseph R.; and Tressler, Richard E., 4,415,545, Cl. 423-348.000.
- Trico Products, Incorporated: See—  
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,415,155, Cl. 273-26.00E.
- Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, to Seienia, Industrie Elettroniche Associate, S.p.A. System for floatingly supporting a load. 4,415,304, Cl. 414-589.000.
- Tristram, Edward W.: See—  
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvrat, Matthew J., Jr., 4,415,496, Cl. 260-239.30B.
- Tritec Industries, Inc.: See—  
Durkan, Gerald, 4,414,982, Cl. 128-716.000.
- Trocciola, John C.: See—  
Vine, Raymond W.; Trocciola, John C.; and Setzer, Herbert J., 4,415,537, Cl. 422-180.000.
- Trout, David H., to White Consolidated Industries, Inc. Chuck force modulator system for rotary type machine tool. 4,414,871, Cl. 82-40.00R.
- Trustee for David Roth: See—  
D'Elia, Conrad A., 4,415,617, Cl. 428-86.000.
- TRW Inc.: See—  
Drutchas, Gilbert H., 4,415,054, Cl. 180-79.100.
- Trzyna, William A.: See—  
Kulka, Raymond J.; and Trzyna, William A., 4,415,842, Cl. 315-411.000.
- Tsai, Chung-Chieh, to Stauffer Chemical Company. Phase stable compositions containing a paraffinic polyol and an isocyanate reactive prepolymer. 4,415,469, Cl. 252-182.000.
- Tsang, Wen-Ghih; and Slauch, Lynn H., to Shell Oil Company. Syngas conversion process. 4,415,675, Cl. 518-715.000.
- Tsang, Wen-Ghih; and Slauch, Lynn H., to Shell Oil Company. Syngas conversion process. 4,415,676, Cl. 518-715.000.
- Tschechoslowakische Akademie der Wissenschaften: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zerkova, Eva, 4,415,700, Cl. 524-548.000.
- Tsubuku, Mitsuro; and Yoshihiro, Tadanobu, to Fuji Electric Co., Ltd. Handling apparatus. 4,415,305, Cl. 414-753.000.
- Tsukioka, Kazumi: See—  
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933, Cl. 358-281.000.
- Tsumita, Norikazu: See—  
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262, Cl. 355-125.000.
- Tsuruma, Yumiko: See—  
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573, Cl. 424-251.000.
- Tsuyoshi Masumoto: See—  
Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529, Cl. 420-434.000.
- Tsuzuki, Hiroyoshi; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Motor drive circuit for camera. 4,415,249, Cl. 354-173.000.
- Tucker, Raymond W.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Tullman, Edward J., to Singer Company. The. Buttonhole width adjusting mechanism. 4,414,907, Cl. 112-158.00B.
- Turbard, Alan M.; and Foley, Peter N., to Borg-Warner Ltd. Environmental control system. 4,414,818, Cl. 62-176.100.
- Turner, Robert L. Subscriber telephone test set. 4,415,778, Cl. 179-175.10R.
- Turpin, Charles H.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598, Cl. 426-394.000.
- Turpin, Eugene W. Bead breaking tool. 4,415,014, Cl. 157-1.280.
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Vine, Fred B., 4,415,013, Cl. 152-367.000.
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Schimko, Reinhold, 4,414,806, Cl. 66-75.200.
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Diener, Erwin; and Diner, Uriel, 4,415,552, Cl. 424-91.000.
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Hull, Maury L.; and Dorius, Lee, 4,415,176, Cl. 280-612.000.  
Vyas, Girish N., 4,415,491, Cl. 260-112.50R.
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Bentley, Joseph J.; Brown, Thomas E.; and Urine, Jerome, 4,414,917, Cl. 118-695.000.
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Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, 4,415,693, Cl. 524-198.000.  
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Jacobson, Jeff A.; and Valle, Louis G., 4,414,997, Cl. 137-151.000.
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Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506, Cl. 260-986.000.
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- Van den Boom, Johannes: See—  
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148, Cl. 267-122.000.
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Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715, Cl. 24-283.000.
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Beuse, Robert H.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279, Cl. 374-204.000.
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Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772, Cl. 369-60.000.
- Vasiliev, Alexei V.: See—  
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorjeva, Elizaveta A.; Podanenko, Alexander T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538, Cl. 422-224.000.
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Heinis, Robert P.; and Vass, Eric, 4,415,270, Cl. 366-216.000.
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Frei, Willi, 4,414,882, Cl. 91-442.000.
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Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, 4,415,498, Cl. 260-351.100.
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Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., 4,415,615, Cl. 428-40.000.
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Vinciarelli, Patrizio, 4,415,959, Cl. 363-21.000.
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Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010, Cl. 371-37.000.  
Saito, Takashi; and Kumaki, Takashi, 4,416,004, Cl. 369-77.200.  
Sugiyama, Hiroyuki, 4,415,936, Cl. 358-322.000.
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Meyer, Leonard S., 4,415,061, Cl. 182-92.000.
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Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozky, Rudolf-Helmut, 4,414,944, Cl. 123-339.000.
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Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767, Cl. 381-45.000.
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Copeland, Robert J.; and Martin, John D., 4,415,759, Cl. 136-246.000.
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Barbieri, Joseph C., 4,415,006, Cl. 138-115.000.
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Chiang, Robert L., 4,415,439, Cl. 208-120.000.
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Blum, Klaus; and Strasser, Rudolf, 4,415,499, Cl. 260-410.90N.
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Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650, Cl. 430-273.000.
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Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644, Cl. 430-106.600.
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Satzinger, Gerhard; Herrmann, Manfred; Fritsch, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495, Cl. 260-239.00D.
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Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767, Cl. 381-45.000.
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Craig, Harold M.; Wagner, Walter B.; and Strock, William J., 4,414,816, Cl. 60-757.000.
- Wagner, Walter R., to UOP Inc. Apparatus for making filament reinforced plastic screen. 4,415,396, Cl. 156-425.000.
- Walber, James P.: See—  
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,415,781, Cl. 200-5.00A.
- Wald, Fritz; and Kalejs, Juris P., to Mobil Solar Energy Corporation. Control of atmosphere surrounding crystal growth zone. 4,415,401, Cl. 156-608.000.
- Walker, Francis H.: See—  
Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., 4,415,351, Cl. 71-87.000.
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Moeckel, George P.; and Wallick, George C., 4,415,999, Cl. 367-73.000.
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Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830, Cl. 313-331.000.
- Wang, C. Wallace: See—  
Gelernt, Barry; and Wang, C. Wallace, 4,415,402, Cl. 156-626.000.
- Wang, Kang-Bo: See—  
Schumacher, Ignatius; and Wang, Kang-Bo, 4,415,744, Cl. 360-20.000.
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Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906, Cl. 346-74.500.
- Wang, Teng-Ching. Folding chair having a reversible seat. 4,415,201, Cl. 297-57.000.
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Capaccio, Giancarlo; Smith, Francis S.; and Ward, Ian M., 4,415,522, Cl. 264-210.800.
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Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, 4,415,593, Cl. 426-4.000.
- Warner, Steven B.: See—  
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521, Cl. 264-176.00F.
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Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., 4,415,293, Cl. 405-216.000.
- Wasserman, Kurt J., to Insolar, Inc. Solar collection mat element. 4,414,960, Cl. 126-426.000.
- Watanabe, Haruo: See—  
Itoh, Hiroshi; and Watanabe, Haruo, 4,414,942, Cl. 123-339.000.
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Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657, Cl. 435-106.000.
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Baron, Walter J.; and Cleaver, Laird C., 4,415,022, Cl. 165-95.000.
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- Wavelek: See—  
Lo, Kwok S., 4,415,860, Cl. 328-22.000.
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Wright, Clem B., 4,415,199, Cl. 297-159.000.
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Kraus, Josef; and Wech, Erich, 4,414,900, Cl. 101-363.000.
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Gordon, Marvin; and Lichtenstein, Joseph, 4,415,288, Cl. 401-132.000.
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Fair, Rickey F.; and Wilcox, John R., 4,414,959, Cl. 126-332.000.
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Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,415,325, Cl. 425-397.000.
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McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016, Cl. 164-429.000.

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Rezakhany, Saeed, 4,414,977, Cl. 128-342.000.
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Werner, Georg; and Wisniewski, Paul, 4,415,295, Cl. 405-291.000.
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Wiech, Raymond E., Jr., 4,415,528, Cl. 419-46.000.
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Wagner, James C.; Barnard, James E.; and Woerner, Robert J., 4,416,020, Cl. 378-181.000.
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Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,415,592, Cl. 424-331.000.
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Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,415,587, Cl. 424-273.00R.
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De Cuester, Robert J. M.; Hoeben, Louis J. M.; and Wood, Clair, 4,415,836, Cl. 315-50.000.
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Romine, Donnie; and Woodard, Harry L., 4,415,080, Cl. 206-303.000.
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Craemer, Robert H.; and Woolston, A. Brent, 4,415,978, Cl. 364-475.000.
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Gratzer, Nelson R.; and Wright, William E., 4,414,834, Cl. 72-58.000.
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Kutta, Helmut W.; and Wunderlich, Donald K., 4,415,337, Cl. 44-24.000.
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Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124, Cl. 241-28.000.
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Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvrat, Matthew J., Jr., 4,415,496, Cl. 260-239.30B.
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Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088, Cl. 209-687.000.
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Ruddle, Frank H.; and Lin, Pin-Fang, 4,415,405, Cl. 156-645.000.
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Schwartz, Michael A.; and Yamagata, Toshio, 4,414,895, Cl. 101-177.000.
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Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,414,953, Cl. 123-571.000.
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- Sakurai, Yoshihiro, 4,414,929, Cl. 123-73.00R.
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Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamoto, Takahito, 4,415,828, Cl. 313-118.000.
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Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,415,508, Cl. 261-114.00R.
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Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620, Cl. 428-117.000.
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Maruyama, Teruo; Yamauchi, Shinya; Yamamura, Shiro; and Morikawa, Yoshiyuki, 4,415,320, Cl. 418-150.000.
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Nishioka, Kimihiko; and Yamashita, Nobuo, 4,415,240, Cl. 350-442.000.
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Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381, Cl. 148-153.000.
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Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reichi, 4,415,411, Cl. 204-29.000.
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Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569, Cl. 424-248.570.
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Koike, Keiichi; and Yanadori, Michio, 4,415,465, Cl. 252-70.000.
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Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572, Cl. 424-250.000.
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Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088, Cl. 209-687.000.
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Ugari, Takenori; and Yano, Yoichi, 4,416,024, Cl. 455-303.000.
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Yeda Research and Development Company Ltd.: See—  
Manassen, Joost; and Dror, Yaakov, 4,415,500., Cl. 260-429.00R.  
Yih, Roy Y.: See—  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,415,354., Cl. 71-103.000.  
Yokoi, Gunpei, to Nintendo Co., Ltd. Figure displaying game apparatus. 4,415,153., Cl. 273-1.0GC.  
Yonezawa, Toshio: See—  
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372., Cl. 148-1.500.  
Yong, Samuel H.: See—  
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.  
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Yoshida Kogyo K. K.: See—  
Kumano, Isamu, 4,414,718., Cl. 24-396.000.  
Yoshihiro, Tadanobu: See—  
Tsubuku, Mitsuro; and Yoshihiro, Tadanobu, 4,415,305., Cl. 414-753.000.  
Yoshioka, Ryuzo: See—  
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504., Cl. 260-501.120.  
Yoshisato, Akiyuki, to Alps Electric Co., Ltd. Video clamp circuit. 4,415,929., Cl. 358-171.000.  
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Koide, Atsushi; and Yoshizawa, Masayuki, 4,415,667., Cl. 435-212.000.  
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Youree, Gene T.: See—  
Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., 4,414,870., Cl. 82-36.00R.  
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Zadera, Lumir, to George Fischer, Ltd. Process of compacting moulding sand. 4,415,015., Cl. 164-37.000.  
Zaneveld, Lourens J. D.: See—  
Joyce, Cathy L.; and Zaneveld, Lourens J. D., 4,415,585., Cl. 424-273.00P.  
Zaremski, Donald R., to Allegheny Ludlum Steel Corporation. Method of controlling oxide scale formation and descaling thereof from metal articles. 4,415,415., Cl. 204-141.500.  
Zarudiansky, Alain. Methods and apparatus for recording and or reproducing tactile sensations. 4,414,984., Cl. 128-774.000.  
Zenith Radio Corporation: See—  
Kulka, Raymond J.; and Trzyna, William A., 4,415,842., Cl. 315-411.000.  
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Zhabilov, Harry P.; and Karavassileff, Todor Y., to DSO "Pharmachim". Compositions, processes for their preparation and method for treatment of neoplasms. 4,415,553., Cl. 424-95.000.  
Zielke, Darrell W., to West American Sound, Inc. Cassette handling device. 4,415,301., Cl. 414-31.000.  
Zogg, Urs, to Willi Studer, Fabrik fuer elektronische Apparate. Transistor differential circuit with exponential transfer characteristic. 4,415,820., Cl. 307-491.000.  
Zschokke Wartmann AG: See—  
Meier, Albert, 4,415,824., Cl. 310-89.000.  
Zudkevitch, David; and Belsky, Stephen E., to Allied Corporation. Process for the separation of high boiling oxygenated compounds from mixtures with phenol and/or cresol. 4,415,409., Cl. 203-51.000.  
Zumsteg, Alphonse, to Societe Suisse pour l'Industrie Horlogere Management Services SA. Oscillator circuit with digital temperature compensation. 4,415,870., Cl. 331-176.000.  
Zunkel, Richard L.: See—  
Schnarr, Raymond H.; and Zunkel, Richard L., 4,414,703., Cl. 16-52.000.  
Zurkova, Eva: See—  
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bally Manufacturing Corporation: See—  
Nutting, David J.; and Frederiksen, Jeffrey E., Re. 31,441., Cl. 273-121.00A.  
Block, Merrill. Two-phase transformer and welding circuit therefor. Re. 31,444., Cl. 219-116.000.  
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, to Hoffmann-La Roche Inc. Electrochemical electrode with heating means. Re. 31,440., Cl. 128-635.000.  
Exxon Research and Engineering Co.: See—  
Rosensweig, Ronald E., Re. 31,439., Cl. 34-1.000.  
Frederiksen, Jeffrey E.: See—  
Nutting, David J.; and Frederiksen, Jeffrey E., Re. 31,441., Cl. 273-121.00A.  
Hammacher, Konrad: See—  
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, Re. 31,440., Cl. 128-635.000.  
Hoffmann-La Roche Inc.: See—  
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, Re. 31,440., Cl. 128-635.000.  
McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Company. Treatment of silica. Re. 31,443., Cl. 526-98.000.  
Mindt, Wolfgang: See—  
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, Re. 31,440., Cl. 128-635.000.  
Nutting, David J.; and Frederiksen, Jeffrey E., to Bally Manufacturing Corporation. Player operated game apparatus. Re. 31,441., Cl. 273-121.00A.  
Owens-Illinois, Inc.: See—  
Pfaender, Lawrence V., Re. 31,442., Cl. 65-90.000.  
Pfaender, Lawrence V., to Owens-Illinois, Inc. Method and apparatus for manufacture of glass film. Re. 31,442., Cl. 65-90.000.  
Phillips Petroleum Company: See—  
McDaniel, Max P.; and Welch, Melvin B., Re. 31,443., Cl. 526-98.000.  
Rosensweig, Ronald E., to Exxon Research and Engineering Co. Process for operating a magnetically stabilized fluidized bed. Re. 31,439., Cl. 34-1.000.  
Welch, Melvin B.: See—  
McDaniel, Max P.; and Welch, Melvin B., Re. 31,443., Cl. 526-98.000.

## LIST OF REEXAM PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Honig, Helmut; and Pampouchidis, Georgios, to Vianova Kunsthartz, A.G. Self-crosslinking resin emulsions for cathodically depositable coating compositions. B1 4,174,332., 11-15-83, Cl. 523-404.000.  
La Rochelle, John H.: See—  
Nielsen, Robert P.; and La Rochelle, John H., B1 3,962,136., Cl. 252-454.000.  
Nielsen, Robert P.; and La Rochelle, John H., to Shell Oil Company. Catalyst for production of ethylene oxide. B1 3,962,136., 11-15-83, Cl. 252-454.000.  
Pampouchidis, Georgios: See—  
Honig, Helmut; and Pampouchidis, Georgios, B1 4,174,332., Cl. 523-404.000.  
S. C. Johnson & Son, Inc.: See—  
Verbrugge, Calvin J., B1 4,358,573., Cl. 526-272.000.  
Shell Oil Company: See—  
Nielsen, Robert P.; and La Rochelle, John H., B1 3,962,136., Cl. 252-454.000.  
Verbrugge, Calvin J., to S. C. Johnson & Son, Inc. Waxy maleic anhydride alpha olefin terpolymers. B1 4,358,573., 11-15-83, Cl. 526-272.000.  
Vianova Kunsthartz, A.G.: See—  
Honig, Helmut; and Pampouchidis, Georgios, B1 4,174,332., Cl. 523-404.000.

## LIST OF DESIGN PATENTEEES

- Adkins, Glenn H., to Minibow, Inc. Miniature bow. 271,411., 11-15-83, Cl. D22-5.000.  
Agfa-Gevaert Aktiengesellschaft: See—  
Thiele, Hartmut, 271,349., Cl. D3-35.000.  
Altman, Frank. Rotatable planter. 271,355., 11-15-83, Cl. D6-183.000.  
Altman, Gary M.: See—  
de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., 271,428., Cl. D26-85.000.  
American Cyanamid Company: See—  
Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., 271,418., Cl. D24-26.000.  
American Home Products Corporation: See—  
Cassini, Oleg L., 271,363., Cl. D7-137.000.  
Cassini, Oleg L., 271,364., Cl. D7-137.000.  
Cassini, Oleg L., 271,365., Cl. D7-137.000.  
Cassini, Oleg L., 271,366., Cl. D7-137.000.  
Andersen, Freddie J., to Woodchuck of Halton Hills Inc. Lamp. 271,429., 11-15-83, Cl. D26-104.000.  
Antonacci, Frank; and Carluccio, Ronald. Blow dryer. 271,430., 11-15-83, Cl. D28-13.000.  
Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., to Emerson Electric Co. Sewer cleaning machine. 271,436., 11-15-83, Cl. D32-14.000.  
Banks, John E. Vest or similar article. 271,345., 11-15-83, Cl. D2-184.000.  
Baroody, Terrance A. Coupler for structural tubes or the like. 271,375., 11-15-83, Cl. D8-382.000.  
Baroody, Terrance A. Coupler saddle for structural tubes or the like. 271,376., 11-15-83, Cl. D8-382.000.  
Bauer, Robert J. Barbell. 271,408., 11-15-83, Cl. D21-197.000.  
Bausch & Lomb Incorporated: See—  
Jordan, Paul A.; and Speaker, Edwin A., 271,399., Cl. D16-130.000.  
Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., to Cornelius Company. The Beverage dispensing valve. 271,368., 11-15-83, Cl. D7-398.000.  
Bourke, Robert E., to NBS Incorporated. Camping trailer. 271,388., 11-15-83, Cl. D12-104.000.  
Bourque, Rene, to Gamebridge Inc. Helmet. 271,347., 11-15-83, Cl. D2-232.000.  
Breland, Thomas L., to Glasrock Products, Inc. Kit for a wound drainage system. 271,422., 11-15-83, Cl. D24-56.000.



## LIST OF DESIGN PATENTEES

Brown, Wilbert C.; and Pomponi, Roman F., to TIE/communications, Inc. Direct station selection console. 271,394., 11-15-83, Cl. D14-66.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,357., 11-15-83, Cl. D6-198.000.

Butts, Lawrence D., to Scovill Inc. Knob escutcheon. 271,374., 11-15-83, Cl. D8-353.000.

C.V.B.G.: See—

Klim, Matthew J., 271,377., Cl. D9-378.000.

Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., to American Cyanamid Company. Surgical stapling instrument. 271,418., 11-15-83, Cl. D24-26.000.

Carluccio, Ronald: See—

Antonacci, Frank; and Carluccio, Ronald, 271,430., Cl. D28-13.000.

Carr, Peter B., to International Standard Electric Corporation. Telephone handset. 271,393., 11-15-83, Cl. D14-63.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,363., 11-15-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,364., 11-15-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,365., 11-15-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,366., 11-15-83, Cl. D7-137.000.

Chan, Helen C., to Simmons, Alfred Eli; and Lung, Kui-Yan. Toy figure. 271,404., 11-15-83, Cl. D21-150.000.

Cigolle, Mark: See—

Lerner, Ralph; and Cigolle, Mark, 271,354., Cl. D6-175.000.

Clark Equipment Company: See—

Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., 271,397., Cl. D15-25.000.

Coca-Cola Company, The: See—

Credle, William S., Jr., to Coca-Cola Company. The. Pump. 271,395., 11-15-83, Cl. D15-7.000.

Colgate-Palmolive Company: See—

Seelig, Barry G., 271,431., Cl. D28-64.000.

Connecticut Cycle Accessories, Inc.: See—

Turkington, Mark; and Turkington, Philip, 271,389., Cl. D12-158.000.

Cornelius Company, The: See—

Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., 271,368., Cl. D7-398.000.

CPG Products Corp.: See—

Osborne, Thomas P., 271,406., Cl. D21-185.000.

Credle, William S., Jr., to Coca-Cola Company. The. Pump. 271,395., 11-15-83, Cl. D15-7.000.

Cuccia, Luke P. Watch face. 271,383., 11-15-83, Cl. D10-126.000.

Dansk Pressalit A/S: See—

Thygesen, Rud; and Sorensen, Johnny, 271,417., Cl. D23-71.000.

De Boer, Peter, to Gispem and Staalmebel B.V. Stool. 271,352., 11-15-83, Cl. D6-29.000.

DeSoto, Inc.: See—

Lentz, William L.; Siegel, Richard A.; and Healy, Colin, 271,387., Cl. D11-145.000.

de Vos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Products Corporation. Lighting fixture. 271,427., 11-15-83, Cl. D26-85.000.

de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., to GTE Products Corporation. Lighting fixture. 271,428., 11-15-83, Cl. D26-85.000.

Dooley, Thomas E.: See—

Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Draege, George E.: See—

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevvick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Draheim, Harvey J.: See—

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,357., Cl. D6-198.000.

Dupont, S. T.: See—

Malamoud, Jean G., 271,379., Cl. D10-38.000.

Emerson Electric Co.: See—

Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

ERO Electronic s.r.l.: See—

Zanazzo, Pietro; Mainardi, Giuliano; and Giorgetti, Rodolfo, 271,380., Cl. D10-49.000.

Faust, Steven M., to Warner-Lambert Company. Two color chewing gum. 271,344., 11-15-83, Cl. D1-12.000.

Fetterman, James W. Medical valve. 271,421., 11-15-83, Cl. D24-53.000.

Fortune, William S. Solder removing tool or the like. 271,371., 11-15-83, Cl. D8-51.000.

Fortune, William S. Pin straightening and prying tool or the like. 271,372., 11-15-83, Cl. D8-88.000.

Frye, Jessie L. D. Pendant or the like. 271,384., 11-15-83, Cl. D11-76.000.

Gamebridge Inc.: See—

Bourque, Rene, 271,347., Cl. D2-232.000.

Gesner, John E., to JEG, Inc. Snow scoop. 271,369., 11-15-83, Cl. D8-10.000.

Giorgetti, Rodolfo: See—

Zanazzo, Pietro; Mainardi, Giuliano; and Giorgetti, Rodolfo, 271,380., Cl. D10-49.000.

Gispem and Staalmebel B.V.: See—

De Boer, Peter, 271,352., Cl. D6-29.000.

Glasrock Products, Inc.: See—

Breland, Thomas L., 271,422., Cl. D24-56.000.

Goldsworthy, Malcolm A., to Schott Industrial Glass Limited. Electric heating plate for a food warmer. 271,367., 11-15-83, Cl. D7-363.000.

Graham, John F.: See—

Henneberg, Helmut H.; and Graham, John F., 271,356., Cl. D6-188.000.

GTE Products Corporation: See—

de Vos, Hendrik A. J.; and Labouliere, Elzear R., 271,427., Cl. D26-85.000.

de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., 271,428., Cl. D26-85.000.

Hardy, Bruce N., to Silver Street Incorporated. Drumstick. 271,401., 11-15-83, Cl. D17-22.000.

Healy, Colin: See—

Lentz, William L.; Siegel, Richard A.; and Healy, Colin, 271,387., Cl. D11-145.000.

Hein, Paul R. Helmet. 271,346., 11-15-83, Cl. D2-231.000.

Helein, Charles H. Doll. 271,405., 11-15-83, Cl. D21-166.000.

Henneberg, Helmut H.; and Graham, John F., to Honeywell Information Systems Inc. Magnetic tape reel storage rack. 271,356., 11-15-83, Cl. D6-188.000.

Hesston Corporation: See—

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevvick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Heweston, David I. Collapsible insulating container. 271,362., 11-15-83, Cl. D7-70.000.

Hoff, Patrick E., to Technology Applications Group, Inc. Monopolar electrosurgical device with dual 360° hand switch. 271,419., 11-15-83, Cl. D24-28.000.

Holland, Jackie D. Foldable livestock feeder. 271,433., 11-15-83, Cl. D30-13.000.

Honeywell Information Systems Inc.: See—

Henneberg, Helmut H.; and Graham, John F., 271,356., Cl. D6-188.000.

Ichikawa Press Industry Co., Ltd.: See—

Yabata, Hisao, 271,426., Cl. D26-29.000.

Ideas Materialized, Inc.: See—

Lukach, Daniel, 271,409., Cl. D21-207.000.

International Standard Electric Corporation: See—

Carr, Peter B., 271,393., Cl. D14-63.000.

Inui, Takayasu, to Kabushiki Kaisha Komatsu Seisakusho, Loading shovel. 271,396., 11-15-83, Cl. D15-24.000.

JEG, Inc.: See—

Gesner, John E., 271,369., Cl. D8-10.000.

Jordan, Paul A.; and Speaker, Edwin A., to Bausch & Lomb Incorporated. Ophthalmic instrument. 271,399., 11-15-83, Cl. D16-130.000.

Kabushiki Kaisha Komatsu Seisakusho: See—

Inui, Takayasu, 271,396., Cl. D15-24.000.

Kimbrough, Richard W. M.; and McElhaney, Craig J., to Quaker Oats Company. The. Toy doll house. 271,403., 11-15-83, Cl. D21-114.000.

Klim, Matthew J., to C.V.B.G. Bottle. 271,377., 11-15-83, Cl. D9-378.000.

Knighten, Chester. Violin. 271,400., 11-15-83, Cl. D17-17.000.

Koziatek, Jerome P.: See—

Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Kroll, Frederick H. Counting swatter. 271,414., 11-15-83, Cl. D22-20.000.

Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., to Clark Equipment Company. Articulated loader vehicle body. 271,397., 11-15-83, Cl. D15-25.000.

Kullenback, Jan G. L. S. Toilet adapter for pet animals. 271,435., 11-15-83, Cl. D30-99.000.

Labouliere, Elzear R.: See—

de Vos, Hendrik A. J.; and Labouliere, Elzear R., 271,427., Cl. D26-85.000.

de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., 271,428., Cl. D26-85.000.

Le, Walter. Picture frame. 271,358., 11-15-83, Cl. D6-234.000.

Le, Walter. Picture frame. 271,359., 11-15-83, Cl. D6-234.000.

Le, Walter. Picture frame. 271,360., 11-15-83, Cl. D6-234.000.

Le, Walter. Picture frame. 271,361., 11-15-83, Cl. D6-234.000.

Lendvay, Joseph G.: See—

Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Lentz, William L.; Siegel, Richard A.; and Healy, Colin, to DeSoto, Inc. Miniature greenhouse. 271,387., 11-15-83, Cl. D11-145.000.

Lerner, Ralph; and Cigolle, Mark. Table. 271,354., 11-15-83, Cl. D6-175.000.

Li, Lehmann K.: See—

Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., 271,418., Cl. D24-26.000.

Liao, Sheng-Chung; and Neidhart, John W., to Mine Safety Appliances Company. Dust filtering respirator. 271,432., 11-15-83, Cl. D29-7.000.

Ljungberg, Per A.: See—

Sundeby, Bjorn K.; and Ljungberg, Per A., 271,423., Cl. D25-77.000.

Long, Paul D. Telescopic sight mount for pistol. 271,412., 11-15-83, Cl. D22-7.000.

Love, Hugh E. Bird feeder. 271,434., 11-15-83, Cl. D30-15.000.

Lukach, Daniel, to Ideas Materialized, Inc. Game projectile. 271,409., 11-15-83, Cl. D21-207.000.

Lung, Kui-Yan: See—

Chan, Helen C., 271,404., Cl. D21-150.000.

## LIST OF DESIGN PATENTEES

Lutron Electronics Co., Inc.: See—

Spira, Joel S.; and Mayo, Noel, 271,373., Cl. D8-302.000.

MacKrell, William B.: See—

Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., 271,368., Cl. D7-398.000.

Mainardi, Giuliano: See—

Zanazzo, Pietro; Mainardi, Giuliano; and Giorgetti, Rodolfo, 271,380., Cl. D10-49.000.

Malamoud, Jean G., to Dupont, S. T. Watchcase. 271,379., 11-15-83, Cl. D10-38.000.

Matsushita Electric Industrial Co., Ltd.: See—

Sumisha, Hidemichi; and Minamide, Seikou, 271,392., Cl. D14-11.000.

Mayer, Gerald J. Filter cartridge frame. 271,416., 11-15-83, Cl. D23-4.000.

Mayo, Noel: See—

Spira, Joel S.; and Mayo, Noel, 271,373., Cl. D8-302.000.

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevvick, Timothy A.; and Ten Eyck, Richard E., to Hesston Corporation. Rear mounted mower for tractors. 271,398., 11-15-83, Cl. D15-27.000.

McElhaney, Craig J.: See—

Kimbrough, Richard W. M.; and McElhaney, Craig J., 271,403., Cl. D21-114.000.

Miller, Daniel R., to Nestier Corporation. Box. 271,438., 11-15-83, Cl. D34-43.000.

Minamide, Seikou: See—

Sumisha, Hidemichi; and Minamide, Seikou, 271,392., Cl. D14-11.000.

Mine Safety Appliances Company: See—

Liao, Sheng-Chung; and Neidhart, John W., 271,432., Cl. D29-7.000.

Minibow, Inc.: See—

Adkins, Glenn H., 271,411., Cl. D22-5.000.

Moriyama, Hideo, to Moriyama Sangyo Kabushiki Kaisha. Combined fluorescent and incandescent lamp adapter. 271,425., 11-15-83, Cl. D26-26.000.

Moriyama Sangyo Kabushiki Kaisha: See—

Moriyama, Hideo, 271,425., Cl. D26-26.000.

Morton, Edward W.: See—

Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Motorola, Inc.: See—

Scheid, William J., 271,391., Cl. D13-5.000.

Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., to Questor Corporation. Crib. 271,351., 11-15-83, Cl. D6-16.000.

Mumma, Thurman H. Fish lure. 271,415., 11-15-83, Cl. D22-27.000.

Munroe, Thomas. Belt attached fishing rod holder. 271,413., 11-15-83, Cl. D22-14.000.

NBS Incorporated: See—

Bourke, Robert E., 271,383., Cl. D12-104.000.

Neidhart, John W.: See—

Liao, Sheng-Chung; and Neidhart, John W., 271,432., Cl. D29-7.000.

Nestier Corporation: See—

Miller, Daniel R., 271,438., Cl. D34-43.000.

North American Philips Electric Corp.: See—

Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Novak, Gyora. Sculpture or the like. 271,385., 11-15-83, Cl. D11-131.000.

Noveske, Walter J.: See—

Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

Olivieri, Icaro, to Warrington Inc. Figure skate blade. 271,410., 11-15-83, Cl. D21-225.000.

Osborne, Thomas P., to CPG Products Corp. Toy butterfly. 271,406., 11-15-83, Cl. D21-185.000.

Pomponi, Roman F.: See—

Brown, Wilbert C.; and Pomponi, Roman F., 271,394., Cl. D14-66.000.

Pulos, Arthur J.: See—

Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

Quaker Oats Company, The: See—

Kimbrough, Richard W. M.; and McElhaney, Craig J., 271,403., Cl. D21-114.000.

Questor Corporation: See—

Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Ranua, Walter E.: See—

Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., 271,368., Cl. D7-398.000.

Raz, Zeev. Bathroom cabinet. 271,353., 11-15-83, Cl. D6-104.000.

Reichmann, Richard H.: See—

Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., 271,418., Cl. D24-26.000.

Robbins, Richard J.: See—

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevvick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Robbins, Thomas R. Combined key holder and coin purse. 271,350., 11-15-83, Cl. D3-62.000.

Sagaser, Thomas M.: See—

Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., 271,397., Cl. D15-25.000.

San Antonio, Louis. Ceramic clean-up trim tool. 271,370., 11-15-83, Cl. D8-14.000.

Schaffer, Michael J.: See—

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,357., Cl. D6-198.000.

Scheid, William J., to Motorola, Inc. Battery charging unit for a portable radio or similar article. 271,391., 11-15-83, Cl. D13-5.000.

Schott Industrial Glass Limited: See—

Goldsworthy, Malcolm A., 271,367., Cl. D7-363.000.

Schramm, Buford J. Helicopter. 271,390., 11-15-83, Cl. D12-327.000.

Scovill Inc.: See—

Butts, Lawrence D., 271,374., Cl. D8-353.000.

Seelig, Barry G., to Colgate-Palmolive Company. Dental floss container. 271,431., 11-15-83, Cl. D28-64.000.

Sevvick, Timothy A.: See—

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevvick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Seymour, Allen: See—

Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Sharber, Jerry L. Note paper retrieval tray. 271,402., 11-15-83, Cl. D19-92.000.

Sharp, Amelia A. Wall hanging. 271,386., 11-15-83, Cl. D11-133.000.

Sidrak, Fahim R. Sine template. 271,381., 11-15-83, Cl. D10-62.000.

Siegel, Richard A.: See—

Lentz, William L.; Siegel, Richard A.; and Healy, Colin, 271,387., Cl. D11-145.000.

Sierra, Oscar A. Foot massager and leg exerciser. 271,420., 11-15-83, Cl. D24-36.000.

Silver Street Incorporated: See—

Hardy, Bruce N., 271,401., Cl. D17-22.000.

Simmons, Alfred Eli: See—

Chan, Helen C., 271,404., Cl. D21-150.000.

Simmons Universal Corporation: See—

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,357., Cl. D6-198.000.

Skwirut, Henry: See—

Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Sorensen, Johnny: See—

Thygesen, Rud; and Sorensen, Johnny, 271,417., Cl. D23-71.000.

Speaker, Edwin A.: See—

Jordan, Paul A.; and Speaker, Edwin A., 271,399., Cl. D16-130.000.

Spira, Joel S.; and Mayo, Noel, to Lutron Electronics Co., Inc. Combined light dimmer knob and escutcheon therefor. 271,373., 11-15-83, Cl. D8-302.000.

Stein, Jerome E. Circular navigational rule aid. 271,382., 11-15-83, Cl. D10-65.000.

Sumisha, Hidemichi; and Minamide, Seikou, to Matsushita Electric Industrial Co., Ltd. Cassette for video tape recorder. 271,392., 11-15-83, Cl. D14-11.000.

Sun, George C. Transparent box. 271,378., 11-15-83, Cl. D9-424.000.

Sundeby, Bjorn K.; and Ljungberg, Per A. Beam. 271,423., 11-15-83, Cl. D25-77.000.

Sweeney, Paul B.: See—

Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

Technology Applications Group, Inc.: See—

Hoff, Patrick E., 271,419., Cl. D24-28.000.

Ten Eyck, Richard E.: See—

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevvick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Thiele, Hartmut, to Agfa-Gevaert Aktiengesellschaft. Case for a video cassette. 271,349., 11-15-83, Cl. D3-35.000.

Thiot, Richard E. Laundry room clothes hanger. 271,437., 11-15-83, Cl. D32-58.000.

Thorneburg, James L. Sock. 271,348., 11-15-83, Cl. D2-331.000.

Thygesen, Rud; and Sorensen, Johnny, to Dansk Pressalit A/S. Combined toilet seat and cover, or similar article. 271,417., 11-15-83, Cl. D23-71.000.

TIE/communications, Inc.: See—

Brown, Wilbert C.; and Pomponi, Roman F., 271,394., Cl. D14-66.000.

Turkington, Mark; and Turkington, Philip, to Connecticut Cycle Accessories, Inc. Luggage carrier. 271,389., 11-15-83, Cl. D12-158.000.

Turkington, Philip: See—

Turkington, Mark; and Turkington, Philip, 271,389., Cl. D12-158.000.

Wagner, Oryn B.: See—

Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., 271,397., Cl. D15-25.000.

Warner-Lambert Company: See—

Faust, Steven M., 271,344., Cl. D1-12.000.

Warrington Inc.: See—

Olivieri, Icaro, 271,410., Cl. D21-225.000.

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Andersen, Freddie J., 271,429., Cl. D26-104.000.

Wright, Forrest S. Dumbbell. 271,407., 11-15-83, Cl. D21-197.000.

Yabata, Hisao, to Ichikawa Press Industry Co., Ltd. Fog light. 271,426., 11-15-83, Cl. D26-29.000.

Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., to North American Philips Electric Corp. Compact fluorescent lamp unit. 271,424., 11-15-83, Cl. D26-26.000.

Zanazzo, Pietro; Mainardi, Giuliano; and Giorgetti, Rodolfo, to ERO Electronic s.r.l. Electronic thermostat indicator or similar article. 271,380., 11-15-83, Cl. D10-49.000.



## LIST OF PLANT PATENTEES

Chamberlin, Thomas O., Sr., to H. P. Metzler & Sons, Inc. Peach tree. 5,139., 11-15-83, Cl. 43.000.  
 Chamberlin, Thomas O., Sr., to H. P. Metzler & Sons, Inc. Peach tree 'August Sun'. 5,140., 11-15-83, Cl. 43.000.  
 Garabedian, John M. Plum tree. 5,137., 11-15-83, Cl. 38.000.

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 Chamberlin, Thomas O., Sr., 5,139., Cl. 43.000.  
 Chamberlin, Thomas O., Sr., 5,140., Cl. 43.000.  
 Zaiger, C. Floyd. Apricot tree (Spring Giant). 5,138., 11-15-83, Cl. 39.000.

## CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 15, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	363 K	4,414,754	236	4,414,800	CLASS 75	46	4,414,913	339	4,414,989
67	4,414,691	CLASS 34	288	4,414,801	21	4,415,356	45 R	4,414,991	
160	4,414,692	1	293	4,414,802	29	4,415,357	91	4,414,990	
435	4,414,693	4	340	4,414,803	58	4,415,358	129	4,414,992	
CLASS 3	23	4,414,755	CLASS 60	39,141	60	4,415,359	CLASS 134		
13	4,414,694	155	39,161	4,414,804	65 R	4,415,360	10	4,415,368	
CLASS 4	233	4,414,758	204	4,414,805	124	4,415,361	22.12	4,415,369	
542	4,414,695	CLASS 36	372	4,414,806	130 B	4,415,362	104	4,414,993	
CLASS 5	11.5	4,414,759	424	4,414,807	229	4,415,363	CLASS 135		
475	4,414,696	29	535	4,414,808	CLASS 81	3	4,414,919	CLASS 136	
CLASS 7	50	4,414,761	589	4,414,810	3 R	4,414,864	29	4,414,920	
107	4,414,697	117	641.14	4,414,812	3.1 R	4,414,865	51 R	4,414,922	
170	4,414,698	134	641.2	4,414,817	3.46 R	4,414,866	CLASS 122	233	4,415,758
CLASS 8	141 T	4,414,763	655	4,414,813	177 UJ	4,414,867	7 R	246	4,415,759
114.6	4,415,331	CLASS 37	682	4,414,814	416	4,414,868	CLASS 123	258	4,415,760
444	4,415,332	141 T	726	4,414,815	CLASS 82	4 R	4,414,869	CLASS 137	
524	4,415,333	CLASS 38	757	4,414,816	36 R	4,414,870	25 E	38	4,414,994
694	4,415,334	54	CLASS 62	28	40 R	4,414,871	41.12	77	4,414,995
CLASS 15	429	4,414,765	35	4,415,345	CLASS 83	171	4,414,872	101.27	4,414,996
87	4,414,699	77.83	176.1	4,415,346	311	4,414,873	73 PP	151	4,414,997
105	4,414,700	CLASS 40	222	4,415,347	488	4,414,874	73 R	216	4,414,998
CLASS 16	4,414,701	584	226	4,415,348	508.3	4,414,875	78 E	240	4,414,999
35 R	4,414,702	CLASS 42	235	4,415,349	830	4,414,876	90.16	318	4,415,000
52	4,414,703	70 R	256	4,414,823	CLASS 84	1.13	142.5 R	497	4,415,001
223	4,414,704	90	295	4,414,824	1.19	4,414,877	182	625.23	4,415,002
225	4,414,705	CLASS 43	374	4,414,825	379	4,414,878	192 B	843	4,415,003
370	4,414,706	4	4.21	4,415,347	193	4,414,879	198 D	884	4,415,004
CLASS 17	1 F	4,414,707	58	4,415,348	CLASS 89	216 R	198 F	CLASS 138	
1 R	4,414,708	CLASS 44	90	4,415,349	91	4,414,880	229	96 T	4,415,005
71	4,414,709	1 C	137	4,415,350	CLASS 91	442	274	115	4,415,006
CLASS 19	105	4,414,710	60 H	4,414,827	216 R	4,414,881	299	CLASS 139	
CLASS 24	3 L	4,414,716	75.2	4,414,826	442	4,414,882	326	329	4,415,007
30.5 R	129 C	4,414,717	207	4,414,828	467	4,414,883	339	370.2	4,415,008
129 R	193	4,414,718	84	4,414,829	CLASS 99	304	4,414,942	435	4,415,009
129 R	193	4,414,719	160	4,414,830	494	4,414,884	4,414,943	439	4,415,010
265 WS	193	4,414,720	252	4,414,831	495	4,414,885	4,414,944	CLASS 141	
283	4,414,718	56	276	4,414,832	CLASS 100	45	4,414,945	284	4,415,011
396	4,414,715	62 R	77	4,415,350	45	4,414,887	446	CLASS 148	
CLASS 27	21	4,414,720	88	4,415,351	88	4,414,888	447	1.5	4,415,370
CLASS 29	25.42	4,414,722	100	4,415,352	162 B	4,414,889	452	2	4,415,371
26 A	39	4,414,723	103	4,415,353	245	4,414,890	479	11.5 F	4,415,372
39	156.4 R	4,414,724	121	4,415,354	CLASS 101	44	4,414,946	12 F	4,415,373
156.4 R	159.1	4,414,725	CLASS 72	8	93.15	4,414,892	4,414,947	12 R	4,415,374
156.5 A	159.2	4,414,726	13	4,414,833	123	4,414,893	4,414,948	12.1	4,415,375
159.1	401.1	4,414,727	58	4,414,834	177	4,414,894	4,414,949	16	4,415,376
426.3	464	4,414,730	71	4,414,835	211	4,414,895	4,414,950	101	4,415,377
453	568	4,414,731	349	4,414,836	216	4,414,896	4,414,951	153	4,415,378
464	578	4,414,732	CLASS 73	1 B	248	4,414,897	4,414,952	187	4,415,379
568	579	4,414,733	CLASS 74	23	331	4,414,898	4,414,953	189	4,415,380
578	727	4,414,734	CLASS 75	35	363	4,414,899	4,414,954	CLASS 150	
579	747	4,414,735	CLASS 76	61 R	CLASS 102	60	4,414,962	51	4,415,012
727	751	4,414,736	CLASS 77	61.1 C	206	4,414,900	4,414,963	CLASS 152	
747	837	4,414,737	CLASS 78	66	531	4,414,901	4,414,964	367	4,415,013
751	879	4,414,738	CLASS 79	104	4,414,902	4,414,902	4,414,965	CLASS 156	
837	882	4,414,739	CLASS 80	119 A	CLASS 104	132 D	4,414,966	64	4,415,386
879	CLASS 30	4,414,740	CLASS 81	151	244.1	133	4,414,967	69	4,415,387
882	124	4,414,741	CLASS 82	204	74	156	4,414,968	78	4,415,388
CLASS 33	151	4,414,742	CLASS 83	290 V	85	159	4,414,969	91	4,415,389
124	151	4,414,743	CLASS 84	497	86	200.23	4,414,970	187	4,415,390
373	373	4,414,744	CLASS 85	599	89	206.15	4,414,971	244.13	4,415,391
CLASS 35	125 C	4,414,745	CLASS 86	706	CLASS 110	305	4,414,972	379.8	4,415,392
174 P	174 Q	4,414,746	CLASS 87	766	102	314	4,414,973	384	4,415,393
174 Q	180 R	4,414,747	CLASS 88	847	245	335	4,414,974	419 F	4,415,394
180 R	185 R	4,414,748	CLASS 89	862.36	293	342	4,414,975	419 PG	4,415,395
185 R	265	4,414,749	CLASS 90	863.13	CLASS 112	664	4,414,976	635	4,415,396
265	320	4,414,750	CLASS 91	863.33	158 B	712	4,414,977	635	4,415,397
320	356	4,414,751	CLASS 92	417	169	716	4,414,978	645	4,415,398
356	CLASS 37	4,414,752	CLASS 93	579 E	274	747	4,414,979	645	4,415,399
CLASS 39	122	4,414,753	CLASS 94	606 A	CLASS 114	782	4,414,980	645	4,415,400
125 C	125 D	4,414,754	CLASS 95	788	158 B	785	4,414,981	645	4,415,401
125 D	125 E	4,414,755	CLASS 96	866	219	CLASS 116	4,414,982	645	4,415,402
125 E	125 F	4,414,756	CLASS 97	866	5	236	4,414,983	645	4,415,403
125 F	125 G	4,414,757	CLASS 98	866	CLASS 117	294	4,414,984	645	4,415,404
125 G	125 H	4,414,758	CLASS 99	866	CLASS 118	336	4,414,985	645	4,415,405
125 H	125 I	4,414,759	CLASS 100	866	CLASS 119	394	4,414,986	645	4,415,406
125 I	125 J	4,414,760	CLASS 101	866	CLASS 120	412	4,414,987	645	4,415,407
125 J	125 K	4,414,761	CLASS 102	866	CLASS 121	430	4,414,988	645	4,415,408
125 K	125 L	4,414,762	CLASS 103	866	CLASS 122	448	4,414,989	645	4,415,409
125 L	125 M	4,414,763	CLASS 104	866	CLASS 123	466	4,414,990	645	4,415,410
125 M	125 N	4,414,764	CLASS 105	866	CLASS 124	484	4,414,991	645	4,415,411
125 N	125 O	4,414,765	CLASS 106	866	CLASS 125	502	4,414,992	645	4,415,412
125 O	125 P	4,414,766	CLASS 107	866	CLASS 126	520	4,414,993	645	4,415,413
125 P	125 Q	4,414,767	CLASS 108	866	CLASS 127	538	4,414,994	645	4,415,414
125 Q	125 R	4,414,768	CLASS 109	866	CLASS 128	556	4,414,995	645	4,415,415
125 R	125 S	4,414,769	CLASS 110	866	CLASS 129	574	4,414,996	645	4,415,416
125 S	125 T	4,414,770	CLASS 111	866	CLASS 130	592	4,414,997	645	4,415,417
125 T	125 U	4,414,771	CLASS 112	866	CLASS 131	610	4,414,998	645	4,415,418
125 U	125 V	4,414,772	CLASS 113	866	CLASS 132	628	4,414,999	645	4,415,419
125 V	125 W	4,414,773	CLASS 114	866	CLASS 133	646	4,415,000	645	4,415,420
125 W	125 X	4,414,774	CLASS 115	866	CLASS 134	664	4,415,001	645	4,415,421
125 X	125 Y	4,414,775	CLASS 116	866	CLASS 135	682	4,415,002	645	4,415,422
125 Y	125 Z	4,414,776	CLASS 117	866	CLASS 136	700	4,415,003	645	4,415,423
125 Z	126 A	4,414,777	CLASS 118	866	CLASS 137	718	4,415,004	645	4,415,424
126 A	126 B	4,414,778	CLASS 119	866	CLASS 138	736	4,415,005	645	4,415,425
126 B	126 C	4,414,779	CLASS 120	866	CLASS 139	754	4,415,006	645	4,415,426
126 C	126 D	4,414,780	CLASS 121	866	CLASS 140	772	4,415,007	645	4,415,427
126 D	126 E	4,414,781	CLASS 122	866	CLASS 141	790	4,415,008	645	4,415,428
126 E	126 F	4,414,782	CLASS 123	866	CLASS 142	808	4,415,009	645	4,415,429
126 F	126 G	4,414,783	CLASS 124	866	CLASS 143	826	4,415,010	645	4,415,430
126 G	126 H	4,414,784	CLASS 125	866	CLASS 144	844	4,415,011	645	4,415,431
126 H	126 I	4,414,785	CLASS 126	866	CLASS 145	862	4,415,012	645	4,415,432
126 I	126 J	4,414,786	CLASS 127	866	CLASS 146	880	4,415,013	645	4,415,433
126 J	126 K	4,414,787	CLASS 128	866	CLASS 147	898	4,415,014	645	4,415,434
126 K	126 L	4,414,788	CLASS 129	866	CLASS 148	916	4,415,015	645	4,415,435
126 L	126 M	4,414,789							



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CLASS 199	264 F	4,415,070	113	4,415,093	363 S	4,415,807	12	4,415,171	411	4,415,842	
13 A	4,415,407	352	4,415,071	CLASS 215	367	4,415,808	27	4,415,165	CLASS 318		
CLASS 162	45	4,415,072	252	4,415,094	370	4,415,237	51	4,415,166	139	4,415,843	
198	4,415,408	54	4,415,073	432 R	4,415,809	88	4,415,167	254	4,415,844		
CLASS 164	37	4,415,015	343	4,415,096	484.1	4,415,810	96.1	4,415,168	696	4,415,845	
429	4,415,016	37	4,415,074	CLASS 219	560	4,415,811	125	4,415,169	732	4,415,846	
453	4,415,017	CLASS 200	10.49 R	4,415,788	CLASS 251	62	4,415,139	CLASS 279	2	4,415,847	
CLASS 165	5 A	4,415,780	10.55 B	4,415,789	CLASS 252	8.55 R	4,415,463	CLASS 280	32	4,415,848	
41	4,415,018	6 A	4,415,781	69 G	4,415,791	62.51	4,415,464	47.13 R	99	4,415,849	
47	4,415,019	11 A	4,415,782	98	4,415,792	70	4,415,465	410 C	51	4,415,850	
76	4,415,020	35 R	4,415,783	110	4,415,793	181	4,415,466	460 A	57 N	4,415,851	
77	4,415,021	38 B	4,415,784	121 LM	4,415,794	182	4,415,467	612	74	4,415,852	
95	4,415,022	61.91	4,415,785	121 PH	4,415,795	299.63	4,415,468	650	79 R	4,415,853	
122	4,415,023	144 B	4,415,786	253	4,415,796	301.36	4,415,469	664	114	4,415,854	
160	4,415,024	CLASS 202	4,415,075	273	4,415,797	321	4,415,471	700	208	4,415,855	
185	4,415,025	177	4,415,075	345	4,415,798	373	4,415,472	713	357	4,415,856	
CLASS 166	97	4,415,026	CLASS 203	400	4,415,799	454	4,415,473	763.1	442	4,415,857	
113	4,415,027	51	4,415,409	497	4,415,800	514	4,415,477	CLASS 281	22	4,415,860	
206	4,415,028	CLASS 204	202	90.4	4,415,097	546	4,415,486	31	58	4,415,861	
212	4,415,029	2.1	4,415,410	CLASS 221	4,415,098	547	4,415,487	CLASS 285	10	4,415,862	
241	4,415,030	29	4,415,411	CLASS 222	94	4,415,099	558	4,415,489	253	4,415,863	
261	4,415,031	67	4,415,412	CLASS 223	108	4,415,100	CLASS 254	4,415,140	271	4,415,864	
273	4,415,032	98	4,415,413	CLASS 224	288	4,415,101	CLASS 255	4,415,141	278	4,415,865	
274	4,415,033	129.3	4,415,414	CLASS 225	411	4,415,102	CLASS 256	4,415,141	287	4,415,866	
302	4,415,034	141.5	4,415,415	CLASS 226	590	4,415,103	CLASS 260	4,415,141	294	4,415,867	
308	4,415,035	147	4,415,416	CLASS 227	610	4,415,104	CLASS 261	4,415,141	CLASS 331	111	4,415,869
324	4,415,036	159.24	4,415,417	CLASS 228	41	4,415,105	CLASS 262	4,415,141	176	4,415,870	
331	4,415,037	180 G	4,415,418	CLASS 229	221	4,415,106	CLASS 263	4,415,141	CLASS 333	1.1	4,415,871
373	4,415,038	192 C	4,415,419	CLASS 230	93.5	4,415,107	CLASS 264	4,415,141	18	4,415,872	
47	4,415,039	192 N	4,415,420	CLASS 231	138	4,415,108	CLASS 265	4,415,141	139	4,415,873	
225	4,415,040	199	4,415,421	CLASS 232	181	4,415,109	CLASS 266	4,415,141	178	4,415,874	
551	4,415,041	212	4,415,422	CLASS 233	10	4,415,110	CLASS 267	4,415,141	62	4,415,875	
749	4,415,042	257	4,415,423	CLASS 234	19	4,415,111	CLASS 268	4,415,141	34	4,415,876	
776	4,415,043	279	4,415,424	CLASS 235	130	4,415,112	CLASS 269	4,415,141	CLASS 337	17 C	4,415,212
CLASS 172	25 R	4,415,761	290 R	4,415,425	CLASS 236	57	4,415,114	CLASS 270	49 R	4,415,213	
28	4,415,762	299 R	4,415,428	CLASS 237	CLASS 237	170	4,415,115	CLASS 271	91 R	4,415,214	
CLASS 173	37	4,415,763	CLASS 206	4,415,076	CLASS 238	180 A	4,415,116	CLASS 272	98	4,415,215	
72 A	4,415,764	5.1	4,415,077	44 R	4,415,078	CLASS 239	4,415,117	CLASS 273	107	4,415,216	
138 F	4,415,765	45.14	4,415,078	45.14	4,415,079	CLASS 240	4,415,118	CLASS 274	113 L	4,415,217	
CLASS 175	9	4,415,045	303	4,415,080	CLASS 241	39 R	4,415,117	CLASS 275	147 R	4,415,218	
56	4,415,046	311	4,415,081	CLASS 242	101	4,415,801	CLASS 243	4,415,119	195 M	4,415,219	
305	4,415,047	334	4,415,082	CLASS 243	382	4,415,802	CLASS 244	4,415,120	221 R	4,415,220	
CLASS 177	431	4,415,048	431	4,415,083	CLASS 244	12.3 A	4,415,118	CLASS 245	258 F	4,415,221	
5	4,415,049	461	4,415,084	CLASS 245	CLASS 245	19	4,415,119	CLASS 246	270 R	4,415,222	
CLASS 178	526	4,415,085	526	4,415,085	CLASS 246	8	4,415,120	CLASS 247	276 R	4,415,223	
30	4,415,766	632	4,415,087	CLASS 247	CLASS 247	229	4,415,121	CLASS 248	CLASS 340	27 NA	4,415,879
CLASS 179	2 C	4,415,769	8 LE	4,415,429	CLASS 248	327	4,415,122	CLASS 249	347 AD	4,415,881	
2 DP	4,415,770	8 R	4,415,430	CLASS 249	CLASS 249	425	4,415,123	CLASS 250	347 DA	4,415,883	
2 EB	4,415,771	11 R	4,415,431	CLASS 250	CLASS 250	28	4,415,124	CLASS 251	500	4,415,884	
5 R	4,415,772	12.3 A	4,415,118	CLASS 251	CLASS 251	18 DD	4,415,125	CLASS 252	552	4,415,885	
18 AD	4,415,773	19	4,415,119	CLASS 252	CLASS 252	43 R	4,415,126	CLASS 253	618	4,415,886	
78 R	4,415,774	65	4,415,433	CLASS 253	CLASS 253	58.1	4,415,127	CLASS 254	635	4,415,887	
81 R	4,415,775	89	4,415,434	CLASS 254	CLASS 254	66	4,415,128	CLASS 255	684	4,415,888	
170 NC	4,415,776	120	4,415,435	CLASS 255	CLASS 255	84.2 A	4,415,129	CLASS 256	728	4,415,889	
175.1 R	4,415,777	CLASS 180	138	4,415,050	CLASS 256	CLASS 256	4,415,130	CLASS 257	749	4,415,890	
175.3 F	4,415,778	6.48	4,415,051	6.5	4,415,052	CLASS 257	4,415,131	CLASS 258	767	4,415,891	
CLASS 180	65 R	4,415,053	355	4,415,053	CLASS 258	CLASS 258	4,415,132	CLASS 259	825.31	4,415,892	
79.1	4,415,054	3	4,415,444	CLASS 259	CLASS 259	CLASS 259	4,415,133	CLASS 260	825.37	4,415,893	
198	4,415,055	5	4,415,445	CLASS 260	CLASS 260	CLASS 260	4,415,134	CLASS 261	856	4,415,894	
210	4,415,056	687	4,415,058	CLASS 261	CLASS 261	CLASS 261	4,415,135	CLASS 262	870.03	4,415,895	
227	4,415,057	101	4,415,446	CLASS 262	CLASS 262	CLASS 262	4,415,136	CLASS 263	CLASS 343	5 SA	4,415,898
247	4,415,058	321.1	4,415,447	CLASS 263	CLASS 263	CLASS 263	4,415,137	CLASS 264	5 SM	4,415,897	
CLASS 181	250	4,415,059	333.1	4,415,448	CLASS 264	CLASS 264	4,415,138	CLASS 265	700 MS	4,415,899	
92	4,415,061	406	4,415,449	CLASS 265	CLASS 265	CLASS 265	4,415,139	CLASS 266	754	4,415,900	
109	4,415,062	602	4,415,450	CLASS 266	CLASS 266	CLASS 266	4,415,140	CLASS 267	844	4,415,901	
230	4,415,063	610	4,415,451	CLASS 267	CLASS 267	CLASS 267	4,415,141	CLASS 268	CLASS 346	1.1	4,415,903
CLASS 184	15 R	4,415,064	614	4,415,452	CLASS 268	CLASS 268	4,415,142	CLASS 269	74.5	4,415,904	
CLASS 186	727	4,415,065	615	4,415,453	CLASS 269	CLASS 269	4,415,143	CLASS 270	76 PH	4,415,906	
39	4,415,066	747	4,415,454	CLASS 270	CLASS 270	CLASS 270	4,415,144	CLASS 271	4,415,907		
CLASS 187	757	4,415,067	757	4,415,455	CLASS 271	CLASS 271	4,415,145	CLASS 272	4,415,908		
9 R	4,415,068	767	4,415,456	CLASS 272	CLASS 272	CLASS 272	4,415,146	CLASS 273	4,415,909		
CLASS 188	71.5	4,415,069	767	4,415,457	CLASS 273	CLASS 273	4,415,147	CLASS 274	4,415,910		
71.5	4,415,067	49 S	4,415,089	214 A	4,415,803	CLASS 274	4,415,148	CLASS 275	4,415,911		
72.3	4,415,068	50	4,415,090	255	4,415,804	CLASS 275	4,415,149	CLASS 276	4,415,912		
82.84	4,415,069	60 R	4,415,091	260	4,415,805	CLASS 276	4,415,150	CLASS 277	4,415,913		
			4,415,092	339	4,415,806	CLASS 277	4,415,151	CLASS 278	4,415,914		
						CLASS 278	4,415,152	CLASS 279	4,415,915		
						CLASS 279	4,415,153	CLASS 280	4,415,916		
						CLASS 280	4,415,154	CLASS 281	4,415,917		
						CLASS 281	4,415,155	CLASS 282	4,415,918		
						CLASS 282	4,415,156	CLASS 283	4,415,919		
						CLASS 283	4,415,157	CLASS 284	4,415,920		
						CLASS 284	4,415,158	CLASS 285	4,415,921		
						CLASS 285	4,415,159	CLASS 286	4,415,922		
						CLASS 286	4,415,160	CLASS 287	4,415,923		
						CLASS 287	4,415,161	CLASS 288	4,415,924		
						CLASS 288	4,415,162	CLASS 289	4,415,925		
						CLASS 289	4,415,163	CLASS 290	4,415,926		
						CLASS 290	4,415,164	CLASS 291	4,415,927		
						CLASS 291	4,415,165	CLASS 292	4,415,928		
						CLASS 292	4,415,166	CLASS 293	4,415,929		
						CLASS 293	4,415,167	CLASS 294	4,415,930		
						CLASS 294	4,415,168	CLASS 295	4,415,931		
						CLASS 295	4,415,169	CLASS 296	4,415,932		
						CLASS 296	4,415,170	CLASS 297	4,415,933		
						CLASS 297	4,415,171	CLASS 298	4,415,934		
						CLASS 298	4,415,172	CLASS 299	4,415,935		
						CLASS 299	4,415,173	CLASS 300	4,415,936		
						CLASS 300	4,415,174	CLASS 301	4,415,937		
						CLASS 301	4,415,175	CLASS 302	4,415,938		
						CLASS 302	4,415,176	CLASS 303	4,415,939		
						CLASS 303	4,415,177	CLASS 304	4,415,940		
						CLASS 304	4,415,178	CLASS 305	4,415,941		
						CLASS 305	4,415,179	CLASS 306	4,415,942		
						CLASS 306	4,415,180	CLASS 307	4,415,943		
						CLASS 307	4,415,181	CLASS 308	4,415,944		
						CLASS 308	4,415,182	CLASS 309	4,415,945		
						CLASS 309	4,415,183	CLASS 310	4,415,946		
						CLASS 310	4,415,184	CLASS 311	4,415,947		
						CLASS 311	4,415,185	CLASS 312	4,415,948		
						CLASS 312	4,415,186	CLASS 313	4,415,949		
						CLASS 313	4,415,187	CLASS 314	4,415,950		
						CLASS 314	4,415,188	CLASS 315	4,415,951		

## CLASSIFICATION OF PATENTS

140 R	4,415,909	CLASS 362	85	4,416,016	143	4,415,535	209	4,415,624	404	BI 4,174,332	
	4,415,910		99	4,416,017	159	4,415,536	222	4,415,625		CLASS 524	
154	4,415,911	20	4,415,951		CLASS 376	180	4,415,537	323	43	4,415,683	
	4,415,912	32	4,415,952			224	4,415,538	332	92	4,415,684	
	4,415,913		216	4,415,524		304	4,415,539	335		4,415,685	
	4,415,914	202	4,415,954	317	4,415,525			375	101	4,415,686	
160	4,415,915	225	4,415,955	409	4,415,526	CLASS 423	403	4,415,630	102	4,415,687	
		269	4,415,956		CLASS 378	99	4,415,540	405		4,415,688	
		297	4,415,957			140	4,415,541	408	103	4,415,689	
3.71	4,415,224	301	4,415,958	2	4,416,018	141	4,415,542	411	112	4,415,690	
3.84	4,415,225				4,416,019	178	4,415,543	411	114	4,415,691	
96.14	4,415,226	CLASS 363	58	4,415,980	328	4,415,544	611	4,415,635	183	4,415,692	
96.15	4,415,227	21	4,415,959	181	4,416,020	348	4,415,545		198	4,415,693	
96.20	4,415,228	43	4,415,960	206	4,416,021		CLASS 424	27	200	4,415,694	
	4,415,229	21	4,415,961		4,416,022	1.1	4,415,546	218	405	4,415,695	
96.21	4,415,232	131	4,415,962		CLASS 381	19	4,415,547	225	490	4,415,696	
96.33	4,415,230	135	4,415,963	10	4,415,768	28	4,415,548		512	4,415,697	
	4,415,233	142	4,415,964	45	4,415,767	52	4,415,549	CLASS 430	521	4,415,698	
173	4,415,231				CLASS 382	57	4,415,550	57	538	4,415,699	
269	4,415,234	CLASS 364	136	4,415,965		65	4,415,551	59	548	4,415,700	
310	4,415,235		162	4,415,966	27	91	4,415,552	86	548	4,415,701	
319	4,415,236		168	4,415,967		95	4,415,553	94	612	4,415,702	
338	4,415,237		178	4,415,968	CLASS 384	145	4,415,554	106	705		
432	4,415,238		200	4,415,969		147	4,415,555	109		CLASS 528	
433	4,415,239		208	4,415,970	103	153	4,415,556	110	54.2	4,415,490	
442	4,415,240			4,415,971		172	4,415,557	113	54.21	4,415,703	
476	4,415,241			4,415,972	CLASS 400	172	4,415,558	113	76	4,415,704	
581	4,415,242			4,415,973		172	4,415,559	113	167.5	4,415,705	
		CLASS 381	426	4,415,974	30	172	4,415,560	113	167.5	4,415,706	
			444	4,415,975	94	172	4,415,561	113	231	4,415,707	
201	4,415,243	CLASS 383	472	4,415,976	134	172	4,415,562	113	316	4,415,708	
			474	4,415,977	196.1	172	4,415,563	113	344	4,415,709	
101	4,415,244		475	4,415,978	279	172	4,415,564	113	370		
		CLASS 384	508	4,415,979	322	245	4,415,565	113		CLASS 526	
25	4,415,245		518	4,415,980		246	4,415,566	113	88	4,415,711	
	4,415,246		527	4,415,981	CLASS 401	246	4,415,567	113	98	Re.31,443	
33	4,415,247		708	4,415,982	CLASS 402	248.4	4,415,568	113	122	4,415,712	
43	4,415,248		900	4,415,983		248.57	4,415,569	125	125	4,415,713	
173	4,415,249			4,415,984	CLASS 403	249	4,415,570			4,415,714	
195	4,415,250			4,415,985		250	4,415,571	CLASS 433	142	4,415,715	
230	4,415,251	CLASS 365	12	4,415,987	36	251	4,415,572	16	209	4,415,716	
234	4,415,252		16	4,415,988	246	251	4,415,573		272	BI 4,358,573	
292	4,415,253		19	4,415,989	CLASS 405	252	4,415,574	113	287	4,415,717	
		CLASS 385	41	4,415,990		252	4,415,575	249	348.6	4,415,718	
3 R	4,415,255		77	4,415,991	216	258	4,415,576			CLASS 528	
3 SH	4,415,263		94	4,415,992	259	263	4,415,577		167	4,415,719	
3 TR	4,415,254		184	4,415,993	291	267	4,415,578	17	171	4,415,720	
	4,415,256		189	4,415,994	CLASS 406	269	4,415,579	96	176	4,415,721	
8	4,415,258		190	4,415,995		269	4,415,580	106	194	4,415,722	
11	4,415,259				19	272	4,415,581	122	206	4,415,723	
14 SH	4,415,260	CLASS 366	14	4,415,267	168	272	4,415,582	161	204	4,415,724	
75	4,415,261		85	4,415,268	CLASS 410	272	4,415,583	172		4,415,725	
125	4,415,262		132	4,415,269	69	273	4,415,584	174		4,415,726	
		CLASS 386	165	4,415,275	CLASS 411	273 P	4,415,585	176	272	4,415,727	
			216	4,415,270		311	4,415,587		279	4,415,728	
315	4,415,264				CLASS 414	311	4,415,588	179	388	4,415,729	
338	4,415,265	CLASS 367	8	4,415,996		319	4,415,589			CLASS 536	
350	4,415,266		15	4,415,997	24.5	330	4,415,590	212	7.1	4,415,730	
		CLASS 387	25	4,415,998	31	331	4,415,591	241	18.4	4,415,731	
29	4,415,916		73	4,415,999	417	331	4,415,592	253	27	4,415,732	
70	4,415,917		81	4,416,000	519	72 S	4,415,323	285	53	4,415,733	
		CLASS 398			589	83.1	4,415,324		76	4,415,734	
					753	397	4,415,325				
22	4,415,922	CLASS 368	41	4,415,271	CLASS 415			29	4,415,671	CLASS 544	
23	4,415,918		69	4,415,272		CLASS 426	4,415,593		22	4,415,735	
26	4,415,919		74	4,415,273	2 A	4	4,415,594	291	4,416,023	CLASS 546	
27	4,415,920		160	4,415,274	12	36	4,415,595	303	4,416,024		
37	4,415,923		187	4,415,276	72	101	4,415,596			CLASS 548	
41	4,415,924		190	4,415,277	12	103	4,415,597	4	4,415,672	146	4,415,737
50	4,415,925				170 R	394	4,415,598	102	4,415,673	147	4,415,738
75	4,415,926	CLASS 369	95	4,416,001	CLASS 416	578	4,415,599	104	4,415,674	367	4,415,739
107	4,415,927		117	4,416,002		613	4,415,600			CLASS 502	
139	4,415,928		119	4,415,772	CLASS 417	659	4,415,601				
140	4,415,928		60	4,416,003				62	4,415,681		4,415,740
171	4,415,929		75.2	4,416,004	38	39	4,415,602	85	4,415,679	273	4,415,741
191.1	4,415,930		77.2	4,416,005	131	54.1	4,415,603	100	4,415,680	345	4,415,742
242	4,415,931		173	4,416,006	269		4,415,604	117	4,415,681	475	4,415,743
246	4,415,932	CLASS 370	240	4,416,007			4,415,605	178	4,415,682	491	
281	4,415,933			4,416,008	CLASS 418	65	4,415,606	181	4,415,683		CLASS 560
286	4,415,934		62	4,416,009		90	4,415,607	206	4,415,684	20	4,415,744
294	4,415,935		88		48	244	4,415,608	224	4,415,685	25	4,415,745
320	4,415,936	CLASS 371	100		135	249	4,415,609	252	4,415,686	61	4,415,746
322	4,415,937				179	372.2	4,415,610	332	4,415,687	112	4,415,747
335					260				4,415,688	227	4,415,748
		CLASS 372	37	4,416,010	CLASS 419	15	4,415,611		4,415,689	232	4,415,749
53	4,415,938					29	4,415,612	715	4,415,690		CLASS 562
75	4,415,939				31	36	4,415,613		4,415,691	467	4,415,750
99	4,415,940				46	38	4,415,614		4,415,692	478	4,415,751
106	4,415,941	CLASS 361	93	4,416,014	CLASS 420	40	4,415,615	28	4,415,693	534	4,415,752
135	4,415,942					48	4,415,616		4,415,694		CLASS 564
					434	86	4,415,617	31	4,415,695	418	4,415,753
22	4,415,943				453	88	4,415,618	56	4,415,696	423	4,415,754
40	4,415,944	CLASS 373	93	4,416,015		131	4,415,619		4,415,697	480	4,415,755
102	4,415,945				564	157	4,415,620				CLASS 568
212	4,415,946				585	172	4,415,621	334	4,415,681	365	4,415,756
235	4,415,947	CLASS 374	37	4,415,278	CLASS 422	198	4,415,622	403	4,415,682	475	4,415,757
283	4,415,948		204	4,415,279		200	4,415,623				
296	4,415,949	CLASS 375	4	4,416,015							
433	4,415,950				38						



## CLASSIFICATION OF DESIGNS

D1—	12	271,344		271,360		D9—	378	271,376		D14—	11	271,392		271,408		D26—	26	271,424	
D2—	184	271,345		271,361				271,377			63	271,393		271,409				271,425	
	231	271,346	D7—	70	271,362			271,378			66	271,394		271,410			29	271,426	
	232	271,347		137	271,363			271,379		D10—	38	271,395		271,411		D22—	5	271,427	
	331	271,348			271,364			271,380			49	271,396		271,412			85	271,428	
D3—	35	271,349			271,365			271,381			62	271,397		271,413				271,429	
	62	271,350			271,366			271,382			65	271,398		271,414		D28—	104	271,430	
D6—	16	271,351		363	271,367			271,383		D16—	130	271,399		271,415			13	271,431	
	29	271,352			271,368			271,384		D17—	17	271,400		271,416		D29—	7	271,432	
	104	271,353	D8—	10	271,369			271,385			22	271,401		271,417		D30—	13	271,433	
	175	271,354		14	271,370			271,386		D19—	92	271,402		271,418			15	271,434	
	183	271,355		51	271,371			271,387		D21—	114	271,403		271,419			99	271,435	
	188	271,356		88	271,372			271,388			150	271,404		271,420		D32—	14	271,436	
	198	271,357		302	271,373			271,389			166	271,405		271,421			58	271,437	
	234	271,358		353	271,374			271,390		D12—	104	271,388		271,422		D34—	43	271,438	
		271,359		382	271,375			271,391		D13—	5	271,391		271,407					

## CLASSIFICATION OF PLANTS

P—	38	5,137		39	5,138		43	5,139		5,140				
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GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 :	4,415,080	4,415,860	4,414,994	4,414,851	4,415,673	4,415,656
	4,415,152	4,415,892	4,414,996	4,414,957	4,415,852	4,415,663
	4,415,774	4,415,897	4,414,997	4,415,158	4,415,873	4,415,664
	4,415,810	4,415,900	4,415,018	4,415,163	4,415,891	4,415,784
4 :	4,415,235	4,415,953	4,415,056	4,415,430	4,414,768	4,415,842
	4,415,395	4,415,954	4,415,063	4,415,432	4,415,090	4,415,843
	4,415,992	4,415,987	4,415,076	4,415,542	4,415,591	4,415,849
	4,414,697	4,415,990	4,415,095	4,415,609	4,415,778	4,415,921
6 :	4,414,701	4,415,991	4,415,101	4,415,913	4,415,949	4,415,930
	4,414,738	4,416,022	4,415,110	4,414,776	4,414,773	4,415,932
	4,414,739	4,414,771	4,415,136	4,414,816	4,415,047	4,416,001
	4,414,749	4,414,891	4,415,150	4,414,884	4,415,324	4,416,017
	4,414,785	4,415,042	4,415,165	4,414,963	4,414,703	4,414,728
	4,414,795	4,415,438	4,415,169	4,415,112	4,414,705	4,414,874
	4,414,807	4,415,732	4,415,176	4,415,172	4,414,709	4,415,002
	4,414,812	4,415,759	4,415,177	4,415,190	4,414,725	4,415,068
	4,414,848	4,415,773	4,415,182	4,415,212	4,414,731	4,415,085
	4,414,886	4,415,800	4,415,191	4,415,264	4,414,780	4,415,325
	4,414,917	4,415,998	4,415,206	4,415,280	4,414,783	4,415,355
	4,414,951	4,414,714	4,415,216	4,415,281	4,414,820	4,415,386
	4,414,966	4,414,719	4,415,217	4,415,307	4,414,867	4,415,423
	4,414,969	4,414,832	4,415,239	4,415,377	4,414,895	4,415,532
	4,414,981	4,414,871	4,415,269	4,415,484	4,414,899	4,415,590
	4,414,985	4,414,872	4,415,275	4,415,537	4,414,967	4,415,666
	4,414,993	4,415,017	4,415,330	4,415,617	4,414,968	4,415,696
	4,415,001	4,415,394	4,415,352	4,415,772	4,415,020	4,415,722
	4,415,014	4,415,402	4,415,462	4,415,884	4,415,041	4,415,723
	4,415,138	4,415,405	4,415,491	4,416,021	4,415,043	4,415,724
	4,415,151	4,415,604	4,415,493	4,414,916	4,415,051	4,415,725
	4,415,200	4,415,636	4,415,503	4,415,651	4,415,098	4,415,751
	4,415,203	4,415,672	4,415,513	4,415,652	4,415,117	4,415,788
	4,415,253	4,415,693	4,415,526	4,415,754	4,415,131	4,415,812
	4,415,286	4,415,796	4,415,612	4,415,802	4,415,149	4,415,841
	4,415,301	4,415,855	4,415,661	4,414,721	4,415,154	4,415,956
	4,415,339	4,415,948	4,415,760	4,414,885	4,415,155	4,416,007
	4,415,351	4,414,801	4,415,771	4,415,565	4,415,167	4,414,708
	4,415,353	4,414,975	4,415,839	4,414,695	4,415,202	4,414,863
	4,415,365	4,414,935	4,415,844	4,414,760	4,415,327	4,415,052
	4,415,371	4,415,115	4,415,858	4,414,774	4,415,336	4,415,175
	4,415,373	4,415,242	4,415,867	4,414,777	4,415,346	4,415,197
	4,415,528	4,415,267	4,415,885	4,414,790	4,415,348	4,415,300
	4,415,539	4,415,780	4,415,889	4,414,926	4,415,382	4,415,303
	4,415,546	4,414,713	4,415,893	4,414,961	4,415,387	4,415,790
	4,415,558	4,414,736	4,415,915	4,415,021	4,415,393	4,414,717
	4,415,563	4,414,786	4,415,941	4,415,075	4,415,412	4,414,843
	4,415,599	4,414,792	4,415,960	4,415,099	4,415,433	4,414,974
	4,415,608	4,414,853	4,415,963	4,415,103	4,415,434	4,415,975
	4,415,618	4,414,865	4,415,964	4,415,159	4,415,444	4,414,841
	4,415,662	4,414,906	4,415,967	4,415,211	4,415,452	4,415,134
	4,415,671	4,414,924	4,415,972	4,415,219	4,415,479	4,415,188
	4,415,767	4,414,932	4,415,980	4,415,511	4,415,483	4,415,284
	4,415,794	4,414,973	4,415,986	4,415,525	4,415,524	4,415,833
	4,415,827	4,414,992	4,414,711	4,415,601	4,415,585	4,416,020



## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

22 :	4,414,754 4,414,799 4,415,283 4,415,366 4,415,435 4,415,441 4,415,502 4,415,507 4,415,597 4,415,628 4,415,791 4,414,912 4,415,086 4,415,130 4,415,137 4,415,439 4,415,551 4,415,807 4,415,896 4,415,898 4,415,974 4,415,979 4,415,993 4,416,013 4,414,741 4,414,750 4,414,784 4,414,829 4,414,892 4,414,922 4,414,930 4,415,003 4,415,100 4,415,183 4,415,225 4,415,251 4,415,266 4,415,401 4,415,403 4,415,427 4,415,498 4,415,610 4,415,648 4,415,660 4,415,668 4,415,675 4,415,676 4,415,737 4,415,829 4,415,834 4,415,946 4,415,958 4,415,962 Re.31,444 4,414,723 4,414,723 4,414,724 4,414,729 4,414,733 4,414,805 4,414,809 4,414,811 4,414,822 4,414,839 4,414,842 4,414,855 4,414,879 4,414,902 4,414,925 4,414,955 4,415,016 4,415,054 4,415,074 4,415,091 4,415,105 4,415,141 4,415,146 4,415,166 4,415,189 4,415,194 4,415,291 4,415,299 4,415,369 4,415,391 4,415,466	4,415,516 4,415,531 4,415,583 4,415,655 4,415,681 4,415,681 4,415,697 4,415,749 4,415,847 4,415,875 4,415,878 4,415,985 4,416,023 4,414,704 4,414,854 4,414,923 4,414,931 4,414,986 4,415,013 4,415,282 4,415,396 4,415,598 4,415,615 4,415,653 4,415,694 4,415,782 4,415,894 4,415,970 4,415,450 4,415,065 4,414,788 4,414,834 4,414,911 4,414,954 4,414,960 4,415,024 4,415,025 4,415,084 4,415,087 4,415,113 4,414,903 4,415,011 4,415,106 4,415,173 4,415,162 4,415,292 4,415,801 4,415,872 Re.31,439 4,414,837 4,414,868 4,414,907 4,414,921 4,414,990 4,415,062 4,415,077 4,415,081 4,415,089 4,415,122 4,415,220 4,415,222 4,415,263 4,415,270 4,415,288 4,415,349 4,415,379 4,415,380 4,415,388 4,415,409 4,415,414 4,415,426 4,415,436 4,415,437 4,415,443 4,415,460 4,415,468 4,415,480 4,415,489 4,415,496 4,415,518 4,415,521 4,415,544 4,415,560 4,415,568 4,415,581 4,415,587	4,415,593 4,415,624 4,415,649 4,415,698 4,415,701 4,415,709 4,415,710 4,415,711 4,415,731 4,415,742 4,415,745 4,415,803 4,415,871 4,415,901 4,415,906 4,415,918 4,415,959 4,415,978 4,416,011 4,416,012 4,416,015 4,416,016 4,414,748 4,414,692 4,414,693 4,414,698 4,414,712 4,414,788 4,414,834 4,414,911 4,414,954 4,414,960 4,415,024 4,415,025 4,415,084 4,415,087 4,415,113 4,414,903 4,415,011 4,415,106 4,415,173 4,415,213 4,415,215 4,415,230 4,415,234 4,415,244 4,415,245 4,415,258 4,415,265 4,415,289 4,415,296 4,415,323 4,415,338 4,415,344 4,415,357 4,415,363 4,415,469 4,415,478 4,415,481 4,415,501 4,415,506 4,415,515 4,415,547 4,415,549 4,415,578 4,415,580 4,415,613 4,415,621 4,415,626 4,415,639 4,415,646 4,415,647 4,415,721 4,415,740 4,415,746 4,415,783 4,415,808 4,415,840 4,415,851 4,415,853 4,415,856 4,415,905 4,415,909	4,415,910 4,415,914 4,415,943 4,415,955 4,415,976 4,414,904 4,414,956 4,415,044 4,415,224 4,415,389 4,415,779 4,415,961 Re.31,442 4,414,726 4,414,778 4,414,797 4,414,852 4,414,877 4,414,880 4,414,964 4,414,991 4,415,049 4,415,067 4,415,114 4,415,132 4,415,187 4,415,226 4,415,228 4,415,229 4,415,328 4,415,390 4,415,398 4,415,406 4,415,420 4,415,473 4,415,474 4,415,475 4,415,520 4,415,600 4,415,606 4,415,684 4,415,686 4,415,690 4,415,695 4,415,704 4,415,715 4,415,830 4,415,835 4,415,902 Re.31,443 4,415,005 4,415,033 4,415,034 4,415,036 4,415,129 4,415,367 4,415,431 4,415,440 4,415,442 4,415,459 4,415,714 4,415,729 4,415,857 4,416,000 4,414,775 4,414,813 4,414,875 4,415,171 4,415,861 4,415,927 4,415,969 4,414,715 4,414,716 4,414,770 4,414,793 4,414,796 4,414,814 4,414,823 4,414,858 4,414,888 4,414,915 4,414,959 4,414,982 4,414,998	4,415,064 4,415,078 4,415,116 4,415,147 4,415,179 4,415,180 4,415,204 4,415,208 4,415,223 4,415,232 4,415,278 4,415,294 4,415,297 4,415,332 4,415,334 4,415,341 4,415,345 4,415,354 4,415,376 4,415,378 4,415,410 4,415,415 4,415,425 4,415,455 4,415,527 4,415,545 4,415,575 4,415,576 4,415,622 4,415,628 4,415,629 4,415,638 4,415,654 4,415,670 4,415,679 4,415,706 4,415,736 4,415,748 4,415,762 4,415,763 4,415,825 4,415,832 4,415,928 4,415,984 4,415,996 4,414,691 4,415,164 4,415,287 4,414,696 4,414,710 4,414,744 4,414,756 4,414,844 4,415,061 4,415,331 4,415,348 4,415,350 4,414,772 4,414,870 4,415,071 4,415,139 4,415,199 4,415,237 4,415,416 4,415,446 4,415,536 4,415,543 4,415,674 4,415,837 4,415,926 4,416,014 4,414,734 4,414,759 4,414,769 4,414,817 4,414,846 4,414,909 4,414,918 4,414,936 4,414,965 4,414,995 4,415,027 4,415,028 4,415,029	4,415,030 4,415,031 4,415,032 4,415,035 4,415,037 4,415,038 4,415,045 4,415,174 4,415,181 4,415,193 4,415,205 4,415,218 4,415,293 4,415,337 4,415,453 4,415,463 4,415,507 4,415,517 4,415,677 4,415,678 4,415,691 4,415,712 4,415,717 4,415,755 4,415,805 4,415,859 4,415,879 4,415,880 4,415,895 4,415,951 4,415,983 4,415,999 4,416,009 3,962,136 4,414,962 4,415,817 4,415,939 4,414,747 4,414,824 4,414,987 4,414,999 4,415,133 4,415,311 4,415,312 4,415,456 4,415,635 4,415,821 4,415,850 4,414,919 4,415,066 4,415,140 4,415,184 4,415,512 4,415,768 4,414,836 4,415,207 4,415,530 4,415,719 4,415,747 4,415,752 Re.31,441 4,414,700 4,414,707 4,414,751 4,414,757 4,414,808 4,414,861 4,414,933 4,414,934 4,414,940 4,414,977 4,415,006 4,415,019 4,415,022 4,415,073 4,415,317 4,415,318 4,415,342 4,415,592 4,415,605 4,415,607 4,415,781 4,415,957 4,358,573
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## DESIGN PATENTS

04 :	271,390	271,386	271,391	29 :	271,412	271,431	42 :	271,373
05 :	271,400	271,411	271,437	34 :	271,378	271,348		271,403
06 :	271,345	271,434	271,395		271,424	271,374		271,418
	271,346	271,419	271,421	36 :	271,430	271,381		271,432
	271,350	271,433	271,422		271,344	271,397	44 :	271,370
	271,358	271,369	271,398	17 :	271,363	271,402	47 :	271,384
	271,359	271,377	271,401	18 :	271,364	271,406		271,387
	271,360	271,388	271,354	25 :	271,365	271,413	48 :	271,408
	271,361	271,389	271,356		271,366	271,415		271,420
	271,371	271,394	271,427		271,385	271,416	51 :	271,405
	271,372	271,355	271,428		271,399	271,436	55 :	271,351
	271,382	271,375	271,407	26 :	271,409	271,438		271,357
	271,383	271,376	271,368	27 :	271,414			

## PLANT PATENTS

06 :	5,137	5,138	5,139	5,140	
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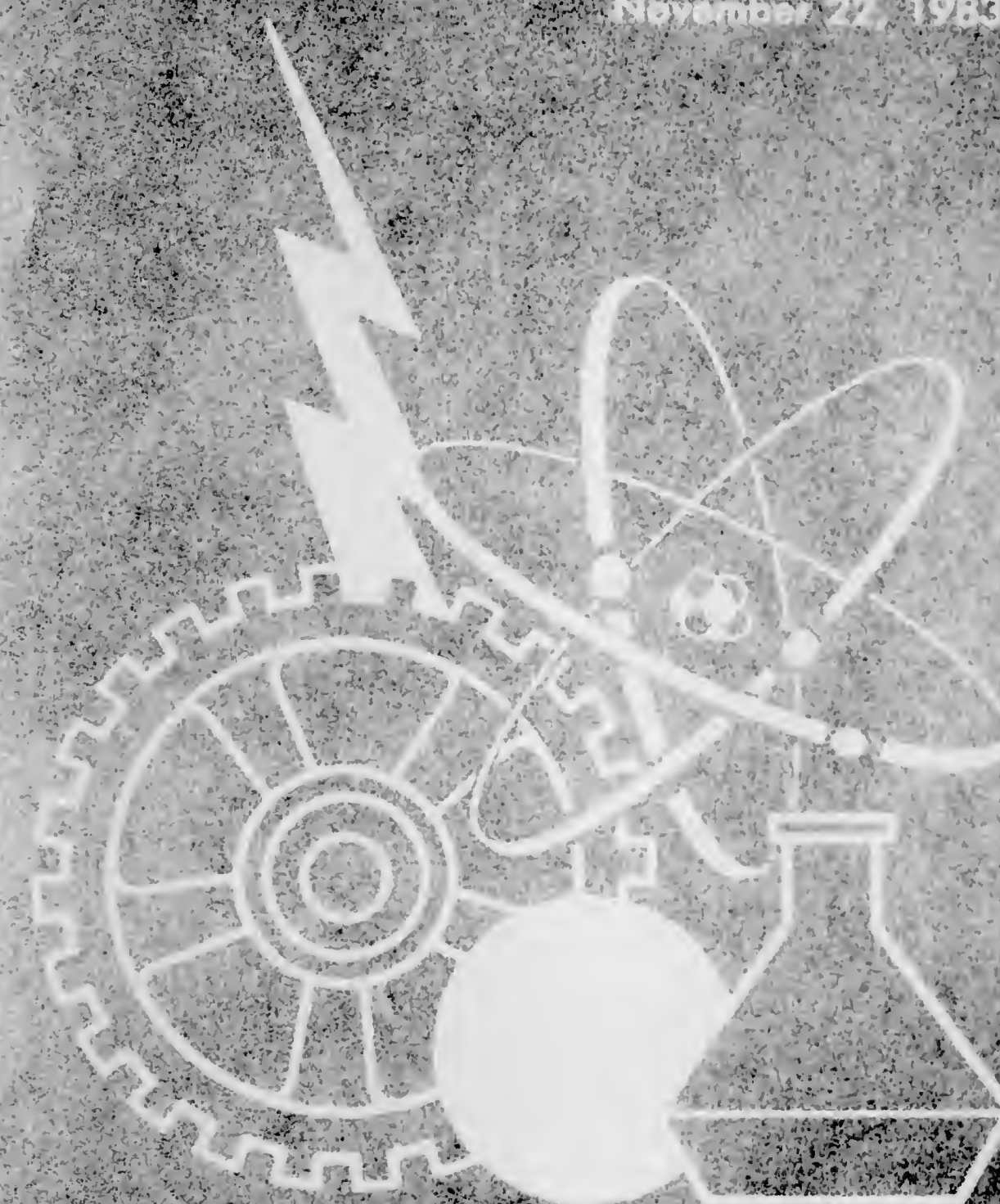
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PATENTS

November 22, 1983



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November 22, 1983                      Volume 1036                      Number 4

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CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1036 OG 24
Reissue Applications Filed	1036 OG 24
Request for Reexamination Filed	1036 OG 24
Patent Certificates of Correction	1036 OG 25
Disclaimers	1036 OG 25
Disclaimers and Dedications	1036 OG 25
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1036 OG 26
Condition of Patent Applications	1036 OG 27
Reissue Patents Granted (31,445)	1257
Plant Patents Granted (5,141)	1259
Patents Granted	
General and Mechanical (4,416,025)	1261
Chemical (4,416,665)	1483
Electrical (4,417,092)	1603
Design Patents Granted (271,439)	1695
Reexaminations	1715
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 49
Classification of	
Patents (Including Reissues and Reexaminations)	PI 53
Designs and Plants	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 58
Change of Address Form and Subscription Order Form	Back Page

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00
GERALD J. MOSSINGHOFF, Commissioner of Patents and Trademarks.	
Dec. 3, 1982.	

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,645,835**, Re. S.N. 533,914, Filed Sept. 19, 1983, Cl. 428/195, MOISTURE-VAPOR-PERMEABLE PRESSURE-SENSITIVE ADHESIVE MATERIALS, Martin E. Hodgson, Owner of Record: *Smith, T. J. & Nephew Ltd., Yorkshire, England*, Attorney or Agent: Albert L. Jacobs, Jr., Ex. Gp.: 164

**3,767,884**, Re. S.N. 488,527, Filed Apr. 29, 1983, Cl. 219/10.55D, ENERGY SEAL FOR HIGH FREQUENCY ENERGY APPARATUS, John M. Osepchuk, et al., Owner of Record: *Raytheon Co., Lexington, Mass.*, Attorney or Agent: William E. Clark, Ex. Gp.: 213

1036 OG 24

**3,896,435**, Re. S.N. 343,225, Filed Jan. 27, 1982, Cl. 343/9R, SIMPLE RADAR FOR DETECTING THE PRESENCE, SPEED AND RANGE OF TARGETS, James N. Constant, Owner of Record: *Inventor*, Attorney or Agent: Warren L. Kern, et al., Ex. Gp.: 222

**3,920,510**, Re. S.N. 384,612, Filed June 3, 1982, Cl. 162/162, PRESSURE AND HEAT SENSITIVE COPYING PAPER, Yoshihiro Hatano, et al., Owner of Record: *Yamamoto Kagaku Goset Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: James E. Armstrong, III, et al., Ex. Gp.: 173

**4,287,949**, Re. S.N. 529,757, Filed Sept. 6, 1983, Cl. 166/212, SETTING TOOLS AND LINER HANGER ASSEMBLY, Hiram E. Lindsey, Jr., Owner of Record: *MWL Tool and Supply Co., Midland, Tex.*, Attorney or Agent: Donald H. Fidler, Ex. Gp.: 356

**4,306,791**, Re. S.N. 438,003, Filed Nov. 1, 1982, Cl. 354/126, SINGLE LENS REFLEX CAMERA, Akihiko Hashimoto, Owner of Record: *Olympus Optical Co. Ltd., Tokyo, Japan*, Attorney or Agent: Ezra Sutton, et al., Ex. Gp.: 211

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**3,967,808**, Reexam. No. 90/000,462, Requested: Oct. 24, 1983, Cl. 251/46, IRRIGATION VALVE WITH METAL SEAT, Calvin A. Liding, Owner of Record: *Irrigation Specialties Co., San Gabriel, Calif.*, Attorney or Agent: Christie, Parker and Hale, Ex. Gp.: 341, Requester: Toro Co., Minneapolis, Minn.

**4,355,572**, Reexam. No. 90/000,459, Requested: Oct. 12, 1983, Cl. 99/516, APPARATUS FOR SEPARATING THE PULP FROM THE SKIN OF FRUIT SUCH AS TOMATOES, Jesus A. Silverstrini, Owner of Record: *IMDEC S.R.L., Mendoza, Argentina*, Attorney or Agent: C. Douglas McDonald, Jr., Ex. Gp.: 240, Requester: Israel Gopstein, Arlington, Va.

**4,389,393**, Reexam. No. 90/000,461, Requested: Oct. 18, 1983, Cl. 424/362, SUSTAINED RELEASE THERAPEUTIC COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT HYDROXYPROPYLMETHYLCELLULOSE, Joseph M. Schor, et al., Owner of Record: *Forest Laboratories, Inc., New York, N.Y.*, Attorney or Agent: Jacobs & Jacobs, Ex. Gp.: 120, Requester: Dow Chemical Co., Midland, Mich.

## PATENT NOTICES

### Certificates of Correction for the Week of Nov. 22, 1983

D. 268,551	4,381,187	4,393,379	4,402,409
D. 269,219	4,381,742	4,393,409	4,402,427
4,260,467	4,382,097	4,393,693	4,402,542
4,320,122	4,382,502	4,393,770	4,402,550
4,335,071	4,383,386	4,393,772	4,402,573
4,347,701	4,383,595	4,393,866	4,402,816
4,350,398	4,384,345	4,394,459	4,402,881
4,358,562	4,384,483	4,394,976	4,403,027
4,358,579	4,384,497	4,395,143	4,403,228
4,358,754	4,384,713	4,395,287	4,403,467
4,362,865	4,385,059	4,395,390	4,403,531
4,363,483	4,385,826	4,396,013	4,403,922
4,367,525	4,386,893	4,396,407	4,404,845
4,369,775	4,387,508	4,396,431	4,405,112
4,369,829	4,389,113	4,397,715	4,405,273
4,370,540	4,389,376	4,397,741	4,405,314
4,371,825	4,389,628	4,398,263	4,405,320
4,372,138	4,389,826	4,398,336	4,405,347
4,376,401	4,389,882	4,398,520	4,405,349
4,377,129	4,390,366	4,398,940	4,405,356
4,378,410	4,390,506	4,399,237	4,405,369
4,379,190	4,390,963	4,399,585	4,405,563
4,379,491	4,391,422	4,399,599	4,406,465
4,380,649	4,391,618	4,399,927	4,406,647
4,380,966	4,392,096	4,400,938	4,407,684
4,380,983	4,392,812	4,401,398	

### Disclaimers

**3,941,441**.—*Douglas Scheerhorn*, Grand Rapids, Mich. DRAWER INTERLOCK SYSTEM. Patent dated

Mar. 2, 1976. Disclaimer filed Sept. 19, 1983, by the assignee, *Steelcase, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

**4,225,875**.—*Alfred Charles Ipri*, Princeton, N.J. SHORT CHANNEL MOS DEVICES AND THE METHOD OF MANUFACTURING SAME. Patent dated Sept. 30, 1980. Disclaimer filed Sept. 30, 1983, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

### Disclaimers and Dedications

**3,431,850**.—*Glenn B. Christopher*, Arlington, Tex. SHAPED CHARGE AND METHOD OF MANUFACTURE THEREOF. Patent dated Mar. 11, 1969. Disclaimer and Dedication filed Sept. 26, 1983, by the assignee, *Jet Research Center, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

**3,784,983**.—*John Presper Eckert, Jr.*, Gladwyne, James R. Weiner, Philadelphia, Pa., and Robert F. Shaw, Brooklyn, N.Y. and *Herbert Frazer Welsh*, Philadelphia, Pa. INFORMATION HANDLING SYSTEM. Patent dated Jan. 8, 1974. Disclaimer and Dedication filed Apr. 3, 1981, by the assignee, *Sperry Corp.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

1036 OG 25



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Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
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	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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# PATENT EXAMINING CORPS RENE D. TEGTMEYER, Assistant Commissioner WILLIAM FELDMAN, Deputy Assistant Commissioner CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthetics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGN, GROUP 290—KENNETH L. CAGE, Director	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents . . . . . Numbers 2,616 to 2,627 inclusive



## REISSUES

NOVEMBER 22, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,445

### SUBMERGED PUMPING SYSTEM

James C. Carter, Pasadena, Calif., assignor to ITT, New York, N.Y.

Original No. 3,369,715, dated Feb. 20, 1968, Ser. No. 548,985, May 10, 1966. Application for reissue Oct. 19, 1977, Ser. No. 842,931

Int. Cl.<sup>3</sup> B65D 88/76; B67D 5/50

U.S. Cl. 222—333

30 Claims



5. A [pump and motor unit adapted for lowering through] pumping system for liquefied gas comprising a fluid transmitting conduit and a pump and motor unit adapted to be lowered into the conduit to pump fluid through the conduit [which comprises], said pump and motor unit comprising

- a motor casing of smaller diameter than the conduit,
- a pump casing mounted on said motor casing having a discharge outlet surrounding the motor casing to discharge fluid into the conduit around the motor casing,
- means on said pump casing defining a downwardly opening pump inlet adapted to receive fluid,
- a motor in said motor casing,
- a shaft extending from said motor through said pump casing,
- impeller means on said shaft coacting with the pump casing to pump fluid from the inlet to the conduit, and
- a tapered seat for said unit at the bottom of said conduit to mount the unit centrally in the conduit and to seal the bottom of the conduit except through the pump; and means for purging the interior of the conduit.

Re. 31,446

### MANUAL OR AUTOMATIC CAMERA AND ELECTRONIC FLASH FOR USE THEREWITH

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Original No. 4,196,988, dated Apr. 8, 1980, Ser. No. 880,800, Feb. 24, 1978. Application for reissue Mar. 31, 1982, Ser. No. 363,859

Claims priority, application Japan, Feb. 28, 1977, 52-20368

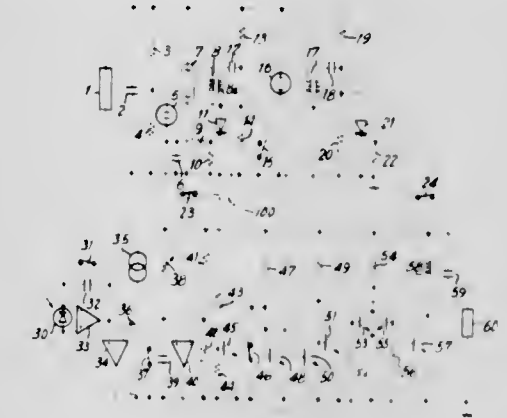
Int. Cl.<sup>3</sup> G03B 7/08, 15/05

U.S. Cl. 354—33

14 Claims

1. In a camera, electrical exposure-time determining means, light-responsive electrical means, manually adjustable electrical means, and selector circuit means electrically connecting said light-responsive electrical means and said manually adjustable electrical means to said exposure-time determining means for selectively controlling the latter either by way of said light-responsive electrical means for automatically determin-

ing the exposure time in accordance with lighting conditions or by way of said manually adjustable electrical means for providing a manually determined exposure time, electronic flash means for providing, if necessary, additional flash illumination to be utilized for exposure, and electrical connecting means connecting said electronic flash means to said selector circuit



means for rendering the latter operable to control said exposure-time determining means by way of said light-responsive electrical means irrespective of whether said selector circuit means is set for controlling said exposure-time determining means by way of said light-responsive electrical means or said manually adjustable electrical means when additional flash illumination is required from said electronic flash means.

Re. 31,447

### HIGH YIELD SILICON CARBIDE PRE-CERAMIC POLYMERS

Ronald H. Baney, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Original No. 4,298,558, dated Nov. 3, 1981, Ser. No. 171,553, Jul. 23, 1980. Application for reissue Apr. 16, 1982, Ser. No. 369,336

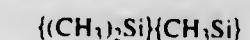
Int. Cl.<sup>3</sup> F27B 9/04

U.S. Cl. 264—65

16 Claims

8. A method of preparing a silicon carbide-containing ceramic article which consists of

- (A) forming an article of the desired shape from a polysilane having the average formula



in which polysilane there is from 0 to 60 mole percent  $(\text{CH}_3)_2\text{Si}=\text{}$  units and 40 to 100 mole percent  $\text{CH}_3\text{Si}=\text{}$  units, wherein there is also bonded to the silicon atoms other silicon atoms and radicals having the formula



wherein R is an alkyl radical of 1 to 4 carbon atoms or phenyl wherein essentially all the remaining bonds on silicon are attached to chlorine or bromine atoms such that the polysilane contains from 24 to [35] 61 weight percent of  $\text{RO}-$  when R is a phenyl radical, and either 0 to 25 weight percent chlorine or 0-35 weight percent bromine, all based on the weight of the polysilane; and

- (B) heating the article formed in (A) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1200° C. to 1600° C. until the polysilane is converted to a silicon carbide-containing ceramic article.



Re. 31,448

**COATING COMPOSITIONS COMPRISING A POLYSULFONE AND FLUOROCARBON POLYMER**

Terence E. Attwood, Staining, and Barry W. Farrant, Great Paxton, both of England, assignors to Imperial Chemical Industries, Ltd., London, England

Original No. 3,981,945, dated Sep. 21, 1976, Ser. No. 461,408, Apr. 16, 1974. Continuation of Ser. No. 47,244, Jun. 11, 1979, abandoned. Application for reissue Jan. 29, 1982, Ser. No. 344,173

Claims priority, application United Kingdom, Nov. 19, 1973, 9583/73

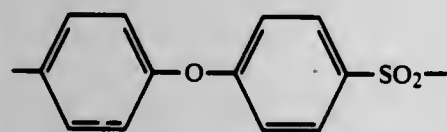
The portion of the term of this patent subsequent to Sep. 21, 1993, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 27/18, 81/06

U.S. Cl. 428—422

5 Claims

10. A coating composition which comprises a polymer mixture of (a) 10% to 90% by weight of at least one thermoplastic aromatic polysulfone having reduced viscosity of at least 0.3 (as measured at 25° C. on a solution of the polymer in dimethyl formamide containing 1 g of polymer in 100 cm<sup>3</sup> of solution) and repeat units



only, and, correspondingly, (b) 90% to 10% by weight of at least one lubricant grade polytetrafluoroethylene powder of average particle size less than 20 μm as measured optically prepared by processes including comminution of a high molecular weight polytetrafluoroethylene, said composition being in the form of a dispersion of said lubricant grade polytetrafluoroethylene dispersed in a solution of said thermoplastic aromatic polysulfone in a solvent therefor.

Re. 31,449

**FLUID-DRIVEN ROTARY ENGINE**

William A. Crider, 1216 Kelley St., S.W., Vienna, Va. 22180

Original No. 4,260,902, dated Apr. 7, 1981, Ser. No. 964,171, Nov. 28, 1978. Application for reissue Sep. 30, 1982, Ser. No. 428,780

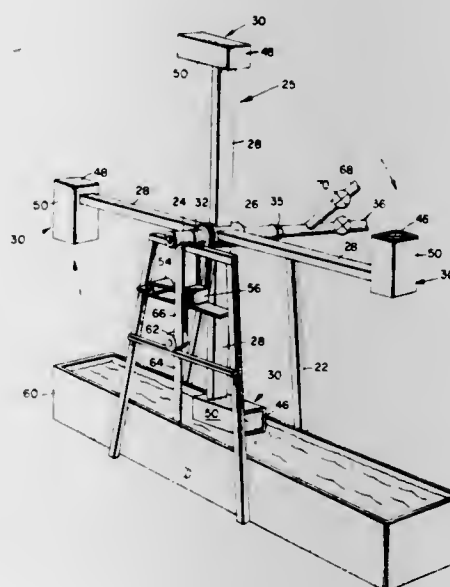
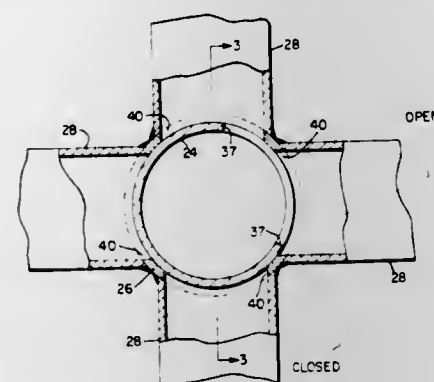
Int. Cl.<sup>3</sup> F03B 13/00, 13/10, 17/06; H02P 9/04

U.S. Cl. 290—43

14 Claims

14. A fluid driven rotary engine comprising at least one spoked wheel assembly mounted for rotation about a horizontally extend-

ing axis and comprising (a) a hub, (b) a set of angularly spaced apart wheel spokes extending radially from said hub and fixed at



their inner ends to said hub for rotation therewith, and (c) a set of liquid collection containers each associated with and fixed to a different one of said spokes at the outer end thereof, and a stationary, hollow fluid-conveying tubular member received in said hub for supplying water or other liquid under pressure to said wheel assembly, each of said spokes being hollow and opening into the interior of the container that is fixed thereto, and said tubular member and said hub having apertures arranged to establish fluid communication between the interior of said tubular member and each spoke for enabling liquid to flow through each spoke to the container at the outer end thereof for collection in the container as each spoke rotates through a pre-selected segment of the circular path of motion of said wheel assembly, said wheel assembly being rotated in a single pre-selected direction by the force-exerting weight of the liquid collected in said containers, and each of said containers having an open end and being arranged to dump the liquid collected therein through its open end as it is rotated with its associated wheel spoke beyond said pre-selected segment.

**PLANT PATENTS**

GRANTED NOVEMBER 22, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,141

**ROSE PLANT**

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Jan. 25, 1982, Ser. No. 342,658

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—8

1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, bright yellow blooms of heavy petallage borne singly and in large sprays (3 to 12 blooms).

5,143

**ILEX AQUIFOLIUM SELECTION**

Rosendo Avila, Azusa, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Mar. 9, 1982, Ser. No. 356,334

Int. Cl.<sup>3</sup> A01H 5/12

U.S. Cl. Plt.—65

1 Claim

1. *Ilex aquifolium* 'Monvila' is a new and distinct selection as substantially shown and described herein, a superior selection characterized by a combination of notable characteristics of variegated foliage, compact habit, small foliage and having strictly male flowers.

5,142

**ROSE PLANT MACCANTER**

Samuel D. McGredy, P.O. Box 14100, Panmure, Auckland, New Zealand

Filed Jun. 28, 1982, Ser. No. 392,548

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—20

1 Claim

1. A new and distinct variety of rose plant of the grandiflora rose class, substantially as shown and described, characterized particularly by currant red buds and flowers retaining color vibrancy upon aging borne one to a stem and in sprays but being capable of producing panicles of 12 to 25 blooms in late summer.

5,144

**CHRYSANTHEMUM NAMED TREASURE**

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Mar. 19, 1982, Ser. No. 359,892

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—78

1 Claim

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, characterized by its unique bright, clear yellow, incurve, standard bloom. This plant is vigorous with strong stems and capability for year round flowering with a substantially constant nine-week response.



## PATENTS

GRANTED NOV. 22, 1983

### ERRATA

For CLASS	See PATENT NO.
053-071 .....	4,416,093
604-020 .....	4,416,274
350-003 .....	4,416,540
417-386 .....	4,416,599
502-055 .....	4,416,798
502-156 .....	4,416,799
502-159 .....	4,416,800
502-153 .....	4,416,801
502-209 .....	4,416,802
502-209 .....	4,416,803
502-213 .....	4,416,804
502-067 .....	4,416,805
502-074 .....	4,416,806
381-094 .....	4,417,098
364-513 .....	4,417,102
369-060 .....	4,417,103
377-018 .....	4,417,135
123-490 .....	4,417,201



# PATENTS

GRANTED NOVEMBER 22, 1983

## GENERAL AND MECHANICAL

4,416,025

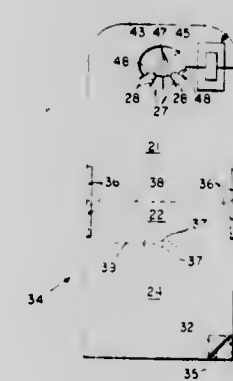
### BIB HAVING SEGMENTED NECK-APERTURE PERIMETRIC EDGE

David M. Moret, and Nicholas A. Ahr, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1983, Ser. No. 487,486  
Int. Cl.<sup>3</sup> A41D 27/12

U.S. Cl. 2—49 R

10 Claims



1. A bib of sheet material, said sheet material having a generally oval-shape neck accommodating aperture defined by a segmented perimetric edge, said perimetric edge being segmented by a plurality of bifurcations in said material which extend radially outwardly from said perimetric edge whereby said sheet material is rendered more conformant and compliant adjacent said neck-accommodating aperture.

4,416,026

### MULTI-PURPOSE MECHANIC'S GLOVE

Michael C. Smith, 10931 Mills Choice Rd., Gaithersburg, Md. 20760

Filed Nov. 23, 1981, Ser. No. 323,893  
Int. Cl.<sup>3</sup> A41D 19/00

U.S. Cl. 2—161 R

10 Claims



1. A multi-purpose mechanics glove adapted to cover substantially the entire hand from the wrist to the fingers comprising four finger stalls and a thumb stall, said glove being formed with a plurality of openings at selected locations to expose corresponding portions only of the hand of the mechanic wearing the glove, at least one opening of said plurality being formed in the palm of the hand to permit feel and control of tool handles and the like, an opening formed at the ball of the thumb for guiding and for cooperation with the user's index finger, at least two openings formed in the index finger stall, one at the ball of the index finger and a second at the palm side of the index finger stall, said second opening being of generally oval elongated shape to permit cooperation with the exposed area of the ball of the thumb in rolling in or rolling out motions of manipulation, said one opening at the ball of the index finger stall aiding in locating type uses of the index finger and permit-

ting cooperation of the facing exposed portions of the balls of the index finger and the thumb in motions of fine manipulation, and the total area of the users hand exposed by the total of the areas of all of said plurality of openings comprising no more than 10% of the total area of said user's hand from the wrist to the finger tips.

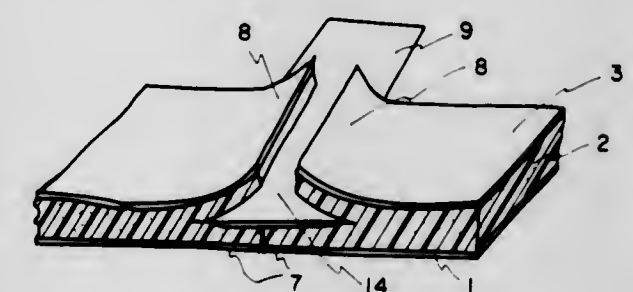
4,416,027

### DIVING SUIT SEAM CONSTRUCTION

Henry L. Perla, 1223 Harbour Island Rd., Orlando, Fla. 32809  
Filed Jan. 31, 1983, Ser. No. 462,530  
Int. Cl.<sup>3</sup> A41D 27/22

U.S. Cl. 2—275

2 Claims



2. A method of diving suit seam construction comprising: providing two pieces of elastomeric material having interior and exterior surfaces and abutting edges; cutting slits into the edges of the abutting pieces of elastomeric material; gluing the abutting edges of the two pieces along the exterior surfaces while the abutting edges of the interior surfaces are folded outward; stitching the exterior surface edges of the pieces; inserting a strip of elastomeric material inside the cavity formed by the seam of the abutting edges of the exterior surfaces and the outwardly folded interior surfaces; and bringing the outwardly folded interior surfaces into abutting relationship and gluing their edges together to form the finished seam.

4,416,028

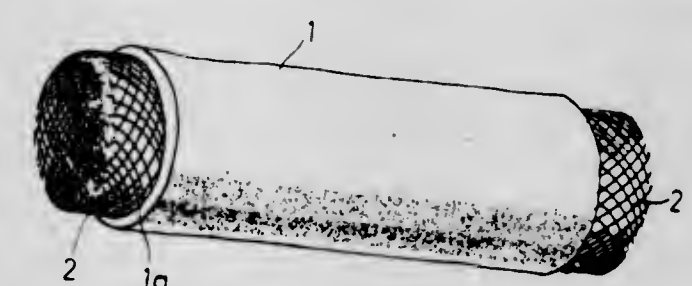
### BLOOD VESSEL PROSTHESIS

Ingvar Eriksson, Ycklinge, Rasbokil; Staffan Bowald, Flskartorp, Rasbo, both of S-755 90 Uppsala, and Christer Busch, Nya Valsätravägen 17B, S-752 46 Uppsala, all of Sweden  
PCT No. PCT/SE80/00161, § 371 Date Jan. 22, 1981, § 102(e)  
Date Jan. 22, 1981, PCT Pub. No. WO80/02641, PCT Pub. Date Dec. 11, 1980

PCT Filed Jun. 4, 1980, Ser. No. 230,942  
Int. Cl.<sup>3</sup> A61F 1/24

U.S. Cl. 3—1.4

10 Claims



1. A blood vessel prosthesis comprising a tubular support



member of an at least partially non-resorbable material without adverse tissue reaction, and at least one inner wall member of a resorbable material without adverse tissue reaction supported by said tubular member and forming a substantially concentric inner wall structure thereto, said inner wall structure being sufficiently porous to permit the passage of blood cells, such as erythrocytes and thrombocytes, through the free inner surface and into at least a substantial part of the thickness thereof, thereby providing a support inside said tubular support member for the formation of a layer of thrombotic material whereby an endothelium coated muscle layer is formed on said tubular support member.

4,416,029

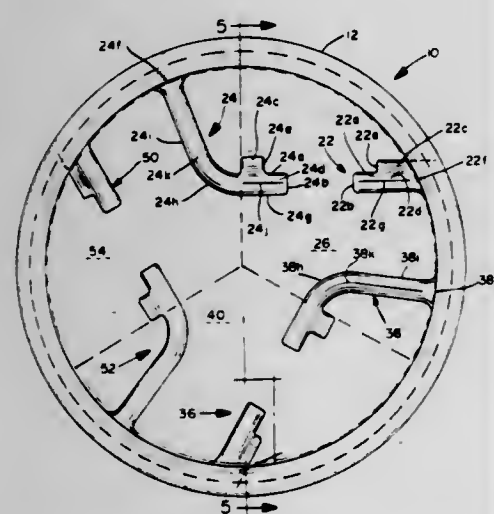
## TRILEAFLET PROSTHETIC HEART VALVE

Robert L. Kaster, 2730 Vagabond La., Plymouth, Minn. 55447  
Filed May 11, 1981, Ser. No. 262,635

Int. Cl.<sup>3</sup> A61F 1/22

U.S. Cl. 3—1.5

42 Claims



## 1. Heart valve comprising:

- a means for housing in a heart and including an internal orifice for blood flow;
- b means projecting inwardly of and spaced about said housing means, said projecting means including a spread plurality of short and long projections; and,
- c means for symmetrically and substantially synchronously moving between occluding and non-occluding positions in said housing means, said occluding means including a like plurality of leaflets including means for freely engaging and moving about each of said plurality of short and long projections, each of said plurality of short and long projections defines an axis about which each of said leaflets moves between said occluding and non-occluding positions, each of said axes operationally bisects said leaflet asymmetrically and unequally whereby each of said leaflets symmetrically and substantially synchronously moves about a said axis with respect to each other in a predetermined geometrical path thereby providing for distributed blood flow through said housing means.

4,416,030

## COMPACT ADJUSTABLE SPA JET AERATOR

Arturo S. Reynoso, 27933 Oakmoor, Canyon County, Calif. 91351  
Filed Sep. 30, 1982, Ser. No. 431,297

Int. Cl.<sup>3</sup> E04H 3/18; A61H 33/02; E03C 1/02

U.S. Cl. 4—496

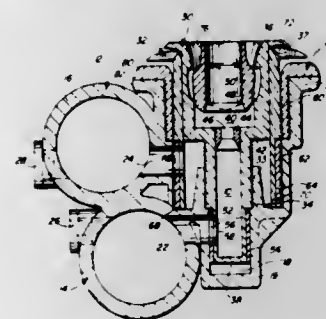
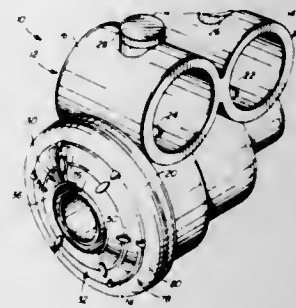
11 Claims

1. An improved compact adjustable spa jet aerator, comprising, in combination:

- (a) a hollow housing having an elongated passageway therein extending to an exit in the exterior surface thereof, said housing defining an air conduit and a water conduit spaced therefrom in stacked relation adjacent to the same side of said passageway, to render said aerator compact

and openings in said conduits communicating with said passageway;

- (b) separate concentric water adjusting means and air adjusting means, each comprising a cylindrical sleeve with a side aperture therein alignable with one of said conduit openings to control the flow of fluid from said conduit, said sleeve being threadably secured for rotation into and



out of said passageway, the inner one of said water and air sleeves defining an aerating chamber in said passageway in communication with said conduits through said conduit openings and apertures; and,

- (c) flexible resilient seal means secured to the exterior of said sleeves to prevent leakage of water and air from said aerator.

4,416,031

## MACHINE ADAPTED FOR USE IN THE MANUFACTURING OF SHOES

Joseph A. Shutt, Rearsby; Kingsley J. Tutt, Birstall; Malcolm Tillyard, Leicester, and Terence J. Brown, Wigston Magna, all of England, assignors to USM Corporation, Farmington, Conn.

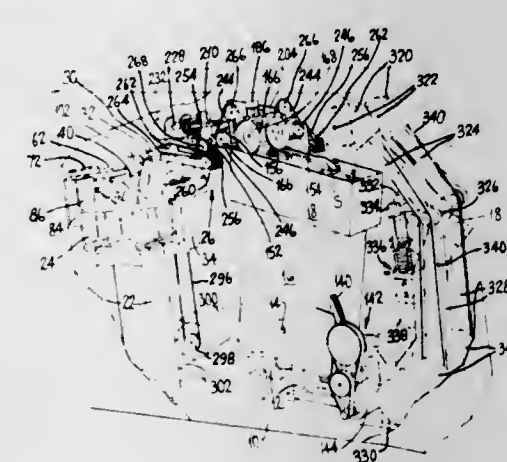
Filed Jun. 5, 1981, Ser. No. 270,991

Claims priority, application United Kingdom, Jun. 10, 1980, 8019008

Int. Cl.<sup>3</sup> A43D 3/00; C14B 1/44

U.S. Cl. 12—127

10 Claims



- 1. A shoe support for a machine for use in the manufacture of shoes, comprising toe end support means, a heel end support arrangement, including heel clamping means for clamping a heel end of a shoe supported thereby, and means for effecting relative movement of approach therebetween to accommodate to the size of shoe to be supported thereby, wherein a "shoe

present" sensing device is provided upon actuation of which relative movement of approach is caused to take place between the toe end support means and heel end support arrangement, said sensing device being supported by the toe end support means in such a manner that it can be actuated by a shoe placed in said toe end support means.

4,416,032

## CONNECTOR ADAPTOR FOR PIN-TYPE BLADE

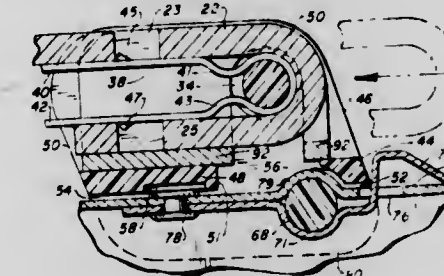
Michael G. Mohnach, 252 Green Acres Dr., and William H. Harblison, 182 Moorland Dr., both of Valparaiso, Ind. 46383

Filed Oct. 5, 1981, Ser. No. 308,403

Int. Cl.<sup>3</sup> B60S 1/40.

U.S. Cl. 15—250.32

6 Claims



- 1. An adaptor for connecting a pin-type wiper blade to a hook-type wiper arm, said wiper blade having a channel there-through extending transversely to the length thereof and a spring retention clip mounted therein, said wiper arm having a hooked end comprising:

first and second spaced apart walls, both walls being parallelogram-shaped and having aligned openings in the lower portion thereof, said openings being aligned with said channel;

- a shouldered pin having a reduced diameter portion extending between an upper portion of the first and second walls;
- a U-shaped spring clip disposed about the reduced diameter portion of the shouldered pin, said hooked end of said wiper arm being disposed over said spring clip and said shouldered pin to secure the adaptor to the wiper arm; and
- a retention pin having a reduced diameter central section and an enlarged diameter portion on one of the ends thereof, said pin extending through said aligned openings and said channel so that the reduced diameter central section is captured by the spring retention clip and the enlarged diameter portion contacts one of said walls to secure the adaptor to the wiper blade.

4,416,033

## FULL BAG INDICATOR

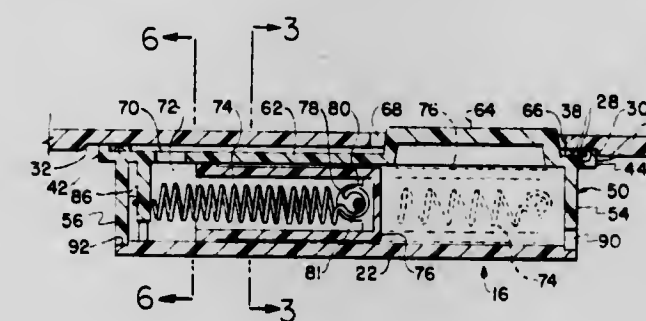
Glenn E. Specht, Massillon, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Oct. 8, 1981, Ser. No. 309,575

Int. Cl.<sup>3</sup> A47L 9/19

U.S. Cl. 15—339

3 Claims



- 1. A bag condition indicator for a vacuum cleaner, including:

- (a) a vacuum cleaner shell,

- (b) an aperture in said shell,
- (c) a housing for said bag condition indicator,
- (d) a spring urged piston mounted in said housing such that air may flow between said housing and said piston,
- (e) an aperture in said housing in an air flow path between said shell aperture and said piston,
- (f) said housing being movably mounted on said shell to vary the flow area of one of said apertures to thereby alter the flow rate of atmospheric air passing through said housing aperture.

4,416,034

## FRONT-SUCTION ARRANGEMENT ON A VACUUM CLEANER

Heinz-Jürgen Ahlf, Berg-Gladbach, and Wieland Gühne, Remscheid, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

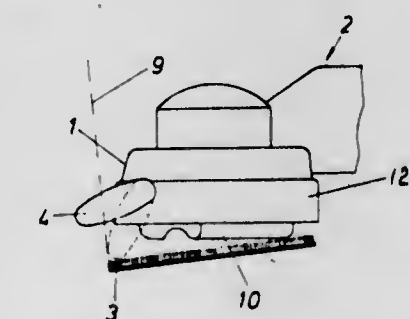
Filed Oct. 22, 1981, Ser. No. 313,757

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041881

Int. Cl.<sup>3</sup> A47L 9/02

U.S. Cl. 15—354

7 Claims



- 1. A device for front suction on a vacuum cleaner including a housing having a front side as viewed in a direction of traveling of the vacuum cleaner and a bottom plane, comprising lifting means mounted to said front side and operative for lifting said front side from a floor in response to a counter pressure exerted on said lifting means by a limiting surface when said lifting means is brought into contact with said limiting surface, said lifting means including a pivotable lever pivotable about a pivot point located on said front side of the housing at a predetermined distance from said bottom plane, said lever being longer than said predetermined distance and being spring-loaded in said direction of traveling and adapted to pivot in the direction of the floor under said counter pressure and thus lift said front side when the lever rests against the floor.

4,416,035

## SAFETY BAR CUTOFF AND BRAKE

Robert C. Schwartz, Lubbock, Tex., assignor to Horn & Gladden Lint Cleaner Company, Inc., Lubbock, Tex.

Filed Oct. 9, 1981, Ser. No. 310,109

Int. Cl.<sup>3</sup> D01G 31/00

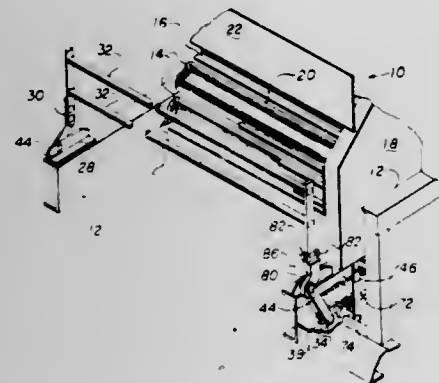
U.S. Cl. 19—0.2

10 Claims

- 1. An emergency stop for textile machinery having:
  - a. a frame having two sides,
  - b. feed rollers within the frame,
  - c. an electric motor for rotating the rollers on the frame,
  - d. rotatable transmission means connecting the rollers and motor,
  - e. a housing on the frame over the rollers, and
  - f. an opening in the housing over the rollers;
 wherein the improvement comprises:
  - g. an actuator arm pivoted to each side of the frame,
  - h. an actuator bar attached to the arms extending across the housing at the opening,
  - i. a trip plate pivoted to the frame,
  - j. the trip plate having a run position and a stop position,



- k. a helical tension trip spring biasing the trip plate to the stop position,
- l. a notch in the trip plate,
- m. a sear on one of the actuator arms in the notch,
- n. so that movement of the actuator bar toward the rollers moves the sear from the notch which allows the trip spring to move the trip plate to the stop position,
- o. a helical tension actuator spring on the actuator arm biasing the sear into the notch,
- p. an electrical switch on the frame with a switch arm bearing against the trip plate when in the run position,



- q. electrical wires connecting the switch to the motor so as to stop the motor when the trip plate moves to the stop position,
- r. a brake assembly on the frame,
- s. the brake assembly having
- t. a stop position to brake the transmission means, and
- u. a run position to disengage the brake assembly from the transmission means,
- v. a helical tension brake spring biasing the brake assembly in the stop position, and
- w. a pitman attached to the trip plate holding the brake assembly in a run position when the trip plate is in the run position.

4,416,036

# FASTENING MEANS FOR THE WRIST STRAP OF A SKI STICK AND METHOD FOR THE MANUFACTURE THEREOF

Yrjö Aho, Espoo, Finland, assignor to Exel Oy, Helsinki, Finland

Filed Feb. 9, 1982, Ser. No. 347,323

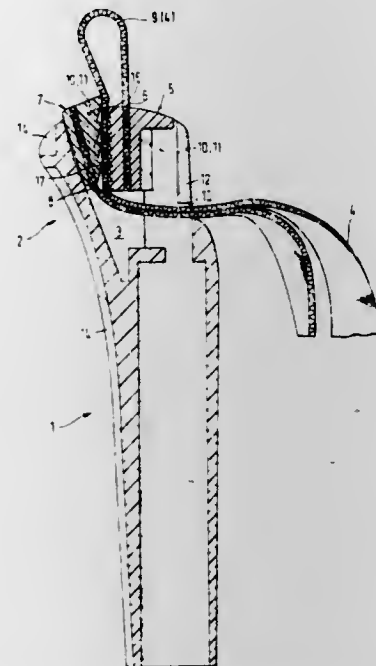
Claims priority, application Finland, Feb. 16, 1981, 810471  
Int. Cl.<sup>3</sup> A63C 11/22

U.S. Cl. 24—136 R

3 Claims

1. A ski stick handle including fastening means for forming a wrist strap loop thereto, said fastening means being positioned in a cavity (3) in a knob-shaped member (2) of said stick handle (1) as a removable unit separable from said knob-shaped member, said unit comprising two discrete plastic elements (5,7) between which a wrist strap (4) can be locked as desired, characterized in that said two discrete plastic elements (5,7) have embedded therein the opposite ends of said wrist strap (4) and that one (5) of said plastic elements is anchored by profile locking (10,11) in anchoring grooves (10) on interior walls of said cavity (3) in such a position that the junction (6) of said wrist strap and said one plastic element (4) is on the top face of said one plastic element (5), and the other of said plastic elements (7) is wedged into a downwardly converging space between said interior cavity wall (3) and said one plastic element (5) in such a position that the junction (8) of said wrist strap and said other plastic element is on the lower face of said other plastic element, the portion of said wrist strap (4) be-

tween said plastic elements (5,7) being passed between said plastic elements (5,7) and through an aperture opening (13) in



the sidewall of said knob-shaped member (2) thereby forming a loop.

4,416,037

# RELEASEABLE CONNECTOR IN LEASHES FOR DOMESTIC ANIMAL, SAFETY LINE OR THE LIKE

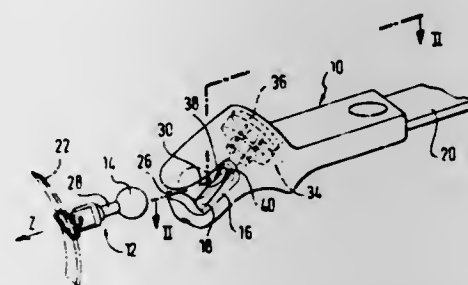
Rudolf Panthöfer, St. Augustin, and Hans Ley, Much, both of Fed. Rep. of Germany, assignors to Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH, Melle, Fed. Rep. of Germany  
Filed Jul. 6, 1981, Ser. No. 280,520

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026418

Int. Cl.<sup>3</sup> A44B 17/00

U.S. Cl. 24—665

8 Claims



1. A releasable connector, for use with a tension line and, comprising:  
a coupler formed with a neck and a spherical spherically shaped head,  
a holder formed with an axis and having oppositely disposed first and second ends disposed on said axis, said first end being adapted for connection to such tension line and said second end being adapted for coupling to said coupler such that tension applied to such line will direct the resultant force along said axis, said holder including a guide channel extending lateral to said axis and opening to one side of said holder for receipt of said head, said holder being formed at said second end with an axially through, laterally opening, recess for receipt of said neck, said holder being still further formed with a lock bolt-receiving, through bore coextensive with said axis and,  
a lock bolt received telescopically in said bore and extending into said guide channel for holding said head captive in said channel, said lock bolt being formed on one side thereof with a recess for registration with said head when said bolt is telescoped to an unlocked position to provide for passage of

said head between said recess and the opposite side of said channel to free said head for release from said channel.

4,416,038

## BALLOON CLIP

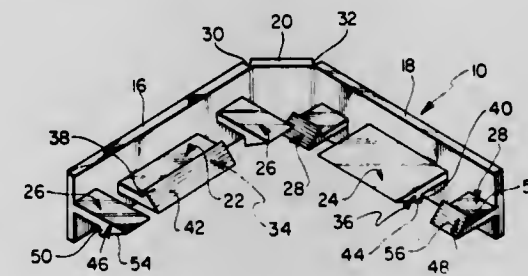
Joseph A. Morrone, III, Westerly, R.I., assignor to Adecon, Inc., Warwick, R.I.

Filed May 24, 1982, Ser. No. 381,535

Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 24—255 SL

5 Claims



1. A closure device for sealing the flexible tubular stem of an inflated balloon and the like comprising:

- a. a first leg;
- b. a second leg;
- c. hinge means interconnecting said first and second legs so that they are movable to closed positions thereof wherein they are in substantially parallel spaced relation;
- d. means for retaining said legs in the closed positions thereof;
- e. a first closure member attached to said first leg and extending generally toward said second leg when said legs are in the closed positions thereof and including a raised shoulder thereon having a beveled outer surface which extends generally to the terminal end of said first closure member;
- f. a second closure member attached to said second leg and is of substantially the same configuration as said first closure member, said second closure member extending outwardly from said second leg in inverted, slightly offset relation to said first closure member with the raised shoulders of said closure members on the same respective sides thereof as the opposite respective closure members, whereby when said legs are moved to the closed position thereof said closure members are deflected slightly to permit the passage of the shoulders thereof into interlocked relation with the shoulders thereof cooperating to define a tortuous path for sealingly securing said stem.

4,416,039

## ARTERY OR VEIN PERFORATOR

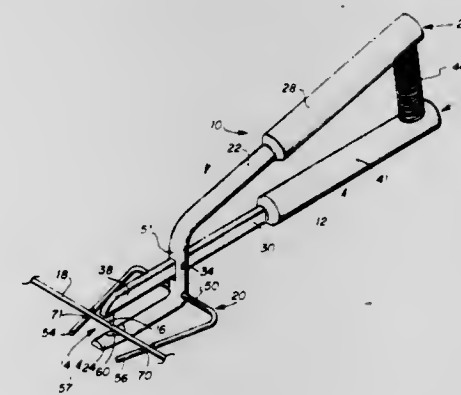
Judith A. Miller, P.O. Box 5068, Pine Bluff, Ark. 71611

Filed Jun. 26, 1981, Ser. No. 277,911

Int. Cl.<sup>3</sup> A01N 1/00

U.S. Cl. 27—21

24 Claims



1. Apparatus for perforating tubular conduit members, said apparatus comprising:

handle means adapted to be grasped manually by a user of said apparatus;  
jaw means adapted to close in response to compression of said handle means;  
needle means associated with said jaw means for puncturing a tubular conduit member when said jaw means closes  
said jaw means including groove means for properly positioning said tubular conduit member with respect to said needle means; and,  
fork means pivotally secured relative to said jaw means to facilitate manipulation of said tubular conduit member.

4,416,040

## WEAVING LOOM WITH INTERCHANGEABLE SECTIONS

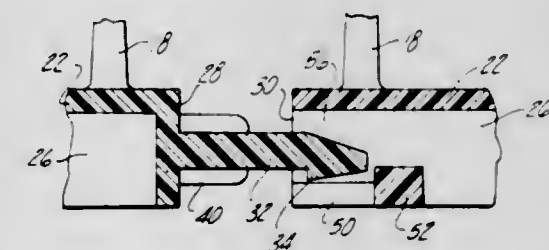
John A. Towsley, Ann Arbor, Mich., assignor to John Alan Enterprises, Ann Arbor, Mich.

Filed May 29, 1981, Ser. No. 268,267

Int. Cl.<sup>3</sup> D03D 29/00

U.S. Cl. 28—152

4 Claims



1. A weaving loom having a plurality of individual sections connected together in end-to-end abutment to form a closed frame on which an article may be woven wherein said sections include pegs upstanding on said sections and canted outwardly away from the area bounded by the closed frame and wherein at least one of the connections between two abutting sections comprises a resilient tongue on one of said two sections projecting into a slot of the other of said two sections, a catch on the tongue, bridge means on said other section engaged by the tongue catch for rendering said two sections incapable of disconnection by means of an axially applied force, and guide and guideway means on respective ones of said two sections constructed and arranged in relation to each other to axially align said two sections, said guide and guideway means and said tongue catch and bridge means further being constructed and arranged in clearance relation to each other to allow said two sections to be twisted relative to each other about a transverse axis passing through their abutting ends in an amount which allows the tongue catch to clear said bridge means on said other section engaged by the tongue catch thereby to allow said two sections to be disconnected by such twisting.

4. A loom frame section comprising a main body having ends adapted to abut ends of adjacent sections and connection means at the ends of the main body for connection with adjacent sections, pegs upstanding on said section and canted outwardly thereon, the connection means at one end of the main body comprising a resilient tongue including a catch and guides on opposite lateral sides of the tongue, the connection means at the other end of the main body comprising a slot, guideways in the slot complementary to the guides for reception of like guides of an adjacent abutting section, and a bridge extending transversely across the slot to provide interlocking connection with a like tongue catch of such adjacent abutting section such that said loom frame section and such adjacent abutting section, when connected together, are incapable of being disconnected by means of an axially applied force, said guides and guideways being constructed and arranged in relation to each other to provide axial alignment of said loom frame section and such adjacent abutting section, when connected together, said guides and guideways and said tongue catch and bridge being constructed and arranged in clearance



relation to each other to allow said loom frame section and such adjacent abutting section, when connected, to be twisted relative to each other about a transverse axis passing through their abutting ends in an amount which allows the tongue catch of such adjacent abutting section to clear said bridge and allow disconnection of such adjacent abutting section from said loom frame section.

4,416,041

# APPARATUS FOR THREADING A THREAD INTO A TEXTURIZING NOZZLE

Peter Gujer, Winterthur; Dieter Guldens, Dinhard; Armin Wirz, Ossingen, all of Switzerland; Hans Knopp, Ludwigshafen, Fed. Rep. of Germany; Dieter Herion, Frankenthal, Fed. Rep. of Germany, and Gerhard Conzelmann, Otterstadt, Fed. Rep. of Germany, assignors to Rieter Deutschland GmbH, Reutlingen, Fed. Rep. of Germany

PCT No. PCT/EP79/00019, § 371 Date Dec. 11, 1979, § 102(e) Date Dec. 11, 1979, PCT Pub. No. WO79/00956, PCT Pub. Date Nov. 15, 1979

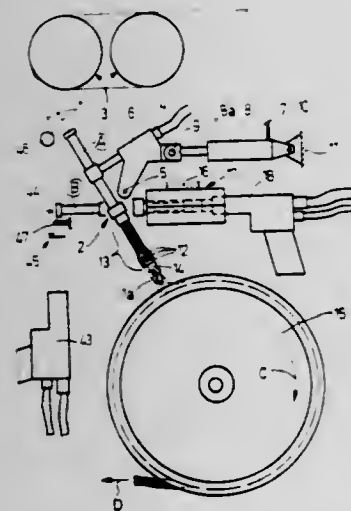
PCT Filed Mar. 24, 1979, Ser. No. 185,906

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817487

Int. Cl.<sup>3</sup> D02G 1/12, 1/16

U.S. Cl. 28—255

8 Claims



3. In an apparatus for texturing thread, the combination comprising

- a texturing nozzle for texturing a moving thread, said nozzle having a thread inlet opening at one end, a thread outlet opening at an opposite end and a plurality of lateral outlet openings between said inlet opening and said outlet opening, said nozzle being movable between a threading-in position and a texturing position;
- a suction device for selectively generating a suction air stream within said nozzle to draw a thread into said nozzle outlet opening in communication with said suction device at said threading-in position; and
- a closable device movable between a closed state forming a sealed duct about said lateral openings and extending to said suction device in said threading-in position and an opened state to permit movement of said nozzle from said threading-in position to said texturing position.

4,416,042

# METHOD AND APPARATUS FOR RAISING THE RAM OF A VERTICAL MILLING MACHINE

Ashford J. Hinson, 19969 Poinciana Ave., Redford, Mich. 48240

Filed Dec. 31, 1981, Ser. No. 336,094

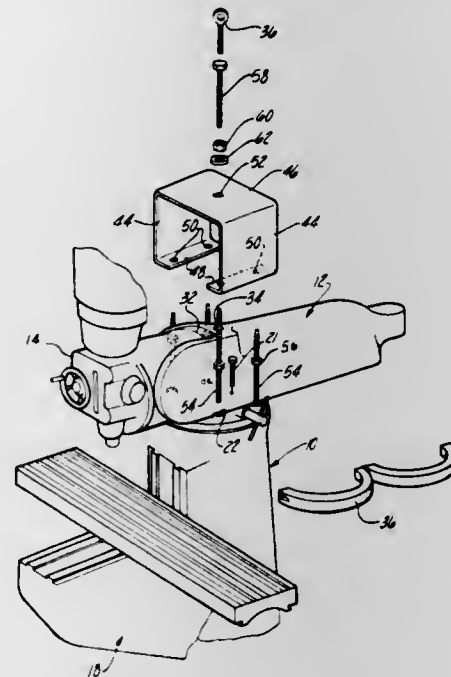
Int. Cl.<sup>3</sup> B23B 47/26, 1/02; B23Q 3/10

U.S. Cl. 29—57

10 Claims

1. A fixture for raising the ram from the base of a milling machine of the type wherein the ram is mounted on the base by means of four mounting bolts, two at each side of the ram, which extend down through openings in a base flange on the

ram and thread into registering threaded openings on a support mounted in a horizontally fixed position on the base, said ram having a raised central portion between said bolt openings which is provided with a threaded vertical opening for receiving an eye bolt for lifting the ram, said fixture comprising an inverted, generally U-shaped bracket having a pair of vertically extending legs interconnected at their upper ends by a bight section, the lower ends of said legs having laterally extending flanges thereon, said legs and bight section being dimensioned such that the bracket can be placed on the ram in an elevated position with the flanges registering vertically with the mounting bolt openings in the base flange of the ram with the bight section spanning the raised central portion of the ram and spaced thereabove, said laterally extending flanges having openings therein adapted to register with the bolt openings on the base flange of the ram, a guide screw extending vertically through each opening in said laterally extending flanges and



adapted to be extended through the bolt openings in the base flange and threaded into the openings in said support after the mounting bolts have been removed therefrom, a stop on each screw located substantially above the lower end thereof and adapted to bear against the lower side of each of said flanges to support the bracket in said elevated position, said bight section having an opening therein registering vertically with the eye bolt opening in the central raised portion of the ram when the bracket is mounted in said elevated position, a lift screw extending downwardly through the opening in the bight section of the bracket and adapted to be threaded into and locked against rotation in said eye bolt opening and a nut threaded on said lift screw and adapted to bear down against the top face of the bight section so that, when the nut is threaded downwardly on the lift screw while bearing against the top face of the bight section, the lift screw is displaced upwardly to thereby raise the ram while it is guided vertically by the four guide screws which are threaded into said support.

4,416,043

# DISC ROLL

Susumu Aoki, Yokohama; Hiroshi Asaumi, Kamakura; Shigeo Take, Ayase, and Masazumi Akase, Yokohama, all of Japan, assignors to Nippon Asbestos Company, Limited, Tokyo, Japan

Filed May 8, 1981, Ser. No. 262,029

Claims priority, application Japan, May 12, 1980, 55-61749

Int. Cl.<sup>3</sup> B21B 27/00

U.S. Cl. 29—132

6 Claims

1. A disk roll made of a thin sheet, said thin sheet being prepared from a mixture of flaky vermiculite particles having a diameter of 1 mm or less and a thickness of 100μ or less obtained by pulverizing expanded vermiculite with 40 to 230%

weight, on the basis of the amount of vermiculite, of wallstone fibers having a length of 3 mm or less in accordance with the sheet-forming process of a paper making technique.

4,416,044

# CAST RECUPERATOR TUBE

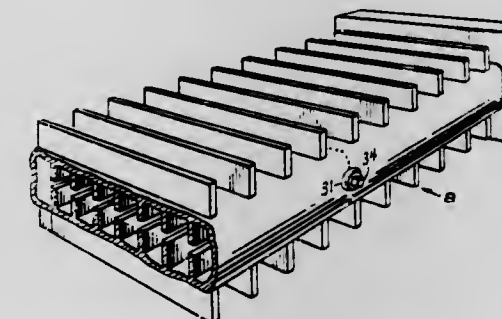
Richard F. Stockman, Friendship, and Paul L. Macler, Wellsville, both of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Apr. 2, 1981, Ser. No. 246,214

Int. Cl.<sup>3</sup> B23P 15/26

U.S. Cl. 29—157.3 R

13 Claims



1. A method of casting a hollow metallic envelope having a desired interior surface shape and a desired exterior surface shape comprising the steps of:

- a. forming a sand core contoured to provide the desired interior surface shape of the metallic envelope and having integral therewith protuberances extending laterally outward therefrom, said sand core being formed of two end modules and at least one center module adapted to mate in end-to-end abutment;
- b. forming independent upper and lower portions of a sand mold which mate to form a cavity adapted to receive the sand core and contoured to provide the desired exterior surface shape of the metallic envelope and having passageways formed therein that include sprues and gates for the pouring of molten metal into the cavity, the upper and lower portions of the sand mold having depressions for receiving the protuberances extending laterally outward from the sand core;
- c. placing the sand core into the lower portion of the sand mold with the protuberances extending from the sand core fitted in the depressions in the lower portion of the sand mold whereby the sand core is supported within the cavity of the sand mold so as to form a lower clearance space therebetween;
- d. placing the upper portion of the sand mold over the sand core with the depressions therein fitted on the protuberances extending from the sand core thereby abutting the upper portion of the sand mold with the lower portion of the sand mold thereby forming an upper clearance space between the sand mold and the sand core continuous with the lower clearance space therebetween;
- e. enclosing the abutting upper and lower portions of the sand mold in a stongback thereby imparting rigidity to the sand mold; and
- f. pouring a quantity of molten metal into the sprues and gates of the sand mold to supply molten metal into the clearance space that upon cooling solidifies to the hollow metallic envelope.

4,416,045

# SNAP RING REMOVAL TOOL

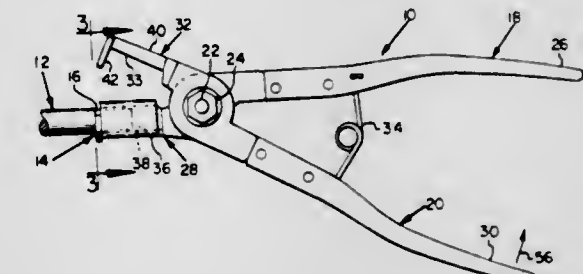
Harold D. Staten, Medford, Oreg., assignor to Helen Donaldson; Melody J. Donaldson, both of Medford and Tracey Donaldson Decker, Gold Hill, all of Oreg.

Continuation of Ser. No. 116,869, Jan. 30, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,269

Int. Cl.<sup>3</sup> B23P 19/04

U.S. Cl. 29—229

3 Claims



1. A pliers-type snap ring removal and installation tool comprising:

- first and second elongated crossed pliers members pivotally interconnected at their intersection to define a handle portion and a head portion on opposite sides of the pivotal interconnection;
- a shaft receptacle at the end of the head portion of the first member for receiving a shaft lengthwise of the handle portion of the first member by movement of the shaft receptacle longitudinally of said shaft into a position rearwardly adjacent an annular snap ring groove in the shaft; and
- a ring-engaging means at the end of the head portion of the second member and forward of the shaft receptacle for engaging a split snap ring at two points along opposite lateral sides of the shaft, one point on each lateral side of the split in the snap ring, as the ring-engaging means is moved laterally of said shaft toward the shaft receptacle by pivoting the handle portion of the second member toward a position lengthwise of the shaft;
- the shaft receptacle and ring-engaging means being sized and arranged to fit through a narrow opening surrounding said shaft, so that positioning the tool with a shaft received lengthwise in the shaft receptacle, a split snap ring can be installed in the annular snap ring groove in the shaft by positioning the snap ring in the groove with the split straddling the shaft and squeezing the handle portions of the tool together and the split snap ring can be removed from said shaft by positioning the tool lengthwise on the shaft with the split in the ring facing the ring engaging means and squeezing the handle portions of the tool together;
- the shaft receptacle being positioned nearer the intersection of the pliers members than the ring-engaging means so that the tool can be slid axially along the shaft into abutment with the snap ring to position the ring engaging means for engaging the snap ring.

4,416,046

# METHOD OF BINDING SHEETS USING STITCHERS

Ronald E. Stokes, Newport Pagnell, England, assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 106,422, Dec. 21, 1979, Pat. No.

4,358,040. This application Jun. 10, 1982, Ser. No. 387,080

Int. Cl.<sup>3</sup> B23P 17/00

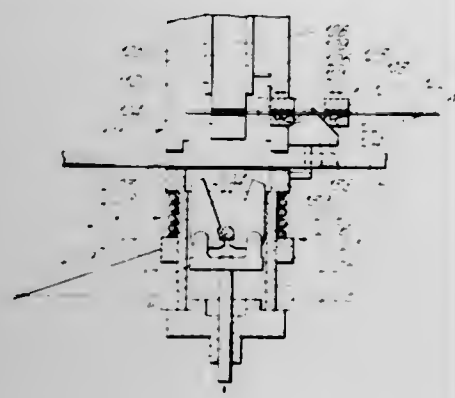
U.S. Cl. 29—417

1 Claim

1. A method of binding a set of sheets comprising cutting a piece of wire from a supply of wire, forming said cut wire into a staple, and driving said staple through a set to bind the sheets together, the improvement including the step of determining the length of said piece of wire automatically in accordance



with the thickness of said set of sheets, said step of determining being effected by the step of advancing the wire by a fixed distance and then further advancing the wire by a distance



dependent upon the thickness of the set and the step of positioning a wire cutter in accordance with the thickness of the set.

4,416,047

# METHOD OF MANUFACTURING A SHUTTER LINK

Gustav Rixinger, Brackenheim-Hausen, and Rudolf Nagel, Schöneich, both of Fed. Rep. of Germany, assignors to Tuerenwerke Rixinger GmbH & Co., KG, Brackenheim-Hausen, Fed. Rep. of Germany

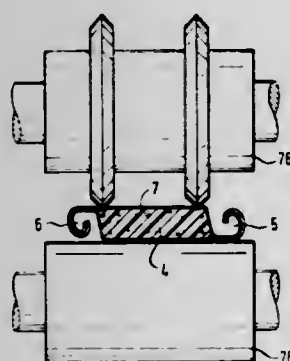
PCT No. PCT/EP80/00066, § 371 Date Oct. 2, 1981, § 102(e) Date Oct. 2, 1981

PCT Filed Jul. 30, 1980, Ser. No. 308,552

Int. Cl.<sup>3</sup> B23P 3/00, 19/04

U.S. Cl. 29—460

18 Claims

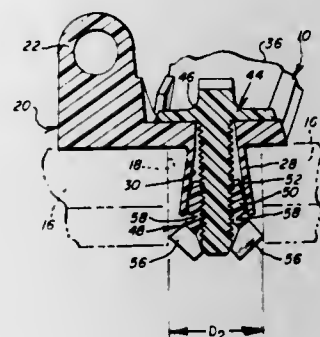


1. In a method of manufacturing a shutter link for a multi-link overhead shutter or roller blind comprising forming a hollow section by assembling two sheet-metal shells, filling the cavity of the hollow section with a heat-insulating compound, providing said hollow section at its longitudinal sides with hinge elements and with two slots disposed adjacent to the two hinge elements and extending the length of the shutter link, defining said slots by bending flanges from the shell wall inwardly towards the cavity, the slots being disposed on one wide side of the shutter link, the slots being bridged by narrow webs defined by slot interruptions, and providing the flanges of the slots on their side facing the cavity with notches formed adjacent to the bending lines and extending parallel to the slot, the improvement comprising the steps of forming an additional notch centrally between said notches on the side of one of said shells facing away from said cavity and press forming said slots by pressing in on said shell to tear said shell along the additional notch.

4,416,048  
TOILET SEAT MOUNTING ARRANGEMENT  
Timothy J. Otte, Sheboygan Falls, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.  
Filed Nov. 30, 1981, Ser. No. 326,019  
Int. Cl.<sup>3</sup> B23P 19/00

U.S. Cl. 29—526 R

14 Claims



1. An arrangement for attaching a toilet seat to a toilet bowl, said bowl defining at least one mounting hole, comprising: a base adapted to be supported upon said bowl, the upper portion of said base having an integral hinge post for hingedly mounting said seat to said base, and the lower portion of said base including a stem having a longitudinal bore, said stem being disposed in said mounting hole, and removable fastener means including a bolt disposed within said bore and expandable nut means threaded on said bolt so that the arrangement is insertable into said hole, and said bolt operates from the seat side of said bowl to expand said nut means toward engagement with the periphery of said mounting hole for securely maintaining said arrangement affixed to said seat thereby providing a secure hinge mounting for said seat.

4,416,049  
SEMICONDUCTOR INTEGRATED CIRCUIT WITH  
VERTICAL IMPLANTED POLYCRYSTALLINE SILICON  
RESISTOR

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 910,248, May 30, 1970, abandoned.

This application Jan. 8, 1981, Ser. No. 223,446

Int. Cl.<sup>3</sup> H01L 21/22

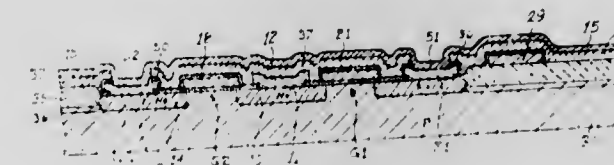
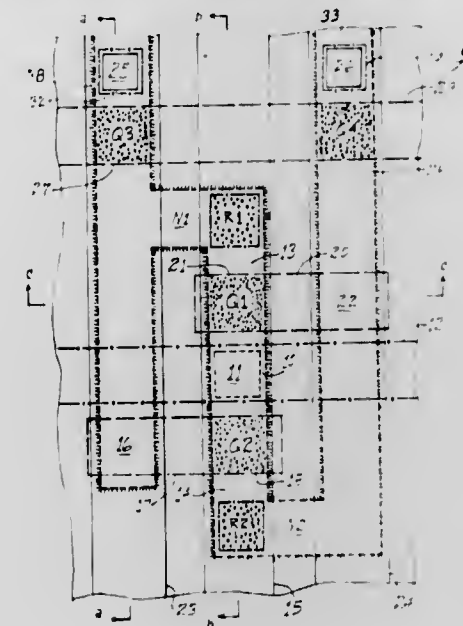
U.S. Cl. 29—571

5 Claims

5. A method of making a transistor and a non-rectifying resistor element in an integrated circuit comprising the steps of:

- depositing polycrystalline silicon on a face of a semiconductor body and patterning to define a transistor gate, and introducing impurity to make the gate highly conductive and to form a conductive area to provide electrical contact to one side of the resistor and to provide a region of the transistor;
- depositing material on said face directly over said conductive area and also separately over an interconnect area spaced from said conductive area, said material exhibiting substantial resistivity;
- introducing impurity into said interconnect area to create a low resistance interconnect for the transistor while masking said material over said conductive area; and
- depositing a conductive coating directly over said mate-

rial to provide electrical contact to the other side of the resistor, whereby the resistor is provided by the said



material in a vertical direction between said electrical contacts.

4,416,050

# METHOD OF FABRICATION OF DIELECTRICALLY ISOLATED CMOS DEVICES

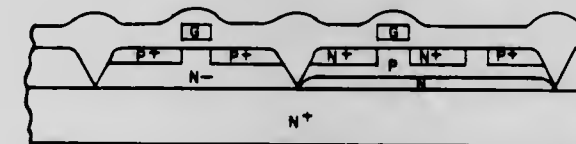
John C. Sarace, Temecula, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1981, Ser. No. 305,247

Int. Cl.<sup>3</sup> H01L 21/265

U.S. Cl. 29—571

6 Claims



1. A method of fabricating an isolation structure between semiconductor devices on a body of semiconductor material of a first conductivity type and a first dopant concentration to retard latch-up effects between devices comprising the steps of:

- depositing a layer of semiconductor material of said first conductivity type and a second dopant concentration on said body of semiconductor material;
- defining an etchant resistant and oxide inhibiting masking pattern on a major surface of said layer of semiconductor material where distinct silicon islands and corresponding semiconductor devices are to be formed;
- etching openings in said layer at regions defined by said pattern, said openings extending through said layer to said body;
- depositing dopant species of a second conductivity type in predetermined ones of said silicon islands so that the major surface and exposed edges of said ones of said islands becomes second conductivity type;
- thermally oxidizing the exposed surface portions of said body of semiconductor material so that oxide fills said

openings and electrically and physically separates the silicon islands;  
removing said oxide inhibiting masking pattern;  
thermally oxidizing the exposed surface portions of said body of semiconductor material to form a thin oxide layer over the major surface of said silicon islands;  
forming a gate element on said thin oxide layer on said silicon islands;  
selectively providing a first dopant species of second conductivity type in silicon islands of first conductivity type, and a second dopant species of first conductivity type in silicon islands of second conductivity type, thereby forming source and drain regions of a field effect transistor; and  
selectively removing portions of said thin oxide layer to form contact areas to said active regions.

4,416,051

# RESTORATION OF HIGH INFRARED SENSITIVITY IN EXTRINSIC SILICON DETECTORS

Richard N. Thomas, Murrysville, and Timothy T. Braggins, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

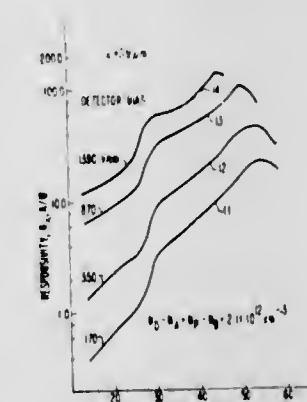
Division of Ser. No. 5,535, Jan. 22, 1979, Pat. No. 4,246,590.

This application Jul. 7, 1980, Ser. No. 166,421

Int. Cl.<sup>3</sup> H01L 21/225

U.S. Cl. 29—572

8 Claims



1. A method for restoring after detector fabrication high radiant energy sensitivity in crystalline extrinsic detector material doped with dopant atoms to provide a predetermined energy level located between the valence and conduction band of the detector material comprising the steps of:

- forming a layer having a damaged crystalline lattice structure in said detector material and raising the temperature of said detector material above 900° C. for a period of time to allow impurity atoms of a first type which diffuse readily throughout said detector material at times said material is above 900° C. to be trapped by said damaged crystalline lattice structure to enhance the majority carrier lifetime of the detector material whereby the number of ionized dopant atoms is reduced.

4,416,052

# METHOD OF MAKING A THIN-FILM SOLAR CELL

Theodore G. Stern, San Diego, Calif., assignor to General Dynamics, Convair Division, San Diego, Calif.

Filed Mar. 29, 1982, Ser. No. 363,195

Int. Cl.<sup>3</sup> H01L 31/06, 31/18

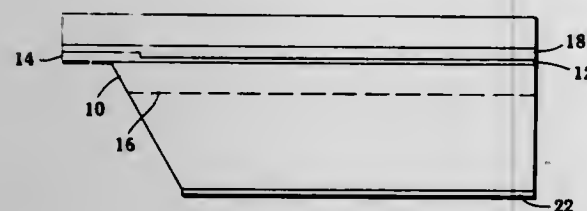
U.S. Cl. 29—572

7 Claims

1. A method of forming a thin gallium arsenide solar cell of improved efficiency, which comprises the steps of:  
providing a self-supporting photovoltaic cell comprising gallium arsenide having a thickness of at least about 250 micrometers;  
forming a pattern of contact lines across the front surface of said photovoltaic cell and a bus bar contact along one edge of said front surface;



bonding a thin visible-light transparent coverslide to said front surface;  
initially etching the back surface of said photovoltaic cell to uniformly reduce the thickness of said photovoltaic cell to a minimum useful thickness;



applying a stop-etch material to said back surface except in the area corresponding to said bus;  
further etching said back surface down to said bus;  
removing said stop-etch material, and  
applying a light reflective electrically conductive material to the surface protected by said stop-etch.

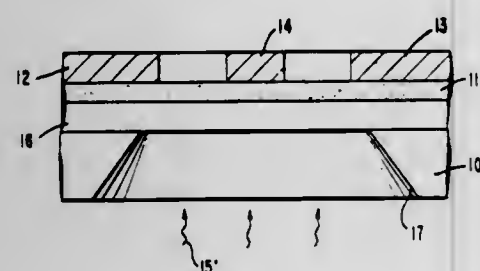
4,416,053

**METHOD OF FABRICATING GALLIUM ARSENIDE BURRIS FET STRUCTURE FOR OPTICAL DETECTION**  
Luis Figueroa, Woodland Hills, and Huan-Wun Yen, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 133,183, Mar. 24, 1980, Pat. No. 4,346,394.  
This application May 17, 1982, Ser. No. 379,522  
Int. Cl.<sup>3</sup> H01L 21/283, 21/308

U.S. Cl. 29—572

11 Claims



1. A process for fabricating an integrated optical photodetector on a substrate of semi-insulating III-V semiconductor material comprising:

- forming an undoped buffer layer of mixed III-V semiconductor material on at least a portion of said substrate, said buffer layer having an indirect bandgap;
- forming at least one opening in said substrate to expose at least one portion of said buffer layer; and
- forming at least one detector on said buffer layer operably associated with at least one opening by a process including:
  - forming an active region of III-V semiconductor material on said buffer layer, said buffer layer having an indirect bandgap, the value of which is larger than that of said active region, and
  - forming a pair of electrodes in contact with said active region.

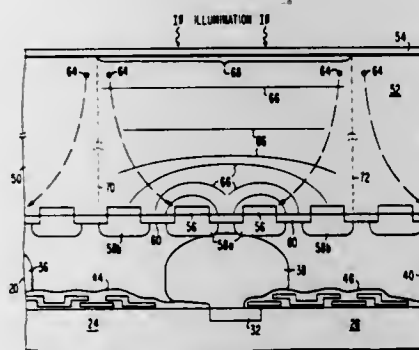
4,416,054

**METHOD OF BATCH-FABRICATING FLIP-CHIP BONDED DUAL INTEGRATED CIRCUIT ARRAYS**  
Richard N. Thomas, Franklin Borough, and Michael M. Sopira, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 165,158, Jul. 1, 1980, Pat. No. 4,369,458.  
This application Sep. 29, 1982, Ser. No. 427,333  
Int. Cl.<sup>3</sup> H01L 21/28

U.S. Cl. 29—572

8 Claims



1. A method of batch-fabricating a plurality of high-density flip-chip bonded dual integrated circuit arrays comprising the steps of:

fabricating a first integrated circuit for signal processing having a first array of electrical signal storage cells with an injection region and a metallic cell contact disposed at each cell;

fabricating a second integrated circuit for radiation detection having a substrate with a first side conditioned for accepting a radiation image thereon, and a second side, opposite said first side, including a second array of metallic detector contacts disposed on the surface thereof, said second array being fabricated with a greater density of contacts than said first array for substantially equal surface areas, each metallic detector contact being fabricated of a physical size which is smaller than said metallic cell contacts;

bonding each metallic cell contact of said first integrated circuit to a corresponding group of metallic detector contacts of said second integrated circuit to render a dual integrated circuit flip-chip configuration; and  
dividing the bonded dual integrated circuit flip-chip configuration into a plurality of high-density dual integrated circuit flip-chip bonded predetermined arrays.

4,416,055

**METHOD OF FABRICATING A MONOLITHIC INTEGRATED CIRCUIT STRUCTURE**  
Jeremiah P. McCarthy, Framingham, and Marvin Tabasky, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 4, 1981, Ser. No. 327,383  
Int. Cl.<sup>3</sup> H01L 21/31, 21/318

U.S. Cl. 29—577 C

16 Claims

1. The method of fabricating monolithic integrated circuit structure incorporating a bipolar transistor and a resistor comprising:

providing a body of semiconductor material including a first section having semiconductor material of one conductivity type encircling a first sector of the opposite conductivity type inset at a surface of the body and a second section having semiconductor material of the one conductivity type encircling a second sector of the opposite conductivity type inset at the surface of the body;  
forming an adherent layer of a first protective material on said surface, the portion of said layer overlying a predetermined part of said first sector being thinner than the portion of said layer overlying the remainder of said first section, and the portion of said layer overlying a predeter-

mined part of said second sector being thinner than the portion of said layer overlying the remainder of said second section;

forming an adherent layer of a second protective material on the thinner portion of said layer of the first protective material overlying a predetermined zone within said part of said first sector, and forming an adherent layer of the second protective material on the thinner portion of said layer of the first protective material overlying a predetermined zone within said part of said second sector;

introducing conductivity type imparting material of the one conductivity type into said part of said first sector other than said predetermined zone protected by said second protective material, the thicker portion of the layer of the first protective material protecting the remainder of the first section, to form a region of the one conductivity type of low resistivity within said first sector; and simulta-

material except for the portion thereof underlying the layer of the second protective material which overlies said predetermined zone of said part of said first sector by treating the body of semiconductor material in the presence of a material to convert semiconductor material underlying the first protective material to first protective material of the layer, said second protective material preventing conversion of the underlying semiconductor material of said predetermined zone of said part of said first sector;

removing the layer of the second protective material overlying said predetermined zone of said part of said first sector;

reducing the thickness of the layer of the first protective material sufficiently to form an opening in the layer of the first protective material exposing the surface of said predetermined zone while leaving a layer of the first protective material overlying the remainder of said first section and said second section; and

introducing conductivity type imparting material of the one conductivity type into a first portion and conductivity type imparting material of the opposite conductivity type into a second portion of said predetermined zone as delineated by said opening, said second portion being located between said first portion and said surface

whereby said second portion of said predetermined zone provides the active emitter region, said first portion of said predetermined zone provides the active base region, the portion of said first sector of the opposite conductivity type adjacent to said first portion of said predetermined zone provides the active collector region, and said region of the one conductivity type of low resistivity provides a base contact region of a bipolar transistor in said first section; and said region of the one conductivity type of high resistivity provides a resistor, and said first and second regions of the one conductivity type of low resistivity provide resistor contact regions of a resistor within said second section.

4,416,056

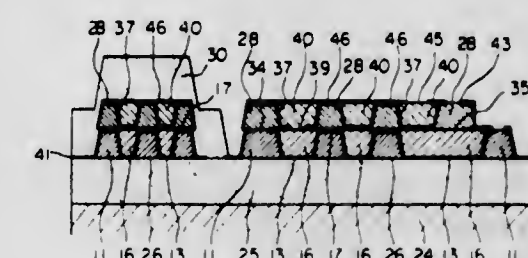
**PROCESS FOR PREPARATION OF FILM COILS**  
Yoshio Takahashi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP78/00049, § 371 Date Aug. 13, 1979, § 102(e) Date Aug. 3, 1979, PCT Pub. No. WO79/00383, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 12, 1978, Ser. No. 154,402  
Claims priority, application Japan, Dec. 13, 1977, 52-149548; Dec. 13, 1977, 52-149549; Dec. 13, 1977, 52-149551

Int. Cl.<sup>3</sup> G11B 5/42; H01F 41/04  
U.S. Cl. 29—603

4 Claims



1. A process for the preparation of thin-film coils, which comprises: forming a first plane coil layer having a flat top face by arranging a plurality of first spiral conductor patterns wound in the same direction, each of said first conductor patterns being positioned on the same plane adjacent to one another and being insulated from one another; forming an insulating layer on said first plane coil layer, said insulating layer having a plurality of selectively positioned apertures therein such that each of said conductor patterns is exposed by at least one aperture; and forming and laminating on said insulating layer a second plane coil layer having a flat top face.

neously introducing conductivity type imparting material of the one conductivity type into said part of said second sector other than said predetermined zone protected by said second protective material, the thicker portion of the layer of first protective material protecting the remainder of the second section, to form first and second regions of the one conductivity type of low resistivity within said second sector;

removing the layer of the second protective material overlying said predetermined zone of said part of said second sector;

introducing conductivity type imparting material of the one conductivity type into the predetermined zone of said part of said second sector to form a region of the one conductivity type of high resistivity extending between said first and second regions of the one conductivity type of low resistivity;

increasing the thickness of the layer of the first protective



lating layer a second plane coil layer which overlaps some of said plurality of apertures by arranging a plurality of second spiral conductor patterns wound in a direction opposite to that of said plurality of first spiral conductor patterns of the first plane coil layer, each of said second conductor patterns being positioned on the same plane adjacent to one another and being insulated from one another, the conductor patterns in the first plane coil layer being directly connected through said apertures to the conductor patterns in the second plane coil layer alternatively to form one coil comprising all of said conductor patterns thus directly connected in series.

4,416,057

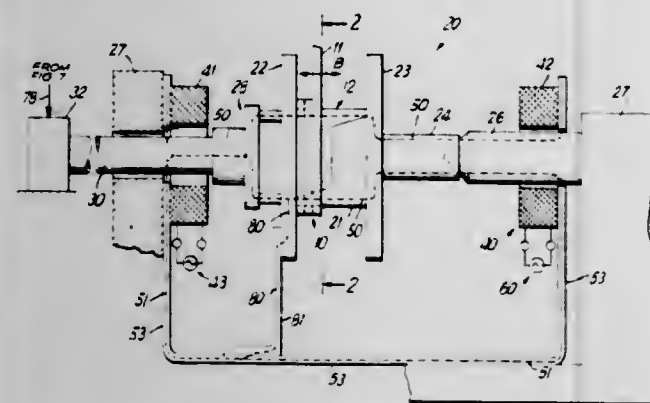
# METHODS OF TESTING THE INTEGRITY OF AN ELECTRICAL COIL AS IT IS WOUND

John Tardy, Somerville, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 28, 1981, Ser. No. 267,980  
Int. Cl.<sup>3</sup> H01F 7/18

U.S. Cl. 29—605

5 Claims



1. A method of testing the integrity of an electrical coil including turns of an insulated wire, which comprises:

- (a) applying an A.C. input signal to a first test winding positioned opposite to a second test winding and magnetically coupling said first test winding to said second test winding by magnetic flux directed through a magnetic flux path so that an A.C. output signal is induced in the second test winding having a first electrical characteristic; and
- (b) winding turns of said wire of said electrical coil about said magnetic flux path while monitoring said A.C. output signal for a change in the output signal characteristic from said first electrical characteristic to a different characteristic, such change being indicative of eddy currents in wound turns of wire of said electrical coil to provide an indication whether the turns being wound are shorted.

4,416,058

# APPARATUS FOR WINDING COILS AND INSERTING COILS AND WEDGES INTO STATOR CORES

John J. Henry, Sr., and Buddy S. Stuckey, both of Fort Wayne, Ind., assignors to Essex Group Incorporated, Ft. Wayne, Ind.

Filed Dec. 17, 1981, Ser. No. 331,848  
Int. Cl.<sup>3</sup> H02K 15/06

U.S. Cl. 29—734

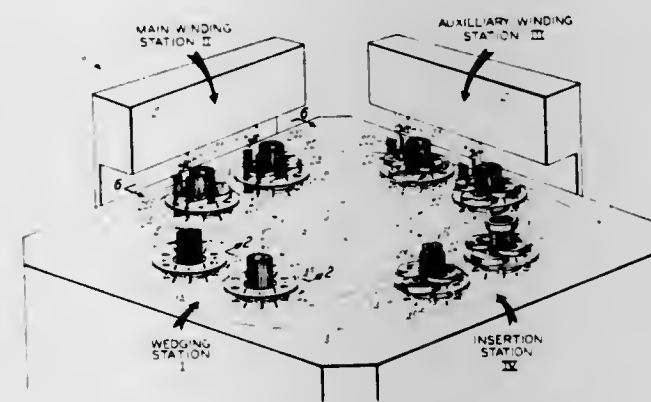
11 Claims

1. Apparatus for forming dynamoelectric field windings and for inserting the windings into slots between the teeth of a stator core comprising:

transfer tool means comprising wall means defining a tool bore having an axis, said wall means forming a plurality of axially extending wedge holding slots circumferentially spaced about the tool bore axis for temporarily holding wedges for subsequent insertion into a stator core, said wall means also including a plurality of axially extending wedge guide blades circumferentially disposed about the tool bore axis and equal in number to the number of wedge holding slots, each wedge guide blade having a pair of oppositely and circumferentially facing, axially extending

channels formed therein, each channel facing a corresponding axially extending channel in the wedge guide blade adjacent thereto, each pair of corresponding facing channels defining a wedge guide slot extending in vertical alignment with one of said wedge holding slots, each pair of adjacent wedge guide blades also defining a vertical wire receiving space therebetween extending the length of said wedge guide blades, said blades each having a base adjacent said wedge holding slots and a tip spaced furthest from said wedge holding slots;

means for inserting wedges into said wedge holding slots; wire winding means including nozzle means having a wire dispensing end, and means for moving said wire dispensing end in a plane over said guide blade tips in a plurality of concentric circular paths of predetermined radii, said paths having an axis outside said tool bore and parallel to said tool bore axis, said winding means constructed and arranged to push wire from said dispensing end forming multiple circular turns of each of said plurality of predetermined radii, wherein said wedge guide blades are constructed and arranged such that the turns of each different predetermined radii fall by gravity into and down through a different predetermined pair of wire receiving spaces without interference from said wedge guide blades and accumulate to form substantially cylindrical, concentric dynamoelectric field windings on said transfer tool means;



inserter means including a plurality of elongated, axially extending, circumferentially disposed, spaced apart finger elements equal in number to said wedge guide blades, each element having a radially outwardly facing axially extending surface, and means for moving said elements vertically upwardly within said tool bore after the field windings have been formed on said transfer tool means such that each of said elements is aligned with and has its said outwardly facing surface abutting one of said wedge guide blades and the spaces between adjacent finger elements are aligned with the said wire receiving spaces, each of said finger elements including a top portion for extending above said tips of said wedge guide blades and aligning radially with and engaging the teeth of a stator core, said inserter means also including stripper means for moving upwardly within said bore of said transfer tool means and within the bore of a stator core disposed on said finger elements to push said field windings upwardly along the spaces between said guide blades and finger elements and over said top portion of said finger elements into the slots of the stator core, said inserter means also including pusher means for pushing wedges from said wedge holding slots along said wedge guide slots into the stator core slots over field windings as the windings are being inserted into the stator core slots, said means for moving said elements including means for retracting said elements from within said tool bore.

4,416,059

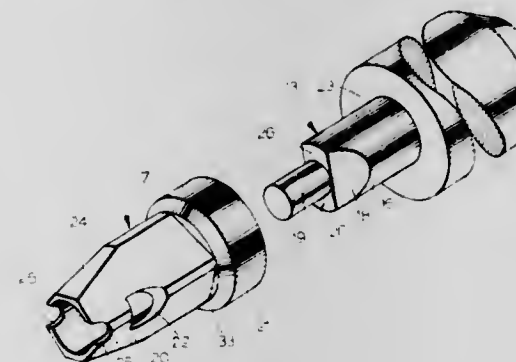
# WIRE INSERTION TOOL

John W. Humphrey, Eden Prairie, and Raymond A. Silbernagel, Ramsey, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed Dec. 18, 1981, Ser. No. 332,179  
Int. Cl.<sup>3</sup> B23P 19/02

U.S. Cl. 29—751

15 Claims



1. A wire insertion tool usable for inserting a wire into a split cylinder connector comprising:

- a forward rod portion having a longitudinal axis and a forward end for engagement with said wire, said wire being generally perpendicular to the longitudinal axis of said forward rod portion;
- a hollow sleeve portion having a longitudinal axis generally parallel to the longitudinal axis of said forward rod portion, a side wall surrounding said forward rod portion and an elongated bore extending through at least a portion of said sleeve portion, said bore being spaced radially outwardly from said forward rod portion to define a generally annular space therebetween for receiving a portion of said split cylinder connector, said sleeve portion extending forward beyond the forward end of said forward rod portion;
- a pair of wire engaging notches disposed in the forwardmost end of said hollow sleeve portion and on opposite sides thereof for engaging and aligning said wire, the rearwardmost portion of each of said notches for engaging with the wire during said inserting; and
- at least a pair of closed loop openings disposed rearwardly of said forward end of said forward rod portion, said openings extending through said side wall and communicating with said bore for the purpose of removing wire scraps and the like which are generated during the insertion procedure.

4,416,060

# SLIDE FASTENER FINISHING MACHINE

Toshiaki Nakagawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,784

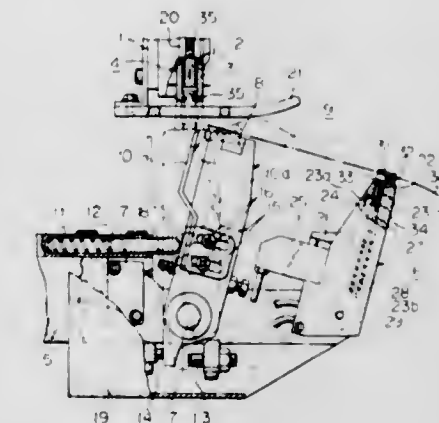
Claims priority, application Japan, Jun. 4, 1980, 55-75063  
Int. Cl.<sup>3</sup> A41H 37/06; B21D 53/50

U.S. Cl. 29—767

5 Claims

1. A slide fastener finishing machine for applying a bottom stop to a slide fastener chain comprising an upper frame, a bottom stop fastening head mounted on said upper frame for vertical movement and having a punch, a lower frame, a slider holding jig fixedly secured to said lower frame and offset from the position right below said punch for an operator to thread said slide fastener chain, with his fingertips grasping said slide fastener chain, through said slider holding jig, a die holder mounted on said lower frame between said position right below the punch and said slider holding jig, said die holder having a die on the top thereof and being movable to a first position in which said die is aligned with said punch from a second position, to which said die holder is normally biased by biasing means, in which the die is offset from the punch, pusher plate means secured to and extending from said die holder to be pushed by the back of the hands of the operator as one end of

said slide fastener chain threaded through said slider holding jig overlies said die holder to position said die holder directly beneath said punch such that the fingertips of said operator



continuously grip the slide fastener chain during threading through said slider holding jig and application of said bottom stop.

4,416,061

# METHOD FOR JOINTING CABLES

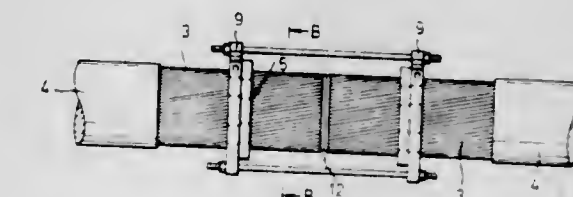
Lars Aanerud, Blystadia, and Georg Balog, Tranby, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,755

Claims priority, application Norway, Aug. 26, 1980, 802529  
Int. Cl.<sup>3</sup> H01B 13/20

U.S. Cl. 29—828

7 Claims



1. A method for jointing cables, each cable having a core and at least one layer of longitudinal armoring elements surrounding the core, comprising:

- cutting the armoring elements of each cable to a predetermined jointing position;
- mounting a circumferential bracket onto the elements of each of the cables to be jointed at a predetermined distance from the jointing position;
- individually securing each of the armoring elements to the circumferential bracket;
- lifting the armoring elements away from the ends of the cables;
- jointing the cable cores;
- repositing the armoring elements;
- stretching the armoring elements of each cable towards the armoring elements of the other cable so that they will overlap;
- cutting the overlapped portion of the armoring elements;
- jointing the armoring elements of the jointed cables; and
- removing the circumferential bracket thereby releasing the secured armoured elements.



4,416,062

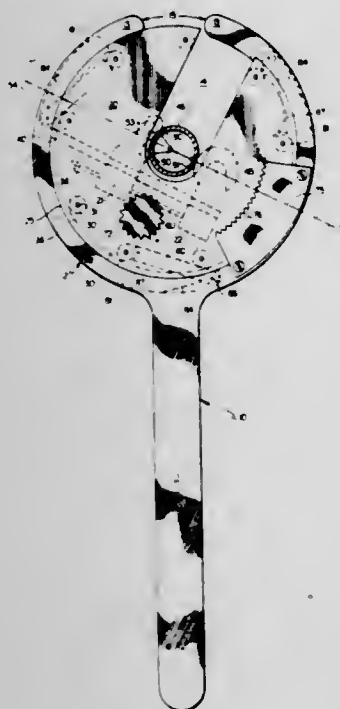
## SELF CENTERING PIPE CUTTING DEVICE

John R. Cummings, 3687 S. 2200 West, West Valley City, Utah 84119

Filed Aug. 13, 1981, Ser. No. 292,641  
Int. Cl.<sup>3</sup> B23D 21/08

U.S. Cl. 30—101

8 Claims



1. A self centering pipe cutting device comprising: a handle assembly including (i) a handle section configured in length and size to fit within small areas where working access to a pipe is otherwise limited, and (ii) a cutter support frame affixed to one end of said handle and configured to partially circumscribe a pipe cutting area, said frame including a gap having a width sufficient to permit passage of a section of pipe therethrough;
- a pair of cutter guide plates rotatably positioned on opposing sides of said support frame and including means for coupling the respective plates into fixed, substantially parallel orientation with respect to each other, said cutter guide plates each having an elongate opening in size equal to the frame gap width and extending in common alignment from a central location of each plate through its perimeter to provide access means for insertion of a pipe to the central location of the guide plates;
- a pair of linear track guides respectively formed along the interior faces of the guide plates and in parallel orientation, said track guides being located toward the center of each plate and across a plate section uninterrupted by said elongate openings;
- a cutter assembly including a tracking body with upper and lower tracking means configured to travel said respective linear track guides on the opposing inner faces of the cutter guide plates, said cutter assembly further comprising a cutting tool mounted at an edge of the cutter assembly toward the center of the guide plates when in tracking position, and in an orientation adapted for contracting and cutting an external circumferential path around an inserted pipe;
- a roller support assembly including a tracking body with upper and lower tracking means configured to travel said respective linear track guides on the opposing inner faces of said guide plates, said roller assembly further comprising a pair of support rollers rotatably mounted at an edge of the roller assembly toward the center of the guide plates in opposing orientation to the cutting tool such that a line parallel to said linear track guides and passing through the point of projected cutting contact of said cutting tool also passes midway between the pair of support rollers;
- adjustment means coupled to the cutter assembly at one end

and the roller assembly at the other end and having rotational drive means attached to the cutter support frame as opposed to the handle section and adapted for adjustment operation by mere rotation of the handle assembly about the pipe cutting area to simultaneously move the cutter and roller assemblies in converging or diverging direction, depending on the direction of force applied to the drive means, said converging and diverging directions being parallel with said parallel line passing through the cutter tool and midsection of the roller pair; and ratchet and pawl means coupled between the cutter support frame and rotatable guide plates, said ratchet and pawl means being operable to actuate rotational movement of the guide plates and attached cutter and roller assemblies when the handle assembly is rotated in one direction, without counter guide plate rotation upon reverse directional movement of the handle assembly.

4,416,063

## GOLDEN PROPORTION CALIPERS

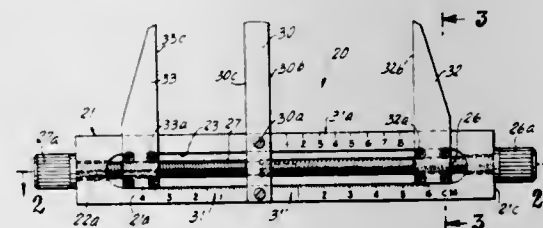
Jack Nestor, 110 1st Ter., Miami Beach, Fla. 33139, and William A. Shoemaker, Jr., 6860 SW. 96th St., Miami, Fla. 33156

Filed Mar. 2, 1982, Ser. No. 353,960

Int. Cl.<sup>3</sup> G01B 5/14

U.S. Cl. 33—163

16 Claims



1. A proportional divider comprising an elongated holder having a longitudinal bore formed with a centralized enlargement providing a track, a rotatable spindle extending through said bore and projecting from said holder at, at least, one end thereof, a terminal knob mounted on said projecting spindle end for manually rotating said spindle, said spindle having two threaded portions, each extending from a midportion of the spindle toward opposite ends thereof, the threads of said portions being reversed with respect to each other and being differently pitched in a ratio approximating 1 to 0.618, threaded means mounted in said track and engaging each of said spindle portions, said holder having a front face onto which said track opens along the length thereof, a reference index including a pointer mounted on said holder front face to extent perpendicularly to the axis of the spindle in a fixed predetermined relation with respect to said spindle midportion, each of said threaded means having a front surface extending into said track front face opening for guided displacement of these along said opening, and a pair of movable indices, each being mounted on one of said threaded means front surfaces and including a pointer disposed perpendicularly to said spindle for movement in said ratio toward and away from said reference pointer on manual axial rotation of said spindle by said knob.

4,416,064

## LADDER BAR DIAL

Roger W. Hurst, Box 124, Hartford, Ky. 42347

Filed Jun. 30, 1982, Ser. No. 394,004

Int. Cl.<sup>3</sup> G01B 5/00

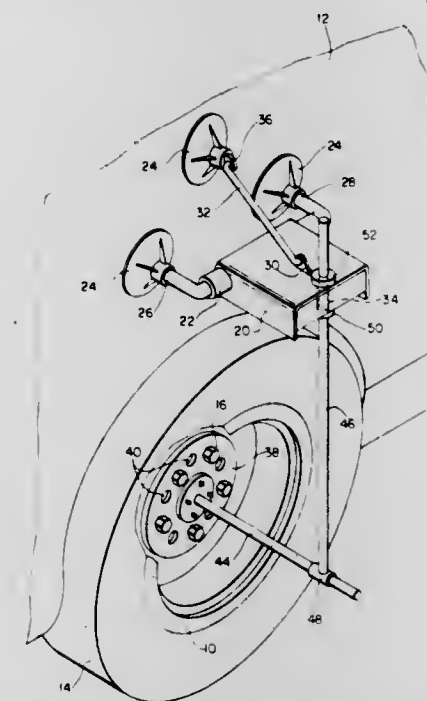
U.S. Cl. 33—181 AT

6 Claims

1. An auxiliary device for determining a requirement for rear suspension adjustments of a racing vehicle comprising a main body, means for mounting said main body to a body portion of said racing vehicle, with said main body in substantially a horizontal plane, a first rod means for securing said first rod on the center line of a wheel with said first rod substantially

perpendicular to a vertical plane through said wheel, a second rod, a bearing-coupling on one end of said second rod, said bearing-coupling adapted to be placed over and along said first

oriented index lines for cooperation with said reflected horizontally positioned reticle scales and vertically positioned index lines.



rod, said second rod having sufficient length to extend through an aperture in said main body when in use, and a pair of locator means, said pair of locator means having an axial aperture which will slip over said second rod with a frictional fit.

4,416,065

## METHOD OF AND APPARATUS FOR ALIGNING VEHICLE FRONT AND REAR WHEELS

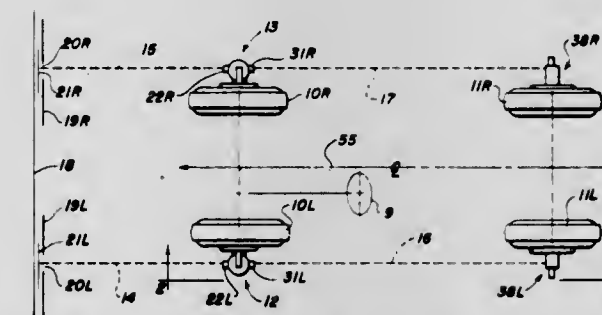
Lee Hunter, 13501 Ladue Rd., Creve Coeur, Mo. 63141

Filed Jan. 29, 1982, Ser. No. 343,825

Int. Cl.<sup>3</sup> G01B 7/315

U.S. Cl. 33—203.15

13 Claims



1. In apparatus for aligning the front and rear wheels of a vehicle relative to the geometric center line of the vehicle, the combination of: means carried by the front wheels of the vehicle for projecting light beams forwardly and for projecting other light beams rearwardly toward the rear wheels; reticles in said other light beam projecting means forming a pattern which includes horizontally positioned scales and images representing zero positions on the horizontal scales; means carried by the rear wheels of the vehicle in position presenting targets for the reticle formed patterns projected rearwardly by said other light beam projectors, said targets including horizontal scales for cooperation with said vertically positioned index lines of said reticles and reflective surfaces for cooperation with said horizontally positioned scales of said reticles to reflect the horizontal scales toward the front wheels; and target screens carried by said front wheels in rearwardly facing positions for receiving the horizontally positioned scales as reflected from said reflective surfaces carried by said rear wheels, said target screens presenting vertically

4,416,066  
ARRANGEMENT FOR ORIENTATION DURING JOURNEYS IN LAND VEHICLES

Bertold Romacker, Esslingen, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

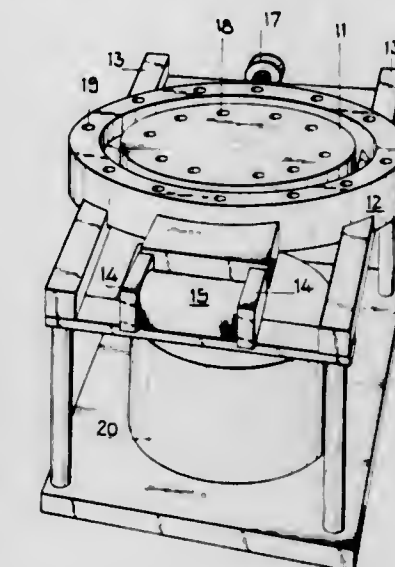
Filed Sep. 11, 1980, Ser. No. 186,252

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936774

Int. Cl.<sup>3</sup> G01C 22/00, 23/00, 19/00

U.S. Cl. 33—318

32 Claims



1. An arrangement mounted on a land vehicle for the purpose of orientation on journeys of the land vehicle comprising, in combination:

first means for ascertaining the distance traveled by the vehicle;

second means for ascertaining changes in direction of the vehicle, said second means including a direction indicator for determining changes in direction of the vehicle with said direction indicator being rigidly connected to said vehicle, and an inertial mass mounted in said vehicle to be substantially friction free so that it does not perform the changes in vehicle direction with the vehicle, said mass being disposed in said vehicle such that said direction indicator carries out rotary movements about the mass as the vehicle changes direction, with these rotary movements being a measure of the changes in vehicle direction; and,

third means, responsive to output signals from said first and second means, for indicating the path traveled, including distance and changes of direction, and the current location of the vehicle, said third means including fourth means for supporting a map and for rotating the map corresponding to direction changes of the vehicle so as to always indicate the true heading and location of the vehicle on the map.

4,416,067

## CORRECTION METHOD AND DEVICE FOR A MAGNETIC FIELD PROBE

Hartmut Scherer, and Peer Thilo, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin &amp; Munich, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 378,020

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123180

Int. Cl.<sup>3</sup> G01C 17/38

U.S. Cl. 33—356

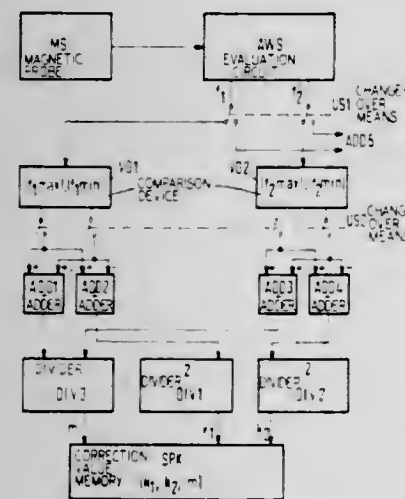
8 Claims

1. A correction system for a magnetic field probe which



measures an external magnetic field in terms of magnitude and direction, and wherein the probe is moved in a circle before a beginning of the measurement, comprising:

- means for determining maximum and minimum values of a magnetic field vector relative to the probe by continuous measurement of said magnetic field vector during the circular movement;
- means for forming a correction vector from a halved vector sum of said maximum and minimum values;



means for vectorially adding the correction vector to the respective measured values of the probe during the continuous measurement;

the magnetic field probe being followed by an evaluation circuit whose output is selectively connected over a changeover means to a calibration means or to a measuring unit having a display device connected thereto; and a correction value memory being provided whose input is connected to the calibration means and its output is connected to the measuring unit.

4,416,068

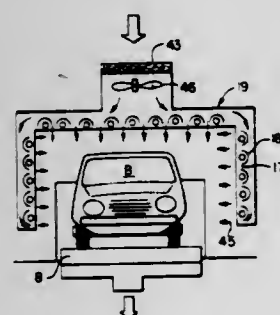
**APPARATUS FOR SURFACE TREATMENT OF OBJECTS**  
Hans E. Nilsson, Henan, and Ake Carlsson, Trollhättan, both of Sweden, assignors to Infrarodteknik AB, Vanersborg, Sweden  
Filed Dec. 3, 1981, Ser. No. 327,232

Claims priority, application Sweden, Dec. 11, 1980, 8008707; Feb. 27, 1981, 8101282

Int. Cl.<sup>3</sup> F26B 23/04

U.S. Cl. 34—4

16 Claims



1. Apparatus for surface treatment in a booth adapted for application of a surface treatment material to a body comprising:

- a traversable carrier in said booth containing means for controlled energy transfer to said body;
- said means in said carrier being in groups, with at least one element in each group, each group having a separate energy supply;
- flow means adjacent said energy-transfer means to direct ventilating medium from said carrier toward said body;
- means to position said body at a predetermined work area in said booth;
- a parking area for receiving said carrier when not in use;

means to drive said carrier from said parking area to traverse said work area and return said carrier to said parking area; ventilating means to supply ventilating medium to said carrier and to exhaust spent ventilating medium from said booth; and

control means to actuate said drive means and to operate said separate energy supplies to supply heat to a selected area of said body during said traverse, in a way that is specific to the treating material used, the specific part of the body and the specific body.

4,416,069

**ENHANCEMENT OF COLOR QUALITY OF LUMBER DURING DRYING**

Howard N. Rosen; Robert E. Bodkin, both of Carbondale, and Kenneth D. Gaddis, Johnston City, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 246,971, Mar. 24, 1981, Pat. No. 4,343,095. This application Aug. 19, 1981, Ser. No. 294,096

Int. Cl.<sup>3</sup> F26B 7/00

U.S. Cl. 34—13.8

9 Claims

1. A process for simultaneously drying and darkening lumber throughout its thickness by subjecting the lumber to steam generated by the drying wood in the absence of air at temperatures from 215° to 320° F. and pressures from 15 to 40 psi.

4,416,070

**AIR-DIRECTING DEVICE FOR MULTIPLE CYLINDER DRYER OF PAPER MACHINE**

Timo Vedenpää, Jyväskylä; Yngve Lindström; Pekka Eskelinen, both of Turku, and Jorma Kotanen, Jyväskylä, all of Finland, assignors to Valmet Oy, Finland

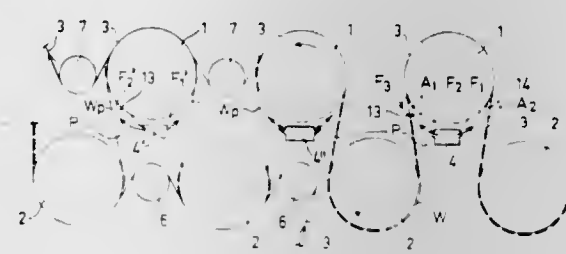
Filed Nov. 24, 1981, Ser. No. 324,861

Claims priority, application Finland, Dec. 1, 1980, 803721

Int. Cl.<sup>3</sup> F26B 13/08

U.S. Cl. 34—114

2 Claims



1. An air-directing device for a multiple cylinder dryer of a paper machine, said multiple cylinder dryer having a plurality of cylinders and a paper web passing over the cylinders, said device comprising

- air-supplying means for supplying and directing air to said multiple cylinder dryer, said air-supplying means including air-blowing members for blowing air, said air-supplying means being so placed and said air-blowing members being so disposed and directed that the air blown out from said members is directed into the clefts defined by the surface of the drying cylinder and the paper web thereby producing a pressure effect in said clefts, each of said air-blowing members comprising a doctor having a doctor beam for conducting and directing air, said doctor beam having a surface, air-blowing apertures formed through said surface and a Coanda guide baffle having a leading edge affixed to said surface of said doctor beam next-adjacent said apertures and a spaced opposite trailing edge affixed to said surface in spaced relation with said apertures in a manner whereby said Coanda guide baffle is free from said apertures but directs air from said apertures into said clefts.

4,416,071

**APPARATUS FOR RAPID ANNEALING OF REFRACTORY FIBER BODIES**

Richard N. Cunningham, Jefferson County, Colo., and Romain E. Loeffler, deceased, late of Jefferson County, Colo. (by Carolyn R. Loeffler, personal representative), assignors to Manville Service Corporation, Denver, Colo.

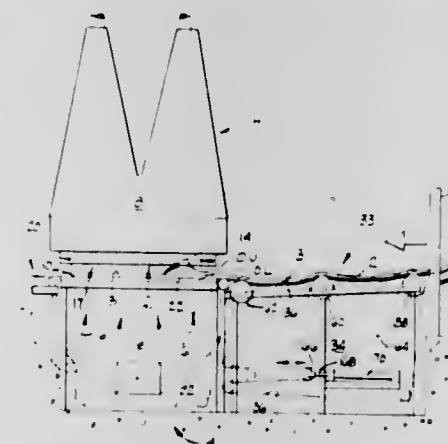
Division of Ser. No. 73,412, Sep. 7, 1979, Pat. No. 4,294,878.

This application May 18, 1981, Ser. No. 264,745

Int. Cl.<sup>3</sup> F26B 13/00

U.S. Cl. 34—155

16 Claims



1. Apparatus for the annealing of a body of refractory fiber according to a process comprising passing air at a temperature in the range from about 750° F. to about 1400° F. through said body for a period of from about 5 to about 200 seconds while maintaining said body with a predetermined dimension in the direction of air flow, which apparatus comprises:

- (a) a pair of parallel opposed foraminous platens;
- (b) means for moving at least one of said platens in a direction normal to the other while maintaining the platens parallel to each other;
- (c) means for passing heated air through and from one platen to and through the other platen; and
- (d) means for intermittently inserting segments of said body serially into the space between said platens and retaining each of said segments in said space for said period of 5 to 200 seconds with the opposed faces of said platens being in contact with the surfaces of said segments and spaced apart at a predetermined distance, such that said heated air passed from one platen to the other also passes through the segment located between said platens and thereby anneals said segment.

4,416,072

**HEEL AND SOLE ASSEMBLY FOR AN ADJUSTABLE ARCH SHOE**

Vahe Sarkissian, Paris, France, assignor to Touchwood International S.A., Geneva, France

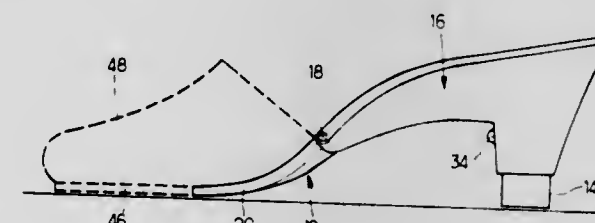
Filed Sep. 22, 1981, Ser. No. 304,573

Claims priority, application France, Oct. 9, 1980, 80 21611

Int. Cl.<sup>3</sup> A43B 3/24, 13/28, 21/36

U.S. Cl. 36—100

2 Claims



1. A heel and sole assembly for an adjustable arch shoe of the type comprising a fixed support element having a heel portion

and a sole portion, a pivoting element positioned above the rear part of the fixed support element and in spaced relation to said rear part so that it can be raised or lowered in relation to said fixed support element; manually operable locking means to lock the pivoting element in the position corresponding to the height chosen for the heel, and prestressed spring means positioned between the fixed support element and the pivoting element to force the latter upwards, characterized in that the pivoting element comprises a hollow structure heel body covering the heel portion of the fixed support with sufficient clearance that said hollow structure heel body can freely slide along said heel when said pivoting element rotates, and a sole body articulated upon said fixed support element on a level with the zone of inflection of the sole's arch, said locking means being made up of a single axially slidable pin mounted against the force of a spring, said spring positioned within a horizontally recessed opening formed in the internal vertical face of the heel portion of the fixed support element, the external end of said pin protruding through one of several openings formed on the internal face of said hollow structure heel body.

4,416,073

**WATER-BORNE INFLATABLE PROMOTIONAL DEVICE**  
Robert K. Vicino, and Mark S. Bachman, both of San Diego, Calif., assignors to Robert Keith & Co., Inc., San Diego, Calif.

Filed Apr. 5, 1982, Ser. No. 365,128

Int. Cl.<sup>3</sup> G09F 19/00

U.S. Cl. 40—326

2 Claims



1. A floating display comprising:  
an inflatable envelope made of a plurality of fabric panels sewn together along permeable seams;  
said panels being shaped and dimensioned so that the envelope when inflated assumes the enlarged shape of a product;  
a blower mounted in one of said panels, said blower being directed to continuously introduce into said envelope a sufficient flow of ambient air to maintain said envelope inflated;  
at least one pocket within said envelope;  
ballast means within said pocket to keep said inflated envelope in a generally stable position when towed over a body of water;  
a bailing tube in the lower portion of said envelope to evacuate fluid out of said envelope;  
within said envelope, a plurality of anchoring patches attached at selected locations to said sections;  
a plurality of tethers, each having one end connected to one of said patches; the other ends of said tethers joining together to form a towing line;  
said towing line exiting said envelope through an orifice in the envelope for attachment to a towing device.

4,416,074

RING VIEWER

Benjamin G. Guerrero, Los Angeles, and Saint Elmo B. Berford, Lakewood, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 29, 1982, Ser. No. 426,464

Int. Cl.<sup>3</sup> G02B 27/02

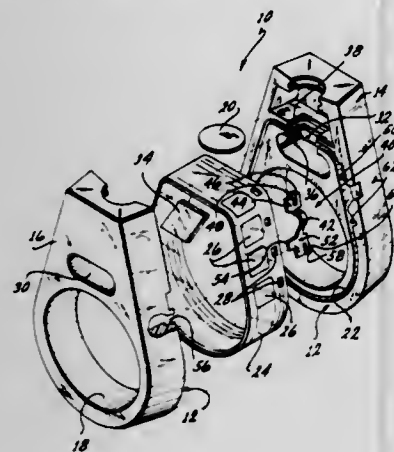
U.S. Cl. 40—364

6 Claims

6. A ring viewer comprising:  
two molded housing halves permanently welded together to form a ring housing;



- a finger opening formed in said housing adapted to accommodate the finger of a wearer;
- a track formed internally of said housing between said housing halves and surrounding said finger opening;
- an endless strip of film having a number of frames and corresponding perforations thereon moveably captured in said track;
- a light aperture formed in said housing, said light aperture extending entirely through one of said housing halves and being closed by a wall in said other housing half;



- a mirror mounted at a preselected angle in said light aperture to reflect light received from a light source;
- a lens captured between said housing halves and aligned with said mirror;
- two film openings formed in said housing in alignment with said lens and said mirror on either side of said track to allow said light reflected by said mirror to pass through a frame of said film to be seen by a viewer on said lens; and
- a unitary film advance mechanism held in said ring adjacent said film including means to move said film a frame at a time upon application of pressure thereto.

4,416,075

## ILLUMINATED CAKE DECORATION

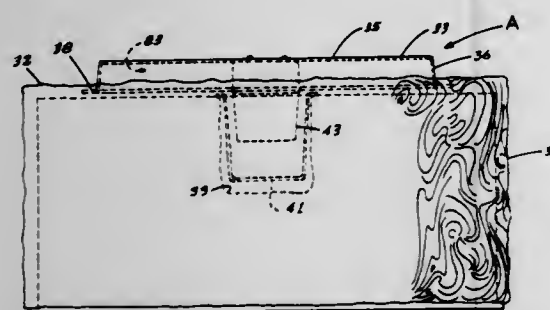
Ronald E. Bauer, 2215 Dawes, Overland, Mo. 63114

Filed Oct. 28, 1981, Ser. No. 315,959

Int. Cl.<sup>3</sup> G09F 19/00

U.S. Cl. 40—546

19 Claims



1. A food product decorating accessory for providing illuminated decoration on the surface of a cake or other similarly decoratable food product; said accessory including a decorative cover plate for being applied externally to and upon said surface of said cake; said cover plate overlying at least a portion of said surface of said cake; said cover plate having at least one portion thereof to allow for the transmission of light through said cover plate; illumination means being located below said cover plate for providing a light source visible through said light-transmissive portion of said cover plate when viewed from above said cover plate by an observer of said cake.

4,416,076  
**DEVICE FOR RETAINING CARTRIDGES IN THE  
 MAGAZINE OF A SEMI-AUTOMATIC SHOTGUN  
 DURING A REPLACEMENT OF THE CARTRIDGE IN  
 THE FIRING CHAMBER**

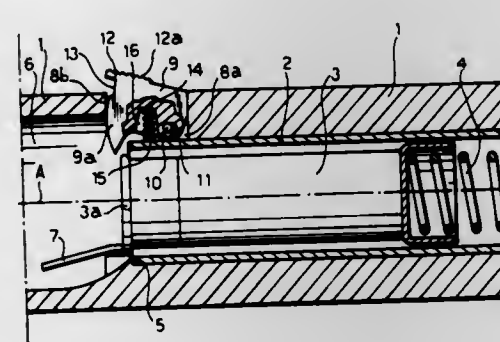
Leonardo Ottolini, Brescia, Italy, assignor to Luigi Franchi S.p.A., Fornaci, Italy

Filed Dec. 28, 1981, Ser. No. 335,032

Claims priority, application Italy, Jan. 23, 1981, 20556 E/81  
Int. Cl.<sup>3</sup> F41C 25/08

U.S. Cl. 42—17

2 Claims



1. In a semi-automatic shotgun including an elongate tubular cartridge magazine with an open end through which cartridges are discharged to the firing chamber of the shotgun, a device for retaining the cartridges in the magazine during replacement of a cartridge in the firing chamber, comprising:

- a fixed pin extending perpendicular to the longitudinal axis of the magazine;
- a lever having a portion accessible from outside the gun, and a hooked portion within the gun;
- means for pivotally coupling the lever to the pin, said coupling being loose in the direction of the longitudinal axis of the magazine, whereby the lever is angularly displaceable about the pin from a first position, in which said hooked portion is spaced from the open end of the magazine, to a second position, in which said hooked portion extends transverse the open end of the magazine, so as to constitute a stop for the cartridges therein;
- a spring for resisting displacement of the lever from the first position to the second position, and
- means for releasable locking of the lever in the second position.

4,416,077

## COMBINATION EXTRACTOR AND HOLD DOWN MECHANISM FOR A BOLT-ACTION RIFLE

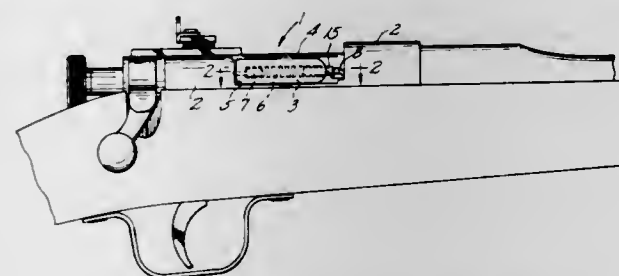
James G. Thompson, 4655 Butte Falls Hwy., Eagle Point, Oreg. 97524

Filed Jun. 14, 1982, Ser. No. 388,272

Int. Cl.<sup>3</sup> F41C 15/00, 11/06

U.S. Cl. 42—25

6 Claims



4. A bolt assembly for a bolt-action rifle, said assembly including,
  - a bolt main body member including a locking lug defining a bore,
  - a hold down plunger slidably mounted within said locking lug,

- an extractor pin also slidably mounted within said locking lug,
- resilient means biasing said hold down plunger and said extractor pin in opposite directions, and
- an extractor movably mounted adjacent one end of said bolt main body member, said extractor pin in biased engagement with said extractor for urging same into engagement with the rim of a cartridge casing for withdrawing of the cartridge casing from a rifle barrel chamber.

4,416,078  
HANDGUN

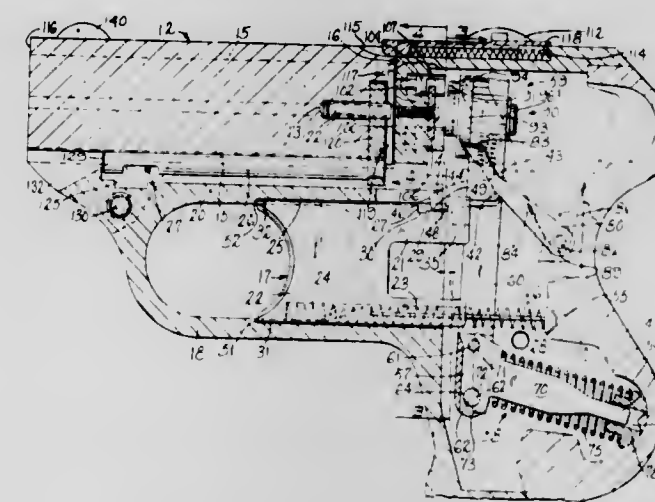
Robert L. Hillberg, Cheshire, Conn., assignor to COP, Inc., Torrance, Calif.

Division of Ser. No. 111,870, Jan. 14, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,114

Int. Cl.<sup>3</sup> F41C 19/00

U.S. Cl. 42—69 R

16 Claims



1. A multi-barrel handgun comprising a frame, a barrel assembly including a plurality of barrels mounted on the frame, a breech block on the frame, a plurality of firing pins supported by the breech block, each of the firing pins aligned with an associated one of the barrels, a trigger supported on the frame for movement between ready and firing positions, a hammer pivotally supported on the frame, a sear mounted on the hammer and capable of being engaged by the trigger, means for pivoting the hammer toward the rear of the frame upon movement of the trigger toward its firing position and engagement of the trigger with the sear, means for releasing the sear from engagement with the trigger, a ratchet rotatably mounted on the hammer, a firing lug on the ratchet, pawl means for rotating the ratchet, and notch and detent means associated with said ratchet for rotating the ratchet to secure sequential alignment of the firing lug with each of the firing pins and including a plurality of notches symmetrically arranged around the axis of said ratchet and a detent member, the number of notches being equal to the number of barrels, each of said notches being adapted to receive said detent member and be engaged by said pawl means, and means for forcing the hammer forward upon release of the sear engagement so as to cause the striking of an associated firing pin by the firing lug.

4,416,079

## FISHING APPARATUS

Vincent B. Hodshre, 2701 NE Adams St., Peoria, Ill. 61603

Filed Jun. 7, 1982, Ser. No. 385,456

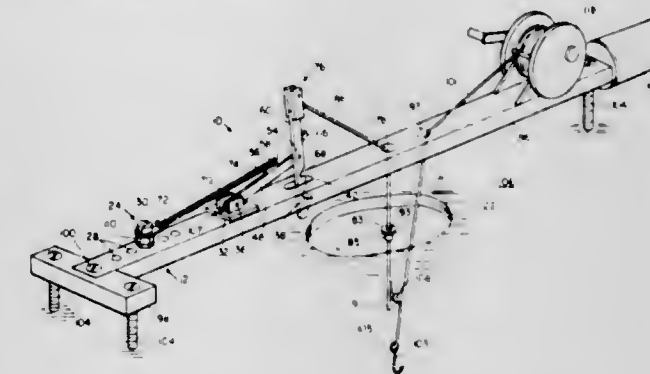
Int. Cl.<sup>3</sup> A01K 97/01

U.S. Cl. 43—15

10 Claims

1. A fishing apparatus comprising:
  - a main support member;
  - a first member connected to said main support and movable between first and second positions;
  - a trigger member connected to said first member,
  - an extension connected to said trigger, said extension includ-

- ing a pair of spaced apart members having an axle extending therethrough;
- means for retaining said trigger and said first member in said first position;
- means for resiliently urging said trigger and said first member toward said second position;
- a first guide in said main support;
- a wire releasably connected to said axle and extending through said first guide;



- first and second limiting means carried by said wire for limiting movement of said wire through said guide in response to said second limiting means engaging said first limiting means and said first limiting means engaging said main support member;
- a reel mounted on said main support;
- a second guide in said main support;
- a fishing line extendably connected to said reel and extending through said second guide; and
- means connected to said wire for releasably engaging said fishing line.

4,416,080

## FISH LURE WITH AN OVERLAY

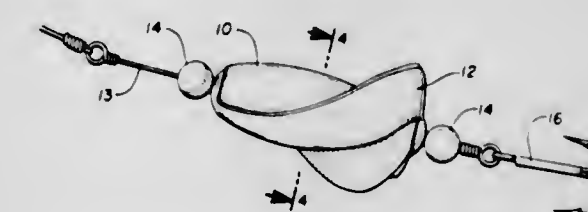
Lawrence E. Morrissette, 340 Bd des Ecoles, 83140 Six-Fours-Plage, France

Filed Oct. 26, 1981, Ser. No. 314,962

Int. Cl.<sup>3</sup> A01K 85/00

U.S. Cl. 43—42.2

8 Claims



1. A fish lure comprising:
  - (a) a main body of a tapered, fluted screw with a bore through its longitudinal axis;
  - (b) a shaft extending through said bore;
  - (c) line connector means on said shaft on the narrow, forward end of said tapered screw;
  - (d) hook connector means on said shaft on the wide, rear end of said tapered screw; and
  - (e) an overlay secured to and extending longitudinally along said screw in spaced and unbalancing relation thereto, said overlay being constructed and arranged to cause said screw to be unbalanced and vibrate as it rotates about said shaft and to cause water to pass between said overlay and said screw as the lure is drawn through water.



4,416,081

**JAW CONFIGURATION FOR ANIMAL TRAP**

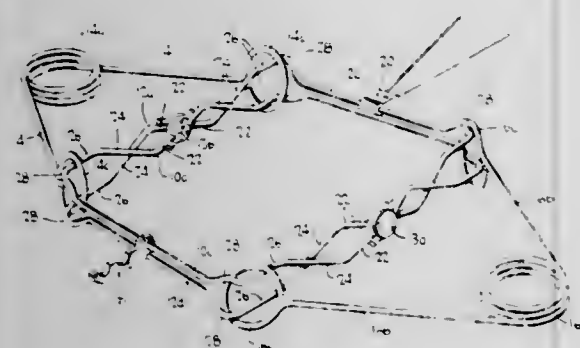
William E. Askins, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Feb. 23, 1982, Ser. No. 351,591

Int. Cl.<sup>3</sup> A01M 23/26

U.S. Cl. 43—90

11 Claims



1. In an animal trap of the type comprising two frames, each frame having a jaw-forming side and first and second end members extending from said jaw-forming sides, pivot means connecting the first end member of one frame to the second end member of the other of said frames, and connecting the second end member of said one frame to the first end member of the other frame for pivotal movement of said frames about a common axis between a set position, in which said jaw-forming side of said one frame is positioned remote from the jaw-forming side of the other frame, and a closed position in which said jaw-forming sides of said one and said other frames are positioned closely adjacent one another in opposite sides of an imaginary plane containing said common axis and residing between said jaw-forming sides in said closed position of said frames, actuator means for forcefully biasing said frames to rotate toward said closed position and trigger means for releasably maintaining said frames in said set position in opposition to said actuator means,

the improvement wherein said first and second end members of at least said one frame are configured to include an inner section extending generally radially outward from said common axis at an acute angle relative to said imaginary plane, a remote section extending generally inward from the jaw-forming side of said one frame and in parallel spaced relation to said imaginary plane when said frame members are in said closed position, and an intermediate section extending between the inner and remote sections.

4,416,082

**MARINE ANIMAL TRAP**

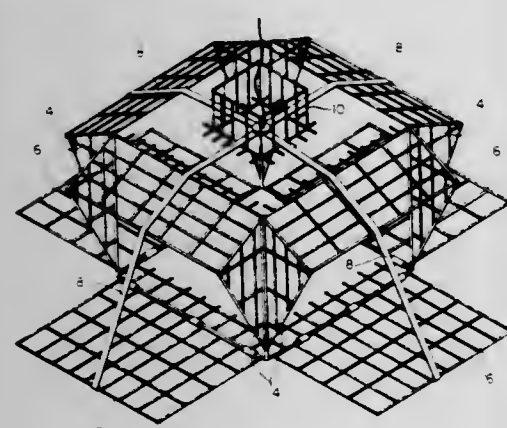
Charles Strobel, 15 Parma Rd., Island Park, N.Y. 11558

Filed Feb. 16, 1982, Ser. No. 348,688

Int. Cl.<sup>3</sup> A01K 69/10

U.S. Cl. 43—102

7 Claims



1. A marine animal trap, consisting:

- (a) a rectangular rod frame having edges defining a top, a base and four sides;
- (b) a covering extending over the base of the frame;
- (c) a wire mesh extending over the top of the frame;
- (d) four wire mesh doors, each hinged to one of the four edges of the base of the frame;
- (e) wire mesh outwardly converging extensions of the sides and top edges of the frame having edges defining closures with the wire mesh doors;
- (f) means for baiting the trap; and
- (g) cords extending from each of the doors and from the means for baiting to the top of the frame whereby the doors can be closed and the means for baiting lifted vertically during elevation of the trap.

4,416,083

**MOLDABLE TOY VEHICLE**

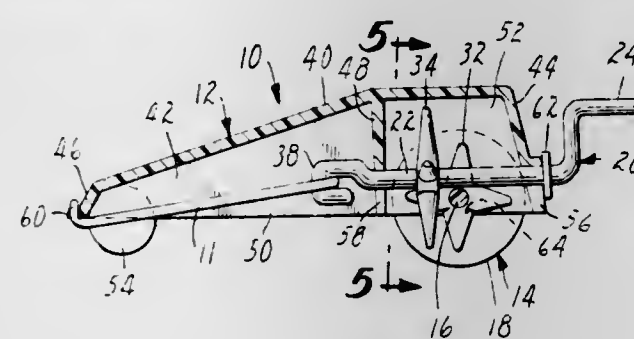
James F. Kubiawicz, Fridley, Minn., assignor to Custom Concepts, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 212,546, Dec. 3, 1980, abandoned. This application Jul. 8, 1982, Ser. No. 396,153

Int. Cl.<sup>3</sup> A63H 17/00

U.S. Cl. 46—208

5 Claims



1. A toy vehicle consisting only of parts molded in finished form of a polymeric material in combination with a rubber band, said parts comprising:

- a unitary integrally molded driven member comprising an axle having an axis, two wheels coaxial with and at opposite ends of said axle, and a star gear coaxially fixed on said axle between said wheels and having 4 to 6 radially projecting teeth disposed at generally equal angles about said axle;
- a unitary integrally molded drive member comprising a drive shaft having an axis and first and second ends, winding means at said first end adapted to be manually engaged to rotate said drive shaft about its axis, a hook at an end of said drive shaft opposite said winding means receiving a length of said rubber band, and a star gear coaxially fixed on said drive shaft between said winding means and hook and having 4 to 6 radially projecting teeth disposed at generally equal angles about said drive shaft; and
- a unitary integrally molded body including interconnected walls defining a cavity opening through a bottom side of said body, band engagement means adjacent one end of said body engaging a portion of said rubber band, means at the end of said body opposite said one end receiving and rotatably supporting the drive shaft of said drive member adjacent said winding means with said hook within said cavity and spaced from said band engagement means to support said rubber band therebetween, and means on said walls along the bottom side of said body receiving and rotatably retaining the axle of said driven member with the axis of said axle transverse to the axis of said drive shaft, with said drive shaft on the side of said axle opposite said bottom side of said body to retain said drive shaft in place and with the teeth of said star gears positioned in right-angle engagement to transfer driving force from said rubber band to said wheels.

4,416,084

**PROTECTIVE DEVICE**

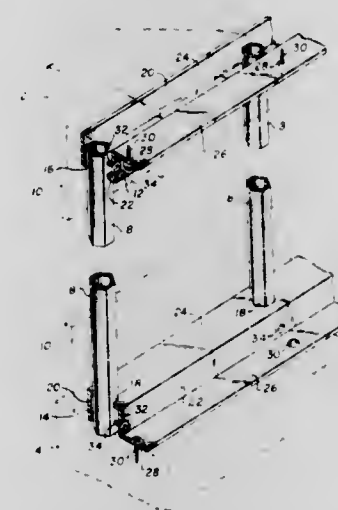
Giuseppe Zen, 3475 Pandora St., Vancouver, British Columbia, Canada (V5K 1W7)

Filed May 7, 1982, Ser. No. 375,852

Int. Cl.<sup>3</sup> E06B 3/68

U.S. Cl. 49—50

5 Claims



1. A protective device for a building adapted to be installed at a window to prevent ingress, the device comprising: a first member adapted to be attached to one edge of the window; a second member adapted to be mounted to a further edge of the window, opposed to the first member; each member being a channel member of generally U-shape, the U having limbs joined by a bridge, with a flange extending from one limb of the U, remote from the bridge; holes to receive screws formed in the flange; recesses formed in the bridge of the U at predetermined centers; a bar extending between a pair of opposed recesses to prevent ingress, holes extending through a limb of the U adjacent the flange to permit locating means to extend into the channel member to locate the bars, the bars also being located by the attachment of the members to the window edges.

4,416,085

**AUTOMATIC GATE OPENER**

Robert W. Lybecker; Karl A. Senghaas, both of San Antonio, and James W. Olafson, Kerrville, all of Tex., assignors to Bomar Corporation, San Antonio, Tex.

Filed May 3, 1982, Ser. No. 373,859

Int. Cl.<sup>3</sup> E05F 15/02

U.S. Cl. 49—340

10 Claims

1. A gate opening device for use at remote locations comprising: stationary mounting means; linkage rod pivotally connected on a first end to said stationary mounting means and pivotally connected on a second end to said gate, said linkage rod having an intermediate pivot point between said first and second ends thereof; cylinder means pivotally mounted on said stationary mounting means, said cylinder means having a cylinder rod extending therefrom with a first end being pivotally connected to said linkage rod and a second end forming a piston inside said cylinder means; control means connecting to said cylinder means for operating said cylinder means, said control means including a bi-directional gear pump for supplying hydraulic fluid to operate said cylinder means; and sensor means for signaling said control means to activate

said bi-directional gear pump to supply said hydraulic fluid under pressure to said cylinder means, said pressurized



hydraulic fluid moving said gate to an opened or closed position via said piston, cylinder rod and linkage rod.

4,416,086

**ADJUSTABLE DOOR MOUNTING ARRANGEMENT FOR REFRIGERATED DISPLAY CABINETS**

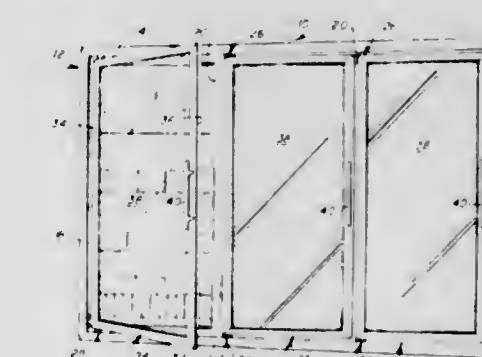
Frank M. Niekrasz, Homewood, Ill., assignor to Ardco, Inc., Chicago, Ill.

Filed Aug. 3, 1981, Ser. No. 289,779

Int. Cl.<sup>3</sup> F05D 7/08

U.S. Cl. 49—388

19 Claims



1. An adjustable door mounting arrangement for mounting a door on a structure comprising:

- a generally rectangular frame adapted to be affixed to said structure and defining a door opening and including a first frame member and a second frame member maintained in spaced, generally parallel relation by a plurality of transversely spaced apart column members;
- first and second hinge means disposed at respective upper and lower corner portions of said door for hingedly connecting said door to said frame for providing swinging movement of said door inwardly and outwardly with respect to said door opening about an axis;
- said first hinge means including adjustment means for adjustably positioning the first hinge means longitudinally of said first frame member whereby the axis about which said door swings may be shifted thereby accommodating realignment of said door relative to said frame;
- said first hinge means including a first hinge pin defining said swinging axis and extending outwardly from said door, said adjustment means comprising a first hinge bracket including a body portion defining pin receiving means and having upstanding lug means;
- said first frame member including a web portion defining a first slot within which said lug means extends and is selectively positionable therewithin by shifting said hinge bracket longitudinally of said first frame member, said first



hinge pin extending within said pin receiving means and said first slot in said first frame member.

4,416,087

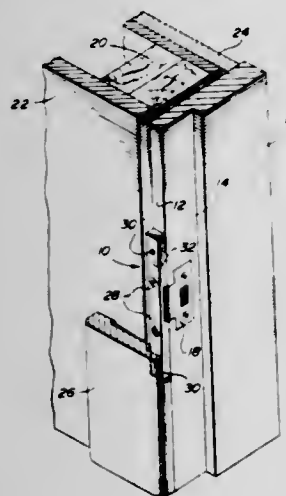
**DOOR FRAME REINFORCER**

Paritosh K. Ghatak, 510 Johnston Dr., Bethlehem, Pa. 18017  
Filed Sep. 29, 1981, Ser. No. 306,690

Int. Cl.<sup>3</sup> E06B 1/04

U.S. Cl. 49—462

1 Claim



1. In a door frame, including, generally, a door jamb including a stop attached to an upright stud, and a striker plate or other bolt receiver means on said jamb, jamb reinforcing means comprising:

- (a) a rigid brace bar located longitudinally proximate the edge of said jamb adjacent said bolt receiver; and
- (b) at least two reinforcing rods positioned through said brace bar transversely into said jamb at a generally right angle thereto, said rods being of a length sufficient to span said jamb for a distance about at least two thirds the depth of the door frame; and,
- (c) nuts, one each mounted on said interior rod ends.

4,416,088

**MOTOR-VEHICLE SIDE DOOR**

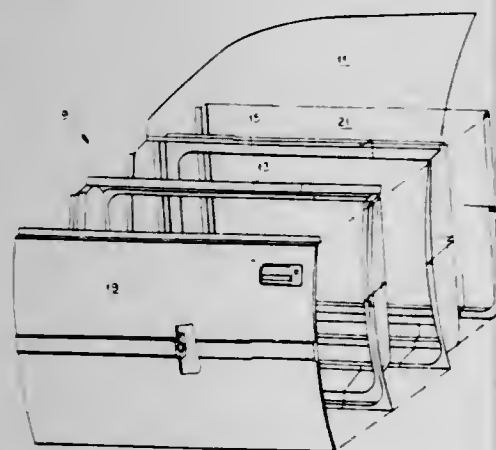
Klaus J. Feucht, Geimersheim; Egbert Rossie, and Karl Bauer, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG, Ingolstadt, Fed. Rep. of Germany  
Filed Feb. 3, 1981, Ser. No. 231,143

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004897

Int. Cl.<sup>3</sup> B60J 5/04

U.S. Cl. 49—502

8 Claims



1. A motor-vehicle door comprising:  
a door frame having an inner side and an outer side and formed with a plurality of narrow threaded apertures

opening at said outer side and with a plurality of relatively wide throughgoing holes;  
a hinge connected to said frame between said sides;  
an inner door panel against said inner side;  
means releasably securing said inner panel to said inner side for forming of said frame and inner panel a door assembly;  
a window pane vertically displaceable in and above said frame;  
window-operating mechanism on said assembly connected to said pane for raising and lowering same;  
a door latch on said frame;  
door-latching mechanism on said assembly connected to said latch for operating same;  
an outer door panel against said outer side and formed with respective relative wide holes at the narrow apertures of the frame and with a plurality of relatively narrow and inwardly open threaded apertures; and  
means including respective relatively narrow screw fasteners engaging through said wide holes in said threaded apertures for releasably securing said outer panel to said outer side for mounting said outer panel on said assembly and removing said outer panel from said assembly without removal of said inner panel, the loose fit of said fasteners in said wide holes permitting said outer panel to be shifted on said frame.

4,416,089

**DOOR AND WINDOW ARRANGEMENT**

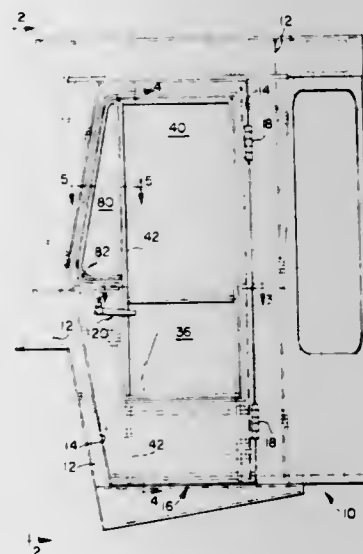
Bernard J. Lambke, Jr., Kenosha, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 9, 1981, Ser. No. 252,516

Int. Cl.<sup>3</sup> B60J 5/04; E05D 15/22

U.S. Cl. 49—502

4 Claims



1. A door and window arrangement comprising:  
a door frame having an inward projecting flange;  
an outer frame having an outward projecting flange overlapping said inward flange;  
a gimp pressed onto said flanges to hold said door frame and said outer frame together;  
an inner frame defining a pair of tracks secured to said outer frame;  
an insulating broad sealed into one of said tracks at its lower end;  
a fixed pane of glass secured to and resting upon said board;  
a movable pane of glass sealed to a movable frame;  
a slider member affixed to said movable frame and positioned in the other of said tracks; and  
means for adjustably positioning said movable pane relative to said inner frame.

4,416,090

**BELT SANDING MACHINE**

Bertil Jonasson, Eneryda, Sweden, assignor to Landskrona Produktion AB, Sweden

Continuation of Ser. No. 142,502, Apr. 21, 1980, abandoned.

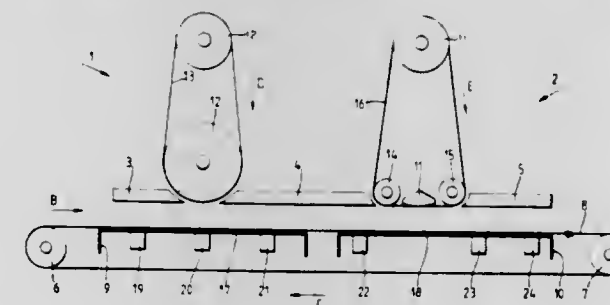
This application May 13, 1982, Ser. No. 377,893

Claims priority, application Sweden, Apr. 25, 1979, 7903612

Int. Cl.<sup>3</sup> B24B 21/04

U.S. Cl. 51—138

9 Claims



1. A belt sanding machine comprising:  
a sanding unit having a feed direction with a feed end and an exit end with respect to said feed direction;  
guide means at said feed and exit ends for setting the sanding depth of said sanding unit;  
a flexible feed conveyor for feeding workpieces to be sanded in the feed direction past said sanding unit; and  
a pressure table on the side of said feed conveyor opposite said sanding unit for pressing a workpiece positioned on said feed conveyor against said sanding unit and said guide means as the workpiece is fed past said sanding unit by said feed conveyor, said pressure table including a rigid planar support member rigidly set a preselected distance from said guide means, said support member having a plurality of openings therethrough; a plurality of pressure members, each pressure member movable through an associated support member opening between a retracted position in which said pressure member is retracted within said planar support member, allowing said feed conveyor to contact said planar support member to constitute a rigid support surface for pressing a workpiece against said sanding unit, and an extended position in which said pressure member extends through the associated support member opening to move said feed conveyor a distance from said planar support member; and means for resiliently urging each of said pressure members in their extended positions against said feed conveyor with substantially the same force so that said feed conveyor constitutes a resilient and flexible support surface for pressing a workpiece positioned thereon with a substantially constant pressure at any location thereof against said sanding unit and said guide means.

4,416,091

**GRINDING DEVICE FOR THE CONTINUOUS AND IN SITU REPROFILING OF A RAILROAD TRACK**

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Dec. 4, 1980, Ser. No. 213,073

Claims priority, application Switzerland, Dec. 31, 1979, 11502/79

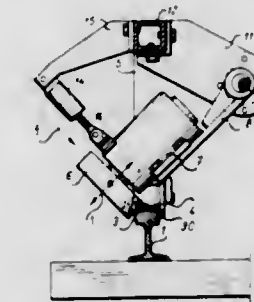
Int. Cl.<sup>3</sup> B24B 23/00

U.S. Cl. 51—178

7 Claims

1. Grinding device for the reprofiling in situ and continuously of a rail of a railway track comprising at least one grinding unit comprising at least one peripheral grinding wheel driven in rotation by means of a motor, this device being mounted on a tool carrying frame of a railroad vehicle so that the axis of rotation of the grinding wheel forms an angle with the longitudinal axis of the rail and that said rotation axis has no intersection with the rail itself, means to displace the grinding wheel vertically relative to the vehicle and to apply it against the rail with a determined force, and means automatically

bodily moving the grinding wheel in an alternating movement along a direction forming an angle with the rail, the amplitude of the alternating movement of the grinding wheel, projected into a plane perpendicular to the longitudinal axis of the rail



passing through the contact zone between the grinding wheel and the rail, being approximately equal to the projection l in the same plane, of the width of the working face of the grinding wheel diminished by the width f of the ground portion of the rail.

4,416,092

**CLEANING APPARATUS**

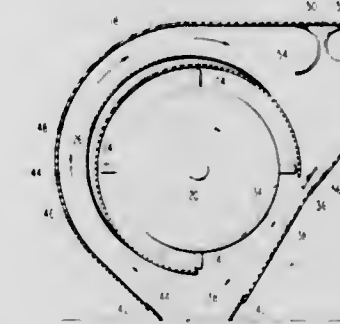
Robert T. Nelson, 12601 Arrowhead Ter., Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 324,563, Nov. 24, 1981, abandoned. This application Jan. 7, 1982, Ser. No. 337,832

Int. Cl.<sup>3</sup> B24C 3/02, 3/06

U.S. Cl. 51—425

5 Claims



1. An apparatus for movement over a surface external of the apparatus to clean the surface with abrasive material comprising:

- (a) a housing having an enclosure with an opening for exposing a portion of the surface external of said housing to abrasive material from the apparatus;
- (b) a rotatable drum within said housing, said drum including a plurality of circumferentially spaced blades extending radially from the peripheral surface of the drum for propelling abrasive material along a delivery path toward the surface to be treated;
- (c) a hopper for storing abrasive material, said hopper having an opening communicating with said delivery path;
- (d) means for delivering abrasive material from said hopper to said drum for propulsion of the abrasive material toward said housing opening, said means including said hopper opening and said blades, said blades being positioned to pass across said hopper opening in close proximity thereto for removing abrasive material from said hopper and projecting it along said delivery path;
- (e) said housing including a substantially unobstructed recovery path for receiving abrasive material rebounding from the surface being treated and returning the rebounding abrasive material to said hopper;
- (f) said drum imparting sufficient kinetic energy to abrasive material delivered thereto to effect cleaning of the surface to be treated and to return rebounding abrasive material to said hopper;



- (g) a drum housing substantially circumscribing said drum, said drum housing having an opening comprising a minor portion thereof to provide for delivery of abrasive material from said hopper to said blades and providing space for said delivery path, said hopper having an elongated opening at the bottom aligned with said drum housing opening so that small even slices of abrasive material are successively removed from said hopper by said blades and propelled along said delivery path; and
- (h) said delivery path, the plane of rotation of said drum, said recovery path and said hopper lying in the same plane.

4,416,093

## PANEL SYSTEM INTERCONNECTING MEANS

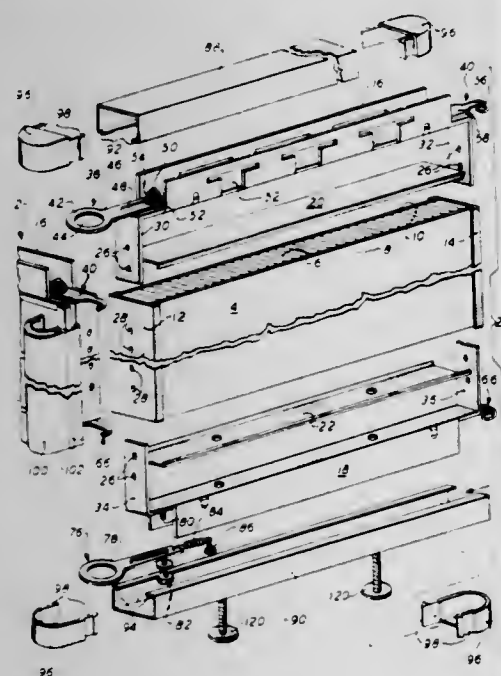
Stephen A. Salkeld, Mechanicsburg, and Mark E. Stock, McSherrystown, both of Pa., assignors to Litton Business Systems, Inc., York, Pa.

Continuation of Ser. No. 47,569, Jun. 11, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 347,111

Int. Cl.<sup>3</sup> E04B 1/346

U.S. Cl. 52—71

2 Claims



1. In a panel system comprising a plurality of panels and means for interconnecting said panels, said interconnecting means including:
- a first connecting member in a given plane, said first connecting member comprising ring member;
  - a second connecting member in the same plane as said first connecting member, said second connecting member comprising a hook member having a hook portion interengageable with said ring member;
  - said hook portion of said hook member extending completely through said ring member from one side of the latter to the other;
  - means mounting at least one of said connecting members for shifting movement in the same plane in which both said first connecting member and said second connecting member lie and in a direction away from the related interengageable connecting member; and
  - resilient means connected to said shiftably movable connecting member for biasing said shiftably movable connecting member in said direction away from the related interengageable connecting member.

4,416,094

## ATTIC WINDOW ASSEMBLY

Franz Bügener, Heusenstamm; Manfred Rinklake, Friedrichsdorf; Werner Horch, Dietzenbach; Wilhelm Röttger, Heusenstamm; Günter Jöst, and Johann Kirsch, both of Rodgau, all of Fed. Rep. of Germany, assignors to Braas & Company GmbH, Munich, Fed. Rep. of Germany

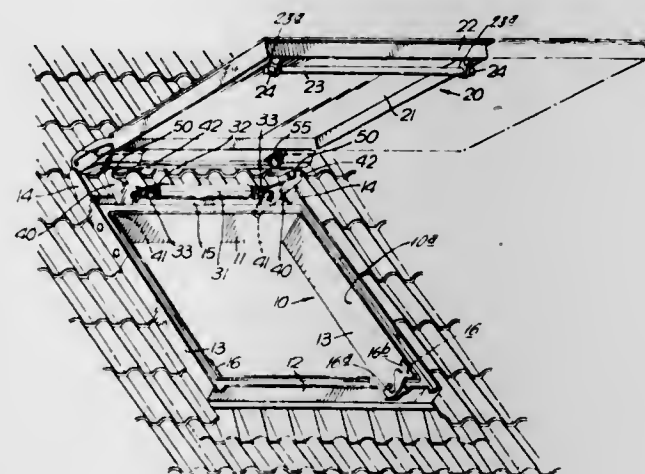
Filed Jun. 5, 1981, Ser. No. 270,900

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031318

Int. Cl.<sup>3</sup> E05F 1/00; E04B 7/16

U.S. Cl. 52—72

11 Claims



1. In a window assembly including a panel mounted for pivotal movement relative to a casing in a roof sheathing, a moving rib attached to the panel and a guide rib operatively connected to the moving rib, actuating means for automatically pivoting the panel from a closed position overlying the casing to an open position disposed at a predetermined angle to the casing comprising at least one actuating lever, a preloaded spring member connected between the ends of said actuating lever, one end of said actuating lever pivotally connected to the guide rib at a fixed pivot and the other end of said actuating lever being movably supported in a guide parallel to the longitudinal axis of said spring member whereby upon release of the panel from a closed position, movement of the other end of the actuating lever effects a pivoting of the guide rib and panel to a predetermined angular position relative to the casing for a given linear displacement of said spring member and wherein said guide may be fixed at different distances relative to the casing for selectively varying the angular displacement of said panel by said actuating means.

4,416,095

## SUPPORT HANGER KIT FOR SUSPENSION CEILINGS AND METHOD OF INSTALLATION

Donovan Truluck, 313 Alameda Pkwy., Arnold, Md. 21012

Filed Sep. 1, 1981, Ser. No. 298,363

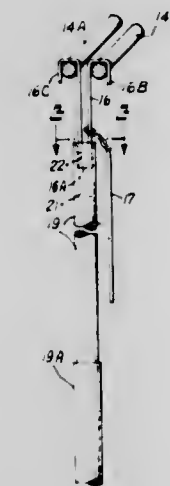
Int. Cl.<sup>3</sup> E04B 5/52

U.S. Cl. 52—173 R

18 Claims

1. A new and improved method for installation of suspended ceilings between a set of parallel ceiling joists employing an improved support hanger; the support hanger having a generally U-shaped configuration that provides a generally U-shaped bend portion with the free ends thereof bent outwardly away from each other and downwardly toward the bottom of the U-shaped bend portion to form two hooked ends which open downwardly and lie in substantially the same plane with the U-shaped bend portion; the method comprising tying a suspension wire to be supported in space between the set of parallel ceiling joists near the U-shaped bend portion of the support hanger, inserting the U-shaped bend portion of the support hanger together with attached suspension wire in a keyway formed in the end of an elongated pole of sufficient length to reach between the parallel ceiling joists from the

floor, the keyway in the end of the pole providing a press fit for the support hanger U-shaped bend portion and preventing relative rotation between the inserted support hanger and the pole, raising the end of the pole with the inserted support hanger and attached suspension wire through the space between the set of parallel ceiling joists by orienting the pole and support hanger insert so that the plane containing the downwardly directed hooked ends is parallel to the axes of the set of parallel ceiling joists, raising the end of the pole together with the inserted support hanger sufficiently above the level of the parallel ceiling joists so that the support hanger hooked ends



will clear the tops of the ceiling joists, rotating the pole and inserted support hanger relative to the set of ceiling joists so that the plane containing the downwardly directed hooked ends is substantially at right angles with respect to the longitudinal axes of the set of parallel ceiling joists, lowering the end of the pole with the inserted support hanger thus oriented to cause the downwardly directed hooked ends of the support hanger to engage the tops of the ceiling joists and tugging the end of the pole downwardly with sufficient force to release the support hanger from its press fit in the keyway and leave it suspended together with its attached suspension wire at a desired point in space along the length of the ceiling joists.

4,416,096

## INSULATING WINDOW INSERT

Allan C. Schuster, and Georgia L. Schuster, both of 439 E. Main St., Whiteland, Ind. 46184

Filed Sep. 25, 1981, Ser. No. 305,758

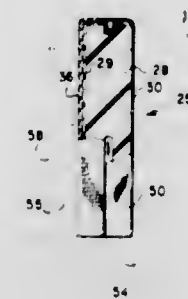
Int. Cl.<sup>3</sup> E06B 3/26

U.S. Cl. 52—202

3 Claims

1. An insulating window insert panel for forming a vapor and draft barrier and for supporting decorative material for use with double hung windows or the like comprising:
- a generally rectangularly shaped block of polystyrene foam having a shape adapted to fit between the window sills and window frame members on the sides and in spaced relation to one of the window lights,
  - means in said block forming a peripheral groove,
  - a sheet of vapor barrier material positioned between said block and said window light having a marginal edge received in said groove,
  - a blanket of fluffy polyester material positioned in overlying relation to said vapor barrier sheet and also having marginal edges adapted to be received in said groove,
  - a front sheet of decorative material positioned on the exposed frontal surface of said block and having marginal edges adapted to be received in overlying relation to the edge of said block, and
  - a retainer band encircling said block in said groove gripping the marginal edges of said vapor barrier and said blanket and compressing the same in said groove, whereby said

panel may be fitted tightly inside the window frame forming an insulating barrier and vapor shield while supporting



decorative material for viewing from the inside of the room.

4,416,097

## UNIVERSAL BEAM CONSTRUCTION SYSTEM

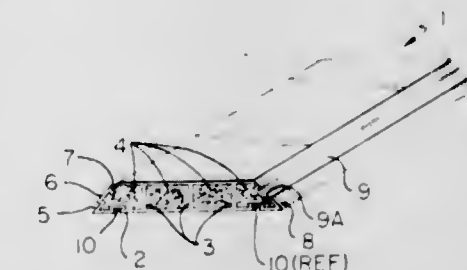
Richard L. Weir, 2217 Grant Ave., Dayton, Ohio 45406  
Continuation of Ser. No. 659,836, Feb. 20, 1976, abandoned.

This application Nov. 16, 1977, Ser. No. 851,965

Int. Cl.<sup>3</sup> E04F 17/08; E04C 1/10, 1/04

U.S. Cl. 52—220

9 Claims



1. An element of construction which is reversible in application, comprising an elongate relatively flat, plate-like body having parallel outer faces one of which is wider than the other and oppositely sloping side edges, one of which sloping side edges has projecting means formed integral therewith and the other of which is recessed to accommodate like projecting means on a similar element, said side edges being constructed and arranged to provide that a plurality of said elements can be brought together in a side edge abutting relation to form a wall structure wherein adjacent elements may be co-planar or at right angles to each other or compositely arranged to form a structural beam, depending on the differential positioning of the adjacent elements in one sense or another enabled by their reversibility, at least one outer face of said element embodying therein means defining a recess providing that on placing a pair of said elements with faces thereof including said recess in abutting relation and with said recesses therein aligned, said recesses commonly accommodate a male configured connecting device to join said elements in their face abutted relation.



4,416,098

## SLAB-SHAPED BUILDING ELEMENT

Johann Goldinger, A-6511 Zams/Österreich, Hinterfeldweg 8, Austria

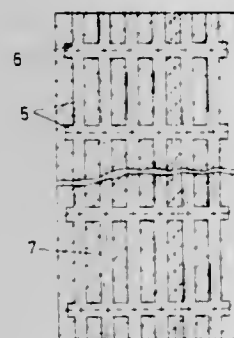
Filed May 22, 1981, Ser. No. 266,282

Claims priority, application Austria, Jun. 2, 1980, 2901/80

Int. Cl.<sup>3</sup> E04C 2/04

U.S. Cl. 52—309.16

14 Claims



1. A slab-shaped building element, particularly a wall element of a one story height, of lightweight concrete reinforced by reinforcing rods, wherein at least one grid of heavy concrete is enclosed in said lightweight concrete parallel to side faces of said building element, a reinforcing grid consisting of reinforcing rods being disposed in said grid of heavy concrete, said lightweight concrete being bonded directly to said heavy concrete grid.

4,416,099

## COMPOUND GIRDER FORMING A RIGID CONNECTION FOR PREFABRICATED CEILING PANELS

Ulrich Fiergolla, Schillerstrasse 8, 4992 Espelkamp, and Josef Mottmayr, Eduard-Schmid-Strasse 26, 8000 Muenchen 90, both of Fed. Rep. of Germany

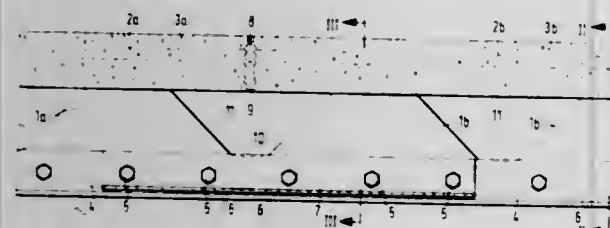
Filed May 18, 1981, Ser. No. 264,416

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019744

Int. Cl.<sup>3</sup> E04B 1/20

U.S. Cl. 52—319

9 Claims



1. A compound girder of a type to be assembled at least partially at the building site, for rigidly connecting in a bending stiff manner a plurality of prefabricated concrete ceiling panels each panel having a given width, comprising separate compression upper chord sections each corresponding in its length substantially to the given width of the corresponding concrete ceiling panel, said separate upper chord sections being embedded in the concrete of the respective ceiling panel, a plurality of initially separate web means rigidly and individually secured to the respective separate upper chord section, said separate web means having an upper portion partially embedded in the concrete of the respective ceiling panel so that a lower portion of the separate web means projects from the respective ceiling panel, initially separate lower tension chord means having an uninterrupted length corresponding to the girder length, and connecting means securing said projecting lower web portions to said lower chord means, whereby the length of the ceiling panels extends across the length of the girder.

4,416,100

## MODULAR WOODEN FLOOR UNITS AND METHOD OF MANUFACTURE THEREOF

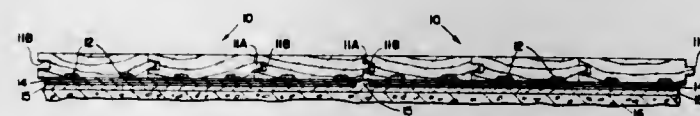
Roy A. Troendle, Sr., New Orleans, La., assignor to Troendle, Inc., New Orleans, La.

Filed Sep. 4, 1981, Ser. No. 299,334

Int. Cl.<sup>3</sup> E04F 15/022

U.S. Cl. 52—390

1 Claim



1. A modular floor unit comprising a plurality of lengths of tongue and groove strip flooring having a flat smooth finish on one side and a plurality of channel recesses on their other side  
(a) said lengths of floor stripping all being of the same length and solid uniform thickness with the tongues inserted in the grooves,  
(b) a plywood backing member shorter than the length of said stripping and extending beyond one long end of said stripping on the side opposite the flat smooth finish side, the grain of said plywood being at a right angle to the longitudinal axis of the lengths of said strip flooring,  
(c) a bonding glue in said channel recesses between said stripping and said plywood,  
(d) a plurality of staple means connecting said plywood backing to said stripping, said staples entering said strip flooring from the plywood side, and  
(e) said modular unit of stripping having a tongue end across one end of said stripping and a grooved end across the opposite end.

4,416,101

## INSULATING GLASS WINDOW STRUCTURE

Paul Derner, Gelsenkirchen, and Dietrich Martin, Witten, both of Fed. Rep. of Germany, assignors to BFG GLASSGROUP, Paris, France

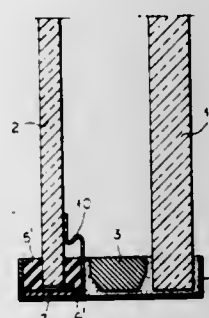
Filed Apr. 13, 1981, Ser. No. 253,297

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014207

Int. Cl.<sup>3</sup> E04C 1/42

U.S. Cl. 52—398

6 Claims



1. An insulating window structure comprising:  
an inner glass pane;  
an outer glass pane;  
a frame including means for spacing said panes apart, said frame extending around the periphery of said panes to define therein a gas-filled space; and  
resilient means for connecting at least one of said panes to said frame so as to enable the displacement of said one of said panes toward and away from the other of said panes, said resilient means having at least one leaf spring characteristic in which restoring force against said one of said panes is plotted along an ordinate and displacement of said one of said panes is plotted along the abscissa of a graph which has a horizontal portion centrally of said characteristic, said resilient means acting upon said one of said panes at a working point of said characteristic lying along

said horizontal portion whereby force resisting displacement of said one of said panes remains substantially constant during displacement thereof against said resilient means.

4,416,102

## PLASTIC BUSHING FOR USE WITH STEEL/WOOD TRUSS STRUCTURES

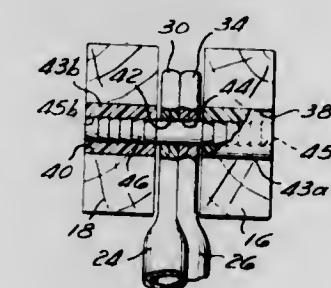
Dierk D. Peters, 16526 Zumaque St., Rancho Santa Fe, Calif. 92067

Filed Sep. 2, 1980, Ser. No. 182,952

Int. Cl.<sup>3</sup> E04C 3/02

U.S. Cl. 52—692

12 Claims



1. A truss joist assembly comprising:  
(a) two spaced chord sections, each of said chord sections having an opening;  
(b) a metal web diagonally spanning said chord sections between said openings, each end of said web having an aperture which is of smaller diameter than said chord section openings, each said web aperture being registered with one of said chord section openings;  
(c) resilient means for absorbing vibrations to said truss joist assembly, said vibrational absorbing means being positioned within at least one of said chord section openings and having a bore coaxial with said chord section opening;  
(d) a pin penetrating said web aperture and said bore to secure said web to said chord sections.

4,416,103

## APPARATUS FOR LOADING SLICED AND BULK FOOD PRODUCTS

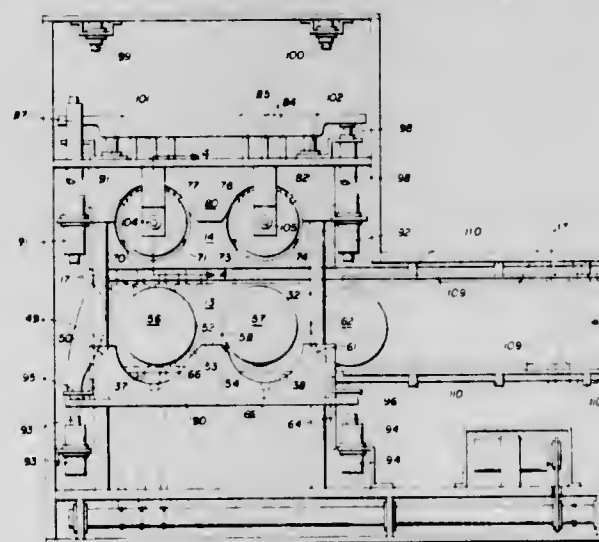
Gerald Ewer, 2818 Calaveras Dr., Fairfield, Calif. 94533, and Arnold Agre, 8762 Gray Fox Dr., Evergreen, Colo. 80439

Filed Feb. 6, 1981, Ser. No. 232,135

Int. Cl.<sup>3</sup> B65B 25/06, 35/40, 57/14; B65G 25/08

U.S. Cl. 53—517

2 Claims



2. Apparatus for supporting a knife-edge penetrable product at a loading station for transfer by plunger means of the product to a receiving station including, a plurality of knife blades in a single horizontal plane having sharpened edges positioned for engagement and temporary support of said

product on said edges proximate the perimeter of said product, and a movable support member mounted to support said product at said loading station and formed for retraction from said loading station to deposit said product on said edges, wherein the improvement in said apparatus is comprised of:

means for uni-directional retraction of said movable support member, and said plurality of knife blades consists of three knife blades, a first two of which are mounted in spaced relation for engagement of said product at its perimeter as said movable support member begins to retract and the third of which is mounted for engagement of said product at its perimeter opposite said first two when said movable support member is fully retracted.

4,416,104

## CLAMPING MECHANISM FOR IMPULSE SEALER

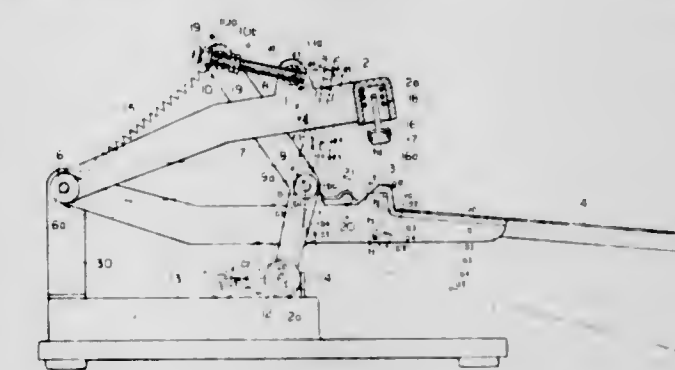
Teruo Yamada, Suita, Japan, assignor to Fuji Manufacturing Company Limited, Osaka, Japan

Filed Sep. 21, 1981, Ser. No. 304,412

Int. Cl.<sup>3</sup> B65B 7/06, 51/14

U.S. Cl. 53—371

7 Claims



1. A work clamping mechanism comprising a base member having first pivot means thereon, a pair of spaced apart parallel drive arms pivoted at one end on said first pivot means, work support means secured to the opposite ends of said drive arms, pressure bar means pivotally mounted at one end on said pivot means between said drive arms and having clamping means secured to the opposite end thereof, second pivot means on each of said drive arms intermediate the ends thereof, a pair of lever arms pivoted at their mid-points on said second pivot means with one end of each lever slidably engaging said base member and connecting means pivotally connected to the opposite ends of said lever arms and pivotally connected to said pressure bar means between the ends thereof so that upon pivoting of said drive arms by the work support means said pressure bar means is pivoted through said lever arms and connecting means to clamp the work between said clamping means and said work support means.

4,416,105

## TRAINING DEVICE FOR HORSES

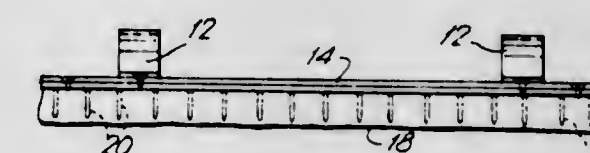
Yves Gauthier, 7433 St. Vincent, Ste. Scholastique, Mirabel, Quebec, Canada J0N 1S0, and Robert Gravel, 3195 Dickson Ave., Montreal, Quebec, Canada H1N 2J9

Filed Sep. 21, 1981, Ser. No. 304,177

Int. Cl.<sup>3</sup> B68B 1/00

U.S. Cl. 54—71

3 Claims



1. A horse training device comprising a flat backing plate;



pad of sponge-like material affixed to one side of said backing plate;  
 a plurality of pins of slightly lesser length than the thickness of said pad, mounted on said backing plate so that their pointed ends are normally retained within said pad, said pad being compressible to expose the pointed ends of said pins; and  
 mounting brackets on the side of said backing plate opposite said pad for mounting said backing plate on a head pole whereby on turning of the head of the horse beyond a predetermined degree, the pad is compressed and the pointed ends exposed for contact with the horse's skin.

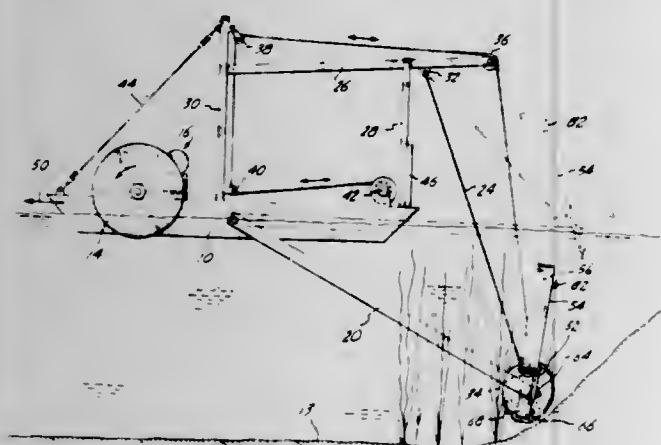
4,416,106

# METHOD AND APPARATUS FOR REMOVAL OF AQUATIC PLANT GROWTH

James L. Hawk, 22435 SE. 288th, Kent, Wash. 98031  
 Filed Apr. 8, 1982, Ser. No. 366,478  
 Int. Cl.<sup>3</sup> A01D 44/00

U.S. Cl. 56—8

14 Claims



1. A method of removing aquatic plants growing from the bottom of a body of water comprising the steps of:  
 (a) moving a first, substantially horizontally oriented, elongate bar through the plants beneath the surface of the water permitting the plant stalks to wrap around the bar;  
 (b) continuing to move the bar and wrap the plant stalks thereby breaking the stalks of at least a first portion of the plants at a point between the bar and the plant roots and pulling the roots of at least a second portion of the plants out of the bottom;  
 (c) moving the bar to a desired location and severing the plant stalks wrapped around said bar to free the plant stalks from the bar.

4,416,107

# LAWN MOWER BLADE CONTROL MECHANISM

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Continuation-in-part of Ser. No. 158,700, Jun. 12, 1980, Pat. No. 4,362,368. This application Apr. 16, 1982, Ser. No. 369,121  
 Int. Cl.<sup>3</sup> A01D 69/10

U.S. Cl. 56—11.3

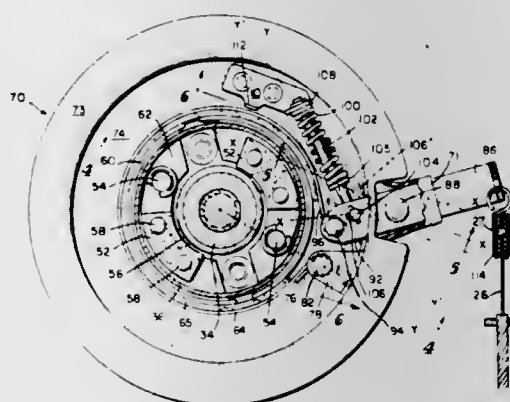
17 Claims

1. Lawn mower blade control mechanism having a driving drum mounted on the depending end of a drive shaft, a blade carrier mounted for coaxial rotation therewith and comprising clutch shoes movably mounted on said blade carrier and biased toward clutching engagement with said drum, brake drum segments connected to move the shoes to de-clutched position, and a brake band surrounding the brake drum segments and movable thereagainst to de-clutch the shoes and brake the blade carrier, wherein the improvement comprises a brake lever pivoted on a supporting pivot located radially outward from the path of said brake segments and having a lever arm extending generally radially inward from such pivot to a con-

nection with a movable end of said brake band located close to said path,

a spring reaction support spaced angularly from said movable end of the brake band, and a compression spring reacting against said reaction support and extending therefrom closely beside and tangentially along said movable end,

means for connecting the free end of the spring for movement with and for transmitting force to said movable end of the brake band in a direction generally parallel with and in the same direction as the brake-engaging movement of said movable end, so as to apply spring force from said closely and tangentially disposed spring substantially directly to the movable end of the brake band to bias the same to brake-engaged position, and



means adapted to be actuated manually by the lawn mower operator for moving said lever arm and movable end of the brake band, against the bias of said spring, to disengage the brake band from engagement with said brake drum segments and thereby permit said clutch shoes to move into engagement with said driving drum,

wherein said means for connecting the free end of the spring and transmitting force therefrom to the movable end of the brake band comprises means connecting such free end to a thrust point on said lever arm between its pivot axis and its connection with the movable end of the brake band so that when said lever is in brake-ON position, the spring exerts thrust thereon along a thrust line at an angle close to 90° to a line connecting the lever pivot to the thrust point.

4,416,108

# DEVICE FOR REDUCING EVAPORATION LOSS FROM CARBURETORS AND FUEL TANKS

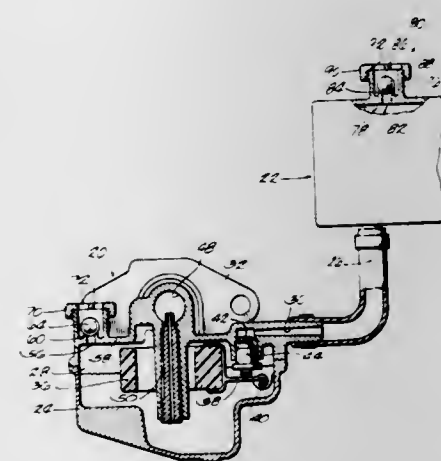
Burzoe K. Gandhi, Whitefish Bay, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 12, 1982, Ser. No. 367,591

Int. Cl.<sup>3</sup> A01D 35/00; B65D 51/16

U.S. Cl. 56—17.5

11 Claims



1. A lawn mower including a blade housing, a wheel for

supporting the blade housing for movement along the ground, a rotatable cutting blade supported in the blade housing, and an internal combustion engine for rotatably driving said cutting blade, the internal combustion engine including a carburetor having a float bowl adapted to contain a quantity of liquid fuel and adapted to have a contained air space above the liquid fuel, and means for selectively venting said float bowl to the atmosphere, said means for selectively venting including means for venting the air space to the atmosphere in response to engine vibration when said internal combustion engine is running and for precluding evaporation of fuel from the float bowl into the atmosphere when said engine is not running.

4,416,109

# MOWER ATTACHMENT DRAFT LINKAGE RESPONDING TO GROUND CONTOUR

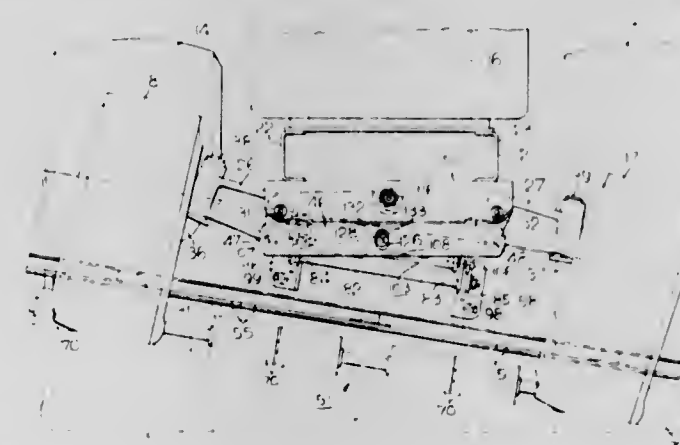
John J. Slazas, Cedarburg, Wis., assignor to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Jan. 3, 1983, Ser. No. 455,006

Int. Cl.<sup>3</sup> A01D 35/28

U.S. Cl. 56—209

5 Claims



1. In combination with a tractor having a longitudinally extending main frame supported at its front end by a pair of laterally spaced steerable wheels and at its rear end by a pair of laterally spaced traction wheels,

a pair of laterally extending spindle supports having their laterally inner ends pivotally connected to laterally spaced points of said front end of said main frame for vertical swinging movement about a first pair of parallel longitudinal axes,

a pair of spindles rotatably supporting said front wheels and having upright portions pivotally connected to laterally outer portions of said spindle supports, respectively, for steering movement relative thereof about a pair of generally upright laterally spaced steering axes,

a laterally extending axle link having its laterally opposite ends pivotally connected to the laterally inner ends of said spindle supports on a second pair of longitudinal axes parallel to and spaced below said first pair of longitudinal axes,

a mower in underslung relation to said tractor including at least one rotary cutting blade and a housing for said blade, a longitudinally extending hitch member connected to laterally spaced portions of said mower housing,

a transversely extending mower hitch support pivotally connected intermediate its laterally opposite ends to said front end of said frame for pivotal movement about a central longitudinal axis,

pivot means pivotally connecting said laterally opposite ends of said hitch support to laterally spaced portions of the front end of said hitch member for vertical swinging movement of the latter about a transverse pivot axis, and a lateral thrust connection between a central part of said axle link and an intermediate part of said hitch support disposed below said central longitudinal axis, said thrust connection being operable to swing said hitch support about said central longitudinal axis to maintain said trans-

verse axis in substantially parallel relation to the ground traversed by said front wheels during predetermined swinging movement of said spindle supports about said first pair of longitudinal axes.

4,416,110

# SPLICING APPARATUS FOR SPUN YARNS

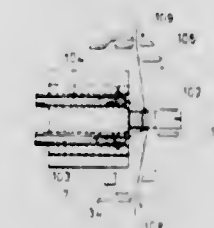
Hiroshi Mima, Jyoyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 22, 1982, Ser. No. 360,697

Claims priority, application Japan, Mar. 23, 1981, 56-42927  
 Int. Cl.<sup>3</sup> D01H 15/00

U.S. Cl. 57—22

7 Claims



1. A splicing apparatus for spun yarns comprising a splicing member arranged at the center of the splicing apparatus and including a splicing hole for jetting a compressed fluid to the lapped portion of two yarn ends to effect splicing, clamping device for clamping yarn ends on the package side and on the bobbin side, respectively, before the yarn splicing operation, cutting device for cutting yarn ends, untwisting nozzles which are arranged on both the sides of the splicing hole so that the yarn ends of a predetermined length from the clamping point are sucked into the untwisting nozzles to be untwisted, a yarn gathering lever having a supporting shaft and levers turning with the shaft as the fulcrum and arranged between the clamping point and the splicing hole to take out the yarn ends left in the untwisting nozzles, and a stopping means for regulating the quantity of turning of the yarn gathering lever.

4,416,111

# AIR MODULATION APPARATUS

Dean T. Lenahan; Robert J. Corsmeier, both of Cincinnati, Ohio, and Albert P. Sterman, deceased, late of Cincinnati, Ohio (by Florence G. Sterman, executor), assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 25, 1981, Ser. No. 238,257

Int. Cl.<sup>3</sup> F02C 7/18

U.S. Cl. 60—39.29

21 Claims

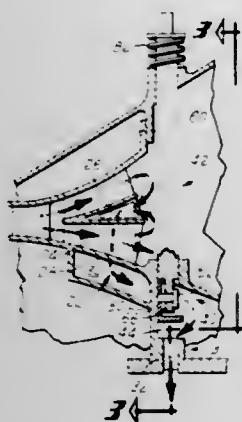
1. In a gas turbine engine having a cooling air circuit therein for directing cooling air to an engine rotor component, an air modulation apparatus comprising:

(a) an annular nozzle including a plurality of circumferentially spaced vanes and a plurality of flow passages, each of said flow passages being disposed between and defined by adjacent ones of said vanes and each flow passage having an inlet and an outlet, each said inlet being effective for receiving a portion of said cooling air;

(b) valve means effective for covering only a portion of said nozzle to prevent flow to a first portion of said plurality of flow passages and thereby reducing the amount and increasing the velocity of cooling air exiting freely from a



remaining portion of said plurality of flow passages of said nozzle not provided with valve means; and



(c) actuation means for opening and closing said valve means.

4,416,112

# FUEL INJECTOR FOR DUCTED ROCKET MOTOR

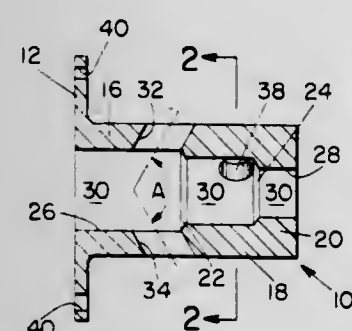
Gary W. Johnson, McGregor, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 28, 1981, Ser. No. 334,505

Int. Cl.<sup>3</sup> F02K 7/10

U.S. Cl. 60—251

14 Claims



1. A fuel injector for a ducted rocket motor through which fluid fuel from a gas generator passes and is distributed into the secondary combustor of the motor, said fuel injector comprising:

an elongate tubular member having a fuel flow passage that extends axially through said tubular member between an entry orifice for entry of compressible fluid fuel into said tubular member and an exit orifice, rearward of said entry orifice, for exit of a portion of said fluid fuel from said tubular member;

said axial fuel flow passage having a cross-sectional area that decreases at a first rearwardly sloping step located between an entry annular section of said tubular member that comprises said entry orifice and a center annular section of said tubular member adjacent and rearward said entry annular section and further decreases at a second rearwardly sloping step located between said center annular section and an exit annular section comprising said exit orifice;

said axial fuel flow passage communicating with radial fuel flow passages that permit exit radially from said tubular member of another portion of said fluid fuel, said radial passages grouped fore and aft along said tubular member, a forward group thereof having a pair of said radial flow passages spaced from one another about said entry annular section and extending through the wall thereof adjacent said first step and a rearward group thereof having a rearward pair of said radial flow passages spaced about said center annular section and extending through the wall thereof adjacent said second step.

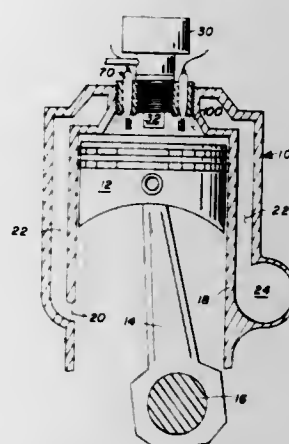
4,416,113  
INTERNAL EXPANSION ENGINE  
Francisco Portillo, Ave. Durango Y 12 ESTE #231, Cananea, Sonora, Mexico

Filed Dec. 15, 1980, Ser. No. 216,436

Int. Cl.<sup>3</sup> F01K 21/02

U.S. Cl. 60—513

4 Claims



1. An expansion engine system, comprising:  
a source of non-combusting liquid operating fluid;  
a solenoid-operated fluid injector valve means including a solenoid having a central aperture, spring means operatively disposed in said aperture, an armature means adapted to move longitudinally up and down within said aperture, said spring means for normally biasing said armature longitudinally at least partially out of said aperture and said armature means being responsive to the energization of said solenoid for moving longitudinally upward against said spring bias and substantially within said aperture said fluid injector valve means further including a pressure cavity, an inlet to said pressure cavity for supplying said liquid operating fluid from said supply thereto, injection cage means operably disposed at the lower longitudinal end of said fluid injector valve, said cage means including a generally cup-shaped member having a top opening to a generally cylindrical bore and a closed bottom, a plurality of radial apertures operably disposed about the periphery thereof for injecting said operating fluid from said bore under inlet pressure, a longitudinally activated slug means dimensioned to be operatively received within said bore of said cage means and having a plurality of longitudinally aligned feed apertures communicating said pressure cavity with said cage bore, one side of said slug means being operatively coupled to said solenoid armature for moving longitudinally up and down therewith and substantially in and out of said cage bore, said slug means having walls for operatively sealing the radial output injection apertures of said cage means with said slug walls and for sealing the bottom apertures of said slug means against said closed bottom of said cage bore whenever said armature is at least partially out of said armature, and being responsive to the energization of said solenoid to lift longitudinally upward as said armature moves against said spring bias into said aperture for unsealing said radial cage apertures and feeding said liquid operating fluid from said pressure cavity under inlet pressure through the longitudinal feed apertures of said plug means into said cage bore for injection through the radial apertures thereof to permit fluid injection therefrom.

a motor-driven constant pressure injector pump means for supplying said non-combusting operating fluid under pressure from said source into said inlet of said solenoid-operated fluid injector valve means;

linkage means including a cylinder block, a piston having a piston face, said piston being adapted to move longitudinally up and down within said cylinder block, said cylinder block having an exhaust port, a rotatable shaft, and

means operatively coupled between said piston and said shaft for translating said reciprocating piston movement into shaft rotation for doing work and the like, said linkage means also including an expansion chamber operably disposed longitudinally above said piston face for transforming an expansion of said operating fluid therein into a longitudinally downward movement of said piston within said cylinder block, said cage means being operably disposed into said expansion chamber for injecting said operating fluid therein, and condenser means being operably coupled to said cylinder block for condensing said operating fluid vapor exiting said exhaust port for improving the flow efficiency of the engine;  
control means for timing the injection of said liquid operating fluid into said expansion chamber;  
evaporation means for rapidly vaporizing said injected liquid operating fluid into a vapor state;  
said evaporation means to be operably coupled into said cylinder housing and disposed within said expansion chamber for vaporizing operating fluid coming into contact therewith;  
power supply means for controlling the energization of said evaporation means.

4,416,114

# THERMAL REGENERATIVE MACHINE

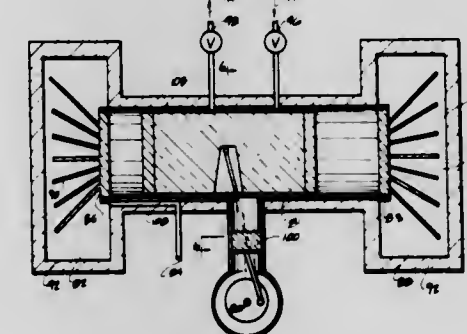
William R. Martini, 2303 Harris, Richland, Wash. 99352

Filed Jul. 31, 1981, Ser. No. 289,043

Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—526

7 Claims



1. A thermal regenerative machine comprising:  
a vessel chamber filled with a gaseous working fluid, said chamber having a heat source surface at one end, a heat sink surface at its remaining end, and a side wall connecting the two ends;  
a porous heat exchange assembly located within the vessel chamber and defining an expansion space adjacent to the heat source surface and a compression space adjacent to the heat sink surface;  
means for cyclically varying the volumes of the expansion space and compression space so as to alternately expand the gaseous working fluid in the expansion space and compress the gaseous working fluid in the compression space and to further move the gaseous working fluid back and forth between the expansion space and compression space through the heat exchange assembly;  
said heat exchange assembly comprising:  
first thermal conductor means facing outwardly toward the heat source surface for alternately (1) receiving heat by conduction and radiation when near the heat source surface or (2) supplying heat to the gaseous working fluid either passing through the first thermal conductor means or located in the expansion space by convection and radiation;  
second thermal conductor means facing outwardly toward the heat sink surface for alternately (1) transferring heat by conduction and radiation when near the heat sink surface or (2) absorbing heat from the gaseous working fluid either passing through the second thermal

mal conductor means or located in the compression space by convection and radiation;  
regenerator means interposed between said first and second thermal conductor means for thermally insulating them from one another while allowing the gaseous working fluid to move back and forth between them in a substantially thermodynamically reversible manner;  
the heat storage capacity of the first thermal conductor means being adequate to supply the quantity of heat required by the gaseous working fluid in the expansion space for one cycle without substantial change in the temperature of the first thermal conductor means;  
the heat storage capacity of the second thermal conductor means being adequate to absorb the quantity of heat produced by the gaseous working fluid in the compression space for one cycle without substantial change in the temperature of the second thermal conductor means.

4,416,115

# INTERNAL COMBUSTION ENGINE WITH SUPERCHARGER

Koso Iida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

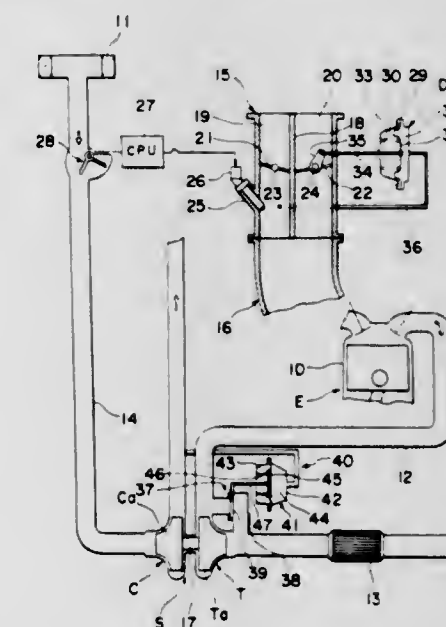
Filed May 28, 1981, Ser. No. 267,857

Claims priority, application Japan, Jun. 5, 1980, 55-79051[U]

Int. Cl.<sup>3</sup> F02M 35/10; F02D 23/00

U.S. Cl. 60—600

7 Claims



1. A fuel supply system for an internal combustion engine having at least one combustion chamber, which system comprises, in combination:

a supercharger;  
a fuel intake passage means communicating at one end with a source of air through said supercharger and at the opposite end with the combustion chamber, a portion of said fuel intake passage means between said supercharger and the combustion chamber having a partition wall formed therein for defining first and second intake passages;  
an exhaust manifold leading from the combustion chamber to the atmosphere for discharge of exhaust gases emitted from the engine;  
primary and secondary throttle valves operatively housed within said first and second intake passages, respectively, for regulating the flow of air towards the combustion chamber, said primary throttle valve being adapted to be controlled by an acceleration pedal;  
means for biasing said secondary throttle valve to assume a closed position to substantially close said second intake passage;  
means, responsive to the pressure inside a portion of said fuel intake passage means at a position downstream of at least



one of said primary and secondary throttle valves and upstream of the combustion chamber with respect to the direction of flow of air towards the combustion chamber, for opening said secondary throttle valve against said biasing means when the pressure attains a value at least as great as a predetermined value, such that opening of said secondary throttle valve gradually increases with increases in the pressure; and  
a fuel injecting nozzle for supplying fuel to the combustion chamber in admixture with the air fed through said intake passage means in a controlled air-fuel mixing ratio.

4,416,116

## THERMAL ENGINE ARRANGEMENT

Alexander Kückens, Schillerstrasse 22, 2067 Reinfeld/H., Fed. Rep. of Germany

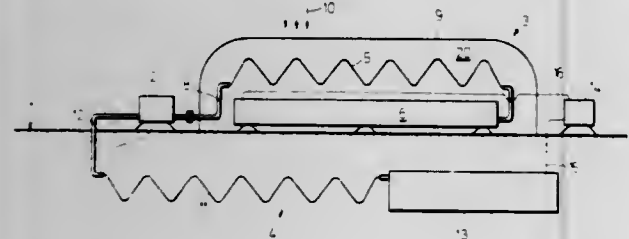
Filed May 28, 1981, Ser. No. 268,110

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3024016

Int. Cl.<sup>3</sup> F03G 7/02

U.S. Cl. 60—641.8

8 Claims



5. A thermal power engine arrangement comprising a closed series circuit for a vaporizable refrigerating agent utilized as the thermal fluid for the engine including, a condenser storing and preheating tank, an evaporator connected to said storing and preheating tank, a hood enclosing the storing and preheating tank and evaporator directly exposed to the heat of the air and to solar radiation and defining a common heating chamber for the storing and preheating tank and evaporator, a thermal power engine connected to the evaporator and drivable by vaporized refrigerating agent, a condenser coil connected to the engine to receive refrigerant from the engine, a condenser collecting tank connected to the condenser coil for receiving condensate from the condenser coil, said condenser coil and collecting tank being located at a predetermined depth beneath the ground surface in direct heat transfer contact with the ground and a condensate pump connected to the collecting tank and storing and preheating tank for conveying the condensate from the collecting tank into the storing and preheating tank and a vaporizable refrigerating agent in the closed series circuit.

4,416,117

## THERMALLY PRODUCING A HIGH-SPEED ATOMIZED LIQUID JET

Johan E. Nyberg, 18 Kyrkogatan, S-981 00 Kiruna, Sweden

Filed Jan. 21, 1981, Ser. No. 226,700

Claims priority, application Sweden, Feb. 1, 1980, 8000826

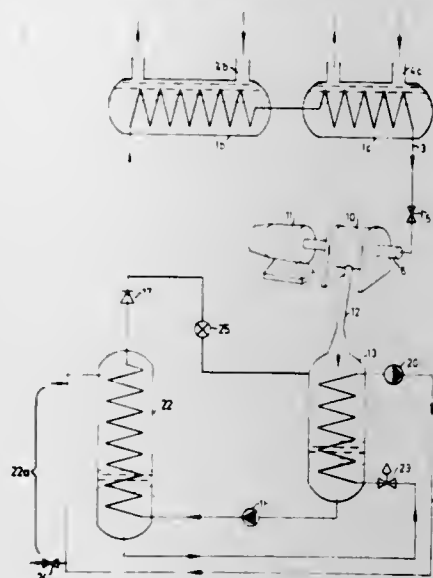
Int. Cl.<sup>3</sup> F01K 25/02

U.S. Cl. 60—650

4 Claims

1. A method of thermally producing a flow of a working medium, especially for driving turbines and the like, the method comprises heating the working medium to a predetermined temperature in a closed space at a pressure, maintaining said pressure at a value exceeding the steam formation pressure of the working medium at said temperature such that the work-

ing medium is in liquid phase, tapping a controlled flow from the closed space, passing the liquid flow through at least one



outflow nozzle against lower pressure to form a jet of atomized small droplets of liquid.

4,416,118

## METHOD AND APPARATUS FOR CONTROLLING THE FORMATION OF A TEMPORARY PLUG IN A FLUID TRANSMISSION LINE

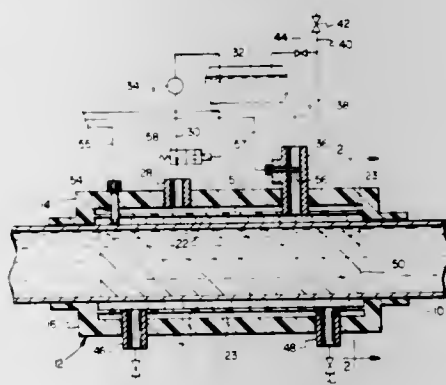
Beryle D. Brister, P.O. Box 9272, Amarillo, Tex. 79105

Filed Dec. 21, 1981, Ser. No. 332,231

Int. Cl.<sup>3</sup> F25C 1/00

U.S. Cl. 62—66

8 Claims



1. A method for controlling the formation of a temporary plug in a fluid transmission line, said plug comprising a quantity of liquid disposed within the interior of said transmission line and frozen by circulating a cryogenic fluid through a chamber formed by a housing disposed around the exterior of said transmission line; providing a housing disposed around the exterior of said transmission line and forming a chamber delimited at least in part by the exterior surface of said transmission line, said housing including a fluid inlet conduit and a fluid vent conduit; providing a first temperature sensor at a point above said surface of said transmission line delimiting said chamber and in the flow path of said cryogenic fluid through said chamber below which point the level of liquid cryogenic fluid is to be limited; circulating a cryogenic fluid through said chamber and venting fluid vapor from said chamber through said vent conduit; sensing a change in temperature at said point in said flow path; and throttling the flow of cryogenic fluid to said chamber when the sensed temperature indicates the presence of liquid cryogenic fluid at said point in said flow path.

4,416,119

## VARIABLE CAPACITY BINARY REFRIGERANT REFRIGERATION APPARATUS

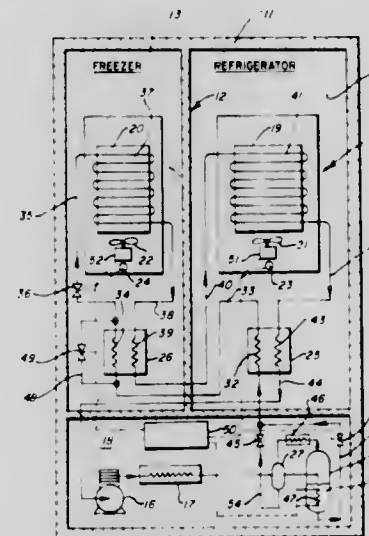
Raymond G. Wilson, and Edwin H. Frohbleter, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 8, 1982, Ser. No. 338,581

Int. Cl.<sup>3</sup> F25B 41/00, 17/00

U.S. Cl. 62—149

22 Claims



1. In a refrigeration apparatus having means defining a below-freezing refrigerated zone and an above-freezing refrigerated zone, means for providing binary refrigerant to said zone for refrigerating said zone including a compressor and a condenser, a first evaporator in heat transfer association with said below-freezing refrigerated zone, a second evaporator in heat transfer association with said above-freezing refrigerated zone, a first heat exchanger, a second heat exchanger, and refrigerant flow conduit means providing a flow circuit successively through said first heat exchanger, said second heat exchanger, said first evaporator, said second heat exchanger in heat exchange relationship with the refrigerant flowing therethrough to said first evaporator, said second evaporator, and said first heat exchanger in heat exchange relationship with the refrigerant flowing therethrough to said second heat exchanger, to said compressor, the improvement comprising:

bypass means for causing the refrigerant to bypass said second heat exchanger as an incident of the temperature in said above-freezing zone rising above a preselected temperature and the temperature in said below-freezing zone remaining below a second preselected temperature.

4,416,120

## SPRAY ASSEMBLY FOR REFRIGERATED DISPLAY CASES

Munim Yono, 41292 Marks Dr., Novi, Mich. 48050, and Russell L. Dolin, 190 Southfield, Ecorse, Mich. 48229

Filed Aug. 6, 1982, Ser. No. 405,931

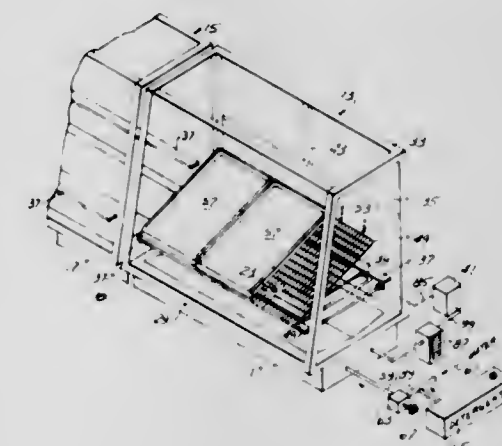
Int. Cl.<sup>3</sup> A47F 3/04

U.S. Cl. 62—231

7 Claims

1. A spray assembly for refrigerated display cases, each case having front, rear, top and end walls and converging downwardly inclined bottom plates having a depending drain pipe; a hollow base upon a floor underlying and supporting said bottom plates and case including a first chamber, said drain extending through said base and adapted for connection to a sewer pipe; front and rear ledges in said case interconnecting and supported upon said end walls and spaced above said bottom plates; a refrigerating system including tubing underlying connected to and spanning said ledges; a series of laterally aligned downwardly inclined wire grates at their front edges mounted upon said front ledge adjacent

said front wall and at their rear edges adjustably mounted upon said rear wall above said rear ledge; said grates with adjacent front, rear and end walls and bottom plates defining a spray chamber; said grates adapted to supportably mount thereon a series of laterally aligned food display pans; a water pipe connectable to a source of pressurized water extending into and along the bases of said cases within said first chambers; a normally closed automatic valve within each first chamber below said bottom plates respectively connected to said water pipe;



an upright spray support pipe connected to each valve; a horizontal closed end sprayer pipe intermediate its ends mounted upon and in communication with said spray support pipe and extending along the length of said case centrally thereof; there being opposed pairs of rows of spray outlets extending from opposite sides of said spray pipe outletting into said spray chamber for washing and rinsing said grates, tubing and interior surfaces of said case and for automatic withdrawal through said drain pipe; said automatic valves being adapted to be energized successively for the progressive washing of said cases.

4,416,121

## DEVICE FOR THE RECOVERY OF HEAT

Bertil Sjöstedt, Flen; Gunnar Carlsson, and Hans Lindholm, both of Katrineholm, all of Sweden, assignors to Elektro Standard AB, Katrineholm, Sweden

PCT No. PCT/SE81/00126, § 371 Date Nov. 18, 1981, § 102(e) Date Nov. 18, 1981, PCT Pub. No. WO81/03219, PCT Pub. Date Nov. 12, 1981

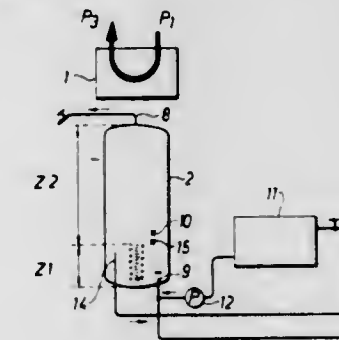
PCT Filed Apr. 24, 1981, Ser. No. 324,353

Claims priority, application Sweden, Apr. 30, 1980, 8003303

Int. Cl.<sup>3</sup> F25B 27/02

U.S. Cl. 62—238.6

10 Claims



1. A device for supplying heat in a building, comprising a compressor driven heat pump (1), the vaporizer (4) of which is adapted to receive heat from a heat source, and the condenser (6) of which is situated in the lower part (21) of a container (2)



for consumption hot water, a supply connection (9) for cold water being likewise situated in said lower part (Z1) of the container (2), whereas the hot water discharge connection (8) is situated in the upper part of the container (2), and means for transferring heat from said lower part (Z1) of the container (2) to said building, said heat transfer means comprising a liquid circulation circuit (14, 12, 11, 16, 9) in heat transferring contact with the water inside said container (2) in the region of said condenser (6), said liquid circulation circuit being arranged to emit heat to the building outside said container (2) via at least one liquid circulation element (16, 11, 23).

4,416,122

# UNITARY REMOVABLE REFRIGERATION SYSTEM AND COOLER

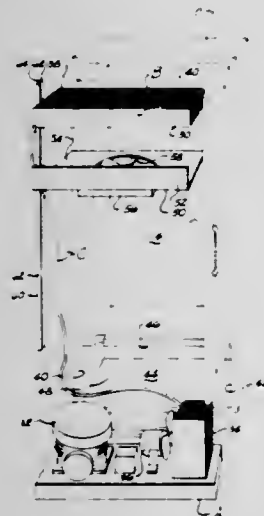
Robert A. Johnson, Spartanburg, S.C., assignor to Tannetics, Inc., Erie, Pa.

Filed May 3, 1982, Ser. No. 373,893

Int. Cl.<sup>3</sup> F25D 19/02

U.S. Cl. 62—448

7 Claims



1. A refrigerated cabinet for merchandising and dispensing beverages and the like containers from vertically spaced shelves in a cabinet interior comprising:

- a vertical cabinet having a cabinet front which is open to said cabinet interior;
- a refrigeration unit carried in said cabinet including a compressor, an evaporator, and refrigerant tubing connecting said compressor and evaporator in fluid communication;
- lower compartment means carried by said cabinet having an open front receiving said compressor for installation and removal from said cabinet front effectively isolating said compressor in said cabinet from said cabinet interior;
- upper compartment means housing said evaporator carried in an upper portion of said cabinet, said evaporator being installable and removable from said upper compartment means from said cabinet front;
- means channeling said refrigerant tubing from said compressor to said evaporator adjacent a front opening of said cabinet interior; and
- said compartment means and channeling means facilitating removal and replacement of said refrigeration unit from the front of said cabinet for servicing without need of removing said containers from said shelves or moving said cabinet.

4,416,123

# APPARATUS FOR WET HEAT TREATING A TEXTILE PRODUCT

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

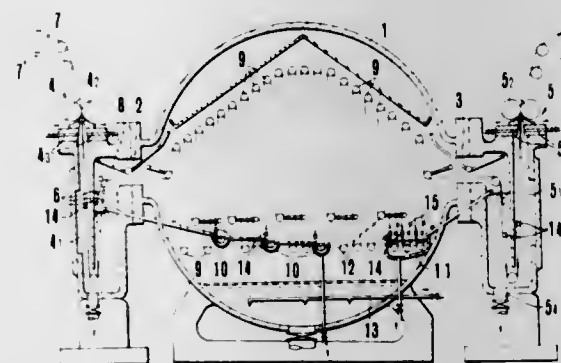
Filed Aug. 19, 1981, Ser. No. 294,388

Claims priority, application Japan, Sep. 16, 1980, 55-128399; Oct. 17, 1980, 55-145517; Oct. 17, 1980, 55-145518; Nov. 18, 1980, 55-162240

Int. Cl.<sup>3</sup> D06B 3/12, 23/18

U.S. Cl. 68—5 E

4 Claims



1. A high pressure steamer for wet heat treating a textile product continuously, comprising a steamer body having an inlet on one side and an outlet on the opposite side, an inlet side seal mechanism connected to and located outwardly from the inlet of said steamer body, an outlet side seal mechanism connected to and located outwardly from the outlet of said steamer body, said inlet and outlet side seal mechanisms arranged for maintaining high pressure and high temperature wet heat conditions in said steamer body, said inlet side seal mechanism including a liquid seal tank for holding a treating solution for immersing the textile product therein, means in said inlet side seal mechanism for guiding the textile product downwardly through said liquid seal tank and then upwardly to the inlet of said steamer body, at least one liquid application tank in said steamer body, means for conveying the treating solution from the liquid seal tank to said at least one liquid application tank for immersing the textile product therein.

4,416,124

# SHEET-DYEING APPARATUS

Eckard Godau, Kronthaler Weg 10, 6238 Hofheim (Tanus), Fed. Rep. of Germany

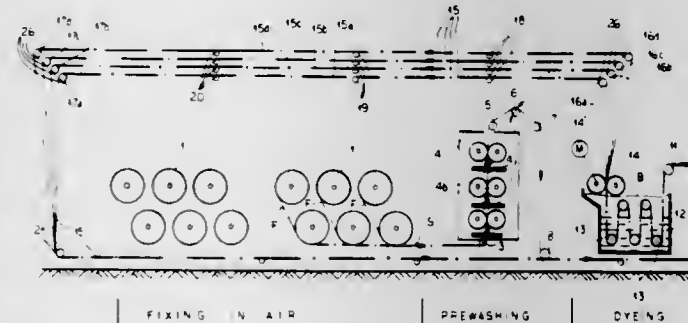
Filed Dec. 22, 1980, Ser. No. 218,817

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951695; Dec. 4, 1980, 3045646; Dec. 4, 1980, 3045647

Int. Cl.<sup>3</sup> D06B 23/00

U.S. Cl. 68—9

11 Claims



1. A system for dyeing a textile strand in the form of a sheet of parallel filaments, said system comprising: a vat containing a bath of a liquid dye; first guides in said vat defining a first path section therein entirely underneath the surface of said bath;

second guides outside said vat defining a second path section passing through a gas-treatment location, said first and second path sections together forming an annular path; supply means for feeding said strand from a supply to said path upstream of said first path section relative to a predetermined direction of travel around said path; and drive means for conducting said strand in at least two separate passes around said annular path for contacting said strand with said liquid dye bath in each of said passes and for passing said strand through said gas-treatment location in each of said passes, said passes of said strand being generally coplanar and interleaved in said first path section, said second guides including two separate sets of second guides defining two separate horizontal second path subsections together constituting said second path section, said strand passing over one of said second path subsections on one of said passes and over the other second path subsection on the other of said passes, said path formed by said first and second path sections lying generally in an upright plane generally perpendicular to said array of filaments and generally parallel to their direction of travel in said path, said second guides including deflecting rollers positioned approximately in the middle of said portions and deflecting said strand therein so each pass is of the same length.

4,416,125

# FEED DEVICE EQUIPMENT FOR LETTING OUT HIDES

Herbert Dietrich, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

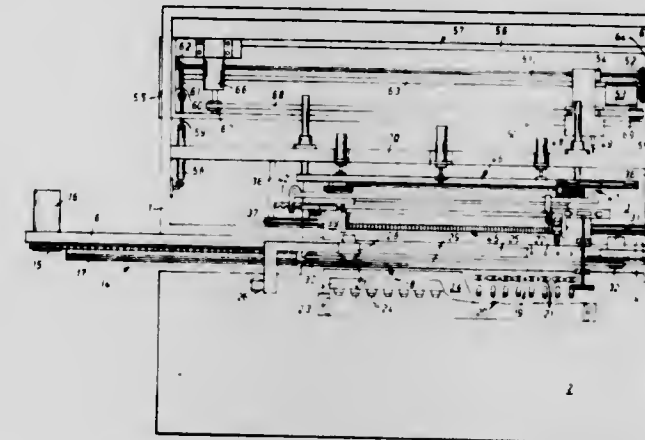
Filed Apr. 2, 1982, Ser. No. 364,898

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1981, 3113836

Int. Cl.<sup>3</sup> C14B 15/00, 17/00

U.S. Cl. 69—21

10 Claims



1. A device for letting out a hide to be cut and sewn at seam areas extending in a longitudinal direction and at an angle to an edge of the hide, comprising: a pair of clamping jaws for clamping the hide at each seam area; jaw drive means for moving the jaws laterally of the longitudinal direction to clamp the hide at each seam area; a parting sword movable between the jaws and extending in a longitudinal direction, said parting sword including a hide hair divider for parting hair on the hide to form a furrow therein; sword drive means connected to said parting sword for moving said sword in the longitudinal direction to form the furrow and upwardly to push the hide at each seam area between said jaws; cutting means for cutting the seam area after it is clamped by said clamping jaws; backspacing means connected to at least one of said jaws for moving said jaws with respect to each other for a first selected amount in the longitudinal direction; a sewing machine for sewing the seam area after said jaws

are moved by said backspacing means and the seam is cut by said cutting means; a seam gripper for gripping the seam after it is sewn by said sewing machine and moving the seam downwardly of said clamping jaws and laterally of said longitudinal direction by a second selected amount corresponding to a distance between adjacent seam areas on the hide; and gripper drive means for moving said seam gripper downwardly and transversely of the longitudinal direction for repositioning the hide to bring an additional seam area thereof into alignment with said parting sword.

9. A method of letting out a hide to be cut and sewn at a plurality of equally spaced seam areas comprising: placing the hide hair side down on a table having a slit therein extending in a longitudinal direction parallel to the seam areas to be cut and sewn; passing a parting sword through said slit and into contact with the hide for parting hairs of the hide in the vicinity of the slit and forming a furrow in the hide hairs; providing a pair of clamping jaws over the hide having a space therebetween aligned with the slit; pushing the hide upwardly through the space between the jaws to form a seam area; moving the jaws together to clamp the hide in the seam area; cutting the hide in the seam area; backspacing one of said jaws with respect to the other in the longitudinal direction to offset the cut hide in the seam area thereafter sewing the hide in the seam area; gripping the hide at the sewn seam area; moving the jaws apart to unclamp the seam area; moving the gripped seam area downwardly and laterally of said slit in a direction transverse to said longitudinal direction by an amount corresponding to the equal space between seam areas; and using the parting sword to produce an additional furrow in the hide in an additional seam area.

4,416,126

# LUGGAGE LATCHING SYSTEM

Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Dec. 10, 1980, Ser. No. 214,883

Int. Cl.<sup>3</sup> E05B 65/52, 37/02

U.S. Cl. 70—71

35 Claims



1. A latching system for a luggage article including a plurality of spaced latches each mounted for movement between a hasp-engaging position and a hasp-disengaging position, a latch actuator, drive means connected between said actuator and each latch for moving the latches in unison from their respective hasp-engaging to their respective hasp-disengaging positions responsive to movement of the actuator from a rest position, biasing means for returning said latches to the respective hasp-engaging positions upon release of the actuator and, through said drive means, for returning the actuator to the rest



position, each of said latches being movable from its hasp-engaging position to its hasp-disengaging position independently of the drive means when the latch is disengaged from a hasp whereby the hasp may be reengaged with the latch while the actuator is retained in the rest position.

4,416,127

**MAGNETO-ELECTRONIC LOCKS**

Mariano Gomez-Olea Naveda, Vuelta del Castillo, 3 - 5° A, Pamplona, Spain

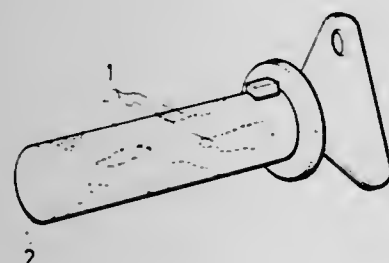
Filed May 28, 1981, Ser. No. 267,859

Claims priority, application Spain, Jun. 9, 1980, 492254

Int. Cl.<sup>3</sup> E05B 19/00, 47/00

U.S. Cl. 70—276

19 Claims



1. In an magneto-electronic lock comprising a key body having a magnetic combination, a receiver of the key body in the interior of which there are arranged magnetic detectors, a bolt, and an electronic circuit device connected between the bolt and the detector, the improvement comprising: positive and negative magnetisation means which cooperate, depending on the position thereof, in the electric conduction, opening, closing or blocking of an electronic circuit including an electric opening pulse of a gate; a means for determining the electric continuity both in the key and in the receiver thereof; an electric derivation means for opening the code; passive positive and negative relay means in combination with positive and negative magnetic elements; positive and negative magnetic means whose potentials act on the passive relays in the contact threshold; positive and negative magnetic means which, in combination by proximity to the passive relays, act on them with an opposite polarity maintaining them static with respect to their means potential, changing the conduction state thereof when magnetic elements having a higher potential are juxtapositioned; and a multiple contact connector means capable of being combined with the key.

4,416,128

**CYLINDER LOCK**

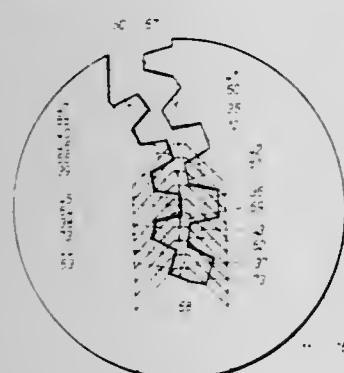
Wolfgang Steinbrink, Heiligenhaus, Fed. Rep. of Germany, assignor to C. Ed. Schulte GmbH, Velbert, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,845

Int. Cl.<sup>3</sup> E05B 19/02, 27/02

U.S. Cl. 70—364 A

7 Claims



1. A cylinder lock comprising a housing; a cylinder rotatably arranged in said housing and having a key passage with two

lateral walls having respectively first and second pluralities of longitudinal ribs for lateral profile varying, the longitudinal ribs of said first and second pluralities of ribs having end faces lying respectively on two limiting lines which define therebetween a uniformly extending strip-like gap in said key passage, said cylinder also having a plurality of openings; a plurality of pins arranged in said openings of said cylinder and having axes which define a longitudinal center plane; and a substantially flat key insertable into said key passage of said cylinder and having a front part provided with a plurality of notches cooperating with said pins in said cylinder, said key having first and second lateral faces provided respectively with first and second pluralities of longitudinal grooves for receiving said longitudinal ribs of said key passage of said cylinder; the longitudinal grooves of said first and second pluralities of grooves having bottom faces lying respectively on two further limiting lines which define therebetween a uniformly extending strip in said flat key, said strip-like gap of said key passage and said strip of said flat key being arcuate at least in the height region of said notches of said flat key, and said longitudinal center plane defined by said axes of said pins cutting through the arc of said strip-shaped gap and said strip as a secant, so that the arc extends substantially identically far at both sides of said longitudinal center plane.

4,416,129

**CYLINDER LOCK WITH KEY REMOVABLE PLUG**

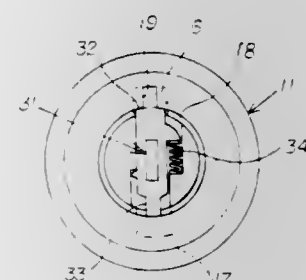
Robert P. Thimot, Marlboro, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed Jun. 4, 1981, Ser. No. 270,501

Int. Cl.<sup>3</sup> E05B 15/14, 29/02

U.S. Cl. 70—369

11 Claims



1. A cylinder lock comprising:  
a shell defining a plug cavity, a plurality of locking shell tumblerways, and a control shell tumblerway;  
a plug received by and rotatable in said plug cavity between locked and open positions and defining a plurality of locking plug tumblerways alignable with said locking shell tumblerways, a control plug tumblerway alignable with said control shell tumblerway, and a keyway for receiving keys;  
a locking tumbler positioned in each of said locking plug tumblerways, each of said locking tumblers being biased into an active position and movable into an inactive position by a proper key in said keyway, and wherein said locking tumblers prevent rotation of said plug when in said active positions and allow rotation thereof when in said inactive positions;  
a control tumbler retained by said control plug tumblerway and biased into a latched position and movable into a release position by a control key in said keyway;  
blocking means axially engaging said control tumbler with said plug in said locked position so as to prevent axial withdrawal thereof from said shell;  
stop means preventing movement of said control tumbler into a position that eliminates said axial engagement between said blocking means with said plug in said locked position; and  
abutment means shaped and arranged with said plug in said open position to prevent axial withdrawal thereof with

said control tumbler in said latched position and to permit axial withdrawal thereof with said control tumbler in said release position.

4,416,130

**PULSING IMPACT STRAIGHTENER**

Edward E. Judge, Jr., Lansing, Mich., assignor to Industrial Metal Products Corporation, Lansing, Mich.

Filed Mar. 20, 1981, Ser. No. 245,890

Int. Cl.<sup>3</sup> B21K 1/08

U.S. Cl. 72—10

42 Claims



1. Elongated production workpiece straightener characterized by means for gauging magnitude and plane of maximum workpiece distortion, means for peening the workpiece surface, and programmable means responsive to said gauging means for automatically controlling the application of said peening on the concave side of said plane of distortion to effect workpiece straightening through compressive elongation of workpiece surface fibers on said concave side.

4,416,131

**PROCESS AND APPARATUS FOR MONITORING LENGTH AND DIAMETER OF HELICAL CORRUGATED PIPE**

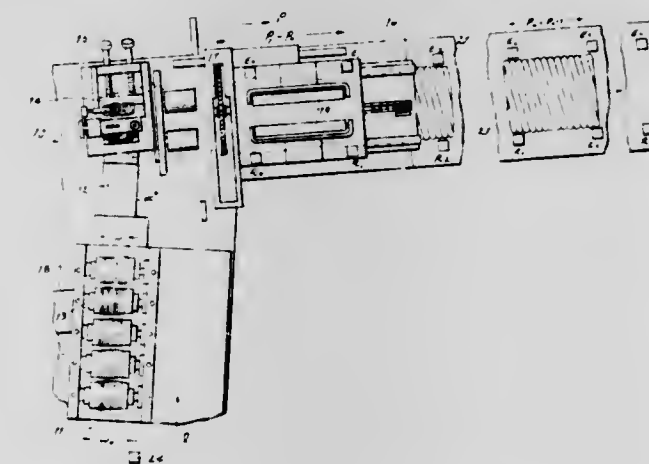
Walter Z. Davis, Spokane, Wash., assignor to Helical Control Systems, Inc., Spokane, Wash.

Filed Jan. 6, 1982, Ser. No. 337,411

Int. Cl.<sup>3</sup> B21C 37/12

U.S. Cl. 72—12

14 Claims



1. A process for monitoring the diameter of a helical corrugated metal pipe while the pipe is being formed from a strip of corrugated sheet metal having a known width (w), comprising: continuously feeding the strip of sheet metal to a corrugated pipe forming station at a feed angle with respect to an intended pipe forming axis; continuously measuring the length (l) of the strip of sheet metal being fed to the corrugated pipe forming station; continuously corrugating the strip of sheet metal and continuously forming the corrugated sheet metal into a corrugated pipe at the corrugated pipe forming station and

directing the continuously formed corrugated pipe substantially coaxially along the intended pipe forming axis; sensing the presence of a section of the formed corrugated pipe as it passes a first reference location along the intended pipe forming axis; sensing the presence of the section of the formed pipe as it passes a second reference location that is spaced a desired distance (p) downstream of the first reference location; determining the pipe diameter value of the pipe section as a function of sheet metal width (w), pipe section length (p), and length (l) of sheet metal strip used to form the pipe section; and recording the determined pipe diameter value.

4,416,132

**METAL FORMING LUBRICANT AND METHOD OF USE THEREOF**

Donald J. Sargent, West Lafayette, Ind., assignor to E/M Lubricants, Inc., West Lafayette, Ind.

Division of Ser. No. 276,937, Jun. 24, 1981. This application

Mar. 25, 1983, Ser. No. 479,017

Int. Cl.<sup>3</sup> B21B 45/02

U.S. Cl. 72—41

10 Claims

6. In a method of forming two piece cans from black plate steel in which a blank is produced from the black plate steel and the blank is subjected to drawing and ironing operations to produce an elongated can body, the improvement comprising the additional steps of:

- prior to the drawing operation, coating the portion of the black plate steel which ultimately becomes the exterior of the can body with a first coating lubricant, said first coating lubricant comprising 2.5 to 3.75 percent terpene phenolic resin, 0.3 to 2.5 percent esterified styrene maleic anhydride, 2.5 to 3.75 percent synthetic polymethylene wax, 0.3 to 2.0 percent unsaturated fatty acid, 0.3 to 2.0 percent amines, 0.05 to 0.5 percent potassium hydroxide, 24.0 to 32.0 percent of a compound comprising an anion selected from Group VIb of the Periodic Table and a cation selected from Group VIa of the Periodic Table, 8.5 to 11.5 percent synthetic wax emulsion and the remainder distilled water;
- drying the first coating lubricant;
- coating the portion of the black plate steel which ultimately becomes the interior of the can body with a second coating lubricant, said second coating comprising 5.0 to 20.0 percent synthetic wax emulsion and the remainder distilled water; and
- after the ironing operation, removing said first and second coating lubricants by washing the elongated, enclosed can body in a slightly alkaline solution.

4,416,133

**AUTOMATIC MACHINE FOR FINISHING COOKWARE BODY BLANKS**

Edward A. Doyle, Sheboygan, Wis., assignor to E. A. Doyle Manufacturing Corporation, Sheboygan, Wis.

Filed Oct. 28, 1981, Ser. No. 315,667

Int. Cl.<sup>3</sup> B21D 39/08

U.S. Cl. 72—58

14 Claims

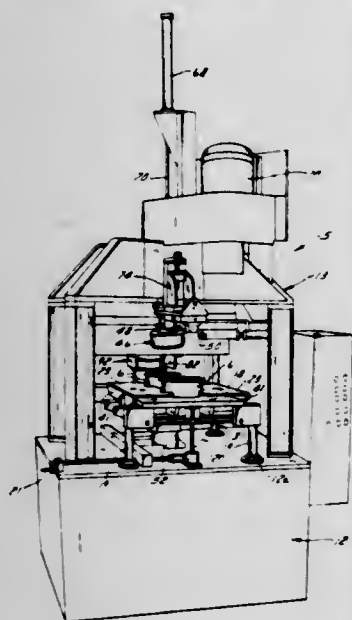
1. A machine for performing a finishing operation upon a metal container blank having a circular bottom wall and an upright side wall that are concentric to an axis of the blank, said operation requiring rotation of the blank about its axis relative to a tool that engages the blank, said machine being characterized by:

- a tail stock having a substantially horizontal top surface, said tail stock being freely rotatable about an upright station axis and being movable upward from and downward to a lowered position in which its said top surface is at a predetermined level;
- a conveyor arranged for transporting a blank substantially horizontally onto and off of said tail stock when the same



is in said lowered position and whereby the blank is delivered to the tail stock with the bottom wall of the blank resting on said top surface and with the axis of the blank substantially coinciding with said station axis;

C. a driver head confined to rotation about said station axis at a location substantially above said level, to be clear of blanks transported by the conveyor, said driver head having a bottom surface coaxially engageable with the bottom wall of a blank for imparting rotation thereto;



D. drive means for continuously rotating said driver head; and

E. lift means for raising said tail stock above its lowered position and clamping the bottom wall of a blank thereon against said bottom surface of the driver head, so that the blank can be rotated by the driver head for performance of said operation.

4,416,134

# PROCESS FOR MANUFACTURING SEAMLESS METAL TUBES

Chihiro Hayashi, Amagasaki, Japan, assignor to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

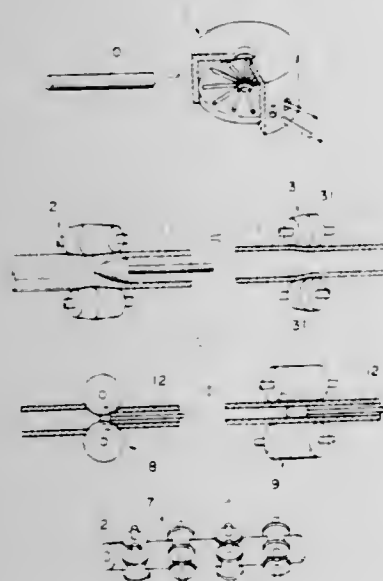
Filed Jul. 9, 1981, Ser. No. 281,901

Claims priority, application Japan, Feb. 17, 1981, 56-22540

Int. Cl.<sup>3</sup> B21B 19/04

U.S. Cl. 72-68

14 Claims



1. A process for manufacturing seamless metal tubes which comprises the steps of piercing a billet in a piercing mill to form a hollow shell having a wall thickness to outer diameter ratio of 5 to 15% and thereafter reducing the outer diameter of the said shell by rolling to equalize the wall thickness by means of

a cross-roll type rotary mill having 3 or 4 rolls arranged around a pass line without any internal tools, the axes of said rolls being inclined so that the shaft ends on the shell-entry side of the rolls are at a cross angle  $\gamma$  from the pass line, said axes being inclined at a feed angle  $\beta$  so as that the shaft ends on either side of the rolls face the peripheral direction on the same side of the shell being worked, said cross angle  $\gamma$  being negative and said feed angle  $\beta$  being as small as possible.

4,416,135

# WIRE COILING MACHINE

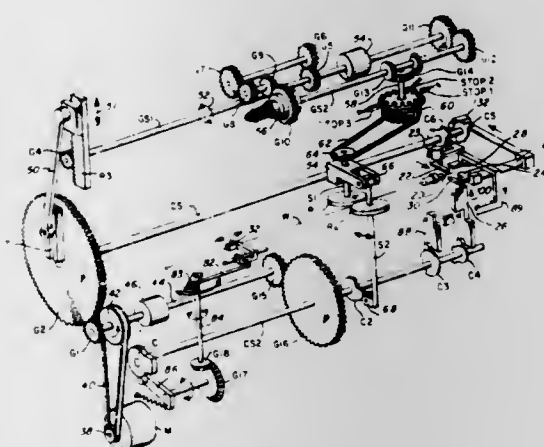
Frank S. Russell, Northboro, Mass., assignor to Sleeper & Hartley Corp., Worcester, Mass.

Filed Sep. 10, 1981, Ser. No. 300,758

Int. Cl.<sup>3</sup> B21F 3/027, 11/00, 35/02

U.S. Cl. 72-130

24 Claims



1. A wire coiling machine comprising: means for receiving wire adapted to be formed into a spring, and extending along a wire feed path, first feed means disposed along the feed path and adapted to provide bi-directional wire movement, second feed means also disposed along the feed path and adapted to provide uni-directional wire movement, first control means for selectively controlling the first feed means to provide, during a first forming operation, wire movement toward a work station, temporary interruption of movement, followed by wire movement away from the work station, second control means for selectively controlling the second feed means to provide, during a second forming operation, selective wire feed to the work station, and means supported at the work station including control means therefor for performing bending, coiling or the like on the wire to complete formation of said spring.

4,416,136

# PIPE-BENDING MACHINE

Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln 91, Fed. Rep. of Germany

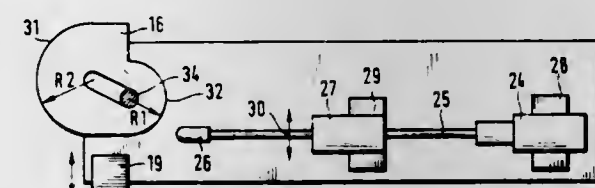
Filed Sep. 2, 1981, Ser. No. 298,753

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033300

Int. Cl.<sup>3</sup> B21D 7/04

U.S. Cl. 72-157

12 Claims



1. A pipe-bending machine comprising a stand, a bending

table supported for rotation relative to the stand, an adapter sleeve for clamping a portion of the processed pipe, a sliding carriage mounted for free reciprocating movement on the stand and connected to the adapter sleeve, a bending form mounted on an upper surface of said bending table and having at least two curved peripheral sections each defining a center of its curvature, the form being shiftable on said upper surface of said bending table in a radial direction relative to the axis of rotation of the table, from a first working position in which the axis of rotation of the table coincides with one center of curvature of the form into another working position in which the axis of rotation of the table coincides with the other center of curvature of the form, means for arresting the form in the selected working position, and clamping means arranged on the bending table for movement against the selected peripheral section of the bending form to clamp a portion of the pipe to be bent.

4,416,137

# ROLL CONSTRUCTION

Robert Marshall, North Anston, England, assignor to Davy-Loewy Limited, Sheffield, England

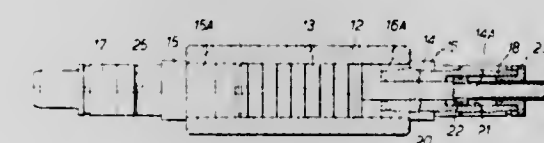
Filed Dec. 2, 1981, Ser. No. 326,537

Claims priority, application United Kingdom, Mar. 20, 1981, 8108859

Int. Cl.<sup>3</sup> B21B 31/32

U.S. Cl. 72-243

4 Claims



1. A rolling mill comprising at least four rolls, at least one of said rolls having axial compliance and comprising: a sleeve having a bore therethrough and forming the barrel of said roll; first and second end members secured on said bore at respective ends of said sleeve, at least one of said end members having therethrough a passage with a diameter significantly less than the diameter of said bore; an arbor located within said bore between said end members and axially movable within said bore to adjust the axial compliance of said roll; a roll neck integral with each said member, for mounting said roll in a rolling mill, one said neck having therein a cylinder-forming recess; and adjustment means for said arbor, said means including a piston located in said recess and connection means operatively attached between said arbor and said piston and passing axially through said passage of said one end member.

4,416,138

# EXTRUSION PRESS DIE CHANGE ASSEMBLY

Howard W. Freese, Rushville, and Danil Lukach, Rochester, both of N.Y., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 127,398, Mar. 5, 1980, abandoned. This application Dec. 24, 1981, Ser. No. 334,311

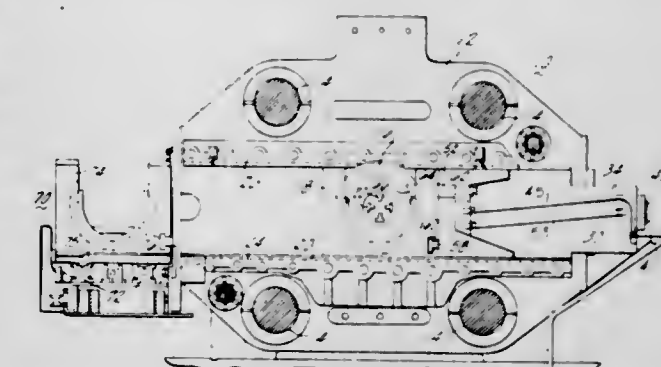
Int. Cl.<sup>3</sup> B21C 35/04

U.S. Cl. 72-263

1 Claim

1. An extrusion press having a platen against which a die is supported for extrusion of material therethrough; a holder for the die having an open side through which the die is movable and mounted for sliding movements along the platen between an extrusion position and a die transfer station; a two part assembly mounted on the platen for sliding movements with the holder, the assembly including a primary slide containing a main cylinder and a secondary cylinder; a main piston having a rod extending in one direction through one end of the main cylinder and being secured to the platen; a secondary piston

having a rod extending in the opposite direction through the opposite end of the secondary cylinder, the secondary piston rod being fixed to a secondary slide forming part of the assembly and being detachably secured to the holder; the cylinders being arranged so that when the main and secondary pistons and rods are fully retracted in their respective cylinders, the holder and die are located in extrusion position, and when the



main and secondary pistons and rods are fully extended, the secondary slide is moved away from the primary slide and the holder and die are located at the transfer station; the holder having an open side through which the die is movable, the holder also having a bore through which a finger attached to the primary slide projects into retaining engagement with a die in the holder, the finger being retracted to release the die when the secondary slide is moved away from the primary slide.

4,416,139

# GUIDING A MANDREL OR PUNCH FOR PIERCING OR COLD-EXTRUSION

Heinrich Hesse, Anton Merkle, Siegfried Gross, and Gerhard Radtke, all of Bielefeld, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

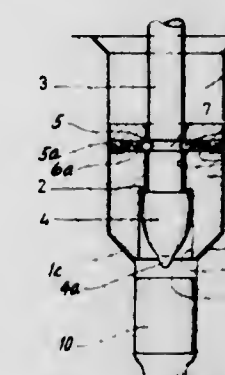
Filed Jun. 1, 1981, Ser. No. 268,801

Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017821

Int. Cl.<sup>3</sup> B21C 23/20, 26/00

U.S. Cl. 72-267

4 Claims



1. Device for guiding a punch or mandrel in a die cavity, the punch or mandrel having a stem and a head on the stem, the head having a larger diameter than the stem, defining a shoulder accordingly, comprising:

annular means receiving a portion of the stem and of the head and having a shoulder by means of which the annular means can be seated on the shoulder of the head, the annular means including a first front end member, and a second rear member displaceably connected to the front member;

said die cavity having a centering surface, said front member having a matching front end surface for being seated and centered on said centering surface, thereby centering the mandrel or punch; and



releasable lock means locking the annular means to the stem, the front member including means for unlocking the locking means, for being released upon advance of the stem and upon abutment of said front end surface and said center surface.

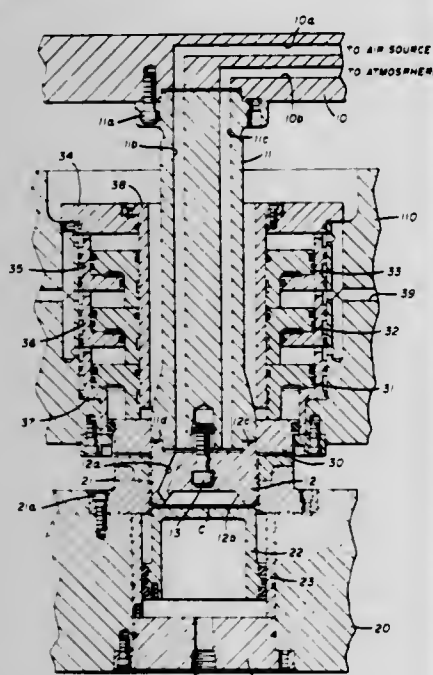
4,416,140

# CAN REMOVAL METHOD FOR USE WITH A DOUBLE ACTION CUPPER

Joseph D. Bulso, Jr., and William R. Lewers, both of Canton, Ohio, assignors to Redicon Corporation, Canton, Ohio  
Division of Ser. No. 171,905, Jul. 24, 1980, Pat. No. 4,343,173.  
This application Jan. 11, 1982, Ser. No. 338,213  
Int. Cl.<sup>3</sup> B21D 45/00

U.S. Cl. 72-345

2 Claims



1. A method of forming a container from sheet stock in a double acting press comprising the steps of:

- (A) closing the press and blanking the stock;
- (B) forming the container with a draw horn and forming die;
- (C) opening the press and ejecting the formed container from the forming die while simultaneously withdrawing the draw horn;
- (D) initially directing pressurized air only against at least part of an interior wall surface of the formed container to expel it from the press as the container reaches the die line and the draw horn clears the container.

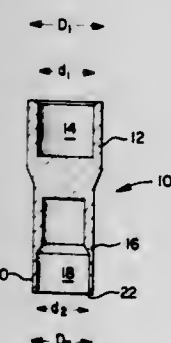
4,416,141

# METHOD AND APPARATUS FOR FORMING AN ELECTRICAL CONNECTOR

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio  
Filed Jan. 11, 1982, Ser. No. 338,804  
Int. Cl.<sup>3</sup> B21D 22/00

U.S. Cl. 72-345

14 Claims



1. A method of forming an electrical connector having a first

cylindrical portion with a first outside diameter, said first cylindrical portion defining a first cylindrical recess therein, and a second cylindrical portion with a second outside diameter, said second cylindrical portion defining a second cylindrical recess therein, said second outside diameter being less than said first outside diameter, comprising the steps of:

- (a) forming a cylindrical billet of ductile metal, said cylindrical billet having an outer diameter substantially equal to said first diameter,
- (b) placing said billet in a first die and forming an intermediate billet by back extruding said first portion of said connector over a punch cooperating with said die, while forward extruding said billet in said die to form a portion of reduced diameter, said portion of reduced diameter having an outside diameter approximately equal to said second outside diameter,
- (c) placing said intermediate billet in a movable die section, said movable die section have an upper portion of an inside diameter substantially equal to said first diameter and a lower portion of an inside diameter substantially equal to said second diameter, said first cylindrical portion of said connector being positioned in said upper portion of said die and said portion of reduced diameter being positioned in said lower portion of said die,
- (d) moving said intermediate billet and said movable die section downward from an initial position by means of a finish punch, said finish punch contacting said intermediate billet and being received within said first cylindrical recess, downward movement of said movable die section forcing said portion of reduced diameter over a stationary punch within said die such that said portion of reduced diameter is forward extruded, thereby forming said second cylindrical portion and said second cylindrical recess therein and producing said connector,
- (e) retracting said finish punch from said connector, and
- (f) ejecting said connector from said movable die section by raising said stationary punch with respect to said movable die section.

4,416,142

# APPARATUS FOR SIMULTANEOUSLY FORMING A CAP MEMBER WITH INTERNAL THREADS

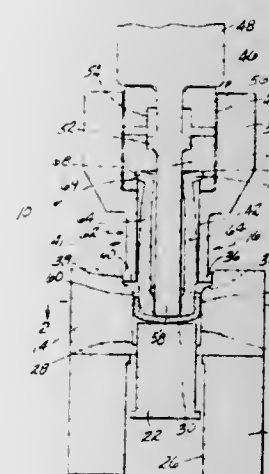
Thomas Thorne-Thomsen, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 31, 1981, Ser. No. 297,813

Int. Cl.<sup>3</sup> B21D 22/20, 53/24; B21K 1/56

U.S. Cl. 72-348

5 Claims



1. An apparatus for forming a cap-like member from a blank of material comprising:

- die means for shaping the cap-like member;
- plunger means co-acting with the die means for simultaneously forming the member with internal threads therein, said plunger means including a movable punch operator having an opening with a substantially curved slot at one end; and

a collapsed, segmented punch having a plurality of segments separated by longitudinal slots, each of said segments having a lip on one end being pivotally received within said curved slot for supporting said segment, and one or more of said segments further having external threads on a second end thereof;

a reciprocating rod extending through said plunger having a plurality of splines at one end projecting into each of said longitudinal slots, said rod fastening the lips of said segments within said curved slot;

said segments being pivoted about said lips between a collapsed position whereby said segments are movable inwardly toward said rod corresponding to rod movement in one direction and to an expanded position wherein the rod movement is in a second direction so that the rod end having said splines thereon engages the second end of said segments and forces them outward resulting in a solid plunger to push said blank into the die means and form said cap having substantially the configuration of said die means.

4,416,143

# CONNECTOR STRAIGHTENING TOOL

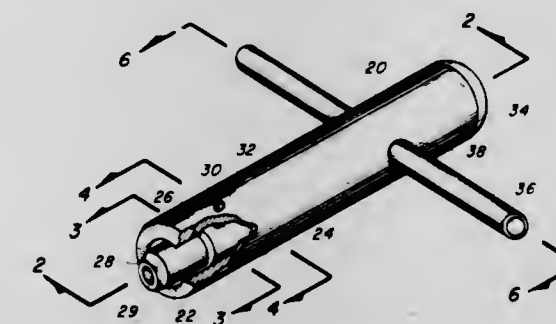
Claude H. Fouroux, 8632 Cypress Ave., Cypress, Calif. 90630, and Craig W. Boardman, 393 Sunrise Cir., Costa Mesa, Calif. 92627

Filed Sep. 27, 1982, Ser. No. 424,355

Int. Cl.<sup>3</sup> B21D 3/14

U.S. Cl. 72-479

9 Claims



1. An improved hand held electrical connector shell straightening tool comprising:

- (a) a body having a first and second end, said first end having a bore therein;
- (b) a hollow cylindrical plug having a stepped shoulder and a tapered end, the extended portion of said shoulder being of a diameter to be insertably received within said bore in the first end of said body and defining a cavity between said plug and said bore for forceably receiving said electrical connector shell therebetween straightening said shell to conform to the inside diameter of the bore and simultaneously the outside of said cylindrical plug with the internal hollow portion of said cylinder providing clearance for projections within said electrical connector;
- (c) means to attach said plug within said bore of the body for securing therewith; and,
- (d) gripping means appended to said body defining raised projections for hand manipulation thereof.

4,416,144

# APPARATUS FOR EVALUATING SLIDER FLYING DYNAMICS

Tsu F. Chen, Dresher, and Juan M. Gottschalk, Elkins Park, both of Pa., assignors to Sperry Corporation, New York, N.Y.  
Filed Apr. 21, 1982, Ser. No. 370,448

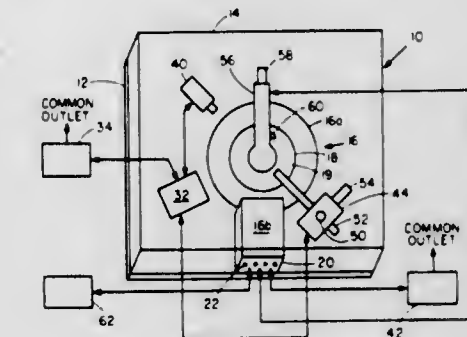
Int. Cl.<sup>3</sup> G01M 19/00; G01N 3/30, 19/00

U.S. Cl. 73-12

17 Claims

1. A test apparatus comprising:

a disk drive supporting said sample;  
a head assembly mounted adjacent said disk sample, said head assembly having a slider head in proximity with said disk sample;



a hammer assembly mounted adjacent said disk sample, said hammer assembly having a hammer movable into engagement with said disk sample; and  
means for controlling said hammer for making predetermined dents in said disk sample.

4,416,145

# ULTRASONIC LEAK DETECTING METHOD AND APPARATUS

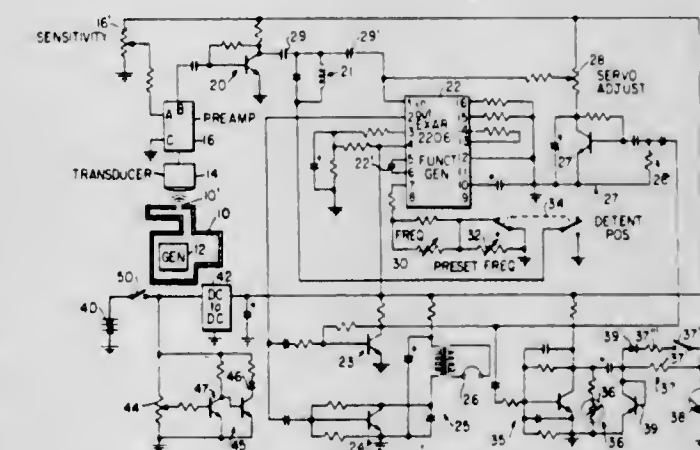
Mark Goodman; John R. Zeno, both of New York, and Marty Borroso, Brooklyn, all of N.Y., assignors to UE Systems, Inc., New York, N.Y.

Filed Feb. 10, 1982, Ser. No. 347,584

Int. Cl.<sup>3</sup> G01N 29/04

U.S. Cl. 73-40.5 A

31 Claims



1. Apparatus for indicating the presence of ultrasonic energy comprising:

- an ultrasonic transducer means for converting ultrasonic energy into electrical energy having a related ultrasonic frequency;
  - an amplifier means for amplifying the electrical energy produced by said transducer means to produce an amplified ultrasonic signal;
  - a heterodyne means for translating the frequency of the amplified ultrasonic signal into the audio frequency range by modulating it with a carrier frequency signal whose frequency differs from the ultrasonic frequency by a frequency within the audio range, said heterodyne means including a carrier frequency signal generator and a suppressed-carrier amplitude modulator means for modulating said amplified ultrasonic signal with said carrier signal to produce an output audio frequency signal related to the amplified ultrasonic signal; and
  - an indicator means responsive to the amplitude of the audio frequency signal for indicating an output level related to the level of the ultrasonic energy.
22. In a method of detecting small openings in an otherwise



closed container, involving the steps of pressurizing the container with a gas, detecting the existence of ultrasonic energy outside the container due to the pressure of the gas through the opening with an ultrasonic detector that converts the ultrasonic energy into energy in the audio range, and locating the origin of the ultrasonic energy outside the container by passing the ultrasonic detector over the outer surface of the container to locate the position at which the largest audio energy signal is obtained, the improvement comprising the step of covering the outer surface of the container with a layer of a liquid having a surface tension such that the pressure of the gas through small openings in the container causes the formation and bursting of bubbles in the layer of liquid at that location, said bubbles having a size such that their bursting generates ultrasonic energy.

25. An ultrasonic energy generator comprising: an oscillator circuit means for producing an electrical oscillation in a narrow ultrasonic band of frequencies, said oscillator circuit including a feedback path with a piezoelectric crystal, said crystal having a resonant frequency in said narrow band of frequencies and converting the electrical oscillation signals in the feedback path into ultrasonic energy; and sweep means for causing the output of said oscillator to vary within said narrow band of frequencies at a periodic frequency rate that is no higher than the upper limit of the audio range.

29. An ultrasonic transducer for converting ultrasonic energy into electrical energy having a selected ultrasonic frequency comprising:

at least two piezoelectric crystals electrically connected in series and spaced adjacent each other on a generally planar surface such that both are exposed to the ultrasonic energy, the degree of curvature of said planar surface being related to the distance from said surface for which said transducer means is focused to received ultrasonic energy; and

an amplifier means including an input field-effect transistor, said crystals being connected in series between a gate terminal of said field-effect transistor and a common reference level, said input field-effect transistor being biased to have a high impedance between the gate terminal and the common reference level sufficient to avoid loading the series arrangement of crystals.

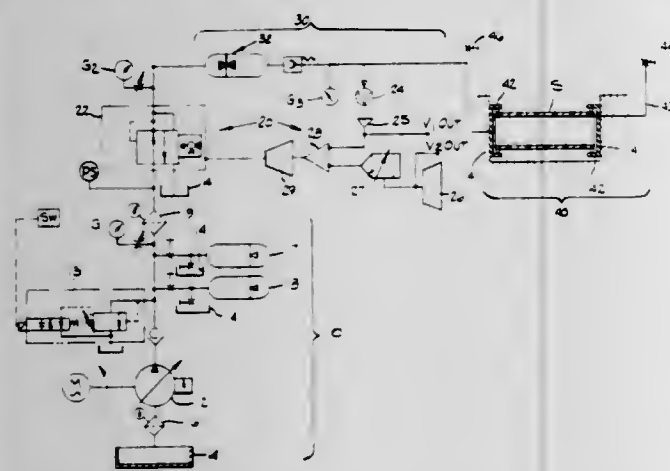
4,416,146

#### PLASTIC PIPE TESTER WITH FEEDBACK CONTROLLED PRESSURIZER

Roy A. Ambrose, 7854 S. Johnson Ct., Littleton, Colo. 80127  
Filed Mar. 5, 1982, Ser. No. 355,032  
Int. Cl.<sup>3</sup> G01M 3/28

U.S. Cl. 73-49.5

4 Claims



1. An apparatus for testing a sample of plastic pipe by internally pressurizing said sample in a controlled manner, comprising:

- (a) a source of hydraulic pressure;
- (b) means for conducting at least a portion of said hydraulic pressure to said sample to internally pressurize said sample;
- (c) a pressure monitoring means for generating a first electrical signal proportional to the hydrostatic pressure within said sample;
- (d) a function generator for generating a second electrical signal proportional to the desired hydrostatic pressure within said sample as a function of time;
- (e) a means for generating a third electrical signal proportional to the difference between said first electrical signal and said second electrical signal; and
- (f) a means for controlling flow of hydraulic fluid from said source to said means for transmitting in response to said third electrical signal.

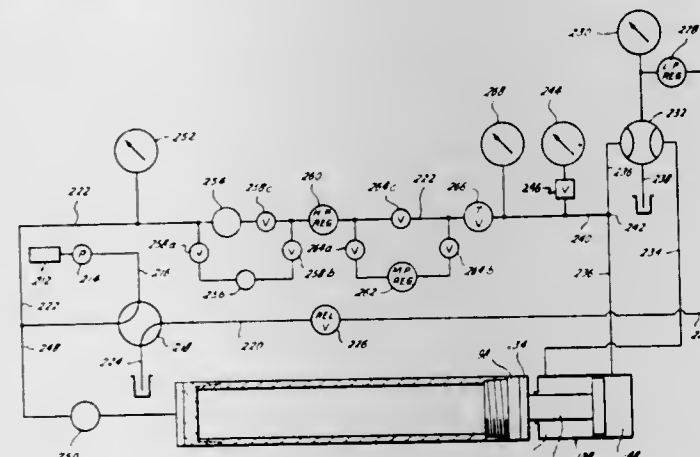
4,416,147

#### APPARATUS AND METHOD FOR HYDROSTATICALLY TESTING PIPE

Brian B. Hasha, 17211 Ash Butte, Houston, Tex. 77090  
Filed Jul. 15, 1981, Ser. No. 283,484  
Int. Cl.<sup>3</sup> G01M 3/28

U.S. Cl. 73-49.6

22 Claims



1. An improved testing apparatus for hydrostatically testing threaded pipe of the type having a frame for containing a threaded pipe; a first threaded test plug rotatably mounted on said frame having a threaded portion in the form of the male end of a threaded pipe for threadably sealing the female end of a threaded pipe contained within said frame; a second threaded test plug rotatably mounted on said frame having a threaded portion in the form of the female end of a threaded pipe for threadably sealing the male end of a threaded pipe contained within said frame; means for introducing test fluid into the interior of said threaded pipe through at least one of the rotatably mounted test plugs sealing the ends of said threaded pipe contained within said frame; means for containing test fluid within the interior of said threaded pipe; means for subjecting said test fluid inside said threaded pipe to hydrostatic pressure; a compression cylinder mounted on said frame having a longitudinally movable compression cylinder piston slidably disposed within said compression cylinder for abutting one of the sealed ends of said threaded pipe; and a conduit for transmitting said hydrostatic pressure from the test fluid in said threaded pipe to a back chamber of said compression cylinder to urge said compression cylinder piston into contact with said sealed end of said threaded pipe to transmit force from said compression cylinder to the sealed ends of said threaded pipe; wherein the improvement comprises means for initiating the transmission of hydrostatic pressure

to the back chamber of said compression cylinder when a specific pre-selected value of hydrostatic pressure is exceeded in the test fluid inside said threaded pipe.

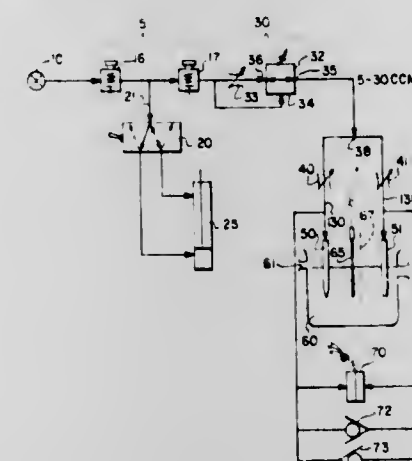
4,416,148

#### SURFACE TENSION METER

John P. Klus, Madison; Everett E. Gibbons, Monona; Eric L. Brodsky, Madison, and Victor P. Janule, Sun Prairie, all of Wis., assignors to Madison-Klipp Corporation, Madison, Wis.  
Filed Feb. 6, 1981, Ser. No. 232,091  
Int. Cl.<sup>3</sup> G01N 13/02

U.S. Cl. 73-64.4

5 Claims



1. An apparatus for determining the surface tension of a liquid comprising: a pressure vessel for containing the liquid, a tube having an orifice positioned below the surface of the liquid, means for providing a source of gas under pressure to said tube, means connected between said source of gas and said tube for controlling the bubble rate of the gas to the tube independently of the pressure within said vessel, means for determining the pressure of the liquid at said orifice, means for measuring the pressure in said tube as compared to the pressure at said orifice as a function of the surface tension of the liquid.

4,416,149

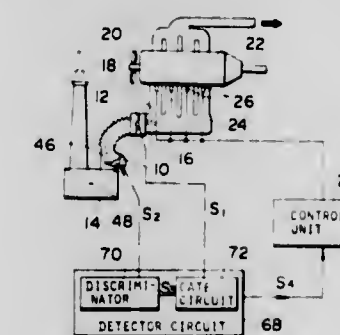
#### METHOD AND DEVICE FOR DETECTING ENGINE IDLING

Hidetoshi Kitamura, Higashikurume, and Hirohisa Kato, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1982, Ser. No. 348,683  
Claims priority, application Japan, Apr. 9, 1981, 56-52384  
Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73-118

5 Claims



4. A method for detecting engine idling comprising the steps of:

detecting a throttle valve angle position in which throttle valve open angle is less than a predetermined angle; determining an intake air flow rate; discriminating whether the determined air flow rate is less than a predetermined value; and producing a signal indicative of engine idling when the throttle valve is at an open angle less than the predetermined angle and air flow rate is less than the predetermined value.

4,416,150

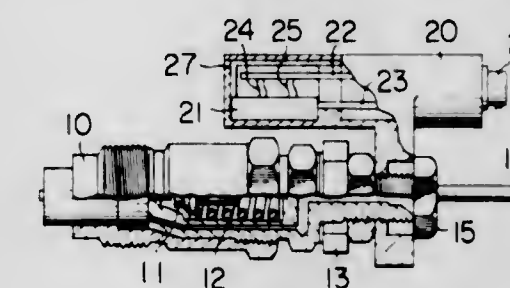
#### FUEL INJECTION TIMING DETECTING APPARATUS FOR DIESEL ENGINES

Yoshiyuki Kago, Aichi, and Sigeyuki Akita, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan  
Filed Oct. 2, 1981, Ser. No. 307,934

Claims priority, application Japan, Oct. 22, 1980, 55-146978  
Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73-119 A

3 Claims



1. A fuel injection timing detecting apparatus for Diesel engines comprising: a preliminarily-magnetized pressure pin disposed within a body of a fuel injection nozzle of a Diesel engine and responsive to a pressure of pressurized fuel supply to be displaced against a spring force of a pressure spring which is in engagement with said pressure pin; magnetic sensing means disposed outside of said fuel injection nozzle body and fixed to the same to sense a magnetic variation caused by the displacement of said pressure pin, thereby detecting the displacement of said pressure pin; and a signal processing circuit for amplifying and processing an output signal of said magnetic sensing means, wherein said magnetic sensing means comprises a flux-gate magnetometer including a toroidal magnetic core, an excitation coil and a sensing coil wound on said magnetic core; said signal processing circuit includes an excitation circuit including an oscillator circuit for generating an exciting signal having a predetermined frequency and supplied to said excitation coil and a detecting circuit responsive to an output signal of said sensing coil to generate a detection signal indicative of a magnetic variation caused by the displacement of said pressure pin; and all the component parts of said fuel injection timing detecting apparatus other than said magnetic sensing means are magnetically shielded.

4,416,151

#### METHOD AND APPARATUS FOR DETERMINING IN SITU HYDROCARBON CHARACTERISTICS INCLUDING HYDROGEN DENSITY

John J. Uilo, Bethel, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.  
Filed Dec. 9, 1981, Ser. No. 328,880  
Int. Cl.<sup>3</sup> E21B 49/00; G01V 5/14

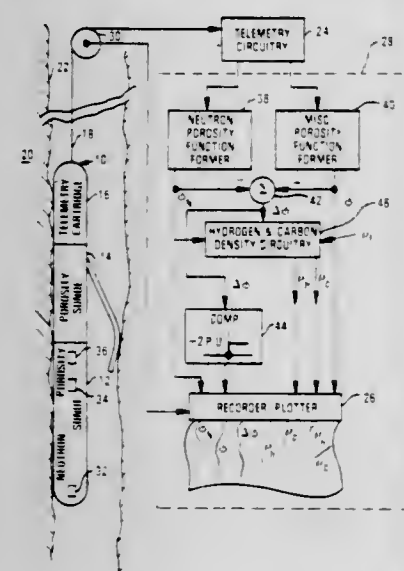
U.S. Cl. 73-152

20 Claims

1. A method for investigating characteristics of the oil within a geological formation while it remains in situ, said method comprising the steps of:



- a. irradiating said geological formation with neutrons;
- b. detecting the resultant neutron flux distribution and generating therefrom a first signal indicative of formation porosity and hydrogen density of the fluid in said formation;
- c. deriving from said geological formation a second signal indicative of formation porosity but which is less affected



by the nature of the pore fluid, whether it be water or liquid hydrocarbon, than said first signal;

- d. combining said first and second signals to generate a signal proportional to the differential therebetween; and
- e. determining from said differential signal a signal indicative of the hydrogen density of said oil.

4,416,152

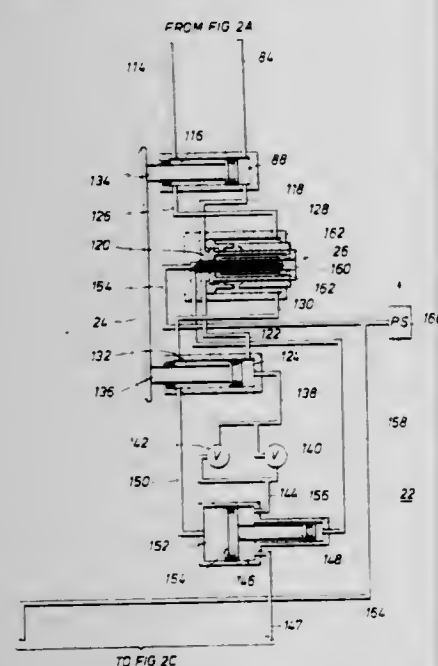
## FORMATION FLUID TESTING AND SAMPLING APPARATUS

Herbert C. Wilson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1981, Ser. No. 310,249  
Int. Cl.<sup>3</sup> E21B 47/00, 43/00

U.S. Cl. 73—155

16 Claims



1. Fluid sampling apparatus for obtaining samples of connate fluids from subsurface earth formations traversed by a borehole comprising:

- a body member adapted for suspension in a borehole;
- first fluid sample collecting means cooperatively arranged on said body member for receiving a first sample of connate fluids;
- second fluid sample collecting means cooperatively arranged on said body member for receiving a second sample of connate fluids;

fluid sampling probe means cooperatively arranged on said body member, said probe means having a first fluid flow path comprising a central passage along the longitudinal axis of said probe and a second fluid flow path comprising a plurality of radially spaced longitudinal passages disposed about the longitudinal axis of said probe;

hydraulic fluid power means for telescopically extending said sampling probe means into fluid communication with an earth formation;

first fluid passage means including said first flow path within said sampling probe means providing an unrestricted fluid path between said earth formation and said first sample collecting means; and

second fluid passage means including said second flow path within said sampling probe means providing an unrestricted fluid path between said earth formation and said second sample collecting means.

4,416,153

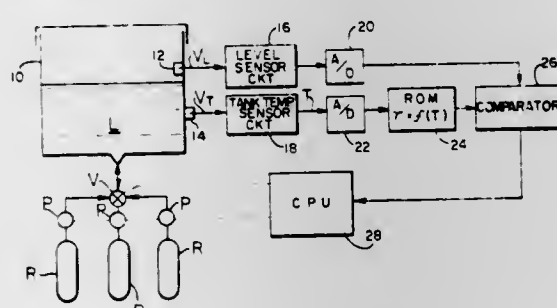
## METHOD OF COMPENSATING A THERMISTOR

Robert C. Williams, Churchville, Pa., assignor to Innovative Medical Systems, Corp., Ivyland, Pa.

Filed Mar. 15, 1982, Ser. No. 358,463  
Int. Cl.<sup>3</sup> G01F 23/22

U.S. Cl. 73—295

6 Claims



1. A system for controlling the level of liquid applied to a tank which is subjected to temperature variations, comprising: first thermal sensor means adapted to be mounted within the tank at a predetermined threshold level for producing a first analog signal indicative of absolute temperature at the level;
- second thermal sensor means adapted to be attached to the tank for producing a second analog signal indicative of tank temperature;
- digital encoder means for converting said first and second analog signals to respective first and second digital data signals;
- digital storage means addressed by said second digital data signal and stored with discrete values of a voltage threshold function related to tank temperature for producing an appropriate threshold value upon the address of said second digital data signal; and
- a digital comparator connected to said encoder means and said storage means for signaling the discontinuance of liquid flow to the tank when the magnitude of said first digital data signal is equal to or greater than said threshold value.

4,416,154

## METHOD FOR MEASURING THE SURFACE AREA OF A SOLID

Arnold M. Schaffer, and Joseph G. Gallagher, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 11, 1981, Ser. No. 291,906  
Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—571

8 Claims

6. A method for measuring the surface area of a solid having

a surface area in excess of about 10 square meters/gram which comprises:

- (a) placing said solid in a photoacoustic measuring zone;
- (b) surrounding said solid with a coupling gas comprising a gas having a normal boiling point at least about 25° C. below the temperature at which the photoacoustic effect is being measured and a critical temperature not less than about 2° C.;
- (c) causing photoacoustic signals to be emitted from said solid;
- (d) measuring the intensity of said photoacoustic signals;
- (e) removing said coupling gas from said photoacoustic measuring zone;
- (f) surrounding said solid with a second coupling gas comprising a permanent gas having a critical temperature not greater than about -73° C.;
- (g) causing additional photoacoustic signals to be emitted from said solid;
- (h) measuring the intensity of said additional photoacoustic signals;
- (i) calculating a ratio of the intensity of said photoacoustic signals to the intensity of said additional photoacoustic signals;
- (j) repeating steps (a) and (i) using a second solid of known surface area; and
- (k) estimating the surface area of the first solid by making use of the following relationship:

$$SA_1 = (SA_2)(R_1/R_2)$$

where  $SA_1$  is the surface area of the first solid,  $SA_2$  is the known surface area of the second solid,  $R_1$  is the ratio of intensities calculated in step (i) which corresponds to the first solid and  $R_2$  is the ratio of intensities calculated in step (i) which corresponds to the second solid.

4,416,155

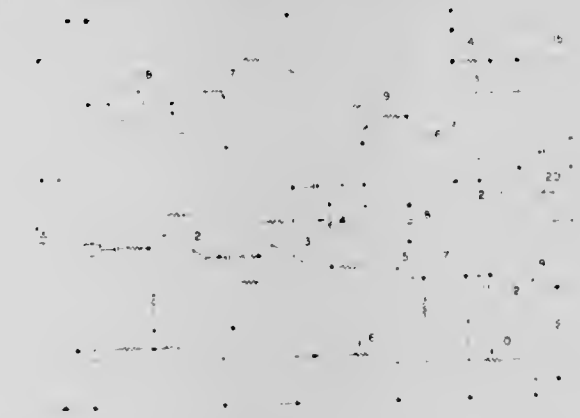
## ELECTRONIC NOISE DETECTORS

Raymond L. Kirby, Alabaster, Ala., assignor to Buddy B. Simpson A/B Electronics, Woodland, Ala.

Filed Feb. 17, 1982, Ser. No. 349,622  
Int. Cl.<sup>3</sup> G08B 21/00; G01H 9/00

U.S. Cl. 73—646

1 Claim



1. An electronic noise detector device with a monitoring mode and a response mode, the device when in its monitoring mode having the ability to listen for noise, to detect noise, to distinguish between noise of different lengths of time with such being measured by the duration of the noise being monitored, and to respond to noises of different decibel levels and different lengths of duration by triggering a response mode of the device, and to do same on a continuous non-stop basis in a manner so that noises which exceed the predetermined decibel level but which are shorter in length than a predetermined time of duration will not trigger the response mode of the device; and

when in its response mode, after being triggered by the monitoring mode, having the ability to sound an audible alarm for varying lengths of time, while simultaneously interrupting the monitoring mode of the device from responding to the noise created by the audible alarm of said response mode.

mode, even though said alarm of the response mode does exceed the predetermined decibel level of unacceptability for an academic environment, and even though said alarm does exceed the predetermined length of time as measured by its duration, the interruption being such as to prevent the device from retriggering the response mode of the device and thereby prevent the device from going into an endless cycle of alarms, said device comprising:

- (a) means for converting sound waves into a voltage potential signal;
- (b) means for inverting and amplification of the signal at a fixed gain;
- (c) means for inverting and amplification of the signal with an adjustable gain;
- (d) means for setting the device to response to noise in the range of 40 db to 90 db;
- (e) means for setting a threshold level which allows monitoring of a given sound level for a time period of up to five seconds without triggering the response mode;
- (f) means for automatically interrupting the monitoring mode when the device is in a response mode; and
- (g) means for automatically returning the device to a monitoring mode upon completion of the response mode.

4,416,156

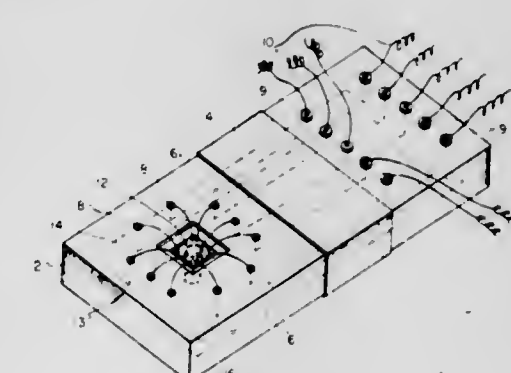
## HIGH PRESSURE ELECTRICAL FEEDTHRU

Anthony M. Demark, Plymouth Meeting, and William K. Erhardt, Richboro, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 23, 1981, Ser. No. 333,842  
Int. Cl.<sup>3</sup> G01L 9/06

U.S. Cl. 73—727

10 Claims



1. An electrical feedthru comprising a plurality of electrical conductors, an electrically insulating ceramic structure extending longitudinally along said conductors and being in fluid-tight relationship therewith,
- a first plurality of electrical connectors mounted on a first end of said ceramic structure with each of said connectors being connected to a respective one of said electrical conductors at one end of said electrical conductors,
- a second plurality of electrical connectors mounted on a second end of said ceramic structure with each of said second connectors being connected to respective ones of the other ends of said electrical conductors,
- a surface area encircling said ceramic structure intermediate said first and second plurality of electrical connectors to provide a surface for connection to a surrounding housing as a fluid-tight seal therebetween,
- an aperture in one end of said ceramic structure adjacent to a first one of said plurality of electrical connectors,
- a sensor mounted within said aperture and
- a plurality of electrical connectors connecting said sensor to said first plurality of electrical connectors.



4,416,157

## INCLINED MANOMETER

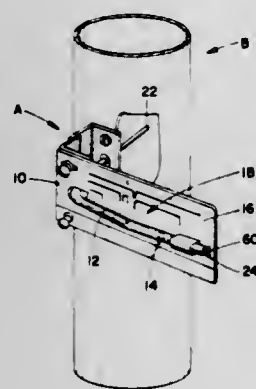
Richard C. Cornelison, Hiram, Ohio, assignor to Condar Co., Hiram, Ohio

Filed Aug. 13, 1981, Ser. No. 292,503

Int. Cl.<sup>3</sup> G01L 7/18

U.S. Cl. 73-747

11 Claims



1. A manometer for gauging the draft of a flue pipe comprising:

- an opposed pair of inclined manometer legs, one of said legs having a first open-ended terminal end and a second of said legs having a second open-ended terminal end, each of said legs being inclined at a relatively large angle and being integrally joined at a midpoint nadir, said nadir including a recess; and,
- a mounting plate for mounting said pair of legs, said plate including a gauge for identifying pressure differential between said first terminal end and said second terminal end and wherein said first terminal end is adapted to be received in said flue pipe and said second terminal end is opened to the environment of said flue pipe;
- said mounting plate being attached to a mounting bracket and including means for selectively leveling said manometer legs;
- said mounting bracket comprising a pair of opposed right angle brackets, said pair being fastened together, a first of said brackets including means for fastening said pair to said flue pipe and including an aperture for receiving a terminal end portion of said first manometer legs, said first open-ended terminal end being received in said flue pipe and a second of said brackets being fastened to said mounting plate.

4,416,158

## PUNCHING-SHEARING METHOD FOR INSPECTING QUALITY OF BUTT WELDED JOINT

Tadashi Takimoto, Fuchu; Hirotugu Oshibashi, Musashino; Katsuyoshi Ueyama, Musashino; Muneyuki Ohara, Musashino; Mitsuo Nakamura, Higashikurume, and Takayoshi Amano, Fussa, all of Japan, assignors to Japanese National Railways and Hakusan Seisaku-sho Co., Ltd., both of Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,531

Claims priority, application Japan, Jun. 18, 1981, 56-94327

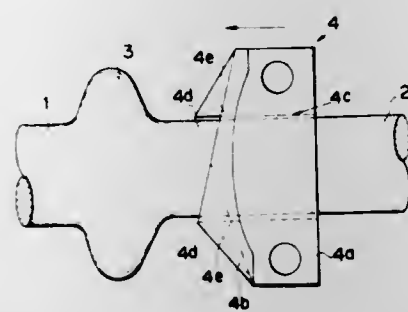
Int. Cl.<sup>3</sup> G01N 3/24

U.S. Cl. 73-842

2 Claims

1. A punching-shearing method for inspecting the quality of a butt welded joint, which comprises:
  - subjecting steel members to a pressure butt welding process under heat to form an annular bulge around a joint portion of the steel members,
  - subjecting the annular bulge to punching-shearing process under red heat immediately after the pressure butt welding process from one side of the annular bulge in parallel with the axes of the steel members by use of a shearing die having higher and lower shearing edge portions so that the higher shearing edge portions penetrate the annular bulge prior to the lower shearing edge portions, so as to cause the base of the bulge to remain around the joint

portion in a slightly higher position than the peripheral surface of the steel members, and



determining the quality of the joint portion of the steel members from the peripheral surface of the base of the bulge remaining on the peripheral surface of the joint portion of the steel members.

4,416,159

## VORTEX FLOWMETER

Roger J. Williamson, Harlow, and David N. Batchelder, London, both of England, assignors to IIT Industries, Inc., New York, N.Y.

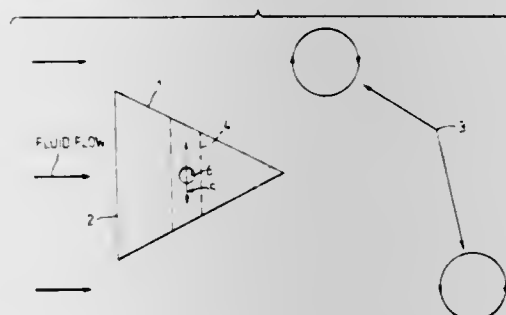
Filed Oct. 19, 1981, Ser. No. 312,494

Claims priority, application United Kingdom, Nov. 27, 1980, 8038032

Int. Cl.<sup>3</sup> G01F 1/32

U.S. Cl. 73-861.22

1 Claim



1. A vortex shedding flowmeter for measuring the velocity of flow of a fluid in a pipe, said flowmeter comprising: a bluff body located in the pipe so that fluid flow therein produces vortices which are shed from the bluff body at a rate dependent on the velocity of the fluid flow, the vortices produced by the fluid flow being shed alternately from opposite edges of a surface of the bluff body which faces the direction from which the said fluid comes, first and second intersecting holes in said bluff body, said first hole extending into said bluff body from one of the surfaces thereof downstream of the first mentioned surface, said hole having an axis substantially at right angles to the direction of fluid flow, a light source, a light detector facing said light source at the ends of said second hole so that a light beam traverses said first hole in a direction at right angles to the axis of said first hole, said light beam being modulated in accordance with the frequency of the oscillations in said first hole, and measuring means responsive to the modulation of said light beam to give an output reading dependent upon the fluid flow rate, wherein said bluff body has as its cross section a scalene triangle with one flat face facing the oncoming fluid and set substantially normal thereto, wherein said first hole is a blind hole extending from another of its faces into the bluff body, and wherein a Fabry-Perot interferometer is located at the inner end of the blind hole, the output of the interferometer giving a signal whose value depends on the fluid flow rate.

4,416,160

## APPARATUS FOR DETECTING TORQUE IN ELECTRIC DYNAMOMETER

Hiroshi Sugimoto, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

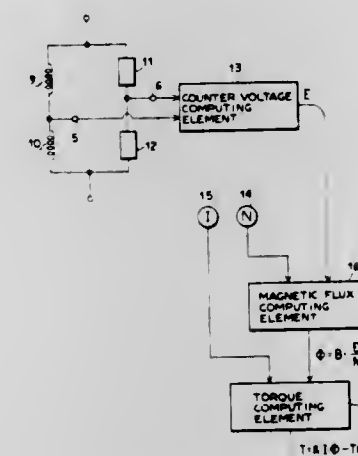
Filed Mar. 2, 1982, Ser. No. 354,042

Claims priority, application Japan, Apr. 27, 1981, 56-62430

Int. Cl.<sup>3</sup> G01L 3/22

U.S. Cl. 73-862.17

1 Claim



1. An apparatus for detecting torque in an electric dynamometer which comprises:

- first and second resistors having the same ratio as resistance ratio  $R_a/R_i$  of an armature winding resistance  $R_a$  to an interpole winding resistance  $R_i$  of the DC machine, said first and second resistors being in series and inserted in parallel to the armature of said DC machine;
- a counter-voltage computing element connected to a point for connecting said armature winding with said interpole winding and a point for connecting said first resistor with said second resistor, respectively, and by which a counter voltage  $E$  of said DC machine is computed from a potential difference  $V$  between said points in accordance with the following equation:

$$E = V \times \frac{R_a + R_i}{R_i} - V_B$$

where  $V_B$  is brush drop voltage;

- a device for detecting speed of rotation of a rotor of said DC machine connected to said rotor and generating a signal in response to the speed of rotation of said rotor;
- a magnetic flux computing element for transmitting an output signal by receiving an output signal from said device for detecting speed of rotation as well as an output signal from said counter-voltage computing element;
- an armature current detector for detecting armature current of said DC machine; and
- a torque computing element for obtaining torque by receiving an output signal from said magnetic flux computing element and an output signal from said armature current detector.

4,416,161

## METHOD AND APPARATUS FOR MEASURING TORQUE

Sarkis Barkhoudarian, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 14, 1981, Ser. No. 301,683

Int. Cl.<sup>3</sup> G01L 3/10

U.S. Cl. 73-862.36

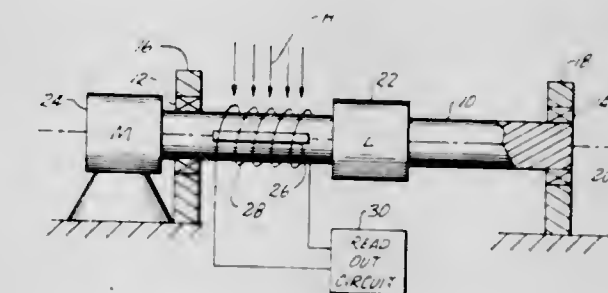
34 Claims

1. A method for sensing the torque transmitted by a rotatable shaft from a prime mover to a load, the method comprising the steps of:

- generating in the vicinity of the shaft a magnetic field;
- forming on the shaft an elongated boundary between ferromagnetic regions having different coercivity, the bound-

ary extending along the axis of the shaft and being differentially displaced by twisting of the shaft, the forming step forming the boundary in alignment with the axis of the shaft in the absence of torsional stress; and detecting changes in magnetization in the regions during rotation of the shaft.

24. In a power transmission system, the combination comprising: a shaft having a central axis; means for supporting the shaft for rotation about its central axis;



means for generating a magnetic field in the vicinity of the shaft;

means for forming on the shaft in the vicinity of the magnetic field an element in which a ferromagnetic material having low coercivity is surrounded by a ferromagnetic material having high coercivity so as to exhibit the avalanche-Barkhausen effect, said element being differentially displaced as a function of twisting displacement of said shaft; and means for sensing the avalanche-Barkhausen effect in said element.

4,416,162

## GRAM BEAM FORCE GAUGE

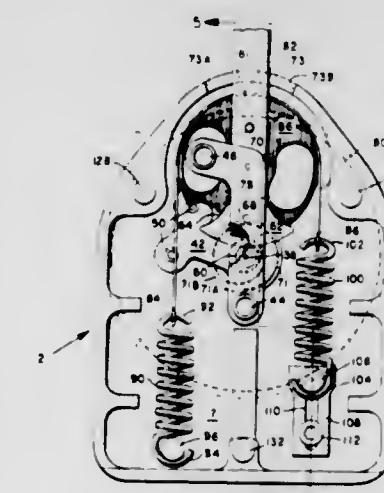
Alfred L. Lea, Doylestown, Pa., and Frank A. Votta, Jr., Clearwater, Fla., assignors to Ametek, Inc., New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,350

Int. Cl.<sup>3</sup> G01L 1/04

U.S. Cl. 73-862.62

4 Claims



1. A gram beam force gauge comprising:

- a housing having a peripheral wall and a partition with a front face and a rear face substantially perpendicular to the peripheral wall,
- a dial mounted on the front face of said partition,
- a pointer overlying said dial and mounted on a rotatably mounted shaft passing through said partition,
- a pinion mounted on the shaft to the rear of the partition,
- a sector gear engaged by the pinion,
- a drum carrying said sector gear and rotatably mounted



adjacent the rear face of the partition on an axis parallel to the axis of the pinion,  
 a flexible band passing around the drum for rotating the drum and having a pair of free ends,  
 a first extension coil spring having one end secured to the housing and the other end secured to one of the free ends of the band,  
 a second extension coil spring having an end connected to the other of said free ends of the band,  
 a slide connected to the other end of the second spring and adjustably secured to the partition for preloading said springs and zero adjusting the pointer, and  
 a force transmitting beam secured to the drum and extending through an opening in the peripheral wall and beyond the housing, the peripheral wall limiting the movement of the beam.

4,416,163

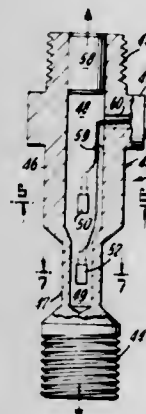
### STRAIN GAGE LOAD CELL INSENSITIVE TO EXTERNAL PRESSURE

Alexander Yorgiadis, 1404 Garza St., Anaheim, Calif. 92804  
 Filed Jun. 3, 1981, Ser. No. 269,904

Int. Cl.<sup>3</sup> G01L 1/22, 1/26

U.S. Cl. 73—862.65

7 Claims



1. A strain gage load cell for the measurement of axial loads comprising a tubular member having a longitudinal opening therein and means for applying said axial load longitudinally thereof, at least two strain gages mounted on the inner surface of the wall defining said opening, means for connecting said gages to an indicator to sense axial strain applied to said member, and means for modifying the sensitivity of one of said gages relative to the other to cause said gages to react uniformly in response to circumferential strain and non-uniformly to said axial load.

4,416,164

### PUSH-BUTTON TYPE TUNING APPARATUS

Teruo Shimazu, Atsugi, Japan, assignor to Mitsumi Electric Company, Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,054

Claims priority, application Japan, Jun. 17, 1980, 55-84506

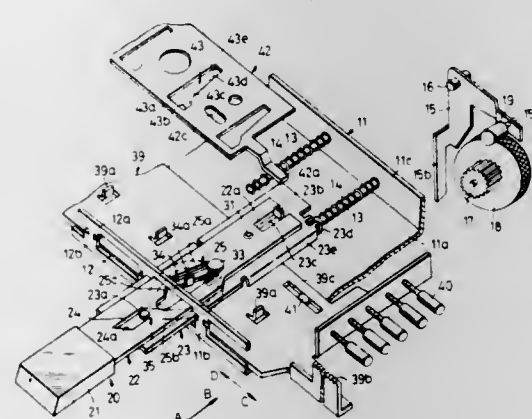
Int. Cl.<sup>3</sup> H03J 5/12; G05G 1/02

U.S. Cl. 74—10.33

8 Claims

1. A push-button type tuning apparatus comprising: a frame; a plurality of push-button assemblies each having a push-button on one end thereof, and inserted into and supported by said frame, said push-button assembly being slidable in the pushing direction between a non-operational position and an operational position;  
 a cam member provided on said frame, said cam member being slidable in a direction perpendicular to the pushing direction of said push-button assembly; and  
 a tuner provided on said frame, said tuner being tuned according to the sliding quantity of said cam member, said push-button assembly further having a memory piece which has a V-shaped cam portion, said memory piece being rotatably supported in the vicinity of the open por-

tion of said V-shaped cam portion in a state where the vertex of said V-shaped cam portion faces towards the direction of said push-button, and first locking means for locking said memory piece at a desired rotated position, p1 said cam member further having a projecting cam portion provided on the inner side of said V-shaped cam portion of said memory piece,



said V-shaped cam portion of said memory piece which is in the locked state, making contact with and pushing against said projecting cam portion of said cam member upon sliding of said push-button assembly in the operational position, and guiding said projecting cam portion to said vertex of said V-shaped cam portion to slide said cam member in the perpendicular direction with respect to the pushing direction of said push-button assembly.

4,416,165

### STEPPING GEAR

Klaus Kramer, Bad Bramstedt, and Rolf Huss, Hamburg, both of Fed. Rep. of Germany, assignors to Focke and Company, Verden, Fed. Rep. of Germany

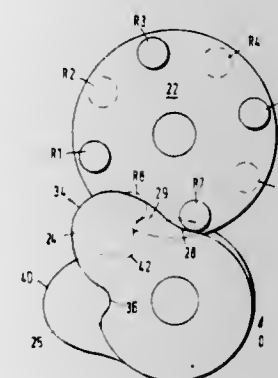
Continuation of Ser. No. 116,417, Jan. 29, 1980, abandoned. This application Dec. 29, 1981, Ser. No. 350,927

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903732

Int. Cl.<sup>3</sup> F16H 25/16, 53/00

U.S. Cl. 74—70

7 Claims



1. A stepping gear mechanism, comprising: an output member, at least one wheel connected to said output member, said wheel being provided with rollers alternately arranged on both sides thereof, driving means comprising two disc cams rotationally secured to an input, said disc cams being engaged with said rollers in form locking engagement at all times, said cam discs rotating in one direction and normally causing either no wheel rotation or wheel rotation in a first, forward direction, but wherein a first one of said disc cam includes means for causing reverse movement of said wheel comprising an undercut formed in a roller engaging surface thereof, the second of said disc cams including a zone of increased cam radius circumferentially offset from the location of said undercut.

4,416,166

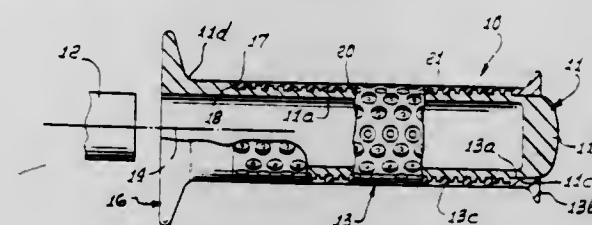
### HANDLE GRIP

James H. Jannard, Laguna Niguel, and George J. Tackles, San Jose, both of Calif., assignors to Oakley, Inc., Irvine, Calif.  
 Filed Mar. 30, 1982, Ser. No. 363,631

Int. Cl.<sup>3</sup> B62K 21/26

U.S. Cl. 74—551.9

11 Claims



1. A two-part grip for a handle defined by a bicycle or motorcycle, or the like, comprising  
 (a) a one piece lengthwise elongated inner support sleeve adapted to fit on and grip the handle, and  
 (b) a one piece lengthwise elongated outer sleeve fitted over the inner sleeve and positioned to be comfortably grasped by the user, the outer sleeve having an outer surface and there being an exterior zone adjacent said outer sleeve,  
 (c) and protuberances integral with the inner sleeve and holes extending radially through the outer sleeve, the protuberances received in the holes,  
 (d) the protuberances spaced apart lengthwise of said sleeves and also spaced apart circumferentially of said sleeves, the protuberances having surfaces exposed to said exterior zone via said holes which are also spaced apart lengthwise and circumferentially of the sleeves,  
 (e) the sleeves closely interfitting one another lengthwise between and circumferentially between said spaced protuberances,  
 (f) both sleeves being non-metallic and the said surfaces of the protuberances being inwardly of a cylinder defined by said outer surface of the outer sleeve.

4,416,167

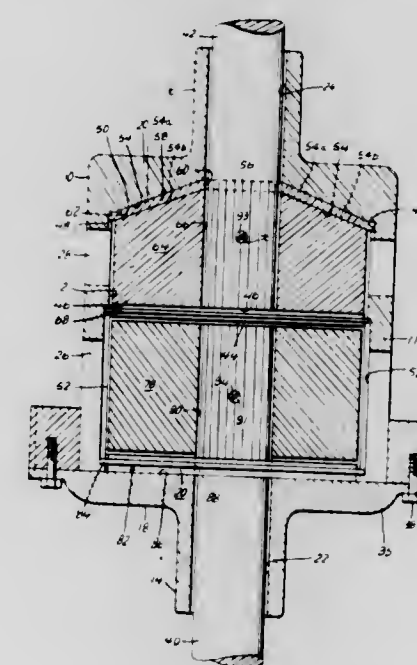
### CLUTCH DRIVE DIFFERENTIAL

Artis J. Stacy, 3008 Hoagland Ave., Fort Wayne, Ind. 46807  
 Filed Dec. 15, 1980, Ser. No. 216,377

Int. Cl.<sup>3</sup> F16H 35/04

U.S. Cl. 74—650

9 Claims



1. A clutch drive differential comprising a hollow drive casing having opposite ends provided with first and second coaxial shaft receiving bores, first and second coaxial shafts disposed in end-to-end relation rotatably received by said first and second bores, respectively, first and second drive wheels

internally of said casing secured to but axially movable on said first and second shafts, respectively, for rotation therewith, said drive wheels being axially juxtaposed, a clutch plate keyed to said casing for axial movement and interposed between adjacent radial faces of said drive wheels and being operatively frictionally engageable therewith, cam means interposed between the opposite end face of said first drive wheel and the adjacent first inner end face of said casing for imparting rotation to said first drive wheel and axial movement of said first drive wheel into operative engagement with said second drive wheel in response to relative rotation between said casing and said first drive wheel, the opposite end face of said second wheel being operatively frictionally engageable with the adjacent second inner end face of said casing, whereby relative rotation between said casing and said first wheel moves the latter axially into operative engagement with said second wheel causing the second drive wheel to move axially into operative engagement with said second casing end face and thereby frictionally rotationally locking both drive wheels and casing together for rotation in unison.

4,416,168

### TRANSMISSION AND SUB-TRANSMISSION WITH MUTUALLY CONTENTING HELICAL GEARS

Hajime Arai, Aichi, and Shoji Haga, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

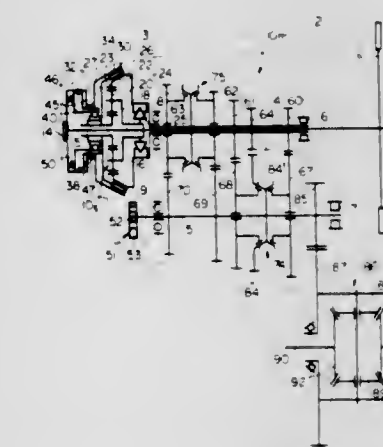
Filed Oct. 7, 1980, Ser. No. 194,857

Claims priority, application Japan, Nov. 5, 1979, 54-143755

Int. Cl.<sup>3</sup> F16H 3/06, 3/44

U.S. Cl. 74—740

5 Claims



1. A transmission for an automotive vehicle, comprising:  
 (a) a main transmission device comprising:

- a main casing;
  - a rotatably supported power output shaft;
  - a tubular intermediate shaft rotatably supported parallel to the power output shaft; and
  - a plurality of helical gears on said shafts for transmitting rotational power between them;
- the helical engagement of at least one pair of said helical gears, one of which is on said tubular intermediate shaft, exerting a first axial force on said tubular intermediate shaft when said pair of helical gears are transmitting rotational power with said tubular intermediate shaft rotating in a certain predetermined rotational direction;
- (b) a power input shaft coaxial with the tubular intermediate shaft and passing through its central hole, with its one end protruding out of one end of said tubular intermediate shaft, and its other end protruding out of the other end of said tubular intermediate shaft and being driven; and
  - (c) a subtransmission comprising:
    - a sub-casing;
    - a helical sun gear;
    - a carrier connected to said one end of the power input shaft;



a helical ring gear connected to said one end of the tubular intermediate shaft;

a plurality of helical pinions rotatably supported by the carrier and meshed between the sun gear and the ring gear; and

a frictional engagement means which selectively connects said sun gear to either said sub-casing or said ring gear, and which comprises a frictional engagement element rotationally connected with said sun gear, a spring which drives said frictional engagement element in a first axial direction opposite to the direction of said first axial force toward engagement with said ring gear and exerts a second axial force on said tubular intermediate shaft via said frictional engagement element and said ring gear when said frictional engagement means is connecting said sun gear to said ring gear, said second axial force opposing to said first axial force, and a fluid pressure actuator which, when actuated, drives said frictional engagement element in a second axial direction opposite to said first axial direction toward engagement with said sub-casing by overcoming said spring; wherein the handedness of said ring gear and said pinions is so arranged that, when the power input shaft and the carrier are being driven in said certain rotational direction and are rotationally driving the ring gear and the tubular intermediate shaft via a planetary movement of the planetary pinions, in said certain rotational direction, the helical engagement of said planetary pinions and said ring gear exerts a third axial force on said tubular intermediate shaft via said ring gear which is opposed to said first axial force.

4,416,169

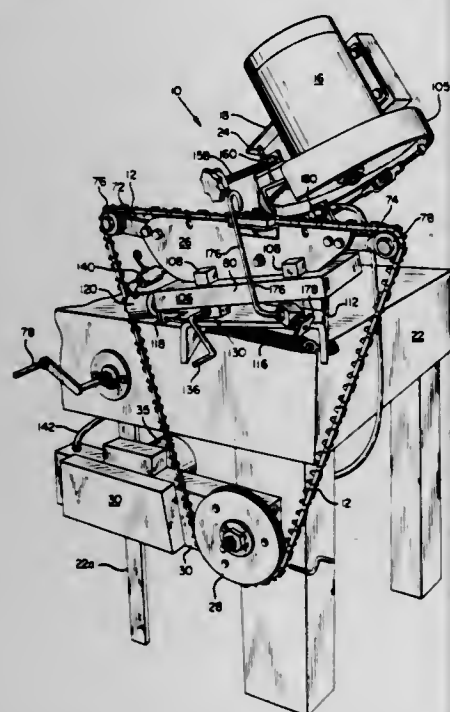
**AUTOMATIC SAW CHAIN GRINDER**

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg.  
Filed Mar. 31, 1981, Ser. No. 249,744

Int. Cl.<sup>3</sup> B23D 63/16

U.S. Cl. 76—25 A

18 Claims



1. An automatic saw chain grinder for grinding a selected surface of successive cutter links of a saw chain, comprising: a rotatable grinding wheel, mounting means mounting the grinding wheel for movement toward and away from a grinding position, saw chain support means for mounting a saw chain for indexing movement therealong to position successive cutter links adjacent said grinding position, first hydraulic pressure-operated means acting on said mounting means for controlling the movement of said

grinding wheel toward and away from said grinding position,

indexing means including a power-operated reciprocating rod means acting on a chain wheel for moving said chain along said support means to index successive cutter links for sharpening,

and power-operated sequencing means operable to reciprocate said rod means and pressurize and depressurize said hydraulic pressure-operated means in sequence such that a first cutter link is indexed for grinding before said grinding wheel is moved to said grinding position and said grinding wheel is moved from said grinding position before a second cutter link is indexed for grinding,

carriage means mounting said saw chain support means for reciprocation to move a cutter link on said support means between said grinding position and a retracted position,

second hydraulic pressure-operated means acting on said carriage means for controlling said reciprocation,

common hydraulic conduit means for supplying pressure fluid from a common source to said first and second pressure-operated means,

and control means for controlling the operation of said first and second pressure-operated means in sequence upon operation of said sequencing means to pressurize and depressurize said common conduit means such that said grinding wheel moves to said grinding position before said support means moves an indexed cutter link to said grinding position and such that said support means moves said cutter link to said retracted position before said grinding wheel moves from said grinding position.

4,416,170

**METHOD OF PRODUCING A STEEL CAUL**

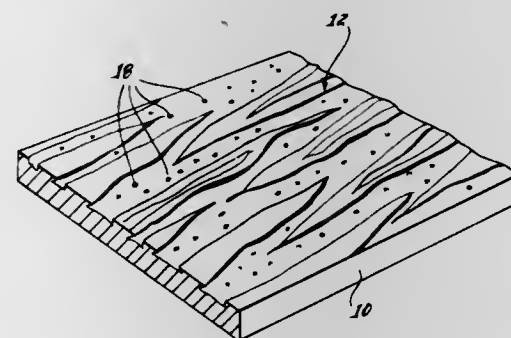
Donald B. Gibson, and Gerald F. Laughinghouse, both of Rock Hill, S.C., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 288,644, Jul. 30, 1981, abandoned, which is a division of Ser. No. 201,715, Oct. 29, 1980. This application Mar. 28, 1983, Ser. No. 479,106

Int. Cl.<sup>3</sup> B21K 5/20

U.S. Cl. 76—107 R

4 Claims



1. A process for forming a steel caul to use in forming panel surfaces on panels made of reconstituted wood by pressing said cauls against said reconstituted wood at temperatures of up to about 475° F., said process comprising the steps of:

- selecting one face of said caul to form said panel surfaces,
- forming a decorative pattern on said selected face, said decorative pattern being adapted to be pressed against the reconstituted wood panels to form the panel surfaces on said panels, and
- thereafter, roughening the decorative pattern formed on the selected face of said steel caul by sand blasting said face with number 12-35 sand thereby forming a multiplicity of indentations in said decorative pattern on said selected face said indentations being large enough to capture and retain the carbon materials produced by the use of said caul in forming said panel surfaces, but not being so large as to have a visibly noticeable detrimental effect on the said decorative pattern in said selected face.

4,416,171

**TAB-TOP CAN OPENER**

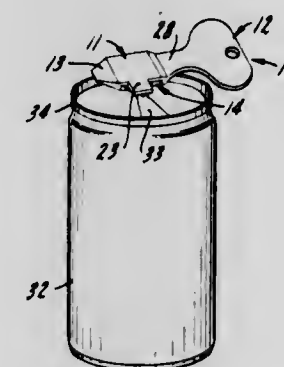
John F. Chmela, Mt. Prospect; Carl R. Fletcher, Arlington Heights, and Norton Sarnoff, Northbrook, all of Ill., assignors to Ensar Corporation, Wheeling, Ill.

Filed Dec. 21, 1981, Ser. No. 332,868

Int. Cl.<sup>3</sup> B67B 7/40, 7/44

U.S. Cl. 81—3.46 R

7 Claims



1. A tab-top can opener comprising a slotted body portion integrally formed with a handle at one end and chisel-like starter edge at an opposite end, said opener having a long axis extending in a direction from said handle end to said starter edge end, said body portion including a transverse tab slot extending therethrough with openings at upper and lower sides, the opening at the lower side being the opening for tab insertion, the body having spaced-apart first and second wall portions connecting at opposite side walls to define the depth and width of said slot, said tab slot being sized to accommodate a major portion of a can tab therein, at said lower side said first wall portion including a striker projection extending slot-outwardly a distance from said lower side, whereby said opener is capable of engaging a can tab within said slot transversely to said long axis, and said opener capable of opening a tab-top can by means of rotating the opener around said long axis, wherein during engagement of a tab in said tab slot the long axis is maintained in generally parallel relationship with the top of the can, wherein said opener is useful for prying open cans of both the removable and stay-on type tab-tops.

4,416,172

**APPARATUS FOR AUTOMATICALLY FEEDING SCREWS TO A SCREWING MECHANISM**

Walter Medinger, Waldrand 7, D-6730 Neustadt, Fed. Rep. of Germany

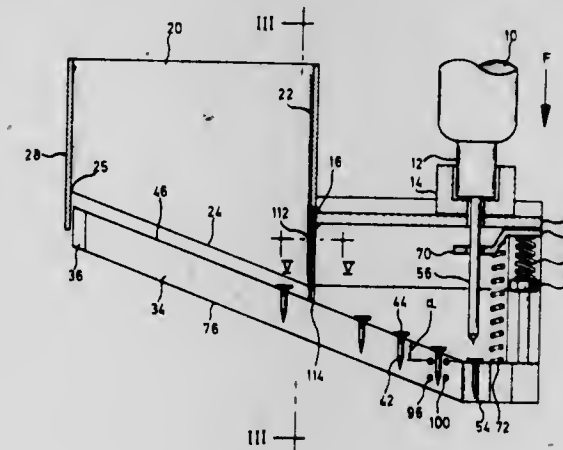
Filed May 14, 1981, Ser. No. 263,361

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018382

Int. Cl.<sup>3</sup> B25B 23/02

U.S. Cl. 81—57.37

11 Claims



1. Apparatus for automatically feeding screws to a screwing

mechanism which includes a rotary screw tool at a screw-in site, said apparatus comprising:

a container fixedly connected to said screwing mechanism, said container adapted to contain a supply of screws,

a feed channel communicating said container with said screw tool to guide screws from said container to a position aligned with a longitudinal axis of said tool,

said feed channel and tool being mounted to provide for relative movement therebetween in a generally up and down direction of said longitudinal axis to selectively engage and disengage said tool and an aligned screw, and

spring means arranged to act against said feed channel and screwing mechanism to urge said feed channel and screwing tool apart toward a screw-disengaging condition.

4,416,173

**WRENCH ADAPTER**

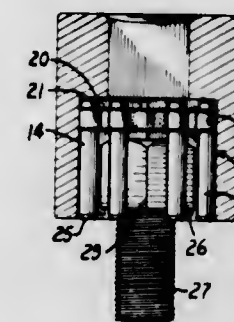
Edward J. Reblsh, Euclid, Ohio, assignor to Russell, Burdick & Ward Corporation, Cleveland, Ohio

Filed Dec. 7, 1981, Ser. No. 327,810

Int. Cl.<sup>3</sup> B25B 13/58

U.S. Cl. 81—185

22 Claims



1. A wrench adapter for wrenches having a regular polygonal wrenching opening therein which provides flats and corners at the intersection of adjacent flats, comprising a plurality of generally cylindrical rigid pins, and a retainer connecting said pins, said retainer positioning said pins in an array in which said pins are substantially parallel and are symmetrically positioned about a central axis, said adapter being insertable into and removable from such wrenching opening with said pins positioned in said corners thereof, said adapter permitting use of a wrench on fasteners having a size different from the size of the wrenching opening therein, said pins being operable to engage associated flats of such an opening and adjacent surfaces of such a fastener and upon such engagement being operable to transfer substantial torque applied to such wrench to such fastener.

4,416,174

AUXILIARY SUPPORT FIXTURE FOR A STEADY REST  
Paul J. Owsen, Traverse City, Mich., assignor to Century Specialties, Inc., Traverse City, Mich.

Filed Jun. 24, 1981, Ser. No. 276,729

Int. Cl.<sup>3</sup> B23B 3/36, 25/00

U.S. Cl. 82—38 R

6 Claims

1. An auxiliary support fixture for a steady rest having a plurality of movable fingers extending from one end thereof between opposing faceplates, operative to be moved by a pneumatically operated piston for engaging a workpiece to be machined by a tool, said fixture comprising:

a bracket mounted on one faceplate of the steady rest, said bracket including an arcuate slot therein which is concave with respect to the end of the steady rest;

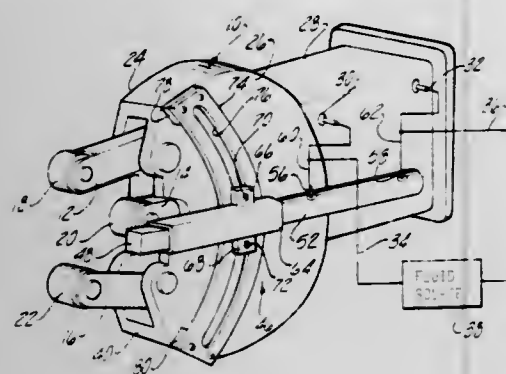
an elongated cylinder containing a pneumatically operated piston;

an abutment member connected to one end of the piston, said abutment member including a stationary end face for engaging a workpiece;

means for connecting said cylinder to the slot in the bracket

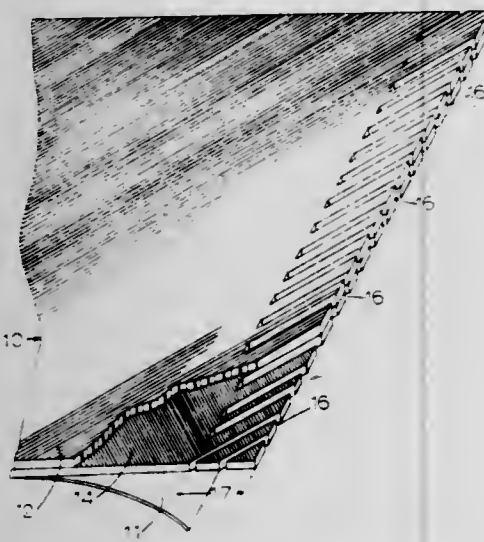


whereby the angle of the longitudinal axis of the cylinder may be adjusted; and means for connecting said pistons of the steady rest and support fixture to a common fluid source so that said



abutment member and steady rest fingers move in unison, with the abutment member being adapted to engage the workpiece diametrically opposite the machine tool to provide additional backup support for the workpiece during machining operations.

**4,416,175**  
**COMPOSITE LAMINATING METHOD AND PRODUCT**  
Timothy J. Bettner, Costa Mesa; Frank E. Sullivan, Redondo Beach, and Croydon R. Hartley, Fountain Valley, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.  
Filed Feb. 1, 1982, Ser. No. 344,479  
Int. Cl.<sup>3</sup> B26D 7/06; B32B 31/00, 5/12  
U.S. Cl. 83—29



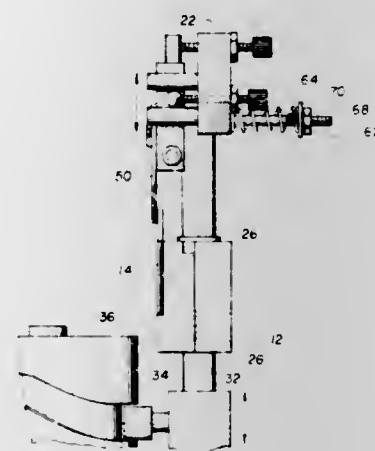
1. A method of providing structural drop-off in a two-ply resin impregnated prepried laminate wherein each ply of said laminate has unidirectionally oriented fibers, with the fibers of each ply oriented across the fibers of the other ply on a bias, comprising the step of:

feather cutting a common edge of said two-ply resin impregnated prepried laminate so that said feather cuts are parallel to the orientation of the fibers in one said ply and across the orientation of the fibers in the other said ply whereby negligible structural effect is caused in said one ply and significant structural effect is caused in the other ply by shortening of the fibers along the feather cut edge.

**4,416,176**  
**CUTTER ASSEMBLY FOR CUTTING STRIP MATERIAL**  
Frederick Forthmann, 688 Pascack Rd., Washington Township, Washington County, N.J. 07675  
Filed Jan. 15, 1982, Ser. No. 339,761  
Int. Cl.<sup>3</sup> B26D 1/08

U.S. Cl. 83—582

6 Claims



1. A cutter assembly for cutting strip material into individual lengths, comprising a fixed support, a fixed blade having a first side secured to said support and an opposite second side and having a top cutting edge over which the strip material to be cut is fed, a movable member movable upwardly and downwardly relative to said fixed blade, guideway means defined at laterally spaced locations on said movable member, means connected to said movable member to move it upwardly and downwardly, a movable blade assembly including a block portion and a blade portion, said block portion having a guide portion extending laterally outwardly from each end and confined in respective guideway means, said blade portion having a bottom knife edge cooperable with said top cutting edge of said fixed blade to sever the strip material, spring means acting between said movable blade assembly and said movable member to urge said movable blade toward said movable member, and a plurality of threaded adjustment members threaded to said movable member and acting on said movable blade assembly at laterally and vertically spaced locations to adjust the position of said movable blade assembly relative to said movable member and said fixed blade.

**4,416,177**  
**DATA INPUT FOR COMPUTER ORGAN**  
Marvin Loeb, 2120 Middlefield Rd., Palo Alto, Calif. 94301  
Filed Mar. 2, 1981, Ser. No. 239,849  
Int. Cl.<sup>3</sup> G10H 1/02

U.S. Cl. 84—1.19

2 Claims

1. In combination a digital computer organ equipped with an optical card reader having a number of optical sensors in a pattern and operable for altering the contents of a number of voice patterns of the organ;

a keyboard with a plurality of keys, a first group of keys of the keyboard being specific to selected voice patterns of said computer organ, and a second group of keys of the keyboard being function keys for modification of a selected voice pattern, said keyboard being operative to generate a binary signal to indicate actuation of individual keys of the keyboard;

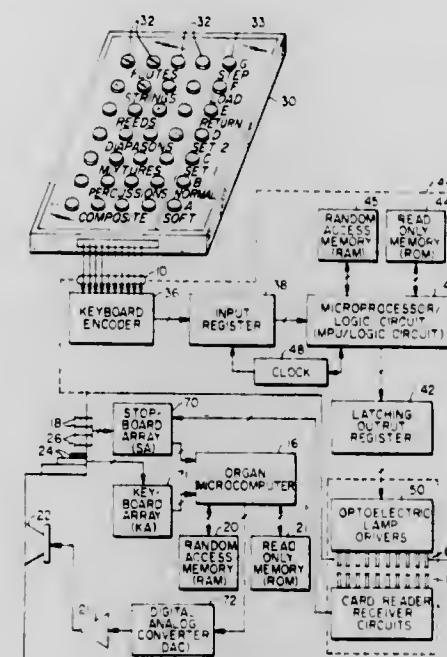
a decoder responsive to said binary signal for generating a unique digital word identifying a selected voice pattern;

a storage register for temporarily storing said digital word from said decoder;

a circuit means responsive to said stored word in said storage register for generating a plurality of digital bytes in a preselected sequence;

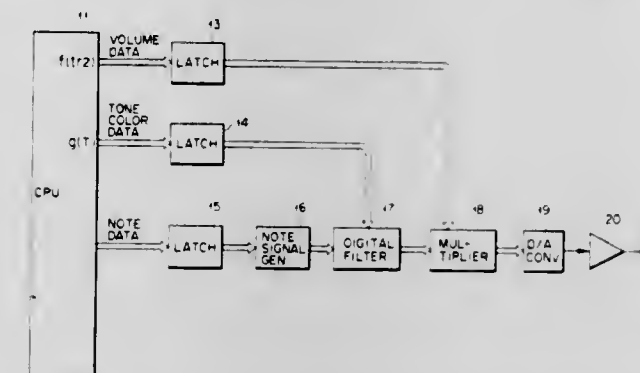
a number of optoelectrical emitters adjacent to and arranged in an array matching the pattern of said optical sensors of

said optical card reader of said digital computer organ; and a number of drivers coupled to said optoelectrical emitters and responsive to said sequence of bytes for driving corresponding optoelectrical emitters such that



**4,416,178**  
**TOUCH RESPONSE PROVIDING APPARATUS**  
Hideaki Ishida, Hachioji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan  
Filed Dec. 15, 1981, Ser. No. 330,843  
Claims priority, application Japan, Dec. 22, 1980, 55-182230; Dec. 22, 1980, 55-182231  
Int. Cl.<sup>3</sup> G10H 1/06, 1/34, 1/46  
U.S. Cl. 84—1.19

16 Claims



1. A touch response providing apparatus for changing the characteristics of output musical sound from an electronic keyboard musical instrument, having a plurality of performance keys, according to the state of operation of a performance key being operated, comprising:

a set of at least three switches coupled to each of said performance keys of the electronic keyboard musical instrument and which are switched in a predetermined order at the time of the operation of said each key;

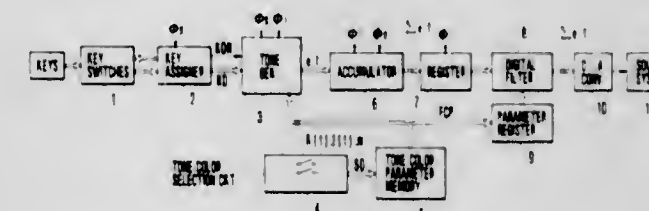
counting means coupled to said set of at least three switches for each of said keys for counting the periods required for the switching of the individual switches corresponding to an operated key at the time of the key operation, and for providing a count output corresponding to the length of the counted periods; and

control means coupled to said counting means for controlling at least two characteristics of the output musical sound produced by the instrument in correspondence with

the key operation as a function of the count output of said counting means.

**4,416,179**  
**ELECTRONIC MUSICAL INSTRUMENT**  
Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 21, 1982, Ser. No. 370,177  
Claims priority, application Japan, Apr. 23, 1981, 56-60609  
Int. Cl.<sup>3</sup> G10H 1/02  
U.S. Cl. 84—1.19

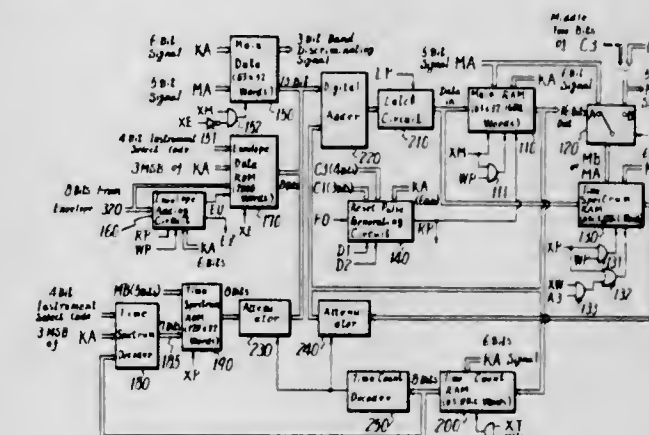
11 Claims



1. An electronic musical instrument comprising: keyboard means having a plurality of keys; tone color selecting means for selecting a tone color among predetermined tone colors; tone signal generating means for generating, on a time division basis, musical tone signals corresponding to depressed keys among said plurality of keys, said musical tone signals collectively forming a periodic sequence of sampled values which occurs respectively, each said musical tone signal containing a fundamental component and harmonic components determined by the selected tone color; accumulating means connected to said tone signal generating means for accumulating the sampled values of said sequence and resetting the accumulated value to a predetermined value after outputting an accumulated musical tone signal represented by said accumulated value once per repetition of said sequence; digital filtering means connected to said accumulating means for imparting a fixed formant characteristic characterizing said selected tone color to said accumulated musical tone signal; and musical tone forming means for forming a musical tone in accordance with said accumulated musical tone signal.

**4,416,180**  
**WAVE SYNTHESIZING APPARATUS**  
Hiroshi Ichigaya, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan  
Continuation of Ser. No. 180,457, Aug. 22, 1980, abandoned.  
This application Sep. 17, 1982, Ser. No. 419,524  
Claims priority, application Japan, Aug. 24, 1979, 54-107823  
Int. Cl.<sup>3</sup> G10H 1/06  
U.S. Cl. 84—1.23

27 Claims



1. A waveform synthesizing apparatus comprising: means for digitally storing a selected plurality of identifiers



of previously selected harmonic and non-harmonic component waveforms of a selected analog output signal to be synthesized, some of said harmonic and non-harmonic identifier being stored in said means for digitally storing plural times corresponding to a selected rate at which an amplitude value for said corresponding component waveform is to be formed,

means for digitally generating a plurality of addresses, one at a time in sequence, said means for generating is connected to said means for digitally storing and adapted to repetitively generate said plurality of addresses and to cause said means for digitally storing to read out at a predetermined rate, for a predetermined time interval and in a predetermined sequence each of the members of said plurality of identifiers of components,

means for digitally sensing each said readout component identifier during a corresponding time interval and including means for calculating a corresponding amplitude value for each said respective harmonic and non-harmonic waveform component during said corresponding time interval, each said amplitude value is calculated at the rate corresponding to said number of times said corresponding component identifier is stored in said means for storing,

means for digitally combining during said corresponding time interval each said calculated amplitude value with a plurality of previously calculated and combined component amplitude values to form a digital value and

means for simultaneously forming during said corresponding time interval an analog output signal based on said corresponding digital value.

4,416,181

## PRETUNED HEAD FOR DRUM OR THE LIKE

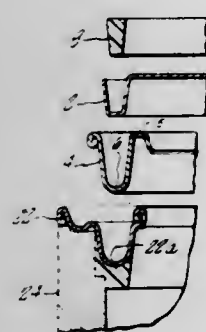
Donald R. Hartry, La Canada, and Remo D. Belli, Sherman Oaks, both of Calif., assignors to Remo, Inc., North Hollywood, Calif.

Filed Apr. 3, 1981, Ser. No. 250,912

Int. Cl.<sup>3</sup> G10D 1/10, 13/02

U.S. Cl. 84—272

3 Claims



1. For use with the shell of a drum, tambourine, banjo or similar musical instrument, the improvement comprising, in combination: a hoop member having an inner rim and an outer rim defining an annular channel therebetween, a polymeric vibratile sheet stretched flat under tension across said inner rim of the hoop member and in contact therewith, said vibratile sheet having a peripheral portion secured in said channel, an annular plug received in said hoop member between said inner and outer rims, the tension forces in said vibratile sheet acting to produce a tone of the desired pitch when the sheet is caused to vibrate prior to installation on the shell, said vibratile sheet remaining out of contact with said shell after such installation.

4,416,182

## KEYBOARD INSTRUMENT TEACHING DEVICE

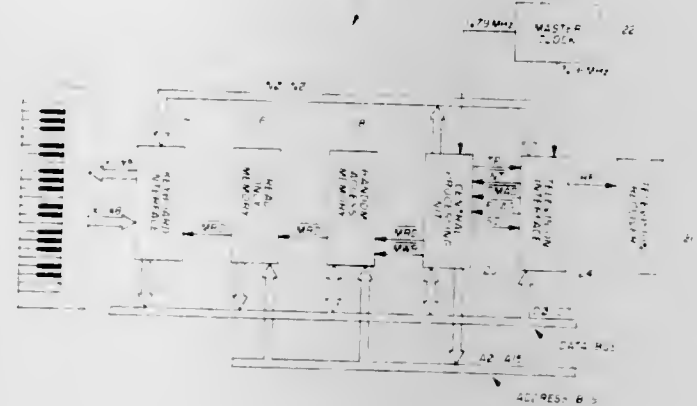
Stephen A. Wise, Macungie, and John T. Whitefield, Harleysville, both of Pa., assignors to Allen Organ Company, Macungie, Pa.

Filed Sep. 24, 1981, Ser. No. 305,051

Int. Cl.<sup>3</sup> G09B 15/00; A63F 9/22; G06F 15/44

U.S. Cl. 84—470 R

8 Claims



1. Apparatus for self instruction of a student of keyboard musical instruments which enables the student to correlate the positions of the keys on a musical instrument keyboard with the positions of the notes on a musical scale comprising:

a keyboard having a plurality of keys corresponding to the notes of a musical scale for generating a first set of control signals in an initialization or set up mode and for generating key-note correlation signals in an instruction or game mode;

at least one storage means having a predetermined combination of logical signals contained therein said predetermined combination of logical signals providing a source for a random sequence of one or more notes over a predetermined range in the game mode, said at least one storage means generating a second set of control signals in response to the actuation of one or more of said keys in either the set up or game modes;

means for generating audio tones and displaying video images in accordance with said first and second sets of control signals on a video display means having an audio tone generating means associated therewith enabling the student to respond to the visually displayed images and audio tones by his or her selection of one or more of said keys and to visually and audibly check the accuracy of such selection.

4,416,183

## ROCKET RETENTION AND IGNITION SYSTEM

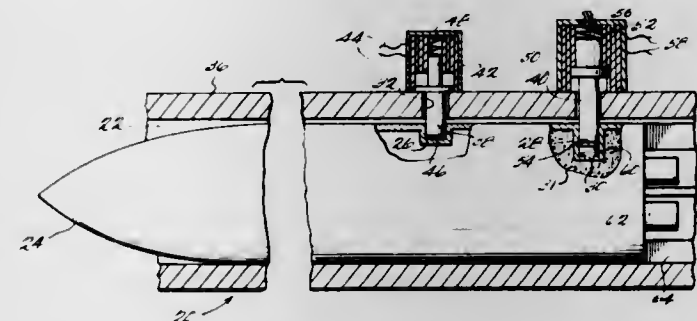
Robert W. Adams, 11404 Farmland Dr., Rockville, Md. 20852, and Charles R. Donohoe, 15309 Basswood Ct., Rockville, Md. 20853

Filed Jul. 28, 1981, Ser. No. 287,643

Int. Cl.<sup>3</sup> F41F 3/06

U.S. Cl. 89—1,807

27 Claims



1. A rocket retention and ignition system comprising:

at least one rocket launch tube having a launching cavity therein for receiving a rocket to be launched and having a bore through a wall thereof for accommodating a retaining and firing pin;

a single rocket retaining and firing pin positioned so as to be linearly movable through said bore between a withdrawn position and an extended position wherein the pin extends into said launching cavity and shaped at a retaining end thereof for engaging, when extended, a retaining groove formed in a rocket received within said launching cavity, and having a firing contact for electrically engaging a firing contact of said rocket, the outside diameter of said retaining pin being of substantially the same size as the diameter of said bore in which it is received, but sufficiently smaller in diameter than said bore to allow for the linear displacement of said pin within said bore;

means for moving said pin to either its extended position for engaging the retainer groove of the rocket or to its withdrawn position for disengaging a rocket being launched or for permitting the loading of a rocket into the launch tube; and

means for conducting a rocket firing signal to said firing contact of said pin to fire said rocket.

4,416,184

## AMMUNITION CHANNEL

Erich Jenny, Schwerzenbach, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

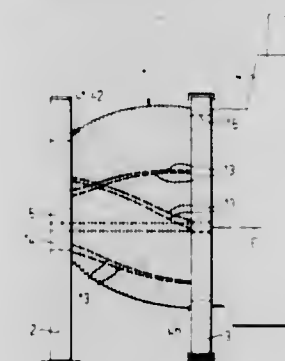
Filed May 21, 1981, Ser. No. 266,087

Claims priority, application Switzerland, Jun. 4, 1980, 4319/80

Int. Cl.<sup>3</sup> F41D 10/04

U.S. Cl. 89—33 BB

3 Claims



1. An ammunition channel for the infeed of ammunition to a weapon which is pivotable about an elevation axis, comprising: two end portions;

one of said end portions being mounted to be pivotable conjointly with the weapon;

a plurality of substantially planar plate-shaped elements pivotably arranged between both of said end portions;

tension and torsion resilient elements guided through said plate-shaped elements and attached to said end portions;

a shaft arranged substantially coaxially with respect to the elevation axis of the weapon;

said shaft being rotatably mounted in both of said end portions;

said plate-shaped elements being pivotably mounted upon said shaft; and

said tension and torsion resilient elements being arranged at essentially the same radial spacing from the shaft and directly extending through said plate-shaped elements.

4,416,185

## ALTERNATE AMMUNITION BELT FEEDER OF AN AUTOMATIC FIRE ARM HAVING A LINEAR BREECH

Norbert Schenk, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

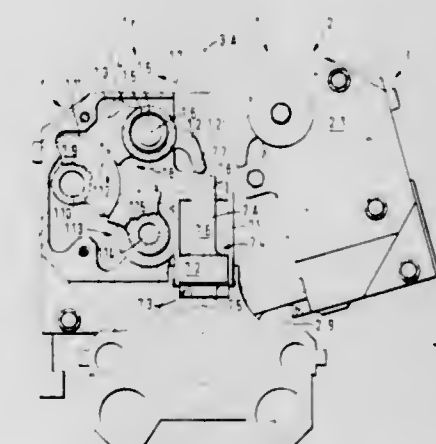
Filed Jun. 24, 1981, Ser. No. 276,828

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023957

Int. Cl.<sup>3</sup> F41D 10/32

U.S. Cl. 89—33 SF

9 Claims



1. An improved alternate ammunition belt feeder for an automatic fire arm having a linear breech, in particular a machine cannon, for selectively feeding ammunition from two separate ammunition belts arranged above the belt feeder via respectively a first and second cartridge feeding means, said first and second feeding means including two rotatable mirror-symmetrically arranged cartridge feeding stars mounted on respective support shafts therefor and a gas-pressure actuated energy converter including a piston-cylinder arrangement which is adapted to selectively provide driving energy received from the propellant gas which forms during firing to one of the two cartridge feeding stars and further having a housing which is laterally movable relative to the longitudinal axis of the weapon between a first and second end position through an intermediate position so that when said housing is selectively switched into one of the two end positions a ready to be fired cartridge from the first or second guide means is directly positioned into a position for entrainment by the breech of the weapon by the coaction of an energy receiving means which is operatively connected to the energy converter which is adapted to coact with said first (second) feeding means, the improvement comprising,

- (a) said support shafts of the cartridge feeding stars are operatively mounted in said housing which is pivotally mounted in said belt feeder about an axis which is spaced from and parallel to the longitudinal axis of the weapon, so that said housing can be swung from one end position to the other end position via said intermediate position;
- (b) said energy receiving means having a first actuating member which is adapted to coact with the piston of said piston-cylinder arrangement;
- (c) said energy receiving means having a second actuating member which is operatively connected via form-locking driving means with the respective support shafts of the cartridge feeding stars;
- (d) switching and control means are adapted to be operatively connected to the respective support shaft of the cartridge feeding star to introduce the required rotary and axial movement thereto for loading and unloading;
- (e) the housing has a cartridge expelling slit for each cartridge feeding means;
- (f) the cartridge expelling slits are separated from each other by a bisecting foot portion;
- (g) when said housing is in the intermediate position there is no form-locking engagement between the piston and the energy receiving means, said foot portion having a U-



profile so that the breech of the weapon can reciprocate along its operative path without engaging any parts of said ammunition belt feeder; and  
(h) said housing having a belt inlet opening adjacent to and to the left or right of said swing axis;

#### 4,416,186 SEAR BUFFER

Leroy J. Sullivan, Singapore, Singapore, assignor to Chartered Industries of Singapore Private Limited, Jurong Town, Singapore

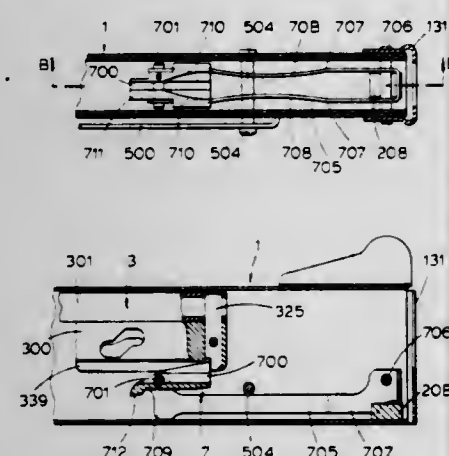
Filed Jul. 6, 1981, Ser. No. 280,740

Claims priority, application United Kingdom, Dec. 11, 1980, 8039739

Int. Cl.<sup>3</sup> F41D 11/02

U.S. Cl. 89—198

8 Claims



1. A sear buffer for a gas operated gun including a U-shaped member having resilient bowed longitudinal arms, each of said arms having a free end for mounting a sear therebetween and locating means for securing said U-shaped member to the gun.

#### 4,416,187

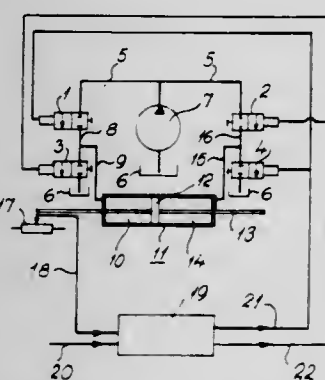
ON-OFF VALVE FLUID GOVERNED SERVOSYSTEM  
Nyström Per H. G., Grahallavägen 10, SE-490 30 Borensberg, Sweden

Filed Feb. 10, 1981, Ser. No. 233,130

Int. Cl.<sup>3</sup> F15B 13/044, 13/16

U.S. Cl. 91—361

1 Claim



1. A servosystem comprising in combination, a fluid-actuated double-acting piston-cylinder unit, two on-off electrically controlled valves for governing supply of fluid to said unit arranged between a high pressure source and a low pressure reservoir for said fluid, two conduits for supplying fluid from said source to the opposing sides of said piston each having a branch connection being branched off from a fluid connection between the said high pressure source and one of said valves, common controller means coupled for operating the valves with two separate alternating trains of electrical pulses of variable width synchronously emitted therefrom, fluid control means connected between each of the said con-

duits and the source for supplying fluid to said piston from the source, means governing the opening and closing of each of said valves by said two separate output pulse signal trains emitted from said common controller in a manner respectively tending to move said piston in opposite directions to a servo position established in response to difference in pulse width in the two said pulse trains, and means for influencing the controller output pulse trains to establish said servo position in response to a comparison of the position of the piston with a governing signal, wherein said fluid control means consist of on-off valves governed by said pulse trains and are coupled upstream between said conduits and the high pressure source, and wherein one valve upstream to the branch connection of one conduit to the said piston and the valve downstream to the branch connection of the other conduit to the said piston are connected to a first of said pulse trains for synchronous governing, and that the two remaining valves are connected to the second of said pulse trains.

#### 4,416,188 BRAKE BOOSTER

Masayoshi Katagiri, Takashi Fujii, both of Toyota, and Osamu Ogura, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

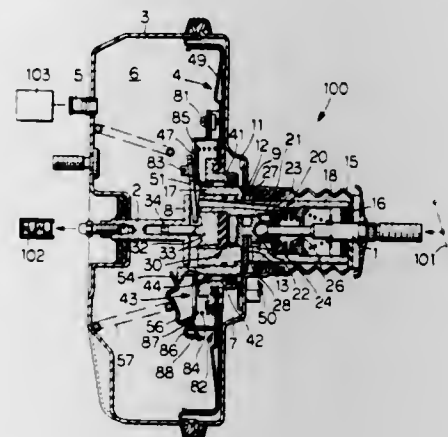
Filed May 19, 1981, Ser. No. 265,224

Claims priority, application Japan, May 26, 1980, 55-72379[U]; May 27, 1980, 55-72859[U]

Int. Cl.<sup>3</sup> F15B 9/10

U.S. Cl. 91—369 B

10 Claims



1. A brake booster comprising:

- an input member;
- an output member;
- a power piston disposed in a booster casing in such a manner as to divide an interior of said casing into two chambers so that said power piston may be actuated by a pressure difference in said two chambers, said power piston having a central bore;
- a control piston coupled for axial movement within the central bore of said power piston and having a control valve means for controlling said pressure difference and a first transmission means coupled for transmitting an operational force received by said input member to said output member;
- a reaction lever having a first input portion, and a second input portion, said reaction lever having a central output portion and being coupled to abut said output member at said central output portion, said reaction lever being coupled to receive an output force from said power piston at said first input portion and an output force of said first transmission means at said second input portion wherein said first and second input portions are located on opposite sides of said central output portion, for producing a larger stroke at said output member than the stroke at said input member;
- a second transmission means coupled for axial movement

relative to said power piston and control piston, said power piston having an internal surface and said control piston having an external surface spaced from the internal surface of said power piston, said second transmission means being disposed in said space for transmitting said output force of said power piston to said first input portion of said reaction lever;

stopper means for limiting the relative movement of said second transmission means with respect to said power piston;

biasing means for biasing said second transmission means against said stopper means with a predetermined resilient force; and

said second transmission means being constructed and arranged such that it couples said power piston and said control piston in relatively fixed relationship with respect to one another when the reactionary force from said reaction lever exceeds said predetermined resilient force in response to movement of said power piston.

said third control orifice means when said second load chamber is subjected to negative load.

#### 4,416,190 SEAL FOR COMPRESSOR

Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

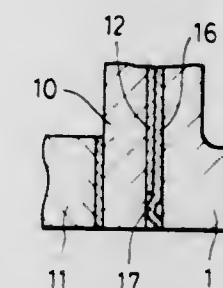
Filed Dec. 8, 1980, Ser. No. 214,097

Claims priority, application Japan, Dec. 13, 1979, 54-172526[U]; Jan. 31, 1980, 55-11033[U]

Int. Cl.<sup>3</sup> F04B 1/16, 1/18

U.S. Cl. 92—71

21 Claims



1. A compressor comprising:

- a cylinder block;
- a cylinder head rigidly mounted on one end of said cylinder block;
- a valve plate interposed between said cylinder block and said cylinder head;
- a sheet-like suction valve interposed between said cylinder block and said valve plate and having an outer peripheral edge; and
- a gasket having elasticity and provided at least between said cylinder block and said cylinder head; said gasket having a radially inner flat portion, a radially outer flat portion and an axially projected swell located between said radially inner and said radially outer flat portions; said radially inner flat portion, said radially outer flat portion and said axially projected swell being formed integrally on said gasket; said axially projected swell being located in the vicinity of an outer peripheral edge of said gasket and extending along the whole circumference of said gasket; said axially projected swell being located radially outwardly of the outer peripheral edge of said sheet-like suction valve; said radially inner flat portion, said radially outer flat portion and said axially projected swell being wholly fixedly interposed between said cylinder block and at least one of said cylinder head and said valve plate and being elastically held within a clearance therebetween to seal at least the junction between said cylinder block and said cylinder head; said axially projected swell having, in a free state, a predetermined axial size which is larger than the sum of the thicknesses of said suction valve and other portions of said gasket, both in a free state; said clearance having a width thereof substantially determined by the sum of the thicknesses of said other portions of said gasket and said suction valve; and said axially projected swell being disposed within said clearance in a manner maintaining a swelled state thereof.

#### 4,416,189 FULLY COMPENSATED FLUID CONTROL VALVE

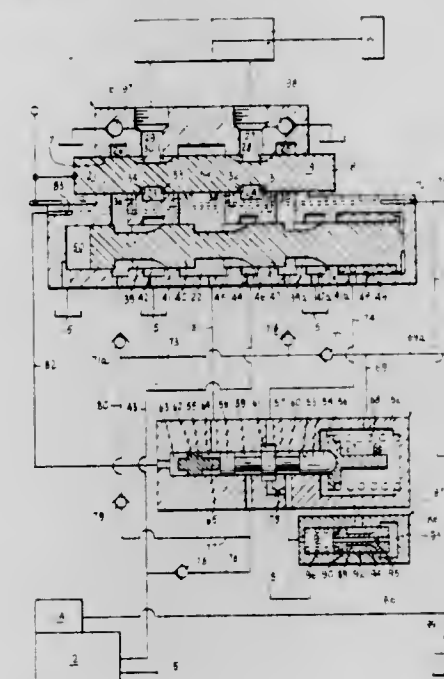
Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 21, 1982, Ser. No. 390,477

Int. Cl.<sup>3</sup> F15B 13/02

U.S. Cl. 91—421

23 Claims



19. A valve assembly comprising a housing having an inlet chamber connected to a pump, first and second load chambers connected to a fluid motor, and first and second outlet chambers connected to exhaust means, means operable to selectively communicate said first and second load chambers with said inlet chamber and said first and second outlet chambers, first control orifice means interposed between said inlet chamber and said first and second load chambers, second control orifice means interposed between said first load chamber and said first outlet chamber, third control orifice means interposed between said second load chamber and said second outlet chambers, first negative load fluid throttling means between said first outlet chamber and said exhaust means, second negative load fluid throttling means between said second outlet chamber and said exhaust means, connecting means between said first and said second negative load fluid throttling means, and control means operable to throttle fluid flow by said first negative load fluid throttling means to maintain a relatively constant pressure differential across said second control orifice means when said first load chamber is subjected to negative load and to throttle fluid flow by said second negative load fluid throttling means to maintain a relatively constant pressure differential across



4,416,191

## VACUUM BOOSTER DEVICE

Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissan Kogyo Kabushiki Kaisha, Nagano, Japan

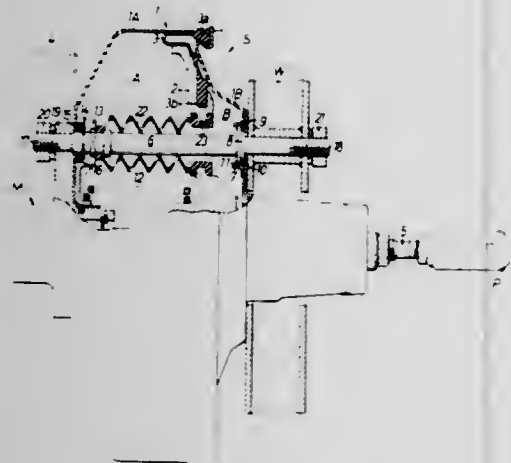
Filed May 7, 1981, Ser. No. 261,149

Claims priority, application Japan, Sep. 19, 1980, 55-133437[U]

Int. Cl.<sup>3</sup> F16J 15/18

U.S. Cl. 92—165 PR

6 Claims



1. In a vacuum booster device comprising a booster shell divided into a front bowl and a rear bowl, a booster piston accommodated in said booster shell, and tie rods extending through said booster piston for connection of said front and rear bowls, the improvement comprising a mounting support fixedly secured to an inside surface of the rear wall of said rear bowl, a stepped flange integrally formed around the outer periphery of said tie rods and fitted in said mounting support, said stepped flange having a large flange portion and a small flange portion, an annular recess defined by said stepped flange, said mounting support and said rear wall of said rear bowl, an elastic sealing member disposed in said annular recess, a retainer ring mounted in said mounting support and cooperating with said sealing member for firmly holding in place said large flange portion of said stepped flange.

4,416,192

## MULTI-DIRECTIONAL NOZZLE ASSEMBLY FOR A FLUID DISPENSING DUCT SYSTEM

Masao Izumi, Fujisawa, and Hiroshi Yoshida, Zama, both of Japan, assignors to Nissan Motor, Company, Limited, Kanagawa, Japan

Filed Nov. 24, 1981, Ser. No. 324,429

Claims priority, application Japan, Nov. 26, 1980, 55/165287

Int. Cl.<sup>3</sup> F24F 13/062

U.S. Cl. 98—40 N

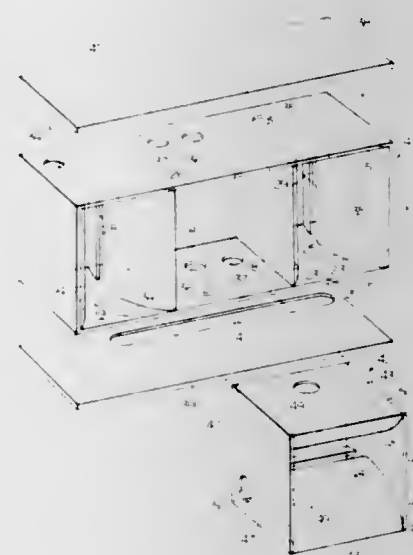
2 Claims

1. A multi-directional nozzle assembly for a fluid dispensing duct system, comprising:

a housing structure having first, second and third directions perpendicular to one another and at least three sections arranged in the first direction of the housing structure and consisting of first and second sections respectively constituted by the outermost two of the three sections and a third section constituted by the remaining one of the three sections, each of the first and second sections being arranged with a fluid dispensing passageway extending in a direction parallel with the second direction of the housing structure and first and second control fluid chambers spaced apart from each other across the fluid dispensing passageway in a direction-parallel with the first direction of the housing structure, the housing structure further having in each of the first and second sections a pair of slots providing communication between the fluid chambers, respectively, of each of the first and second sections in directions parallel with said first direction of the housing structure, a fluid inlet opening for allowing the first

control fluid chamber to be open at the fluid inlet end of each of the first and second sections, a first fluid distribution passageway between the first control fluid chamber of the first section and the second control fluid chamber of the second section, a second fluid distribution passageway providing communication between the first control fluid chamber of the second section and the second control fluid chamber of the first section, a first pair of openings each for providing communication between said first fluid distribution passageway and said third section and a second pair of openings each for providing communication between said second fluid distribution passageway and said third section so that a flow of fluid to be discharged from the fluid dispensing passageway is to be deflected by the slots of the housing structure in a plane parallel with the first and second directions of the housing structure, two control valve units each provided in conjunction with one of the control fluid chambers of each of the first and second sections and operative to regulate the direction in which a flow of fluid to be passed through the fluid dispensing passageway of each of the first and second sections is to be discharged therefrom, and

a nozzle unit detachably fitted in the third section of the



housing structure and having a fluid dispensing passageway extending in a direction parallel with the second direction of the housing structure, a pair of control fluid chambers spaced apart from each other across the fluid dispensing passageway of the nozzle unit and a pair of slots providing communication between the fluid dispensing passageway and the control fluid chambers of the nozzle unit in directions parallel with one of the first and third directions of the housing structure, a first pair of openings each for providing communication between said first fluid distribution passageway and one of the control fluid chambers of the nozzle unit, and a second pair of openings each for providing communication between said second fluid distribution passageway and the other of the control fluid chambers of the nozzle unit, the nozzle unit being assumable in the third section a first position in which a flow of fluid to be passed through the fluid dispensing passageway of the nozzle unit is to be deflected by the slots of said nozzle unit in a plane parallel with the second and third directions of the housing structure and a second position in which a flow of fluid to be passed through the fluid dispensing passageway of the nozzle unit is to be deflected in a plane parallel with the first and second directions of the housing structure.

4,416,193

## SYSTEM FOR VAPOR PRECIPITATION AND RECOVERY IN A CONTINUOUS COATER

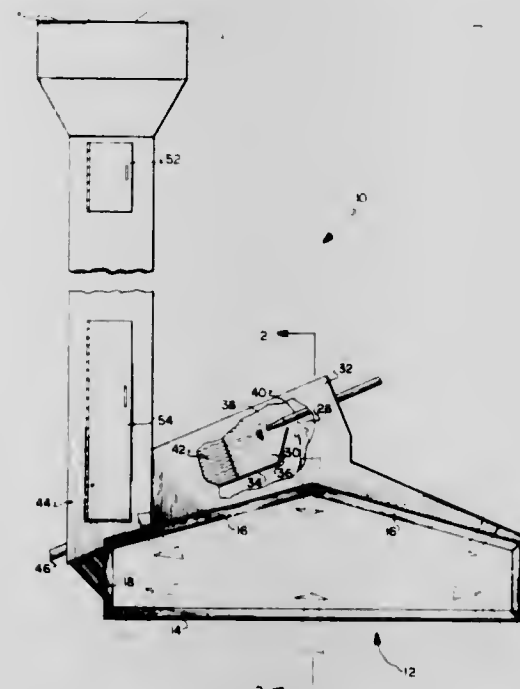
John Sharpless, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Feb. 5, 1982, Ser. No. 346,014

Int. Cl.<sup>3</sup> B05D 1/02; B01D 47/06

U.S. Cl. 98—115 SB

18 Claims



1. In a continuous coater having entrance and exit passages and a spray booth, at least one of the passages communicating with said spray booth, the improvement of a vapor precipitation and recovery system, comprising:

- a scrubbing chamber located above said at least one passage;
- a slot opening, said opening located substantially across the entire width of the top of said at least one passage so that said at least one passage communicates with said scrubbing chamber;
- said scrubbing chamber having a spray nozzle means for providing a spray;
- a precipitant baffle maintained within said scrubbing chamber and in close juxtapositional relationship to said spray nozzle means so as to be sprayed thereby;
- said scrubbing chamber having a shield plate located between said spray nozzle means and said slot opening;
- an exhaust stack, said exhaust stack located adjacent to said scrubbing chamber and being in communication therewith.

4,416,194

## BEVERAGE PASTEURIZING SYSTEM

David M. Kemp, Naperville, Ill., assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 3, 1981, Ser. No. 327,238

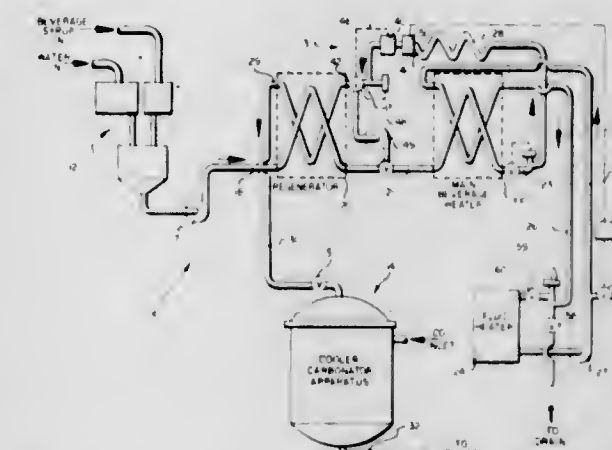
Int. Cl.<sup>3</sup> A23L 3/00

U.S. Cl. 99—275

15 Claims

1. A pasteurizing system, comprising, in combination: a heat recovery regenerator for receiving an incoming flow of beverage liquid and for transferring heat from an outgoing flow of beverage liquid to the incoming beverage liquid flow, a main beverage heater connected to the regenerator for heating the incoming beverage liquid flow to a pasteurizing temperature, a transfer line for leading the beverage from the regenerator to the main heater, a fluid heater for providing hot fluid to the main heater and thereby heat the beverage flow, a holding tube for holding the hot beverage until the pasteurizing process is complete and for transferring the hot beverage to the heat recovery regenerator, where the beverage loses heat to more incoming beverage, a low beverage temperature sensor in the holding tube for sensing excessively low beverage temperature, a diversion valve located in the holding tube downstream

of the low temperature sensor but upstream of the heat recovery regenerator, and operated by the low temperature sensor, and a diversion line leading from the diversion valve to the



transfer line, whereby excessively cool beverage fluid in the holding tube is quickly recycled through the main heater for further heating and pasteurization.

4,416,195

## PIMENTO CORING MACHINE

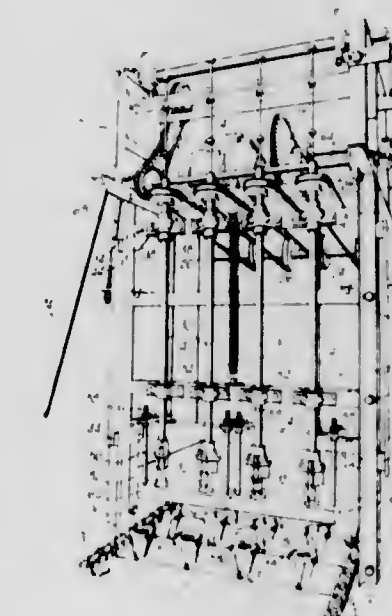
William T. Miller, Haddock, Ga., assignor to Cherokee Products Company, Haddock, Ga.

Filed Jan. 17, 1983, Ser. No. 458,483

Int. Cl.<sup>3</sup> A23N 4/00, 4/12, 7/08

U.S. Cl. 99—544

12 Claims



1. In a machine for coring pimentos and the like, a conveyor transporting pimentos to and from a coring position and dwelling at the coring position, a reciprocating coring knife carriage at the coring position and moving at substantially right angles to the path of movement of the conveyor toward and away from the conveyor whereby coring knives on said carriage can remove cores from pimentos and the like on the conveyor while the conveyor is dwelling and the carriage is substantially at its nearest proximity to the conveyor, the movements of the conveyor and carriage being synchronized but also being subject to non-synchronization at certain times, the improvement comprising mechanical means on the carriage and reciprocating with the carriage and entering an open space of the conveyor without contacting the conveyor when the carriage is at said nearest proximity to the conveyor and the conveyor and carriage are in proper synchronization, and the mechanical means engaging a mechanical part of the conveyor and thereby arresting movement of the carriage toward the conveyor substantially short of the nearest proximity of the carriage to the conveyor to prevent engagement of the coring knives of the



carriage with product holding cups of the conveyor when the conveyor and carriage are out of synchronization.

4,416,196

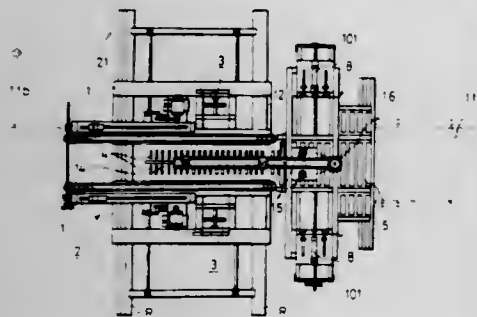
## TYING MACHINE

Masatoshi Yamada, and Takaji Fuse, both of Funabashi, Japan, assignors to Yamada Kikai Kogyo Kabushiki Kaisha, Chiba, Japan

Continuation-in-part of Ser. No. 244,977, Mar. 18, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,952 Int. Cl.<sup>3</sup> B65B 13/20

U.S. Cl. 100—7

16 Claims



1. A tying machine comprising a bundle shaping unit including side aligning means for aligning sides of a bundle to be tied, a tying unit including a pair of tying devices disposed opposite to each other for tying a string around the bundle and press means exercising a compressing force upon the bundle to be tied during the tying operation effected by said tying devices, a feeding device for stopping the bundle during the operation of said bundle shaping unit and feeding the bundle from said bundle shaping unit to said tying unit one by one upon completion of each cycle of the operation of said bundle shaping unit, said feeding device including a conveyor portion associated with said tying unit and defining a predetermined linear path of travel of a bundle between said pair of tying devices, and means for moving said pair of tying devices transversely relative to said predetermined linear path of travel selectively away from or toward each other whereby different tying positions for bundles to be tied can be established.

4,416,197

## WASTE MATERIAL COMPACTOR APPARATUS

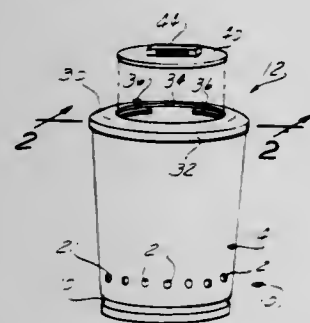
Charles W. Kehl, 11466 Irvington, Warren, Mich. 48093

Filed Oct. 14, 1981, Ser. No. 311,346

Int. Cl.<sup>3</sup> B30B 15/06

U.S. Cl. 100—214

21 Claims



1. A cover for a waste receptacle having an open top end comprising:

- a lip member adapted to engage the top end of the receptacle, the lip member having a central aperture;
- a cover member having a shape proximate the shape of the central aperture for removably closing the central aperture in the lip member and adapted to be inserted through the central aperture into the waste receptacle for compacting the contents thereof; and
- flanges formed on the lip member adjacent to and extending inward from the edges of the central aperture, the flanges

supporting the cover member thereon to close the central aperture in the lip member.

4,416,198

## DRIVE FOR PRODUCING MOTION WITH DWELLS

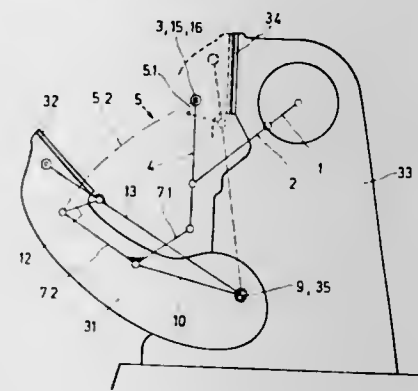
Otto Rasenberger, Emmendingen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,622

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116172

Int. Cl.<sup>3</sup> B41F 1/07; F16H 21/32  
U.S. Cl. 101—3 R

11 Claims



1. Drive for producing motion with intervening dwells comprising a four-bar linkage defining a couple curve travel path traversable only in part and having equally coincident forward and return paths, and a dwell-producing driven rocker arm pair connected thereto, the couple curve travel path having a vertex therein dividing said couple curve travel path into a short curve path for producing a dwell and an elongated curve path extending at an angle to the short curve path for producing a movement, said vertex of said couple curve being identical with an instantaneous pole defining the start and end of the dwell.

4,416,199

## MULTICOLOR IMPRINTER

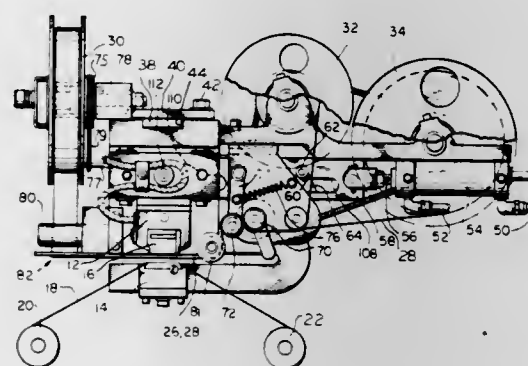
Charles F. Davison, Brookfield, Ill., assignor to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Filed Sep. 1, 1982, Ser. No. 413,705

Int. Cl.<sup>3</sup> B41J 35/24; B41F 1/10

U.S. Cl. 101—193

22 Claims



1. In an imprinting device of the type wherein material to be printed is moved into an impact marking zone between a movable head and a fixed head one of which includes marking indicia thereon, in which a transfer tape is moved through the marking area between the material and the marking indicia from a supply means and is received by a takeup means by a drive, the improvement wherein:

the supply means comprises a rotatable supply reel mounted with its axis of rotation parallel to the direction of tape travel through the marking zone and a plurality of transfer

tapes of different colors wound upon one another as a multilayer structure on said supply reel; and comprising a guide structure mounted between said supply reel and the marking zone including means for separating the multilayer structure into the individual tapes and directing the tapes towards the marking zone parallel and coplanar to one another, the individual tapes being positioned at the marking zone in parallel side by side coplanar relationship in a plane normal to the movement of the indicia, the indicia dimensioned to imprint the material by all of the tapes simultaneously.

4,416,200

## PAPER FEED MECHANISM FOR ROTARY DIE CUTTER

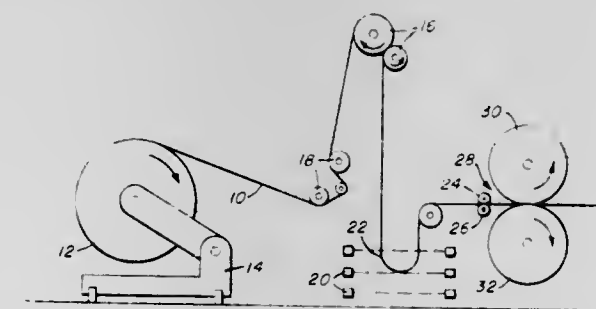
William S. Yon, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Sep. 29, 1982, Ser. No. 428,152

Int. Cl.<sup>3</sup> B41F 13/04

U.S. Cl. 101—228

6 Claims



1. System for eliminating the untreated portions of a web while producing a series of treated areas along the length of the web for the purpose of eliminating waste between treated areas and permitting the two-stage treatment of areas during successive revolutions of the treatment rolls, comprising a pair of parallel treatment rolls carrying treatment means operative at the aligned centerlines of the rolls to effect treatment, said treatment means including a trailing edge and a leading edge, said treatment means gripping and forwardly propelling the web, at the peripheral velocity of the rolls, while effecting treatment, a pair of feed rolls between which the web passes, the feed rolls in synchronization with the treatment means, traveling under the propulsion of the web when the web is engaged by the treatment means and controlling the travel of the web when the web is released by the treatment means, feed roll drive means for producing relative forward and reverse movement of the feed rolls independently of the web propulsion thereof, said drive means serving to drive at least one of the feed rolls through a cycle at a peripheral velocity equal to the propelled velocity of the web imparted thereto by the treatment rolls in the forward direction of movement of the web for a first adjustable distance from a point prior to alignment of the trailing edge of the treatment means with the aligned rolls' centerlines to an adjustable point beyond the aligned centerlines corresponding to a point at or beyond disengagement of the trailing edge of the treatment means from the web, and for a second adjustable distance from a point at or prior to engagement of the leading edge of the treatment means, prior to the aligned centerline of the rolls, to a point beyond the aligned centerlines, and, between disengagement of the trailing edge from the web and engagement of the leading edge with the web, drives the feed rolls in a reverse direction at a velocity equal to the forward velocity of the web for a third distance at least as great as the combined first and second distances.

4,416,201

## INK ROLLER ASSEMBLY WITH CAPILLARY INK SUPPLY

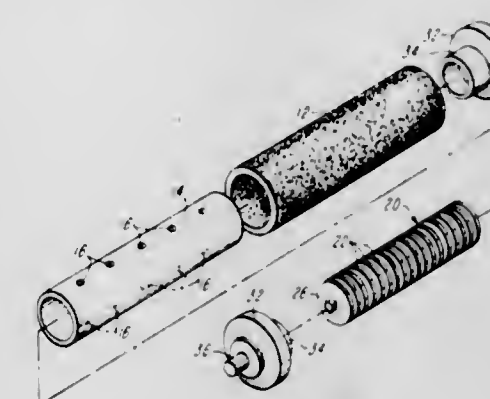
John R. Kessler, West Carrollton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 18, 1981, Ser. No. 322,459

Int. Cl.<sup>3</sup> B41F 31/14; B41L 27/16

U.S. Cl. 101—348

7 Claims



7. An ink roller assembly adapted to provide a uniform application of ink over an extended period of use, comprising a cylindrical sleeve of flexible and porous ink retaining material, a substantially rigid cylindrical support tube within said sleeve for supporting said sleeve, a generally cylindrical ink retaining unit disposed within said tube, means for closing the opposite ends of said support tube, said ink retaining unit including a series of axially spaced generally circular walls having integral central hub means, said hub means rigidly connecting said series of walls together to define therebetween a series of axially spaced annular ink retaining storage chambers each having a width predetermined by said hub means and adapted to receive and store a supply of ink, said walls of said ink retaining unit having an outer diameter generally equal to the inner diameter of said support tube, the spacing between adjacent said walls being greater than the thickness of each said wall, and means defining a plurality of openings through said support tube to provide for a controlled flow of ink from said annular ink retaining chambers into said sleeve.

4,416,202

## CONVEYOR BENCH/WORK STATION WITH SHUNT

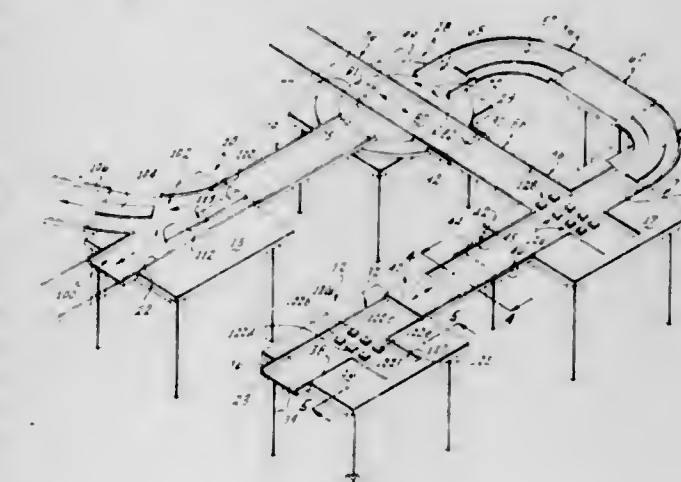
Jack Rooklyn, Northridge, Calif., assignor to Industrial Management Co., Chatsworth, Calif.

Filed May 15, 1981, Ser. No. 263,773

Int. Cl.<sup>3</sup> B61J 1/00

U.S. Cl. 104—88

4 Claims



1. In a conveyor system, in combination, means providing a trackway having a flat bottom and side flanges extending between a plurality of work stations where work pieces or parts are to be transferred between work stations a carrying truck movable along the trackway between work stations, the



truck having supporting means provided by ball castors in fixed positions whereby the truck can move in different directions, the said truck having guide rollers at corners thereof on vertical axes positioned to engage the side flanges of the trackway, the trackway having portions including change in direction which can be traversed by the truck, the trackway having guide elements at said portions, the truck having additional guide rollers on vertical axes at intermediate positions on two sides of the truck, positioned to engage said elements whereby the truck is positively guided while changing direction.

#### 4,416,203 RAILWAY VEHICLE LAMINATED MOUNT SUSPENSION

James W. Sherrick, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

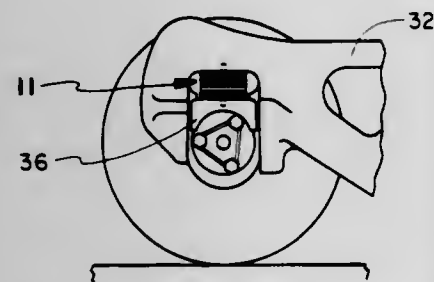
Continuation of Ser. No. 195,969, Oct. 10, 1980, abandoned.

This application Jun. 14, 1982, Ser. No. 388,286

Int. Cl.<sup>3</sup> B61F 5/30; F16F 1/40, 1/44

U.S. Cl. 105—224.1

10 Claims



1. A mount for providing flexibility and wheel load equalization between the undercarriage and axles of a vehicle comprising:

- a top plate and a bottom plate;
- a body of elastomeric material disposed between and attaching to said top and bottom plates;
- a plurality of shim means disposed at spaced intervals within said body of elastomeric material, said shim means dividing said body of elastomeric material into a plurality of individual layers;
- a bearing plate disposed between and attaching to two of said elastomer layers such that at least one of said elastomer layers is disposed between said bearing plate and top and bottom plates;
- at least two lower pin means attaching at a spaced interval to said bottom plate and extending downwardly therefrom;
- at least two upper pin means, said upper pin means extending downwardly from said top plate through at least one of said elastomer layers and attaching to said bearing plate, whereby upon application of a normal force to said top plate of said mount each of said elastomer layers deflect in compression, and upon application of a lateral force to said mount only said at least one of said elastomer layers deflects in shear, said elastomer layers disposed between said top plate and said bearing plate being prevented from deflecting in shear by said upper pin means extending therebetween.

2. In a railway vehicle mount of the type including a body of elastomeric material having first and second opposite ends respectively attachable to first and second vertically spaced and relatively moveable vehicle components for compressive deflection of said body upon relative vertical movement of said vehicle components toward each other and for lateral shear deflection of said body upon relative horizontal movement between said vehicle components, the improvement comprising:

- rigid means for increasing the lateral shear spring rate of said body in relation to the compression spring rate thereof;
- said rigid means including (a) a bearing plate member extending through and bonded to said elastomer body in spaced and generally parallel relationship to said opposite

ends thereof, and (b) pin means fixedly connected to and extending from said bearing plate member to one of said ends of said body for preventing lateral shear deflection of a first portion of said body between said plate and said one end of said body, and for restricting lateral shear deflection of said body to a second portion thereof between said bearing plate member and the other of said ends of said body; whereby upon relative vertical movement of said vehicle components towards each other both of said portions of said body deflect in compression, and upon relative horizontal movement between said vehicle components only said second portion of said body deflects in lateral shear.

#### 4,416,204 AUTOMATIC PIPING MACHINE

Akira Kaze, Sakai, Japan, assignor to Eagle Industry Co., Ltd., Osaka, Japan

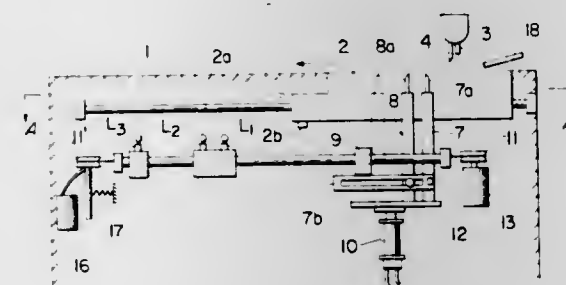
Filed Oct. 8, 1980, Ser. No. 194,949

Claims priority, application Japan, Dec. 19, 1979, 54-165850

Int. Cl.<sup>3</sup> D05B 3/00

U.S. Cl. 112—68

10 Claims



1. A pocket forming apparatus having a center knife, two side needles and two corner cut knives, comprising: a sewing plate having means for carrying a fabric material thereon, a drag fixed on said sewing plate such that the drag engages limit switches to start and stop said center knife and said two side needles, said two corner cut knives being essentially aligned with the line of travel of the center knife, and the distance between the corner cut knives being determined by the position of a stopper, and adjusting means for mechanically changing the distance between the limit switches for said starting and stopping simultaneously and equally with changing of the distance between said two corner cut knives.

#### 4,416,205 YARN FEEDING APPARATUS

Jack M. Schwartz, Rte. 1, Fairmont, Ga. 30139

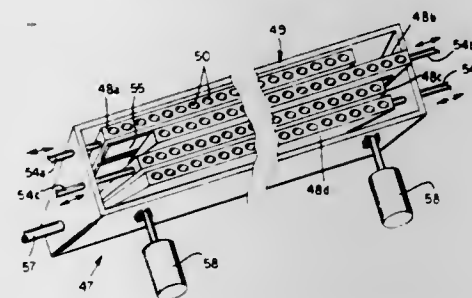
Division of Ser. No. 209,735, Nov. 24, 1980, Pat. No. 4,351,691.

This application Jun. 21, 1982, Ser. No. 390,398

Int. Cl.<sup>3</sup> D05C 15/00

U.S. Cl. 112—79 R

2 Claims



1. Apparatus for feeding yarns to a tufting machine or the like, comprising:

a housing;  
a plurality of yarn support members carried by said housing; each yarn support member having a plurality of yarn feeding tubes aligned on a predetermined first path;  
displacement means operatively associated with at least one of said support members to selectively and individually displace said one support member relative to the other support members, along said first path; and  
movement means operative to displace said housing, together with each yarn support member, along a second path substantially transverse to said first path, so as to place a selected one of said yarn support members in operative yarn feeding alignment with the tufting machine or the like.

#### 4,416,206 CONTROL FOR AUTOMATIC BUTTONHOLE APPARATUS IN ZIGZAG SEWING MACHINE

Nobuyoshi Matsumura, Yao, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

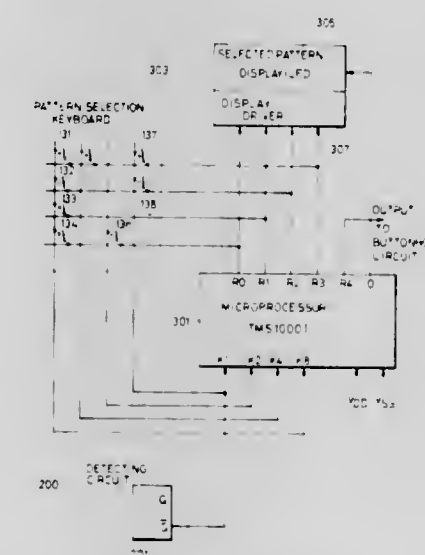
Filed Jun. 8, 1981, Ser. No. 271,572

Claims priority, application Japan, Sep. 5, 1980, 55-123810

Int. Cl.<sup>3</sup> D05B 3/06

U.S. Cl. 112—158 B

13 Claims



1. An automatic buttonholing apparatus in a zigzag sewing machine, comprising: selecting means including at least a pattern sewing selecting switch for selecting pattern sewing and a buttonholing selecting switch for selecting buttonholing, means for generating an electric signal corresponding, respectively, to operation of said pattern sewing selecting switch or of said buttonholing selecting switch, a presser bar means, an attachment affixed to said presser bar means for said buttonholing, detecting means for detecting that said attachment is affixed to said presser bar means, and means responsive to the output of said detecting means to act on said electric signal generating means for rendering ineffective the generation of the electric signal corresponding to the operation of said pattern sewing selecting switch.

#### 4,416,207 BLIND STITCH SEWING MACHINE

Erwin Maier, Koengen, Fed. Rep. of Germany, assignor to Maier-Unitas GmbH, Koengen, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,557

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113088

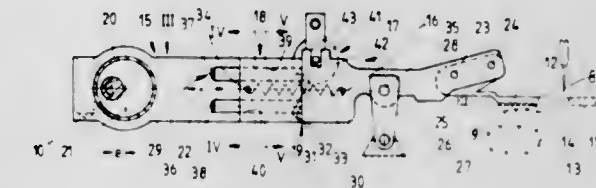
Int. Cl.<sup>3</sup> D05B 1/24, 27/22

U.S. Cl. 112—178

12 Claims

1. A blind stitch sewing machine comprising a stitch plate having an opening; a plunger below said stitch plate moveable

in a predetermined direction; a needle above the stitch plate swingable in a direction transverse to said predetermined direction; a fabric feeder extending from above through said opening in said stitch plate; means for moving said fabric feeder along a substantially elliptical path between a forward and a rearward end position against at least one pressure foot and including a main drive shaft and transmission means between said main drive shaft and said fabric feeder; means in



said transmission means for stitch shortening and tacking and comprising coupling means normally coupling said drive shaft to said fabric feeder so that the latter is moved along said substantially elliptical path between said forward and said rearward end positions during rotation of said drive shaft; and control means moveable between a first position holding said fabric feeder in said forward end position to thereby disengage said coupling means and a second position out of engagement with said fabric feeder to reengage said coupling means.

#### 4,416,208 AUXILIARY DEVICE FOR A SEWING MACHINE

Karl Nufer, Steckborn, Switzerland, assignor to Fritz Gegauf AG Bernina-Nachmaschinenfabrik, Steckborn, Switzerland

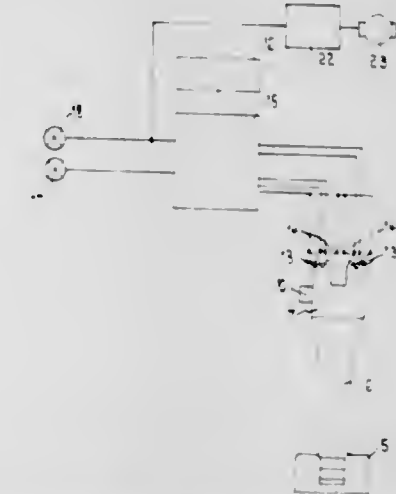
Filed May 29, 1981, Ser. No. 268,138

Claims priority, application Switzerland, Aug. 26, 1980, 6409/80

Int. Cl.<sup>3</sup> D05B 29/12

U.S. Cl. 112—240

7 Claims



1. In a sewing machine of the type having variable machine set ups corresponding to different machine sewing operations and having interchangeable presser feet corresponding to specific set ups, an auxiliary device for indicating the attachment of a presser foot not corresponding to a determined set up, said device comprising: first means for delivering information corresponding to the type of presser foot in response to presser foot insertion into the machine; second means for delivering information corresponding to the set up of the machine; electronic means connected to said first and second means for receipt and comparison of the information delivered by said first and second means and for determination if the inserted presser foot is of the type corresponding to the set up; and indicating means connected to said electronic means for indi-



cating to a machine operator if the presser foot corresponds to the machine set up.

4,416,209

# METHOD FOR STITCHING ORNAMENTAL LETTERS BY SEWING MACHINE

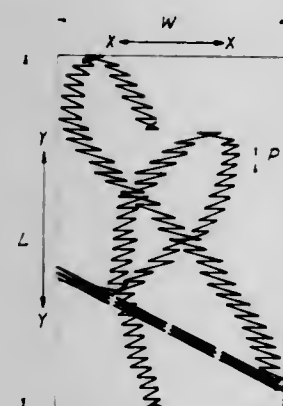
Hanyu Susumu, Hachioji, Japan, assignor to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Apr. 22, 1981, Ser. No. 256,429

Claims priority, application Japan, May 10, 1980, 55-61256  
Int. Cl.<sup>3</sup> D05C 5/04

U.S. Cl. 112-266.1

2 Claims



1. A method of stitching a series of ornamental letters with a sewing machine which is incorporated with a memory storing stitch control data for controlling a needle and a fabric feeding device to produce stitches of a selected pattern, said method comprising the steps of:

- producing a series of stitches in a zig-zag pattern in response to said stitch control data,
- feeding the fabric being stitched on alternate stitches in the direction of said series of characters to form the stitches closely adjacent each other, and
- said stitches defining the height of the letters in the direction of lateral swinging movement of the needle and the width of the letters in the direction of fabric feeding movement of the fabric feeding device, respectively.

4,416,210

# DRILL BARGE TRANSPORT BY SURFACE EFFECT VEHICLES

Ray S. Lacy, Jr., and Thomas P. Johnson, both of P.O. Box 205, Orange, Tex. 77630

Filed Jul. 11, 1980, Ser. No. 167,722

Int. Cl.<sup>3</sup> B60V 1/06

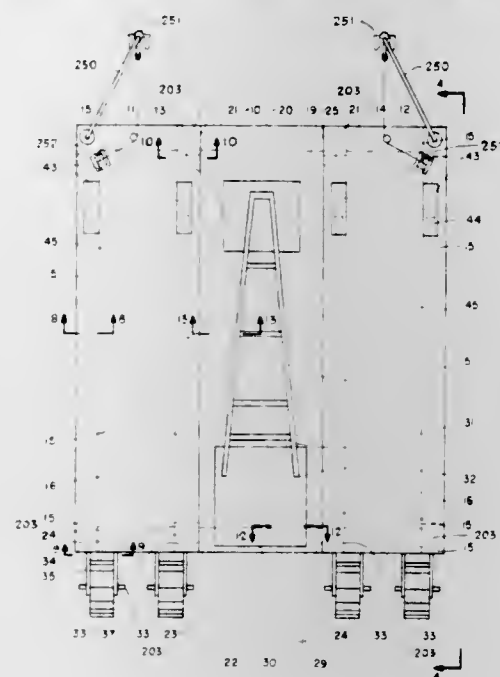
U.S. Cl. 114-67 A

5 Claims

1. A method for the transport of a drilling rig over variable terrain such as marshlands, dry land and water, comprising the steps of:

- mounting sufficient equipment including a drilling rig for the drilling of a well on a drill barge such that when in transport configuration, the distribution of both dead loads and variable loads thereon may be made conducive to the balance of the barge; providing the front and rear ends only of the barge with a surface effect skirt; providing a first and a second surface effect vehicle, each having means for its own movement; positioning of the surface effect vehicles along opposite sides of the barge; detachably and sealingly connecting the surface effect vehicles to the sides of the barge; activating the surface effect vehicles by flowing compressed air under them and also

flowing compressed air under the barge from at least one of the vehicles so as to lift and transport the barge to a



desired location for the drilling of a well; and lowering the barge.

4,416,211

# INDICATOR DEVICE WITH CALIBRATION MEANS

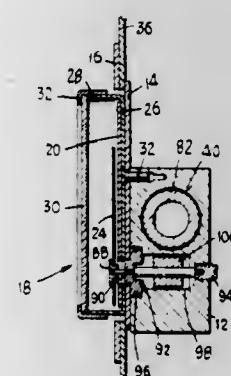
Leslie J. Hoffman, 821 Derby-Milford Rd., Orange, Conn. 06477

Filed Nov. 4, 1981, Ser. No. 318,312

Int. Cl.<sup>3</sup> G01D 5/06, 5/42

U.S. Cl. 116-204

31 Claims



1. An adjustable indicating device adapted to enable its range to be expanded or contracted, with compensatory "zero" adjustment, comprising in combination:

- a scale plate having indicia thereon in a housing representative of a range of values,
- a pivotally mounted indicating member movable in an arc over said scale plate and adapted to designate various values thereon,
- means operationally coacting with means that is responsive to a change in a condition, for shifting said indicating member over said scale plate,
- said shifting means comprising a follower permanent magnet, comprising means for mounting said follower magnet for rotative movement, and comprising a driving permanent magnet which shifts in response to changes in said condition and which is adapted to react with the said follower magnet,
- adjustable magnetic means comprising a trim permanent magnet disposed in said housing within the sphere of influence of the driving permanent magnet and the follower permanent magnet, for altering the reaction between said driving and follower permanent magnets so as

to effect either an expansion or else a contraction of the range of movement of said indicating member as the driving permanent magnet responds to a predetermined change in said condition, and

- "zero" mechanical adjustment means providing an adjustable connection between the indicating member and the follower permanent magnet, thereby to enable the indicating member to be adjusted to a "zero" position with respect to the scale plate, for either an expanded or a contracted range of the indicating member.

4,416,212

# RESCUE SIGNAL

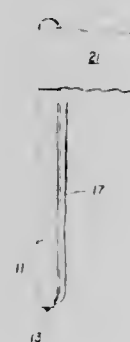
Thomas L. Howard, 1972 Scudder Dr., Akron, Ohio 44320

Filed Apr. 29, 1981, Ser. No. 258,664

Int. Cl.<sup>3</sup> G01B 1/02; B64B 1/50

U.S. Cl. 116-210

9 Claims



1. An elongated inflatable rescue signal comprising: an elongated, hand-held inflatable tubular member having a signal flag affixed to the upper portion thereof and a mouth-piece having a tube and one-way valve for inflation of said tubular member affixed to the lower portion thereof, said elongated inflatable tubular member being constructed of a relatively thin, flexible, but nearly inextensible material, so as to enable the folding of said signal into a compact package for storage and the subsequent erection thereof by blowing of adequate air into said tubular member through the mouth-piece until said member is fully inflated, thereby providing a semi-rigid staff for support of the signal flag.

4,416,213

# ROTARY COATING APPARATUS

Fumio Sakiya, Ibara, Japan, assignor to Tazmo Co., Ltd., Japan

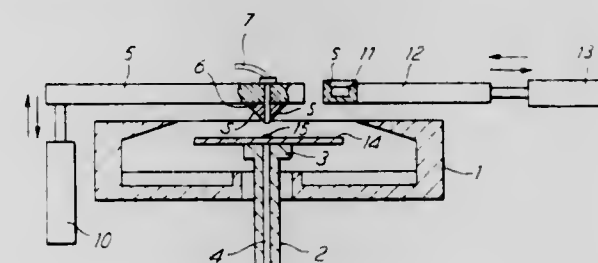
Filed Feb. 9, 1982, Ser. No. 347,220

Claims priority, application Japan, Feb. 14, 1981, 56-20318

Int. Cl.<sup>3</sup> B05C 11/08, 13/02

U.S. Cl. 118-52

4 Claims



- A rotary coating apparatus comprising:
  - a nozzle for depositing a coating liquid,
  - a first cylinder for moving said nozzle in a vertical direction for a predetermined distance,
  - a cap normally covering the underside of said nozzle,
  - a second cylinder for horizontally shifting said cap relative to said nozzle to remove said cap from said nozzle for depositing said coating liquid, and
  - a rotatable substrate support means for supporting a

substrate adjacent said nozzle, said first cylinder lowering said nozzle to just above the surface of said substrate.

4,416,214

# COATING APPARATUS

Yasuhinori Tanaka, and Hiroshi Chikamasa, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 274,704, Jun. 17, 1981. This application

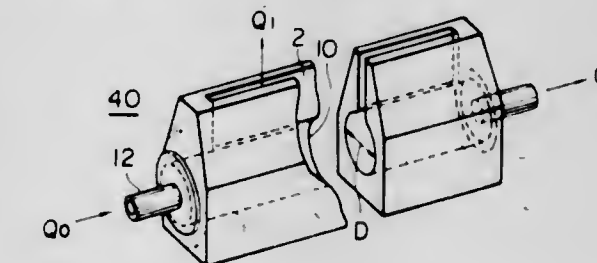
Feb. 23, 1982, Ser. No. 351,387

Claims priority, application Japan, Jul. 8, 1980, 55-92282

Int. Cl.<sup>3</sup> B05C 3/02

U.S. Cl. 118-410

3 Claims



1. An extruder for supplying a coating solution onto a surface of a continuously-run flexible belt-shaped support comprising: an extruder body having a solution pool formed therein and a slit extending longitudinally therefrom, said solution pool communicating with said slit, a coating solution inlet port formed at one end of said extruder body along a lengthwise direction of said slit, and a coating solution discharge port formed in said extruder body at the end thereof opposite said end in which said coating solution supplying port is formed.

4,416,215

# APPARATUS FOR FABRICATING GRAVURE PRINTING CYLINDERS WITH SYNTHETIC RESIN SURFACE

Eiichi Tachibana, Funabashi, and Shinichi Hikosaka, Musashino, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 170,156, Jul. 18, 1980, Pat. No. 4,339,472.

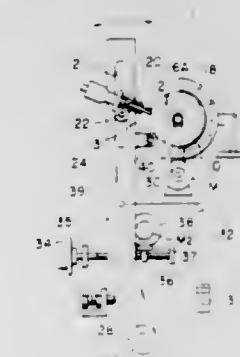
This application Apr. 26, 1982, Ser. No. 371,996

Claims priority, application Japan, Jul. 27, 1979, 54-95734

Int. Cl.<sup>3</sup> B05C 3/18, 11/02

U.S. Cl. 118-642

8 Claims



1. Apparatus for applying a synthetic resin solution spirally to the surface of a cylindrical base, comprising: means for supporting and rotating the base; a resin solution retainer disposed along and closely adjacent to the base to define therebetween a sump for retaining the resin solution; means for moving the solution retainer slowly away from the base to cause the resin solution in the sump to flow onto the surface of the base for application of the solution to the base surface as a spirally laid layer, comprising a substantially vertical lever disposed adjacent to the base and pivotally supported at its lower end for movement



toward and away from the base, said lever supporting adjustably thereon said solution retainer; means for moving said lever and thereby the solution retainer away from said base; and drying means disposed along said base to dry the solution applied to the base surface.

4,416,216

# **APPARATUS FOR FORMING AN INHOMOGENEOUS OPTICAL LAYER**

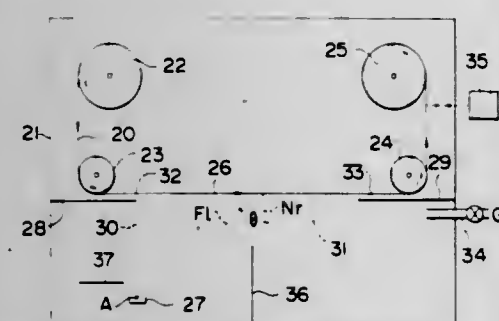
Kazuo Nakamura, Tokyo; Hirotsugu Mizorogi, Ebina, and Akihiko Iiso, Sakura, all of Japan, assignors to Ulvac Seimaku Kabushiki Kaisha and Nihon Shinku Gijutsu Kabushiki Kaisha, both of Japan

Filed Apr. 29, 1982, Ser. No. 373,144

Claims priority, application Japan, Jul. 31, 1981, 56-119149  
Int. Cl.<sup>3</sup> B05D 1/34, 5/06

U.S. Cl. 118—696

4 Claims



1. An apparatus for forming an inhomogeneous optical layer on a surface of a substrate comprising a vacuum vessel, means for moving the substrate along a travelling path in the vacuum vessel, said travelling path having a path section or a number of path sections, source means for evaporating an evaporation substance in the vacuum vessel, deposition rate regulating means for causing the evaporation substance evaporated from the source means to be deposited on the surface of the substrate moving along the travelling path with the depositing rate being varied monotonously along the travelling path in the path section or each of the path sections, and exposure means for causing the deposited evaporation substance to be exposed to reaction gas which is able to react on the evaporation substance.

4,416,217

# **APPARATUS FOR FORMING AN INHOMOGENEOUS OPTICAL LAYER**

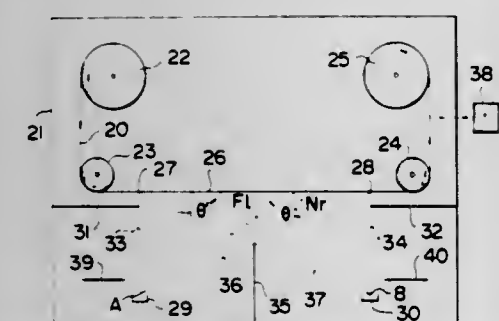
Kazuo Nakamura, Tokyo; Hirotsugu Mizorogi, Ebina, and Akihiko Iiso, Sakura, all of Japan, assignors to Ulvac Seimaku Kabushiki Kaisha and Nihon Shinku Gijutsu Kabushiki Kaisha, both of Japan

Filed Apr. 29, 1982, Ser. No. 373,145

Claims priority, application Japan, Jul. 31, 1981, 56-119150  
Int. Cl.<sup>3</sup> B05D 1/34, 5/06

U.S. Cl. 118—696

2 Claims



1. An apparatus for forming an inhomogeneous optical layer on a surface of a substrate comprising a vacuum vessel, means for moving the substrate along a travelling path in the vacuum vessel, said travelling path having a path section or a number of path sections, two different source means for evaporating their

respective different evaporation substances in the vacuum vessel, deposition rate regulating means for causing each of the evaporation substances evaporated from their respective source means to be deposited on the surface of the substrate moving along the travelling path with the depositing rate of each of the substances being varied monotonously along the travelling path in the path section or each of the path sections.

4,416,218

# **PROCESS AND APPARATUS FOR FEEDING POULTRY**

Wolfgang Holz, 8091 Hart-Ramerberg, Oberbayern, Fed. Rep. of Germany

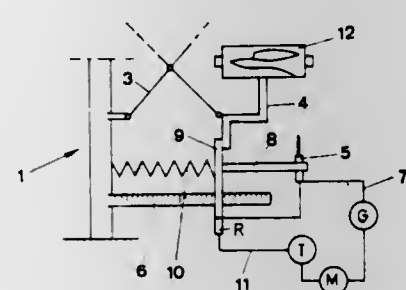
Filed Aug. 7, 1980, Ser. No. 175,957

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2932040

Int. Cl.<sup>3</sup> A01K 5/02, 39/012

U.S. Cl. 119—18

10 Claims



1. A process for feeding a large number of egg laying poultry confined in a number of enclosures and from which the dung and eggs are continuously removed, comprising the steps of: providing a feeding means time controlled to normally provide feed to said poultry during a predetermined time period of each day; determining the average desired weights of said poultry and the weight of feed required for them during feeding to reach a weight of a predetermined value; selecting a small number of said poultry and while feeding the entire large number during said controlled time period monitoring the weights of said selected small number; and terminating the feeding of the entire large number before the end of said controlled time period in response to said weight of said small number reaching said predetermined value.

4,416,219

# **EGG COLLECTING SYSTEM AND METHOD**

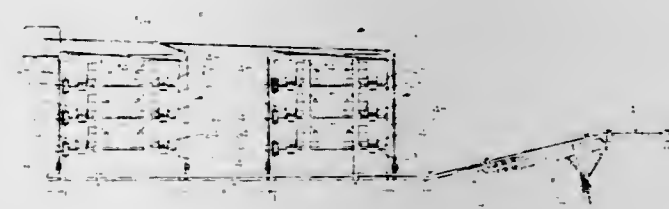
Terry A. Dill, Keota, Iowa, assignor to Jefferson Industries Company, Fairfield, Iowa

Filed Jun. 7, 1982, Ser. No. 386,114

Int. Cl.<sup>3</sup> A01K 31/16

U.S. Cl. 119—48

6 Claims



6. A method for collecting eggs from a series of vertically tiered confinement cage rows each tier of which has an associated egg-receiving row conveyor with a delivery end, and a horizontally extended vertically movable conveyor means for receiving eggs from said row conveyor means comprising the steps of:

- providing a power means on said horizontally extended conveyor means,
- moving said horizontally extended conveyor means vertically to one of a plurality of selected positions in

which said horizontally extended conveyor is in egg-receiving relation with at least one of said row conveyor means; and  
(c) driving each said row conveyor means through said power means only during the period of time in which said horizontally extended conveyor means is in an egg-receiving relation therewith.

4,416,220

# **AUTOMATIC HOG FEEDING SYSTEM**

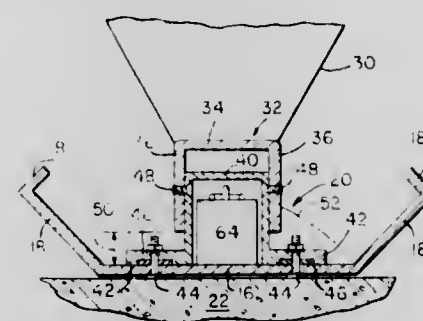
Larry Dougan, Rte. 1, Iowa Falls, Iowa 50126

Filed Mar. 2, 1982, Ser. No. 354,309

Int. Cl.<sup>3</sup> A01K 5/02

U.S. Cl. 119—51.11

9 Claims



1. Automatic animal feeding apparatus comprising: a horizontally disposed, extended feed trough having a planar bottom portion and upstanding side portions; an inverted U-shaped, open bottomed cover mounted above and coextensively with said trough; a plurality of paddles operatively mounted for movement through said trough and said cover to move feed therethrough; said cover being positioned relative to said trough as to provide a horizontal feed passage gap between the lower edges of said cover and the upper surface of said planar trough portion; said paddles coacting with said gap to controllably urge feed through said gap into said trough; and said cover being vertically adjustably mounted relative to said trough thereby providing predetermined gap vertical dimensions, and controlling the amount of feed urged therethrough.

4,416,221

# **NIPPLE WATERER AND VALVE**

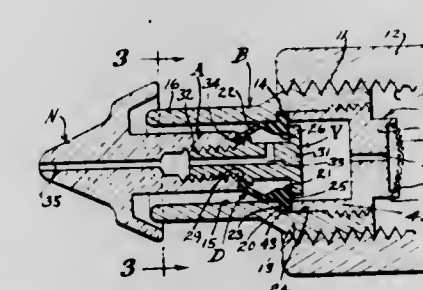
Richard T. Novey, Turlock, Calif., assignor to Alpha Poultry & Livestock Equip., Inc., Victorville, Calif.

Filed Oct. 5, 1981, Ser. No. 308,469

Int. Cl.<sup>3</sup> A01K 7/06

U.S. Cl. 119—72.5

15 Claims



11. A center flow animal waterer comprised of a body and flow restricting restricting valve-nipple-boot assembly, and a retainer-flow control;

- the body being an elongated tubular extension for a supply pipe of water under pressure and having a shoulder normal to a central axis and facing an inlet end of the body opening into the supply pipe with a retainer-flow control securing said valve-nipple-boot assembly to the said shoulder,
- the valve-nipple-boot assembly including, a boot of elastomeric material engageably positioned against the body

shoulder and having a rearwardly faced valve seat and a forwardly extending barrel having a cylindrical flow passage therethrough and a flexible bellows extending from the barrel and radially inward to an anchor ring, a valve element having a stem with a clamp face engageable against a rearward side of the anchor ring and having an imperforate valve disc engageable against the rearwardly faced valve seat and having a flow restricting port opening from an annulus between the stem and boot barrel and opening forwardly therethrough, and a nipple having a clamp face engageable against the forward side of the anchor ring and having a flow passage centrally therethrough and in open communication with the valve element port for water discharge, there being coupling means securing the clamp faces of the valve element and nipple to the boot anchor ring,

and the retainer-flow control including a member upstream of the valve-nipple-boot assembly in the body and having a flow blocking wall with an orifice at least as restrictive as the flow restricting port through the valve element, the nipple and valve element being rigid one with the other and carried by the elastic boot for angular displacement laterally of the said axis and tipped removal of the valve disc from the valve seat.

4,416,222

# **HOT WATER HEATER CIRCUITRY**

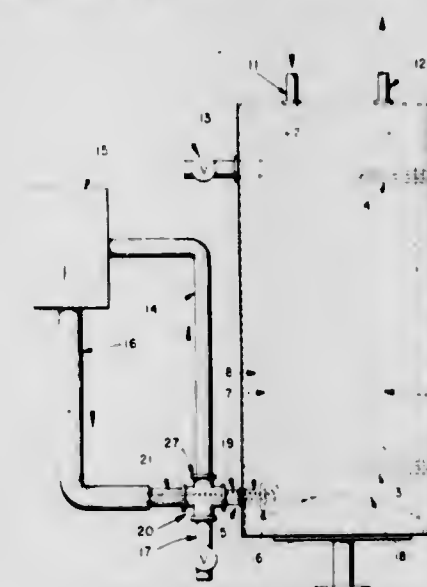
Charles W. Staats, Yeadon, Pa., assignor to Bradford-White Corporation, Philadelphia, Pa.

Filed May 5, 1981, Ser. No. 260,741

Int. Cl.<sup>3</sup> F22B 5/00

U.S. Cl. 122—13 R

4 Claims



1. Dual flow circuitry, adapted to connect in fluid-communication with an opening in the side of a heated residential hot water tank, containing water having a plurality of temperature layers, said circuitry including a conduit able to carry both an inflowing and an outflowing stream, said conduit comprising:

- a first cylindrical pipe connected in fluid-sealing relation to said tank opening at one end and connected in fluid-sealing relation to a "cross" pipe fitting at the other end;
- said "cross" pipe fitting having four openings;
- a second cylindrical pipe having an annular plug, in fluid-sealing relation to the interior of said second cylindrical pipe, and a centrally disposed tube, in fluid-sealing relation to said annular plug and extending through and annularly spaced from said second cylindrical pipe, said "cross" pipe fitting and said first cylindrical pipe;
- a valve sealing off one "cross" pipe fitting opening;
- supplemental residential water heating means having a cold water inflow and a hot water outflow streams, said inflow stream in fluid-communication with the fourth



opening in said "cross" pipe fitting and said outflow stream in fluid-communication with said centrally disposed tube; and  
f. said centrally disposed tube being composed of a flexible material such that upon insertion through said opening in said hot water tank said tube extends to an upper predetermined level in said tank.

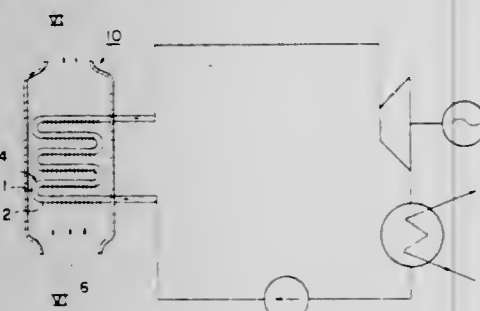
4,416,223

## HEAT EXCHANGERS

Kenichi Hashizume, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan  
Continuation of Ser. No. 151,831, May 21, 1980, abandoned.  
This application Sep. 10, 1982, Ser. No. 416,470  
Int. Cl.<sup>3</sup> F22B 37/10

U.S. Cl. 122—367 C

1 Claim



1. A heat exchanging method for generating a vapor from a liquid while preventing a dry out condition in the tubes of a heat exchanging device comprising the steps of:

providing a heat exchanging device comprising an inlet located at a lower portion of said heat exchanging device, an outlet located at an upper portion of said heat exchanging device and internal heat transfer tube assemblies mounted in a fluid flow path of said device between said inlet and outlet, each tube assembly comprising a tube and a plurality of plate-like fins secured to the outer surface of said tube to extend radially therefrom, said tubes being arranged horizontally and each of said fins being secured to the outer peripheral surface of only the lower half of an associated tube from one side thereof to the other and functioning to prevent overheating of an upper half of the associated tube;

feeding a high temperature gas into the inlet of said heat exchanging device and through said fluid flow path; and passing a liquid through said tube assemblies and vaporizing said liquid by heat from said high temperature gas to form within at least one of said tubes a liquid vapor and a thin liquid film along an upper inner wall of said at least one tube, said fins which are only at the lower surface of said tubes preventing the overheating of an upper half of said at least one tube and a drying out of said thin liquid film therein.

4,416,224

## INTERNAL COMBUSTION ENGINE

William M. Hobby, 244 Sylvan Blvd., Winter Park, Fla. 32789, and Joseph M. Valdespino, 5023 Golf Club Pkwy., Orlando, Fla. 32808

Filed Jan. 18, 1982, Ser. No. 340,256

Int. Cl.<sup>3</sup> F02M 21/02

U.S. Cl. 123—3

16 Claims

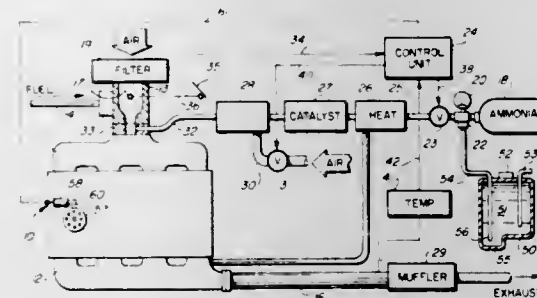
1. An improvement in an internal combustion engine having an auxiliary fuel system comprising in combination:

an internal combustion engine having fuel feed means for feeding a hydrocarbon fuel-air mixture to said engine combustion chambers;

an auxiliary fuel system feeding an auxiliary fuel to said internal combustion engine with said hydrocarbon fuel-air mixture;

a first auxiliary fuel dissociation means for dissociating the

fuel in said auxiliary fuel system being fed to said internal combustion engine using exhaust heat from said engine; and a second auxiliary fuel dissociation means for dissociating the fuel in said auxiliary fuel system being fed to said



internal combustion engine when said engine has insufficient heat from said exhaust heat to dissociate said auxiliary fuel, whereby said internal combustion engine runs on dissociated auxiliary fuel in combination with a hydrocarbon fuel-air mixture.

4,416,225

## IMPROVEMENTS RELATING TO INTERNAL COMBUSTION ENGINES

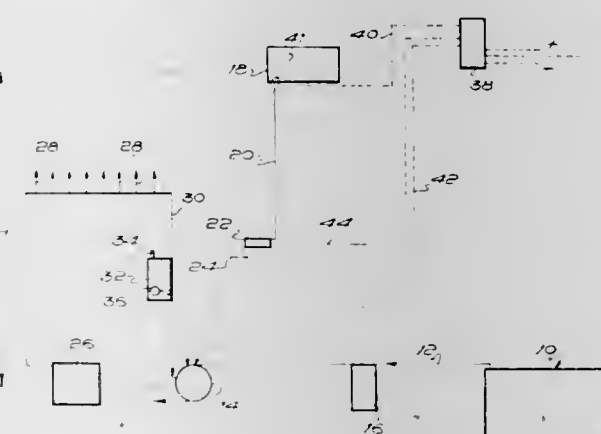
Albert B. Constantine, 2 Tintagel, Great Lumley, Chester-le-Str. Co. Durham DH3 4NE, England, and Alan D. Walker, Yatton, England, assignors to Albert Constantine and Cadbury Schweppes Transport Services Ltd., both of Birmingham, England

Filed Aug. 7, 1981, Ser. No. 291,097

Int. Cl.<sup>3</sup> F02M 25/02

U.S. Cl. 123—25 E

7 Claims



1. An internal combustion engine which is set to be run on an emulsion of fuel and water including a water supply line, a fuel supply line, an emulsifier for forming an emulsion of fuel and water supplied from the said lines, the engine having a return line for returning overspill emulsion to be returned to the emulsifier, characterized in that in the return line there is a surge tank having a vent to atmosphere.

4,416,226

## LASER IGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Minoru Nishida; Tadashi Hattori; Shinichi Mukainakano, all of Okazaki; Toru Mizuno, Aichi, and Tukas Goto, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippon-denso Co., Ltd., Kariya, both of Japan

Filed Jun. 1, 1982, Ser. No. 383,835

Claims priority, application Japan, Jun. 2, 1981, 56-85308

Int. Cl.<sup>3</sup> F02P 23/00

U.S. Cl. 123—143 B

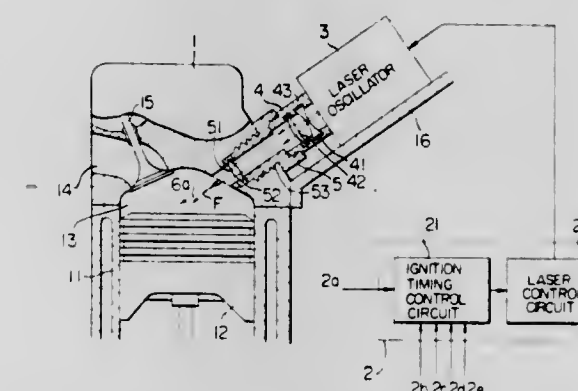
5 Claims

1. A laser ignition apparatus for an internal combustion engine for igniting an air-fuel mixture supplied into a combustion chamber of said engine, comprising:

means for generating a laser beam of a high energy density;

means for controlling the generation of said laser beam in response to an ignition timing signal for said engine; and means for guiding and directing said laser beam from said laser beam generating means to a predetermined position within said combustion chamber,

said laser beam generating means including a single laser oscillator for generating at least two pulse-shaped laser beams during each compression stroke of said engine, a first laser beam of said two pulse-shaped laser beams



having a high energy density sufficient to cause breakdown of said air-fuel mixture, a second laser beam of said two pulse-shaped laser beams having an energy density lower than said first laser beam but having a longer duration, wherein said single laser oscillator includes means for controlling the production of said first laser beam of high energy density and said second laser beam of lower energy density and said first laser beam is effective to generate a plasma and said second laser beam is irradiated to the plasma before the plasma is diffused.

4,416,227

## HOSE JOINT WITH A SHELTERING COVER

Noriaki Imamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

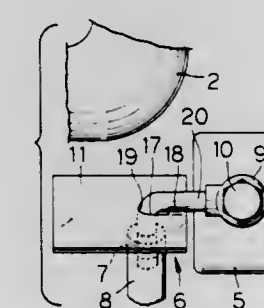
Filed Nov. 18, 1980, Ser. No. 207,888

Claims priority, application Japan, Jul. 24, 1980, 55-101579

Int. Cl.<sup>3</sup> F02B 77/11

U.S. Cl. 123—198 D

8 Claims



1. A hose joint, adapted to connect a hose to a fluid apparatus disposed in the vicinity of a radiant heat source, comprising:

a tubular portion including a hose attaching portion at one end thereof having a hose fitted thereon, and further including a bent portion bent between said hose attaching portion and another end of the tubular portion;

a connecting portion disposed at said other end of said tubular portion for being connected to a fluid apparatus; and a plate-like sheltering cover having a U-shape notch therein and secured to said tubular portion between said hose attaching portion and said connecting portion such that the sheltering cover is interposed between the radiant heat source and said hose so as to intercept and disperse radiant heat from the radiant heat source away from said hose,

said U-shape notch of the sheltering cover engaging said tubular portion in the neighborhood of said bent portion,

said tubular portion sheltering an area formed by said U-shape notch and thereby preventing the radiant heat from reaching said hose through said U-shape notch.

4,416,228

## SEPARATELY IGNITED INTERNAL COMBUSTION ENGINE WITH AT LEAST ONE MAIN COMBUSTION CHAMBER AND AN IGNITION CHAMBER

Walter Benedikt, Stuttgart; Reinhard Latsch, Vaihingen, and Hans Schlembach, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

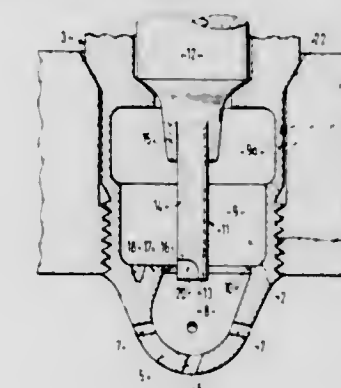
Filed Jan. 7, 1982, Ser. No. 337,855

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101326; Dec. 5, 1981, 3148296

Int. Cl.<sup>3</sup> F02P 1/00; F02B 3/00

U.S. Cl. 123—268

42 Claims



1. An internal combustion engine, comprising means forming at least one main combustion chamber; means forming a separate ignition chamber separated from said main combustion chamber by a first wall and connected with said main combustion chamber by at least one passage in said wall; ignition means including a center electrode provided in said ignition chamber and forming together with said wall a spark gap, said center electrode having a free end which extends into said ignition chamber and being hollow near said free end and formed as a heat pipe; and an insulator with an insulator shoe which extends into said ignition chamber and supports said center electrode so that said insulator together with said insulator shoe forms an insulating gap.

4,416,229

## FUEL INJECTION SYSTEM FOR DIESEL ENGINES

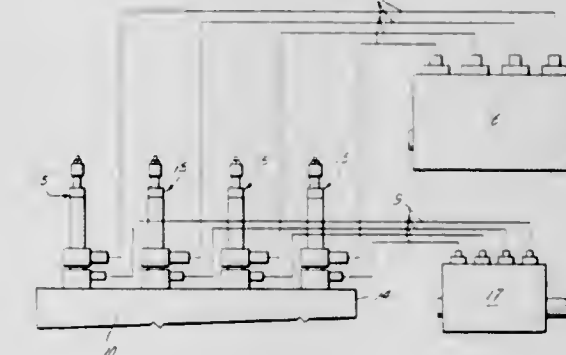
Charles D. Wood, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 29, 1981, Ser. No. 278,653

Int. Cl.<sup>3</sup> F02M 43/00

U.S. Cl. 123—304

6 Claims



1. An improved system for operating a diesel engine with a combination of diesel fuel and alternative fuel having a low cetane number, wherein the engine includes at least one cylinder



der having a piston therein to form a combustion chamber at one end of the cylinder, comprising a single fuel injector adapted to be connected with the combustion chamber of said cylinder of the engine, said injector including a cavity therein having a port through which fuel may be injected into the combustion chamber and a valve seat about the port, a valve member shiftable between one position on the seat to close the port and another position spaced from the seat to open the port, means which is responsive to the pressure of fuel in the cavity to urge said valve member to open position, means urging the valve member toward closed position with a force which is independent of such fuel pressure, means for supplying diesel fuel to the cavity of said injector at a location near the valve seat, means for supplying alternative fuel to the cavity of said injector the diesel fuel being supplied at a relatively low pressure which does not move the valve member to open position, the alternative fuel being supplied at a relatively high pressure which is sufficient to move the valve member to open position at intervals just prior to the movement of the piston of the cylinder of the chamber into which the fuel is to be injected into high center position during its compression stroke, and said fuel supplying means including means to prevent the back flow of fuel therein, and thus maintain the cavity filled with fuel, except when alternative fuel is displaced within the cavity by the supply thereto of diesel fuel, whereby a plume of both fuels having the diesel fuel at its tip is injected into said chamber to enable the diesel fuel to be ignited by the compression in the chamber and the alternative fuel to be ignited by the diesel fuel.

4,416,230

## ENGINE CONTROL APPARATUS

Shinji Katayose, Tokyo; Masatsugu Ohwada, Yokosuka, and Takashi Oka, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

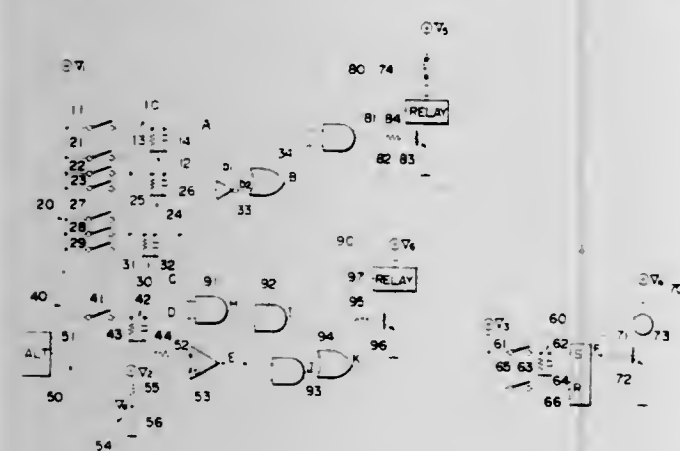
Filed Aug. 16, 1982, Ser. No. 408,629

Claims priority, application Japan, Aug. 19, 1981, 56-130469

Int. Cl.<sup>3</sup> F02D 33/00

U.S. Cl. 123—325

7 Claims



1. An apparatus for controlling an internal combustion engine of an automotive vehicle having a transmission, a clutch, a throttle valve, a brake booster storing therein pressure supplied from an engine intake manifold, and sources for generating signals indicative of: (a) the throttle valve opening at an angle less than a predetermined value, (b) the transmission being in high gear or in neutral, (c) the transmission being in low gear, (d) the clutch being disengaged, and (e) the engine operating at a speed less than a predetermined value, said apparatus comprising first means for generating a signal (f) when the pressure in the brake booster increases over a first predetermined value, the first means terminating the generation of the signal (f) when the pressure in the brake booster falls below a second predetermined value lower than the first predetermined value, second means for terminating delivery of fuel to the engine upon the occurrence of two conditions indicated by signals (a) and (b), third means for restarting the engine upon the occurrence of three conditions indicated by

signals (c), (d) and (e) or upon the occurrence of two conditions indicated by signals (e) and (f), and fourth means for preventing the second means from terminating fuel delivery to the engine upon the occurrence of one condition indicated by signal (f).

4,416,231

## LOW SPEED AIR BLEED ABSORPTION REDUCER OIL SAVING DEVICE FOR CARBURETOR

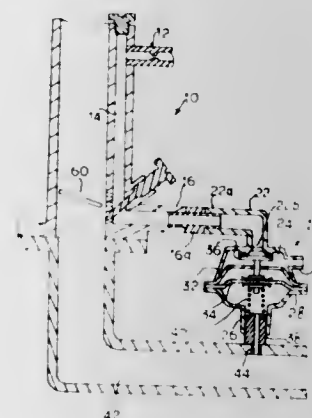
Min D. Lai, SFL, No. 7, Alley 21, Lane 239, Pa Ter Rd., Sec. 2, Pan Shiao City, Taipei Hsien, Taiwan, Taiwan

Filed Feb. 22, 1982, Ser. No. 350,702

Int. Cl.<sup>3</sup> F02M 23/08

U.S. Cl. 123—327

3 Claims



1. A low-speed air bleed absorption reducer fuel-saving device for connection to the fuel intake tube and the valve of a carburetor for use to save fuel fed to the engine of a land vehicle when the land vehicle to which it is connected is travelling downhill, changing from a lower speed to a higher speed by virtue of gear shifting, or on the point of executing a braking action, the fuel saving device comprising

an air intake control mechanism having a connection to an air purifier,  
an air intake bypass porthole connected to said intake control mechanism,  
a low speed fuel network connected to said bypass porthole and to the engine of the land vehicle to feed the cylinders of the engine,  
said air-intake control mechanism including  
a valve gate to block and unblock said air intake bypass porthole from said connection to the air purifier,  
said airtake control mechanism having a connection to the fuel intake tube of the carburetor and to a throttle valve of the carburetor  
and means connected to said valve gate to automatically move said valve gate between blocking and unblocking positions, with vacuum in the fuel intake tube when the throttle valve is closed moving said means and said valve gate to an unblocking position allowing air from said connection to the air purifier into said air intake control mechanism to said bypass porthole into said low-speed fuel network to feed the air to the cylinders of the engines.

4,416,232

## ELECTRICAL FUEL INJECTION PUMP GOVERNOR

Makoto Shiozaki; Satoshi Haseda; Jun Tarui, all of Kariya; Osamu Ito, Toyota; Nobuhito Hobo, Inuyama; Yoshihiko Tsuzuki, Toyota; Shizuo Kawai, Kariya, and Hiroshi Sami, Numazu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 13, 1981, Ser. No. 282,955

Claims priority, application Japan, Jul. 14, 1980, 55-96631

Int. Cl.<sup>3</sup> F02D 1/04

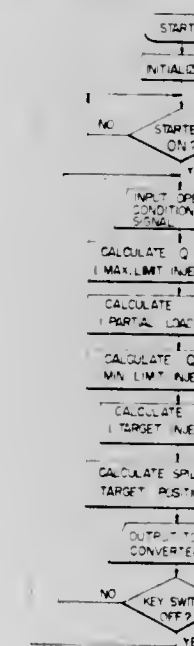
U.S. Cl. 123—357

7 Claims

1. In a fuel injection pump having a spill ring used for the fuel system of a compressed ignition type internal combustion

engine, an electrical fuel injection pump governor for optimally regulating the amount of fuel injected in nonlinear relation with the displacement of said spill ring in accordance with the engine running conditions, said governor comprising:

an electromagnetic actuator for driving said spill ring;  
an actual position detector for electrically detecting the displaced position of said spill ring and generating an actual position signal;  
an engine running condition detector for detecting the engine running condition to generate an electrical detection signal, said engine running condition detector including a rotational speed detector for generating a rotational speed indication signal by detection of the engine rotational speed;  
target value calculating means including target injection amount calculator means for calculating the target value



of injection amount corresponding to the detection signal from said running condition detector, memory map means storing data of a plurality of spill-ring target positions corresponding to two parameters of engine rotational speeds and target values of injection amount, and position calculating means capable of searching and reading out desired data of spill-ring target position from said memory map means in correspondence with the two parameters of an engine rotational speed and target value of injection amount wherein different desired data of spill-ring target position can be read out from said map means in order to follow variation in engine rotational speed even with respect to a same target value of injection amount; and drive means for comparing said target position indication signal with said actual position signal and driving said electromagnetic actuator in accordance with the error between said two signals.

4,416,233

## CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Max Straubel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,532

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908792

Int. Cl.<sup>3</sup> F02D 1/06, 1/14

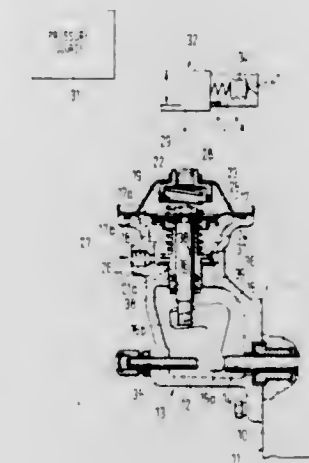
U.S. Cl. 123—383

3 Claims

1. In a control apparatus for limiting the movement of a supply quantity adjustment member of a fuel metering apparatus for an internal combustion engine in accordance with induced air-pressure in an intake manifold of the engine, which includes a housing, a movable wall disposed within the housing between a first pressure chamber and a counterpart pressure chamber which are defined by the housing and the movable wall, an adjustment member means actuated by the movable

wall for limiting the movement of the supply quantity adjustment member, connecting means for connecting the first pressure chamber to the intake manifold of the engine, and restoring means for exerting a force on the movable wall to determine an initial disposition of the movable wall, wherein the movable wall is displaceable by the induced air pressure of the engine against the force of the restoring means, the improvement which comprises:

a pressure source means for generating a reference absolute pressure, including



an absolute pressure controller for maintaining the reference absolute pressure at a constant absolute pressure level, and

engine parameter correcting means for correcting the reference absolute pressure in accordance with an engine parameter wherein the reference absolute pressure increases when the engine parameter changes; and second connecting means for connecting the pressure source means to the counterpart pressure chamber.

4,416,234

## IGNITION SYSTEM SPARK TIMING CONTROL DURING ENGINE CRANKING

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

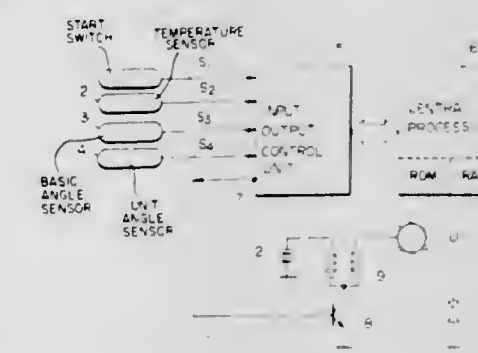
Continuation of Ser. No. 137,000, Apr. 3, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 387,160

Claims priority, application Japan, Apr. 19, 1979, 54-47280

Int. Cl.<sup>3</sup> F02P 5/14

U.S. Cl. 123—424

2 Claims



1. A method of controlling an ignition system spark timing for a spark ignition internal combustion engine, comprising the steps of:

- sensing the engine temperature and generating an engine temperature signal indicative of the sensed engine temperature;
- detecting a mode of operation when the engine is being cranked and generating an output signal;
- finding in response to said engine temperature signal and output signal by table look-up in a read only memory a



value of spark advance which corresponds to the sensed engine temperature, said read only memory having a plurality of spark advance values and a plurality of corresponding engine temperature values stored therein, which spark advance values and corresponding engine temperature values define a two dimensional table, said two dimensional table having a first zone in which the values of spark advance decrease with an increase in engine temperature, a second and subsequent zone in which the values of spark advance remain essentially constant with an increase in engine temperature, and a third and subsequent zone in which the values of spark advance increase with an increase in engine temperature, the values of engine temperature in said first zone being lower than the values of engine temperature in said second zone and the values of engine temperature in said second zone being lower than the values of engine temperature in said third zone; and (d) providing a spark advance determined by said table look-up as a value of spark advance.

4,416,235

# IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hiroo Utsumi, Kariya; Yukio Sakakibara, Anjo; Teruyoshi Ito, Kariya; Kiyokane Kaji, and Mitsuyuki Banno, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

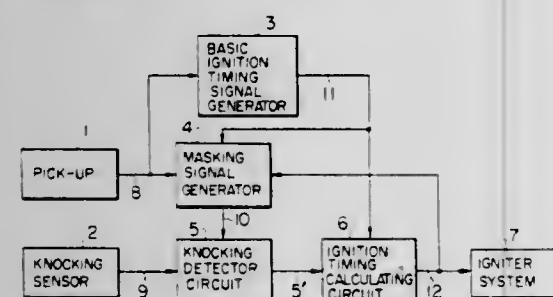
Filed Sep. 14, 1981, Ser. No. 301,748

Claims priority, application Japan, Nov. 19, 1980, 55-165979[U]

Int. Cl.<sup>3</sup> F02P 5/04

U.S. Cl. 123-425

6 Claims



1. An ignition timing control apparatus for an internal combustion engine, comprising a pick-up incorporated in a distributor, a circuit for preparing a basic ignition timing indicating signal on the basis of an output signal from said pick-up, a knocking detector circuit for detecting presence or absence of knocking to thereby produce a knocking indicating signal, an actual ignition timing generating circuit responsive to said basic ignition timing indicating signal and said knocking indicating signal for generating an actual ignition command signal which is then applied to an igniter system of said engine, and a masking signal generator circuit responsive to the output signal from said pick-up for producing a masking signal to inhibit operation of said knocking detector circuit for a predetermined period which begins at a time point leading said basic ignition timing by a predetermined crank angle.

4,416,236

# AIR-FUEL RATIO CONTROL SYSTEM

Takuro Morozumi, Mitaka, and Hitoshi Suzuki, Niiza, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 333,194

Claims priority, application Japan, Dec. 26, 1980, 55-189095

Int. Cl.<sup>3</sup> F02B 33/00; F02M 7/00

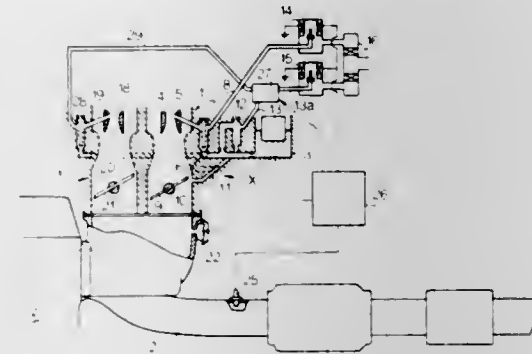
U.S. Cl. 123-438

3 Claims

1. In an air-fuel ratio control system for an internal combustion engine having a two-barrel carburetor comprising a primary side having a main metering system and a slow speed

system and a secondary side having a main metering system, an induction passage, a throttle valve provided in each side, an exhaust passage, first detector means for detecting the concentration of a constituent of exhaust gases passing through said exhaust passage, two electromagnetic valves for correcting the air-fuel ratio of the air-fuel mixture supplied by said carburetor, electronic control circuit comprising a judging circuit for judging an output signal of said first detector means, and a driving circuit for driving said electro-magnetic valves in dependency on an output signal of said first detector means for controlling the air-fuel ratio to a value approximately equal to the stoichiometric air-fuel ratio;

second detector means for producing an output signal when said carburetor changes from a primary side operation to the operation by both of the primary and secondary sides,



a first passage connecting the slow speed system of said primary side to one of said electromagnetic valves; a second passage connecting the main metering system of said secondary side to said one of the electromagnetic valves; a third passage connecting said main metering system of said primary side to the other electromagnetic valve; an electromagnetically operated change-over valve for changing the connection between said electromagnetic valve and said first and second passages; said electromagnetically operated change-over valve being so arranged to normally communicate said electromagnetic valve with said first passage and to communicate said electromagnetic valve to said second passage by said output signal of said second detector means.

4,416,237

# METHOD AND AN APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, and Masaki Mitsuyasu, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 25, 1982, Ser. No. 352,457

Claims priority, application Japan, Feb. 26, 1981, 56-26066

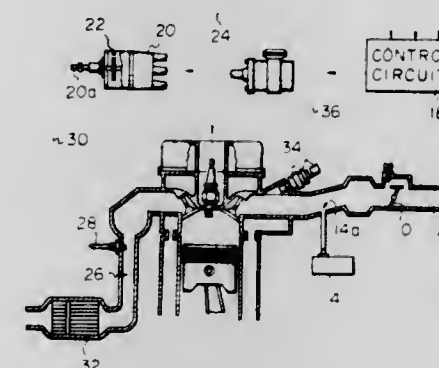
Int. Cl.<sup>3</sup> F02B 3/00

U.S. Cl. 123-438

10 Claims

1. A method for controlling the air-fuel ratio in an internal combustion engine comprising the steps of: detecting the running speed of the engine for producing a first electrical signal which indicates the detected speed; detecting the intake manifold pneumatic pressure of the engine for producing a second electrical signal which indicates the detected pressure; detecting the concentration of a predetermined component in the exhaust gas for producing a third electrical signal which indicates the detected concentration; detecting the degree of the acceleration or deceleration of the engine for producing a fourth electrical signal which indicates the detected acceleration or deceleration degree; calculating, depending upon the first and second electrical

signals, a value which corresponds to a basic fuel feeding rate to the engine; calculating, depending upon the third electrical signal, a first correction factor which corresponds to the deviation of the actual air-fuel ratio in the engine from a desired air-fuel ratio; judging, depending upon the fourth electrical signal, whether or not the engine is under the accelerating or decelerating condition; when the engine is under the accelerating or decelerating condition, calculating, depending upon the fourth electrical signal, a second correction factor by using a function which represents a relationship between the acceleration or deceleration degree and the second correction factor; correcting the calculated value related to the fuel feeding rate in accordance with the calculated first correction factor;



when the engine is under the accelerating or decelerating condition, correcting the corrected value related to the fuel feeding rate in accordance with the calculated second correction factor; adjusting, depending upon the corrected value related to the fuel feeding rate, the actual fuel feeding rate to the engine; repeating the above sequence of steps so that the air-fuel ratio in the engine is controlled within a predetermined range; detecting the change of the first correction factor during the accelerating or decelerating condition; and correcting, in response to the detected change of the first correction factor, said function related to the second correction factor.

4,416,238

# FUEL INJECTION SYSTEM

Heinrich Knapp, Leonberg; Rudolf Sauer, Bellingen; Rudolf Krauss, Stuttgart, and Udo Hafner, Lorch, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,900

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118168

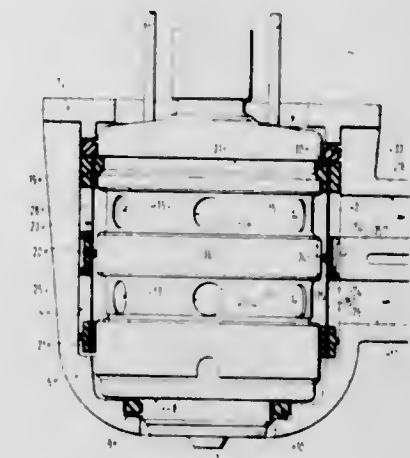
Int. Cl.<sup>3</sup> F02M 55/00

U.S. Cl. 123-470

3 Claims

1. In a fuel injection system for an internal combustion engine which includes an air intake tube, a fuel injection valve for injecting fuel into the air intake tube, the fuel injection valve including: an axis, an outer or circumferential surface extending about the axis, a fuel inflow groove which extends radially inward from the outer surface of said fuel injection valve and which includes at least one fuel inlet opening therein, a fuel outflow groove which extends radially inward from the outer surface of said fuel injection valve and which is axially offset from said fuel inflow groove by an annular protrusion of said fuel injection valve, said fuel outflow groove including at least one fuel outlet opening therein, a holder body which surrounds the fuel injection valve and includes

a guide opening in which the fuel injection valve is disposed, a fuel supply line which opens into the guide opening adjacent the fuel inlet opening of the fuel injection valve, a fuel outflow line which opens into the guide opening adjacent the fuel outlet opening of the fuel injection valve, a fuel filter, which is disposed in the guide opening of the holder body and extends axially to cover the fuel inlet and fuel outlet openings of the fuel injection valve, the fuel filter including



a plurality of annular elastic supporting bodies for radially guiding the fuel injection valve in the guide opening of the holder body, wherein the plurality of annular elastic supporting bodies includes a middle supporting body opposite said annular protrusion for sealing off the fuel inlet openings and the fuel supply line from the fuel outlet openings and the fuel outflow line, and a degassing conduit provided in said annular protrusion which leads from the fuel inflow groove to the fuel outflow groove.

4,416,239

# ELECTRONIC CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH CORRECTION MEANS FOR CORRECTING VALUE DETERMINED BY THE CONTROL SYSTEM WITH REFERENCE TO ATMOSPHERIC AIR PRESSURE

Sadao Takase, and Akio Hosaka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

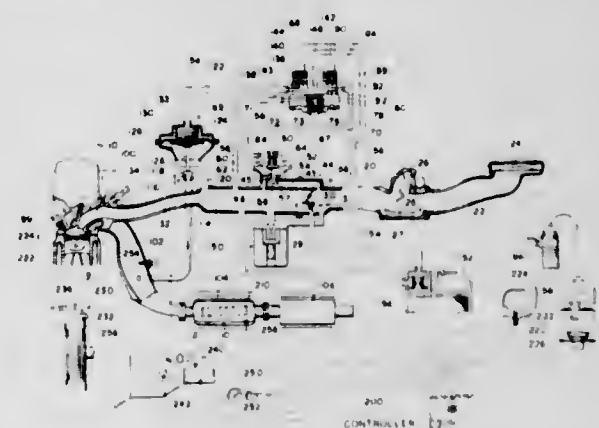
Filed Aug. 31, 1981, Ser. No. 297,929

Claims priority, application Japan, Sep. 4, 1980, 55-121769

Int. Cl.<sup>3</sup> F02M 51/00, 25/06; F02P 3/02

U.S. Cl. 123-478

17 Claims



11. An electronic control system for an internal combustion engine for controlling engine operation based on at least an intake vacuum pressure of the engine and an atmospheric air pressure comprising: a pressure sensor for measuring a pressure introduced and producing a pressure signal representative of said pressure introduced;



switching means, associated with said pressure sensor, for selectively introducing an intake vacuum pressure and an atmospheric air pressure into said pressure sensor; and a control unit, associated with said switching means to produce a periodic signal for operating said switching means for switching introduction of said intake vacuum pressure and said atmospheric pressure at a given timing, said control unit receiving said pressure signal from said pressure sensor and producing a control signal for controlling the engine operation.

4,416,240

# **DEVICE AND METHOD FOR CONTROLLING FUEL INJECTED INTERNAL COMBUSTION ENGINE PROVIDING HOT DECELERATION ENRICHMENT**

Hiroki Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

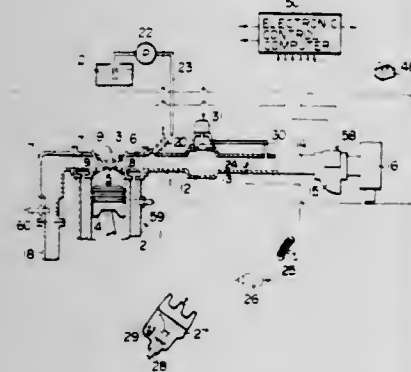
Filed Apr. 27, 1982, Ser. No. 372,387

Claims priority, application Japan, Jun. 4, 1981, 56-86295

Int. Cl.<sup>3</sup> F02D 17/00

U.S. Cl. 123—493

14 Claims



1. For an internal combustion engine comprising an intake manifold and a fuel injection valve fitted to said intake manifold which is selectively opened and closed by selective supply of an actuating signal thereto and which when so opened injects liquid fuel into said intake manifold, said internal combustion engine having an operational cycle:

an engine control method, comprising the processes, repeatedly and simultaneously performed, of:

- (a) sensing the flow rate of air into said intake manifold with an intake air flow meter which measures the flow rate of air into said intake manifold and which outputs an intake air flow rate signal representative of said air flow rate;
- (b) sensing the revolution of said internal combustion engine with an engine revolution sensor which responds to revolution of said internal combustion engine and which outputs an engine revolution signal representative of said internal combustion engine revolution;
- (c) determining at a sequence of instants separated by successive intervals successive instances of the value of a first quantity approximately representing the proper amount of fuel to be injected through said fuel injection valve, said determination being at least partly based upon said intake air flow rate signal and said engine revolution signal;
- (d) performing the following processes in the specified order:
  - (d0) determining the current value of a second quantity approximately representing the actual amount of fuel to be injected through said fuel injection valve, said determination being at least partly based upon said intake air flow rate signal and said engine revolution signal;
  - (d1) determining an average value of all said successive instances of the value of said first quantity approximately representing the proper amount of fuel to be injected through said fuel injection valve which have

been determined in some time interval up to the present;

- (d2) comparing the current value of said first quantity approximately representing the proper amount of fuel to be injected through said fuel injection valve with said average value and based thereupon determining whether or not said internal combustion engine is being decelerated at the present time, by comparing said current value with said average value;
- (d3) if, according to said comparison, it is so determined that said internal combustion engine is being decelerated at the present time, and if it is also determined that said internal combustion engine is fully warmed up at the present time, adjusting the current value of said second quantity approximately representing the actual amount of fuel to be injected through said fuel injection valve by increasing it somewhat, so as to produce an adjusted value corresponding to the actual fuel amount; and optionally
- (d4) further adjusting said adjusted value corresponding to the actual fuel amount;

and

- (e) at proper fuel injection points in said operational cycle of said internal combustion engine, modifying said actuating signal according to the current adjusted value of said second quantity and supplying the modified actuating signal to said fuel injection valve in such a fashion as to cause said fuel injection valve to open for a time period which will allow an amount of fuel approximately equal to the fuel amount represented by said current adjusted value of said second quantity corresponding to the actual fuel amount to pass through said fuel injection valve so as to be injected into said intake manifold.

4,416,241

# **MIXTURE FORMATION SYSTEM FOR MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINES WITH EXTERNALLY SUPPLIED IGNITION**

Heinrich Knapp, Leonberg; Peter Romann, Stuttgart, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

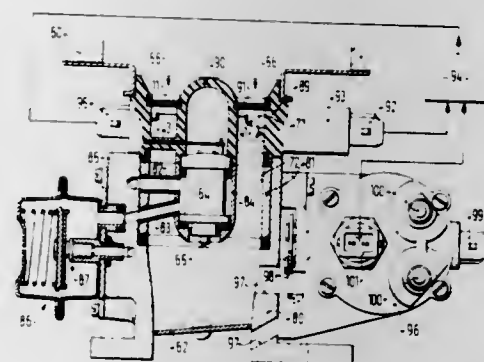
Filed Jul. 27, 1981, Ser. No. 287,002

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1980, 3032066

Int. Cl.<sup>3</sup> F02M 51/00

U.S. Cl. 123—494

14 Claims



1. A mixture formation system for mixture-compressing internal combustion engines with externally supplied ignition, comprising:

- a generally tubular air intake fitting having an electromagnetic injection valve element disposed concentrically therein and upstream of a throttle device disposed in said fitting,
- an air-flow rate meter disposed upstream of a fuel outlet location of said valve element directed coaxially relative to said air intake fitting for measuring the flow of intake

air, means defining an annular gap which surrounds said injection valve element, said air-flow rate meter including at least one temperature-dependent resistor disposed in said annular gap surrounding said injection valve element upstream of said fuel outlet location, and means for regulating the temperature of said resistor in accordance with flowing air mass to a constant value, the inner diameter of said annular gap extending concentrically with the outer diameter of said injection valve element, and the outer diameter of said annular gap extending concentrically with the inner diameter of said air intake fitting.

4,416,242

# **INTAKE HEATING APPARATUS OF AN INTERNAL COMBUSTION ENGINE**

Keigo Kato, and Yosio Kuroiwa, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

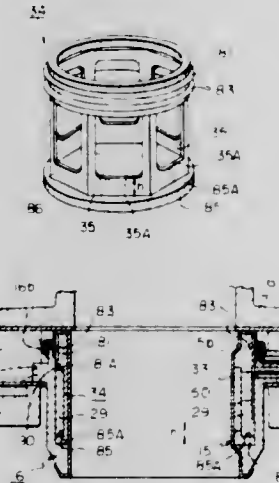
Filed Feb. 22, 1982, Ser. No. 351,310

Claims priority, application Japan, Oct. 5, 1981, 56-157533

Int. Cl.<sup>3</sup> F07M 31/00

U.S. Cl. 123—549

6 Claims



1. An intake heating apparatus of an internal combustion engine comprising a hollow heater vessel, which is placed in an intake passage between a fuel supply means and a cylinder of the engine to heat an intake, said hollow heater vessel comprising: an inner pipe having therein a mixture passage which is aligned with the intake passage; an outer pipe in which said inner pipe is press-fitted; an insulating annular PTC element holder which is located between said inner pipe and said outer pipe and which has holes in which PTC elements are fitted and held; and an annular elastic electrode which is connected to an external electrical power supply and is located between the PTC elements and the outer pipe, so that the electrode comes into contact with the PTC elements, whereby the inner pipe is heated by heating the PTC elements to heat the intake passing through the heater vessel, said holes of the PTC element holder having lower edges which are off-set from the lower end of the elastic electrode.

4,416,243

# **VACUUM CONTROL VALVE**

Mitukatsu Naito, Nagoya; Kiyotoshi Yano, and Kazuo Itou, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 20, 1982, Ser. No. 370,069

Claims priority, application Japan, Apr. 21, 1981, 56-57729[U]

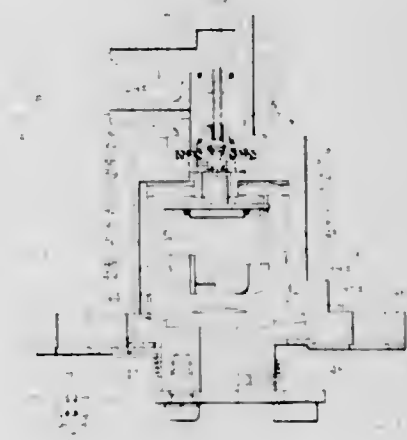
Int. Cl.<sup>3</sup> F02M 25/06

U.S. Cl. 123—569

3 Claims

1. A vacuum control valve for controlling an amount of exhaust gas to be recirculated into combustion chambers of an engine comprising:

- a cover and a housing;
- a vacuum port formed on said cover and to be connected with a vacuum source;
- an output port formed on said cover and to be connected with a diaphragm chamber of a EGR valve of said engine;
- a vacuum modulating chamber formed in said cover and communicated with said output port and having a diaphragm;
- a movable member coupled with an opening of said diaphragm so as to be moved with said diaphragm, said movable member having therein a valve chamber and a valve port opening to said vacuum modulating chamber, said movable member further having a hole for communicating said valve chamber with the atmosphere;
- a valve member disposed in said valve chamber and facing to said valve port;
- a first spring disposed in said valve chamber for biasing said valve member towards said valve port;
- a pipe disposed in said vacuum modulating chamber, one end thereof being communicated with said vacuum port and the other end projecting into said valve port for introducing a negative pressure from said vacuum source into said vacuum modulating chamber;
- a second spring disposed in said vacuum modulating chamber and biasing said movable member in such a direction



that said movable member is moved away from said pipe, whereby when the negative pressure in said vacuum modulating chamber exceeds a preset load determined by the biasing force of said second spring said valve member seats on said other end of said pipe for cutting off the communication between said vacuum port and said vacuum modulating chamber and said vacuum modulating chamber is communicated with said valve chamber for introducing the atmospheric pressure into said vacuum modulating chamber through said valve port, thereby to modulate the pressure in said vacuum modulating chamber at a predetermined value in accordance with said preset load;

- a cam chamber formed in said housing;
- a cam member rotatably disposed in said cam chamber and being linked with an acceleration pedal, wherein a diameter of said cam member is larger than that of said diaphragm;
- a cam follower means disposed in said cam chamber and having a cam follower being in contact with a cam surface of said cam member;
- a spring holder disposed in said cam chamber;
- a guide hole formed in a wall of said housing into which a guide portion of said spring holder is inserted and by which said spring holder is guided, so that the end of said



guide portion is in contact with said movable member; and,  
a third spring disposed in said cam chamber and between said cam follower means and said spring holder for urging said spring holder in a direction opposite to the biasing direction of said second spring, whereby when said cam member is rotated the urging force of said third spring becomes larger and thereby said preset load of said second spring is changed so as to change the predetermined value at which the pressure in said vacuum modulating chamber is controlled.

4,416,244

# CONTROL SYSTEM FOR A DUAL FUEL INTERNAL COMBUSTION ENGINE

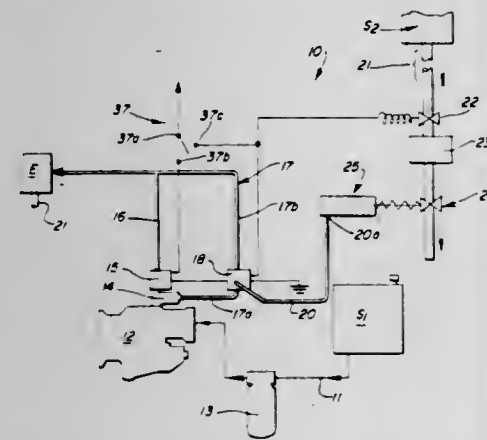
Ross W. McDonald, Bartholomew, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 24, 1981, Ser. No. 334,374

Int. Cl.<sup>3</sup> F02B 7/02

U.S. Cl. 123—577

11 Claims



1. A control system for a dual fuel internal combustion engine, the latter having a first fuel source and a second fuel source under a predetermined pressure, said system comprising: primary means for metering fuel to the engine from the first fuel source as a function of engine load and operator demand; means for generating a control signal as a function of engine load; means for metering fuel from the second fuel source to the engine as a function of said control signal whenever it is desired to operate the engine in a dual fuel mode; and means responsive to operation of the engine in a dual fuel mode for modulating the fuel metered by said primary metering means by an amount which provides substantially the same fuel energy content delivered to the engine in the dual fuel mode as in the single fuel mode; said primary fuel metering means including a variable speed fuel pump, and a first feed line for connecting said pump to the engine, and said modulating means including means disposed in said first feed line for restricting flow a predetermined amount only when the engine is operating in the dual feed mode.

4,416,245

# APPARATUS FOR DISTRIBUTING ELECTRICAL SIGNALS

Darwin O. Taft, Bainbridge, and Howard E. Van Siclen, Jr., Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 26, 1982, Ser. No. 382,065

Int. Cl.<sup>3</sup> F02P 1/00

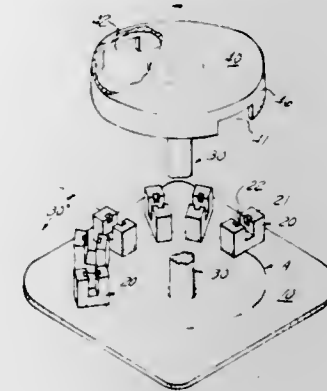
U.S. Cl. 123—613

2 Claims

1. An apparatus for distributing electrical signals in a predetermined sequence within an engine ignition system, said apparatus of the type having a plurality of signal means for providing output signals within said engine ignition system, said signal means including a plurality of switches arranged in a circular pattern, each of said switches comprising a light emitting diode and a light detector adapted to supply an electrical signal in response to receipt of light from said diode; and means

for blocking and allowing light to pass from said diode to said detector in a predetermined sequence, the improvement wherein said blocking and allowing means comprises:

a member that extends between the light emitting diode and light detector, said member having two windows therein



spaced 180 degrees apart and adapted to be rotated as the crankshaft of the engine rotates, and wherein there are only as many switches as there are cylinders in the engine whereby for each revolution of said member said first and second windows allow two signals to pass between each diode and detector.

4,416,246

# INTERNAL COMBUSTION ENGINE WITH FUEL INJECTION AND AC TYPE HIGH TENSION SPARK

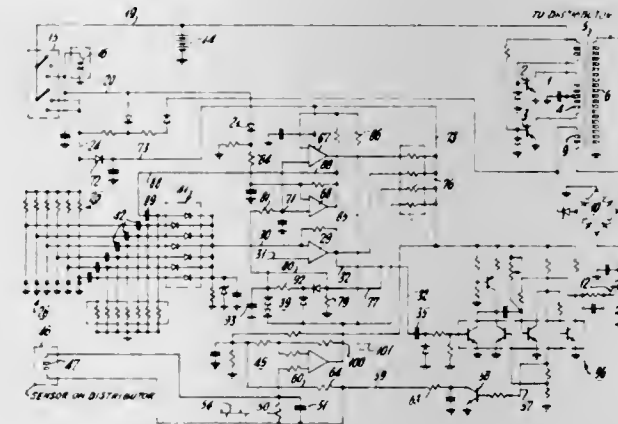
Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,322

Int. Cl.<sup>3</sup> F02P 9/00

U.S. Cl. 123—618

8 Claims



1. In combination with an internal combustion engine having a crank shaft and employing fuel injection and including an AC type high tension electric spark to ignite a combustible mixture of said injected fuel,

a fuel injection valve having an electrically conductive material plunger in seating contact with an electrically conductive material body of said valve when closed, said plunger being actuated by fuel pressure to open said valve,

first electrical circuit means for connecting a resistor in series with said plunger,

a comparator having two inputs and an output, second circuit means for connecting a predetermined EMF to one of said comparator inputs,

third circuit means for connecting the other of said comparator inputs to said plunger,

said comparator output providing a signal to initiate said electric spark when said plunger is actuated by the fuel pressure, the improvement comprising

means for gating said comparator to permit said electric

spark initiating signal only during a predetermined number of degrees of said crank shaft rotation.

releasably retained on said post to retain said post in said aperture, so that said arms can be telescoped on said post, and said

4,416,247

# DOMINO TOPPLING TOY

Takashi Yoshida, Tokyo, Japan, assignor to Yoshida Kogelsha, Tokyo, Japan

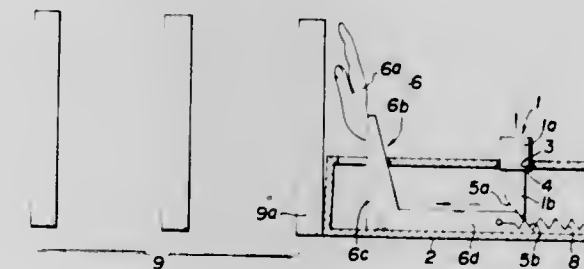
Filed Jun. 2, 1982, Ser. No. 384,396

Claims priority, application Japan, Dec. 31, 1979, 54-183018

Int. Cl.<sup>3</sup> F41B 15/00; A63B 71/00

U.S. Cl. 124—79

1 Claim



1. A domino toppling toy for imparting a toppling force to a first domino piece of a domino train consisting of a housing having a front, a back, a top and an opening in said top adjacent said front,

a moveable member accommodated in said housing and moveable between a first position adjacent said front and a second position adjacent said back, said moveable member having a head portion extending through said opening and above said housing, said head portion extending horizontally beyond said front when said moveable member is in said first position, and

operation means for operating said moveable member from said second position to said first position to exert said toppling force and automatically from said first position back to said second position upon removal of manual force on said means, said operation means consisting of an operation member vertically, slideably mounted through said top of said housing and having a first tapered surface on an end in said housing.

a second tapered surface on an end of said moveable member opposite to said head portion, said second tapered surface engaging with said first tapered surface, and a tension spring connected between said back of said housing and said end of said moveable member opposite to said head portion, said spring constantly urging said moveable member toward said second position.

4,416,248

# ASH DISPOSAL DAMPER FOR BARBECUE KETTLE

Erich J. Schlosser, Lindenhurst, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.

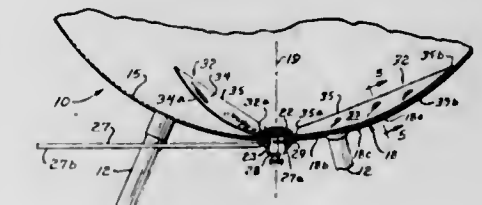
Continuation-in-part of Ser. No. 222,125, Jan. 22, 1981, abandoned. This application Jul. 10, 1981, Ser. No. 282,261

Int. Cl.<sup>3</sup> F24B 3/00

U.S. Cl. 126—9 B

14 Claims

1. In a kettle-type barbecue grill having a generally hemispherical bottom extending around a center vertical axis and having a plurality of air intake openings equally circumferentially-spaced around said bottom with damper means for covering said air intake openings, the improvement of said damper means including a post rotatable about said vertical axis and having a removable radial arm for each of said openings retained thereon and extending therefrom, said removable arms being maintained at a predetermined angular orientation on said post, said bottom having an aperture aligned with said vertical axis and said post being received into said aperture, and a handle secured to said post below said bottom, and



4,416,249

# OVEN BURNER RADIANT

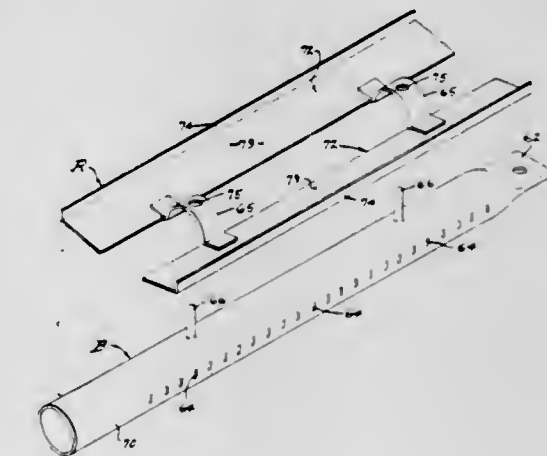
Howard R. Reynolds, deceased, late of Los Angeles, Calif., and by Pauline N. Reynolds, executrix, 1131 East Wakeham Ave., Santa Ana, Calif. 92705

Continuation of Ser. No. 900,588, Apr. 27, 1978, abandoned, and a continuation-in-part of Ser. No. 749,316, Dec. 10, 1976, Pat. No. 4,144,870. This application Aug. 23, 1982, Ser. No. 410,534

Int. Cl.<sup>3</sup> F24C 3/00

U.S. Cl. 126—41 R

6 Claims



1. An improved radiant heat burner for gas stoves, and including: a burner tube receiving primary combustion air from a shutter control and with a row of jet openings at a horizontal median plane for directing laterally disposed flames with said primary combustion air from the side of said burner tube, and a flat imperforate radiant of substantially non-corrosive material positioned to the side of the burner tube by at least one yoke and juxtaposed horizontally above said row of jet openings and offset immediately above said median plane, there being an opening between the burner tube and the juxtaposed radiant admitting secondary combustion air from above the burner tube to enter beneath the radiant and over the flames for efficient combustion and intense heating of said radiant.



4,416,250

**COMBUSTION APPARATUS AND REFRACTORY ELEMENTS FOR USE IN COMBUSTION APPARATUS**

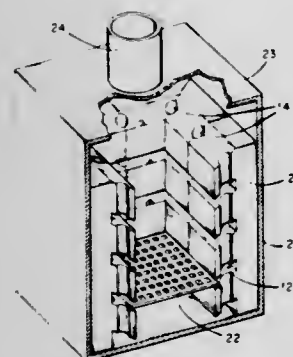
Stanley J. Kuzia, 610 Front St., Manchester, N.H. 03102

Filed Aug. 28, 1981, Ser. No. 297,432

Int. Cl.<sup>3</sup> F23M 5/00

U.S. Cl. 126—146

8 Claims



1. A refractory casting configuration for use in lining firepots of stoves and furnaces comprising:

- (a) an upright element of refractory material having an outside face, an inside face, a first side, a second side, a bottom end and a top end;
- (b) at least one slot extending entirely across said inside face angling toward said top end as it extends toward said outside face;
- (c) a recess in each of said first side and said second side extending from said bottom end to said top end and intersecting each of said at least one slot, whereby when a plurality of said elements are placed in side-by-side contact, said at least one slot in each element becomes continuous with said at least one slot in each of said plurality, and each of said recess mates with a corresponding recess in an adjacent block to form a vertical flue passage.

4,416,251

**THERMOSHIELD**

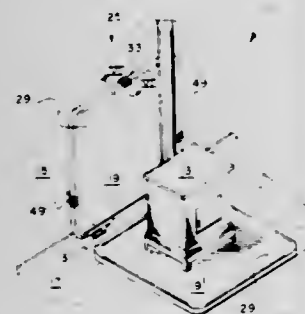
William H. Rachels, Sr., Memphis, Tenn., assignor to Rachels-Horton Industries, Inc., Memphis, Tenn.

Filed Oct. 30, 1981, Ser. No. 317,125

Int. Cl.<sup>3</sup> F24C 15/36

U.S. Cl. 126—201

5 Claims



1. Thermoshield means intended for use in conjunction with a space heating appliance, said thermoshield means comprising a sub-assembly including a planar sheet of heat insulating material for providing an optimum heat barrier and a panel member formed from durable sheetmetal for providing support and a covering for at least one side of said sheet of heat insulating material and thusly establishing a durable obverse side for said sub-assembly, the marginal edges of said panel member being foldably doubled about the entire perimeter of said sheet of heat insulating material, thus encasing the obverse side and the marginal edges thereof, said panel member being fixedly crimped in place about the perimeter of the reverse side of said sub-assembly, support means for supporting said sub-assembly in an optimum up-right disposition between the space heating

appliance and a wall situated adjacent thereto thus said sub-assembly provides a heat shield for the wall, continuous ridge means defining the circumjacency of said obverse side of said sub-assembly for providing an enhancement in the effectiveness of said support means; said support means including at least: (1) leg support means for engaging and thus supporting the lowermost portion of said sub-assembly a spaced distance above a floor surface thus allowing for free passage of air beneath said thermoshield means, and (2) solitary upper-offset bracket/wall attachment means for: (a) establishing and maintaining an optimum spaced distance between the uppermost portion of said sub-assembly and the wall which is being shielded therewith, and (b) providing a solitary means for attaching said sub-assembly to the wall; said leg support means includes leg attachable/detachable means for removably joining said leg support means to said sub-assembly, and said solitary upper-offset bracket/wall attachment means including solitary bracket attachable/detachable means for removably joining said solitary upper-offset bracket/wall attachment means to said sub-assembly, said leg attachable/detachable means as well as said solitary bracket attachable/detachable means are similiary characterized by peculiar-shaped self-engagable channellike means for interlockable engagement with said ridge means.

4,416,252

**APPARATUS FOR REMOVING AND TRANSPORTING ASHES**

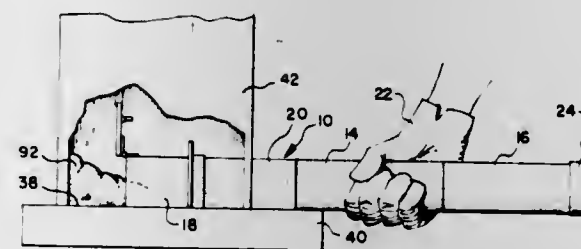
Charles J. Blank, Jr., c/o 311 Wonderly Ave., Dayton, Ohio 45419

Filed Feb. 26, 1982, Ser. No. 352,625

Int. Cl.<sup>3</sup> F23J 1/00; A01B 1/02; B65B 1/04

U.S. Cl. 126—242

11 Claims



1. An apparatus for removing and transporting ashes and the like from a hearth, comprising;

- a scoop member having a hollow body, said body having a forward end defining an ash receiving opening, and a scoop lid mounted to said body to rotate outwardly therefrom for alternately covering and uncovering said opening;
- a container member defining an ash storage compartment and including a lid member defining a mouth shaped to receive said forward end and a flap mounted to said lid member to rotate into said compartment for alternately covering and uncovering said mouth; and
- means attached to said scoop lid and said flap for linking said scoop lid to said flap such that insertion of said forward end into said mouth when said scoop lid and said flap are linked causes said scoop lid and said flap to rotate, thereby uncovering said opening and said mouth so that ashes contained within said body may pass to said storage compartment.

4,416,253

**APPARATUS FOR CONTROLLING FLOW OF COMBUSTION PRODUCTS**

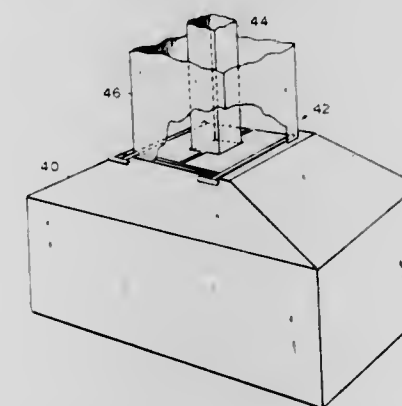
John C. Ickes, 2017 S. Florida, Joplin, Mo. 64801

Division of Ser. No. 155,610, Jun. 2, 1980. This application Nov. 9, 1981, Ser. No. 319,809

Int. Cl.<sup>3</sup> F23L 3/00

U.S. Cl. 126—292

7 Claims



1. A damper assembly for cooperation with an associated flue:

- an inner flue extending along substantially the entire axial extent of the associated flue, said inner flue defining first and second parallel flow paths which are respectively inside of and outside of said inner flue;
- means for modulating the flow through said second flow path;
- means for mounting said inner flue in generally coaxial relationship with the axis of the associated flue, said means for modulating comprises a pair of generally planar members; and
- said generally planar members are each pivotally mounted.

4,416,254

**FLUE STRUCTURE FOR DOMESTIC HEATING EQUIPMENT**

Raymond B. DiPietro, 205 S. Central Ave., Minoa, N.Y. 13116

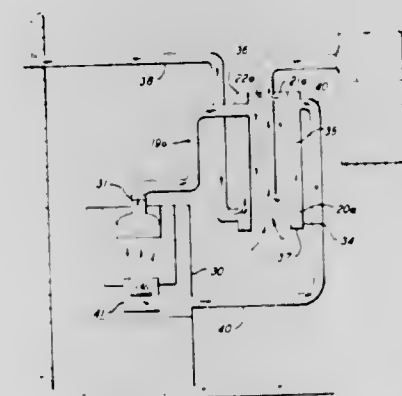
Continuation-in-part of Ser. No. 147,358, May 2, 1980,

abandoned. This application Sep. 14, 1981, Ser. No. 301,981

Int. Cl.<sup>3</sup> F23J 11/00

U.S. Cl. 126—307 A

2 Claims



1. For use in domestic heating equipment having a connection for attaching an external flue pipe thereto, improved external flue structure comprising a first flue pipe adapted to be connected at one end to the heating equipment connection, the other end of the first flue pipe being connected to the sidewall of a second flue pipe, the second flue pipe being vertically disposed and having a closed upper end and open lower end, the first flue pipe being connected to the second flue pipe sidewall a short distance below its closed upper end, a third flue pipe of smaller diameter than the second flue pipe and positioned in the latter in substantially concentric relation thereto, the upper end of the third flue pipe passing in sealed

relation through the closed upper end of the second flue pipe and extending into communication with a chimney, the lower end of the third flue pipe being open and terminating a predetermined distance above the lower end of the second flue pipe whereby flue gases from the heating equipment pass into the second flue pipe and flow downwardly therein until they enter the lower end of the third flue pipe and pass upwardly therein to the chimney, a cylindrical jacket member concentric with and surrounding the second flue pipe, the jacket member being closed at its upper and lower ends whereby a closed annular chamber is formed between the second flue pipe and member, a first conduit means communicating with the lower end of the chamber for delivering outside air to the chamber, and a second conduit means connecting the upper end of the chamber to the heating equipment whereby preheated air for combustion is delivered to the latter.

4,416,255

**WEDGE-SHAPED SOLAR AIR HEATING DEVICE**

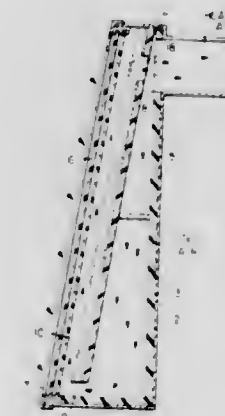
John J. Secamiglio, Roanoke, Va.; Edward T. Secamiglio, Philadelphia, Pa., and Anthony J. Secamiglio, Roanoke, Va., assignors to Sun Powered Inc., Roanoke, Va.

Filed Jun. 4, 1982, Ser. No. 385,083

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—422

14 Claims



1. A solar heating device adapted to be mounted against the exterior of a building and having rearwardly extending ducts for insertion into a building through an opening to the interior of the building, which comprises means defining a wedge-shaped casing having a heat pervious front wall inclined toward the building at an angle providing incidence to the sun and providing a wedge-shaped configuration with the tapered end being uppermost, two parallel essentially triangular side walls, bottom and top walls, and a rear wall, said casing having internally thereof a divider panel parallel and coextensive with the inclined front wall but for the lower end of the panel which terminates spacedly above the bottom, thus forming a passage from resultant front and rear chambers, said casing having first duct-forming means extending rearwardly from the upper portion of the rear wall and communicating with said rear chamber, and second duct-forming means extending rearwardly from the upper portion of the rear wall and communicating with said front chamber, said first and second duct-forming means constituting a casing support extension being located in relatively remote, elevated relationship to the lower portion of said casing rear wall, there being an air inlet at the end of said first duct-forming means remote from the communication thereof with said rear chamber, there being an air outlet in the portion of said second duct-forming means remote from the communication thereof with said front chamber, and heat transfer means disposed within said front chamber and comprising a heat-impervious rounded corrugated sheet overlying the forwardly-presented surface of the divider panel and having evenly-spaced longitudinal, alternating half round countours, and on the face of said corrugated sheet a superimposed heat impervious fine mesh metal screen, and said front



wall comprising a heat-pervious double-glazed pane with pre-determined spacing between glazings, and wherein downwardly diverging baffles are disposed across the rear cool air chamber from back to front.

4,416,256

## SOLAR WATER HEATERS

Ferdinand C. Korwill, Dalkeith, Australia, assignor to S. W. Hart & Co. Pty. Ltd., Welshpool, Australia

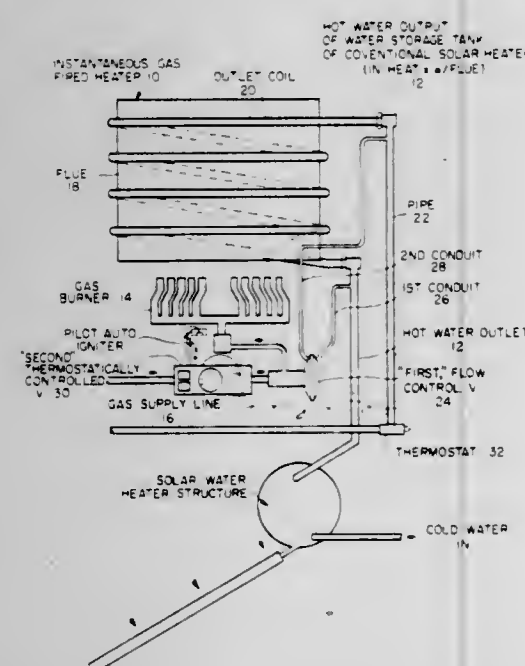
Filed Mar. 5, 1981, Ser. No. 240,672

Claims priority, application Australia, Mar. 6, 1980, PE2664

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—427

5 Claims



1. A solar water heater comprising
  - (a) a water storage tank having a cold water inlet pipe and a hot water outlet pipe;
  - (b) an instantaneous gas fired water heater operatively connected to said hot water outlet pipe and comprising a gas burner;
  - (c) a gas supply line to said gas burner;
  - (d) means for auto-igniting said gas burner;
  - (e) a flow control valve located in said gas supply line and arranged to allow gas to be fed to said gas fired water heater in response to water flow through said hot water outlet;
  - (f) a thermostatically controlled valve located in said gas supply line and arranged to allow gas to be fed to said gas fired water heater in response to the temperature of the water in said hot water outlet pipe; and
  - (g) a thermostat mounted in said hot water outlet pipe downstream of said gas fired water heater and arranged to cause said thermostatically controlled valve to open when the water in said hot water outlet pipe downstream of said gas fired water heater is at or below a predetermined minimum temperature and to cause said thermostatically controlled valve to close partially or completely so as to reduce or eliminate the amount of gas which can flow therethrough when the water in said hot water outlet reaches a predetermined maximum temperature, whereby gas flows to said gas fired water heater only when both said flow control valve and said thermostatically controlled valve are open.

4,416,257

## SOLAR ENERGY COLLECTOR

Neville R. Bale, Cnr Avian & Killick Sts., Maroochydore, Qld., Australia

PCT No. PCT/AU80/00060, § 371 Date May 7, 1981, § 102(e)

Date May 7, 1981, PCT Pub. No. WO81/00755, PCT Pub.

Date Mar. 19, 1981

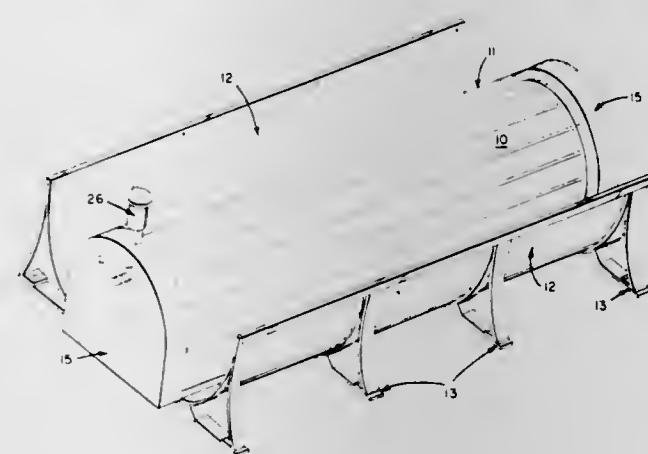
PCT Filed Sep. 7, 1980, Ser. No. 269,038

Claims priority, application Australia, Sep. 7, 1979, PE0387

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—427

10 Claims



1. A solar collector, comprising:
  - a longitudinal parabolic reflector;
  - a collector core assembly within said reflector and formed of a series of spaced tubes exposed to the direct rays of the sun and to rays reflected by said reflector;
  - said tubes being arranged in a cylindrical array and forming a fluid path between annular inlet and outlet manifolds;
  - a storage tank located within said array; and
  - means for connecting said manifolds to opposite ends of said tank whereby said fluid is heated as it passes in said tubes from said inlet manifold to said outlet manifold to said tank.

4,416,258

## HEAT STORAGE MEANS

Benjamin T. Gravely, 7001 Buckhead Dr., Raleigh, N.C. 27602

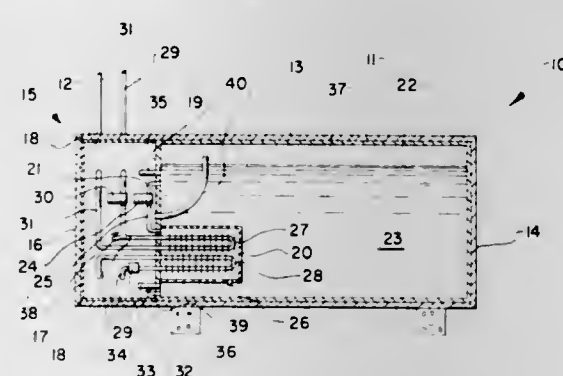
Continuation of Ser. No. 8,437, Feb. 1, 1979. This application

Jul. 24, 1981, Ser. No. 287,094

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—428

11 Claims



1. A heat storage means comprising: an insulated enclosure; a tank portion and an equipment portion disposed interiorly of said enclosure; an insulated, readily removable closure forming part of said insulated enclosure adjacent said equipment portion whereby ready access into said equipment portion is provided; a passive means to maintain substantial thermal equilibrium between said tank portion and said equipment portion in the form of a liquid impervious, heat conductive interface means separating such tank portion from such equipment portion; an immersion air vent extending through said interface

into the upper portion of said tank portion to provide pressure equilibrium without loss of tank fluid through evaporation; and equipment means mounted within said equipment portion, at least a part of which is functionally designed to penetrate said tank portion through said interface and at least a part of which gives off heat during operation, said equipment, among other things, controlling heat transfer within said tank portion whereby a compact heat storage means is provided with substantial thermal equilibrium being maintained between said tank portion and said equipment portion.

4,416,259

## METHOD AND ARRANGEMENT FOR HEAT CONDITIONING OF BUILDINGS

Lars Skogström, and Bengt Bergqvist, both of Stockholm, Sweden, assignors to Aeromotor Trading Company AB, Stockholm, Sweden

PCT No. PCT/SE80/00102, § 371 Date Dec. 11, 1980, § 102(e)

Date Dec. 5, 1980, PCT Pub. No. WO80/02190, PCT Pub.

Date Oct. 16, 1980

PCT Filed Apr. 10, 1980, Ser. No. 224,542

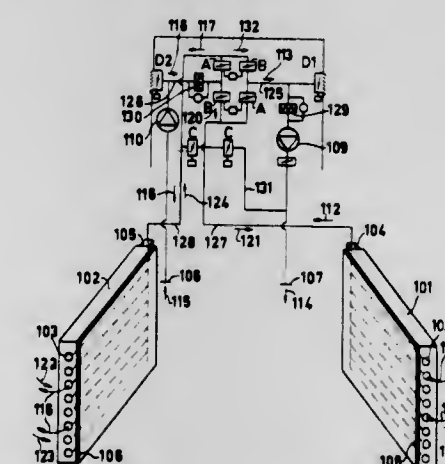
Claims priority, application Sweden, Apr. 11, 1979, 7903251;

Mar. 3, 1980, 8001647

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—429

17 Claims



1. Method for air conditioning a region in a building where the building utilizes construction elements of concrete or the like having channels therein through which air is passed between the outside environment and said region, comprising passing air from said region through the channels of said elements from said region to the outside environment for a first predetermined period of time to thereby transfer the temperature condition of the air leaving the region to said construction elements, reversing the flow by passing said air from the outside environment through said channels to said region for a second predetermined period of time to thereby transfer the temperature condition of the construction elements to said air entering said region, alternating said flows for said first and second periods of time regularly substantially continuously, and regulating said flows and said first and second periods of time to control the temperature in said region and to simultaneously balance the air pressure in said region, so that said construction elements function as regenerative heat exchangers.

7. An arrangement for air conditioning a region within a building where the building utilizes construction elements of concrete or the like having channels wherein through which air is passed comprising, a first group of channels in said construction elements, means to connect said first group of channels to the outside environment, a second group of channels at a different location in said construction elements, second means to connect said second group of channels to the outside environment, at least one exhaust duct for said region adapted to be alternately communicated with said first group of channels and said second group of channels, at least one inlet duct for said region adapted to be alternately communicated with

said first group of channels and said second group of channels, pump means to force said air through said ducts and channels, and valve means operably connected to said exhaust and inlet ducts and to said first and second groups of channels to connect said exhaust duct alternately with said first and second groups of channels while simultaneously connecting said inlet duct alternately with said second and first group of channels to control the flow of air reversibly through said first and second groups of channels between said ducts and the outside environment.

4,416,260

## SOLAR HEATING SYSTEM FOR GREENHOUSES AND THE LIKE

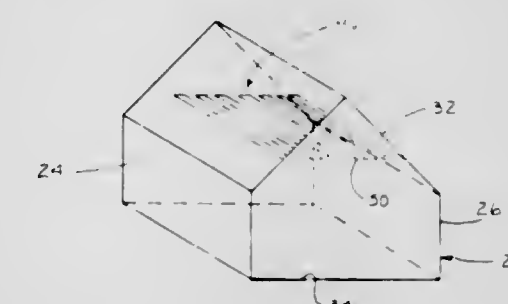
Budd L. Proctor, Manchester, Mo., assignor to PSI Energy Systems, Inc., Fenton, Mo.

Filed Oct. 13, 1981, Ser. No. 310,898

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—429

7 Claims



1. A solar heating system for greenhouses and the like having a translucent roof, said system comprising a black plastic sheet spaced below an upper portion of said translucent roof and extending transversely under the roof in spaced relation thereto to define with the roof a substantially enclosed plenum to provide a solar collection space for hot air generated therein by solar energy, said black plastic sheet forming a floor of the roof plenum and a ceiling for a greenhouse space to be heated below, a solar integral self-contained heat storage chamber supported upon a floor of the greenhouse, air directing means supported within a housing connected to and supported upon said chamber for selectively directing;
  - (a) hot air from said roof plenum to said solar heat storage chamber in a charge cycle,
  - (b) hot air from said roof plenum to a greenhouse space to be heated in a direct heat cycle and,
  - (c) hot air from said solar heat storage chamber to a greenhouse space to be heated in a discharge cycle, the solar heat storage chamber being provided with means for directing hot air therefrom to a hot air manifold to direct hot air to selected floor areas of the greenhouse to provide heat thereto, said manifold being comprised of a laterally extending conduit supported above the floor of the greenhouse and communicating with a plurality of longitudinally extending flexible heat distribution conduits extending along and supported by the floor of the greenhouse, said flexible conduits being moveable to said selected areas to provide variable heat thereto as desired.



4,416,261

# SOLAR COLLECTOR COMPRISING AN ABSORBER PLATE WHICH EXCHANGES HEAT WITH THE EVAPORATOR SECTION OF A HEAT PIPE

Herman H. M. van der Aa, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

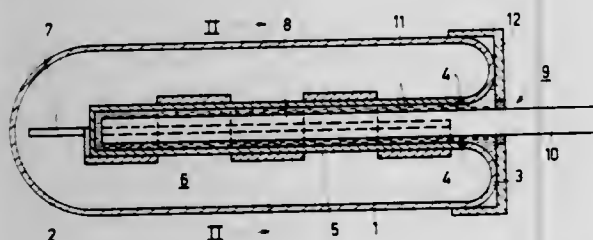
Filed Nov. 12, 1981, Ser. No. 320,248

Claims priority, application Netherlands, Dec. 11, 1980, 8006716

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—433

2 Claims



1. A solar collector, which comprises a metal heat pipe having an evaporator section and a condenser section; a metal tube spaced from and surrounding the evaporator section, one end of said metal tube being closed and the other end being open; a metal solar heat absorber plate thermally conductively connected to the metal tube; an evacuated transparent glass envelope spaced from and surrounding the metal tube and the absorber plate connected thereto, said envelope being joined to the open end of the metal tube by means of a glass-metal seal; a thermally conductive liquid medium filling the space between the metal tube and the evaporator section of the heat pipe; and a seal between the heat pipe and the envelope.

4,416,262

# HIGH RATIO MICROWAVE ENERGY CONCENTRATING COLLECTOR

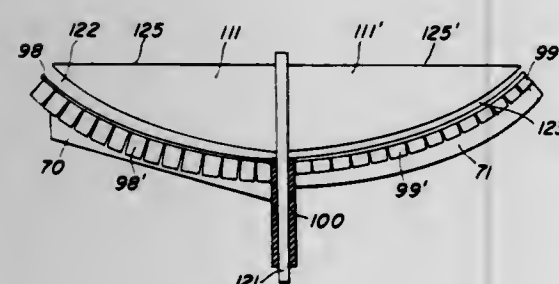
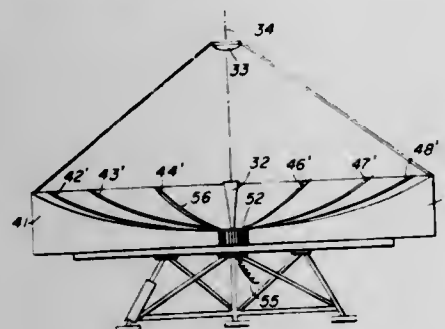
William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 171,097, Jul. 22, 1980, Pat. No. 4,340,031. This application Dec. 10, 1981, Ser. No. 329,389

Int. Cl.<sup>3</sup> F24J 3/02; G02B 5/08

U.S. Cl. 126—438

30 Claims



1. A concentrating microwave energy collector comprising:

a disc reflector having a surface which is a paraboloid of revolution; an energy absorbing means along the axis of revolution and arranged for energy transfer to a conductor operatively connected thereto; said disc reflector including a plurality of fixed radially extending supports, each having a top inclined surface, and also having side planar surfaces disposed parallel to said axis; a plurality of flexible members mounted above said supports and having tab portions in vertical planar contact with the side surfaces of said supports and being vertically slidably adjustable relative thereto; said supports and flexible members being operatively adjustable in parabolic relationship relative to the axis of revolution; said tabs being affixed to said supports after said adjustment; and a microwave energy reflective surface installed on top of said flexible members.

29. The method of constructing a paraboloid of revolution for microwave energy collection, including the steps of: arranging a plurality of reflector surface supports having a first upper surface in radial arrangement about the axis of a paraboloid and having planar surfaces parallel to and coincident with said axis; mounting a plurality of flexible members above said first surface of said supports with vertical portions in contact with planar vertical surfaces of said supports; urging said flexible members upwardly against a fixed template which has a parabolic shaped bottom edge; fixing said flexible members to said supports; covering said flexible members with a sheetlike member which conforms to the contours of the flexible members; supporting a microwave energy receiver along the axis of the paraboloid above the sheetlike member; connecting said receiver to a conductor.

4,416,263

# HIGH RATIO SOLAR ENERGY LINEAR TYPE CONCENTRATING COLLECTOR

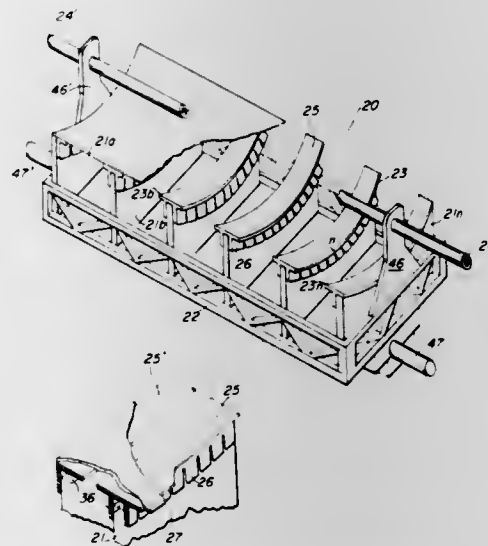
William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 329,389, Dec. 10, 1981, which is a continuation of Ser. No. 171,097, Jul. 22, 1980, Pat. No. 4,340,031. This application Jan. 18, 1982, Ser. No. 340,065

Int. Cl.<sup>3</sup> F24J 3/02; G02B 5/08

U.S. Cl. 126—438

24 Claims



1. A solar energy linear type concentrating collector including: a heat collector; a parabolic reflector arranged to collect, concentrate, and direct solar rays toward the heat collector, heat transfer fluid in contact with said collector at a distance from said reflector,

4,416,265

# SOLAR COLLECTOR

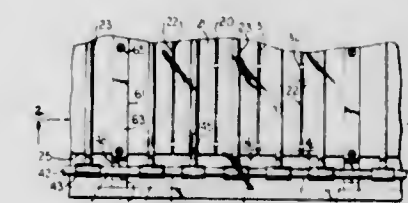
John G. Wallace, Box 55a, Rte. 1, Mound City, Kans. 66056

Filed Dec. 16, 1981, Ser. No. 331,187

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—446

2 Claims



said heat collector being conductive and coated with absorptive means for improving heat transfer to said heat transfer fluid and arranged co-incident with the focal line of the parabolic reflector, a plurality of spaced supports arranged transversely of the axis of the collector; each of said supports having a top surface and also having major side planar surfaces transverse to said axis; a flexible member mounted above each of said supports and having tabs in vertical planar contact with the major side surface of said supports, and being vertically slidably adjustable relative thereto; said supports and flexible members being adjustable in coacting parabolic relationship; said tabs being ultimately fixed to said supports to prevent relative movement therebetween; said parabolic reflector being in continuous contact with, and supported by, top surfaces of said flexible members; whereby the spaced support and flexible member combination provides intermittent load bearing surfaces for the said reflector.

23. The method of constructing a linear parabolic solar energy collector, including the steps of: arranging a plurality of reflective surface supports with major planar sides perpendicular to the axis of the collector, said supports having an inclined upper surface; mounting a flexible member above said inclined upper surface of said supports, said flexible member having vertically downwardly extending tabs in contact with said major planar sides of said supports; urging said flexible members upwardly against a template having a parabolic shaped bottom edge; fixing said flexible member to said supports; mounting a reflective surface above said flexible members; mounting a heat transfer fluid conduit at the focal line of the parabolic reflective surface so that said reflector-collector structure acts in correlated operation with said absorptively coated fluid conduit.

4,416,264

# SOLAR HEAT COLLECTOR

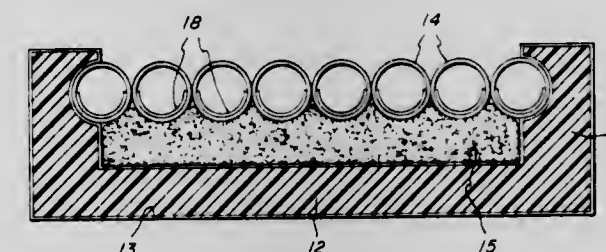
Carlyle S. Herrick, and Richard S. Alben, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,811

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—442

3 Claims



1. A solar energy collector structure comprising: a housing enclosing a flow volume having heat insulative sides of structural foam, a plurality of partially evacuated tubular members substantially transparent to incident solar radiation mounted on the top of said housing, an absorber of filamentary material contained within said housing, said fibers being positioned to intercept the radiation transmitted through the evacuated tubular member cover, and a heat resistant transparent elastomer positioned between each tubular member to chemically bond said tubes and provide a substantially planar, self-supporting, weather tight tubular cover.

1. In combination with a structure having elongated, substantially parallel framing members each having a side face, an inner edge and an outer edge, a solar collector comprising:

- a pair of base panel support members each attached to a respective framing member side face in spaced relation from and substantially parallel to a respective framing member outer edge;
- a base panel having an outer surface and connected to said base panel support members, said base panel extending between an opposed pair of said framing member side faces;
- a plurality of juxtaposed extruded metal collector plates positioned on said base panel outer surface, each of said collector plates comprising:
  - an inlet end;
  - an outlet end;
  - a web having opposite side margins; and
  - a fluid conduit terminating at and open at said inlet and said outlet ends;
- said adjacent pair of framing members each having a first and a second elongated slot, each of said elongated slots opening onto a respective framing member outer edge;
- an inlet header positioned in said first slots for relative movement with respect to said framing members, said inlet header being attached to said collector plate inlet ends and communicating fluid with said fluid conduits;
- an outlet header positioned in said second elongated slots and movable therein relative to said framing members, said outlet header being connected to said collector plate outlet ends and communicating fluid with said fluid conduits;
- a plurality of mechanical fasteners each positioned at a respective web side margin for loosely retaining said collector plates against said base panel outer surface, each of said mechanical fasteners comprising:
  - a head positioned outwardly of a respective web; and
  - a shank fixedly embedded in said base panel adjacent a respective web side margin;
- a transparent cover attached to and extending between said framing member outer edges;
- a ceiling panel attached to and extending between said framing member inner edges; and
- a layer of thermally insulating material positioned between said base panel and said ceiling panel.



4,416,266

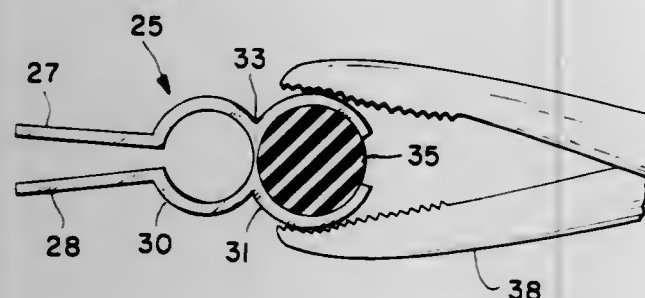
## MEDICAL CLIP

Robert M. Baucom, Carrollton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

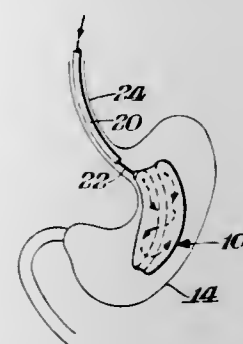
Filed May 15, 1981, Ser. No. 264,381  
Int. Cl.<sup>3</sup> A61B 17/12

U.S. Cl. 128—325

3 Claims



self-sealing substance to facilitate puncture thereof with insufflation means through which the balloon is inflated and to



facilitate sealing of the puncture upon removal of the insufflation means.

4,416,268

## ENDOSCOPE HAVING TWO DETACHABLE ARMOUR TUBES

Tadao Hagino, Yokohama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

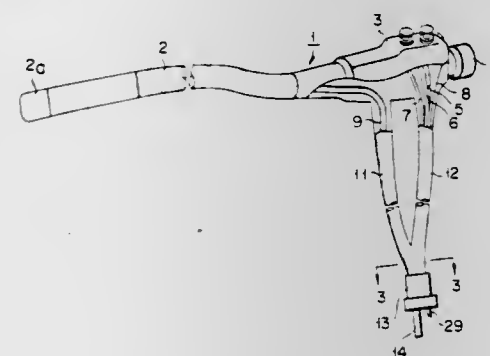
Filed Jun. 29, 1981, Ser. No. 278,096

Claims priority, application Japan, Jul. 10, 1980, 55-94190;  
Sep. 30, 1980, 55-136127

Int. Cl.<sup>3</sup> A61B 1/06

U.S. Cl. 128—6

6 Claims



1. An endoscope coupled with a light source unit, comprising:  
an endoscope body including a control section and an insert section;  
a first armour tube having one end connected with said control section;  
a light source;  
a light guide extending from said light source and through said endoscope body, alone and only through said first armour tube;  
a second armour tube having one end connected with said control section and separated from said first armour tube up to about the distal end portions of each said tube;  
an elongated insert means extending from said endoscope body and said second armour tube and terminating at the distal end thereof to be inserted into a body cavity;  
first coupling means connecting the ends of said first and second armour tubes to said control section for coupling said light guide and said insert means to the light source unit; and

a second removable coupling means for connecting said first and second armour tubes to a light source and sources of water, air, and suction, said coupling means including a hole formed therein through which the said first armour tube is inserted, an engaging pin having a tip extendable into the through hole, a spring urging the engaging pin into the through hole, and a recess formed in the face of the first armour tube adapted to engage the tip of the

4,416,267

## METHOD AND APPARATUS FOR TREATING OBESITY

Lloyd R. Garren, and Mary L. Garren, both of P.O. Box 3738, Wilmington, Del. 19807

Filed Dec. 10, 1981, Ser. No. 329,182

Int. Cl.<sup>3</sup> A61B 17/00

U.S. Cl. 128—1 R

7 Claims

1. A stomach insert for treating obesity in humans by reducing the stomach volume comprising a flexible, free-floating and unattached, inflatable balloon having a central opening extending therethrough, the balloon being inflatable to a volume of a person being treated, at least a portion of the balloon having a

engaging pin to firmly position the first armour tube with respect to said coupling means.

4,416,269

## APPARATUS FOR VIBRATING THE ULNA IN VIVO

Shogo Enomoto, Tokorozawa; Masanobu Sawai, Yamato; Iwao Seo, and Tomonobu Yamaguchi, both of Ami, all of Japan, assignors to Teikoku Hormone Mfg. Co. Ltd. and Mitsubishi Petrochemical Co., Ltd., both of Tokyo, Japan

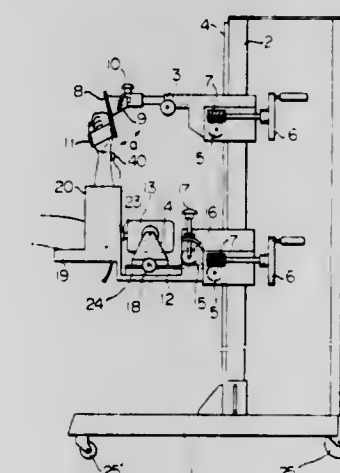
Filed Jul. 7, 1981, Ser. No. 281,045

Claims priority, application Japan, Jul. 11, 1980, 55-93826

Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 128—41

8 Claims



1. An apparatus for vibrating an ulna in vivo, comprising:  
a base stand;  
a main post provided upright on said base stand;  
a horizontally extending upper arm secured to an upper part of said main post for vertical movement;  
a plate means for fixing the back of a hand, said plate means being secured to an end of said upper arm for free movement at an arbitrary angle of inclination with respect to said upper arm, and having a band member which holds said hand onto said plate means so as to bring said back of said hand into closest possible contact with a surface of said plate means and to lift an antebrachium and maintain it suspended in the air;  
a lower arm means secured for vertical movement to a lower part of said main post and extending in the same horizontal direction as said upper arm;  
an excitor means mounted on the lower arm for sliding movement in the axial direction of said lower arm and in a horizontal direction perpendicular thereto, said excitor having a movable head which projects horizontally so as to abut against an olecranon in the axial direction of said lower arm; and  
a brachium resting plate fixed ahead of said excitor; wherein said ulna is vibrated by the excitor while its ends are kept free.

4,416,270

## PERCUSSOR

Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation of Ser. No. 50,685, Jun. 21, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,468

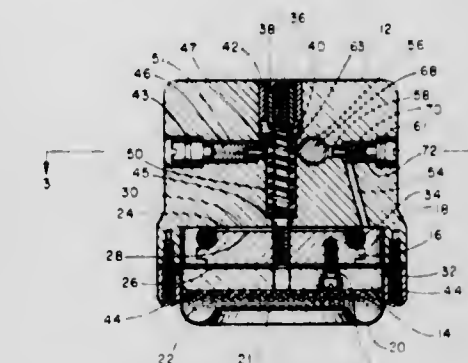
Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128—53

8 Claims

1. A percussor comprising  
an oscillating assembly comprising a reciprocating plate and an applicator cooperating therewith for directing reciprocating motion from said plate to a user,  
a rigid housing member having therein first and second gas chambers, and first gas sealing means between said gas chambers,  
second gas sealing means cooperating with said reciprocating

ing plate to prevent gas leakage from said first chamber through said oscillating assembly,  
gas inlet means for introducing gas into said first gas chamber at a pressure therein sufficient to overcome said first gas sealing means whereby gas enters said second gas chamber and causes movement of said oscillating assembly in a first direction of said reciprocating motion,



gas outlet means for venting gas from said second gas chamber whereby pressure therein is reduced causing movement of said oscillating assembly in a second direction of said reciprocating motion, and  
biasing means urging said first gas sealing member to form a gas seal between said first and second gas chambers.

4,416,271

## SPINAL MISALIGNMENT DETECTIVE AND CORRECTIVE APPARATUS

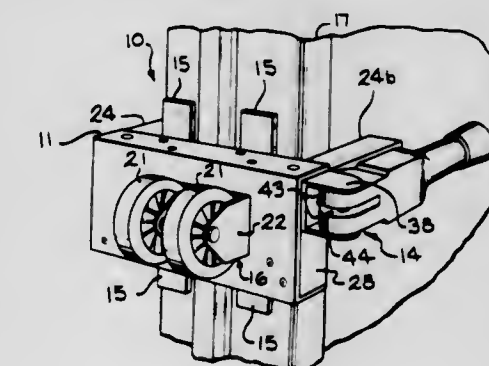
Kern E. Chester, 104 Academy Dr., Paragould, Ark. 72450

Filed Oct. 16, 1981, Ser. No. 312,164

Int. Cl.<sup>3</sup> A61H 15/00

U.S. Cl. 128—57

12 Claims



12. A spinal misalignment and corrective apparatus for mounting on a vertically-extending door jamb member and comprising, a base member, a pair of wheels extending outwardly from said base member and mounted for rotation on a horizontal axis, support means operatively connected to said base in opposed relationship to said pair of wheels for removably holding said apparatus to such vertically-extending door jamb member, said support means including a pair of outwardly-extending rectangular tube members pivotally mounted on said base member, the distal ends of said tube members being moveable toward one another to engage such vertically-extending door jamb member, resilient stop means on said base member for engaging and protecting such vertically-extending door jamb member, and clamping means operatively connected to said tube members, said clamping means including linkage means having one end connected to one of said tube members, said linkage means extending through the other of said tube members and operatively connected to a handle assembly, said handle assembly including a cam and handle means, whereby movement of said handle means urges the distal ends of said tube members to engage such vertically-extending door jamb member, said linkage means including



adjusting means for adjusting the initial spacing between said tube members.

4,416,272

**COMBINATION UNDERPANT AND HERNIAL TRUSS**  
Nedwyn R. Nelkin, Overland Park, Kans., assignor to H. G. Enterprises, Kansas City, Mo.

Filed Apr. 24, 1981, Ser. No. 257,236

Int. Cl.<sup>3</sup> A61F 5/24

U.S. Cl. 128—96

7 Claims



1. A combination underpant and hernial truss comprising:
  - (a) an underpant brief having front, rear and crotch portions and spaced legholes separated by said crotch portion;
  - (b) said front portion having a truss pad connected thereto and protruding inwardly of said brief to engage and support an abdominal hernial area of the body of a wearer;
  - (c) a belt and a means for adjusting the tension of said belt, said belt encircling said brief and being secured to said front portion near a lateral center thereof and substantially adjacent said pad for directing hernia retaining force thereon; said belt being free from securement to said rear portion so as to allow selective movement upwardly and downwardly relative to said rear portion to adjust to the wearer's comfort.

4,416,273

**CONNECTOR VALVE ASSEMBLY FOR ENDOTRACHEAL TUBES**

Jerry L. Grimes, 1798 N. Garey Ave., Pomona, Calif. 91767

Filed Jun. 15, 1981, Ser. No. 273,662

Int. Cl.<sup>3</sup> A61M 16/00

U.S. Cl. 128—207.16

2 Claims



1. A connector valve assembly for admission of catheters through endotracheal tubes comprising:
  - (a) a connector body having a tracheal tube port, a respiratory tube port and an open end portion for insertion of a catheter through said body and said tracheal tube;
  - (b) a valve means at said open end portion including a ring

seal portion for sealably engaging said catheter and a check valve disposed inwardly of said ring seal portion toward said respiratory tube port and said tracheal tube port;

- (c) wall means defining an air lock chamber between said ring seal portion and said check valve for insertion of a catheter without opening said connector body to the outside atmosphere;
- (d) said wall means includes an end wall with said ring seal portion extending therethrough and a surrounding side wall having a lower skirt portion sized to fit over said open end portion;
- (e) said open end portion having a shoulder; said skirt portion having an inwardly directed flange providing an inner shoulder to confront said shoulder;
- (f) a disc member having a peripheral edge captured between said shoulder and said inwardly directed flange and having portions providing a valve seat wherein said check valve has a flapper attached to said disc member and sealably engaging said valve seat.

4,416,274

**ION MOBILITY LIMITING IONTOPHORETIC BIOELECTRODE**

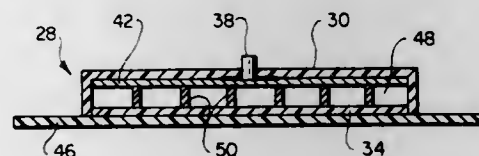
Stephen C. Jacobsen, Salt Lake City, and Richard D. Luntz, Murray, both of Utah, assignors to Motion Control, Inc., Salt Lake City, Utah

Filed Feb. 23, 1981, Ser. No. 236,753

Int. Cl.<sup>3</sup> A61M 15/08

U.S. Cl. 604—20

13 Claims



1. A bioelectrode for use in the iontophoretic delivery of ions into the skin or tissue of a person comprising means holding ions to be delivered, one side of which is for placement against the person's skin or tissue, said holding means being adapted to inhibit movement of ions in a direction generally parallel to the surface of the skin or tissue, an electrically conductive sheet of material disposed at a substantial portion of the other side of said holding means, and means for coupling said sheet of material to an electrical source.

4,416,275

**APPARATUS FOR APPLYING A URINE RECEPTACLE TO A MALE**

Herbert A. Omley, P.O. Box L-2, Wickenburg, Ariz. 85358

Filed Dec. 21, 1981, Ser. No. 332,938

Int. Cl.<sup>3</sup> A61B 17/00

U.S. Cl. 128—303 A

11 Claims

1. An apparatus for applying an elastic ring to a shaft of a penis for use in attaching a urine receptacle thereto comprising:

- a housing means, an elastic ring having slots on a end surface,
- a plurality of cooperating jaw means pivotally mounted on said housing for movement generally radially relative to each other piston means,
- each jaw means having an outwardly directed finger means at the end of the jaw remote from its pivotal connection for engaging slots in said end surface of the said elastic ring,
- a first means mounted on said jaw means for biasing said jaw

4,416,277

**RETURN ELECTRODE MONITORING SYSTEM FOR USE DURING ELECTROSURGICAL ACTIVATION**

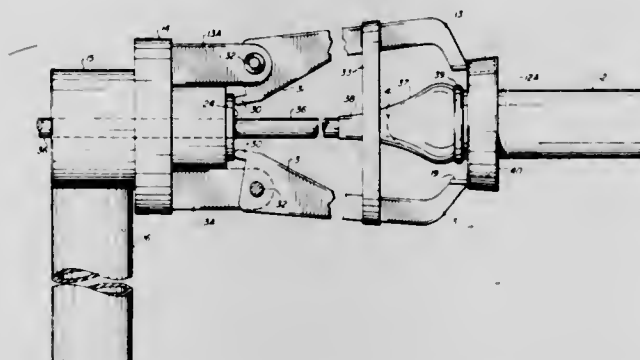
David W. Newton, Boulder; Frederic M. Hulett, III, Longmont, both of Colo., and Christopher Owens, San Antonio, Tex., assignors to Valleylab, Inc., Boulder, Colo.

Filed Nov. 3, 1981, Ser. No. 317,780

Int. Cl.<sup>3</sup> A61B 17/39

U.S. Cl. 128—303.13

17 Claims



an opening means extending through said housing means axially aligned with the longitudinal axis of the ring for receiving therethrough in a direction extending outwardly of said finger means a tool means for holding the glans penis while the expanded ring is placed thereover and while the jaw means are sequentially biased toward each other to position the ring firmly around the shaft of the penis.

4,416,276

**ADAPTIVE, RETURN ELECTRODE MONITORING SYSTEM**

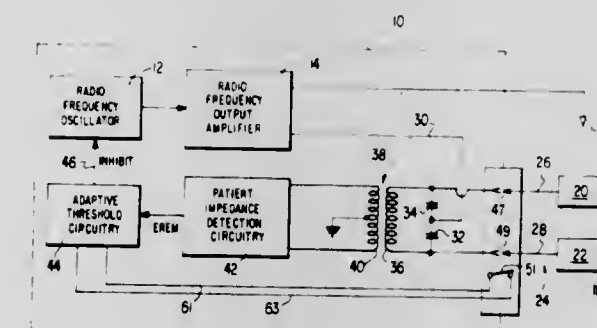
David W. Newton, Boulder, and William G. Paterson, Longmont, both of Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Oct. 26, 1981, Ser. No. 315,053

Int. Cl.<sup>3</sup> A61B 17/39

U.S. Cl. 128—303.13

26 Claims



1. A return electrode monitoring system for use with a split patient return electrode having two, electrically isolated electrode elements adapted for contacting a patient, said system comprising

- means responsive to the impedance between said two electrode elements for producing a signal which is a function of said impedance;
- means for establishing a desired range having an upper limit and a lower limit for said impedance when the patient is in contact with the electrode elements;
- determining means responsive to said signal for determining whether said impedance is within said desired range; and
- adjusting means for automatically adjusting said upper limit to adapt said system to the particular impedance of said patient in response to said particular impedance occurring within the desired range.

1. A return electrode monitoring system for use with a patient return electrode adapted for contacting a patient, said return electrode having two, spaced apart conductors attached thereto for connecting the electrode to a generator of electro-surgical current which passes through the electrode, said system comprising

- means for applying a monitoring current through said conductors to said electrode;
- detecting means responsive to said monitoring current for producing a signal which is a function of the impedance between said two conductors, said detecting means including means including a synchronous detector for substantially eliminating any effect the electrosurgical current might have on the production of said signal when said electrosurgical and monitoring currents are simultaneously applied to said return electrode;
- means for establishing a desired range having at least an upper limit for said impedance; and
- determining means responsive to said signal for determining whether said impedance is within said desired range whereby said monitoring system is susceptible to negligible interference from the electrosurgical current when monitoring is continued during application of the electrosurgical current to the patient.

4,416,278

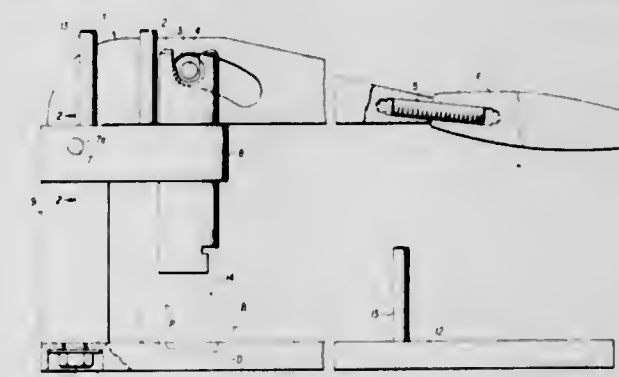
**BONE PLUG CUTTER**

Joseph E. Miller, 641 Argyle Ave., Westmont, Quebec, 3C1  
Continuation of Ser. No. 61,067, Jul. 26, 1979, abandoned. This application May 18, 1981, Ser. No. 265,075

Int. Cl.<sup>3</sup> A61B 17/32

U.S. Cl. 128—305

5 Claims



1. A bone plug cutter for cutting a bone plug from a portion of the bone comprising:







extending oppositely in horizontally alignment for extending around the lower chest just below said breasts, and the third of said strap means extending upwardly over the adjacent shoulder, said strap means of each said cup means



being secured to the others by the free ends thereof, and independently of the strap means of the other breast cup means, for independently supporting each breast in its natural position, shape and size.

4,416,285

# IMPROVED OPTICAL CATHETER AND METHOD FOR MAKING SAME

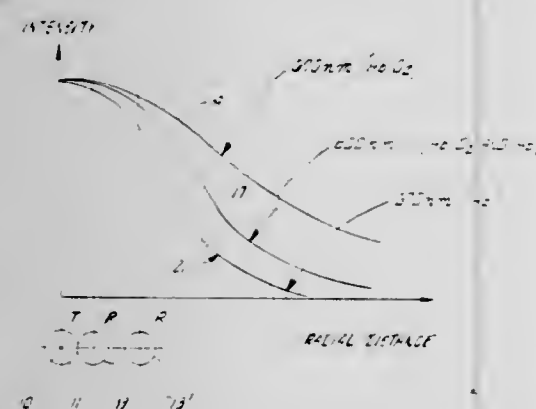
Robert F. Shaw, Portola Valley, and John Sperinde, San Jose, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Continuation of Ser. No. 964,612, Nov. 29, 1978, Pat. No. 4,395,470, which is a continuation of Ser. No. 733,279, Oct. 18, 1976, abandoned. This application Aug. 13, 1981, Ser. No. 292,696

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> A61B 5/00

U.S. Cl. 128—634

6 Claims



1. A population of catheters suitable for use during photometric analysis of a fluid, each member of said population of catheters having a single transmitting optical fiber having proximal and distal ends with aperture means respectively formed therein for conducting radiant energy therethrough, each member of said population of catheters also having a single receiving optical fiber having proximal and distal ends with aperture means respectively formed therein for conducting radiant energy therethrough, at least some of said transmitting and receiving fibers within said population of catheters differing sufficiently in a cross-sectional dimension from one another such that calibration of individual members of said population of catheters would otherwise be necessary to carry out accurate photometric analysis of the fluid even if said transmitting and receiving optical fibers of said members were used in parallel and tangent configuration at said distal ends, said aperture means being located at said distal ends of said transmitting and receiving optical fibers in each member of said population of catheters so that said fibers respectively have centroids of area spaced from one another at a fixed distance which is identical for all members of said population of catheters such that the need for individual calibration of each member of said population of catheters is eliminated

despite differences in the dimensions of said transmitting and receiving optical fibers.

4,416,286

# ULTRASONIC BLOOD FLOW MEASURING APPARATUS

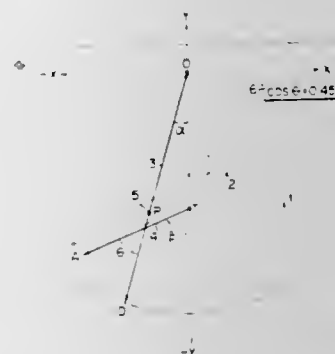
Kazuhiro Iinuma, Yaita; Yasutsugu Seo, Otawara, and Shigeru Sato, Chigasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 6, 1981, Ser. No. 232,235

Claims priority, application Japan, Feb. 12, 1980, 55-15811  
Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—663

9 Claims



1. An ultrasonic blood flow measuring apparatus comprising:  
transducer means for transmitting an ultrasonic beam into an object, receiving an ultrasonic echo reflected from the object, and converting such echo into an electrical signal;  
scanning means for scanning the object with said ultrasonic beam;  
first detecting means for detecting a tomogram signal of the object from said electrical signal;  
display means for displaying said tomogram of the object corresponding to said tomogram signal;  
second detecting means for extracting a Doppler signal from said electrical signal;  
marker generating means responsive to operator control for selectively locating on said display means and superimposed over said tomogram both a first marker indicative of a selected first direction in which said ultrasonic beam travels when passing through a selected portion of a vessel in the object in which the blood flow is to be measured, and a second marker which is indicative of a second direction in which blood flows through said portion of said vessel; and  
calculating means responsive to the location of said first and second markers on said display means for calculating an angle  $\theta$  defined by said first and second directions and for calculating the velocity of the blood flow through said portion of said vessel based on said Doppler signal and said angle  $\theta$ .

4,416,287

# DISCHARGE VALVE FOR A BLOOD PRESSURE MEASURING DEVICE OR THE LIKE

Karlheinz Riester, Jungingen, Fed. Rep. of Germany, assignor to Rudolf Riester GmbH & Co., KG, Jungingen, Fed. Rep. of Germany

PCT No. PCT/EP81/00010, § 371 Date Sep. 28, 1981, § 102(e) Date Sep. 28, 1981, PCT Pub. No. WO81/02096, PCT Pub. Date Aug. 6, 1981

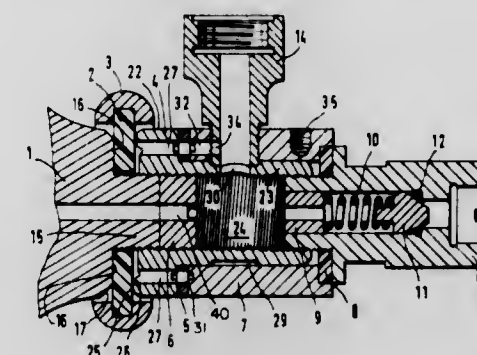
PCT Filed Jan. 27, 1981, Ser. No. 308,540  
Int. Cl.<sup>3</sup> A61B 5/02; F61K 25/00

U.S. Cl. 128—685

7 Claims

1. In a discharge valve for a blood pressure measuring device or the like, including a valve casing having a central bore therethrough which is in fluid communication with an inflatable cuff, a pressure measuring device and an air outlet, with

said air outlet leading to an outlet valve seat located on the exterior of the valve casing, the improvement wherein said valve seat is circular, comprising an elastic annular valve washer concentrically disposed with respect to said circular valve seat and engaging said seat on one side thereof, a stud-shaped guide member on which said valve washer is mounted, a ring-shaped control element mounted on the outer edge of said valve washer for deflecting said washer from the valve seat, a flat, annular support surface engaging the other side of



said valve washer having an outer diameter at least approximately equal to that of said circular valve seat along which the valve washer presses against the valve casing on the side of said washer which faces the air outlet, a conical ring-shaped surface extending radially outward from the outer diameter of said support surface at an angle of about 45° away from the valve washer, the air outlet having a smaller diameter than said circular valve seat, and the valve washer having a larger outer diameter than said support surface.

4,416,288

# APPARATUS AND METHOD FOR RECONSTRUCTING SUBSURFACE ELECTROPHYSIOLOGICAL PATTERNS

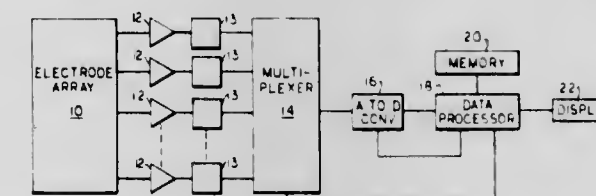
Walter J. Freeman, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 14, 1980, Ser. No. 178,170

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—731

14 Claims



1. An apparatus for recovering a pattern of cell generated electrical field potential  $U$  occurring at a specific time  $t$  and at a selected depth within a living organ from an associated pattern of electrical potential  $V$  at said specific time and at the surface of said living organ, said cell generated electrical field potential  $U$  having coordinates  $x', y'$  and being describable as  $U = U(x', y', t)$ , said electrical potential  $V$  having coordinates  $x, y$  and being describable as  $V = V(x, y, t)$ , said apparatus comprising:

an electrode array for detecting values of  $V(x, y, t)$  at a plurality of points on the surface of said living organ, said points being spaced from each other by a distance determined by the expected spatial frequency of said electrical potential  $V(x, y, t)$ ;

means for digitizing the detected values of  $V(x, y, t)$ ; and means for spatially deconvolving the digitized values of  $V(x, y, t)$  to recover the desired pattern of electrical field potential  $U(x', y', t)$  within said living organ, said deconvolving means including computing a transform function  $f_2 = f_2(x-x', y-y')$ , said transform function having the value determined by an equation which describes the field potential at each of a plurality of subsurface points with respect to the field potential of each of a plurality of other selected sets of subsurface electric field potential genera-

tors, such that the potential at any one point is the sum of potentials from such surrounding generator sets, with each potential having a value determined by the laws of conduction in the volume of said organ, and means for computing the product of said surface field potential  $V(x, y, t)$  and the inverse of said transform function to generate values of the electric field potential  $U(x', y', t)$ .

4,416,289

# CIRCUITS FOR DETERMINING VERY ACCURATELY THE POSITION OF A DEVICE INSIDE BIOLOGICAL TISSUE

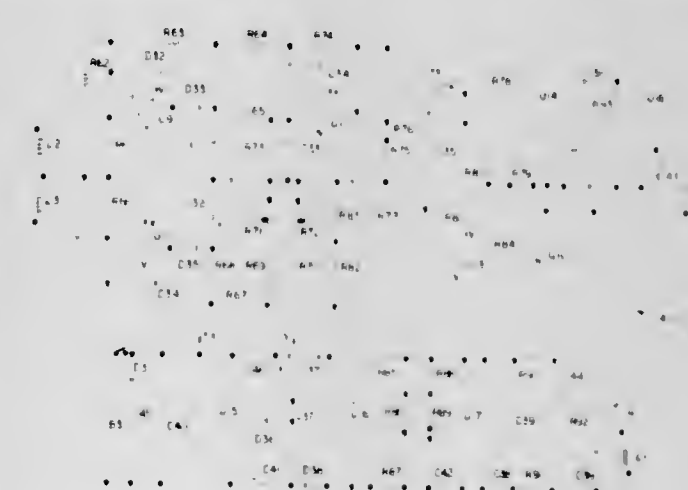
Robert G. Bresler, Watertown, Mass., assignor to McCormick Laboratories, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 261,521, May 7, 1981. This application Apr. 26, 1982, Ser. No. 371,078

Int. Cl.<sup>3</sup> A61B 5/05, 5/06

U.S. Cl. 128—737

14 Claims



1. A circuit for determining very accurately the position of a device in biological tissue, comprising:

a detector means,

said detector means having a field coil which, when activated, generates a field, said detector means also having a first receiving coil and a second receiving coil which are both disposed in the field generated by said field coil,

said first receiving coil producing a first a.c. output signal and said second receiving coil producing a second a.c. output signal when the field is generated, and

an alarm means,

said alarm means having a first rectifier means and a first integrator means, said first rectifier means receiving the first a.c. output signal and converting it to a first d.c. signal and said first integrator means converting the first d.c. signal to a first d.c. averaged signal,

said alarm means also having a second rectifier means and a second integrator means, said second rectifier means being an active rectifier having an amplifier means and a means for adjusting the output of said amplifier means, said second rectifier means receiving the second a.c. output signal and converting it to a second d.c. signal, the amplitude of which may be varied by said means for adjusting, and said second integrator means converting the second d.c. signal to a second d.c. averaged signal, the amplitude of the second d.c. averaged signal being adjusted by said means for adjusting to be identical with the first d.c. averaged signal when the device is not detected,

said alarm means further including an alarm amplifier means which receives the first and second d.c. average signals and produces an alarm output corresponding to any difference between them, as would be caused by the presence of the device inside the field, whereby the alarm output is used to activate an alarm.



4,416,290

**MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH VEIN INDICATION**

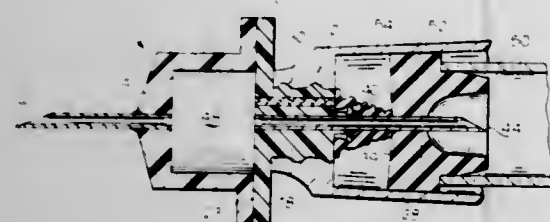
Lawrence Lutkowski, East Rutherford, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Aug. 30, 1982, Ser. No. 412,647

Int. Cl.<sup>3</sup> A61B 5/14

U.S. Cl. 128—764

8 Claims



1. A needle assembly for collecting one or more liquid samples from a source for subsequent discharge sequentially into a plurality of evacuated containers, comprising

- (a) a housing defining a sample collection chamber therein;
- (b) a front wall on said housing;
- (c) a rear wall on said housing;
- (d) an intravenous point spaced from said front wall;
- (e) a negative pressure point spaced from said rear wall;
- (f) cannula means extending from said intravenous point to said negative pressure point;
- (g) means in said cannula means for communicating the lumen of said cannula means with said sample collection chamber;
- (h) a resilient sleeve extending over the portion of said cannula means extending from said back wall to said negative pressure point;
- (i) a flange on said sleeve on the end thereof adjacent said rear wall;
- (j) a passage containing a gas permeable, liquid impermeable filter extending from said chamber through said rear wall; and
- (k) a flat surface on said sleeve flange for cooperating with said rear wall for blocking gas from passing through said filter;
- (l) whereby when said intravenous point engages said source, liquid enters said chamber through said communicating means by forcing gas in said chamber through said filter, and when said negative pressure point comes in contact with an evacuated container the stopper thereof causes collapse of said sleeve, moving said sleeve flange against said rear wall for cooperating blockage of said passage.

4,416,291

**MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH VEIN ENTRY INDICATOR**

Joseph Kaufman, Emerson, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Jul. 20, 1981, Ser. No. 284,894

Int. Cl.<sup>3</sup> A61B 5/14

U.S. Cl. 128—766

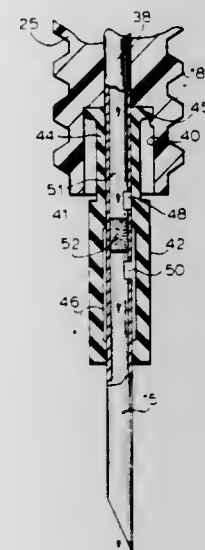
13 Claims

1. A multiple sample needle assembly for determining vein entry when collecting blood samples from a patient comprising:

- a housing have a forward end, a rearward end and a chamber within, said housing being translucent at least around the chamber so that said chamber is viewable by a user of said assembly;
- a first cannula in fluid communication with said chamber extending outwardly from said forward end adapted for insertion into a patient;
- a second cannula in fluid communication with said chamber extending outwardly from said rearward end adapted for

penetration of an evacuated container for collection of a blood sample;

- a pair of spaced holes through the side of the outwardly extending portion of the second cannula, said holes communicating with the lumen of said second cannula;
- an air-permeable, blood impermeable porous plug positioned in the lumen of said second cannula in the space between said holes;
- a resilient, slidable valve on the exterior of said second



- cannula; said resilient slidable valve being slidable on said second cannula from a first position covering at least one of said pair of holes for preventing blood from flowing out of said second cannula to a second position allowing blood to flow out of said one hole; and
- means in said resilient slidable valve for allowing blood to flow out of said one hole and back into said second cannula through the other of said pair of holes whereby blood is collected from said second cannula, into a container attached thereto.

4,416,292

**METHOD AND APPARATUS FOR DETERMINING THE NEUTRAL AXIS OF A FOOT OR THE LIKE**

Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230

Filed Aug. 19, 1981, Ser. No. 294,307

Int. Cl.<sup>3</sup> A61B 5/10

U.S. Cl. 128—779

12 Claims



8. A level for finding the neutral axis of a foot comprising in combination:

- a level including a centering indicator,
- adhesive means on said level remote from said indicator for temporarily affixing said level to a person,
- and adjustable orientation means interposed between said level and said adhesive means to alter the angular relationship between said adhesive means and said level whereby said level can be moved once said adhesive means has been affixed to the person to initialize said level.

4,416,293

**METHOD AND APPARATUS FOR RECORDING GAIT ANALYSIS IN PODIATRIC DIAGNOSIS AND TREATMENT**

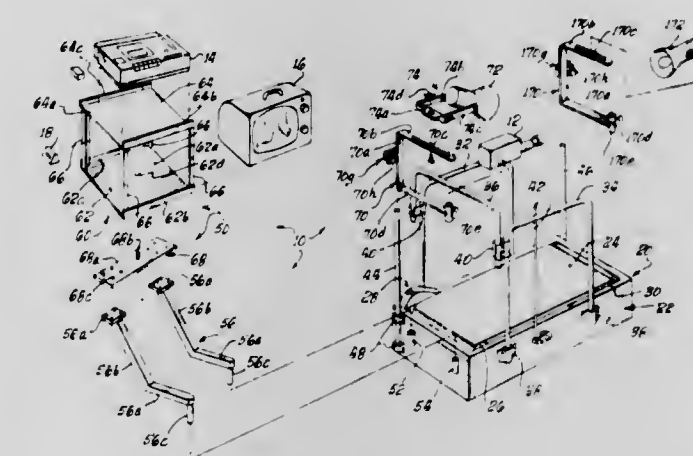
Blair V. Anderson, 1695 Lakeside Dr., Reno, Nev. 89509; Morris Feldman, 528 "B" St., Santa Rosa, Calif. 95403, and Richard Jacoby, Phoenix, Ariz. 85001

Filed Mar. 19, 1981, Ser. No. 245,319

Int. Cl.<sup>3</sup> A61B 5/10

U.S. Cl. 128—782

8 Claims



- 1. A method for recording gait analysis for diagnosis and treatment of podiatric conditions comprising: (1) having a subject whose gait is being analyzed move on a treadmill which is controllable by an operator; (2) Simultaneously recording and displaying a view of the patient's activity under the controlled conditions; (3) recording the diagnosis session by sound recording; (4) altering the conditions of activity of the subject by alteration of the treadmill characteristics; (5) recording by video and sound the effects of the altered treadmill conditions; and (6) analyzing the results comparatively.

4,416,294

**LEAF STRIPPER**

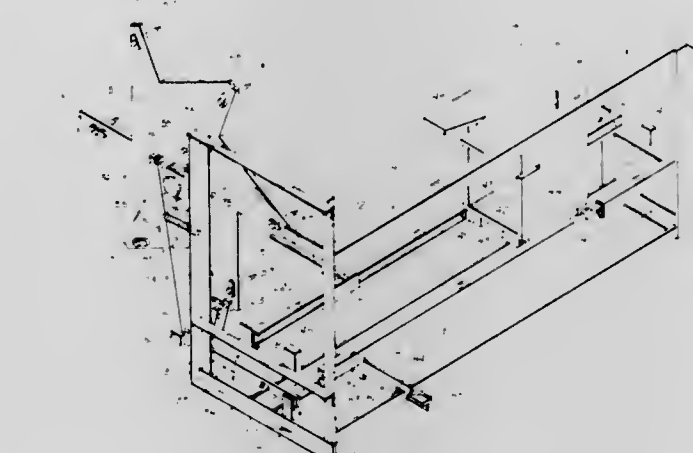
Raymond L. Turpin, 146 W. Chrystal St., Dover, N.J. 07801, and William K. Medford, RD 1 Box 306, Clyde, N.C. 28721

Filed Aug. 24, 1982, Ser. No. 411,014

Int. Cl.<sup>3</sup> A01P 45/16; B26D 1/00

U.S. Cl. 130—30 R

10 Claims



1. A device for stripping burly tobacco or the like from its associated stalk comprising, in combination:

- a frame,
- a wheel rotatably carried on said frame having means for retaining a plurality of stalks thereon,
- stripping means carried on said frame oriented to run the length of the stalk, removing tobacco therefrom,
- advancing means for moving successive tobacco stalks in registry with said stripping means,
- and indexing means for stopping said advancing means when a successive stalk is in position to be stripped.

4,416,295

**SMOKING-MATERIAL RODS AND A METHOD OF MAKING SUCH RODS**

Collin C. Greig, Salisbury, and Richard G. Hook, Winchester, both of England, assignors to Union Camp Corporation, Wayne, N.J.

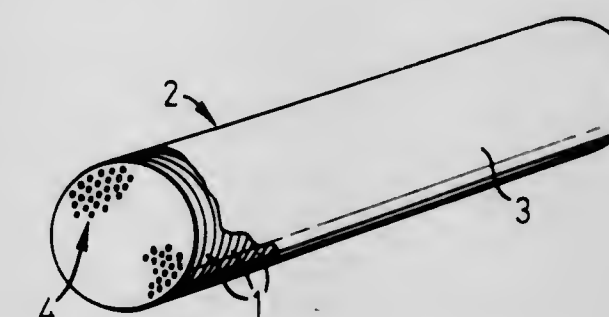
Filed Oct. 7, 1981, Ser. No. 309,489

Claims priority, application United Kingdom, Oct. 17, 1980, 8033543

Int. Cl.<sup>3</sup> A24F 1/00; A24D 1/00, 1/18

U.S. Cl. 131—364

16 Claims



- 1. A rod of smoking material, for use as at least part of a smoking article, which is formed by a multiplicity of lamina-form self-sustaining smoking-material elements extending transversely of the rod and located in face-to-face contact with one another, wherein the elements are provided with smoke passages therethrough.

4,416,296

**COMPOSITION AND METHOD FOR HAIR TREATMENT**

William E. Meyers, Helena, Ala., assignor to Carson Products Company, Savannah, Ga.

Filed Nov. 17, 1980, Ser. No. 207,437

Int. Cl.<sup>3</sup> A45D 7/00

U.S. Cl. 132—7

12 Claims

- 1. A composition for treating hair when applied thereto, comprising a non-aqueous solution of guanidine hydroxide and from 0.5% to 25% by weight of said solution of an inert organic solvent for said guanidine hydroxide, the user adding a preselected amount of water to said solution before applying said composition to the hair, said composition having a pH greater than 11.8.

4,416,297

**HAIR WAVING OR STRAIGHTENING PROCESS AND PRODUCT**

Leszek J. Wolfram, Stamford; David Cohen, Milford, and Norman N. Tehrani, Stamford, all of Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 114,479, Jan. 23, 1980, abandoned. This application Aug. 13, 1981, Ser. No. 292,452

Int. Cl.<sup>3</sup> A45D 7/04

U.S. Cl. 132—7

25 Claims

- 1. In a process for waving or straightening hair, which comprises the sequential steps of:

- (a) moistening the hair with an aqueous solution;
  - (b) winding strands of the hair over curling rods;
  - (c) contacting the hair with a composition which contains a reducing agent;
  - (d) rinsing the hair;
  - (e) contacting the rinsed hair with a composition which contains a neutralizing agent;
- the improvement which comprises:
- (i) said composition employed in step (a) containing at least one cationic polymer product which forms a substantially water insoluble complex with an anionic surfactant in the presence of hair; and



- (ii) said composition employed in step (c) containing at least one anionic surfactant.

4,416,298

# ELECTRICAL IGNITION SYSTEM FOR CATALYTICALLY HEATED CURLING DEVICE

Conrad Berghammer, Kronberg; Walter Schäfer, Frankfurt am Main, and Rolf Stühler, Wiesbaden-Delkenheim, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

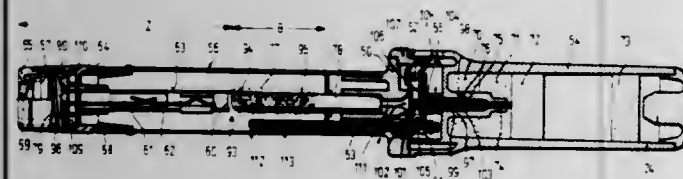
Filed Mar. 9, 1982, Ser. No. 356,566

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3109353

Int. Cl.<sup>3</sup> A45D 2/12

U.S. Cl. 132—33 R

4 Claims



1. In a curling device having a tubular body defining a combustion chamber therein, and having first and second ends and a hair winding portion disposed between the first and second ends and surrounding the combustion chamber, heating means including a catalyst means disposed in the combustion chamber, a housing member proximate the tubular body including fuel supply means for storing a fuel in a liquid state, and aspirating means coupled between the fuel supply means and the combustion chamber for vaporizing the fuel and for mixing the vaporized fuel with air and for supplying a vaporized fuel/air mixture to said catalyst means, self-contained electrical ignition means mounted in the first end of the tubular body proximate the catalyst means for initiating oxidation of the vaporized fuel/air mixture in the presence of the catalyst means, the improvement comprising:

- a battery chamber, including a battery, mounted in said electrical ignition means;
- an air chamber disposed between said battery chamber and said combustion chamber for inhibiting heat flow between said battery chamber and said combustion chamber, said air chamber being substantially sealed from both said battery chamber and said combustion chamber and having an opening only to ambient air outside said tubular body;
- an accessible button member located in the tip of said first end of said tubular body;
- an incandescent filament, proximate said catalyst means, for oxidizing the vaporized fuel/air mixture in the presence of said catalyst means; and
- conductive means providing an electrical connection between said battery and said incandescent filament, when said button member is pressed, thereby electrically activating said incandescent filament.

4,416,299

# COIN LOADER

Charles T. Bergman, Watertown, Wis., assignor to Brandt, Inc., Watertown, Wis.

Filed Aug. 13, 1981, Ser. No. 292,653

Int. Cl.<sup>3</sup> G07D 9/00

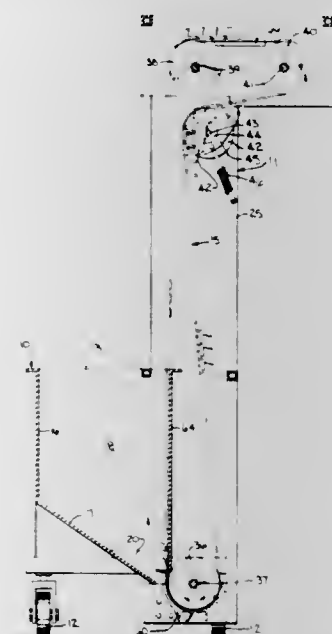
U.S. Cl. 133—1 R

4 Claims

1. A coin loader, comprising:
- a bin having an open top and including interior walls which slope toward a low area adjacent the bottom of a vertical wall of the bin;
  - a support framework mounted to the bin and rising therefrom at said vertical wall;
  - a flexible conveyor belt extending about rollers supported on

said framework, said conveyor belt having a vertical run disposed in said vertical wall and extending upwardly therefrom and a horizontal run extending from the top of the vertical run to a discharge point laterally of said bin; said conveyor belt being imperforate to the smallest coins to be handled;

a plurality of flights spaced along said belt and each including a ledge portion which projects away from the surface



of said belt a distance greater than one-half the largest diameter of coins to be handled and which terminates in a lateral edge formed from a series of curves;

a comb disposed at said low area of said bin and having surfaces which are spaced from and complement the lateral edge of the flights and through which the flights pass at the bottom of said vertical run; and

a motor connected to rotate at least one of said rollers.

4,416,300

# HEAT SHIELDED THERMOPLASTIC WASH ARM FOR DISHWASHER

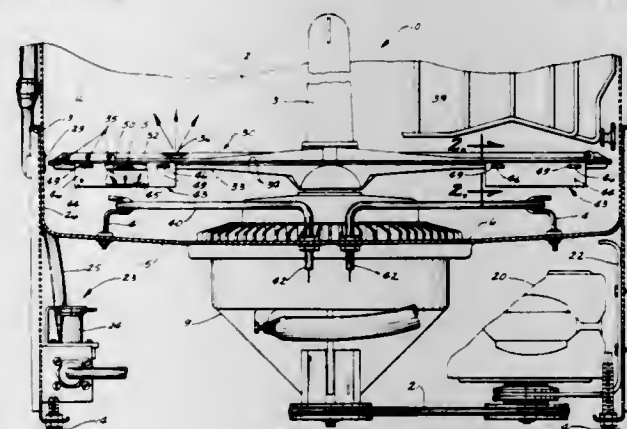
Lawrence J. Jordan, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Sep. 25, 1981, Ser. No. 305,620

Int. Cl.<sup>3</sup> B08B 3/02

U.S. Cl. 134—108

10 Claims



1. An article washing apparatus having a washing chamber and a liquid pumping system associated with the bottom wall thereof, the combination comprising: a rotatable horizontally elongated thermoplastic wash arm associated with said liquid pumping system and operable for effecting the washing of said articles by spraying liquid thereon; means for heating spaced upwardly from said bottom wall generally subjacent said elongated thermoplastic wash arm and energizable for heating said washing chamber; and means rotatable with said thermoplastic wash arm disposed between said means for heating and said

thermoplastic wash arm and including heat shield means mounted on said thermoplastic wash arm to effectively shield said thermoplastic wash arm from heat radiated by said heating element.

4,416,301

# ANNULAR PISTON VALVE

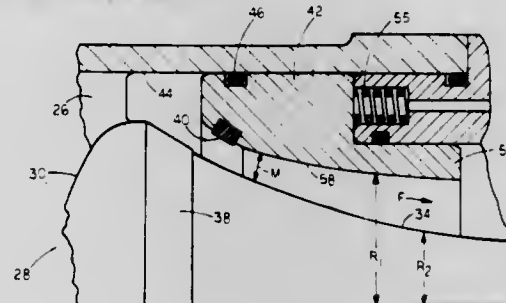
Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Jun. 22, 1981, Ser. No. 275,924

Int. Cl.<sup>3</sup> F16K 15/02

U.S. Cl. 137—220

6 Claims



1. A valve body having a generally cylindrical inner surface; a rigid piston seat ring slidable in and along said inner surface;
  - a streamlined flow diverter of varying circular cross-section fixed in said valve body coaxially with said inner surface and having a rounded upstream surface increasing to a maximum diameter and a tapered surface downstream thereof;
  - a narrow band machined around said tapered surface immediately downstream of said maximum diameter forming a seating surface; and
  - a resilient main seal ring carried on the leading portion of said seat ring engageable with said seating surface;
  - an internal shoulder in and around said valve body downstream of said seating surface forming a reduced diameter interior surface downstream therefrom;
  - an external shoulder on and around said piston seat ring facing said internal shoulder; and
  - means biasing between said shoulders to urge said piston seat ring into sealing engagement with said seating surface;
- the outer surface of said flow diverter and the inner surface of said piston seat ring being contoured so that, when said seat ring is retracted to withdraw said main seal ring from said seating surface, the flow area between said piston seat ring and said flow diverter diminishes to a location slightly downstream of said main seal ring and then does not thereafter diminish over said tapered surface.

4,416,302

# SELECTIVELY FOLDABLE SIDE INLET BALLCOCK

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631

Division of Ser. No. 220,812, Dec. 29, 1980, Pat. No. 4,338,964.

This application Nov. 18, 1981, Ser. No. 322,401

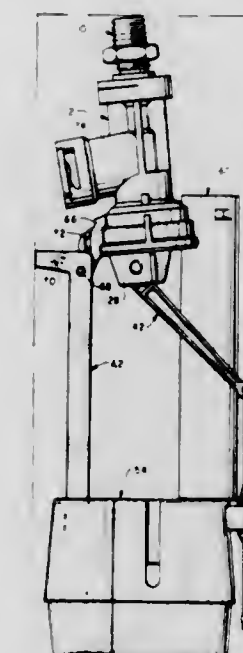
Int. Cl.<sup>3</sup> F16K 43/00, 33/00

U.S. Cl. 137—315

7 Claims

1. In a side inlet ballcock of the type having a generally horizontally extending water inlet tube secured to a generally horizontally extending valve housing enclosing a valve, a water outlet tube normally connected horizontally intermediate said valve housing extending generally vertically downwardly therefrom, a float guide connected adjacent end of said valve housing opposite said water inlet tube normally extending vertically downwardly of said valve housing, a valve control arm vertically pivotally connected to said valve housing end projecting generally horizontally therefrom, a float normally vertically slideable on said float guide, and a float connector pivotally connected to said valve control arm and normally extending generally vertically downwardly connected to said float; the improvements including: pivot means

operably connecting an upper end portion of said float guide selectively pivotal in a generally vertical plane outwardly in a direction away from said valve housing end and to a folded position approaching generally parallel to said water inlet tube and valve housing horizontal extension, said float moving slideably along and with said float guide to said folded position, said float connector pivoting relative to said valve control arm and moving with said float and float guide to said folded



position; attachment means selectively removably connecting an upper end portion of said water outlet tube to said valve housing; whereby, said ballcock may be shipped with said water outlet tube removed and said float guide, float and float connector assembled but in said folded position, and may be assembled for use merely by selective attachment of said water outlet tube and pivoting said float guide to its normal vertically downwardly extending position carrying said float and float connector therewith.

4,416,303

# MOTOR VEHICLE FUEL TANK

Dieter Scheurenbrand, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

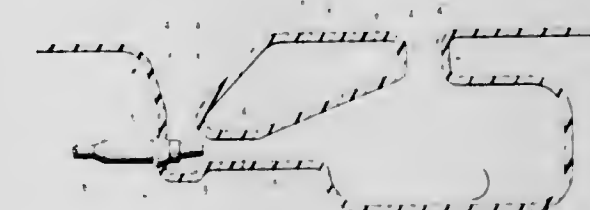
Filed Feb. 20, 1981, Ser. No. 236,507

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006254

Int. Cl.<sup>3</sup> E03B 11/00

U.S. Cl. 137—576

10 Claims



9. A plastic fuel tank for motor vehicles, the fuel tank includes a surge tank disposed exteriorly of an interior space of the fuel tank, means for separating the surge tank from the fuel tank, and fuel return means, characterized in that a first means is provided for communicating the surge tank with the interior space of the fuel tank, a second means separate from the first means, is provided for communicating the interior space of the fuel tank with the surge tank, and in that the fuel return means and said second communicating means form an injector means for injecting fuel into the surge tank, the fuel return means



includes a discharge nozzle adapted to discharge returned fuel into the second communicating means.

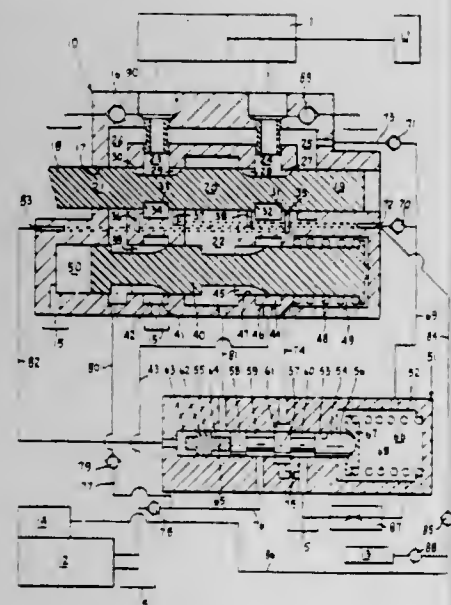
4,416,304

**FULLY COMPENSATED FLUID CONTROL VALVE**

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.  
Continuation of Ser. No. 247,887, Mar. 26, 1981, Pat. No. 4,362,087. This application Sep. 21, 1982, Ser. No. 420,699. The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> F15B 13/02

U.S. Cl. 137—596.13

10 Claims



1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said load chambers with said fluid supply chamber and said fluid exhaust means, first variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said load chambers and said fluid exhaust means, positive load fluid throttling means between said fluid inlet chamber and said fluid supply chamber, control means of said positive load fluid throttling means having pilot amplifying valve means, said pilot amplifying valve means having control force generating means responsive to pressure differential across said first variable metering orifice means, said pilot amplifying valve means operable through control of said positive load fluid throttling means to maintain a relatively constant pressure differential across said first variable metering orifice means and means responsive to negative load pressure in said load chambers having closing means operable to deactivate in closed position said positive load throttling means through said pilot amplifying valve means.

4,416,305

**VALVED COUPLING FOR CONDUITS**

Denis S. Commette, Mantoloking, and Carl W. Sundberg, Jr., Shrewsbury, both of N.J., assignors to Gusmer Corporation, Lakewood, N.J.

Filed Dec. 22, 1981, Ser. No. 333,267

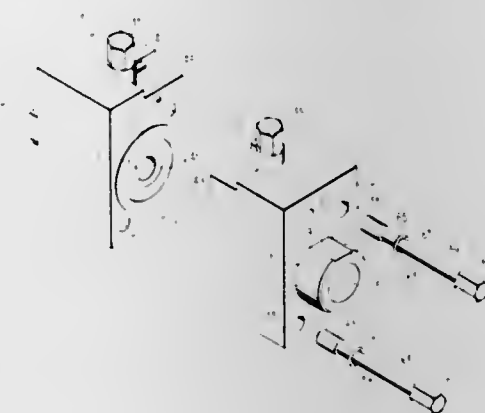
Int. Cl.<sup>3</sup> F16L 37/28

U.S. Cl. 137—614

5 Claims

1. A coupling for conduits comprising a pair of blocks having opposed flat faces, means for detachably securing the blocks together with their opposed flat faces in sealed relationship with each other, a passageway through each block perpendicular to the opposed flat faces for the passage of liquid, a

ball valve disposed in each passageway for opening and closing the passageway, each ball valve having a spherical outer surface which, in the closed position of the valves, is disposed in said passageway closely adjacent the plane of the associated said flat face, said spherical surface of each said ball valve lying entirely on one side of the associated said plane, and an annular beveled surface coaxial with each said passageway and opening through the associated said opposed flat face, each said



annular beveled surface being conical and lying on a cone whose apex is disposed a substantial distance from the centroid of the spherical outer surface of the associated said ball valve on the same side of said centroid as said beveled surface, each said annular beveled surface terminating in circular edges disposed in two spaced parallel planes, a portion of said spherical outer surface of said ball valve being disposed between said spaced parallel planes in the closed position of the valves.

4,416,306

**METHOD AND APPARATUS FOR CONTROLLING ARTICULATED FLUID LOADING ARMS UPON EMERGENCY DISCONNECTION**

Eugene R. Le Devehat, Sens, France, assignor to FMC Corporation, Chicago, Ill.

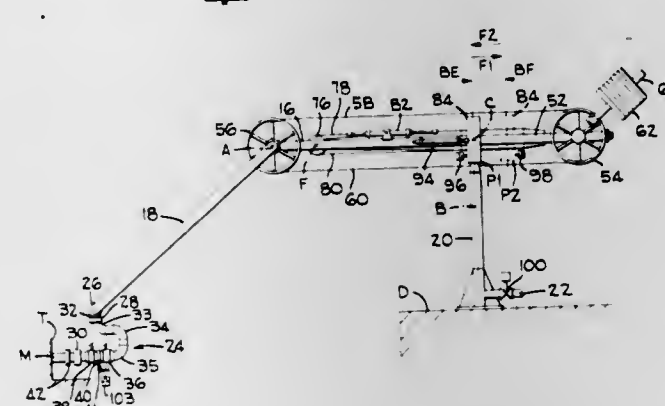
Filed Aug. 3, 1981, Ser. No. 289,739

Claims priority, application France, Aug. 4, 1980, 80 17184

Int. Cl.<sup>3</sup> B63B 35/44

U.S. Cl. 137—615

17 Claims



1. An articulated loading arm for transferring fluid from one fluid handling means to another and for controlling movement of the outer end of the loading arm during emergency disconnection thereof from an adjacent fluid handling means, said arm comprising:

- an inner arm member;
- means mounting said inner arm member for pivotal movement about a first horizontal axis;
- an outer arm member pivotally connected at one of its ends to the outer end of said inner arm member for movement about a second horizontal axis;
- a first counterweight supported by said inner arm member and coupled to said outer arm member to counterbalance said loading arm about said first horizontal axis and said outer arm member about said second horizontal axis;

an auxiliary counterweight movably supported by said inner arm member for adjusting the entire loading arm about said first horizontal axis between a substantially balanced condition with the arm empty and a substantially balanced condition with the arm filled with fluid; and means for moving the auxiliary counterweight between positions wherein said substantially balanced conditions are achieved.

4,416,307

**VALVE ASSEMBLY**

Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Division of Ser. No. 107,278, Dec. 26, 1979, Pat. No. 4,327,773.

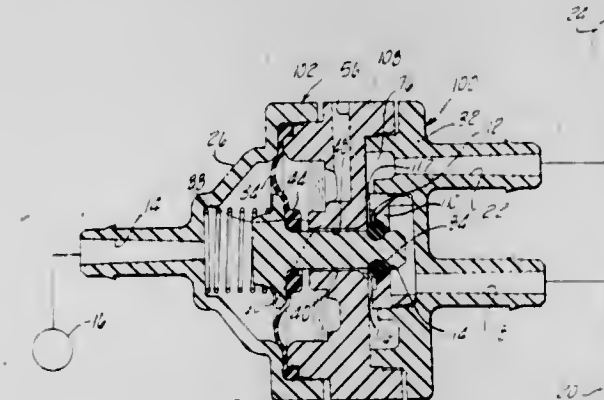
This application Nov. 12, 1981, Ser. No. 320,469

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> F15B 13/042

U.S. Cl. 137—625.66

3 Claims



1. A valve assembly comprising: a generally cylindrical housing, a movable wall formed by a diaphragm and a stationary wall disposed in said housing and dividing said housing into a control chamber at one side of said diaphragm, a constant pressure chamber between said diaphragm and stationary wall and an operating chamber at one side of said stationary wall, a first valve passage communicating with said constant pressure chamber and said operating chamber, a pressure supply port, a second valve passage communicating said operating chamber with said supply port, an actuating port communicating with said operating chamber, valve closure means being movable between a position wherein said first valve passage is closed and said second valve passage is open and a position in which said first valve passage is open and said second valve passage is closed, said valve closure means being connected to said movable wall for movement therewith by way of an axially movable operating member extending through said diaphragm and held in sealing engagement with said one side of said diaphragm in response to pressure in said control chamber less than said pressure in said constant pressure chamber for movement of said operating member with said diaphragm between said positions upon establishing a control pressure in said control chamber to place said supply port in communication with said operating chamber when said valve closure means is in one of said positions and to close said supply port and open said operating chamber and actuating port to the atmosphere when said valve closure means is in another of said positions, an end wall disposed coaxially with said stationary wall, said supply and actuating ports axially extending from said end wall, one of said ports being disposed radially outwardly from the axis of said housing, said walls being disposed in sealing engagement with each other to form an annular chamber, and radially inwardly extending passage means communicating said annular chamber with said operating chamber, said stationary wall and end wall being disposed in random relationship to each other about the axis of said housing, said one of said ports communicating with said annular chamber for all positions of said stationary wall relative to said end wall.

4,416,308

**FLEXIBLE ONE-WAY VALVE AND METHOD OF PRODUCING**

James F. Bower, 7598 Frazer Dr., Riverside, Calif. 92509  
Continuation of Ser. No. 98,735, Nov. 30, 1979, abandoned. This application Apr. 1, 1982, Ser. No. 364,224

Int. Cl.<sup>3</sup> F16K 15/14

U.S. Cl. 137—846

5 Claims



1. In a flexible one-way valve of the type incorporated into the open end of a distensible bag, said valve formed from two flexible members having identical peripheral configurations and adhered along selected edges to form a planar valve support and a valve portion depending from and perpendicularly disposed to said valve support, said valve being seated in said open end by adhering peripheral edges of said support to peripheral edges of said open end, the improvement comprising:

- a valve portion having an inlet of maximum width and an outlet, said valve portion having opposing sealed peripheral edges tapering inward to define a substantially intermediate positioned throat, said throat having a width lesser than either said inlet or said outlet and said opposing edges tapering outward from said throat to said outlet, whereby said throat in said valve portion prevents outward displacement of said valve portion upon inversion of said bag.

4,416,309

**INDEXED PIPE**

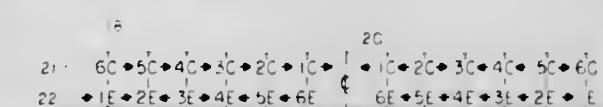
Hamid Salim, 6898 Bowie Rd., Cambridge, Ohio 43725

Filed Jun. 7, 1982, Ser. No. 385,554

Int. Cl.<sup>3</sup> F16L 9/00, 55/00

U.S. Cl. 138—104

5 Claims



1. An indexed underground type pipe, comprising: a rigid hollow cylindrical geometric shaped pipe section for burial underground, a connection means at each end of said pipe section for underground connection to another pipe section, a first reference scale longitudinally marked along said pipe section, a second reference scale longitudinally marked along said pipe section adjacent to and parallel with said first reference scale whereby a small excavation through the ground to expose a portion of said pipe section will reveal both said first and second reference scales, said first reference scale comprising a first series of numeric indications and a first indication means associated with each of said first numeric indications for referencing each of said first numeric indications to at least one particular point on said pipe section, said second reference scale comprising a second series of numeric indications complementary to said first series of numeric indications and a second indicating means associated with each of said second numeric indications for referencing each of said second series



to at least one particular point on said pipe section, whereby the first and second numeric designations and their associated indicating means exposed by the small excavation provides identification of the longitudinal extent to both ends of said pipe section.

4,416,310

## DOUBLE-LIFT JACQUARD MECHANISM

Paul Sage, Lyons, France, assignor to Verdol S.A., Caluire, France

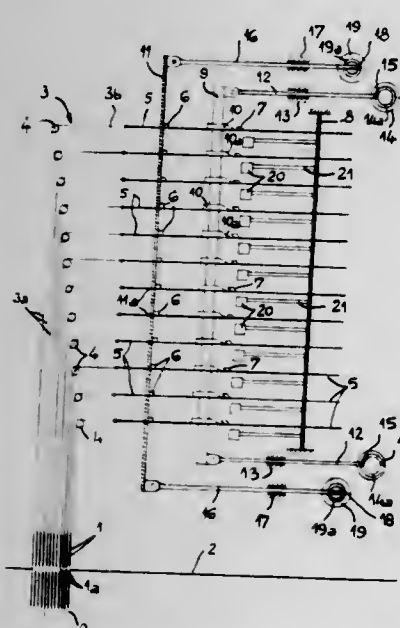
PCT No. PCT/FR81/00019, § 371 Date Oct. 5, 1981, § 102(e) Date Oct. 5, 1981, PCT Pub. No. WO81/02434, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 17, 1981, Ser. No. 309,970

Claims priority, application France, Feb. 22, 1980, 80 04281 Int. Cl.<sup>3</sup> D03C 3/20, 3/06

U.S. Cl. 139—59

9 Claims



1. An improved Jacquard mechanism operative to open the shed of warp threads in a loom by double-lift displacements of heddles according to information taken from a pattern selecting device, the mechanism comprising:

- (a) a first plate and a second plate reciprocated by the loom toward and away from each other, the plates having apertures therethrough which are mutually aligned;
- (b) multiple resilient blades associated respectively with the heddles, the blades passing transversely of the plates through their apertures, and the blades being respectively connected at one end with corresponding heddles and operative to displace the heddles;
- (c) a shoe fixed to each blade between the first and second plates and operative to abut the second plate and support the blades against the second plate whereby to lower heddles associated with said blades as the second plate is reciprocated;
- (d) a catch on each blade, and a bar fixed transversely through the first plate at each aperture and disposed parallel to the blade thereat and having a catch-engaging end disposed to abut the catch of the adjacent blade in the blade's normal position, whereby reciprocation in the first plate engages the bars with the catches and displaces the associated heddles to raised positions; and
- (e) blade deflecting means associated with each blade, each deflecting means being under the control of a pattern selecting device and operative thereby to deflect the blade at the beginning of reciprocation of the first plate from the blade's normal position to a deflected position in which the catch can pass by said end of the bar and through said first plate, whereby a deflected bar is displaced only by reciprocation of the second plate to lower its associated heddle.

4,416,311

## TREE HARVESTER

Andrew Gemmell-Murdoch, Glastonbury via Gympie, Australia, assignor to Murdoch Logging Industries Pty. Ltd., Gympie, Australia

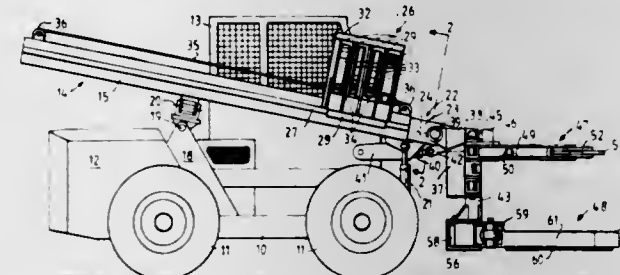
PCT No. PCT/AU80/00102, § 371 Date Jul. 21, 1981, § 102(e) Date Jul. 21, 1981, PCT Pub. No. WO81/01496, PCT Pub. Date Jun. 11, 1981

PCT Filed Dec. 1, 1980, Ser. No. 285,117

Claims priority, application Australia, Dec. 5, 1979, PE1620 Int. Cl.<sup>3</sup> D01G 23/08

U.S. Cl. 144—3 D

12 Claims



1. A tree harvester comprising:

- a de-limbing carrier;
- a grapple carrier slidably mounted on said de-limbing carrier for longitudinal movement relative to said de-limbing carrier;
- a grapple assembly mounted on said grapple carrier for releasably gripping a tree trunk;
- a shear assembly for severing the tree trunk;
- a de-limbing assembly, movably mounted on said de-limbing carrier, for engaging releasably about the tree trunk;

and

moving means connected to said grapple assembly and said de-limbing assembly for simultaneously moving said grapple assembly relative to said de-limbing assembly in a direction away from, or towards, each other, said moving means including a first means for longitudinally moving said grapple carrier and grapple assembly in a first direction relative to said de-limbing carrier and a second means interconnecting said de-limbing assembly and said grapple carrier to move said de-limbing carrier as said first means moves said grapple carrier in the first direction relative to said de-limbing carrier.

4,416,312

## GUIDING MECHANISM FOR TIMBER CUTTING MACHINES

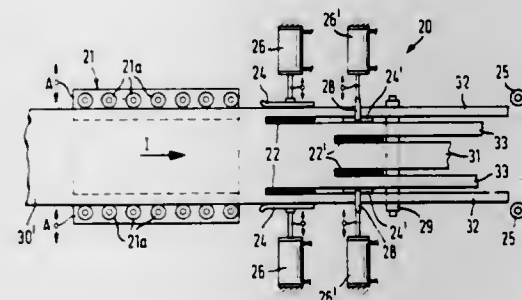
Sven E. Östberg, Söderhamn, Sweden, assignor to Kockums Industri A.B., Soderhamn, Sweden

Filed Jun. 24, 1981, Ser. No. 276,960

Claims priority, application Sweden, Jul. 3, 1980, 8004919 Int. Cl.<sup>3</sup> B27C 9/00, 1/08; B27B 15/08; B27M 1/00

U.S. Cl. 144—39

10 Claims



7. A machine for cutting a succession of logs, said machine comprising:

- adjustable cutting means for cutting the oppositely disposed side portions of a log to produce an elongated block having substantially parallel, planar lateral surfaces, said cut-

ting means being adjustable for cutting each successive log to a block having a preselected lateral separation between said lateral block surfaces;

sawing means for longitudinally cutting at least one board from said block, said sawing means being spaced from said cutting means in the direction of feed of said block;

infeed guide means positioned between said cutting means and said sawing means to engage said lateral block surfaces for fixing the lateral position of said block prior to said block reaching said sawing means, said infeed guide means being adjustable for engaging said lateral block surfaces of said block being cut by said cutting means; and

guide means positioned laterally adjacent said sawing means and operable independent of said infeed guide means to engage said lateral block surfaces of said block being cut by said sawing means for fixing the lateral position of said block while being cut in order to prevent said block from applying a lateral torque to said sawing means, said guide means being adjustable for engaging said lateral block surfaces of said block being cut by said sawing means independent of the adjustment of said infeed guide means.

4,416,313

## DOUBLE ACTING LOG SPLITTER

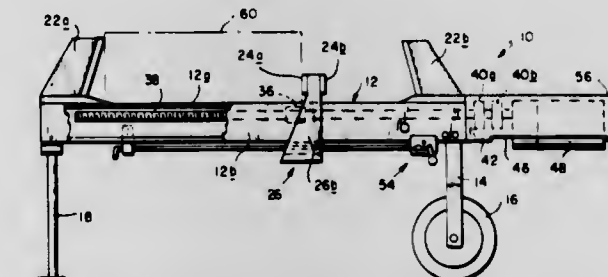
Richard E. Seeger, Kittery Point, Me., assignor to Armatron International, Inc., Melrose, Mass.

Filed Oct. 30, 1981, Ser. No. 316,884

Int. Cl.<sup>3</sup> B27L 7/00

U.S. Cl. 144—193 R

10 Claims



1. A double acting log splitter comprising:

- a frame defining a longitudinally extending log supporting surface;
- a pair of mutually spaced fixed splitting components arranged in a confronting relationship at opposite ends of said supporting surface;
- a carriage mounted on said frame for movement in opposite directions between said fixed splitting components;
- a movable splitting component mounted on said carriage at a location overlying said supporting surface, said movable splitting component being arranged to coact with either of said fixed splitting components to split a log positioned axially therebetween on said supporting surface;
- a screw located beneath and extending in a direction parallel to the length of said supporting surface;
- bearing means for rotatably supporting one end portion of said screw, with the remainder of said screw extending in cantilever fashion from said bearing means;
- a nut connected to said carriage and threaded onto said screw; and
- reversible drive means connected to the said one end portion of said screw for rotatably driving said screw in one direction to move said nut and said carriage towards one of said fixed splitting components, and for rotatably driving said screw in the opposite direction to move said nut and said carriage towards the other of said fixed splitting components.

4,416,314

## HACKSAW BLADE CONNECTING MEANS

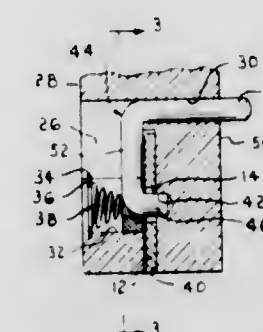
Jerome C. Uskert, 21 N. 675 W., Valparaiso, Ind. 46383

Filed Jun. 21, 1982, Ser. No. 390,289

Int. Cl.<sup>3</sup> B27B 21/02

U.S. Cl. 145—33 R

5 Claims



1. In a hacksaw frame and blade combination wherein the hacksaw frame includes a handle member, and a longitudinally spreadable contractable member having spaced end parts supporting the ends of a hacksaw blade, the improvement thereof comprising:

- each of said parts of said hacksaw frame being formed with a slotted recess and spaced first and second holes in said part;
- said part having a second slotted recess in said part intersecting said first slotted recess for receiving therein one end of said hacksaw blade;
- a pin having a "U" shape, one leg thereof extending through said first mentioned hole in said part, a second leg of said pin member being truncated and extending into said second hole, and a base member connecting said legs moveable laterally in said grooved recess; and
- a spring member anchored in said grooved recess, one end thereof engaging said base of said pin biasly retaining said first and second legs in said holes.

4,416,315

## DEVICE FOR CARRYING VALUABLES

Newman C. Foley, Superior, Wis., assignor to N.B.F. Company, Inc., Superior, Wis.

Filed Jan. 18, 1983, Ser. No. 458,973

Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 150—47

7 Claims



1. A device for carrying valuables comprising:

- a container for the valuables, said container having means for selectively opening or closing it and having an aperture in one end thereof;
- a hanger support member movably mounted within said container;
- a hanger member movably connected at one end to said support member;
- said hanger member and said support member being movable.



able between a first extended position wherein said support member is disposed adjacent said one container end and said hanger member is removed from said container, and a second retracted position wherein said support member is positioned inwardly from said one container end and said one end of said hanger member is disposed within said container with a portion of said hanger member extending through said container aperture; and means on said container and said support member for releasably maintaining said support member and said hanger member in said retracted position.

4,416,316

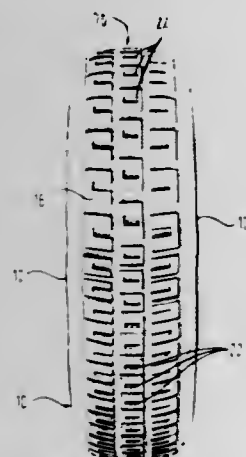
## TIRE TREADS AND TIRES

Michael C. Clatworthy, Staffordshire; William P. S. Mack, Birmingham, and Douglas J. Major, Sutton Coldfield, all of England, assignors to Dunlop Limited, London, England  
Filed Mar. 6, 1981, Ser. No. 241,222  
Claims priority, application United Kingdom, Mar. 13, 1980, 8008633

Int. Cl.<sup>3</sup> B60C 11/10

U.S. Cl. 152—209 R

8 Claims



1. A tread for a temporary replacement tire for producing a deliberately audible alternating two note sound during normal running in unworn or partially worn condition of the tread, said tread comprising a tread pattern formed from the same material as the tread having two circumferentially displaced first and second circumferential parts, each extending approximately one half of the total tire circumference; each circumferential part comprising a regular tread pattern having at least one circumferentially extending row of tread blocks defined by grooves, some of the blocks having pockets in the tread pattern and spaced apart in the circumferential direction, the leading edges of said pockets being generally transverse to the direction of travel and the pockets being shaped as substantially closed geometric figures; the pitch of the first circumferential part being approximately twice that of the second circumferential part.

4,416,317

## PNEUMATIC TIRE FOR MOTOR VEHICLES HAVING A TREAD PATTERN WHICH ADAPTS THE TIRE FOR GOOD PERFORMANCE AND LOW ROAD NOISE

Renato Caretta, Gallarate, Italy, assignor to Societa' Pneumatici Pirelli S.p.A., Milan, Italy

Filed Dec. 1, 1981, Ser. No. 326,401

Claims priority, application Italy, Dec. 5, 1980, 26490 A/80  
The portion of the term of this patent subsequent to Aug. 30, 1997, has been disclaimed.

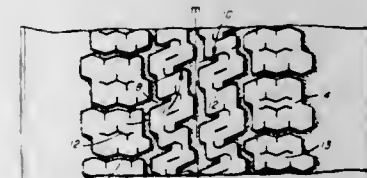
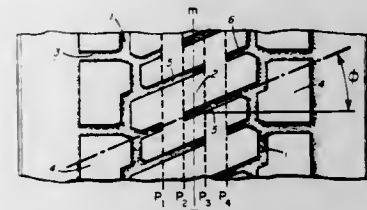
Int. Cl.<sup>3</sup> B60C 11/08, 11/12

U.S. Cl. 152—209 R

6 Claims

1. In a pneumatic tire for motor vehicles which has on its radially outer surface a tread band provided with a tread pattern comprising at least three longitudinal grooves, with a central groove along the tire midline and two longitudinal grooves symmetrical with respect to the tire midline, which

divide the tread band into circumferential portions having substantially the same width; the two axially outer circumferential portions being further divided into a plurality of circumferentially spaced apart blocks by a plurality of transverse grooves extending in a substantially axial direction, the inner circumferential portions being at least two continuous circumferential ridges, the edges of said ridges being grooved with oblique grooves all inclined in the same sense with respect to the midline of the tire and substantially parallel to one another, the improvement comprising each said oblique groove having



a rectilinear axis inclined with respect to said midline of the tire at an angle of between 55° and 75°, the projections of the axis of the oblique grooves on one edge of each ridge being distinct from the axis of the oblique grooves on the other edge of that ridge; the oblique grooves on the axial inner edges of said two ridges being generally in alignment with each other so as to form a single oblique groove extending on both sides of said central groove, the projections of all said oblique grooves along the circumferential direction of the tire constituting parallel lines which do not overlap.

4,416,318

## ANTI-SKID CHAIN AND MAKING THEREOF

Hansjörg Rieger, Aalen, and Dietmar H. Holzwarth, Schwäbisch Gmünd, both of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,451

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3111271; Mar. 17, 1981, 8108431[U]

Int. Cl.<sup>3</sup> B60C 27/00; B21D 39/00; B21F 15/02

U.S. Cl. 152—213 A

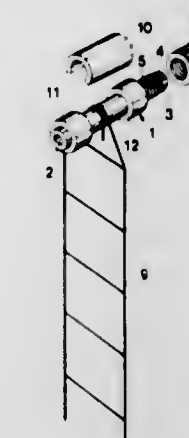
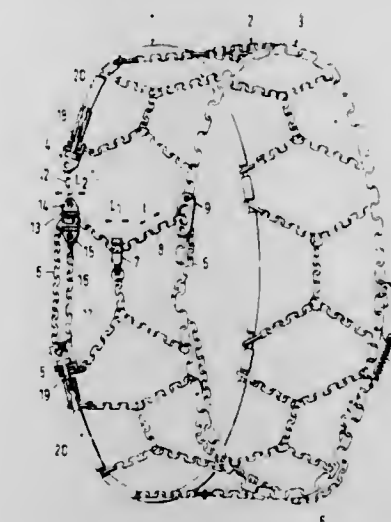
23 Claims

1. Anti-skid chain for vehicle tyres, said chain having retaining means including an inner retaining device and an outer retaining device, which, when the chain is assembled, come to rest respectively against the inner side and the outer side of the tyre, said retaining devices serving to retain chain-strand lengths extending over the tread, said inner retaining device comprising a resilient arcuate member adapted to be resiliently slipped over the tyre and a chain tensioning strand for tensioning said arcuate member and bridging a gap between the ends of said arcuate member, said chain tensioning strand having at least one free end which, after being deflected at least once by a deflection device, is guided over the tread of the tyre to the outer retaining device, said deflection device (13) guiding the tensioning strand (6) out of the region of the inner retaining device (1) to the tread is held at a distance from end parts (4, 5) of the inner retaining device (1) by connecting elements (6, 12) movable relative to the inner retaining device (1).

23. Process for producing an anti-skid chain according to

claim 1, characterised by attaching the end parts (4, 5) to the inner retaining device (1) consisting of elastic spring-steel wire,

roll is conically tapered, said tapered end being provided with a slot and having a portion with outer threads, a nut having inner threads and an inner conical portion of smaller dimensions than the conical portion of the roll being arranged by



after the ends of the inner retaining device (1) have previously been given a corrugated deformation.

tightening on said threads to press the slotted portion of the roll together for squeezing and locking the ladder tape roll axially to the tilting bar.

4,416,319

## CLOSURE FOR TIRE CHAINS

Peter Hofmann, Aalen-Unterkochen, Fed. Rep. of Germany, assignor to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

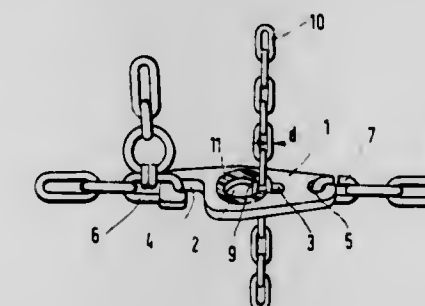
Filed Jul. 23, 1982, Ser. No. 401,339

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129907

Int. Cl.<sup>3</sup> B60C 27/00

U.S. Cl. 152—213 R

22 Claims



1. Closure for tyre chains, including non-skid tyre chains, with a basic body with at least one connecting lug for the end member of a retaining line and with a pull-through orifice having an elastic insert for a tension-chain line, as well as with a locking slot adjacent to this pull-through orifice for locking the tension-chain line, characterised in that the insert (11) overlapping the basic body (1) on both sides by means of retaining shoulders (17, 18) forms at least one engagement cam (13, 14) narrowing the mouth (12) of the locking slot (3), for the elastic clamping of a leg of a chain link (9) of the tension-chain line (10), this leg being introduced into the locking slot (3) by overcoming the engagement cam (13, 14).

4,416,320

## LADDER TAPE ROLL FOR VENETIAN BLINDS

Inge Nordin, Hökerum, Sweden, assignor to Roland Olofsson, Lerum, Sweden

Filed Jul. 14, 1982, Ser. No. 398,387

Int. Cl.<sup>3</sup> E06B 9/38

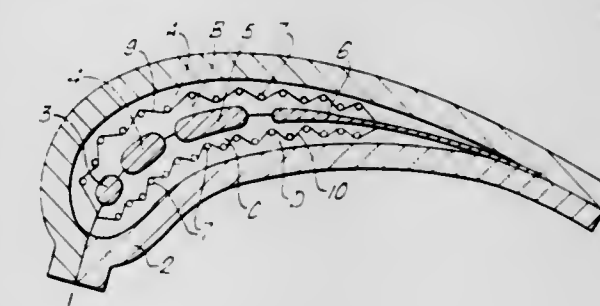
U.S. Cl. 160—177

2 Claims

1. A ladder tape roll for venetian blinds and having a through hole intended for receiving and for non-rotatable connection with the tilting bar of the blind and provided with means for axial locking of the ladder tape roll in relation to the tilting bar and further being provided with fixing means for the ladder tapes of the blind, wherein one end of the ladder tape

1. A method of making an article having one or more internal passages therein comprises the steps of:

- (a) making a pre-form of the article in at least two pieces, with each passage at least partially formed in one or more of the pieces of the pre-form,
- (b) making one or more casting cores each of appropriate shape to define a required passage in the finished article,
- (c) assembling the pre-form and the cores in a predetermined position in a casting mould, and
- (d) heating the pre-form to a sufficient temperature to melt it and thereafter allowing it to cool to form the finished article.





4,416,322

# MOULDING MACHINE, MORE ESPECIALLY A CHILL MOULDING MACHINE COMPRISING A FRAMEWORK AND AT LEAST ONE CORE EXTRACTION JACK MOUNTED ON A BEARING ELEMENT MOVABLE ON THE FRAMEWORK

Michel Tremmeaux, 11 Rue Clement Ader, 71100 Chalon sur Saone, France

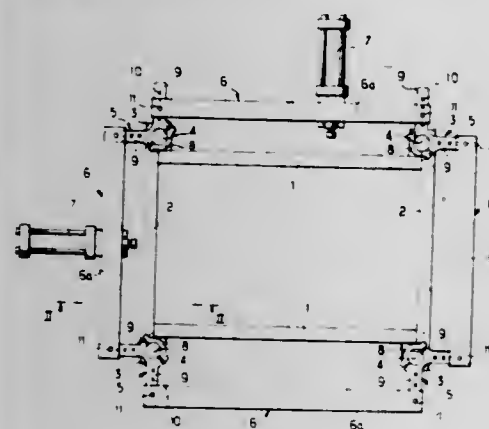
Filed Jun. 1, 1981, Ser. No. 268,771

Claims priority, application France, Jun. 27, 1980, 80 14425

Int. Cl.<sup>3</sup> B22D 33/04

U.S. Cl. 164—340

9 Claims



1. A moulding machine, and especially a chill moulding machine, comprising a framework and at least one core or middle part extraction jack 7 mounted on a bearing element 6 movable on the framework characterized in that the bearing element 6 is carried by at least two supports 5 secured against movement on guide devices 4 provided on the framework and in that the supports 5 each comprise a securing member 8 locked on the corresponding guide device 4 and each support 5 comprises two arms 9 positioned at right angles to each other and integral at their proximal ends with the supports 5 and means 11 mounting the ends of the bearing element 6 to an arm 9 of each of the supports 5.

4,416,323

# AIR COOLER FREEZE PROTECTION

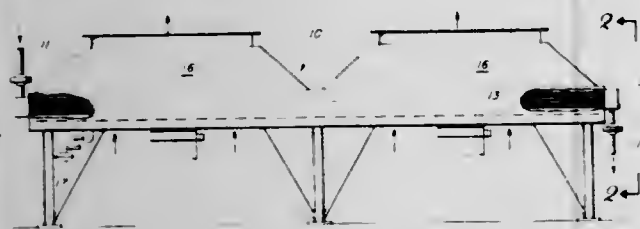
David A. Evans, Cloquet, Minn., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 29, 1980, Ser. No. 191,881

Int. Cl.<sup>3</sup> F28F 11/00

U.S. Cl. 165—11 R

4 Claims



1. A method of protecting an ambient air cooled heat exchanger having a plurality of rows of tubes from freeze-up during cold weather operation comprising:

- inserting, from the outlet ends thereof, thermocouple means into the interior of tubes in the row nearest the incoming cooling air, said thermocouple means being positioned far enough in said tubes to substantially negate the effect of the temperature of fluid collected from other tubes;
- maintaining at least 80 percent of the internal cross-sectional area of said tubes open to flow about said thermocouple means;
- monitoring the outputs from said thermocouple means to obtain an indication in the event of the temperature in any of said tubes nearing the freezing point; and
- reducing the air flow over said tubes in the event of an

indication of the temperature in any of said tubes nearing the freezing point.

4,416,324

# VEHICLE TEMPERATURE CONTROL APPARATUS

Shinji Sutoh; Hara Toshizo; Hiroyuki Sugiura, and Toshio Kojima, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

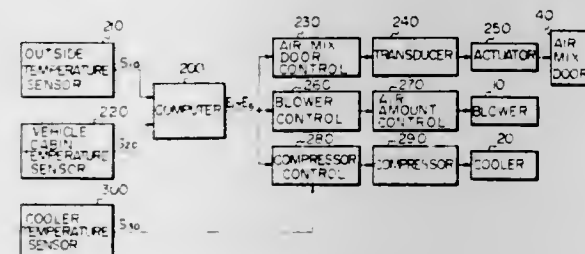
Filed Apr. 3, 1981, Ser. No. 250,973

Claims priority, application Japan, Apr. 10, 1980, 55-47373

Int. Cl.<sup>3</sup> F28F 27/00

U.S. Cl. 165—12

4 Claims



1. An air conditioning apparatus for a vehicle comprising: an air flow duct communicating with a vehicle cabin; a blower for forcing air through the duct; a cooler for cooling air in the duct; a heater for heating air in the duct; a temperature control door disposed in the duct for controlling a proportion of air passing through the heater; and operation control means for correlatively or cooperatively controlling the blower, cooler and temperature control door, said operational control means being constructed in such a manner that, when it is desired to raise the vehicle cabin temperature while operating in a maximum cooling mode, the operating speed of the blower is progressively decreased from an upper limit to a lower limit and maintained at the lower limit, the temperature control door is maintained at a position for preventing the heater from heating air passing through the cooler until the speed of the blower reaches the lower limit and starts to heat air passing through the cooler when the speed of the blower settles at the lower limit, and the cooler turn-off temperature level is maintained at a predetermined lower level until the speed of the blower reaches the lower limit and changed to a predetermined upper level when the speed of the blower reaches the lower limit;

said operation control means being constructed to further correlatively or cooperatively control the blower, cooler and temperature control door in such a manner that the speed of the blower is progressively increased from the lower limit to the upper limit when the cooler turn-off temperature level is maintained at the predetermined upper level and the temperature control door continues to heat air passing through the cooler.

4,416,325

# HEAT EXCHANGER

Robert O. Barratt, Cedar Knolls, and Howard N. Franklin, Parsippany, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 31, 1980, Ser. No. 135,419

Int. Cl.<sup>3</sup> F28D 15/00; F23L 15/04

U.S. Cl. 165—47

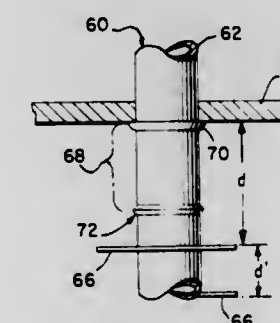
7 Claims

1. A combustion air preheater for heating combustion air with heat energy provided from hot flue gas, said preheater comprising, in combination:

- a first heat exchanger having a partition separating the first heat exchanger into lower and upper heat transfer compartments, a plurality of heat pipes extending from within said lower heat transfer compartment to within said upper

heat transfer compartment for effecting heat transfer therebetween, each of said heat pipes comprising a closed cylindrical wall having an upper portion and a lower portion and a plurality of fins extending radially outward from said wall, said wall extending through a hole in said partition of substantially the same diameter as said wall, said upper portion being welded to said partition at the lower surface thereof, said upper and lower portion being welded together at a location below said partition, with at least the distance between the welded joint and the partition being devoid of any fin the resulting area devoid of fins being sufficient so that the removal of heat is limited to the extent that the partition is heated to a temperature high enough to avert excessive precipitation of moisture and the concomitant corrosion at the upper surface thereof;

a second heat exchanger defined by a plurality of tubes supported in a shell by tube sheets for transferring heat energy from one side of said tubes to the other side thereof;



first duct means for conveying the flue gas into said second heat exchanger and over the exterior surfaces of said tubes and to such lower compartment in said first heat exchanger; and second duct means for conveying the combustion air into and through the upper compartment of said first heat exchanger; and through said tubes of said second heat exchanger; whereby the hot flue gas is passed over the exterior surface of said tubes and then through said lower compartment and the combustion air is passed through the upper compartment and then through the interior of said tubes so that heat energy from the flue gas in a first higher temperature range is transferred through said tubes in said second heat exchanger to the combustion air and additional heat energy from said flue gas in a lower temperature range is transferred to said combustion air from the lower compartment to the upper compartment through said heat pipes.

4,416,326

# APPARATUS FOR MELTING REFRIGERATED BUTTER

Johannes M. H. Van Vlaenderen, Amstelveen, Netherlands, assignor to Alfa-Laval N.V., Amstelveen, Netherlands

Filed Dec. 28, 1981, Ser. No. 335,096

Claims priority, application European Pat. Off., Dec. 29, 1980, 80201237.7

Int. Cl.<sup>3</sup> F28F 13/00

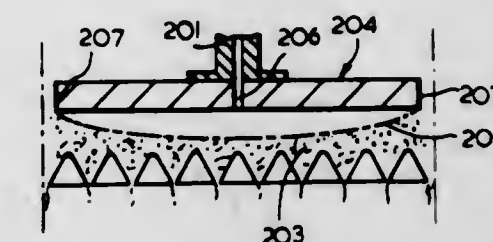
U.S. Cl. 165—120

9 Claims

1. An apparatus for melting a refrigerated substance, said apparatus comprising:

- a frame;
- a grating rigidly attached to said frame in a substantially horizontal plane, and comprising a plurality of tubes which are adapted to receive a hot medium therethrough; and
- a mechanically energized punching means displaceably associated relative to said frame for pressing a block of said substance which is to be melted against and through said grating, said substance passing into a molten state as a result of contact with said hot tubes, and being discharged

in liquid form through said grating, said tubes of said grating being provided with walls, that wall portion of a



given tube facing away from said block of substance to be melted being provided with a heat barrier.

4,416,327

# CASING FOR AN INTERIOR UNIT OF A SPLIT TYPE OF AN AIR CONDITIONING APPARATUS

Minoru Nakada, Fujishi; Yoshiro Shimma, Shimadashi; Osamu Inoue, and Sei Suma, both of Fujishi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

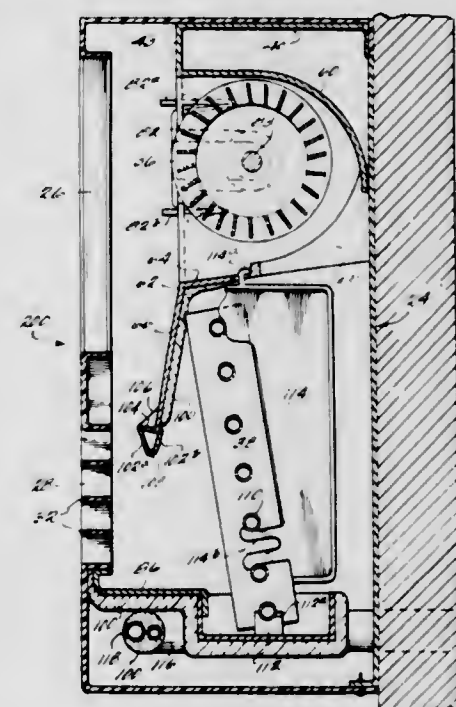
Filed Oct. 7, 1980, Ser. No. 195,069

Claims priority, application Japan, Oct. 13, 1979, 54-132064

Int. Cl.<sup>3</sup> F24H 3/06; F25D 21/14

U.S. Cl. 165—122

6 Claims



1. A casing for an interior unit of an air conditioning apparatus comprising:

- a first integrally molded housing having a front panel with a plurality of apertures, a pair of opposite first side walls connected to said front panel and a pair of opposed top and bottom walls connected to said front panel and first said side walls, respectively;
- a second integrally molded, one piece housing sized to fit inside said first housing comprised of an upper wall and two outer side walls, said upper wall having a front edge, a first vertical separator wall spaced inwardly from one side wall so as to extend substantially parallel with said one side wall, a curved upper rear wall positioned between the other side wall and said first separator wall and spaced below said upper wall, said curved wall having a top and bottom edge, said top edge being connected to the front edge of said upper wall and extending rearwardly and downwardly therefrom; a horizontal separator wall positioned between said other side wall and said first separator wall and beneath said curved rear wall for separating the area within said first housing into separate fan and heat exchange chambers, said horizontal separator



including a flat portion having front and rear edges, an upstanding projection extending from said rear edge substantially along the whole length of said rear edge, a flap portion extending downwardly at a predetermined angle from said front edge and terminating along bottom edge and a plurality of spaced apart rib members connected to and extending between the upstanding projection and the bottom edge of said curved upper rear wall, and rear wall means removably attached to the wall of room for housing said second housing.

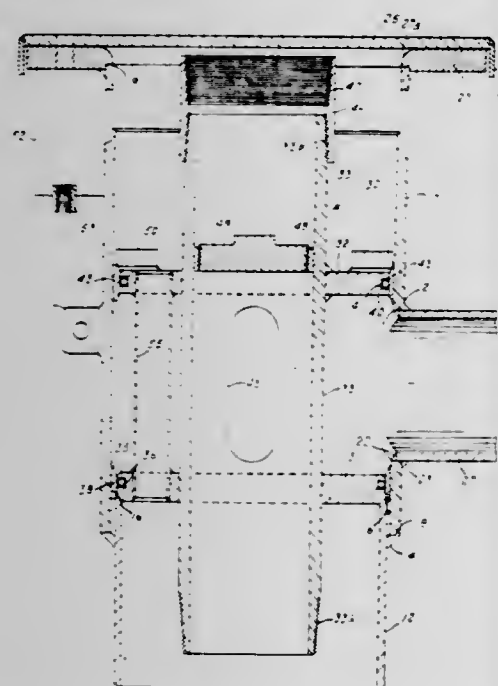
4,416,328

## PITLESS ADAPTER

Henry A. Baski, 1586 S. Robb Way, Denver, Colo. 80226  
Continuation-in-part of Ser. No. 99,831, Dec. 3, 1979, Pat. No. 4,298,065. This application Nov. 2, 1981, Ser. No. 317,452  
Int. Cl.<sup>3</sup> E21B 33/04

U.S. Cl. 166—65 R

22 Claims



1. A pitless adapter assembly for a water well system or the like operable by a submersible type pump having a motor in the well or a turbine type pump having a motor above the well to pump underground water or other fluids upwardly through a relatively small diameter drop pipe string mounted within a relatively large diameter casing pipe string to a laterally extending discharge pipeline located a substantial distance beneath the ground, and comprising:

an outer barrel means for providing an elongated annular cavity extending from the upper end portion of the casing pipe to the surface of the ground and having a lowermost portion with a central opening at the bottom end thereof adapted to be fixedly connected to an uppermost portion of the well casing pipe located beneath the discharge pipe; a laterally extending discharge opening in an intermediate portion adapted to be connected to the discharge pipe; and an uppermost portion with an inlet opening at the upper end thereof and extending upwardly from the discharge pipe to ground level; the outer barrel means further comprising:

said lowermost portion being made of one piece of pipe having a diameter approximately equal to the diameter of the casing pipe;

said intermediate portion being made of one piece of pipe having an inside diameter larger than the outside diameter of said lowermost portion;

the upper end of said lowermost portion being telescopically received within the lower end of said intermediate portion and fixedly connected thereto;

annular seat means extending laterally between said low-

ermost portion and said intermediate portion for providing an upwardly facing abutment surface;

a pair of axially vertically spaced concentric annular flat sealing surfaces in said intermediate portion having a diameter less than the inside diameter of said intermediate portion and greater than the diameter of said lowermost portion, the said sealing surfaces being located in axially upwardly vertically spaced relationship to said discharge opening and the other of said sealing surfaces being located in axially downwardly vertically spaced relationship to said discharge opening;

said uppermost portion being made of one piece of pipe having an inside diameter approximately equal to or greater than the inside diameter of said intermediate portion;

an inner spool means mounted in said barrel means for directing the flow of water from the drop pipe to the discharge pipe and having a continuous one piece center pipe with a lowermost portion adapted to be connected to an uppermost portion of the drop pipe adjacent the connection of said outer barrel means to the well casing pipe; an uppermost portion adapted to be connected to a tool for raising and lowering said spool means and the drop pipe; a pair of axial spaced annular plate members fixedly mounted on the outer periphery of said center pipe and defining an annular cavity therebetween adapted to be located axially opposite said discharge opening with one plate member axially vertically spaced thereabove and the other plate member axially vertically spaced therebelow; a discharge opening in said center pipe located axially opposite said annular cavity; and means associated with an upper portion of said center pipe for preventing upward flow of water therethrough;

said plate members being axially vertically spaced a distance approximately equal to the axial distance between said sealing surfaces on said intermediate portion of said barrel means, and having a peripheral diameter less than the inside diameter of said intermediate portion and said upper portion of said barrel means and greater than the inside diameter of said lower portion;

a sealing means mounted on the periphery of each of said plate members for compressible sealing engagement with said sealing surfaces;

a seating means on the lowermost plate member for abutting engagement with said annular seat means on said barrel means to supportively hold said spool means in said barrel means with said sealing means in sealing engagement with said sealing surfaces to prevent flow of water from said annular cavity between said plate members and said intermediate portion of said barrel means;

the construction and arrangement of said barrel means and said spool means being such that said spool means is freely telescopically movable upwardly and downwardly relative to said barrel means along the entire distance between said seat means in said intermediate portion and said inlet opening at the upper end of said upper portion of said barrel means whereby, after said barrel means is connected to the casing pipe, said spool means is connectable to the drop pipe at ground level above said inlet opening and said spool means and said drop pipe are lowerable into said barrel means until said seat means on said barrel means becomes engaged with said seating means on said spool means whereafter said spool means and said drop pipe are held against vertical downward movement by said barrel means while being vertically upwardly movable to subsequently remove said spool means and said drop pipe from said barrel means; and

a cover means adapted to be removably mounted on the upper end of said barrel means across said inlet opening after said spool means has been inserted therein.

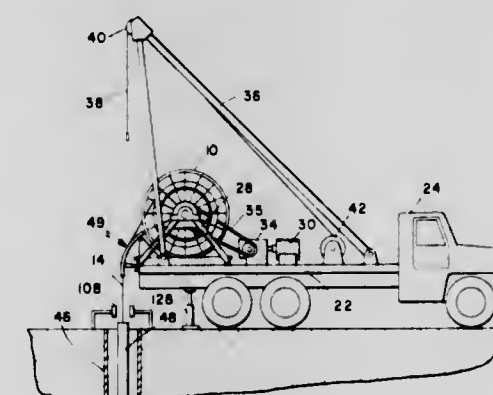
4,416,329

## OIL WELL SETUP AND PUMPING APPARATUS

Curtis J. Tanner, San Diego; Richard E. Bender, Escondido; Anton K. Simson, Poway, and Hugh McCutchen, Jr., San Diego, all of Calif., assignors to Henlan, Inc., Midland, Tex.  
Filed Aug. 13, 1981, Ser. No. 292,590  
Int. Cl.<sup>3</sup> E21B 17/00, 17/04, 19/08

U.S. Cl. 166—68

14 Claims



14. A ribbon rod for use in oil well apparatus to replace a conventional steel sucker rod, comprising:

an elongated ribbon of relatively stiff fiber reinforced plastic having a limited degree of flexibility with the reinforcing fibers having a modulus of elasticity on the order of about fifty five million pounds per square inch so that said ribbon will effectively transmit pumping forces and be windable upon a reel; and

face strips of woven fabric bonded on the faces of said ribbon to provide transverse bending strength and stiffness; and

an edge protection strip formed of material such as glass or Kevlar bonded to each edge of said ribbon, said edge strips facilitating the pultrusion process used in making said ribbon.

4,416,330

## SIDE POCKET MANDREL

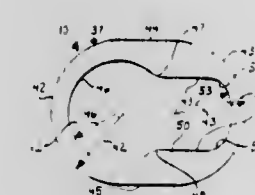
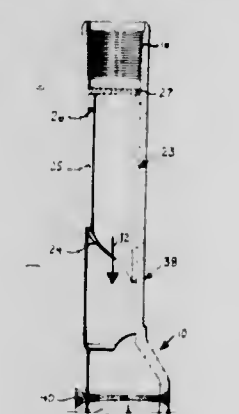
David T. Merritt, Celina; David W. Fish, Carrollton, and Olen R. Long, Celina, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 19, 1982, Ser. No. 350,283

Int. Cl.<sup>3</sup> E21B 23/02

U.S. Cl. 166—117.5

9 Claims



1. A side pocket mandrel, comprising:

a. a one-piece main body section having

i. a main bore therethrough,

ii. a receptacle bore alongside said main bore, iii. port means communicating said receptacle bore with the exterior of said main body section, and iv. means on its lower end for attachment to a well tubing string; and

b. an upper body section welded to the upper end of said main body section by a circumferential weld, said upper body section having

i. connecting means at its upper end providing a reduced diameter portion adapted for connecting the upper body section to a well tubing string,

ii. a main passage through said upper body section including said connecting means in alignment with the main bore of said main body section, and

iii. a longitudinal groove in the inner wall of said main passage extending upwardly from said receptacle bore substantially to said upper reduced diameter portion and providing space above said receptacle bore for operation of a kickover tool for inserting a flow control device therein, the upper body wall, surrounding said main bore and said groove, being thicker on either side of said groove and tapering in thickness toward opposed locations on a transverse plane where the axis of symmetry passes through the wall section.

4,416,331

## BIMETALLIC WELL SCREEN FOR USE IN INJECTION WELLS AND METHOD OF MAKING SAME

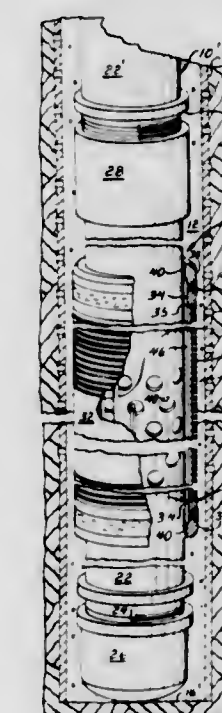
James A. Lilly, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 11, 1982, Ser. No. 347,829

Int. Cl.<sup>3</sup> E21B 43/08

U.S. Cl. 166—236

8 Claims



1. A bimetallic well screen assembly for use in an injection well at elevated temperatures comprising a pipe base member having a perforated portion intermediate its ends and unperforated portions adjacent thereto, an integral well screen member having a slotted portion overlying said perforated portion and unslotted end ring portions at each of its ends overlying said unperforated portions, said slotted portion extending continuously between said end ring portions, said well screen member having a temperature coefficient of expansion which is greater than the temperature coefficient of expansion of the pipe base member, said end ring portions having a radially compressed shrink fit connection to the underlying pipe base member at atmospheric temperatures, but being either slightly out of contact with said pipe base member or at least substantially unstressed at elevated operational temperatures, any spacing between said other end ring and said pipe base member



at said elevated operational temperatures being no greater than the maximum width of the slot openings in the slotted portion of the screen member.

4,416,332

# METHOD FOR INCREASING THE PRESSURE IN OIL-BEARING GEOLOGICAL STRUCTURES

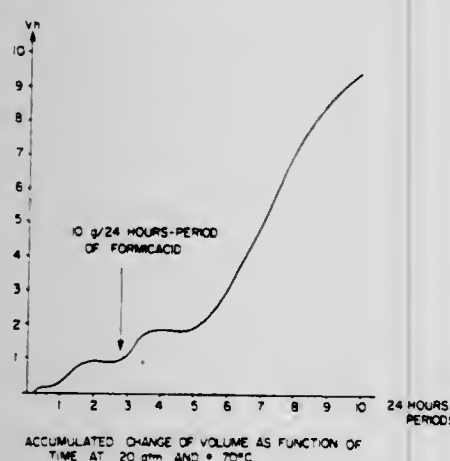
Lars I. Wiberger, Skara; Peter H. Rönnow, Mölnlycke; Per F. Tengblad, Upsala, and Bert G. H. Hellman, Akersberga, all of Sweden, assignors to Chemical Dynamics Sweden AB, Gräbo, Sweden

Continuation of Ser. No. 85,713, Oct. 17, 1979, Pat. No. 4,300,632. This application Jun. 3, 1981, Ser. No. 269,993 Claims priority, application Sweden, Oct. 26, 1978, 78111118 The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> E21B 43/22

U.S. Cl. 166—246

4 Claims



1. A method for increasing pressure in geological oil-bearing structures by gas production due to microbial activity, said method comprising adding to a geological oil-bearing structure a methane producing anaerobic micro-organism, a culture medium and formic acid such that the formic acid is converted to carbon dioxide and methane gases resulting in increased pressure in said structure.

4,416,333

# CORROSION INHIBITING PROCESS FOR A REMOTELY LOCATED DEEP CORROSIVE GAS WELL

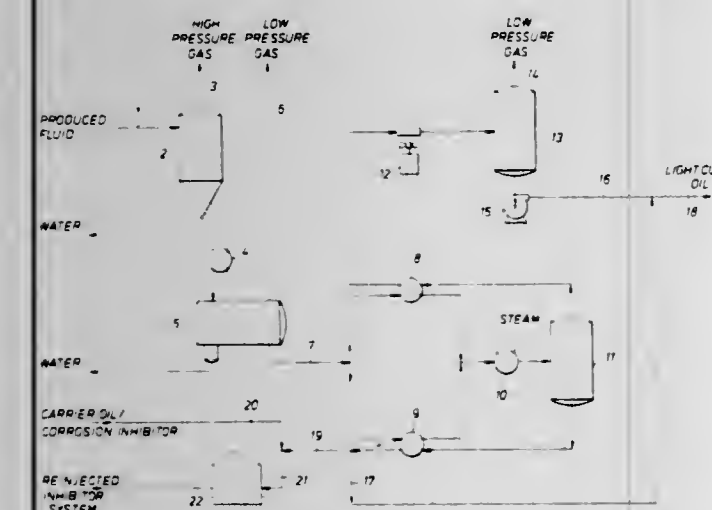
David L. Mundhenk, and Michael A. Curole, both of Metairie, La., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 20, 1982, Ser. No. 370,017

Int. Cl.<sup>3</sup> E21B 43/40, 47/06

U.S. Cl. 166—250

4 Claims



1. A process for controlling corrosion in a well which produces a hot, highly pressurized, corrosive gas, by continuously

injecting an oil-phase liquid containing an oil-soluble corrosion inhibitor, comprising:

treating such a well which (a) is located remotely with respect to the source of a manufactured carrier oil that is capable of maintaining an oil-phase liquid at the bottom-hole conditions within the well to be treated and (b) produces, or is near a well which produces, a gas which contains a significant proportion of high-boiling, oil-soluble, organic compounds which condense as a liquid phase when the produced gas is cooled and depressurized; determining phase characteristics, at the bottomhole temperature and pressure in the well to be treated, of mixtures of the gas produced by the well to be treated, a condensate comprising the high boiling components of gas produced from that well or a nearby well, a corrosion inhibitor which is effective at the bottomhole temperature within the well to be treated and a manufactured carrier oil capable of containing that corrosion inhibitor in a separate liquid-phase in contact with the gas produced by the well to be treated at the reservoir pressure and temperature of the well to be treated; and

continually circulating into the well to be treated a mixture of the so-tested components in proportions such that the mixture is capable of maintaining a corrosion inhibitor-containing liquid-phase at the bottomhole pressure and temperature of the well to be treated when the amount of the manufactured carrier oil is less than that needed to maintain such a liquid phase when none of the condensate is present but enough of the manufactured carrier oil is present to maintain such a liquid-phase during fluctuations of the extent likely to occur in the composition of the condensate or reservoir temperature or pressure in the well to be treated.

4,416,334

# POTATO HARVESTING APPARATUS

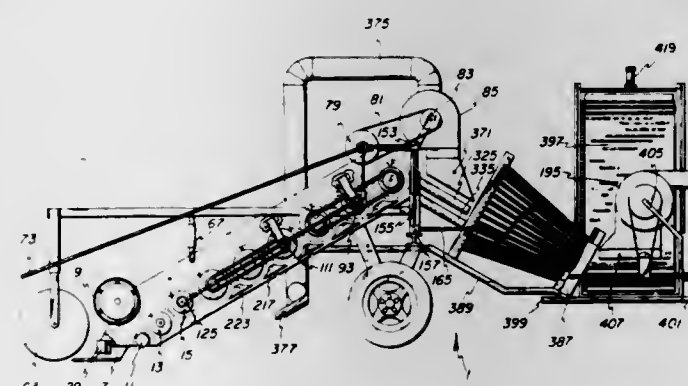
Alain M. Bouillon, Minnesota Ave., North Greenbush, N.Y. 12144

Filed Sep. 28, 1982, Ser. No. 425,518

Int. Cl.<sup>3</sup> A01D 17/06, 17/08

U.S. Cl. 171—27

8 Claims



1. A potato harvesting apparatus for harvesting potatoes at maximum ground speed without regard to wet conditions, for removing during such harvesting operation practically all the dirt from the potatoes without bruising or otherwise damaging the potatoes, for separating the potato vines from the potatoes, for removing said separated potato vines and depositing same in the harvesting track and covering same with the dirt removed from the potatoes; said apparatus comprising a share, disk coulters, a cylindrical rake, primary, secondary and tertiary cylindrical cages, drive transmission means, shaker-tine means, a grinder suction fan and conductor pipe, cutting means and a conical cage; said share digging up the potatoes sufficiently for pick up by a first one of said primary cylindrical cages for transfer over to said primary, secondary and tertiary cylindrical cages, said cylindrical cages being in the harvesting flow of the potatoes and being arranged and disposed in ascending relationship to one another starting, in order, with said primary cylindrical cages and followed by said secondary

cylindrical cages and ending with said tertiary cylindrical cages, said disk coulters separating and cutting the vines between adjacent rows of potatoes, said cylindrical rake being arranged and disposed before and above said first one of said primary cylindrical cages to engage and pick up the excess of vines, dirt and potatoes that said first one of said primary cylindrical cages can not handle and to move such excess of vines, dirt and potatoes onto a second one of said primary cylindrical cages, the periphery of each of said cylindrical cages having a uniform diameter throughout, said drive transmission means being operatively connected with said cylindrical cages and causing all of said cylindrical cages to rotate in the same direction and at the same rate of material-flow delivery speed, said cylindrical cages engaging, picking up and transferring said potatoes and vines to said shaker-tine means for separating said potatoes from said vines, said shaker-tine means comprising a shaker-tine assembly having tines spaced apart to allow said potatoes to drop therethrough while retaining said vines thereon, said grinder suction fan being arranged and disposed above said shaker-tine assembly to suck up said vines, separated from said potatoes, remaining on said tines to grind said vines into little pieces and to conduct same through said conductor pipe and deposit same beneath said cylindrical cages in such harvesting track, said rotating cylindrical cages, while so engaging, picking up and transferring said potatoes and vines, engaging and removing the dirt from said potatoes, including breaking up dirt clods, and said cylindrical cages sifting the dirt removed from the harvested potatoes down and through said cylindrical cages to cover said little pieces of vines deposited in the harvesting track, said cutting means being arranged and disposed beneath said cylindrical cages to cut up any vines in the material flow that slip between said cylindrical cages, and said conical cage being arranged and disposed with respect to said shaker-tine assembly to receive and carry along through said conical cage without bruising same said potatoes separated from said vines.

4,416,335

# GROUND-CLEARING AND MOUND-BUILDING SCARIFIER

Stig-Gunnar Lofgren, Jarved, and Bo G. Ekeborg, Bonassund, both of Sweden, assignors to Mo och Domsjö Aktiebolag, Örnsköldsvik, Sweden

Filed Dec. 7, 1981, Ser. No. 328,309

Claims priority, application Sweden, Dec. 16, 1980, 8008842

Int. Cl.<sup>3</sup> A01B 33/06, 49/04, 63/08, 63/111

U.S. Cl. 172—2

9 Claims



1. A ground-clearing and mound-building device that can be towed along the ground to move material on the surface to one side, expose the surface of the ground, and build mounds on the cleared ground for planting and forest regeneration, comprising, in combination:

- (1) a frame arranged to be attached to a vehicle above the ground;
- (2) a scarifying means mounted on the frame for rotation about its central axis, circular in cross-section and having a peripheral surface that digs into the ground during rotation thereof when in contact with the ground under pressure;
- (3) means for moving the scarifying means into and away

from contact when the ground and arranged to bring the scarifying means into such contact with the ground at any of a plurality of selected contact pressures;

(4) drive means for rotating the scarifying means at a selected rotation rate; and

(5) means for controlling at least one of the selected contact pressure and the selected rotation rate to dig, loosen, and displace a surface layer of the ground and push such loosened ground into mounds.

4,416,336

# TOOL BAR CARRIER WITH CASTING WHEELS

Marlin W. Hohn, Rte. 1, Box 2C, Parkston, S. Dak. 57366

Filed Jan. 12, 1982, Ser. No. 338,988

Int. Cl.<sup>3</sup> A01B 63/32; B60D 1/00

U.S. Cl. 172—386

2 Claims



1. A tool bar carrier including a frame having a tongue at the front thereof adapted to be connected to a pulling device, tool bar means movably mounted on said frame opposite said tongue, means connected between said frame and said tool bar means by which said tool bar means can be lifted relative to said frame, wheel carrier means pivotally mounted on said frame and including axles, the axis of said axles being in a location to the rear of said pivotal mounting, wheels journaled on said axles and adapted to castor around said pivotal mounting, and flexible connecting means connected between said frame and said pulling device adapted to be adjustably shortened so that the position of said frame relative to said pulling device is flexible within limits prescribed by the length of said flexible means.

4,416,337

# DRILL HEAD ASSEMBLY

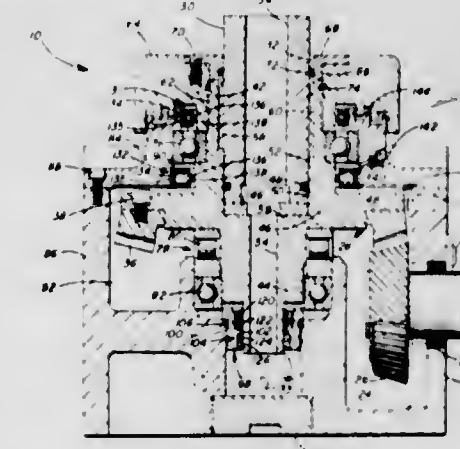
Albert Phillips, 465 Kiwanis Ave.; Donald L. DeVall, 1082 Charles Ave.; Hu D. Devall, Rte. 1, Box 362A, all of Morgantown, W. Va. 26505

Continuation of Ser. No. 46,812, Jun. 8, 1979, abandoned. This application May 26, 1981, Ser. No. 267,090

Int. Cl.<sup>3</sup> E21C 7/02

U.S. Cl. 173—57

5 Claims



1. A drill head assembly comprising, a drill housing having an internal cavity with an upper opening and a lower opening extending therethrough, a rotatable drill retaining member positioned in said drill



housing internal cavity and extending through said upper opening,  
 said drill retaining member having a central bore therethrough,  
 a tubular member coaxially aligned with said drill retaining member, said tubular member having an internal bore for receiving said drill retaining member,  
 said tubular member internal bore extending axially through said drill housing internal cavity from said upper opening to said lower opening and adaptable for the conveyance of rock cuttings and dust therethrough,  
 means for nonrotatably connecting said drill retaining member to said tubular member in said internal bore thereof, drive means positioned in said drill housing for rotating said tubular member,  
 said tubular member having an upper end portion and a lower end portion with an intermediate body portion positioned between said upper and lower end portions in said internal cavity, said tubular member upper and lower end portions being positioned oppositely of said internal cavity upper and lower openings respectively,  
 said drill retaining member being supported in said drill housing by said tubular member intermediate body portion to resist lateral thrust and thereby prevent lateral shifting movement of said drill retaining member in said drill housing,  
 said drill retaining member central bore and said tubular member internal bore being aligned to form a continuous passageway for the conveyance of rock cuttings and dust produced during the drilling operation from said internal cavity upper opening to said internal cavity lower opening and out of said drill housing,  
 said continuous passageway being subjected to a reduced pressure to evacuate said rock cuttings and dust out of said drill housing to a suitable collection point,  
 said tubular member lower end portion being positioned in said drill housing to form an annular space between said tubular member lower end portion and said drill housing adjacent said internal cavity lower opening,  
 a carrier member positioned in said annular space and nonrotatably connected to said drill housing, said carrier member including a body portion having an internal bore concentric with said annular space,  
 said carrier member internal bore including an enlarged diameter portion positioned above a reduced diameter portion with an intumed shoulder separating said enlarged diameter portion from said reduced diameter portion,  
 seal means positioned in said carrier member bore enlarged and reduced diameter portions between said tubular member lower end portion and said carrier member for sealing said annular space around said tubular member lower end portion in said drill housing,  
 said seal means including a plurality of annular seals positioned in overlying relation in said bore enlarged diameter portion, each of said annular seals including a sealing lip urged into sealing engagement with said tubular member lower end portion,  
 a pair of sealing rings positioned in overlying relation in said bore reduced diameter portion and sealingly engaging said tubular member lower end portion below said annular seals,  
 an upper shoulder extending outwardly from said carrier member body portion,  
 means positioned between said carrier member body portion and said drill housing below said shoulder for sealing around said carrier member to prevent the escape of lubricant from said drill housing internal cavity through said annular space,  
 dust evacuation means positioned below said carrier member and communicating with said continuous passageway through said drill retaining member and said tubular member for maintaining said annular seals removed from contact with the rock cuttings and dust by the evacuation thereof from said drill housing, and  
 said seal means being operable to prevent the escape of

lubricant from said cavity through said annular space around said tubular member lower end portion and the entrance of foreign matter through said annular space into said cavity.

4,416,338

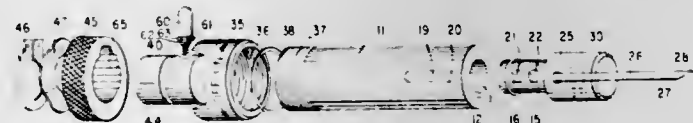
**CONTROL MECHANISM FOR A PNEUMATIC TOOL**  
 James W. Nelson, Union Grove; Raymond R. Zuzinec, and Michael L. Foster, both of Kenosha, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jun. 25, 1981, Ser. No. 277,194

Int. Cl.<sup>3</sup> B25D 17/00

U.S. Cl. 173—134

7 Claims



1. In a pneumatic tool including a cylinder having a rear end and a front end, means for securing an implement to the cylinder at the front end, a piston in the cylinder adapted to be driven alternately forwardly and rearwardly by pressurized air, and control mechanism comprising a control body secured to the rear end of the cylinder, said body having an inlet for pressurized air and an outlet for regulated air directed toward the front end and a transverse opening communicating with said inlet and said outlet, a valve pin in said transverse opening and movable to a selected one of a plurality of positions between first and second extremes, the amount of air from said inlet to said outlet being a minimum in the first extreme and a maximum in the second extreme, means biasing said valve pin to one of the extremes, and control means for placing said valve pin in a selected one of the positions, said control means including a plurality of detent means engageable with said valve pin for retaining said control means in a condition corresponding to the selected position of said valve means.

4,416,339

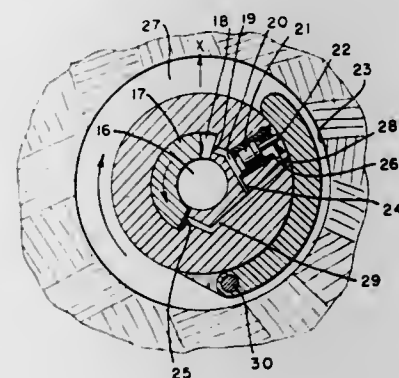
**BIT GUIDANCE DEVICE AND METHOD**  
 Royce E. Baker, P.O. Box 1377, Medina, Tex. 78055, and Glennwood Singletary, Rte. 6, Box 510, Hickory, N.C. 28601

Filed Jan. 21, 1982, Ser. No. 341,472

Int. Cl.<sup>3</sup> E21B 7/04

U.S. Cl. 175—61

13 Claims



1. A drill bit guidance device comprising: a collar member, a piston means, said piston means having a paddle member, said paddle member pivotably joined to said collar member, said collar member having a fluid conduit, said fluid conduit communicating with said piston means, a gate means, said gate means within said collar member, said gate means oscillatable around said fluid conduit, a fluid supply means, said fluid supply means communicating with said fluid conduit whereby said fluid from said supply means is directed through said fluid

conduit to said gate means to allow said piston means to pivot said paddle member.

4,416,340

**ROTARY DRILLING HEAD**

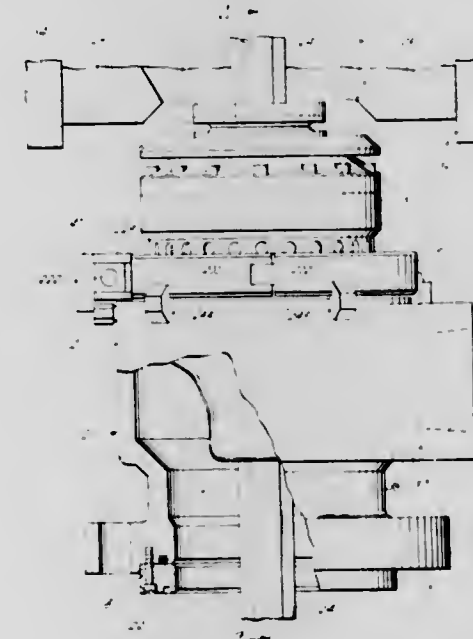
Edmond I. Bailey, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 24, 1981, Ser. No. 334,372

Int. Cl.<sup>3</sup> E21B 3/02

U.S. Cl. 175—195

11 Claims



1. A drilling head for attachment to a drilling control stack member, comprising:  
 a tubular body having a flow bore therethrough and a side bore;  
 a closure member cooperatively engaging said body around one end of said flow bore and having a bore adapted to receive a drive tube extending through said flow bore;  
 means for attaching the other end of said flow bore to the drilling control stack member;  
 securement means for releasably securing said closure member to said body, said securement means including a plurality of segments engageable with surfaces of said closure member and said tubular body, the juncture of said segments being hinged together excepting at one juncture joined by a variable length linkage;  
 said variable length linkage drawing said segments tightly around said closure member and tubular body for securing said member and body together and loosening said segments around said closure member and tubular member for unsecuring said member and body;  
 an impact motor for applying a variable torque to said variable length linkage for actuating said securement means, said impact motor imparting a continuous rotary motion to said variable length linkage for securing said member and body until the torque of said impact motor receives a predetermined resistance from said variable length linkage causing said impact motor to impart a series of rotary impact blows to said variable length linkage to tightly secure said segments around said member and body, said impact motor delivering a succession of rotational hammer blows to said variable length linkage to initiate the actuation of said variable length linkage for unsecuring said member and body and decreasing the torque applied to said variable length linkage until a smooth rotary motion is applied to unsecure said segments from around said member and body.

4,416,341

**COMBINATION WEIGHING MACHINE**

Takashi Hirano, Kobe, Japan, assignor to Yamata Scale Company, Ltd., Hyogo, Japan

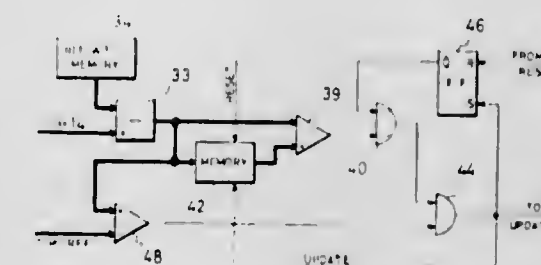
Filed Nov. 23, 1981, Ser. No. 323,951

Claims priority, application Japan, Dec. 4, 1980, 55-171736; Mar. 11, 1981, 56-35629

Int. Cl.<sup>3</sup> G01G 19/22

U.S. Cl. 177—25

7 Claims



6. Apparatus for delivering quantities of a product with each quantity being of an acceptable total weight relative to a predetermined reference weight; comprising a plurality of weighing balances adapted to weight fractions of said quantity, respectively and for unloading of said product therefrom to collect them for delivery; means for generating the values of combinations of weights of said quantity fractions on the weighing balances; means for comparing said value of combinations of weights with said reference weight to select two values therefrom, one being greater than the nearest to said reference weight, and the other being less than and nearest to said reference weight; and means for comparing said selected two values with at least two ranges of weight having an order of priority and being preset about said reference weight, and means for unloading said product from the weighing balances contributing to the value which is in the range of weight of higher order of priority.

4,416,342

**APPARATUS AND METHOD FOR WEIGHING ROLLING RAILCARS**

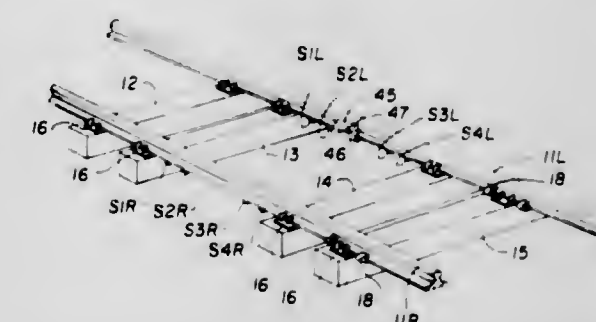
Edwin D. Snead, Box 798, Georgetown, Tex. 78626

Continuation-in-part of Ser. No. 247,801, Mar. 26, 1981, abandoned. This application Jan. 4, 1982, Ser. No. 336,893

Int. Cl.<sup>3</sup> G01G 21/22, 3/14

U.S. Cl. 177—163

28 Claims



1. A system for weighing railcars in motion comprising a length of rail of generally uniform cross section supported at opposite ends in the manner of conventional rail; said length of rail including an unsupported section intermediate its ends, defining a weigh span; said weigh span having a length less than the minimum distance between adjacent axles of said railcars;  
 means mounted on said weigh span at four respective measuring points therealong for producing electric signals corresponding to the respective bending moments at said measuring points; said four measuring points comprising two pairs of points, each pair consisting of an outboard and inboard point, and each pair being disposed in a re-



spective half of said weigh span; the points of said pairs being spaced approximately the same distance from each other; means for summing the signals of said four signal producing means while a railroad axle moves between said two inboard measuring points.

4,416,343

**ELECTROMECHANICAL WEIGHER**

Erich Knothe, Bovenden; Dieter Blawert, and Bernd Schubart, both of Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

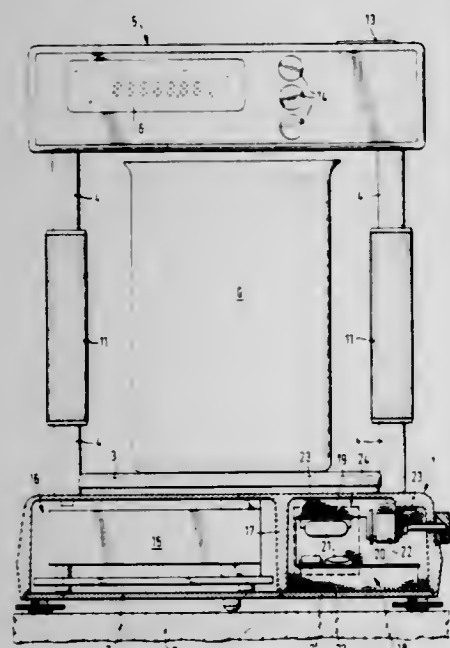
Filed Mar. 8, 1982, Ser. No. 355,385

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 8114093[U]

Int. Cl.<sup>3</sup> G01G 21/28

U.S. Cl. 177—180

9 Claims



1. An electromechanical weigher to be used in areas subject to explosion hazards comprising:

an electro-mechanical weighing mechanism adapted and constructed to be explosion-proof by having the ratio of current intensity to wire cross section be so low that spark formation cannot occur and the heating of constituents on the basis of power loss of the electric system remains far below a critical ignition temperature of explosive material, wherever it is possible in the components of said mechanism to do so; and

a case for said mechanism adapted and constructed so that all components of said mechanism which cannot be explosion-proofed are enclosed in chambers which are filled with explosion-impeding granular material.

4,416,344

**OUTRIGGERED VEHICLE CAPABLE OF CRABWISE TRANSLATION**

Minoru Nakada, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,297

Int. Cl.<sup>3</sup> B62D 57/02

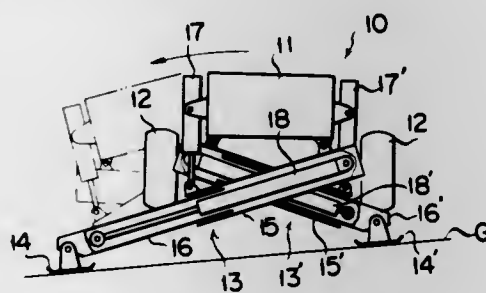
U.S. Cl. 180—8 R

4 Claims

1. A vehicle capable of crabwise translation, comprising: a body having ground engaging means for longitudinal translation; first and second pairs of extensible outrigger beams connected to the body, each outrigger beam extending generally transversely of the vehicle, each outrigger beam of each pair being spaced longitudinally of the vehicle; a set of lift cylinders co-acting with the pairs of outrigger beams for moving the body and the ground engaging means up and down with respect to the ground; first and second pairs of extend cylinders mounted to the

first and second pairs of outrigger beams, respectively, for independently extending and contracting the same; a fluid circuit for independently actuating the set of lift cylinders, the first pair of extend cylinders, and the second pair of extend cylinders which comprises:

a source of fluid under pressure, lift control valve means connected between the pressurized fluid source and the lift cylinders for controlling communication therebetween,



a first extend control valve between the pressurized fluid source and the first pair of extend cylinders for controlling communication therebetween, and

a second extend control valve between the pressurized fluid source and the second pair of extend cylinders for controlling communication therebetween;

whereby the vehicle can be shifted crabwise by selective actuation of the set of lift cylinders and the first and second pairs of extend cylinders.

4,416,345

**ROTARY ASSISTANCE MECHANISMS, MORE ESPECIALLY FOR VEHICLE STEERING**

Andre Barthelemy, Saint-Remy-les-Chevreuse, France, assignor to Automobiles Citroen and Automobiles Peugeot, both of Paris, France

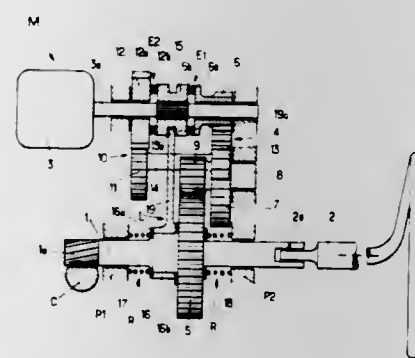
Filed Oct. 26, 1981, Ser. No. 315,048

Claims priority, application France, Oct. 27, 1980, 80 22967

Int. Cl.<sup>3</sup> B62D 5/04

U.S. Cl. 180—79.1

9 Claims



1. A rotary assistance mechanism, adapted to be coupled to a rotatable driven member capable of turning in opposite directions in response to a torque applied by a rotating drive shaft, said rotary assistance mechanism comprising:

a motor with a rotatable output shaft; a rotatable speed reducer mounted for transmitting rotation between said output shaft and said driven member, said speed reducer having at least one intermediate shaft so that when said speed reducer is driven by the motor, said driven member rotates in either of said opposite directions at a speed lower than the rotation speeds of the shafts formed by said motor output shaft and said at least one intermediate shaft; a sliding part coaxial with said driven member, said sliding part being slidable in response to a torque transmittal to the driven member;

resilient means mounted to exert an action against sliding of said sliding part so that said sliding part may slide in relation to the amplitude and the direction of the torque applied by said drive shaft;

and at least one clutch mounted on one of said shafts which rotate faster than the driven member, said at least one clutch being actuated when said sliding part slides against said resilient means, whereby when said at least one clutch is actuated, said output shaft is coupled to said speed reducer so that rotation of the output shaft by said motor assists in the rotation of said driven member.

4,416,346

**EXTENSIBLE STEERING, PROPULSION AND SKIRTING MEANS FOR GROUND EFFECT VEHICLES**

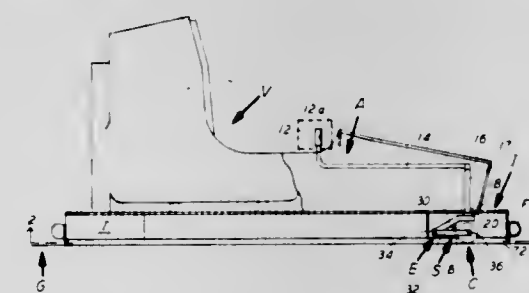
Russell J. Logan, 2301 S. Millbend, Apt. 1007, The Woodlands, Tex. 77380

Filed Dec. 29, 1980, Ser. No. 220,505

Int. Cl.<sup>3</sup> B60V 1/16

U.S. Cl. 180—119

1 Claim



1. A skirt member for use with ground effect vehicles which employ a chamber for capturing pressurized fluid as a means for providing lift to the vehicle, and which hover above a support surface, comprising a resilient flap attached to and surrounding the outer periphery of the chamber, having a lip member forming a seal between the chamber and the support surface, wherein said flap is attached to said chamber by an attachment means comprising a flexible, inflatable hose which serves as a belt to releasably mount said resilient flap to the periphery of the chamber.

4,416,347

**APPARATUS FOR PROPULSION CONTROL IN A MOTOR VEHICLE HAVING AN ANTI-LOCKING SYSTEM**

Hannes Bertling, Vaihingen, and Heinz Leiber, Leiman, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

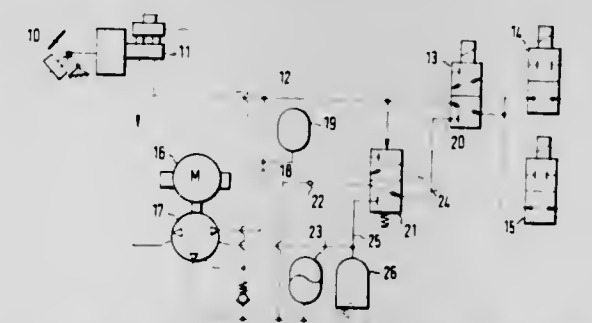
Filed Jun. 1, 1981, Ser. No. 268,619

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021116

Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 180—197

14 Claims



1. A brake apparatus for a motor vehicle having anti-skid regulation and regulation of the start-up slippage, including a brake pressure generator for supplying a pressure medium in a main line, a pressure source containing a pump, valve means actuatable by a control circuit in accordance with wheel movement behavior for blocking the supply of said pressure medium

and for diverting said pressure medium into a return-flow line, a further valve for connecting said pressure source to wheel brakes of said motor vehicle, said control circuit actuating said valve means for the purpose of pressure regulation, said further valve being incorporated into said return-flow line for the purpose of feeding the pressure of said pressure source into said return-flow line and via said valve means into a wheel brake cylinder of a wheel exhibiting a start-up slippage.

4,416,348

**COWLING FOR TRICYCLE VEHICLE**

Takumi Fukui, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

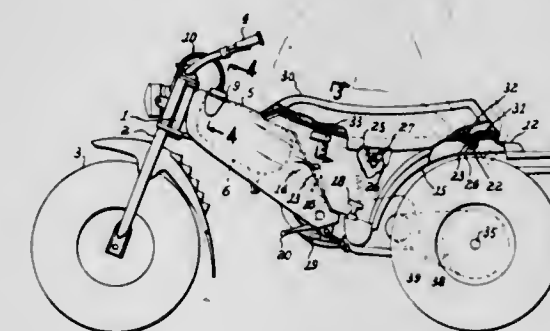
Filed Sep. 5, 1980, Ser. No. 184,651

Claims priority, application Japan, Sep. 13, 1979, 54-117736

Int. Cl.<sup>3</sup> B60J 1/04

U.S. Cl. 180—210

4 Claims



1. A cowl for a tricycle vehicle of the type having a body, two rear wheels, one forward steerable wheel, a steering head pipe for steering said forward wheel, and an engine disposed forwardly of the rear wheels and rearwardly of the forward wheel, said cowl comprising: a front cowl member rearwardly of said steering head pipe, disposed so as to be grippable by the knees of the rider, a rear cowl member disposed rearwardly of said front cowl member, the front portion of the rear cowl member extending above the rear portion of the front cowl member, a seat on said rear cowl member, and a fuel tank mounted to said body forwardly of said seat and immediately rearwardly of said steering head pipe, said front cowl member covering said fuel tank, and said cowl members being detachably attached to said body.

4,416,349

**VISCOELASTICALLY DAMPED REINFORCED SKIN STRUCTURES**

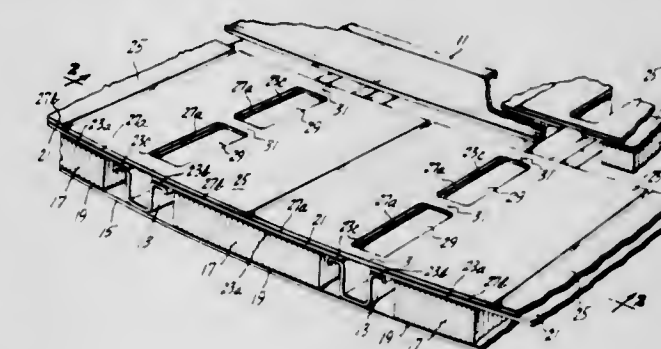
Lloyd D. Jacobs, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1981, Ser. No. 306,951

Int. Cl.<sup>3</sup> F16F 15/00

U.S. Cl. 181—208

6 Claims



1. In a reinforced skin structure including a plurality of

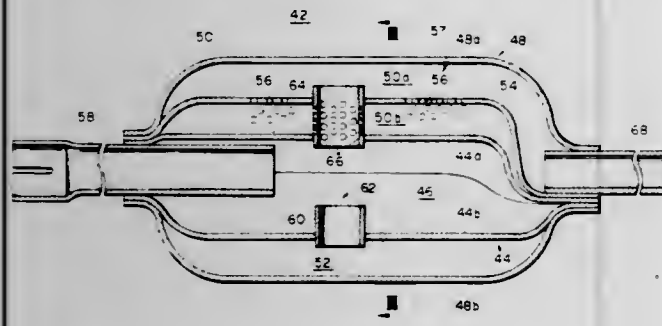


frames, a plurality of spaced-apart stringers and a skin, said plurality of stringers being affixed to and supported by said plurality of frames, said skin being affixed to and supported by said plurality of stringers, said plurality of stringers having a U-shape with outwardly projecting flanges oriented such that said skin is affixed to the crossmembers of said U-shaped stringers and the flanges of said U-shaped stringers are affixed to said plurality of frames, the improvement comprising an integral damping mechanism, said integral damping mechanism comprising:

- (A) core layers attached to said skin and located between adjacent pairs of spaced-apart stringers; and,  
 (B) viscoelastic coupling means for selectively attaching said core layers to said stringers, said viscoelastic coupling means comprising:
- (1) a relatively stiff coupling comprising:
    - (a) a first panel comprising a plurality of sections, each of said first panel sections extending from the flange of one of said stringers to the flange of the next adjacent stringer so as to overlie the core layer lying between said adjacent stringers; and,
    - (b) a second panel comprising a plurality of sections, each of said second panel sections overlying an adjacent pair of first panel sections so as to span the area between the flanges of a U-shaped stringer;
  - (2) stringer/coupling viscoelastic layers for attaching said first panel sections to said stringers;
  - (3) core/coupling viscoelastic layers for attaching said first panel sections to said core layers; and
  - (4) panel/panel viscoelastic layers for attaching said second panel sections to said first panel sections.

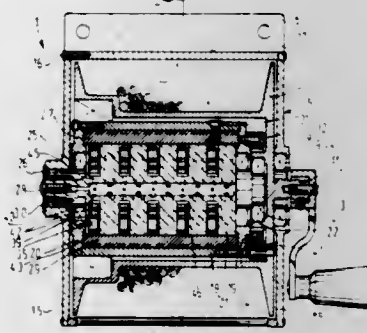
#### 4,416,350 MUFFLER

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan  
 Filed Jun. 11, 1982, Ser. No. 387,507  
 Claims priority, application Japan, Jun. 26, 1981, 56/100090  
 Int. Cl.<sup>3</sup> F01N 1/08  
 U.S. Cl. 181—272



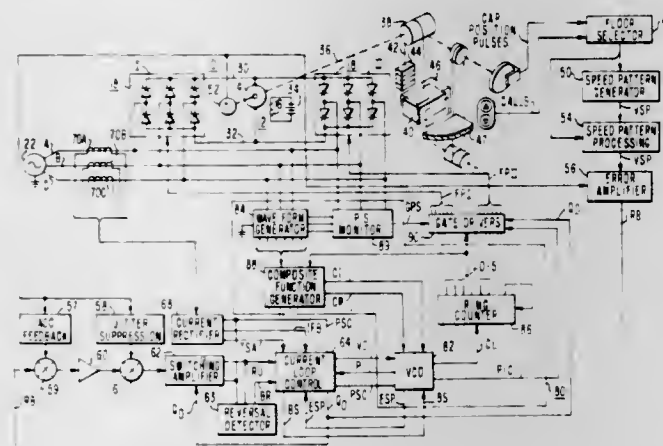
1. A muffler comprising:  
 an inner shell having therein an expansion chamber;  
 an outer shell covering said inner shell to define a clearance therebetween, said inner shell being fixed to said outer shell to define a continuous line of contact therebetween thereby to divide the clearance into first and second cavity sections;  
 means connecting said expansion chamber to said first cavity section thereby allowing said first cavity section to show a sound damping effect;  
 an inlet pipe leading to said expansion chamber thereby introducing thereinto a gas issued from a noise source;  
 an outlet pipe extending from said first cavity section to the open air thereby discharging the gas, fed to the first cavity section through said means, into the open air.

4,416,351  
**REEL FOR A LIFE-LINE**  
 Alfonsus A. Geurtsen, Deventer, Netherlands, assignor to Machinefabriek Geurtsen Deventer B.V., Deventer, Netherlands  
 Filed Apr. 15, 1981, Ser. No. 254,215  
 Claims priority, application Netherlands, Apr. 29, 1980, 8002506; Nov. 5, 1980, 8006056  
 Int. Cl.<sup>3</sup> A62B 1/12  
 U.S. Cl. 182—238 12 Claims



1. A reel for a life-line comprising a frame, a winding member journaled in said frame so as to be rotatable about a rotary axis, damping means connected on the one hand with the frame and on the other hand with the winding member and counteracting the rotation of the winding member, said damping means comprising at least one cam member and a plurality of piston pumps rotatably co-operating herewith along a relative path of movement with respect to one another and each having a cylinder and a piston displaceable therein and being in contact with the cam member, whilst of each pair of pumps, whose pistons are moved in opposite senses by the cam member, the cylinders communicate with one another through a channel having a restriction, characterized by at least one set of pumps comprising a plurality of pump pairs which co-operate with the cam member along one and the same relative path of movement and which communicate each with a common channel portion through a restriction.

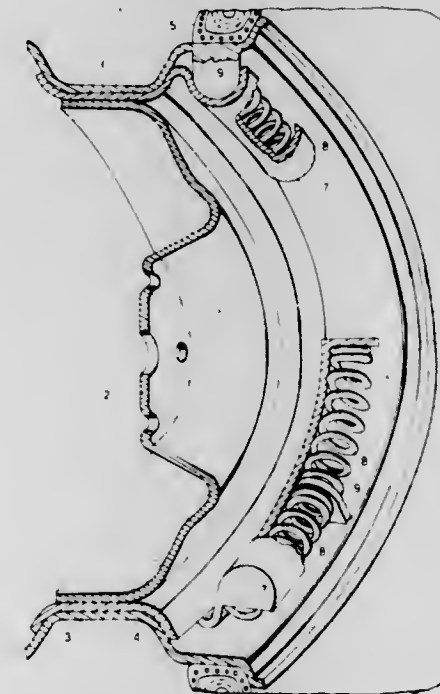
4,416,352  
**ELEVATOR SYSTEM**  
 Ali L. Husson, Hackettstown, and Vladimir Uherek, Parsippany, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Feb. 17, 1982, Ser. No. 349,485  
 Int. Cl.<sup>3</sup> B66B 1/30; H02P 1/22  
 U.S. Cl. 187—29 R 6 Claims



1. An elevator system including an elevator car driven by a DC drive motor energized by dual converter means which switches from one converter bank to the other in response to a reference signal by retarding the firing angle of the gate drive pulses applied to the operative converter bank to a predetermined inversion end stop, applying the gate drive pulses to the

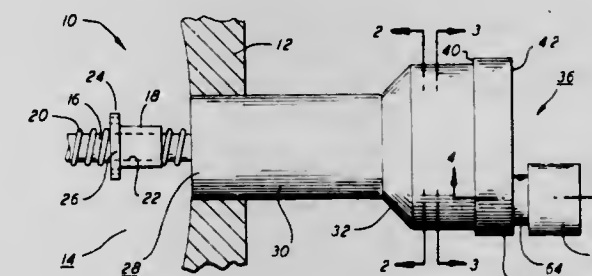
other converter bank, and advancing the firing angle thereof back towards rectification, the improvement comprising: means responsive to the reference signal for selecting the rate, from at least first and second different rates, at which the firing angle of the gate drive pulses is advanced back towards rectification.

4,416,353  
**METHOD AND DEVICE FOR ACHIEVING AN ANTI-LOCKING EFFECT WHILE STOPPING THE WHEELS OF A VEHICLE**  
 Vassil W. Ivanov, Sofia, Bulgaria, assignor to VMEI "Ienln", Sofia, Bulgaria  
 Filed May 21, 1981, Ser. No. 266,101  
 Int. Cl.<sup>3</sup> B60T 1/06  
 U.S. Cl. 188—2 A 5 Claims



2. An anti-brake-locking device for the wheel of a vehicle, the wheel being carried by a hub, the hub having a braked member secured to the wheel, the improvement wherein the braked member and the wheel are mounted for limited rotational movement with respect to each other and comprising elastic elements interposed between the braked member and the wheel, such elastic elements while the brakes are locked constantly urging the braked member and the wheel to rotate relative to each other into a central, neutral position.

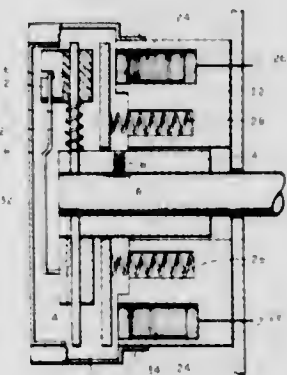
4,416,354  
**ROTARY FEEDTHRU CONTROL**  
 David Seibel, Lakeville, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.  
 Filed Jul. 1, 1981, Ser. No. 279,413  
 Int. Cl.<sup>3</sup> G05G 5/06  
 U.S. Cl. 188—166 6 Claims



1. A mechanism for controlling an ultra-high vacuum rotary feedthru, said mechanism comprising:

a rotatable shaft;  
 a brake drum extending around said shaft and coaxial therewith;  
 a carrier plate affixed to said shaft; said carrier plate having at least one carrier block associated therewith;  
 at least one brake shoe pivotably affixed to said carrier block and spaced apart from said carrier plate thereby; and  
 means for moving said brake shoe between a first position, whereat said brake shoe applies, via a biasing means, a frictional force against said drum thereby preventing movement of said carrier plate, and a second position, whereat said brake shoe is spaced apart from said drum thereby permitting rotation of said carrier plate, said moving means including a wedge affixed to a pressure rod eccentric with respect to said rotatability, said wedge being so positioned that upon the urging of said rod, said wedge pivots said brake shoe, against said biasing means, from said first position to said second position.

4,416,355  
**CENTRIFUGALLY CONTROLLED DIFFERENTIAL TAPE REEL BRAKE**  
 Herbert F. Sanford, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.  
 Continuation of Ser. No. 334,777, Dec. 28, 1981. This application Mar. 21, 1983, Ser. No. 477,284  
 Int. Cl.<sup>3</sup> B65H 23/06; B60T 13/06  
 U.S. Cl. 188—185 20 Claims



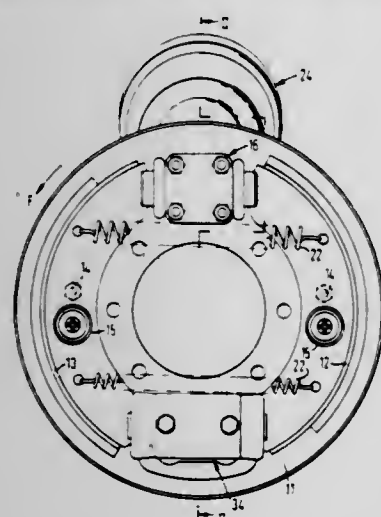
14. A brake comprising an input shaft means for connecting the brake to a rotating device to be braked, brake pad means, support means attached to said shaft for slideably supporting said brake pad means between a first and a second radial position with respect to said shaft, braking surface means in contact with said brake pad means for braking said shaft means and centrifugally actuated means connected to said brake pad means and said shaft means to control the radial position of the brake pad means inversely dependent on the angular velocity of said shaft means to provide variable braking torque.

4,416,356  
**HYDRAULIC WHEEL CYLINDER ASSEMBLIES AND DRUM BRAKES INCORPORATING SAME**  
 Duncan W. Osborne, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England  
 Filed Sep. 16, 1981, Ser. No. 302,530  
 Claims priority, application United Kingdom, Sep. 27, 1980, 8031307  
 Int. Cl.<sup>3</sup> F16D 65/24

1. A hydraulic wheel cylinder assembly for an internal shoe drum brake, the wheel cylinder assembly comprising: a cylinder body having a through bore therein; a pair of piston assemblies slidable in said bore;



an inlet port in the cylinder body which opens into said bore for supplying hydraulic pressure to urge the piston assemblies away from each other;  
an automatically adjustable variable length tappet assembly incorporated in each piston assembly, each tappet assembly comprising a rotatable screw-threaded component interengaged with a non-rotatable screw-threaded component;  
a one-way drive mechanism associated with each tappet assembly and comprising a driven member which is rotationally fast with the rotatable screw-threaded component



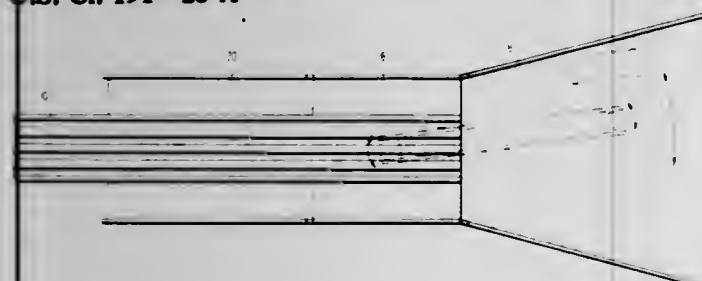
and a driving member which is rotationally fast with the cylinder body;  
a spring connection between the driven member and the rotatable screw-threaded component allowing relative axial movement therewith;  
and stop means on the driven member for limiting movement of the driven member in the direction of the other piston assembly, the arrangement being such that the spring connection yields during continuing movement of the screw-threaded components in the direction of the other piston assembly when the driven member is arrested by said stop means.

#### 4,416,357 GUIDE STRUCTURE FOR TROLLEY RAIL AND FLYING PICKUP

John A. Szysh, P.O. Box 309, York, Pa. 17405  
Filed Aug. 28, 1981, Ser. No. 297,318  
Int. Cl.<sup>3</sup> B60M 1/34

U.S. Cl. 191—23 A

4 Claims



1. In combination with a substantially horizontal, overhead trolley rail housing having a plurality of parallel open bottom slots extending lengthwise of the housing;  
a plurality of electric rail conductors, one mounted up in each said slot respectively and providing a downwardly facing, collector-contacting, rail surface;  
a trolley unit, carried by a vehicle which unit may be of the order of 60 feet vertically above the vehicle operator, said unit having a number of contact shoes equal to the number of said conductors and being adapted to engage therewith, to be removed therefrom and returned thereto, said unit permitting both lateral and vertical movement with respect to said housing and including means for biasing said

contact shoes into engagement with said downwardly facing surface of said conductors;  
inverted channel shaped guide means for automatically aligning the contact shoes carried by said trolley with said rails, said guide means including an approach section extending from one end of said housing, sloping upwardly therefrom and diverging horizontally widely outwardly of said housing, a central section, and an exit section sloping upwardly from said central section toward said rails, the horizontal dimension of the channel of said central and exit sections being such that said trolley when travelling therethrough has said contact shoes accurately horizontally aligned with said rails, the horizontal portion of said central section being vertically positioned so that when said trolley is within said section, said contact shoes are spaced below said rails;  
whereby positioning of the trolley in said approach section and advancing it successively through all three sections is effective first to align said contact shoes horizontally with the rails and simultaneously space said contact shoes below the level of the rails and then permit the trolley to rise vertically while maintaining horizontal alignment until said contact shoes smoothly and accurately engage with the undersurface of the rails.

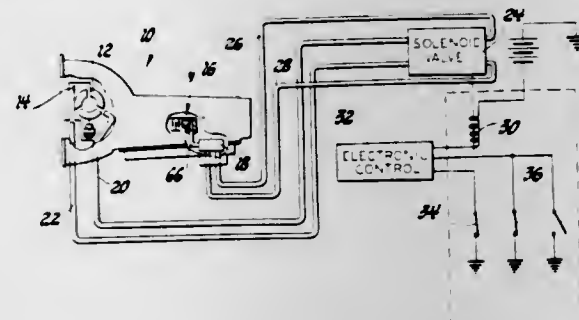
#### 4,416,358 ELECTRO-HYDRAULIC CONTROL FOR A TRANSMISSION HAVING A TORQUE CONVERTER CLUTCH

Gerald E. Kapp, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 21, 1981, Ser. No. 265,834  
Int. Cl.<sup>3</sup> B60K 41/22; F16D 25/10

U.S. Cl. 192—3.32

2 Claims



1. A control for a multispeed ratio automatic shifting transmission having a torque converter and a selectively engageable clutch for bypassing the torque converter, said control comprising: a pressure passage; shift valve means selectively operable for providing a ratio interchange between a high speed ratio and a low speed ratio including passage means connected to means for establishing said high speed ratio, a restriction in the passage means, an exhaust passage and a slidable valve member operable to selectively connect said passage means to said pressure passage to establish the high speed ratio or to said exhaust passage when the low speed ratio is established; electric switch means responsive to the pressure in said passage means between said valve member and said restriction for actuation when said passage means is pressurized and deactuation when said passage means is exhausted; and means for controlling the engagement and disengagement of the selectively engageable clutch and being responsive to actuation or deactuation of said electric switch means to momentarily disengage said clutch when said passage means is pressurized to establish the higher ratio or exhausted to disestablish the higher ratio.

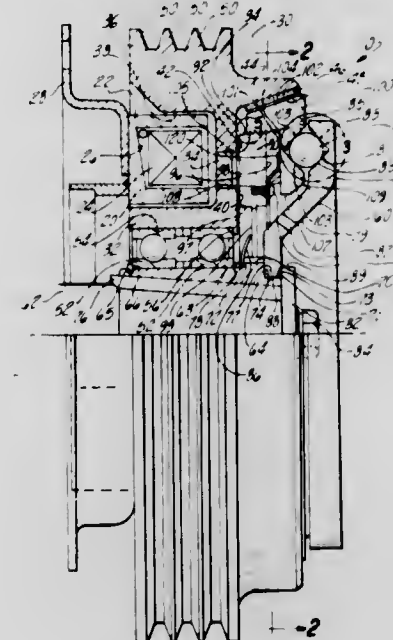
#### 4,416,359 ELECTROMAGNETIC CONE CLUTCH WITH BALL TORQUE BOOSTER

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Mar. 23, 1981, Ser. No. 246,538  
Int. Cl.<sup>3</sup> F16D 13/75, 27/10

U.S. Cl. 192—54

11 Claims



1. A torque transmitting device comprising:  
output means; and  
input means, coaxially disposed with said output means, said input means further comprising:  
an annular magnetic armature having a threaded outer diameter;  
an annular adjustable friction ring member threadably mounted on said threaded outer diameter of said annular magnetic armature for relative motion therewith;  
a drive plate member coaxially disposed with said annular magnetic armature, said drive plate member further being mounted adjacent to said annular magnetic armature; and  
means for translating torque from said drive plate member to said annular adjustable friction ring member, said translating means further comprising:  
a plurality of spherical members interposed said annular adjustable friction ring member and said drive plate member, said plurality of spherical members adapted to simultaneously engage said drive plate member and said annular adjustable friction ring member to provide direct torque transmission to said output means; and  
clutch actuating means, for actuating said torque translating means, said clutch actuating means producing a circuitous flux path through said output means and said annular magnetic armature so as to transmit torque through said drive plate member, through said plurality of spherical members, and through said annular adjustable friction ring member to said output means, said clutch actuating means further comprising:  
electromagnetic means, mounted adjacent said output means, for producing a circuitous magnetic flux path when energized.

#### 4,416,360 DRIVE FOR AUTOMOBILE AUTOMATIC TRANSMISSION

Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

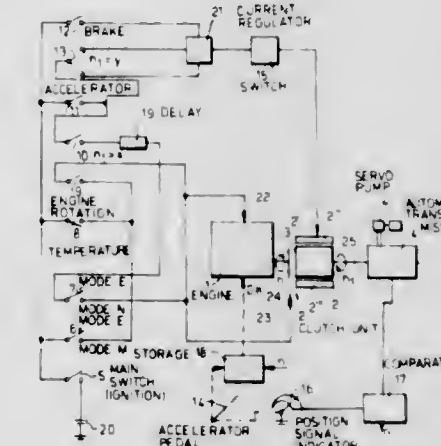
Filed Sep. 26, 1980, Ser. No. 191,079

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943563

Int. Cl.<sup>3</sup> B60K 41/02

U.S. Cl. 192—0.076

10 Claims



1. A vehicle drive train, comprising an internal combustion engine having an output shaft, an automatic transmission having an input shaft, a drive-up motor of a noncombustion type being in torque-transmitting connection with said input shaft, a clutch between said output shaft and said drive-up motor having an engine-side part and a transmission-side part, a flywheel, and control means responsive to flywheel speed for controlling clutch engagement, said transmission being of the type automatically shifting between stages upon receiving shifting signals, said flywheel being permanently connected with said transmission-side clutch part, said flywheel, clutch and drive-up motor replacing a hydrodynamic torque converter, and said control means permitting engagement of said clutch only when an accelerator lever is actuated and flywheel speed is above a predetermined value.

4,416,361  
FRICTION FACINGS REINFORCED WITH STITCHING  
Kiyohisa Suzuki, Toyota; Yasunobu Yamamoto, Chiryu; Ryochi Tomikawa, Toyota; Toshiaki Sakabe, Toyota; Hiroshi Ban, Toyota, and Nobuyasu Ishida, Tokai, all of Japan, assignors to Aisin Seiki Co., Ltd., Kariya, Japan  
Continuation of Ser. No. 132,425, Mar. 21, 1980, abandoned.  
This application Dec. 23, 1981, Ser. No. 333,771  
Claims priority, application Japan, Mar. 30, 1979, 54-38847  
Int. Cl.<sup>3</sup> F16D 69/02

U.S. Cl. 192—107 M

9 Claims

1. A friction facing comprising a non-woven fibrous lamina, reinforced with stitches of a continuous brass wire, which has been impregnated with a binder, wherein said friction facing is attached to a clutch mechanism.

#### 4,416,362 MATERIAL DISCHARGE APPARATUS WITH IMPROVED DISCHARGE TUBE

Harold J. Kilts, Middleton, and Laurence J. Swaziek, Madison, both of Wis., assignors to Madison Farm Structures, Inc., Madison, Wis.

Filed Jul. 31, 1981, Ser. No. 288,946

Int. Cl.<sup>3</sup> B65G 11/10

U.S. Cl. 193—25 C

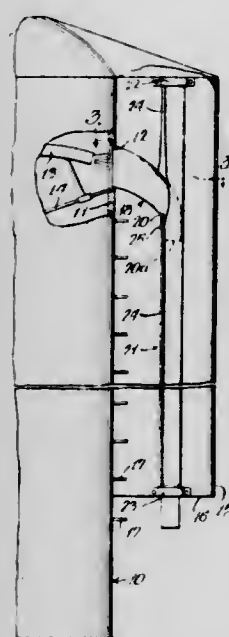
10 Claims

1. In apparatus for delivering material from a mass of material stored in a silo which has a vertical series of doorways, said material being removed from the top of the mass and dis-



charged through the one of said series of doorways which is nearest above the top of the mass into a chute on the silo, which apparatus includes a transfer conduit adapted to be mounted in said one of said series of doorways to receive discharged material and having an outer end portion with an open end to direct said material into a tube through which it is delivered to the lower end of the chute, the improvement comprising:

an upright flexible tube which is open at the bottom and has a continuous upright slit extending substantially from top to bottom thereof;



first means fixedly securing the top of said flexible tube in the chute near the top of the uppermost silo doorway; second means fixedly securing the bottom of said flexible tube in the chute near the bottom of the chute; and fastener means which closes said slit and which may be selectively opened to admit the open end of the transfer conduit to the flexible tube at any desired level while retaining said slit closed below said open end whereby the transfer conduit may be mounted in any one of said series of doorways and direct material into the tube at said desired level while the entire tube remains fixedly secured in the chute.

4,416,363

#### VENDING MACHINE WITH SEPARATE INTERLOCKING SECTIONS

Sven Stork, Siegen, Fed. Rep. of Germany, assignor to Electrolux Siegen GmbH, Siegen, Fed. Rep. of Germany  
Filed Jul. 3, 1980, Ser. No. 165,751

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1979, 2927696

Int. Cl.<sup>3</sup> G07F 7/02, 11/62

U.S. Cl. 194—4 D

7 Claims

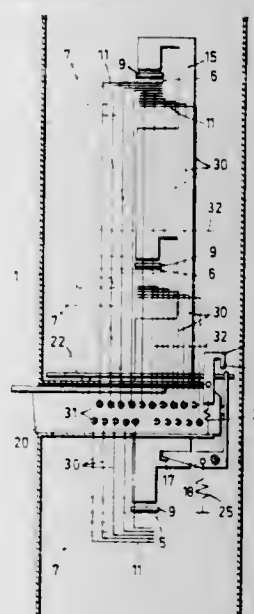
1. In a vending machine comprising, a housing, separate lockable sections disposed in said housing, each of said sections being divided into rows for holding articles to be dispensed, and provided with locking elements, lever means for locking and unlocking of the locking elements of said lockable sections, a stamping mechanism which includes a number of stamping punches corresponding to the number of said sections in the machine and being operable individually by pivoting of respective locking elements, an interlocking device operatively connected to the lever means to cause the same to selectively engage the locking elements, and an actuating key inserted into a correspondingly shaped openings in said housing for actuating the interlocking device and unlocking the locking elements of said sec-

tions, said actuating key including a matrix for the stamping punches, subdivided into fields, the improvement which comprises:

a plurality of push rods being formed of a narrow sheet metal web, and arranged one above another in said housing so as to be movable longitudinally therein, said push rods engaging the stamping mechanism in response to withdrawal of an article from the vending machine,

the locking elements being formed of locking hooks pivotally mounted on said push rods,

the lever means including a guide rail member for engaging the locking elements,



the interlocking device comprising a vertical locking bar for engaging said guide rail member, an angular lever which engages said vertical locking bar, and at least one spring biased anti-theft plate actuated by said actuating key to pivot against the force of the spring relative to said vertical locking bar, and disengage the angular lever, and

said actuating key which acts on said anti-theft plate comprising a housing having orifices disposed on one side thereof and an interchangeable stamping matrix disposed therewithin.

4,416,364

#### COIN VALIDATING ARRANGEMENT

Robert D. Bellis, near Oldham, and Dennis Wood, Denshaw, both of England, assignors to Coin Controls Limited, Royton, England

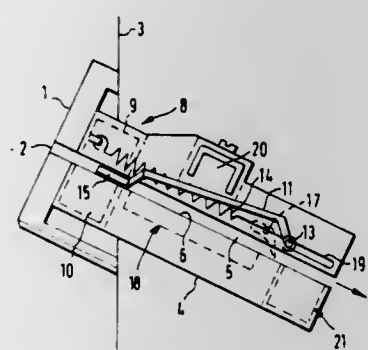
Filed Nov. 28, 1980, Ser. No. 211,128

Claims priority, application United Kingdom, Dec. 4, 1979, 7941789

Int. Cl.<sup>3</sup> G07D 5/08

U.S. Cl. 194—100 A

32 Claims



23. A coin validating arrangement comprising a coin receiving slot opening into a coin guide path, an obturator, means mounting the obturator in a blocking position obstructing

passage of all coins inserted in the slot, coin validating means positioned to sense the validity of a coin currently obstructed by the obturator, and means whereby the obturator is moved out of the blocking position to allow passage of a coin which has been validated by the validating means, the obturator being mounted to return along the coin path and re-present all non-validated coins at the coin receiving slot.

4,416,365

#### COIN EXAMINATION APPARATUS EMPLOYING AN RL RELAXATION OSCILLATOR

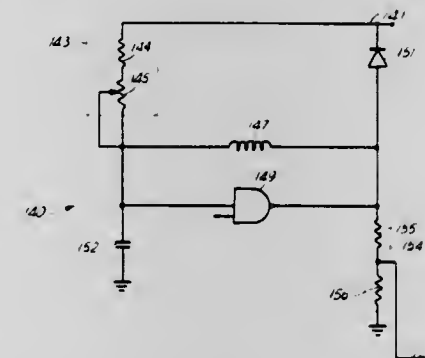
Frederic P. Helman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.

Filed Aug. 21, 1981, Ser. No. 295,139

Int. Cl.<sup>3</sup> G07D 5/08

U.S. Cl. 194—100 A

9 Claims



1. A coin testing apparatus comprising means to subject a coin to an electromagnetic field and to produce a digital signal indicative of the degree of interaction of the coin with the field, and means to determine whether said signal corresponds to that for an acceptable coin, wherein said means to subject a coin to an electromagnetic field and to produce a digital signal comprises a coin passageway and a resistor-inductor type relaxation oscillator having an oscillation frequency determining inductor adjacent the coin passageway, the inductor producing the electromagnetic field in the coin passageway, said resistor-inductor relaxation oscillator having a substantially linear frequency change with respect to change in the effective inductance in the oscillator over a range of inductance suitable for testing coins and producing an output signal which is digital in nature and requires no amplitude discrimination or shaping to be suitable for counting, and said means to determine whether said signal corresponds to that for an acceptable coin comprises counting means for counting the digital output signal.

4,416,366

#### EMERGENCY STOP MECHANISM

Michael Maryonovich, Whitefish Bay, and Edward Ebey, Neshotah, both of Wis., assignors to Masco Corporation, Taylor, Mich.

Continuation-in-part of Ser. No. 201,507, Oct. 23, 1980, Pat. No. 4,359,207. This application Mar. 11, 1981, Ser. No. 242,687

Int. Cl.<sup>3</sup> B65G 41/00

U.S. Cl. 198—320

9 Claims

1. A grain handling apparatus including an elongated carrier, and a lifting device for raising one end of said carrier, said lifting device including a trolley upon which said carrier partly rests, a first and second link pivotally connected together, said first link being fastened to said carrier, said second link being connected to said trolley, a primary cable and reel means operative to play out and take up said cable, said cable being fastened to said trolley and exerting a force on said trolley along a path on the underside of said carrier in a direction of increased potential energy upon being taken up by said reel, and a stop mechanism, said stop mechanism comprising: a secondary cable fastened at each of its ends to said carrier

at fastening points beyond said path and extended parallel to said path;

a stationary jaw fixedly fastened to said carrier and disposed adjacent said secondary cable;

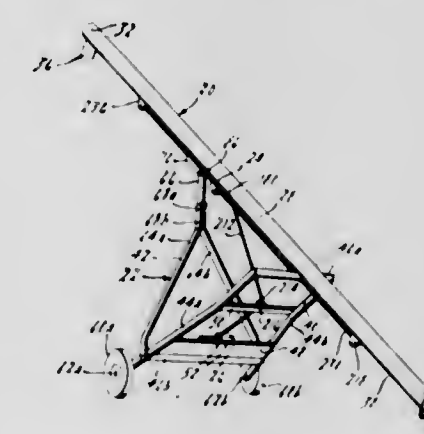
a movable jaw movably fastened to said trolley such that said movable jaw is selectively movable into contact with said secondary cable to grip said secondary cable between said jaws and thereby prohibits motion of said carrier along said path;

biasing means biasing said movable jaw towards said secondary cable and said stationary jaw;

retracting means fastened to said primary cable and movably fastened to said trolley;

said retracting means includes a lever pivotally connected to said trolley with one end in engagement with a stop means fastened to said primary cable;

said lever having a second end in engagement with said movable jaw;



said retracting means constructed to respond to the magnitude of tension along said primary cable with said tension being transmitted to said stop means, said lever, said movable jaw, and said biasing means such that said retracting means has its lever pivoted to a first position and moves said movable jaw away from said secondary cable against the force of said biasing means when an amount of tension is in excess of a predetermined minimum value, said biasing means moving said movable jaw to grip said secondary cable and pivoting said lever to a second position upon a decrease in tension in said primary cable below said predetermined minimum, and said lever again retracting said movable jaw upon a later increase in tension above said predetermined minimum, said predetermined minimum amount of tension being less than the amount of tension in said line required to maintain the position of said trolley.

4,416,367

#### TROLLEY AND CHAIN CLEANER

Richard L. Easton, Rives Junction, and Richard H. Friedlund, Jackson, both of Mich., assignors to LubeCon Maintenance Systems, Inc., Fremont, Mich.

Filed Aug. 28, 1981, Ser. No. 297,099

Int. Cl.<sup>3</sup> B65G 45/00

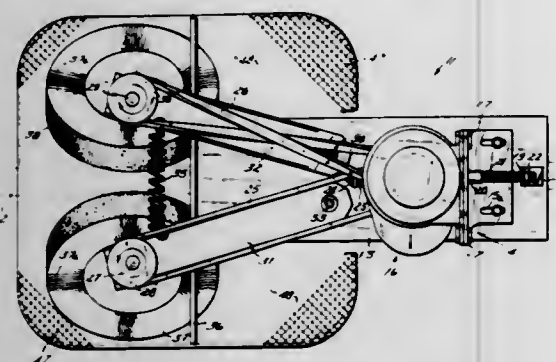
U.S. Cl. 198—496

6 Claims

1. A trolley and chain cleaner combination for conveyors and the like comprising: a mounting bracket adapted to be secured to a conveyor track; a motor on said bracket; a pair of brushes; hubs through said brushes askew to the plane of said brushes; support means for said hubs and brushes and having arms



movable on a common pivot and operably secured to said bracket;



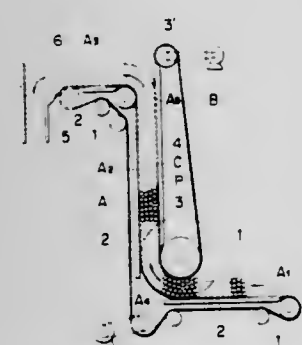
drive means connected to each of said brushes and said motor; and resilient means urging said brushes toward each other.

#### 4,416,368 CONVEYOR MECHANISM FOR CYLINDRICAL ARTICLES

Tsuyoshi Muramatsu, and Shuji Hara, both of Hiratsuka, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Hiratsuka, Japan  
Continuation of Ser. No. 220,185, Dec. 23, 1980, abandoned, which is a continuation of Ser. No. 49,224, Jun. 18, 1979, abandoned. This application Jul. 20, 1982, Ser. No. 400,055  
Int. Cl.<sup>3</sup> B65G 15/14

U.S. Cl. 198—604

11 Claims



1. A conveyor mechanism for transferring cylindrical articles, such as cigarettes, from the lower level to a higher level and through a concavity passage area including:  
an endless backing conveyor belt;  
an upper pulley and a lower pulley supporting said endless backing conveyor belt;  
an endless conveyor belt forming a first plane section extending from about said lower pulley, and a second plane section extending between said lower and upper pulleys in confronting relation to said endless backing conveyor belt;  
a plurality of spaced cylindrical support members transversely extending within said endless conveyor belt perpendicularly to an intended direction of conveyance and projecting from only one side of said endless conveyor belt;  
at least one endless chain extending substantially parallel with said endless conveyor belt on said only one side thereof while retaining said spaced cylindrical support members;  
first chain holding means for supporting said at least one endless chain on said only one side of the endless conveyor belt;  
and second chain holding means for reducing belt slack including a sprocket wheel provided on said only one side of the endless conveyor belt coaxially with said lower pulley and having a diameter larger than that of said lower pulley to support said at least one endless chain such that

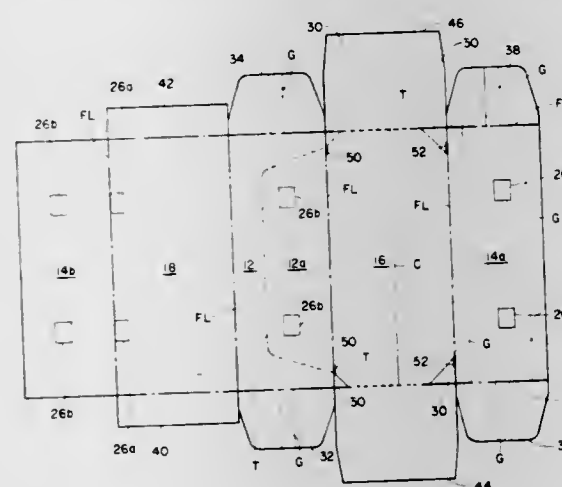
said endless conveyor belt forms a smooth curved transitional section between said first plane section and said second plane section;  
whereby safe and easy access to articles in conveyance is provided in case of mechanical breakdown from the other side of said endless conveyor belt unobstructed by said at least one endless chain and said chain holding means which permits one to reach for the articles on the conveyor belt without fear of one's hands being caught between said endless conveyor belt and the sprocket arrangement; and whereby the surface of the conveyor belt is precluded from floating in said concavity passage area by the said at least one endless chain and sprocket arrangement.

#### 4,416,369 DISPLAY AND DISPENSING CARTON

Edward P. Burns, Cos Cob, Conn., assignor to Nabisco Brands, Inc., Parsippany, N.J.  
Filed Jan. 11, 1982, Ser. No. 338,681  
Int. Cl.<sup>3</sup> B65D 5/64

U.S. Cl. 206—45.29

9 Claims



1. A combination shipping and display carton having a first carton blank configuration, a second shipping configuration and a third display configuration, said carton comprising:  
(a) in said first configuration a single unitary blank, said blank having:  
(i) first and second rear wall panels formed as the opposite ends of the unitary blank, with at least one adhesive means formed on at least one of the rear wall panels,  
(ii) a front wall panel having a bottom panel and a top panel on opposite sides thereof, said front, top and bottom panels joining said first and second rear wall panels,  
(iii) a plurality of first and second end panels attached to at least one of the rear, front, top and bottom wall panels with a second adhesive means formed on at least one of each of said first and second end panels,  
(iv) said blank being formed with a tear line parallel to the end panels across the top panel and extending across the front panel to traverse the panel from said first end to said second end, said top panel having a transverse crease line formed therein,  
(v) one side of said blank providing space for printed advertising matter to be used in said second and third configurations,  
(b) in said second configuration, a closed shipping carton, said carton having:  
(i) said first and second rear wall panels joined together by said first adhesive means to define a rectangular enclosure with said space for said printed advertising matter on the outside thereof,  
(ii) said end panels being secured together by the second adhesive means to form a closed shipping carton,

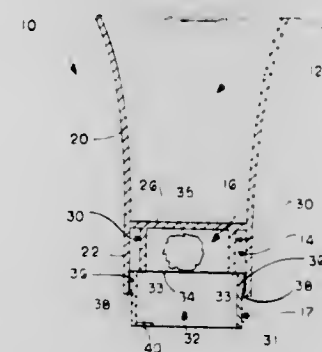
(c) in said third display configuration, said carton having:  
(i) said front and top panels being severed along said tear line,  
(ii) said top panel being folded along said crease line,  
(iii) said front panel and said top panel being adjacent to and reinforcing said rear wall panel, said upstanding front and top folded configuration providing a display panel for said printed advertising matter.

#### 4,416,370 COMPARTMENTED CONTAINER

Robert Beall, 11 Heather La., Columbia, Mo. 65201  
Filed Aug. 25, 1982, Ser. No. 411,452  
Int. Cl.<sup>3</sup> B65D 85/00, 77/40, 3/24

U.S. Cl. 206—217

17 Claims



1. A compartmented container adaptable for holding a liquid and a non-liquid substance therein comprising a body member having a first substantially cup-like portion for holding the liquid substance therein and a second portion defining a second compartment for holding the non-liquid substance therein, said body member having first and second ends and a closed side wall portion extending therebetween, a floor member disposed at an intermediate location along the closed side wall portion separating the cup-like portion from said second compartment, a closed wall member extending from said floor member into said second compartment forming a cavity therewithin adaptable to receive the non-liquid substance therein, said closed wall member being positioned in spaced relation inwardly from the closed side wall portion of said body member to form a space therebetween, a closure member slidably receivable within said second compartment including a closed wall member shaped to be movable in the space between the closed side wall portion of said body member and the closed wall member forming said cavity, said closure member having a rupturable membrane extending thereacross adjacent one end thereof whereby said membrane can be moved against the cavity forming wall member to rupture said membrane and provide access to the non-liquid substance stored in said cavity.

#### 4,416,371 GARMENT CONTAINER

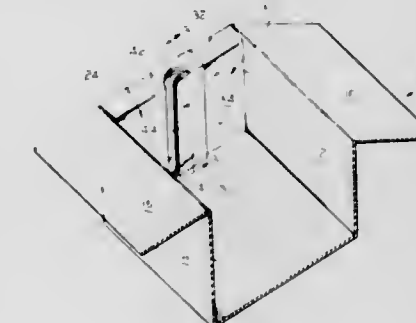
James F. Naubelmer, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.  
Filed Mar. 12, 1982, Ser. No. 357,633  
Int. Cl.<sup>3</sup> B65D 85/18

U.S. Cl. 206—289

3 Claims

1. In a collapsible container adapted to hold a plurality of garments on hangers, formed from a unitary blank of foldable sheet material, such as paperboard, and being self-contained so as to require no outside securing means to maintain it in erected position, the combination of:  
(a) a bottom wall panel having pairs of opposed side and end walls foldably joined thereto and to each other and upstanding therefrom to form a boxlike structure;  
(b) at least one of said end walls including a pair of hollow sections extending toward each other for opposed side walls in partially overlapping, telescoping relation;  
(c) each of said hollow sections including:

(i) an outer panel foldably joined to an adjacent end edge of a related side wall panel;  
(ii) an upper panel foldably joined to an upper edge of said outer panel and extending inwardly therefrom;  
(iii) an inner panel foldably joined to an inner edge of said upper panel and extending downwardly therefrom;  
(iv) a bottom flange foldably joined to a lower edge of the inner panel and extending outwardly therefrom over the bottom wall panel;



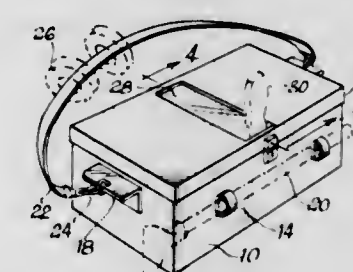
(d) the upper and inner panels of said sections having aligned hanger receiving openings therein;  
(e) said sections having interlocking engagement with each other to maintain said container in erected position without requiring outside securing means; and  
(f) one of the bottom flanges of said sections having a locking tab and the other bottom flange of said sections having a slot, said slot being adapted to receive said locking tab to provide a locking engagement.

#### 4,416,372 DRYWALLER'S TOOL BOX

Gary L. Polk, 10369 Gold Coast Pl., San Diego, Calif. 92126  
Filed Sep. 29, 1982, Ser. No. 427,390  
Int. Cl.<sup>3</sup> B65D 85/28

U.S. Cl. 206—372

9 Claims



1. A drywall hanger's tool kit comprising:  
(a) a case;  
(b) a blade-holding rack defining a plurality of parallel vertical slots;  
(c) said rack having converging sidewalls such that the width of said slots progressively decrease from a widest slot to a narrowest slot; and  
(d) a lid for said case having a blade handle clearance cutout spanning said slots centrally and perpendicular thereto, such that a plurality of drywall paste applicator blades of decreasing blade width can be stored in the respective decreasing-width slots of said rack with the handles of said blades extending through said cutout when said lid is on said case.



4,416,373

## INTERLOCKING STACKABLE BOTTLES

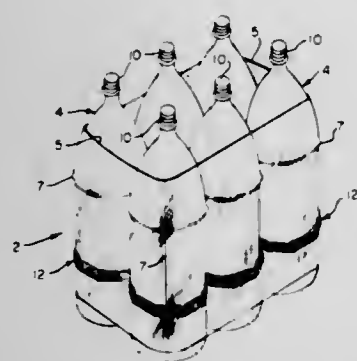
Pierre J. deLarosiére, 30 Rua D. Palmela, Lisbon, Portugal

Filed Feb. 4, 1982, Ser. No. 345,684

Int. Cl.<sup>3</sup> B65D 65/00, 85/62, 21/02

U.S. Cl. 206—432

4 Claims



## 1. In a bottle of the type having:

(a) a liquid container made of a plastic material, the container being generally symmetric in shape about a symmetry axis and having a container opening in it for filling and discharging liquid, the container opening being located so that the symmetry axis passes centrally through the opening;

(b) a top closure for sealing the container opening; and

(c) a base cup joined to the liquid container at an end of the container generally opposite to the container opening, the base cup being made of a plastic material and being shaped to permit the bottle to stand upright on a horizontal surface with the symmetry axis of the container extending in a substantially vertical direction, a bottle-rest reference surface being defined to be a plane tangent to the points of the base cup on which the base cup rests when the bottle is standing upright on a horizontal surface;

the improvement which comprises:

(i) a base-cup interlock band joined to the base cup, the interlock band extending generally parallel to the bottle-rest reference plane and around an outer surface of the base cup, the interlock band including a plurality of interlock band segments, each interlock band segment corresponding to a side of a reference equilateral polygon defined to be lying in the reference plane and centered on the symmetry axis, the number of interlock band segments being equal to four times an integer greater than one, an outwardly facing surface of each interlock band segment defining an interlock facet, each interlock facet extending in a direction generally parallel to the corresponding side of the reference polygon and in a direction generally parallel to the symmetry axis, an intersection between each pair of adjacent interlock facet segments being generally rounded, each interlock facet having a plurality of grooves passing through it extending generally parallel to the symmetry axis of the liquid container to define vertical facet grooves, the width of the vertical facet grooves being greater than the spacing between adjacent grooves to permit the vertical facet grooves of two facets on different bottles to mesh, each pair of adjacent facets having a plurality of grooves extending generally parallel to the reference plane to define horizontal facet grooves, the horizontal facet grooves extending between a first vertical facet groove located on a first facet of a pair of adjacent facets and closest to a second facet of the pair and a second vertical groove located on the second facet and closest to the first facet, the width of the horizontal facet grooves being greater than the spacing between adjacent grooves and the spacing between boundaries of the facet and horizontal facet grooves adjacent to the boundaries to permit the horizontal grooves of two facets of the different bottles to mesh, the horizontal and vertical grooves of the interlock facets thereby cooperating to prevent bottles from moving relative to one another in two directions

when the bottles are placed in alignment facet-to-facet with facet grooves engaged; and

(ii) a bottle-stacking support connected to the base cup and abutting a base portion of the liquid container, the bottle-stacking support being located symmetrically with respect to the symmetry axis of the liquid container and spaced apart from the bottle-rest reference plane, the base cup being shaped to define a closure guide which opens from the bottle-stacking support to the bottle-rest reference plane, the closure guide being shaped to receive the top of a closure of a second bottle whose symmetry axis is generally colinear with the symmetry axis of the bottle having the bottle-stacking support and to guide the closure top to the bottle-stacking support, the bottle-stacking support being adapted to transmit the weight of the bottle having the bottle-stacking support to the top of the closure of the second bottle.

4,416,374

## NEST AND STACK CONTAINER

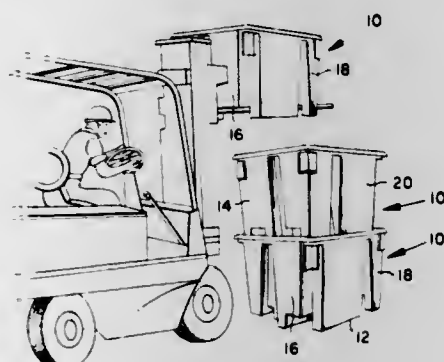
Rush B. Smith, Philadelphia, and Pasquale C. Daloisio, New Hope, both of Pa., assignors to Pennsylvania Pacific Corporation, Warminster, Pa.

Filed Apr. 16, 1982, Ser. No. 368,917

Int. Cl.<sup>3</sup> B65D 21/04

U.S. Cl. 206—507

2 Claims



1. A lidless open-stacking seamless plastic container comprising,

a bottom and four upwardly extending walls, said walls comprising a front wall, a rear wall, a right wall and a left wall,

said bottom including five downwardly extending legs forming supporting members for the container, a center leg extending somewhat off-center between said front and rear walls, extending in end-to-end relation adjacent said right wall between said front wall and said rear wall with a right wall gap between them, front and rear left wall legs extending in end-to-end relation adjacent said left wall between said front wall and said rear wall with a left wall gap between them, said right wall gap being closer to said front wall than said left wall gap, channels formed between said center leg and said right and left wall legs, and extending between said front and rear walls for the entry of the tines of a forklift truck, and

said walls including a plurality of depressions, said depressions forming stacking lugs internally of the container with a front wall stacking lug adjacent said front wall substantially centrally thereof, a right wall stacking lug adjacent said right wall, a left wall stacking lug adjacent said left wall, a rear wall stacking lug adjacent said rear wall somewhat off center thereof toward said left wall, said right wall stacking lug being closer to said front wall than said left wall stacking lug, a right rear corner stacking lug adjacent said rear wall near said right wall and a left rear corner stacking lug adjacent said rear wall near said left wall, each of said stacking lugs having an upper stacking surface,

said front, rear, right and left wall stacking lugs having a flat

surface extending inwardly from the top of the container and a stacking surface positioned beneath the flat surfaces, depressions in the corner formed by the rear wall and left wall and in the corner formed by the rear wall and right wall and forming rear wall corner stacking lugs with stacking surfaces,

whereby with an upper container placed upright on top of a lower container with the front walls thereof facing in opposite directions the rear end of said center leg on the upper container contacts the front wall stacking surface of the lower container and the front end of said upper container center leg contacts a rear wall stacking surface of the lower container, said right wall legs of the upper container contact the left wall stacking surfaces of the lower container, and said left wall legs of the upper container contact the right wall stacking surfaces of the lower container, the lower container thereby providing support for the upper container without the need for a lid as a stacking base, and

whereby with an upper container placed over a lower container with the front walls thereof facing in the same direction, the legs on the bottom of the upper container slide past the stacking surfaces and lugs of the lower container and the upper container thus nests within the lower container.

4,416,375

## COMPUTER PRINT FORM COVER SHEET FOR MULTI-COMPARTMENT MEDICINAL DISPENSING DEVICE

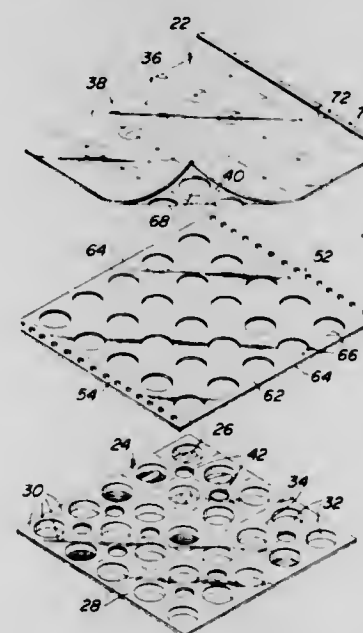
Milton Braverman, and Leonard Zink, both of Philadelphia, Pa., assignors to Medi-Dose, Inc., Feasterville, Pa.

Filed Apr. 30, 1982, Ser. No. 373,561

Int. Cl.<sup>3</sup> B65D 83/04, 85/56, 75/42, 7/28

U.S. Cl. 206—534.1

9 Claims



1. A supply of cover sheets suitable for mechanized handling of computer driven printing means, each of said cover sheets being adapted for securement to a base of a multicompartment medicinal dispensing device to seal said device, said base comprising a plurality of individual medicine holding units releasably secured together along predetermined separator lines, each of said units including a chamber and a flange, each of said cover sheets being divided by weakened lines corresponding to said predetermined separator lines to form individual closure members, one for each unit, said closure members having an inner surface having an adhesive thereon, each of said cover sheets being releasably secured by said adhesive at sequential longitudinal positions along a carrier web, said carrier web having engagement portions in the form of respective marginal edge portions including plural apertures therein arranged to be engaged by computer driven means to carry said cover sheets to a printing station for applying indicia

thereon, said carrier web also including plural die cut areas, each of said areas being located under a respective closure member, each of said cover sheets covering said web except the portion including the plural apertured portion of said respective marginal edge portions, said cover sheets being arranged to be removed from said carrier web with said die cut areas of said web remaining secured to said cover sheet to enable said cover sheet to be secured to said base via said flanges whereupon said die cut areas overlie said chambers.

4,416,376

## BAG PACKAGE AND RELATED METHOD

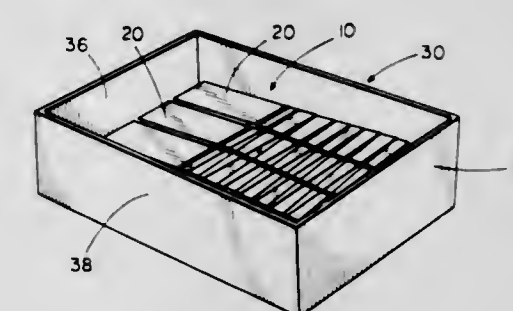
Richard W. Scheffers, Mount Prospect, and Hugo Boeckmann, Arlington Heights, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Sep. 30, 1982, Ser. No. 431,449

Int. Cl.<sup>3</sup> A45C 11/20; B65D 73/00

U.S. Cl. 206—554

8 Claims



1. A method to package a chain of plastic bags in a rectangular carton having a bottom wall and two opposite pairs of vertical walls, wherein each bag is formed of plastic film in a rectangular shape having an upper edge, a lower edge, and opposite lateral edges with zipper-locking profiles running along such bag near an upper edge of such bag, and wherein the bags in the chain are connected one after another at a trailing lateral edge of one and a leading lateral edge of another, the method comprising steps of

(a) laying a whole number of the bags in the chain onto the bottom wall of the carton so as to form a first layer of the bags in the chain, and so as to align the profiles of the bags of the first layer generally along a straight line that is oblique with respect to a selected one of the vertical walls of the carton,

(b) folding the chain where two successive bags in the chain are connected to each other,

(c) laying a whole number of the bags in the chain onto the first layer so as to form a second layer of the bags in the chain, and so as to align the profiles of the bags of the second layer generally along a straight line that is oblique,

(d) laying a whole number of the bags in the chain onto the second layer so as to form a third layer of the bags, and so as to align the profiles of the bags of the third layer generally along a straight line that is parallel to but spaced from the straight line aligning the profiles of the first layer,

wherein the straight lines aligning the successive layers follow a zigzag course.

4,416,377

## CONTROLLED ACCESS PACKAGE

Robert H. Swanberg, Montvale, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 10, 1982, Ser. No. 356,928

Int. Cl.<sup>3</sup> B65D 5/54

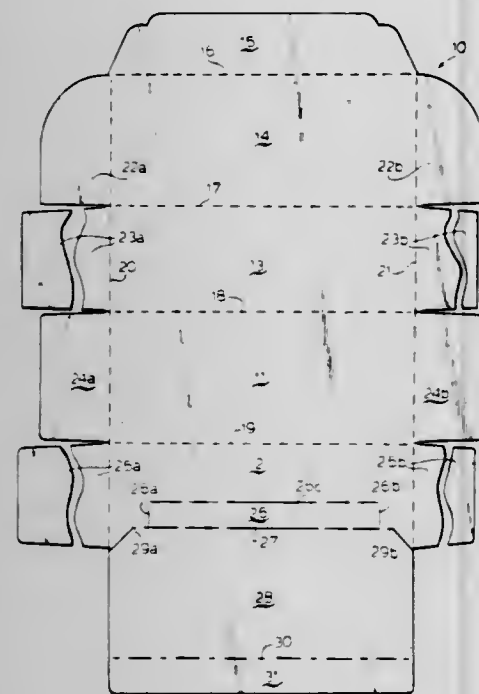
U.S. Cl. 206—602

4 Claims

1. A carton formed from a one-piece sheet, particularly suited for packaging two different products separated from each other, comprising: connected front, bottom, back and cover panels and a front cover closure flap;



end closure flaps at the ends of the carton;  
a generally rectangular break-away strip cut-perforated in the top of the front panel; and  
a shelf panel connected along its back edge to the back panel and connected along its front edge to the top of the break-away strip along a cut-perforated line and by nips at each end to the front panel, the said shelf panel being spaced from the bottom panel to provide separate areas above and below the shelf panel;  
the said carton being packaged with one product below the shelf panel and the second product above the shelf panel



with the end closure flaps closing the ends of the carton and the front cover closure flap being secured to the break-away strip of the front panel to completely seal the carton;

the said carton being adapted to be opened by raising the front cover closure flap and tearing loose the break-away strip,

whereby the first product above the shelf panel will be accessible until exhausted after which the shelf panel can be torn from the nips at each end to provide access to the second product.

4,416,378

## STATIC DIVERTER MODULE

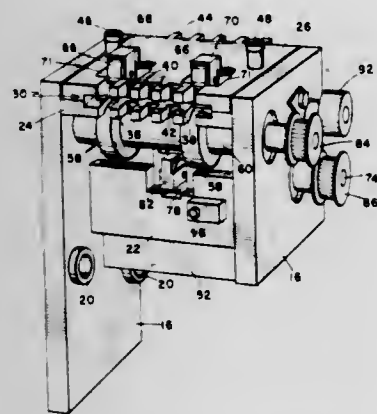
Gregory E. Miller, 1661 Felicita La., Escondido, Calif. 92025

Filed Dec. 1, 1980, Ser. No. 211,024

Int. Cl.<sup>3</sup> B07C 5/00; B65H 5/00

U.S. Cl. 209—583

12 Claims



1. A diverter unit for a ticket handling system, said unit comprising:

housing means having a pair of spaced apart plates defining

a primary transport passage therebetween having an inlet and an outlet,  
primary drive means for transporting a ticket through said passage between the inlet and the outlet, and  
diverter means including a pair of spaced apart curved plates defining a capture passage therebetween intersecting said primary transport passage, and a diverter plate extending from said capture passage into said transport passage for intercepting and diverting a ticket passing in a predetermined direction in said primary transport passage from said primary transport passage into said capture passage.

4,416,379

## BICYCLE STORAGE DEVICE

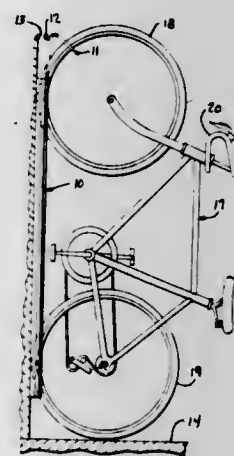
Joseph V. Graber, 3739 County Trunk M, Middleton, Wis. 53562

Filed Jul. 10, 1981, Ser. No. 281,963

Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211—19

13 Claims



1. A bicycle storage device comprising, an elongated wheel receiving channel having a base wall and laterally spaced relatively diverging side walls adapted to receive a wheel of a bicycle with the bicycle wheel disposed in a longitudinal medial plane bisecting the channel, a rigid wheel engaging hook, and bracket means attached to both side walls of the channel rigidly mounting one end of the hook solely on said side walls of the channel with the hook extending from said one end thereof crosswise of said longitudinal medial plane and terminating with its free end at the other side of said longitudinal medial plane, the hook being offset from the open side of the channel a distance such that the free end of the hook is spaced from a plane through the open side of the channel a distance greater than the radial depth of the rim and tire portion of a bicycle wheel to allow the bicycle wheel to be moved laterally of said longitudinal medial plane past the free end of the hook and then shifted in said longitudinal medial plane until it rests in the channel and engages the hook for support thereby.

4,416,380

## PRODUCT MERCHANDISING RACK

Paul Flum, University City, Mo., assignor to Paul Flum Ideas, Inc., St. Louis, Mo.

Filed May 11, 1981, Ser. No. 262,117

Int. Cl.<sup>3</sup> A47F 7/28

U.S. Cl. 211—49 D

17 Claims

1. A rack device adaptable for use on a support structure for storing and merchandising shelved products comprising an open grid rack structure formed by a plurality of connected spaced rod members including a front wall portion extending substantially across the entire front portion of said device, a rear wall portion and spaced rod members connected therebetween, said spaced rod members including a first set of spaced rod members arranged in groups to form a plurality of parallel adjacent tracks extending between the front and rear wall portions for supporting rows of products thereon, each of said

rod members forming said first set of spaced rod members having an angularly disposed upwardly extending portion associated therewith forming a portion of said front wall, a second set of spaced rod members disposed in a common plane above the first set of spaced rod members to form a plurality of channels extending between the front and rear wall portions for guiding products positioned on the tracks in parallel rows therebetween, each of said channels being positioned such that a respective track forms the bottom thereof, each of said rod members forming said second set of spaced rod members having an angularly disposed downwardly extending portion associated therewith forming at least a portion of said rear

seal the opening of a bottle, said closure member including a plurality of spaced apart disk-shaped wing members extending parallel with said base, said wing members being adapted to deform when said closure member is inserted into a bottle to hold the cap on the bottle and prevent spillage therefrom.

4,416,382

## MERCURY CONTAINER

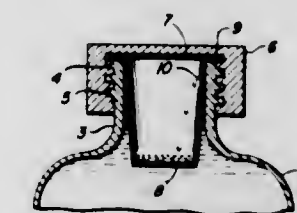
James B. Lawrence, and Bruce J. Lawrence, both of Coopersburg, Pa., assignors to Bethlehem Apparatus Company, Inc., Hellertown, Pa.

Filed Mar. 22, 1982, Ser. No. 360,378

Int. Cl.<sup>3</sup> B65D 55/00

U.S. Cl. 215—231

5 Claims



1. A container for the transport and storage of metallic mercury comprising a bottle having a neck which terminates in a rim, a truncated conical thimble disposed within said neck, said thimble having a flange adapted to rest on said rim, at least one opening having closure means, said opening formed in the upper side wall of said thimble adapted to allow a one way entry into the thimble of a small amount of expanding mercury which is retained in the thimble and separated from the rest of the mercury in the bottle, and a closure member adapted to engage the outer surface of said neck and the upper surface of said flange thereby sealing said bottle and said thimble against the loss of any mercury contained therein.

4,416,383

## CLOSURE AND SEALING DEVICE

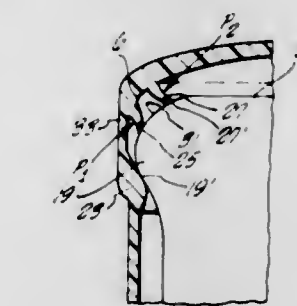
Carl E. Frahm, 1428 Oak Meadow Rd., Arcadia, Calif. 91006; Erick L. Larson, 4916 Del Monte Rd., La Canada, Calif. 91001, and John M. S. McAulay, 2412 W. 227th St., Torrance, Calif. 90501

Filed Oct. 29, 1981, Ser. No. 316,239

Int. Cl.<sup>3</sup> B65D 41/48

U.S. Cl. 215—256

11 Claims



1. A closure device for closing and sealing a vessel orifice defined by a vessel lip protruding radially and axially from the orifice comprising:

a generally cup-shaped body having a radially extending cover portion adapted to cover the orifice and a depending skirt portion extending axially from the cover portion adapted to surround and close the orifice defined by the lip;

a first elongated sealing member adjacent the junction of the cover portion and the skirt portion of the closure device

wall, a transverse rod member spaced above said first set of spaced rod members and extending substantially across the front portion of said device, said transverse rod member being connected to the rod members of said second set of spaced rod members and to the upwardly extending portion of each of the rod members of said first set of spaced rod members together forming said front wall, and other rod members attached to said first set of spaced rod members for supporting the rear wall portion at a higher elevation than the front wall portion when said device is supported on a horizontal surface whereby rows of products positioned in each of the channels will slide along the respective channels on the respective tracks positioned therebelow towards the front wall portion.

4,416,381

## BOTTLE CAP WITH INTEGRAL MEASURING CUP AND BOTTLE CLOSURE

Everett W. Swartwout, 5816A S. Wolf Rd., Western Springs, Ill. 60558

Filed Nov. 27, 1981, Ser. No. 325,295

Int. Cl.<sup>3</sup> B65D 41/26

U.S. Cl. 215—228

10 Claims



1. A bottle cap including an integral measuring cup comprising a base having a periphery, a sidewall extending upwardly from said periphery forming a cup having at least one graduation on the interior wall of said cup indicating a volume level, and a closure member extending from the base and adapted to



extending inwardly from the cup-shaped body portion constructed and arranged to be urged into sealing engagement with the lip upon being placed over the orifice defining lip, the first sealing member being constructed and arranged to seal against a generally radially extending surface of the lip; and

a second elongated sealing member adjacent the junction of the cover portion and skirt portion of the closure device extending inwardly from the cup-shaped body portion constructed and arranged to be urged into sealing engagement with the lip upon being placed over the orifice defining lip, the second sealing member being constructed and arranged to seal against a generally axially extending surface of the lip, the first sealing member and the second sealing member being angularly disposed to each other so that the first sealing member is urged into further sealing engagement with the lip when the pressure inside the vessel is greater than the ambient pressure and the second sealing member is urged into further sealing engagement with the lip when ambient pressure is greater than the pressure inside the vessel.

4,416,384

## TANK CONTAINER WITH MOUNTING MEANS

Anders Bjurling, Skultuna, Sweden, assignor to Dynatrans AB, Hisings Backa, Sweden

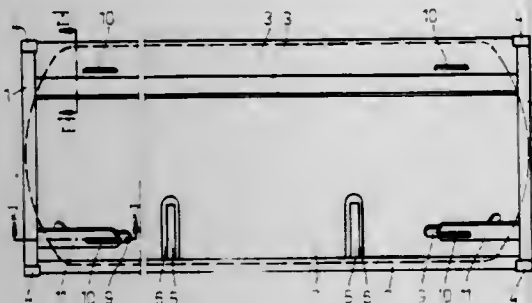
PCT No. PCT/SE81/00073, § 371 Date Nov. 6, 1981, § 102(e) Date Nov. 6, 1981, PCT Pub. No. WO81/02561, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 9, 1981, Ser. No. 320,955

Claims priority, application Sweden, Mar. 7, 1980, 8001797 Int. Cl.<sup>3</sup> B65D 88/06

U.S. Cl. 220—1.5

3 Claims



1. A metal tank container comprising a framework surrounding a substantially cylindrical tank with curved surface ends disposed therein, characterized in that a plurality of longitudinally disposed axial suspension plate members are affixed to the tank with one set mounted on the cylindrical tank surface with a mount pliable in the radial direction to bear thereupon for transmitting forces substantially only in their longitudinal direction and another set mounted on the tank ends with a mount pliable in the longitudinal direction to bear thereupon for transmitting forces substantially only in their radial direction and which suspension plate member sets are disposed between the framework and the tank at opposite ends thereof with the respective axial and radial members bearing on the tank walls substantially only in the respective axial and radial directions of the tank wall, and thereby mounted so that the forces between the tank and the framework are transmitted substantially without bending moments on the curved surfaces of the tank wall.

4,416,385

## FREIGHT CONTAINERS

Kenneth D. Clare, Cheadle, and Michael F. J. Ambrose, Macclesfield, both of England, assignors to Fairey Engineering Limited, Hounslow, England

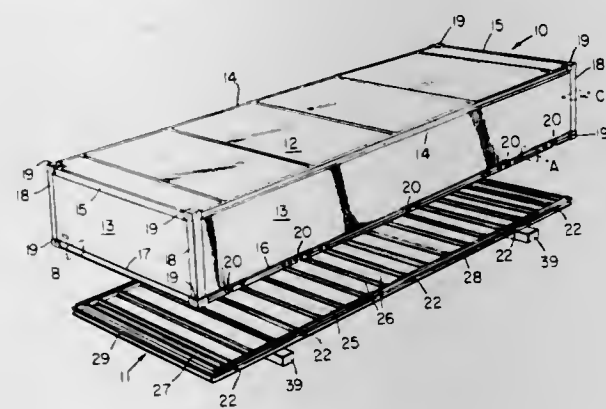
Filed Dec. 22, 1981, Ser. No. 333,626

Claims priority, application United Kingdom, Dec. 23, 1980, 8041268

Int. Cl.<sup>3</sup> B65D 19/04, 88/00, 81/02

U.S. Cl. 220—1.5

8 Claims



1. A stackable rectangular freight container which comprises a rigid bottomless rectangular container body having a doorless top wall and four doorless side walls, the top wall and side walls being permanently joined together at their adjacent edges along the respective edges of the container body, and the only access to the interior of the container body being through the open lower side, in combination with a rigid load supporting pallet of rectangular profile over which the container body can be lowered to enclose a load supported on the pallet, the pallet then forming the floor of and totally closing the container, and means being provided for releasably securing the peripheral edge of the pallet to the lower edges of at least two opposite side walls of the container body to secure the container in its closed condition such that in the closed condition the lower edges of the container body lie outside and around the peripheral edge of the pallet, said container body including support means configured so that when said container is used the closed container is placed on a flat supporting surface and said support means of the container body rests on the supporting surface with the pallet suspended clear of the supporting surface by the container body through the releasable securing means.

4,416,386

## CONTAINER FOR PRESSURIZED PRODUCTS

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 217,616, Dec. 18, 1980, Pat. No. 4,345,047.

This application Mar. 15, 1982, Ser. No. 358,066

Int. Cl.<sup>3</sup> B65D 8/22; C08L 63/00

U.S. Cl. 220—67

14 Claims

1. A container for pressurized products comprising a top portion and a bottom portion having overlapped cylindrical wall sections in telescoped relation and an adhesive composition interposed therebetween bonding the opposed surface portions of the overlapped sections to each other, the adhesive being comprised of an admixture of about 10 to about 70% by weight of a thermoplastic vinyl chloride polymer resin about 20 to about 85% by weight of a thermoplastic acrylonitrile/butadiene/styrene copolymer containing about 10 to about 30% by weight acrylonitrile, about 10 to about 30% by weight butadiene and about 40 to about 70% by weight styrene and about 5 to about 30% by weight of a thermosetting epoxy resin.

4,416,387

## PAINT PRESERVER

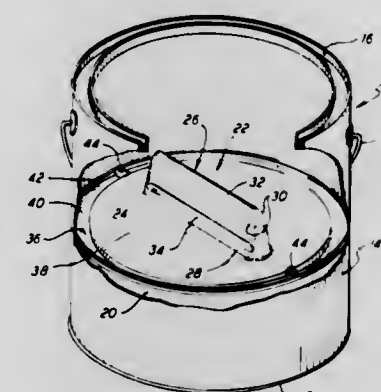
Joseph V. D'Antonio, Media, Pa., assignor to Richard L. Bates, Camillus, N.Y., a part interest

Filed Jun. 11, 1982, Ser. No. 387,448

Int. Cl.<sup>3</sup> B65D 25/10

U.S. Cl. 220—93

7 Claims



1. A device for protecting a substance in a container having a cylindrical wall with an inner diameter and a closed bottom, against the environment, said device having an upper side and a lower side and comprising:

a generally flat, resilient central portion;  
a compressible, elongated, resilient hollow handle extending upwardly from and in a crosswise directions to said central portion, said handle having opposite end sections and side sections;

channel means extending peripherally about said central portion, said channel means including a base portion, an inner wall portion extending upwardly from said base portion and a generally circular outer wall portion extending upwardly from said base portion, said central portion extending across the upper part of said inner portion to form a cavity when said device is sitting on the substance in the container for rendering said device buoyant;  
crease means extending radially across said channel means; and

an annular peripheral portion extending radially outwardly from the outer wall portion of said channel means for engaging the wall of a container in which said device is inserted;

said device having a generally flattened open condition and folding along said crease means upon the compression of the side sections of said handle into a closed position for reducing the projected area of said device for enabling the insertion and removal of said device into and out of a container, said device assuming the open position upon release of said handle in a container for covering the substance and sealing the substance from the environment.

4,416,388

## PRESSURE RELIEF DEVICE

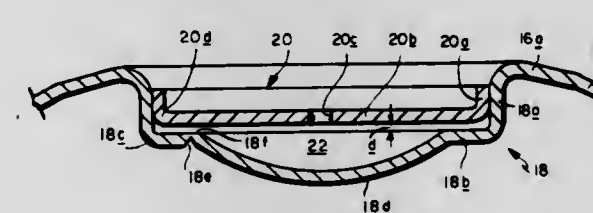
Walter J. Mulawski, Chelmsford, Mass., assignor to Sexton Can Company, Inc., Everett, Mass.

Filed Sep. 20, 1982, Ser. No. 419,665

Int. Cl.<sup>3</sup> F17B 1/14; B21D 51/26

U.S. Cl. 220—207

11 Claims



1. A pressure relief device for a container having a cylindrical

cal side wall which is closed at one end by an internally concave bottom wall, said device comprising:

an externally protruding first cup formed as an impression in said bottom wall, said first cup having a first circular wall joined at one end to said bottom wall and closed at the opposite end by a first base portion;

a tab member in said first base portion, said tab member being partially circumscribed by a line of reduced material thickness, said first base portion being adapted to separate along said line in response to an overpressurization of the contents of said container, thus freeing said tab member for outward deflection to provide an outlet through which said contents may escape; and

a second element having a second circular wall forcibly received within the first circular wall of said first cup, said second circular wall being dimensioned to coact with said first circular wall to radially stress said first base portion in tension.

8. For use with a container having an internally concave closure wall, a pressure relief device comprising:

an externally protruding impression in said closure wall, said impression having a single weakened line of reduced material thickness partially circumscribing a tab member, said line being adapted to rupture in response to overpressurization of the contents of said container, thus permitting said tab member to deflect outwardly and to create an opening through which said overpressurized contents may be vented to the atmosphere, and

metering means forcibly seated in said impression for radially outwardly stressing said impression and for reducing the rate at which said contents are vented through said opening.

4,416,389

## RETAINED TAB EASY OPEN END (SMALL POUR HOLE)

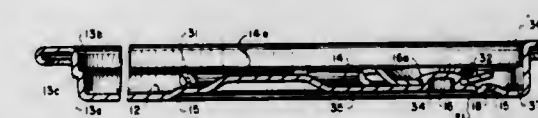
Harlen E. Wilkinson, Crystal Lake, and Fred W. Wren, Addison, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 26, 1982, Ser. No. 436,858

Int. Cl.<sup>3</sup> B65D 41/32

U.S. Cl. 220—269

8 Claims



1. An easy open closure for a hollow cylindrical container body having at least one open end said closure comprising:

(a) a circular recessed central panel situated in a plane bounded by an outwardly stepped annular wall generally normal to said plane,

(b) a peripheral flange atop said wall extending radially outward for joining said closure to one open end of said container body;

(c) a raised portion of said recessed panel offset to one side thereof and extending from said wall to about the middle of said recessed panel and said raised portion is in a plane slightly above the plane of said recessed central panel;

(d) an integral rivet formed within said raised portion;

(e) a displaceable panel in said raised portion disposed about said rivet and substantially defined by scoring;

(f) a ring pull tab having a tab nose and a tab lift with a central web therebetween and wherein said tab web is apertured to be joined to said displaceable panel by means of said rivet and said ring pull tab staked by said integral rivet with said tab nose near said wall and said tab lift near said middle, and

(g) an unstepped portion of said wall in the area adjacent said tab nose.



4,416,390

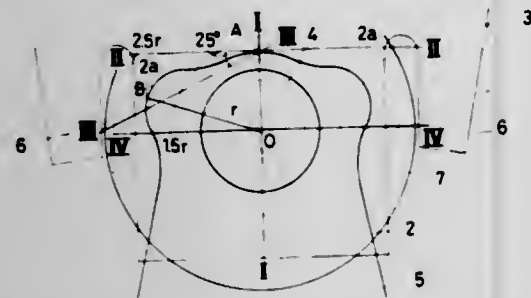
**CLOSURE ARRANGEMENT FOR EASY OPEN TYPE CONTAINER**

Minoru Takeda; Toshimi Nitta, and Hitoshi Saito, all of Iwatsuki, Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan  
Filed Jul. 27, 1982, Ser. No. 402,334

Claims priority, application Japan, Jul. 29, 1981, 56-117671  
Int. Cl.<sup>3</sup> B65D 17/34

U.S. Cl. 220—273

7 Claims



1. A closure arrangement for an easy open type container comprising:

- a closure panel surface;
- a rivet formed to project integrally from the panel surface;
- a score line defining a tear opening portion including the rivet therein;
- a pulling tab secured, by staking, to the rivet and extending in a direction opposite to the tear opening portion;
- said pull tab including a front end portion serving as a fulcrum for the pulling tab on lifting a rear end portion of the pulling tab;
- said score line including a point lying on a longitudinal axis of the pulling tab passing through the center of the rivet, said point being a minimum distant point from the center of the rivet, and said score line extending from the minimum distant point to the right side and the left side to project outwardly between a first subsidiary line crossing at right angles to the longitudinal axis at the minimum distant point and a third subsidiary line passing through the center of the rivet and extending in parallel with the first subsidiary line to form a pair of swelling score line sections on both sides of the rivet.

4,416,391

**SEALS-CAPS FOR FUEL TANKS**

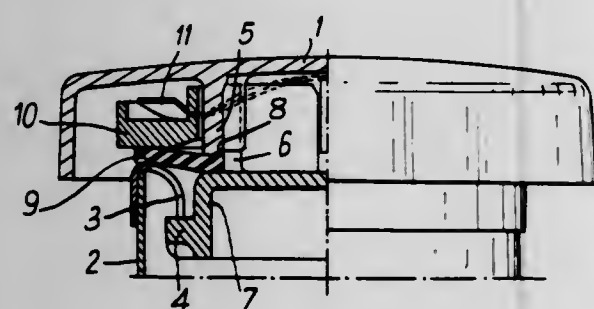
Jean-Michel Sarrazin, Sainte Luce sur Loire, France, assignor to Compagnie des Produits Industriels de l'Ouest, Nantes, France

Filed Aug. 13, 1982, Ser. No. 408,046

Claims priority, application France, Aug. 13, 1981, 81 15667  
Int. Cl.<sup>3</sup> B65D 53/00

U.S. Cl. 220—304

5 Claims



1. A seal-cap, particularly for fuel tanks, comprising a body having a cylindrical prolongation directed toward a spout of the fuel tank, an element formed thereon having radially extending wings which travel along a helicoidal gradient located inside said fuel spout, a seal gasket being welded between a shoulder of said element and the lower edge of said cylindrical

prolongation, a U-shaped ring being urged against said gasket by spring means which rest upon the inner side of said cap.

4,416,392

**DISPENSER FOR ADHESIVE COATED SHEET MATERIAL**

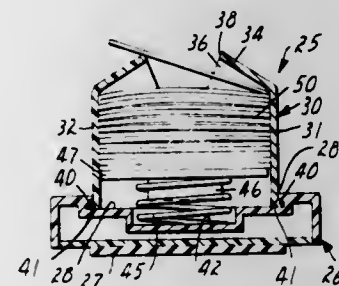
Daniel D. Smith, Cottage Grove, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1981, Ser. No. 235,842

Int. Cl.<sup>3</sup> B65H 1/00

U.S. Cl. 221—45

7 Claims



1. A dispenser comprising flexible sheet material stacked with each sheet adhered adhesively by a narrow band of readily releasable repositionable adhesive coated on the lower side along one edge thereof to the next adjacent sheet along alternately opposite edges of successive sheets, said stacked material being placed in a container comprising side walls joined by a top wall which top wall is divided to define two symmetrical portions by a dispensing opening extending transversely of the top wall in a direction parallel to said sidewalls, said opening being spaced from said sidewalls with said portions of the top wall covering the edges of said stack of adhesive coated sheets whereby, pulling an edge of one sheet, which edge is free of adhesive, will draw that sheet through the opening of the dispenser and the adhesive on the opposite edge of the sheet withdrawn will withdraw the adjacent adhesive free edge of the next successive sheet in the stack to pull said adjacent edge through the opening, then the dispensed sheet can be peeled from said next sheet in the stack leaving the free edge of the next sheet projecting through said dispensing opening.

4,416,393

**INFLATOR GUARD**

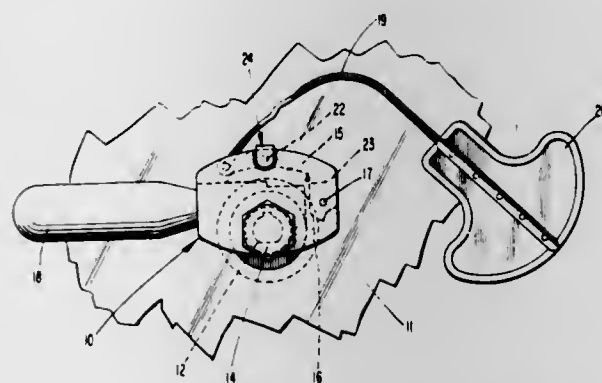
Harry L. Zimmerly, Largo, Fla., assignor to Halkey-Roberts Corporation, Paramus, N.J.

Filed Sep. 23, 1981, Ser. No. 305,038

Int. Cl.<sup>3</sup> B63C 9/24; B67B 7/24

U.S. Cl. 222—5

8 Claims



1. In combination, a manually operated inflator and a guard therefor to prevent the inadvertent operation of the inflator, the inflator having a body, means for mounting on the body a compressed gas containing capsule having a frangible seal, a piercing pin movable toward the seal to pierce it, means thus to

move the piercing pin, and a lever pivoted on the body to actuate the piercing pin when a part of the lever is swung outwardly from the body of the inflator, the guard being a generally U-shaped member having a broad main part and parallel legs extending therefrom, the guard being separate from both the body of the inflator and the lever, the broad main part of the guard overlying the retracted part of the lever which is swung out when the inflator is operated, and the legs of the guard forcible engaging opposite sides of the body of the inflator and thus holding the guard in place on the inflator.

4,416,394

**REGULATING APPARATUS FOR AUTOMATICALLY CONTROLLING THE PRODUCTION OF A COMMUNUTED MIXTURE HAVING PRESCRIBED COMPOSITION**

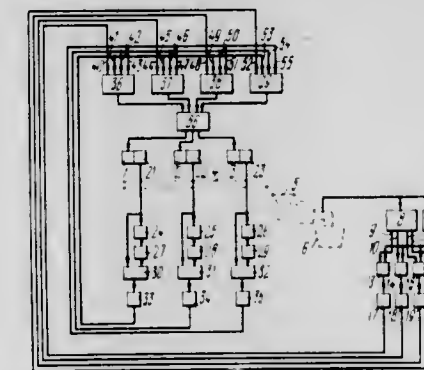
Yakov E. Gelfand; Marina L. Komova, both of Leningrad; Eduard G. Shtengel, Pushkin, and Leonid M. Yakovis, Leningrad, all of U.S.S.R., assignors to Vsesojuzny Nauchno-issledovatel'skiy i proektno-konstruktorskiy institut po avtomatizatsii predpriyatiy promyshlennosti stroitelnykh materialov, Leningrad, U.S.S.R.

Filed Aug. 20, 1981, Ser. No. 294,793

Int. Cl.<sup>3</sup> B67D 5/08

U.S. Cl. 222—55

1 Claim



1. A regulating apparatus for automatically controlling the production of a comminuted mixture out of big-sized starting materials by means of a comminution device, said comminuted mixture having a prescribed concentration of controlled components, said apparatus comprising:

- metering devices for dispensing said starting materials, each of said metering devices having a control input;
- a plurality of starting material flow meters equal in number to the number of said starting materials, said starting material flow meters being respectively responsive to the rates of flow of the starting materials metered by said metering devices;
- a comminuted mixture flow meter responsive to the rate of flow of the mixture leaving said comminution device;
- a composition determining means having a plurality of outputs equal in number to the number of said controlled components for developing at said outputs signals respectively proportional to the concentrations of said controlled components in the mixture leaving said comminution device;
- a plurality of multiplying devices equal in number to the number of said controlled components and each having a first input, a second input and an output, said first inputs of said multiplying devices being connected to said comminuted mixture flow meter and said second inputs of said multiplying devices being respectively connected to said outputs of said composition determining means;
- a first plurality of integrators equal in number to the number of said controlled components and each having an input and an output, said inputs of the integrators of said first plurality of integrators being respectively connected to said outputs of said multiplying devices;
- a plurality of circuits equal in number to the number of said starting materials and each including a delay unit and an aperiodic unit and having an input and an output, said

inputs of said circuits being respectively connected to said starting material flow meters;

- a plurality of subtraction devices equal in number to the number of said starting materials and each having a first input, a second input and an output, said first inputs of said subtraction devices being respectively connected to said starting material flow meters and said second inputs of said subtraction devices being respectively connected to said outputs of said circuits;
- a second plurality of integrators equal in number to the number of said starting materials and each having an input and an output, said inputs of the integrators of said second plurality of integrators being respectively connected to said outputs of said subtraction circuits;
- a plurality of adders equal in number to the number of said controlled components and each having a plurality of inputs equal in number to the number of said starting materials, an additional input, and an output, the inputs of said plurality of inputs of each of said adders being respectively connected to said outputs of the integrators of said second plurality of integrators and said additional inputs of said adders being respectively connected to said outputs of the integrators of said first plurality of integrators; and
- a control means for adjusting said metering devices and having a plurality of inputs equal in number to the number of said controlled components and a plurality of outputs equal in number to the number of said starting materials, said inputs of said control means being respectively connected to said outputs of said adders and said outputs of said control means being respectively connected to said control inputs of said metering devices.

4,416,395

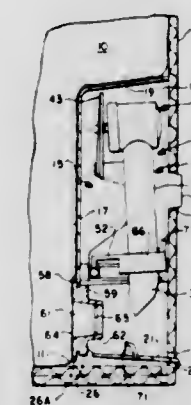
**BULK LIQUID CONTAINER, TAP AND TAP ASSEMBLY THEREFORE**

Rene J. M. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602  
Continuation-in-part of Ser. No. 146,762, May 5, 1980, Pat. No. 4,314,654, which is a continuation-in-part of Ser. No. 116,475, Jan. 9, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 305,922

Int. Cl.<sup>3</sup> B67B 7/26

U.S. Cl. 222—83

8 Claims



1. A tap assembly for dispensing liquid from a pouch having a dispensing fitting attached to one wall of the same, the fitting having a passage therethrough and an exterior annular portion extending from the wall of the pouch and terminating in an outer end, the fitting also having a sealing membrane serving to seal the passage, the tap assembly comprising a tubular body having an end portion adapted to be projected into the passage of the fitting to disrupt the membrane, a dispensing valve at the other end of the body, means forming a seal between the peripheral surface of said end portion of the body and the outer end of the fitting, and means for forming another seal between the outer end of said annular portion and the body, said last named means including an annular member surrounding and carried by said tubular body, said member being formed of



pliable material shaped to form a socket recess dimensioned to embrace the said outer end of the annular portion of the fitting and to establish a seal between the outer end of the fitting and the tubular body when said end portion is thrust into the fitting to establish the first named seal and then to rupture the diaphragm, and is thereafter further advanced into the fitting to position the outer end of the fitting within the recess and in sealing engagement with said annular member.

7. A tap construction for dispensing liquid from a liquid containing pouch, the pouch having a dispensing fitting secured to one wall of the same and having an opening through which liquid may flow, comprising an elongated tubular body having a flow passage through the same, a hollow valve body having one side of the same secured to one end of the tubular body and in communication with the passage, one end of the valve body, namely that end which is lower-most when the tap is in dispensing position, having a wall forming an annular valve seat, an annular valve member within the valve body and adapted to engage said seat, an operating stem extending through the valve body and having its lower end fixed to the valve member, means forming a closure for the upper end of the valve body, said closure means having an opening for accommodating the valve stem and formed to maintain a seal between the valve body and the valve stem, and operating means in the form of a strip for moving the stem and valve member from a lower closed position in which the valve member is in sealing engagement with the seat, to a position in which the valve member is raised from the seat to permit dispensing of liquid, the strip having two spaced slots, one slot being at an end of the strip, and the second slot located intermediate the ends of the strip and having a keyhole configuration, a member mounted on the tap body having a notch and dimensioned to be engaged by the slotted end of the strip to form a fulcrum attachment, the upper exterior end of the valve stem being dimensioned and formed to be engaged and retained within the second slot to form a fulcrum attachment.

8. A tap assembly for mounting on one wall of a carton which has an inner flexible liner capable of containing liquid to be dispensed, the assembly comprising an elongated housing having an open front, a back wall and spaced side walls, the front edges of the side and bottom walls having means for attaching the same to said one wall of said carton, the side walls being so formed and of such material that they can be sprung apart, a tap dimensioned to be accommodated in the housing, the tap comprising an elongated tubular body and an arm fixed to the body, the arm having two aligned pivot pins on an axis at right angles to the axis of the body, pivot openings in the side walls near the back wall, and on an axis extending laterally of the length of the housing and parallel to the back wall, parallel guide tracks formed on the inner faces of the side walls extending from the front edges of the side walls to said pivot openings, said tracks being formed to guide the pivot pins into said pivot openings when the pins are engaged in said tracks at the open front of the housing and then manually traversed to the inner ends of the tracks with outward springing of the side walls.

4,416,396

**PORTABLE FUEL AND OIL DISPENSING CONTAINER**

Jackson G. Ward, P.O. Box 241, Prairie Grove, Ark. 72753

Filed Feb. 10, 1981, Ser. No. 233,049

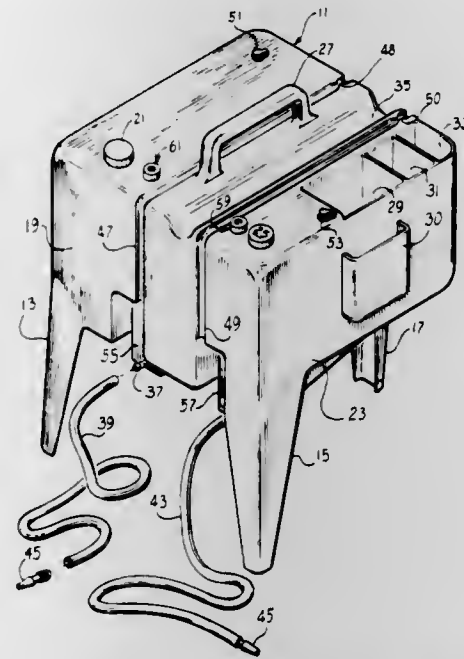
Int. Cl.<sup>3</sup> B67D 5/08

U.S. Cl. 222—129

13 Claims

1. A dual container and dispenser for two different liquids comprising  
a unitary dispenser body having first and second adjoining isolated compartments suitable for liquid containment,  
a conduit in communication with the interior of said first compartment near the bottom thereof,  
a hose connected to said conduit,  
a valve member including a normally closed liquid valve connected internally to said conduit to control liquid flow therethrough and a passage from the top exterior of said

liquid compartment to the portion of said conduit exterior to said valve,  
means including an external actuating member for opening said liquid valve upon manual operation of said actuating member, and



leg members for supporting said dispenser with the bottom of said compartments spaced above the surface on which said dispenser is placed.

4,416,397

**TAMPERPROOF METERING DISPENSER**

Frank E. Brown, 1741 Camino De Villas, Burbank, Calif. 91501

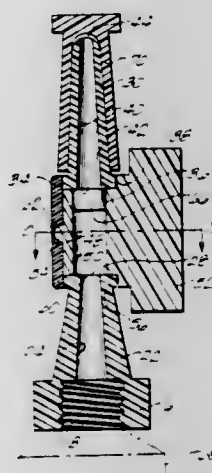
Continuation of Ser. No. 148,780, May 12, 1980, abandoned,

which is a continuation of Ser. No. 941,030, Sep. 11, 1978, abandoned. This application Jan. 12, 1981, Ser. No. 224,620

Int. Cl.<sup>3</sup> G01F 11/04

U.S. Cl. 222—219

11 Claims



10. A dispenser comprising:

a body having an inlet passage for receiving and containing material to be dispensed, an outlet passage for containing and dispensing a metered amount of the material, and a valve seat between the inlet and outlet passages, the valve seat having a first opening from the inlet passage and a second opening to the outlet passage;  
a rotatable valve member disposed in the valve seat, the valve member having a first passage extending through it and a second passage extending through it and intersecting the first passage; and  
a first piston in the first passage, and a second piston in the second passage, each piston being movable in its corresponding passage from relatively nearer the first opening

to relatively nearer the second opening when such passage is aligned with the inlet and outlet passages, each piston being sufficiently short in length to unblock passage across the intersection of the two passages, the length of each piston being greater than the width of the passage containing the other piston.

4,416,398

**VARIABLE SPRAY OVERCAP AEROSOL ASSEMBLY**

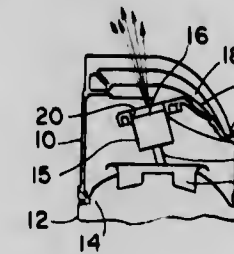
Michael G. Knickerbocker, McHenry, Ill., assignor to Seaquist Valve Co., Div. of Pittway Corp., Cary, Ill.

Continuation-in-part of Ser. No. 171,357, Jul. 23, 1980, Pat. No. 4,328,911. This application Feb. 11, 1982, Ser. No. 347,887

Int. Cl.<sup>3</sup> B65D 83/14, 55/12

U.S. Cl. 222—402.13

18 Claims



18. A plural rate aerosol assembly for use with an aerosol container having a valve for discharging an aerosol product at a first rate upon movement of the valve in a first direction and a second rate upon movement of the valve in a second direction, comprising in combination:

an actuator button having a terminal orifice;  
a valve stem connecting said actuator button with the valve for enabling discharge of the aerosol product from said terminal orifice upon movement of the valve;  
an overcap rotatably secured to the aerosol container for at least partially covering said actuator button;  
a finger actuator movably mounted relative to said overcap; and  
means established between said finger actuator and said actuator button for enabling said finger actuator to move the valve in the first direction upon a first rotational position of said overcap and for enabling said finger actuator to move the valve in the second direction upon a second rotational position of said overcap.

4,416,399

**AEROSOL CANISTER**

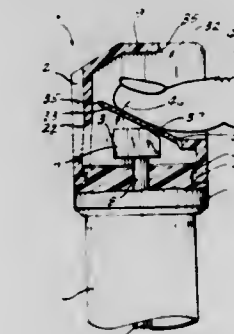
Erwin W. Parr, and Timothy B. Brandt, both of Des Moines, Iowa, assignors to Ziphron, Inc., Des Moines, Iowa

Filed Jun. 12, 1981, Ser. No. 272,908

Int. Cl.<sup>3</sup> B65D 83/14

U.S. Cl. 222—402.13

1 Claim



1. An actuator mechanism for an aerosol container of a type including a chamber for holding fluid under pressure, an outlet opening disposed in said container, and valve means attached to said container for controlling the flow of fluid from said outlet opening, said actuator mechanism comprising:

a cap having an outlet opening on one side thereof;  
means for attaching said cap to said container adjacent to said outlet opening;

actuation means for selectively causing fluid to be dispensed from said chamber and out through the outlet opening of said cap upon reciprocation of said actuation means with respect to said container, said actuation means including nozzle means for permitting fluid to be sprayed there-through, said nozzle means being aligned with the outlet opening in said cap, and stem means operatively attached to said nozzle means and to said valve means for communicating fluid from the container chamber, through said valve means and to said nozzle means when said valve means is open;

access means disposed in said cap for permitting manual reciprocation of said actuation means;

means for slideably connecting said cap to said actuation means for preventing said stem means from bending during actuation of said actuation means, said connecting means comprises means for forming a groove disposed in one of said actuation means and cap and a complementary projection means on the other of said actuation means and said cap for being disposed in said groove, said groove means and projection means being of such a relative size and shape to permit relative sliding movement thereof, a second groove means in one of the actuation means and cap and being disposed on the opposite side from the first said groove means, and a second projection means on the other of said actuation means and cap and being disposed in said second groove means for relative sliding movement of one with respect to the other of said second groove means and second projection means, and the first said groove means and the second groove means are disposed on opposite sides of said actuation means and the first said projection means and the second projection means are disposed on opposite interior sides of said cap, said access means being disposed to one side of said groove means and projection means, said access means further being disposed on the opposite side of said cap from said cap outlet opening and said connecting means being disposed generally between said cap outlet opening and said access means, said access means includes means on said cap for forming an access opening, flap means disposed in said opening, and being attached to said cap on at least two sides thereof for preventing accidental actuation of said actuation means and for permitting at least one of said attachments to said cap to be selectively forceably broken for permitting said flap to be pushed against said actuation means for spraying said fluid under pressure from said container, said flap means attachments include a relatively stronger hinge attachment at the bottom thereof and a relatively weaker frangible attachment at the top thereof, whereby the top of said flap means will pivot inwardly of said cap and downwardly onto said actuation means when said flap means is pushed for spraying of said fluid, and wherein said cap is closed at the top thereof to prevent accidental actuation of said actuation means; and  
means for automatically aligning the nozzle with the cap outlet opening, said aligning means comprising the first said complementary groove means being too small to receive the second projection means whereby the cap cannot be placed over the actuation means in a reverse fashion.

4,416,400

**ONE PIECE DISPENSER**

Frank E. Dougherty, Sr., Mays Landing, N.J., assignor to Dougherty Brothers Company, Buena, N.J.

Filed Oct. 24, 1978, Ser. No. 954,253

Int. Cl.<sup>3</sup> B65D 47/18

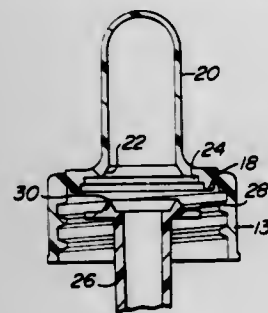
U.S. Cl. 222—420

7 Claims

1. A one piece dispenser comprising a circular cap having threads on a surface thereof to facilitate coupling of the cap to



a container, a flexible bulb integral in one piece at the open end thereof with a top wall of said cap, said bulb having a wall thickness of substantially less than the wall thickness of said top wall of said cap so as to be more flexible, a pipette coaxial with said cap and bulb, one end of said pipette having a flange welded to said top wall of said cap at a location radially inwardly of the periphery of said flange and adjacent the intersection of said top wall and said open end of said bulb, the inner



surface of said top wall of said cap having an annular recess within which is disposed said pipette flange, said top wall of said cap extending radially outwardly from the periphery of said flange, said inner surface of said top wall having a bead radially outwardly from said recess, said bead being adapted to contact the rim of a container when the cap is coupled to a container, said one end of said pipette being in open communication with said bulb, said cap, bulb and pipette being made from a polymeric plastic material.

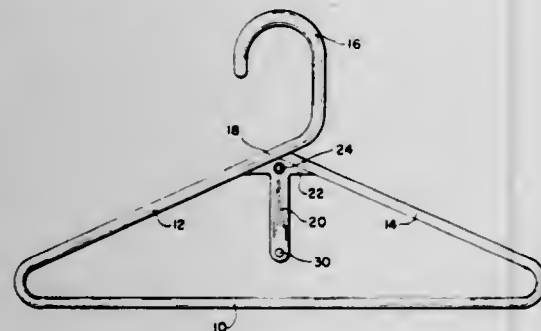
#### 4,416,401 CLOTHES HANGER

Richard J. King, c/o Reel King, Inc., 149 Hamilton St., Leominster, Mass. 01453

Filed Mar. 22, 1982, Ser. No. 360,399  
Int. Cl.<sup>3</sup> A47J 51/082, 51/097

U.S. Cl. 223—88

2 Claims



1. A one-piece molded clothes hanger of plastic material comprising a hook, a closed loop including a bottom generally straight bar and connected bars sloping upwardly from the ends of the straight bar to the hook, said bars having a degree of resilient flexibility so that the bottom straight bar may be flexed so that its center portion approaches the junction of the sloping bars and returns to original shape upon release of the force flexing the straight bar,

a thin flexible strap molded integral with the hanger and having an end at the junction of the sloping bars and depending therefrom, a hole at one end of the strap, a stud at the other end thereof, the stud having an enlarged head with a diameter greater than that of the hole so that the hole end of the strap is detachably connectible to the stud end making a loop, whereby said loop formed from said flexible strap is capable of receiving said straight bottom bar in flexed condition and holding said bottom bar flexed, or is capable of receiving the hook of another hanger.

#### 4,416,402 SPARE TIRE MOUNT FOR PICKUP TRUCK

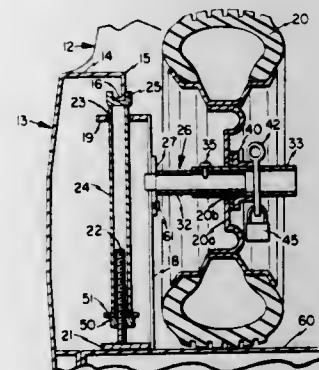
Lee M. Matthew, Frederick, Okla., assignor to James Elton Matthew, Burkburnett, Tex.

Filed Jan. 19, 1983, Ser. No. 459,277

Int. Cl.<sup>3</sup> B60R 9/02

U.S. Cl. 224—42.24

10 Claims



1. A spare tire mount for a pickup truck comprising:  
a main support structure comprising:  
a support member having an upper and lower plate affixed at either end thereof, said upper plate having an opening therethrough;  
a threaded member affixed to the upper side of said lower plate and extending upward therefrom;  
a follower assembly threadly positioned on said threaded member;  
an elongated latching element slidably positioned through said opening in said upper plate, said latching element having a lower end in contact with said follower assembly on said threaded member and an upper end adapted to engage the underside of upper sidewall portion of the load bed of a pickup truck when said spare tire mount is in an operable position; and  
tire securing means comprising:  
a carriage slidably mounted on said main support means; and  
tire mounting means affixed to said carriage adapted to receive a spare tire.

#### 4,416,403 CHILD CARRYING BACK PACK

Allan H. Johnson, Im Haeldele 52, 7634 Kippenheim, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,848

Claims priority, application Canada, Jun. 3, 1980, 353272

Int. Cl.<sup>3</sup> A45F 3/00

U.S. Cl. 224—161

5 Claims



1. A carrier adapted to be worn by an adult to secure in place a child seated upon the adult's shoulders, comprising: upper support means including: frame means having a pair of interconnected side frame members adapted to be laterally spaced in an upright orientation behind and projecting upwardly of the shoulders of the adult; flexible back restraint means at-

tached to said side frame members to define a retaining web which in use is spaced behind the head of the adult and supports the back and seat of the child; and front restraint means attached to each of said side frame members and adapted to secure the child against movement out of said carrier in the forwards direction; lower support means comprising a belt adapted to be strapped to the body and supported on the hips of the adult; a thrust support interconnecting the frame means to said belt said thrust support being formed by downwardly extended lower ends of said side frame members; said retaining web having a bottom portion from which extend a pair of laterally spaced length-adjustable shoulder straps adapted to extend over the front of the adult's shoulders and be attached to said lower support means; and a pair of transverse frame members interconnecting said side frame members at spaced locations in their length, the opposite ends of said transverse frame members being pivotally interconnected to the respective side frame members to form a parallelogram linkage which is movable between an extended condition wherein the side frame members are spaced apart and a collapsed condition wherein the side frame members lie adjacent each other.

#### 4,416,404 BELT TYPE GARMENT FOR CARRYING TENNIS BALLS AND THE LIKE

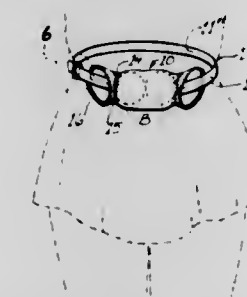
Fitz A. S. C. Daniels, 6060 Duke St., Alexandria, Va. 22304

Filed Jan. 26, 1983, Ser. No. 461,227

Int. Cl.<sup>3</sup> B65D 85/00

U.S. Cl. 224—224

8 Claims



1. A belt type garment for carrying tennis balls and the like comprising:  
an elongate, longitudinally extending belt portion having front and rear surfaces and on one extremity thereof means thereon for removably fastening said belt portion around the waist of the wearer with said rear surface facing the wearer and said front surface facing away from the wearer; and  
a tubular section for carrying at least one of the balls having its longitudinal joinder secured by means to the rear surface of the belt portion such that the belt portion passes through the tubular section longitudinally at the inner circumference having an opposite extremities of the tubular section, symmetrical orifices having throats constricted transversely to the tubular axis by elongate elastic strips of less longitudinal length than the circumference of said tubular section which are by means secured to the inner circumference at each throat in the stretched condition such that when the elastic is relaxed, a plurality of successive gathers extends circumferentially at each throat forming between them a storage compartment and adjacently on each extremity of said tubular section infundibuliform orifices, with forward facing semi-elliptical perimeters;  
whereby said elastically constricted throats allow for ease of insertion and removal of the ball while at the same time providing a secure compartment for containing the ball.

#### 4,416,405 CAMERA BODY TIE DOWN AND QUICK RELEASE DEVICE

Jerome P. Callouet, 213 Myrtle Grove Dr., Donaldsonville, La. 70346

Filed Jul. 19, 1982, Ser. No. 399,893

Int. Cl.<sup>3</sup> A45F 5/00

U.S. Cl. 224—257

6 Claims



1. For use with a camera having an around the neck support strap connected to rings at each end of the camera; a camera tie down/quick release strap adapted to hold the camera against the chest of the wearer in a carrying position and permitting quick selective eye level positioning of the camera in a shooting position without detaching the camera from being secured to the body, comprising:

- a U-shaped strap means having camera attaching means at each of its ends and being adapted to pass over and beneath the camera without interfering with or blocking the camera lens opening;
- a body tie down quick release strap carried by the loop portion of said U-shaped strap foldable back upon itself, and
- means for attaching and releasing the foldable back upon itself portion of the quick release strap for providing the quick release and the body tie down.

#### 4,416,406 VEHICLE LUGGAGE CARRIER

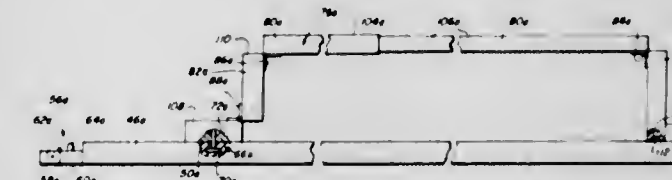
Harry V. Popeney, 18136-45 Oxnard St., Tarzana, Calif. 91356

Filed Dec. 10, 1981, Ser. No. 329,289

Int. Cl.<sup>3</sup> B60R 9/04

U.S. Cl. 224—314

8 Claims



1. In a vehicle having a luggage supporting surface and a luggage carrier means connected thereto, the improvement which comprises a luggage rack assembly comprising, in combination:

- a spaced parallel pair of longitudinally extending raised side rails slideably disposed in parallel rail tracks secured to said luggage supporting surface; and,
- a spaced parallel pair of longitudinally extending sub-assemblies disposed between said side rails, each said sub assembly comprising, in combination,
  - i. an elongated rack track,
  - ii. an elongated luggage retainer keyed to said rack track having a portion thereof moveable between a collapsed flat storage position generally parallel to said rack track and on operative raised luggage engirdling position spaced above said rack track.



4,416,407

**DISPENSING OF FASTENERS WITH A PIVOTED AND  
DISENGAGEABLE FEED MECHANISM**

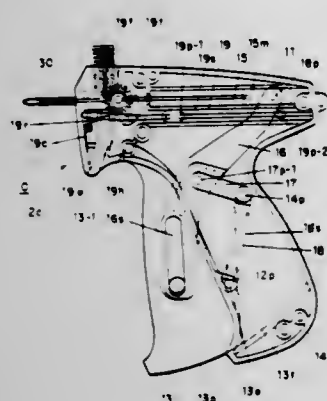
Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 2, 1981, Ser. No. 317,218

Int. Cl.<sup>3</sup> B25C 5/11

U.S. Cl. 227—67

17 Claims



1. Apparatus for dispensing fasteners comprising a device for receiving an assemblage of fasteners; means for feeding the fasteners received by said device; and a pivoting linkage having two separate pivot points at opposite ends of said link for controlling the feeding means;

wherein the feeding means includes a reciprocal slide and a feed pawl pivotally connected to respective opposite ends of said link at said separate pivot points;

said slide includes spaced apart projections which are successively engaged during the feeding of said fasteners; and said projections are engaged by a lever which is operated by a trigger of said device.

4,416,408

**SOLDER REMOVING DEVICE**

Ernst Spigir, P.O. Box 160, CH-8640 Rapperswil, Switzerland

Filed May 22, 1981, Ser. No. 266,324

Int. Cl.<sup>3</sup> B23K 1/00

U.S. Cl. 228—19

7 Claims



1. A solder removing device, comprising
  - (a) an open-mesh structure including at least one strand and being formed by knitting, weaving, stranding, braiding or crocheting;
  - (b) adjacent sections of said strand being in non-contiguous relation thereby defining open spaces for absorbing molten solder;
  - (c) at least the surface portion of said strand being metallic and receptive to solder flux;
  - (d) said surface portion being coated with solder flux to render it more capable of wetting with molten solder.

4,416,409

**METHOD FOR MANUFACTURING A METAL CASING  
FOR GATE VALVES USED IN NUCLEAR REACTORS  
AND THE LIKE**

Erwin Müller, Herdecke; Bernd Kollmann, Witten-Stockum; Ferdinand Sonnabend, Dortmund; Gert Petzolt, Nordkirchen; Josef Balz, Castrop-Rauxel; Bernhard Walloschek, Witten-Stockum, and Friedrich Risse, Bochum-Querenburg, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Division of Ser. No. 87,950, Oct. 25, 1979, Pat. No. 4,319,736

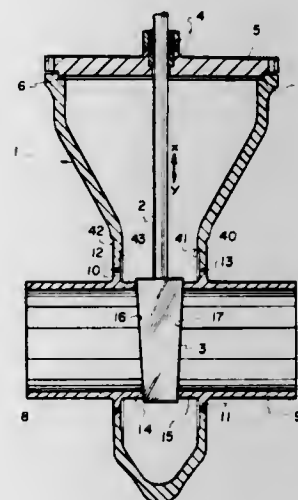
This application Nov. 6, 1980, Ser. No. 204,545

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847579

Int. Cl.<sup>3</sup> B23K 28/02

U.S. Cl. 228—173 R

1 Claim



1. A method of manufacturing a forged metal casing for accessories which can be employed in installations requiring high safety measures and which must be tested with a testing device and using a die, comprising the steps of introducing a bloom into the die and using a mandrel to hot-work the bloom so as to form it into a tubular body having open end and a closed opposite end, inserting a tool having both a rectangular cross-sectional portion and a cylindrical cross-sectional portion into the tubular body, and hot-working the tubular body so as to deform it at at least two diametrically opposed sides thereof to form interior planar surfaces of the planar wall portions thereof with the cylindrical portion of the tool bearing against the cylindrical portion of the tubular body at a location spaced from said planar wall portions, forming a port in at least one of the wall portions having a diameter less than that of the width of the at least one wall portion to leave a planar approach area therearound, and connecting a pipe connection to the port with a welding seam in a manner so that the test device can be used to test the welded seam and the boundary between the welded seam and at least one wall portion.

4,416,410

**SANDPAPER ROLL DISPENSER**

Ronald S. Herrmann, 3353 Polk St., N.E., Minneapolis, Minn. 55418

Filed Jun. 3, 1982, Ser. No. 384,474

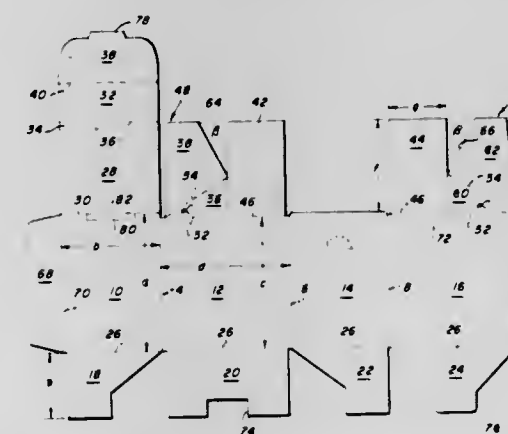
Int. Cl.<sup>3</sup> B65D 5/08, 5/54

U.S. Cl. 229—38

10 Claims

1. A paperboard blank for forming a dispenser for rolls of sandpaper or the like, comprising
  - (a) a rectangular blank (2), containing first (4), second (6), and third (8) spaced vertical fold lines for defining rear (10), first side (12), front (14), and second side (16) walls, respectively;
  - (b) rear (18), first side (20), front (22), and second side (24) wall bottom flaps connected by horizontal fourth fold lines (26) with the lower edges of said rear, first side, front and second side walls, respectively;

- (c) a rectangular rear wall top flap (28) connected at its lower edge by a horizontal fifth fold line (30) with the upper edge of said rear wall;
- (d) a rectangular rear wall top locking member (32);
- (e) horizontal sixth fold means (36) connecting said rear wall top locking member with the upper edge of said rear wall top flap;
- (f) a rear wall top locking flap (38) connected by a horizontal seventh fold line (40) with the upper edge of said rear wall top locking member;
- (g) first (42) and second (44) rectangular side wall top flaps connected by horizontal eighth fold lines (46) with the upper edges of said first and second side walls, respectively, each of said first and second side wall top flaps having a width (g) that is less than the associated side wall, said side wall top flaps being adjacent the fold lines defining said front wall, respectively, whereby said first and second side wall top flaps are spaced from the vertical edges of said side walls remote from said front wall, respectively; and
- (h) first (48) and second (50) side wall top members connected by horizontal ninth fold lines (52) with the upper edges of said first and second side walls adjacent the vertical edges of said side walls remote from said front wall, respectively, each of said side wall top members containing angularly arranged tenth fold lines (54) each extending from the corresponding vertical edge of said side walls remote from said front wall at an acute angle (α)



relative to the top edge of the associated side wall, thereby to define in each side wall top member a triangular first portion (56, 60) connected with the associated side wall and a second portion (58, 62), the generally, vertical edge of said second portion adjacent the associated side wall top flap being relieved and angularly arranged at an acute angle (β) relative to the adjacent vertical edge of the associated side wall top flap,

whereby when said rear, first side, front, and second side walls are folded inwardly about said first, second, and third fold lines to form a hollow tube having a rectangular cross-sectional configuration, when said first side, rear, front, and second side wall bottom flaps are folded upwardly about said fourth fold lines to positions normal to their associated walls, when said first and second side wall top flaps are folded downwardly about said eighth fold lines to positions normal to their associated walls, when said first and second side wall top members are folded downwardly about said ninth fold lines to positions normal to their associated walls, when said rear wall top flap is folded downwardly about said fifth fold line to a position normal to said rear wall, and when said rear wall top locking flap is folded downwardly about said seventh fold line to a position normal to said rear wall top flap, the dispenser is in a closed shipping condition; and when said rear, first side, front, and second side walls are folded inwardly about said first, second and third fold lines to form a hollow tube having a rectangular cross-sectional configuration, when said first side, rear, front, and second side wall bottom flaps are folded upwardly about said

fourth fold lines to positions normal to their associated walls, when said second portions of each of said first and second side wall top members are folded downwardly about said tenth fold lines, respectively, when said rear wall top flap is folded downwardly about said fifth fold line to a position in contiguous relation with said first and second side wall top member second portions, and when said rear wall top locking member is folded downwardly about said sixth fold means to a position parallel to and spaced from said rear wall top flap with said first and second side wall top member second portions arranged therebetween, the dispenser is in its dispensing condition.

4,416,411

**SLEEVE-TYPE CARTON FOR TAPERED ARTICLES**

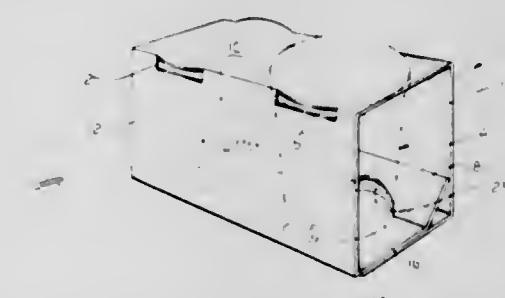
John D. Desmond, Philadelphia, Pa., and B. Mesquida-Felner, Forest Hills, N.Y., assignors to Container Corporation of America, Chicago, Ill.

Filed Jun. 10, 1982, Ser. No. 387,018

Int. Cl.<sup>3</sup> B65D 5/02, 65/10, 75/06

U.S. Cl. 229—40

1 Claim



1. A sleeve-type carton, for enclosing at least two articles which are tapered throughout substantially their entire height, said carton being formed of a unitary blank of foldable sheet material, such as paperboard, and comprising:

- (a) pairs of opposed top and bottom and side walls foldably interconnected to form a rectangular, tubular structure open at the ends;
- (b) said side walls being parallel to each other throughout their height and having, adjacent the upper edges thereof, openings for receiving the upper portions of said packaged articles and preventing the movement thereof within said structure;
- (c) said bottom wall being joined to said side walls at corners which are uninterrupted throughout their length;
- (d) said bottom wall including:
  - (i) tabs projecting upwardly therefrom for engagement with a lower portion of said articles to prevent the movement of said articles toward a side wall of said structure;
  - (ii) an internal panel sloping upwardly toward an adjacent side wall and presenting an opening for receiving lower portions of said article and preventing the movement of said articles toward an end of said structure.

4,416,412

**COLLAPSIBLE CARTON WITH INTERIOR PARTITIONS**

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Filed Jul. 12, 1982, Ser. No. 397,660

Int. Cl.<sup>3</sup> B65D 5/36, 5/48

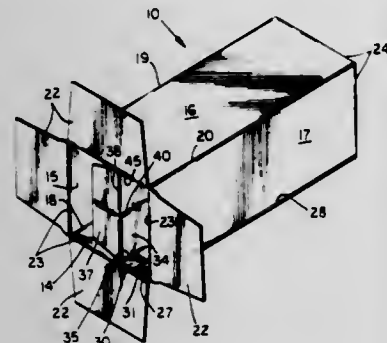
U.S. Cl. 229—41 R

11 Claims

1. A carton formed from a flat blank of paperboard or the like, comprising:
  - foldably interconnected side panels defining a carton chamber having an open end;
  - partition panel means extending across said chamber and foldably connected to two glue panels affixed to opposing side panels of said carton, said partition panel means being located adjacent to said open end of said carton chamber;



fold-away panel means defined in one of said glue panels, said fold-away panel means being foldably connected to said partition panel means and foldable away from the remainder of said glue panel to permit said partition panel means to collapse from an erect position blocking said open end of said carton chamber to a collapsed position

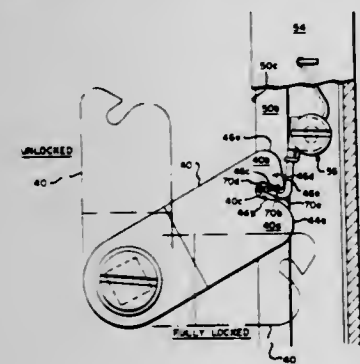


opening said carton chamber for the insertion of an article; and  
locking flap means foldably connected to said partition panel means and extending outwardly therefrom, whereby said partition panel means is prevented from collapsing when said locking flap means is folded substantially perpendicular thereto.

4,416,413

## POST OFFICE LOCKER

Richard J. Chester, Kennedy, N.Y., assignor to American Locker Security Systems, Inc., Jamestown, N.Y.  
Filed Oct. 28, 1981, Ser. No. 315,635  
Int. Cl.<sup>3</sup> B65D 91/00; E05B 65/06, 11/00  
U.S. Cl. 232—24 10 Claims



1. A post office locker permitting delivery and safe storage until pick up of both letters and packages to tenants of a multiple tenant building or the like, which comprises in combination:

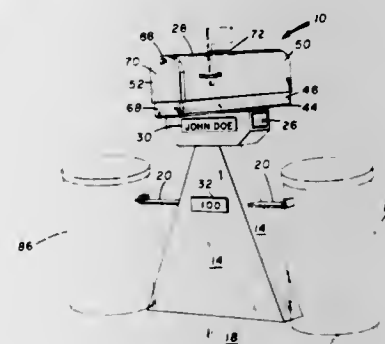
- a plurality of letter boxes assigned one to each of said tenants and accessible only to the tenant to which it is assigned and to a mailman charged with the delivery of mail to said building;
- at least one package storage cabinet sized to receive packages too large to be accommodated within said letter boxes and accessible only to a given tenant to which a package is to be delivered and to said mailman, said cabinet having a door and an access lock movable between door fully locked and unlocked conditions for permitting opening of said door to afford access to said cabinet by means of an access key made available by said mailman to said given tenant by placement of said access key in the letter box of said given tenant, said access lock permitting said access key to be inserted into and/or removed therefrom only when said access lock is in said door fully locked condition; and
- latch means for maintaining said access lock in an intermediate door locked condition when said door is returned to closed condition and said access lock is moved from said

door unlocked condition towards said door fully locked condition, and said latch means includes means under the control of said mailman for releasing said latch means to permit movement of said access lock from said intermediate door locked condition to said door fully locked condition.

4,416,414

## UTILITY YARD MARKER

Allen T. Edgerton, 135 Wilgate Rd., Owings Mills, Md. 21117  
Filed Jul. 22, 1982, Ser. No. 400,898  
Int. Cl.<sup>3</sup> B65D 91/00 9 Claims

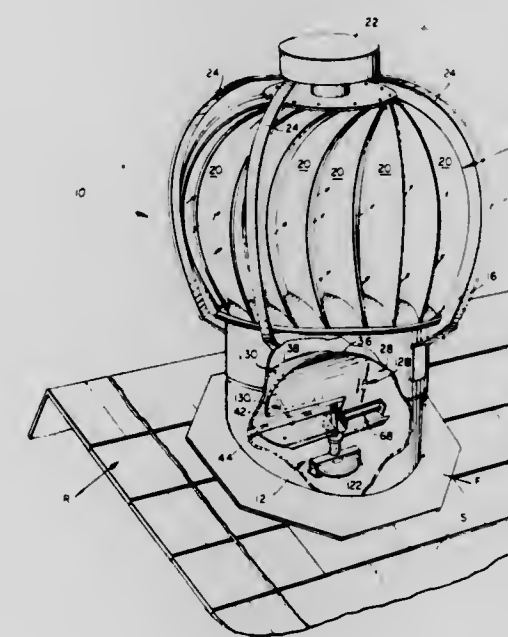


1. A marker device, having a utility for providing a plurality of functions, comprising:
  - a structural frame means;
  - a receiving compartment portion, said receiving compartment portion being located within said structural frame means and suitably affixed thereto at the upper end thereof, said receiving compartment portion being for receiving newspapers and other items and being a first utility component;
  - a covering means, said covering means being suitably affixed to the exterior of said structural frame means so as to enclose said structural frame means and said receiving compartment portion, said covering means having a suitable first aperture therein to provide access to said receiving compartment portion;
  - at least one securing means, said securing means being suitably affixed to said structural frame means and extending therefrom to the exterior of said covering means, a suitable second aperture being provided in said covering means for each securing means provided so as to project therethrough, said securing means being for the purpose of securing objects thereto and being a second utility component;
  - an internal storage area, said internal storage area being structurally formed by the permanently affixed enclosing covering means on said structural frame means and located therewithin, said internal storage area having a floor member therein, said internal storage area having a suitable third aperture provided in said covering means for access thereto, said internal storage area being for the storage of articles and being a third utility component;
  - identification means, said identification means being applied and affixed in position on the exterior of said covering means, said identification means being a fourth utility component;
  - a support plate means, said support plate means being suitably affixed to the topmost surface of said structural frame means; and
  - at least one expandable mail box means, said expandable mail box means being suitably affixed to said support plate means, said expandable mail box means being a fifth utility component.

4,416,415

## AUTOMATIC DAMPER ASSEMBLY

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Sur-off, Jericho, N.Y., a part interest  
Filed Oct. 20, 1981, Ser. No. 313,345  
Int. Cl.<sup>3</sup> F24F 7/06, 13/16  
U.S. Cl. 236—49 26 Claims



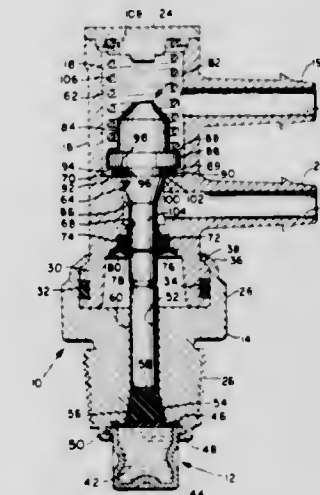
1. An automatic temperature and pressure responsive damper assembly for use within the conduit of a ventilating system designed to exhaust air from a defined space into the atmosphere comprising:
  - a. mounting means for mounting said damper assembly within said conduit;
  - b. at least one vane movably mounted on said mounting means, said vane being movable between an open position wherein said vane permits the passage of air through said conduit and a closed position wherein said vane precludes the passage of air through said conduit;
  - c. means for opening said vane when the temperature of the air in said defined space reaches a predetermined level, said opening means including:
    - i. camming means having a camming surface thereon secured to said vane and being carried by said mounting means;
    - ii. a temperature responsive drive assembly mounted to detect temperature changes of the air in said conduit, said drive assembly being adapted to actuate in response to the temperature changes within a predetermined range; and
    - iii. transmission means operably extending between said drive assembly and said camming surface of said camming means for communicating movement of said drive assembly to said camming means such that said vane is moved to varying positions in response to temperature changes of the air in said conduit; and
  - d. spring biasing means biasing said vane to said closed position and urging said camming means into contact with said transmission means, said biasing means opening said vane when there is a pressure differential of a predetermined magnitude between the end of said conduit in communication with said defined space and the end of said conduit in communication with said atmosphere, the pressure being greater at the end of said conduit in communication with said defined space.

4,416,416

## TWO-PORT THERMALLY RESPONSIVE VALVE

Edgar W. Maltby, Elgin, Ill., assignor to Eaton Corporation, Cleveland, Ohio  
Continuation of Ser. No. 235,179, Feb. 17, 1981, abandoned, which is a continuation of Ser. No. 93,704, Nov. 13, 1979, abandoned. This application Apr. 29, 1982, Ser. No. 373,187  
Int. Cl.<sup>3</sup> G05D 23/12 11 Claims

U.S. Cl. 236—86



1. A thermally responsive valve comprising:
  - housing means defining,
    - (i) first and second fluid ports,
    - (ii) a fluid chamber communicating with said ports,
    - (iii) tapered valve seat means, and
    - (iv) a seal engaging surface disposed within said fluid chamber intermediate said ports;
  - a valve member disposed within said housing for displacement between first and second positions for selectively establishing communication between said ports, said valve member defining,
    - (i) seal receiving means disposed within said fluid chamber,
    - (ii) a tapered valve surface engageable with said valve seat means when said valve member is in said first position to limit displacement thereof in one axial direction, and
    - (iii) a portion extending exteriorly of said fluid chamber;
  - a compliant seal carried with said valve member by said seal receiving means, and engageable with said seal engaging surface for limited axial compression of said seal when said valve member is in said first position, said seal being axially displaced from said seal engaging surface when said valve member is in said second position;
  - means biasing said valve member to said first position;
  - seal means disposed intermediate said exteriorly extending portion and said housing to effect continuous sealing engagement therebetween to fluidly isolate said fluid chamber; and
  - thermally responsive means engaging said exteriorly extending portion and operative to displace said valve member between said first and second positions in responsive to sensing predetermined temperatures,
  - said seal receiving means comprising an annular groove formed within said valve member, said groove defined by an upper transverse wall portion, a lower transverse wall portion, and a cylindrical surface portion connecting said upper and lower wall portions,
  - said compliant seal comprising a seal ring received in said annular groove and having a radial thickness substantially greater than the radial thickness of said lower transverse wall portion, and
  - said seal engaging surface including an annular shoulder extending inward radially beneath portions of said compliant seal ring such that in said first position, said compliant seal ring sealingly abuts thereagainst.



4,416,417

**STERILIZED STORAGE CONTAINER**

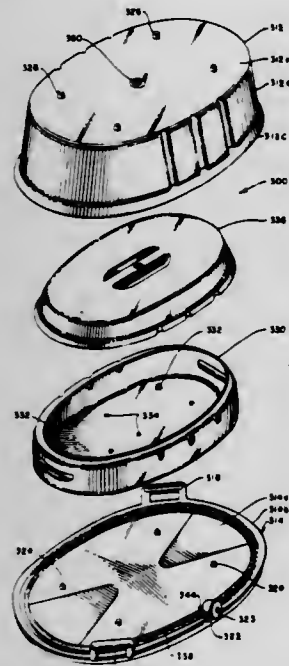
Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Whelchel, Newport Beach, Calif., assignors to Roger S. Sanderson, Dana Point, Calif.

Continuation of Ser. No. 172,421, Jul. 25, 1980, Pat. No. 4,374,570, which is a continuation-in-part of Ser. No. 895,239, Apr. 10, 1978, Pat. No. 4,247,517, which is a continuation-in-part of Ser. No. 821,042, Aug. 1, 1977, Pat. No. 4,251,482, which is a continuation-in-part of Ser. No. 734,228, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 703,044, Jul. 6, 1976, Pat. No. 4,196,166, which is a continuation-in-part of Ser. No. 640,824, Dec. 15, 1975, abandoned. This application Feb. 12, 1982, Ser. No. 348,353

Int. Cl.<sup>3</sup> G05D 27/00

U.S. Cl. 236—92 R

8 Claims



## 1. An article of manufacture comprising:

means defining an expandable chamber including wall means movable in response to gaseous pressure changes such that the chamber when closed will expand when the pressure within the chamber exceeds the pressure surrounding the chamber;

a valve in a wall of said chamber means which controls fluid flow into the otherwise closed chamber including temperature responsive means which is responsive to the temperature of the fluid flowing into the chamber to close said valve at a predetermined temperature to capture a quantity of the fluid in the chamber.

4,416,418

**FLUIDIZED BED RESIDENTIAL HEATING SYSTEM**

Stephen L. Goodstine, 691 Kennedy Rd., and Brian C. Jones, 258 Mountain Rd., both of Windsor, Conn. 06095

Filed Mar. 5, 1982, Ser. No. 354,151

Int. Cl.<sup>3</sup> F24H 1/22; F22B 1/00

U.S. Cl. 237—19

2 Claims

1. A fluidized bed combustion system for residential or industrial building heating comprising:

a combustor having a chamber, said combustor being uncooled and insulated so as to provide a substantially adiabatic combustion chamber;

a bed of highly abrasive inert refractory particles disposed within the combustion chamber;

means for supplying an ash bearing particulate fuel to the bed of highly abrasive inert refractory particles for combustion therein to generate hot flue gas;

an inlet air plenum disposed beneath the combustion chamber and connected to an air supply;

a flue for venting the flue gas generated in the combustor to the atmosphere;

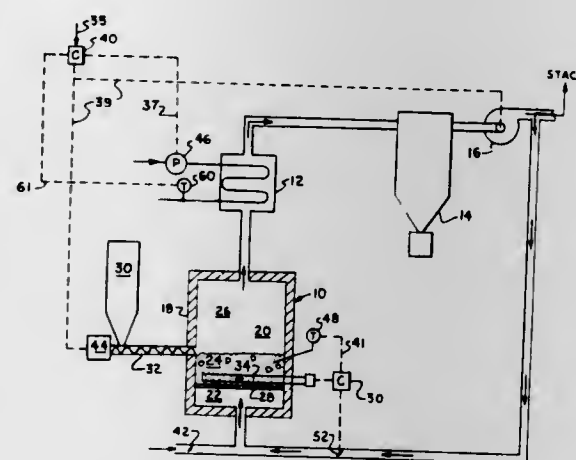
f. a heat exchanger disposed in the flue downstream with respect to gas flow of the combustor;

g. means for circulating a heat transfer fluid first through the heat exchanger in heat exchange relationship with the hot flue gas thereby cooling the flue gas and heating the heat exchange fluid and thence through the building to heat the building;

h. a particulate collector disposed in the flue downstream of the heat exchanger and for removing any ash particles entrained in the cooled flue gas;

i. a gas duct interconnecting the inlet air plenum with the flue at a location downstream of the particle collector;

j. an induced draft fan disposed in the flue at a location downstream of the connection of the gas duct to the flue for drawing the flue gas through the flue and causing a portion of the flue gas to flow to the inlet air plenum and be drawn



upwardly therefrom with air through the combustion chamber to fluidize the inert particles and the ash bearing particulate fuel therein;

k. damper means disposed within the gas duct and selectively positionable therein for regulating the flow of recirculated flue gas to the inlet air plenum;

l. means for positioning said damper means within the gas duct so as to regulate the flow of recirculated flue gas so as to maintain the temperature of the particulate bed below the ash softening temperature of the ash bearing particulate fuel; and

m. an electric heating means disposed within the combustion chamber of the combustor and immersed within the particulate bed therein for maintaining the temperature of the bed above the ignition point temperature of the ash bearing particulate fuel during periods in which fuel is not being supplied to the combustor.

4,416,419

**RAILWAY BED**

Ietatsu Ohno, 1-2, 1-chome, Kasuya, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 71,718, Aug. 31, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,673

Claims priority, application Japan, Aug. 31, 1978, 53-106511; Feb. 15, 1979, 54-16503

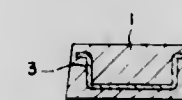
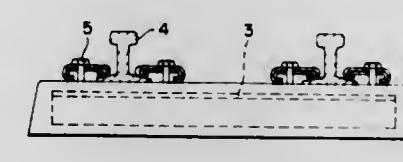
Int. Cl.<sup>3</sup> E01B 3/46

U.S. Cl. 238—89

1 Claim

1. A railway bed adapted for reducing vibration pollution comprising an elastic member of a material from the class consisting of hard rubber and synthetic resins forming a tie extending longitudinally between and beyond the rails and located between the rails and ground surface, wherein a pair of rails is fitted on said elastic member, a single U-shaped reinforcing steel rigid member integrally molded in the lengthwise direction fully within said elastic member and separated thereby from metallic contact with the rails, said single member having a length to extend between and beyond the rails, thereby to reduce the vibrations of rail cars by shock absorption by the interacting combination of rails, the elastic member,

the rigidity of the rigid member and rail fastening means, said rail fastening means comprising a bolt or the like for mounting



the rails directly on the elastic material embedded in said elastic material to extend between the open arms of the U-shaped member and toward the bottom thereof.

4,416,420

**PORTABLE FOUNTAIN FOR POOLS OR SPAS**

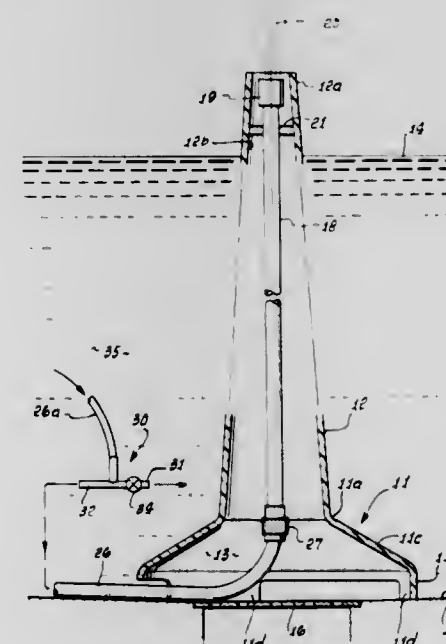
Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Ray, Calif. 90271

Filed Mar. 1, 1982, Ser. No. 353,370

Int. Cl.<sup>3</sup> B05B 17/08

U.S. Cl. 239—22

8 Claims



1. In a pool or spa portable fountain and in combination with the pool or spa, the combination comprising

(a) a pedestal and an upright tube supported by the pedestal, the pedestal adapted to be adjustably positioned on the bottom of the pool or spa so that the top portion of the tube projects above water surface level,

(b) a duct supported to extend upwardly within the tube, and a discharge head at the terminal of the duct to discharge water under pressure to form a fountain spray pattern,

(c) and a hose extending from a lower portion of the duct and via the interior of the pedestal to the exterior thereof, to receive a pressurized stream of water for delivery to the duct,

(d) the duct being relatively rigid and vertically elongated within the tube, and the hose being flexible and having connection with the lower terminal of the duct,

(e) the pedestal having generally bell shaped, hollow configuration, and the tube tapering upwardly from the pedestal, the pedestal and tube having one-piece, integral molded plastic construction, the bell shaped pedestal forming

multiple support legs, the hose projecting between leg extents,

(f) and a flow divider including a tee connected with said hose, the divider having a discharge to the pool or spa, whereby part of the water supplied to the divider flows to the pool, and the remainder of the water supplied to the divider flows to the fountain via said hose, said divider including an adjustable control valve connected with said tee to adjust the flow of water to the pool to thereby increase or decrease the flow to the fountain,

(g) the pedestal located over a drain in said bottom of the pool or spa, the pedestal opening downwardly.

4,416,421

**HIGHLY CONCENTRATED SUPERSONIC LIQUIFIED MATERIAL FLAME SPRAY METHOD AND APPARATUS**

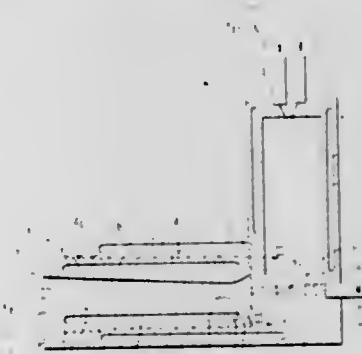
James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Continuation-in-part of Ser. No. 196,723, Oct. 6, 1980, abandoned. This application Jul. 28, 1981, Ser. No. 287,652

Int. Cl.<sup>3</sup> B05B 7/20

U.S. Cl. 239—79

17 Claims



1. In a flame spray method comprising the steps of: continuously combusting, under pressure, a continuous flow of an oxy-fuel mixture confined within an essentially closed internal burner combustion chamber, discharging the hot combustion product gases from the combustion chamber through a flow expansion nozzle as a high velocity hot gas stream, and feeding material to said stream for high temperature heat softening or liquefaction and spraying at high velocity onto a surface positioned in the path of the stream at the discharge end of the nozzle,

the improvement wherein the step of feeding said material comprises introducing said material in solid form outside of said combustion chamber and axially into a converging flow of hot combustion product gases after exit from the combustion chamber while entering a converging portion of the flow expansion nozzle having a nozzle bore of a length that is at least five times that of the nozzle bore throat, to restrict the diameter of the column of particles passing through the nozzle bore, to prevent build-up of particle material on the nozzle bore wall while insuring sufficient particle dwell time within the bore to effect particle heat softening or melting and flow at supersonic flow velocity prior to impact against said surface.

4,416,422

**STEPLESSLY ADJUSTABLE DEVICE FOR INJECTING BLACK LIQUOR INTO A SODA DIGESTER**

Valentin Tinnis, Espoo, Finland, assignor to Ekono Oy, Helsinki and A. Ahlstrom Osakeyhtio, Karhula, both of, Finland

Filed Jul. 1, 1981, Ser. No. 279,691

Int. Cl.<sup>3</sup> B05B 1/32

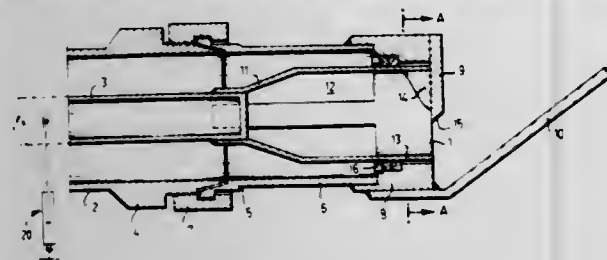
U.S. Cl. 239—455

6 Claims

1. A device for adjusting the flow quantity and drop size of black liquor to be injected into a soda digester, said device comprising a valve for adjusting a primary pressure of said



device, and an outflow opening the cross-sectional area of which is adjustable for adjusting the drop size, an outer pipe and inner pipe arranged coaxially rotatably inside said outer pipe and provided with openings for providing a flow connection between inner parts of said outer and inner pipes, the outer end of said outer pipe being provided with an end piece covering a part of the cross-sectional area of the outer end of said



outer pipe, which part is asymmetric as to the centre axis of said outer pipe, and the outer end of said inner pipe being provided with a nozzle piece covering a part of the cross-sectional area of the outer end of said inner pipe, which part is asymmetric as to the centre axis of said inner pipe, said outflow opening being formed by an opening which remains entirely free in the outer end of both pipes outside the areas covered by said end piece and said nozzle piece.

4,416,423

#### ELECTROMAGNETICALLY ACTUATABLE VALVE, IN PARTICULAR A FUEL INJECTION VALVE FOR FUEL INJECTION SYSTEMS

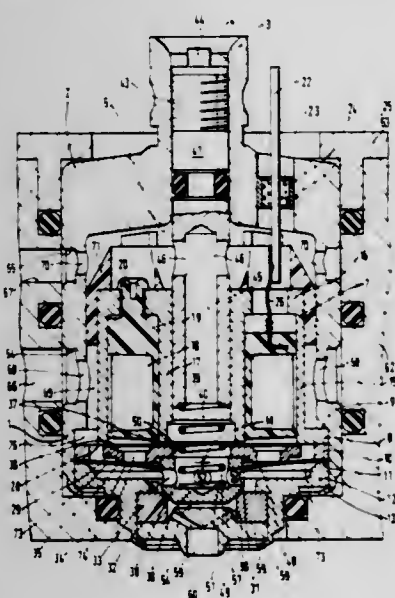
Rudolf Krauss, Stuttgart, and Udo Hafner, Lorch, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Sep. 30, 1981, Ser. No. 307,241

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046889

Int. Cl.<sup>3</sup> F02M 51/00

U.S. Cl. 239—585

23 Claims



1. An electromagnetically actuated fuel injection valve for fuel injection systems of internal combustion engines, comprising a valve housing including a wall, a magnetic coil mounted on a core having a predetermined length and constructed of ferromagnetic material and a movable armature firmly connected with a valve element arranged to cooperate with a fixed valve seat with said valve element guided by means of a guide diaphragm clamped to said housing at its outer circumference, characterized in that said guide diaphragm includes a central guide opening forming an inner edge surface through which said valve element extends toward said valve seat, said guide diaphragm inner edge surface being arranged to surround said valve element in contact therewith to provide an axial guidance while preventing radial movement for said valve element,

said guide diaphragm is spring tensioned on a concentric guide edge of said armature located on a side oriented toward said valve seat with said armature spaced from said guide diaphragm inner edge surface in contact with said valve element, said armature being relatively flat and oriented toward said valve seat, said guide diaphragm further arranged to guide said armature in a direction parallel to said valve seat and said core further having an end face extending radially outward of said flat armature and a compression spring for generating a closing force on said valve element.

4,416,424

#### METHOD AND APPARATUS FOR DEASHING COAL LIQUEFACTION EFFLUENTS

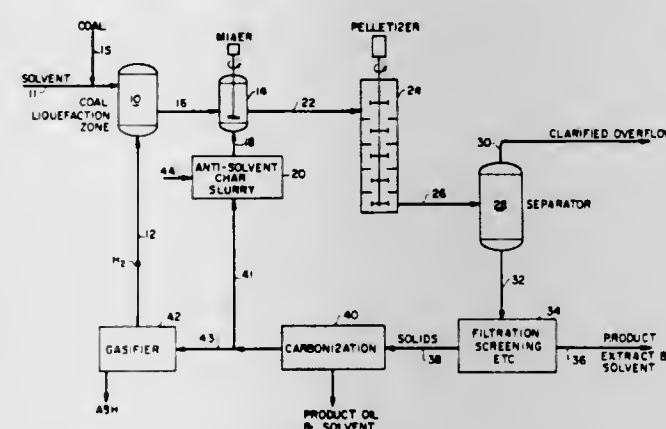
Francis P. Burke, Bethel Park, Pa., assignor to Conoco Inc., Wilmington, Del.

Division of Ser. No. 933,359, Aug. 14, 1978. This application Aug. 31, 1981, Ser. No. 297,686

Int. Cl.<sup>3</sup> B02C 19/00

U.S. Cl. 241—101 B

10 Claims



1. An apparatus for agglomerating and separating finely divided residual solids from liquid coal liquefaction product comprising:

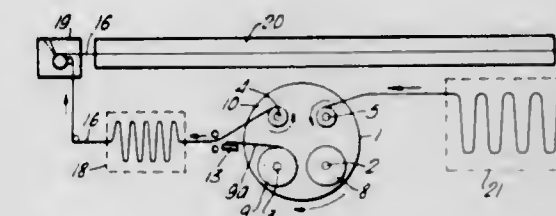
- (a) means for carbonizing a mixture of carbonaceous liquid and coal-derived solids at 450° to 525° C. (842° to 977° F.) to form carbonized solids, said carbonized solids being substantially larger than said residual solids,
- (b) means for grinding said carbonized solids to form ground carbonized solids in the 325×28 mesh size range,
- (c) means for providing a coal liquefaction product slurry,
- (d) means for providing a precipitating solvent,
- (e) means for adding ground carbonized solids consisting essentially of solids from step (b) and said precipitating solvent to said coal liquefaction product slurry, to form a separation mixture comprising (i) liquid coal liquefaction product (ii) liquid precipitating solvent (iii) residual solids, 95 percent of said residual solids being less than 10 micron in size and (iv) said added ground carbonized solids,
- (f) means for agitating said separation mixture in an agitation means to form readily screenable pellets each said pellet being from 1 to 10 mm in size and thus substantially larger than said added ground carbonized solids, each of said pellets comprising a portion of said residual solids and a portion of said ground carbonized solids, said agitation means comprising
  - (i) an agglomerating vessel having an axis, a first and a second end and an inlet and an outlet;
  - (ii) at least one agglomerating zone co-axially positioned in said vessel, said zone having an outer diameter equal to the outer diameter of said vessel and a first end and second end, each of said first and second ends having an opening centrally positioned therein for charging materials to said zone and recovering materials from said zone;
  - (iii) an agitator means positioned in each of said zones, said stirrer means comprising at least one paddle means rotatably positioned in said zone so that said paddle means is rotated about a central axis of said vessel with an outer

edge of said paddle means defining an outer agitator diameter as said paddle means is rotated and with an inner edge of said paddle means defining an inner agitator diameter as said paddle means is rotated; and

(iv) means for rotating said paddle means; said outer agitator diameter being equal to at least one-half the outer diameter of said zone, the length of said zone between said first and second ends being equal to at least one-half said outer agitator diameter, said paddle means having a width measured parallel to said axis of at least one-fifth of said outer agitator diameter and a length measured perpendicularly to said axis equal to at least half said width and said centrally positioned openings in said first and second ends having an outer diameter no greater than said inner agitator diameter,

(g) means for screening said pellets from said liquid coal liquefaction product whereby said liquid coal liquefaction product is separated from said residual solids, said residual solids comprising a portion of each of said pellets.

comprises placing a roll of web material on one mandrel of the turret, angularly displacing the turret to bring the roll of web material into a position from whence it can be unwound and passed into the web treatment section of the apparatus, unwinding the roll of web material and treating the first side of the web and rewinding the treated web on another mandrel of the turret, angularly displacing the turret to bring the roll into



a position from whence it can be unwound and passed into the web treatment section of the apparatus, unwinding the roll of web material and treating the second side of the web, rewinding the web on another mandrel of the turret and angularly displacing the turret to bring the treated roll of web materials into a position from whence it may be removed from the apparatus and removing the treated roll from the apparatus.

4,416,425

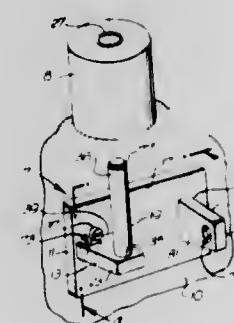
#### PAPER ROLL DISPENSER

Paul Kish, 15102 Kenosk Dr., Baldwin Park, Calif. 91706  
Filed Apr. 20, 1982, Ser. No. 370,086

Int. Cl.<sup>3</sup> B65H 19/00

U.S. Cl. 242—55.2

11 Claims



1. A paper roll dispenser comprising: bracket means adapted for attachment to a support surface; first and second support arms extending generally in parallel from said bracket means; a spindle extending from one end of said first support arm in a direction generally toward said second support arm and having a length sufficient to substantially span the distance between said support arms, said spindle being adapted for rotatably supporting a paper roll between said support arms, said first support arm being rotatably attached to said bracket means such that rotation of said first support arm moves said spindle between a first position spanning between said support arms and a second position swung clear of said second support arm; and a stop tab protruding from said bracket means adjacent to said first support arm, said first support arm having an inboard face which cooperates with said stop tab to limit rotation of said first support arm when said spindle is in said second position.

4,416,426

#### WEB TREATMENT APPARATUS

Ronald C. E. Cooper, Brentwood, England, assignor to Ciba-Gelby AG, Basel, Switzerland

Filed Jul. 23, 1981, Ser. No. 285,902

Claims priority, application United Kingdom, Jul. 31, 1980, 8025120

Int. Cl.<sup>3</sup> B65H 75/34, 19/04

U.S. Cl. 242—56.9

4 Claims

1. Method of treating a roll of web material by use of a web treatment apparatus which comprises a web treatment section and a rotatable turret having at least three driven mandrels on which rolls of web material may be located, which method

1. In a spinning reel for fishing including a housing provided at its upper part with an attaching member for attaching said housing to a fishing rod and carrying a rotary shaft having a handle; a rotor rotatably mounted on the front part of said housing and having a bail arm for retaining the fishing line, said rotor being adapted to be rotated in accordance with the rotation of said rotary shaft; and a spool provided at the front end of said rotor and adapted to make reciprocating motion in the axial direction in accordance with rotation of said rotary shaft, an improvement which comprises: a sleeve having a bent peripheral flange and formed at a front part of said housing so as to project into a recess formed in the rear part of said rotor; a braking disc fitted to a portion of said sleeve behind said sleeve and clamped by a frictioning braking member; a one-way engaging mechanism interposed between said braking disc and said rotor and adapted to disengage said braking disc from said rotor when said rotor is rotating in the forward direction and to make said braking disc and said rotor when said rotor is rotating in the backward direction; a leaf spring provided at the rear end of said frictioning braking member; and a manipulation rod mounted on said housing and extending in the axial direction of said spool, said manipulation rod being adapted to press said leaf spring.



# 4,416,428 FISHING REEL

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

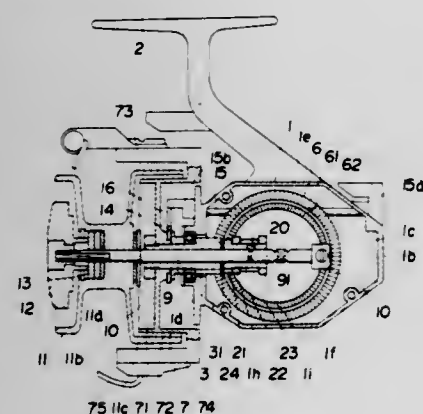
Filed Jan. 5, 1982, Ser. No. 337,126

Claims priority, application Japan, Jan. 19, 1981, 56-5470[U]; Jan. 19, 1981, 56-5471[U]

Int. Cl.<sup>3</sup> A01K 89/01

U.S. Cl. 242—84.21 R

6 Claims



1. A fishing reel comprising a reel body having a front wall and side walls, a rotary frame disposed in front of said front wall at said reel body, supported rotatably to said reel body, and having a tubular driven shaft, a spool disposed in front of the front wall at said reel body and having a spool shaft having at the outer periphery thereof a traverse groove, a handle supported to the side wall at said reel body, a transmission mechanism for transmitting rotation of said handle to said rotary frame, and a reciprocation mechanism for reciprocating said spool shaft longitudinally of said reel body, said transmission mechanism comprising a drive shaft having a master gear rotatable together with said handle and said driven shaft having a pinion engageable with said master gear, said master gear having at one side thereof a first annular toothed portion engageable with said pinion and a second annular toothed portion different in diameter than said first toothed portion, said reciprocation mechanism comprising said traverse groove provided at the outer periphery of said spool shaft, an association shaft having an association gear engageable with said second toothed portion at said master gear and being supported to said reel body only rotatably with respect to said spool shaft, and an engaging member supported to said association shaft and engageable with said traverse groove, so that said association shaft differs from said driven shaft in rotational speed, whereby the reciprocation of said spool caused by the rotation of said engaging member rotating together with said association shaft is not synchronized with respect to the rotation of said rotary frame.

# 4,416,429

## WATER SKI TOW ROPE REEL APPARATUS

Donald W. Jessamine, 2341 S. Del Rio, Apache Junction, Ariz. 85220

Filed Jun. 29, 1981, Ser. No. 278,177

Int. Cl.<sup>3</sup> B65H 75/34, 75/38, 75/40

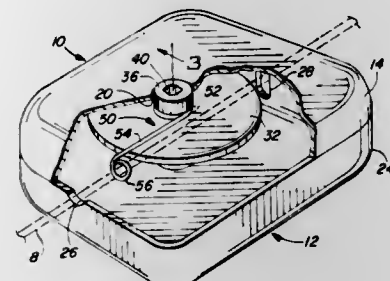
U.S. Cl. 242—86.5 A

5 Claims

1. Reel apparatus for a two rope, comprising, in combination:

- a rope;
- housing means movable on the rope;
- first aperture means in the housing means through which the rope extends;
- second aperture means in the housing means remote from the first aperture and defining a slot through which the rope extends;
- core means disposed within and secured to the housing means about which the rope is wound, including a core secured to the housing means, and a guide plate secured to the core;

winding means for winding the rope about the core means including a winding stem rotatable about the core means, an arm secured to the winding stem and movable therewith,



a loop secured to the arm through which the rope extends, and handle means for rotating the winding stem and the arm and the loop for winding the rope about the core means between the housing means and the guide plate.

# 4,416,430

## LOAD LOWERING DEVICE

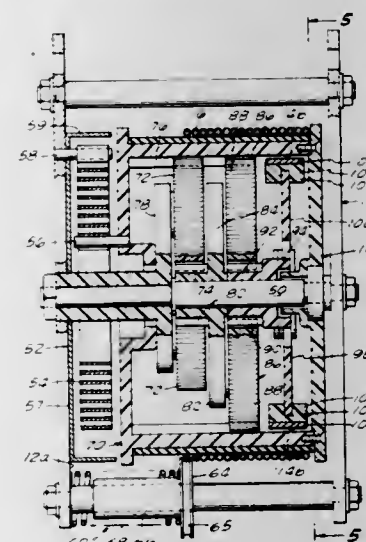
Roger Totten, Ventura, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Filed Feb. 1, 1982, Ser. No. 344,622

Int. Cl.<sup>3</sup> B65H 75/48

U.S. Cl. 242—107.3

10 Claims



1. A load lowering device, comprising:
- (a) a housing;
  - (b) interconnecting means for removably interconnecting said housing to a rigid support member;
  - (c) an axle extending transversely of said housing;
  - (d) a hollow drum mounted for rotation within said housing about said axle;
  - (e) a length of cable adapted to be uniformly wound about said drum upon rotation of said drum in a first direction and adapted to be paid out from said drum upon rotation of said drum in a second, opposite direction; said cable having an inner end disposed within said housing and having a free outer end;
  - (f) cable rewind means operably associated with said drum for yieldably resisting rotation of said drum in said second direction when said cable is paid out from said drum, said means being adapted to cause rotation of said drum in said first direction upon said cable being substantially paid out thereby causing said cable to be rewound upon said drum;
  - (g) guide means associated with said housing for guiding the travel of said cable with respect to said drum as said cable is rewound thereupon;
  - (h) braking means carried within said drum adapted to yieldably resist rotation of said drum in said second direction to

control the rate at which said cable is unwound from said drum, said braking means comprising:

- (1) an internally toothed, annular shaped gear ring affixed to the inner surface of said hollow drum;
  - (2) a first support disposed within said hollow drum and affixed to said axle;
  - (3) at least one first planet gear rotatably carried by said first support and being adapted to engage said gear ring and be driven thereby as said drum rotates;
  - (4) an externally toothed first sun wheel rotatably carried by said axle and adapted to engage and be rotatably driven by said first planet gear;
  - (5) a second support rotatably carried by said axle within said hollow drum and affixed to said sun wheel for rotation therewith;
  - (6) at least one second planet gear rotatably carried by said second support and being adapted to engage said ring gear and be driven thereby as said drum rotates;
  - (7) an externally toothed second sun wheel rotatably carried by said axle and adapted to engage and be rotatably driven by said second planet gear;
  - (8) a governor mechanism rotatably carried by said axle and operably associated with said second sun wheel; and
  - (9) braking elements associated with said governor mechanism for actuation thereby upon rotation of said drum to bring said elements into pressural engagement with a braking surface provided internally of said drum; and
- (i) load connecting means associated with said outer end of said cable for connecting said cable to the load to be lowered, said means including cushioning means for cushioning the impact forces imparted to said cable due to a limited free fall of the load with respect to the outer end of said cable subsequent to the interconnection of the load connecting means with the load.

adjacent ends of said rollers carried by said depending member forming the other side of said opening; whereby said guiding member insures the proper guiding of yarn for threading into said lateral threading passageway by positively positioning yarn beneath and requiring lifting of said adjacent ends of said rollers.

# 4,416,432

## CASSETTE BRAKING MECHANISM

Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

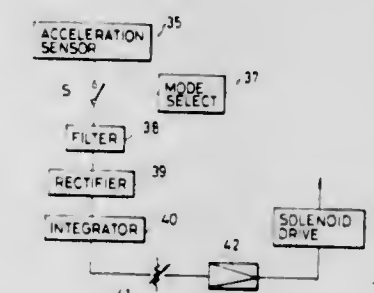
Filed Dec. 29, 1981, Ser. No. 335,317

Claims priority, application Japan, Dec. 29, 1980, 55-187926[U]; Dec. 29, 1980, 55-187927[U]

Int. Cl.<sup>3</sup> B65H 23/08; G11B 15/43, 15/32

U.S. Cl. 242—199

10 Claims



1. A cassette tape machine comprising:
- at least one rotatable shaft member;
  - a hub coupled for rotation with said shaft member and having means for engaging a reel on a tape cassette, said reel rotating said hub in a supply direction when said reel acts as a supply reel;
  - means for detecting vertical vibration of said cassette tape machine; and
  - braking means for applying a predetermined braking force to said reel in response to said detected vertical vibration of said machine.

# 4,416,431

## YARN TENSIONING DEVICE

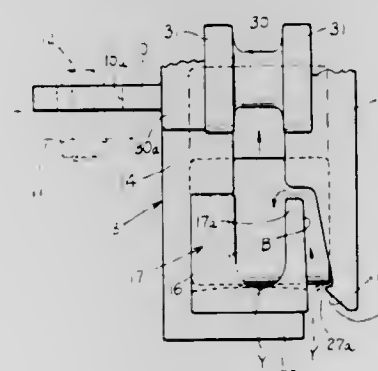
Hans S. Singer, 191 Inglewood, Greenville, S.C. 29615

Filed Jul. 2, 1981, Ser. No. 279,843

Int. Cl.<sup>3</sup> B65H 59/22, 59/26

U.S. Cl. 242—151

2 Claims



1. A yarn tensioning device utilizing cylindrical rollers carried for rotation in a plurality of spaced longitudinally aligned upright receptacles in a housing having a depending member, said receptacles opening into a yarn passageway positioning said rollers transversely in rotating engagement with said yarn at spaced positions along said yarn passageway comprising:
- a lateral threading passageway having an opening beneath said rollers adjacent an end thereof and on one side of said yarn passageway for feeding yarn into the yarn passageway;
  - an element carried by said housing defining said yarn passageway and having an upwardly extending yarn guiding surface extending upwardly forming one side of said opening of said lateral threading passageway below said rollers; and
  - an inwardly extending guiding member projecting beneath

# 4,416,433 SIGNAL BALLOON DISPENSING APPARATUS

Joseph H. Bellina, 3949 Kabel Dr., New Orleans, La. 70114

Filed Jul. 13, 1981, Ser. No. 282,809

Int. Cl.<sup>3</sup> B64B 1/50; H04B 1/04

U.S. Cl. 244—33

10 Claims



1. A self-contained signal balloon dispensing apparatus comprises:



- a. a lower case having a bottom and attached to enclosing side walls with an open top;
- b. an upper lid assembly hingedly affixed to the lower case, at the open top, the lid assembly providing at least a pair of half enclosure sections, at least one of which provides a horizontal partition when in a closed position to at least partially seal the open top;
- c. a vertical partition mounted within said lower case and dividing said lower case into two parts;
- d. a shaft mounted within said lower case and attached at one end portion to said partition and at the opposite end portion to said side wall;
- e. a dispensing spool wound with a length of tether line, rotatably mounted on the shaft;
- f. a helium gas dispensing canister mounted in the lower case on the opposite side of the partition from the spool;
- g. an inflatable balloon mounted within the case and connected to the canister;
- h. trigger means including a gripping surface extending exteriorly of the lower case for actuating the canister to dispense helium into the balloon;
- i. a signaling light source normally carried in one of the lid assembly half enclosure sections and attached to the balloon and to one end of the tether line, a horizontal baffle adjacent a portion of the open end of the lower case above the canister supports the light source and separates it from both the helium canister and the dispensing spool so that when the balloon is inflated, it is free to ascend without interference from light source, the spool, or the canister.

4,416,434

#### BLADE SECTION FOR ROTATING WINGS OF AN AIRCRAFT

Jean-Jacques Thibert, Anne-Marie Rodde, both of Verrieres le Buisson, and Jean-Marc E. Pouradier, Port-Saint-Louis-du-Rhone, all of France, assignors to Societe Nationale Industrielle Aerospatiale and Office National d'Etudes et de Recherches Aerospatiales, both of, France

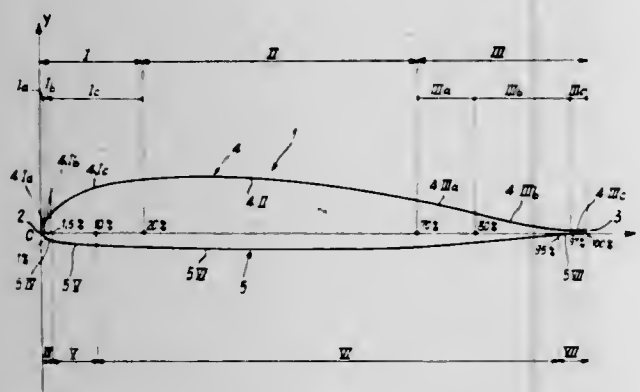
Filed Aug. 17, 1981, Ser. No. 293,683

Claims priority, application France, Sep. 24, 1980, 80 20490

Int. Cl.<sup>3</sup> B64C 3/10

U.S. Cl. 244—35 R

14 Claims



1. A blade section for a helicopter rotor blade comprising, between the leading edge and the trailing edge, a convex lower surface and an upper surface which is convex over the greater part of its length, but concave near the trailing edge, the upper surface comprising:

- a first zone extending from the leading edge to not more than 30% of the length of the chord in the direction of the trailing edge,
- said first zone comprising:
  - a first region in which the curvature of the surface has a maximum value at the leading edge and decreases rapidly toward the trailing edge;
  - a second region adjacent said first region in which the curvature is substantially constant, and
  - a third region adjacent said second region and extending to

not more than 30% of the chord from the leading edge in which the radius of curvature decreases rapidly; and a second zone adjacent said first zone and extending to at least 60% of the length of the chord from the leading edge in which the curvature of the upper surface is substantially constant.

4,416,435

#### BAGGAGE-HANDLING SYSTEM FOR AIRPORTS

Valer Szendrödi, and Karoly Gyurics, both of Budapest, Hungary, assignors to Ikarus Karosszeria es Jarmugyar, Budapest, Hungary

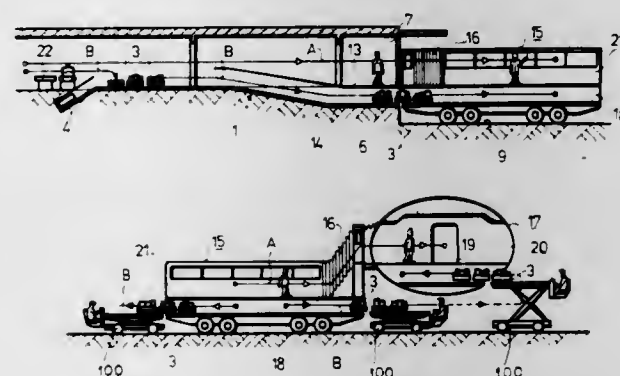
Continuation of Ser. No. 183,928, Sep. 3, 1980, abandoned. This application Dec. 17, 1982, Ser. No. 450,756

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007130

Int. Cl.<sup>3</sup> B64F 1/30, 1/31, 1/32

U.S. Cl. 244—114 R

1 Claim



1. A baggage-handling system for luggage at an airport having a plurality of check-in stations for boarding passengers, a plurality of reception areas spaced from said check-in stations in one direction for passengers awaiting embarkation upon an aircraft, and a plurality of arrival areas for deplaning passengers preparing to leave the terminal, said system comprising:

- a plurality of first transport tracks extending from said check-in stations to said reception areas in said direction;
- a plurality of second tracks extending away from said arrival areas, said first and second tracks being mutually spaced and parallel to one another and forming part of a track network;
- a transverse track forming part of said network interconnecting all of said first and second tracks;
- a multiplicity of baggage carriers shiftable along said tracks and adapted to receive baggage at said stations and carry said baggage to said reception areas and for carrying said baggage away from said arrival areas;
- an empty-carrier track extending across all of said first and second tracks for transporting empty carriers from said second tracks to said first tracks at said stations, said first and second tracks having free ends at said areas spaced above grade whereby a transport vehicle can travel on grade to said areas for receiving and discharging baggage-laden carriers for said first tracks and said second tracks, respectively, the reception and arrival areas each being formed with passenger ramps at a level above that of the perspective tracks and parallel thereto; and above grade
- a bus-type transport vehicle for receiving passengers from and delivering passengers to said ramps, said vehicle having a passenger compartment with a floor substantially in line with said ramps and a luggage compartment below said floor for receiving said carriers, said first and second tracks having other ends inclined downwardly away from said areas to said empty carrier track which is located below grade; and
- a housing receiving said other ends of said first and second tracks and said empty-carrier track, said housing having an inclined apron covering said empty-carrier track.

4,416,436

#### AERIAL TRANSPORT OF PAYLOADS WITH VERTICAL PICK UP AND DELIVERY

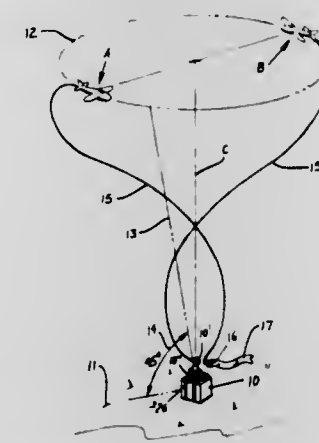
Francis M. Wilson, Jr., Kennesaw, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 23, 1981, Ser. No. 314,254

Int. Cl.<sup>3</sup> B64D 1/22

U.S. Cl. 244—137 R

8 Claims



1. In the aerial transportation of a payload the method of vertical pick up and delivery of such payload from a surface by two airplanes in flight comprising the steps of: flexibly connecting said payload to each said airplane while flying at substantially the same altitude and at a predetermined bank angle in a substantially circular first orbit around and above said payload; causing said airplanes to move at approximately the same speed and to be diametrically opposite one another while initially lifting said payload from said surface; causing one of said airplanes to reduce its bank angle while maintaining said speed whereby said one airplane describes a flight path at a radius approximately twice that of the other airplane and the two airplanes become positioned in side by side formation within approximately one circle of said other airplane with said payload trailing, between and below said airplanes; subsequently causing said airplanes to descend to a predetermined altitude above a selected delivery point for said payload with the airplane nearer to said point at a selected bank angle to locate it a predetermined distance to the side of said point and the airplane farther from said point at a selected bank angle to locate it approximately twice the distance from said point as, and trailing, said nearer airplane; causing said nearer airplane to increase its bank angle to commence a substantially circular second orbit around and above said point while simultaneously causing said farther airplane to commence a flight path approximately twice that of said nearer airplane, both airplanes moving at approximately the same speed; causing said farther airplane to gradually increase its bank angle so that it converges with the aforesaid circular second orbit of said nearer airplane at about the time said nearer airplane completes approximately one circle and the two airplanes become approximately diametrically opposite one another in said circular second orbit; and then causing the two airplanes to simultaneously descend while maintaining approximately the same speed until said payload reaches said delivery point.

4,416,437

#### SAFETY LOCK FOR A CARRYING AND JETTISONING DEVICE FOR LOADS TRANSPORTED UNDER AIRCRAFT

Jean H. Hasquenoph, Lagny, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Apr. 2, 1982, Ser. No. 364,588

Claims priority, application France, Apr. 3, 1981, 81 06750

Int. Cl.<sup>3</sup> B64D 1/02

U.S. Cl. 244—137 R

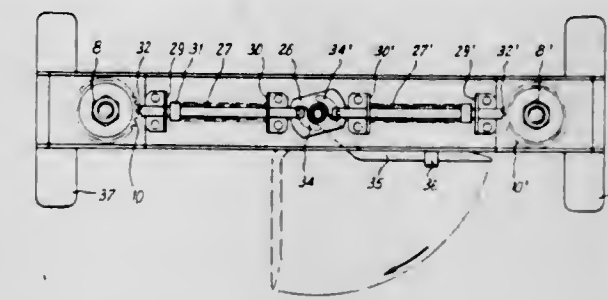
3 Claims

1. In a carrying and jettisoning device for loads transported under aircraft, comprising:

suspension hooks for the load pivoted to movable supports

and adapted to take an open position and a closed working position, means ensuring a limited vertical movement of said supports, fixed bearings adapted to be engaged by the load supported by the suspension hooks when said hooks are in an uppermost position, and a system for locking said suspension hooks in their closed position and for controlling the opening of said hooks, which comprises a pivoted locking element adapted to hold said suspension hooks in their closed position; a safety lock comprising:

- a pivoted body,
- a control member rigid with said pivoted body and adapted when actuated to pivot said safety lock body between a first position and a second position, and inversely,
- a first extension rigid with said pivoted body and adapted, in said first position of said safety lock body, to cross the



path of the pivoted locking element of the suspension hook to prevent movement of said locking element in a direction allowing the locking system for the suspension hooks to be liberated and, in said second position of said safety lock body, to free said path of the pivoted locking element, and

a second extension rigid with said pivoted body, co-acting with movable members disposed in the vicinity of the means ensuring a limited vertical movement of the suspension hooks so that in said first position of the pivoted body said movable members are removed from said means ensuring a limited vertical movement of the suspension hooks while, in said second position of the pivoted body, said movable members engage said means ensuring a limited vertical movement of the suspension hooks in order to prevent the actuation thereof and thus the vertical movement of the suspension hooks.

4,416,438

#### BOTTLE HOLDER

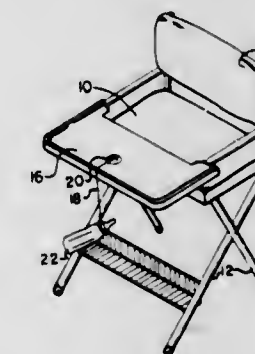
Sterling J. King, 311 Hillcrest Dr., Leucadia, Calif. 92024

Filed Feb. 20, 1981, Ser. No. 236,604

Int. Cl.<sup>3</sup> A47B 15/00

U.S. Cl. 248—102

3 Claims



1. An infant's feeding bottle supporting apparatus comprising:

- a suction cup for detachable attachment to a flat support surface and including an attachment knob,
- an elongated flexible strap having a maximum length of



twenty-six inches secured at one end to said suction cup attachment knob, adjustable loop means formed at the other end of said flexible member for detachably securing around the neck of a nursing bottle, a bead secured to said other end and slidable on said flexible member for defining said adjustable loop means, loop retaining stop means and safety stop means for defining the minimum and maximum sizes of said loop, and said stop means comprising beads having throughbore and said flexible member extending through the bore.

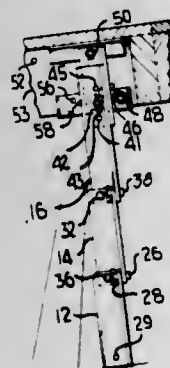
4,416,439

## ADJUSTABLE LEG ASSEMBLY

Fred Dimpfel, 14100 Montfort Dr. #3260, Dallas, Tex. 75240; Steven J. Hahn, 127 Oberlin Ter., Lansdale, Pa. 19446; Brian J. Dyson, 7560 Taylor Rd., Riverdale, Ga. 30274, and Sandra F. Doyon, P.O. Box 603, Montross, Va. 22520  
Filed Apr. 10, 1981, Ser. No. 253,152  
Int. Cl.<sup>3</sup> F16M 11/38

U.S. Cl. 248—188.6

12 Claims



8. A load bearing support comprising a horizontally extending main body, at least one adjustable leg assembly depending from said main body, said leg assembly including a plurality of nestable segments, and means for pivotally interconnecting adjacent segments, wherein each of said segments comprises a pair of flat plates disposed at an angle of more than 90° with respect to each other.

4,416,440

## INGOT MOLD AND METHOD

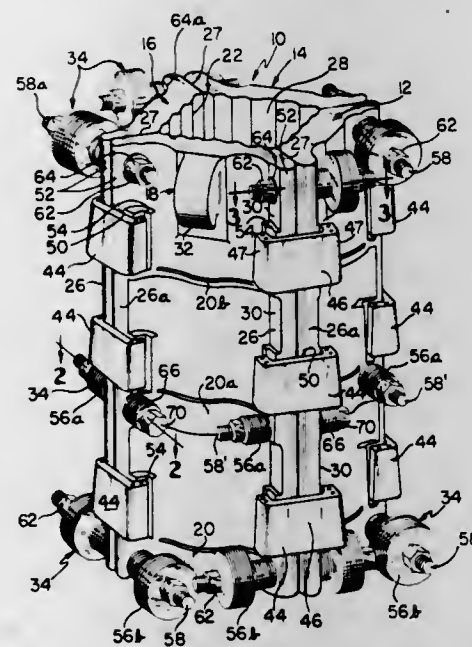
Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio 44126, and Thomas P. Kicher, South Euclid, Ohio, assignors to Harold M. Bowman, Cleveland, Ohio  
Continuation-in-part of Ser. No. 78,447, Sep. 24, 1979, Pat. No. 4,358,084, which is a continuation-in-part of Ser. No. 3,093, Jan. 15, 1979, Pat. No. 4,269,385, which is a continuation-in-part of Ser. No. 669,650, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,060, Jul. 29, 1975, abandoned. This application May 22, 1981, Ser. No. 266,382  
Int. Cl.<sup>3</sup> B22D 7/08

U.S. Cl. 249—82

28 Claims

1. In a method for molding ingots comprising, providing a mold having side wall sections defining at least in part a generally vertically oriented mold cavity, the wall sections comprising generally vertically extending juncture surfaces adapted for opening and closing relative to one another resulting from the pouring of molten metal into the mold cavity and the resultant heating and subsequent cooling of the mold and associated ingot formed therein, clamping such juncture surfaces together by adjustable spring fastener means coacting between said wall sections and preloading said spring fastener means a predetermined amount so that said spring fastener means will provide sufficient clamping force to maintain said juncture surfaces in generally preloaded abutting condition until completion of the filling of the mold cavity to a predetermined extent with molten metal and the formation of an ingot skin on a poured ingot therein having sufficient structural integrity to support the molten interior of the ingot, said spring

fastener means being operable to prevent leakage of molten metal between said juncture surfaces and to control stresses occasioned from the pouring of molten metal into the mold, said spring fastener means being applied to said mold to preload said juncture surfaces generally adjacent the upper and lower ends of said mold, said predetermined preload being



determined by combining the total force of fluid static loading with the total forces to restrict the free thermal deformation from the assembled mold wall sections occurring during the pouring of molten metal into the mold, in order to prevent leakage between the mold wall sections, said free thermal deformation being determined by the formula:

$$W = \frac{-3M_T}{4Eh^3} (x^2 + y^2)$$

wherein W represents the thermal bending deformation of the mold section,  $M_T$  is the thermal moment, x and y are respectively the x and y coordinates of the outermost corner of the mold wall section, E is the modulus of elasticity of the mold wall section and h is the thickness of the mold wall section, and then commencing the pouring of molten metal into the mold cavity and filling the latter to predetermined extent with molten metal, said spring fastener means upon completion of the filling of the mold to predetermined extent and formation of the said ingot skin, being operable to compress beyond the preloaded condition due at least in part to the thermal moment in said wall sections and permit controlled separation of said juncture surfaces, thus limiting the stresses applied to the wall sections during the metal pouring operation and resultant heating of the mold sections.

2. An ingot mold comprising one or more mold wall sections defining at least in part a generally vertically oriented mold cavity into which molten metal is adapted to be poured, spring fastener means coacting between adjacent sections for clamping the latter together along generally vertically extending juncture surfaces, said spring fastener means being operable to prevent leakage of molten metal between said juncture surfaces and to control stresses occasioned from the pouring of molten metal into the mold cavity and the resultant heating of the mold wall sections, and resisting separation of said juncture surfaces during the pouring operation and resultant heating of the mold, said spring fastener means including means for preloading said spring fastener means to a predetermined extent and with sufficient clamping force to maintain said juncture surfaces in a generally preloaded abutting condition until completion of the filling of the mold cavity a predetermined extent with molten metal and the formation of an ingot skin on a poured ingot therein having sufficient structural integrity to support the molten interior of the ingot, said spring fastener

means being capable of applying to said mold a predetermined amount of force to said juncture surfaces generally adjacent the upper and lower ends of said mold, said predetermined amount of force being determined by combining the total force of fluid static loading with the total forces for restricting the free thermal deformation from the assembled mold wall sections occurring during the pouring of molten metal into the mold, in order to prevent leakage between the mold wall sections, said free thermal deformation being determined by the formula:

$$W = \frac{-3M_T}{4Eh^3} (x^2 + y^2)$$

wherein W represents the thermal bending deformation of the mold section,  $M_T$  is the thermal moment, x and y are respectively the x and y coordinates of the outermost corner of the mold wall section, E is the modulus of elasticity of the mold wall section and h is the thickness of the mold wall section, said fastener means being operable to compress beyond the preloaded condition due at least in part to the thermal moment in said wall sections and permit controlled separation of said juncture surfaces so as to respond to the thermal deformation configuration of the ingot mold, thus limiting the stresses applied to the wall sections during the metal pouring operation and resultant heating thereof, said spring fastener means possessing memory and being adapted to return to substantially their preheated size condition after cooling thereof to cause said mold juncture surfaces to return to generally preloaded abutting relationship.

4,416,441

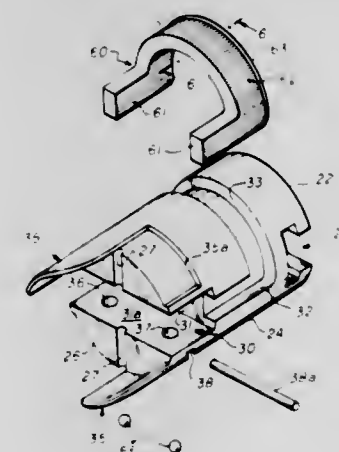
## BLOWOUT PREVENTER

Denzal W. Van Winkle, P. O. Box 79737, Houston, Tex. 77079  
Division of Ser. No. 89,180, Oct. 29, 1979, Pat. No. 4,392,633.  
This application Sep. 27, 1982, Ser. No. 423,561

Int. Cl.<sup>3</sup> E21B 33/06

U.S. Cl. 251—1 A

6 Claims



5. A blowout preventer for sealing against an elongate member comprising:

- a preventer body having a longitudinal bore therethrough with aligned transverse bores intersecting the longitudinal bore;
- ram bodies in said transverse bores with each ram body having a continuous groove that extends diametrically across the front thereof, along each side thereof and transversely over about half of each ram body between the groove on each side thereof;
- closure means closing the outer ends of the transverse bores;
- operating means for moving said ram bodies longitudinally of the transverse bores for sealably engaging an elongate member in the longitudinal bore and to close off fluid communication through the longitudinal bore, said operating means extending through said closure means;
- an elastomer body with members embedded in the upper and

lower surfaces thereof for fitting in that part of the groove extending diametrically across the front of each ram body; f. recesses spaced longitudinally in said members; g. positioning means positioned in each ram body and in the recesses in said members to retain said elastomer body in position in the groove extending diametrically across the front of each ram body; h. an additional elastomer body for each groove portion extending along each side of the ram body, and transversely over about half of the ram body between the groove on each side of each ram body; and i. a projecting lip on that portion of said additional elastomer body that fits in the groove portion which extends transversely over about half of the ram body between the groove portions on the side of each ram body.

4,416,442

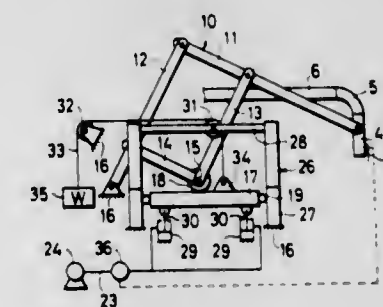
METHOD AND APPARATUS FOR REMOVING SLAG  
Soichi Hiroshima; Hidenao Hirasawa; Yoshinori Nakasai, and Keiichi Takayama, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,771

Claims priority, application Japan, Apr. 10, 1981, 56-54198  
Int. Cl.<sup>3</sup> C21B 3/04

U.S. Cl. 266—44

4 Claims



1. In a method of removing slag from a body of hot metal by applying a suction from a suction head and in which the suction head is supported in the desired position relative to the surface of the hot metal by a supporting means including a linkage means and movable for moving the suction head up and down relative to the hot metal, the step of holding the suction head in the desired vertical position by applying to the supporting means a constant upward force greater than the force with which the suction head is attracted downwardly by the weight thereof and the weight of the parts connected thereto, and, at the same time, applying to said supporting means a downward force sufficient to resist said upward force for thereby holding the said supporting means and said suction head at the desired vertical position against said upward force.

4,416,443

## PROCESS AND APPARATUS FOR DETECTION OF THE STOPPAGE OF A TUYERE FOR BLOWING A GAS THROUGH THE BOTTOM OF A REFINING CONVERTER

Alfred F. Helff, Thionville, and Jean-Claude H. Muller, Longeville-les-Metz, both of France, assignors to Societe Lorraine de Laminage Continu, Paris, France

Filed Jul. 14, 1982, Ser. No. 398,361

Claims priority, application France, Dec. 8, 1981, 81 22936  
Int. Cl.<sup>3</sup> C21B 7/16

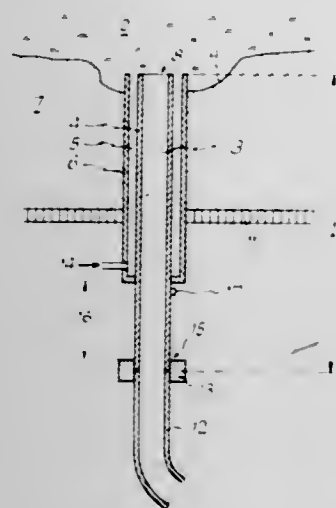
U.S. Cl. 266—47

11 Claims

1. A process for detecting stoppage of gas flow in a tuyere of a metallurgical bottom-blown converter having a refractory lining and a base plate, said tuyere extending through the base plate and the refractory lining, to blow, into and under a molten metallic bath in the converter, a gas compressed at a given pressure and delivered by the tuyere into the molten metallic bath at a pressure lower than said given pressure, said method



comprising measuring the temperature of the tuyere at a location below the base plate and detecting abnormal elevation of



the temperature of the tuyere indicating a stoppage in the gas flow in the tuyere.

4,416,444

## UNDERWATER CUTTING ROD

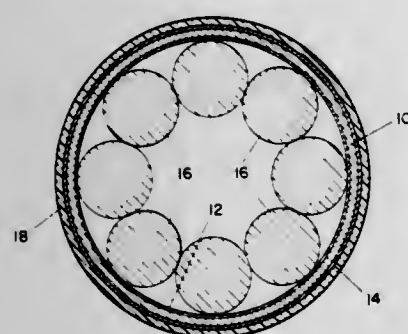
Jerome S. Brower, P.O. Box 1768, Pomona, Calif. 91769

Filed Mar. 28, 1983, Ser. No. 479,461

Int. Cl.<sup>3</sup> B23K 9/18

U.S. Cl. 266—48

12 Claims



1. An electrode for use in a cutting torch comprising a metallic tube coated on the inside and outside with a layer of conductive material, a plurality of rods within said tube, said rods selected from the group consisting of steel, aluminum, magnesium, titanium, tungsten, molybdenum or alloys thereof.

4,416,445

## VISCOUS SPRING DAMPER

L. Dale Coad, Milan, Ohio, assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 950,949, Oct. 13, 1978, abandoned.

This application Dec. 9, 1980, Ser. No. 214,771

Int. Cl.<sup>3</sup> F16F 9/08

U.S. Cl. 267—35

12 Claims

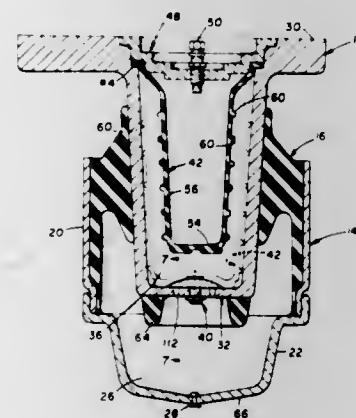
1. A viscous spring damper having non-linear damping characteristics including a relatively soft damping characteristic over a selectable load range and a relatively high spring rate below the selectable load range, the damper comprising:

an outer member and an inner member connected by an elastomeric shear spring and defining a main fluid chamber therebetween which contains a fluid and has a main chamber volume, the outer and inner members being movable relative to each other such that the shear spring is stressed and the main chamber volume is varied;

a restricted orifice means for providing fluid communication between the main chamber and a second chamber defined by the inner member;

an expandable and contractible bladder which is selectively charged with gas to a selectable gas pressure independent

of the fluid pressure by charging means for selectively varying the bladder's expandability and contractibility and causing it to be in contact with said inner member and said restricted orifice means in an unstressed condition, the bladder being disposed in said second chamber such that the bladder gas pressure controls the fluid pressure at which fluid flows from the main chamber through the orifice means into the second chamber, whereby under loads which cause a fluid pressure which is too small to



compress the bladder, the damper has a relatively high spring rate which is affected by the resiliency of the elastomeric shear spring and the compressibility of the fluid and whereby under loads which are sufficiently great to compress the bladder and cause fluid to flow from the main chamber into the second chamber, the damper has a relatively soft damping characteristic which is affected by the compressibility of the bladder and flow rates through the orifice means.

4,416,446

## VIBRATION-ATTENUATING COUPLING DEVICE

Masamitsu Murakami, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

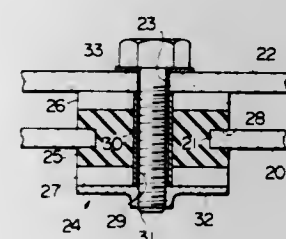
Filed Jul. 8, 1981, Ser. No. 281,363

Claims priority, application Japan, Jul. 25, 1980, 55-105786[U]

Int. Cl.<sup>3</sup> F16F 3/08

U.S. Cl. 267—140.3

6 Claims



1. A vibration-attenuating coupling device for use with a first member having inner and outer faces and formed with an opening having a center axis and a second member having inner and outer faces and formed with an opening having a center axis substantially aligned with the opening in the first member, comprising:

a laminar vibration absorptive structure securely fitted to said first member through the opening therein and having opposite end faces one of which is securely attached to the inner face of said second member, and

rigid fastening elements held in engagement with the other end face of the vibration absorptive structure and with the outer face of the second member through the opening in the second member,

said vibration absorptive structure comprising a first resilient member having opposite end faces and fitted to said first

member through the opening therein, a second resilient member secured between one end face of the first resilient member and the inner face of said second member and a third resilient member secured between the other end face of said first resilient member and one of said fastening elements, each of the second and third resilient members being smaller in spring constant than the first resilient member.

4,416,447

## MACHINE FOR FORMING BOOKLETS OF INTERCALATED SHEETS

Romano Conti, Via Pier della Francesca 37, Prato, Firenze, Italy

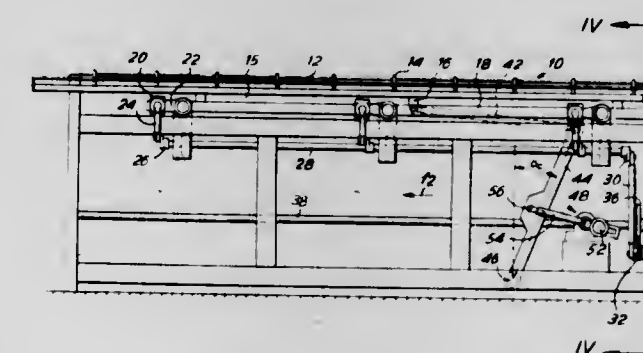
Filed Sep. 3, 1981, Ser. No. 299,179

Claims priority, application Italy, May 14, 1981, 9413 A/81; May 14, 1981, 11646/81[U]

Int. Cl.<sup>3</sup> B65H 39/02

U.S. Cl. 270—54

6 Claims



1. A machine for the formation of booklets with intercalated multiple sheets, comprising:

means for forming a plurality of fixed seats each for a pile of sheets;

a main conveyor having a stationary longitudinal plane, a plurality of mobile longitudinal bars each with pegs forming a plurality of transfer seats means for a reciprocating displacement of said bars in a vertical direction from a position with said bars and pegs below said plane to a position with said bars and pegs above said plane and in a horizontal direction with respect to said stationary plane for advancing sheets in an advancement direction;

holding means for transferring individual sheets of each pile to said main conveyor;

a secondary conveyor operatively associated with at least one of said fixed seats for a pile of sheets having a greater thickness than sheets of other piles, operable to withdraw a lowermost sheet of the pile in said at least one fixed seat and to bring it to a holding position for said holding means, said secondary conveyor operable to move said sheets in a direction substantially transverse to the advancement direction from the pile at said at least one fixed seat to said holding position;

drive means for driving said secondary conveyor operatively coupled to said holding means and operating in synchronism with the transfer of a sheet from said holding position to said main conveyor, which successively receives the sheets of the booklet,

a frame carrying said main conveyor, said means forming a plurality of fixed seats and said secondary conveyor,

a support structure above said secondary conveyor for restraining all but a lowermost sheet of the pile in said at least one fixed seat from movement by said secondary conveyor in the direction transverse to said advancement direction; and

an adjustable bank movably mounted on said support structure for adjusting a distance between said secondary conveyor and said support structure to correspond to a thickness of sheets in the pile at said at least one fixed seat;

said holding means comprising a suction holder movable from said holding to said main conveyor;

said means for reciprocating displacement of said bars comprising a slide bar to which said bars with connected pegs are slidably mounted, first crank means connected to said slide bar for lifting and lowering said slide bar, an oscillating bar pivotally connected at one end to said bars and an opposite end to said frame, and second crank means connected to said oscillating bar at an intermediate location thereof for moving said bars and pegs in said advancement direction.

4,416,448

## METHOD AND APPARATUS FOR THE INSERTION OF AT LEAST ONE INSERT OR SUPPLEMENT INTO PRINTED PRODUCTS

Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

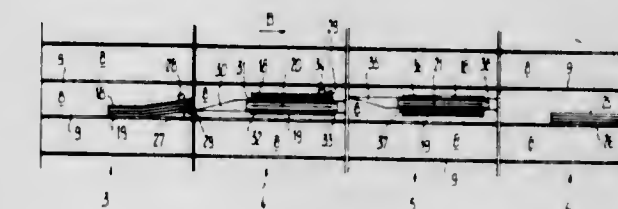
Filed Oct. 29, 1981, Ser. No. 316,435

Claims priority, application Switzerland, Nov. 17, 1980, 8496/80

Int. Cl.<sup>3</sup> B65H 5/30

U.S. Cl. 270—55

16 Claims



1. A method for stuffing at least one insert into printed products, especially for stuffing at least one insert into folded primary printed products wherein each printed product is composed of at least one sheet panel folded over on itself to present two planar outside surfaces, comprising the steps of:

bringing together at least two printed products in a superposed relationship, wherein the printed products are in side-by-side relationship with their outside surfaces juxtaposed one another;

moving said superposed printed products conjointly along a common processing path;

opening each superposed printed product during their conjoint movement along their processing path after the latter have been brought together in their superposed relationship; and

stuffing inserts into an opening of each printed product which has been opened.

4,416,449

## DOCUMENT SEPARATING APPARATUS AND METHOD

George P. McInerney, Andalusia, Pa., assignor to Technitrol, Inc., Philadelphia, Pa.

Filed Dec. 9, 1981, Ser. No. 328,951

Int. Cl.<sup>3</sup> B65H 3/52

U.S. Cl. 271—122

16 Claims

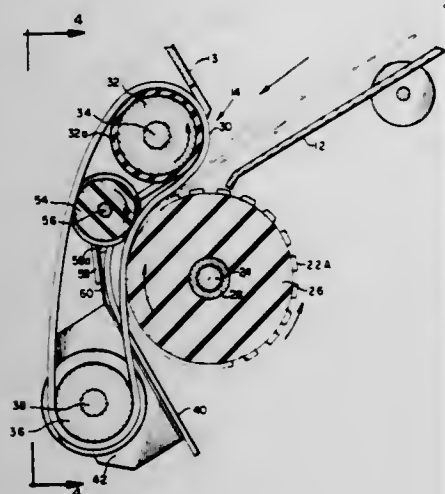
15. The method of separating documents using a friction drum which is opposed by a counter-rotating stripper friction belt deflected over a non-friction surface slightly smaller than drum diameter intermediate the length of the drum axis comprising:

driving the drum in the direction of desired document flow;

driving the belt in the opposed direction;



guiding the documents by flanges of a free-wheeling pulley urged into the drum each side of the belt; and



4,416,450

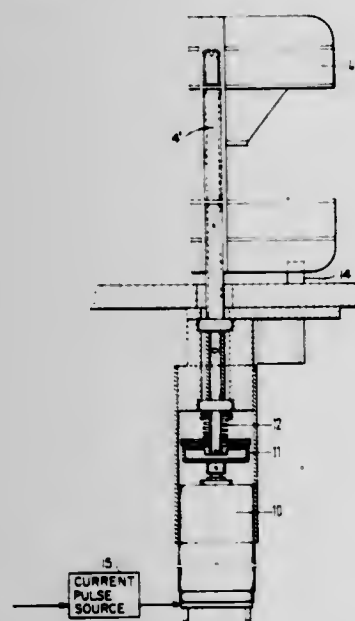
## LETTER CONVEYOR SWITCH DRIVE

Mans van Wijngaarden, Leidschendam, Netherlands, assignor to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie), The Hague, Netherlands  
Filed Jun. 22, 1981, Ser. No. 276,022  
Claims priority, application Netherlands, Jul. 2, 1980, 8003834

Int. Cl.<sup>3</sup> B65H 29/60

U.S. Cl. 271—303

1 Claim



1. A switching device for a letter-type conveyor having driven belts between which letters are conveyed one after the other from one direction to one of two alternate directions, said switching device comprising:

- (A) a low momentum fast-acting switching tongue pivoted downstream on a shaft for oscillation between two stop positions for directing letters in one of said two alternate directions,
- (B) a spring-urged friction clutch mounted on said shaft,
- (C) a reversible low-momentum high torque electric rotary motor axially of said shaft and driving said clutch, and
- (D) a source of a short driving current pulse for said motor having a duration slightly longer than the time to move said tongue between its two stop positions,

whereby said clutch will not slip on starting of said motor, but

will slip and not bounce when said tongue is urged in one of its two stop positions.

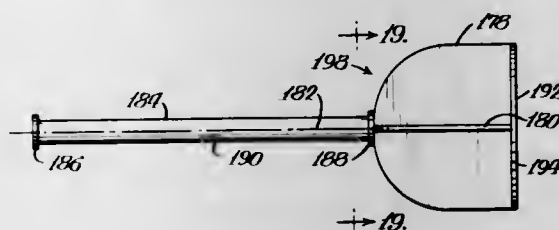
4,416,451

## AQUATIC EXERCISE ASSEMBLY

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801  
Continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Oct. 13, 1981, Ser. No. 310,788  
Int. Cl.<sup>3</sup> A63B 21/00

U.S. Cl. 272—116

16 Claims



1. An aquatic exercise assembly for use in water to strengthen muscles, improve muscle tone and enhance muscular coordination, comprising:

- a generally impact-resistant water-engageable imperforate shaft formed of substantially water-impermeable material having a fin-engageable end portion and a manually grippable portion for being grasped under water adjacent said fin-engageable end portion, said shaft being elongated and extending in an axial direction along an axis, said manually grippable portion of said shaft having a maximum width defining a thickness taken in a radial direction generally transverse to said axis and said shaft being movable in said water; and
- a plurality of water-engageable fins providing a hydrodynamic resistance assembly secured to and extending generally radially outwardly from each fin-engaging end portion of said shaft, said fins being substantially rigid to substantially avoid radial deflection and being angularly disposed with respect to each other for deflecting water and creating a pressure head and fluid resistance to water flow as said shaft is moved in said water, each of said fins having an axial engaging portion extending the entire length of each fin along said axis, said axial engaging portions of said fins directly secured to and touching each other in coaxial alignment with said axis of said shaft, each of said fins having a height extending from said axial engaging portion of an outer extremity of said fin substantially greater than the maximum thickness of said manually grippable portion of said shaft for enhanced hydrodynamic resistance, each of said fins having a solid, generally planar water-impingement surface lying in the axial direction and extending continuously across said fin from said axial engaging portion to said outer extremity with an imperforate, water-impermeable cross-sectional area to provide a solid barrier in coplanar relationship and alignment with said axis to hydrodynamically engage said water and said rigid fins being positioned an effective distance from said manually grippable portion of said shaft for exerting a hydrodynamic torque on said manually grippable portion of said shaft as said shaft is being moved in said water to strengthen the muscles of the user of the exercise assembly.

4,416,452

## BOWLING BALL FINGER GRIP INSERT

Donald L. Heimbigner, 802 Rhododendron Dr., Vancouver, Wash. 98661

Filed Dec. 30, 1981, Ser. No. 335,603

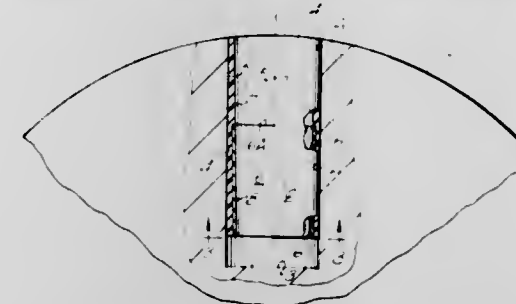
Int. Cl.<sup>3</sup> A63B 43/02

U.S. Cl. 273—63 A

12 Claims

1. A finger grip insert for bowling balls, said insert comprising:

a first finger engageable member of tubular shape for recessed securement within a bowling ball defined bore and having a truncated conical inner wall for contact with an inserted finger, a second finger engageable member formed integral with and inset within said first member



and of a resilient nature and being of greater resiliency than said first member for contact by the fingertip pad of the inserted finger, said second finger engageable member being inset within said first finger engageable member so as to provide an uninterrupted internal wall surface of the insert.

4,416,453

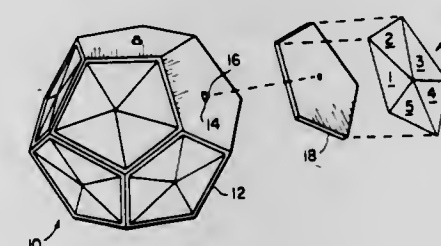
## REGULAR SOLID MULTI-COLORED PUZZLE

Albert Sasso, 8 Rall Ct., Roseland, N.J. 07068  
Filed Jun. 14, 1982, Ser. No. 387,921

Int. Cl.<sup>3</sup> A63F 9/08

U.S. Cl. 273—155

11 Claims



1. A multi-colored puzzle, comprising:

- a hollow, regular solid base;
- a plurality of plates corresponding in number, size and shape to the faces of the regular solid base, and disposed on corresponding faces of the base;
- means for coupling the plates in pairs, whereby the pairs of plates are rotatable relative to corresponding faces of the base;
- the plates being divided into a plurality of triangles, with each plate having the same number of triangles and the triangles on any one plate having edges adjacent the edges of the triangles on adjacent plates;
- the triangles being of different colors, and each plate having triangles of the same colors with the relative positions of triangles of a particular color varying in a predetermined order; and
- the plates being rotated by a user of the puzzle in pairs relative to the corresponding faces until a discrete solution to the puzzle is achieved, whereby all of the adjacent edges of the triangles are of different colors.

4,416,454

## MANAGEMENT TEACHING GAME METHOD

Robert P. Delamontagne, 284 Westcott Blvd., Pennington, N.J. 08534

Division of Ser. No. 73,200, Sep. 7, 1979, Pat. No. 4,289,313.

This application Jul. 2, 1981, Ser. No. 279,776

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273—243

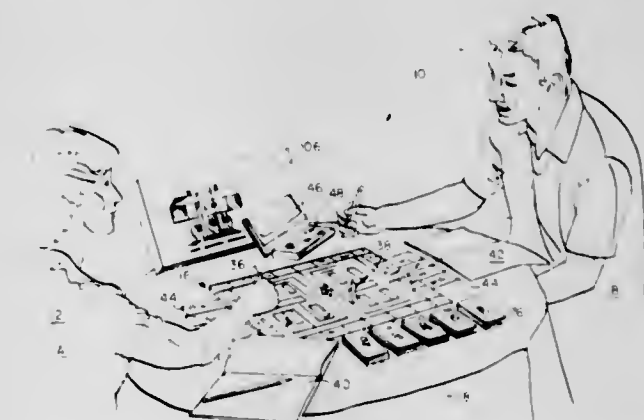
1 Claim

1. A method of playing a management teaching game of the type including a game board having a first player territory

representing the real-life work environment of a first player, a second player territory representing the real-life work environment of a second player, a path connecting said first and second player territories together and a plurality of player positions representing real-life work situations located along said path, said player positions having predetermined penalty and reward values, said game further including at least a first and second player piece, said method comprising the steps of:

determining the position of said first and said second player pieces by a random chance means so that said first and second player pieces are advanced by random amounts along said path;

posing identified questions and multiple choice answers to said identified questions alternately to said first and second players, said identified questions and multiple choice answers to said identified questions concerning specific subjects related to the real-life work of said first and second players;



answering said identified questions when said first and second player pieces are in said first and second player territories so that said first player answers questions when said first player piece is in said first player territory and said second player answers questions when said second player piece is in said second player territory;

indicating the correctness of any one of said identified multiple choice answers to any one of said identified questions posed during said posing step in such a way that more than one player knows if the question is correctly answered, but only the player performing the answering step knows the content of the multiple choice answer selected; and, receiving a reward, said reward being directly dependent upon the cumulative number of correct answers given by a player to questions corresponding to the subject matter category of the player position in which an opponent player piece lands.

4,416,455

## INTERLOCKING WORD GAME UTILIZING PRISMATIC BLOCKS AND METHOD OF PLAYING SAME

Leo J. Munson, Van Nuys; Felix Griaudze, San Pedro; David T. Okada, Manhattan Beach, all of Calif., and Bernard Loomis, New York, N.Y., assignors to CPG Products Corp., Minneapolis, Minn.

Filed Sep. 30, 1981, Ser. No. 306,989

Int. Cl.<sup>3</sup> A63F 3/00

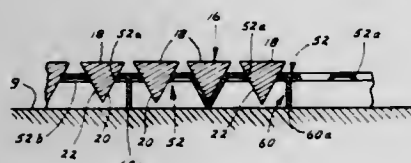
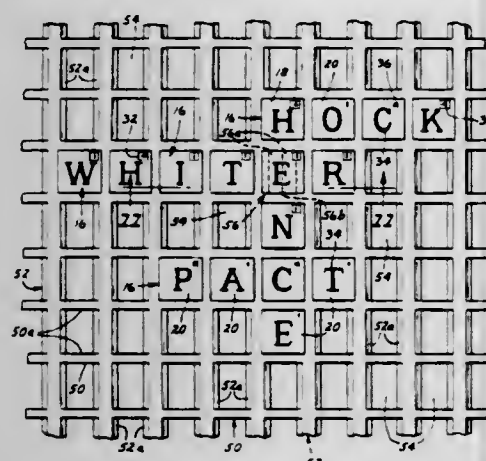
U.S. Cl. 273—272

23 Claims

23. A word game comprising a plurality of prismatic blocks, each having first, second and third acutely angled rectangular faces and parallel end faces having triangularly configured edges, said first and second faces each having a letter thereon, and a planar game board for holding said blocks, said game board having a plurality of elongated rectangular openings, the longer dimension of each opening corresponding to the distance between said triangularly configured end faces and the shorter dimension of each opening being less than the length of any of said triangularly configured edges, said game board



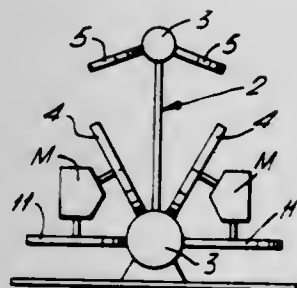
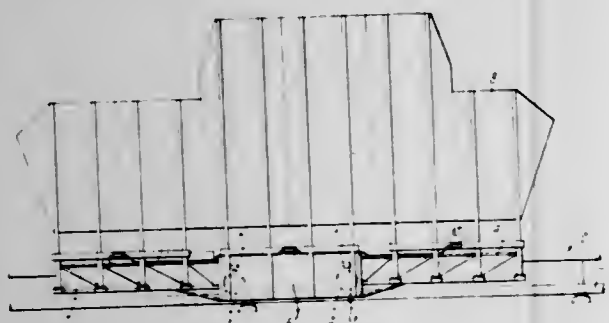
thereby holding said blocks so that said blocks are readily removable and holding said blocks so that only said selected first or second faces are visible, the shorter dimension of each



rectangular opening maintaining the first or second face of any block placed therein in a raised relation with respect to said planar board.

#### 4,416,456 TROLLEYS FOR TARGET RANGES

Lindsay C. Knight, Albury, Australia, assignor to Australasian Training Aids Pty. Ltd., Albury, Australia  
Continuation-in-part of Ser. No. 967,770, Dec. 8, 1978. This application Apr. 28, 1981, Ser. No. 258,053  
Int. Cl.<sup>3</sup> F41J 9/02; B61B 13/06; E01B 25/10  
U.S. Cl. 273—359 17 Claims

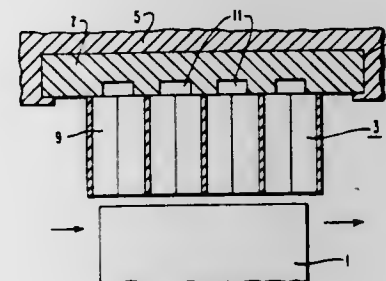


1. A trolley and a mono-rail track on which said trolley runs, said track comprising upper and lower elongate members extending one above the other in spaced parallelism, means for interconnecting said elongate members to provide a rigid track assembly, at least the lower elongate member having a periphery that is at least partially circular, said trolley comprising a chassis provided with an upper pair of jockey wheels which engage said upper elongate member on substantially opposite sides thereof and a lower pair of drive wheels which engage

said lower elongate member, each of said lower pair of drive wheels being inclined upwardly and outwardly relative to said lower elongate member and serving to support the weight of the trolley, each of said lower drive wheels having a periphery which is concavely curved to provide intimate contact with the circular part of the periphery of said lower elongate member, the point of peripheral contact of said drive wheels being closer to the vertical axis of the track than the uppermost parts thereof, hydraulic motor means for driving said trolley, hydraulic circuit means for operating said hydraulic motor means, said hydraulic circuit means including means for controlling said motor means for braking effect, additional brake means adapted to engage at least said upper elongate member for further braking effect, and additional substantially horizontal wheels which engage side portions of said lower elongate member.

#### 4,416,457 GROOVED HONEYCOMB LABYRINTH SEAL FOR STEAM TURBINES

Ralph E. McGinnis, Ridley Township, Delaware County, and Lewis Gray, Nether Providence, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Jan. 24, 1983, Ser. No. 460,693  
Int. Cl.<sup>3</sup> F16J 15/44; F01D 11/08  
U.S. Cl. 277—53 7 Claims



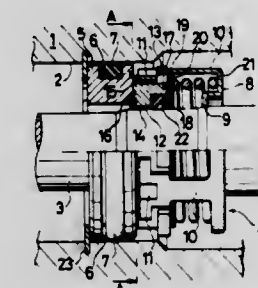
1. A honeycomb labyrinth seal cooperatively associated with rotatable steam turbine blades, said honeycomb seal comprising:  
a base portion;  
a plurality of rows of honeycomb cells extending radially inwardly from the base portion so that each cell is open adjacent said blade;  
a plurality of passages so disposed that each cell is connected to at least one passage and at least one passage is open upstream of the rows of honeycomb cells and at least one passage is open downstream of said rows of honeycomb cells, thereby permitting steam to flow through said passages and cells from the upstream side to the downstream side of said honeycomb labyrinth seal.

#### 4,416,458 MECHANICAL FACE SEAL WITH MINUTE PORES IN SLIDING SURFACE

Akira Takenaka; Keiichi Shimazaki, both of Nagoya, and Yasumitsu Kuwazuru, Toyota, all of Japan, assignors to Taiho Kogyo Kabushiki Kaisha, Aichi, Japan  
Filed Sep. 17, 1982, Ser. No. 419,575  
Claims priority, application Japan, Sep. 18, 1981, 56-147244  
Int. Cl.<sup>3</sup> F16J 15/20, 15/34  
U.S. Cl. 277—96.1 1 Claim

1. A mechanical seal comprising:  
a fixed member to be fixedly attached to a stationary portion where sealing is required;  
a rotary member to be fixedly mounted to a rotary shaft rotatably mounted in said stationary portion; and  
means for pressing said rotary member against one axial side of said fixed member so as to slidably contact a sliding surface of said rotary member to a sliding surface of said fixed member;

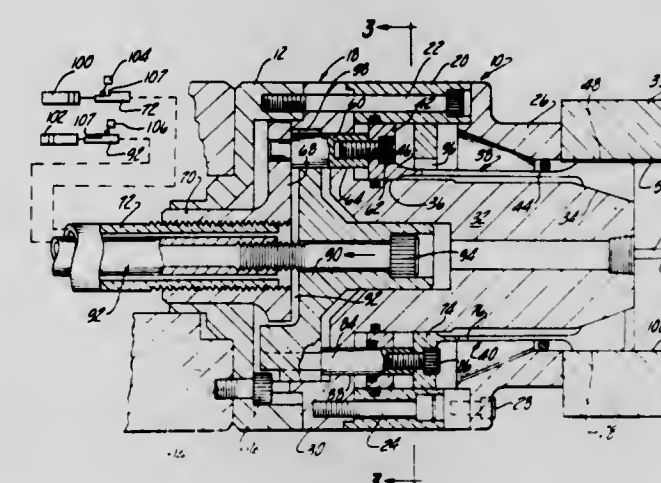
one of said sliding surfaces being formed of a metallic material having a hardness of 350 and more than 350 in Vickers hardness system Hv and provided minute pores of not exceeding 30  $\mu$ m in major diameter and from 100 to 270 per measuring length of 2.5 mm in number;  
said number of minute pores being counted by scanning said sliding surface by means of a contact needle having a rounded tip of 2  $\mu$ m in radius being equipped with a surface roughness measuring instrument, drawing measured roughness in magnified curve longitudinality by 20,000



times and laterally by 100 times on a recording paper, drawing upper and lower peak count level lines in parallel to and apart by 0.25 mm in dimensions shown in the recording paper above and below the mean reference line in the magnified measured roughness curve on said recording paper and counting the number of pores assuming that there is one pore when said upper peak count level line intersects the magnified measured roughness curve at least once within two intersections between said lower peak count level line and said magnified measured roughness curve.

#### 4,416,459 COLLET CHUCK FOR SPLINED WORKPIECES

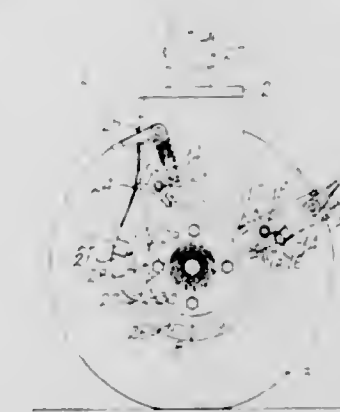
Longine V. Morawski, 1497 Boston Blvd., Detroit 48206, and Lawrence V. Morawski, 38255 Fairway Ct., Apt. 82C Mt. Clemens 48044, both of Mich.  
Filed Jun. 3, 1981, Ser. No. 270,146  
Int. Cl.<sup>3</sup> B23B 5/22  
U.S. Cl. 279—2 R 9 Claims



1. In combination, a chuck and a workpiece having a base diameter surface interrupted at regularly circumferentially spaced intervals by axially extending, radially projecting splines having radially facing surfaces, said chuck having a body, at least two collets supported on said body, each collet having a plurality of regularly circumferentially spaced fingers which extend axially forwardly on the chuck body and are radially resilient at their forward ends, each of said fingers having radially facing work-engaging surfaces at their forward ends, the fingers of the collets being interdigitally disposed circumferentially at their forward ends around a common circle so that the circumferentially adjacent work-engaging surfaces are associated with different collets, the circumferentially adjacent work-engaging surfaces being spaced apart

circumferentially a distance at least slightly greater than the circumferential extent of the radially facing surface of each spline on the workpiece and the number of collets being related to the number of splines on the workpiece so that, when a workpiece is telescopically engaged with the collet fingers, the work-engaging surfaces of at most one of the collets will register radially with the radially facing surfaces of the splines and operating means for shifting each of the collets to the work-engaging and work-releasing positions, said means being operative to shift one collet to the work-releasing position in the event that the work-engaging surfaces thereof are not displaced radially a distance sufficient to engage the base diameter surface of the splined workpiece when the collet is shifted to the work-engaging position.

4,416,460  
DRIVE MECHANISMS  
Lionel G. Morris, 17 Ferguson Ave., Myrtle Bank, State of South Australia, Australia  
Filed Apr. 2, 1981, Ser. No. 250,249  
Int. Cl.<sup>3</sup> B60K 9/00  
U.S. Cl. 280—3 4 Claims



2. A traction jockey wheel comprising a support frame, a ground engageable traction wheel supported by the support frame for traction about a substantially horizontal axis and steering about a substantially vertical axis, a ratchet wheel co-axially secured to the traction wheel, a spring loaded pawl adjustably supported by a manually operable lever arm which is pivotally co-axially supported with respect to the traction wheel, and effective to cause a ratchet drive with respect to the ratchet wheel in either of a selected traction rotational direction, and a spring loaded pawl adjustably supported by the supporting frame and effective by engagement against the ratchet wheel to impede motion of the ratchet wheel in either of the selected rotational traction directions, braking means pivotally supported by the support frame and including an interlocking tooth, spring means arranged to urge the tooth into an interlocking braking position with respect to the ratchet wheel, and inter-engaging cam means between braking means and the lever arm arranged so as to hold the tooth from an interlocking braking position only when the lever arm is in a selected operating range of positions.

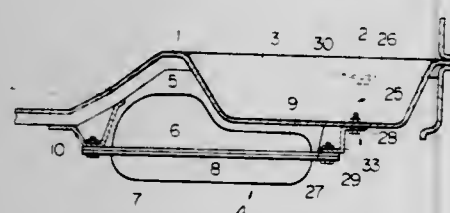
4,416,461  
FUEL STORAGE VESSEL SUPPORTING STRUCTURE  
Toshio Hayashi, and Isao Hayashi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Jan. 29, 1982, Ser. No. 343,928  
Claims priority, application Japan, Feb. 10, 1981, 56-19269  
Int. Cl.<sup>3</sup> B60K 15/08  
U.S. Cl. 280—5 A 2 Claims

1. A fuel storage vessel supporting structure for supporting a fuel storage vessel of an automotive vehicle having a fore-and-aft direction, the fuel storage vessel having front and rear



end portions and the vehicle having a vehicle body structure, comprising:

- a front bracket member rigidly interconnecting the vehicle body structure and the front end portion of said fuel storage vessel, and
- a rear bracket member comprising a pair of fixed end portions bent horizontally and fastened to the vehicle body structure, a front weir-shaped portion downwardly depending from the fixed end portions and fastened to the rear end portion of said fuel storage vessel, a rear weir-shaped portion extending rearwardly of the front weir-shaped portion and downwardly depending from the fixed end portions, the rear weir-shaped portion being shallower



in depth than the front weir-shaped portion and gradually merging at the fixed end portions, an intermediate portion connecting together the front end rear weir-shaped portions and convergingly tapered toward and terminating at the fixed end portions for forming a pair of stress raising portions which are ready to be deformable, and fastening means for fastening said rear weir-shaped portion and said vehicle body structure and forwardly escapable together with said vehicle body structure from said rear weir-shaped portion and interconnecting the vehicle body structure and the rear end portion of said fuel storage vessel and partially deformable to permit the fuel storage vessel to be retained stationary.

4,416,462

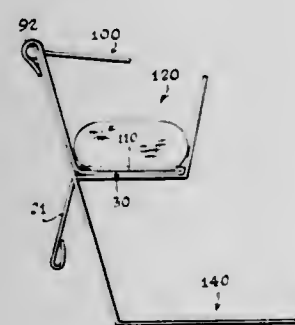
**REMOVEABLE CUSHION FOR A SHOPPING CART**

Judith D. Thompson, 723 Dresden Dr., Newport News, Va. 23601

Filed Apr. 15, 1982, Ser. No. 368,554  
Int. Cl.<sup>3</sup> A47D 1/10; A47C 4/30, 31/00

U.S. Cl. 280—33.99 B

10 Claims



1. In combination with a nesting shopping cart having a flat bottom, sloping sides, a raised handle portion at the rear of the cart, and a pivoted seat portion having leg holes adapted to receive a child's leg; a removable cushion device comprising: an elongated cushioned segment having a flap member projecting from its free end, an intermediate cushioned segment having smaller generally rectangular cushioned segments projecting from its sides, an end cushioned segment, and fastening means on said flap member and said elongated cushioned segment, which cooperate to releasably secure the removable cushion device to, and provide a protective covering for the handle portion of the shopping cart.

**BULK STORAGE CART**

William E. Marsh, Jr. deceased, late of New Braunfels, Tex., and Elizabeth A. Marsh, executrix, 36 Guada Cono, New Braunfels, Tex. 78130

Filed Nov. 6, 1981, Ser. No. 318,919  
Int. Cl.<sup>3</sup> B62B 1/10

U.S. Cl. 280—79.3

14 Claims



13. In combination with a bulk storage cart consisting of a base, opposing side walls, rear wall, and cross piece secured laterally to opposing upper side walls: a plurality of tubular members secured to at least said cross piece, a compression spring carried in each tubular member, forward limit stop means for said spring in each tubular member, spring compressing means associated with each spring, means associated with the foremost end of each tubular member to change the direction of travel of said cable, said cables and foot plate forming a gate for said cart.

4,416,464

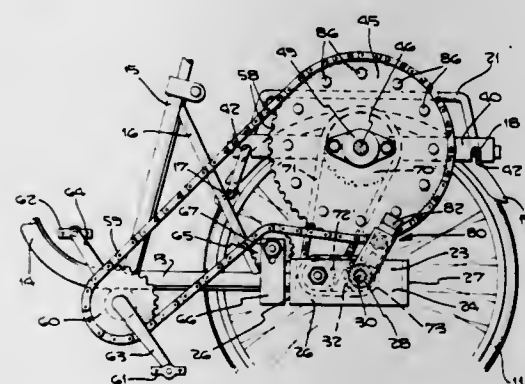
**SPRING ASSIST DRIVE FOR CYCLE**

Robert G. Mattox, 4846 Radford, North Hollywood, Calif. 91607

Filed Sep. 8, 1981, Ser. No. 299,809  
Int. Cl.<sup>3</sup> B62M 1/10

U.S. Cl. 280—215

6 Claims



1. A spring assist drive for a peddle operated vehicle of the cycle type which has a frame for a front steerable wheel and seat, a rear drive wheel assembly comprising a drive wheel sprocket with drive shaft, foot pedals on appropriate pedal arms and a power sprocket motivated by said pedals serving as parts of said vehicle of conventional structure and relationship, said spring assist comprising a spring cage on the frame, a spirally wound coil spring for said cage, said spring having an inner and an outer end, a spring power sprocket, a spring power shaft rotatably mounting said spring power sprocket on

said frame and a spring wind sprocket anchored to said cage at a location above and no further forward than said drive wheel sprocket, the location of the axis of rotation of said spring wind sprocket being spaced from the location of the axis of rotation of said drive wheel sprocket, said coil spring having the inner end fixed on said spring power shaft and the outer end attached to said cage adjacent the perimeter, an endless drive chain interconnecting said power sprocket with said spring wind sprocket, and a transfer chain means between said spring power sprocket and said drive wheel sprocket comprising a continuous permanent operating drive from said power sprocket whereby the energy built up in the spring has a continuously expendable auxiliary driving engagement with said drive wheel.

4,416,465

**CRASH RESISTANT MOTORCYCLE**

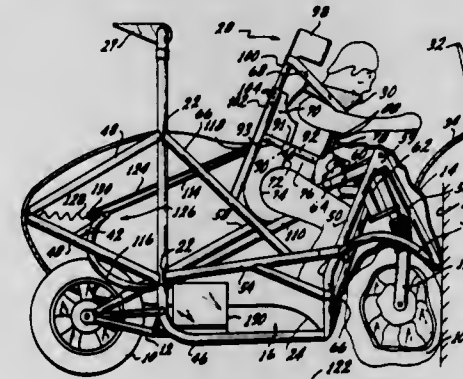
Tadeus Winecki, San Diego, Calif., assignor to Martha Winecki and Henry Winecki, both of Vancouver, Wash., a part interest

Division of Ser. No. 143,527, Apr. 24, 1980, Pat. No. 4,311,335.  
This application Dec. 8, 1980, Ser. No. 214,347

Int. Cl.<sup>3</sup> B62J 27/00

U.S. Cl. 280—290

3 Claims



1. In a motorcycle having two wheels in tandem, a frame interconnecting said wheels, a steering assembly for steering at least one wheel and a seat assembly for supporting at least one rider, the improvement wherein said seat assembly comprises: a body restraint to hold the rider in the seat; a shock absorber mounted rigidly to the motorcycle frame; an actuating cable extending from said shock absorber to the back of said seat; and a retraction system connected to the back of said seat urging said seat toward the normal position for use; whereby said seat is movable forwardly in response to inertial forces upon frontal impact between the motorcycle and another object, with said shock absorber absorbing impact energy, with said retraction system returning said seat to approximately the original position once impact energy has been absorbed.

4,416,466

**TRAILER HITCH GUIDE**

W. Sidney Park, 513 Morningside Dr., Louisville, Ky. 40206

Filed May 5, 1981, Ser. No. 260,754

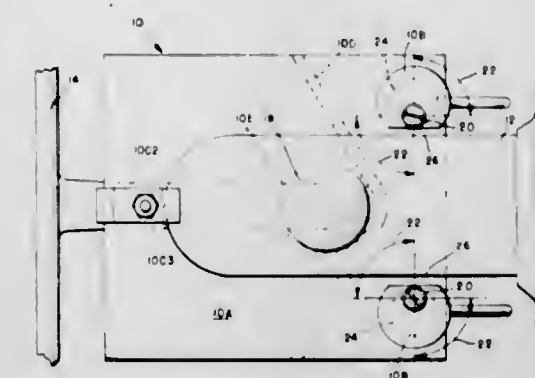
Int. Cl.<sup>3</sup> B60D 1/06

U.S. Cl. 280—477

4 Claims

3. A trailer hitch guide for guiding a towing ball on a towing vehicle into position with respect to a receiving means on a trailer tongue of a towed vehicle, comprising: means for securing said guide on the trailer tongue of the towed vehicle; and means for guiding the towing ball into position with respect to the trailer tongue whereby the towing ball is in alignment with the receiving means of the trailer tongue; said securing means comprising stop means adjustably secured to said hitch guide and engageable with the end-

most portion of the trailer tongue for longitudinally positioning said hitch guide on the tongue and for preventing



longitudinal movement of said guide with respect to the tongue.

4,416,467

**TOWING COUPLINGS**

Harry S. Bradley, Bradford, England, assignor to H. & K. Bradley (Trailer Equipment) Limited, Bingley, England

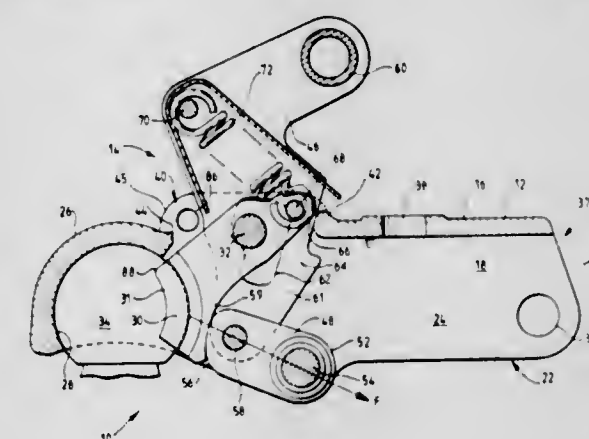
Filed Aug. 31, 1981, Ser. No. 298,100

Claims priority, application United Kingdom, Sep. 6, 1980, 8028862

Int. Cl.<sup>3</sup> B60D 1/06

U.S. Cl. 280—512

22 Claims



1. A towing coupling for a trailer vehicle comprising: a fixed part and a moveable keeper, which together are adapted to clamp on a tow ball when the keeper is in a locking position, but to release the tow ball when the keeper is in an unlocking position; a cam engaged with the keeper; single spring means urging the keeper away from the locking position and into engagement with the cam and also urging the cam in the direction of motion which causes it to apply a force to the keeper urging the keeper towards the locking position; and lever means mechanically linked to the cam for moving the cam against the loading of the single spring means to allow the keeper to move away from the locking position.

4,416,468

**PASSIVE SAFETY BELT SYSTEMS**

Douglas J. Cunningham, Lutterworth, England, assignor to Britax (Wingard) Limited, United Kingdom

Filed Apr. 22, 1981, Ser. No. 256,477

Claims priority, application United Kingdom, Apr. 30, 1980, 8014199

Int. Cl.<sup>3</sup> B60P 7/04

U.S. Cl. 280—802

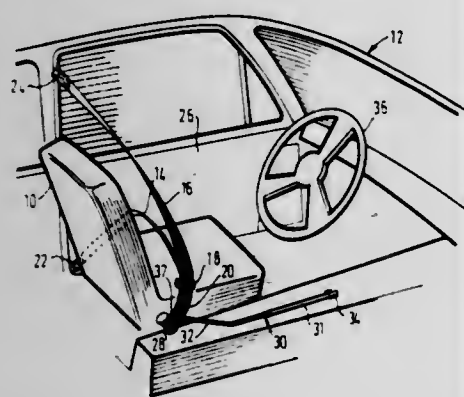
5 Claims

1. A passive safety belt system in combination with a vehicle body having a front-hinged door and a seat located adjacent to said door, the system comprising:



a shoulder strap, a lap strap and a common strap interconnected to form a three point safety belt, the free ends of the shoulder and lap straps being connected to the rear end of the door in proximity to the top and bottom corners thereof and the free end of the common strap being guided, at a location inboard of and adjacent to the bottom of the back of the seat, on to an inertia reel;

a rigid arm formed in two relatively movable sections and pivotally mounted for angular movement about a pivot axis adjacent to the front inboard corner of the bottom of



the seat so that the free end of the arm is movable between a first position adjacent to the location at which the common strap is guided on to the inertia reel and a second position in front of and spaced from the chest of the occupant of the seat; and

means for coupling the free end of the arm to the safety belt; the inboard end of the pivot axis, relative to the vehicle body, being above and in front of the outboard end thereof, so that, as the door is opened, the belt moves the arm from the first position to the second position and the belt is moved forwardly away from the occupant.

4,416,469

**PASSIVE SAFETY BELT SYSTEM**

Douglas J. Cunningham, Lutterworth, and George G. Sanders, Polesworth, both of England, assignors to Britax (Wingard) Limited, Birmingham, England

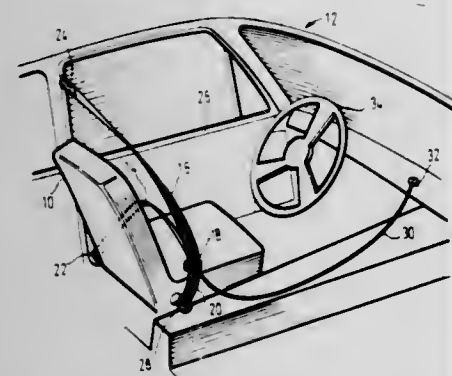
Filed Apr. 22, 1981, Ser. No. 256,530

Claims priority, application United Kingdom, Apr. 30, 1980, 8014158; May 13, 1980, 8015857; Sep. 12, 1980, 8029601; Oct. 8, 1980, 8032288

Int. Cl.<sup>3</sup> B60K 21/10

U.S. Cl. 280—804

8 Claims



1. For use in a motor vehicle having a steering wheel, a fascia forward of the steering wheel and a seat located adjacent to a front-hinged door, a passive safety belt system comprising: a shoulder strap, a lap strap and a common strap interconnected to form a three point safety belt;

anchorage means for the free end of the shoulder strap connected to the door in proximity to the top rear corner thereof;

anchorage means for the free end of the lap strap connected to the door in proximity to the bottom rear corner thereof;

anchorage means for the free end of the common strap incorporating an inertia reel and connected to a location on the vehicle inboard of, and adjacent to the bottom of the back of, the seat; and

puller means interconnecting a point on the safety belt which is inboard of the seat when the door is closed with a point on the vehicle which is forward of the seat in front of and above the normal position of knees of an occupant of the seat, said last mentioned point being forward of the steering wheel and closely adjacent to the fascia when the door is opened, so that, the force applied to the safety belt by the door, when it is opened, causes the puller means to apply a resilient force to the shoulder strap thereby to displace the junction between the lap, shoulder and common straps out of the plane containing said three anchorage means in a direction away from the seat.

4,416,470

**DEVICE FOR OBTAINING ACCURATE REGISTRATION OF HANDWRITTEN IMPRESSIONS ON CONTINUOUS BUSINESS FORM SETS**

Siegfried Beck, Renningen, and Philipp Drescher, Stuttgart, both of Fed. Rep. of Germany, assignors to Drescher GmbH & Co. KG, Rutesheim, Fed. Rep. of Germany

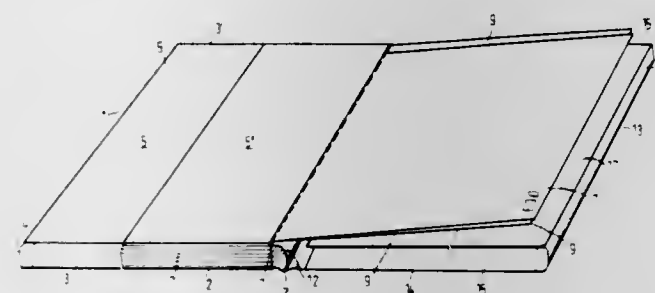
Filed Dec. 18, 1981, Ser. No. 332,322

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049464

Int. Cl.<sup>3</sup> B41L 5/02; B42D 3/18, 19/00

U.S. Cl. 281—7

12 Claims



1. A device for obtaining accurate registration of handwritten impressions on continuous business form sets, the latter being separable into individual form sets by means of longitudinally spaced transverse perforations that also permit zig-zag folding of the form sets into a stack, the individual form sets having predetermined planar dimensions, the device comprising:

receiving means for receiving a zig-zag folded stack of the continuous business form sets, said receiving means being a receiving pocket at least partially surrounding the zig-zag folded stack, said pocket having an opening facing in the direction in which the continuous form sets are pulled therefrom;

said pocket including: a base plate, a back wall connected to the base plate, mutually adjacent side walls also connected to said base plate, and a cover plate parallel to said base plate, said cover plate being connected to said back wall and said side walls to conjointly define therewith the pocket space for receiving the zig-zag folded stack therein;

said cover plate including a rear portion extending over only a part of said base plate, said side walls having respective edges facing away from said back wall, said wall edges, said cover plate and said base plate conjointly defining said opening, said pocket also including a flap-like front portion pivotally connected to said rear portion at said opening so as to extend in the direction in which the continuous business form sets are pulled from said pocket; and

registration means for registering and maintaining the form

sheets of a given form set in a predetermined spaced relationship to each other, said registration means including: a registration plate defining a writing surface whereon the form set is placed to receive the handwritten entry, and connection means for movably connecting said plate to said pocket; and,

said connecting means being an articulating hinge-like joint connecting said registration plate to said pocket so as to permit pivoted translation of said registration plate into and out of a position parallel to said base plate;

said registration plate being made of a stiff material and having substantially the same planar dimensions as an individual form set, said registration plate including an outer edge spaced away from said articulating hinge-like joint and said front portion too having an outer edge spaced away from the location whereat the same is connected to said rear portion, said front portion outer edge and said registration plate outer edge being parallel to each other.

4,416,471

**COLOR-DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SHEET**

Noboru Yamato; Akira Hasegawa, and Ippai Shimizu, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,731

Claims priority, application Japan, Nov. 12, 1980, 55-158215

Int. Cl.<sup>3</sup> B41M 5/22

U.S. Cl. 282—27.5

16 Claims

1. Color-developing sheet for a pressure sensitive recording sheet having a color-developing layer comprising an organic electronic acceptive color developing agent, calcium carbonate and acrylamide-modified polyvinylalcohol having an average degree of polymerization of 600 to 1700 and containing 1-30 mol% of acrylamide.

4,416,472

**HOLDDOWN AND PACKOFF APPARATUS**

John H. Fowler, and David L. Gruller, both of Houston, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 22, 1980, Ser. No. 219,323

Int. Cl.<sup>3</sup> F16L 35/00

U.S. Cl. 285—3

20 Claims



1. A well apparatus for preventing axial movement of a hanger disposed within a head, the head having a bore therethrough and there being an annulus between the hanger and head, and for sealing the annulus between the hanger and head, the hanger having a shoulder thereon and the head having a seat in the bore, the shoulder being supported by the seat, and

the head having a holddown groove in the wall of the bore spaced above the seat, comprising:

an expandable ring disposed on a surface of the shoulder on the hanger adjacent the holddown groove in the bore of the head for expanding into holddown engagement with the holddown groove, said ring having a tapered surface;

a locking ring having first connection means connected to the hanger and a tapered surface shaped for camming engagement with said tapered surface of said expandable ring for camming said expandable ring radially outwardly into holddown engagement with the holddown groove when said first connection means is made up;

releasable actuation means for actuating said locking ring into camming engagement with said expandable ring whereby said expandable ring engages the holddown groove to prevent axial movement of the hanger within the head, said actuation means including a body having second connection means connected to the hanger;

a member disposed on said body and engaging said locking ring for transmitting force from said body to said locking ring for making up said first connection means;

cooperable means on said body, member and hanger for disconnecting said second connection means and effecting release of said actuation means as said first connection means is made up, said cooperable means including said first and second connection means being oppositely-handed threaded connections and an axial lost motion connection between said body and said member;

first sealing means disposed in the annulus between the hanger and head above said expandable ring for sealing engagement with the hanger;

second sealing means independent of said first sealing means disposed in the annulus between the hanger and head for sealing engagement with the bore of the head; and

compression means having third connection means for connecting to the hanger upon disconnection of said second connection means for compressing said first and second sealing means in series.

4,416,473

**FLEXIBLE JOINT FOR CONNECTION OF TWO PIPES**

Jacques E. Lamy, Fontenay-aux-Roses; Dominique Michel, Paris, and Francisco D. M. Serrano, Issy-les-Moulineaux, all of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

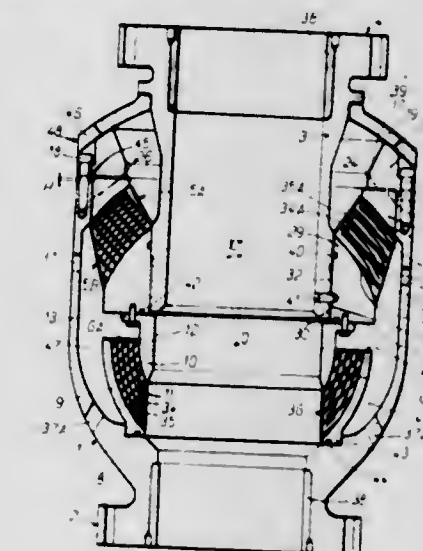
Filed Jun. 19, 1981, Ser. No. 275,394

Claims priority, application France, Jul. 11, 1980, 80 15454

Int. Cl.<sup>3</sup> F16L 27/10

U.S. Cl. 285—41

8 Claims



1. A flexible joint for connecting together a first pipe with a second pipe, comprising:

a cup-shaped piece having an upper annular edge forming an



upper cylindrical opening and also having a lower flange forming a lower axial orifice for connection with the first pipe;

a tubular piece for connection with the second pipe, said tubular piece being coaxial with the cup-shaped piece and being arranged partly therein;

a first and a second flexible spherical ring, each including a stack of alternating layers of spherical metal rings and elastomers, arranged between the cup-shaped piece and the tubular piece on opposite sides of a center of oscillation, said first and second flexible spherical rings having their concave surfaces directed concentrically towards the center of oscillation;

first mounting means for connecting the first and second flexible spherical rings to the cup-shaped piece;

second mounting means, positioned between the first and second flexible spherical rings, for interconnecting said first and second flexible spherical rings together;

means for connecting the tubular piece to the second mounting means;

an upper flange being attached to the upper annular edge forming the upper cylindrical opening of the cup-shaped piece and having a spherical upper surface; and

a spherical collar being supported by the tubular piece and having a spherical inner concave surface for riding in a complementary cooperating manner on the spherical upper surface of the upper flange above the upper annular edge forming the upper cylindrical opening of the cup-shaped piece;

whereby the tubular piece is able to oscillate at an angle of about  $\pm 10^\circ$  with respect to its vertical axis.

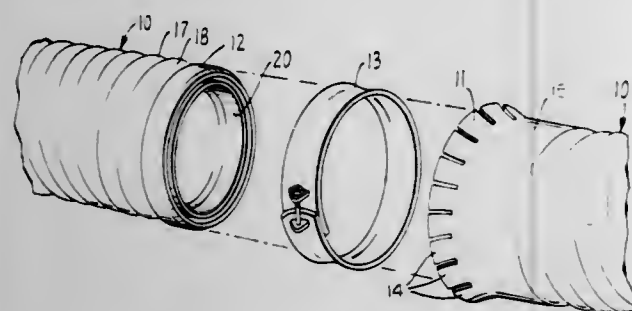
4,416,474

## PIPE COUPLING

Robert F. Miller, 3368 Las Huertas Rd., Lafayette, Calif. 94549, and Paul K. Davis, 1121 Bay St., Alameda, Calif. 94501  
Filed Jan. 12, 1981, Ser. No. 224,080  
Int. Cl.<sup>3</sup> F16L 59/16

U.S. Cl. 285—47

10 Claims



1. A section of corrugated pipe having complementary bell and spigot end portions, and more particularly comprising:

a bell end portion longitudinally segmented to form a plurality of integrally formed flexible side wall strips connected to and projecting from a substantially cylindrical shroud, each of said side wall strips terminating in a curved end; and

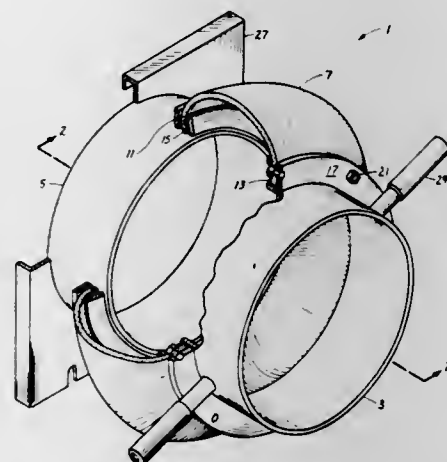
a spigot end portion receivable within said bell end portion, the exterior surface thereof defining a pair of axially spaced annular recesses and terminating in a cylindrical extension, one recess being located for radial engagement by the side wall strips of another section when connected therewith, the other recess being located axially between said one recess and said cylindrical extension for receiving a resilient O ring seal that contacts with the interior surface of the shroud of a bell end portion of another pipe section.

4,416,475

## FLEXIBLE COUPLING

Ralph C. Stacey, Greenfield Center, N.Y., assignor to Tarrant Manufacturing Company, Saratoga Springs, N.Y.  
Filed Dec. 9, 1982, Ser. No. 448,242  
Int. Cl.<sup>3</sup> F16L 27/10, 55/00, 27/00; A47L 9/24  
U.S. Cl. 285—229

8 Claims



1. A flexible coupling for flow of effluent therethrough, said flexible coupling comprising two collars and an annular flexible member, each of said collars having a longitudinal axis, one of said collars having means carrying said annular flexible member in fixed relationship therewith and the other of said collars having means freely mounting in retentive and sealing relationship said annular flexible member to allow 360° relative rotation or swivel of said collars and, with respect to said longitudinal axes of said collars, to allow relative alignment, misalignment and offset disposition, and relative disposition of said longitudinal axes of said collars at different angles to each other, and said flexible coupling having self-cleaning means to prevent such effluent from causing said flexible coupling to clog up and malfunction.

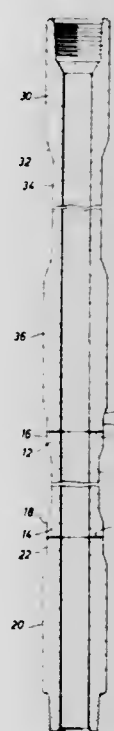
4,416,476

INTERMEDIATE WEIGHT DRILL STEM MEMBER  
William R. Garrett, Conroe, Tex., assignor to Oncor Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 188,027, Sep. 17, 1980, abandoned. This application Nov. 21, 1980, Ser. No. 208,987  
Int. Cl.<sup>3</sup> F16L 15/00

U.S. Cl. 285—286

14 Claims



1. A drill stem member, comprising

a tubular body being sufficiently rigid for operating under compression while adding weight to the drill stem near the drill bit and being sufficiently flexible for negotiating commonly encountered borehole dog-legs, said body having a wall thickness of at least 0.620 inches, said body having upper and lower upset ends,

a bottom tool joint having a threaded connection lower end for connection to an adjoining drill stem member, and an upper end with a wall dimension equal to said lower upset of said body,

a first weld joining said body lower upset end and said upper end of said bottom tool joint,

a top tool joint having

a threaded connection upper end for connection to an adjoining drill stem member,

a lower end with a wall dimension equal to said top upset end of said body, and

a reduced external diameter intermediate length between its threaded upper end and its lower end to provide a lifting surface above said intermediate length, and

a second weld joining said body upset end and said lower end of said top tool joint.

4,416,477

## CHILD-PROOF LATCH

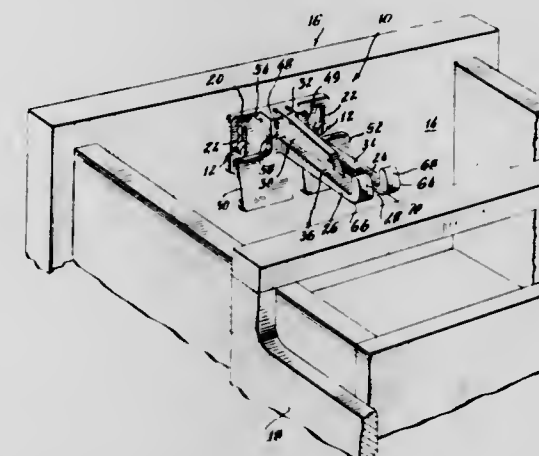
Walter Bialobrzski, 68 Summerwood Dr., Wallingford, Conn. 06492, and Paul A. Sperry, 376 State St., North Haven, Conn. 06473

Filed Nov. 2, 1981, Ser. No. 317,010

Int. Cl.<sup>3</sup> E05C 19/06

U.S. Cl. 292—19

6 Claims



1. A child-proof latch for attachment to a closure panel of a drawer, cabinet or the like, the closure panel being moveable with respect to a frame or the like, the latch comprising:

a support base for mounting on said closure panel;

a pair of elongate restraining arms projecting outwardly with respect to said base in generally parallel relation to each other and being separated along their length by a space, each said restraining arm having an end portion including means for abutting said frame, said restraining arms being biased toward said frame to provide for engagement of said frame by both said abutting said panel with respect to said frame to a predetermined distance, each said restraining arm being movable independently of the other restraining arm against said bias away from said frame to disengage said abutting means to permit further opening of said panel only upon simultaneous movement of both restraining arms; and

a wall projecting from said base in said space between said restraining arms, said wall having a length sufficient to span the said predetermined distance between said panel and said frame, said wall including an upper surface located above said restraining arms, said wall for preventing single finger simultaneous movement of both said restrain-

ing arms by imposition of a downward force on said restraining arms.

4,416,478

## TAMPER DETERENT SEAL PROVIDING INDICATION OF TAMPERING FOR WATTHOUR METERS

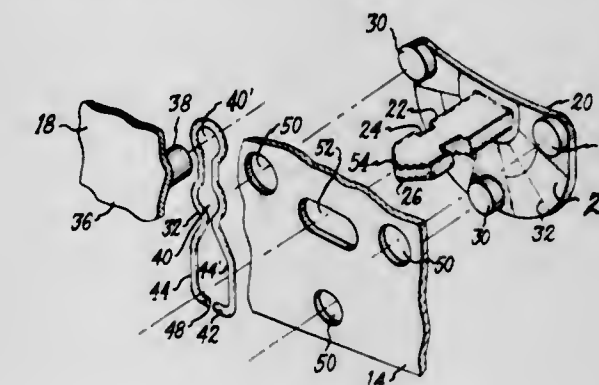
Robert S. Canney, Berwick, Me., assignor to General Electric Co., Somersworth, N.H.

Filed Nov. 10, 1980, Ser. No. 205,466

Int. Cl.<sup>3</sup> B65D 33/34

U.S. Cl. 292—307 R

9 Claims



1. The combination comprising:

(a) a seal constructed of a frangible material forming a replaceable element, said seal including a stem having a notch formed in one end thereof and having, at its other end, a head capable of being readily fragmented when placed under stress;

(b) a kilowatt hour meter including a clip configured to receive the stem of said seal and engage the notch in the one end of the stem of said seal; and

(c) a meter box for mounting said kilowatt hour meter, said meter box having a removable cover configured to press against a portion of said kilowatt hour meter when said cover is installed on said meter box to retain said kilowatt hour meter in said meter box, said cover having an opening formed in a portion thereof which is in alignment with said clip on said kilowatt hour meter, whereby, when the stem of said seal is inserted through the opening the notch on the stem of said seal lockingly engages said clip, to secure said cover to said meter box and provide a seal which, when placed under stress, fragmentizes to provide a visual indication of at least attempted unauthorized tampering to gain access to the inside of said meter box.

4,416,479

## ATTACHABLE CARRIER HANDLE AND PICK-UP APPARATUS

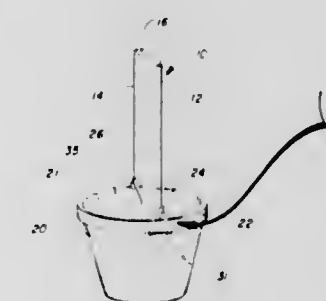
Camille J. Rocquin, 1410 Demosthenes St., Metairie, La. 70005

Filed Aug. 26, 1982, Ser. No. 411,915

Int. Cl.<sup>3</sup> A01K 29/00

U.S. Cl. 294—1 B

2 Claims



1. A disposable pick-up apparatus having removable handle means, comprising:

a. a container portion having a continuous side wall, and a bottom portion integrally attached to said side wall, to-



gether defining a container space therein; said side wall further comprising an upper annular shoulder portion therearound;

b. removable handle means, comprising:

- i. a substantially horizontally disposed handle portion having cushion means therearound for grasping; and
- ii. first and second downwardly depending extender portions connectable on their upper ends to said horizontal handle portion, and on their lower ends, each of said extender portions further comprising inner and outer flexing members, having triangulated brackets wherein the base of said triangulated bracket engages the bottom edge of said shoulder portion of said container, and said inner flexing member engages the inner wall of said container for maintaining said shoulder portion at rigid engagement therebetween; wherein upon outward flexing, said flexing members disengage said shoulder portion of said container; and

c. pick-up means, for retrieving items to be picked up, said means further comprising at least a first moisture-proof surface, and a second adhering textured surface for making contact with the item to be picked up.

4,416,480

## PNEUMATIC RELEASE FOR LOAD HOOK

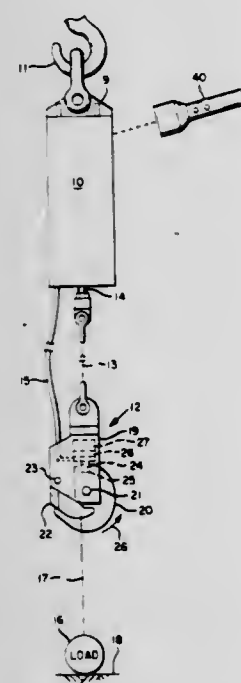
Jack M. Moody, Milwaukie, Oreg., assignor to Cranston Machinery Co., Inc., Oak Grove, Oreg.

Filed Sep. 8, 1981, Ser. No. 299,810

Int. Cl.<sup>3</sup> B66C 1/38

U.S. Cl. 294—83 R

6 Claims



1. A pneumatic release device for a load hook which is releasable by pneumatic pressure, comprising a compressed air reservoir connected through a valve to said load hook to release a load from said hook, an air pump cylinder and piston operable by the application of said load to the hook to move said piston in an air pumping stroke to pump air into said reservoir, and means for reversing said piston stroke when load tension is removed from said hook, said device comprising a self contained power and control module containing said air pump cylinder and piston, air reservoir and valve, said load hook being connected to a piston rod in said piston, and an air pressure line extending from said module to said load hook.

4,416,481

## BOTTLE CARRIER

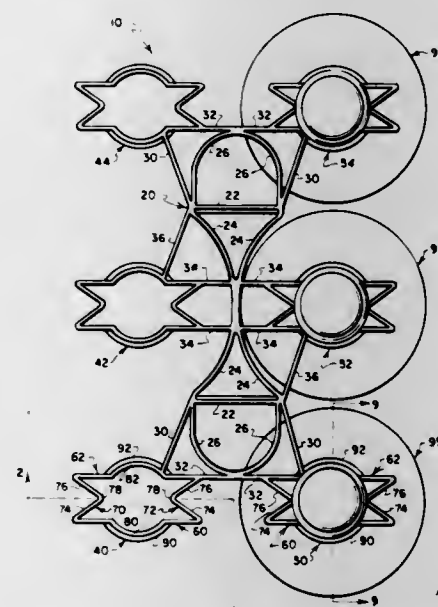
Myron E. Ullman, Canfield, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio

Filed Apr. 1, 1981, Ser. No. 250,085

Int. Cl.<sup>3</sup> B65D 71/00

U.S. Cl. 294—87.2

14 Claims



1. A one-piece bottle carrier made of relatively rigid plastics material and comprising:

- (a) a plurality of bottle-neck-receiving formations each including an endless band defining a neck-receiving opening;
- (b) each band having at least one W-shaped portion formed from two elongate inner leg portions each having first and second opposed end regions, the inner leg portions being interconnected at their first end regions and forming a "V" shaped projection which projects in a direction toward the center of its associated neck-receiving opening, and two outer leg portions each of which is connected to a separate one of the inner leg portions at the second end regions thereof, the configuration of each of the W-shaped portions serving to permit parts of its associated band to move relatively toward and away from each other (i) to enable cap-carrying portions of a bottle neck to be inserted through the opening; and (ii) to grip bottle neck portions inserted through the opening;
- (c) framework means for interconnecting the spaced neck-receiving formations to support the neck-receiving formations in a predetermined array; and
- (d) the V-shaped projections being configured to engage neck portions of bottles inserted through associated ones of the neck-receiving openings, and to cooperate with other parts of the endless bands to securely releasably grip such bottle neck portions.

4,416,482

## VEHICLE GATE ASSEMBLY

Charles C. Patterson, Waco, Tex., assignor to Willie Mae Patterson, Waco, Tex.

Filed Jan. 2, 1981, Ser. No. 222,247

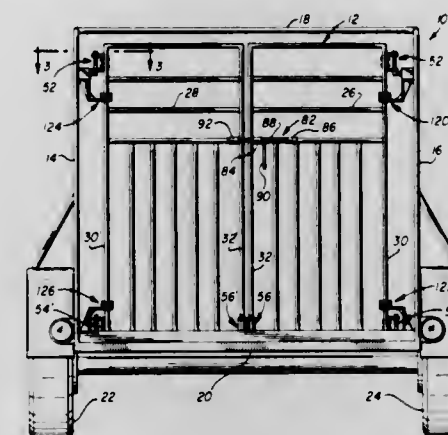
Int. Cl.<sup>3</sup> B60P 3/00

U.S. Cl. 296—3

16 Claims

1. A gate assembly used with a vehicle which has a cargo area defined by at least two sides extending substantially parallel to one another, comprising: a gate member connected to the vehicle within the cargo area and moveably disposed between an opened position to allow access into the cargo area and a closed position to limit access into the cargo area, said gate member having a body with first and second sides; guiding means connected to the vehicle for restricting movement of the first side of said gate member to a direction line substan-

tially parallel to the parallel sides of the vehicle and for restricting movement of the second side of said gate member to a direction line substantially perpendicular to the parallel sides of the vehicle when said gate member is being moved between



the opened and closed positions; and locking means adapted to maintain the first and second sides of said gate member in a fixed transverse relation to the parallel sides of the vehicle when said gate member is in the closed position.

4,416,483

## ARRANGEMENT FOR STORING TOOLS AND INSTRUMENTS IN POWER VEHICLES

Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Autohaus Lorinser G.m.b.H., & Co., Waiblingen, Fed. Rep. of Germany

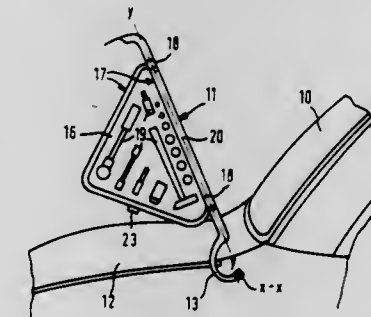
Filed Jul. 15, 1981, Ser. No. 283,665

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101161

Int. Cl.<sup>3</sup> B60R 11/06

U.S. Cl. 296—37.1

27 Claims



1. An arrangement for storing objects, particularly tools and instruments, in a trunk of a power vehicle, the trunk having a trunk cover turnable about a turning axis for opening and closing thereof, said arrangement comprising a wall element arranged at an inner surface of the trunk cover and pivotable about a pivot axis relative to the trunk cover between a closed position in which it forms a closed compartment and an open position in which the compartment is opened, wherein the pivot axis is inclined relative to the turning axis of said trunk cover so that in the open position said wall element is inclined toward a side of the vehicle and thereby facilitates access to the tools and instruments; and means for pivotally mounting said wall element at one side of said inner surface of said trunk cover.

4,416,484

## FLAT BED SIDE ASSEMBLY

David O'Neill, Billings, Mont., assignor to Richard P. O'Neill, Miles City, Mont., a part interest

Filed Mar. 18, 1982, Ser. No. 359,264

Int. Cl.<sup>3</sup> B60P 1/64

U.S. Cl. 296—43

11 Claims

1. A removable side assembly for a flat bed of a truck or trailer, said side assembly including a barrier portion, a socket

portion, a support portion and a holder portion; said barrier portion including a plurality of generally rectangular panels, said panels being disposed generally vertically in an end to end relationship around the periphery of said flat bed; said socket portion including a plurality of pocket sections, said pocket sections being arranged around the periphery of said flat bed adjacent the lower edges of said panels, each of said pocket sections extending downwardly from a plane through said flat bed; said support portion including a plurality of elongated bar members having cross-sectional configurations substantially the same as those of said pocket sections, each bar member having its lower end disposed within one of said pocket sections, said bar members extending upwardly from said pocket sections generally vertically; said holder portion including a plurality of bracket members with at least one bracket member engaging each of said bar members, each bracket member including a plate section, a strip section having its ends affixed to said plate section and being bent into a configuration to



provide an opening having substantially the same cross-sectional configuration as that of said bar members for separable engagement therewith, a hook member extending from one end of said plate section, said hook member including a connector section extending substantially perpendicularly from a transverse edge of said plate section, said connector section extending from said plate section a distance substantially equal to the thickness of a barrier panel, a projecting section extending from an edge of said connector section remote from said plate section, said projecting section extending from said connector section in the same direction as said plate section and substantially parallel thereto; whereby said barrier panels are positioned against said bar members with the lower edges thereof resting on said flat bed and the upper edges of said barrier panels being retained between said plate section, said connector section and said projecting section of said holder portions to provide a continuous side assembly around the periphery of said flat bed.

4,416,485

## MULTIPLE USE: PONTOON BRIDGE SECTION

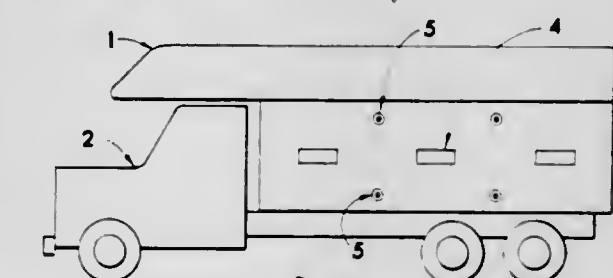
Alvin L. Long, Civilian Gen. Del., Beale A.F.B., Calif. 95903

Filed Sep. 2, 1981, Ser. No. 298,902

Int. Cl.<sup>3</sup> B62D 25/00, 29/00, 33/00

U.S. Cl. 296—188

3 Claims



1. A protective cover for a military vehicle, said vehicle having a cargo box with at least four apertures for receiving cargo support structure, said protective cover comprising: a support structure of metal framework, said support structure having two longitudinally extending sides, two later-



ally extending sides, and at least four depending legs, said legs being received in said cargo box apertures;  
 a recess in each of said longitudinally extending sides of said support structure;  
 at least two bullet resisting pontoon decking panels, said panels being fixed to said longitudinally extending sides of said support structure and to said vehicle cargo box, said panels having gun ports formed therein and a tongue formed thereon, said tongue extending upwardly and adjacent said recess when said panels are fixed to said longitudinally extending sides, and said cargo box;  
 a pontoon bridge section, said pontoon bridge section having a pair of gunwales, each said gunwale having a groove formed therein, said pontoon bridge section being placed upon said support structure such that each gunwale is received in one of said recesses and such that each panel tongue is received in one of said grooves.

4,416,486

## VEHICLE CAB

James B. McNaught, St. Germaine-en Laye, and Guy E. P. Colotte, Bretigny, both of France, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles  
 PCT No. PCT/EP80/00076, § 371 Date May 1, 1981, § 102(e) Date Apr. 3, 1981, PCT Pub. No. WO81/00541, PCT Pub. Date Mar. 5, 1981

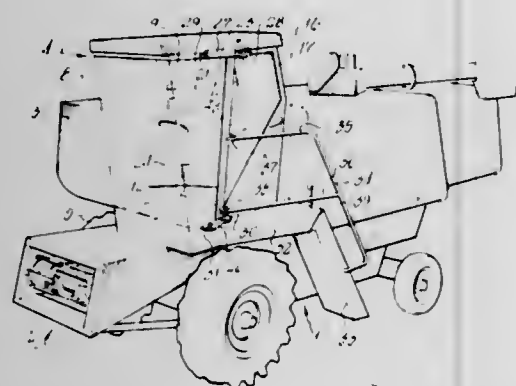
PCT Filed Aug. 9, 1980, Ser. No. 253,744

Claims priority, application United Kingdom, Aug. 31, 1979, 7930255

Int. Cl.<sup>3</sup> B62D 33/06

U.S. Cl. 296—190

9 Claims



1. A cab for an agricultural, industrial or construction vehicle having a front wall, rear wall, side walls and a driver access door; hinge assemblies connected between a forward upright edge of the door and an adjacent side wall so that the door swings about an upright hinge axis (X-X) between a closed and fully open position; an entry platform that is provided alongside the doorway; steps provided at the rear of the platform for access from the ground; and stop means that prevents the door opening beyond the outer edge of the platform and thereby defines the fully open position of the door; the cab being adapted so that in the closed position the door is angled from said adjacent side wall (9) towards the rear wall (20, 22) with its outer surface facing both sideways and rearwards, and in the fully open position defined by said stop means (34) is angled from said adjacent side wall (9) sideways and rearwards over the full width of the platform (32) with its inner surface facing rearwards; and said hinge axis (X-X) being orientated relative to the plane of the door (17) so that the upper edge of the door (17) moves outwards further than the lower edge of the door (17) as the door is opened and the door is thereby inclined outwards from bottom to top in the fully open position.

# 4,416,487 SLIDING ROOF STRUCTURE FOR AUTOMOBILE BODIES

Yasunari Hirotsu, and Yoshimitsu Tanaka, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan  
 Filed Aug. 13, 1981, Ser. No. 292,720

Claims priority, application Japan, Aug. 15, 1980, 55-112817  
 Int. Cl.<sup>3</sup> B60J 7/10

U.S. Cl. 296—222

8 Claims

1. A sliding roof structure for an automobile body including a roof panel formed with a roof opening defined by a downwardly bent peripheral flange, a roof side rail formed at each side of the roof panel, a reinforcement member of an inverted channel shape having a downwardly extending inboard flange, a substantially horizontal top wall, and a downwardly extending outboard flange having a lower end contiguous with an outwardly extending horizontal flange, said reinforcement member being attached at said inboard flange with said peripheral flange of the roof panel, a sliding roof carrying frame for movably carrying a sliding roof and having an opening corresponding to the opening of the roof panel and disposed beneath the roof panel, bracket means secured to said roof side rail, means for connecting said sliding roof carrying frame to said bracket means, downwardly projecting locating means provided on said reinforcement member at the horizontal flange for cooperating with said sliding roof carrying frame for locating the latter.

4,416,488

## ARM REST FOR A VEHICLE SEAT

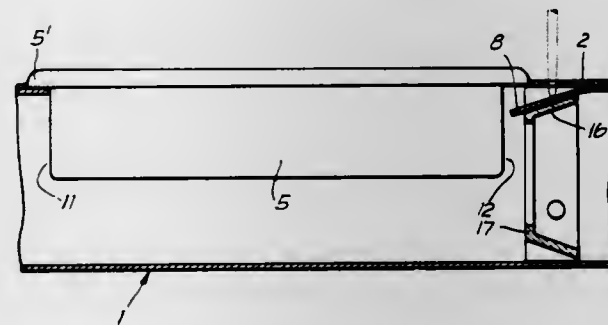
Helmut Wall, Kirchheim-Teck, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH, Fed. Rep. of Germany  
 Filed Mar. 17, 1981, Ser. No. 244,675

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 8009110[U]

Int. Cl.<sup>3</sup> A47C 7/54

U.S. Cl. 297—411

4 Claims



1. Arm rest for a vehicle seat, such as an airplane passenger seat or a bus seat, comprising:  
 a hollow support including an opening in one side wall;  
 a control device which is constructed to be received within said opening of said side wall of said support;  
 said control device having extended portions disposed on opposite sides thereof which engage the narrow edges of said opening and extend beyond said opening;  
 a flexible tongue connected to said side wall, the free end of said tongue extending toward one side of said control device to prevent lateral shifting of said control device

when in a locking position, said tongue being deflected out of said locking position into a release position where shifting of said control device toward said tongue is allowed;  
 a stop means for limiting the degree to which said tongue can be deflected into the interior of said support;  
 a stiffening body arranged within said support, said stop means being formed by a surface of said stiffening body; said surface being canted to correspond to the maximum deflection position of said tongue;  
 whereby said extended portion of said control device opposite said tongue can be disengaged from the edge of said opening.

4,416,489

## CHISEL FOR A CRUST BREAKING FACILITY

Thomas Hagenmacher, Gampel; Edwin Gut, Steg; Hans Friedli, Steg, and Gottfried Maugweiler, Steg, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

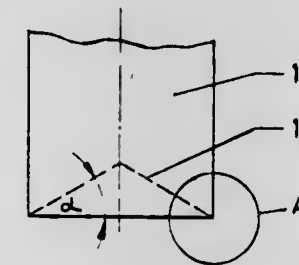
Continuation of Ser. No. 184,480, Sep. 5, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 421,895

Claims priority, application Switzerland, Sep. 10, 1979, 8150/79

Int. Cl.<sup>3</sup> C25C 3/14

U.S. Cl. 299—94

12 Claims



1. Breaking device for a crust breaking facility for breaking the solidified crust of solid electrolyte on an electrolytic cell for the production of aluminum which comprises a chisel having a bottom face and edge regions thereof, wherein at least parts of the edge regions of the chisel project beyond the other regions of said chisel and are shaped as cutting edges to form a recess in said bottom face, including inclined portions extending inwardly from said edge portions such that the bottom face of the chisel does not feature any areas which are inclined outwards which would create outwardly acting forces concurrent with pushing the chisel through the crust, thereby the force required for breaking through the crust is considerably reduced, the lateral forces are directed inwardly and a circular hole in the crust is developed.

4,416,490

## PRESSURE CONTROL VALVE FOR A HYDRAULIC BRAKE SYSTEM

Hans D. Reinartz, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.  
 60606

Filed Nov. 3, 1981, Ser. No. 317,718

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3046781

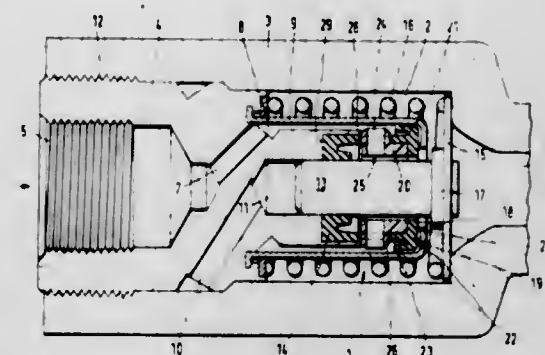
Int. Cl.<sup>3</sup> B60T 8/26, 11/34

U.S. Cl. 303—6 C

15 Claims

1. A pressure control valve for a hydraulic brake system comprising:  
 a control piston having one end thereof guided through an annular seal and in a bore of said housing connected to atmosphere; said annular seal being in abutment with a step in said housing;  
 a closure member carried by said piston adjacent the other end thereof;  
 a support plate for engagement with a valve spring carried

by said piston between said closure member and said other end of said piston;  
 an annular body encircling said piston disposed adjacent said annular seal, said annular body providing a valve seat adjacent said closure member;  
 a tubular body surrounding said annular body and fastened to said housing;



a return channel disposed between said annular body and said tubular body having a check valve therein opening in the direction from an outlet chamber to an inlet chamber; and  
 radial channels provided in a selected one of said annular body and a first clearance between said annular body and said annular seal.

4,416,491

## PRESSURE CONTROLLING ARRANGEMENT FOR USE IN A VEHICLE BRAKE SYSTEM

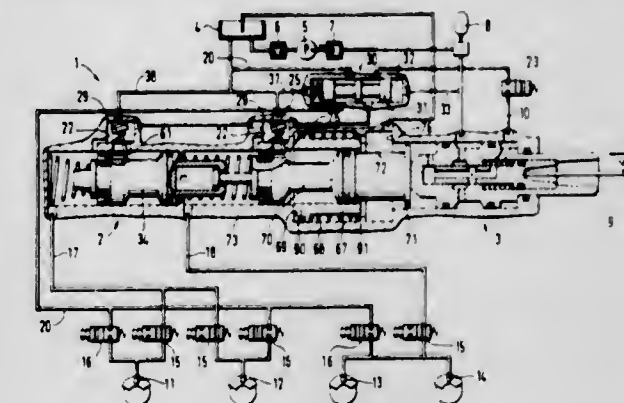
Juan Belart, Walldorf; Jochen Burgdorf, Offenbach; Dieter Kircher, Frankfurt am Main; Hans-Wilhelm Bleckmann, Obermoeren, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.  
 Filed Oct. 28, 1981, Ser. No. 316,153

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040562

Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 303—113

10 Claims



1. An arrangement for controlling the effective pressure of a hydraulic braking fluid in a vehicle braking system provided with an auxiliary source of pressurized hydraulic fluid and antiskid control equipment, in dependence on the position of a brake pedal, comprising a master cylinder device including a housing defining a bore having a first section of a smaller diameter and an aligned adjacent second section of a larger diameter, and at least one master piston received in said first section of said bore for movement in opposite directions and operatively connected to the brake pedal for movement thereof; with at least in one of such directions, said master piston delimiting a working compartment in said first section of said bore frontwardly thereof as considered in the other direction and having an extension received with a spacing in said second section of said bore; at least one positioning piston surrounding said extension for sealed sliding relative thereto and to said



housing in said second section of said bore; entraining means on said extension and on said positioning piston for engaging one another in an engaging position of said positioning piston relative to said extension; and means for admitting the pressurized fluid from the auxiliary source into said working compartment and into said second section of said bore frontwardly of said positioning piston during antiskid control action of the antiskid control equipment to replenish the supply of pressurized fluid in said working compartment and to urge said positioning piston into a predetermined position relative to said housing in which said entraining means is engaged and said master piston assumes a defined position within said bore.

4,416,492

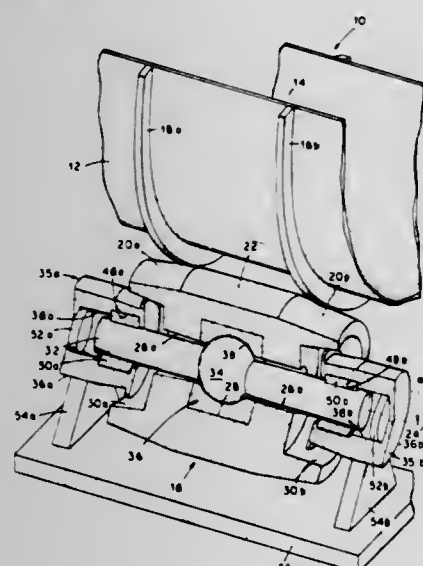
# SYSTEM FOR AUTOMATICALLY ALIGNING A SUPPORT ROLLER SYSTEM UNDER A ROTATING BODY

B. Huston Singletary, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 21, 1982, Ser. No. 400,544  
Int. Cl.<sup>3</sup> F16C 13/06, 23/04

U.S. Cl. 308—203

4 Claims



1. A system for supporting a body for rotation about a central axis extending therethrough, comprising:
  - a pair of support rings mounted on said body and projecting outward therefrom and extending around its periphery in spaced apart relation axially of said central axis;
  - a support roller having at opposite ends thereof tapered peripheral surfaces which respectively engage the outermost surfaces of said support rings and which decrease in diameter toward the ends of the roller, an aperture extending between the end surfaces of said roller and having a ball-type swivel surface formed at the middle portion thereof, a shaft disposed within the aperture in said roller with its ends projecting outward therefrom, the middle portion of said shaft being formed with a ball-type swivel surface conformably engaging the swivel surface on said roller to thereby permit universal pivotal movement of the roller relative to the shaft; and
  - a pair of fixedly positioned support elements each comprising:
    - (1) a housing (2) an annular bearing fixed in said housing and slidably fitted around a respective end of said shaft so that the shaft is reciprocable along the central axis of the bearing, and (3) means for limiting movement of said shaft along the central axis of said bearing.

4,416,493

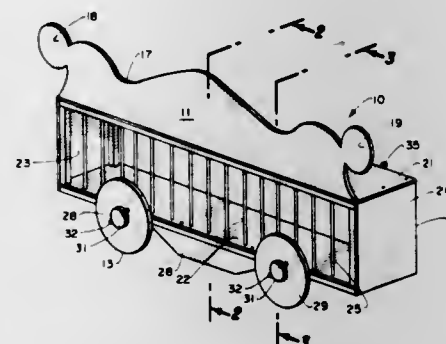
# WALL MOUNTED DISPLAY CASE FOR STUFFED ANIMALS

Gary D. Sumner, 6804 Bix Ave., Citrus Heights, Calif. 95610  
Filed Apr. 27, 1981, Ser. No. 257,701

Int. Cl.<sup>3</sup> A01K 1/00

U.S. Cl. 312—245

8 Claims



1. A wall mountable, three dimensional display case for displaying a plurality of stuffed animals or the like in an environment aesthetically pleasing to the eye comprising:
  - an elongated top planar section spaced from and secured to an elongated bottom planar section by side panels affixed to both of same, said sections and panels forming a box open along the front thereof and the rear thereof,
  - a plurality of spaced elongated vertical members removably secured along the open front of said box simulating the spaced bars of a cage, wherein said members are dowels inserted into aligned holes in the top and bottom planar sections, the holes in the top planar section extending all the way through said top planar section, the holes in the bottom planar section extending only part way there-through whereby dowels can be removed upwardly from said top and bottom planar sections,
  - a pair of spaced circular planar sections mounted along the front lower portion of said box simulating wheels, and
  - a vertical planar section mounted along the length of said top planar section, normal thereto, whereby after wall mounting, removal of selected ones of said dowels permits access to the interior of said box whereby stuffed animals may be inserted therein with subsequent replacement of said selected ones of said dowels thereby simulating the caging of animals inside of said cage.

4,416,494

# APPARATUS FOR MAINTAINING A COILED ELECTRIC CONDUCTOR IN A DRILL STRING

Larry A. Watkins, and Leon H. Robinson, Jr., both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

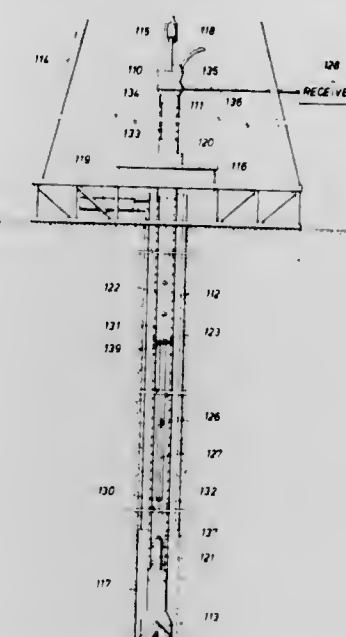
Filed Oct. 6, 1980, Ser. No. 194,098  
Int. Cl.<sup>3</sup> H01R 4/64

U.S. Cl. 339—15

37 Claims

26. A drilling apparatus having a sectionalized tubular drill string, a rotary drill bit connected thereto, and means for adding additional pipe sections to said drill string, an insulated electric conductor disposed within said drill string and having a lower end at a subsurface location, an upper end proximate the upper end of said drill string, an intermediate portion arranged as a spring coil within a flexible coiled wire storage means, which means is supported in the drill string, and a connector at said upper end, said connector being adapted to permit the addition of pipe sections to the upper end of said

drill string upon elevating said upper end of said conductor relative to said drill string and thereby permitting said conduc-



tor to be extended through additional pipe sections added to said drill string.

4,416,495

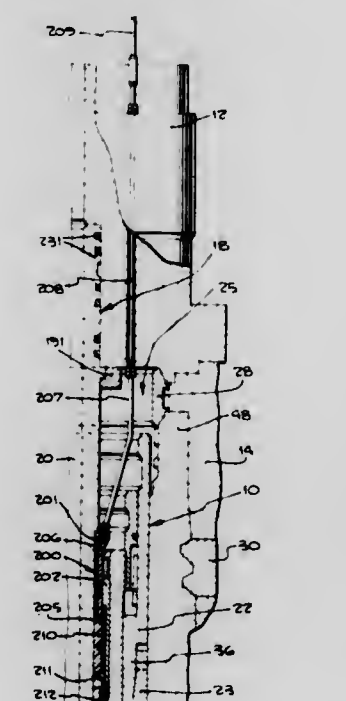
# CONCENTRIC ELECTRIC CONNECTOR FOR SUBSEA WELL APPARATUS

Albert M. Regan, Huntington Beach, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 5, 1981, Ser. No. 270,736  
Int. Cl.<sup>3</sup> H01R 13/523

U.S. Cl. 339—16 C

4 Claims



1. In a subsea well apparatus having a tubing mandrel associated with a Christmas tree of the well and being removably landed in a tubing hanger associated with the wellhead, the improvement comprising:
  - a socket having an interior cylindrical wall carried in the tubing hanger and an electrical contact member located in the inner wall and exposed to the interior of the socket;
  - the mandrel carrying an exterior wall dimensioned for sliding, telescoping reception within the socket and an electrical contact member located in the exterior wall and exposed to the exterior of the mandrel, the mandrel electrical contact member being positioned for engaging the socket contact member when the mandrel is landed; and
  - upper and lower annular seal means located in one of the

walls above and below the contact members for purging environmental liquid from the contact members as the mandrel lands in the socket and for sealing the contact members from environmental liquid when engaged.

4,416,496

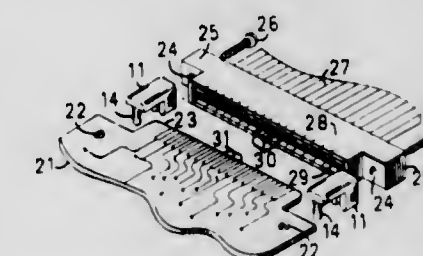
# EDGE ANCHORS FOR PRINTED CIRCUIT BOARD CONNECTORS

Paul E. Brefka, 196 Cordaville Rd., Southborough, Mass. 01772  
Filed Mar. 6, 1981, Ser. No. 241,023

Int. Cl.<sup>3</sup> H01R 13/62

U.S. Cl. 339—17 C

9 Claims



1. An anchor, injection-molded in one piece, for use with an electrical connector mounted on edge contacts protruding from a printed circuit board (p.c.b.), wherein mounting holes on the connector are directly aligned with the centerline of the plane of the p.c.b. and the anchor comprises:
  - (a) a receiving block abutting the edge of the p.c.b.;
  - (b) an extension to that block over the surface of the p.c.b.;
  - (c) a connecting means, acting between the extension and the p.c.b. perpendicular to the p.c.b.;
  - (d) a horizontal, cylindrical bore aligned with the centerline of the plane of the p.c.b. and extending between an outer receiving face and an inner board-contacting face of the receiving block, designed to receive a screw which will secure the connector to the device;
  - (e) a vertical slot running along the length of the underside of the receiving block from the inner face to the outer face and extending upwardly to the horizontal bore as an injection mold release,

the sum of which provides both a self-securing means to anchor the device to the p.c.b., without the need for additional attachment means, and a firm securing means to anchor the connector to the device, which, when simply slipped perpendicularly onto the p.c.b. and the connector slipped onto the protruding edge of the p.c.b. and screwed into the anchor, prevents horizontal movement and disconnection.

4,416,497

# SPRING CLIP ELECTRICAL CONNECTOR FOR STRIP CONDUCTOR CABLE

Gordon T. Brandsness, White Bear Lake; Robert L. Ebright, Bloomington, and Alexander J. Orosz, Roseville, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 286,746

Int. Cl.<sup>3</sup> H05K 7/12

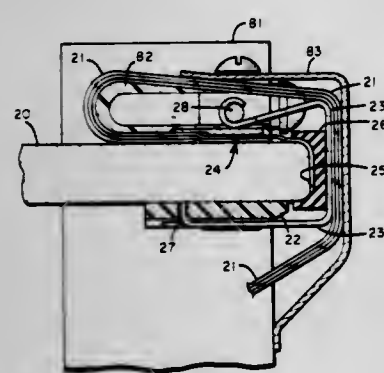
U.S. Cl. 339—17 F

9 Claims

1. An electrical connector apparatus for electrically connecting a multiplicity of printed lands upon, and normal to the edge of, a planar substrate to a like multiplicity of stripped conductor ends within a flexible flat cable, which apparatus comprises:
  - spring clip means generally U-channel shaped with spring force exerting side planes of the U-channel for exerting squeezing compressive high spring first force normal to, and between, the side planes of the U-channel;
  - elastomeric pad means affixed to the U-channel interior at a base plane of the U-channel of said generally U-channel shaped spring clip means for exerting an elastomeric ex-



pansive second force normal to, and into the U-channel from, said base plane of the U-channel; retention means for affixing both said planar substrate with a multiplicity of printed circuit lands normal to the edge of said substrate, plus said flexible flat cable with said like multiplicity of stripped conductor ends which is bendably disposed, meaning draped, over the edge of said planar substrate, within said U-channel shaped spring clip means so that both said planar substrate and said flexible flat cable draped thereon are directly compressively squeezed by said compressive high spring first force normal to the side planes of the U-channel of said generally U-channel shaped spring clip means, and so that both said planar substrate and said flexible flat cable draped thereon are



forcefully and compressively subject to said elastomeric expansive second force, resultant from said elastomeric pad means, normal to the U-channel base plane of the U-channel of said generally U-channel shaped spring clip means;

whereby with said flexible flat cable bendably disposed between said spring clip means and said planar substrate, said squeezing compressive high spring first force serves to compressively electrically contact said multiplicity of stripped conductor ends of said flexible flat cable against said multiplicity of printed circuit lands upon said planar substrate, while said elastomeric expansive second force serves to retain said flexible flat cable between said spring clip means and said planar substrate.

4,416,498

#### SOCKET-TYPE CONNECTORS FOR ELECTRIC CONNECTORS

Kyoichi Sado, Saitama, and Kazutoki Tahara, Ageo, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 131,687, Mar. 18, 1980, abandoned.

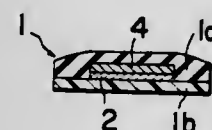
This application Dec. 10, 1981, Ser. No. 329,325

Claims priority, application Japan, Mar. 20, 1979, 54-3801

Int. Cl.<sup>3</sup> H01R 13/52

U.S. Cl. 339—60 R

2 Claims



1. A socket-type connector in which the electrical connection is secured by inserting an electroconductive plate-like plug thereinto comprising:

- a base plate formed of an electrically insulating rigid material;
- a socket body formed of an electrically insulating and elastically resilient material covering said base plate forming a flat pocket with the base plate;
- at least one plate-like contacting element formed of a conductive material located inside said pocket formed by said base plate and said socket body, said contacting element being bonded to at least one of said base plate and said socket body and being urged into close contact by

said resilient socket with the other of said socket body and said base plate so as to leave no void space within the pocket; and

- (d) said socket body being bonded to said base plate on opposite sides of said contacting element along the direction of insertion of said plug, said socket body being elastically deformable to expand said pocket to form a void space for receiving said plate-like plug inserted thereinto, said plug being subjected to compressive force and urged against said contacting element due to the resilient deformation of said socket body.

4,416,499

#### ELECTRICAL CONNECTOR ASSEMBLY

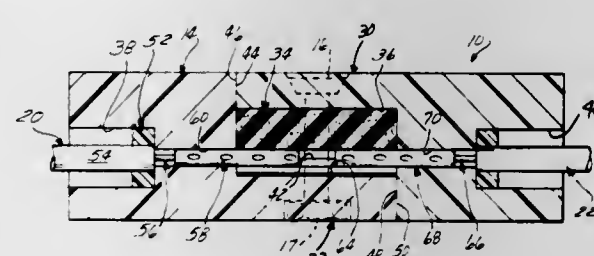
John F. Frascatore, Unadilla; Dean R. Nelson, Sidney, both of N.Y., and Edward K. Marsh, Orlando, Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 22, 1981, Ser. No. 313,566

Int. Cl.<sup>3</sup> H01R 13/22

U.S. Cl. 339—92 M

7 Claims



1. An electrical connector assembly for establishing an electrical connection between a plurality of electrical leads comprising:

- a cover;
- a base;
- each of said cover and base being configured with portions adapted to be interfit together upon assembly of said cover and base;
- means for releasably retaining said cover and base together;
- each of said interfit portions having opposing surfaces formed thereon;
- said base bearing a plurality electrically conductive, parallel groove contacts, extending thereacross; each of said groove contacts electrically connected to a respective one of some of said leads, each of said plurality of groove contacts consisting of an elongated generally Vee shaped element;
- a plurality of pin shaped contacts carried by said cover each configured and located to be advanced laterally onto a respective one of said groove contacts by interfitting of said cover and base portions, each of said pin shaped contacts adapted to be electrically connected to a respective one of the remainder of said leads, whereby an electrical connection therebetween may be established upon interfitting of said cover and base portions.

4,416,500

#### SCREWLESS ELECTRICAL TERMINAL

Paul Stenz, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,904

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042057

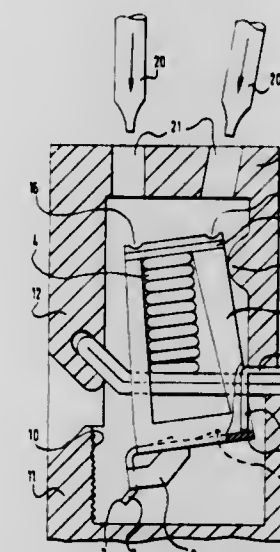
Int. Cl.<sup>3</sup> H01R 9/08

U.S. Cl. 339—95 D

16 Claims

1. A screwless electrical terminal comprising first and second clamping members for clamping between them an electrical conductor, said first member being a cage-like member movable bodily and tiltable relative to the said second member, clamping means resiliently biasing the first member to a conductor-clamping position, and a latching stop adapted to re-

leasably retain the first clamping member in an open position for reception of a conductor between the clamping members, said clamping members having a predetermined conductor-insertion direction, said first clamping member having a pivot element on that side of the first clamping member at which a conductor is inserted, and said terminal further including an



abutment facing the said pivot element for engagement thereby on movement of the first clamping member in the direction opposite the conductor-insertion direction, the abutment and pivot element being so disposed that such movement of the first clamping member tends to pivot the first clamping member to increase the conductor-clamping force exerted by the first clamping member.

4,416,501

#### TERMINAL FOR ESTABLISHING ELECTRICAL CONTACT WITH A SHIELDED CABLE

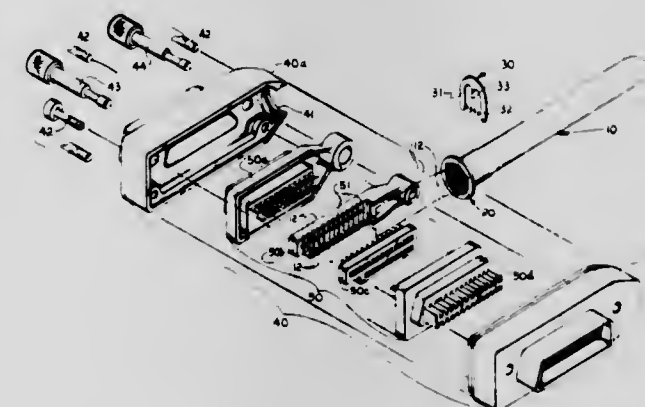
David F. Fusselman, Elizabethtown, and Timothy A. Lemke, Carlisle, both of Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 23, 1981, Ser. No. 324,132

Int. Cl.<sup>3</sup> H01R 11/20

U.S. Cl. 339—97 R

7 Claims



1. In an electrical connector surrounded by a metallic shroud into which an insulated cable having a flexible conductive shield beneath an outer layer of insulation enters through an opening in such shroud for termination on said connector, a terminal for establishing an electrical connection between the shield and the shroud comprising a ferrule positioned on said cable beneath and supporting a portion of said flexible conductive shield, and a "U"-shaped insulation penetrating device penetrating the outer layer of insulation and capturing said ferrule and said shield and establishing contact with the flexible conductive shield with an inward compressive force while presenting an outwardly projecting portion, said opening in said shroud defining a spaced recess into which the outwardly

projecting portion of the insulating penetrating device fits and makes contact with the shroud.

4,416,502

#### ELECTRICAL CONNECTOR

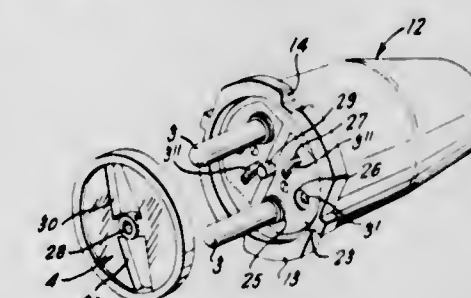
Clive Rumble, London, England, assignor to Corabelment A.G., Vaduz, Liechtenstein

Filed Jul. 29, 1981, Ser. No. 287,914

Int. Cl.<sup>3</sup> H01R 13/58, 29/00

U.S. Cl. 339—103 M

8 Claims



1. An electrical connector comprising:
  - a body within which a plurality of extendable electrically conductive pins are housed, said body having a front end portion and a rearwardly extending portion;
  - a plurality of electrically conductive plates mounted at the front end portion of said body, each of said plates having apertures therein;
  - a plurality of pairs of electrically conductive pins slidably mounted in said body so as to be movable between a retracted position behind said plates and an extended functional position extending frontwardly through respective apertures of said plates, said pins having a rear portion, the rear portion of said pins being in electrical contact with a respective plate of said plurality of plates when said pins are in the extended functional position;
  - a rotatable masking means mounted in front of said plates, said masking means having opposed windows therein so as to allow the selective exposure and extension of a pair of said electrically conductive pins;
  - a plurality of electrical terminals at the rearwardly extending portion of said body;
  - a plurality of electrical connections extending through said body, each of said connections extending from a respective terminal of said plurality of terminals through said body to a respective plate of said plurality of plates; and
  - a casing receiving said body, said casing having a rearwardly extending socket capable of receiving an electrical cable.

4,416,503

#### GRIPPING OR LOCATING DEVICES

Derek Hayes, Bungay, England

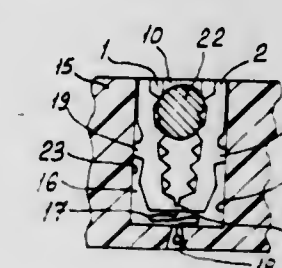
Filed Jul. 13, 1981, Ser. No. 282,585

Claims priority, application United Kingdom, Jul. 14, 1980, 8022922

Int. Cl.<sup>3</sup> H01R 13/40

U.S. Cl. 339—220 R

10 Claims



1. In a device for gripping or locating an elongated member, which device comprises the combination of a pair of jaws made at least partly of resilient plastics material, said pair of



jaws including resilient means joining respective first ends of the jaws, whereby respective second ends of the jaws are able to flex resiliently away from one another, each of said jaws further including an inwardly-facing surface and an outwardly-facing surface, the inwardly-facing surfaces of the two jaws confronting one another, and a camming means including a pair of spaced-apart inwardly-facing surfaces between which the pair of jaws is insertable, with said first ends of the jaws first, for the purpose of engaging said outwardly-facing surfaces of the pair of jaws with said inwardly-facing surfaces of said camming means so that the jaws are urged towards one another in order to grip or locate an elongated member disposed in said gap intermediate the first and second ends of the jaws and substantially parallel to said ends, the improvement wherein the confronting, inwardly-facing surfaces of the jaws define a gap which increases in width in the direction from the first ends of the jaws towards the second ends thereof, and said jaws and said camming means are shaped so that, when the pair of jaws is inserted into said camming means between said inwardly-facing surfaces thereof with no elongated member in said gap, there exists a gap between the outwardly-facing surface of one of the jaws and the adjacent inwardly-facing surface of the camming means in a region extending from the second end of said one jaw towards the first end thereof, whereby urging together of the jaws takes place by engagement of a limited area of the outwardly-facing surface of said one of the jaws and the adjacent inwardly-facing surface of the camming means.

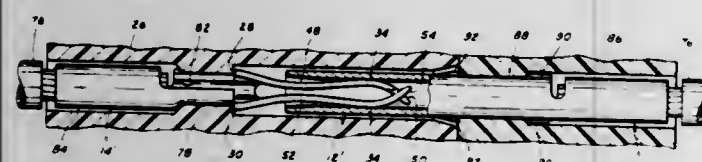
4,416,504

# CONTACT WITH DUAL CANTILEVERED ARMS WITH NARROWED, COMPLIMENTARY TIP PORTIONS

Jerzy R. Sochor, 164 Rockview, Irvine, Calif. 92715  
Continuation of Ser. No. 92,125, Nov. 7, 1979, abandoned. This application Mar. 8, 1982, Ser. No. 355,472  
Int. Cl.<sup>3</sup> H01R 13/05

U.S. Cl. 339—252 P

5 Claims



1. An electrical contact comprising:

a body portion,

a pair of freestanding elongated cantilevered contact arms extending from said body portion in a first and mating direction,

the end portion of each of said contact arms remote from said body portion having a convex mating surface facing away from the other contact arm in a second and flexing direction which is perpendicular to said first and mating direction,

each of said contact arms comprising a bent sheet metal member whose width, as measured in a third and lateral direction perpendicular to said first and second directions, is substantially greater than its thickness, as measured generally in said second and flexing direction,

each of said contact arms being flat when traversed in said third and lateral direction on either surface thereof at any location therealong,

said contact arms each having a tip portion, at the free end thereof, that is narrower, in said third and lateral direction, than the rest of said contact arm,

the tip portion of one arm being on the left side thereof and the tip portion of the other arm being on the right side thereof, when said contact arms are viewed in said second and flexing direction, so that said tip portions occupy complementary spaces in the width dimension of said contact when viewed in said second and flexing direction,

the tip portion of each contact having a substantially uniform width in said third and lateral direction, said tip portions having a separation which, when viewed in said second and flexing direction, is substantially parallel to said first and mating direction, said contact arms also curving toward and overlapping each other at the tip portions thereof, when viewed in said third and lateral direction.

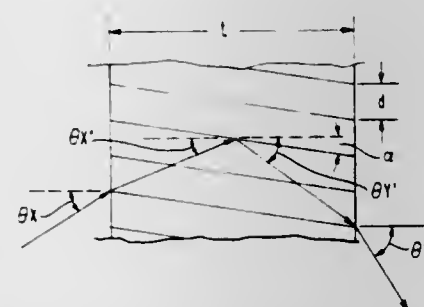
4,416,505

# METHOD FOR MAKING HOLOGRAPHIC OPTICAL ELEMENTS WITH HIGH DIFFRACTION EFFICIENCIES

LeRoy D. Dickson, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Oct. 26, 1981, Ser. No. 314,645  
Int. Cl.<sup>3</sup> G02B 27/17; G03H 1/20

U.S. Cl. 350—3.71

4 Claims



1. A method of making holographic optical elements with high diffraction efficiencies by optically replicating a previously recorded interference pattern from a master element onto a closely adjacent, unexposed copy element which is known to change in thickness as a result of post-exposure processing, said interference pattern consisting of parallel Bragg surfaces within the master element oriented at a desired angle relative to the master element surface, said method being characterized by the steps of:

illuminating the master element with a coherent replicating beam oriented to initially establish Bragg surfaces within the closely adjacent copy material at an intermediate angle relative to the copy material surface, said intermediate angle being different from the desired final angle of the Bragg surfaces in the copy; and

processing the copy material to fix the Bragg surfaces, said Bragg surfaces being tilted to the desired final angle as a result of process-induced changes in the thickness of the copy material.

4,416,506

# APPARATUS FOR SPLICING FIBER OPTIC WAVEGUIDES

Tore R. Johnson, Harrisburg, and Keith Johnson, Jr., Manheim, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.  
Filed Jul. 22, 1981, Ser. No. 285,714  
Int. Cl.<sup>3</sup> G02B 7/26

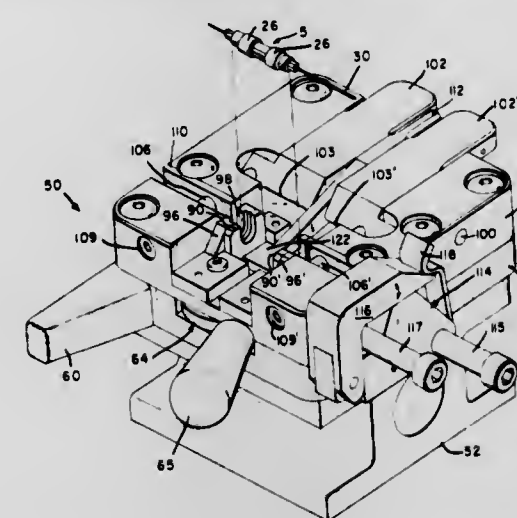
U.S. Cl. 350—96.21

7 Claims

1. Apparatus 50 for splicing a pair of optical waveguides 32, 34 in a connector 5 of the type having an elongate tubular body 12 with a stepped external surface, three elongate cylindrical rods 2 therein defining an interstitial passageway 44 therebetween, and a pair of crimping collars 26 which are advanced to the center of the body 12 to radially compress the body 12 and effectuate the splice, said apparatus 50 comprising:

means for advancing said crimping collars 26 toward the center of said body 12, said means comprising U-shaped

crimping cradles 92, 92' which bear against said collars 26 from opposite directions,



holding means for holding said tubular body 12, said holding means remaining stationary while said means for advancing advances said crimping collars.

4,416,507

# METHOD FOR IN SITU SPLICING OPTICAL FIBER CABLES

Jean P. Hulin; Andre Bouvard, and Patrick Le Maitre, all of Conflans Sainte Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Saint Honorine, France

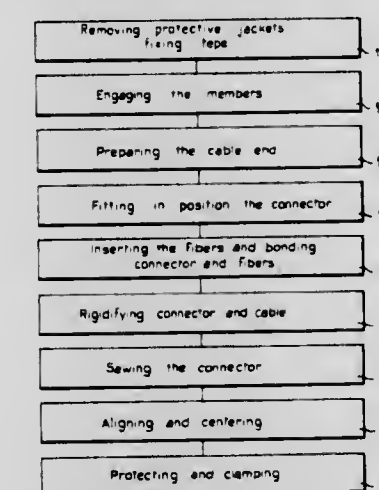
PCT No. PCT/FR81/00038, § 371 Date Apr. 30, 1981, § 102(e) Date Apr. 30, 1981, PCT Pub. No. WO81/02794, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 13, 1981, Ser. No. 261,178

Claims priority, application France, Mar. 14, 1980, 80 05737  
Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.22

8 Claims



1. A method for splicing two optical fiber transmission cables each provided with a dielectric support in which are housed optical fibers, said method comprising the following operating steps performed on each cable end:

- (a) the cable ends are stripped over a predetermined length;
- (b) the fibers thus freed are opened-out;
- (c) the support which has been freed from its fibers is cut at right angles to its axis and a terminal connector provided with grooves is fixed on the end of the support;
- (d) the fibers are turned down into the grooves of the terminal connector and are rigidly fixed therein, said turning down and fixing step including the following operations: a hollow member provided with a longitudinal slot having a width in the vicinity of the diameter of a fiber is arranged coaxially to the terminal connector and the member is rotated in such a manner as to ensure that the

slot is placed successively opposite to each groove so as to permit introduction of the fibers successively within each groove of the terminal connector after the fibers have been released from the cable support, a first O-ring seal previously engaged on the cable end is slidably displaced along the terminal connector so as to apply the fibers to the bottom of the grooves of the terminal connector, the fibers are bonded in position within the grooves of the terminal connector, (e) the terminal connector as well as the fibers carried by this latter are cut at right angles to the axis of the connector; (f) each support-connector assembly is fixed in position by rigidification means; (g) the two cables are aligned by alignment means, said alignment step consisting in introducing within the terminal connector of the first cable at least one centering pin into a longitudinal opening formed in each terminal connector, the centering pin projecting from the cutting face of the terminal connector and engaging in a corresponding opening of the terminal connector of the second cable.

4,416,508

# OVERHEAD ELECTRIC AND OPTICAL TRANSMISSION CABLES

Phillip Dey, New Barnet; Peter Fearn, Huyton; Karl W. Plessner, Kings Langley; Kenneth H. Pickup, Uppermill; Bernard Gaylard, Altrincham, and Arthur B. Murphy, Rainford, all of England, assignors to BICC Public Limited Company, London, England

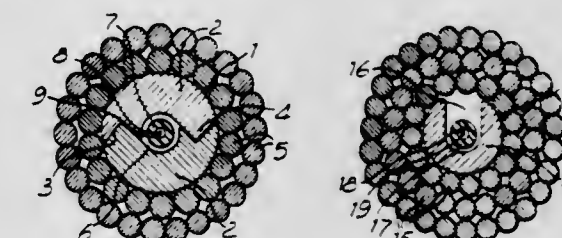
Division of Ser. No. 220,291, Dec. 29, 1980, Pat. No. 4,359,598, which is a continuation of Ser. No. 904,557, May 10, 1978, abandoned. This application May 20, 1982, Ser. No. 380,117  
Claims priority, application United Kingdom, May 13, 1977, 20234/77; Jan. 24, 1978, 2861/78

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> G02B 5/14

U.S. Cl. 350—96.23

27 Claims



12. An overhead flexible electric transmission conductor adapted to be freely supported from spaced supports in long lengths, comprising a substantially circumferentially rigid central core having an elongate compartment constituted by a space formed within and extending throughout the length of the core, at least one separate flexible optical guide loosely housed in the elongate compartment and, surrounding the central core, at least one layer of helically wound bare elongate elements of metal or metal alloy.

4,416,509

# UNIVERSAL REFLECTOR OF ELECTROMAGNETIC WAVES MOUNTED ON A FLOAT

Drndarski Milan, Evgenija Kunicica br. 12, 24000 Subotica, Yugoslavia

Filed May 20, 1981, Ser. No. 265,641

Claims priority, application Yugoslavia, May 26, 1980, 1416/80

Int. Cl.<sup>3</sup> G02B 5/122

U.S. Cl. 350—102

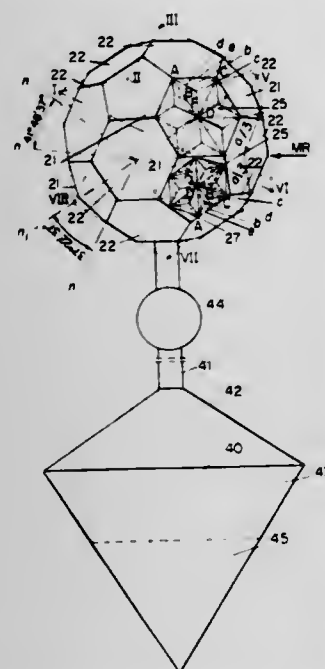
5 Claims

1. A reflector for electromagnetic radiation which reflects radiation from any arbitrary angle in three dimensions in paral-



el to incoming radiation to within approximately  $\pm 20^\circ$ , said reflector comprising:

- (a) a reflector body in the shape of a modified icosahedron having twenty regular hexagonal surfaces and twelve regular pentagonal surfaces;
- (b) six regular trilateral pyramids formed on each of the twenty regular hexagonal surfaces, one edge of each of the trilateral pyramids being one edge of the associated



hexagonal surface and the vertex of the trilateral pyramid opposite said one edge thereof being the center of the associated hexagonal surface; and

- (c) six regular trilateral pyramids formed on each of the twelve regular pentagonal surfaces, one edge of one of the trilateral pyramid being a part of one edge of the associated pentagonal surface and the vertex of the trilateral pyramid opposite said one edge thereof being the center of the associated pentagonal surface.

4,416,510

#### RETROREFLECTIVE STRUCTURE AND METHOD OF MANUFACTURING THE SAME

Ludwig Eigenmann, Vacallo, Switzerland

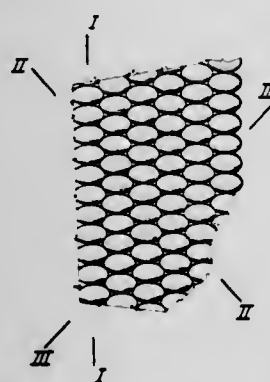
Continuation of Ser. No. 6,503, Jan. 25, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,141

Claims priority, application Italy, Jan. 31, 1978, 19827 A/78 The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.<sup>3</sup> G02B 5/128

U.S. Cl. 350—106

20 Claims



1. A method of manufacturing a retroreflective roadway pavement regulating sign of the type comprising retroreflectors adapted to reflect light beams impinged thereon by automobile carried source of light, comprising the steps of providing a primary planar material including a larger quantity of elementary retroreflectors; and forming from the primary

planar material elementary retroreflective elements each including a smaller quantity of the interconnected elementary retroreflectors each being elongated in plane view and asymmetrical in a vertical plane and the plane view.

4,416,511

#### PROJECTION SCREEN ARRANGEMENT

Ulli Weinberg, Roth, Fed. Rep. of Germany, assignor to Reflecta GmbH Foto Film Projektion, Schwabach, Fed. Rep. of Germany

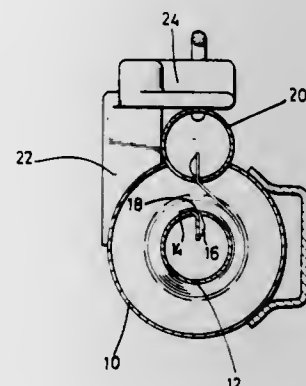
Filed Mar. 15, 1982, Ser. No. 358,182

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115177

Int. Cl.<sup>3</sup> G03B 21/56

U.S. Cl. 350—117

7 Claims



1. A projection screen arrangement comprising a housing; a roller rotatably disposed in the housing and carrying a projection screen extendible from and retractable into the housing by being unwound from and wound on to the roller; spring means loading the roller in the winding-in direction; at one end of the housing, a rotary actuating member which is non-rotatably connected to the roller and which is actuatable from the outside of the housing for tensioning the screen when in the extended position; a terminal bar member at the end of the screen remote from the roller; a push member radially displaceably mounted in the housing and adapted to be engaged by the terminal bar member when the projection screen is in the fully wound-in condition; spring means urging the push member away from its actuated position; a detent member which is displaceable by the push member; and a detent means which is non-rotatably connected to the rotary actuating member and co-operable with the detent member when the push member is actuated, thereby to arrest the roller in the winding-in direction.

4,416,512

#### NON-MECHANICAL ELECTROMAGNETIC SCANNING DEVICE

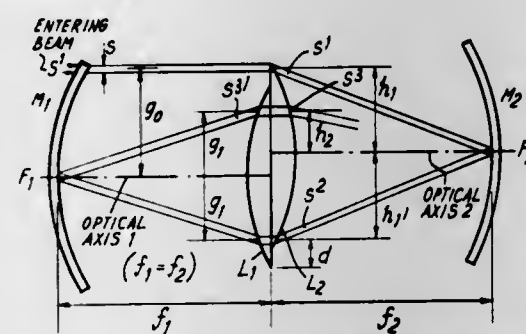
Brett J. Sinclair, P.O. Box 11415, Denver, Colo. 80211

Continuation of Ser. No. 159,898, Jun. 16, 1980. This application Jun. 7, 1982, Ser. No. 385,750

Int. Cl.<sup>3</sup> G02B 27/10, 27/17

U.S. Cl. 350—171

3 Claims



1. In a system, for use in a non-mechanical electromagnetic

scanning device having a source of pulsed beams of electromagnetic energy, said system comprising:

- (i) first and second opposed mirrors disposed in spaced relationship
- (ii) means disposed between said mirrors to offset, at each pass of the beam between said mirrors, a pulsed beam directed onto one of said mirrors and reflected thereby towards the other of said mirrors, thereby to result in a plurality of successively offset passes of pulsed beam, the improvement that, in combination:

- (a) said second mirror is less than wholly reflective over all of its reflective surface whereby a portion of the beam at each said pass towards said second mirror emerges through said less than wholly reflective second mirror
- (b) said mirrors are of the same focal length and have their optical axes parallel
- (c) said offsetting means serve to offset each said pass of the beam normal to said optical axes, and
- (d) said beam is refocused at each said pass so as to maintain uniform spot diameter,

whereby the portions of beam emerging through said second mirror from a linear scan pattern.

4,416,513

#### AUTOMATIC AND MANUAL FOCUS CONTROL FOR OBJECTIVE LENS ASSEMBLY

Kyozo Uesugi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

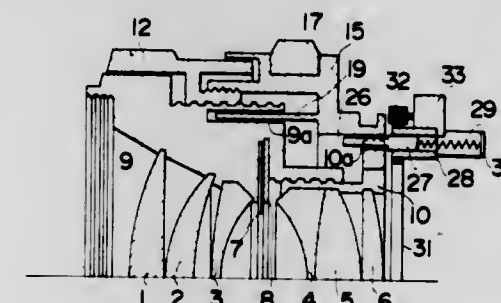
Filed Jul. 10, 1980, Ser. No. 167,303

Claims priority, application Japan, Jul. 16, 1979, 54-90510

Int. Cl.<sup>3</sup> G02B 7/04; G03B 3/00

U.S. Cl. 350—255

13 Claims



1. An objective lens assembly for use with a camera which includes an automatic focus control device having a driving mechanism, comprising:

- a manually movable focussing ring;
- first and second lens groups disposed along a common optical axis, said first and second lens groups being capable of changing focus not only when said both lens groups are concurrently shifted along the optical axis but also when either one of said lens groups is shifted relative to the other along the optical axis;
- a first movable barrel carrying said first lens group;
- a second movable barrel carrying said second lens group, said second movable barrel being movably supported by said first movable barrel so as to be integrally moved with said first movable barrel;
- first means interconnecting said manual focussing ring with said first movable barrel such that said first movable barrel is moved along the optical axis in response to the movement of said manual focussing ring, thereby moving said first and second lens groups concurrently along the optical axis; and
- means for interconnecting said second movable barrel to said driving mechanism so that said second movable barrel is automatically moved, thereby said second lens group being moved relative to the first lens group along the optical axis.

4,416,514

#### COLOR FILTER

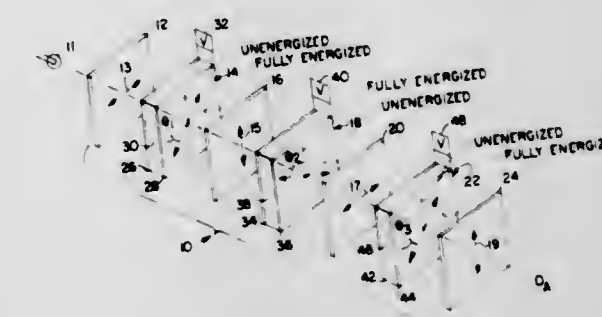
William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 10, 1980, Ser. No. 205,660

Int. Cl.<sup>3</sup> G02F 1/13

U.S. Cl. 350—335

31 Claims



1. A filter for varying the spectral composition of visible light, said filter comprising:

- a plurality of different dichroic polarizers stationed along an optical path to intercept light traveling therealong, each of said dichroic polarizers structured for selectively plane polarizing a different part of the visible spectrum while transmitting the remainder of the visible spectrum unpolarized;
  - a plane polarizer stationed along said optical path for polarizing substantially uniformly all wavelengths of the visible spectrum; and
  - a plurality of voltage responsive twisted nematic liquid crystals one for each of said dichroic polarizers, said twisted nematic liquid crystals being stationed along said optical path and structured for varying the rotation of linearly polarized light in accordance with the voltage applied thereto,
- said dichroic polarizers, said plane polarizer, and said twisted nematic liquid crystals being arranged along said optical path in a predetermined sequence and azimuthal orientation to modify the spectral content of visible light incident to said filter so that said filter transmits any one of a predetermined number of colors whose saturation and hue are related to the voltages applied to said twisted nematic liquid crystals.

4,416,515

#### OPTICAL FILTER IN FLUORESCENT LIQUID CRYSTAL DISPLAY DEVICES

Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 956,969, Nov. 2, 1978, abandoned. This application Mar. 23, 1981, Ser. No. 246,182

Claims priority, application Japan, Nov. 7, 1977, 52-133849

Int. Cl.<sup>3</sup> G02F 1/13

U.S. Cl. 350—350 F

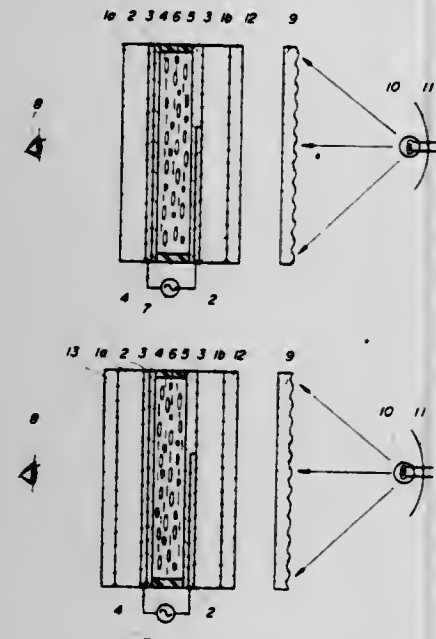
5 Claims

1. A fluorescent liquid crystal display having a display side and a rear side comprising:
- a pair of substrates including a rear substrate and a display side substrate;
- liquid crystal material interposed between said pair of substrates;
- a fluorescent material mixed within said liquid crystal material for producing fluorescence;
- an exciting source at said rear side of said display for emitting exciting radiation to stimulate the fluorescent material to produce said fluorescence;
- a diffusing plate interposed between the exciting source and said rear substrate;
- the wavelength of the fluorescence being different from the wavelength of the exciting radiation, the fluorescent mate-



rial having a high absorption coefficient with respect to the exciting radiation;

first filter means between said diffusing plate and said rear substrate for controlling the propagation of the exciting radiation from said rear side to said display, said first filter means permitting the exciting radiation capable of being absorbed by the fluorescent material to pass therethrough and preventing the exciting radiation having a wavelength



which is substantially equal to the wavelength of the fluorescence from passing therethrough and preventing said fluorescence from passing therethrough to said rear side of said liquid crystal display; and second filter means adjacent said display side substrate for permitting passage of said fluorescence therethrough and for preventing the exciting radiation not absorbed by said fluorescent material from passing therethrough.

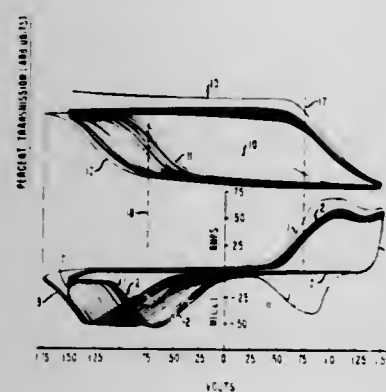
4,416,516

**MATRIX ADDRESSABLE ELECTROCHROMIC DEVICES**  
Gerardo Beni, Old Bridge, and Lawrence M. Schiavone, Howell, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 14, 1981, Ser. No. 254,076  
Int. Cl.<sup>3</sup> G02F 1/17

U.S. Cl. 350—357

7 Claims



1. A display comprising a plurality of elements and means for selectively changing the optical properties of said elements wherein said elements comprise an electrochromic electrode, an electrolyte, and a counterelectrode wherein a surface of a region of said electrochromic electrode and a surface of a region of said counterelectrode contact said electrolyte characterized in that said electrochromic electrode comprises electrochromic iridium oxide and said surface of said region of said counterelectrode contacting said electrolyte is essentially de-

void of compositions other than tantalum oxide and high resistivity materials.

4,416,517

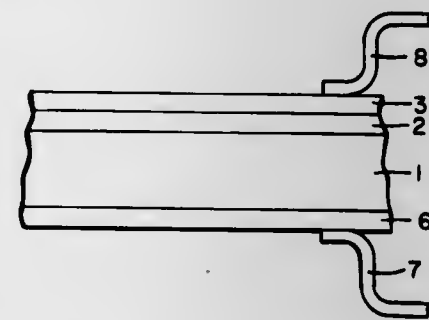
**ELECTROCHROMIC DEVICES INCLUDING A MICA LAYER ELECTROLYTE**

George H. Beall, Big Flats, and Francis P. Fehlner, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 218,937, Dec. 22, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 350,122  
Int. Cl.<sup>3</sup> G02F 1/17

U.S. Cl. 350—357

13 Claims



1. A electrochromic device comprising at least one solid inorganic electrochromic layer, a solid electrolyte layer in contact with the electrochromic layer which is permeable to cations but substantially impermeable to electrons, and electrode means for applying an electrical potential across the electrolyte and electrochromic layers, characterized in that the solid electrolyte layer comprises polycrystalline mica, the mica crystals in the layer not exceeding about 20 microns in their largest dimension and containing at least one species of exchangeable interlayer cation selected from the group consisting of Na<sup>+</sup>, Li<sup>+</sup> and H<sup>+</sup>.

4,416,518

**OBJECTIVE COMPRISING ASPHERICAL SURFACES, WHOSE FOCAL LENGTH IS VARIABLE OVER A WIDE RANGE**

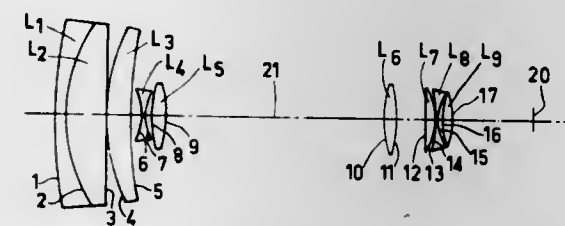
Edgard A. Hugues, Courbevoie; Jean-Marie Bacchus, Bagnolet, both of France, and Jan Haisma, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,158

Claims priority, application France, Sep. 28, 1979, 79 24154  
Int. Cl.<sup>3</sup> G02B 13/18, 15/14

U.S. Cl. 350—427

10 Claims



1. A variable focal length objective lens for focusing an image of an object at a stationary image plane, said lens having an aperture number between 1.5 and 2 and comprising components, each having at least one lens element, arranged along an optical axis, including:

(a) first and second stationary components arranged in order between an object field and the stationary image plane, said components having positive focal lengths; and  
(b) first and second movable components each comprising a single element, arranged in order between the first and second stationary components, said first movable component having a negative focal length and said second movable component having a positive focal length, at least one of said

single elements having an aspherical surface, said movable components being axially displaceable relative to each other to effect a focal length variation of at least 5 to 1.

4,416,519

**OBJECTIVE FOR VIDEO DISKS**

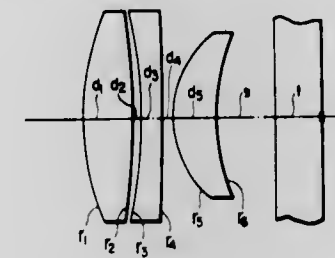
Yuko Kobayashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 294,826

Claims priority, application Japan, Sep. 2, 1980, 55-120645[U]  
Int. Cl.<sup>3</sup> G02B 9/14, 21/02

U.S. Cl. 350—475

7 Claims



1. An objective for video disks consisting of a first, second and third lenses, said first lens being a positive lens, said second lens being a negative lens, said third lens being a positive meniscus lens having a concave surface on the video disk side, said objective for video disks satisfying the following conditions:

- (1)  $1.5 < f_{12}/f_3 < 3.0$
- (2)  $0.7f < D < 1.65f$

wherein reference symbol  $f$  represents the focal length of the lens system as a whole, reference symbol  $f_{12}$  represents the composite focal length of the first and second lenses, reference symbol  $f_3$  represents the focal length of the third lens, and reference symbol  $D$  represents the overall length of the lens system, and

in which said objective for video disks has the following numerical data:

$r_1 = 1.5700$		
$d_1 = 0.3355$	$n_1 = 1.69981$	$v_1 = 29.51$
$r_2 = -4.5434$		
$d_2 = 0.0530$		
$r_3 = -2.8939$		
$d_3 = 0.1395$	$n_2 = 1.74132$	$v_2 = 26.52$
$r_4 = -28.7100$		
$d_4 = 0.0698$		
$r_5 = 0.6472$		
$d_5 = 0.3070$	$n_3 = 1.76300$	$v_3 = 25.68$
$r_6 = 1.2643$		
$f = 1$		
$t = 0.3349$		

$$\left. \begin{array}{l} f_{12} = 2.614 \\ f_3 = 1.430 \end{array} \right\} \frac{f_{12}}{f_3} = 1.83$$

$$D = (d_1 + d_2 + d_3 + d_4 + d_5) = 0.905$$

$$s = 0.48$$

wherein reference symbols  $r_1$  through  $r_6$  respectively represent radii of curvature of respective lens surfaces, reference symbols  $d_1$  through  $d_5$  respectively represent thicknesses of respective lenses and airspaces between respective lenses, reference symbols  $n_1$ ,  $n_2$  and  $n_3$  respectively represent refractive indices of respective lenses at  $\lambda = 830$  nm, reference symbols  $v_1$ ,  $v_2$  and  $v_3$  respectively represent Abbe's numbers of respective lenses for d-line, reference symbol  $t$  represents the thickness of cover glass, reference symbol  $s$  represents the working distance.

4,416,520

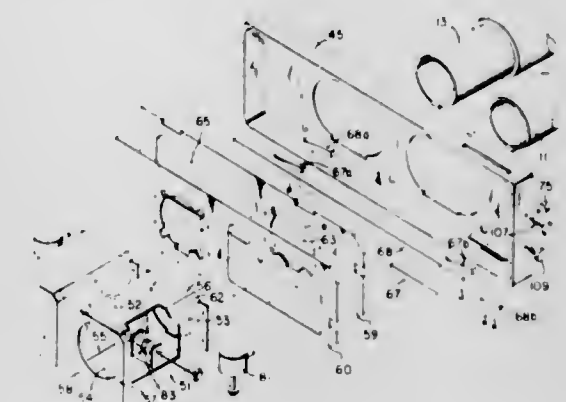
**SLIDE PROJECTOR HAVING TWO IMAGE-PROJECTION SYSTEMS WHICH OPERATE WITH A SINGLE SLIDE TRAY**

Milo G. Kramer, Mukilteo, Wash., assignor to Source Technologies Corporation, Mukilteo, Wash.

Filed Jul. 24, 1981, Ser. No. 286,709  
Int. Cl.<sup>3</sup> G03B 21/20, 21/26

U.S. Cl. 353—101

4 Claims



1. In a multiple image slide projector which includes a projector housing and first and second image projection systems which in turn each include a projection lens, a portion of the projection lens being within the projector housing, wherein each image projection system projects slides acquired from a slide tray onto a screen, an apparatus for precisely aligning the images on the screen, comprising:

mounting boxes positioned within the projector housing for supporting each projection lens, said mounting boxes substantially surrounding the longitudinal dimension of the portion of its projection lens which is within the projector housing;  
mounting plates for each mounting box, secured to the front end of the mounting box, the mounting plates having an opening therein through which the projection lens extends;  
means within the projector housing for supporting said mounting plates in the vicinity of the front of the projector for lateral movement thereof; and  
means for moving the images on the screen by moving at least one of said mounting plates, which in turn results in corresponding movement of the mounting box secured thereto and its projection lens, the direction of movement of said one mounting plate being at a substantially right angle to the longitudinal axes of the image projection systems.

4,416,521

**SYSTEM AND METHOD FOR DETERMINING THE LIGHT TRANSMISSION CHARACTERISTICS OF COLOR PICTURE TUBE SHADOW MASKS**

Ernesto J. Alvero, and William R. Kelly, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 28, 1981, Ser. No. 267,749  
Int. Cl.<sup>3</sup> G03B 41/00

U.S. Cl. 354—1

7 Claims

1. A system for determining the exposure time required to expose the screen of a television panel in accordance with the light transmission characteristics of the shadow mask associated with said screen comprising:

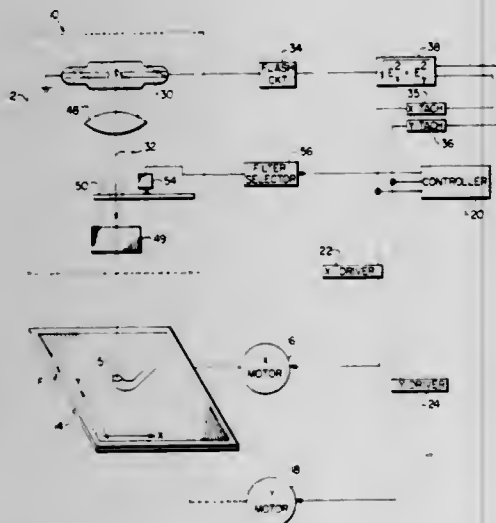
means for providing the actual transmission characteristics of said shadow mask;  
means for providing a minimum acceptable transmission value;  
means for providing the maximum acceptable transmission value;  
means responsive to said actual transmission characteristics



[illegible]

**4,416,522**  
**DAYLIGHT PHOTOPLOTTING AND FILM THEREFOR**  
**Ronald B. Webster, Ellington, Conn., assignor to The Gerber**  
**Scientific Instrument Company, South Windsor, Conn.**  
**Filed Jan. 25, 1982, Ser. No. 342,195**  
**Int. Cl.<sup>3</sup> G03B 41/00**

## 8 Claims



sion layers of the color film is sensitive, and not including wavelengths to which a second emulsion layer is sensitive; a second source of non-visible radiant energy, the radiant energy of the second source including wavelengths to which the second emulsion layer of the film is sensitive and not including wavelengths to which the first emulsion layer is sensitive,

means for bringing the first and second sources separately into registration with a beam axis;

means for projecting the radiant energy emitted from the sources along the beam axis and onto a spot on the film surface,

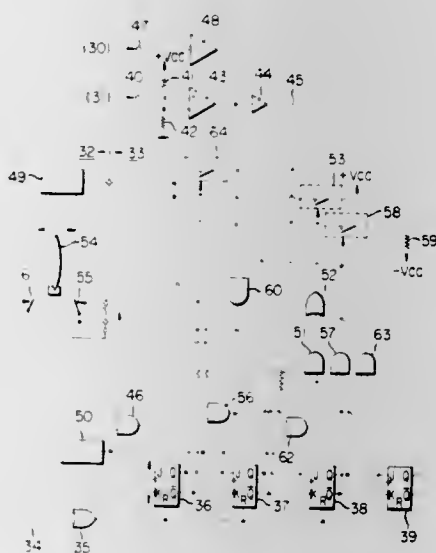
support means for supporting the radiant energy sources and the projecting means so that the beam axis is generally perpendicular to the support surface, and

means for moving the film and spot relative to one another to expose locations on the film in accordance with a desired plot.

Filed May 20, 1982, Ser. No. 380,438  
Claims priority, application Japan, May 28, 1981, 56-81336;  
May 29, 1981, 56-82668

Int. Cl.<sup>3</sup> G03B 3/10

## 17 Claims

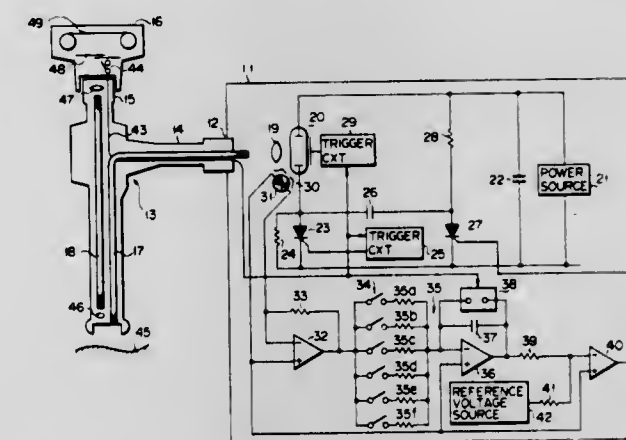


1. An automatic focusing system including:

- (A) focus adjustable lens means;
- (B) focus detecting means for detecting the focus adjusted state of said lens means and producing an output indicative of the focus adjusted state of said lens means;
- (C) adjust means for adjusting the focus of said lens means on the basis of the output of said focus detecting means;
- (D) discriminating means for discriminating whether the focus detection by said focus detecting means is sufficiently possible at a position whereat said lens means is currently placed, said discriminating means producing a characteristic output when the focus detection by said focus detecting means is not sufficiently possible; and
- (E) shift means for forcibly shifting said lens means to a predetermined position in response to the characteristic output of said discriminating means, said shift means having a control circuit for shifting said lens means to another position when the characteristic output is still being produced by said discriminating means with said lens means forcibly shifted to said predetermined position.

## U.S. Cl. 354—31

## 8 Claims



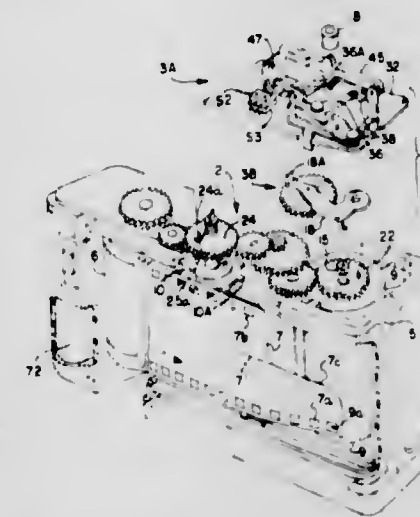
means coupled to said light emission amount calculating circuit and to said electronic flash unit for stopping a light emission of said electronic flash unit responsive to said output signal of said light emission amount calculating circuit to thereby emit said substantially constant amount of light irrespective of the distance to a subject or a lowering in emission efficiency of said electronic flash unit or a lowering in power source voltage.

**Filed Jul. 13, 1981, Ser. No. 282,722**

Int. Cl.<sup>3</sup> G03B 1/18

### 31 Claims

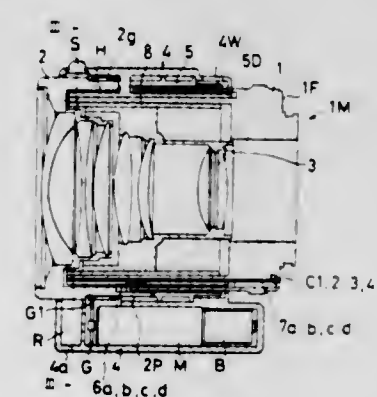
1. In a camera utilizing a 35 mm-type cassette film dispenser including a cassette housing containing a filmstrip having edge perforations and a film leader extending from the cassette housing, said camera having a film compartment covered by a door; a take-up spool in said compartment; motor means for driving said take-up spool; a film engaging rotary sprocket means disposed in advance of said take-up spool to engage said



improvement wherein there is provided repeatedly manually operable means not requiring the opening of said door for energizing said motor drive means each time it is operated for a predetermined period to advance the film at least one film frame after the initial loading of the film and before said film leader is wound on the take-up spool to the extent that an unexposed frame is in position to be exposed, to increase the likelihood that said capturing means can capture a film perforation if it fails to do so on the first operation of said manually operable means.

Filed May 27, 1981, Ser. No. 267,568  
Claims priority, application Japan, Jun. 11, 1980, 55-78859  
Int. Cl.<sup>3</sup> G03B 3/10; G02B 7/04

## 7 Claims



1. An interchangeable lens barrel comprising a mount securing lens barrel having a mount which can be attached to a mount of a camera body, focusing lens means rotatably supported on the mount securing lens barrel and moving in directions of the optical axis when it rotates, a driving circuit having a driving motor, a driving mechanism connected to the driving motor for rotating the focusing lens means, outside actuation switch means provided in the driving circuit of the driving motor, signal transmitting and receiving means for receiving a driving signal of the driving motor from the camera body, said



signal transmitting and receiving means being provided on the portion of the mount securing lens barrel that is opposed to the mount of the camera body, said signal means including a plurality of sliding contacts connecting said drive motor on the lens barrel with the driving circuit regardless of the axial displacement of the lens barrel from the mount.

4,416,527

# APPARATUS OF PREVENTING BOUND OF DIAPHRAGM BLADES IN CAMERA

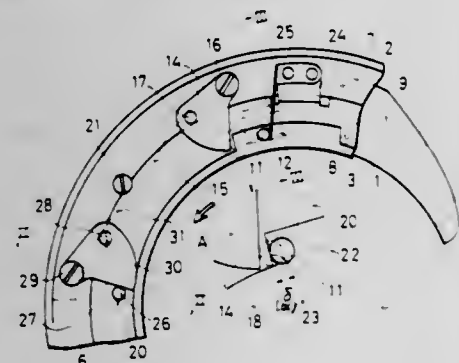
Zenichi Okura, Ichikawashi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,079

Claims priority, application Japan, Jun. 22, 1981, 56-92027

Int. Cl.<sup>3</sup> G03B 9/06

U.S. Cl. 354—272



1. In a diaphragm actuator of a lens of a camera, comprising a stationary support ring, a blade ring which is rotatable in and relative to the support ring and which has a plurality of diaphragm blades rotatable thereto by means of pivots, said diaphragm blades being movably connected to said support ring so that the rotational movement of the blade ring relative to the support ring causes the diaphragm blades to open and close in order to control a diaphragm opening defined by the diaphragm blades, and an angular displacement limiting member which limits the angular displacement of the blade ring to control the diaphragm opening in accordance with a predetermined aperture F number of the associated lens, said blade ring being rotated until it is brought into contact with the limiting member when the diaphragm blades are closed, the improvement comprising an apparatus for preventing the blade ring from bounding when the blade ring comes into contact with the limiting member, said bound preventing apparatus comprising a bound preventing ring which is rotatable relative to the support ring and which comes into contact with the blade ring to brake the movement of the blade ring immediately before the blade ring comes into contact with the limiting member.

4,416,528

# CAMERA LENS ACCESSORY MOUNTING CONSTRUCTION

Steven M. Breslau, Evanston, Ill., and M. Gary Grossman, Fort Lee, N.J., assignors to Sima Products Corporation, Chicago, Ill.

Filed Jun. 17, 1982, Ser. No. 389,220

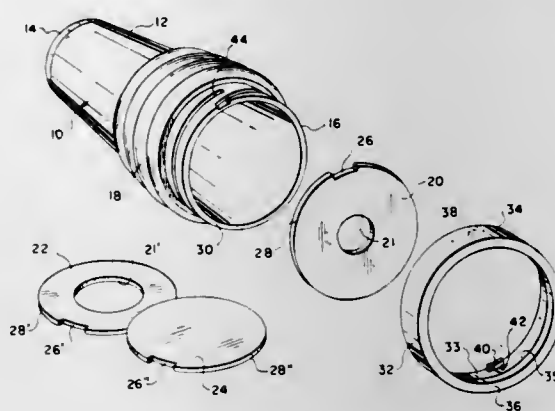
Int. Cl.<sup>3</sup> G03B 11/06; G02B 7/00

U.S. Cl. 354—296

8 Claims

1. A camera lens accessory and mounting device for positioning and locking one or more accessories at a front end of the lens comprising, at least one accessory having a perimeter edge, a notch formed in said accessory along said edge, a mounting ring, said ring including a pair of oppositely-facing lugs extending radially within the ring from the inner-facing

circumference thereof, said accessory being positionable within said ring to be retained therein by said lugs, and said



13 Claims

ring with accessory positioned therein being mountable to said front end of the lens to retain the accessory thereon.

4,416,529

# RACKS FOR DEVELOPING AND/OR FIXING FILM

Alfons Kastl, Munich, Fed. Rep. of Germany, assignor to AG-FA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

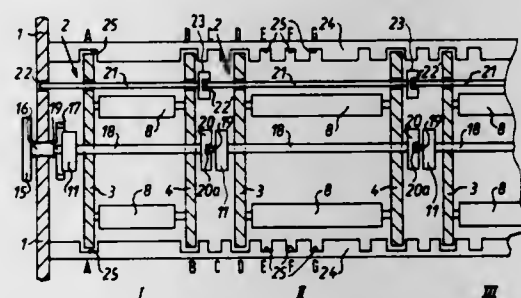
Filed Apr. 27, 1982, Ser. No. 372,102

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119318

Int. Cl.<sup>3</sup> G03B 3/08

U.S. Cl. 354—320

20 Claims



1. An arrangement for processing radiation-sensitive articles, particularly for developing and fixing film, comprising:

- (a) a container for accommodating a processing medium for radiation-sensitive articles;
- (b) a first conveying device for conveying radiation-sensitive articles having first dimensions along a first path;
- (c) a second conveying device for conveying radiation-sensitive articles having second dimensions different from said first dimensions along a second path, said devices having different dimensions;
- (d) guide means in said container for removably positioning said devices therein, said devices being receivable in said container simultaneously, and said guide means being arranged to position said devices such that said paths are out of alignment with one another;
- (e) a drive for said devices; and
- (f) coupling means for coupling said devices to one another and to said drive in such a manner that one of said devices transmits driving force from said drive to the other of said devices, said coupling means comprising a driving member on each of said devices adapted to be coupled to said drive, first coupling elements on said driving members, and second coupling elements connected with said driving members and arranged to mate with said first coupling elements.

4,416,530

# POLARIZING FILTERS FOR ENHANCING CONTRAST IN XEROGRAPHIC COPYING MACHINES

Richard D. Hebert, and Daniel J. Lasky, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,369

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 R

24 Claims

# LATCHING AND TENSIONING MECHANISM FOR CLOSED-LOOP BELT SUPPORTING CAPSTAN

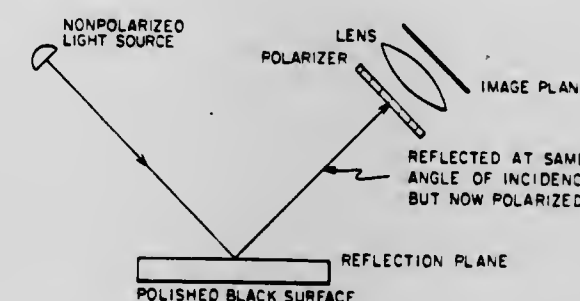
Alfonso A. Rosati, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,720

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 BE

5 Claims

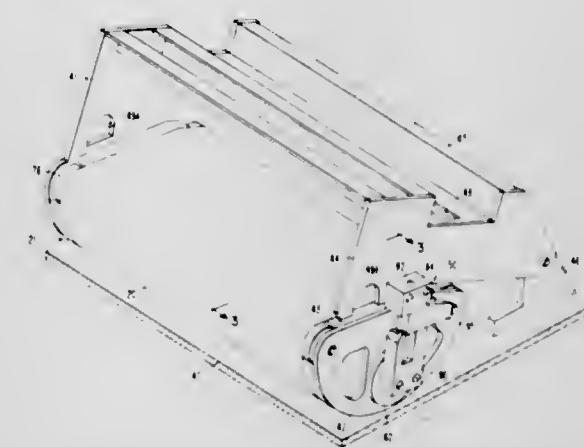


1. In a photocopying apparatus, comprising a light source, a reflection plane, optical elements to focus the light and an image plane;

the improvement comprising;

a light polarizing means juxtaposed between said reflection plane and said image plane;

whereby specularly reflected polarized light from said reflection plane directed toward said image plane, is prevented from being incident upon said image plane by said polarizing means.



1. In a copier having a flexible belt guide frame attached at one end in cantilever fashion to the copier base with said guide frame including a bar movably mounted for applying outwardly directed tension to the inner face of the belt when the belt is positioned over said guide frame, an improvement comprising:

interlock receiving means on said copier base located in proximity to the end of said guide frame opposite said cantilever fashion attached end,

a member having an arm with interlocking means and means for moving said belt tensioning bar thereon, and

means mounting said member to said guide frame opposite end for rotation between (i) a first position wherein said base interlock receiving means and said arm interlocking means engage for securing said guide frame opposite end to said copier base while said belt moving means of said arm actuates said bar in a belt-tensioning direction, and (ii) a second position wherein said arm interlocking means is disengaged and said belt moving means causes said bar to release belt tension, said member and said mounting means being cooperatively interrelated for locating said member clear of said guide frame opposite end when in said second position.

4,416,531

# ELECTROPHOTOGRAPHIC COPYING APPARATUS AND SUBSYSTEMS THEREFOR

Edward F. Mayer, San Jose, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan

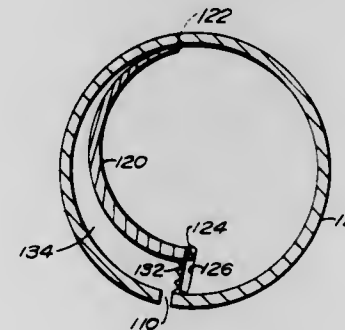
Division of Ser. No. 199,096, Oct. 20, 1980, Pat. No. 4,384,784.

This application Apr. 2, 1982, Ser. No. 364,653

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 TR

13 Claims



1. An electrophotographic copying apparatus including a photosensitive surface movable cyclically past a plurality of processing stations and adapted to retain for at least two cycles thereof an electrostatic latent image formed on said photosensitive surface by exposing charged portions of said surface to a light image of an original, said stations including a developing station having means for applying a developing powder to said latent image to form a powder image of said original and a transfer station for bringing a copy sheet into registry with said powder image for transferring said powder image thereto, said transfer station including a roller adapted to rotate adjacent said surface in synchronism therewith and including holes extending inwardly to pressure means forming a low pressure on the surface of said roller for holding a copy sheet thereto to bring it into contact with said powder image and later forming a higher pressure on said roller surface for releasing said copy sheet.

4,416,533

# NONIMPACT PRINTER

Kazuyoshi Tokunaga, Katsuta, and Masayasu Anzai, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

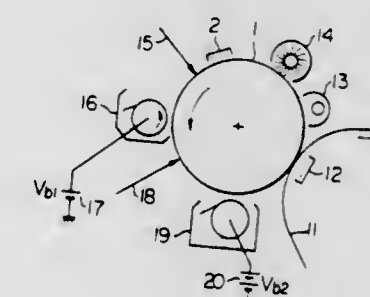
Continuation of Ser. No. 93,034, Nov. 9, 1979, abandoned. This application May 19, 1982, Ser. No. 379,913

Claims priority, application Japan, Dec. 19, 1978, 53-155791

Int. Cl.<sup>3</sup> G03G 15/01, 15/08

U.S. Cl. 355—4

11 Claims



1. A nonimpact printer comprising: a recording medium movable in a predetermined direction; single charging means



for uniformly charging said recording medium; means for forming a first latent image of electric charges on said recording medium; first developing means for developing said first latent image into a first visible image; means for forming a second latent image of electric charges on said recording medium with said first visible image formed thereon; and second developing means for developing said second latent image into a second visible image having a color different from that of said first visible image, the bias voltage for said second developing means being set higher than the bias voltage of said first developing means, said single charging means, said first latent image forming means, said first developing means, said second latent image forming means, and said second developing means being arranged, in that order, in the direction of movement of said recording medium whereby a visible image of a plurality of colors is formed on said recording medium during one cycle of movement of said recording medium.

4,416,534

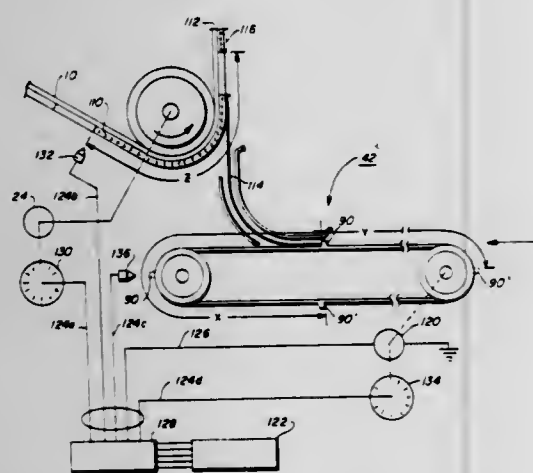
#### APPARATUS AND METHOD FOR REGISTERING COPY SHEETS IN A VARIABLE PITCH REPRODUCTION MACHINE

Jacob N. Kluger, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1981, Ser. No. 318,300  
Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 SH

9 Claims



1. In a reproduction machine for copying images from a variable pitch moving image source onto a moving copy sheet, apparatus for synchronizing sheet and image registration comprising:

- (a) means for moving the sheet into image transfer relationship with the source to transfer an image to said sheet;
- (b) means for generating speed signals related to the speed of said source and said copy sheet respectively;
- (c) means for monitoring the position registration of said copy sheet with respect to an image on said source; and
- (d) control means coupled to outputs from said means for generating and said means for monitoring to compare the difference if any between position and speed registration, and further coupled to said means for moving to register the image with the sheet at the point of image transfer.

4,416,535

#### ELECTROPHOTOGRAPHIC COPYING APPARATUS

Takafumi Tottori, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1982, Ser. No. 382,354

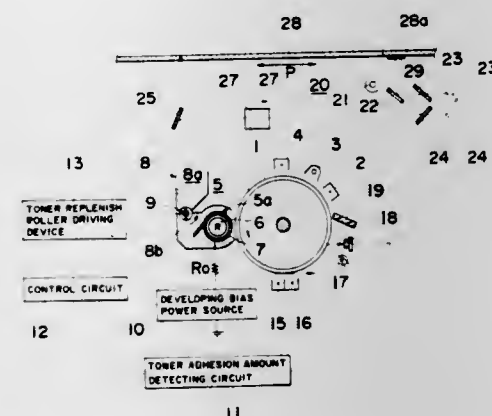
Claims priority, application Japan, Jun. 8, 1981, 56-87733  
Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 D

5 Claims

1. An electrophotographic copying apparatus which comprises an original document image exposure device in which original document magnification with respect to a photosensitive surface of a photoreceptor is changeable, a developing device for developing an electrostatic latent image formed on

the photosensitive surface of the photoreceptor, a developing electrode provided within the developing device and grounded via an impedance element and a developing bias power source, a black reference image with white background which is arranged adjacent to a platform for the original document so that a reference latent image corresponding to the reference image is formed on the photosensitive surface of the photoreceptor, a detector for detecting amount of toner adher-



ing to said reference latent image after development of the reference latent image by said developing device, means for replenishing toner to a developer in said developing device when the toner amount detected by the detector falls below reference toner amount, a correcting means for changing the reference toner amount and/or voltage of the developing bias power source according to an operation for changing the original document magnification.

4,416,536

#### LIGHT MEMORY REMOVING SYSTEM IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Ikuo Itoh; Shunju Anzai, both of Nara, and Kunio Ohashi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

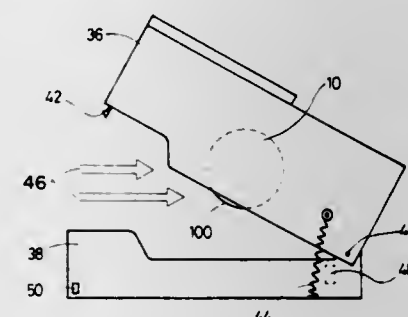
Filed May 5, 1982, Ser. No. 375,175

Claims priority, application Japan, May 12, 1981, 56-71595; May 12, 1981, 56-71597

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 R

5 Claims



1. An electrophotographic copying machine comprising: a photosensitive drum; image forming elements disposed around said photosensitive drum, said image forming elements including a corona charging unit, an exposure unit, a developing unit, a transcription unit and an erase unit; a housing for accommodating said photosensitive drum and said image forming elements, said housing constructed to be separated substantially along a path of a copy paper; detection means for developing a detection signal when said housing is closed from a separated state; light memory removing means for activating at least said transcription unit and said erase unit for removing a light mem-

ory effect developed on said photosensitive drum while said housing is separated; and a control circuit for enabling said light memory removing means when said detection signal is developed from said detection means.

4,416,537

#### CLEANING SYSTEM

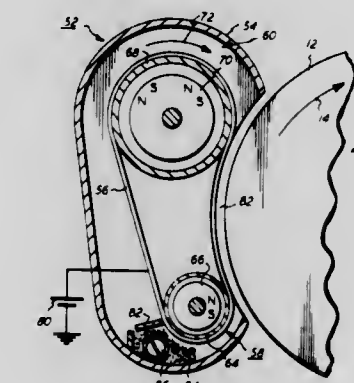
Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 18, 1981, Ser. No. 266,396

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—15

15 Claims



1. An apparatus for removing particles from a substantially rigid member, including:

- flexible means, positioned closely adjacent to the rigid member defining a cleaning zone therebetween, for transporting a cleaning material into contact with the particles adhering to the rigid member;
- means for maintaining said flexible means at a pre-selected tension of sufficient magnitude to compress the cleaning material and particles in the cleaning zone and to space said flexible means from the rigid member; and
- means for moving said belt toward the rigid member upon actuation of the apparatus and away from the rigid member upon de-actuation of the apparatus.

4,416,538

#### IMAGE ENHANCEMENT

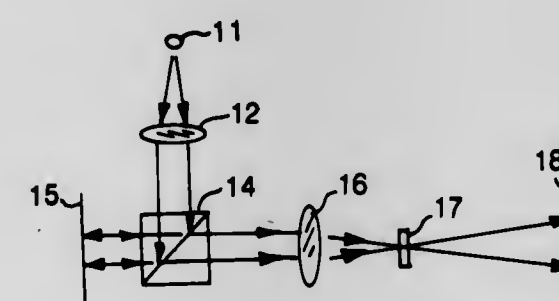
Peter F. Mueller, Concord, and H. John Caulfield, Nagog Woods, both of Mass., assignors to Aerodyne Research, Inc., Billerica, Mass.

Filed Dec. 7, 1981, Ser. No. 328,021

Int. Cl.<sup>3</sup> G03B 27/54

U.S. Cl. 355—67

7 Claims



1. Image enhancement apparatus adapted to display increased detail in greatly lighter and greatly darker areas of a photographic film which has surface perturbations in areas of density gradations comprising  
a light source,  
a means to direct light from said source to a photographic film at an object plane for specular reflection from said plane,  
a spatial filter,  
a means to focus reflected light from said plane to a focal

position substantially at said spatial filter and to direct light from said filter to an image plane, whereby scattered light from said surface perturbation and specularly reflected light from said object plane are differentiated by said spatial filter to project at said image plane an image corresponding to said surface perturbations.

4,416,539

#### METHOD OF LOCATING ABNORMAL ORIGINALS

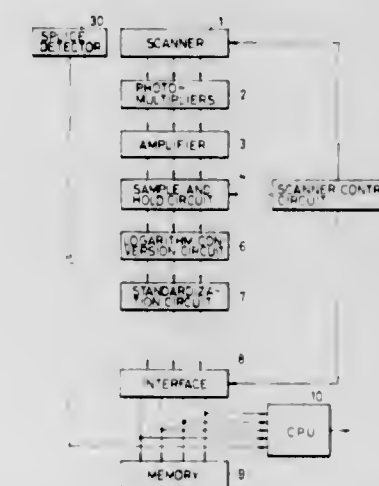
Takaaki Terashita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1982, Ser. No. 389,353

Claims priority, application Japan, Jun. 22, 1981, 56-96290  
Int. Cl.<sup>3</sup> G03B 27/72

U.S. Cl. 355—77

6 Claims



1. A method for locating an abnormal original for photographic print exposure control, comprising subjecting a number of small portions of the original to photometry, determining an average of each of one or more characteristic values determined from the measured values, for frames which are considered to be included in a series of originals, and comparing, using a plurality of said averages, to distinguish an abnormal original from a normal original.

4,416,540

#### APPARATUS AND METHOD FOR HOLOGRAPHIC CONTACT COPYING

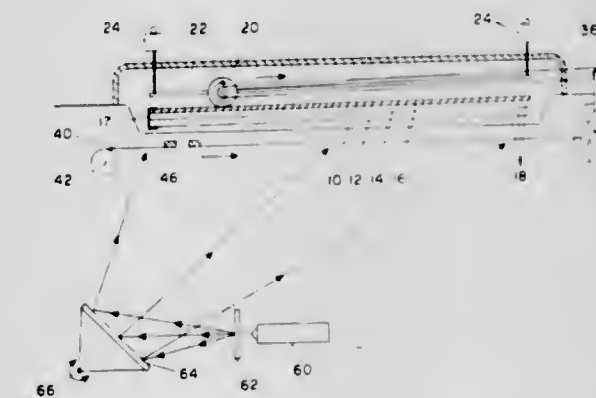
Peter Nicholson, 4401 - 11th St., Long Island City, N.Y. 11101

Filed Nov. 23, 1981, Ser. No. 323,953

Int. Cl.<sup>3</sup> G03H 1/20

U.S. Cl. 350—3.69

10 Claims



1. An apparatus for producing a film copy hologram from a film master hologram containing a recorded image, comprising:

- tray means having a generally clear bottom for holding a master holographic film, a blank film and a cover sheet in a substantially flat condition, with the blank film between the master film and cover sheet, and with the emulsion side of the blank film generally in contact with the emulsion side of the master film, and with the other side of said



master film generally in contact with the bottom of said tray; means for exerting pressure on the cover sheet to obtain optical contact between the cover sheet and blank film, between the blank film and master film, and between the master film and tray bottom; means for defining a slit and means for moving same across the underside of said tray; and means for generating a reconstruction beam and for directing said beam to the underside of said tray and through said slit and clear tray bottom, to thereby duplicate in the blank film the holographic image in the master film.

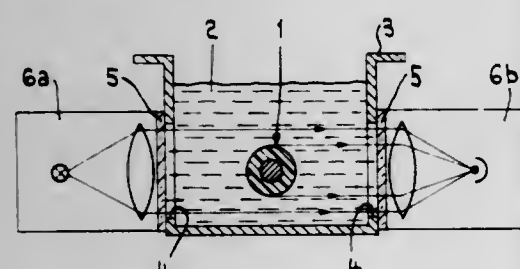
4,416,541

**PROCESS AND DEVICE FOR THE MEASUREMENT OF A PHYSICAL QUANTITY OF AN EXTRUDED ELEMENT**  
 Urs P. Studer, Riehen, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland  
 Filed Apr. 30, 1981, Ser. No. 258,952  
 Claims priority, application Switzerland, May 8, 1980, 3593/80

Int. Cl.<sup>3</sup> G01B 11/04

U.S. Cl. 356—386

6 Claims



1. Process for automatic control of a physical quantity of an extruded element issuing from an extruder in a hot condition and cooling down gradually as it moves away from said extruder to reach a cooled condition, by means of a first and a second regulating loop in which said first regulating loop comprises the measurement of said quantity carried out on said element in the hot condition in the close vicinity of an exit of said extruder for quickly regulating and correcting variations from a first reference value and said second regulating loop comprises the measurement of said quantity carried out on said element in the cooled condition for providing an auxiliary regulation of said quantity with respect to a second reference value of said element in the cooled condition.

4,416,542

**NIGHTTIME/DAYTIME DIFFUSE ATTENUATION COEFFICIENT DEVICE FOR SEAWATER**  
 Gregory C. Mooradian, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

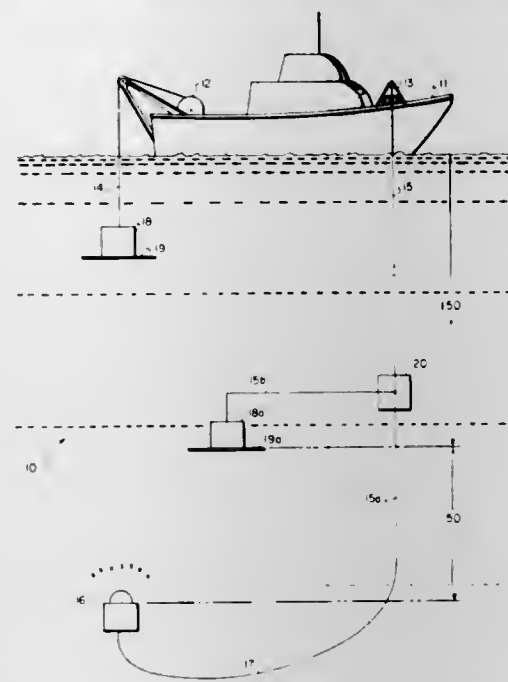
Filed Jun. 15, 1981, Ser. No. 273,785  
 Int. Cl.<sup>3</sup> G01N 21/17

U.S. Cl. 356—435

10 Claims

1. An apparatus for measuring the diffuse attenuation coefficient of seawater during both day and night comprising:  
 a pulsed cosine emitter source disposed below the water's surface several scattering lengths of interest for emitting pulsed light;  
 a cosine response irradiance receiver interposed between the pulsed light emitting means and the water's surface being spaced from the pulsed cosine emitter source at least one scattering length of interest and facing downward for

receiving irradiance from the pulsed light emitting cosine emitter source to generate responsive signals; and



4,416,543

**APPARATUS FOR TREATING POWDERY RUBBER MIXTURES**

Heinz Brinkmann, Bennigsen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

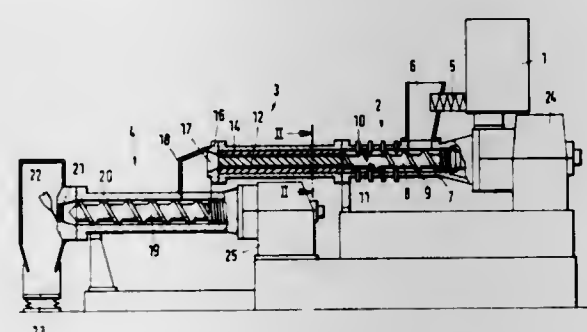
Filed Sep. 1, 1981, Ser. No. 298,366

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036397

Int. Cl.<sup>3</sup> B29B 1/10

U.S. Cl. 366—80

2 Claims



1. Apparatus for treating powdery rubber mixtures to form processed intermediate products, said apparatus comprising a filling extruder having a rotary filling screw disposed in a filling extruder housing, and means for feeding the powdery rubber mixtures to said filling extruder housing; a mixing and plasticising housing secured to the downstream end of said filling extruder housing, said mixing and plasticising housing having teeth formed on the interior thereof and having positioned therein a central conveyor spindle having exterior teeth and rotatably coupled to the downstream end of said rotary filling screw and disposed concentrically in said plasticising housing, a plurality of axially freely movable planetary gear spindles having exterior teeth, said planetary gear spindles being symmetrically disposed around said central conveyor spindle within said plasticising housing, the teeth on said planetary gear spindles meshing with the internal teeth on said plasticising housing and the exterior teeth in said central conveyor spindle thereby causing said planetary spindles to orbit about said central conveyor spindle and provide a conveying action, said central conveyor spindle and said planetary spindle

achieving essentially pressure-less plasticisation and uniform distribution and consequent homogeneity of the components of the powdery rubber mixtures, means located in the region of the discharge end of said plasticising housing axially to locate said planetary spindles, and a forming extruder at the downstream side of said plasticising housing to process material discharged from said mixing and plasticising housing, said forming-out extruder being in cascade arrangement with said plasticising housing to receive therefrom the essentially pressure-free components homogenized in said plasticizing housing.

4,416,544

**DEVICE FOR MIXING, DISPERSING AND HOMOGENIZING COMPOUNDS WITH AT LEAST ONE VISCOUS COMPONENT**

Josef A. Blach, Wilhelmstrasse 24, D-7144 Asperg, Fed. Rep. of Germany

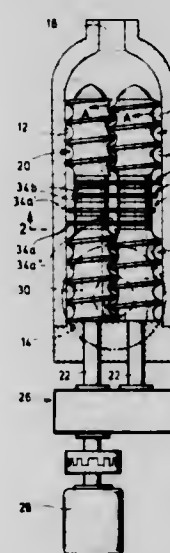
Filed Nov. 20, 1981, Ser. No. 323,176

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047314

Int. Cl.<sup>3</sup> B29B 1/10; B01F 7/10

U.S. Cl. 366—85

7 Claims



1. In a device for mixing, dispersing and homogenizing compounds with at least one viscous component, said device exhibiting in a housing at least two parallel intermeshing shafts which can be driven in the same direction, each of said shafts having a plurality of ring disc sections disposed at an axial distance from each other, said disc sections each having at least one elevation from a circle concentric to the shaft axis, wherein the circumferential areas of the ring disc sections of the two shafts exhibiting the greatest distance from their associated shaft axes, as seen in axial direction, overlap, wherein the improvement comprises said ring disc sections being spaced axially from each other by a distance that is substantially greater than the thickness of said ring disc sections, said ring disc sections on adjacent shafts being arranged opposite one another and the axial spacings along said shafts between said ring disc sections being arrayed opposite one another.

4,416,545

MIXER

Heinz Krimmel, Ludwigsburgerstrasse 14, D-7015 Korntal-Münchingen-1, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,766

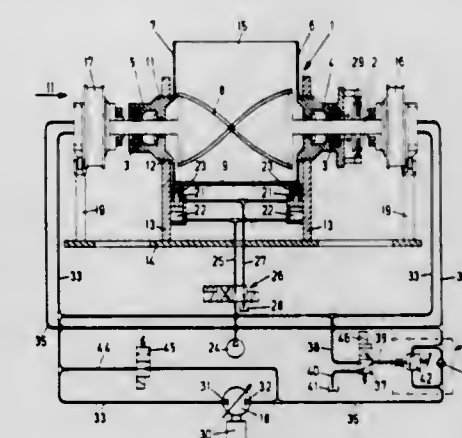
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112685

Int. Cl.<sup>3</sup> B01F 7/02; B28C 1/16

U.S. Cl. 366—99

6 Claims

1. A mixer having a mixing trough; rotatable mixing and kneading blades within the mixing trough; a charging and discharging opening in said mixing trough; a rotatable mixing shaft connected to said blades, said trough being pivotable



4,416,546

**BUOYANCY-RESPONSIVE DEVICE**

Malcolm F. Parkins, Elm Tree Cottage, South End, Ogbourne St. George, near Marlborough, England

PCT No. PCT/GB81/00132, § 371 Date Feb. 23, 1982, § 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00167, PCT Pub. Date Jan. 21, 1982

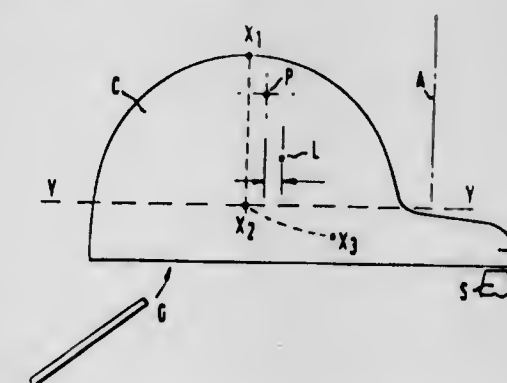
PCT Filed Jul. 3, 1981, Ser. No. 355,583

Claims priority, application United Kingdom, Jul. 4, 1980, 8022093

Int. Cl.<sup>3</sup> B01F 13/02

U.S. Cl. 366—102

4 Claims



1. A buoyancy-responsive device, for repeatedly disturbing a first fluid in which it is immersed, comprising a hollow body forming a chamber with an open mouth, which faces downwardly in a rest position of the body to collect a second, lighter, fluid rising from below, the body being pivoted about a horizontal axis and having its centre of gravity offset therefrom, so that the body by its weight tends to maintain the rest position but is capable of rotation to an unstable position, in which the mouth faces laterally, the chamber having an upper fluid-collecting portion which, in the rest position, is substantially symmetrical about a vertical plane so as to collect said lighter fluid and displace said first fluid downwardly without disturbing the body from its rest position, and the chamber also having a lower fluid-collecting portion which, in the rest position, is asymmetrical about said vertical plane and, due to buoyancy upthrust when sufficiently filled with collected



lighter fluid, exerts a turning moment about said axis, overcoming the effect of the weight thereof, to swing said body from the rest position rapidly to discharge collected fluid through the mouth, the body thereafter returning to the rest position.

4,416,547

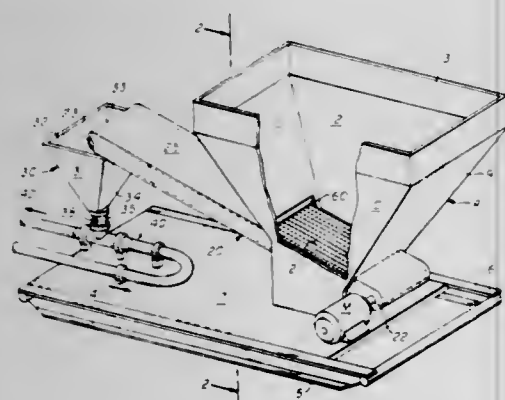
## PORTABLE PROPORTIONING DEVICE

Raymond F. Mikolajczyk, Rte. 1, Box 57-A, Broussard, La. 70518

Filed Jan. 28, 1982, Ser. No. 343,443  
Int. Cl.<sup>3</sup> B01F 15/02

U.S. Cl. 366—150

1 Claim



1. A rotary drilling fluid mixing arrangement including:
  - a. support means;
  - b. upright hopper means for receiving dry bulk material carried by said support means;
  - c. mixing hopper means carried by said support means and spaced laterally from said hopper means;
  - d. continuous conveyor means extending from adjacent the lower end of said upright hopper means to adjacent the upper end of said mixing hopper means, said conveyor means extending throughout the width of said upright hopper means to form the bottom surface therein;
  - e. means to move said conveyor means and carry dry bulk material from said upright hopper means to said mixing hopper means;
  - f. control means to control the amount of material on said conveyor means as it moves from said upright hopper means, said control means including:
    1. an opening in a wall of said upright hopper means through which said continuous conveyor means extends; and
    2. regulating means to regulate the size of the opening and thereby control the amount of bulk material which may be carried on the conveyor means from said upright hopper means to said mixing hopper means, said regulating means comprising:
      - (a) movable plate means;
      - (b) means to support said movable plate means on said upright hopper means adjacent the opening in the wall thereof; and
      - (c) means to raise and lower said movable plate means;
  - g. discharge means adjacent the lower end of said mixing hopper means;
  - h. liquid conducting conduit means connected to receive material from said discharge means; and
  - i. means to regulate the amount of dry bulk material transferred by said conveyor means from said upright hopper means to said mixing hopper means, said means including a variable speed motor to move said conveyor means.

4,416,548

## APPARATUS FOR GAS OR LIQUID ADMIXTURE

Olof G. Carre, Alnö; Paul W. Josefsson, Sörberge; Lars E. Näsman, Alnö, and Stig B. H. Zetterqvist, Sundsbruk, all of Sweden, assignors to Sunds Defibrator Aktiebolag, Sweden

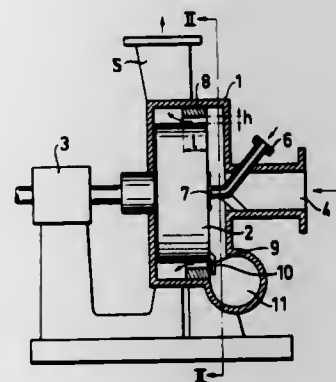
Filed Feb. 17, 1981, Ser. No. 234,786

Claims priority, application Sweden, Mar. 13, 1980, 8001970

Int. Cl.<sup>3</sup> B01F 7/12

U.S. Cl. 366—168

16 Claims



1. Apparatus for continuously mixing a fluid processing medium with a pulp suspension comprising a cylindrical rotor including a planar radial face and a cylindrical axial outer surface, a housing surrounding said rotor, said housing including a pulp suspension inlet facing the center of said substantially planar radial face of said rotor and an outlet proximate to said cylindrical axial outer surface of said rotor, gap means for forming an annular gap between said cylindrical axial outer surface of said rotor and said housing along a predetermined portion of said cylindrical axial outer surface of said rotor, said planar radial face being free of mixing protrusions and allowing a substantially unimpeded flow of said pulp suspension to permit mixing of said pulp suspension at said gap means, processing medium inlet means for feeding said fluid processing medium to said pulp suspension inlet, and turbulence creating means located at the periphery of said planar radial face of said rotor so as to create turbulence in said pulp suspension at the entrance to said annular gap.

4,416,549

## APPARATUS FOR AGITATING AND PUMPING A LIQUID SLURRY

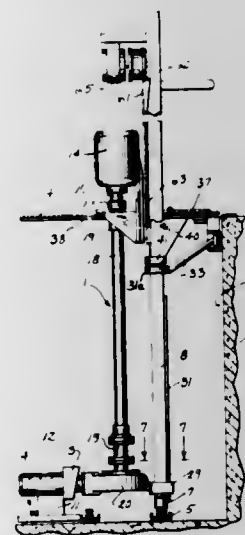
Stephen L. Kretschmer, Elk Grove Village, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Dec. 7, 1981, Ser. No. 327,792

Int. Cl.<sup>3</sup> B01F 7/16, 15/00

U.S. Cl. 366—190

12 Claims



1. An apparatus for agitating and pumping a liquid slurry, comprising a vessel containing the liquid slurry, a fixed vertical column disposed within said vessel, a motor-pump unit

mounted for vertical movement on said column, said motor-pump unit including a pump located within the vessel for agitating and pumping the liquid slurry and a motor located a substantial distance above the pump and positioned outside the vessel, said motor-pump unit also including a driving connection between the motor and the pump, first mounting means for mounting the motor-pump unit for rotation about the axis of said column, and second mounting means connected to said motor-pump unit for mounting the motor-pump unit for tilting movement about a horizontal axis with respect to the column, said second mounting means being movable on said vertical column whereby said motor-pump unit can be moved vertically within said vessel, said motor-pump unit being movable to an upper position where the pump is located adjacent the top of the vessel and said motor-pump unit then being capable of being tilted about said horizontal axis to raise the pump to a level above the vessel.

4,416,550

## DRIVE ASSEMBLY FOR A TIMEPIECE

Robert Wolber, and Roland Maurer, both of Lauterbach, Fed. Rep. of Germany, assignors to Gebrüder Junghans GmbH, Schramberg, Fed. Rep. of Germany

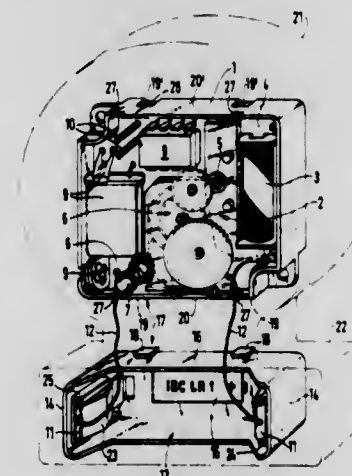
Filed Jul. 17, 1981, Ser. No. 284,212

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 8024739

Int. Cl.<sup>3</sup> G04B 19/00, 37/00

U.S. Cl. 368—88

8 Claims



1. A timepiece drive assembly adapted to be mounted in a timepiece housing, said assembly including:
  - a movement casing containing a circuit board and first mating means,
  - a battery-receiving member having second mating means configured for removable securement with said first mating means of said casing, said battery-receiving member forming a chamber and including battery contact terminals removably secured in said chamber, and
  - flexible connecting wires extending between said terminals and said casing to electrically couple said terminals to said circuit board, said wires being of sufficient length to permit said battery-receiving member to be separated from said casing and positioned in spaced relationship therewith within the timepiece housing while maintaining an electric coupling between said terminals and said circuit board.

4,416,551

## BATTERY MICROCALORIMETER

Kwang-Yil Kim, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 11, 1981, Ser. No. 300,878

Int. Cl.<sup>3</sup> G01K 17/00

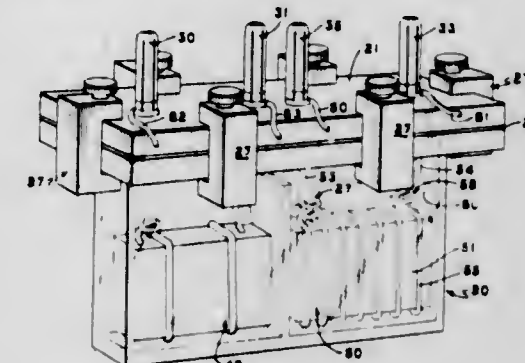
U.S. Cl. 374—31

3 Claims

1. In a calorimeter:
  - (a) a thin sample container having opposite faces of large

area with respect to the thickness of the container, cover means for closing said container in liquid-tight relation, and terminal means carried by said cover means for making electrical connections therethrough, said container being separated by a narrow partition extending between said faces into first and second narrow chambers having surfaces which make up the faces of said container, said partition being of less height than said container;

(b) a pair of heat sinks having faces apposed to the faces of said container;



- (c) a pair of thermopiles having first faces thermally engaging said faces of said container, and second faces thermally engaging said faces of said heat sinks, whereby to conduct heat from said container to said sink and give electrical outputs determined by the flow of said heat; and
- (d) the nonliquid components of an electrochemical cell mounted in one of said chambers connected to said terminal means.

4,416,552

## CORRELATION THERMOGRAPHY

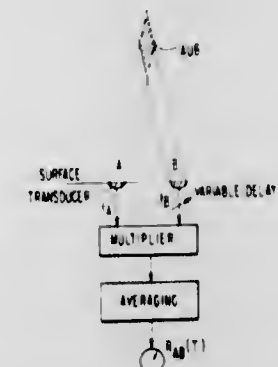
Robert A. Hessemer, Jr., 757 Corplno De Pecho, Green Valley, Ariz. 85614, and Lloyd J. Perper, 3725 Ironwood Hill Dr., Tucson, Ariz. 85745, assignors to Robert A. Hessemer, Jr., Green Valley; Lloyd J. Perper and Theodore Bowen, both of Tucson, all of, Ariz.

Filed Oct. 15, 1981, Ser. No. 311,632

Int. Cl.<sup>3</sup> G01K 1/00

U.S. Cl. 374—117

20 Claims



1. A passive remote thermal radiation sensing and processing system for non-invasive temperature measurement of the interior of a body, said system comprising:
  - at least first and second directional receiving means for receiving thermally-generated energy from inside said body and generating corresponding electrical signals, each of said first and second directional receiving means having a defined directional receiving pattern and said first and second directional receiving means being adapted to be coupled with the surface of said body at different locations about said body so that their directional receiving patterns intersect;
  - multiplier means connected to receive the electrical signals generated by said first and second directional receiving



means for producing a product output signal proportional to the product of said electrical signals; and averaging means connected to said multiplier means for averaging said product output signal over a period of time to generate a correlation output signal which is a measure of the thermally-generated energy within the volume of intersection of the directional receiving patterns of said first and second directional receiving means.

4,416,553

## TEMPERATURE-SENSING APPARATUS

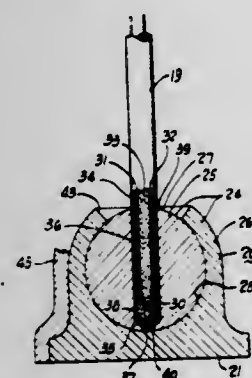
David A. Huebner, Maple Heights, Ohio, assignor to Noral, Inc., Cleveland, Ohio

Filed Aug. 26, 1981, Ser. No. 296,433

Int. Cl.<sup>3</sup> G01K 1/16, 7/04

U.S. Cl. 374-165

20 Claims



1. A temperature-sensing apparatus adapted to be placed in contact with a surface for sensing the temperature of the surface comprising, in combination:

a temperature-sensitive sensor means; manipulable support means connected to said sensor means; conductor means connected to said sensor means and extending within said support means; a universal joint having first and second parts with first and second interengaged surfaces thereon, respectively; means connecting said first part to said support means to be manipulable therewith, said sensor means mounted towards an end of said connecting means near said first and second interengaged surfaces; and

a contact face adapted to engage a surface the temperature of which is to be sensed and connected to said second part whereby a heat flow path from the surface is through said contact face and said first and second interengaged surfaces to said sensor means, with said universal joint permitting said contact face to remain in engagement with the surface for a range of movement of said manipulable support means.

4,416,554

## THRUST BEARING FOR ROCK BITS

Walter A. Pribbenow, Ponca City, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 9, 1982, Ser. No. 396,938

Int. Cl.<sup>3</sup> F16L 33/06; E21B 10/22

U.S. Cl. 384-95

3 Claims

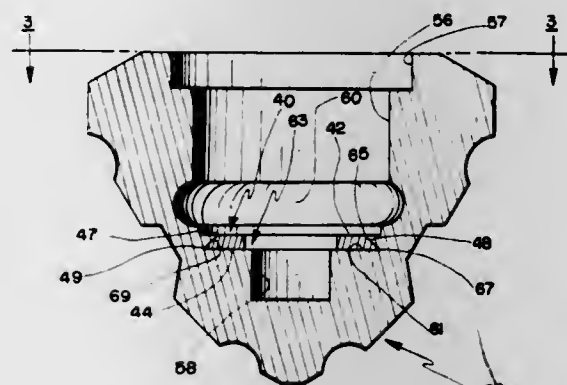
1. A rotary rock bit comprising:

a bit body having an upper end connectable to a drillstring, at least one bearing journal extending from an opposite end of said body, said bearing journal defining at least one radially disposed bearing surface thereby,

a cutter cone rotatably positioned on said journal, said cutter cone defining at least one radially disposed bearing surface, said cone bearing surface being so configured to mate with said at least one radially disposed bearing surface formed by said bearing journal, and

at least one radially disposed intermediate thrust bearing positioned between said radially disposed bearing surfaces formed by said journal and said cone, said intermediate bearing is secured between said journal and bearing by

intermediate bearing retention means, wherein an outside peripheral surface formed on said intermediate radially disposed thrust bearing is chamfered and noncircular, a first noncircular outside peripheral edge formed on said intermediate thrust bearing nearest a thrust bearing cavity formed in said cone is larger than a second parallel noncircular outside peripheral edge formed on said thrust bearing nearest said radially disposed bearing surfaces formed by said journal, said chamfered surface being formed between said first and second outside peripheral edges formed on said thrust bearing, said chamfered noncircular bearing registers with a matching chamfered noncircular



cavity formed in said cone, said first outside peripheral edge of said thrust bearing is smaller than said matching chamfered noncircular cavity formed in said cone, said chamfered thrust bearing is first aligned with said cavity in said cone, said thrust bearing is subsequently placed into registering engagement with said cavity, said thrust bearing being subsequently rotated out of alignment with an opening formed in said cone forming said cavity, said chamfered surfaces formed in said thrust bearing and said cone come in contact with one another to secure said thrust bearing within said cone to prevent dislodgement of said thrust bearing from said matching cavity formed in said cone.

4,416,555

## BEARING SYSTEM FOR VERTICAL TYPE ROTARY MACHINE

Shunzo Tomioka; Kinpei Okano; Masanori Matsuo; Akira Hasegawa, and Akira Kitamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,869

Claims priority, application Japan, Sep. 30, 1980, 55-135287

Int. Cl.<sup>3</sup> F16C 17/02

U.S. Cl. 384-415

18 Claims

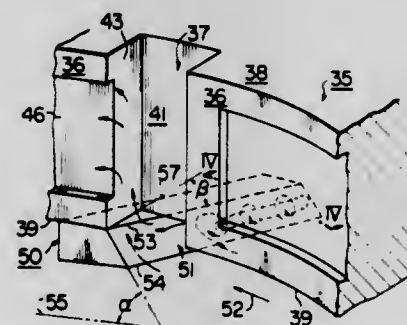
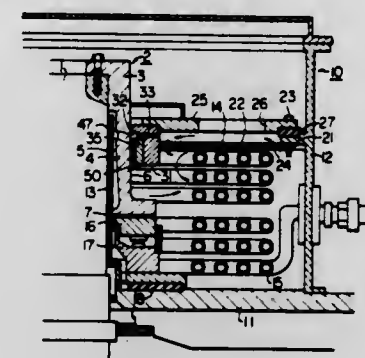
1. A bearing system for a vertical type rotary machine including a vertically extending rotor shaft, comprising:

an oil tank disposed around said rotor shaft and receiving lubricating oil in said oil tank;

a guide bearing disposed around said rotor shaft in a concentric relation thereto for guiding said rotor shaft, said guide bearing having upper and lower end surfaces and a cylindrical bearing surface extending therebetween and facing the periphery of said rotor shaft with at least a lower peripheral portion of said bearing surface dipped in the oil within said oil tank, said guide bearing including a plurality of generally axially extending oil grooves formed in said bearing surface, each of said oil grooves having axial one end thereof opening into said lower end surface of said guide bearing and having a bottom surface and leading and trailing side surfaces with respect to the rotational direction of said rotor shaft;

a plurality of oil guide members with one associated with each of at least some of said oil grooves, each of said oil guide members being located adjacent to said lower end surface of said guide bearing and adjacent to said trailing

side surface of the associated oil groove, each of said oil guide members having a guide surface facing the direction of flow of the oil within said oil tank accompanied with the rotation of said rotor shaft for introducing the oil into the associated oil groove; and



said guide surface having an upper edge adjacent to said lower surface of said guide bearing and a lower edge remote therefrom, said lower edge being advanced toward the oil flow with respect to said upper edge, and said guide surface extending radially outwardly beyond said bottom surface of said oil groove.

4,416,556

## TYPE CARRIER FOR USE IN IMPACT-TYPE PRINTING MACHINES

Nobuo Iwata, Sagami-hara; Koh Matsuhisa, Yokohama; Hiromi Takada, Yokohama, and Takami Suzuki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

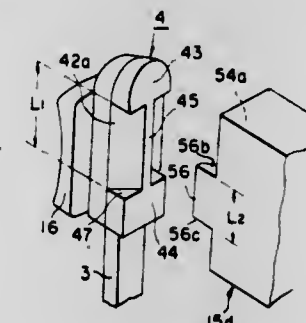
Filed Oct. 23, 1981, Ser. No. 314,507

Claims priority, application Japan, Jul. 20, 1981, 56-113200

Int. Cl.<sup>3</sup> B41J 1/30

U.S. Cl. 400-144.2

14 Claims



1. A type carrier for use in a printing machine, in which said type carrier is rotatably supported and rotatably driven to bring a desired type into a printing position where said desired type is impacted by a hammer to make an imprint, wherein said type carrier comprises a hub and a plurality of fingers extending generally radially from said hub, at least one of said fingers including a generally rectangularly shaped printing section defined along the lengthwise direction of the corresponding finger, said printing section including a front surface on which at least one type is provided, a first flat impact surface formed at the back surface of said printing section opposite to said

front surface and having a relatively large first width extending in the direction perpendicular to the lengthwise direction of said printing section, a second flat impact surface contiguous to and lying in the same plane as said first flat impact surface and having a second width which is narrower than said first width, and a pair of sloped aligning portions extending from opposite edges of said second flat impact surface in the directions generally toward said front surface and separating away from each other and also from the plane defined by said first and second flat impact surfaces.

4,416,557

## SERIAL PRINTER

Kenichiro Arai, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of Japan

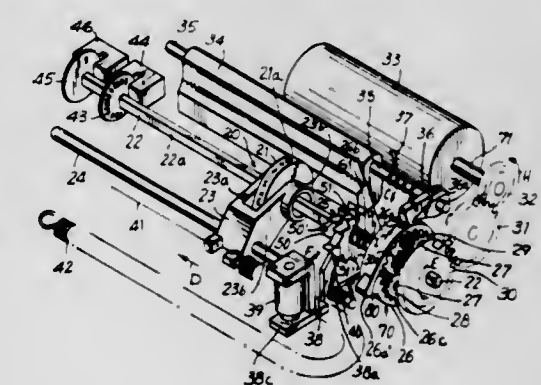
Filed Jun. 29, 1981, Ser. No. 278,141

Claims priority, application Japan, Jul. 3, 1980, 55-91055

Int. Cl.<sup>3</sup> B41J 7/48

U.S. Cl. 400-152

13 Claims



1. A serial printer for printing characters on a printing tape comprising a frame, a selecting shaft rotatably supported on said frame and motor means for rotating said selecting shaft, a printing head slidably supported on said selecting shaft for rotation therewith, said printing head having a first group of characters and at least a second group of characters alternately disposed thereon, a first ratchet rotatably supported on said selecting shaft and associated with said first group of characters, a second ratchet rotatably supported on said selecting shaft and associated with said second group of characters, said first ratchet having a plurality of first teeth, each of said first teeth corresponding in position to a given one of said characters in said first group of characters, said second ratchet having a plurality of second teeth, each of said second teeth corresponding in position to a given one of said characters in said second group of characters, pawl means pivotally supported on said frame for selective engagement with the teeth on one of said first and second ratchets, said first and second ratchets being slidably supported on said selecting shaft and being movable between a first position where said first teeth are in alignment with said pawl means for selective engagement therewith and a second position where said second teeth are in alignment with said pawl means for selective engagement therewith, said pawl means selectively engaging one of said first and second teeth after one of said first and second groups has been selected, electromagnet means for selectively pivoting said pawl means, said pawl means, when pivoted by said electromagnet means, engaging one of the teeth on one of said first and second ratchets to stop the rotation of said selecting shaft so that the character on said printing head corresponding to the tooth selected by said pawl means can be printed on said printing tape, said selecting shaft including first biasing means for biasing said first and second ratchets in said second position, a first bevel gear slidably supported on said selecting shaft for rotation therewith and a second bevel gear mounted on said printing head in meshing engagement with said first bevel gear, a printing mechanism including printing cam means coupled to



said selecting shaft for printing the character selected by said pawl means on said printing tape, said printing cam means including planet gear mechanism having a planet lever secured to said selecting shaft, said planet lever having at least one planet gear rotatably secured thereto, said printing cam means having an internal gear which meshingly engages with said planet gear, said motor means including a sun gear driven thereby which is meshingly engaged with said planet gear, said pawl means including engagement means which selectively prevents said printing cam means from rotating, said planet gear mechanism further rotating said selecting shaft when said engagement means prevents said printing cam means from rotating, said pawl means including second biasing means for biasing said pawl means in a third position where said engagement means is engaged with said printing cam means, the activation of said electromagnet means moving said pawl means into a fourth position where said pawl means meshes with the teeth on one of said first and second ratchets and said engagement means is released from said printing cam means, said print mechanism including printing hammer means pivotally coupled to said frame for pressing said printing tape against the character selected to be printed by said pawl means, and lever means coupled to said printing hammer means for pivoting same, said printing cam means pivoting said lever means when said pawl means is engaged with the teeth on one of said first and second ratchets.

4,416,558

# METHOD OF CONTROLLING A PRINTER IN AN INTERACTIVE TEXT PROCESSING SYSTEM TO PRINT RECORDS FROM STORED FILES OF SPATIALLY RELATED DATA

John W. McInroy, Paul D. Waldo, and Harold R. Webster, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,301  
Int. Cl.<sup>3</sup> B41J 25/18

U.S. Cl. 400—279

6 Claims

NO. IN FILE	ENTRY NUMBER	ENTRY DATE	SERIAL NO.	ENTRY DATE
1	1	1/1/81	1	1/1/81
2	2	2/2/81	2	2/2/81
3	3	3/3/81	3	3/3/81
4	4	4/4/81	4	4/4/81
5	5	5/5/81	5	5/5/81
6	6	6/6/81	6	6/6/81
7	7	7/7/81	7	7/7/81
8	8	8/8/81	8	8/8/81
9	9	9/9/81	9	9/9/81
10	10	10/10/81	10	10/10/81

1. A method of printing with a printer a file of spatially related data which is stored in a text processing system and defined by a table of header data including field names and maximum field width information and wherein the records of said file are stored in a vector format including row and column designations, said method comprising the steps of:

- establishing for said printer the number of print positions in each line;
- transferring from said table of field names each field name in succession together with a number of blank padding characters determined by the maximum widths of the fields as indicated in said table;
- starting another print line whenever the next field name and padding characters exceed the number of print positions remaining in said line until all the header data has been transferred;
- storing print position data identifying where each transferred field begins; and
- transferring to said printer a control character prior to the transfer of each said vector formatted record to cause the data associated with each of said column designations

to be aligned with the start of its corresponding field name.

4,416,559

# APPARATUS, MOUNTABLE ON AN OFFICE MACHINE, FOR FEEDING SINGLE SHEETS FROM A PAPER STACK STORED IN A MAGAZINE

Helmut Steinhilber, Koenigstrasse 47, Rottweil, Fed. Rep. of Germany

PCT No. PCT/DE80/00151, § 371 Date Jun. 16, 1981, § 102(e) Date May 27, 1981

PCT Filed Oct. 15, 1980, Ser. No. 269,007

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941816

Int. Cl.<sup>3</sup> B41J 13/10

U.S. Cl. 400—629

5 Claims



1. An apparatus, mountable on an office machine, for feeding single sheets from a stack of paper stored in a magazine (20) to a platen (14) of the office machine having a separate-feed roller (28) frictionally engaging the stack of paper, having a drive wheel (18) driven, when the apparatus is mounted, by the platen (14), and having a gear mechanism (40, 42, 46) connecting said drive wheel (18) with said separate-feed roller (28) in such a manner that upon the rotation of the platen (14) counter to the paper insertion direction said separate-feed roller (28) is driven in the paper insertion direction, wherein

said magazine (20) is pivotally supported and is in engagement with a control cam (34), and

said control cam (34) is movable by said drive wheel (18) via said gear mechanism (40, 42, 46) in such a manner that upon the rotation of the platen (14) counter to the paper insertion direction said control cam (34) pivots said magazine (20) into a position in which the stack of paper (24) rests against said separate-feed roller (28), and upon rotation of the platen (14) in the paper insertion direction said control cam (34) pivots said magazine (20) into a position in which the stack of paper (24) does not rest against said separate-feed roller (28).

4,416,560

# COMPUTER PRINTER CARRIAGE CONTROL APPARATUS INCLUDING AN ENCODING DISK

Douglas E. Wood, Benton Harbor; Wayne J. Kooy, Gallen, and Lawrence C. Unger, Benton Harbor, all of Mich., assignors to Printek, Inc., Benton Harbor, Mich.

Filed Oct. 16, 1981, Ser. No. 311,946

Int. Cl.<sup>3</sup> B41J 29/42

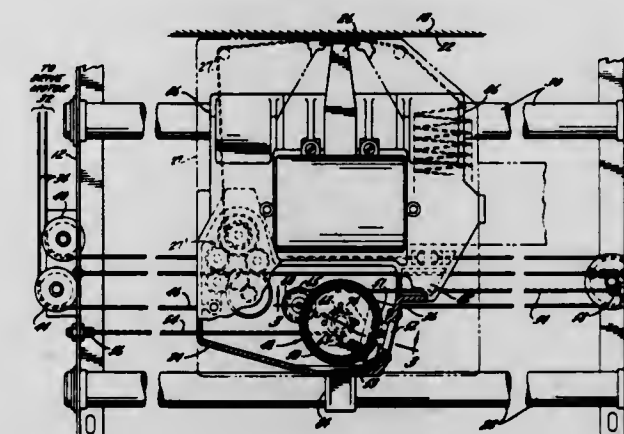
U.S. Cl. 400—705.1

8 Claims

1. In a computer printer for serially printing a line of printed characters having a carriage with a print head thereon, the carriage arranged on guide rails that extend parallel to the line of characters and between frame members of the printer and having a drive motor, controlled by a logic control circuit, for

driving the carriage back and forth between the frame members of the printer, a carriage control apparatus comprising

- an encoder disk mounted for rotation on the carriage and having a coded pattern on its periphery;
- sensing means for detecting the coded pattern and transmitting the pattern to the logic control circuit; and



(c) encoder disk drive means interconnecting the encoder disk and the frame members in a fixed relationship so that the rotational displacement of the encoder disk bears a fixed relationship to the position of the carriage along the line of printed characters.

4,416,561

# MOUNTING ARRANGEMENT

Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

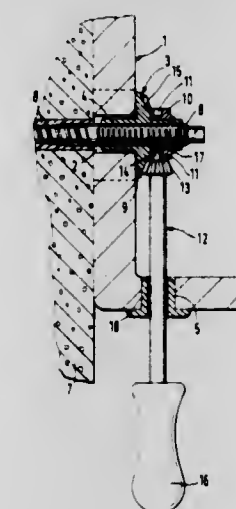
Filed May 4, 1981, Ser. No. 260,284

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017749

Int. Cl.<sup>3</sup> F16B 23/00

U.S. Cl. 403—8

13 Claims



1. A mounting arrangement for mounting a sanitary object having wider and narrower adjoining cut-outs and an opening with the axis of the opening extending substantially normal to the axes of the cut-outs, to a supporting wall, the arrangement comprising a bolt member anchorable in the wall on which the sanitary object is to be mounted; a nut member having a wider portion substantially corresponding to the wider cut-out of the sanitary object and a narrower portion substantially corresponding to the narrower cut-out of the object, said nut member being formed as a collar nut having a collar which forms said wider portion and a shaft which forms said narrower portion, said nut member being screwable onto said bolt member so as to fix the object between said nut member and the wall; and means for screwing said nut member onto said bolt member for fixing the object, said screwing means including an actuating member arranged to extend through the opening of the sanitary object and to engage said nut member and to be

supported by the latter so as to screw said nut member onto said bolt member and to thereby fix the object.

4,416,562

# MULTI-PARTITE ASSEMBLY

Claus Jöns, Sachsenheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

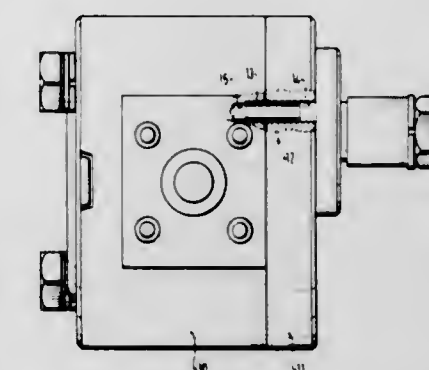
Filed Dec. 3, 1980, Ser. No. 212,672

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 7936314[U]

Int. Cl.<sup>3</sup> F16B 17/00

U.S. Cl. 403—13

6 Claims



1. A multi-partite assembly, comprising at least two parts each having a bore, one which has a larger diameter and the other of which has a smaller diameter; and a substantially cylindrical centering element received in said bores and having an outer diameter equal to the diameter of said one bore, said element being slidably received in said one bore and with a friction-fit in the other of said bores so as to align the same.

4,416,563

# SHAFT COUPLING DEVICE

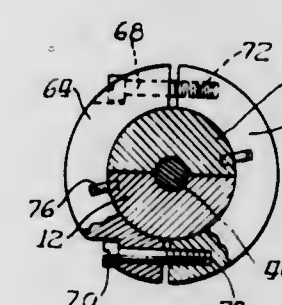
Edward H. Zemke, Chicago; Kenneth L. Guenther, Park Ridge, and Friedrich W. Baethke, Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 29, 1982, Ser. No. 362,778

Int. Cl.<sup>3</sup> F16C 3/00

U.S. Cl. 403—14

20 Claims



1. A device for rigidly coupling at least two shafts comprising: a first shaft retained within supporting means; a coupling end on the first shaft; a coupling piece integral with the first shaft at the coupling end; a second shaft to be coupled to the first shaft, the second shaft retained within second supporting means; a coupling end on the second shaft extending between the first and second supporting means; a coupling piece integral with the second shaft at the coupling end of the second shaft which engages the first coupling piece; releasable collar means placed around the coupling ends for rigidly joining the shafts at their coupling ends and a locating pin protruding outward from the circumference of the coupling piece on either of the shafts to engage and

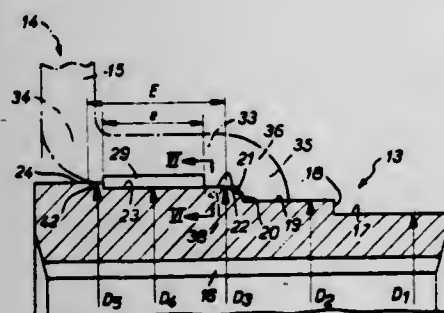


provide an axial reference position for the collar along the axis of the shafts.

4,416,564

## HUB AND WEB ASSEMBLY

Rene Billet, Lamorlaye, and Pierre Renaud, Le Plessis-Trevisse, both of France, assignors to Valeo, Paris, France  
Filed Oct. 28, 1981, Ser. No. 315,975  
Claims priority, application France, Oct. 31, 1980, 80 23307  
Int. Cl.<sup>3</sup> B25G 3/00; F16B 7/18; F16D 1/00  
U.S. Cl. 403—282 21 Claims



1. An assembly of two coaxial components comprising an inner component defining a cylindrical hub and an outer component including a sleeve having an axial drive fit onto said inner component, one of said components having longitudinal broaching serrations, substantially complementary serrations on the other of said components having the appearance of being formed by said broaching serrations, said broaching serrations and said complementary serrations being intermeshed, the improvement wherein said outer component has an intumed terminal end, and said inner component has a transverse shoulder, said intumed terminal end bearing axially against said transverse shoulder and positively determines the axial position of said outer component on said inner component.

4,416,565

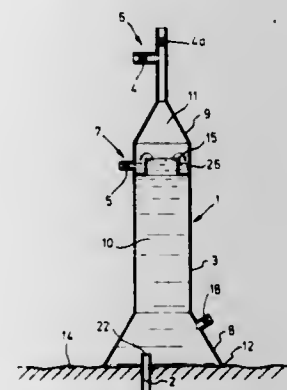
## METHOD AND COLUMN FOR COLLECTION AND SEPARATION OF OIL, GAS AND WATER FROM BLOWING WELLS AT THE SEA BED

Ole C. Ostlund, Ovre Stokkavai 21, Stavanger, Norway  
PCT No. PCT/NO80/00034, § 371 Date Jul. 1, 1981, § 102(e)  
Date Jul. 1, 1981, PCT Pub. No. WO81/01310, PCT Pub. Date May 14, 1981  
PCT Filed Oct. 31, 1980, Ser. No. 280,005  
Claims priority, application Norway, Nov. 2, 1979, 793524  
Int. Cl.<sup>3</sup> E02B 15/04 15 Claims

1. A balancing column for collecting and separating gas, water and oil flowing from an underwater well head, said column comprising:  
(a) a vertically arranged column, said column having ballast means for lowering said column over said well head in

a vertical position, said column having a closed upper end and an open lower end for supporting said column on the sea bed;

- (b) an oil accumulator in the lower and middle portion of the column for dissipating the kinetic energy of an upflowing oil-gas mixture;  
(c) a gas accumulator in the upper end of the column for accumulating gas as it separates from said oil-gas mixture;  
(d) first and second valve means for equalizing the hydrostatic pressure inside and outside the lower edge of the



column resting on the sea bed, said valve means regulating the accumulated oil and gas within the column to provide a positive engagement between the column and the sea bed, said first valve means discharging oil from said oil accumulator and said second valve means discharging gas from said gas accumulator at predetermined rates for said equalization;

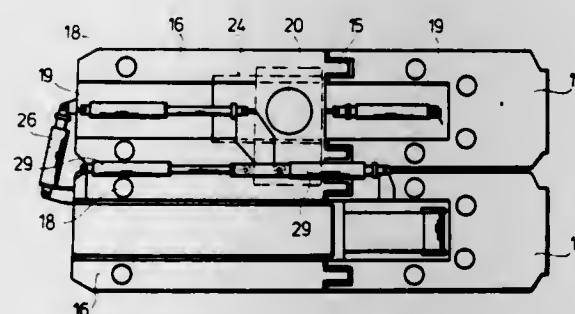
whereby the positive engagement between the column and the sea bed is maintained to prevent a breakout of the sea bed below the column.

4,416,566

## SUPPORTING APPARATUS FOR THE PROTECTION OF MINE GATE CROSSINGS

Ferenc Szebenyi; Janos Nemeth; Jozsef Bohnert, all of Budapest; Andras Solymos, Tatabanya; Miklos Petrassy, Tatabanya; Tamas Kovacs, Tatabanya; Jozsef Krupanszky, Tatabanya, and Istvan Noll, Tatabanya, all of Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary  
Filed Apr. 13, 1982, Ser. No. 367,841  
Claims priority, application Hungary, Apr. 13, 1981, 947/81  
Int. Cl.<sup>3</sup> E21D 23/00 9 Claims

U.S. Cl. 405—291



1. In a self-advancing support apparatus for protecting mine gate crossings and for engaging the reversing/driving head of a longwall and a gate conveyor, the support apparatus having at least two side by side support units, each unit being formed as a longwall face support and a gate support coupled together by at least one connecting element and including a base, a canopy, tracing elements connected between them by articulation at least one advancing element and holding device mounted on the base, a guide track extending in the direction of a gate conveyor for advancing the reversing/driving head of a longwall conveyor and an actuating/controlling unit, the

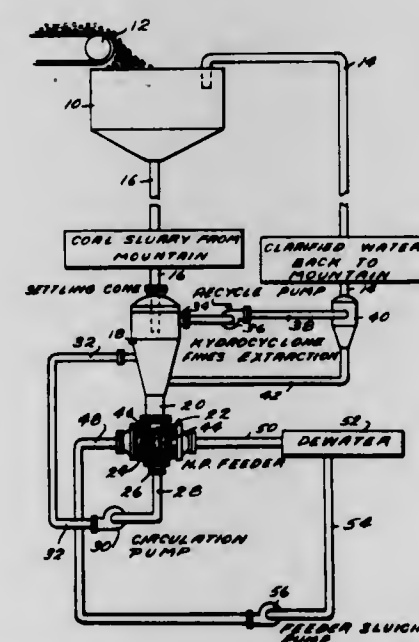
improvement comprising: holding means for engaging the reversing/driving head of the longwall conveyor and having at least two degrees of freedom of movement, an extendible cantilever connected to each canopy and at least one means connected to the two units together for directionally guiding same.

4,416,567

## METHOD AND APPARATUS FOR TRANSPORTING MINED PARTICLES FROM AN ELEVATED SITE

Carl L. Elmore, and Erwin D. Funk, both of Glens Falls, N.Y., assignors to Kamy, Inc., Glens Falls, N.Y.  
Filed Feb. 18, 1982, Ser. No. 349,817  
Int. Cl.<sup>3</sup> B65G 53/33 15 Claims

U.S. Cl. 406—63



1. A method of transporting heavier than water particles from an elevated supply site to a delivery site at a substantial elevation below said elevated supply site comprising the steps of

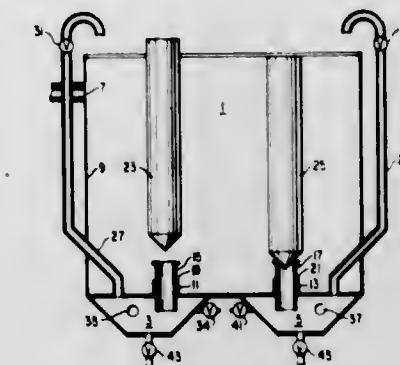
- mixing the particles at said supply site with liquid to form a slurry of particles and liquid,
- introducing slurry at said supply site into a confined path extending downwardly from said supply site to said delivery site,
- confining a volume of slurry material in energy transmitting relation to the slurry in said confined path such that the static head of the slurry in said confined path is transmitted to the confined volume,
- continuously withdrawing material from said confined volume at spaced first and second positions and introducing liquid into said confined volume in such a way as to (1) maintain the pressure conditions within said confined volume generally equal to the static head of the slurry in said confined path minus friction losses and (2) enable slurry from said confined path to flow into said confined volume and the particles thereof to move within the confined volume such that the material at the first withdrawal position contains the larger particles of the slurry and the material at the second withdrawal position is substantially devoid of the larger particles of the slurry,
- continuously separating a liquid fraction from the material withdrawn from the confined volume of said second withdrawal position in such a way that the pressure of said liquid fraction is not materially lowered with respect to the pressure of the material in said confined volume,
- pumping the liquid fraction along a confined path extending upwardly to said supply site, and
- utilizing the liquid fraction pumped along said upwardly extending confined path at said supply site as the liquid in said mixing step.

4,416,568

## TWIN OUTLET FEED DISTRIBUTOR

Raymond L. Anderson, P.O. Box 219, Faro, Yukon, Canada K0B 1K0  
Filed Feb. 25, 1982, Ser. No. 352,402  
Int. Cl.<sup>3</sup> B65G 53/30 3 Claims

U.S. Cl. 406—123



1. A twin outlet feed distributor for collecting ores and slurries and distributing them for further handling and distribution consisting of a single upper chamber, at least two lower chambers immediately below said upper chamber, a valve between said upper chamber and each of said lower chambers, a pump associated with each of said lower chambers for removing ore and slurry from said lower chambers, a vent pipe from each of said lower chambers, the upper end of each of said vent pipes being directed into said upper chamber, and a high pressure water inlet into each lower chamber for flushing slurry and ore selectively from said lower chambers through said vent pipe into said upper chamber.

4,416,569

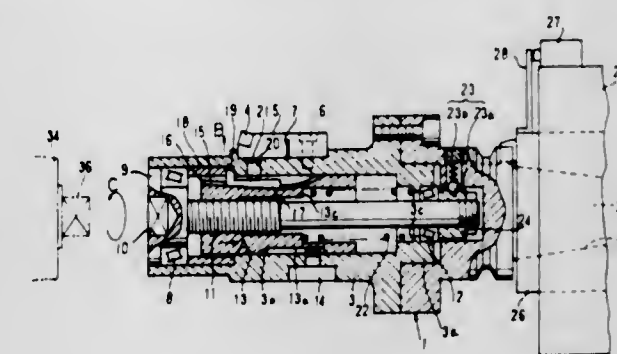
## TOOL POSITION COMPENSATING MECHANISM

Tetsuro Yamakage, Anjob, and Toshiharu Takashima, Chiryu, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan  
Filed Apr. 10, 1981, Ser. No. 253,048  
Claims priority, application Japan, Apr. 30, 1980, 55-58203[U]

Int. Cl.<sup>3</sup> B23B 25/00, 29/034

U.S. Cl. 408—4

7 Claims



1. A tool holder for use on a machine tool comprising:  
a shank receivable in a tool spindle of said machine tool;  
a tool mounting shell integrally provided on said shank and fixedly carrying a cutting tool including a cutting blade support end, said cutting blade support end being bendable toward a radially outward direction of said tool mounting shell;  
a screw shaft rotatably supported in said tool mounting shell in axial alignment with the axis of said shank and provided with first positive drive means at an outer axial end thereof;  
a sleeve received in said tool mounting shell and being rotatable therewith, said sleeve being threadably engaged with said screw shaft for being axially moved when relative



rotation between said tool mounting shell and said screw shaft is brought about, said sleeve being formed with a cam surface which is sloped along and relative to the axis of said tool shank; and

transmitting means interposed between said cutting tool and said cam surface of said sleeve for bending said cutting tool support end of said cutting tool toward said radial outward direction when moved by the wedge action of said cam surface at the time of axial movement of said sleeve;

said machine tool including:

a work table for mounting a workpiece thereon, said tool spindle and said work table being relatively movable with each other in first to third directions, said first to third directions being perpendicular to one another;

second positive drive means nonrotatably provided on said work table and engageable with said first positive drive means of said screw shaft;

feed means for effecting relative movement between said tool spindle and said work table in said first to third directions so as to bring said first positive drive means into engagement with said second positive drive means; and a spindle drive motor connected to said tool spindle for rotating said spindle, with said first and second positive drive means being engaged with each other, so as to effect said relative rotation between said tool mounting shell and said screw shaft.

4,416,570

**PRECISION WORK HOLDER FOR MACHINE TOOLS**

Carl T. Argenbright, 44 N. Spring St., Shippensburg, Pa. 17257

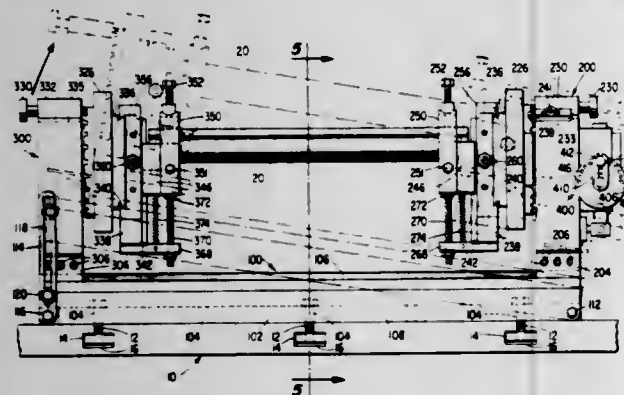
Continuation of Ser. No. 149,569, May 14, 1980, abandoned.

This application Oct. 14, 1982, Ser. No. 434,529

Int. Cl.<sup>3</sup> B23Q 3/18

U.S. Cl. 409—222

26 Claims



1. A work holder for precision positioning and movement of a workpiece relative to a machine tool to facilitate the formation of complex surfaces on the workpiece, the work holder comprising:

a base;

a pair of spaced stocks mounted on said base, one of said stocks being a headstock and the other of said stocks being a tailstock;

a headstock spindle assembly supported on said headstock for rotation about an axis;

drive means for effecting precisely controlled, slow rotation of said headstock spindle assembly about said axis;

a tailstock spindle assembly supported on said tailstock for free rotation about said axis;

a chuck supported on each of said spindle assemblies for firmly clamping the workpiece therebetween, said tailstock spindle assembly being rotatable by said drive means through the clamped, rotating workpiece;

adjustable mounting means on each of said spindle assemblies for permitting synchronous adjusting movement and secure positioning of said chucks relative to said spindle assemblies in two orthogonal directions transverse to said axis when the workpiece is clamped between said chucks

and is manually moved for adjustment transversely of said axis; and base elevating means for varying the relative heights of the two ends of said base to tilt said axis at a selected angle of inclination.

4,416,571

**TRUCK AND RAIL TRANSPORTATION SYSTEM**

Robert A. Krause, 3838 Rainbow Blvd., Apt. 708, Kansas City, Kans. 66103

Filed Feb. 17, 1981, Ser. No. 234,647

Int. Cl.<sup>3</sup> B60F 1/04; B60P 3/32; B61D 3/12

U.S. Cl. 410—53

7 Claims



1. A convertible rail and highway vehicle for use on railroad rails, and for use on highways with tractors having a fifth-wheel mechanism, said vehicle comprising:

an elongated container having a bottom exterior surface, said bottom exterior surface having first and second opposite ends and opposite lateral sides;

a first pair of spaced apart rails mounted at one of said first ends of said container floor and a second pair of spaced apart rails mounted at said second end of said container floor;

a fifth wheel carriage having a base with a fifth-wheel plate and a fifth-wheel pin and having a plurality of wheels rotatably attached to said base retentively engaging said first pair of spaced apart rails and being adapted to roll along said rails to permit longitudinal movement of said fifth-wheel carriage with respect to said container;

carriage locking means for locking said fifth-wheel carriage to said rails to prevent longitudinal movement thereon;

said fifth-wheel carriage having said fifth-wheel pin extending downwardly therefrom for engagement with said fifth wheel mechanism of said tractor;

a highway wheel carriage having a carriage frame, highway wheels for engaging a highway being rotatably mounted to said carriage frame, and a plurality of wheels rotatably mounted to said carriage frame adapted to retentively engage said second pair of spaced apart rails for rolling movement thereon in a longitudinal direction with respect to said container;

second locking means for locking said carriage frame to said second pair of rails to hold said carriage frame against longitudinal movement thereon;

first and second bogie engaging pins attached to said first and second ends of said container floor and extending downwardly therefrom;

a railroad bogie having a bogie frame having a longitudinal axis, a pair of wheel axles transverse to said longitudinal axis, railroad wheels rotatably mounted on the ends of said wheel axles, railroad rails for rolling movement thereon, and first and second couplers extending from opposite ends of said bogie frame,

a pair of fifth wheel mechanisms pivotally mounted on said bogie frame for pivotal movement about first and second pivotal axes which are spaced apart longitudinally on said bogie frame; and

said fifth wheel mechanisms each having a receptacle sized for receiving one of said bogie engaging pins, and pin locking means being provided on said fifth wheel mechanisms for locking said bogie engaging pins in said receptacles.

4,416,572

**COLLAPSIBLE FASTENER WITH PLASTIC SLEEVE**

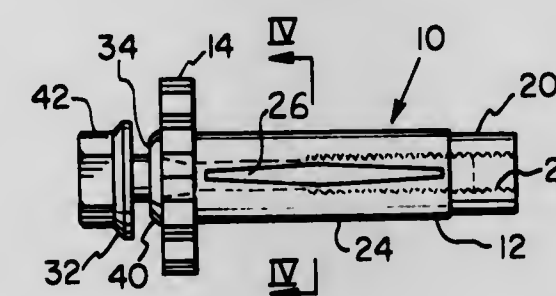
Daniel A. Black, Pleasant Hills, Pa., assignor to Textron Inc., Providence, R.I.

Filed May 18, 1981, Ser. No. 264,436

Int. Cl.<sup>3</sup> F16B 13/04

U.S. Cl. 411—38

4 Claims



1. In a collapsible fastener for joining workpieces wherein a tubular sleeve has a head on one end bearing against one surface of the work, an internally threaded tail and a shank extending between said sleeve ends, the shank of the sleeve including longitudinally extending slots and the resulting strips being notched internally intermediate the ends, and a screw with threads is extended through the head and the sleeve and is threaded into the tail such that by turning the screw, the tail travels toward the head and the strips are folded against the other surface of the work, the improvement comprising:

A. a compressible annulus on the opposite side of the head of the sleeve from the shank and surrounding the bore of the sleeve, said annulus being radially inwardly tapered through its periphery toward the longitudinal central axis of the tubular sleeve, said tubular sleeve and annulus being one piece;

B. the screw shank between the top of the screw threads and the head portion having a diameter approximately equal to or less than the root diameter of the screw threads and being devoid of threads; and

C. the length of the sleeve between the end opposite the sleeve head and the internal notches being less than the length of the screw shank carrying threads

such that the annulus is tightly engaged by the screw against the work to provide a seal therebetween, said screw threads, fastener length and internally threaded tail length being selected so that for a given thickness of workpieces overtightening of the fastener is prevented by the absence of threads on the screw shank.

4,416,573

**PLOW BOLT**

John A. Matalis, Lombard; Richard L. Heinie, Havana, and Duane E. Wegerer, Canton, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,709

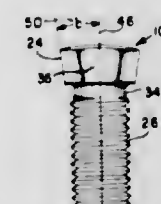
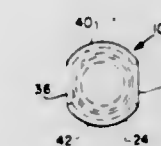
Int. Cl.<sup>3</sup> F16B 00/00

U.S. Cl. 411—378

1 Claim

1. In a plow bolt having an elongated threaded body and a head attached coaxially to an end thereof, said head having an inverted truncated generally right circular conical periphery with diametrically opposite planar surfaces superposed

thereon, the improvement wherein said planar flat surfaces of said head are disposed at substantially the same angle relative



4,416,574

**MULTIPLE PIECE BOLT-TYPE FASTENER**

Jerome R. Klimowicz, 3827 W. LeGrande Blvd., 103N, Mequon, Wis. 53092

Continuation-in-part of Ser. No. 47,268, Jun. 11, 1979, Pat. No. 4,266,460. This application Dec. 19, 1980, Ser. No. 218,366

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> F16B 39/04, 35/00

U.S. Cl. 411—397

6 Claims



1. A bolt-type fastening unit, comprising a threaded shank having an offset end surface defining a generally inclined end surface, a cup-shaped drive head having a base wall and a threaded axial opening from the base to substantially the entrance to said axial opening, said head being threaded onto said shank and establishing a chamber within the head and the end of the shank, said head having at least three lateral and circumferentially spaced openings through the side wall spaced from the entrance to said cup-shaped head, said openings being non-parallel whereby the exterior of said three openings into said chamber intersect within said chamber establishing at least one of said openings fully communicating with said chamber, and an interlocking means fixedly extending through said opening into overlying engagement with said offset end surface to interlock the head to the shank and transmit the turning force applied to the head to the shank, said cup-shaped head having an axial depth of an essentially constant thickness at least greater than twice the axial length of said locking openings whereby the portion of the head extending from said opening onto said shank is at least equal to the portion inclusive of said opening.



4,416,575

## UNION NUT

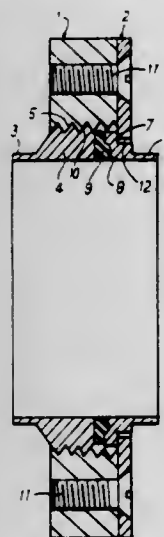
Harry McCarthy, London, England, assignor to Quinn Engineers Ltd., London, England

Filed Sep. 17, 1981, Ser. No. 302,985

Claims priority, application United Kingdom, Mar. 18, 1981, 8108419

Int. Cl.<sup>3</sup> F16B 37/00

U.S. Cl. 411—432



1. A union nut, for drawing axially together a first tube portion having an external thread and a second tube portion having a radially outwardly projecting flange, comprising an annular body having at least part thereof made of a synthetic resinous plastics material and provided with an internal thread to engage with the external thread of said first tube portion, and tool-engaging abutment means secured releasably on the annular body and projecting radially inwardly beyond said internal thread for abutment axially against said flange of said second tube portion.

4,416,576

## METHOD OF FORMING SCORE IN CAN END PLATE AND METHOD OF ATTACHING TAB TO THE SAME FOR FACILITATING THE OPENING OF CAN

Kiyoshi Kawamata, 2-337 Takahana Cho, Ohmiya City, Saitama Prefecture, Japan

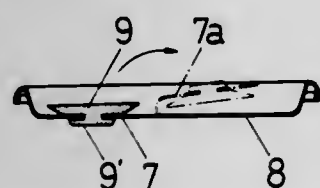
Filed Nov. 9, 1981, Ser. No. 319,878

Claims priority, application Japan, Mar. 30, 1981, 56-46847

Int. Cl.<sup>3</sup> B21D 51/38

U.S. Cl. 413—12

3 Claims



1. A method of providing a can end plate with a score and a tab for facilitating the opening, comprising the steps of: coating said can end plate with a layer of a thermoplastic resin at at least one side of said can end plate; forming a score in said can end plate through said layer of thermoplastic resin such that a tab attaching opening formed in said can end plate is surrounded by said score; fitting an attaching projection of a tab member formed of a synthetic resin in said tab attaching opening; and heating and pressing said attaching projection by a heating device to form an anchoring portion while melting, pressing and charging said thermoplastic resin into said score and also sealing the juncture between said tab and said can end plate with said thermoplastic resin.

4,416,577

## ROBOT HAND OF AN INDUSTRIAL ROBOT

Hajimu Inaba, Hino, and Ryo Nihei, Musashino, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

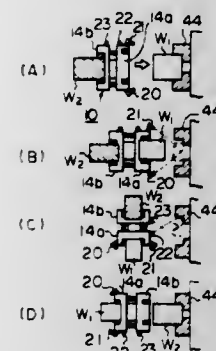
Filed Jul. 30, 1981, Ser. No. 288,284

Claims priority, application Japan, Aug. 6, 1980, 55/107077

Int. Cl.<sup>3</sup> B65H 29/06

U.S. Cl. 414—226

10 Claims



1. A robot hand provided for an industrial robot which is used in association with a machine tool for carrying out a manipulating operation of attaching a workpiece to and detaching a workpiece from a workpiece holding means of the machine tool, said robot hand comprising:

- two sets of grasper means arranged side by side, each grasper means having a finger assembly for grasping a workpiece therein, and
- means attached to grasper means for removing chips and other foreign materials attached to said workpiece holding means of said machine tool while said manipulating operation of said robot hand is carried out.

4,416,578

## MULTI-STORY ELEVATOR-TYPE GARAGE

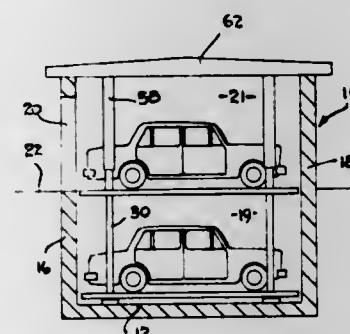
Hahns-Jürgen Behncke, Ringseeweg 29, Bad Wiessee, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,437

Int. Cl.<sup>3</sup> E04H 6/06, 6/12

U.S. Cl. 414—249

12 Claims



10. A multi-story elevator-type garage comprising at least two vertically spaced apart vertically moveable platforms with one situated above the other, each of said platforms being shiftable to an access level, a moveable carrier operatively connected to said platforms for causing upward and downward movement of said platforms, a garage roof operatively associated with said platforms and being disposed over the uppermost of the platforms by a distance at least sufficient to accommodate a motor vehicle when the platforms are in their uppermost position, a support operatively connected to said garage roof, a column forming part of said carrier and being engageable with said support, a sliding member disposed within and engaging said column, synchronesh spindle screws connected at their upper ends to said sliding member, ball-and-socket joints which receive said spindle screws at their lower ends, a drive unit operatively connected to said carrier for shifting said carrier and the platforms therewith, said drive unit

being comprised of nuts located and associated with at least one of said platforms, said synchronesh spindle screws being operative with said nuts and being rotated with respect to said nuts for causing said platforms to move upwardly and downwardly through rotary motion of said spindle screws, a drive motor associated with said drive unit, and a drive element operatively connected to said spindle screws and drive motor for causing rotation of said spindle screws.

4,416,579

## POWER-ACTUATED LOW PROFILE CARGO GUIDE

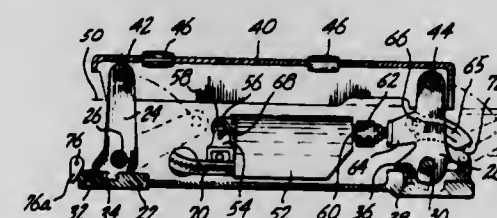
John Alberti, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 29, 1981, Ser. No. 278,478

Int. Cl.<sup>3</sup> B60P 1/64; B63B 25/22

U.S. Cl. 414—534

8 Claims



1. A cargo guide assembly for restraining movement of cargo in a cargo hold comprising:

- a base;
- a guide rail;
- first means for mounting said guide rail to said base for movement of said guide rail between a first position in which said guide rail engages and restrains the movement of said cargo and a second position in which said guide rail is out of restraining engagement with said cargo, said first means including a first mounting pawl pivotally mounted on said base for swinging movement between an erect position in which said first mounting pawl is substantially orthogonal to said base and a retracted position in which said first mounting pawl is substantially oblique to said base, a second mounting pawl having an actuation pin formed thereon, said second mounting pawl being pivotally mounted on said base for swinging movement between an erect position in which said second mounting pawl is substantially orthogonal to said base and a retracted position in which said second mounting pawl is substantially oblique to said base, said guide rail being pivotally mounted at a first end to said first mounting pawl and at a second end to said second mounting pawl, said first and second mounting pawls being held in substantially parallel relation by said guide rail such that said first and second mounting pawls move in unison, said guide rail being in its first position when said first and second mounting pawls are in their respective erect positions and said guide rail being in its second position when said first and second mounting pawls are in their respective retracted positions;

actuator means mounted on said base, said actuator means being operable from a remote location to move said guide rail from its first position toward its second position, said actuator means including an actuator body and an extensible rod mounted within said actuator body, said extensible rod being operable for extension from said actuator body and retraction into said actuator body;

actuator linkage means affixed to said extensible rod and connecting said actuator means to said second mounting pawl so that operation of said actuator means to extend and retract said extensible rod moves said second mounting pawl between its erect and retracted positions, said linkage means including an actuation link affixed to said extensible rod, said actuation link having an elongate slot formed therein, said actuation pin of said second pawl engaging a first end of said slot when said second mounting pawl is in its erect position, and said actuation link

exerting a force on said actuation pin through the surface defining said first end of said slot to move said second pawl toward its retracted position; and

first biasing means associated with said base and said guide rail for biasing said guide rail toward its cargo-restraining position.

4,416,580

## CLAW CRANE WITH PUSHERS

Yukio Haga; Tomeo Kai; Akira Shirayama, and Gengi Kanatani, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

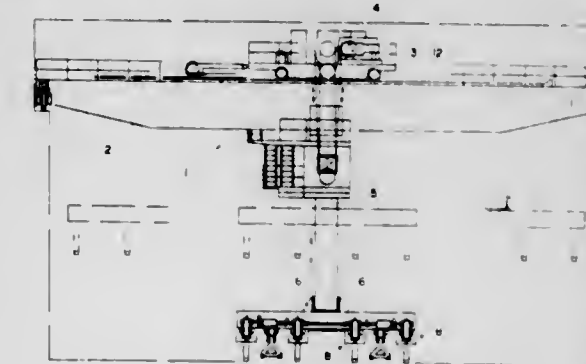
Filed Aug. 20, 1980, Ser. No. 179,643

Claims priority, application Japan, Aug. 30, 1979, 54-109647

Int. Cl.<sup>3</sup> B66C 1/42

U.S. Cl. 414—626

7 Claims



1. A pusher equipped claw crane comprising:

- a mast suspended from crane hoist means so as to be moved vertically;
- a main beam pivotally coupled to the lower end of said mast;
- a plurality of sub-beams arranged on the lower part of said main beam to cross the same at right angles;
- a plurality of claw shifter means suspended from the lower part of two of said sub-beams to be moved in the axial direction thereof;
- pusher means arranged between two adjacent claw shifter means and suspended from the lower part of one of said sub-beams to be moved in the axial direction thereof;
- means for moving said claw shifter means and for moving said pusher means with respect to said sub-beams; and
- tilting means attached to an intermediate part of said mast for controlling tilting movement of said sub-beams.

4,416,581

## METHOD AND APPARATUS FOR COOLING AN EXPANDER

Carl H. Geary, Jr., Greensburg, Pa., assignor to Elliott Turbo-machinery Co., Inc., Jeannette, Pa.

Filed Feb. 16, 1982, Ser. No. 349,402

Int. Cl.<sup>3</sup> F01D 5/18

U.S. Cl. 415—1

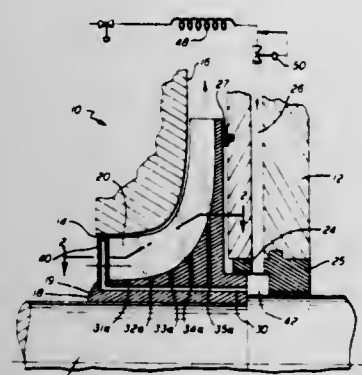
8 Claims

1. A method for providing thermal protection to a hot gas expander having solid vanes including the steps of:

- rotating the expansion wheel of a hot gas expander by passing hot gas therethrough;
- supplying a cooling media to the inlet end of each vane of the rotating expansion wheel;
- distributing the cooling media in the direction of hot gas flow over the inlet end of each vane of the expansion wheel for essentially the full height of the vane;
- supplying the cooling media to the base of the pressure side of each vane at least over the inducer portion of each vane; and



distributing the cooling media over the pressure side of each vane at least over the inducer portion whereby film cool-



ing of the hot gas expander is achieved with minimal cooling of the hot gas.

4,416,582

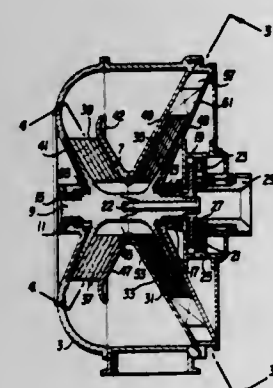
**MULTI-STAGE TURBINE ROTOR**

Benjamin G. Glass, 3011 Stockett Way, San Diego, Calif. 92117  
Filed Sep. 22, 1980, Ser. No. 188,987

Int. Cl.<sup>3</sup> F01D 1/36, 17/14

U.S. Cl. 415—59

11 Claims



1. A multi-stage turbine for geothermal application which is driven by a fluid such as steam or a similar gas and which comprises a casing and a rotor on a shaft journalled for rotation in said casing, said rotor comprising two adjacent disc packs mounted in tandem on said shaft, the first of said packs being a circular fluid inflow pack with an outer circumference having fluid inlet means, at least one inlet for the introduction of fluid under pressure into said casing, an internal nozzle mounted in said casing for communicating and controlling the flow of fluid from said inlet to said inlet means and through said inflow pack to drive said shaft, the second of said packs comprising spaced apart conically configured discs having an outer circumference with fluid outlet means, the discs of each pack having central openings which define a common fluid passageway within said rotor and said passageway being located adjacent said shaft to provide direct communication for fluid discharged from the interior of said inflow pack to be received by the interior of said outflow pack and to flow through said outflow pack to drive said shaft before the fluid exits from said outflow means at the outer circumference of said second pack.

4,416,583

**CENTRIFUGAL VAPOR COMPRESSOR**

Edison H. Byrns, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 137,173, Apr. 4, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,748

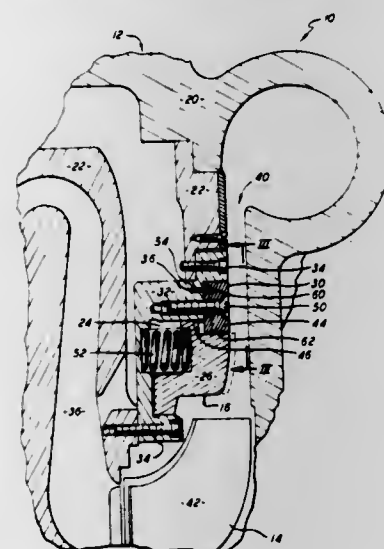
Int. Cl.<sup>3</sup> F04D 27/00

U.S. Cl. 415—148

2 Claims

1. A centrifugal vapor compressor comprising:

a housing defining an inlet passage, a diffuser passage, and a diffuser valve recess extending from the diffuser passage; an impeller rotatably mounted in said housing on an axially extending shaft and including a radially extending impeller blade; an annular diffuser valve extending around the impeller blade and supported by the housing for axial movement within the diffuser valve recess and the diffuser passage between minimum and maximum throttling positions, said annular diffuser valve having an outside annular face facing the diffuser passage, at least one axially extending, radially projecting face extending radially outward from said outside annular face, and a flange radially extending from each of said axially extending, radially projecting



faces, each of said flanges having a radially extending surface facing the diffuser passage; stop members mounted on the housing in the diffuser passage portion of the housing, each of said stop members having a surface facing the diffuser passage which is coplanar with the walls of the diffuser passage and each of said stop members positioned for engagement with one of the axially extending, radially projecting faces of the diffuser valve to limit movement of the diffuser valve circumferentially about its axis and positioned for engagement with the radially extending surface of each of the flanges of the diffuser valve to limit axial movement of the diffuser valve at the maximum throttling position; and fastening means for disengagably securing each of the stop members to the housing.

4,416,584

**AMBIENT PRESSURE WATER TURBINE**

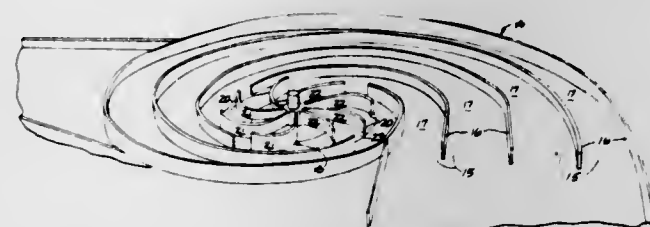
Peter E. Norquest, P.O. Box 5501, Boise, Id. 83705

Filed Aug. 28, 1980, Ser. No. 182,109

Int. Cl.<sup>3</sup> F01D 1/08

U.S. Cl. 415—184

7 Claims



1. An ambient pressure water turbine for use in conjunction with a low total energy supply of water, comprising: runner means for receiving water exposed to ambient atmospheric pressure, said runner means being mounted for rotational movement about a central vertical axis; a plurality of vanes fixed about said runner at equally spaced locations about said central vertical axis, each vane ex-

tending outward relative to said central vertical axis from an inner vane end to an outer vane end, each vane having an upright rear face extending between its ends, and further being provided with an oppositely directed front face;

runner floor means located directly beneath the vanes for elevationally supporting water flowing along each vane; water discharge means positioned beneath said runner in open hydraulic communication with the inner vane ends for freely receiving water from the inner vane ends; and infeed means operably interposed between the supply of water and the runner periphery, said infeed means comprising a series of spiral chutes for conveying water under ambient atmospheric pressure in hydraulic communication with the supply of water and leading toward inner chute ends circumferentially spaced about and radially adjacent to the runner periphery, each chute having both progressively lowered elevation and progressively reduced width in the direction of the water flow for increasing the water velocity to the maximum obtainable value for the flowing depth of water being delivered to the runner and for directing the water onto the runner floor means at a flow rate and angle relative to the runner periphery such that the water enters the runner in a supercritical flow condition and is maintained in such condition as it traverses the runner floor means while in contact with the rear faces of the respective vanes, the minimum slope of the ambient atmospheric pressure chutes being sufficient to prevent the water from attaining uniform flow prior to reaching the runner periphery.

4,416,585

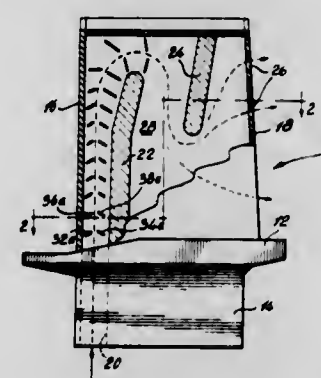
**BLADE COOLING FOR GAS TURBINE ENGINE**

William Abdel-Messeh, Beloeil, Canada, assignor to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada  
Continuation-in-part of Ser. No. 112,745, Jan. 17, 1980, abandoned. This application Aug. 12, 1981, Ser. No. 292,249

Int. Cl.<sup>3</sup> F01D 5/08

U.S. Cl. 416—97 R

11 Claims



1. A blade for use in a gas turbine engine comprising hollow passageways in the blade for passing a coolant therethrough in a direction parallel to the axis of the passageway, the passageway including opposed walls, at least one of the walls having longitudinally spaced-apart pairs of ridges formed on said wall, each ridge in a pair being spaced apart to form a gap and defining an angle  $\theta$  therebetween and each ridge defining an angle  $\phi$  to the axis of the passageway, and wherein:

$$\theta = 2\phi \pm \pi/2;$$

each ridge having a height E and the passageway having a width H between the opposed walls wherein the ratio E/H is within the range of 0.04 and 0.333.

4,416,586

**SUBMERSIBLE MOTOR PUMP ASSEMBLY**

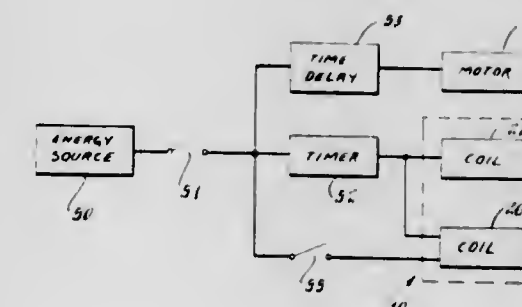
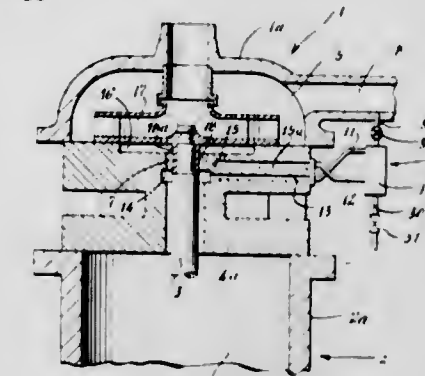
Herbert Diederich, Frankenthal; Karl Gaffal, Hessheim, and Hugo Scherzer, Heidelberg-Rohrbach, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany  
Filed Apr. 9, 1981, Ser. No. 252,584

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015211

Int. Cl.<sup>3</sup> F04B 49/10; F03B 11/00

U.S. Cl. 417—13

18 Claims



1. A submersible motor pump assembly for circulation of a liquid which contains magnetizable solid impurities, comprising a pump having a casing with discharge means for pressurized liquid; a motor having a housing and including a rotary shaft arranged to drive said pump; a device defining with said shaft a clearance communicatively connecting the interior of said casing with the interior of said housing; and apparatus for preventing penetration of impurities from said casing into said housing via said clearance, including liquid conveying means defining a path for the flow of at least one stream of liquid from said discharge means into said clearance, and filter means provided in said path to intercept impurities in the stream of liquid entering said path so that said conveying means delivers to said clearance a stream of flushing liquid which is at least substantially free of impurities, said filter means comprising a magnetically operated filter adapted to attract and thus intercept magnetizable impurities in said path, and said magnetically operated filter including a container, and a plurality of electromagnets in said container, said electromagnets defining a series of passages for the flow of liquid from said discharge means toward said clearance so that each of said electromagnets can attract some magnetizable impurities during flow of liquid through the respective passage.

4,416,587

**HEAT OPERATED PUMP**

John M. Tribbey, Bayswater, Australia, assignor to Malz Nominees Pty. Ltd., Caulfield, Australia

Division of Ser. No. 940,765, Sep. 8, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 168,770

Int. Cl.<sup>3</sup> F04B 19/24

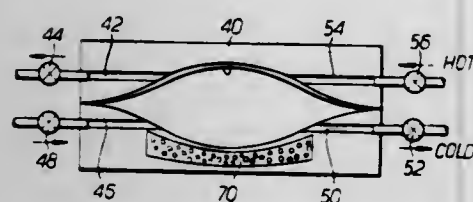
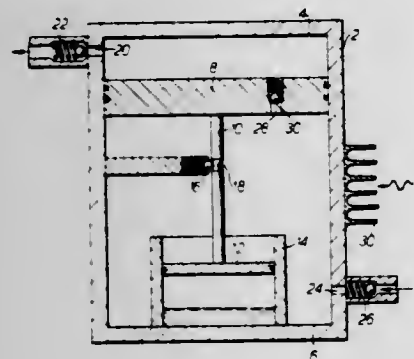
U.S. Cl. 417—52

3 Claims

1. A transducer for converting heat energy of a fluid into kinetic energy, said transducer comprising:



- (a) cylinder means and at least one piston slidably mounted therein;  
 (b) a volatile fluid contained within the cylinder means;  
 (c) a pump, said pump including a pump chamber, a pumping element movable therein, inlet and outlet means for admitting and discharging said fluid from the pumping chamber, said piston and said cylinder means being located within said pump chamber whereby said piston is connected to said pump;



- (d) non-linear restraining means which acts on said piston and is operable to hold said at least one piston in a first stable position  
 (e) means to apply heat energy to said volatile fluid, whereupon said volatile fluid evaporates to exert increased pressure on said at least one piston sufficient to overcome said restraining means, and said at least one piston moves to a second stable position at which the restraining force applied to said at least one piston by said non-linear restraining means is less than at said first stable position.

4,416,588

## AIR COMPRESSOR FOR PAINT PUMPS

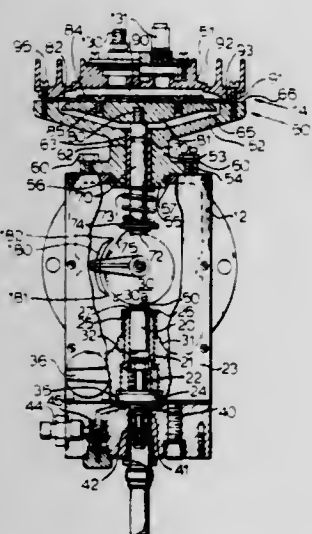
Rudolf Karlner, Minnetonka, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Mich.

Filed Jul. 18, 1980, Ser. No. 169,955

Int. Cl.<sup>3</sup> F04B 41/06

U.S. Cl. 417-199 R

12 Claims



1. In an airless liquid coating spray pump having a reservoir housing with a pump drive power transmitting means received in the housing, a liquid coating pump piston extending through a wall of the housing having an end within the housing engaging the power transmitting means, and a liquid coating pump-

ing chamber exterior of the housing operatively acted upon by reciprocation of the piston, the improvement of a bore through a wall of the housing, a second piston received in the bore having an end in the housing in engagement with the power transmitting means, a gas compressor exterior of the housing, and a second end of the second piston operatively associated with the gas compressor, each of the pistons being reciprocated by engagement with the power transmitting member, and the reciprocation of each piston being effective to operate the associated liquid coating pump and compressor to compress gas by the gas compressor and to pressurize liquid coating by the liquid coating pump, and means for disengaging one of the pistons from engagement with the power transmitting means, said means for disengaging effective to de-activate one of the liquid coating pump and compressor upon disengagement of one of the pistons from engagement with power transmitting means, said means being selectively actuatable to provide selected operation in each of three modes, a first of said modes simultaneously operating said liquid coating pump and said gas compressor, a second of said modes operating only said gas compressor, and a third of said modes operating only said liquid coating pump.

4,416,589

## VIBRATION ACTUATED LIQUID PUMP

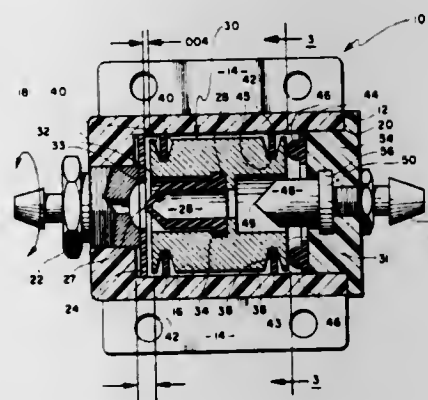
John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008

Filed Sep. 18, 1981, Ser. No. 303,216

Int. Cl.<sup>3</sup> F04B 17/00, 35/00, 21/04

U.S. Cl. 417-211

5 Claims



1. A pump for pumping fluids comprising:  
 an elongated body forming a first fluid inlet end and a second fluid exit end, said body further defining a cylindrical bore therethrough,  
 a free-moving piston weight mass having a first pumping end and a second suction end is suspended within said cylindrical bore by resilient means positioned between the weight mass and the cylindrical bore, said piston forming a passageway therethrough, said resilient means is two substantially radially disposed resilient rings suspending said piston in said cylindrical bore, a first resilient ring being retained in a circumferential groove formed in said piston and positioned near said first pumping end of said piston weight mass, a second resilient ring being retained in a groove formed in said piston and positioned near said second suction end of said piston, the outer peripheral edge of the resilient rings do not move axially relative to the piston weight means suspended in the cylindrical bore by the rings, said piston weight mass, when positioned approximately halfway within said cylindrical bore defines a first fluid inlet chamber formed between said second suction end of said piston, an inner wall of said cylindrical bore formed by said body and said first inlet end, a second fluid reservoir chamber being formed between said first pumping end of said piston, said inner wall of said cylindrical bore and said second fluid exit end, said first fluid inlet chamber and said second fluid reservoir cham-

ber varying in volume as the weight mass moves axially within said cylindrical bore,  
 a source of fluid directed to said first fluid inlet end,  
 a first one-way valve means secured to said body in fluid communication with said first fluid inlet end,  
 a second one-way valve means secured to said piston weight mass in fluid communication with said passageway formed by said piston weight mass, said second valve means is closed when said piston moves within said cylindrical bore toward said second fluid exit end thereby forcing any fluid within said second fluid reservoir chamber out of said exit end, said first one-way valve means communicating with said first fluid inlet end opens substantially simultaneously as said piston moves toward said fluid exit end drawing fluid through said first fluid inlet end from said source of fluid substantially filling said first fluid inlet chamber, as said piston weight mass reverses direction at the end of its stroke, said one-way valve means in communication with said first fluid inlet end being closed and the valve means in communication with said piston weight mass is opened thus transferring fluid into said reservoir chamber thereby completing one cycle of said pump, and vibration means positioned substantially adjacent said elongated body, oscillatory motion, upon operation of said vibration means, serves to move said suspended weight mass axially to and fro within said body to pump fluid therethrough from said fluid source.

4,416,590

## HYDRAULIC DRIVE LIQUID TRANSFER PUMP SYSTEM

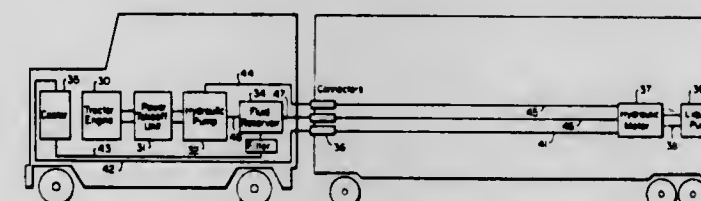
Eugene C. Colucci, Niagara Falls, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 8, 1981, Ser. No. 223,436

Int. Cl.<sup>3</sup> F04B 9/08, 17/00; F17C 7/02

U.S. Cl. 417-231

7 Claims



1. In a hydraulic drive liquid transfer pump system comprising:  
 (1) a tractor having an internal combustion engine, an air reservoir, air brakes with cylinder and a source of electric power,  
 (2) a power takeoff unit connected to said internal combustion engine having a power takeoff cylinder having an engage port and a disengage port,  
 (3) hydraulic pump means mounted on the tractor and connected to said power takeoff means,  
 (4) a fluid reservoir communicating with said hydraulic pump means,  
 (5) a trailer,  
 (6) hydraulic motor means mounted on said trailer,  
 (7) hydraulic fluid line means intercoupled between said hydraulic pump and said hydraulic motor means, said hydraulic fluid line means carrying a hydraulic fluid,  
 (8) liquid pump means driven by the hydraulic motor means,  
 (9) filter means located within said hydraulic fluid line means, the improvement consisting of a control system connected to said tractor air reservoir and said power takeoff unit comprising:  
 (a) means to sense the temperature of said hydraulic fluid, said means connected to said source of electric power,  
 (b) means to sense the pressure differential of said hydraulic fluid across said filter means, said means connected to said source of electric power,

(c) means to sense the hydraulic fluid level in said fluid reservoir, said means connected to said source of electric power,  
 (d) a manually operated parking control valve in communication by means of pneumatic conduit with the tractor air reservoir, the air brake cylinder, the disengage port of the power takeoff unit, an air operated inversion valve, a manually operated pumping control valve, and an air operated power takeoff valve,  
 (e) said air operated inversion valve in communication by means of pneumatic conduit also with the tractor air reservoir, the manually operated pumping control valve, the air operated power takeoff valve, and a solenoid operated valve,  
 (f) said manually operated pumping control valve in communication by means of pneumatic conduit also with the air operated power takeoff valve,  
 (g) said air operated power takeoff valve in communication by means of pneumatic conduit also with the engage port and the disengage port of the power takeoff unit,  
 (h) said solenoid operated valve in communication by pneumatic conduit means also with said power takeoff valve and by electric connection means to said temperature sensor means, said pressure differential sensor means and said liquid level sensor means.

4,416,591

## RECIPROCAL PUMP WITH IMPROVED VALVE

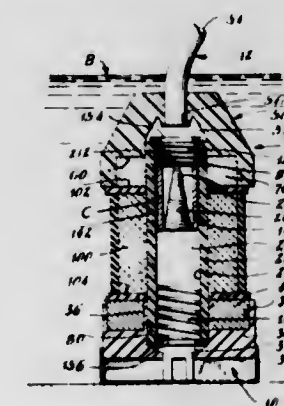
E. Robert Horwinski, Cheshire, Conn., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 4, 1981, Ser. No. 289,862

Int. Cl.<sup>3</sup> F04F 7/00; F04B 17/04, 21/04

U.S. Cl. 417-241

53 Claims



1. A valve member for a pump of the type having a liquid filled passage including a liquid inlet, a liquid outlet and an interconnecting valve chamber wherein said valve member is movable in a first direction from said inlet to said outlet and in a second direction from said outlet to said inlet, said valve member including a valve carried thereon and closed when said member is moving in said first direction and opened when said member is moving in said second direction, said valve having an elongated, generally hollow body extending axially and having a central cavity, a cap portion closing said cavity, a base portion exposing said cavity and a valving portion between said cap portion and base portion, said valving portion being a coil spring formed into normally abutting convolutions with ever-increasing external diameters in a direction from said cap toward said base and with a spring contact which allows said convolutions to separate as said valve member is driven in said second direction.



4,416,592

## LIQUID FLOW CONTROL APPARATUS

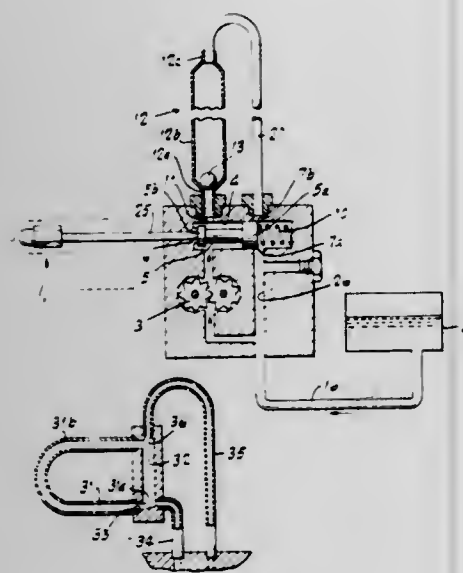
Herbert E. Lindtveit, Centerport, N.Y., assignor to Sid Harvey, Inc., Valley Stream, N.Y.

Filed Apr. 15, 1981, Ser. No. 254,469

Int. Cl.<sup>3</sup> F04B 49/04, 49/08

U.S. Cl. 417—290

1 Claim



1. Apparatus for controlling the flow of a liquid from a source (3) to a sump (26) so as to permit the flow for a predetermined time and then to terminate the flow, comprising:

- a. conduit means (31, 32, 35 or 41, 32, 35) having an inlet end (34) adapted for connection to the source and an outlet end (35) adapted for connection to the sump, said conduit means including an elongated large diameter section (31, 32 or 41, 32) between two small diameter sections (34, 35); and
- b. a valve member (33) captured in the large diameter section and having a diameter smaller than the diameter of the large diameter section and greater than the diameter of the small diameter sections; said valve member being small as compared to the length of the large diameter section, said valve member being biased toward the inlet end of said large diameter section and reposing adjacent said inlet end in the absence of flow through the conduit means, and being movable toward the outlet end by the flow of liquid, said valve member being moved to engage said outlet end by a flow of liquid through the conduit means for a substantial time determined by the relative dimensions of the valve member and the large diameter section, said valve member being effective upon engagement with said outlet end to block the flow of liquid through the conduit means;
- c. said large diameter section comprising first and second conduits extending between the inlet end and the outlet end, said first conduit being relatively long and having a portion extending downwardly in the direction of flow adjacent said inlet end, followed by a portion extending from the lower end of said downwardly extending portion to a locality adjacent said outlet end;
- d. said second conduit being relatively short and extending continuously upwardly; and
- e. said valve member is biased by gravity to said lower end, and is moved through said first conduit toward said outlet end by the flow of liquid from said source, and returns by gravity to said lower end through said second conduit when the flow ceases.

4,416,593

## GAS OPERATED DOWN HOLE PUMP

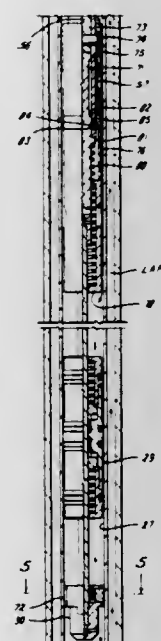
Leslie L. Cummings, 4018 W. Alabama, Houston, Tex. 77027

Filed Aug. 22, 1980, Ser. No. 180,426

Int. Cl.<sup>3</sup> F04B 47/08

U.S. Cl. 417—344

14 Claims



1. A double acting, gas operated pump for lifting formation fluid from a well, comprising a housing connectible to the lower end of a production string suspended within the well, means forming upper and lower pump chambers within the housing, a piston sealably slidable in each chamber, the lower chamber on one side of the piston therein connecting with the lower end of the housing and the upper chamber on one side of the piston therein connecting with the upper end of the housing to deliver formation fluid into the production string, valve means controlling the flow of formation fluid into and out of each pump chamber in order to prevent such fluid from being pumped therefrom as it is being supplied thereto and prevent such fluid from being pumped therefrom as it is being supplied thereto and prevent such fluid from being supplied thereto as it is being pumped therefrom, means including a reversing valve having a spool for supplying gas from a remote source to the first chamber on the other side of the piston therein while exhausting gas from the second chamber on the other side of the piston therein to a zone of relatively low pressure outside the production string, when the spool is in a first position, and for supplying gas from the remote source to the second chamber on said other side of the piston therein while exhausting gas from the first chamber on the other side of the piston therein to said zone of relatively low pressure when the spool is in a second position, whereby said pistons are caused to reciprocate in order to pump formation fluid from one chamber while the other chamber is being filled therewith, means for shifting said spool between its first and second positions in response to reciprocation of said piston, including a rod connected to the spool and extending through the piston, and means including spring means in which energy is stored and then released to shift the spool into each of its positions with a snap action as the piston moves into each of its opposite positions, the other piston being free of the rod.

4,416,594

## HORIZONTAL TYPE VIBRATING COMPRESSOR

Kaoru Ichikawa, Shiraoka, Japan, assignor to Sawafuji Electric Company, Ltd., Japan

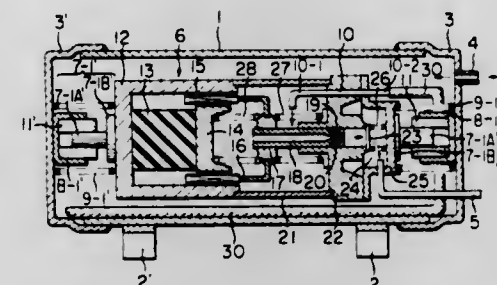
Filed Aug. 12, 1980, Ser. No. 177,591

Claims priority, application Japan, Aug. 17, 1979, 54-113615[U]; Apr. 9, 1980, 55-48041[U]

Int. Cl.<sup>3</sup> F04B 21/00

U.S. Cl. 417—360

2 Claims



1. In a horizontal type vibrating compressor having a cylindrical container defining a chamber and having a horizontally extending axis for accommodating a compressor unit having a horizontally extending axis, the container having a pair of closure members closing opposite axial ends of the container, each closure member spaced outwardly of opposite axial ends of the compressor unit, the container adapted to receive a lubricant therein adjacent the bottom of the chamber, the compressor unit defining a compressor chamber and including a horizontally extending pumping cylinder and a horizontally extending and movable pumping piston inserted into the pumping cylinder at a location of the compressor chamber, the compressor unit including a magnet and a coil adapted to be energized for vibrating movement with respect to the magnet to move the pumping piston horizontally, an improvement comprising:

- a sleeve-shaped cushioning member defining a cylindrical space and made of cushioning material connected to one of an inner surface of one closure member and a spacing opposite axial end of the compressor unit, said cushioning member disposed coaxially with the compressor unit axis;
- a pin-shaped supporting member connected to the other of the closure member inner surface and facing opposite axial end of the compressor unit, said pin-shaped supporting member extending coaxially with the compressor unit axis and received for horizontal movement in said cylindrical space of said cushioning member;
- a pre-compressed spring engaged between the closure member inner surface and the facing opposite axial end of the compressor unit whereby relative axial movement between the compressor unit and the container are restricted by a biasing force of said precompressed spring and an engagement between said pin-shaped supporting member and said cushioning member; and
- an air-oil mixture supplying conduit connected between a bottom of said container chamber and a top of said compressor chamber, said conduit made at least in part of braided fibers in said container chamber for admitting an air/mixture into said conduit through said braided fibers and having an end disposed above the portion of the compressor chamber where the pumping piston is inserted into the pumping cylinder.

4,416,595

## MINIATURE ROTARY INFUSION PUMP WITH SLIDE LATCH AND DETACHABLE POWER SOURCE

Harry W. Cromie, Pittsburgh, Pa., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 13, 1981, Ser. No. 243,540

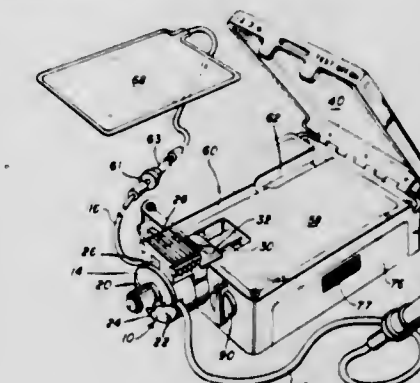
Int. Cl.<sup>3</sup> F04B 43/12

U.S. Cl. 417—476

5 Claims

1. In a pressure pump for fluids through flexible tubing which comprises a pressure member of generally circular

periphery, means for moving said pressure member in orbital motion about an axis of rotation, and a sleeve member positioned about said pressure member and spaced for receiving and retaining the flexible tubing in a predetermined position between the pressure member and the sleeve member with the tubing surrounding said pressure member, the sleeve member being divided into a pair of substantially semi-circular jaws attached together at one end in hinged relation to permit opening and closing of the jaws about the pressure member to facilitate installation of the tubing, the improvement comprising, in combination:



said jaws each defining grippable means comprising outwardly projecting tab members adjacent their ends opposite said one end, and sliding gripper means carried in sliding slot means defined in said pressure pump, said sliding gripper means defining a slot to receive said tab members in abutting relationship and carried by said pump, said gripper means being capable of gripping the opposite ends of the jaws and retaining them together in closed relation in a first sliding position and releasing said jaws to permit them to open in a second sliding position.

4,416,596

## FLUID-TRANSFER SYSTEM AND METHOD

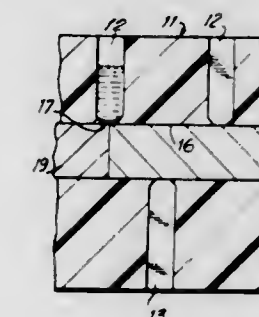
Eric S. Lichtenstein, 420 Taconic Rd., Greenwich, Conn. 06830

Filed Apr. 9, 1981, Ser. No. 252,706

Int. Cl.<sup>3</sup> F04B 7/04

U.S. Cl. 417—488

23 Claims



1. A fluid-transfer system comprising a barrel having an axis and having first and second open ends, first and second pistons fittingly received in said first and second open ends, respectively, said pistons having opposed closed ends within said barrel, said barrel having at least one first opening for transfer of fluid into said barrel as the said interior ends of said pistons are moved apart with the space formed therebetween in registry with said first opening and at least one second opening spaced apart from said first opening along said axis of said barrel for transfer of said fluid out of said barrel when said interior ends are moved toward each other when the space therebetween is in registry with said second opening, said interior ends being shaped for fitting each other for expelling substantially all fluid therebetween, said barrel including a third opening therein for transfer of another fluid into said barrel, first and second reservoirs for holding at least a first and second fluid, respectively, connecting with said first and third



opening, respectively for delivery of fluid therethrough and at least one chamber connected with said at least one second opening for receiving fluid therethrough, said reservoirs and barrel being of a molded synthetic resin forming a module, whereby appropriate scheduling of the positioning of said pistons in said barrel makes it possible to draw a selected quantity of said first fluid into said barrel and to transfer same into said chamber and to draw a selected quantity of said second fluid into said barrel and to transfer same into said chamber.

4,416,597

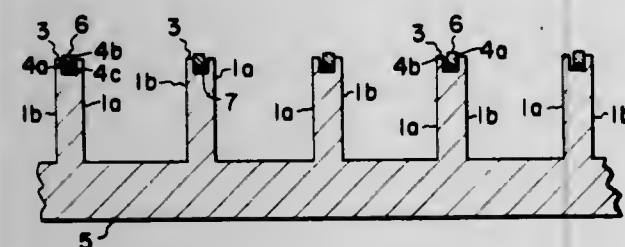
# TIP SEAL BACK-UP MEMBER FOR USE IN FLUID APPARATUS OF THE SCROLL TYPE

David H. Eber, and Arthur L. Butterworth, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.  
Continuation of Ser. No. 232,528, Feb. 9, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 478,396

Int. Cl.<sup>3</sup> F01C 1/02, 19/08; F16J 15/16; F16F 1/08

U.S. Cl. 418—55

6 Claims



1. A wrap element with tip seal and back-up member for use in fluid apparatus of the scroll type comprising

- a wrap element defining at least a first flank surface of generally spiroidal configuration about a reference axis, said flank surface extending generally in an axial direction and terminating in a tip surface lying in a plane substantially perpendicular to said reference axis;
- a groove disposed within said tip surface of spiroidal configuration generally conforming to that of said flank surface, said groove including at least a radially outer lateral wall and a bottom wall;
- a tip seal disposed at least partially within said groove and extending longitudinally about the spiroidal configuration thereof; and
- a back-up member comprising a strip of material disposed within said groove between its bottom wall and said tip seal and extending longitudinally about the spiroidal configuration of the groove, said strip of material having a preformed configuration such that its radially inner edge portion engages the tip seal and is disposed axially toward the tip surface of said wrap element with respect to the radially outer edge portion thereof, which outer edge portion engages a wall of the groove, and said strip of material being constructed of an elastic material such that as said radially inner edge portion is displaced toward the bottom wall of the groove and relative to the radially outer edge portion, an opposing spring force is developed in order to provide a seal and prevent fluid from leaking under the tip seal.

4,416,598

# ROTARY VANE PUMP WITH PRESSURE BIASED FLOW DIRECTING END PLATE

Johann Merz, Bopfingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,413

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018649

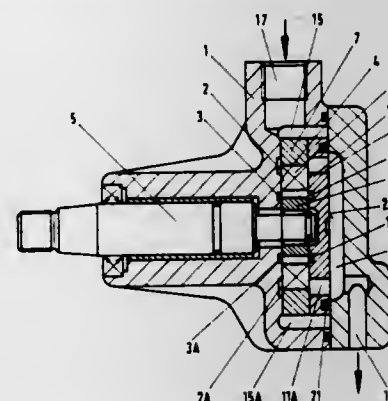
Int. Cl.<sup>3</sup> F04C 2/00, 15/00

U.S. Cl. 418—132

4 Claims

1. In a rotary vane pump including a housing (1) enclosing a suction chamber (15, 15A) and an outlet chamber (20) from

which fluid is discharged under a pump pressure, a cam ring (7) mounted in the housing and having an outer peripheral portion, a rotor (6) mounted within the housing and formed with slots extending radially outward from inner ends relative to a rotor axis, a plurality of vanes (8) slidable within said slots and engageable with the cam ring to form variable volume vane chambers, and flow control surface means (4, 10) fixed to the housing on opposite axial sides of the rotor for conducting fluid from the suction chamber to the vane chambers and from the vane chambers to the outlet chamber, including a flow directing plate (10) having an upstream side confronting the rotor, a downstream side confronting the outlet chamber, circumferentially spaced suction passages (12, 12A) in fluid communication with the suction chamber, and outlet passages (11, 11A) in fluid communication with the outlet chamber, the



improvement comprising seal means (21) on the flow directing plate limiting exposure of the downstream side thereof to the pump pressure within a predetermined pressure area (22) thereon having a radially outer chordal portion bordering the peripheral portion of the cam ring in spaced relation to the suction passages, and a radially inner constricted portion spaced radially inwardly of said suction passages and the inner ends of those of the vane slots aligned with the suction passages during rotation of the rotor about the rotor axis for exerting pressure forces on the downstream side of the flow directing plate unbalanced on the upstream side within a radially inner zone through which the rotor axis extends, whereby clearances between the plate and the rotor are reduced by bending of the plate with maximum flexure within said radially inner zone.

4,416,599

# DIAPHRAGM PUMP WITH COMPENSATION MEANS IN THE HYDRAULIC CONTROL CHAMBER

Jacques H. De Longchamp, La Chatre, France, assignor to Dosapro Milton Roy, Point Saint Pierre, France

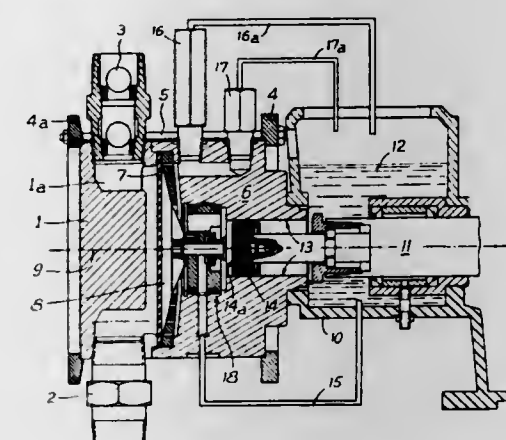
Filed Oct. 14, 1981, Ser. No. 311,256

Claims priority, application France, Oct. 17, 1980, 80 22242

Int. Cl.<sup>3</sup> F04B 43/02

U.S. Cl. 417—386

5 Claims



1. Hydraulically controlled diaphragm pump, comprising a

4,416,601

# CONTINUOUS VULCANIZER

Masakazu Hasegawa, Tokyo; Michio Takaoka, Chiba; Hiroto Oshima, Oimachi, and Keiichi Katoaka, Urawa, all of Japan, assignors to Fujikura Cable Works, Ltd., Japan

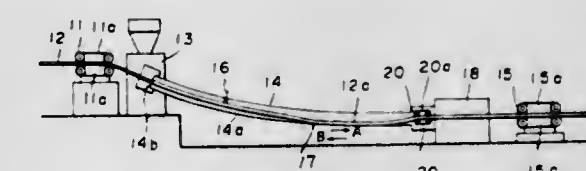
Filed Nov. 19, 1981, Ser. No. 322,764

Claims priority, application Japan, Jun. 10, 1981, 56-89358

Int. Cl.<sup>3</sup> B29H 5/28

U.S. Cl. 425—68

4 Claims



1. A continuous vulcanizer for continuously curing a covering material on a conductor which comprises:

- a feed means for feeding the conductor in one direction at a constant speed;
- an extruder for applying the covering material to the conductor delivered from said feed means to form a cable;
- a vulcanizing tube extending from said extruder, the cable passing through said vulcanizing tube, said vulcanizing tube having a catenary-shaped curing section extending from its inlet to a location intermediate to its inlet and outlet, and said curing section being filled with a pressurized curing medium;
- a take-off means disposed forwardly of said vulcanizing tube for hauling the cable in such a manner that the cable is delivered along a predetermined path in said vulcanizing tube, the cable being kept away from the internal wall of said vulcanizing tube over said catenary-shaped curing section;
- a positioning sensor arranged in said vulcanizing tube for sensing the position of the cable relative to the internal wall of said vulcanizing tube, said take-off means being controlled through said positioning sensor; and
- a load applying means disposed between said extruder and said take-off means for applying a load to the travelling cable at a location forwardly of said curing section of said vulcanizing tube and comprising a pair of opposed rotational members held against and gripping the cable and a brake means for controlling a force necessary to rotate said opposed rotational members, so that a tension exerted on the cable in a direction opposite to the direction of travel of the cable is applied to the traveling cable, thereby cancelling a tension exerted by the pressure of said curing medium on the cable in a direction of travel of the cable so as to maintain the cable in said curing section in a predetermined catenary shape.

4,416,600

# APPARATUS FOR PRODUCING HIGH PURITY METAL POWDERS

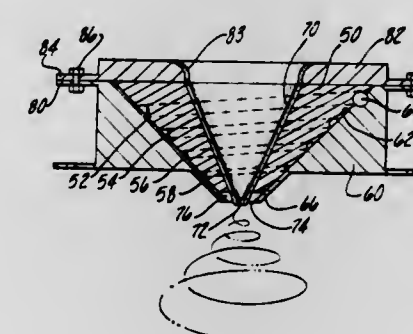
Chester J. Lecznar, Warren, Mich., and Griff E. Williams, Salt Lake City, Utah, assignors to Griff Williams Co., Salt Lake City, Utah and Ryan Metal Powder Technologies, Inc., Warren, Mich.

Filed Feb. 10, 1982, Ser. No. 347,409

Int. Cl.<sup>3</sup> B01J 2/02

U.S. Cl. 425—7

10 Claims



1. In an apparatus for producing metal powders, said apparatus including a source of atomization fluid, an atomization unit with a nozzle therein through which molten metal is poured and contacted with the fluid at an exit of the nozzle to atomize the metal into particles, and a tank particles as they fall from the unit to an opening in bottom portions of the tank where the particles may be collected;

the improvement comprising:

an interchangeable insert having a spiral channel of decreasing cross-sectional dimension formed therein, a receptacle for the insert, said channel cooperating with the receptacle to define a spiral duct of decreasing cross-sectional dimension from an inlet coupled to the source of atomization fluid to an outlet adjacent the exit of the nozzle, said duct being adapted to generate from said fluid source a rotating fluid of a given velocity at the outlet of the duct for atomizing the molten metal into preselected particle sizes, whereby inserts with different channel configurations may be used to produce powders of different particle sizes.

4,416,602

# INJECTION MOLDING APPARATUS FOR MANUFACTURING ARTICLES FROM DIFFERENT TYPES OF PLASTIC MATERIAL

Ernst Neumeister, Stein, Fed. Rep. of Germany, assignor to Wilhelm Rögge Kunststoff-Metallisierung, Nuremberg, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,382

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037252

Int. Cl.<sup>3</sup> B29F 1/12

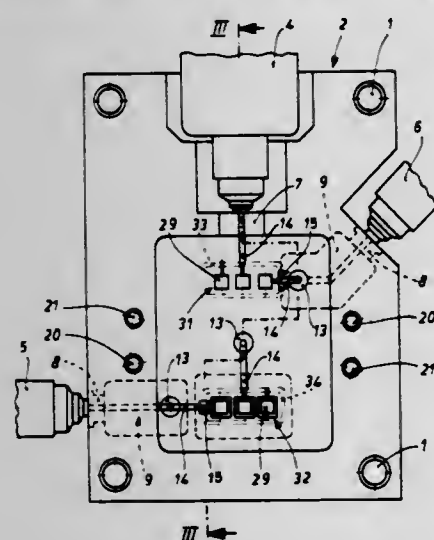
U.S. Cl. 425—130

10 Claims

1. In an injection mold apparatus for manufacturing molded bodies from at least two types of plastic, in which apparatus two injection units are connected to a single mold cavity, and a core piece which is movable back and forth occupies a region of the mold cavity when said core is in the blocking position, and said core in this position separates (by blocking off) a first mold cavity region (associated with the first injection unit) and the entrance opening of material coming from the first injection unit.



tion unit into the mold cavity from a second mold cavity region (which is connected to the second injection unit), whereby first the second mold cavity region is filled from the second injection unit and then, after the core is withdrawn, the region of the mold cavity initially occupied by said core, and the first mold cavity region, are filled from the first injection unit, and whereby the core has a recess;



the improvement comprising that the recess is provided in the blocking region of the core and is in fluid communication with the second mold cavity region when the core is in the blocking position, and the entrance opening of material coming from the first injection unit in the mold cavity lies near the core when the core is in the blocking position.

4,416,603

## LOW PRESSURE HOT MOLDING MACHINE

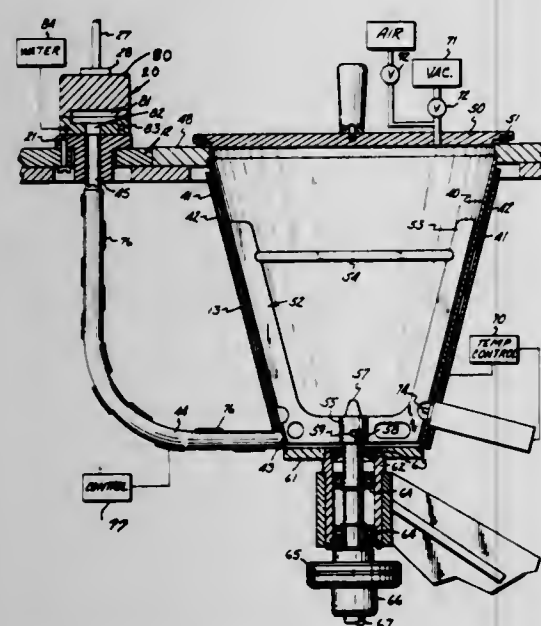
Michael I. Peltzman, and Israel D. Peltzman, both of 1646 Hampshire Ave. South, Minn. 55426

Filed Oct. 7, 1981, Ser. No. 309,238

Int. Cl.<sup>3</sup> B29F 1/06

U.S. Cl. 425—153

19 Claims



1. A low pressure ceramic molding machine comprising: support including a table surface; a molding tank mounted on said support and positioned below the table surface; said tank including means to provide heat to the tank for heating materials in the tank and to cause ceramic materials to be heated to a level sufficient to maintain a slurry state; means to provide fluid under a low pressure to the interior said tank to pressurize the interior of said tank and to

cause ceramic material in a slurry state to be under pressure; said tank having an outlet for permitting said ceramic material in a slurry state to be moved outwardly under such low fluid pressure in a molding cycle; a conduit positioned exteriorly of the tank connected to said tank outlet and extending laterally from the tank to open to the table surface; means to mount a die on said table surface, such die having a surface with an opening alignable with said conduit, whereby when the surface of such die and the table surface are held in contact ceramic material in a slurry state will be forced into such die when the tank is under pressure; said means to mount a die including a die holder for holding such die comprising column means mounted on said support and positioned above said table surface adjacent such die and laterally offset from said tank; a cross member mounted on said column means in position to overlie such die in place on the table surface and being spaced upwardly therefrom; and a fluid pressure cylinder mounted on said cross member and having an extendable and retractable rod and being adapted to exert a force to hold such die with a force toward said table surface to insure communication between the die opening and the conduit during the molding cycle.

2. In a low pressure ceramic molding machine, a tank, means to provide gaseous fluid under pressure to said tank, an outlet from said tank, means for connecting said outlet to a molding die, means for heating said tank to a level sufficient to maintain a ceramic material in a slurry state whereby ceramic material will be urged by the fluid pressure in the tank through said outlet and the means for connecting, the improvement comprising means to permit using substantially all the material in the tank without waste, the tank being formed to have a generally conical shaped interior surface along substantially its entire axial working length and having the outlet provided at a location to permit discharge of material from said tank, the means for connecting the outlet to the die offset from the central axis of the tank, means to support such a die at a position offset from the central axis of the tank, the means to connect comprising a conduit that has an end directed to be coupled to a die on the means to support, and the means to selectively provide gaseous fluid under pressure to the tank selectively providing pressure at a pressure level acting on the surface of the ceramic material therein sufficient to force such ceramic material through the outlet and the means to connect without movement of the material by a mechanical element.

4,416,604

## UNIVERSAL MOLDING SYSTEM AND METHOD

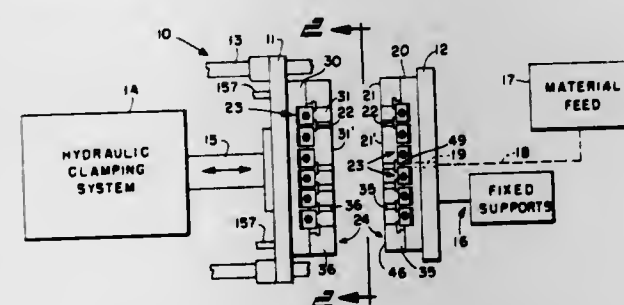
Ernest S. Bender, Chardon; Marty C. Ignasiak, and Michael H. Jones, both of Cleveland, all of Ohio, assignors to Associated Enterprises, Inc., Cleveland, Ohio

Filed Jun. 1, 1981, Ser. No. 269,425

Int. Cl.<sup>3</sup> B29E 1/00

U.S. Cl. 425—183

41 Claims



1. An injection molding system, comprising plural mold inserts, mold base means for supporting at least one mold insert thereon, rail means for holding at least one mold insert on said

mold base means, and holding means for holding said at least one mold insert to said rail means to prevent lateral movement of said mold insert relative to said mold base means and from movement out of the plane of such mold base means while permitting sliding of said mold insert along said rail means.

4,416,605

## SCREEN/DIVERTER CHANGING MECHANISM FOR EXTRUDERS

Masashi Konno, Akashi, and Osamu Ikeda, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

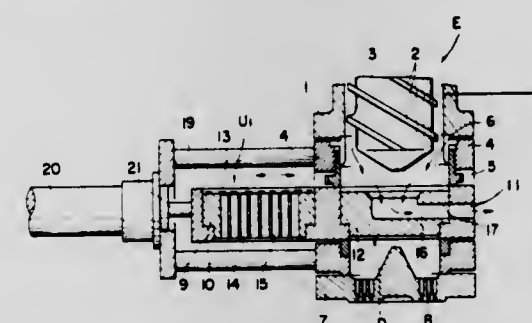
Filed May 4, 1982, Ser. No. 374,751

Claims priority, application Japan, May 7, 1981, 56-66511[U]

Int. Cl.<sup>3</sup> B29F 3/06

U.S. Cl. 425—185

5 Claims



1. A screen/diverter changing mechanism for an extruder of the type including an extruding cylinder with an outlet at the downstream end thereof and an extruding screw rotatably disposed in said cylinder and circumferentially formed with a feed flight member for forwarding a plasticized material through the outlet of the cylinder for extrusion through a screen located at the downstream end of the extruding cylinder, said screen/diverter changing mechanism comprising:

- a retainer box fixed to the downstream end of the extruding cylinder, said retainer box internally defining a longitudinal flow passage for plasticized material and a transverse guide bore which is in communication with said longitudinal flow passage;
- a die plate fixed to the downstream end of said retainer box, said die plate being provided with a plurality of extruding nozzles in communication with said longitudinal flow passage;
- a slide body slidably received in said transverse guide bore, said slide body internally defining a transverse diverting port;
- a screen unit detachably fitted in said slide body, said screen unit internally defining a longitudinal flow passage for plasticized material, said screen unit being provided with a screen mounted in said longitudinal flow passage and, downstream of said screen, a plurality of extruding nozzles;
- a diverter unit detachably fitted in said slide body, said diverter unit internally defining a bent flow passage for diverting the flow of plasticized material from the extruder cylinder, the downstream end of said bent flow passage being in communication with said transverse diverting port in said slide body; and
- a drive mechanism linked to said slide body for selectively positioning either the upstream end of said longitudinal flow passage in said screen unit or the upstream end of said bent flow passage in said diverter unit in communication with said longitudinal flow passage in said retainer box;
- said retainer box and said slide body being sized and shaped so that, when said longitudinal flow passage in said screen unit is in communication with said longitudinal flow passage in said retainer box, the portion of said slide body containing said diverter unit projects outwardly of said retainer box, permitting removal of said diverter unit and its replacement with a second screen unit.

4,416,606

## APPARATUS FOR GRANULATING SODIUM PERCARBONATE

Junichiro Sugano, Nagoya; Shuichi Kobayashi, Yokkaichi; Tomoyuki Yui, Yokkaichi; Tsuneo Fujimoto, Yokkaichi, and Minoru Kubota, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

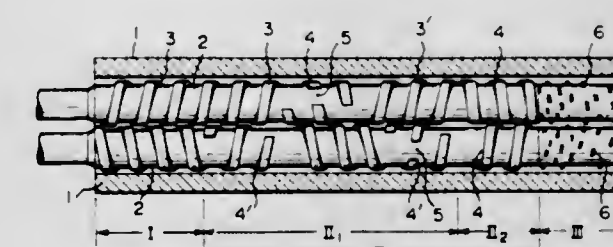
Filed Oct. 20, 1981, Ser. No. 313,199

Claims priority, application Japan, Oct. 22, 1980, 55-147760; Jul. 30, 1981, 56-119640

Int. Cl.<sup>3</sup> B01F 7/08

U.S. Cl. 425—202

3 Claims



1. A granulator comprising a receptacle and a pair of intermeshing rotating screws provided therein in parallel alignment, one end of the receptacle having a hopper for charging a material, the other end thereof having a downwardly opening discharge port and the top surface thereof having a cover; wherein

the inside of said receptacle is composed of a feeding zone, a kneading zone and a breaking zone,

the feeding zone has forwardly conveying screw blades on both of the two screws,

the kneading zone is comprised of an upstream section and a downstream section, said upstream section having an alternate arrangement of a pair of a backwardly conveying screw blade on one screw shaft and a forwardly conveying screw blade on the other in opposition to each other and a pair of a forwardly conveying screw blade on said one screw shaft and a backwardly conveying screw blade on said other screw shaft in opposition to each other, said alternation of the forwardly and backwardly conveying screw blades occurring at least once in each of said screw shafts, and either one of the forwardly and backwardly conveying screw blades in each pair being discontinuous for meshing with the other screw blade in said pair, and said downstream section having backwardly conveying screw blades on both of the two screw shafts, the blades are aligned with the same pitch in each of the feeding zone, the upstream section of the kneading zone and the downstream section thereof,

the breaking zone is of an open structure and has a plurality of projections provided on both of the two screw shafts for breaking agglomerated masses, and that portion of the cover of said receptacle which corresponds to the feeding zone and the upstream section of the kneading zone is a fixed cover and that portion of the cover of the receptacle which corresponds to the downstream section of the kneading zone is a movable cover.



4,416,607

# APPARATUS FOR THE CONTINUOUS FORMATION OF BIAXIALLY ORIENTED THERMOPLASTIC MATERIALS AND FORMING ARTICLES THEREFROM BY INTERMITTENT FORMING MEANS INTERFACED THEREWITH

Thomas W. Winstead, Baltimore, Md., assignor to Maryland  
Cup Corporation, Owings Mills, Md.

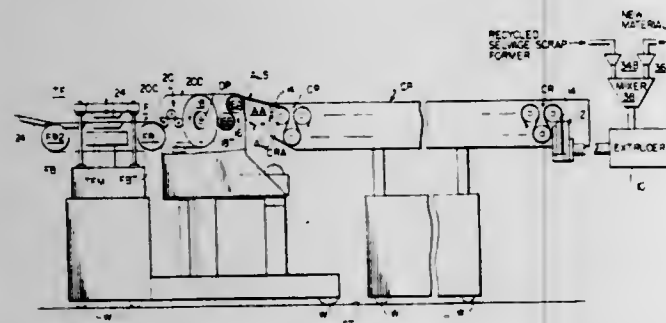
Division of Ser. No. 117,510, Feb. 1, 1980, Pat. No. 4,307,049.

This application Jun. 15, 1981, Ser. No. 273,414

Int. Cl.<sup>3</sup> B29C 3/00

U.S. Cl. 425—325

9 Claims



1. An apparatus for extruding and presenting a continuous web of thermoplastic material in a continuous mode and transferring incremental lengths thereof to an orienting and forming device and forming products in the latter in an intermittent mode downstream of and with no effect on said continuous mode, comprising:

first means continuously extruding and presenting a web of thermoplastic material at a temperature suitable for subsequent orientation to an accumulation position;

interface means continuously ingesting said extruded web from said extruding and presenting means and intermittently discharging predetermined throw lengths of said web;

orientation means intermittently receiving said predetermined throw lengths of said web and continuously biaxially orienting said web over each said throw length; each said throw length corresponding to a given actuation cycle of said intermittent orientation means; and

thermoformer means downstream of said orientation means and synchronized therewith to ingest such said throw length of biaxially oriented web and form products therein.

4,416,608

## APPARATUS FOR FORMING PARISONS

Lawrence R. Deardurff, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 13, 1982, Ser. No. 434,149

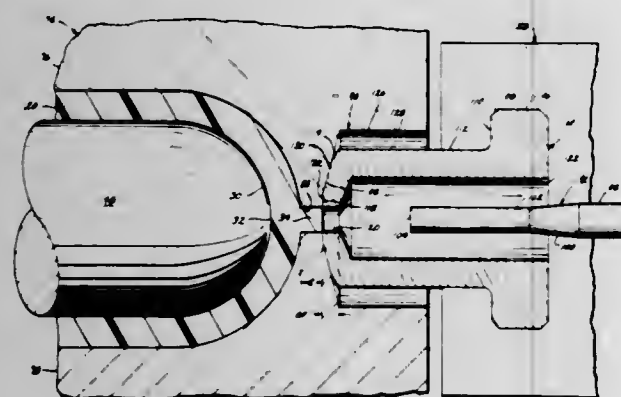
Int. Cl.<sup>3</sup> B27F 1/03

U.S. Cl. 425—548

21 Claims

U.S. Cl. 431—2

7 Claims



1. An injection nozzle comprising:  
a hollow base portion;

a hollow main body portion continuous with said hollow base portion and extending outwardly therefrom;

a beveled heat transfer control portion extending inwardly of said hollow main body portion and joining with said main body portion at an acute angle and being continuous with said hollow main body; and

a mold mating portion extending inwardly of said beveled heat transfer control portion and terminating in a centrally located outlet port, said outlet port having an inwardly extending annular wall providing fluid communication with said hollow main body portion, said mold mating portion suited for contact with an injection mold inlet and said inwardly extending annular wall of said outlet portion having a height of less than 0.06 inches.

11. In an injection molding apparatus having a sectional mold and a plastic distribution manifold assembly with plasticating means for periodically supplying heated plastic material to an injection nozzle in communication with the sectional mold during a molding cycle, the improvement comprising:

said mold sections movable into sealing engagement to form a mold cavity and defining an injection nozzle accepting recess, said recess having an indwelling recess wall terminating at an acutely angled mating portion which includes a centrally located gate in fluid communication with the interior of said mold cavity;

said injection nozzle including a hollow base portion in fluid communication with said distribution manifold and insertable into said injection nozzle accepting recess and terminating in a nozzle end portion including an angled heat transfer control portion, said angled heat transfer control portion being more acutely angled than the angle of said acutely angled recess mating portion, such that said heat transfer control portion does not contact said acutely angled mating portion of said recess and said nozzle end portion including an acutely angled mating portion having a centrally located outlet port in fluid communication with said base portion and in registry with said gate portion, said acute angle being substantially equal to the acute angle of said recess wall acutely angled mating portion; wherein, the total additive length of the inside of said gate portion of said mold and the inside of said outlet port of said injection nozzle being equal to or less than about 0.06 inches.

4,416,609

## METHOD AND APPARATUS FOR BURNING WASTE OILS

Walter Weber, Lechaschau, Austria, assignor to The Firm of Jörg Santer, Schwaz, Austria

PCT No. PCT/AT80/00020, § 371 Date Mar. 2, 1981, § 102(e)

Date Mar. 2, 1981, PCT Pub. No. WO81/00144, PCT Pub. Date Jan. 22, 1981

PCT Filed Jun. 27, 1980, Ser. No. 243,919

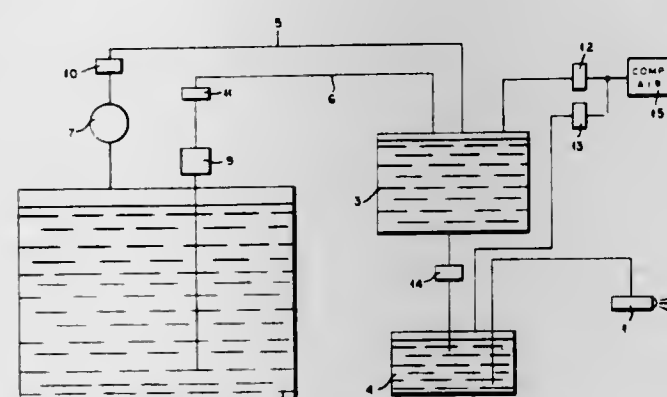
Claims priority, application Austria, Jun. 29, 1979, 4557/79

Int. Cl.<sup>3</sup> F23K 5/00

21 Claims

U.S. Cl. 431—2

7 Claims



1. A method of burning waste oil comprising the steps of:

- collecting waste oil in a collecting vessel;
- applying suction to a pressure vessel and communicating said pressure vessel with said collecting vessel to draw oil from said collecting vessel through a pump-free conduit into said pressure vessel by the suction therein; and
- thereafter forcing oil from said pressure vessel through a pump-free conduit into an atomizing burner by applying gas pressure to said pressure vessel, thereby atomizing oil in said burner under pressure and burning the atomized oil.

4,416,610

## WATER-IN-OIL EMULSIFIER AND OIL-BURNER BOILER SYSTEM INCORPORATING SUCH EMULSIFIER

John P. Gallagher, Jr., Pennsauken, N.J., assignor to Hydroll, Inc., New York, N.Y.

Continuation of Ser. No. 130,513, Mar. 14, 1980, Pat. No.

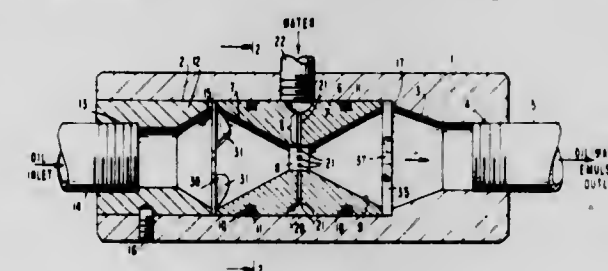
4,344,752. This application Feb. 12, 1982, Ser. No. 348,592

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> F23D 13/14

U.S. Cl. 431—4

19 Claims



1. In an improved oil-burning heat-producing system which has a rated maximum firing rate and which includes a firebox, means supplying fuel-oil under pressure, means supplying admix water under pressure, an emulsifier for emulsifying said water into said oil in the form of small droplets, an atomizing burner adapted to atomize said water-in-oil emulsion into tiny globules in air and to project said atomized emulsion into said firebox, whereby water globules which contain one or more droplets become still more finely atomized by the rapid vaporization of said droplets, the improvement wherein said emulsifier has:

an approximately cylindrical oil-flow constraining throat D centimeters in diameter carrying the flowing fuel oil in a given flow direction therethrough, said throat being located between smoothly converging and smoothly diverging generally conical flow surfaces which are substantially symmetrical relative to said throat;

means in communication with said smoothly converging flow surface for imparting swirling movement to the oil flow in a direction at an angle to said given flow direction before said flowing fuel oil reaches said throat; and

a multiplicity n of water-injection holes in said throat, each water-injection hole having a smaller diameter of d centimeters than said throat diameter, each of said water injection holes extending approximately radially to said throat; the combined areas (0.25πd²) of said n water-injection holes being 0.075 to 0.30 times the total area (0.25πD²) of said oil-flow throat.

4,416,611

## FLUE DAMPER CONTROL

Joseph C. Zivny, 208 Northwood Rd., Riverside, Ill. 60546

Filed Dec. 10, 1980, Ser. No. 215,108

Int. Cl.<sup>3</sup> F23N 3/00

U.S. Cl. 431—20

11 Claims

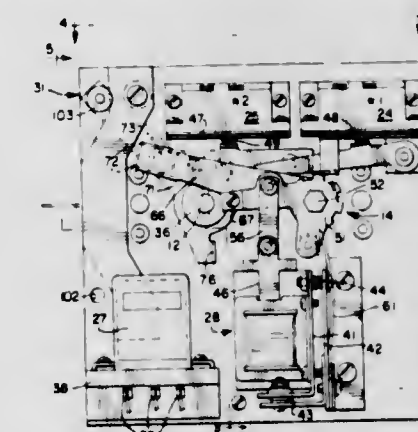
1. An automatic control for a flue damper including a damper plate mounted in a flue pipe and pivotally movable

between an open position and a closed position, said control comprising in combination:

a solenoid mounted for substantially vertical movement of an armature between an energized position and a deenergized position;

a lever mechanism operatively connecting said armature to the damper plate for moving said damper plate to its open position when said solenoid is energized; and return spring means cooperating with the damper plate for returning the damper plate to its closed position when said solenoid is deenergized;

said lever mechanism including a mounting pin parallel to the pivot axis of the damper plate, first lever means operatively connected to said armature and pivotally mounted on said pin, and second lever means operatively connected



4,416,612

## CIGARETTE LIGHTER

Hiromaro Tabata, Tokyo, Japan, assignor to Miki Corporation, Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,434

Claims priority, application Japan, Nov. 6, 1980, 55-155233

Int. Cl.<sup>3</sup> F23Q 2/16

U.S. Cl. 431—131

3 Claims

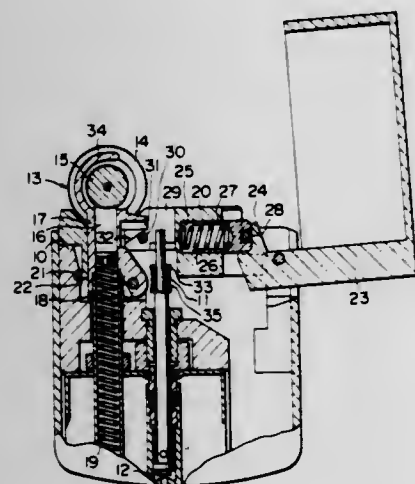
1. In a cigarette lighter of the type including a lighter body having therein a gas tank, a nozzle extending upwardly from said gas tank, an ignition system located in the upper portion of the lighter body and including a flint holder on which a striking member support wheel, a striking member and a flint are mounted, and a cover pivotally supported by the lighter body and movable between an open position in which the ignition system is exposed and a closed position in which the ignition system is enclosed by the cover, the improvement comprising:

regulating member having an opening, one end of said regulating member being pivotally supported by said lighter body and the other end thereof being pivotally supported by said cover, whereby said regulating member pivots during the opening and the closing movements of said cover;

means for pivotally supporting said flint holder on said lighter body so that said flint holder extends upwardly through said opening of said regulating member;



means for biasing said flint toward said striking member and for urging said flint holder to pivot about said means for pivotally supporting to a lowered position in which said cover can close; and means provided on said regulating member for engaging said flint holder to prevent pivoting of said flint holder to said lowered position when said cover is open and to allow



said flint holder to pivot toward said lowered position as said cover is closed; whereby when said cover is opened said flint holder is maintained in a raised position by said means for engaging and when said cover is closed said regulating member is lowered so that said flint holder is pivoted to said lowered position by said means for biasing.

4,416,613

**BLOWPIPE TYPE OF BURNER**

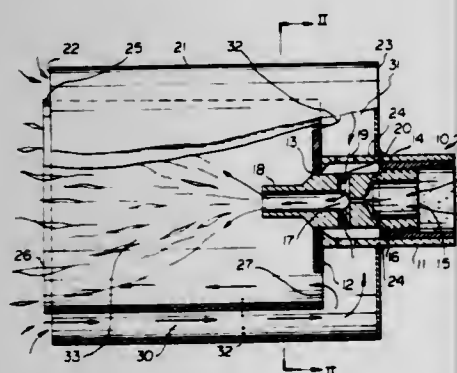
Leonard M. Barisoff, Box 104, Grand Forks, British Columbia, Canada (VOH 1H0)

Filed Aug. 5, 1980, Ser. No. 175,380

Int. Cl.<sup>3</sup> F23D 15/02

U.S. Cl. 431—243

2 Claims



1. A blowpipe type of burner including a cylindrical housing, a nozzle body provided with a mixing chamber, an axial gas inlet port to said mixing chamber, a plurality of radial air inlet ports to said mixing chamber, and an axially extending burner tube connected to said mixing chamber, whereby mixed gas is substantially completely burned in said burner tube, the improvement, in combination with said burner, of a self-cooling shield, said shield comprising:

- a disc-like, centrally apertured baffle secured at the extreme forward end of said cylindrical housing, and having said axially extending burner tube projecting through said central aperture;
- an outer tubular member, secured concentrically to said cylindrical housing by a disc-like centrally apertured rear wall, said central aperture surrounding said cylindrical housing and being secured thereto, thereby to provide

said outer tubular member as having a closed rear end and an annular open forward end;

- an inner tubular member secured concentrically within said outer tubular shield and to said disc-like baffle by a plurality of bracing connections, thereby to provide said inner tubular member as having an annular open rear end and a circular open forward end;
- said outer tubular member and said inner tubular member defining, therebetween, an annular chamber for back-flow of cooling air;
- the rear wall of said outer tubular member and said disc-like baffle defining, therebetween, a rear cylindrical chamber;
- said cylindrical housing having aperture means communicating said rear cylindrical chamber with said radial air inlet ports of said mixing chamber

whereby cooling air is drawn in laminar flow into said annular chamber from the annular open end of said outer tubular member to said rear cylindrical chamber, where said air is bifurcated into two flows, a first air flow to provide combustion-supporting air to said radial air inlets, and a second air flow to enter the annular open rear end of said inner tubular member and then to be expelled, along with hot gaseous products of combustion, through an annular zone within, and along the wall of, said inner tubular member.

4,416,614

**ASPHALT HEATING KETTLE APPARATUS**

Albert L. Moody, Lawrenceville, Ga., assignor to F. C. Brown Rentals, Inc., Smyrna, Ga.

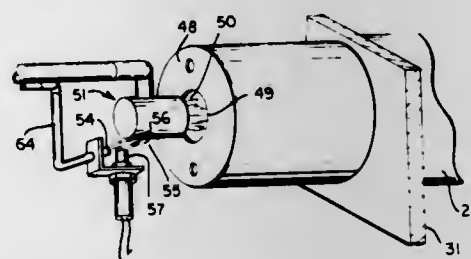
Division of Ser. No. 214,631, Dec. 10, 1980. This application

Sep. 16, 1982, Ser. No. 418,615

Int. Cl.<sup>3</sup> F23Q 9/00; E01C 19/45

U.S. Cl. 431—278

5 Claims



1. High velocity gas fuel burner apparatus with improved pilot light, comprising:

- main burner means having an outlet port operative to direct a flow of gas fuel toward a burner passage at substantial velocity in a predetermined direction for ignition within said burner passage; and
- a pilot gas burner providing a pilot flame originating behind said main burner outlet port and directed forwardly toward said main burner outlet port so that the pilot flame ignites the gas fuel entering said burner passage, the origin of the pilot flame at said pilot gas burner being located behind the point of ignition of the main burner and thereby not inadvertently extinguished by the ignition blast of the main burner flame.

4,416,615

**FUEL BURNER CONSTRUCTION**

Elmer Ketchum, Jr., 21507 H. Dr., South, Homer, Mich. 49203

Filed Feb. 17, 1981, Ser. No. 234,832

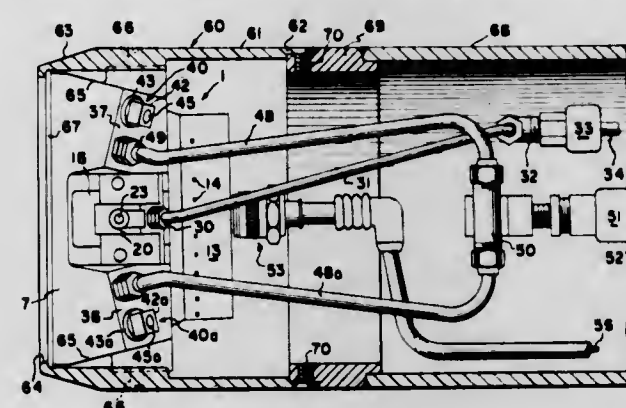
Int. Cl.<sup>3</sup> F23Q 9/00

U.S. Cl. 431—285

21 Claims

21. A fuel burner construction comprising a pair of nozzles; means mounting said nozzles in opposed, spaced apart, directly confronting relation; an air passage extending axially completely through each of said nozzles; means for delivering fuel transversely into each air passage between its ends; and means for delivering air through the air passage of each of said noz-

zles at a velocity sufficient to atomize, entrain, and discharge such fuel from each of said nozzles, said nozzles being so



located by said mounting means that atomized fuel discharged from each of said nozzles impinges on atomized fuel discharged from the other of said nozzles.

4,416,616

**WICK FOR BURNING LIQUID FUEL**

Hideharu Shimizu, Yamatokoriyama, and Akihiko Hashimoto, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

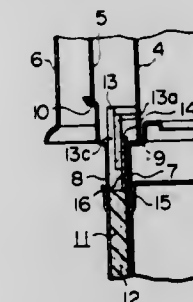
Filed Oct. 2, 1981, Ser. No. 308,138

Claims priority, application Japan, Oct. 2, 1980, 55-138548

Int. Cl.<sup>3</sup> F23D 3/18; F24C 5/04

U.S. Cl. 431—325

3 Claims



1. A wick for burning a liquid fuel comprising:

- a liquid fuel supplying section for supplying a liquid fuel; a combustion section having a lower part making detachable contact with said liquid fuel supplying section and adapted to evaporate said liquid fuel supplied through said liquid fuel supplying section, said combustion section comprising a thin sheet body consisting of ceramic fibers and a knitted or woven fabric consisting mainly of glass fibers, said fabric and sheet body being superposed on one another with the top end of said fabric projecting slightly above the top end of said thin sheet body, said lower part of said combustion section being formed of a knitted or woven fabric mainly consisting of glass fibers for detachably coupling said combustion section with said liquid fuel supplying section.

4,416,617

**APPARATUS FOR BURNING SPIRIT OR SIMILAR LIQUID FUELS**

Bengt E. O. Ebbeson, Halmstad, Sweden, assignor to Origo-verken I Halmstad Aktiebolag, Halmstad, Sweden

PCT No. PCT/SE79/00195, § 371 Date Sep. 26, 1980, § 102(e)

Date Sep. 26, 1980, PCT Pub. No. WO80/01602, PCT Pub.

Date Aug. 7, 1980

PCT Filed Sep. 26, 1979, Ser. No. 197,108

Claims priority, application Sweden, Jan. 29, 1979, 7900744

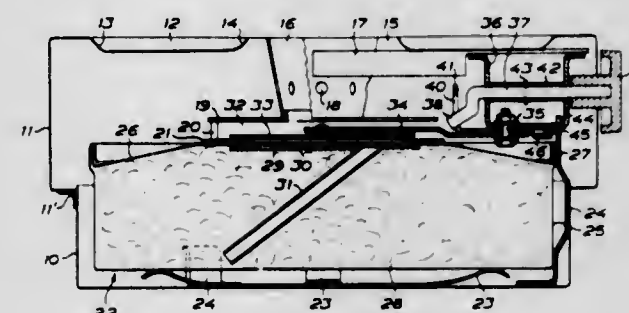
Int. Cl.<sup>3</sup> F23D 3/40

U.S. Cl. 431—326

8 Claims

1. Apparatus for burning spirit, or a similar liquid fuel, comprising a container means for containing said fuel and absorbing

means for absorbing said fuel, said container means having a surface for exposing said absorbing means, a burner tube located above said container means and physically separate therefrom, a flange means extending outwardly from a lower edge of said burner tube, a ring secured to said flange means and spaced from said flange means to form a gap for the intake of combustion



air between said tube and said absorbing means, said ring having an aperture adapted to be aligned with said surface of said container,

a plate for covering said aperture, mounted for pivotal movement between said ring and said flange, elastic biasing means for urging said container means against said ring to align said surface and said aperture, and wherein the burner tube (16) is a truncated cone with the smaller end below the larger end.

4,416,618

**GAS-FIRED INFRA-RED GENERATORS AND USE THEREOF**

Thomas M. Smith, 114 Villinger Ave., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 238,418, Feb. 26, 1981, Ser. No.

186,491, Sep. 12, 1980, Pat. No. 4,378,207, Ser. No. 178,121,

Aug. 14, 1980, Pat. No. 4,373,904, Ser. No. 20,079, Mar. 13,

1979, Pat. No. 4,290,746, and Ser. No. 952,332, Oct. 18, 1978,

Pat. No. 4,326,843, said Ser. No. 20,079, and Ser. No. 952,332,

each is a continuation-in-part of Ser. No. 906,229, May 15, 1978,

Pat. No. 4,157,155, said Ser. No. 20,079, Ser. No. 186,491, Ser.

No. 952,332, and Ser. No. 178,121, each is a continuation-in-part

of Ser. No. 863,251, Dec. 22, 1977, Pat. No. 4,224,018, said Ser.

No. 238,418, Ser. No. 20,079, Ser. No. 186,491, Ser. No. 952,332,

and Ser. No. 178,121, each is a continuation-in-part of Ser. No.

94,901, Nov. 16, 1979, Pat. No. 4,272,238, and Ser. No. 775,838,

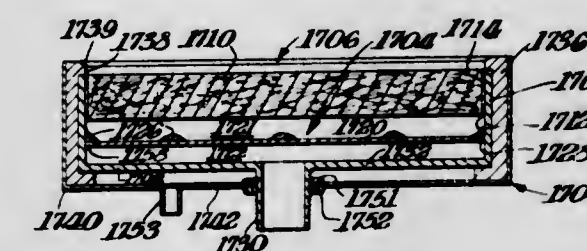
Mar. 9, 1979, Pat. No. 4,272,237. This application Jun. 30, 1981,

Ser. No. 279,081

Int. Cl.<sup>3</sup> F23D 13/12

U.S. Cl. 431—328

8 Claims



1. A gas-fired infra-red generator having a thick porous ceramic fiber matrix through the thickness of which a combustion mixture is passed to emerge from one face and to burn on that face, that matrix face being entirely uncovered so that the burning extends completely over that face, the edges of the matrix around that face being fitted in the mouth of a plenum body and adherently sealed against the inside surface of the mouth by silicone adhesive that withstands temperatures as high as about 450° F., the mouth around the adhesive being of



metal sufficiently thick to carry off heat and keep its temperature low enough to thermally protect the adhesive.

4,416,619

**POROUS CERAMIC COMBUSTION REACTOR**

Laurence B. Craig, Glen Cove, and Alfred J. Farina, Baldwin, both of N.Y., assignors to Thermocatalytic Corp., Williston Park, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,463

Int. Cl.<sup>3</sup> F23D 13/12

U.S. Cl. 431-328

1 Claim



1. A porous ceramic reactor for use in a heating system, said reactor being tubular and having an outer surface at which combustion occurs, said outer surface having indentations to break up the surface continuity in the form of at least two spirals of opposing twist, providing a lozenge pattern, extending continuously along the length thereof.

4,416,620

**LARGER CAPACITY VORTEX BURNER**

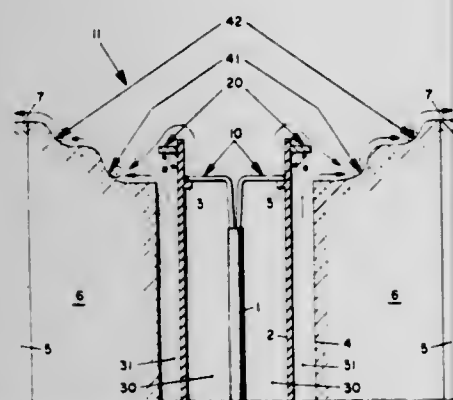
Charles W. Morck, Philadelphia, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Jun. 8, 1981, Ser. No. 271,494

Int. Cl.<sup>3</sup> F23D 13/12

U.S. Cl. 431-348

11 Claims



1. A vortex burner comprising:  
a. a burner block adapted to be inserted in a furnace wall, the block having a cup and a bore extending through the block to the cup base;  
b. primary air supply means within the bore having a forward end extending beyond the cup base;  
c. fuel gas supply means, having nozzles, within the primary air supply means for mixing fuel gas with primary air and imparting a whirling flow pattern to the primary air and

fuel gas mix as it exits from the forward end of the primary air supply means;  
d. secondary air supply means surrounding the primary air supply means within the bore;  
e. means for deflecting the secondary air flow into a depression in the cup surface; and  
f. means for deflecting the whirling primary air and fuel gas mix into the depression for mixing with the secondary air and for anchoring the primary air, secondary air and fuel gas mixture to the cup surface.

4,416,621

**CERAMIC COMBUSTION CHAMBER AND METHOD OF MAKING IT**

Werner Huther, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

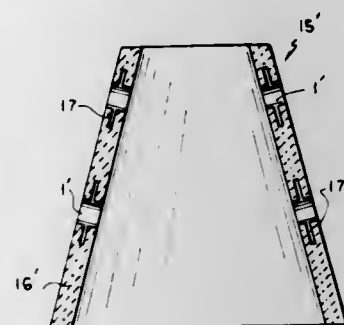
Filed Aug. 14, 1981, Ser. No. 292,861

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031689

Int. Cl.<sup>3</sup> F23D 15/02

U.S. Cl. 431-352

1 Claim



1. A tubular ceramic combustion chamber wall having a plurality of air inlet ports each extending completely through the thickness of the wall, and a double wall formation extending around each of the inlet ports, the two walls of each formation being formed by an annular slot in the wall of its respective port, and the depth of each slot being at least equal to the thickness of the chamber wall.

4,416,622

**METHOD AND PLANT SUCH AS A KILN PLANT FOR TREATING GRANULAR OR PULVEROUS RAW MATERIAL**

Jorn Touborg, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,368

Claims priority, application United Kingdom, Nov. 25, 1980, 80377729

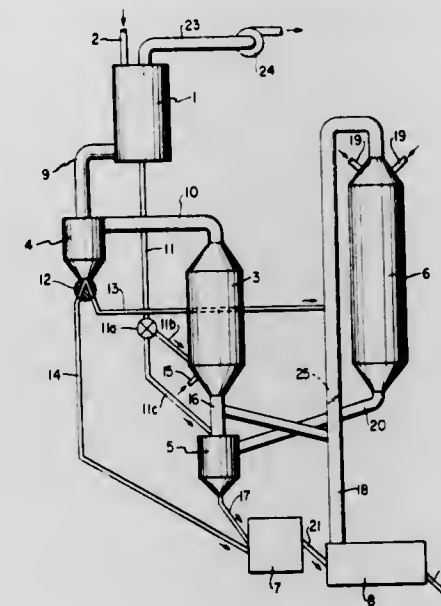
Int. Cl.<sup>3</sup> F27B 15/00; F26B 7/02; C04B 7/02

U.S. Cl. 432-14

10 Claims

1. Method for treating pulverous raw materials in a kiln plant including a generally stationary reaction zone coupled upstream to a preheating zone and a precalcination zone and downstream to a cooler, comprising preheating the material in the preheating zone in suspension, precalcining the preheated material in the precalcination zone in suspension, separating the precalcined material from smoke gases in a separator zone, dividing the precalcined separated material into a first material flow and a second material flow, suspending the first material flow in cooling air from the cooler, burning and melting the suspended first material flow in the generally stationary reaction zone, separating the melted first material flow in a cyclone from smoke gases, feeding the melted material flow to a rotating nodulisation drum coupled downstream of the cyclone, feeding the smoke gases separated from the melted first material flow to the precalcination zone as combustion air, feeding

the second material flow directly to the rotating nodulisation drum for mixing with the melted material flow so that the



mixture is nodulised therein, and feeding the nodulised mixed material flows to the cooler.

4,416,623

**MUFFLE FURNACE**

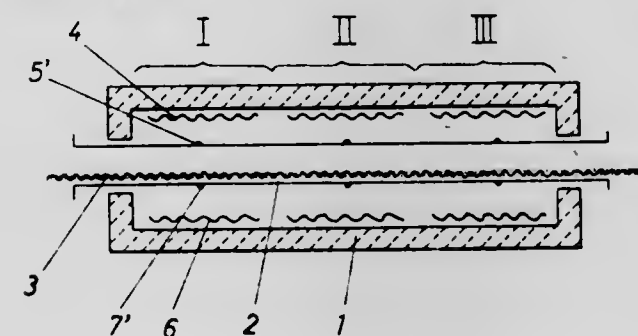
Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,603

Int. Cl.<sup>3</sup> F27B 1/26, 5/14; F27D 11/00

U.S. Cl. 432-36

4 Claims



1. In a muffle furnace in which a plurality of successive heating zones are provided along the length of an elongate, metallic muffle which extends longitudinally through said heating zones, the improvement comprising  
a pair of spaced, independently operable heaters provided in each of said heating zones adjacent the upper and lower sides, respectively, of said muffle,  
a pair of temperature sensors mounted on said upper and lower sides, respectively, of said muffle in each of said zones,  
means for operating one of said heaters in each of said zones until a predetermined temperature is detected by one of the corresponding pair of sensors in the associated zone, and  
means for controlling the operation of the other of said heaters in each zone to minimize the difference in temperatures detected by the corresponding pair of sensors in the associated zone.

4,416,624

**VERTICAL TUNNEL KILN**

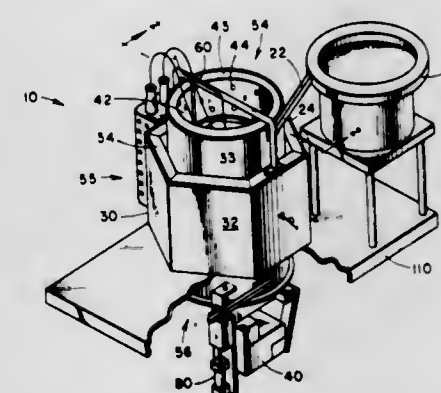
Terry R. Bloom, Middlebury, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Nov. 27, 1981, Ser. No. 325,111

Int. Cl.<sup>3</sup> F27B 9/14

U.S. Cl. 432-134

16 Claims



1. A vertical tunnel kiln that transmits parts downwardly for firing and removes volatiles by the exhaust of gases from the interior of said kiln, comprising a casing forming an interior core, a helical ramp extending from one end of said vertical tunnel kiln to an oppositely disposed end of said vertical tunnel kiln and providing a track adapted to receive said parts thereon which are subjected to temperature gradients as they progress downwardly from the upper to the lower end of said kiln, heating means for heating said kiln which receives and confines said heat to fire said parts, means forming interior baffles for controlling the movement of gases through said kiln and to effect preferred temperature gradients within said kiln as the parts on said track progressively advance from the upper to the lower end of said kiln, means for developing a vibratory force communicated to said track whereby the parts are successively advanced from the upper to the lower end of said kiln, feeder means for orienting and supplying said parts to the upper end of said track, and timed discharge means for controlling the discharge rate of said parts at the lower end of said kiln, whereby said interior baffle means controls the flow of gases through said kiln to effect an exhaust of volatiles from said kiln as said parts move downwardly through said temperature gradients and are fired.

4,416,625

**ORTHODONTIC SPRING FORCE ADJUSTMENT AND DISCONNECTABLE CONNECTION**

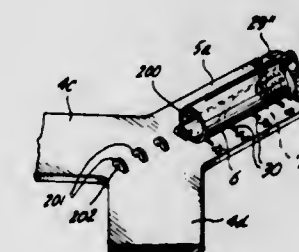
Maclay M. Armstrong, Seattle, Wash., assignor to Northwest Orthodontics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 33,111, Apr. 25, 1979, Pat. No. 4,368,039, which is a continuation-in-part of Ser. No. 655,401, Feb. 5, 1976, Pat. No. 4,155,161, which is a continuation-in-part of Ser. No. 613,243, Sep. 15, 1975, abandoned. This application Feb. 26, 1980, Ser. No. 124,842

Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433-5

13 Claims



1. In an orthodontic appliance including force-reaction means engageable with the wearer's head and/or neck, an



orthodontic treatment force-applying device for applying a force to a jaw and resilient force-producing means connected between the force-reaction means and the force-applying device, the improvement comprising the force-producing means including a helical spring having a hook carried by one end thereof, and a plurality of arches carried by the appliance, arranged in a row aligned with said spring and selectively engageable by said hook for adjusting the degree of force produced by said spring.

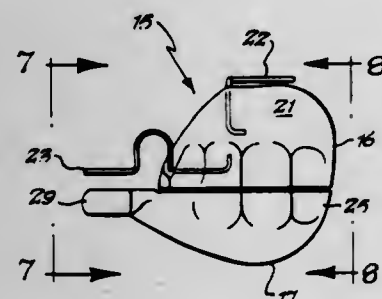
4,416,626

# METHOD FOR RECAPTURING ANTERIOR DISPLACED MANDIBULAR DISC AND ORTHOPEDIC DEVICE THEREFOR

William D. Bellavia, 511 West Ave., Medina, N.Y. 14103  
Filed Oct. 19, 1981, Ser. No. 312,759  
Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433—7

14 Claims



1. A method of recapturing an anterior displaced mandibular disc comprising the steps of moving the mandible to an anterior position from its normal position to increase the vertical height between the condyle and fossae, firmly retaining the mandible in said anterior position to permit said mandibular disc to become displaced to a more posterior position, periodically moving said mandible to a more posterior position in increments until it is returned to a permanent position which is anterior to its original normal position, and providing sufficient clearance between the lower and upper molars to permit eruption of certain of said molars during said periodic movement of said mandible, to thereby cause said erupted molars to maintain the increased vertical height.

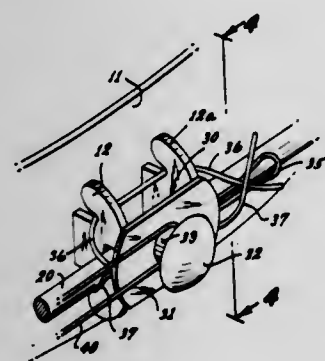
4,416,627

# ORTHODONTIC APPLIANCE

William W. Beazley, 3055 El Vido, Los Angeles, Calif. 90049  
Filed Jun. 7, 1977, Ser. No. 804,345  
Int. Cl.<sup>3</sup> A61C 3/00

U.S. Cl. 433—18

4 Claims



1. An orthodontic appliance for use in combination with an orthodontic arch wire and an elastic band and including a band fitted around a tooth comprising in combination:

- a pair of T-shaped brackets on the band each having a groove on top, the grooves being aligned with each other and receiving the arch wire;
- a ligating member having a base placed on top of the grooves and retaining the arch wire therein, there being

wire ends secured to the base and tied under the T-shaped brackets and twisted together to hold the member on the brackets; and  
the member having a hook on top of the base as anchoring post for a loop of the elastic band.

4,416,628

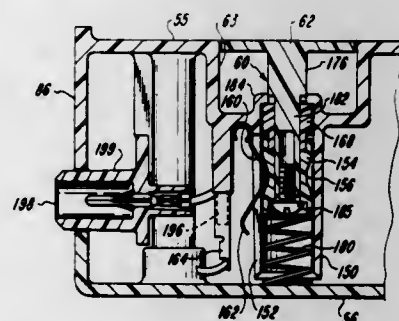
# PUSH-BUTTON SWITCH AS USED IN ORAL HYGIENE APPLIANCE

Michael A. Cammack; Christopher W. Elkins; Clarence J. Hickman, and Keith M. Mullins, all of Ft. Collins, assignors to Teledyne Industries, Inc.

Division of Ser. No. 97,039, Nov. 23, 1979. This application Apr. 27, 1981, Ser. No. 257,919  
Int. Cl.<sup>3</sup> A61G 17/02

U.S. Cl. 433—80

6 Claims



1. In a device which includes a supply of liquid, a pump for propelling said liquid, and means for delivering the propelled liquid to a point of use, the improvement comprising:

- a housing defining a cavity within which said pump is seated;
- means defining an outlet in said housing;
- means defining an inlet coupling member in said housing;
- an electric motor seated in said cavity for driving said pump;
- a button depressably mounted in an exposed position in a wall of said housing;
- a barrel disposed in said housing beneath said button with an opening being defined through the wall of said barrel;
- a spool slidable longitudinally within said barrel and having a pair of axially-spaced external wall surfaces facing said opening individually at respective different distances therefrom;
- means coupled between said button and said spool for moving said spool axially between first and second positions in alternate directions upon successive depressions of said button;
- a resilient conductive finger projecting through said opening and against said spool, movement of said spool between said first and second positions serving to align respective different ones of said surfaces in engagement with said finger and correspondingly change locations of a contact portion on said finger;
- a conductive contact element disposed in the path of said contact portion and engageable with disengageable therewith upon change between said locations;
- and means for connecting said contact portion and said contact element in circuit with said motor.

4,416,629

# OSSEOINTERFACED IMPLANTED ARTIFICIAL TOOTH

Peter G. Mozsary, 530 Tennessee Ave., Vallejo, Calif. 94590, and Robert E. Lapevic, 40 N. Gate Victoria Ave., Milpitas, Calif. 95035

Filed Jul. 6, 1982, Ser. No. 395,139  
Int. Cl.<sup>3</sup> A61C 8/00

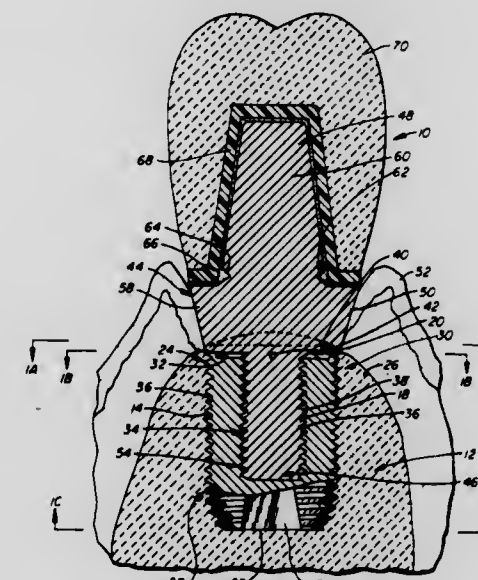
U.S. Cl. 433—174

8 Claims

- 1. An artificial tooth implantable in a jaw bone comprising:
  - a. an implantable tooth root, said root having a distal end portion intended for extending into the jaw bone and a proximal end portion being accessible from the outer

surface of the jaw bone; said root further including a hollow extending from said proximal end portion of said root toward said distal end portion of said root;

- b. means for fixing said root to the jaw bone;
- c. a post, said post having a first portion fitting within said hollow of said root and a second portion extending outwardly from said hollow; said second portion having an outer surface which slopes downwardly toward said first



portion of said post said second portion of said post further including a base connected to said first portion or said post; a stem extending from said base; and a weakened portion at said connection between said base and stem for breakably connecting said base to said stem;

- d. means for fixing said first portion of said post within said hollow of said root;
- e. a crown connected to post.

4,416,630

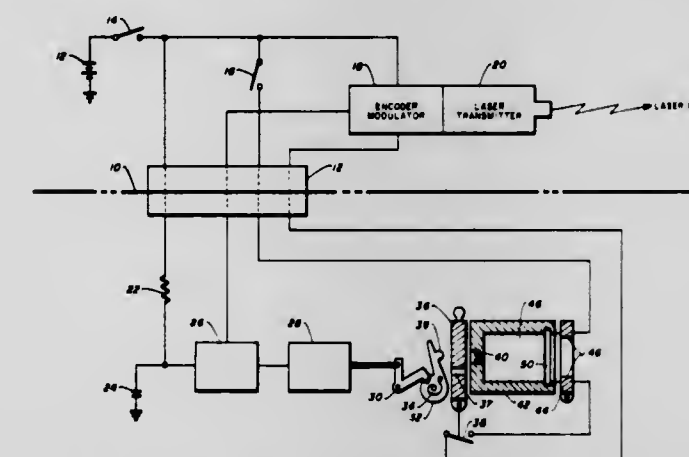
# WEAPONS EFFECT SIGNATURE SIMULATOR

James M. Hagen, Riverside, and James D. King, Sierra Madre, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 1, 1982, Ser. No. 344,859  
Int. Cl.<sup>3</sup> F42D 7/00; F41F 27/00

U.S. Cl. 434—16

7 Claims



1. In a weapons effect signature simulator for use with a weapons engagement simulator, said signature simulator comprising:

- a means for responding to the simulated firing of a rocket propelled weapon; means providing a report, flash and smoke associated with the actual firing of a weapon; means to determine if said signature simulator is correctly loaded; and means to inhibit the firing of said weapons simulator when incorrectly loaded.

4,416,631

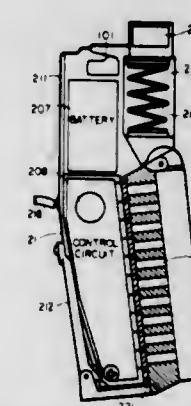
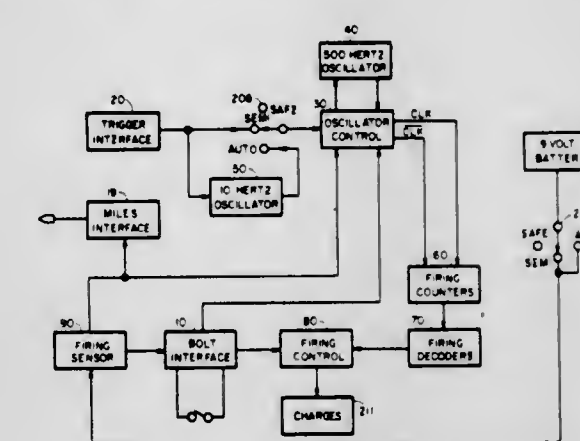
# SMALL ARMS FIRING EFFECTS SIMULATOR

Christopher R. Dawson, Glendora, and Ronald E. Purkis, Upland, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1982, Ser. No. 375,797  
Int. Cl.<sup>3</sup> F41C 13/00

U.S. Cl. 434—16

13 Claims



1. A small arms fire simulator for use with a rifle utilizing the magazine, ejection port, and trigger of said rifle, comprising: a plurality of pyrotechnic charges; means for packaging said charges into a magazine for insertion into said rifle including: an expendable plastic casing having configured therein a plurality of cylindrical wells having an exit orifice, for fixedly receiving said pyrotechnic charges; ignition bridge wires embedded within each of said wells and within each of said pyrotechnic charges; metal silkscreened conductive area connecting said bridge wires in adjacent wells; and means for electronically controlling the order and rate of discharge for said pyrotechnic charges operably connected to said charges and the trigger mechanism of said rifle.

4,416,632

# PAINT-BY-NUMBERS KIT

Mort Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,626  
Int. Cl.<sup>3</sup> G09B 11/10

U.S. Cl. 434—84

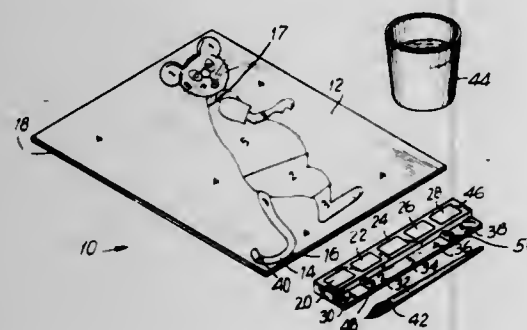
6 Claims

1. A watercolor kit for producing watercolor pictures, comprising:

- (a) a picture sheet having a plurality of picture areas to be painted on a paint-receiving work surface of the sheet, and a plurality of water-insoluble picture lines on the work surface and together with the picture areas constituting a picture;
- (b) a plurality of different water-based watercolor paints for



- application to the work surface of the picture sheet to produce a watercolor picture;
- (c) a plurality of different selector means for identifying the different colors of the water-based paints;
- (d) a plurality of different water-soluble indicia means each located on the work surface in a respective picture area thereon, each indicia means corresponding to a respective selector means for identifying which water-based paint color is to be applied to the respective picture area; and
- (e) brush means for applying a selected water-based paint color on the work surface directly over the respective picture area and directly over the water-soluble indicia



means located therein and in disappearing relationship with the same to thereby cause the selected water-based paint color itself to dissolve the water-soluble indicia means, and for applying the water-based paint colors over the water-insoluble picture lines and in non-obscuring relationship therewith to thereby permit the picture lines to be visible even if directly covered on the work surface by the water-based paints,

whereby the watercolor picture is not marred by the unsightly presence of the indicia means appearing through the applied watercolor paints, and by the covering of the picture lines.

4,416,633

# EDUCATIONAL AND RECREATIONAL MATHEMATICAL DEVICE IN THE FORM OF A BAND, RING OR CONCENTRIC RINGS

Max A. Gulack, 880 Fifth Ave., New York, N.Y. 10021

Filed Aug. 18, 1978, Ser. No. 935,183

Int. Cl.<sup>3</sup> G09B 19/02

U.S. Cl. 434-188

5 Claims



1. An educational and recreational mathematical device comprising at least one band which is endless or adapted to have ends thereof fastened to form an endless band and a plurality of individual digits imprinted on the band at regularly spaced intervals, the digits when all read consecutively clockwise as a number constituting a quotient obtained by dividing a number constituted of  $(P-1)/n$  nines, in which P is a prime number greater than 5 and n is an integer at least 1, by P and adding to the lefthand end of said quotient any number of zeros necessary to increase the number of digits in said quotient to  $(P-1)/n$ , n being so selected that  $(P-1)/n$  nines is the mini-

mum number of nines divisible by P so that said quotient is an integral number.

4,416,634

# DENTAL PRACTICE MEANS

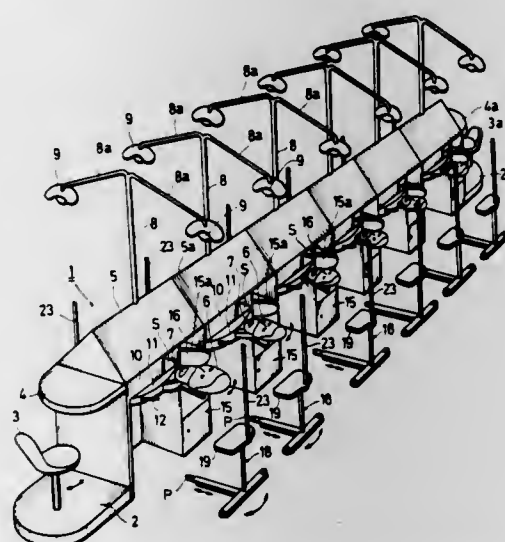
Daryl R. Beach, 8-2, Wado-cho, Atami-shi, Shizuoka-Pref, Japan

Filed Feb. 1, 1982, Ser. No. 344,401

Int. Cl.<sup>3</sup> G09B 23/28

U.S. Cl. 434-263

1 Claim



1. An assembly for training concurrently one or more dental trainees, comprising, in combination,
  - a plurality of pairs of training stations positioned on a floor and connected to each other in an extended straight line with two ends, each pair having face-to-face seating positions for a pair of said dental trainees;
  - a table positioned on each of said ends of said line of connected plurality of stations for use by instructors;
  - a platform raised above said floor at a predetermined height and disposed at each of said ends; and
  - a horizontally and vertically movable chair attached by support base to said platform at each end, for seating said instructor at a suitable level for unobstructed observation of said trainee and hands of said trainees; and wherein each of said stations comprises
    - a sloping top for each pair of stations thereby to form, in cross section, a triangle, whereby said sloping tops extend continuously from one end of said line to the other end of said line;
    - each pair of stations having connected at the top of said sloping top, a vertical support means with a pair of horizontal support means extending therefrom at the top of said vertical support means and in opposing directions, and light means at the end of each horizontal support means, said horizontal and vertical support means disposed so that said light means is positioned above a position holding a patient's head sample;
    - a support table for holding said patient's head sample, said supporting table holding means for supplying vacuum or other power directing means;
    - a shelf extending between each of a pair of stations;
    - a section shelf disposed to the right of said supporting table;
    - a dental tray held adjacent said head sample and on said second shelf;
    - a plurality of cabinets disposed below said second shelf, for holding one or more dental tools;
    - a chair for holding said trainee to be within easy working area of said sample head, said chair comprising a T shaped base, having one end of a leg of said T, rotatably connected to said floor, and a top bar of said T having wheels connected at the ends thereof, whereby said chair is rotatable about said connected leg end so that said dental trainee is within a prescribed work area of

said head sample at all times, and said chair further comprising a vertical base support connected to said T support base, a seat connected to said vertical base support, and a vertically extending rod connected to said seat at the back thereof and toward the middle thereof, whereby a dental trainee has a constant check on his posture by contact of his back against said vertically extending rod; whereby the entire assembly has suitable positioning of all components thereof so that said instructor can readily observe without any substantial obstruction, said dental trainees and their hands.

4,416,635

# MOLECULAR MODELS

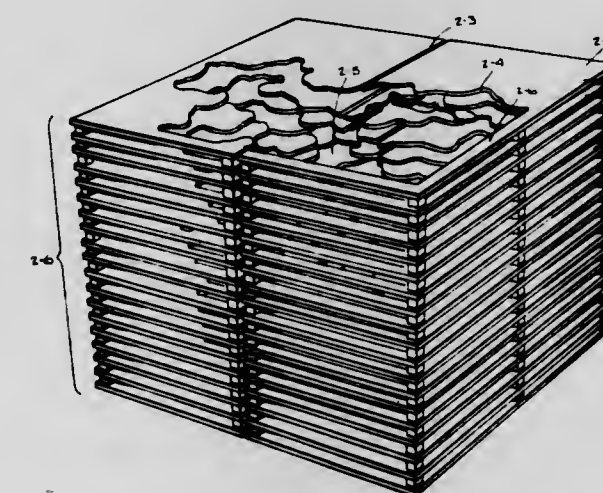
Graham M. Smith, Scotch Plains, N.J., assignor to Merck &amp; Co., Inc., Rahway, N.J.

Filed Dec. 24, 1981, Ser. No. 334,196

Int. Cl.<sup>3</sup> G09B 23/26

U.S. Cl. 434-280

2 Claims



1. A scale model illustrating the space filling nature of atoms in a molecular structure, comprising a plurality of adjacent parallel relatively thin rigid flat sheets, each sheet cut out to represent a cross section plane of an individual molecule having edges defining the boundary of space filling atoms intersecting said cross section, said parallel sheets ordered to represent sequential cross sectional planes of a molecular structure in axial alignment whereby said edges define a surface boundary of said molecular structure.

4,416,636

# CONNECTOR FOR VANE STEERING OF MARINE DRIVE

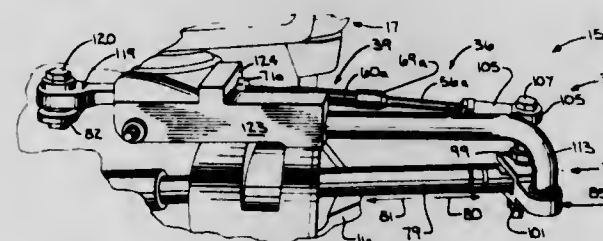
James Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 16, 1981, Ser. No. 321,752

Int. Cl.<sup>3</sup> B63H 21/26

U.S. Cl. 440-51

8 Claims



5. A steering system for a boat, comprising a lost motion connector having a notch to rotatably retain an axially movable input member, said notch having sides to pivotally retain said axially movable input member and ends to form stops limiting the rotation of said lost motion connector with respect to said axially movable input member, said input member operatively connected to rotate a

pivotal vane located within the slip stream of a drive unit to control the direction of boat movement in response to the movement of said input member when spaced from said stops, said input member operatively connected to directly rotate said drive unit in response to the movement of said input member when engaging one of said stops to control the direction of boat movement.

4,416,637

# MARINE STEERING MECHANISM AND ASSOCIATED ACTUATING AND LOCKING DEVICE

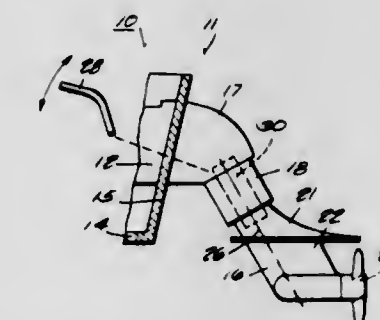
Gerald E. Kashmerick, Lindenhurst, Ill., and Lawrence E. Zdanowicz, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 13, 1981, Ser. No. 282,407

Int. Cl.<sup>3</sup> B63H 21/26

U.S. Cl. 440-60

20 Claims



1. A marine propulsion device comprising a movable steering member, a movable steerable member including a propeller, and steering means operatively connected with said steering member and said steerable member and including a cylinder having opposite first and second end portions, a piston operatively connected with said steering member for reciprocative movement within said cylinder between said first and second end portions in response to movement of said steering member and for permitting movement of said steerable member in response to movement of said steering member, supply means communicating with each of said first and second cylinder end portions and adapted for communication with a sump, said supply means being operative, in response to steering member movement effecting movement of said piston away from one of said cylinder end portions, for conducting hydraulic fluid from the sump into said one of said cylinder end portions, and discharge means communicating with each of said first and second cylinder end portions and adapted for communication with a sump, said discharge means being operative, in the absence of movement of said steering member, for blocking hydraulic fluid flow from each of said cylinder end portions so as thereby to lock said piston against movement in said cylinder, and being further operative, in response to movement of said steering member effecting movement of said piston away from said one cylinder end portion, for affording hydraulic fluid flow from the other of said first and second cylinder end portions to the sump so as thereby to free said piston for movement within said cylinder.

4,416,638

# APPARATUS FOR FEEDING FUEL TO A MARINE ENGINE

Frank Ellis, 56, Thamespoint, Fairways, Broom Rd., Teddington, Middlesex, England TW11 9PP

Continuation of Ser. No. 131,476, Mar. 18, 1980, abandoned.

This application Aug. 26, 1982, Ser. No. 411,873

Claims priority, application United Kingdom, Mar. 20, 1979, 7909743; Mar. 28, 1979, 7910874; Apr. 11, 1979, 7912882

Int. Cl.<sup>3</sup> B63H 21/00

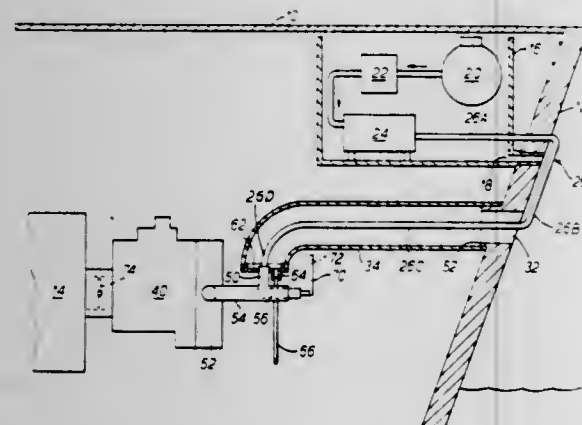
U.S. Cl. 440-88

11 Claims

1. Apparatus for feeding liquified petroleum gas fuel which is gasified and fed to the carburetor of an internal combustion



engine comprising a generally annular chamber having an inner wall provided with a plurality of peripherally spaced orifices and connectible to a fuel feed pipe and mountable on the carburetor such that gasified fuel flows through the orifices thereof to the carburetor, a conduit connected to the annular chamber, a branch pipe connected to the conduit to provide a fuel duct from the fuel feed pipe to the conduit, a helical rotary scroll valve located in the conduit to obturate an adjustable



proportion of the branch pipe opening into the conduit dependent upon the rotational position of the scroll valve, a radial lever connected to the scroll valve to cause rotary motion thereof, an adjustment means for the area of the annular chamber orifices comprising a slide plate having further orifices corresponding to the chamber orifices and movable to bring the chamber orifices and further orifices progressively into and out of strict register, and means for clamping the slide plate at any required position within its range of movement.

4,416,639

## MANAGEABLE SAFETY DINGHY

Thomas C. Gillmer, 1 Shipwright Harbor, Annapolis, Md. 21401  
Filed Jun. 22, 1981, Ser. No. 275,912  
Int. Cl.<sup>3</sup> B63H 16/06

U.S. Cl. 440—106

14 Claims



1. A manageable safety means for a vessel, comprising:
  - a vessel;
  - a pair of oars;
  - a flotation means, said flotation means being suitably affixed to the exterior surface of said vessel, said flotation means providing a positive bouyancy and stability to said vessel for safety;
  - a pair of oarlock means, said oarlock means being adjustable, said adjustable oarlock means being affixed to an interior surface of said vessel, said pair of oars being removably inserted into and through said pair of oarlock means, said adjustable oarlock means being positioned so as to position said oars removably inserted therein so as to clear said flotation means, said adjustable oarlock means providing a flexibility to provide the best rowing trim for said vessel

and to provide a managing capability to arrange seating of passengers and stowing of gear to enhance said safety, each of said oarlock means of said pair of adjustable oarlock means consisting of a track means, said track means being located on said interior surface of the gunwale of said vessel, said track means being affixed by suitable means to said interior surface of said gunwale of said vessel, the exposed surface of said track means having a plurality of detent indentations therein, a slide means, said slide means being slidably affixed to said track means, said slide means sliding freely on said track means, said slide means having a threaded aperture therein and there-through, a socket means, said socket means being affixed to said slide means by suitable means, a fastening means, said fastening means having a first end and a second end, said first end being cylindrical and threaded on the outside thereof, said second end having a knob-like configuration, said first end of said fastening means being removably and threadably inserted into said threaded aperture in said slide means, said knob-like configuration of said second end of said fastening means being used in manually turn said threaded end thereof in said threaded aperture to thereby tighten said fastening means against said track means and thereby locking said slide means in place, the distal end of said first end being further located when locking so as to enter one of said plurality of said detent indentation, and a pair of oarlock ring means, said oarlock ring means having a first end and a second end, said first end being configured as an open circular ring, said second end being configured as a rod-like pin, said rod-like pin being suitably affixed to the outer periphery of said open circular ring so as to project longitudinally outwardly therefrom, said oarlock ring means being removably inserted into said socket means by inserting said projecting rod-like pin portion into said socket means; and

a longitudinal seat means, said longitudinal seat means running in a fore and aft direction in relation to said vessel, said longitudinal seat means being located on the longitudinal center-line of said vessel, said longitudinal seat means facilitating the positioning of a rower operating said pair of oars in said pair of adjustable oarlock means.

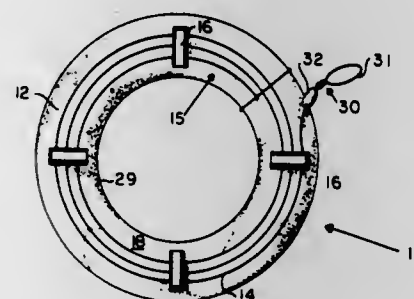
4,416,640

## LIFE RING

Jay P. Eickenhorst, Stinson Beach, Calif., assignor to Dennis J. Romano, San Francisco, Calif., a part interest  
Filed Mar. 16, 1981, Ser. No. 244,269  
Int. Cl.<sup>3</sup> B63C 9/08

U.S. Cl. 441—81

3 Claims



1. An improved life ring, comprising:
  - a generally doughnut-shaped ring buoy having a top surface, a bottom surface, a closed, generally convex edge wall that defines the circumferential exterior of the ring buoy, and an inner circular edge;
  - a rope connected at one end to said ring buoy and having a free end for holding when said ring buoy is thrown; and
  - a series of releasable attachment means solely on one of said top and bottom surfaces of the ring buoy, spaced angularly apart on said one surface, for retaining the rope visibly exposed, coiled circumferentially along said one

surface and for quickly and immediately releasing the entire coil of rope with little resistance to the travel of the ring buoy when it is thrown, in any orientation, with the rope's free end held, said releasable attachment means consisting of a series of strips disposed in generally radial configuration on said one surface and each having a component extending over the coil of rope with means for releasing the components in response to pressure from any direction of pull which the rope can exert when the ring buoy is thrown.

4,416,641

## ANTI-EXPOSURE JACKET

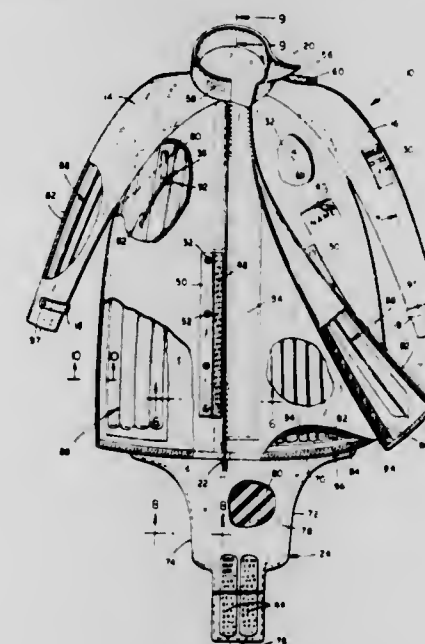
Dominic J. Splnosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,239

Int. Cl.<sup>3</sup> B63C 9/10

U.S. Cl. 441—94

11 Claims



1. A garment for protecting the wearer thereof from exposure to the elements comprising:
  - A. a jacket having a body portion tailored to fit the torso of said wearer and arm portions for covering the arms of said wearer, said jacket body and arm portions including:
    - (i) an inner and outer layer of material forming a chamber therebetween,
    - (ii) fastening means disposed about the edges of said body portion and at specific locations on the inner rear and front outer surfaces of said body portion, said arm portions being sealed at the edges thereof, and
    - (iii) crotch means having one end affixed to the lower edge of said outer layer of material, said crotch means being positionable between the legs of said wearer with the other end thereof fastened to said front outer surface of said body portion when in use and being fastened in position at the inner rear surface of said outer layer of material when not in use;
  - B. insulation means affixed to the outer surface of said inner layer of material and disposed within said chamber, formed by said inner and outer layers;
  - C. inflatable bladder means including:
    - (i) a back section having fastening means along its side edges,
    - (ii) a pair of arm sections having fastening means along its side edges, and
    - (iii) a pair of front sections having fastening means, all of said sections being joined together about the periphery of a neck opening, said arm sections being adapted to be rolled and joined at said arm section fastening means into tubular sleeves, said back section being additionally joined to said front section by cooperation of their respective fastening means, said bladder means being adapted to be received

within said chamber between said insulation means and the inner surface of said outer layer of material; and

D. means for inflating said bladder means.

4,416,642

## METHOD FOR PREVENTING BLOCKED APERTURES IN A CATHODE RAY TUBE CAUSED BY CHARGED PARTICLES

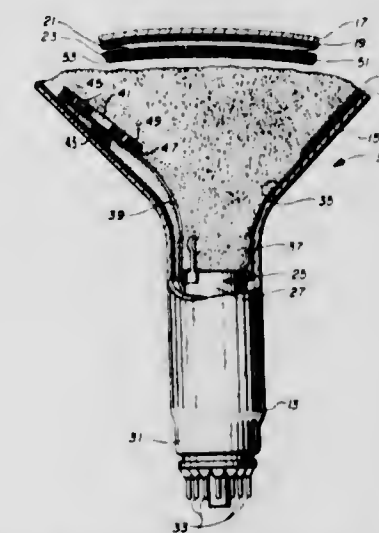
David D. VanOrmer, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,563

Int. Cl.<sup>3</sup> H01J 9/20

U.S. Cl. 445—11

1 Claim



1. A method of processing an evacuated cathode-ray tube having an envelope with a conductive coating disposed on an interior surface portion thereof, a luminescent viewing screen within said envelope, means for producing at least one electron beam for exciting said screen to luminescence, an apertured mask having an interior surface facing said electron beam producing means, said mask being closely spaced from said screen, an evaporator assembly for depositing a primary metal film on the interior surfaces of said funnel portion of said envelope and of said mask, and gettering means for depositing a gas-sorbing getter material film on said primary metal film, the method including the steps of:
  - agitating said tube so as to dislodge any insulative particles therein,
  - orienting said tube so that any of said insulative particles are disposed upon said interior surfaces,
  - depositing a substantially uniform and continuous primary metal film on said interior surfaces thereby rendering conductive any of said insulative particles disposed on said surfaces, and
  - applying said gas-sorbing getter material film to said primary metal film.

4,416,643

## PLANAR DRIVE DEVICE

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,755

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004663

Int. Cl.<sup>3</sup> E21C 27/34, 29/16

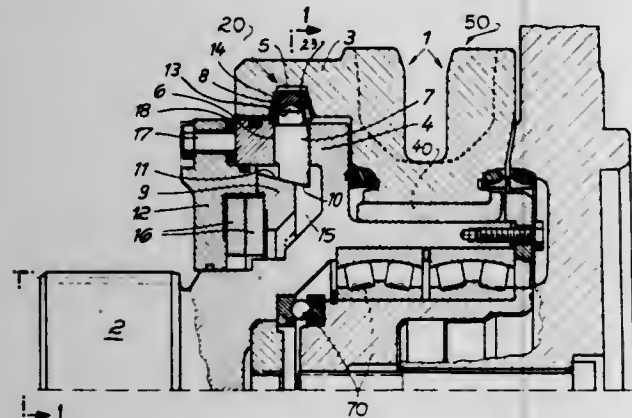
U.S. Cl. 464—38

9 Claims

1. A planer drive mechanism comprising, a sprocket wheel for driving a planer chain, a drive shaft for driving the sprocket wheel, said sprocket wheel having a secondary rim, said drive shaft having a primary rim, friction clutch means connected between said primary and secondary rims for permitting limited movement therebetween, said secondary rim having a circular groove of trapezoidal cross-section defined therein, said primary rim having a plurality of radially extending cir-



cumferentially spaced bores therein aligned with said circular groove, a coupling bolt movably received in each of said bores adapted to be moved toward said circular groove, each coupling bolt having a tapered bolt head secured on a side thereof adjacent said circular groove, a centering ring movably mounted on said drive shaft having a bevelled surface in engagement with a base of each of said coupling bolts, a pressure ring connected to said drive shaft and bearing against said centering ring to bias said coupling bolts radially outwardly toward said circular groove through said bevelled surface and said coupling bolt bases, each of said tapered bolt heads com-



prising a separate friction segment frictionally engaged with said circular groove, said friction segments are shaped and distributed in said circular groove to form a substantially continuous friction ring having a small clearance between adjacent friction segments in a circumferential direction of said circular groove, each coupling bolt includes a small diameter portion with a centering cone, each friction segment having a blind bore therein for receiving said small diameter portion and centering cone for biasing said friction segments at a central location thereof into engagement with said circular groove whereby each friction segment is bulged outwardly at a central portion thereof in said circular groove.

4,416,644

# **FLEXIBLE SHAFT ASSEMBLY WITH UNIVERSAL ADAPTER**

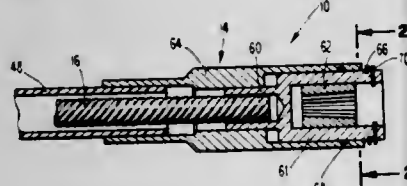
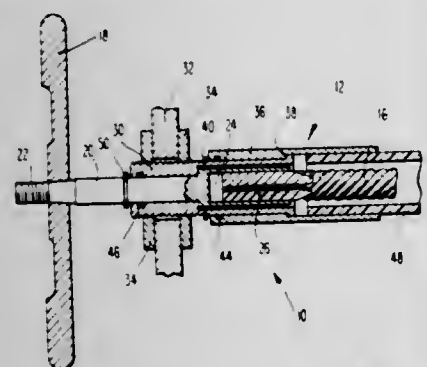
Walter Kulischenko, East Brunswick; William F. Bogan, Somerville, and William C. Ellis, Bridgewater, all of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 1, 1982, Ser. No. 344,462

Int. Cl.<sup>3</sup> F16C 1/02, 1/08

U.S. Cl. 464—52

8 Claims



1. Apparatus for turning a valve stem of a valve by means of a handwheel rotating a flexible shaft, said apparatus comprising:

a sleeve mounted in a supporting member, means rotatable within said sleeve and interconnecting one

end of said flexible shaft with said handwheel, said flexible shaft having an outer casing in longitudinal alignment with said sleeve,

a first ferrule rotatably mounted over an inner end of said sleeve and affixed to one end of said casing,

a socket member secured to the other end of said flexible shaft,

a second ferrule secured to the other end of said casing, said socket member rotatably mounted within said second ferrule, and

other means seated within said socket member for engaging said valve stem whereby rotation of said handwheel and flexible shaft causes said socket member to rotate therewith while said first ferrule is independently rotatable to automatically relieve torsional stresses in said casing, said second ferrule and said first ferrule rotating in accordance with each other and said ferrules rotating said casing.

4,416,645

# **PILOTED FLEXIBLE COUPLING**

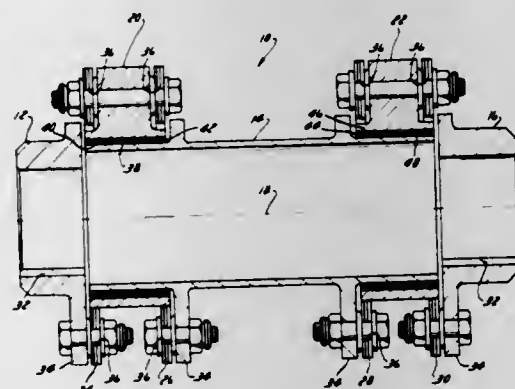
Walter A. Fredericks, Warren, Pa., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jan. 13, 1982, Ser. No. 339,024

Int. Cl.<sup>3</sup> F16D 3/78, 3/50

U.S. Cl. 464—99

12 Claims



1. A flexible torque transmission coupling, comprising: a flexible disc having a central longitudinal axis and having a plurality of angularly-spaced, longitudinal apertures equidistant from said axis;

first and second rigid elements aligned along said axis, wherein said disc is alternately secured to said first and second rigid elements through said apertures so as to transmit torque between said rigid elements; and cooperating means on said first and second rigid elements for eliminating angular misalignment between said first and second rigid elements while still permitting axial misalignment between them,

wherein said cooperating means comprises said first rigid element having a cylindrical outer surface portion and said second rigid element having a cylindrical inner surface portion, wherein said cylindrical outer surface fits into said cylindrical inner surface with a close sliding fit.

4,416,646

# **BICYCLE CHAIN-SHIFTING DEVICE**

Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,950

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013854

Int. Cl.<sup>3</sup> F16H 7/22; F16C 1/10

U.S. Cl. 474—80

13 Claims

1. In a chain-shifting device for a bicycle or the like comprising a chain mover unit (17), a movable support member (21) supporting said chain mover unit (17), a fixed support member (23) to be attached to the frame of the bicycle, guide means (32,

4,416,647

# **BELT TENSIONER**

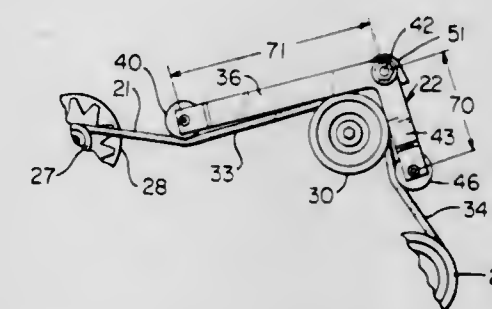
Jack D. White, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 26, 1981, Ser. No. 267,190

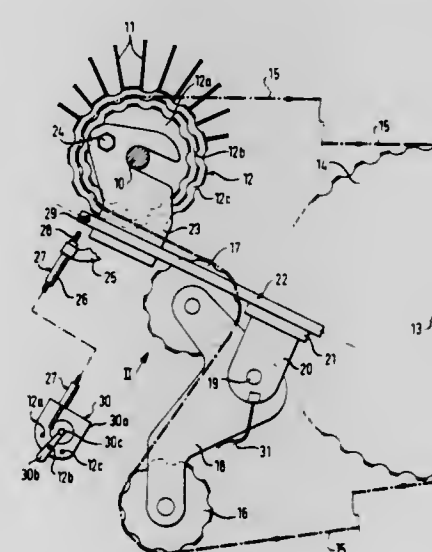
Int. Cl.<sup>3</sup> F16H 7/12, 7/10

U.S. Cl. 474—134

15 Claims



34) supported on said fixed support member (23), said movable support member (21) being guided by said guide means (32, 34) from movement along a path of movement, first spring means (36) biasing said movable support member (21) towards one end of said path of movement (FIG. 3), an adjusting switch (30) including a switch housing (30a) and an operating member (30b) to be attached to a part of the bicycle, said operating member (30b) having a plurality of switch positions (12a-12c) with respect to said switch housing (30a), a terminal one (12a) of said switch positions (12a-12c) corresponding to said end of said path of movement and being defined by switch stop means, transmission means (27, 38, 40, 40a) extending between said operating member (30b) and said movable support member (21) for positioning said movable support member (21) along said path of movement by said operating member (30b) against the action of said first spring means (36), said transmission means (27, 38, 40, 40a) comprising a pulling member (28) and automatic compensating means for compensating for a change of the effective length of said transmission means so as to readjust in operation a predetermined position of said mover unit (17) when said operating member is in said terminal position (12a) and when a change of the effective length of the transmission means (27, 38, 40, 40a) has occurred, the improvement which consists in that said compensating means com-



prises a first compensating member (38) and a second compensating member (40) connected to a first section (28) and a second section (40a) of said transmission means respectively and rotatably mounted with respect to each other about an axis of rotation (34 b), a clamp roller free-wheel unit (42) being provided between said first and second compensating members (38, 40) such as to lock said compensating members (38, 40) with respect to each other in a first relative rotational direction for allowing transmission of a pulling force through said transmission means (27, 38, 40, 40a) and to allow relative rotation of said compensating members (38, 40) in a second rotational direction for compensating for a change of the effective length of said transmission means (27, 38, 40, 40a), and that a first abutment member (40b) is operationally connected to one (40) of said compensating members (38, 40) and a second abutment member (44) is operationally connected to a part (34) of said device which is movable with respect to said one compensating member (40) during movement of said movable support member (21) along said path of movement such that said abutment members (40b, 44) engage each other when said movable support member (21) approaches said one end of said path of movement, such engagement effecting relative rotation of said compensating members (38, 40) in said second rotational sense when a change of the effective length of said transmission means 27, 38, 40, 40a) has occurred.

1. In the combination of a tensioner and an endless power transmission belt which is employed in driving a sheave comprising at least one accessory which upon being driven creates a slack side and a tight side in said belt on opposite sides of said sheave, said belt having an outside surface and an inside surface, said tensioner comprising, a first support arm having pivot means, a first idler pulley rotatably carried by said arm, and a pivot pin extending through said pivot means for pivotally supporting said first arm adjacent said sheave with said first pulley engaging said slack side of said belt on said outside surface thereof to enable tensioning thereof, a second support arm integrally formed with said first support arm, and supported by said pivot pin, a second idler pulley rotatably carried by said second arm and engaging said tight side of said belt on said outside surface thereof, and means connecting said second arm to said first arm to thereby move said first arm and its pulley into belt tensioning and dampening engagement against said slack side once said tight side of said belt moves said second pulley and second arm, said first arm being of extended length and having an inner end provided with said pivot means and said first pulley rotatably carried adjacent the outer end of said first arm, said second arm having an inner end and said second pulley rotatably carried adjacent the outer end of said second arm, said connecting means comprising means fixing said inner end of said second arm to said inner end of said first arm to define a substantially V-shaped unitary structure, the improvement wherein said first arm is longer than said second arm and said first pulley engages said slack side of said belt at a distance from said sheave greater than the distance said second pulley engages said tight side of said belt from said sheave whereby a greater amount of slack side tensioning than tight side tensioning is provided through the mechanical advantage of said first arm being longer than said second arm.

4,416,648

# **BELT TENSIONER**

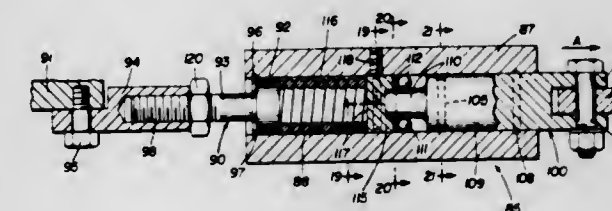
Mijo Radocaj, Massillon, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 224,468, Jan. 12, 1981, abandoned. This application Mar. 5, 1981, Ser. No. 240,822

Int. Cl.<sup>3</sup> F16H 7/12

U.S. Cl. 474—135

6 Claims



1. A device for tensioning an endless drive belt of a vehicle



engine accessories drive system of the type in which bracket means is pivotally mounted on the engine with an idler pulley rotatably mounted thereon for tensioned engagement with the drive belt when the bracket means is moved in belt tensioning direction, and in which the device has a housing containing a spring biased shaft movable in the housing in belt tensioning direction, and in which a one-way clutch is provided restraining shaft movement in the other direction, wherein the improvement comprises:

- (a) a tubular housing having first and second open ends and having a cylindrical bore therein extending between said open ends;
- (b) a shaft having outer and inner ends including a main cylindrical body having a portion projecting out of said housing at said first housing end, and another portion which is slidably mounted within said bore and movable in belt tensioning direction within said cylindrical bore, and the shaft also having an axially extending reduced diameter conical portion projecting within said bore from said body toward the second end of said housing to the inner shaft end;
- (c) means pivotally connecting said outer shaft end with said bracket means;
- (d) first spring means having inner and outer ends in said cylindrical bore located between the inner shaft end and the second open housing end;
- (e) an end cap in said bore engaged between the inner end of said first spring means and said conical portion inner shaft end;
- (f) tension adjusting means for said first spring means engaging said first spring means outer end within said cylindrical bore adjacent said second housing end and adapted to be pivotally mounted on said engine;
- (g) one-way clutch means including spherical ball means located within said cylindrical bore between said end cap and said body for wedging engagement with said conical shaft portion; and
- (h) second spring means operatively engaged with said ball means and end cap biasing said ball means into wedging engagement with said conical shaft portion;
- (i) whereby said first spring means biasing tension may be adjusted and said shaft body is biased for movement in belt tensioning direction.

4,416,649

### REDUCED NOISE POSITIVE DRIVE POWER TRANSMISSION SYSTEM

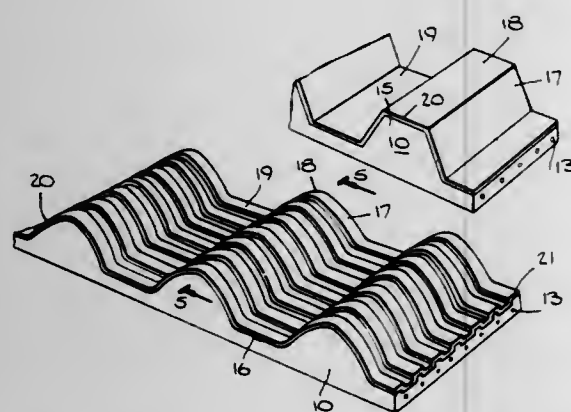
Robert C. Kohn, Bethany, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 14, 1979, Ser. No. 75,476

Int. Cl.<sup>3</sup> F16G 5/20

U.S. Cl. 474—153

37 Claims



1. A positive drive power transmission system including a belt having a tensile member with a plurality of elastomer teeth secured to at least one side of the tensile member and extending along the tensile member, with each belt tooth having a flank portion and a tip portion, said flank portion of one tooth being spaced from the next consecutive flank portion of a next consecutive belt tooth by a belt land area, at least one of said flank portions including a first working surface area, and at least one

toothed pulley having a plurality of pulley teeth which mesh with the belt teeth, with each pulley tooth having a second working surface area which makes impact contact with the first working surface area of the respective belt teeth when the belt and pulley are in meshing engagement, the belt and pulley generating an operating noise level at a given meshing frequency characteristic of the impact contact between the first and second working surface areas of the belt and the pulley, the improvement comprising a plurality of projections of predetermined size and shape formed on said first working surface areas to modify the impact contact between the first and second working surface areas by promoting a cushioning effect at the area of impact contact and thereby reduce the operating noise level of said power transmission system at the given meshing frequency.

4,416,650

### DRIVE WHEEL AND SPROCKET ASSEMBLY

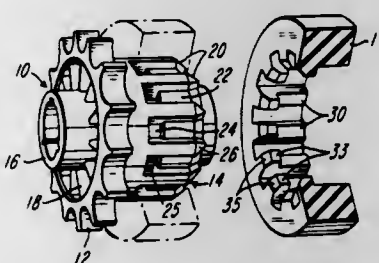
John J. Wilkins, Cincinnati, Ohio, assignor to The E.W. Buschman Company, Cincinnati, Ohio

Filed Jun. 26, 1981, Ser. No. 277,768

Int. Cl.<sup>3</sup> F16H 55/30, 55/12

U.S. Cl. 474—161

9 Claims



1. A drive wheel assembly comprising:  
a hub of rigid material coaxially mounted about an axle sleeve  
an annular body having an outer driving surface and an inner surface;  
the inner surface of said body having thereon a plurality of radially inwardly extending and circumferentially spaced ribs integrally connected with said body over the entire length thereof,  
means on said hub including an outside surface having thereon a plurality of grooves positioned to intermesh with said ribs to form a spline connection,  
means on said hub forming a shoulder intersecting with each of said grooves, and  
each of said ribs on said annular body including a tooth proportioned to hook over and interlock with said shoulder in the associated said groove in response to relative axial movement of said drive wheel and hub to the fully assembled relation thereof and thereby to secure said drive wheel axially on said hub,  
said drive wheel being formed of a sufficiently resilient material for temporary compression of said teeth during assembly of said parts prior to expansion thereof into said locking relation with said shoulders.

4,416,651

### ENVELOPE GUMMER CYLINDER CLUTCH AND BRAKE

John Sullivan, San Jose, and Harold R. Lillibridge, Burlingame, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

Filed Jul. 30, 1981, Ser. No. 288,522

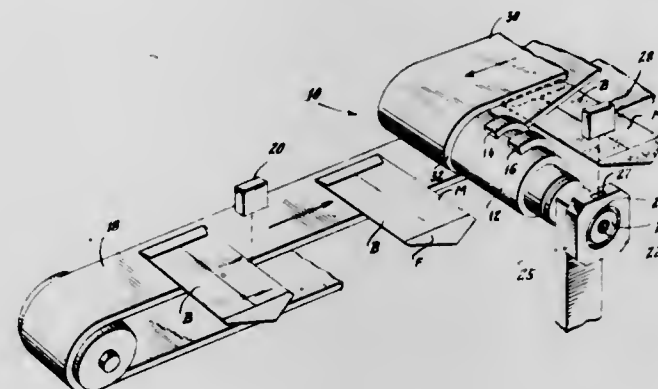
Int. Cl.<sup>3</sup> B31B 1/62

U.S. Cl. 493—12

11 Claims

1. In an envelope forming apparatus, means for applying gum to spaced locations on an envelope blank comprising; a gummer cylinder for applying gum to an envelope blank, arcuate, spaced gummer pads for contact with an envelope

blank extending along the circumference of said gummer cylinder,  
means for drivingly rotating said cylinder,  
means for feeding an envelope blank beneath said gummer cylinder,  
means for sensing an envelope blank on said feed means, and



means for disconnecting said drive means from said cylinder and simultaneously stopping the rotation of said cylinder with the said spaced gummer pads in the twelve o'clock position in response to the failure of said sensing means to sense said envelope blank.

4,416,652

### UNIT FOR SCORING WEBS OF PAPER IN THE LENGTHWAYS DIRECTION

Rudolf Fischer, Ludwigshafen-Oggersheim, and Rudolf Stab, Wachenheim, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

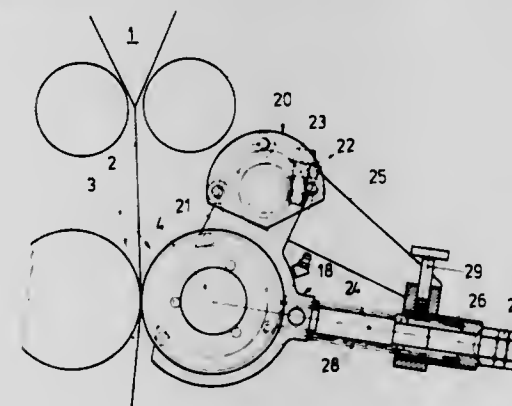
Filed Jul. 20, 1981, Ser. No. 284,611

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029091

Int. Cl.<sup>3</sup> B26D 3/08; B31B 1/25

U.S. Cl. 493—399

5 Claims



1. A scoring unit for the lengthwise scoring of a web of paper, comprising  
first and second rolls for gripping two sides of said web and advancing said web, said first roll having a keyway running therealong;  
means for driving at least one of said rolls; a collar mounted about said first roll and means allowing radial play between said collar and said first roll, said collar having a radial groove formed therein;  
a sharp-edged wheel supported on said collar;  
a back-up part disposed opposite to said sharp-edged wheel so as to cooperate therewith to score the web as it is fed therebetween;  
coupling means for driving said collar from said first roll, comprising a driver ring mounted adjacent the collar and having a radial screw with an inner end functioning as a key by which it is keyed on said first roll allowing said driver ring to be keyed at a number of different positions along the first roll, and an axial pin extending from said ring for drivingly joining said ring with said collar, said

pin being receivable in said radial groove in said collar, said collar being thereby permitted to float radially, and to be driven while out of round with respect to said first roll; a support rod extending parallel to said rolls; and a carriage slidably supported on said support rod and connected to the collar for adjusting the position of said collar and sharp-edged wheel along the first roll.

4,416,653

### APPARATUS FOR STACKING FAN-FOLDED PAPER

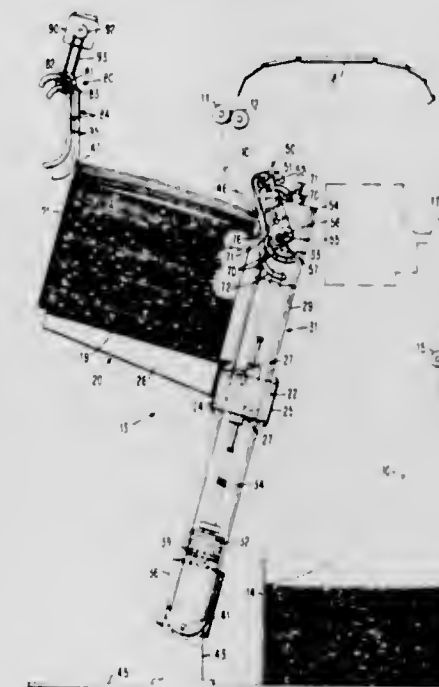
Thomas A. Breski, Binghamton, N.Y., and Robert A. Ryan, deceased, late of Endwell, N.Y. (by The Bank of New York Inc., executor), assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,844

Int. Cl.<sup>3</sup> B65H 45/00

U.S. Cl. 493—412

19 Claims



1. An apparatus for stacking a web of continuous prefolded paper forms comprising  
means for advancing said web in elongated form for refolding into a fan-folded stack,  
stack support means for receiving said web from said advancing means and supporting said stack,  
said stack support means being movable for adjusting the position of the uppermost edge formed by the uppermost layer of said stack relative to said means for advancing said web, and  
a compacting mechanism for compressing said stack support means during folding of said web onto said stack including  
a plurality of elongate rigid compacting elements vertically suspended along and to one side of said stack,  
said compacting elements having a pivot connection above and a free end terminating below said uppermost layer of said stack,  
said compacting elements having an active surface between said pivot connection and said free end facing said one side of said stack, and  
means for imparting a downward stroke to said vertically suspended compacting elements whereby said active surface of said compacting elements is brought into sliding engagement with said uppermost edge of said stack then an upward stroke when said vertically suspended compacting elements are disengaged from said stack, said compacting elements being freely pivotable at said pivot connection during said downward and upward strokes.



4,416,654

## PHERESIS APPARATUS

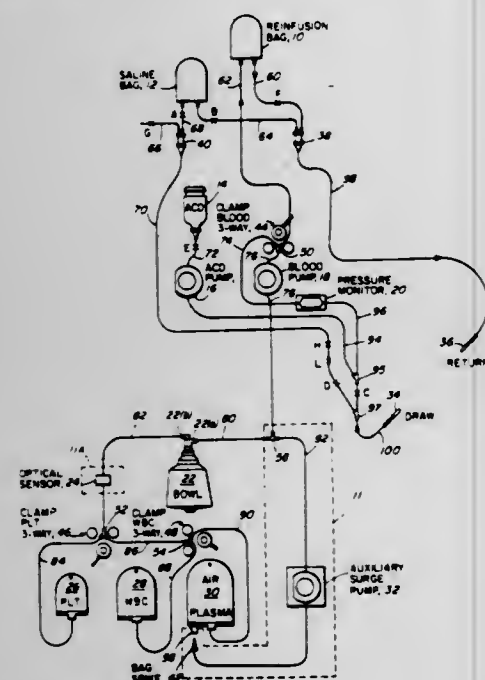
Donald W. Schoendorfer, Brookline, and Lee E. Hansen, Wellesley, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Sep. 3, 1981, Ser. No. 299,194

Int. Cl.<sup>3</sup> B04B 11/00

U.S. Cl. 494—10

18 Claims



## 1. Apparatus comprising:

- a centrifuge;
- an enclosed fractionation volume on said centrifuge;
- an inlet and outlet port mounted on said centrifuge, the ports being in fluid communication with said fractionation volume;
- receptacle means outside said centrifuge for collecting a first fractionated whole blood component from said outlet port;
- pump means for (i) first causing whole blood to flow into said inlet port at a predetermined rate and (ii) secondly for causing a first fractionated component of whole blood to be recirculated to the inlet port of said centrifuge to elutriate the remaining contents in the fractionation volume.

4,416,655

## CENTRIFUGES AND CENTRIFUGE CLEANING METHODS

Peter H. E. Bennett, East Grinstead, England, assignor to The Chartwell House Group Limited, England

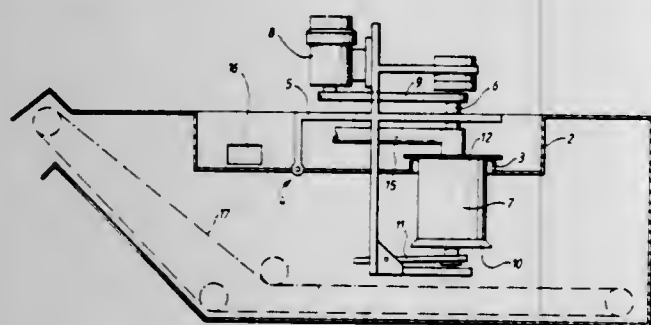
Filed Jul. 27, 1981, Ser. No. 286,907

Claims priority, application European Pat. Off., Mar. 19, 1981, 81301180.6; United Kingdom, Jan. 19, 1981, 8101565

Int. Cl.<sup>3</sup> B04B 11/08

U.S. Cl. 494—40

6 Claims



1. In a centrifuge comprising a drum, a drive system for rotating the drum, an inlet for supplying contaminated liquid to the drum, the drum having at least one orifice in its upper part to permit the discharge of filtered liquid; the improvement

comprising an apertured lower end to the drum, a closure movable between a position in which said aperture is closed by the closure and a position in which the aperture is open, a cleaning member disposed within the drum for movement relative to the axis of rotation; means for effecting displacement of said closure into its position uncovering the aperture during a cleaning operation, and means for establishing relative movement between the cleaning member and the drum during such cleaning operation, said drum having a peripheral wall drivable continuously in rotation by the drive system, the lower end of said wall defining said aperture, said closure being constituted by a bottom wall movable parallel to the axis of the drum between a raised closed position and a lowered open position.

4,416,656

## HARD SURFACING FOR A CENTRIFUGE CONVEYOR

Leonard Shapiro, Upper Darby, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

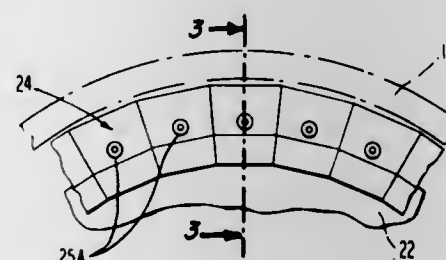
Continuation-in-part of Ser. No. 877,056, Feb. 13, 1978,

abandoned, which is a continuation-in-part of Ser. No. 136,123, Mar. 31, 1980, Pat. No. 4,328,925. This application Apr. 6, 1982, Ser. No. 366,102

Int. Cl.<sup>3</sup> B04B 1/20

U.S. Cl. 494—53

11 Claims



1. Improved hard surfacing for a helically formed, metal screw conveyor of a centrifuge, said conveyor extending in outward radial direction along a line between its rotational axis and its distal surface relative to said axis, said conveyor being rotatable transverse to said radial line about said axis, comprising:

- a series of preformed backing member made of a metal which is weldable to said conveyor
- a weld holding said backing member to said conveyor, with each backing member extending in radial direction substantially beyond the distal surface of said conveyor,
- a preformed wear-resistant member, engaging its associated backing member at a contact surface between them which, in use, extends along a helical line about said axis generally following the distal edge of said conveyor,
- said wear-resistant member having a distal portion extending in radial direction substantially beyond the distal surface of said conveyor, with said backing member disposed between said conveyor and said wear-resistant member, the distal portion of said wear-resistant member being braced by said conveyor through said backing member against deflection in axial direction towards said conveyor,
- a passageway for each associated wear-resistant member and backing member, extending through at least one of said members to said contact surface between them,
- and securing means extending through each passageway for securing each wear-resistant member to its associated backing member, thereby providing a unitary assembly of said members and holding said wear-resistant member against movement in radial direction,
- said weld being accessible for unitarily replacing said assembly.

4,416,657

## ABDOMINAL CATHETER IMPLANT

Rickey T. Berglund, 2275-68 Caminito Pescado, San Diego, Calif. 92107

Filed Aug. 13, 1982, Ser. No. 407,744

Int. Cl.<sup>3</sup> A61M 25/00

U.S. Cl. 604—9

17 Claims



1. A catheter implantable in a living subject for supplying fluid to a first chamber in the body of the subject and controllably allowing fluid to pass from the first chamber into a second chamber of the subject, the catheter comprising:

- a body adapted for implantation in the subject and having a proximal end and a distal end;
- means for mounting said body in the subject with the proximal end adjacent to exterior of the subject and with the body extending into the interior of the subject;
- said body having passage means therein leading from a location adjacent the proximal end into the interior of the body;
- said passage means having inlet means adjacent said proximal end and outlet means communicating with said first chamber of the subject when the catheter is implanted in the subject whereby a fluid can be passed from the inlet means through the passage means and the outlet means to the first chamber; and
- valve means on the body for controlling the flow of the fluid therethrough from the first chamber to the second chamber.

4,416,658

## BLOOD SUCTION DEVICE

Masaaki Numazawa, Kamakura; Hidetaka Tashiro, Hadano, and Shuichi Ishii, Yokohama, all of Japan, assignors to Senko Medical Instrument Mfg. Co., Tokyo, Japan

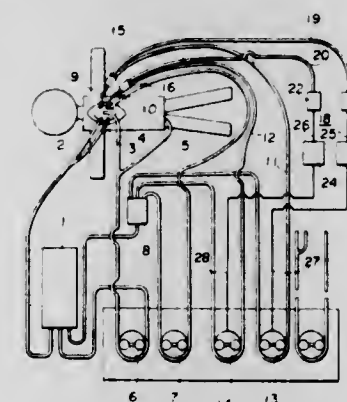
Filed Oct. 22, 1981, Ser. No. 314,027

Claims priority, application Japan, Oct. 30, 1980, 55-152867; Oct. 30, 1980, 55-155577

Int. Cl.<sup>3</sup> A61M 31/00

U.S. Cl. 604—48

4 Claims



1. A blood suction device for removing blood from a surgical field comprising:
  - a suction tip of a type used in cardiomy operations made of

- a tubular member forming a blood conduit along the entire length thereof for sucking the blood;
- a pumping tube communicating at one end thereof with said suction tip and at the other end thereof with a blood reservoir;
- a roller pump of a type used in cardiomy operations driven by a motor and positioned between said one and the other end of said pumping tube for acting thereupon to convey the blood from said suction tip to said reservoir;
- pressure sensing means mounted on said suction tip for sensing a pressure exerted thereon, said pressure sensing means having an outlet to which one end of a pressure conduit is connected; and
- control means positioned remotely from said suction tip for converting said sensed pressure at the other end of said pressure conduit into an electrical signal and generating a control signal for driving said motor, said control signal causing said motor to revolve at an increased or decreased revolution rate in response to said sensed pressure, and when no pressure is sensed with said pressure sensing means, to revolve at a predetermined revolution rate including zero revolution.

4,416,659

## SUSTAINED RELEASE CAPSULE FOR RUMINANTS

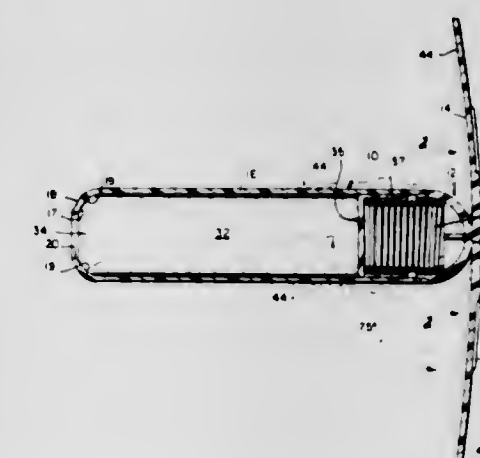
Barbara E. Simpson, Indianapolis, Ind., and Norman A. Gervais, Hardy, Va., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 9, 1981, Ser. No. 319,183

Int. Cl.<sup>3</sup> A61M 7/00

U.S. Cl. 604—48

13 Claims



1. A sustained release capsule adapted to be retained in the rumen of a ruminant animal for delivery of an administrative composition thereto over a prolonged period, comprising an elongated tubular body containing an administrative composition and including a delivery area for delivery of such composition to the rumen, retention arms attached to the body for retaining the capsule in the rumen, said arms being attached to the capsule body at junctions spaced inward from the sides of the body and having resiliently bendable portions extending from such junctures outward to such sides, and the body having curved surfaces along which such arm portions may bend, said arms normally standing outward from the body and being bendable along such curved surfaces so as to be moved from such normal outstanding positions to administration positions along the sides of the body for passage through the esophagus into the rumen of the animal and being adapted to resiliently return to their normal outstanding positions in the rumen.



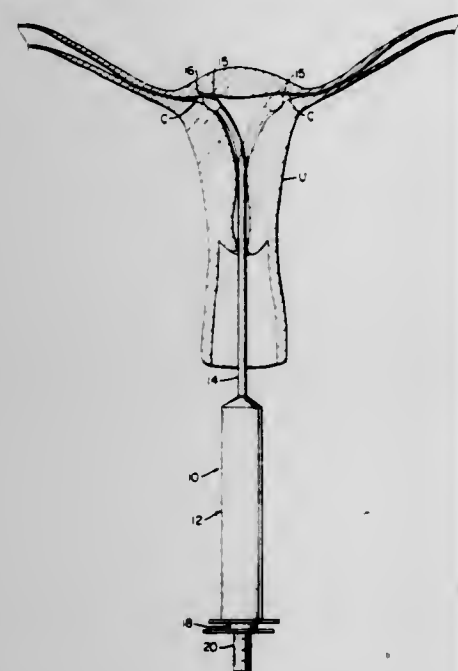
4,416,660

**METHOD OF TRANSVAGINAL STERILIZATION**

Charles A. Dafoe, 725 Republic Bldg., Denver, Colo. 80202  
Continuation of Ser. No. 594,269, Jul. 9, 1975, Pat. No. 4,136,695. This application May 2, 1978, Ser. No. 902,159  
Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604—55

3 Claims



1. The method of transcervical sterilization of females comprising the steps of:

- blindly inserting a plurality of needles into the uterus for a distance to penetrate the body tissue at one of the cornul portions on one side of the uterus;
- injecting a sclerosing agent composed of paraformaldehyde in an alcohol solution through the needles into the body tissue from a point externally of the uterus in a concentration sufficient to occlude the cornul portion on the one side of the uterus;
- withdrawing the needles from the tissue and relocating them in the body tissue of the opposite cornul portion and injecting a predetermined amount of said sclerosing agent therethrough and into the body tissue at that point; and
- withdrawing the needles from the uterus.

4,416,661

**INJECTION SITE FOR FLUIDS**

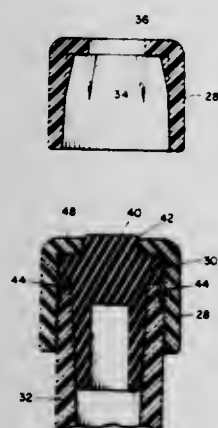
Melvin H. Norman, Oakland; Reinhold R. Manske, Hayward, and Neil J. Sheehan, Berkeley, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 24, 1981, Ser. No. 334,277

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—86

8 Claims



1. An injection site device for a parenteral fluid administration system, comprising a generally tubular injection port having an outlet, an inlet end and a bore; an elastomeric plug,

a portion of which extends within the bore of the inlet conforming generally to the bore, the plug having an annular outwardly extending flange which generally covers the end of the inlet; and a cap member having a top portion having a central aperture and a skirt portion having an inner wall fitting around and generally conforming to a portion of the outer wall of the port inlet, the cap skirt including a plurality of longitudinal projections beginning at about the top portion of the inner wall of the skirt and tapering in a downwardly direction, the cap member compressingly engaging the flange of the plug by means of a bond between at least a portion of the longitudinal projections on inner wall of the skirt of the cap and the outer wall of the port, the engagement resulting in projection of at least a portion of the top of the plug through the aperture of the cap member.

4,416,662

**ROLLER INFUSION APPARATUS**

Charles F. G. Dore, Harrow, and Geoffrey R. Chambers, Northwood, both of England, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

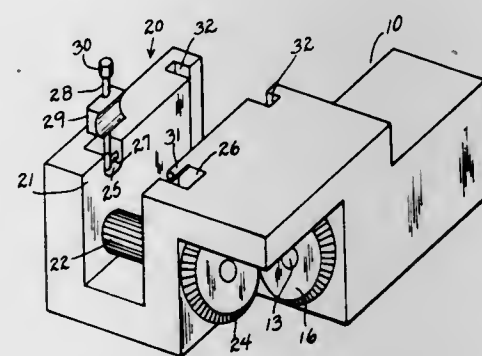
Filed Jun. 8, 1981, Ser. No. 271,271

Claims priority, application United Kingdom, Jun. 13, 1980, 8019431

Int. Cl.<sup>3</sup> A61M 37/00

U.S. Cl. 604—154

25 Claims



12. A powered medicinal infuser apparatus for infusing medicinals over long periods in a continuous manner comprising a housing carrying a toothed roller means, means for holding a disposable plastic syringe having a smoothly profiled plunger in predetermined disposition to said housing with said plunger extending transversely to the axis of rotation of and in driving penetrating engagement with said toothed roller, a motor for driving said toothed roller means, and a transmission operably coupling said motor and toothed roller means.

4,416,663

**SELF-STERILIZING HYPODERMIC SYRINGE**

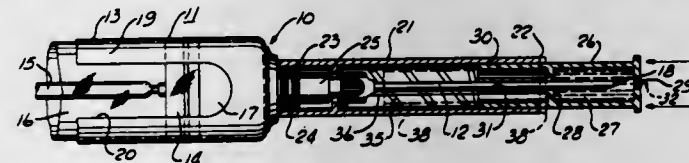
Robert M. Hall, Capetown, South Africa, assignor to Steri-Pac, Inc., Pittsburgh, Pa.

Filed Oct. 26, 1981, Ser. No. 314,766

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—163

6 Claims



1. A self-sterilizing hypodermic syringe for repeated use in veterinary applications or the like comprising, a hypodermic syringe including a tubular hypodermic needle fitted at one end with fluid pressure means to eject or draw fluid through said hypodermic needle, the improvement comprising a cap-

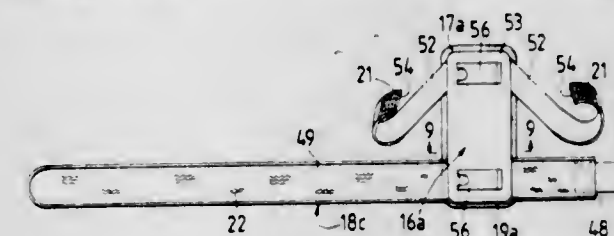
4,416,664

**CATHETER SECURING DEVICE**

Charles E. Womack, 2122 Helton Dr., Florence, Ala. 35630  
Filed Sep. 11, 1981, Ser. No. 301,451  
Int. Cl.<sup>3</sup> A61M 5/32

U.S. Cl. 604—174

4 Claims



sule containing sterilizing fluid and having perforative ends of flexible material with elastic memory tendencies for self sealing after axial perforation by the forward end of said needle, said capsule coaxially and slidably received over the forward end of said needle with the forward exposed portion of said needle slidably penetrating one end of said capsule in perforation and lodged in said sterilizing fluid, capsule guide means slidably guiding said capsule for axial movement on said needle when axial force is applied against the other end of said capsule to cause said exposed end of said needle to penetrate said other outer end of said capsule for hypodermic penetration, said capsule guide means including a rigid tubular guide sleeve coaxially received over said hypodermic needle with clearance, one end of said tubular guide sleeve removably secured to said syringe with a portion of the free forward end of said needle exposed beyond the other end of said tubular guide sleeve for hypodermic penetration, said capsule slidably receivable in said tubular guide sleeve for guided axial movement, and spring means for axially urging and positioning said capsule outward to its original position of rest, such that said exposed end portion of said needle is again enclosed in said capsule for sterilization when said force is removed.

1. A device for securing a catheter or the like to a leg of a person comprising:

- a supporting pad-like member adapted to extend alongside and contact said leg of a person,
- at least one flexible strap secured to said pad-like member adjacent one end portion thereof and extending laterally therefrom in position to encircle said leg of the person,
- means detachably connecting said strap about said leg of the person,
- means carried by said pad-like member for detachably connecting a catheter thereto and restraining longitudinal movement thereto, and
- a pair of additional flexible straps secured to and extending diagonally from the other end portion of said pad-like member toward said one flexible strap with connector means detachably connecting end portions of said additional flexible straps to the outer surface of said one flexible strap.



## CHEMICAL

### 4,416,665 WATER-INSOLUBLE AZO DYESTUFF, FOR DISCHARGE PRINTING

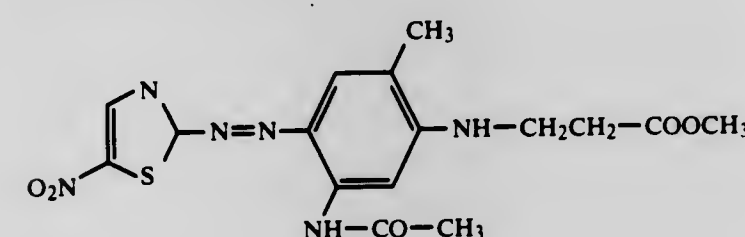
Horst Tappe, Dietzenbach, and Kurt Roth, Hofheim, both of  
Fed. Rep. of Germany, assignors to Cassella Aktiengesell-  
schaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Sep. 21, 1981, Ser. No. 303,852

Claims priority, application Fed. Rep. of Germany, Sep. 27,  
1980, 3036576

Int. Cl.<sup>3</sup> C09B 29/04; D06P 5/17

U.S. Cl. 8—464 2 Claims

1. In the process for printing hydrophobic fiber materials by  
the discharge printing process using an azo dyestuff, the im-  
provement comprises said azo dyestuff being the water-insolu-  
ble dyestuff of the formula



the dyestuff.

### 4,416,666 COAL-WATER SLURRY AND METHOD FOR ITS PREPARATION

James E. Funk, Alfred Station, N.Y., assignor to Alfred Univer-  
sity Research Foundation Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 88,815, Oct. 26, 1979, Pat. No.  
4,282,006, which is a continuation-in-part of Ser. No. 957,166,  
Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser.  
No. 790,337, Apr. 25, 1977, abandoned. This application Jul. 31,  
1981, Ser. No. 288,737

The portion of the term of this patent subsequent to Aug. 4, 1998,  
has been disclaimed.

Int. Cl.<sup>3</sup> C10L 1/32

U.S. Cl. 44—51 59 Claims

1. A stable deashed coal-water slurry containing from about  
65 to about 85 percent of solids by weight of slurry, from about  
15 to about 35 percent of carrier water by weight of slurry,  
from about 0 to about 14 weight percent of ash by weight of  
solids, and from about 0.01 to about 4.0 weight percent of  
dispersing agent by weight of dry coal, wherein:

- said coal-water slurry has a Brookfield viscosity of less  
than 4,000 centipoise when tested at a solids content of 75  
weight percent, ambient temperature, and 60 revolutions  
per minute;
- said coal-water slurry has a yield stress of from about 0.1  
to about 10 Pascals;
- the viscosity of said coal-water slurry decreases at a  
constant shear rate with time, decreases at an increasing  
shear rate, and decreases at an increasing temperature;
- said coal-water slurry comprises a compact of finely-  
divided particles of coal dispersed in said carrier water;
- at least about 85 weight percent of the particles of coal in  
said coal-water slurry have a particle size less than 300  
microns;
- no more than 0.5 weight percent of the particles of coal in  
said slurry have a particle size less than 0.05 microns;
- from about 5 to about 36 weight percent of the particles  
of coal in said slurry are of colloidal size, being smaller  
than about 3 microns, and said colloidal sized particles of  
coal have a net zeta potential in said coal-water slurry of  
from about 15 to about 85 millivolts; and
- said compact of finely divided particles of coal has a  
particle size distribution substantially in accordance with  
the following formula:

$$CPFT = \frac{D^n - D_s^n}{D_L^n - D_s^n} \cdot 100,$$

where

CPFT=cumulative weight percent, dry basis, of particles  
finer than a particle of stated size, D,

D=diameter of any particle in the compact,

$D_L$ =diameter of largest particle in compact, sieve size or  
its equivalent, being from about 38 to about 400 mi-  
crons,

$D_s$ =diameter of smallest particle in compact, being from  
about 0.01 to about 0.4 microns, and

$n$ =numerical exponent, with  $n$  being from about 0.2 to  
about 0.5 and with all diameters sized in microns.

### 4,416,667 METHANOL, ETHANOL, OR GASOHOL FUEL CONTAINING AS A WEAR-INHIBITING ADDITIVE A REACTION PRODUCT OF AN ETHER-AMINE WITH A PHOSPHATE OR A SUBSTITUTED PHOSPHONIC ACID

Benjamin J. Kaufman, Wappingers Falls; Rodney L. Sung, Fish-  
kill, and William M. Sweeney, Wappingers Falls, all of N.Y.,  
assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,156

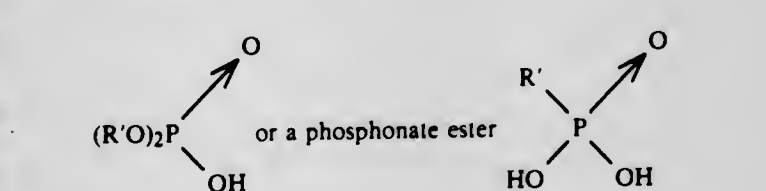
Int. Cl.<sup>3</sup> C10L 1/26

U.S. Cl. 44—56 37 Claims

1. A fuel composition for internal combustion engines com-  
prising:

- a major portion of a fuel containing (i) at least one alcohol  
selected from the group consisting of ethanol and metha-  
nol and (ii) gasoline in amount of 0-50 volumes per vol-  
ume of alcohol; and
- a minor wear-inhibiting amount, 0.2-3 w %, of, as a  
wear-inhibiting additive, a reaction product of

(i) an amine having the formula  $(ROR')_n-NH_2$  wherein R



contains 1-30 carbon atoms and is selected from the group  
consisting of alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl,  
and aryl groups and R' is a divalent hydrocarbon group  
containing 1-30 carbon atoms and is selected from the  
group consisting of alkylene, alkenylene, alkarylene,  
aralkylene, cycloalkylene, and arylene groups, and a is an  
integer 1-3 with

(ii) a phosphonic acid

### 4,416,668 ANTISTATIC AGENTS FOR ORGANIC LIQUIDS

Neil E. S. Thompson, Creve Coeur, Mo., assignor to Petrolite  
Corporation, St. Louis, Mo.

Continuation of Ser. No. 954,512, Oct. 25, 1978. This application  
Jun. 4, 1982, Ser. No. 385,179

Int. Cl.<sup>3</sup> C10L 1/22, 1/24

U.S. Cl. 44—62 6 Claims

1. An antistatic composition comprising an organic fluid  
containing an antistatic amount, in the concentration of 1 to 10  
parts per million, of an antistatic agent consisting of (1) a poly-  
mer containing  $\alpha$ -olefin units selected from the group consist-  
ing of 1-decene, 1-dodecene, 1-tetradecene and 1-octadecene  
units and maleimide units and (2) a 1-decene-SO<sub>2</sub> copolymer,  
the ratio of maleimide copolymer to SO<sub>2</sub> copolymer being  
100:1 to 1:100.



4,416,669

**FUEL AND LUBRICANT COMPOSITIONS FOR OCTANE REQUIREMENT REDUCTION**

L. B. Graiff, Houston; Z. L. Murphy, Cypress, both of Tex., and J. A. N. Scott, Hillegom ZH, Netherlands, assignors to Shell Oil Company, Houston, Tex.

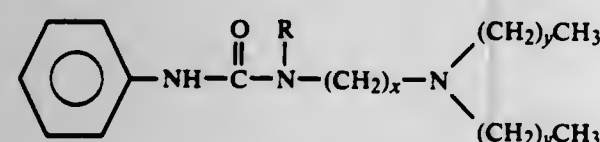
Filed Feb. 22, 1982, Ser. No. 350,668

Int. Cl.<sup>3</sup> C10L 1/22

U.S. Cl. 44—71

6 Claims

1. A gasoline boiling range hydrocarbon fuel composition incorporating a minor amount of an additive composition which is both highly polar and soluble in hydrocarbons and yet relatively insoluble in water and which exhibits octane requirement reduction properties, said additive composition comprising a class of substituted ureas represented by the formula:



in which X has a value from one to four, Y has a value from zero to three, and R is hydrogen or a hydrocarbyl radical having from one to three carbon atoms.

4,416,670

**CARBIDE COATED COMPOSITE SILICON NITRIDE CUTTING TOOLS**

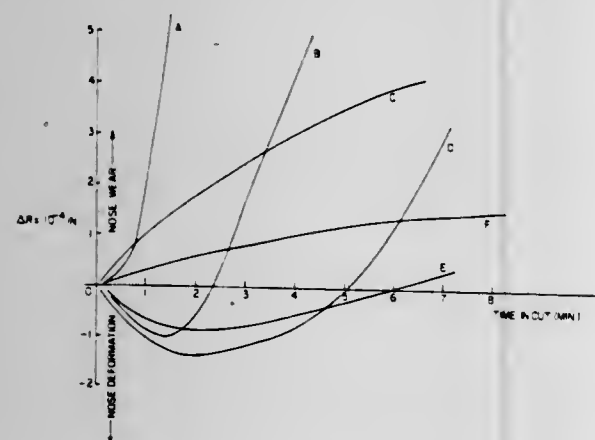
Vinod K. Sarin, Lexington; Sergej-Tomislav Buljan, Acton, and Charles D'Angelo, Southboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,362

Int. Cl.<sup>3</sup> B24D 11/00

U.S. Cl. 51—295

15 Claims



1. A coated composite ceramic cutting tool comprising a composite silicon nitride substrate body having at least one adherent coating layer; said substrate body consisting essentially of particles of a hard refractory material uniformly distributed in a matrix consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a metal oxide densification aid selected from the group consisting of yttrium oxide, magnesium oxide, zirconium oxide, hafnium oxide, the lanthanide rare earth oxides, and mixtures thereof; said adherent coating layer consisting essentially of a material selected from the refractory metal carbides.

4,416,671

**METHOD OF OPTIMIZING THE COLLECTION EFFICIENCY OF AN ELECTROSTATIC PRECIPITATOR**

Wenzel von Jordan, Darmstadt, and Franz Neulinger, Dietzenbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

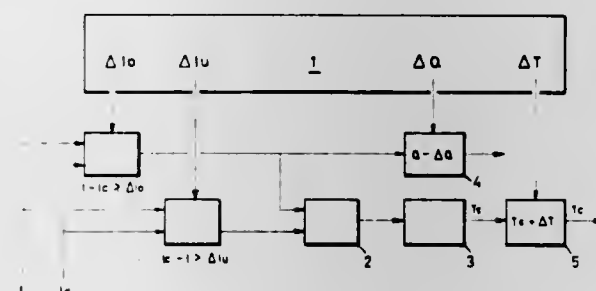
Filed Mar. 5, 1982, Ser. No. 355,038

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108968

Int. Cl.<sup>3</sup> B03C 3/00

U.S. Cl. 55—4

6 Claims



1. A method of optimizing the collection efficiency of a dry-process electrostatic precipitator which is preceded by an evaporative cooler, wherein liquid is sprayed into the evaporative cooler at a rate Q which is controllable to maintain a desired temperature  $T_c$  of an acid containing flue gas stream which is passed through the evaporative cooler and electrostatic precipitator, comprising the steps of:

- intermittently measuring the acid dew point  $T_s$  of the flue gas stream downstream of the evaporative cooler and setting the desired temperature  $T_c$  in dependence on the measured acid dew point  $T_s$  and a preselected margin of safety  $\Delta T$ , in accordance with  $T_c = T_s + \Delta T$ ,
- determining a desired input current  $I_c$  for the electrostatic precipitator at the temperature  $T_c$  and storing  $I_c$ , and
- continuously obtaining the deviations of the actual input current  $I$  of the precipitator from the desired input current  $I_c$  and initiating the measurement of the acid dew point  $T_s$  in response to a predetermined deviation  $\Delta I$  to update the desired temperature  $T_c$ .

4,416,672

**DEGASSER**

Gene E. Underwood, 3915 Placid Dr., Casper, Wyo. 82601

Continuation of Ser. No. 170,018, Jul. 18, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,255

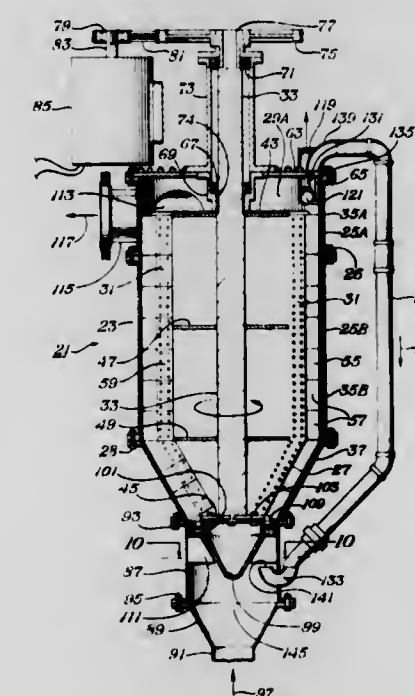
Int. Cl.<sup>3</sup> B01D 19/00

U.S. Cl. 55—190

34 Claims

1. Apparatus for removing gas from a fluid, comprising: a housing comprising wall structure defining a chamber having a central axis extending between first and second ends of said housing, inlet means in fluid communication with said chamber, located at said first end of said housing for receiving fluid to be processed, a plurality of blade means located in said chamber for rotation about said central axis, said blade means being angularly spaced around said axis, means for rotating said blade means for spinning the fluid received through said inlet means, against the inside surface of the wall of said housing as a thin layer and moving said fluid as a thin layer to the end of said chamber opposite said inlet means for allowing the gas in said fluid to separate from said fluid, gas outlet means at said end of said chamber opposite said inlet means and spaced radially outward from said axis for withdrawing the gas separated from said fluid and, fluid outlet means at said end of said chamber opposite said inlet means, said fluid outlet means being spaced radially outward from said

axis and radially outward from said gas outlet means for withdrawing the fluid from which the gas has separated. 25. Apparatus for removing gas from a fluid comprising: a housing comprising wall structure defining a chamber having a central axis extending between first and second ends of said housing, inlet means located at said first end of said housing for receiving fluid to be processed, a plurality of blade means located in said chamber for rotation about the central axis of said housing, said blade means being angularly spaced around said axis, means for rotating said blade means for spinning the fluid received through said inlet means against the inside surface of the wall of said housing as a thin layer and moving said



fluid as a thin layer to the end of said chamber opposite said inlet means for allowing the gas in said fluid to separate from said fluid, gas outlet means at said end of said chamber opposite said inlet means for withdrawing the gas separated from said fluid, fluid outlet means at said end of said chamber opposite said inlet means for withdrawing fluid from which the gas has separated, and conduit means having one end at said end of said chamber opposite said inlet means and an opposite end in fluid communication with said inlet means for flowing fluid from said end of said chamber opposite said inlet means, to said inlet means for controlling the thickness of the layer of fluid on the inside surface of the wall of said housing and for preventing said fluid from flowing through said gas outlet means.

4,416,673

**DUST COLLECTOR FOR FURNACE CHARGING INSTALLATION**

Michel Kirchen; Marc Solvi, both of Luxembourg, and Clement Burton, Esch s/Alzette, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Feb. 19, 1982, Ser. No. 350,253

Claims priority, application Luxembourg, Feb. 23, 1981, 83,161

Int. Cl.<sup>3</sup> B01D 45/00

U.S. Cl. 55—267

5 Claims

1. Apparatus for separating particulate matter from a stream of pressurized dust-laden gas, the gas to be passed through the separating apparatus being discharged from an intermediate storage hopper of a furnace charging installation, the hopper being provided with a steeply rising gas discharge conduit which has a pressure equalization valve associated therewith, comprising:

- a plurality of perforated discs;
- means supporting said perforated discs in a parallel spaced

apart relationships in the gas stream, said supporting means orienting said discs at an oblique angle with respect to the horizontal; means positioned below said discs for collecting particulate matter separated from the gas stream; and an extension of said hopper discharge conduit, said conduit extension being oriented at an angle with respect to said discharge conduit, said supporting means being positioned in said conduit extension; said support means comprising: a generally saddle-shaped suspension member; means for removably attaching a first end of said suspension member to said conduit extension;



means for mounting said perforated discs from said saddle-shaped member, said mounting means including removable fasteners which engage said saddle-shaped member and said discs, said mounting means further comprising spacers for maintaining the desired axial displacement between said discs; and means for removably attaching the one of said discs displaced the farthest from said saddle-shaped member to said conduit extension whereby said attaching means and saddle-shaped member define a coaxial portion of said conduit extension.

4,416,674

**FILTER FOR TREATING A PARTICLE-CARRYING GASEOUS STREAM**

Matthew A. McMahon, Wappingers Falls; Raymond F. Wilson; King D. Eng, both of Fishkill, and Robert B. Burns, Huntington, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

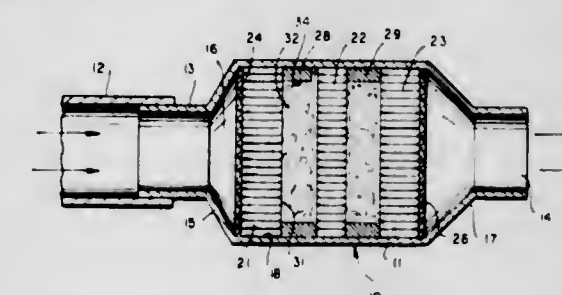
Continuation of Ser. No. 200,754, Oct. 27, 1980, abandoned.

This application Mar. 22, 1982, Ser. No. 360,707

Int. Cl.<sup>3</sup> B01D 50/00, 39/20; F01N 3/28

U.S. Cl. 55—485

2 Claims



1. Apparatus for removing particulate matter from a hot gaseous stream which comprises;



a casing 11 having an inner wall which defines an elongated filter chamber 18,  
inlet 13 and outlet 14 means communicating with said filter chamber 18 to conduct said hot gaseous stream therethrough,  
a plurality of adjacently positioned rigid filter beds 21, 22, 23, fixedly disposed within said filter chamber 18, and each comprising a disc-like, monolith structured, ceramic member extending transversely of said filter chamber 18, the respective filter beds being spaced apart to define a turbulation chamber 31 therebetween,  
a spacer ring 28 disposed within said turbulation chamber defining the periphery thereof, and being in abutting engagement with disc-like ceramic members,  
a gas pervious, non-rigid filter media mass comprised of randomly disposed fibrils being positioned in said turbulation chamber so as to substantially fill said turbulation chamber, at least a segment of said fibrils being disposed adjacent to the spacer ring 28 and being compressibly retained between the abuttingly engaged spacer ring and said disc-like ceramic members.

4,416,675

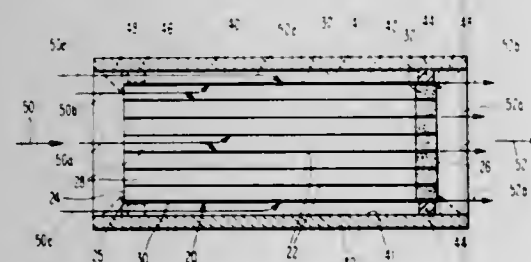
## HIGH CAPACITY SOLID PARTICULATE FILTER APPARATUS

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,993  
Int. Cl.<sup>3</sup> B01D 39/20

U.S. Cl. 55—502

12 Claims



1. In an apparatus for removing solid particulates from fluids, a filter of honeycomb structure comprising:  
a matrix of thin porous interconnected walls defining an open inlet end face and an opposing outlet end face of the filter and a multiplicity of cells extending substantially longitudinally between the inlet and outlet end faces, all of the cells being open at the inlet end face and closed near the outlet end face,  
the thin walls having interconnected open porosity of a volume and size sufficient to enable fluid to enter and flow within the thin walls to and through the outlet end face of the filter and to prevent at least a significant portion of the solid particulates in the fluid from flowing through the thin walls to and through the outlet end face of the filter.

4,416,676

## HONEYCOMB FILTER AND METHOD OF MAKING IT

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

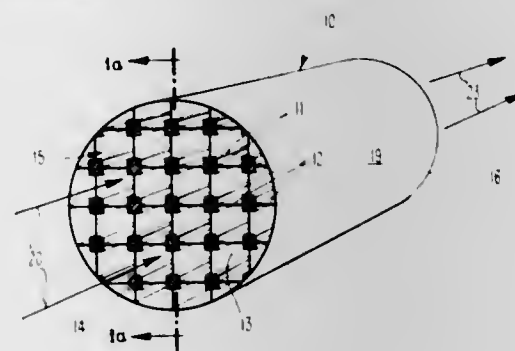
Filed Feb. 22, 1982, Ser. No. 350,994  
Int. Cl.<sup>3</sup> B01D 39/20

U.S. Cl. 55—523

23 Claims

1. A filter for removing solid particulates from fluids passed therethrough comprising:  
a multiplicity of interconnected thin porous walls forming a matrix defining at least one inlet end face and at least one outlet end face of the filter and a multiplicity of cells each extending through the filter from at least one of the inlet or outlet end faces,  
an inlet group of the cells each open only at said at least one inlet end face,

an outlet group of the cells each open only at said at least one outlet end face of the filter,  
a first subset of the thin walls having a first uniform thickness, each first subset thin wall being shared in common by one of the outlet cells and one or more of the inlet cells adjoining the outlet cell and having an interconnected open porosity of a size and volume sufficient to allow the fluid to flow completely across the first uniform thickness of the first subset of thin walls while preventing at least a significant portion of the solid particulates in the fluid from passing completely across the first subset of thin walls,  
a second subset of the thin walls having a second uniform thickness, each second subset thin wall interconnecting with at least one thin wall of the first subset and forming a common wall between a pair of adjoining inlet cells and having an interconnected open porosity of a size and volume sufficient to allow fluid to flow completely through the longer dimensions of each of the second subset thin walls to the interconnected thin wall of the first subset and to prevent at least a significant portion of the solid particulates from passing either completely across or through the second subset of thin walls in any direction, and



said first uniform thickness differing from said second uniform thickness.

20. In a method of fabricating a filter of honeycomb structure for removing solid particulates from fluids passed through the filter comprising the steps of (a) providing a matrix of thin brittle interconnected porous walls defining an inlet end face and outlet end face on opposite sides of the filter and a multiplicity of cells extending between the inlet and outlet faces and through the filter and further having interconnected open porosity of a size and volume sufficient to enable fluid to flow completely across the thickness of the thin walls and to restrict at least a significant portion of the solid particulates from flowing either completely across or through the thin walls in any direction, (b) forming an inlet group of cells open at the inlet end face and closed at the outlet end face and an outlet group of cells open at the outlet end face and closed near the inlet end face, a first subset of the thin walls being shared in common by adjoining inlet and outlet cells and a second subset of the thin walls being shared in common by pairs of adjoining inlet cells, the improvement comprising the step of intersecting in a substantially perpendicular fashion each of the thin walls of the first subset with a thin wall of the second subset whereby a flexing joint is formed therebetween.

4,416,677

## SPLIT SHELF VAPOR AIR SEPARATION PROCESS

Ravindra F. Pahade, North Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 25, 1982, Ser. No. 381,844  
Int. Cl.<sup>3</sup> F25J 5/00

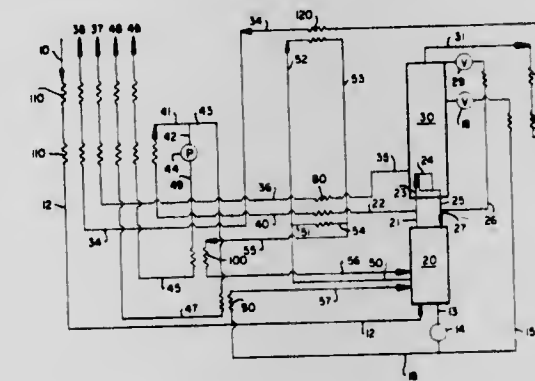
U.S. Cl. 62—13

13 Claims

1. In a process for the separation of air by rectification wherein gaseous feed air at greater than atmospheric pressure and substantially free of water and carbon dioxide is introduced into a high pressure column operating at a pressure of

from about 80 to 180 psia where said feed air is separated by rectification into a nitrogen-rich fraction and an oxygen-enriched fraction, and wherein a portion of said nitrogen-rich fraction is removed from said high pressure column and warmed by indirect heat exchange with said feed air by partial traverse of a reversing heat exchange zone, said portion being sufficient to maintain self-cleaning of the reversing heat exchange zone, the improvement comprising:

(A) warming said portion comprising from about 10 to 18 percent of the feed air flow;



(B) dividing the warmed portion into a first part comprising from about 50 to 90 percent of said warmed portion and a second part comprising from about 10 to 50 percent of said warmed portion;

(C) expanding said first part to a pressure of from about 15 to 35 psia;

(D) warming the expanded first part by passage through said reversing heat exchange zone;

(E) removing from said process said first part as nitrogen-rich gas; and

(F) directly recovering said second part as high pressure nitrogen-rich gas.

4,416,678

## METHOD AND APPARATUS FOR MAKING GLASS FILAMENT OR FIBERS

Diether Böttger, Hochheim, Fed. Rep. of Germany, assignor to Eglasstrek Patent Promotion & Awarding GmbH, Hochheim, Fed. Rep. of Germany

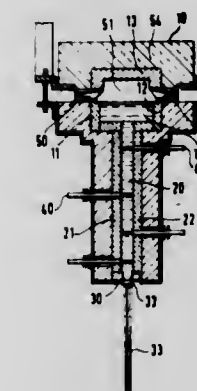
Filed Nov. 4, 1981, Ser. No. 318,319

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111484

Int. Cl.<sup>3</sup> C03B 37/09, 37/025

U.S. Cl. 65—2

6 Claims



6. A method of producing glass filaments which comprises the steps of:  
heating a stream of molten glass while passing it horizontally through a forehearth;  
diverting glass from said stream downwardly through intermediate chambers of elongated cross section between pairs of closely juxtaposed walls of said chambers in substantially laminar streams;  
heating the glass of each of said streams within said cham-

bers by passing an electric current directly through the glass of said streams between electrodes projecting from at least one of the walls of each chamber into the respective glass stream and extending toward the other wall of the respective chamber; and  
extruding filaments from each of said streams through an orifice of a nozzle plate at the bottom end of each of said chamber.

4,416,679

## TRANSPORT SYSTEM FOR HEATED GLASS PANES AND METHOD OF TRANSPORTING GLASS PANES

Horst Frielingsdorf, Am Melsenhort 2, 5630 Remscheid, 11, Fed. Rep. of Germany

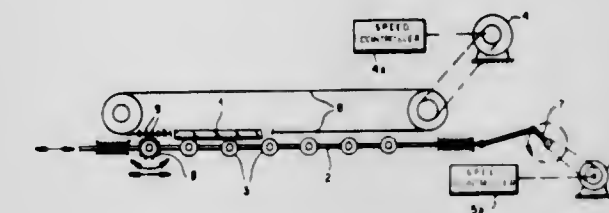
Filed Mar. 26, 1982, Ser. No. 362,129

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113410

Int. Cl.<sup>3</sup> C03B 35/18

U.S. Cl. 65—118

7 Claims



1. In a glass-treatment apparatus in which glass bodies are displaced through a thermal treatment station, a glass-carrying conveyor system for carrying said bodies without sagging which comprises:

a roller conveyor formed with a plurality of rollers reciprocating said body and having radii R in contact therewith; means for imparting a linear reciprocation  $V_{grate(osc)}$  to said conveyor;

means for imparting to said rollers an angular velocity component  $\omega_{trans}$  in one sense, thereby contributing a linear velocity component  $R \cdot \omega_{trans}$  to a pane supported thereby; and

means for imparting an angular oscillation  $\omega_{osc}$  to said rollers for contributing an oscillatory component  $R \cdot \omega_{osc}$  to said panes whereby the relative displacement of said glass body and said roller conveyor is  $R \cdot \omega_{osc} + R \cdot \omega_{trans}$ , each of said rollers being provided at an end thereof with a respective sprocket wheel and said sprocket wheels mesh with a common pass of an endless chain.

5. A method of passing a hot glass pane through a treatment station without sagging of the pane which comprises the steps of:

(a) supporting said pane on a roller grate in said treatment station;

(b) imparting the linear reciprocating  $V_{grate(osc)}$  to said grate while said pane is supported by said grate and traverses said station;

(c) imparting to the rollers of said grate an angular velocity component  $\omega_{trans}$  in a direction such that said component displaces said pane continuously through said station, said rollers having a radius R where they engage said pane; and

(d) imparting an angular velocity oscillation  $\omega_{osc}$  to said rollers whereby said pane is displaced relative to said grate at a velocity corresponding to  $R \cdot \omega_{osc} + R \cdot \omega_{trans}$ , rotation being imparted to said rollers by causing a sprocket wheel at an end of each of said rollers to mesh with a common pass of a drive chain.

7. In an apparatus for the manipulation of glass panes at a temperature which might cause said pane to sag between two supported locations, wherein a roller grate having a multiplicity of mutually parallel transversely spaced rollers is journaled on said grate and are driven by an endless roller drive element, and wherein the grate is connected to a reciprocating grate



drive, the improvement which comprises in combination therewith:

- respective sprocket wheels formed on each of said rollers at one end thereof;
- a common pass of an endless drive chain engaging each of said sprocket wheels for rotating them in the same sense, said chain forming said element and being driven so that said pass move in the direction of displacement of said panes on said grate, said pass having a speed proportional to a linear velocity component imparted to said pane by said roller in said direction; and
- means for linearly reciprocating said grate with a linear reciprocation which is superimposed on the rotation imparted to said rollers that said rollers engage said pane with a back-and-forth angular oscillation, the latter means including a crank drive.

4,416,680

# METHOD OF MAKING QUARTZ GLASS CRUCIBLES, AND APPARATUS CARRYING OUT THE METHOD

Rolf Brüning, Bruchköbel, and Friedhelm Habegger, Hammersbach, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

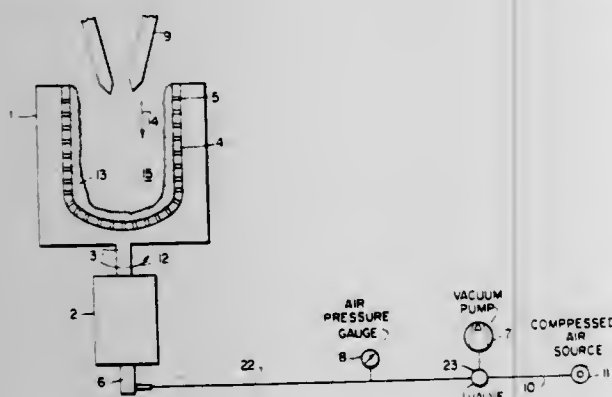
Filed Mar. 25, 1981, Ser. No. 247,394

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014311

Int. Cl.<sup>3</sup> C03P 19/04

U.S. Cl. 65—144

11 Claims



1. Apparatus to manufacture crucibles made of quartz glass from granular particles of quartz, said crucibles being capable of being used in the manufacture of single-crystal silicon blanks for electronic semiconductor applications, said apparatus comprising

- a gas-tight housing (1);
- a hollow mold (4) having a bottom wall portion and a side wall portion and defining a hollow space therein, made of a material which does not react with heated quartz, inserted in said housing and gas-tight with respect thereto, leaving a space between the mold and the housing open to ambient air;
- means (2, 3) for rotatably supporting said housing (1) and said mold (4) therein to rotate said housing and said mold about a vertical axis;
- and heating means located with respect to said mold such that it is introducible into the hollow space of the hollow mold (4);

wherein

the hollow mold comprises:

- a metallic mold body formed with fine bores (5) through the walls thereof in both the bottom and side wall portions to form gas-pervious walls;
- and vacuum pump means (7) for furnishing a vacuum are provided, the vacuum being connectable to the space defined between the gas-tight housing and the hollow mold such that a vacuum can be applied through the gas-pervious walls of said hollow mold to draw the quartz particles against the walls and remove air as the

particles first sinter and then fuse and melt under the influence of heat supplied by the heater means in the hollow space of the mold.

6. Apparatus to manufacture crucibles made of quartz glass from granular particles of quartz, said crucibles being capable of being used in the manufacture of single-crystal silicon blanks for electronic semiconductor applications, said apparatus comprising

- a gas-tight housing (1);
- a hollow mold (4) having a bottom wall portion and a side wall portion and defining a hollow space therein, made of a material which does not react with heated quartz, inserted in said housing and gas-tight with respect thereto, leaving a space between the mold and the housing open to ambient air;
- means (2, 3) for rotatably supporting said housing (1) and said mold (4) therein to rotate said housing and said mold about a vertical axis;
- and heating means located with respect to said mold such that it is introducible into the hollow space of the hollow mold (4);

wherein

the hollow mold comprises:

- a sintered metallic porous body which is porous to the extent that it is gas-pervious throughout its side and bottom walls;
- and vacuum pump means (7) for furnishing a vacuum are provided, the vacuum being connectable to the space defined between the gas-tight housing and the hollow mold such that a vacuum can be applied through the gas-pervious walls of said hollow mold to draw the quartz particles against the walls and remove air as the particles first sinter and then fuse and melt under the influence of heat supplied by the heater means in the hollow space of the mold.

4,416,681

# GLASSWARE MOLD FORMING APPARATUS

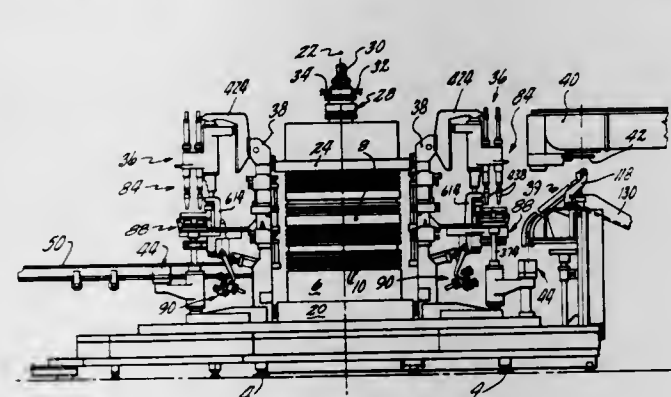
Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 179,381, Aug. 18, 1980, Pat. No. 4,339,264. This application May 7, 1982, Ser. No. 375,844

Int. Cl.<sup>3</sup> C03B 9/40

U.S. Cl. 65—264

7 Claims



1. In a glassware forming apparatus, at least one split blow mold mounted on said machine for movement between its open and closed position, at least one bottom plate mounted on said machine for movement into and out of engagement with said blow mold, blow mold moving means for moving said blow mold between its open and closed position, and bottom plate moving means for moving said bottom plate into and out of engagement with said blow mold, said blow mold moving means being independently operable from said bottom plate moving means.

4,416,682

# 1,3-BIS(AZOLYL)PROPANOLS AS FUNGICIDES AND PLANT GROWTH REGULATORS

Paul A. Worthington, Maidenhead, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jun. 2, 1981, Ser. No. 269,581

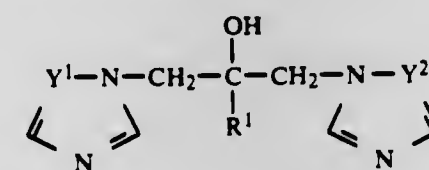
Claims priority, application United Kingdom, Jun. 2, 1980, 8017959; Mar. 30, 1981, 8109923

Int. Cl.<sup>3</sup> A01N 43/50, 43/64; C07D 233/61, 249/08

U.S. Cl. 71—76

7 Claims

1. A compound selected from the group consisting of compounds having the formula:



wherein R<sup>1</sup> is selected from the group consisting of: phenyl or benzyl substituted with one or more of the following: halogen, alkyl or haloalkyl each containing from 1 to 5 carbon atoms, alkoxy or haloalkoxy each containing from 1 to 4 carbon atoms, nitro, cyano, hydroxy, alkylthio containing from 1 to 4 carbon atoms, vinyl, phenyl or phenoxy; and wherein the alkyl moiety of the benzyl is unsubstituted, or substituted with alkyl containing from 1 to 4 carbon atoms, phenyl or chlorophenyl, Y<sup>1</sup> and Y<sup>2</sup> are =CH— or =N—; and salts, metal complexes, methyl, ethyl, propyl, butyl, phenyl, benzyl, p-chlorobenzyl, allyl and propargyl ethers and acetate, pivaloate, benzoate, tosylate and mesylate esters thereof.

6. A process for combating fungi, or regulating plant growth, which comprises applying to a plant, to seed of a plant or to the locus of a plant or seed, an effective amount of a compound as defined in claim 1.

7. A method of treatment of candidiasis or human dermatophyte infections which comprises administering to a human or animal an effective amount of a compound as claimed in claim 1.

4,416,683

# BENZAMIDES, COMPOSITIONS AND AGRICULTURAL METHOD

Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

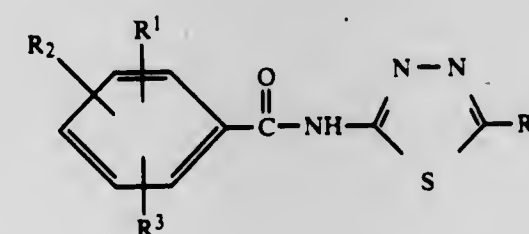
Continuation-in-part of Ser. No. 187,675, Sep. 16, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,323

Int. Cl.<sup>3</sup> A01N 43/02

U.S. Cl. 71—90

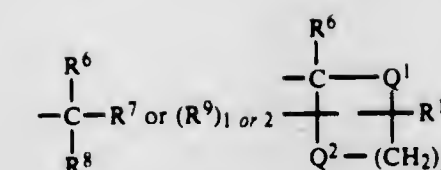
51 Claims

1. A herbicidal composition comprising from about 1 to about 95 percent by weight of a benzamide herbicide of the formula



wherein:

- R<sup>1</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkoxy;
- R<sup>2</sup> is C<sub>1</sub>-C<sub>4</sub> alkylthio or C<sub>1</sub>-C<sub>4</sub> alkoxy;
- R<sup>3</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkylthio, or C<sub>1</sub>-C<sub>4</sub> alkoxy;
- R<sup>5</sup> is



wherein:

- R<sup>6</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>2</sub>-C<sub>4</sub> alkenyl, C<sub>2</sub>-C<sub>4</sub> alkynyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, or C<sub>1</sub>-C<sub>6</sub> alkylthio;
- y is an integer from 0 to 5;
- R<sup>7</sup> and R<sup>8</sup> independently are C<sub>1</sub>-C<sub>13</sub> alkyl or halo-C<sub>1</sub>-C<sub>13</sub> alkyl

wherein:

- R<sup>9</sup> and R<sup>10</sup> independently are hydrogen, halogen, C<sub>1</sub>-C<sub>4</sub> alkyl, or C<sub>2</sub>-C<sub>4</sub> alkenyl;
- Q<sup>1</sup> and Q<sup>2</sup> independently are CH<sub>2</sub>; and the agronomically acceptable salts thereof admixed with an agronomically acceptable carrier, diluent, or adjuvant therefor.

4,416,684

# SYNERGISTIC HERBICIDAL COMPOSITIONS

Gerald H. Thiele, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 26,473, Apr. 2, 1979, abandoned. This application Dec. 31, 1979, Ser. No. 108,445

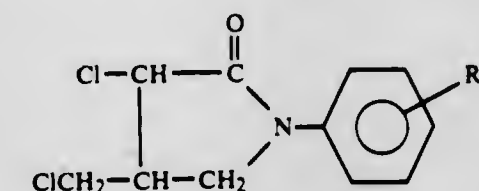
Int. Cl.<sup>3</sup> A01N 43/36, 37/00

U.S. Cl. 71—95

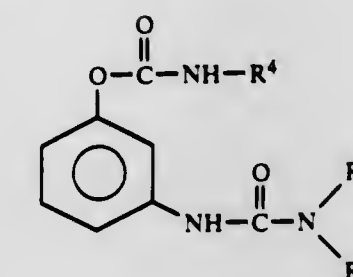
6 Claims

1. A synergistic herbicidal composition consisting essentially of a mixture of

- (a) an effective amount of a pyrrolidone of the formula



- in which R<sup>2</sup> is trifluoromethyl or cyano, and
- (b) an effective amount of a m-ureidophenyl carbamate of the formula



in which

- R<sup>4</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl,
- R<sup>5</sup> is C<sub>1</sub>-C<sub>2</sub> alkyl, and
- R<sup>6</sup> is C<sub>1</sub>-C<sub>2</sub> alkyl,
- at a weight ratio of (a) to (b) of from about 0.5:1 to about 20:1.

4,416,685

# TRIFLUOROETHYL-P-CHLOROPHENYLCARBAMATE HERBICIDE ANTIDOTE

Laddie L. Green, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1981, Ser. No. 335,789

Int. Cl.<sup>3</sup> A01N 25/32

U.S. Cl. 71—95

4 Claims

1. A composition comprising:







the converter blow, wherein said model differential decarburization rate equation (1) is

$$-\tau = F(c, b) - F\left(f^{-1}\left(-\frac{dc}{dt}, b\right), b\right) \quad (1)$$

wherein

$\tau$  is the time delay (minutes),

$-dc/dt$  is the decarburization rate (% min.),

$b$  is the decarburization rate index (1/%) as determined for each heat of molten metal,

$c$  is the carbon content (%) of the molten metal,

$F$  is a function obtained by the integration of a fundamental decarburization model formula,

$$-dc/dt = f(c, b)$$

$f^{-1}$  is an expression derived from said fundamental decarburization model formula,

$$-dc/dt = f(c, b)$$

where  $c$  is a dependent variable, and  $t$  is time and

$$b' = g(b) \quad (2)$$

wherein

$b'$  is the decarburization rate index (1/%) near the endpoint of the blow, and

$g(b)$  is a function for improving the predictability of the carbon content of the molten metal at the endpoint of the blow;

wherein in determining the decarburization rate index,  $b'$ , near the endpoint of the blow by substituting the decarburization rate index,  $b$ , into equation (2), control of the carbon content of the molten metal is achieved by substituting  $b'$  for  $b$  in equation (1), substituting the decarburization rate obtained by the waste analyses into equation (1) and the time point at which the so calculated carbon content coincides with a preselected target carbon content is the end point of the blow; and stopping said blow when the calculated endpoint is reached.

4,416,692

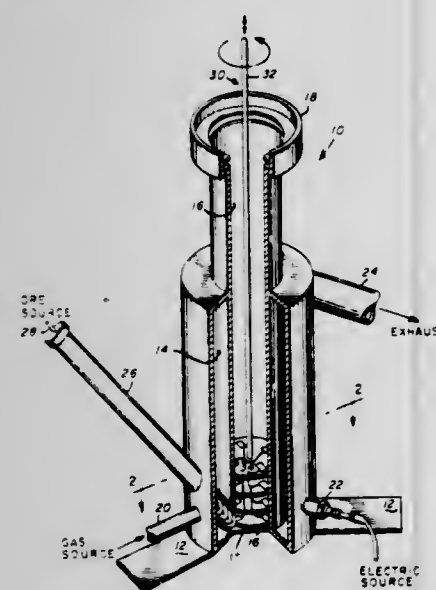
# PROCESS FOR EXTRACTING GOLD, SILVER, PLATINUM, LEAD, OR MANGANESE METALS FROM ORE

Glen R. Burch, 825 Ticonderoga Dr., Sunnyvale, Calif. 94087  
Filed Feb. 23, 1981, Ser. No. 236,997

Int. Cl.<sup>3</sup> C22B 11/12

U.S. Cl. 75—63

16 Claims



1. A process for extracting gold, silver, platinum, lead or

manganese metals from ore comprising such metals, in steps comprising:

- pulverizing an ore material comprising gold, silver, platinum, lead or manganese into fine particles;
- drying the ore particles thoroughly to remove moisture;
- melting, in a suitable right cylindrical melting chamber, a preselected amount of elemental lead and maintaining the molten lead within a predetermined temperature range;
- introducing the dried, pulverized ore into the molten elemental lead at the lower portion of the right cylindrical melting chamber;
- agitating the molten mixture, both translationally and rotationally throughout the introduction of said ore to the right cylindrical melting chamber and as said ore gradually rises from said lower portion of the right cylindrical melting chamber;
- pouring the molten mixture into a cooling vessel to cool the mixture and separate the metallic mixture from the slag; and
- removing the slag from the top of the mixture whereby the metallic mixture may then be recovered or refined to separate the various metallic components of gold, silver, platinum, lead or manganese therein.

4,416,693

# RECOVERY OF TITANIUM METAL VALUES

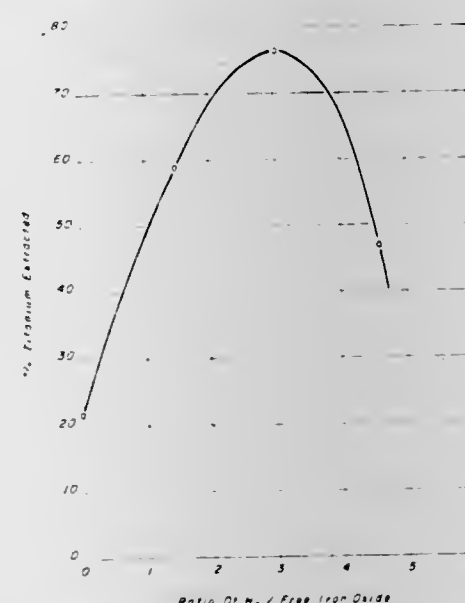
William K. Tolley, Salt Lake City, Utah, assignor to UOP, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 142,510, Apr. 21, 1980, abandoned. This application Dec. 17, 1981, Ser. No. 331,846. The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> C21B 15/00; C01G 23/04

U.S. Cl. 75—101 R

8 Claims



1. In a process for the recovery of titanium metal values from a titanium and iron-bearing source which comprises the steps of:

- crushing said source;
- subjecting the crushed source to an oxidation treatment with an oxidizing agent at an elevated temperature in the range of 700° to 800° C. and less than sufficient to form pseudobrookite;
- subjecting said crushed source to a reductive roast in the presence of a reductant at an elevated temperature;
- leaching the resultant reduced source with a leach solution comprising a hydrogen halide to form soluble metal halide;
- separating insoluble gangue from the soluble metal halide;
- precipitating titanium dioxide from the soluble metal halide by treatment with iron oxides;

- separating and recovering said titanium dioxide;
- regenerating and recovering the iron oxide used in step (f) and the hydrogen halide in step (d), the improvement which comprises using as said reductant in reductive roast step (c) a gas selected from the group consisting of hydrogen, carbon monoxide and mixtures of hydrogen and carbon monoxide in an amount of from about 1.5 to about 4.5 times the amount which is stoichiometrically required to reduce the iron oxide present in said source to metallic iron.

4,416,694

# SAND RECLAMATION

John Stevenson, Sutton Coldfield; John Machin, Lichfield, and David L. Dyke, Birmingham, all of England, assignors to Foseco International Limited, England

Filed May 29, 1981, Ser. No. 268,301

Claims priority, application United Kingdom, Jun. 5, 1980, 8018423

Int. Cl.<sup>3</sup> C04B 19/04

U.S. Cl. 106—84

5 Claims

1. A method of producing an acceptable reclaimed sand from foundry moulds or cores which have been used to produce metal castings which method comprises comminuting to particulate form, used molds or cores formed from a composition consisting essentially of particulate sand, aqueous sodium silicate and an alkylene carbonate, with the content of alkylene carbonate not exceeding 11% by weight based on the weight of aqueous sodium silicate and subjecting the resultant particles to an attrition process so as to remove contaminants therefrom and wherein prior to or during the attrition process the particles are dried so that they contain no more than 0.8% by weight of residual moisture as determined by loss or ignition at 550° C.

4,416,695

# HYDRAULIC CEMENTS

Matthew C. Ball, and Donald W. Tomkins, both of Loughborough, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 179,984, Aug. 21, 1980, abandoned.

This application Nov. 24, 1981, Ser. No. 324,656

Claims priority, application United Kingdom, Aug. 22, 1979, 7929165

Int. Cl.<sup>3</sup> C04B 7/35

U.S. Cl. 106—90

29 Claims

1. A modified hydraulic cement product comprising a hydraulic calcium silicate-based cement having a Blain surface area of at least 3,000 cm<sup>2</sup>/g and/or an iron content of less than 2.5% by weight expressed in terms of the ferric oxide content of the dry cement, in which the cement has been treated with an additive comprising a monoaldehyde under the alkaline conditions prevailing in the cement before or during the setting reaction.

4,416,696

# METHOD FOR HEAT TREATING CEMENT CLINKER RAW MATERIALS

Steven J. Zagar, Milwaukee, and James L. Shy, East Troy, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 16, 1982, Ser. No. 418,703

Int. Cl.<sup>3</sup> C04B 7/44

U.S. Cl. 106—100

7 Claims

1. A method for heat treating pulverulent raw material for the production of cement clinker in an installation comprising a first and second heat exchanger; a reactor operable to receive heat treated raw material from said heat exchanger; and a cooler operable to accept a hot cement clinker from said reactor and cool said reactor with a gas to form a cool clinker and a hot waste gas; said first heat exchange comprising a preheat stage, a calcining stage and a superheating stage with means within said calcining and superheating stages operable to receive a fuel and a gas containing free oxygen and combust said fuel with said gas; said raw material comprising a calcareous component and an argillaceous component; said argillaceous component having an eutectic temperature at which said argillaceous component enters an adhesive phase; said calcareous component having a calcining temperature at which an endothermic reaction occurs to calcine said component and said preheated argillaceous component and said calcined calcareous

ceive a fuel and a gas containing free oxygen and combust said fuel with said gas; said raw material comprising a calcareous component and an argillaceous component; said argillaceous component having an eutectic temperature at which said argillaceous component enters an adhesive phase; said calcareous component having a calcining temperature at which an endothermic reaction occurs to calcine said component and said preheated argillaceous component and said calcined calcareous component having a mutual sintering temperature at which said components sinter to begin to form a cement clinker; the method comprising the steps of:

- supplying a flow of said calcareous component to said preheat stage of first heat exchanger and supplying a flow of said argillaceous component to said second heat exchanger;
- supplying a flow of a hot gas to said preheat stage and preheating said calcareous component with said gas;
- passing said preheated flow of calcareous material to said calcining stage;
- admitting a flow of a fuel to said calcining stage and a flow of a gas containing free oxygen to said calcining stage;
- combusting said fuel with said gas within said calcining stage to produce a hot product gas and further heating said preheated calcareous component with said product gas until said endothermic process is substantially complete;
- passing said further heated calcareous component to said superheating stage and admitting a flow of fuel and a gas containing free oxygen to said superheating stage;
- combusting said fuel with said gas within said superheating stage to produce a hot product gas and heating said calcined calcareous component with said hot product gas to a temperature not less than said sintering temperature;
- discharging said calcareous component from said superheating stage and passing said product gas from said superheating stage to said second heat exchanger and heating said argillaceous component with said product gas to a temperature less than said eutectic temperature; and
- discharging said heated argillaceous component from said second heat exchanger whereby said argillaceous component and said calcareous component may be blended and sintered to a cement clinker in said reactor with said reactor supplying only an additional amount of heat needed to augment the heat of said calcareous component to maintain a sintering reaction between said components.

4,416,697

# METHOD FOR PREHEATING CEMENT CLINKER RAW MATERIALS

Steven J. Zagar, Milwaukee, and James L. Shy, East Troy, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 16, 1982, Ser. No. 418,714

Int. Cl.<sup>3</sup> C04B 7/44

U.S. Cl. 106—100

9 Claims

1. A method for heat treating pulverulent raw material for the production of cement clinker in an installation comprising a first and second heat exchanger; a reactor operable to receive heat treated raw material from said heat exchanger; and a cooler operable to accept a hot cement clinker from said reactor and cool said reactor with a gas to form a cool clinker and a hot waste gas; said first heat exchanger comprising a preheat stage, a calcining stage and a superheating stage with means within said calcining and superheating stages operable to receive a fuel and a gas containing free oxygen and combust said fuel with said gas; said raw material comprising a calcareous component and an argillaceous component; said argillaceous component having an eutectic temperature at which said argillaceous component enters an adhesive phase; said calcareous component having a calcining temperature at which an endothermic reaction occurs to calcine said component and said preheated argillaceous component and said calcined calcareous



ous component having a mutual sintering temperature at which said components sinter to begin to form a cement clinker; the method comprising the steps of:

- supplying a flow of said calcareous component to said preheat stage of first heat exchanger and supplying a flow of said argillaceous component to said second heat exchanger;
- supplying a first flow of a hot gas to said preheat stage and preheating said calcareous component with said gas;
- passing said preheated flow of calcareous material to said calcining stage;
- admitting a flow of a fuel to said calcining stage, a flow of a gas containing free oxygen and a second flow of a hot gas to said calcining stage;
- combusting said fuel with said gas within said calcining stage to produce a hot product gas and further heating said preheated calcareous component with said product gas and said second flow of a hot gas until said endothermic process is substantially complete and reducing the temperature of said product gas and second flow of gas;
- passing said further heated calcareous component to said superheating stage and admitting a flow of a fuel and a gas containing free oxygen to said superheating stage;
- combusting said fuel with said gas within said superheating stage to produce a hot product gas and heating said calcined calcareous component with said hot product gas to a temperature not less than said sintering temperature;
- discharging said calcareous component from said superheating stage and passing said product gas from said superheating stage;
- supplying a third flow of a hot gas to said second heat exchanger and heating said argillaceous component with said third flow to a temperature less than said eutectic temperature; and
- discharging said heated argillaceous component from said second heat exchanger whereby said argillaceous component and said calcareous component may be blended and sintered to a cement clinker in said reactor with said reactor supplying only an additional amount of heat needed to augment the heat of said calcareous component to maintain a sintering reaction between said components.

4,416,698

# SHAPED CELLULOSE ARTICLE PREPARED FROM A SOLUTION CONTAINING CELLULOSE DISSOLVED IN A TERTIARY AMINE N-OXIDE SOLVENT AND A PROCESS FOR MAKING THE ARTICLE

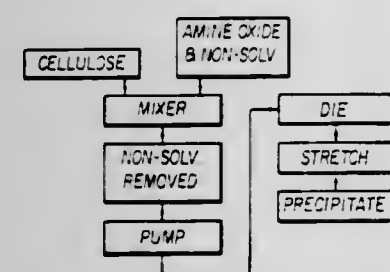
Clarence C. McCorsley, III, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 16,789, Mar. 2, 1979, Pat. No. 4,246,221, which is a continuation-in-part of Ser. No. 847,200, Oct. 31, 1977, abandoned, and Ser. No. 819,082, Jul. 26, 1977, Pat. No. 4,144,080. This application Apr. 3, 1980, Ser. No. 136,990

Int. Cl.<sup>3</sup> C09J 3/04; D01F 6/00

U.S. Cl. 106—163 R

17 Claims



1. A shaped cellulose article which has been formed by a process which comprises shaping a solution containing cellulose dissolved in a solvent therefor which contains a tertiary amine N-oxide solvent for cellulose and a nonsolvent for cellulose which is miscible with the tertiary amine N-oxide solvent, stretching the resulting shaped solution and then precipitating

the cellulose from said resulting shaped solution to form said shaped cellulose article having improved physical properties.

4,416,699

## ALUMINA COATED TiO<sub>2</sub>

Howard W. Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 341,334, Jan. 21, 1982, abandoned. This application Feb. 22, 1983, Ser. No. 468,769

Int. Cl.<sup>3</sup> C09C 1/36

U.S. Cl. 106—300

26 Claims

1. TiO<sub>2</sub> rutile pigment particles exhibiting good resistance to chalk-fade reaction, high gloss and excellent dispersibility suitable for use in paint systems comprising a composite coating consisting essentially of dense alumina and boehmite alumina totaling 2-6% by weight alumina based on the TiO<sub>2</sub>, said composite dense and boehmite alumina present in a weight ratio of 8:1-1:2 of dense to boehmite, the dense alumina defined as alumina having incorporated therein sulfate ion in a weight ratio of aluminum to sulfate of 10:1-1.3:1.

8. A process for preparing a chalk-fade resistant TiO<sub>2</sub> pigment having 2-6% by weight of alumina based on the TiO<sub>2</sub>, said alumina having a 8:1-1:2 weight ratio of dense to boehmite alumina and a weight ratio of aluminum to sulfate of 10:1-1.3:1 comprising

- (a) adding TiO<sub>2</sub> rutile pigment to water with agitation to form a slurry;
- (b) heating the thus prepared slurry to 40°-90° C.;
- (c) adding a soluble basic aluminum compound and/or an inorganic base to the slurry to raise the pH to 7.0-9.5;
- (d) adding a sufficient amount of the soluble aluminum compound to deposit a total of 0.5-2% by weight alumina based on the TiO<sub>2</sub> while maintaining the pH at 7.0-9.5;
- (e) lowering the pH to 5.2-6.5 with an acid;
- (f) adding a sufficient amount of the soluble aluminum compound to deposit in the presence of the required amount of sulfate ions 2-6% by weight of total alumina based on the TiO<sub>2</sub> while maintaining the pH at 5.2-6.5 at a temperature of 40°-65° C.;
- (g) optionally agitating the slurry at 40°-65° C. for 1-180 minutes; and
- (h) separating and washing the thus treated TiO<sub>2</sub> free of soluble salts.

17. A process for preparing a durable TiO<sub>2</sub> pigment having 2-6% by weight of alumina based on the TiO<sub>2</sub>, said alumina having a 8:1-1:2 weight ratio of dense to boehmite alumina and a weight ratio of aluminum to sulfate of 10:1-1.3:1 comprising

- (a) adding TiO<sub>2</sub> rutile pigment to water with agitation to form a slurry;
- (b) heating the thus prepared slurry to 30°-65° C.;
- (c) adjusting the pH to 5.2-6.5;
- (d) adding a sufficient amount of the soluble aluminum compound to deposit in the presence of the required amount of sulfate ions 2-6% by weight of total alumina based on the TiO<sub>2</sub> while maintaining the pH at 5.2-6.5 at a temperature of 30°-65° C.;
- (e) agitating the slurry at 30°-65° C. for 5-180 minutes;
- (f) adjusting the pH to 6.0-9.5;
- (g) agitating the slurry for 5-60 minutes at 40°-70° C. while maintaining the pH of 6.0-9.5; and
- (h) separating and washing the thus treated TiO<sub>2</sub> free of soluble salts.

4,416,700

## PROCESS FOR TREATING CAMEL COLORS

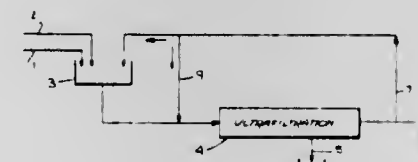
Allen V. Clark, Winter Park, Fla.; Dircl V. Myers, Atlanta, Ga., and Vaughn I. Hatch, Hometown, Ind., assignors to The Coca Cola Company, Atlanta, Ga.

Filed Jul. 20, 1981, Ser. No. 285,131

Int. Cl.<sup>3</sup> A23L 1/27; C13D 3/16

U.S. Cl. 127—34

1 Claim



1. A process for treating Type CP-1 or CP-2 camel color to prepare a camel color concentrate therefrom, comprising: (a) subjecting a mixture of said camel color and water to ultrafiltration through a semi-permeable membrane to yield a permeated fraction which passes through the membrane and a retained fraction which does not pass through the membrane, said retained fraction comprising high molecular weight color bodies and water, the water being present in an amount reduced from that present in the original mixture of camel color and water;

- (b) adding water to the retained fraction and subjecting the resultant mixture to ultrafiltration through a semi-permeable membrane to yield a permeated fraction which passes through the membrane and a retained fraction which does not pass through the membrane, said retained fraction comprising high molecular weight color bodies and water, the water being present in an amount reduced from that present in the resultant mixture; and

- (c) subjecting the retained fraction of step (b) to ultrafiltration through a semi-permeable membrane to yield a permeated fraction which passes through the membrane and a retained fraction which does not pass through the membrane, said retained fraction comprising high molecular weight color bodies and water, the water being present in an amount reduced from that present in the retained fraction of step (b), wherein the pH of said mixture of camel color and water, said resultant mixture and said retained fraction of step (b) is maintained above 6.5 during said ultrafiltration.

4,416,701

## METHOD OF PRODUCING STARCH FROM GRAIN OR GROUND GRAIN PRODUCTS BY THE WET PROCESS

Heinrich Huster, Oelde; Friedrich Meuser, Berlin, and Carl-Heinz Hoepke, Bad Salzungen, all of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,087

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110464

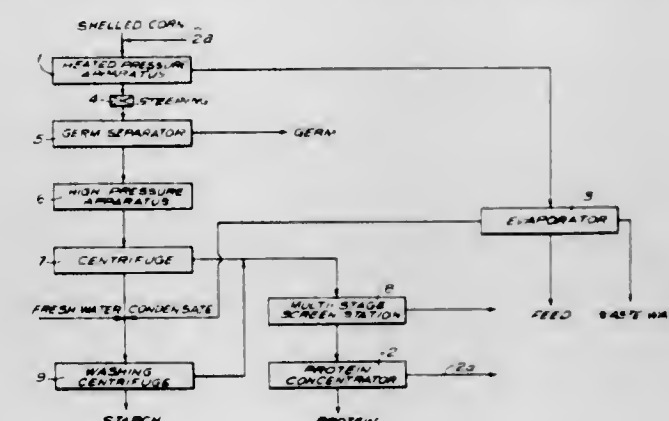
Int. Cl.<sup>3</sup> C13L 1/00, 1/02

U.S. Cl. 127—68

6 Claims

1. In a wet process for obtaining starch from raw grain material, wherein the raw material with process water added is steeped, fragmented, screened to remove fiber, and centrifuged to separate starch and suspended protein, the improvement wherein: the step of steeping comprises briefly steeping the raw material without degrading the morphological grain structures chemically and microbiologically by carrying out the steeping in water at a temperature of about 45° to 60° C. with the steeping time being exclusively for the absorption of water and sufficient to achieve a grain moisture content of greater

than about 35% but no more than 12 hours under atmospheric pressure and no more than about 3 hours under a pressure of at least 5 bar and wherein the step of fragmenting comprises passing the steeped raw material through a splitter head at a



fragmenting pressure of at least 10 bar to fragment same under the action of shear forces and releasing the fragmenting pressure to the atmosphere; whereby the necessary structural disruption between the starch grains and the protein takes place.

4,416,702

## TAPE CARTRIDGE CLEANER

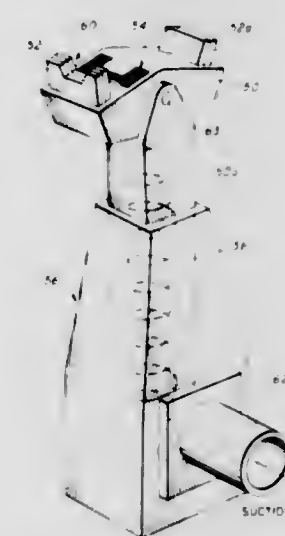
James E. Jackman, Graham, Tex., assignor to Graham Magnetics, Incorporated, North Richland Hills, Tex.

Filed Apr. 9, 1982, Ser. No. 366,852

Int. Cl.<sup>3</sup> B08B 5/02, 5/04

U.S. Cl. 134—6

7 Claims



5. In a process for cleaning interior walls of a ring-like strap of the type used to hold and release magnetic tape for fluidic feeding in tape-reading apparatus, the strap comprising an annular conduit between interior and exterior walls of said strap, said conduit terminating in spaced apertures in said interior wall thereof, said process comprising the steps of

- (a) supplying the air through said exterior wall under pressure into said annular conduit to maintain positive air-streams coming out of said apertures in said interior wall and, thereby, preventing dirt in interior walls from being forced into said apertures while
- (b) carrying out a relative rotation between (1) a suction-cleaning means mounted in biased contact with said interior wall and (2) the interior wall of said strap, the improvement wherein said process comprises the step of utilizing a porous suction cleaning media for receiving within the mass of said cleaning media said dirt.



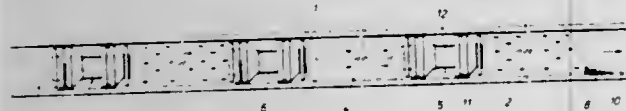
4,416,703

**SYSTEM FOR REMOVING DEBRIS FROM PIPELINES**  
Paul R. Scott, Brazoria, Tex., assignor to Shell Oil Company,  
Houston, Tex.

Filed Nov. 20, 1981, Ser. No. 323,170  
Int. Cl.<sup>3</sup> B08B 9/04

U.S. Cl. 134—8

9 Claims



1. A method for removing particulate debris from a pipeline comprising, inserting a debris entraining gel plug into the pipeline with at least one pseudoplastic plug; moving the gel plug through the pipeline by a circulating motion essentially generating a closed toroid, the wall of the toroid adjacent the wall of the pipeline remaining relatively stationary and the center moving in the direction of motion of the gel plug; collecting at least part of the particulate debris with the gel plug; moving the pseudoplastic plug through the pipeline by viscoelastic flow; sealing the gel plug from fluid in the pipeline with the pseudoplastic plug; isolating the gel plug from the pseudoplastic plug with a mechanical separator; and collapsing the separator up to 40% of the diameter of the pipeline while moving the separator over debris in the pipeline and while substantially maintaining the seal between the gel plug and pseudoplastic plug.

9. The method of claim 1, wherein the gel plug is between pseudoplastic plugs and the separators each comprise at least four polyurethane conical discs supported by a steel body and having dewatering discs at either end of the steel body.

4,416,704

**METHOD AND INSTALLATION FOR CLEANING A SQUEEGEE DEVICE**

Antonius T. H. van de Steeg, St. Anthonis, and Gerardus H. van Mondfrans, BN Sambeek, both of Netherlands, assignors to Stork Brabant B.V., Netherlands

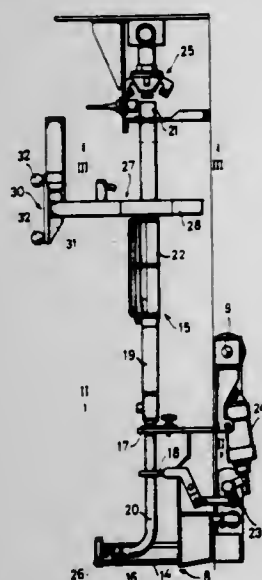
Filed Feb. 5, 1982, Ser. No. 346,203

Claims priority, application Netherlands, Feb. 11, 1981, 8100663

Int. Cl.<sup>3</sup> B08B 3/02

U.S. Cl. 134—34

9 Claims



1. A method of cleaning a squeegee device including a dye pipe and a squeegee blade comprising the steps of: securing the squeegee device in a supporting element which is tiltably mounted in a housing; flushing the pipe from one extremity and simultaneously externally rinsing both the pipe and the squeegee blade; and flushing the pipe from the other extremity.

3. An installation for cleaning a squeegee device comprising: a housing; a frame mounted within the housing; a supporting element for receiving a squeegee device, the supporting element being tiltably mounted on the frame and movable between an inoperative position in which the squeegee device is exposed externally of the housing and an operative position in which the squeegee device is disposed substantially vertically within the housing; a plurality of spraying means stationarily mounted within the housing for spraying the interior and exterior of the squeegee device; and a plurality of spraying means movable within the housing along the length of the squeegee device for dispensing cleaning fluid over the exterior of the length of the squeegee device.

4,416,705

**COMPOSITION AND PROCESS FOR PRODUCTION OF PHOSPHATE COATINGS ON METAL SURFACES**

Gunter Siemund, Heusensramm, and Han Y. Oei, Frankfurt, both of Fed. Rep. of Germany, assignors to Occidental Chemical Corporation, Warren, Mich.

Filed Feb. 26, 1982, Ser. No. 352,925

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108484

Int. Cl.<sup>3</sup> C23F 7/10; C04B 9/02

U.S. Cl. 148—6.15 Z

7 Claims

1. An aqueous acidic zinc phosphate solution which comprises at least 6 g/l of Zn, at least 5 g/l P<sub>2</sub>O<sub>5</sub>, at least 1.0 g/l of an accelerator, calculated as ClO<sub>3</sub>, and about 1 to about 50 g/l of SO<sub>4</sub>, which solution has a total acid number of at least 20, a weight ratio of free P<sub>2</sub>O<sub>5</sub>:total P<sub>2</sub>O<sub>5</sub> of 0.2-0.6:1 and a weight ratio of P<sub>2</sub>O<sub>5</sub>:Zn:ClO<sub>3</sub> of 1:0.5-4.0:0.01-1.0.

2. The composition as claimed in claim 1 in which ClO<sub>3</sub> is present in an amount from about 1 to about 5 g/l.

3. The composition as claimed in claim 2 in which the ClO<sub>3</sub> is present in an amount from about 0.2 to about 2 g/l.

4. The composition as claimed in claim 1 in which the sulfate ions are present in an amount of from about 5 to about 20 g/l.

5. The composition as claimed in claim 2 in which NO<sub>3</sub> is present in an amount of at least 8 g/l and the weight ratio of P<sub>2</sub>O<sub>5</sub>:NO<sub>3</sub> is 1:0.2-6.0.

4,416,706

**PROCESS TO PRODUCE AND STABILIZE A REVERSIBLE TWO-WAY SHAPE MEMORY EFFECT IN A CU-AL-NI OR A CU-AL ALLOY**

Joachim Albrecht, Mülligen; Thomas Duerig, Nussbaumen; Olivier Mercier, Ennetbaden, and Walter Weber, Zurich, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

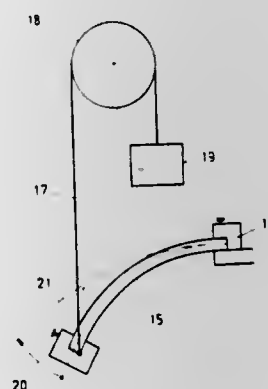
Filed Jul. 29, 1982, Ser. No. 403,129

Claims priority, application Switzerland, Feb. 5, 1982, 707/82

Int. Cl.<sup>3</sup> C21D 8/00

U.S. Cl. 148—11.5 C

3 Claims



1. A process of producing and stabilizing a reversible two-

way shape memory effect in a Cu-Al-Ni or a Cu-Al alloy, which comprises:

- (1) solution treating a cast or powder metallurgically produced alloy in the temperature range of the  $\beta$ -solid solution;
- (2) quenching the solution treated alloy in water;
- (3) deforming said quenched alloy at a temperature below 300° C.; and
- (4) subjecting said deformed alloy to a shape stabilization treatment comprising:
  - (i) heat treating said deformed alloy at a temperature in the range between 150°-425° C. for 0.5 to 180 minutes concomitantly with an externally applied load, thereby producing a tensile, compressive or torsional strain on the alloy of at least 1.0%;
  - (ii) cooling the heat treated alloy; and
  - (iii) releasing the cooled alloy from its externally applied load.

4,416,707

**SECONDARY RECRYSTALLIZED ORIENTED LOW-ALLOY IRON**

Karl Foster, Forest Hills Borough; Gary C. Rauch, Murrysville; Wayne M. Swift, Trafford, and Donald R. Thornburg, Forest Hills Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 14, 1981, Ser. No. 301,543

Int. Cl.<sup>3</sup> H01F 1/04

U.S. Cl. 148—111

40 Claims

1. In the method of producing (110) orientation in silicon-iron alloys having a silicon content less than about 2.5% and in which the alloy may be subject to an  $\alpha\rightleftharpoons\gamma$  phase transformation, the (110) orientation being characterized by a secondary recrystallization grain structure, the steps comprising, making a melt of the desired composition in which the sulfur content is within the range between 0.003% and 0.012%, the aluminum content is within the range between 0.005% and 0.015%, the nitrogen is between 0.003% and 0.015%, and the manganese is within the range between 0.03% and 0.30% casting the melt into ingots or slabs, hot working the ingots or slabs to a hot band, cold rolling to finish gauge in one or more operations with an intermediate annealing between cold-rolling operations, final annealing at a temperature between about 800° C. and 1050° C. and within the  $\alpha$  phase and wherein said final annealing producing said secondary recrystallization grain structure.

4,416,708

**METHOD OF MANUFACTURE OF HIGH SPEED, HIGH POWER BIPOLAR TRANSISTOR**

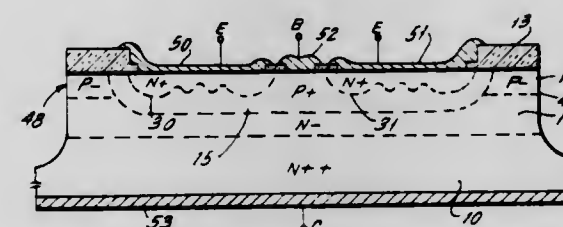
Edgar Abdoulin, Van Nuys, and Alexander Lidow, Manhattan Beach, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Jan. 15, 1982, Ser. No. 339,672

Int. Cl.<sup>3</sup> H01L 21/22

U.S. Cl. 148—187

11 Claims



1. The process of manufacture of a high speed, high power transistor comprising the steps of: forming a thin semiconductor body having flat, parallel first and second surfaces; forming a relatively highly doped base region of one of the conductivity types in said first surface of said semiconductor

body; said base region occupying a first area over said first surface and having a first depth beneath said first surface; forming a diffusion mask over the exposed surface area of said base region; said mask including a plurality of spaced mask islands which are closely spaced to one another in laterally central areas of said base region and define a relatively large peripheral open-mask area which at least partly encloses said base region first area; and diffusing a planar emitter region of the other of the conductivity types through said mask; the average doping concentration of said emitter region beneath said closely spaced islands being lower than the average doping concentration beneath said relatively large peripheral open-mask area.

4,416,709

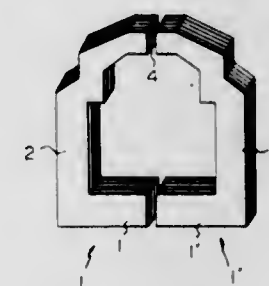
**AMORPHOUS MAGNETIC ALLOY MATERIAL**  
Kazuo Ohya, Chiba; Hiroki Fujishima, Sakura; Norio Ishijima, Higashimurayama; Hiroyoshi Itoga, Ichikawa, and Yasuhiko Kominami, Yachiyo, all of Japan, assignors to TDK Electronics Co., Ltd., Chiba, Japan

Filed Sep. 10, 1981, Ser. No. 300,921

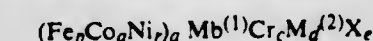
Claims priority, application Japan, Sep. 15, 1980, 55-127568  
Int. Cl.<sup>3</sup> C22C 19/00

U.S. Cl. 148—403

13 Claims



1. An amorphous magnetic alloy material having a high resistance against deterioration when stored for a long period of time at a high temperature and high humidity and having a high wear resistance, wherein said amorphous magnetic alloy material is expressed by the formula:



wherein M<sup>(1)</sup> is ruthenium alone or combined with at least one platinum family element selected from the group consisting of palladium, platinum, iridium, and rhodium, M<sup>(2)</sup> is at least one transition metal element other than iron, cobalt, nickel, ruthenium, palladium, platinum, iridium, rhodium, and chromium, and X is at least one vitrification element with the proviso that the parameters p, q, r, a, b, c, d, and e fulfill the following relationships: p+q+r=100%, p=about 4% to 7%; r=0% to about 10%; a+b+c+d+e=100 atomic %; b=about 0.01 to 8 atomic %; c=about 0.5 to 8 atomic %; d=0 to about 4 atomic %; and e=20 to about 26 atomic %.

4,416,710

**POLYNORBORNENE-BASED COMBUSTIBLE COMPOSITIONS AND PROCESSES FOR THE FABRICATION THEREOF**

William S. Anderson, Sunnyvale, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 14, 1980, Ser. No. 121,344

Int. Cl.<sup>3</sup> C06B 45/10; C10L 1/14

U.S. Cl. 149—19.91

21 Claims

1. A novel composition of matter comprising polynorborene having a liquid fuel material having a heat of combustion above about 9300 Kcal/cc dispersed uniformly therethrough, said composition having a heat of combustion of at least 9300 Kcal/cc.



4,416,711

## PERCHLORATE SLURRY EXPLOSIVE

Harvey A. Jessup, Lehi, and Albert G. Funk, Salt Lake City, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

Filed Dec. 17, 1982, Ser. No. 450,647

Int. Cl.<sup>3</sup> C06B 33/06

U.S. Cl. 149—42

13 Claims

1. An explosive composition comprising, by weight based on the total composition:

- (a) at least about 35% sodium perchlorate,
- (b) from about 17% to about 35% water,
- (c) from about 8% to about 25% polysaccharide polymer of plant origin; and
- (d) minor amounts of gassing and cross-linking agents.

4,416,712

## DOUBLE-BASE SOLID PROPELLANTS

Joachim Mönch, Neunkirchen, and Heinrich Brachert, Troisdorf-Oberlar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

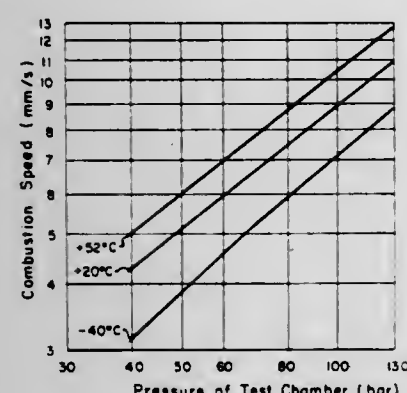
Filed Mar. 23, 1982, Ser. No. 360,963

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113010

Int. Cl.<sup>3</sup> C06B 25/26

U.S. Cl. 149—98

5 Claims



1. Double-base solid propellant composed of at least 85% by weight of a mixture of nitrocellulose and nitroglycerin, and containing, additionally, a mixture in a ratio of 1:0.5 to 1:10, of carbon black and cellulose acetate, in an amount of 0.2 to 6 wt.-%, based on the total weight of the solid propellant.

4,416,713

## METHOD AND APPARATUS FOR JOINING ABUTTING EDGES OF SHEET MATERIAL

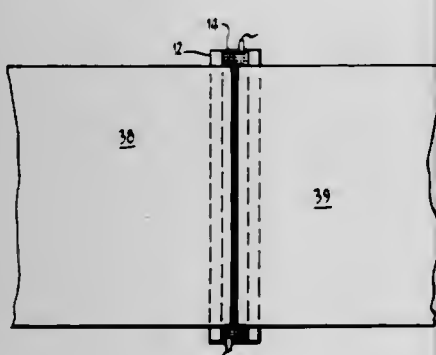
Ronald H. Brooks, 6 Baxter Ct., Chelsea, Victoria, Australia

Filed Jul. 24, 1980, Ser. No. 171,865

Int. Cl.<sup>3</sup> B32B 31/26

U.S. Cl. 156—64

8 Claims



1. A method of joining together abutting edges of woven, felted or other textile sheets, such as carpets, using a web which includes a strip of metal foil or electrically conductive

wires and a heat softenable adhesive composition, said method comprising the steps of

- (a) contacting the abutting edges of said sheets with said web so that the web overlaps said abutting edges,
- (b) passing an electric current through the metal foil or electrically conductive wires to generate heat therein,
- (c) sensing the voltage applied to said metal foil or the electrically conductive wires,
- (d) sensing the current flowing,
- (e) controlling the current flow to thereby control the heat generated in the metal foil or electrically conductive wires to maintain a temperature therein at which the said adhesive composition is softened to a tackiness whereby the adhesive releasably bonds the web to the sheets,
- (f) adjusting the abutting edges as desired to form the required join,
- (g) thereafter increasing the current flow to raise the web temperature and thereby melt the adhesive, and
- (h) terminating the current flow when the adhesive has melted to cause the melted adhesive to set and bond the said sheets to the web.

6. In apparatus for use in joining together abutting edges of woven, felted or other textile sheets, such as carpets, using a web which has a backing strip of paper or paper like material, a strip of metal foil reinforcing filaments or threads at least some of which extend in a substantially transverse direction, and a heat softenable adhesive composition, said backing strip, metal foil and reinforcing material being secured together by a plurality of lines of stitching extending longitudinally of the web, the improvement comprising

- (a) means for connecting an electrical power source to spaced points on said strip of metal foil to enable current to be passed therethrough;
- (b) means to sense the voltage applied to the metal foil;
- (c) means to sense the current flowing therethrough;
- (d) control means responsive to said voltage sensing means and said current sensing means to regulate the current to a first predetermined value which will generate heat sufficient to soften the adhesive composition to a state of tackiness without fully melting the adhesive, whereby abutted edges of the sheets can be adjusted relative to each other to form the desired join; and
- (e) means selectively operated to increase the current to a second predetermined value to fully melt the adhesive once the desired join is formed.

4,416,714

## LABELING MACHINE FOR HEAT SHRINK LABELS

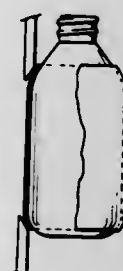
Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation-in-part of Ser. No. 382,374, May 27, 1982, and a continuation-in-part of Ser. No. 438,386, Nov. 1, 1982. This application Mar. 3, 1983, Ser. No. 471,655

Int. Cl.<sup>3</sup> B29C 27/00; B32B 31/00

U.S. Cl. 156—86

17 Claims



1. A method of applying heat shrinkable film to an article having a main, vertical body portion and at least one end portion which curves inwardly from the main body portion, said method comprising:

- (a) tightly applying such film to the body portion of the article without heat shrinking by adhering the leading end

4,416,716

## METHOD OF PRODUCING INTERIOR MATERIAL OF CORRUGATED CARDBOARD

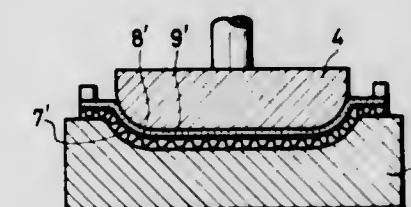
Takashi Ichikawa, and Sadao Moriyama, both of Yokohama, Japan, assignors to Ikeda Bussan Co., Ltd., Kanagawa, Japan

Filed Aug. 4, 1982, Ser. No. 405,238

Claims priority, application Japan, Aug. 27, 1981, 56-134673 Int. Cl.<sup>3</sup> B31F 1/36

U.S. Cl. 156—245

6 Claims



- of the film to the body of the article, wrapping the film about the body, lapping the trailing end of the film over and adhering it to the leading end to form a side seam and also allowing a small overlap of the film over at least one such end portion,
- (b) providing an extensible-retractable tongue or tongues, extensible to and retractable from a heat shielding position wherein it acts as a heat shield between an exterior source of heat and said side seam,
- (c) cyclicly operating such extensible-retractable tongue(s) to extend it to the heat shielding position and thereafter retracting it, and
- (d) applying heat from an external source to predominantly said small overlap to shrink it onto the article while said tongue is in extended position.

4,416,715

## METHOD AND APPARATUS FOR FABRICATING INSULATIVE PANEL

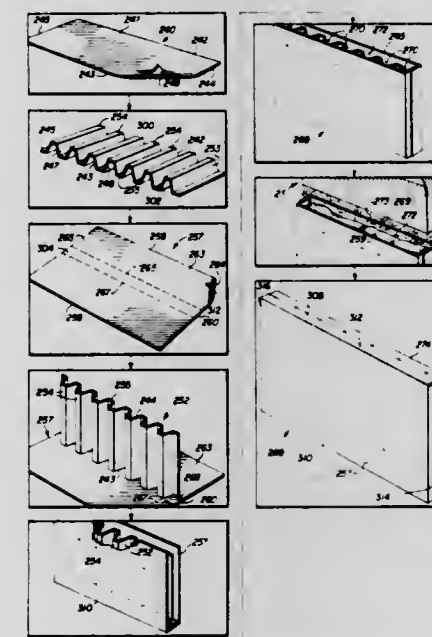
Arthur G. Schramm, Scottsdale, and Jack C. Shaffer, Phoenix, both of Ariz., assignors to Doralyn Ann Hardy, Phoenix, Ariz.

Continuation-in-part of Ser. No. 957,665, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 937,266, Aug. 31, 1978, abandoned. This application May 27, 1980, Ser. No. 153,072

Int. Cl.<sup>3</sup> B31F 1/20; B29C 17/40; B32B 3/00

U.S. Cl. 156—210

15 Claims



1. A method of making an insulating structure comprising the steps of:

- folding a single sheet of planar material to form a substantially rectangular parallelepiped enclosing a corrugated divider and defining an interior space, said envelope having a base, a front and a rear face, two side faces and a top face, that portion of the sheet adapted to be the top face of the envelope being unfolded in this step, said divider having alternating ridges and grooves, the apexes of said ridges and grooves being substantially parallel to each other, the apexes of the divider contacting the front and rear faces of the envelope to form prismatic compartments of substantially constant cross-section extending from the base of the envelope to the top face of the interior space; securing the apexes of the divider to the front and rear faces of the envelope to form a substantially rigid structure; filling the compartments through the top face of the interior space with a loose fill granular insulating material; and forming the top face of the envelope to enclose said interior space.

1. A method of producing interior material of corrugated cardboard comprising the steps of: plasticizing in an oven corrugated cardboard base material by heating and moistening; pressing the thus plasticized corrugated cardboard base material in a forming die separate from said oven and of low temperature in the range from 30° to 70° C. to shape it in a predetermined manner; placing a covering sheet having a thermally melting sheet provided thereon so as to be faced toward the thus shaped corrugated cardboard base material; and thereafter pressing said covering sheet in said low temperature forming die to melt said thermally melting sheet by the heat of said shaped corrugated cardboard base material to thereby bond said covering sheet to said shaped corrugated cardboard base material.

4,416,717

## RAPID PROCESSING OF COMPOSITES

Francis S. Galasso, Manchester; Richard D. Veltri, East Hartford, and Raymond L. Taylor, Durham, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1982, Ser. No. 384,310

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—242

5 Claims

1. In the production of a fiber reinforced epoxy matrix composite part from composite tape the steps of: cutting the tape to size; stacking the cut tapes in the die; first processing the composite within the die at a temperature of from 150° to 190° F. and at a pressure from 80 to 120 psi for between three and five hours; then second processing the composite at a temperature of from 275° to 375° F. and a pressure of from 450 to 550 psi for about one hour; and then third processing the composite at about 300° F. and at atmospheric pressure for about six hours.

4,416,718

## PROCESS FOR SPLITTING SHEET

Timothy K. Fair, Sr., Blaine, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Oct. 26, 1981, Ser. No. 314,712

Int. Cl.<sup>3</sup> B32B 31/18

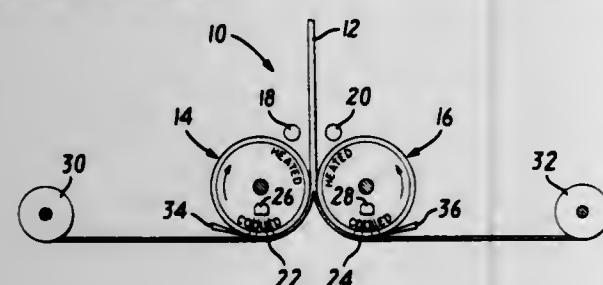
U.S. Cl. 156—344

7 Claims

1. A continuous method for splitting a unitary sheet of thermoplastic polymer net by contacting it with opposed, continuously moving heated surfaces comprising the steps of: (a) heating a sheet of thermoplastic polymer net to a first temperature range wherein said thermoplastic polymer has poor cohesive properties and good adhesive properties with said surfaces;



(b) feeding the opposed faces of said sheet of thermoplastic polymer net between said opposed, continuously moving heated surfaces, said opposed surfaces being heated to a degree sufficient to maintain the temperature of said sheet within said first temperature range, and said heated surfaces moving at substantially the same rate as said sheet whereby said faces adhere to said opposed surfaces and said surfaces moving in a direction parallel to the opposed faces of the said net.



(c) moving said opposed surfaces away from each other to split said sheet of thermoplastic polymer net along a plane substantially parallel to the plane of the surface of the sheet to thereby form sheet parts, each said sheet part continuing to adhere to the surface with which it is in contact;

(d) reducing the temperature of each said sheet part to a temperature range wherein said sheet part is self-supporting and exhibits poor adhesive properties with said surface with which it is in contact;

(e) and removing the sheet parts from the said surface.

4,416,719

**APPARATUS FOR COVERING BASE SHEET SURFACE**  
Tatsuo Horiuchi, Tatebayashi, Japan, assignor to Ushio Denki Kabushiki Kaisha and Kabushiki Kaisha Meiko Shokai, both of Tokyo, Japan

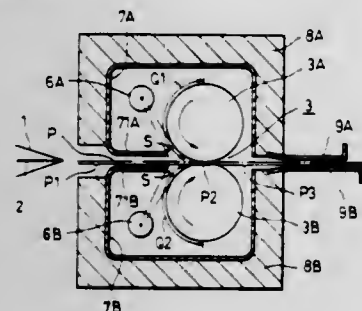
Filed Feb. 1, 1982, Ser. No. 344,294

Claims priority, application Japan, Feb. 27, 1981, 56-26854; Feb. 27, 1981, 56-26855

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—359

2 Claims



1. Laminating apparatus for covering opposite surfaces of a base sheet with plastic film while causing said base sheet to travel together with said plastic film superposed thereon along a base sheet travelling path, which consists of a base sheet feed path, a base sheet heating and press-bonding path and a base sheet discharge path, including a pair of rollers provided in abutment with the base sheet heating and press-bonding path interposed therebetween so as to constitute a pinch roller unit, said apparatus comprising a heat radiation lamp disposed in the vicinity of each of said rollers in such a way that said heat radiation lamp faces a circumferential area of each of said rollers, which area is running toward said base sheet heating and press-bonding path, and said heat radiation lamp also confronts said base sheet feed path, a heat radiation lamp control system adapted to control said heat radiation lamp in such a way that the intensity of the radiant heat from said heat radiation lamp is decreased when the temperature of the circumference of each of said rollers, facing said heat radiation lamp, has risen beyond a predetermined level, and heat transmission members disposed along and on opposite sides of said

base sheet feed path and adapted to receive radiant heat from said heat radiation lamps, respectively, thereby irradiating said base sheet and said plastic film travelling on said base sheet feed path with a part of said radiant heat from said heat radiation lamp, said heat radiation lamps being the sole source of heat for laminating said film to said base sheet.

4,416,720

**TIRE FORMING DRUM**

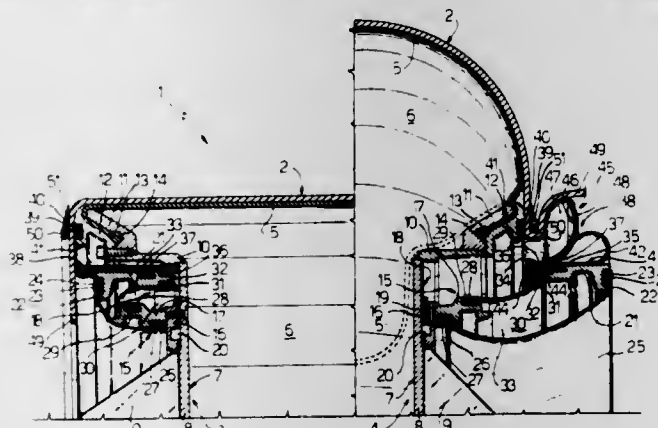
Viscardo Baldoni, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 20, 1982, Ser. No. 420,751

Claims priority, application Italy, Sep. 29, 1981, 68253 A/81 Int. Cl.<sup>3</sup> B29H 17/22, 17/16

U.S. Cl. 156—401

8 Claims



1. A tire forming drum of the type comprising two coaxial half drums which are angularly rigid with each other but are mobile axially relative to each other, each said half drum comprising an annular member arranged to support tubular plies of a carcass of a said tire and a respective bead thereof, characterized in that each said half drum further comprises a tubular member which is axially mobile, under the thrust of multiple air chamber means disposed between said annular member and tubular member, between a rest position in an annular seat provided in that end surface of the relative annular member which is opposite the surface of the latter which faces the other said half drum, and an extracted working position in which said air chamber means are arranged to partly wrap around the relative said bead from the inside by way of a relative end of said tubular plies.

4,416,721

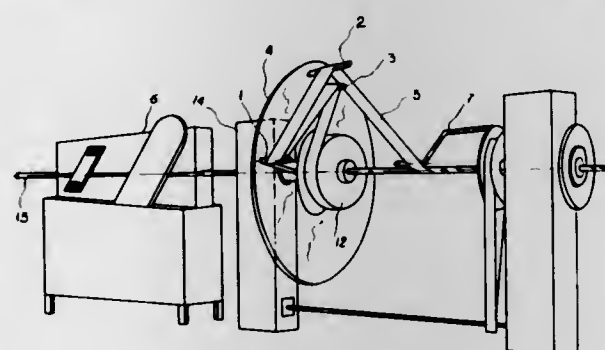
**APPARATUS FOR PRODUCING REINFORCED TUBING**  
Alfio Deregibus, Padua, Italy, assignor to I.T.S. S.r.l., Milan, Italy

Filed Jul. 19, 1982, Ser. No. 399,842

Claims priority, application Italy, May 26, 1982, 21494 A/82 Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—428

5 Claims



1. An apparatus for producing reinforced tubing by applying tapes to a metal core, comprising:

at least two units for moving a metal core rectilinearly; at least two spiral-forming units for successively applying tapes to the moving metal core, as a spiral, forming a continuous layer, each of said spiral forming units comprising:

- a roll of tape concentric to the core;
- a disc adjacent to said roll and concentric to said core;
- tensioning arms secured to said disc, providing tension and a desired inclination to said tape; and
- means for driving said roll and means for driving said disc, said roll and said disc being driven with independent rotary motion and in opposite directions.

4,416,723

**METHOD FOR PRODUCING SAPPHIRE TUBES**

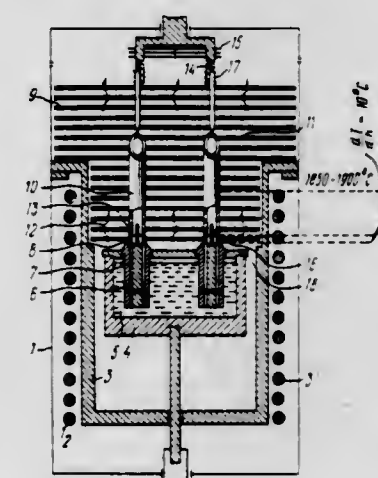
Boris B. Pelts, Lesnaya ulitsa, 63/43, kv. 157, Moscow; Benjamin A. Tumasian, prospekt Lenina, 39/12, kv. 51, Erevan; Leonid P. Egorov, Profsojuznaya ulitsa, 87, korpus 1, kv. 92, Moscow; Lev M. Zatulovsky, Orlikov pereulok, 8, kv. 55, Moscow; Peter M. Chaikin, Staroslobodsky pereulok, 14, kv. 18, Moscow; Efim A. Freiman, 2 Vladimirskaia ulitsa, 15, korpus 1, kv. 53, Moscow; Eduard A. Chalian, ulitsa Gvardeiskaya, 9, kv. 30, Erevan; Grant I. Abramian, ulitsa Olega Koshevo, 26, kv. 3, Erevan; Stepan E. Azolan, 7 ulitsa Agesan, 17, Erevan, and Kliment A. Kostandian, 10 ulitsa Zeituna, 10, kv. 5, Erevan, all of U.S.S.R.

Division of Ser. No. 205,985, Nov. 12, 1980, Pat. No. 4,325,917, which is a continuation of Ser. No. 926,492, Jul. 20, 1978, abandoned. This application Jan. 7, 1982, Ser. No. 337,739

Claims priority, application U.S.S.R., Jul. 21, 1977, 2509201 Int. Cl.<sup>3</sup> B01J 17/18

U.S. Cl. 156—608

9 Claims



4,416,722

**SHEET BINDING**

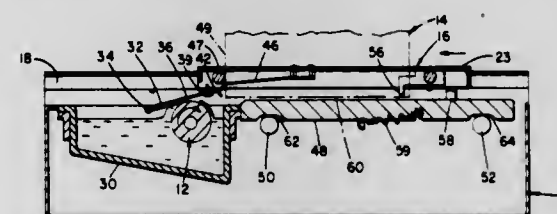
Carl A. Bergman, South Dartmouth; Roy L. Thomas, and Richard A. Bourbeau, both of New Bedford, all of Mass., assignors to Standard Duplicating Machines Corp., New Bedford, Mass.

Filed May 17, 1982, Ser. No. 378,608

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—578

11 Claims



1. Apparatus for binding an edge of a stack of sheets comprising

- a frame,
- a drum rotatably mounted on an adhesive tank on said frame,
- a doctor blade pivotally mounted to adjust the amount of adhesive on an upper surface of said drum,
- a carriage slidably mounted to travel along a carriage axis transverse to the axis of said drum and above the upper surface of said drum,
- said carriage including means to engage said stack of sheets so that during travel of said carriage past said drum, the lower edge of said stack is carried past the upper surface of said drum, and
- wiping means to wipe adhesive off of the surface of said drum immediately prior to the arrival of the leading portion of said lower edge of said stack during travel of said carriage along said carriage axis, to keep excess adhesive from the front edge of said stack of pages,
- said wiping means comprising means to move said doctor blade toward said drum immediately prior to the arrival of the leading portion of said lower edge of said stack of pages during the travel of said carriage,
- said means to move said doctor blade comprising a lever attached to said doctor blade with a portion extending above the upper surface of said drum,
- said carriage having a contact member positioned to push down said lever during travel of said carriage along said carriage axis.

7. A method for producing a crystalline sapphire tube comprising melting aluminum oxide by means of induction heating in an air-tight chamber, pulling a tube from said melt using a seed through a die under an inert-gas blanket and an excess pressure between 0.1 to 0.3 atm. gauge, maintaining a longitudinal temperature gradient of 10° to 20° C./cm in the wall of said tube within a zone between a solidified front and a pulling region wherein the temperature is 1850° to 1900° C., said temperature gradient being maintained at least partially by regulating convective gas flow upstream of said die in said pulling region, annealing said tube at a temperature between 1950° and 2000° C. by heating said tube at a rate of 30° to 40° C./min for between 3 and 4 hours, and cooling said annealed tube to room temperature at a rate of 30° to 40° C./cm.

4,416,724

**METHOD FOR PRODUCING INSULATOR SURFACES**

Bernd Fischer, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Gesellschaft für Schwerionenforschung mbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,205

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046629

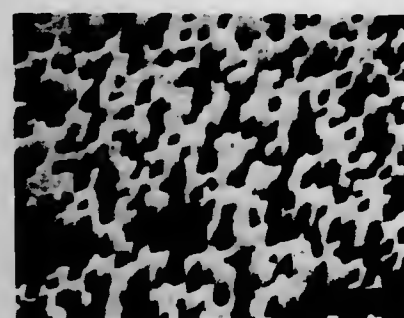
Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00; A61K 27/02; A61N 5/00 U.S. Cl. 156—628

4 Claims

1. A method for producing insulator surfaces by increasing the surface area of a solid body constituting an electrical insulator and presenting such surface, comprising uniformly bombarding the surface of the body with a collimated beam of ions having a density of 10<sup>6</sup>–10<sup>9</sup> ions/cm<sup>2</sup> generating latent nuclear tracks in the surface, and etching the bombarded surface to



widen the nuclear tracks into adjacent, individual etched channels in a manner to cause the number of channels multiplied by



the surface area of an individual channel and divided by the total non-etched surface to be approximately equal to 1.

4,416,725

## COPPER TEXTURING PROCESS

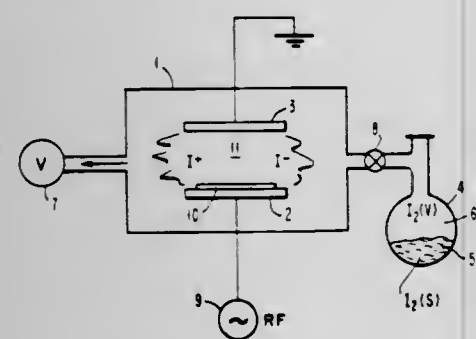
Jerome J. Cuomo, Lake Lindendale; Pamela A. Leary, Wappingers Falls, and Dennis S. Yee, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,922

Int. Cl.<sup>3</sup> C23F 1/00; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—635

9 Claims U.S. Cl. 162—6



1. A room temperature dry process for providing an adherent textured surface to copper characterized by placing the sample within an evacuable chamber; evacuating the chamber; backfilling the chamber with iodine vapor to a pressure of  $\approx 30 \mu\text{Torr}$ ; maintaining the sample at a temperature range room temperature to  $50^\circ\text{C}$ ; applying an RF voltage of approximately 300 V at 50 watts power to grow a copper iodide layer; and removing the copper iodide and removing the sample from the chamber.

4,416,726

## METHOD AND APPARATUS FOR CORRECTING THE ANGLES OF CUT OF QUARTZ PLATES

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,534

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06

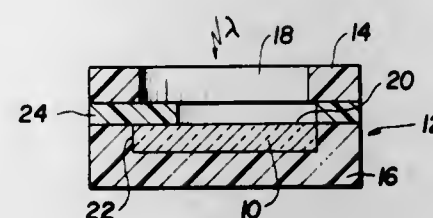
U.S. Cl. 156—643

19 Claims

1. The improved method of correcting the angles of cut of a crystal resonator blank having a pair of opposing major faces comprising the steps of:

- (a) mounting said crystal blank in a holder of etch resistant material;
- (b) positioning said blank and holder in the path of a source capable of effectuating etching of an exposed face of said blank;
- (c) masking a selected portion of at least one of said major

faces with said etch resistant material to provide an exposed face portion; and



(d) subjecting the exposed face portion to said source to cause said exposed face portion to be etched away to a predetermined depth.

4,416,727

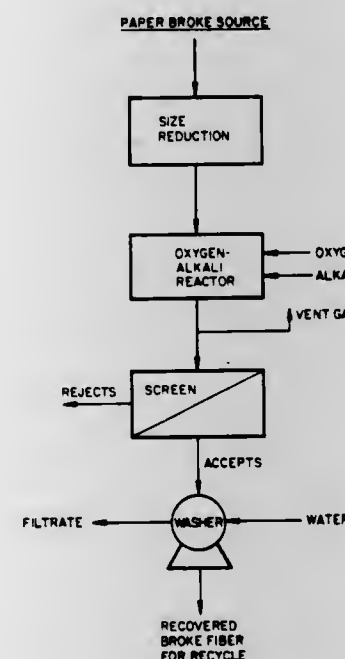
## PROCESS FOR RECOVERING FIBER FROM WET-STRENGTH RESIN COATED PAPER

Edward F. Elton, Whitehall, and Vincent L. Magnotta, Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 11, 1982, Ser. No. 338,773

Int. Cl.<sup>3</sup> D21C 5/02

11 Claims



1. A process for recovering and maintaining the brightness of fibers from a wet-strength resin coated paper waste or broke comprising the steps of:

- (a) shredding the paper waste or broke to a comminuted form;
- (b) subjecting the comminuted paper waste or broke to an alkaline solution to provide a pulp slurry and contacting the pulp with an oxygen atmosphere at elevated temperatures to free individual fibers from the resin and to maintain the brightness of said fibers and residual resin;
- (c) diluting the separated fibers to a screenable consistency and screening the same to remove rejects; and
- (d) recovering a screened fiber pulp for use in paper production.

9. A process for recovering and maintaining the brightness of fibers from a wet-strength resin coated paper waste or paper broke comprising the steps of:

- (a) shredding the paper waste or broke to a 2 to 4 square inch comminuted form;
- (b) subjecting the comminuted paper waste or broke to an alkaline solution charge of 4% to 15% to provide a pulp slurry of 10% to 25% consistency and contacting the pulp slurry with oxygen at a partial pressure of 30 to 60 psi at a temperature of  $110^\circ$  to  $140^\circ\text{C}$ . with mild agitation to free

the paper fibers from the resin and to maintain the brightness of said fibers and residual resin to at least 80% brightness;

- (c) diluting the separated fibers to a 2% to 8% consistency and screening the same to remove rejects; and
- (d) recovering a screened pulp fiber free of resin for reuse in paper production.

4,416,728

## SELF-EXTINGUISHING PAPER MATERIALS

Giancarlo Albanesi, and Gianfranco Rinaldi, both of Milan, Italy, assignors to Saffa S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 350,423, Feb. 19, 1982,

abandoned. This application Jul. 16, 1982, Ser. No. 398,798

Claims priority, application Italy, Mar. 5, 1981, 20134 A/81

Int. Cl.<sup>3</sup> D21H 3/56

U.S. Cl. 162—159

10 Claims

1. A self-extinguishing paper material consisting essentially of cellulose fibers and an effective amount of a flame retarder in the form of red phosphorus powder encapsulated with a cationized melaminic resin prepared from formaldehyde, triethanolamine, melamine and a monohydroxyl aliphatic alcohol having less than five carbon atoms, in weight percent ratios of 36.04 to 30.85%, 29.87 to 25.57%, 25.27 to 21.62% and 8.82 to 21.96% respectively.

8. A method of generating self-extinguishing properties in a cellulosic material which comprises incorporating into said cellulosic material an effective amount of melamine-encapsulated red phosphorus powder, said red phosphorus powder being encapsulated by a melamine condensate prepared from formaldehyde, methanol, triethanolamine and melamine in weight-percent ratios of 36.04–30.85%, 8.82–21.96%, 29.87–25.57% and 25.27–21.62%, respectively.

4,416,729

## AMMONIUM POLYAMIDOAMINES

George R. Killat, and Larry R. Wilson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 4, 1982, Ser. No. 336,538

Int. Cl.<sup>3</sup> D21H 3/48

U.S. Cl. 162—164.3

6 Claims

1. A method for improving the wet strength of paper which comprises contacting the paper pulp with an amount of water-soluble polyamidoamine bearing a pendant ammonium moiety having cross-linking functionality which is effective to increase the wet strength of the paper sheet formed from said pulp, (2) forming the pulp into an article of desired shape and (3) subjecting the article to conditions sufficient to cross-link the polyamidoamine.

4,416,730

## WIRE END SECTION OF A PAPER MAKING MACHINE

Christian Schiel, Heldenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,424

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128156

Int. Cl.<sup>3</sup> D21F 1/02, 1/36

U.S. Cl. 162—264

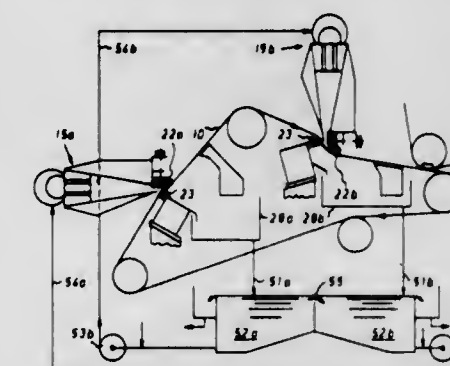
38 Claims

1. A wire end section of a paper making machine, comprising:

- a wire belt for receiving fibrous pulp suspension thereon and for permitting water drainage from the suspension through the wire belt; means for guiding and for driving the belt to move past a head box;
- a head box for feeding pulp suspension to the wire belt; the head box including a first and a second flow guide wall, wherein the first guide wall is upstream in the movement of the wire belt past the head box and the second guide wall is downstream in the movement of the wire belt past the head box; both guide walls extending across the width dimension of the wire belt and extending above one surface of the wire belt; the guide walls defining a channel

between them, and the channel having an outlet opening aimed for feeding pulp to the wire belt, whereby pulp travels through the channel to be fed through the outlet opening;

a slide shoe supported at the second guide wall and being located beyond the outlet opening of the head box and toward the wire belt; the slide shoe including a generally convexly curved first guide surface, which is curved gradually from being oriented more transverse to the path of the wire belt past the head box to being oriented more parallel to that path nearer to the belt and further downstream in the movement of the belt; the first guide surface defining with the belt to a web forming zone for forming a web of the pulp suspension on the belt;



the first guide surface having a plurality of sections, including a first section in the region of the outlet opening and a second section in the region of the web-forming zone downstream along the path of the wire belt from the first section, the second section being curved more sharply than the first section;

a wire belt supporting device located at the opposite surface of the wire belt from the head box, and including a convexly curved second guide surface for engaging the opposite surface of the wire belt; the second guide surface being located in the vicinity of the outlet opening, upstream of the first guide surface in the path of the wire belt, for introducing the wire belt into the web-forming zone.

4,416,731

## APPARATUS FOR CONTROLLING THE POSITION AND LOCATION OF A STATIONARY DEVICE OF A PAPER MACHINE WHICH ACTS ON A PAPER WEB BEING MANUFACTURED THEREIN

Jori Pesonen, Helsinki, and Markku Koivumäki, Jyväskylä, both of Finland, assignors to Valmet OY, Finland

Filed May 10, 1982, Ser. No. 376,537

Claims priority, application Finland, Nov. 25, 1981, 813764

Int. Cl.<sup>3</sup> D21F 1/48, 1/54

U.S. Cl. 162—308

9 Claims

1. Apparatus for controlling the position and location of a stationary device which constitutes a component of a paper machine and which acts on a paper web being manufactured therein over a transverse dimension thereof relative to the direction of travel of the web, said control apparatus being operative to control one or both of the distance of the device from the web and the angular orientation of the device, the device including a frame portion which is carried at each respective transverse end thereof by frame structure of the paper machine through a respective control apparatus, said control apparatus comprising:

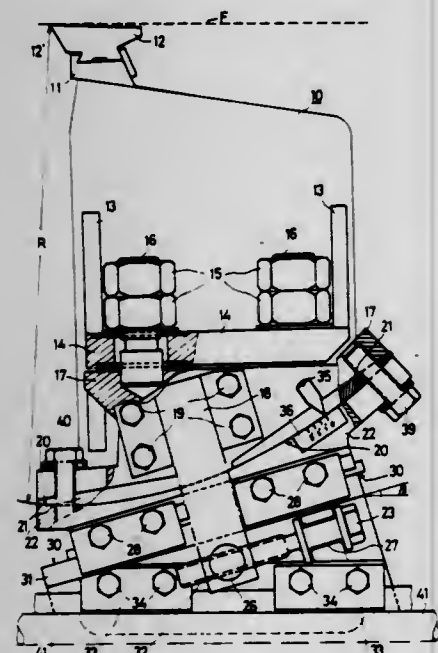
- a slide assembly including,
  - a first slide member supporting a respective end of the frame portion of the stationary device and having a sliding surface;
  - a second slide member supported by the paper machine frame structure and having a sliding surface; and
  - an intermediate slide member having two sliding surfaces,



said intermediate slide member being situated between said first and second slide members and forming a first pair of sliding surfaces with the first slide member and a second pair of sliding surfaces with the second slide member;

wherein one pair of sliding surfaces presented by said intermediate slide member and one of said first and second slide members have a curved segment configuration having a center of curvature which is substantially coincident with or immediately adjacent to a straight edge defining a tip of the stationary device;

wherein the other pair of sliding surfaces presented by said



intermediate slide member and the other of said first and second slide members have a linear configuration extending in the direction of movement thereof; and wherein said control apparatus further includes adjusting means for moving said one of said first and second slide members and intermediate slide member with respect to each other on said curved sliding surfaces to control the angular orientation of the stationary device and for moving said other of said first and second slide members and intermediate slide member with respect to each other on said linear sliding surfaces to control the distance of the stationary device from the web independently of the angular orientation of the stationary device.

4,416,732

## HORIZONTAL COKE OVEN BATTERY

Paul Gernhardt, Heinz Thubeauville, and Carl-Heinz Struck, all of Bochum, Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany  
Filed Mar. 4, 1982, Ser. No. 354,818

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114340; Jun. 4, 1981, 3122112

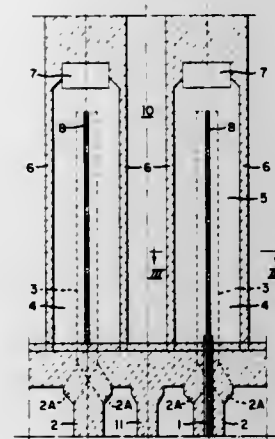
Int. Cl.<sup>3</sup> C10B 21/12, 21/16

U.S. Cl. 202—139

11 Claims

1. In a horizontal coke oven battery in which heating chambers between coking chambers are divided by midfeathers into heating flues, the combination of feed flues extending upwardly through the heating chambers, said feed flues communicating with regenerators for the coke oven battery, and feed flue outlets connecting the feed flues to the heating flues, said feed flue outlets each comprising vertically-elongated slot

means extending along substantially the entire length of an associated feed flue to facilitate soft combustion and flame



formation, thereby greatly reducing temperature peaks and nitrogen oxide formation.

4,416,733

## DRY QUENCHING APPARATUS FOR HOT COKE

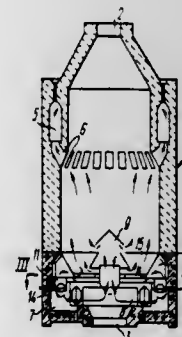
Evgeny P. Likhogub, Stanislav S. Sergeev, and Alexandr N. Minasov, all of Kharkov, U.S.S.R., assignors to Giproxox, Kharkov, U.S.S.R.

Filed Jun. 16, 1982, Ser. No. 389,149

Int. Cl.<sup>3</sup> C10B 39/00, 39/02

U.S. Cl. 202—228

1 Claim



1. A dry quenching apparatus for hot coke comprising: an upright housing having openings for charging and discharging the coke, an annular header for supplying a cooling agent and arranged in the lower portion of said housing, a centrally disposed distributor for the cooling agent arranged in the lower portion of said housing and communicating with said annular header for supplying the cooling agent, a distribution header arranged above said annular header for supplying the cooling agent and communicating with the annular header through openings, vertical partition walls arranged in said distribution header and defining sections therein, each section including at least one said opening whereby said headers communicate with each other, flow governors for the cooling agent each arranged in at least one said opening in each section, and an annular exhaust header for gases arranged in the middle portion of the housing.

4,416,734

## SEPARATION OF NITROALKANOL BY AZEOTROPIC DISTILLATION

Martin J. Jacobs, Terre Haute, Ind., assignor to Angus Chemical Company, Northbrook, Ill.

Filed May 11, 1981, Ser. No. 262,078

Int. Cl.<sup>3</sup> B01D 3/36; C07C 79/18

U.S. Cl. 203—18

23 Claims

1. A process for the separation of nitroalkanol from an aqueous solution thereof, comprising the steps of (a) adding thereto an organic liquid mixture consisting essentially of an aliphatic alcohol of 2-4 carbon atoms and a hydrocarbon of 6-9 carbon atoms, said organic liquid mixture added to the aqueous solution in an amount in excess of that required to form a ternary azeotrope with water, (b) separating the water as a vapor by azeotropic distillation at least until crystals appear in the unvaporized portion of the mixture, (c) cooling the unvaporized portion of the mixture thereby causing substantially complete separation of the nitroalkanol, and (d) recovering the nitroalkanol from the unvaporized mixture.

4,416,735

## DILUENT AND METHOD FOR POTENTIOMETRIC ASSAY OF LIQUIDS

Thomas R. Kissel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1982, Ser. No. 389,515

Int. Cl.<sup>3</sup> G01N 27/46, 1/00

U.S. Cl. 204—1 T

14 Claims

1. In admixture, a urine sample selected for potentiometric assay, and a diluent for said sample, said diluent comprising an aqueous solution having a pH of at least about 10.0 and a predetermined concentration of

(a) a protonated water-soluble organic amine having (i) a pKa greater than or equal to about 9.3, and (ii) a hydroxyalkyl of 1 to 5 carbon atoms, bonded to the nitrogen of the amine, wherein the oxygen-to-carbon bond of the hydroxy is no more than two bonds removed from the nitrogen and

(b) an acid anion, said predetermined concentration being effective to produce a total ionic strength of said admixture within the range of about 150 millimolar and about 250 millimolar.

7. A diluent for compressing the ionic strength range of an aqueous sample, comprising an aqueous solution having

(i) a pH of at least about 10.0;  
(ii) a predetermined concentration of  
(a) a protonated water-soluble organic amine having (i) a pKa greater than or equal to about 9.3, and (ii) a hydroxyalkyl of 1 to 5 carbon atoms, bonded to the nitrogen of the amine, wherein the oxygen-to-carbon bond of the hydroxy is no more than two bonds removed from the nitrogen and

(b) an acid anion; said predetermined concentration being effective to produce, when 4 parts of said solution are added to 1 part of two different saline solutions, one having a total ionic strength of 130 millimolar and the other a total ionic strength of 410 millimolar, a range of said ionic strength for the diluted saline solutions that is between about 150 millimolar and about 250 millimolar; and

(iii) a polymer present in amounts sufficient to provide to said solution a viscosity between about 1.3 centipoise and about 1.9 centipoise when measured at 25° C.

13. A method for potentiometrically determining the concentration of an ionic analyte in an aqueous solution, comprising the steps of

(i) admixing with said solution, a predetermined concentration of

(a) a protonated water-soluble organic amine having (i) a pKa greater than or equal to about 9.3, and (ii) a hydroxyalkyl of 1 to 5 carbon atoms, bonded to the nitrogen of the amine, wherein the oxygen-to-carbon bond

of the hydroxy is no more than two bonds removed from the nitrogen and

(b) an acid anion, in an amount effective to provide a pH of at least about 10.0,

(ii) contacting a quantity of the admixture with a first electrode selective for said ionic analyte,

(iii) before, during, or after step (ii), contacting a quantity of a reference liquid having a known concentration of said analyte, with a second electrode, and

(iv) allowing said quantities to make ion contact with each other to permit a detection of electrical imbalance between them.

4,416,736

## PROCEDURE FOR THE ENRICHMENT OF THE ELEMENT OF INTEREST FROM A SOLUTION FOR NONFLAME ATOMIC ABSORPTION SPECTROSCOPY

Bernhard Huber, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Jan. 6, 1981, Ser. No. 223,070

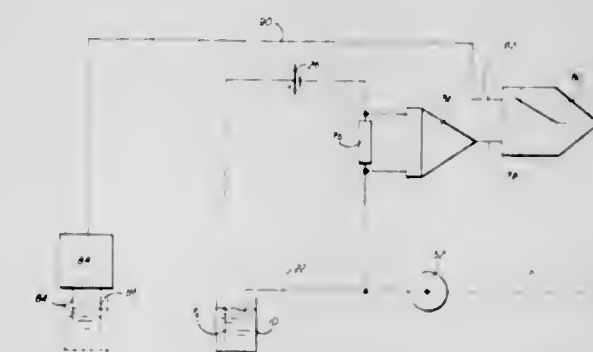
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 3000446

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> G01N 27/46

U.S. Cl. 204—1 T

8 Claims



1. Method for enriching a sought element from a solution for flameless atomic absorption spectroscopy, said method comprising the following steps:

inserting an electrode into a sample vessel containing said solution, said vessel being outside an atomic absorption spectrometer;  
maintaining a constant voltage between said electrode and a counterelectrode;  
integrating, with respect to time, the current passing through said solution via said electrodes;  
terminating the electrolysis when a predetermined value of the current time integral has been reached;  
removing said electrode from said sample vessel and inserting said electrode into a graphite tube through which the measuring light beam of said atomic absorption spectrometer passes; and  
heating said graphite tube, whereby said electrode is indirectly heated and said sample components deposited thereon are atomized.

4,416,737

## PROCESS OF ELECTROPLATING A NICKEL-ZINC ALLOY ON STEEL STRIP

Lowell W. Austin, Welton, W. Va., and James O. Stoddard, Clinton, Pa., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1982, Ser. No. 347,704

Int. Cl.<sup>3</sup> C25D 3/56, 7/00

U.S. Cl. 204—28

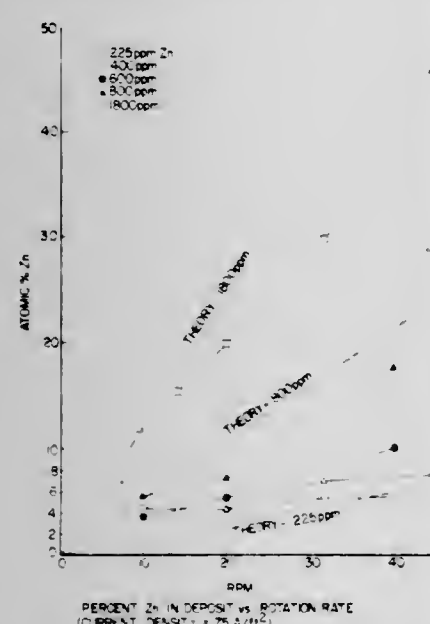
9 Claims

1. A process for electroplating a protective nickel-zinc alloy coating on metal strip or sheet which has a tendency to cor-



ode wherein said nickel-zinc alloy coating consists essentially of at least 80 percent nickel and up to 20 percent zinc, said process comprises:

- providing an aqueous plating solution consisting essentially of dissolved nickel, in an amount ranging from about 25 to 45 g/l, and dissolved zinc, in an amount of at least 40 ppm, wherein the iron content of the plating bath is maintained at less than 100 ppm,
- maintaining said plating bath at a pH of about 3 to about 5 and an elevated temperature of up to about 160° F.; and



immersing said metal strip or sheet in said plating bath and subjecting it to a cathodic plating current density of from about 50 to about 150 amperes/ft<sup>2</sup>, to electroplate a protective nickel alloy coating.

3. The process of claim 1 wherein electroplating is conducted in a continuous plating line assembly; and wherein the zinc content of the nickel coating is dependent on the rate at which the metal strip or sheet is passed through the bath and on the distance through which the metal sheet or strip has traveled into the bath.

4,416,738

## CHROMIUM PLATING

Richard Herrmann, Jr., Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 115,882, Jan. 28, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,013

Int. Cl.<sup>3</sup> C25D 5/14, 5/40

U.S. Cl. 204—32 R

12 Claims

1. A method of restarting the electroplating of chromium onto an article having an electroplated chromium coating, said method comprising the steps of:

- immersing said article in an aqueous alkaline solution of a cyanide salt;
- applying an electrical potential to said article immersed in said solution and reversing the polarity of said potential at predetermined intervals for a first predetermined period of time while said article is immersed in said aqueous alkaline solution; and,
- thereafter immersing said article in a chromic acid chromium electroplating bath and applying a cathodic plating potential to said article to electroplate chromium onto said article.

4,416,739

## ELECTROPLATING OF TITANIUM AND TITANIUM BASE ALLOYS

Wallace Turner, Barnoldswick, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 3, 1981, Ser. No. 240,127

Claims priority, application United Kingdom, Apr. 16, 1980, 8012484

Int. Cl.<sup>3</sup> C25D 5/42

U.S. Cl. 204—32 R

7 Claims

1. A method of electroplating a metal layer onto a titanium or titanium base alloy surface, said method comprising the successive steps of:

- (a) exposing the surface to be electroplated to an aqueous solution comprising hydrofluoric acid and a member selected from the group consisting of formamide and substituted formamides, said solution containing from about 35 to about 45 grams per liter of fluoride ions and from about 1.5 to about 2.5 grams per liter of hydrogen ions and from about 600 to 800 grams per liter of said formamide or said substituted formamide, and continuing the exposure until the reaction between said surface and said solution has substantially abated and a grey deposit, which provides an adhesion-improving key between the titanium or titanium base alloy surface and the metal to be electroplated thereon, is formed on the titanium or titanium alloy surface; and thereafter
- (b) electroplating a metal layer on the thus exposed surface covered by said grey deposit.

4,416,740

## METHOD AND BATH FOR THE ELECTRODEPOSITION OF PALLADIUM/NICKEL ALLOYS

Klaus Schulze-Berge, Remscheid, Fed. Rep. of Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,246

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108467

Int. Cl.<sup>3</sup> C25D 3/56

U.S. Cl. 204—43 N

2 Claims

1. In a method of electrodepositing a palladium/nickel alloy coating upon a substrate wherein said coating is plated onto said substrate by electrodeposition from a bath containing 5 to 30 g per liter of palladium and 5 to 30 g per liter of nickel and having a palladium-nickel ratio such that the coating contains 30 to 90% by weight of palladium, the improvement which comprises providing in said bath during the electrodeposition of said coating at least one acetyleneamine or amino alcohol capable of improving the brightness and mechanical properties of said coating and selected from the group which consists of:

- dimethylpropyn-2-ylamine,
  - 1-diethylaminopropyn-(2),
  - 1-diethylaminopentyn-2-ol-(4),
  - 1-dimethylaminopropyn-(2), and
  - 1,1-diethylpropyn-2-ylamine,
- and mixtures thereof.

4,416,741

## METHOD AND BATH FOR THE ELECTRODEPOSITION OF PALLADIUM/NICKEL ALLOYS

Klaus Schulze-Berge, Remscheid, Fed. Rep. of Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,245

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108466

Int. Cl.<sup>3</sup> C25D 3/56

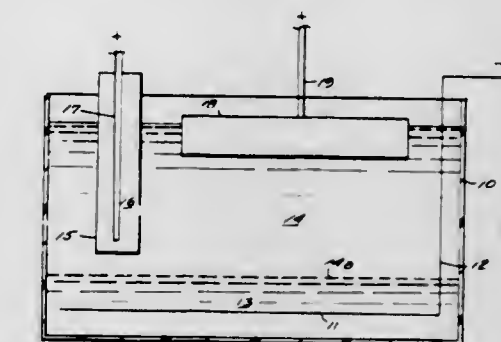
U.S. Cl. 204—43 N

2 Claims

1. In a method of electrodepositing a palladium/nickel alloy coating upon a substrate wherein said coating is plated onto said substrate by electrodeposition from a bath containing 5 to

30 g per liter of palladium and 5 to 30 g per liter of nickel and having a palladium-nickel ratio such that the coating contains 30 to 90% by weight of palladium, the improvement which comprises providing in said bath during the electrodeposition of said coating at least one acetylene alcohol or acetylene alcohol ether capable of improving the brightness and mechanical properties of said coating by promoting mixed crystal deposition, said acetylene alcohol or acetylene alcohol ether being selected from the group which consists of:

- propargylalcohol
- propargylalcoholmonoethoxylate (Hydroxyethylpropargylether)
- butynediol
- butynediol with 2 EO (Bis-(Hydroxyethoxy)-butyne)
- butynediol with 1 PO (2-Hydroxypropylpropbutynylether)
- hexynediol
- 2-methylbutyne-3-ol-2
- 3-methylpentyne-1-ol-3
- 3,4-dimethylpentyne-1-ol-3
- 3-ethylpentyne-1-ol-3
- 3-isopropyl-4-methylpentyne-1-ol-3
- 3-methylhexyne-1-ol-3 and
- 3-propylhexyne-1-ol-3.



trode located solely therein, said first and second phases being in direct liquid-liquid interfacial contact with each other.

4,416,742

## PROCESS AND ELECTROLYTIC BATH FOR MAKING A RHODIUM-PLATED ARTICLE HAVING A BLACK OR BLUE COLOR

Takashi Kinase, Hitachi; Seiji Ichimura, Katsuta; Yoshio Kinjo, Narashino, and Yosuke Matsumoto, Chiba, all of Japan, assignors to Nippon Mining Co., Ltd. and Nippon Metal Plating Co., Ltd., both of Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,939

Claims priority, application Japan, Sep. 25, 1980, 55-134038; Sep. 25, 1980, 55-134039; Sep. 25, 1980, 55-134040

Int. Cl.<sup>3</sup> C25D 3/50, 3/52

U.S. Cl. 204—47

12 Claims

1. A process for electroplating rhodium onto a conductive substrate which process comprises:

- (1) providing an aqueous acidic rhodium plating bath comprised of (a) a free acid, (b) a rhodium in a concentration ranging from about 0.1 to 20 g/l based on the rhodium metal, and (c) at least one additive selected from the group consisting of thiomalic acid and salts thereof, phthalic acid and salts thereof, butynediol and hypophosphite, said additive being present in an amount of at least about 0.01 g/l, with the pH of said bath not exceeding 6; and
- (2) electroplating rhodium onto said substrate as a cathode in said bath under conditions such that the rhodium is plated in the form of a blue or black electroplate.

4,416,743

## ELECTROLYSIS USING TWO ELECTROLYTICALLY CONDUCTING PHASES

Frank S. Holland, Hazel Grove Stockport, England, assignor to Manchem Limited, Manchester, England

Filed Jan. 6, 1983, Ser. No. 456,315

Claims priority, application United Kingdom, Jan. 7, 1982, 8200355

Int. Cl.<sup>3</sup> C25B 1/00; C25C 1/02, 1/08, 1/16

U.S. Cl. 204—59 R

19 Claims

1. A method of electrolysis, which comprises passing an electric current between two electrodes and through an at least two-phase electrolyte system having as a first phase an aqueous

electrolyte solution, and as a second phase an aqueous-immiscible electrolytically conductive liquid with at least one elec-

4,416,744  
PROCESS OF ELECTROLYTICALLY PRODUCING OXYACIDS OF CHLORINE

Karl Lohrberg; Rainer Pfohl, both of Heusenstamm, and Martin Gritschke, Karben, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 268,421, May 29, 1981, Pat. No. 4,370,207, which is a continuation of Ser. No. 110,155, Jan. 7, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,036

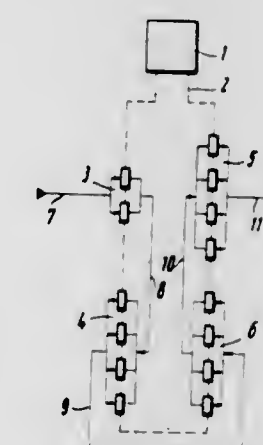
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901221

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C25B 1/24

U.S. Cl. 204—95

4 Claims



1. A process of producing oxyacids of chlorine or salts of such acids by an electrolysis of salt solutions which are contaminated with calcium and/or magnesium or of sea water, which comprises:

- (a) in an initial zone electrolyzing said salt solution with an electrolyte flow rate through an electrolytic cell at above 0.9 meter per second and up to 2.0 meters per second; and
- (b) in a succeeding zone electrolyzing the salt solution obtained from said initial zone of step (a) at an electrolyte flow rate of 0.3 meter per second to less than 0.7 meter per second, the velocity of flow being stated for electrolyte which is free from gas.



4,416,745

**PROCESS FOR RECOVERING NICKEL FROM SPENT ELECTROLESS NICKEL PLATING SOLUTIONS**

Gilbert G. Warren, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 1, 1982, Ser. No. 353,772  
Int. Cl.<sup>3</sup> C25C 1/08

U.S. Cl. 204—112

7 Claims

1. A process for recovering nickel from spent electroless nickel plating solutions comprising:

- adding an inorganic base, selected from the group consisting of sodium hydroxide and potassium hydroxide, to said spent solution to raise the pH thereof to between 10–10.5;
- then adding ammonium hydroxide to said spent solution, to which said inorganic base has been added, and at said pH to raise the pH thereof to at least 11;
- heating said ammonium hydroxide containing spent solution to a temperature of between 40°–50° C.;
- subjecting said heated ammonium hydroxide containing spent solution to electrolysis, at a current density of about 10–30 amperes/ft<sup>2</sup>, for a period of time sufficient to deposit a major portion of the nickel from said spent solution; and
- separating said spent solution from said deposit of nickel.

4,416,746

**BIPOLAR REFINING OF LEAD**

Robert C. Kerby, Rossland, and Clifford J. Krauss, Trail, both of Canada, assignors to Cominco Ltd., Canada

Filed Jan. 11, 1982, Ser. No. 338,654

Claims priority, application Canada, Feb. 12, 1981, 370752  
Int. Cl.<sup>3</sup> C25C 1/18

U.S. Cl. 204—114

4 Claims

1. In the process for the bipolar refinement of lead which includes: using impure lead bullion bipolar electrodes; an electrolyte containing lead fluosilicate, fluosilicic acid, and addition agents; a current density in the range of 100 to 600 A/m<sup>2</sup>; an anode overvoltage maintained below the voltage at which impurities dissolve; an electrical current maintained at a value, related to the internal resistance of the cell, which will not cause the cell voltage to rise above the voltage at which impurities dissolve; periodical reversal of the polarity of the current applied to the cell; and recovering the refined lead from the bipolar electrodes, the improvements in combination which comprise:

- using an electrolyte containing at least about 85 g/l lead as lead fluosilicate and at most about 85 g/l lead fluosilicic acid so that the amount of dissolved lead as lead fluosilicate exceeds the amount of free fluosilicic acid in the electrolyte;
- applying a current to the cell at the beginning of the refining cycle to provide a current density in the cell of from about 240 A/m<sup>2</sup> to 450 A/m<sup>2</sup>;
- applying the current to the cell for a refining cycle time of from about 72 hours to 130 hours;
- reversing the polarity of the current applied to the cell at a frequency of from about 4 to about 60 reversals per minute; and
- limiting the duration of each reversal to a period chosen from within the range of from 40 to 300 milliseconds, such that the total period of current reversal is in the range of from 1% to 4.5% of the refining cycle time,

whereby even dense, strong and readily stripped refined lead deposits are obtained on the bipolar electrodes; whereby the deposited lead has a low impurity content; whereby both nodular and dendritic growths of lead are avoided; and whereby electrical shorting in the cell is substantially reduced.

4,416,747

**PROCESS FOR THE SYNTHETIC PRODUCTION OF OZONE BY ELECTROLYSIS AND USE THEREOF**

Anton Menth, Nussbaumen, and Samuel Stucki, Baden, both of Switzerland, assignors to BBC Brown, Boveri &amp; Company Limited, Baden, Switzerland

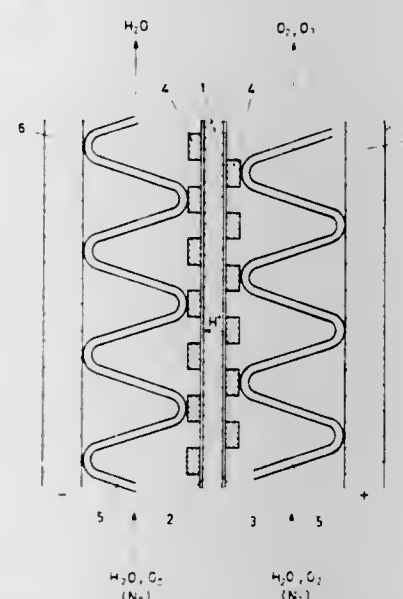
Filed Apr. 29, 1982, Ser. No. 373,107

Claims priority, application Switzerland, May 11, 1981, 3023/81

Int. Cl.<sup>3</sup> C25B 1/02

U.S. Cl. 204—129

6 Claims



1. Process for the synthetic production of ozone by electrolysis, wherein water saturated with oxygen is used as starting material and, as the electrolyte, a solid electrolyte is used, which is coated with platinum on the cathode side and with PbO<sub>2</sub> on the anode side and is in the form of a thin cation exchange membrane, wherein the oxygen-saturated water is led along, both on the cathode side and on the anode side, parallel to the solid-electrolyte membrane, and wherein the current supply to the coatings of the solid electrolyte, which serve as electrodes, is effected, in each case, via an open metallic structure having a low flow-resistance for the water, and wherein the water is simultaneously utilized for removing the heat generated during the process.

4,416,748

**PROCESS FOR REDUCTION OF THE CONTENT OF SO<sub>2</sub> AND/OR NO<sub>x</sub> IN FLUE GAS**

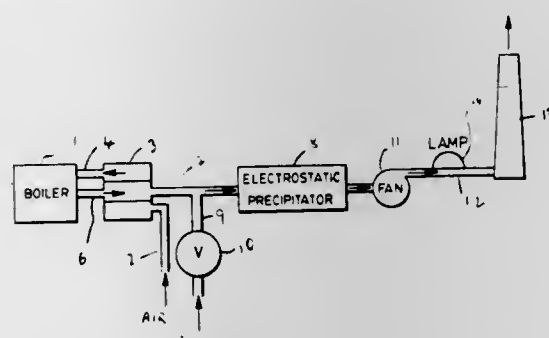
R. D. Samuel Stevens, Downsview, Canada, assignor to Concord Scientific Corporation, Downsview, Canada

Filed Sep. 8, 1981, Ser. No. 300,377

Int. Cl.<sup>3</sup> B01J 19/12, 19/24

U.S. Cl. 204—157.1 P

22 Claims



1. Process for reduction of the content of NO and NO<sub>2</sub> in flue gas containing also substantial quantities of H<sub>2</sub>O vapor comprising mixing the flue gas with NH<sub>3</sub> and irradiating the mixture with ultraviolet radiation of wavelength at least as great as about 190 nm and containing at least one component of

wavelength in the range from about 190 to about 220 nm, said radiation being substantially wholly free of any component with a wavelength below about 190 nm, and said process taking place in the absence of a solid state catalyst.

4,416,749

**CROSSLINKED ETHYLENE/VINYL ACETATE COPOLYMER FILM AND PROCESS FOR TREATING SAME**

Tibor G. Mahr, and Pallatheri M. Subramanian, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

Division of Ser. No. 259,422, May 1, 1981, Pat. No. 4,370,212.  
This application Aug. 30, 1982, Ser. No. 413,214Int. Cl.<sup>3</sup> B32B 27/30; C08F 8/12

U.S. Cl. 204—159.14

10 Claims

1. A process for treating ethylene/vinyl acetate copolymer (EVA) comprising:

- providing an EVA copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight, said film being crosslinked as a result of being subjected to a 0.5 to 16 megarad dosage of high energy radiation; and
  - alcoholizing greater than 80 percent of the acetate groups in the film to depth of 0.5 microns in the film, while alcoholizing less than 80 percent of the acetate groups at depths greater than 0.5 microns.
9. Crosslinked ethylene/vinyl acetate copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight of the copolymer comprising:
- greater than about 80 percent of the acetate in the film to a depth of 0.5 microns being hydrolyzed, and less than 80 percent of the acetate groups at depths greater than 0.5 microns being hydrolyzed.

4,416,750

**ULTRAVIOLET CURABLE BASECOATS FOR VACUUM METALLIZATION**

Edward J. Murphy, Mt. Prospect; Ronald J. Lewarchik, Arlington Hgts., and Jeffrey W. Thompson, Homewood, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 13, 1981, Ser. No. 311,057

Int. Cl.<sup>3</sup> C08G 18/00, 63/00

U.S. Cl. 204—159.19

1 Claim

1. An ultraviolet light-curable liquid coating composition for molded plastic objects comprising an alcoholic solvent solution of:

- a polyurethane oligomer polyacrylate which is a derivative of an organic solvent-soluble hydroxy functional polyester having an average molecular weight of 500–1500 and an average of at least about 2.0 hydroxy groups per molecule, each hydroxy group carrying an acrylate ester group by a plurality of urethane linkages; and
  - a hydroxy-functional polyacrylate which is constituted by an organic polyol having a molecular weight below 500 and at least about 3 hydroxy groups per molecule, said polyol being esterified to contain at least about 1.5 acrylate ester groups per molecule and having at least about 0.5 unreacted hydroxy groups per molecule;
- said polyacrylate ester being present in an amount of from 20–25% of total polyacrylate, and said solution having a solids content of from 60% to 80%, said solution further including a photoinitiator to render the composition curable on exposure to ultraviolet light.

4,416,752

**METHOD OF COATING A CONDUCTING SUBSTRATE AND COATED SUBSTRATES OBTAINED THEREBY**

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,826

Int. Cl.<sup>3</sup> C25D 13/08

U.S. Cl. 204—181 R

13 Claims

1. A method of coating a conducting substrate which comprises using the conducting substrate as the anode in an electrolyzed mixture comprising a cationically polymerizable organic material and 0.1 to 10% by weight, based on the weight of the cationically polymerizable organic material of arylodonium salt or arylsulfonium salt having an MQ<sub>d</sub> anion, where M is a metal or metalloid selected from boron, phosphorus, antimony and arsenic, Q is a halogen radical and d is an integer having a value of 4–6.

4,416,751

**PROCESS FOR PRODUCING A FERROFLUID**

Ami E. Berkowitz, and John L. Walter, both of Schenectady, N.Y., assignors to General Electric Co., Schenectady, N.Y.

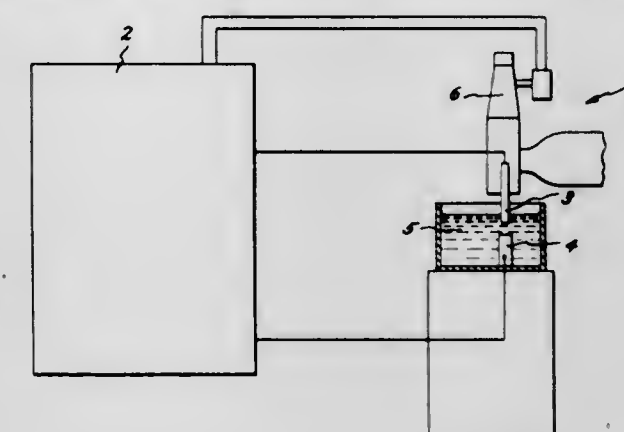
Continuation of Ser. No. 133,587, Mar. 24, 1980, abandoned.

This application Sep. 24, 1981, Ser. No. 305,310

Int. Cl.<sup>3</sup> C07C 2/80

U.S. Cl. 204—165

5 Claims



1. A process for producing a ferrofluid consisting essentially of composite particles composed of polymer-attached magnetic metallic particles in indefinite suspension in a carrier fluid which consists essentially of providing a pair of electrodes, immersing the electrodes in an organic dielectric liquid, applying a pulsed electric potential between the electrodes, adjusting the gap therebetween until there is an electric discharge eroding an electrode producing particulate magnetic material containing said composite particles composed of magnetic metallic particles adherently attached to organic polymer formed by the polymerization of said dielectric liquid, said polymer being in a fibrous or filamentary form, said electrodes being formed of a metallic composition which produces said magnetic metallic particles by said erosion, recovering said magnetic material from the dielectric liquid, and dispersing said recovered material in a carrier fluid in which said composite particles become indefinitely suspended, said composite particles being in the form of filamentary rafts or membranes of a size and density which maintains them in indefinite suspension in said carrier fluid.



4,416,753

**PROCESS FOR ELECTROCOATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE**

Wolfgang Batzill, Münster, and Horst Diefenbach, Nottuln, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany  
Filed Nov. 12, 1981, Ser. No. 320,504

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044447

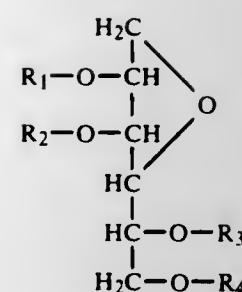
Int. Cl.<sup>3</sup> C25D 13/06, 15/00

U.S. Cl. 204—181 C

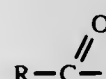
10 Claims

1. In a process for coating an electrically conductive substrate comprising connecting said substrate as the cathode in an electrocoating process, immersing said connected substrate in an electrocoating bath containing a cationic coating agent, carrying out an electrodeposition of said cationic coating agent on said substrate to produce said substrate coated with said cationic coating agent and hardening said substrate coated with said cationic coating agent, the improvement comprising said cationic coating agent comprising an aqueous dispersion comprising a mixture of:

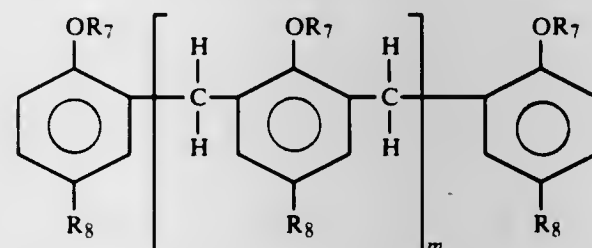
- A. water dispersed or water soluble cationic synthetic resins containing basic groups prepared by reacting resins containing epoxide groups and bases selected from the group consisting of organic amines and Mannich bases followed by protonation with acids to form a carrier resin; and
- B. dispersed, finely divided, ionic plastics selected from the group consisting of epoxide resins, polyester resins, acrylate resin, polyurethane resins and polyamide resins having ionic groups selected from the group consisting of ammonium, sulfonium and phosphonium ions neutralized with acids.



where R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are selected from  
(a) ethoxy or propoxy groups, or mixed ethoxy and propoxy groups, and  
(b) the dehydroxylated residue of a fatty acid molecule, or moiety represented by the formula



where R is a straight-chain hydrocarbon moiety which can be substituted or unsubstituted, saturated or unsaturated, and where unsaturated can contain conjugated or unconjugated double bonds, and  
at least on and up to three of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> is ethoxy, propoxy, or mixed ethoxy and propoxy groups, and  
(II) an ethoxylated or propoxylated, or admixed ethoxylated/propoxylated, phenol formaldehyde resin oil soluble demulsifier substituted at a position para to the ethoxy or propoxy group, or mixed ethoxy/propoxy groups, by a hydrocarbyl group, said modified phenol formaldehyde resin being characterized as follows:



wherein

R<sub>7</sub> represents one or more ethoxy or propoxy groups, or mixed ethoxy and propoxy groups, and  
R<sub>8</sub> is a hydrocarbyl radical selected from the group consisting of alkyl, aralkyl, cycloalkyl, aryl, alkaryl, alkenyl, and alkynyl, and  
m is an integer of one or greater, the molecular weight of said resin ranging from about 2000 to about 20,000; the ratio of demulsifier:surfactant ranging from about 1:1 to about 15:1, based on the sum total volume of the demulsifier and surfactant.

4,416,755

**APPARATUS AND METHOD FOR PRODUCING SEMICONDUCTING FILMS**

Gerald P. Ceasar, Rochester, and Scott F. Grimshaw, Fulton, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1981, Ser. No. 254,341

Int. Cl.<sup>3</sup> C23C 15/00

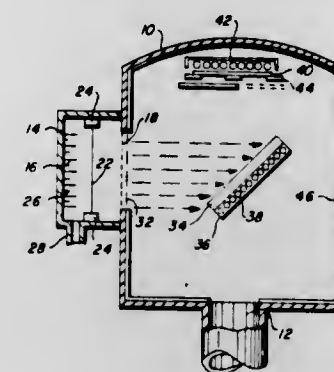
U.S. Cl. 204—192 S

27 Claims

11. In a process for dedusting oils characterized as unconventional whole heavy crudes, heavy petroleum crude fractions and residua, syncrudes and syncrude fractions which contain finely divided solids, water being admixed with said oil and the water and oil emulsified, and the emulsion then separated in an electrostatic coalescer to produce a clean oil phase which is drawn off on recovered, and a solids-containing aqueous phase, the improvement which comprises further admixing with said oil and water emulsion from about 10 parts to about 5000 parts, per million parts by volume of oil, of an admixture of compounds which comprises

- (I) an ester surfactant characterized as follows:

beams whereby sputtering of said vacuum chamber surface by said plasma is minimized, collecting said sputtered target mate-



with a fluorochemical resin water repellent comprised of a polymer or copolymer of a fluoroalkyl ester of an acid selected from the group consisting of acrylic acid and methacrylic acid, said fluoroalkyl group having from about 3 to about 15 carbon atoms.

2. The diaphragm of claim 1 in which said thermoplastic polymer is a polyolefin compound selected from the group consisting of olefins having from 2 to about 6 carbon atoms and their chloro- and fluoro-derivatives.

10. An electrolytic cell for the electrolysis of aqueous solutions of alkali metal chlorides employing the electrolyte permeable diaphragm of claim 2.

4,416,758

**GAS EXTRACTION**

Alfred C. C. Tseung, 60 Grove Ave., London N. 10, and Sameer M. Jasem, 39 Langham Rd., London N. 15, both of England  
Division of Ser. No. 137,114, filed as PCT GB 79/00060, Apr. 11, 1979, published as WO 79/00933, Nov. 15, 1979, § 102(e) date Nov. 5, 1979, Pat. No. 4,300,987. This application Jun. 22, 1981, Ser. No. 275,906

Claims priority, application United Kingdom, Apr. 14, 1978, 14752/78

Int. Cl.<sup>3</sup> C25B 9/00, 11/12; B01J 23/40

U.S. Cl. 204—258

18 Claims

**ELECTROTREATING APPARATUS WITH DEPLETABLE ANODE ROLL**

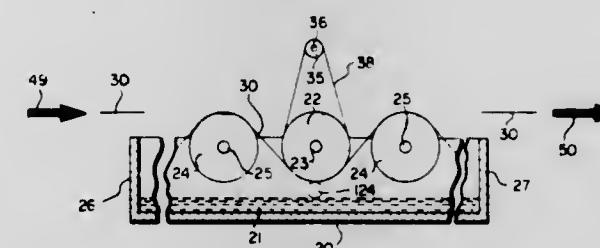
Frank A. Martin, Merrillville, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Dec. 30, 1982, Ser. No. 454,616

Int. Cl.<sup>3</sup> C25D 17/00

U.S. Cl. 204—206

14 Claims



1. An apparatus for electrotreating a continuous metal strip, said apparatus comprising:  
a depletable anode roll having an outer layer composed of plating metal, said outer layer having a peripheral surface;  
another roll axially parallel to and spaced from said anode roll, said other roll having a peripheral surface;  
a closed loop composed of electrically insulative, porous mesh having a plurality of mesh strands;  
said porous mesh extending around a portion of the peripheral surface of each roll to form said closed loop;  
some areas on said portion of the anode roll's peripheral surface being covered by said mesh strands and some areas being uncovered;  
means mounting each of said rolls for rotation;  
means, including each of said rolls, for moving each point on said porous mesh through a series of circuits along a predetermined path defined by said closed loop, in response to rotation of said depletable anode roll;  
and means for assuring that different areas on the peripheral surface of said anode roll are left uncovered by said mesh strands on different circuits of said loop, to provide for relatively uniform erosion of said outer layer of the depletable anode roll during an electrolytic plating process.

1. Oxygen extraction apparatus comprising at least one cell including a cathode for the reduction of oxygen by an electrochemical reaction thereby to produce peroxy ions, an anode adapted to regenerate oxygen, and said cell including, spaced apart from the cathode, means, other than the anode, for the catalytic decomposition of said peroxy ions.

4,416,759

**SPUTTER SYSTEM INCORPORATING AN IMPROVED BLOCKING SHIELD FOR CONTOURING THE THICKNESS OF SPUTTER COATED LAYERS**

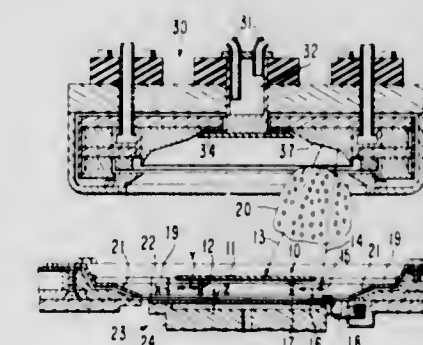
David J. Harra, Santa Cruz; Frederick T. Turner, Sunnyvale, and Martin A. Hutchinson, Santa Clara, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 27, 1981, Ser. No. 325,588

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—298

6 Claims

**COATED THERMOPLASTIC POLYMER DIAPHRAGMS AND A METHOD FOR THEIR PREPARATION**

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 22, 1978, Ser. No. 972,559

Int. Cl.<sup>3</sup> C25B 13/08

U.S. Cl. 204—252

16 Claims

1. An electrolyte permeable diaphragm for use in electrolytic processes comprised of a thermoplastic polymer coated

1. A sputter system comprising an improved blocking shield for contouring the thickness of a sputter-deposited layer, said



sputter system including a target cathode, a substrate mounting means and a means for producing a plasma in said system, said improved blocking shield comprising:

a primary blocking shield structure positioned in said sputter system in between said target cathode and said substrate mounting means, said primary blocking shield being positioned in spaced adjacency to said substrate mounting means to shadow a portion of said substrate mounting means from line-of sight exposure to said target cathode, and

an ancillary blocking shield, said ancillary blocking shield positioned in said sputter system to form an extension of said primary blocking shield in the direction of said substrate mounting means, said ancillary blocking shield being displaced inwardly from the periphery of said blocking shield by a predetermined distance and spaced a predetermined distance above said substrate mounting means and serving to shield against the lateral movement of sputtered atoms which are redirected inwardly of the bottom edge of said primary blocking shield by gas scattering collisions.

4,416,760

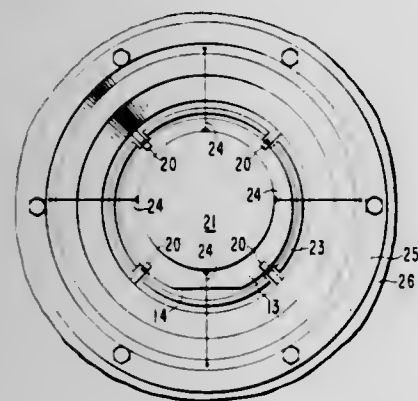
#### APPARATUS FOR ASYMMETRICALLY CONTOURING THE THICKNESS OF SPUTTER COATED LAYERS

Frederick T. Turner, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 27, 1981, Ser. No. 325,589  
Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—298

6 Claims



1. In a cathode sputtering apparatus for producing an asymmetrically contoured sputter coated layer on a substrate mounted on a substrate mounting means located in opposition to a sputter source comprising a target cathode, and blocking shield means positioned inbetween said cathode target and said substrate, said blocking shield serving to block a portion of said substrate from line-of-sight communication with said target cathode, THE IMPROVEMENT COMPRISING: said blocking shield being positioned asymmetrically and in a stationary location with respect to said substrate, said asymmetry being derived from the symmetry of said apparatus.

4,416,761

#### MULTI SLAB GEL CASTING ELECTROPHORESIS APPARATUS

Glenn E. Brown, Baltimore; Timothy P. Karpetsky, Riderwood, and Phillip Jewett, Ridgely, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

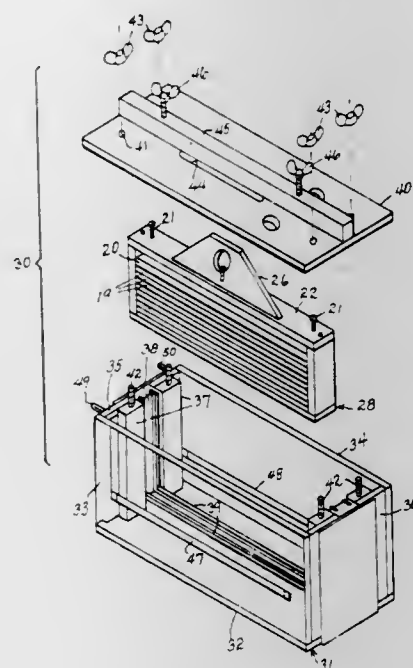
Filed Jul. 27, 1982, Ser. No. 402,353  
Int. Cl.<sup>3</sup> G01N 27/26

U.S. Cl. 204—299 R

13 Claims

1. A slab gel casting device for use in a two-dimensional electrophoresis system comprising a generally rectangular open frame-like rack, at least two elongated gel slab plates receivable longitudinally in said rack, the slab plate being formed adjacent one longitudinal edge thereof with grooves for receiving an elongated isoelectrically focussed polymer-

ized disc gel to which sample is added and subsequently electrophoresed, means to clampingly hold the gel slab plates in the rack, a gel casting receptacle, supporting means in said gel casting receptacle formed to supportingly receive said rack



and to support the rack in an inclined position in the receptacle, and said clamping means comprising clamping plate means receivable in said rack beneath its top portion, and means engaged in the top portion of the rack and clampingly engageable with said clamping plate means.

4,416,762

#### ELECTROPHORETIC APPARATUS

Junichi Akiyama, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

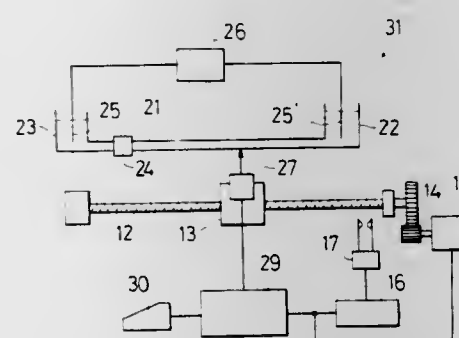
Filed Mar. 22, 1982, Ser. No. 360,765

Claims priority, application Japan, Jul. 31, 1981, 56-121018;  
Jul. 31, 1981, 56-121019

Int. Cl.<sup>3</sup> B01D 13/02

U.S. Cl. 204—299 R

8 Claims



1. An electrophoretic apparatus including a sample introduction system and a measurement system arranged in this order in an electrophoretic column connected between terminal and leading electrolyte bathes which in turn are connected to both the ends of a high voltage power supply circuit, wherein the improvement resides in that said measurement system includes means for detecting zones of respective sample component ions at different instants of time, means for detecting the lengths of zones detected, and operation means for comparing the lengths of the two corresponding zones detected at different instants of time thereby to determine that the two zones are completely separate ones when separation of said zones is completed, when their lengths can be deemed to be equal, but otherwise the same as incompletely separate zones.

4,416,763

#### AIR/FUEL RATIO DETECTING DEVICE FOR USE IN EXHAUST GAS OF IC ENGINE

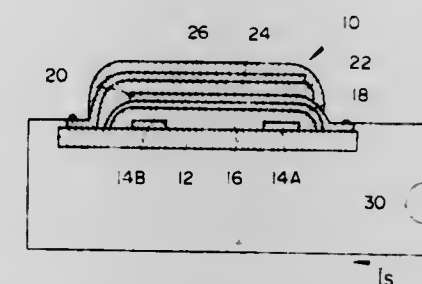
Takeshi Fujishiro, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 18, 1983, Ser. No. 467,879

Claims priority, application Japan, Feb. 27, 1982, 57-31525  
Int. Cl.<sup>3</sup> G01N 27/58; H01L 7/00

U.S. Cl. 204—412

8 Claims



1. An oxygen-sensitive air/fuel ratio detecting device for use in exhaust gas of an internal combustion engine, comprising: a body of a semiconductive oxide of a transition metal; a first pair of electrodes attached to the transition metal oxide body to measure the resistance of the transition metal oxide existing therebetween; and a combination of a microscopically porous layer of an oxygen ion conductive solid electrolyte and a second pair of electrodes attached to the solid electrolyte layer to make a DC current flow in the solid electrolyte layer from selected one of the second pair of electrodes to the other, said combination being arranged such that the exhaust gas comes into contact with the transition metal oxide body always by diffusion through the porous solid electrolyte layer and that the migration of oxygen ions in the solid electrolyte layer caused by the flow of said current takes place in substantially the same direction as the direction of said diffusion of the exhaust gas toward the transition metal oxide body or in substantially the reverse direction depending on the direction of the flow of said current.

4,416,764

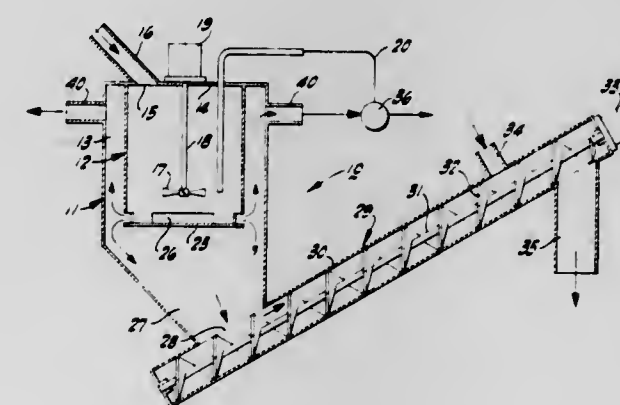
#### METHOD AND APPARATUS FOR EXTRACTING TAR SAND

Benjamin J. Gikis, Los Altos Hills; Abner Y. Jones, Menlo Park, and Rudolf Elbrecht, Los Altos, all of Calif., assignors to Natomas Energy Company, San Francisco, Calif.

Filed Nov. 28, 1980, Ser. No. 211,087

Int. Cl.<sup>3</sup> B03B 5/36; C10G 1/04; C10C 1/18; B01D 11/02  
U.S. Cl. 208—11 LE

11 Claims



1. A method of treating a mixture of sand and a solution of bitumen in a solvent, such mixture resulting from the extraction of tar sand with the solvent, the sand containing coarse particles and fine particles, such method comprising:

(a) providing an upwardly directed flow passage having an

open bottom and having an outlet above and spaced from an open bottom,

(b) causing such mixture to flow in a substantially horizontal direction into such passage above its open bottom and below its outlet,

(c) causing upward flow of solution through such passage and through its outlet, and

(d) maintaining such flow at a rate such that coarse particles of sand will sink through the open bottom of the passage and fine particles of sand will travel with the solution through the passage and its outlet.

4,416,765

#### CATALYTIC CRACKING

Arthur W. Chester, Cherry Hill; William E. Cormier, Jr., Clarksboro, and William A. Stover, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 301,851, Sep. 14, 1981, Pat. No. 4,368,114, which is a continuation-in-part of Ser. No. 100,585, Dec. 5, 1979, Pat. No. 4,309,279, which is a continuation-in-part of Ser. No. 50,588, Jun. 1, 1979, abandoned. This application Aug. 16, 1982, Ser. No. 408,109

Int. Cl.<sup>3</sup> C10G 11/05

U.S. Cl. 208—120

26 Claims

1. In a catalytic cracking process designed for cracking a petroleum fraction over an essentially entirely amorphous cracking catalyst comprising contacting said fraction with said amorphous cracking catalyst at a temperature of from about 400° F. to about 1300° F. to provide a product exhibiting a certain octane number, the improvement of contacting said fraction in said process at a temperature of from about 400° F. to about 1300° F. with a catalyst comprising a major amount of amorphous cracking component and a minor amount of crystalline zeolite component characterized by a Constraint Index of from about 1 to about 12 and a silica to alumina mole ratio of greater than about 12 whereby the product of said process exhibits an increased octane number when compared to the same process conducted with an essentially entirely amorphous cracking catalyst.

4,416,766

#### HYDROCARBON CONVERSION WITH CRYSTALLINE SILICATES

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 144,473, Apr. 28, 1980, Pat. No. 4,309,275.

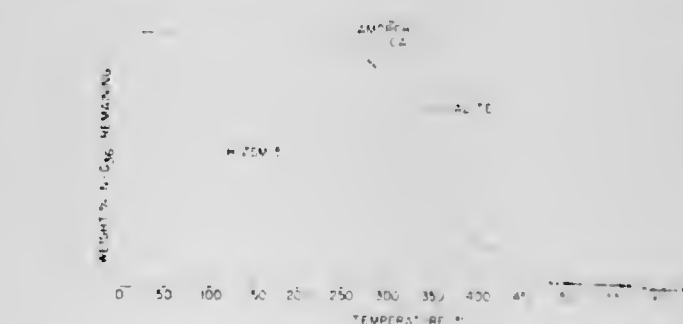
This application Oct. 22, 1981, Ser. No. 313,562

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C10G 11/05

U.S. Cl. 208—135

12 Claims



1. A process for producing olefins from normal paraffins, slightly branched paraffins, and mixtures thereof, comprising contacting a feed which comprises said paraffins with a crystalline silicate having a uniform pore structure, having a pore size such that p-xylene can be adsorbed into said pore structure and o-xylene cannot, and having a silica/alumina mole ratio greater than about 200:1; and, producing an effluent of greater olefin content than said feed.



4,416,767

# METHOD AND APPARATUS FOR THE REMOVAL OF EXCESS SODIUM REAGENT AND BYPRODUCTS OF REACTION PRODUCED DURING THE DESTRUCTION AND REMOVAL OF POLYCHLORINATED BIPHENYLS FROM OIL

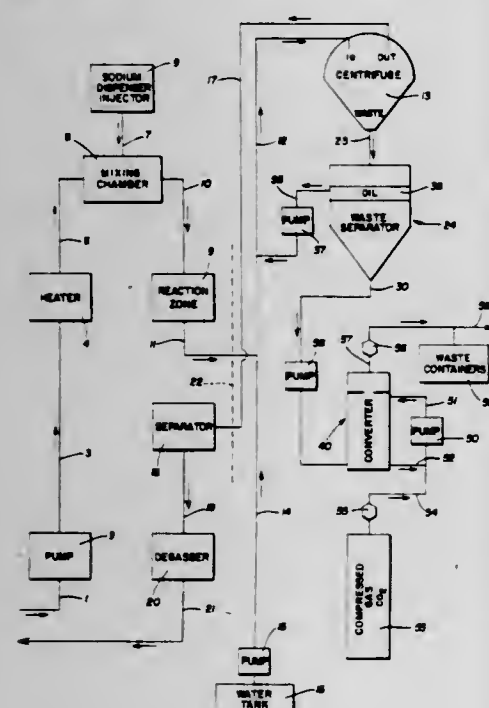
Otis D. Jordan, North Canton, Ohio, assignor to Sun-Ohio, Inc., Canton, Ohio

Filed Nov. 16, 1981, Ser. No. 322,018

Int. Cl.<sup>3</sup> C10G 29/04; C02F 1/70, 1/38, 1/40

U.S. Cl. 208—262

19 Claims



1. A method for the continuous removal of an excess sodium reagent and byproducts of reaction produced during the destruction and separation of polychlorinated biphenyl from a contaminated transformer oil in which said byproducts include sodium chloride and polyphenyl polymer, said method including the steps of:

- providing a continuous flow of the decontaminated oil containing the excess sodium reagent and byproducts of reaction produced during the destruction of the polychlorinated biphenyl in the contaminated transformer oil;
- continuously mixing a predetermined quantity of water with the oil, sodium reagent and byproducts to form an aqueous mixture containing oil, sodium hydroxide and sodium chloride, said quantity of water being continuously sufficient to convert all of the excess sodium to sodium hydroxide and to dissolve and hold in solution said sodium hydroxide;
- continuously supplying said aqueous mixture to a centrifuge;
- continuously removing the separated oil from the centrifuge; and
- removing the waste aqueous mixture remaining in the centrifuge after removal of the oil from the centrifuge for subsequent disposal.

4,416,768

## ORE BENEFICIATION

Sami S. Nosseir, Port Cartier, Canada, assignor to Quebec Cartier Mining Company, Montreal, Canada

Filed Apr. 2, 1982, Ser. No. 365,063

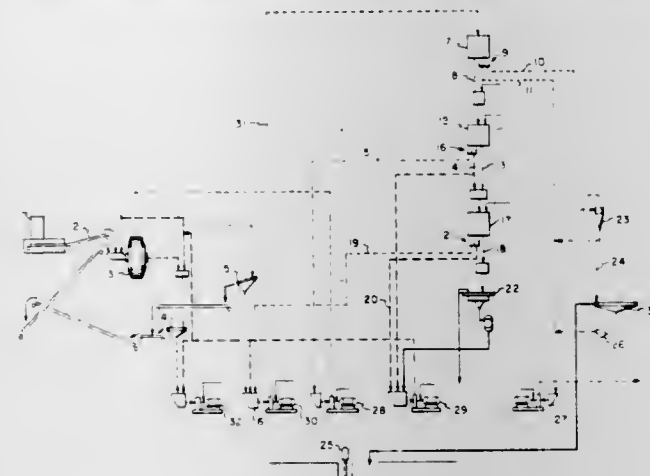
Int. Cl.<sup>3</sup> B03B 5/52

U.S. Cl. 209—3

11 Claims

- Method of processing ore comprising
- (A) grinding and screening said ore to a size containing a significant portion of locked middlings,
- (B) separating the screened undersize in a rougher spiral to obtain a low-value tailing and a concentrate which includes a major portion of locked middlings,
- (C) passing the concentrate therefrom including the locked

middlings to a cleaner spiral for separation into (i) a cleaner concentrate and (ii) a cleaner tailing, the cleaner tailing comprising (a) a cleaner water fraction and (b) a cleaner sand fraction predominating in locked middlings,



- (D) recycling the cleaner sand fraction for regrinding, and
- (E) further processing the cleaner concentrate to obtain a final product.

4,416,769

## FROTH FLOTATION

David J. A. McCaffrey, Cheltenham, England, and William D. Jones, deceased, late of Tewkesbury, England (by Barbara Jones, legal representative), assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 24, 1981, Ser. No. 334,237

Int. Cl.<sup>3</sup> B03D 1/14

U.S. Cl. 209—166

5 Claims

1. A method of treating coal by froth flotation comprising the operation of a froth flotation cell using a "collector" consisting essentially of a paraffinic residual oil having a cut point of at least 190° C. at atmospheric pressure and which has less than 10% of aromatics and less than 10% of naphthenes therein, by weight and recovering coal in the froth.

4,416,770

## SELECTIVE MINERAL RECOVERY

Clarence R. Bresson, and Robert M. Parlman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1982, Ser. No. 383,370

Int. Cl.<sup>3</sup> B03D 1/14

U.S. Cl. 209—167

8 Claims

5. A froth flotation process wherein a pulp of flotation fluid and an ore comprising a sulfide selected from the group consisting of sulfides of iron and copper and comprising a sulfide selected from the group consisting of sulfides of lead and zinc is admixed with a gaseous stream to generate a mineral containing froth and wherein said sulfide selected from the group consisting of sulfides of copper and iron is recovered from said froth,

the improvement comprising:  
incorporating into said pulp a depressant comprising beta-mercaptoethanol in an amount conducive to the suppression of said sulfide selected from the group consisting of sulfides of lead and zinc.

4,416,771

## MINE ORE CONCENTRATOR

Lance L. Henriques, 15 Claremont Ave., New York, N.Y. 10027

Filed May 23, 1981, Ser. No. 256,688

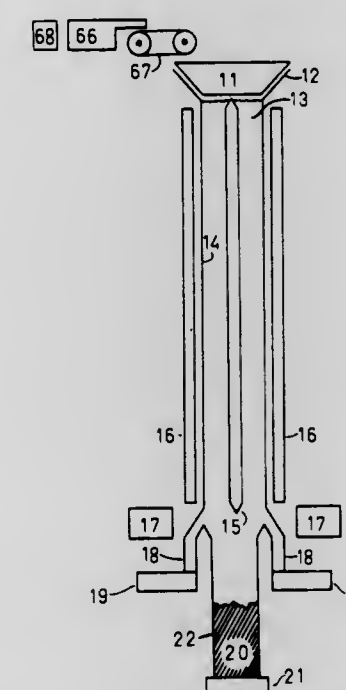
Int. Cl.<sup>3</sup> B03C 1/14

U.S. Cl. 209—224

7 Claims

1. An ore or particle concentrator comprising means form-

ing an elongated generally cylindrical separating chamber containing a supply of liquid, a first elongated core centrally fixed in said chamber and charged with high frequency current so as to establish a generally radially, outwardly extending magnetic field in said liquid, a second elongated core of generally annular form positioned radially outwardly of said chamber and also charged with current so as to establish a generally inwardly extending magnetic field, ore or particle supply



means positioned above said chamber and adapted to distribute material to be separated across the upper end of said chamber, the fields generated by said first and second cores coaxing to move influenced metal components of the material radially outwardly toward the outer wall of the chamber, while relatively uninfluenced material particles continue axially down, and means to separately remove and collect both such components from the separating chamber.

4,416,772

## APPARATUS FOR CONCENTRATING AND FILTERING BODY CAVITY FLUIDS

Takashi Sato, Kanazawa; Makoto Mukai, Fukui; Shiro Nagata, Kurashiki; Yoshimichi Harada, Okayama, and Yasuzo Kirita, Toyonaka, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jul. 24, 1981, Ser. No. 286,625

Claims priority, application Japan, Aug. 4, 1980, 55-107331

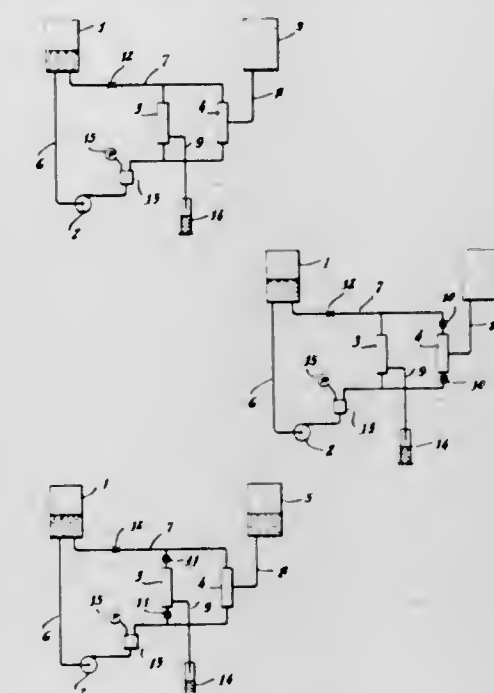
Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—137

4 Claims

1. A body cavity fluid treating apparatus which comprises a first container (1) for holding a body cavity fluid, a second container (5) for holding a concentrated body cavity fluid freed from bacteria, a pump (2) for drawing out the body cavity fluid from said first container, a concentrator (3) for concentrating the body cavity fluid, a filter (4) for filtering the body cavity fluid which has been concentrated in said concentrator, a first flow path (6) connecting said first container with the body cavity fluid inlet of the concentrator and with the body cavity fluid inlet of the filter by means of a branched tube, a second flow path (7) connecting the body cavity outlet of the concentrator and the body cavity fluid outlet of the filter, respectively, with said first container by means of a branched tube, a third flow path (8) connecting the filtrate outlet of the filter with said second container, a fourth flow path (9) connected to the filtrate outlet of the concentrator, means for closing, during the period of body cavity fluid concentration, those branches of the branched tubes in the first and second flow path which are connected to the inlet and outlet of the filter, respectively, and closing, during the period of body

cavity fluid filtration, those branches of the branched tubes in said same flow path which are connected to the inlet and outlet



of the concentrator, respectively, and a pressure adjusting means provided in the second circuit.

4,416,773

## VALVE MECHANISM FOR MULTIPLE DISTRIBUTOR FLUID TREATMENT SYSTEM

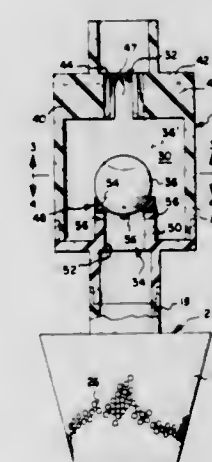
Stephen H. Davis, Middletown, and Daniel W. Simpson, Fairfield, both of Ohio, assignors to Water Refining Company, Inc., Middletown, Ohio

Filed Feb. 22, 1982, Ser. No. 350,710

Int. Cl.<sup>3</sup> B01D 23/20

U.S. Cl. 210—289

7 Claims



1. In a fluid treatment device of the type having a tank defining a treatment bed, particulate treatment material contained within said treatment bed, and a central distribution tube mounted in said bed and terminating in a plurality of distribution means, said distribution means providing fluid communication between said bed and said tube, the improvement wherein each of said distribution means comprises:

valve means having unidirectional flow restriction means such that fluid flow in a first direction from said bed through each of said distribution means to said central distribution tube is relatively unrestricted by said flow restriction means, and fluid flow in a second direction from said central distribution tube through each of said distribution means to said bed is reduced but not eliminated by said fluid restriction means.



4,416,774

**PARTICLE SEPARATING SCREEN UNIT FOR AGITATION TANK**

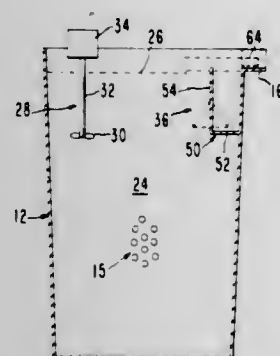
Allan D. Taylor, Walnut Creek, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Feb. 12, 1982, Ser. No. 348,535

Int. Cl.<sup>3</sup> B01D 15/00

U.S. Cl. 210—236

14 Claims



1. Apparatus for use in separating metal and other values from a slurry by adsorption with particles comprising: a tank for holding a slurry containing the values to be separated and a number of particles on which the values are to be absorbed, said tank having an outlet stub launder; a screen unit for the tank, said screen unit including a hollow body provided with an outer side opening and a screen across the side opening to permit slurry flow into the interior of the body; and means on the tank for removably mounting the screen unit in the tank in an operative position near the outlet stub launder thereof, said screen unit having a stub launder removably receivable in the outlet stub launder of the tank when the screen unit is in said operative position, said outlet stub launder being adapted for directing the slurry out of the tank after the slurry has passed through the screen unit, the screen of the screen unit being of a mesh sufficient to permit the slurry to pass from the tank into the screen unit and to prevent particles in the tank from entering the screen unit.

4,416,775

**IN-LINE FILTER AND CARTRIDGE THEREFOR**

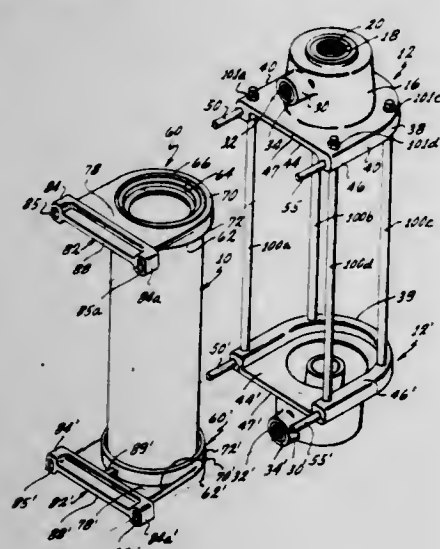
Frank Halbach, Granada Hills, and Jeffrey L. Greene, New Hall, both of Calif., assignors to STD Filter Company, Inc., Sylmar, Calif.

Filed Dec. 14, 1981, Ser. No. 330,094

Int. Cl.<sup>3</sup> B01D 27/08

U.S. Cl. 210—236

9 Claims



1. A filter assembly comprising in combination a casing having ends and containing a filter cartridge, an end fitting at each end of the casing, means holding the end fittings together including holding rods extending between the end fittings, each end fitting including a laterally moveable slide member

having a surface formed for sealing engagement with a surface of the end fitting and having an opposite side conformed for sealing engagement with the end of the said casing, and means whereby the slide members with the casing and cartridge can be removed from the unit without breaking connections to the end fittings the slide members remaining sealed to the ends of the casing.

4,416,776

**OIL FILTER CONSTRUCTION**

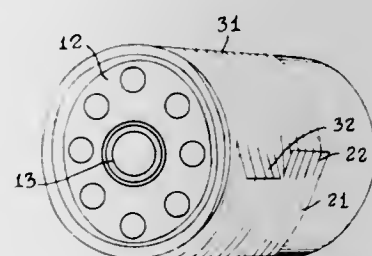
Larry G. Brundidge, 481 45th Pl., NE., Salem, Oreg. 97301

Filed Jul. 26, 1982, Ser. No. 401,677

Int. Cl.<sup>3</sup> B01D 00/00

U.S. Cl. 210—238

8 Claims



1. An improved construction for spin-on type oil filter cylinders having an open end, and a closed end; wherein the improvement comprises:

a first elongated strip of material releasably secured to the cylinder body; wherein the said first strip of material is wrapped a plurality of times around the cylinder body in the clockwise direction, and the removal of said first elongated strip of material from the filter body will tend to impart a rotary movement of the filter body in a counter-clockwise direction, and

a second elongated strip of material releasably secured to the cylinder body; wherein the said second strip of material is wrapped a plurality of times around the cylinder body in the counter-clockwise direction, and the removal of said second elongated strip of material from the filter body will tend to impart a rotary movement of the filter body in a clockwise direction,

each of the said strips of material is coated with an adhesive on its underside.

4,416,777

**SEPARATION OF LEUKOCYTES OR LYMPHOCYTES FROM LEUKOCYTE-CONTAINING SUSPENSION**

Toru Kuroda, Fuji, Yoshinori Takenaka, Saitama, and Nobuaki Tsuda, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

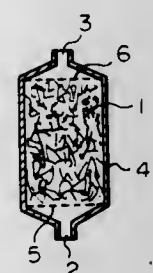
Filed Oct. 3, 1980, Ser. No. 193,571

Claims priority, application Japan, Oct. 9, 1979, 54-129482

Int. Cl.<sup>3</sup> B01D 39/02, 37/02

U.S. Cl. 210—446

19 Claims



1. A material for separating leukocytes from a leukocyte-containing suspension, which comprises a fibrous material having a surface layer coated on the fibrous material, said surface

layer consisting essentially of a substance which is capable of being dissolved by degrees in water at a dissolution rate in water of from 0.3 to 1.0 mg/min-cm<sup>2</sup> at a temperature of 30° C.

4,416,778

**MEANS FOR PREPARING NEOCYTE ENRICHED BLOOD**

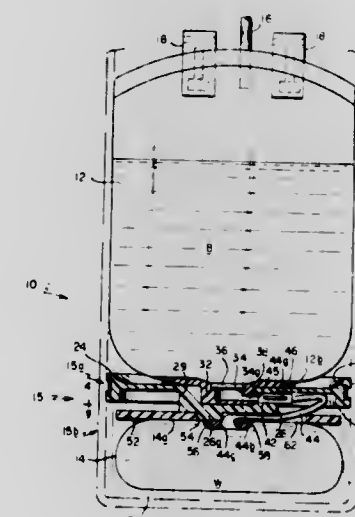
Charles H. Rogers, Duxbury, Mass., assignor to Neocyte, Inc., Rockland, Mass.

Filed Oct. 20, 1981, Ser. No. 313,343

Int. Cl.<sup>3</sup> B01D 21/26

U.S. Cl. 210—516

18 Claims



1. Apparatus for preparing neocyte-enriched blood comprising

A. means defining a first chamber,

B. means defining a second chamber, said chamber-defining means being adapted for mounting in a centrifuge for spinning therewith and having a spinning position,

C. a conduit connecting the interiors of the two chambers said conduit being positioned at the radially outer portion of said first chamber-defining means in said spinning position,

D. means for introducing a liquid into the first chamber,

E. valve means carried by the chamber-defining means and having a seated position blocking said conduit and an unseated position opening said conduit, and

F. means for seating the valve means when the chamber-defining means are subjected to centrifugal force of predetermined magnitude developed by said spinning for preventing liquid flow from the first to the second chamber as the components of the liquid are distributed in the first chamber along a density continuum and for unseating the valve means when the centrifugal force developed by said spinning drops below said predetermined magnitude to permit the flow of a selected volume of liquid from the first to the second chamber.

4,416,779

**METHOD FOR PRODUCING AN AQUEOUS SOLUTION OF HIGH PHOSPHOROUS CONTENT**

Wilhelm K. Ripl, Bernadollstrasse 72, 1000 Berlin 33, Fed. Rep. of Germany, and Bo L. Verner, Belgielei 127, 2000 Antwerpen, Belgium

Filed Sep. 28, 1982, Ser. No. 425,779

Claims priority, application Sweden, Nov. 24, 1981, 8106992

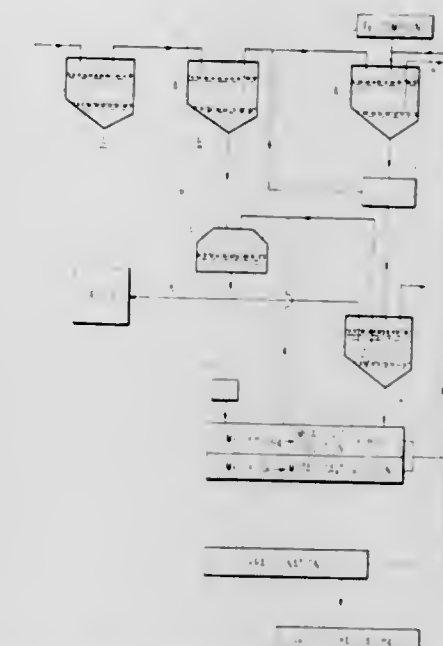
Int. Cl.<sup>3</sup> C02F 3/28

U.S. Cl. 210—603

5 Claims

1. A method for producing an aqueous solution of high phosphorous content, and for recovering metal compounds in a plant for purifying sewage-water or raw-water, said plant including at least one chemical treatment stage in which an iron compound is introduced into the sewage-water or raw-water to produce a chemical aqueous sludge containing precipitated phosphorous, the improvement which comprises treat-

ing the chemical aqueous sludge formed in the chemical treatment stage with hydrogen sulphide in a subsequent treatment stage under anaerobic conditions to dissolve the phosphorous in the water and to form a sludge containing metal sulphide, conducting away the resultant phosphorous-containing water;



dissolving the metal sulphides to form metal salt solutions by adding a strong acid to the metal sulfide-containing sludge; and separating at least an iron salt solution of the metal salt solutions and recycling said iron salt solution to the chemical treatment stage.

4,416,780

**METHOD TO UPGRADE SEWAGE TREATMENT PLANTS OVERLOADED IN CONTINUOUS OPERATION**

Dieter Disselbeck, Bad Soden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 969,842, Dec. 15, 1978, abandoned.

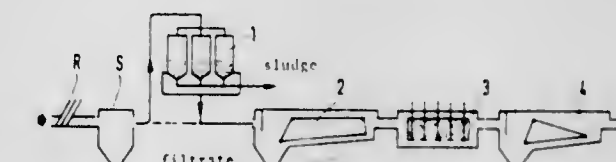
This application Dec. 9, 1981, Ser. No. 329,080

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756171

Int. Cl.<sup>3</sup> C02F 3/04

U.S. Cl. 210—617

4 Claims



1. A method of increasing the capacity of an existing sewage treatment plant comprising passing by means of gravity at least a portion of waste water through a filter device arranged (1) prior to or (2) subsequent to or (3) prior and subsequent to a conventional treatment stage of said sewage treatment plant stage, said filter device being at least one suspended, tube-like woven fabric filter element and an inner filter layer of solids resulting from solids separated during the filtration process from the waste water along the woven fabric filter thus water passes through the filter wall while separating by and in the filter layer (a) solid particles, (b) colloidal components and (c) soluble components to obtain an effluent filtrate with an increased oxygen content.



4,416,781

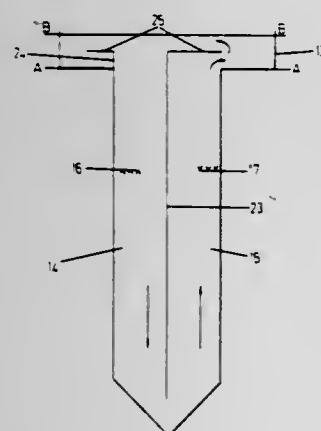
**TREATMENT OF BIOLOGICALLY-DEGRADABLE WASTE**

Martin Bailey, Norton; David A. Hines, Liverpool; John C. Ousby, Norton, all of England; Frank C. Roesler, deceased, late of Norton, England, and by Johanna M. Roesler, executrix, Cambridge, England, assignors to Imperial Chemical Industries PLC, London, England  
Division of Ser. No. 213,596, Dec. 5, 1980, Pat. No. 4,351,730, which is a continuation of Ser. No. 882,224, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 467,511, May 6, 1974, abandoned. This application Jun. 14, 1982, Ser. No. 386,186

Claims priority, application United Kingdom, May 16, 1973, 23328/73; Nov. 21, 1973, 53921/73  
Int. Cl.<sup>3</sup> C02F 3/22, 3/26

U.S. Cl. 210—629

22 Claims



1. A post start-up method for the continuous treatment of sewage by the activated sludge technique utilising a circulatory system which includes a downcomer, a riser, and a basin, the lower ends of the riser and downcomer being connected directly to form a closed zone and their upper ends being operably connected through the basin, the method comprising performing the following steps in a continuous manner:

- circulating a sludge-containing liquid round the circulatory system so that it flows down the downcomer, into the riser, up the riser, and, from the upper end of the riser, back into the downcomer via passage through the basin,
- introducing a gas containing free oxygen into the downcomer,
- disengaging gas from the liquid in the basin before it is recycled back to the downcomer,
- feeding sewage into the circulatory system, and
- discharging part of the liquid from the circulatory system,

the liquid being circulated at such a rate that

- the velocity of the liquid down the downcomer is at least sufficient to entrain substantially all of the gas introduced into the downcomer so that the entrained gas flows concurrently down the downcomer with the liquid, and said liquid, along with entrained gas, at least some of which will dissolve as the liquid descends the downcomer, is transferred at the lower end of the downcomer into the riser, and
- the time taken for one circulation of the liquid around the circulatory system is at least 2 minutes, and the rates at which said sewage is fed to the circulatory system and said liquid is discharged from the circulatory system being such that the average residence time of the sewage in the circulatory system
- corresponds to a plurality of circulations of said liquid round the circulatory system, and
- is at least about one quarter hour.

4,416,782

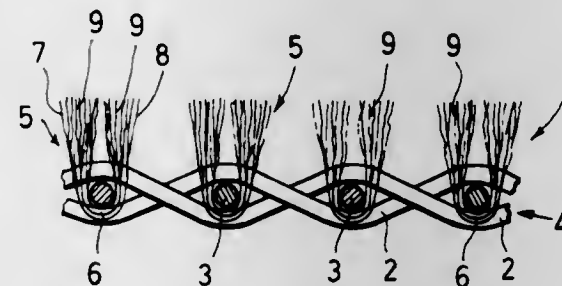
**METHOD FOR SEPARATING OIL FROM AQUEOUS OR SOLVENT DISPERSIONS**

Bruno Kerres, Nettetal, Austria, assignor to Girmes-Werke AG, Fed. Rep. of Germany  
Continuation of Ser. No. 215,371, Dec. 11, 1980, abandoned.  
This application Mar. 18, 1982, Ser. No. 359,190  
Claims priority, application European Pat. Off., Dec. 12, 1979, 79105115.4

Int. Cl.<sup>3</sup> B01D 17/04

U.S. Cl. 210—634

7 Claims



1. A method for separating oil from oil bearing aqueous or solvent liquid dispersions wherein the oil has a lower density than the liquid dispersions, said method being characterized in that an oil containing liquid dispersion is passed through a porous textile flat-shaped article having upstanding free ended piles formed at least partly of oleophilic fibers each having a titer between 0.05 and about 0.5 dtex whereby very small oil drops having a diameter of about 1 to 30 microns in the dispersions are withheld on the oleophilic fibers and coalesce to larger oil droplets which rise to the surface of the liquid dispersions due to their lower density than the liquid dispersions, the said porous textile article being thereby continuously and automatically cleaned by said coalescence from oil agglomerations, so that the fibers are always prepared for new coalescing actions.

4,416,783

**LIQUID CHROMATOGRAPHY COLUMN, PROCESS FOR PREPARING THE SAME AND ITS USE FOR FRACTIONATION**

Kohji Noguchi, and Masao Kasai, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

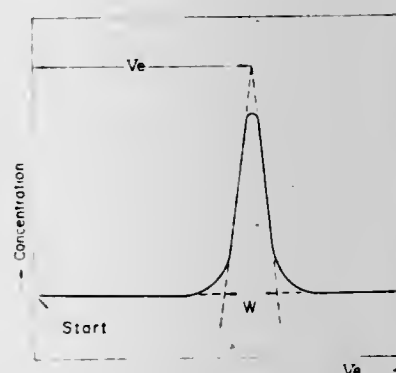
Filed Jan. 20, 1982, Ser. No. 341,040

Claims priority, application Japan, Feb. 12, 1981, 56-17985

Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210—635

18 Claims



18. A method of blood component analysis which comprises developing blood serum on a liquid chromatography column comprising a high packing ratio of gel bed of a totally porous polymer containing vinyl alcohol units and having a weight average grain diameter of 4 to 20  $\mu$ m, and wherein the gel bed has a uniformity degree of 2.0 to 4.0, said uniformity degree

being defined by HETP/Dp, in which HETP represents the height equivalent to a theoretical plate of the column and Dp represents the weight average grain diameter of the polymer.

4,416,784

**FILLING COMPOSITION FOR USE IN LIQUID CHROMATOGRAPHY**

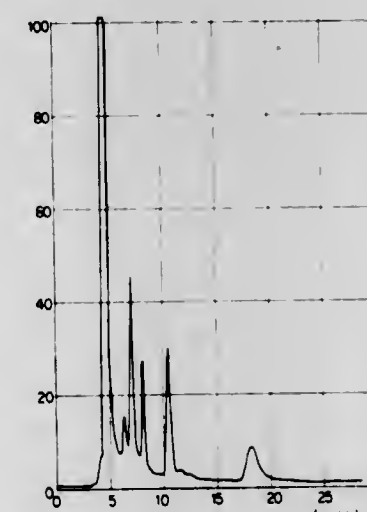
Masaaki Nakao, Kunitachi, and Fumio Kodama, Chofu, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Continuation-in-part of Ser. No. 116,215, Jan. 28, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,350

Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210—635

6 Claims



1. A method for analytically examining a physiological specimen by liquid column chromatography comprising the steps of:

- stabilizing a column comprised of bead-like hydroxymethylated copolymer of styrene and divinylbenzene by passing a phosphate buffer solution or citrate buffer solution in the range of pH 6.5 to 8.0 through the column at a temperature of 5° to 70° C.;
- further stabilizing the column by passing an aqueous solution of serum protein containing 0.2 to 5.0% by weight of said serum protein through the column at a temperature of 5° to 70° C. wherein the serum protein is absorbed onto the column; and
- passing the physiological specimen to be examined through the buffer and protein stabilized column at a temperature of 20° to 40° C. in order to examine the specimen.

4,416,785

**SCALE-INHIBITING COMPOSITIONS OF MATTER**

Russell O. Menke, Valenica, and Michael Bortnik, Los Angeles, both of Calif., assignors to UOP Inc., Des Plaines, Ill.

Filed May 17, 1982, Ser. No. 379,209

Int. Cl.<sup>3</sup> C02F 5/12, 5/14

U.S. Cl. 210—699

7 Claims

1. A composition of matter for inhibiting the formation of scale in a fluid system which is exposed to an aqueous stream which comprises an alkaline mixture of polyvinyl pyrrolidone and aminotri(methylene phosphonic acid).

4,416,786

**PROCESS FOR THE TREATMENT OF CONTINUOUS WASTE WATER STREAMS HAVING CHANGING CONTENTS OF DIFFERENT OXIDIZABLE MATERIALS WITH HYDROGEN PEROXIDE**

Helmut Knorre, Seligenstadt; Joachim Fischer, Rodenbach, and Klaus Stützel, Frankfurt, all of Fed. Rep. of Germany, assignors to Degussa, Frankfurt, Fed. Rep. of Germany

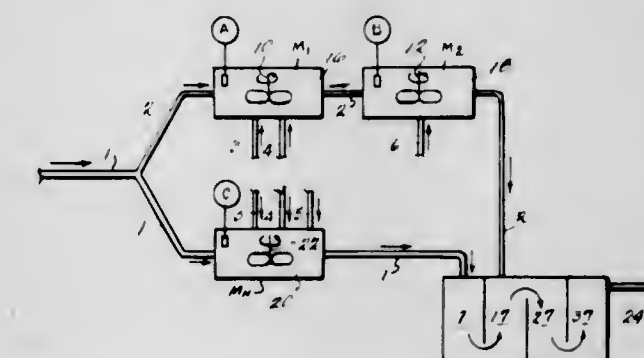
Filed Jun. 28, 1982, Ser. No. 392,464

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 3125452

Int. Cl.<sup>3</sup> C02F 1/72

U.S. Cl. 210—746

20 Claims



1. A process for the treatment of a continuous main waste water stream having a varying content of different oxidizable materials with hydrogen peroxide for the purpose of detoxification and reduction of the chemical oxygen demand and biological oxygen demand, comprising diverting a small portion of the main waste water stream to form a side stream and controlling the amount of hydrogen peroxide added to the main stream by ascertaining the oxidizing agent demand in the side stream by:

- adjusting the pH of the waste water by dosing of alkali or acid continuously to a constant pH value between 3 and 12,
- continuously measuring the redox potential with a platinum, silver, gold, or ion selective electrode and a reference electrode and dosing an aqueous solution of a strong oxidizing agent acting more quickly than H<sub>2</sub>O<sub>2</sub> under comparable conditions until the desired redox value is reached corresponding to the sought breakdown of the toxic material, and then always when the strong oxidizing agent is dosed into the side stream simultaneously adding into the main stream proportional amounts of H<sub>2</sub>O<sub>2</sub> and any necessary further chemicals.

4,416,787

**SOIL RESISTANT YARN FINISH FOR SYNTHETIC ORGANIC POLYMER YARN**

Robert M. Marshall, Chester; William A. Archie, Petersburg, and Kimon C. Dardoufas, Richmond, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 1, 1982, Ser. No. 437,977

Int. Cl.<sup>3</sup> D06M 13/46

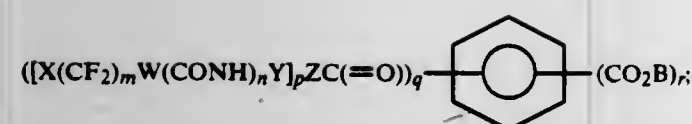
U.S. Cl. 252—8.8

30 Claims

1. A yarn finish composition comprising:

- 15 to 80 weight percent of a quaternary ammonium salt selected from the group consisting of alkyl dodecyl ammonium salt and cocotrialkyl ammonium salt, wherein the alkyl is methyl or ethyl and the anion of the salt is selected from the group consisting of chloride, bromide, iodide, sulfate, ethosulfate, methosulfate and mixtures thereof; and
- 20 to 85 weight percent of a fluorochemical compound having the formula





wherein the attachment of the fluorinated radicals and the radicals CO<sub>2</sub>B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; (CF<sub>2</sub>)<sub>m</sub> and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH<sub>2</sub>RCHOH or is CH<sub>2</sub>RCHOCH<sub>2</sub>RCHOH where "R" is hydrogen or methyl, or "B" is CH<sub>2</sub>CH(OH)CH<sub>2</sub>Q where Q is halogen, hydroxy, or nitrile; or "B" is CH<sub>2</sub>CH(OH)CH<sub>2</sub>OCH<sub>2</sub>CH(OH)CH<sub>2</sub>Q; and r is an integer of at least 1 but not greater than q; and X(CF<sub>2</sub>)<sub>m</sub>, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different.

4,416,788

#### METAL CUTTING OIL AND METHOD FOR USING SAME

Dominic A. Apikos, Crown Point, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Oct. 13, 1981, Ser. No. 310,359

Int. Cl.<sup>3</sup> C10M 1/38, 1/26

U.S. Cl. 252—31

24 Claims

1. A lubricating oil composition comprising a major amount of mineral oil of lubricating viscosity; a minor, effective amount of at least one added sulfur-containing compound; a minor, effective amount of elemental sulfur, said sulfur-containing compound and said elemental sulfur being present each individually in an amount soluble in said composition at 40° F. and being present in combination in an amount effective to improve the extreme pressure properties of said composition and a minor, effective amount of at least one ester component to improve the lubricity of said composition and to increase the solubility of elemental sulfur in said composition, said composition being transparent.

4,416,789

#### HIGH DENSITY INFORMATION DISC LUBRICANTS

Igal Shidlovsky, Princeton, N.J., and William E. Harty, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

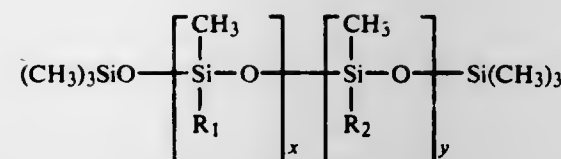
Filed Feb. 1, 1982, Ser. No. 344,535

Int. Cl.<sup>3</sup> B32B 3/02; C10M 3/44

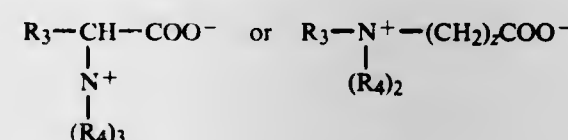
U.S. Cl. 252—34.7

8 Claims

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula



wherein R<sub>1</sub> and R<sub>2</sub> are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises adding to said lubricant a long chain alkyl substituted betaine selected from the group consisting of



wherein R<sub>3</sub> is a long chain alkyl group of 6–20 carbon atoms, R<sub>4</sub> is hydrogen or alkyl of 1–3 carbon atoms and z is an integer.

4,416,790

#### PASTE-LIKE DAMPING MEDIUM AND METHOD FOR ITS MANUFACTURE

Helmut Schürmann, Dachau, and Erich Brand, Munich, both of Fed. Rep. of Germany, assignors to Schiedel GmbH & Co., Munich, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,248

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107996

Int. Cl.<sup>3</sup> C04B 43/00; C10M 5/04

U.S. Cl. 252—62

20 Claims

1. A paste-like damping medium for damping mechanical and/or acoustic vibrations, based on a liquid phase of silicone oil, polyglycol, mineral oil and/or a thermally-stable saturated aliphatic or aromatic carboxylic acid ester, a wetting agent and an agent for stabilizing the intrinsic viscosity, characterized in that it contains approximately 20 to approximately 80% by weight of at least one solid, 80% of which has a particle size of < 20 μm, selected from the group comprising aluminum oxide, aluminum hydroxide, aluminum carbonate, aluminum triphosphate, aluminum silicate, cryolite, barium sulfate, calcium carbonate, calcium hydroxide, calcium triphosphate, calcium fluoride, magnesium oxide, magnesium carbonate, magnesium silicate, magnesium-aluminum silicate, magnesium stearate, lithium stearate, molybdenum sulfide, silicon dioxide, sillimanite, titanium dioxide, zinc sulfide, zinc pyrophosphate and polytetrafluoroethylene, approximately 0.1 to 4% by weight of a wetting agent, approximately 0.5 to 10% by weight of a finely-divided stabilizer of the intrinsic viscosity of at least one member separately selected from the group consisting of magnesium silicate, magnesium-aluminum silicate, aluminum silicate and silicic acids, and approximately 0.1 to 5% by weight of an antioxidant, the % weight being based in each case on the total weight of the damping medium.

4,416,791

#### PACKAGING FILM AND PACKAGING OF DETERGENT COMPOSITIONS THEREWITH

Zia Haq, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,390

Claims priority, application United Kingdom, Nov. 11, 1981, 8133992

Int. Cl.<sup>3</sup> C11D 17/00

U.S. Cl. 252—90

21 Claims

1. A package consisting wholly or partially of plastics film material at least partially soluble in water, wherein said film is provided on its inside surface with a protective layer, in partic-

ulate form, of an inert plastics material having a contact angle to water of at least 80°, whereby said inside surface is protected



from attack by aqueous media while said film on its outside surface is vulnerable to attack by aqueous media.

4,416,792

#### IMINODIPROPIONATE CONTAINING DETERGENT COMPOSITIONS

Paul C. Blackstone, Collingswood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 320,390, Nov. 12, 1981, Pat. No. 4,375,422. This application Sep. 17, 1982, Ser. No. 419,357

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

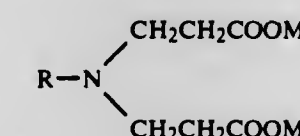
Int. Cl.<sup>3</sup> C11D 1/10, 1/83, 3/075, 11/02

U.S. Cl. 252—110

10 Claims

1. An aqueous detergent slurry composition having a solids content of about 55 to about 75% by weight consisting essentially of:

- (a) about 10%–60% builder;
- (b) about 2%–25% nonionic surfactant;
- (c) 0% to about 30% other ingredients;
- (d) an effective amount to substantially prevent separation of the nonionic from the detergent composition of a surface active iminodipropionate of the general formula:



wherein R is an alkyl, hydroxyalkyl or alkoxyalkyl group containing from about 10 to about 18 carbon atoms and M is an alkali metal cation; and

- (e) the remainder water whereby said nonionic does not undergo substantial separation from said composition.

4. A detergent composition according to claim 1 wherein said other ingredient is selected from one or more of the following: soaps, suds stabilizers, coloring dyes, organic solvents, fluorescent dyes, co-surfactants, carboxymethylcellulose, enzymes, naturalized copolymers of ethylene and maleic anhydrides and perfumes.

4,416,793

#### LIQUID DETERGENT COMPOSITIONS CONTAINING AMINO-SILANES

Christian R. Barrat; John R. Walker, both of Brussels, and Jean Wevers, Strombeek-Bever, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 22, 1982, Ser. No. 421,187

Claims priority, application United Kingdom, Sep. 25, 1981, 8129069

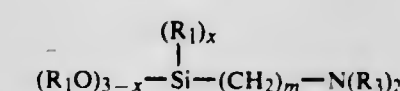
Int. Cl.<sup>3</sup> C11D 9/36, 3/30

U.S. Cl. 252—117

6 Claims

1. A liquid detergent composition having improved machine compatibility, particularly in relation to enamel-coated surfaces, comprising:

- (a) from 5% to 60% by weight of a synthetic organic surface-active agent;
- (b) from 0% to 40% by weight of a detergent builder;
- (c) from 0.001% to 1% by weight of an amino-silane having the formula

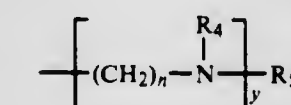


R<sub>1</sub> = C<sub>1-4</sub>-alkyl or C<sub>1-4</sub>-hydroxyalkyl;

x is 0 or 1;

m is 1–6;

R<sub>3</sub> is hydrogen, R<sub>1</sub>, C<sub>1-6</sub>-alkylamine,

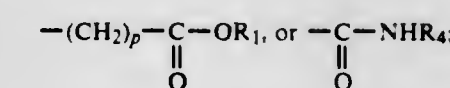


R<sub>4</sub> is hydrogen or R<sub>1</sub>;

n is 1–6;

y is 0–6;

R<sub>5</sub> = R<sub>4</sub>;



p = 1–6;

said composition having a pH, as is, in the range from 6 to 12.

5. A substantially homogeneous liquid detergent composition containing surface-active agents, fatty acid soaps and other conventional detergent additives, characterized in that it contains:

- (a) from 20% to 40% by weight of a mixture of anionic surface-active agents and nonionic surface-active agents in a weight ratio of from 4:1 to 1:4;
- (b) from 10% to 25% of a C<sub>12</sub>–C<sub>18</sub> fatty acid soap; and
- (c) from 0.01 to 0.5 of the amino-silane in accordance with claim 1;

said composition having a pH, measured as is, in the range from 7 to 9.

4,416,794

#### RINSE AID COMPOSITIONS CONTAINING AMINO-SILANES

Christian R. Barrat; John R. Walker, both of Brussels, and Jean Wevers, Strombeek-Bever, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 22, 1982, Ser. No. 421,185

Claims priority, application United Kingdom, Sep. 25, 1981, 81/29067

Int. Cl.<sup>3</sup> C11D 3/30

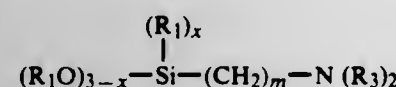
U.S. Cl. 252—174.15

6 Claims

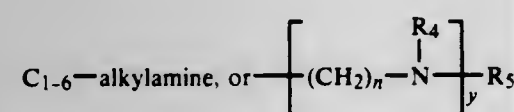
1. A liquid rinse aid composition for use in an automatic dishwashing machine comprising from 1–40% by weight of a low foaming ethoxylated nonionic surfactant, from 0–30% by



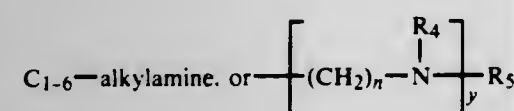
weight of an organic chelating agent and a hydrotrope-water solubilising system characterised in that the composition comprises from 0.05-10% by weight of an amino-silane of the general formula:



$R_1 = C_{1-4}$ -alkyl or  $C_{1-4}$ -hydroxyalkyl;  
 $x$  is 0 or 1;  
 $m$  is 1-6;  
 $R_3$  is hydrogen,  $R_1$ ;



$R_5$   
 $R_4$  is hydrogen or  $R_1$ ;  
 $n$  is 1-6;  
 $y$  is 0-6;  
 $R_5 = R_4$ .



$p = 1-6$ .

4,416,795

#### MIXTURES OF OPTICAL BRIGHTENERS

Thomas Martini, Kelkheim; Hans Frischkorn; Erich Schinzel, both of Hofheim am Taunus, and Heinz Probst, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,561

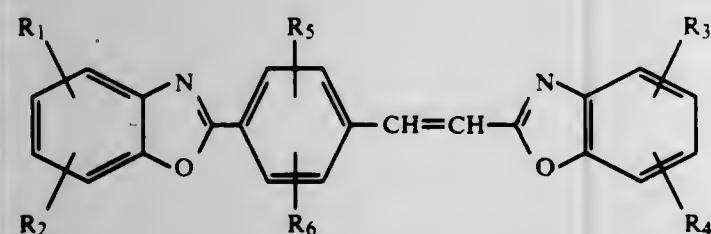
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3104992

Int. Cl.<sup>3</sup> C09K 11/06

U.S. Cl. 252-301.23

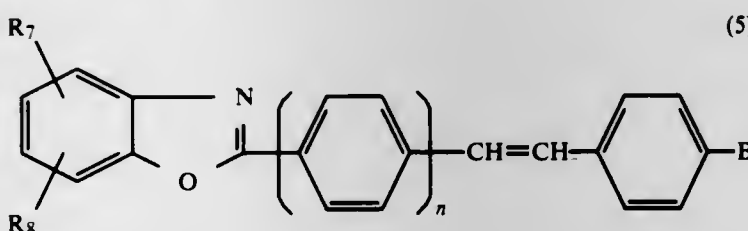
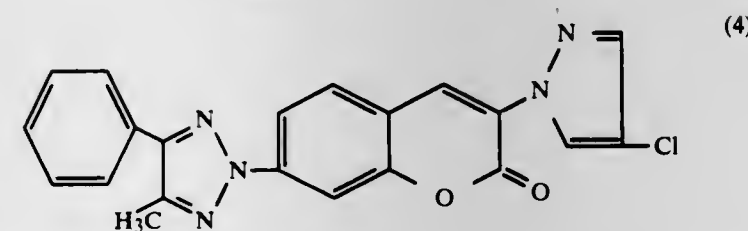
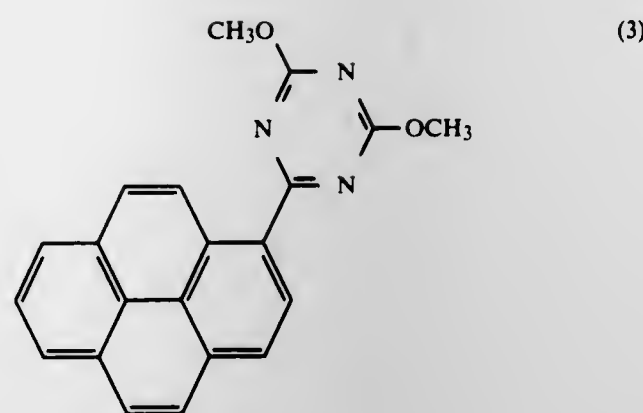
5 Claims

1. A mixture of optical brighteners, which contains  
 (a) 1 to 99% by weight of one or more compounds of the formula (I)

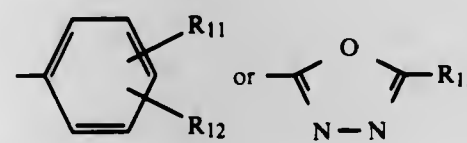
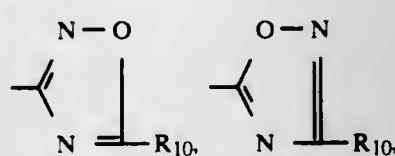


wherein  $R_1, R_2, R_3, R_4, R_5$  and  $R_6$  can be identical or different and denote hydrogen, chlorine,  $C_{1-4}$ -carbalkoxy,  $C_{1-4}$ -alkyl or  $C_{1-4}$ -alkoxy and

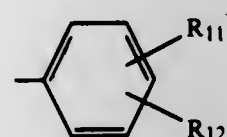
(b) 99 to 1% by weight of one or more compounds of the formulae



in which  $n$  denotes 0 or 1,  $R_7$  and  $R_8$  denote identical or different radicals from the group comprising hydrogen, fluorine, chlorine, phenyl, trifluoromethyl,  $C_{1-4}$ -alkyl, alkoxy, cyano, carbonyl, carboalkoxy, carboxamide and alkyl sulfonates, and two adjacent radicals  $R_7$  and  $R_8$  together can also represent a benzene ring, a lower alkylene group or a 1,3-dioxapropylene group,  $B$  denotes cyano, a group of the formula  $-COOR_9$  or  $CONR_9R_9$ , in which  $R_9$  denotes hydrogen,  $C_{1-18}$ -alkyl, cycloalkyl, aryl, alkylaryl, halogenoaryl, aralkyl, alkoxyalkyl, halogenoalkyl, hydroxyalkyl, carboxyalkyl or carboalkoxyalkyl, or two alkyl radicals or alkylene radicals of the meaning of  $R_9$  together with the nitrogen atom can also form a morpholine, piperidine or piperazine ring, or  $B$  denotes a group of the formulae



in which  $R_{10}$  denotes a straight-chain or branched alkyl group having 1-18 C atoms, preferably 1-6 C atoms, which can be substituted by hydroxyl groups, halogen atoms, alkoxy radicals, aryloxy radicals or aryl radicals, or  $R_{10}$  denotes a group of the formula  $-(CH_2CH_2O)_n-R$  with  $n$  denoting 1, 2 or 3 and  $R$  denoting H or alkyl, or  $R_{10}$  denotes a radical of the formula



$R_{11}$  and  $R_{12}$  denote identical or different radicals from the group comprising hydrogen, fluorine, phenyl, alkyl, alkoxy,

acylamino, cyano, carbonyl, carboalkoxy, carboxamide and alkyl sulfonates, and two adjacent radicals  $R_{11}$  and  $R_{12}$  together can also represent an alkylene group, a fused-on benzene ring or a 1,3-dioxapropylene group, and  $R_{13}$  denotes a phenyl ring which can be substituted by an alkyl group, a cyano group or a carbalkoxy group.

4,416,796

#### EMULSION-BREAKING COMPOSITION

Roland Böhm, Kelkheim, and Martin Hille, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,473

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2854975

Int. Cl.<sup>3</sup> B01D 17/04

U.S. Cl. 252-338

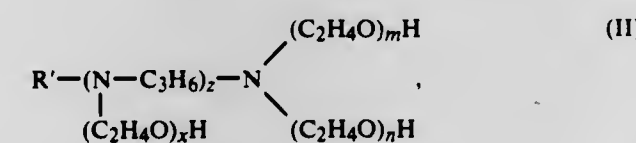
6 Claims

1. Surface active neutral salts of sulfonic acids of the formula I



wherein

$A$  stands for a saturated aliphatic hydrocarbon radical or an aliphatic hydrocarbon radical having one olefinic double bond each having 3 carbon atoms, or a mononuclear or binuclear aromatic radical, especially phenyl or naphthyl,  $C_6H_5$  or  $C_{10}H_7$ ,  $R_1$  stands for alkyl or alkenyl having from 1 to 21 carbon atoms, especially 1 to 18 carbon atoms and  $R_2$  and  $R_3$  each stand for hydrogen or alkyl having from 1 to 4 carbon atoms, and of oxethylated aliphatic amines of the formula II



wherein

$R'$  stands for a saturated aliphatic hydrocarbon radical or an aliphatic hydrocarbon radical having one or two olefinic double bonds each radical having from 8 to 25, preferably 10 to 2, carbon atoms,  $z$  stands for 0 or 1 and  $m, n$  and  $x$  each stand for integers of from 0 to 20, the sum of  $m, n$  and  $x$  amounting to an integer of from 5 to 40, as demulsifiers for the demulsification of water-containing crude oil and oil sludge emulsions.

4,416,797

#### CHLORINATED ORGANIC COMPOUNDS HAVING THEIR RESISTANCE TO DETERIORATION ENHANCED BY 1,3-DICARBONYL COMPOUNDS

Motonobu Minagawa, Kosigaya; Tetsuyu Inoue, Warabi, and Naoyasu Kurita, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Feb. 19, 1981, Ser. No. 235,817

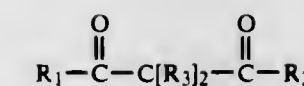
Claims priority, application Japan, Mar. 3, 1980, 55-26256; May 19, 1980, 55-66081

Int. Cl.<sup>3</sup> C09K 15/32

U.S. Cl. 252-400 A

23 Claims

1. A chlorinated organic compound having an enhanced resistance to deterioration, comprising a chlorinated organic compound selected from the group consisting of chlorinated hydrocarbons having from one to about fifty carbon atoms and chlorinated higher fatty acid esters having from ten to about thirty carbon atoms and an effective amount of a 1,3-dicarbonyl compound having the formula:

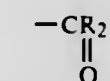


wherein:

$R_1$  is selected from the group consisting of hydrogen, hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy  $OR_1$ , ester  $COOR_1$ , alkyl and alkoxy carbonyl alkyl having from one to about eighteen carbon atoms;

$R_2$  is selected from the group consisting of hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy  $OR_1$ , ester  $COOR_1$ , alkyl and alkoxy carbonyl alkyl having from one to about eighteen carbon atoms; and

$R_3$  is selected from the group consisting of hydrogen, hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy  $OR_1$ , ester  $COOR_1$ , alkyl and alkoxy carbonyl alkyl having from one to about eighteen carbon atoms; and



provided, when both  $R_3$  are hydrogen, at least one of  $R_1$  and  $R_2$  is other than methyl.

4,416,798

#### PULSED REGENERATION OF ADSORPTION COLUMN

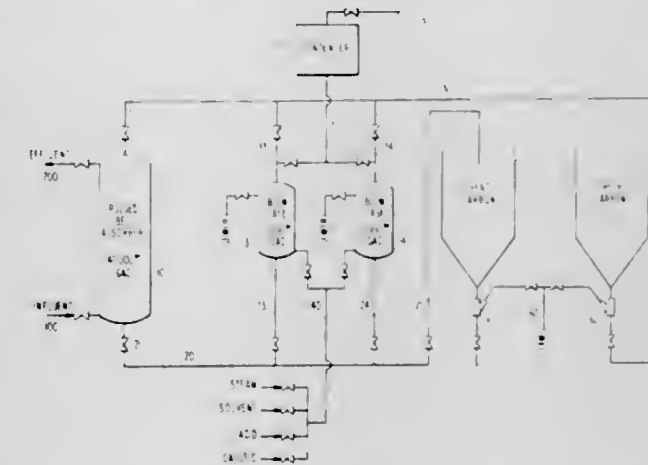
Donald G. Hager, Tucson, Ariz.; Michael L. Massey, Covington, Va., and Frederick Rubel, Jr., Tucson, Ariz., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,566

Int. Cl.<sup>3</sup> B01J 20/34; B01D 15/00

U.S. Cl. 502-420

2 Claims



1. A method of regenerating adsorptive material used in an adsorptive fluid treatment column comprising the steps of:

- delivering influent to one face of a vertical column of adsorptive material;
- withdrawing effluent from another face of said vertical column;
- periodically withdrawing from the one face of said column a fractional portion of spent adsorptive material and depositing same in a first ancillary pressure vessel;
- replenishing said column at the other face with a similar fractional portion of steam regenerated adsorptive material drawn from a second ancillary pressure vessel; and
- regenerating said first vessel spent material with steam over the period between successive withdrawals of said



material whereby the spent material portion in said first vessel withdrawn during a first transfer interim becomes the regenerated material portion supplied by said second vessel during a second, successive transfer interim.

2. A method as described by claim 1 wherein said spent material regeneration is a steam sterilization process.

4,416,799

# CATALYTIC COMPONENT FOR POLYMERIZING $\alpha$ -OLEFIN AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF $\alpha$ -OLEFIN

Masaru Takitani, Keikichi Baba, and Shizuo Tomiyasu, all of Shinnanyo, Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 214,715, Dec. 9, 1980, abandoned. This application Nov. 1, 1982, Ser. No. 438,400

Claims priority, application Japan, Dec. 18, 1979, 54-165336 Int. Cl.<sup>3</sup> C08F 4/64

U.S. Cl. 502—156

19 Claims

1. A catalytic component for polymerization of an  $\alpha$ -olefin, said catalytic component being prepared by the following steps:

- (1) reacting an organic acid ester with an organo-magnesium compound expressed by a general formula  $RMgR'$ , wherein R and R' represent the same or different hydrocarbon radicals having 1-10 carbon atoms;
- (2) reacting the product of step (1) with carbon tetrachloride;
- (3) treating the resultant product from step (2) with a phenol compound; and
- (4) treating the product from step (3) with a titanium compound containing halogen.

4,416,800

# METHOD FOR PRODUCING A CATALYST AND A CARRIER THEREFOR INCLUDING HEAT-RESISTANT FIBERS

Kazunobu Abe, Izumi, and Tadao Nakatsuji, Matsubara, both of Japan, assignors to Sakai Chemical Industry Co., Ltd., Japan Division of Ser. No. 72,599, Sep. 5, 1979, Pat. No. 4,280,926.

This application Mar. 19, 1981, Ser. No. 245,687

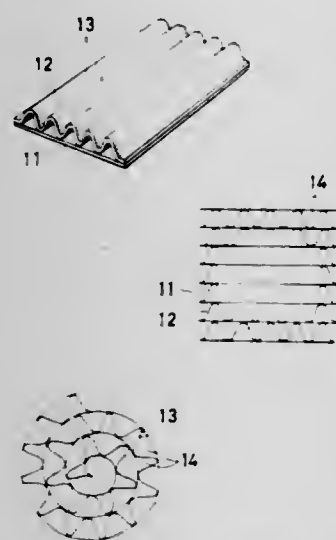
Claims priority, application Japan, Sep. 12, 1978, 53-112558; Jan. 9, 1979, 54-1694; Apr. 27, 1979, 54-53186

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B01J 35/04, 31/28, 21/14, 21/12

U.S. Cl. 502—159

19 Claims



1. A method for producing a catalytic material, which consists essentially of admixing

- (a) a slurry prepared by beating at least one of inorganic fibers of about 1-20 mm in fiber length and of about 0.1-30 microns in diameter selected from the group consisting of asbestos fiber, silica fiber, silica-alumina fiber, chrysotile fiber, rock wool, glass fiber, anthophyllite fiber, potassium titanate fiber, carbon fiber and ceramic fiber, in water, and
- (b) at least one powdery water-insoluble carrier material

selected from the group consisting of titanium oxide and aluminum oxide or a powdery water-insoluble precursor of the carrier material which will be converted into the oxide when calcined,

thereby forming a stock material containing the solid components of fiber and carrier material in an amount of 1-10% by weight with about 80-40 parts by weight of fiber in relation to 20-60 parts by weight of carrier material, forming the stock material into a sheet by paper-making means and drying the sheet,

and then immersing the sheet or a honeycomb structure manufactured therefrom in an impregnating slurry or solution containing catalytically active agents or their precursors which will be converted into the active agent when calcined, and optionally carrier materials or their precursors which will be converted into the oxide when calcined, and drying the sheet or honeycomb structure.

3. The method as claimed in claim 1, wherein the honeycomb structure is manufactured from the sheet with an adhesive which comprises 100 parts by weight of an aqueous colloidal silica solution containing about 10-30% by weight of silica of about 1-100 millimicrons in particle size and about 10-45 millimicrons in average particle size, and 1-50 parts by weight of at least one of finely divided refractory oxide particles selected from the group consisting of silica having specific surface area of 100-400 m<sup>2</sup>/g, primary particle size of 25-150 millimicrons and average particle size of 40-200 millimicrons, alumina having specific surface area of 100-300 m<sup>2</sup>/g, primary particle size of 10-150 millimicrons and average particle size of 30-70 millimicrons, silica-alumina having specific surface area of about 200 m<sup>2</sup>/g, primary particle size of 1-80 millimicrons and average particle size of 10-30 millimicrons, and titania having specific surface area of about 50 m<sup>2</sup>/g, primary particle size of 10-120 millimicrons and average particle size of 15-40 millimicrons, uniformly dispersed in the colloidal solution.

5. The method as claimed in claim 1, wherein the impregnating slurry or solution further contains 1-10 parts by weight of at least one inorganic heat-resistant fiber of about 0.1-30 microns in diameter and about 0.5-5 mm in fiber length selected from the group consisting of asbestos fiber, ceramic fiber, silica fiber, silica-alumina fiber, chrysotile fiber, rock wool, glass fiber, anthophyllite fiber, potassium titanate fiber, carbon fiber and ceramic fiber, in water, and

17. A method for producing a catalytic material, which consists essentially of admixing

- (a) a slurry prepared by beating at least one of inorganic fibers of about 1-20 mm in fiber length and of about 0.1-30 microns in diameter selected from the group consisting of asbestos fiber, silica fiber, silica-alumina fiber, chrysotile fiber, rock wool, glass fiber, anthophyllite fiber, potassium titanate fiber, carbon fiber and ceramic fiber, in water, and
- (b) at least one powdery water-insoluble carrier material selected from the group consisting of titanium oxide and aluminum oxide or a powdery water-insoluble precursor of the carrier material which will be converted into the oxide when calcined,

thereby forming a stock material containing the solid components of fiber and carrier material in an amount of 1-10% by weight with about 80-40 parts by weight of fiber in relation to 20-60 parts by weight of carrier material, forming the stock material into a sheet by paper-making means and drying the sheet, and then

immersing the sheet or a honeycomb structure manufactured therefrom in an impregnating slurry or solution containing carrier materials and catalytically active agents or their precursors which will be converted into their oxides when calcined and drying the sheet or honeycomb structure.

4,416,801

# TOLUIC ACID

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 215,712, Dec. 15, 1980, Pat. No. 4,356,318, which is a continuation-in-part of Ser. No. 174,920, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 108,819, Dec. 31, 1979, abandoned. This application Aug. 19, 1982, Ser. No. 409,716

Int. Cl.<sup>3</sup> B01J 31/06

U.S. Cl. 502—153

3 Claims

1. Perfluorinated polymeric sulfonic acid having, based on the sulfonic acid groups, about 5 to 98.5 mol % of hydrogen ions and 1.5 to about 95 mol % of rhodium, iridium, ruthenium, platinum, palladium or osmium ions.

4,416,802

# CATALYSTS FOR THE PRODUCTION OF MALEIC ANHYDRIDE BY THE OXIDATION OF BUTANE

Carl A. Udovich, Joliet, and Robert C. Edwards, Naperville, both of Ill., assignors to Standard Oil Co. (Indiana), Chicago, Ill.

Filed May 26, 1982, Ser. No. 382,180

Int. Cl.<sup>3</sup> B01J 27/14

U.S. Cl. 502—209

8 Claims

1. A process for the manufacture of a phosphorus/vanadium/metal oxide catalyst suitable for use in the manufacture of maleic anhydride which process comprises reacting in an aqueous medium, a vanadium compound and inorganic acid and metal oxide, then adding orthophosphoric acid to form a soluble vanadium phosphorus metal oxide catalyst removing the acidified water and adding an aliphatic alcohol having 1 to 8 carbon atoms, removing the alcohol and drying the catalyst syrup under vacuum of about 0 to 300 mm Hg at a temperature of 90° to 120° C. to produce the solid catalyst.

4,416,803

# PROCESS FOR THE MANUFACTURE OF CATALYSTS USEFUL FOR THE OXIDATION OF BUTANE TO MALEIC ANHYDRIDE

Carl A. Udovich, Joliet; Eugene H. Hirschberg, Park Forest, and Ralph J. Bertolacini, Lisle Township, DuPage County, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 26, 1982, Ser. No. 382,181

Int. Cl.<sup>3</sup> B01J 27/14

U.S. Cl. 502—209

6 Claims

1. A process for the manufacture of a phosphorus/vanadium/metal oxide catalyst wherein the metal has a valence of at least II which is suitable for use in the manufacture of maleic anhydride, which process comprises reacting orthophosphoric acid in an aliphatic alcohol having 1 to 8 carbon atoms and reacting vanadium compound with an acid and the metal in the aliphatic alcohol to produce a phosphorus/vanadium/metal oxide catalyst which is soluble in the media wherein the dissolved phosphorus/vanadium/metal oxide catalyst is solidified by the evaporation of the acidified alcohol and a brown amorphous catalyst precursor is separated from the product and a deep blue phosphorus vanadium oxide catalyst is recovered.

4,416,804

# ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, and Tai-Hsiang Chao, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 324,302, Nov. 23, 1981, Pat. No. 4,367,137, which is a continuation of Ser. No. 212,780, Dec. 4, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,589

Int. Cl.<sup>3</sup> B01J 27/14

U.S. Cl. 502—213

17 Claims

1. An acidic catalytic composite comprising a porous carrier material containing at least five catalytic components comprising, on an elemental basis, from about 0.01 to about 2 wt% platinum, from about 0.5 to about 5 wt% cobalt, from about

0.01 to about 5 wt% tin, from about 0.01 to about 5 wt% phosphorous and from about 0.1 to about 3.5 wt% of a halogen component.

4,416,805

# SYNTHESIS OF ZEOLITES OF SMALL AND UNIFORM SIZE HAVING A HIGH MAGNESIUM EXCHANGE CAPACITY

John A. Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

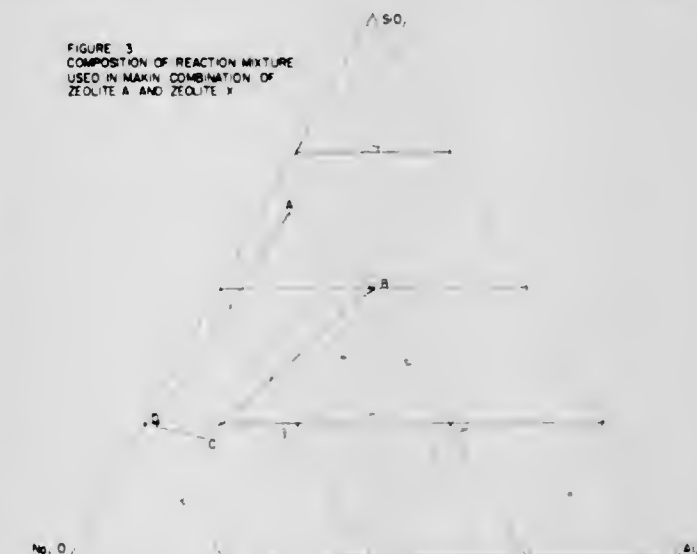
Division of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,856. This application Nov. 4, 1980, Ser. No. 203,927 The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C01B 33/28; B01J 29/06

U.S. Cl. 502—67

6 Claims

FIGURE 3  
COMPOSITION OF REACTION MIXTURE  
USED IN MAKING COMBINATION OF  
ZEOLITE A AND ZEOLITE X



1. A method of producing a combination of zeolite A and zeolite X comprising the steps of:

- (a) dissolving sand in a sodium hydroxide solution at a pressure of at least 100 psig heated to a temperature of at least 130 degrees Celsius to produce a sodium silicate solution having a silica to sodium oxide molar ratio of between 2.4:1 and 2.8:1 to form a sodium silicate solution;
- (b) activating said sodium silicate solution by treating with from 50 to 2000 ppm alumina;
- (c) forming a sodium aluminate solution;
- (d) heating said sodium silicate and sodium aluminate solution to between 40 and 120 degrees Celsius;
- (e) adding together said sodium aluminate solution and said sodium silicate solution to produce a reaction mixture comprising a sodium silicate mother liquor and an amorphous sodium alumina silicate, in total having a water to sodium oxide molar ratio of between 10:1 and 60:1; a sodium oxide to silica molar ratio of between 0.5:1 and 3:1; and a silica to alumina molar ratio of between 2:1 and 15:1;
- (f) heating said mixture;
- (g) reacting said mixture until a combination of zeolite A and zeolite X is formed; and
- (h) recovering said combination of zeolite A and zeolite X.

4,416,806

# CATALYST FOR PRODUCTION OF AROMATIC HYDROCARBONS AND PROCESS FOR PREPARATION

Jean-Rene Bernard, Serezin du Rhone, and Michele Breysse, Villeurbanne, both of France, assignors to Elf France, Paris, France

Continuation of Ser. No. 272,176, Jun. 10, 1981, abandoned.

This application Mar. 4, 1983, Ser. No. 471,902

Int. Cl.<sup>3</sup> B01J 29/12

U.S. Cl. 502—74

32 Claims

1. A process for preparing a bimetallic catalyst for the dehy-



dehydrocyclization of paraffins comprising a carrier comprised of a zeolitic crystalline aluminosilicate exchanged with more than 90% of alkali metal cations and having a pore diameter larger than 6.5 Angstroms; 0.1 to 1.5% platinum; 0.1 to 1.5% rhenium obtained from rhenium carbonyl, the ratio of the rhenium/platinum varying with the pressure of use; a small amount of sulphur such that the ratio x of the number of sulphur atoms to platinum and rhenium atoms is from between about 0.05 and 0.6, said process comprising the impregnating steps carried out in any desired order

- charging the carrier with rhenium by sublimation of rhenium carbonyl;
- impregnating the carrier with an aqueous solution or water soluble complex of platinum;
- incorporating sulphur into the carrier by contacting with a sulphur containing compound;
- the impregnated carrier having received the charges of rhenium carbonyl, platinum complex, and sulphur compound being then dried, optionally calcined, and reduced by hydrogen at a temperature from about 300° C. to 500° C. prior to use.

13. A process for making a bimetallic catalyst for the dehydrocyclization of paraffins, comprising a carrier comprised of a zeolitic crystalline aluminosilicate exchanged with more than 90% of alkali metal cations and having a pore diameter larger than 6.5 Angstroms; 0.1 to 1.5% platinum; 0.1 to 1.5% rhenium obtained from rhenium carbonyl, the ratio of the rhenium/platinum varying with the pressure of use; a small amount of sulphur such that the ratio x of the number of sulphur atoms to platinum and rhenium atoms is from between about 0.05 and 0.6, said process comprising the impregnating steps carried out in any order desired:

- charging the carrier with rhenium by impregnation with a solution of rhenium carbonyl in acetone;
- impregnating the carrier with an aqueous solution or water soluble complex of platinum;
- impregnating sulphur by impregnation of the carrier with a solution of a sulphur containing compound; and
- after the impregnation steps, drying, heat treating and reducing the impregnated carrier with hydrogen at a temperature between about 300° C. and 550° C. prior to use.

14. A bimetallic catalyst prepared by the method of claim 1 or 13.

4,416,807

## CONDUCTIVE VIDEO DISCS

Pabitra Datta, Cranbury, and Ronald N. Friel, Hamilton Square, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,257

Int. Cl.<sup>3</sup> H01B 1/06

U.S. Cl. 252—511

14 Claims

- A conductive molding composition comprising:
  - sufficient conductive carbon black particles so that the composition has a bulk resistivity below 500 ohm-cm at 900 megahertz;
  - from about 0.25 to about 2.5 percent by weight of a suitable lubricant;
  - from about 2 to about 10 percent by weight of a suitable flow modifier; and
  - a thermoplastic material selected from the group consisting of: a homopolymer of styrene, an acrylic acid ester, or a methacrylic acid ester; a copolymer of styrene and acrylonitrile, an acrylic acid ester or a methacrylic acid ester; and mixtures thereof.

4,416,808

## BIS-BETAINE-AMINE OXIDES, PROCESS FOR THEIR PREPARATION, AND CLEANING AGENTS CONTAINING THEM

Günter Blaschke, Winhöring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 439,732

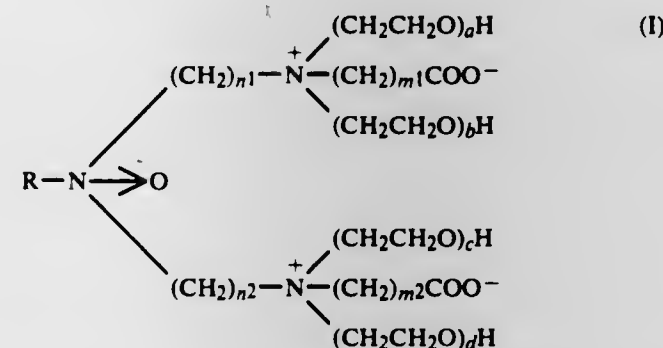
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145734

Int. Cl.<sup>3</sup> C07C 79/16; C11D 1/75, 1/90, 7/32

U.S. Cl. 252—547

4 Claims

- Bis-betaine-amine oxides of the formula



in which

R is a saturated or an olefinically unsaturated hydrocarbon radical having 1 to 3 double bonds and 8 to 22 carbon atoms,

$n^1$  and  $n^2$  each is an integer of from 2 to 3,  $n^1$  and  $n^2$  optionally being identical or different,

$m^1$  and  $m^2$  each is an integer of from 1 to 4,  $m^1$  and  $m^2$  optionally being identical or different, and

a, b, c and d, being identical or different, each is a number of from 1 to 5, with the proviso that the sum ( $a+b+c+d$ ) is at most 10.

4,416,809

## GRANULAR DETERGENT COMPOSITION

Teruo Magari, Funabashi; Mitsuyoshi Yazaki, and Masayoshi Nakamura, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 30, 1982, Ser. No. 373,714

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 66590

Int. Cl.<sup>3</sup> C11D 1/12

U.S. Cl. 252—557

11 Claims

- A granular detergent composition comprising:
  - at least one  $\alpha$ -sulfo fatty acid ester salt having the general formula [I]:



wherein R is an alkyl group having 4 through 20 carbon atoms,  $R_1$  is an alkyl group having 1 through 6 carbon atoms, and  $M_1$  is a salt-forming pair ion;

- at least one fatty acid soap having the general formula [II]:



wherein  $R_2$  is an alkyl group having 8 through 20 carbon atoms, and  $M_2$  is an alkali metal; and

- at least one polycarboxylic acid salt having 2 to 8 carbon atoms, the total content of the components (a) and (b) in the composition being 20% through 80% by weight, the weight ratio of the component (a) to the component (b) being within the range of from 4/1 through 1/4, and the

content of the component (c) in the composition being 1% through 20% by weight.

4,416,810

## DISPOSAL OF RADIOACTIVE AROMATIC LIQUID WASTES

John E. Noakes, 4295 Barnett Shoals Rd., Athens, Ga. 30605

Filed Jul. 30, 1981, Ser. No. 288,534

Int. Cl.<sup>3</sup> G21F 9/16

U.S. Cl. 252—628

5 Claims

- A process for solidifying radioactive wastes comprising an aromatic liquid and an organic fluor, comprising the steps of:
  - making a dispersion of the waste and water, in which at least half of the dispersion by volume is water, at least 3% of the dispersion by volume is a surfactant, and the continuous phase is water
  - mixing the thus-formed dispersion with Portland cement so that for every 100 parts by weight of cement, there is between 30 and 40 parts by weight of water, said water being from the dispersion
  - casting the thus-formed mixture into suitable containers and allowing it to set up
  - transporting the set-up cement-like mixture to a suitable disposal site and
  - leaving the set-up cement-like mixture at the disposal site for permanent disposal.

4,416,811

## DETERGENT SOFTENER COMPOSITIONS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 96,370, Nov. 21, 1979, Pat. No.

4,298,480, which is a continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application Jul. 31, 1981,

Ser. No. 288,921

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C11D 1/86, 10/04, 17/06; D06M 13/48

U.S. Cl. 252—875

23 Claims

- A detergent softener composition capable of imparting improved softness, detergent antistatic and soil antiredeposition properties to fabrics treated therewith in the wash cycle of a laundering process comprising,

- spray-dried detergent particles comprising in percent relative to the weight of the composition, from about 5 to 40% of water soluble nonsoap organic surfactant at least about 90% thereof being an anionic surfactant, from about 1.6 to 7% soap dispersed throughout the particles, and from about 10 to 60% of water soluble neutral to alkaline builder salt;
- about 2 to 20% by weight relative to the weight of the composition, of discrete particles of soap; and
- about 2 to 20% by weight relative to the weight of the composition, of discrete particles of cationic amine softener,

wherein said discrete soap particles do not contain cationic softener and said cationic softener particles do not contain soap, wherein said discrete particles are in admixture with said spray-dried detergent particles and said spray-dried detergent particles do not include cationic amine softener, and wherein said soap is a water soluble or dispersible fatty acid soap, and said cationic softener is a cationic amine softener selected from the group consisting of (1) aliphatic di-(lower) $C_1$ - $C_4$  alkyl, di-(higher) $C_{14}$ - $C_{24}$  alkyl quaternary ammonium salts (2) heterocyclic imide compounds, and mixtures of (1) and (2), the weight ratio of soap to softener being from about 8:1 to 1:3 and the percent concentration of anionic surfactant being at least about  $1.5x+5$ , wherein x represents the percent concentration of softener.

- A detergent softener composition according to claim 1 comprising in weight percentages relative to the total weight of the composition from about 3 to about 5% of the cationic

softener selected from the group consisting of distearyl dimethyl ammonium chloride, di-hydrogenated tallow dimethyl ammonium chloride, di-tallow dimethyl ammonium chloride, distearyl dimethyl ammonium methyl sulfate, di-hydrogenated tallow dimethyl ammonium methyl sulfate, methyl-1-tallow amido ethyl-2-tallow imidazolium methyl sulfate, and methyl-1-oleyl amido ethyl-2-oleyl imidazolium methyl sulfate; the soap selected from the group consisting of an alkali metal salt of a  $C_{10}$  to  $C_{30}$  fatty acid at least about 50% thereof being  $C_{10}$  to  $C_{18}$  fatty acid; the spray-dried detergent particles comprising from about 10 to 60% of detergent builder particles selected from the group consisting of alkali metal phosphate, sodium carbonate, metakaolin and zeolite detergent builders, about 3 to 4.6% soap dispersed throughout the particles, and from about 15 to 23% of the nonsoap anionic surfactant.

4,416,812

## METHOD OF PREPARING TISSUE THROMBOPLASTIN

Udo Becker, Munich; Eugen Schallch, Weilheim, and Manfred Weigert, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 446,088

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150596

Int. Cl.<sup>3</sup> C07G 7/00, 7/026

U.S. Cl. 260—112 R

10 Claims

- A method of producing a tissue thromboplastin preparation which is sensitive to coagulation factor VII comprising extracting an acetone dry powder from mammalian tissue with an aqueous salt solution of 1 to 20 mmol/l of calcium ions.

4,416,813

## ARTIFICIAL CARRIER FOR IMMOBILIZATION OF BIOLOGICAL PROTEINS

Mikio Ikeda, Tachikawa, and Takayuki Tomizawa, Tokyo, both of Japan, assignors to Fujizaki Pharmaceutical Co. Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,249

Claims priority, application Japan, Mar. 18, 1981, 56-37855; Mar. 31, 1981, 56-46211

Int. Cl.<sup>3</sup> C09H 7/00; C12N 11/02, 11/10; G01N 33/54

U.S. Cl. 260—117

23 Claims

- A process for producing an artificial carrier for immobilization of biological proteins which comprises: forming a solution of gelatin, a water soluble polysaccharide and sodium metaphosphate having the formula  $(\text{NaPO}_3)_n$ , wherein n is a whole number from 3 to 6 at a temperature above the gelation temperature of said gelatin; mixing with agitation an acid with said solution to adjust the pH of said solution to between about 2.5 and 6 whereby particles are formed and treating said particles with an aldehyde to thereby insolubilize said particles.

4,416,814

## PROTEIN POLYMER HYDROGELS

Orlando A. Battista, 3725 Fox Hollow Rd., Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 246,660, Mar. 23, 1981, Pat. No. 4,349,470, which is a continuation-in-part of Ser. No. 74,014, Sep. 14, 1979, Pat. No. 4,264,493, which is a continuation-in-part of Ser. No. 952,303, Oct. 18, 1978, abandoned. This application

Sep. 10, 1982, Ser. No. 416,475

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C07G 7/00; C08H 1/00, 1/06, 9/00

U.S. Cl. 260—117

20 Claims

- The method of preparing a three-dimensional structure comprising preparing an aqueous acidic solution of a non-crystalline, natural animal or vegetable protein polymer or mixtures thereof, the polymers having an average molecular weight not exceeding 100,000, shaping the solution into a three-dimensional structure, subjecting the structure to a vapor



phase crosslinking reaction using at least two crosslinking agents in vaporized state to form a crosslinked polymer structure, subjecting the structure to washing with water, subjecting the washed structure to dehydration by immersion in water-miscible organic solvent mixture, subjecting the structure to washing with water and drying the structure to a moisture content of not more than 10 percent.

4,416,815

# FIBER-REACTIVE UNSYMMETRICAL 1:2 CHROMIUM COMPLEX AZO DYES

Hans U. Schütz, Basel, and Arthur Bühler, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,423

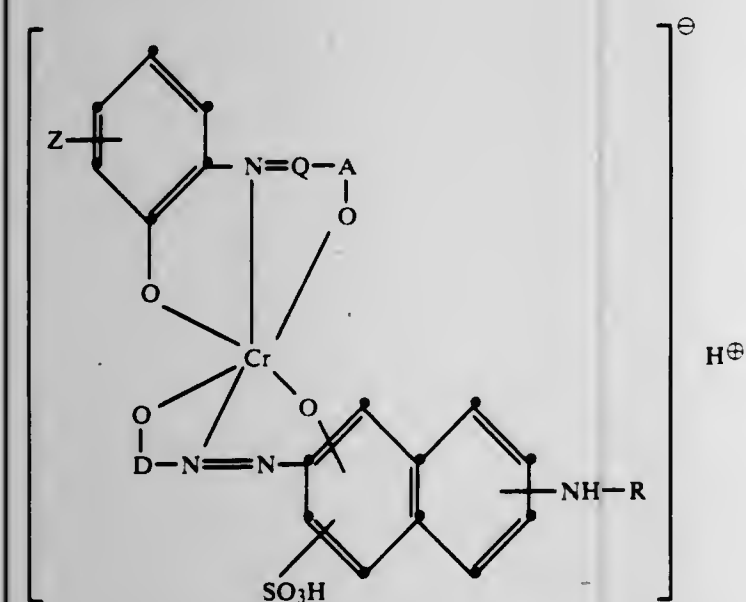
Claims priority, application Switzerland, Oct. 19, 1979, 9416/79

Int. Cl.<sup>3</sup> C09B 45/48, 62/08, 62/24, 62/50

U.S. Cl. 260—145 A

8 Claims

1. A chromium complex dye which, in the form of the free acid, has the formula



wherein Z is hydrogen, nitro, chlorine, or a phenylazo group, Q is a nitrogen atom, A is the radical of a 1-aryl-3-methylpyrazol-5-one, of an acetoacetyl, of a naphthol or of a phenol which couples in the ortho-position to the hydroxyl group and is substituted by acylamino, lower molecular alkyl or low molecular dialkylamino, D is a sulfophenyl radical which can be substituted by nitro or chlorine, or a sulfonaphthyl radical which can be substituted by nitro and is bonded to the azo group in the ortho-position to the oxygen atom, and R is chloroacetyl, bromoacetyl,  $\alpha$ -chloro- or  $\alpha$ -bromoacryloyl, or  $\alpha,\beta$ -dichloro- or  $\alpha,\beta$ -dibromopropionyl.

4,416,816

# 1:2 CHROMIUM COMPLEX OF 1-AMINO-2-(3',5'-DINITRO-2'-HYDROXYPHENYLAZO)-4-SULFONAPHTHALENE AND ALKALI METAL SALTS THEREOF

Hans Grossmann, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 373,630, Jun. 26, 1973, abandoned. This application Nov. 29, 1978, Ser. No. 964,698

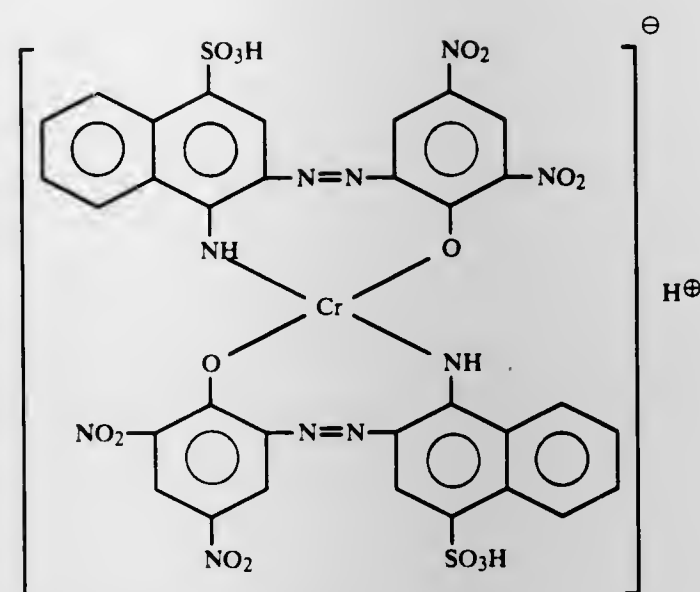
Claims priority, application Switzerland, Jun. 28, 1972, 9676/72

Int. Cl.<sup>3</sup> C09B 45/14; C23F 5/04; D06P 1/10, 3/24

U.S. Cl. 260—151

6 Claims

1. The 1:2 chromium complex of the formula



or an alkali metal salt thereof.

4,416,817

# 3-METHOXY-2-OXA AZETIDINE DERIVATIVES AND THEIR PRODUCTION

Taisuke Matsuo, Ibaraki, and Michihiko Ochiai, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 152,808, May 23, 1980, abandoned. This application Nov. 18, 1981, Ser. No. 322,661

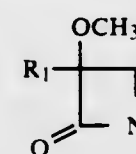
Claims priority, application Japan, Jun. 8, 1979, 54-72812; Mar. 22, 1980, 55-36365

Int. Cl.<sup>3</sup> C07D 205/08, 403/14, 403/12, 403/06

U.S. Cl. 260—239 A

12 Claims

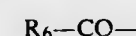
1. A compound of the formula:



wherein R1 is

- (1) amino;
- (2) amino mono-substituted by an acyl group selected from the group consisting of

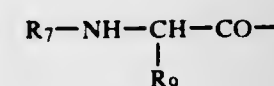
(A) a group of the formula:



wherein R6 is

- (i) C1-6 alkyl or
- (ii) a heterocyclic group selected from the group consisting of isoxazolyl, piperazinyl and imidazolyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, nitro, amino, oxo, thio, phenyl or phenyl mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, nitro or amino;

(B) a group of the formula:



wherein R7 is

- (i) hydrogen,
- (ii) an amino acid residue selected from the group consisting of glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, threonyl, cysteinyl, cystyl, methionyl,  $\alpha$ - or  $\beta$ -aspartyl,  $\alpha$ - or  $\gamma$ -glutamyl, lysyl, arginyl, phenylalanyl, phenylg-

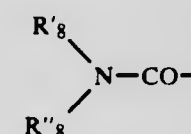
lycyl, tyrosyl, histidyl, tryptophyl or prolyl, the said amino acid residue being unsubstituted or mono- to tri-substituted by amino, lower alkyl amino, amino-protecting group carbamoyl, methylcarbamoyl, sulfamoyl, benzyl, 4-ethyl-2,3-dioxo-1-piperazinocarbonyl or 4-ethyl-2,3-dioxo-1-piperazinocarbonylamino.

- (iii) an amino-protecting group selected from the group consisting of phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maloyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl,  $\beta,\beta$ -trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, (hexahydro-1H-azepin-1-yl)methylene, 2-amino-2-carboxyethylsulfonol, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, di- or trialkylsilyl, benzyl and p-nitrobenzyl,
- (iv) a group of the formula  $R_8-(CH_2)_n-CO-$  in which  $R_8$  is

- (a) a heterocyclic group selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrimidinyl, pyrazinyl, pyridazinyl, piperazinyl, pyrazolyl, imidazolidinyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrido[2,3-d]pyrimidinyl, benzopyranyl, 1,8-naphthyridinyl, 1,5-naphthyridinyl, 1,6-naphthyridinyl, 1,7-naphthyridinyl, 2,7-naphthyridinyl, 2,6-naphthyridinyl, quinolyl, thieno[2,3-b]pyridinyl, tetrazolyl, thiadiazolyl, oxadiazolyl, triazinyl, thienyl, pyrrolyl and furyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by (1) C1-12 alkyl, (2) C1-12 alkyl substituted by phenyl, halogen, hydroxy or C1-3 dialkylamino, (3) C1-3 alkoxy, (4) hydroxy, (5) oxo, (6) thio, (7) formyl, (8) trifluoromethyl, (9) amino, (10) halogen, (11) n- or isopropylsulfonol, (12) coumarin-3-carbonyl, (13) 4-formyl-1-piperazinyl, (14) pyrrolalidoimino, (15) furanalidoimino, (16) thiophenalidoimino, (17) mesyl, (18) a group selected from the group consisting of p-nitrobenzoyl, benzenesulfonyl, toluenesulfonyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, ethanesulfonyl, trifluoroacetyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl,  $\beta,\beta$ -trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, phenyloxycarbonyl, trityl, di- or trialkylsilyl, benzyl and p-nitrobenzyl, (19) C2-4 alkylcarbonylamino or (20) C2-4 alkylcarbonylamino mono- to tri-substituted by halogen, (b) phenyl which is unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, hydroxy or amino, (c) phenylthio which is unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, hydroxy or amino, or (d) C1-3 alkylthio;

n is an integer of 0 to 4; the group  $-(CH_2)_n-$  is unsubstituted or mono- to tri-substituted by (1) amino or (2) a group of the formula  $-NH-COR_8''''$  wherein  $R_8''''$  is amino, piperazinyl or piperazinyl mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, hydroxy, oxo, thio or halogen;

(v) a group of the formula



wherein  $R_8'$  and  $R_8''$  are independently (a) hydrogen, (b) C1-3 alkyl, (c) C1-3 alkyl-carbamoyl, (d) sulfo, (e) phenylcarbonyl or (f) phenylcarbonyl mono- to tri-sub-

stituted by C1-3 alkyl, C1-3 alkoxy, halogen, hydroxy, sulfoxy or benzyloxy; or

(vi) a group of the formula  $R_8'''-SO_2-$

wherein  $R_8'''$  is C1-6 alkyl or C1-6 alkyl mono- to di-substituted by amino, carbonyl, benzyloxycarbonyl or benzyloxycarbonylamino;  $R_9$  is

(i) hydrogen,

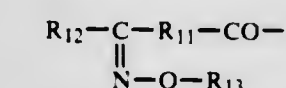
(ii) C1-3 alkyl which is unsubstituted or mono- to tri-substituted by phenyl, carbamoyl, methylcarbamoyl, methylthio, thienylacetamide, ethoxycarbonylmethylcarbamoyl, N-methyltetrazolylthio, halogen or sulfamoyl, (iii) phenyl which is unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, hydroxy, sulfoxy, benzyloxy, benzoyloxy, trimethylsilyl or C2-10 alkylcarbonyloxy,

(iv) a heterocyclic group selected from the group consisting of thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, piperazinyl, triazinyl, tetrazolyl, thiadiazolyl and oxadiazolyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, hydroxy, nitro, sulfoxy, amino, C2-4 alkylcarbonylamino or C2-4 alkylcarbonylamino mono- to tri-substituted by halogen,

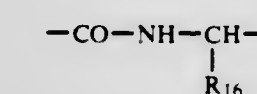
(v) cyclohexenyl selected from the group consisting of cyclohexenyl and cyclohexadienyl,

(vi) piperazinylcarbonylamino which is unsubstituted or substituted by C1-12 alkyl, C1-3 alkoxy, oxo, thio, or amino and which may have a C1-3 alkylene chain between the piperazinyl and carbonylamino moieties;

(C) a group of the formula:



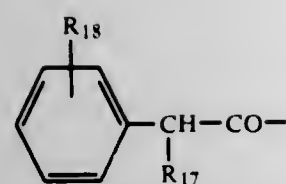
wherein  $R_{11}$  is a chemical bond or a group of the formula:



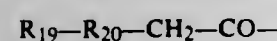
wherein  $R_{16}$  is (a) C1-3 alkyl, (b) phenyl, (c) phenyl mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, nitro, amino or C2-10 alkylcarbonyloxy, or (d) a heterocyclic group selected from the group consisting of thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, furyl, pyrrolyl, thiadiazolyl, oxadiazolyl, triazinyl, tetrazolyl, imidazolyl, pyrazinyl, pyrimidinyl, pyridazinyl and piperazinyl, the heterocyclic group being unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, hydroxy, amino or C2-4 alkylcarbonylamino which is unsubstituted or mono- to tri-substituted by halogen;  $R_{12}$  is (a) a heterocyclic group selected from the group consisting of 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl and 3-pyrrolyl, the heterocyclic group being unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, hydroxy, halogen, amino or C2-4 alkylcarbonylamino which is unsubstituted or mono- to tri-substituted by halogen, or (b) phenyl which is unsubstituted or mono- to tri-substituted by C1-3 alkyl, C1-3 alkoxy, halogen, nitro, amino, hydroxy, or by benzyloxy, benzoyloxy, C2-10 alkylcarbonyloxy,  $\gamma$ -D-glutamyl or 3-amino-3-carboxypropyloxy;  $R_{13}$  is (a) hydrogen, (b) C2-4 alkylcarbonyl which is unsubstituted or mono- to tri-substituted by halogen; (c) C1-3 alkyl, or (d) a group of the formula  $-R_{14}-R_{15}$  wherein  $R_{14}$  is C1-3 alkylene or C1-3 alkenylene, and  $R_{15}$  is carboxyl, methyl ester of carboxyl, ethyl ester of carboxyl, propyl ester of carboxyl or morpholino;

(D) a group of the formula:





wherein R<sub>17</sub> is (a) hydroxy, (b) sulfoxy, (c) carboxyl, (d) sulfamoyl, (e) sulfamoyl mono- to tri-substituted by C<sub>1-3</sub> alkyl or amidino, (f) sulfo, (g) phenoxy carbonyl, (h) phenoxy carbonyl mono- to tri-substituted by C<sub>1-3</sub> alkyl or C<sub>1-3</sub> alkoxy, (i) benzyloxycarbonyl or (j) formyloxy; R<sub>18</sub> is (a) hydrogen, (b) C<sub>1-3</sub> alkyl, (c) C<sub>1-3</sub> alkoxy, (d) halogen, (e) nitro or (f) hydroxy; and (E) a group of the formula:



wherein R<sub>19</sub> is (a) cyano, (b) phenyl, (c) phenyl mono- to tri-substituted by C<sub>1-3</sub> alkyl, C<sub>1-3</sub> alkoxy, halogen, nitro, amino, hydroxy, aminomethyl or aminomethyl mono- to tri-substituted by carbamoyl, (2-oxo-3-benzylideneaminoimidazolidin-1-yl)carbonyl or (2-oxoimidazolidin-1-yl)carbonyl, (d) phenoxy, (e) phenoxy mono- to tri-substituted by C<sub>1-3</sub> alkyl, C<sub>1-3</sub> alkoxy, halogen, nitro, amino, hydroxy, or aminomethyl, (f) C<sub>1-6</sub> alkyl in the case where R<sub>20</sub> is —S—, (g) C<sub>1-6</sub> alkyl mono- to tri-substituted by halogen, hydroxy, cyano or trifluoromethyl, (h) alkenyl selected from the group consisting of vinyl and propenyl, said alkenyl being unsubstituted or mono- to tri-substituted by carboxyl or cyano; or (i) a heterocyclic group selected from the group consisting of 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, isothiazolyl, 1-tetrazolyl, 5-tetrazolyl, pyrrolidinyl, imidazolyl and 1,4-oxathiolyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by C<sub>1-3</sub> alkyl, C<sub>1-3</sub> alkoxy, halogen, nitro, hydroxy, amino, carboxyl, oxo, C<sub>2-4</sub> alkylcarbonylamino, C<sub>2-4</sub> alkylcarbonylamino mono- to tri-substituted by halogen or C<sub>2-4</sub> alkylcarbonyl; R<sub>20</sub> is a chemical bond or —S—; or (3) amino protected by an amino-protecting group selected from the group consisting of phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maloyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β-trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, (hexahydro-1H-azepin-1-yl)methylene, 2-amino-2-carboxyethylsulfonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, di- or trialkylsilyl, benzyl and p-nitrobenzyl.

4,416,818

#### PREPARATION OF N-ALKOXYCARBONYL-SUBSTITUTED CYCLIC LACTAMS AND KETONES

Graham S. Poindexter, Evansville, Ind., assignor to The Dow Chemical Company, Midland, Mich.

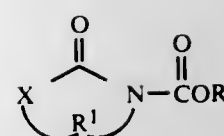
Filed Oct. 9, 1981, Ser. No. 309,958

Int. Cl.<sup>3</sup> C07D 210/00, 207/12

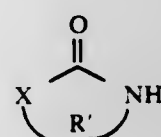
U.S. Cl. 260—239.3 A

6 Claims

1. A process for preparing N-alkoxycarbonyl-substituted cyclic lactams and nitrogen-containing cyclic ketones of the formula



where X is oxygen or methylene, R' is C<sub>2-4</sub> alkylene and R is C<sub>1-20</sub> alkyl comprising reacting a C<sub>1-20</sub> alkyl ester of trichloroacetic acid with a cyclic lactam or nitrogen-containing cyclic ketone of the formula



where X and R' are as previously defined, at a temperature from about 100° C. to about 160° C. in the presence of a catalytically effective amount of an acylation catalyst.

4,416,819

#### PROCESS FOR PREPARING 1,5-BENZOTHAZEPINE DERIVATIVES

Susumu Nagao, Takasaki; Katsuhiko Kurabayashi, Annaka; Nobuyuki Futamura, Maebashi; Hidefumi Kinoshita, Takasaki, and Toshio Takahashi, Annaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

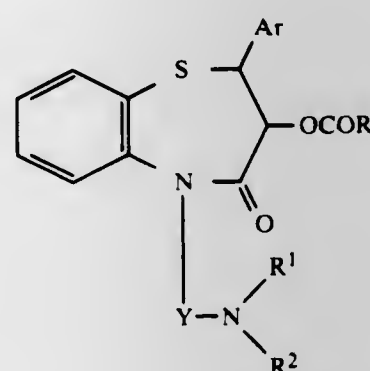
Filed Jul. 9, 1982, Ser. No. 396,734

Int. Cl.<sup>3</sup> C07D 281/02

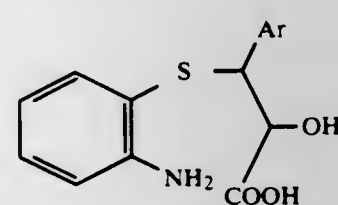
U.S. Cl. 260—293.3 B

11 Claims

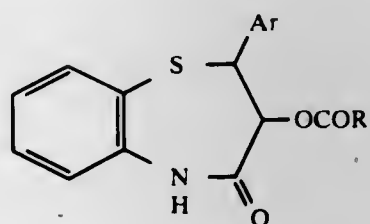
1. A process for preparing 1,5-benzothiazepine derivatives of the formula:



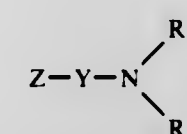
wherein Ar is a phenyl substituted with a lower alkoxy, R is a lower alkyl, R<sup>1</sup> and R<sup>2</sup> are each a lower alkyl, and Y is a lower alkylene, which comprises reacting a 2-hydroxy-3-(2'-amino-phenylthio)-3-phenylpropionic acid of the formula:



wherein Ar is as defined above which is in the form of a salt with a base, with an acylating agent, and reacting the resulting 1,5-benzothiazepine derivative of the formula:



wherein Ar and R are as defined above, or an alkali metal salt thereof with a compound of the formula:



(III)

wherein R<sup>1</sup>, R<sup>2</sup> and Y are as defined above, and Z is a halogen.

4,416,820

#### INDOLE DERIVATIVES AND A METHOD FOR PRODUCTION OF PEPTIDES

Tsunehiko Fukuda, Minoo; Shigeru Kobayashi, Neyagawa, and Masahiko Fujino, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 13, 1982, Ser. No. 339,054

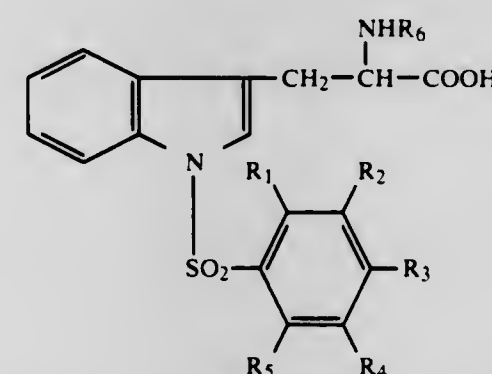
Claims priority, application Japan, Jan. 14, 1981, 56-4506

Int. Cl.<sup>3</sup> C07C 103/52; C07D 209/04

U.S. Cl. 548—496

9 Claims

1. A compound of the formula:



wherein R<sub>1</sub> and R<sub>5</sub> each is hydrogen, methyl or methoxy; R<sub>2</sub> and R<sub>4</sub> each is hydrogen or methyl; R<sub>3</sub> is methyl or methoxy; and R<sub>6</sub> is hydrogen or an α-amino-protecting group.

4,416,821

#### PROCESS FOR PREPARING 16-METHYLENE STEROIDS

Verlan H. VanRheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

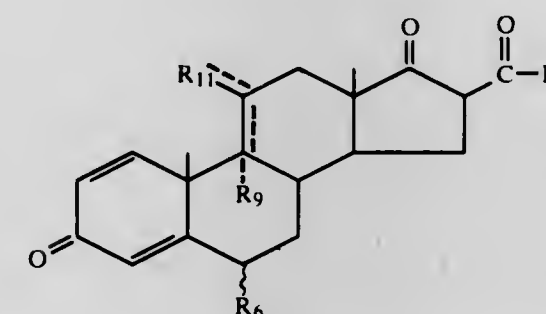
Filed Feb. 17, 1982, Ser. No. 349,490

Int. Cl.<sup>3</sup> C07J 7/00

U.S. Cl. 260—397.1

28 Claims

1. A 16-substituted steroid of the formula



(IIB)

where

R is a hydrogen atom, trifluoromethyl or cyano group or COOR<sub>16</sub>.

R<sub>6</sub> is a hydrogen or fluorine atom or methyl group,

R<sub>9</sub> is nothing or a hydrogen or fluorine atom, which includes the Δ<sup>9(11)</sup> and 9β,11β-epoxide functionality,

R<sub>11</sub> is nothing or a hydrogen or oxygen atom, an α-hydroxy group, or a β-hydroxy group, which includes the Δ<sup>9(11)</sup> and 9β,11β-epoxide functionality, is a single or double bond, and

~ indicates that the attached group can be in either the α or β configuration.

4,416,822

#### 17β-DIFLUOROMETHYL STEROIDS

J. Allan Campbell, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

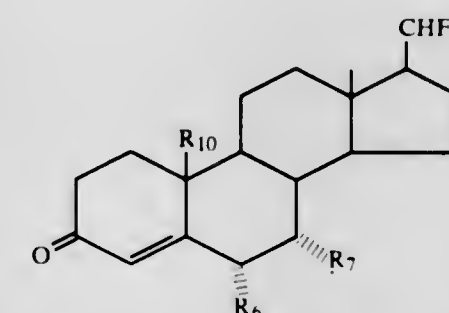
Filed Jul. 9, 1982, Ser. No. 396,968

Int. Cl.<sup>3</sup> C07J 1/00

U.S. Cl. 260—397.4

12 Claims

1. A 17β-difluoromethyl steroid of the formula



(IV)

where R<sub>6</sub> is a hydrogen atom or methyl group with a proviso that R<sub>6</sub> is a hydrogen atom when R<sub>7</sub> is a methyl group; where R<sub>7</sub> is a hydrogen atom or methyl group with a proviso that R<sub>7</sub> is a hydrogen atom when R<sub>6</sub> is a methyl group; and R<sub>10</sub> is a hydrogen atom or methyl group.

4,416,823

#### DIMERIC CARBONYLATION OF 1,3-ALKADIENE

Paul Foley, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,818

Int. Cl.<sup>3</sup> C11C 3/02

U.S. Cl. 260—410.9 R

33 Claims

1. A process for dimeric hydroesterification of 1,3-alkadiene which comprises (1) reacting 1,3-alkadiene with carbon monoxide and alkanol in a liquid medium containing a stabilized halide-free catalyst complex of palladium, tertiary phosphine ligand and thiol compound; and (2) recovering dimeric alkyl alkadienoate product.

4,416,824

#### RECOVERY OF TRIARYLBORANES BY FORMING BORON-CONTAINING METAL COMPOUNDS

Ronald A. Reimer, and Gerald T. Stowe, both of Orange, Tex., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 21, 1981, Ser. No. 333,176

Int. Cl.<sup>3</sup> C07F 15/00, 15/04

U.S. Cl. 260—439 R

11 Claims

1. A process for recovering a triarylborane in solution in organic nitriles which comprises reacting said borane with a cyanide ion and a metal salt wherein said metal is selected from the group consisting of groups IIA, IB, IIB, VIIB and VIII in the presence of said nitrile, and thereafter separating the boron containing reaction product from said nitrile.

7. In a process for the production of dinitriles by the addition of hydrogen cyanide to non-conjugated, unsaturated nitriles in the presence of a zero-valent nickel-organophosphorus ligand containing catalyst promoted with an arylborane wherein the product fluid from said addition is contacted with a paraffin or cycloparaffin to form a primary light hydrocarbon extract phase and a heavy dinitrile phase containing soluble catalyst and promoter which phases are separated the improvement comprising recovering the arylborane by reacting said dinitrile phase with a cyanide ion and a metal salt wherein said metal is selected from the group consisting of groups IIA, IB, IIB, VIIB and VIII, separating the boron containing reaction product from said dinitrile phase.



# 4,416,825 PREPARATION OF ZEROVALENT NICKEL COMPLEXES

John J. Ostermaier, Orange, Tex., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Feb. 23, 1982, Ser. No. 351,421

Int. Cl.<sup>3</sup> C07F 15/04

U.S. Cl. 260—439 R

6 Claims

1. An improved process for the continuous production of a zerovalent nickel complex having the general formula  $Ni(L)_4$  where L is a neutral ligand of the formula  $P(Z)_3$  where Z is R or OR and R is an alkyl or an aryl group of up to 18 carbon atoms which comprises continuously contacting elemental nickel having a surface area of at least about 800 square centimeters per gram of nickel, in a reaction medium comprising in percent by weight based upon the weight of the liquid in the reaction medium at least 50% L, at least 2% of an organic nitrile having 4–20 carbon atoms and at least 100 ppm Cl as an organochloridite while maintaining the temperature in °C. of the reaction within the range defined by a minimum temperature equal to  $102 - 0.375 \times (\%L)$  and a maximum temperature equal to  $58.3 + 0.725 \times (\%L)$ .

# 4,416,826 PERESTERS AND USE THEREOF

Douglas C. Neckers, Perrysburg, Ohio

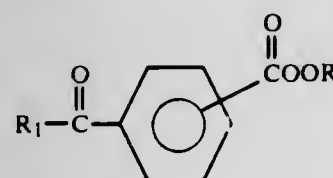
Filed Oct. 29, 1980, Ser. No. 202,040

Int. Cl.<sup>3</sup> C07D 265/30, 211/60, 307/20; C07C 179/18

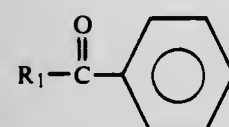
U.S. Cl. 260—453 RZ

10 Claims

1. Compound of the formula:



wherein R is a  $C_1$ – $C_{22}$  alkyl group; and  $R_1$  is an organic group such that the moiety



is a light absorbing chromophore group which produces an excited state by light absorption and is selected from the group consisting of  $C_1$ – $C_{22}$  alkyl groups,  $C_3$ – $C_{22}$  cycloalkyl groups,  $C_6$ – $C_{22}$  aryl groups,  $C_7$ – $C_{22}$  aralkyl groups,  $C_7$ – $C_{22}$  alkaryl groups,  $C_1$ – $C_{22}$  alkoxy substituted aryl groups and morpholinyl, piperidyl, thiophenyl and furanyl heterocyclic groups.

4,416,827

# PROCESS FOR THE RESOLUTION OF THE RACEMATE (1R,2SR)-2-AMINO-1-PHENYL-PROPAN-1-OL

Horst Bethge; Axel Kleemann, both of Hanau, and Jürgen Martens, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,325

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134129

Int. Cl.<sup>3</sup> C07C 99/12, 85/26

U.S. Cl. 260—501.12

13 Claims

1. A process of resolving the racemate (1R,2SR)-2-amino-1-phenyl-propan-1-ol comprising dissolving the racemate together with an optical isomer of S-(carboxymethyl)-cysteine in a solvent in which the salt of said optical isomer with one of the isomers present in said racemate is less soluble than the salt of said optical isomer with the other one of the isomers present in said racemate and precipitating the less soluble salt.

9. A compound which is either (1) a salt of S-(carboxyme-

thyl)-(R)-cysteine and (1R,2S)-2-amino-1-phenyl-propan-1-ol or (2) a salt of S-(carboxymethyl)-(S)-cysteine and (1S,2R)-2-amino-1-phenyl-propan-1-ol.

4,416,828

# PROCESS FOR THE RESOLUTION OF THE RACEMATE S-(CARBOXYMETHYL)-(RS)-CYSTEINE (A)

Horst Bethge; Axel Kleemann, both of Hanau, and Jürgen Martens, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,324

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134042

Int. Cl.<sup>3</sup> C07C 99/12

U.S. Cl. 260—501.12

13 Claims

1. A process of resolving the racemate S-(carboxymethyl)-(RS)-cysteine comprising dissolving the racemate together with an optical isomer of 2-amino-1-phenyl-propan-1-ol in a solvent in which the salt of said optical isomer with one of the isomer present in said racemate is less soluble than the salt of said optical isomer with the other one of the isomers present in said racemate and precipitating the less soluble salt.

9. A compound which is either (1) a salt of S-(carboxymethyl)-(R)-cysteine and (1R,2S)-2-amino-1-phenyl-propan-1-ol or (2) a salt of S-(carboxymethyl)-(S)-cysteine and (1S,2R)-2-amino-1-phenyl-propan-1-ol.

4,416,829

# POLY-HINDERED PHENOL-PHOSPHITES AND PROCESS FOR PREPARATION

Richard J. Lee, Downers Grove; Adam S. Kurasiewicz, Wheaton, both of Ill., and Eugene E. Richardson, Kerrville, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 6, 1982, Ser. No. 433,009

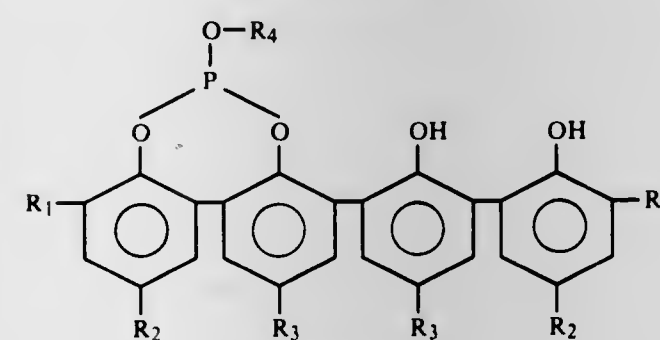
Int. Cl.<sup>3</sup> C07F 9/15

U.S. Cl. 260—927 R

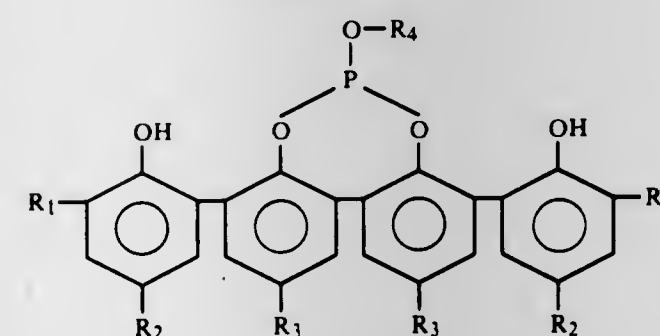
11 Claims

1. A mono-cyclic phosphite and dicyclic phosphite derived from a hexa-alkyl substituted phenol tetramer which have the structural formulae:

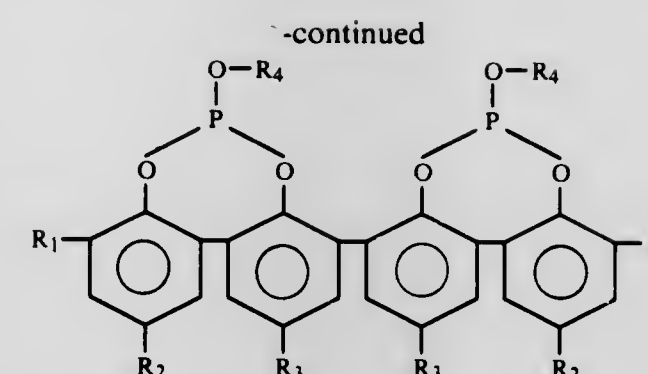
Monocyclic I:



Monocyclic II:

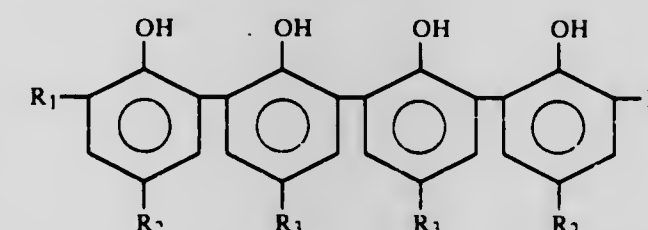


Dicyclic:



wherein  $R_4$  is an alkyl hydrocarbon group containing one to four carbon atoms, the groups  $R_1$ ,  $R_2$ , and  $R_3$  are also alkyl hydrocarbon groups of a size such that the total carbon atom content for the six such groups is at least 42 carbon atoms.

8. The method of preparing a cyclic phosphite structure-containing compound of claim 1 which comprises reacting in the presence of a catalytic amount of iodine a poly-hindered phenol tetramer of the formula:



wherein the groups  $R_1$ ,  $R_2$ , and  $R_3$  are alkyl hydrocarbon groups whose total carbon content is at least 42; with a tri( $C_1$  to  $C_4$  alkyl) phosphite used in at least a molar excess over the equimolar proportions for the mono-cyclic phosphite structural compounds and over the 1 to 2 molar proportions for the dicyclic phosphite structured compound reacted in the presence of an inert hydrocarbon diluent boiling between the temperatures of 35° C. and 175° C. and at the reaction temperature of above 50° C. but not exceeding 100° C. followed by removing at least the coproduct  $C_1$  to  $C_4$  alkanol and excess trialkyl phosphite.

4,416,830

# POLYETHER PHOSPHORIC ACIDS OR ESTERS

Michael Morr, Braunschweig, and Maria-Regina Kula, Wolfenbüttel, both of Fed. Rep. of Germany, assignors to Gesellschaft für Biotechnologische Forschung mbH (GBF), Braunschweig-Stockheim, Fed. Rep. of Germany

PCT No. PCT/EP80/00085, § 371 Date Mar. 3, 1981, § 102(e)

Date Mar. 3, 1981, PCT Pub. No. WO81/00570, PCT Pub.

Date Mar. 5, 1981

PCT Filed Aug. 28, 1980, Ser. No. 243,949

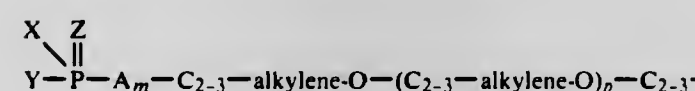
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935134; Oct. 24, 1979, 2943016

Int. Cl.<sup>3</sup> C07F 9/09, 9/165

U.S. Cl. 260—929

5 Claims

1. Compounds of the general formula:



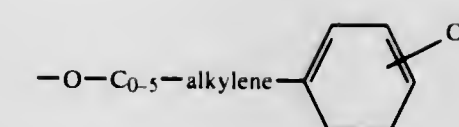
wherein  
 $p = 30$  to  $800$  and  
(a1)

$m = 1$ ,  $A = O$  atom.

$X = OH$  and  $Y = X$  or  $-O-C_1-5-alkyl$ .

$Z = O$  or  $S$  atom; or

(a2)  
 $m = 1$ ,  
 $A = O$  atom  
 $X =$



$Y = X$  or  $-O-C_1-5-alkyl$ ,  
 $Z = O$  atom; or

(a3)

$m = 1$ ,

$A = O$  atom.

$X = OH$ ,  $Y = -S-C_1-5-alkyl$ ,  $-S-C_2-5-alkyl$  amine,

$-S-C_1-5-alkyl$  carboxyl,

$Z = O$  atom; or

(b)

$m = 1$ ,

$A = S$  atom,

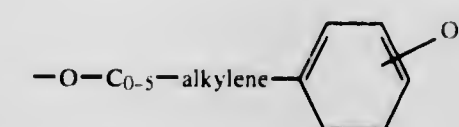
$X = Y = OH$ ,

$Z = O$  atom; or

(c)

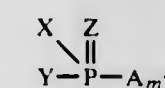
$m = 0$ ,

$X = Y = OH$ ,



$Z = O$  atom,

and their derivatives in which one of the two



groups is replaced by a  $C_1-5$  alkoxy group and the alkali metal derivatives and salts with ammonia and amines, of the acids of phosphorus and of the carboxylic acids.

4,416,831

# AMINO AND SUBSTITUTED AMINO PHOSPHINYLALKANOYL COMPOUNDS

Edward W. Petrillo, Jr., Pennington, N.J., assignor to E. R.

Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 258,194, Apr. 27, 1981, Pat. No. 4,374,131.

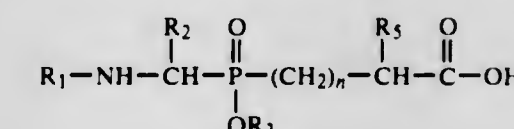
This application Nov. 1, 1982, Ser. No. 438,113

Int. Cl.<sup>3</sup> C07F 9/32, 9/58, 9/65

U.S. Cl. 260—938

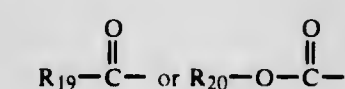
12 Claims

1. A compound of the formula



wherein

$R_1$  is



$n$  is zero or one;

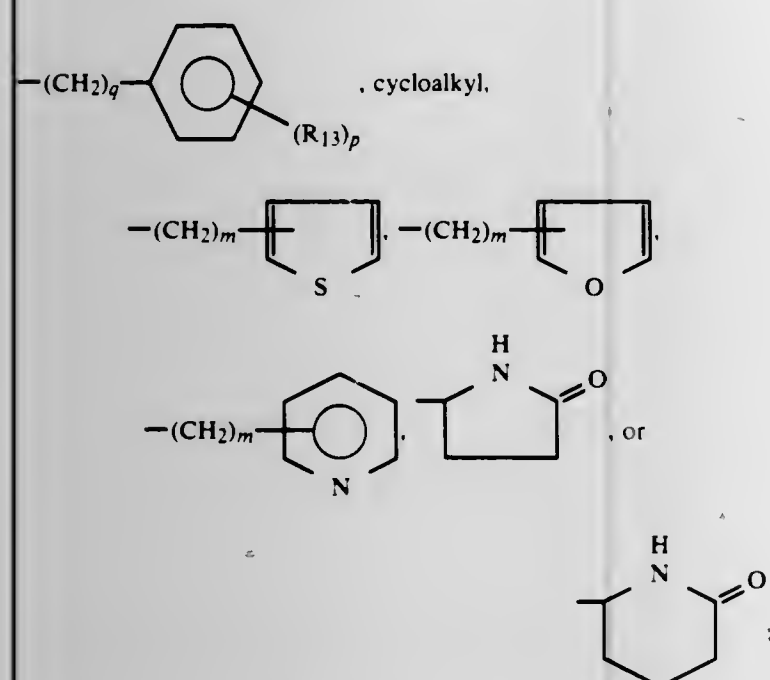
$R_5$  is hydrogen, lower alkyl, halo substituted lower alkyl,

benzyl, or phenethyl;

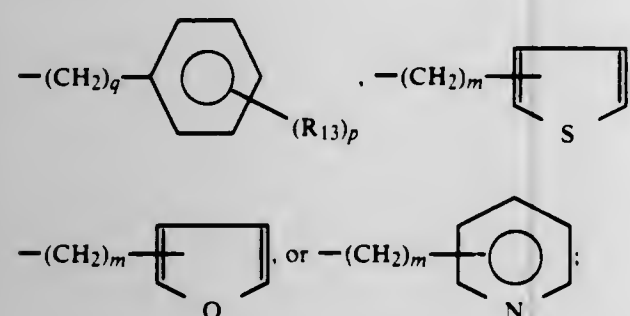
$R_3$  is hydrogen, lower alkyl, benzyl, or benzhydryl;



R<sub>19</sub> is hydrogen, lower alkyl, halo substituted lower alkyl, amino substituted lower alkyl,



R<sub>20</sub> is lower alkyl, phenyl, benzyl, or phenethyl;  
R<sub>2</sub> is hydrogen, lower alkyl, lower alkenyl, halo substituted lower alkyl,



R<sub>13</sub> is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;  
q is zero or an integer from 1 to 7;  
m is zero, one, two or three; and  
p is one, two or three provided that p is more than one only if R<sub>13</sub> is hydrogen, methyl, methoxy, chloro, or fluoro.

4,416,832

**CYANOALKYLPHOSPHORIC ACID ESTER CHLORIDES**  
Bernd-Wieland Krüger; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1982, Ser. No. 344,263

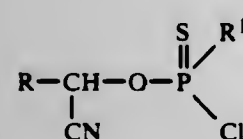
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106497

Int. Cl.<sup>3</sup> C07F 9/14, 9/20, 9/42

U.S. Cl. 260-940

6 Claims

1. A cyanoalkylphosphoric acid ester chloride of the formula



R represents a hydrogen atom, an alkyl radical which is optionally substituted by halogen, C<sub>1</sub> to C<sub>4</sub> alkoxy, C<sub>1</sub> to

C<sub>4</sub> alkylthio or C<sub>1</sub> to C<sub>4</sub> alkylamino and which has 1 to 20 carbon atoms, an optionally halogen-substituted C<sub>2</sub> to C<sub>5</sub> alkenyl or C<sub>2</sub> to C<sub>5</sub> alkynyl radical, a C<sub>3</sub> to C<sub>8</sub> cycloalkyl radical which is optionally substituted by C<sub>1</sub> to C<sub>4</sub> alkyl, C<sub>1</sub> to C<sub>4</sub> alkoxy, phenoxy, benzoyloxy, phenylthio, or phenylmethyl; or halogen, a phenyl-C<sub>1</sub> to C<sub>4</sub> alkyl radical which is optionally substituted by halogen, optionally halogen-substituted C<sub>1</sub> to C<sub>4</sub> alkyl or optionally halogen-substituted C<sub>1</sub> to C<sub>4</sub> alkoxy, a phenyl radical which is optionally substituted by halogen, nitro C<sub>1</sub> to C<sub>4</sub> alkyl, optionally halogen-substituted C<sub>1</sub> to C<sub>4</sub> alkoxy, optionally halogen-substituted C<sub>1</sub> to C<sub>4</sub> alkylthio or trifluoromethyl and/or by optionally halogen-substituted C<sub>1</sub> or C<sub>2</sub> alkylendioxy, or represents a furyl, thienyl or pyridyl radical, and

R<sup>1</sup> represents an optionally halogen-substituted radical selected from C<sub>1</sub> to C<sub>5</sub> alkyl, C<sub>2</sub> to C<sub>5</sub> alkenyl, C<sub>2</sub> to C<sub>5</sub> alkynyl, phenyl, benzyl, C<sub>1</sub> to C<sub>5</sub> alkoxy, phenoxy, benzyloxy, C<sub>1</sub> to C<sub>5</sub> alkylthio, C<sub>2</sub> to C<sub>5</sub> alkenylthio, C<sub>2</sub> to C<sub>5</sub> alkynylthio, phenylthio, benzylthio, C<sub>1</sub> to C<sub>5</sub> alkylamino (monoalkylamino or dialkylamino), phenylamino or benzylamino.

4,416,833

**SUBSTITUTED CARBONYL PHOSPHINYL-ALKANOYL COMPOUNDS**

Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 260,659, May 4, 1981, Pat. No. 4,381,297.

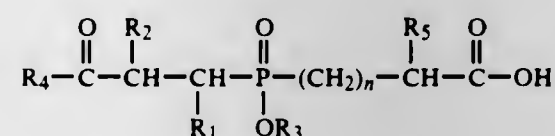
This application Nov. 26, 1982, Ser. No. 444,775

Int. Cl.<sup>3</sup> C07F 9/32, 9/58

U.S. Cl. 260-941

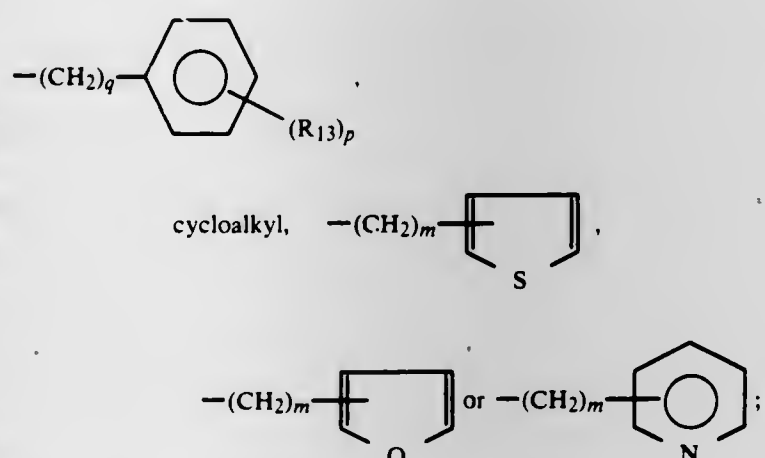
6 Claims

1. A compound of the formula

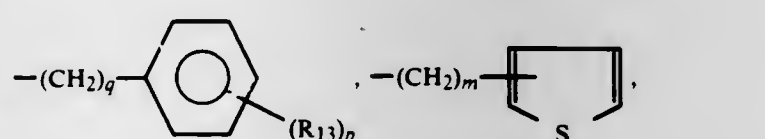


wherein

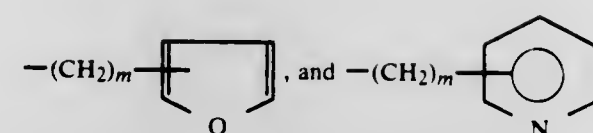
n is zero or one;

R<sub>5</sub> is hydrogen, lower alkyl, halo substituted lower alkyl, benzyl, or phenethyl;R<sub>3</sub> is hydrogen, lower alkyl, benzyl, or benzhydryl;R<sub>4</sub> is hydrogen, lower alkyl, halo substituted lower alkyl,

R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl,



-continued



R<sub>13</sub> is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

q is zero or an integer from 1 to 7;

m is zero, one, two or three; and

p is one, two or three provided that p is more than one only if R<sub>13</sub> is hydrogen, methyl, methoxy, chloro, or fluoro.

4,416,834

**PROCESS FOR THE PREPARATION OF THIOPHOSPHORIC ACID ESTERS**

Peter Feyen, Mettmann, and Friedrich Schmidt, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1980, Ser. No. 190,288

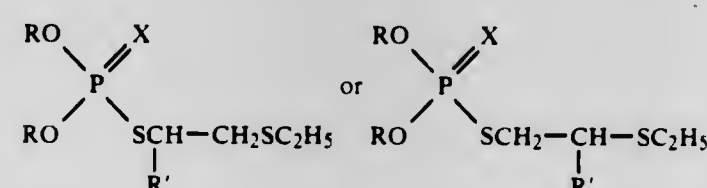
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941587

Int. Cl.<sup>3</sup> C07F 9/165

U.S. Cl. 260-979

6 Claims

1. A process for the preparation of a compound of the formula



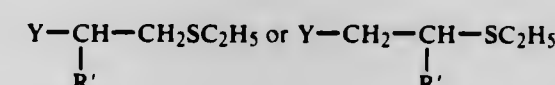
in which

R is alkyl,

X is oxygen or sulphur and

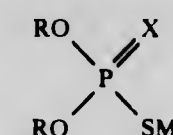
R' is hydrogen or alkyl,

comprising reacting an ethylmercapto compound of the formula



in which

Y is chlorine or bromine, with about 1 to 1.02 times the molar amount of a thiophosphate of the formula



in which

M is a cation other than NH<sub>4</sub><sup>+</sup>, in an aqueous heterogeneous reaction medium at a temperature between about 45° and 65° C. and at a pH between about 5 and 7.5.

4,416,835

**DEVICE FOR RECEIVING A FREE FALLING LIQUID AND THE APPLICATION THEREOF IN A COUNTERCURRENT LIQUID AND GAS COOLING DEVICE**

Jacques G. P. E. Bosne, Viroflay, France, assignor to Hamon-Sobelco, S.A., Brussels, Belgium

Division of Ser. No. 319,372, Nov. 9, 1981, Pat. No. 4,385,010.

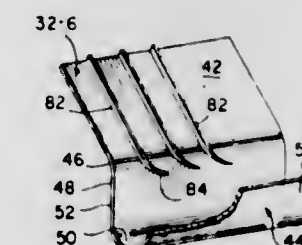
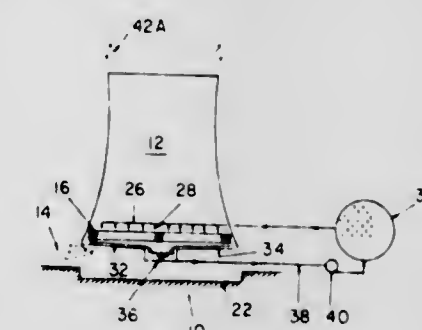
This application Jan. 3, 1983, Ser. No. 455,253

Claims priority, application France, Nov. 12, 1980, 80 24018

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261-110

4 Claims



1. A device for receiving a liquid falling freely in the form of a shower or the like, comprising receiving wall means consisting of a wall inclined to the vertical and a main trough, extending along the lower edge of the wall, characterized in that said device comprises in the path of the liquid received by the inclined wall and before the liquid enters the bottom of the main trough, means for substantially reducing or eliminating the vertical velocity component of the liquid, wherein the means for substantially reducing or eliminating the vertical velocity component of the liquid comprise liquid deflecting surfaces which impart to the liquid before it reaches the bottom of the main trough a substantial velocity component in the direction of the flow of the liquid in the main trough, and wherein the deflecting surfaces are formed by ribs disposed on the inclined wall along the line of greatest slope, at least a part of said ribs being curved in the direction of the flow of the liquid in the main trough.

4,416,836

**INDUCED DRAFT COOLING TOWER**

Joachim R. Sinek, Pittsford, N.Y., assignor to Kennecott Corp., Cleveland, Ohio

Filed Dec. 3, 1981, Ser. No. 326,947

Int. Cl.<sup>3</sup> B01F 3/04

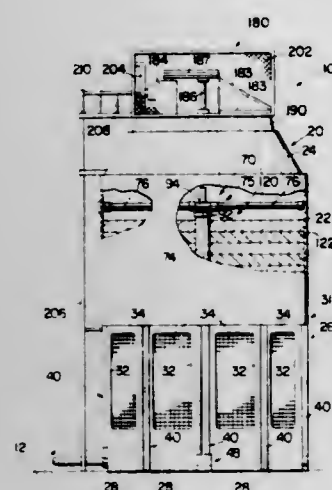
U.S. Cl. 261-112

13 Claims

1. In a cooling tower wherein a heat exchanger in the form of a block of cellular packing is disposed and wherein fluid to be cooled is passed through the packing and cooling air is passed through the packing, the improvement comprising: a unitary, seamless shell fabricated from a plastics material, the shell having a generally cylindrical upper portion and a polygonal lower portion, the lower portion including a plurality of air inlet openings and strengthening sections intermediate the air inlet openings, the air inlet openings



being formed in flat wall portions of the lower portion, the strengthening sections being in the form of corrugations,



the corrugations and the remainder of the shell being of substantially uniform wall thickness.

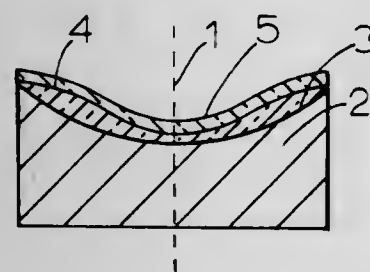
4,416,837

## SPIN CASTING OF CONTACT LENSES

Charles W. Neefe, 2701 Rebecca St., Big Spring, Tex. 79720  
Filed Sep. 13, 1982, Ser. No. 417,641

Int. Cl.<sup>3</sup> B29D 11/00

U.S. Cl. 264—2.1



1. A method of spin casting contact lenses having equal amounts of asphericity on both the concave and convex lens surfaces and having no asphericity when in place on a spherical cornea by the steps providing a concave spin casting mold, placing a selected liquid monomer in the concave mold, rotating the concave mold and the selected liquid monomer at a selected speed to form an aspheric concave surface on the selected liquid monomer, allowing the selected liquid monomer to polymerize to form a solid aspheric optical surface, adhering to the concave mold, adding a liquid lens monomer to the concave aspheric mold and rotating the aspheric surfaced lens mold and the selected lens monomer at the selected speed to form a concave aspheric surface on the liquid lens monomer and a convex aspheric lens surface formed against the aspheric concave mold, allowing the rotating liquid lens monomer to polymerize to form a lens having an aspheric concave and convex surface, removing the aspheric lens from the aspheric concave mold.

4,416,838

## ASSEMBLAGES OF FASTENERS AND METHODS OF MANUFACTURE STRETCHING OF FASTENERS USING CONTACT HEAT

Joseph R. Paradis, Holden, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 5, 1982, Ser. No. 345,992

Int. Cl.<sup>3</sup> B29C 17/02

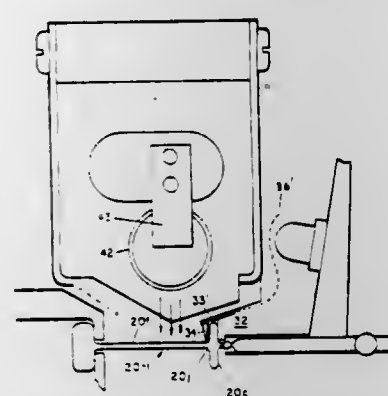
U.S. Cl. 264—25

15 Claims

1. The method of manufacturing an assemblage of fasteners which comprises the steps of:

(a) molding the assemblage as a set of connected individual

fasteners, each individual attachment including an end member which is joined by a filament, and



(b) stretching at least one of the individual fasteners while a heated probe is in contact with the filament of said one fastener at a prescribed position along the length of its filament.

4,416,839

## WHOLLY AROMATIC POLYESTER COMPOSITION, PROCESS FOR PRODUCTION THEREOF, AND PRODUCTION THEREFROM OF A FILM-LIKE OR FIBROUS ARTICLE OF A WHOLLY AROMATIC POLYESTER

Hiroo Inata, and Shunichi Matsumura, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 16, 1982, Ser. No. 399,009

Claims priority, application Japan, Jul. 20, 1981, 56-112256; Aug. 10, 1981, 56-124172; Feb. 22, 1982, 57-26063

Int. Cl.<sup>3</sup> B29D 27/04

U.S. Cl. 264—49

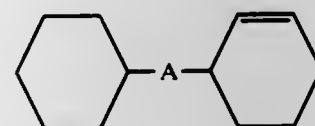
11 Claims

1. A process for producing a film-like or fibrous article of a wholly aromatic polyester, which comprises

(1) melt-molding a wholly aromatic polyester composition comprising

(a) 100 parts by weight of a wholly aromatic polyester containing as a main component at least one compound selected from the group consisting of aromatic dicarboxylic acids, aromatic dihydroxy compounds and aromatic hydroxycarboxylic acids, and

(b) from 5 to 300 parts by weight of a low-molecular-weight compound being substantially non-reactive with the wholly aromatic polyester and having a boiling point of at least about 200° C. under atmospheric pressure and a molecular weight of not more than 1,000, selected from the group consisting of imide compounds, isocyanurate compounds and diphenyl or the formula



wherein A represents —O—, —SO<sub>2</sub>—, —CO— or are alkylene group, an the phenyl groups may be substitutes, into an unstretched film-like or fibrous article, and

(2) removing at least a major portion of the low-molecular-weight compound from the unstretched film-like or fibrous article by extraction with an organic solvent capable of dissolving the low-molecular-weight compound but substantially incapable of dissolving the wholly aromatic polyester under the extracting conditions; or stretching the unstretched film-like or fibrous article, and after, as desired, the stretched article is heat-set, removing at least a major portion of the low-molecular-weight compound from the stretched article by extraction with an organic solvent having the same properties as above.

4,416,840

AL<sub>2</sub>O<sub>3</sub> CERAMIC COMPOSITE

Minyoung Lee, Schenectady, and Lawrence E. Szala, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,903

Int. Cl.<sup>3</sup> C04B 35/00

U.S. Cl. 264—60

10 Claims



1. A process for producing a sintered body comprised of an Al<sub>2</sub>O<sub>3</sub> phase and a substoichiometric Ti<sub>1-x</sub>C<sub>x</sub> phase where x ranges from about 0.65 to about 0.95, said Ti<sub>1-x</sub>C<sub>x</sub> phase ranging from about 20% by weight to about 40% by weight of said sintered body and said Al<sub>2</sub>O<sub>3</sub> phase ranging from about 80% by weight to about 60% by weight of said sintered body, said sintered body having a minimum Rockwell A hardness of about 92, which comprises forming a mixture composed of Al<sub>2</sub>O<sub>3</sub>, non-diamond elemental carbon and a titanium member selected from the group consisting of elemental titanium, titanium hydride and mixtures thereof, said titanium member being used in an amount wherein the titanium component is equivalent to from about 6.2 parts by weight to about 4.2 parts by weight of elemental titanium for each part by weight of said carbon, forming said mixture into a compact, subjecting the compact to a partial vacuum wherein at least at sintering temperature a significant portion of the residual vapor is carbon monoxide, and heating said subjected compact to a sintering temperature ranging from about 1750° C. to about 1850° C. producing said Ti<sub>1-x</sub>C<sub>x</sub> phase in situ and said sintered body, said TiH<sub>2</sub> decomposing completely at a temperature below sintering temperature to produce titanium and hydrogen gas, said mixture containing amounts of said Al<sub>2</sub>O<sub>3</sub>, said titanium member and said carbon which produce said sintered body, said partial vacuum sufficiently removing from the environment of said compact any gas generated during said heating which would have a significantly deleterious effect on said compact.

4,416,841

## METHOD FOR CENTRIFUGAL CASTING OF THERMOSETTING PLASTICS

John E. Corea, 414 12th St., Lakewood, N.J. 08701; Emanuel R. Corea, 102 10th Ave., Belmar, N.J. 07719, and Irving Tashlick, 675 Ocean Ave., Long Branch, N.J. 07740

Division of Ser. No. 242,594, Mar. 11, 1981, Pat. No. 4,350,481.

This application Sep. 13, 1982, Ser. No. 416,893

Int. Cl.<sup>3</sup> B29C 5/04

U.S. Cl. 264—102

4 Claims

1. A method for centrifugally casting thermosetting plastics and the like, this method including the following steps:

(a) assembling and closing a plurality of casting molds each having an upper portion and a lower portion;

(b) placing a prepared dividing hub onto and over a plurality of drive pins provided on a spinner carried by a stationary base, said dividing hub having a top, a bottom and a plurality of sides and a reservoir within said dividing hub;

(c) engaging a plurality of prepared closed casting molds onto and over a like number of nozzles, each of said nozzles extending radially from the sides of said dividing hub wherein said hub as a conduit connecting an extreme tip of each of said nozzles with a bottom portion of the reservoir;

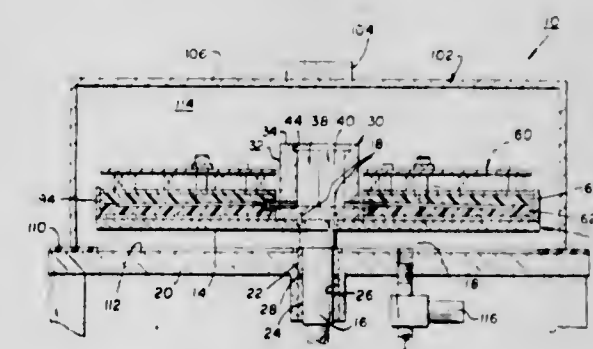
(d) placing a clamping means around the perimeter of the casting molds;

(e) closing and tightening the clamping means to retain the casting molds to the dividing hub during spinning of the hub and casting mold;

(f) pouring a pre-measured quantity of the thermosetting plastic into said reservoir in the dividing hub;

(g) moving a vacuum hood to the stationary base and with gasket means forming a vacuum chamber with said stationary base;

(h) evacuating the now closed vacuum chamber;



(i) spinning the casting molds wherein the thermosetting plastic material flows from the reservoir through the connecting conduit and then into the casting molds;

(j) stopping the spinning casting molds;

(k) venting the vacuum chamber;

(l) moving the vacuum hood to an open condition;

(m) releasing and opening the clamping means;

(n) curing the thermosetting plastic within the casting molds at a station remote from the apparatus;

(o) disassembling the casting molds, and

(p) removing the cast items from the molds after curing.

4,416,842

## DIRECTED CRACKING IN CONCRETE PANEL MANUFACTURE

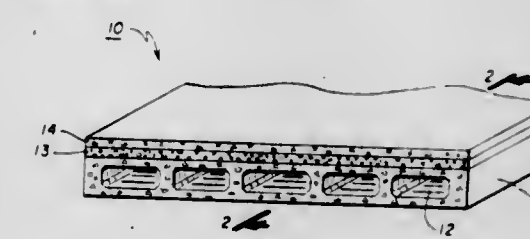
Richard C. Nash, New Prague, and Terrance W. Duffy, Minneapolis, both of Minn., assignors to Fabcon, Inc., Savage, Minn.

Filed Mar. 2, 1981, Ser. No. 239,330

Int. Cl.<sup>3</sup> B28D 1/26

U.S. Cl. 264—145

7 Claims



1. In the method of manufacturing concrete panels wherein a length of substantially flat sandwich structure of concrete and insulation is formed, the structure having an upper concrete layer and a lower concrete support body layer, the insulation being carried intermediate the two, the concrete structure is cured, and then cut to form a plurality of individual panel lengths, the improvement comprising the step of forming indentations while the layer of concrete is still fluid and uncured, the indentations following the path of intended cuts, and subsequently after curing, cutting through the concrete structure along the indentations to form the individual panels, whereby undirected cracking in the upper surface is substantially eliminated.



4,416,843

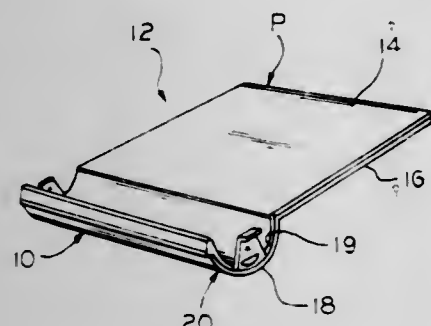
**METHOD OF FORMING COMPOSITE DISPLAY PACKAGE**

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Continuation-in-part of Ser. No. 261,586, May 7, 1981, abandoned. This application Oct. 15, 1982, Ser. No. 434,508  
Int. Cl.<sup>3</sup> B29C 17/10, 6/02

U.S. Cl. 264—152

1 Claim



1. In a method for forming a plurality of composite carded display packages from a single blank of foldable paperboard, the steps comprising of:

- forming a score line intermediate of said blank to divide said blank into a pair of first and second panels;
- forming in the first panel of said blank sets of cut lines extending through said blank;
- forming in the second panel of said blank sets of apertures extending through said blank;
- folding one of said panels over the other and adhesively securing the panels to each other in face-to-face relation so that the apertures of said second panel are generally overlying and in alignment with the cut lines of said first panel;
- inserting said panels into a molding machine;
- forming pockets consisting of shells made integrally with and at one end of said panels and injecting plastic into said mold to substantially cover the shells to form plastic liners in said shells in the areas of each of said sets of cut lines and apertures to create a plurality of individual packages; and
- cutting said packages from said panels.

4,416,844

**DEFLATION-PROOF PNEUMATIC TIRE AND ELASTOMERIC FILLINGS THEREFORE**

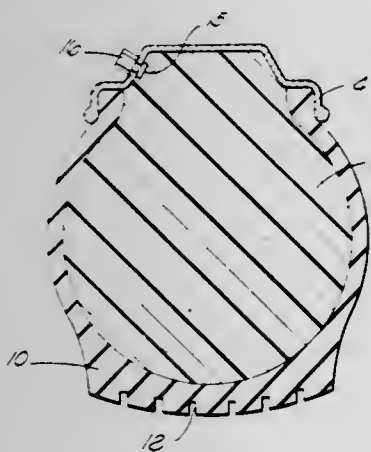
Ransome J. Wyman, 821 Camino Calibri, Calabasas, Calif. 91302

Filed Dec. 23, 1980, Ser. No. 219,456

Int. Cl.<sup>3</sup> B60C 7/00

U.S. Cl. 264—267

13 Claims



1. A method for obtaining a deflation-proof tire, comprising: filling a pneumatic tire casing to a pressure of at least 25 psi with a liquid solution prior to significant production of carbon dioxide, said solution comprising, in combination,

a polyol, an organic polyisocyanate and water, in amounts sufficient to produce carbon dioxide and form a polyurethane elastomer containing polyurea, said pressure being sufficient to prevent bubble formation in the tire; and curing said elastomer to maintain said carbon dioxide dissolved in said elastomer whereby to produce a substantially void-free elastomeric filling material within said casing.

4,416,845

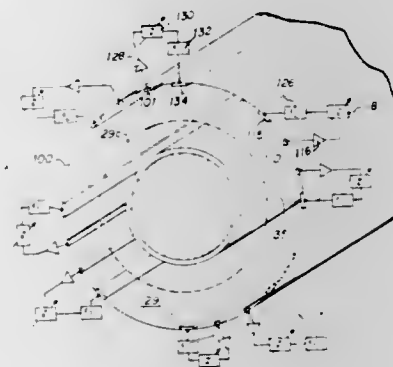
**CONTROL FOR ORBITING CHARGED PARTICLES**  
Winfield W. Salisbury, Scottsdale, Ariz., assignor to Energy Profiles, Inc., Newtown Square, Pa.

Filed Aug. 2, 1979, Ser. No. 63,105

Int. Cl.<sup>3</sup> G21B 1/00

U.S. Cl. 376—107

15 Claims



9. In a fusion reaction system where ions from two sources spiral toward each other on common axis while rotating in opposite senses in orbital paths of common radii in an annular reaction zone of circular symmetry at any given cross section perpendicular to the axis of said paths and bounded by spaced apart outer and inner coaxial electrode walls for promoting collisions of ions in one beam with ions in the other beam, the improvement comprising:

- electrostatic field means operable in the absence of any effective magnetic fields for substantially limiting travel through said zone to orbital paths of the same radii with the walls of at least one of said electrodes having coolant courses connected to a coolant flow system and structure forming cavities in the larger of said electrodes, said cavities being connected to said reaction zone by slots in the walls of said larger electrode wherein the slots and connected cavities form passive systems at resonance relative to characteristics of flow of said ions and which establish focusing fields within the reaction zone to force said ions into paths of said radii.

4,416,846

**NUCLEAR POWER PLANT WITH COOLING CIRCUIT**  
Hans Kastl, Neustadt an der Waldnaab, and Georg Gugel, Kalchreuth, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany  
Continuation of Ser. No. 63,441, Aug. 3, 1979, abandoned. This application Jul. 17, 1981, Ser. No. 284,188

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2835082

Int. Cl.<sup>3</sup> G21C 17/00

U.S. Cl. 376—249

13 Claims

1. A nuclear power plant with a metallic, circulatory cooling loop formed with welding seams and including, as components thereof, a reactor pressure vessel, a heat consumer and a pump, as well as a coolant line connecting the components to one another, and thermal insulation provided on the cooling loop, the welding seams being testable by a track-traversing testing device, comprising a multiplicity of fixedly installed tracks

4,416,848

**DEVICE FOR FIXING A GUIDE TUBE**

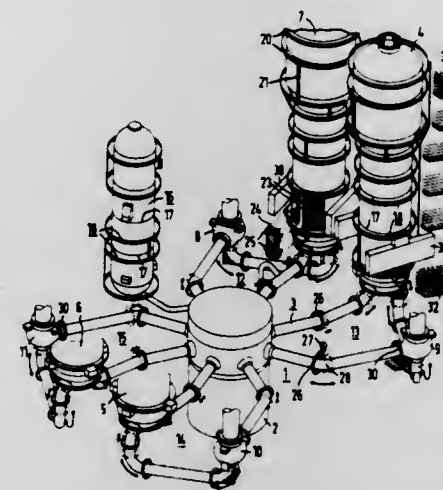
Claude Feutrel, Vauhallan, France, assignor to Commissariat à l'Energie Atomique, Paris, France

Filed May 20, 1981, Ser. No. 265,601

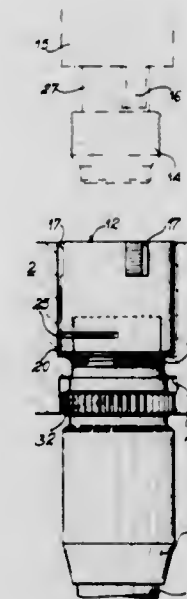
Claims priority, application France, May 27, 1980, 80 11695  
Int. Cl.<sup>3</sup> G21C 19/20, 3/30

U.S. Cl. 376—260

5 Claims



part of the thermal insulation being in vicinity of said tracks and being formed as removable cassettes.



4,416,847

**METHOD AND APPARATUS FOR DETECTING FAILURE OF NUCLEAR FUEL**

Shozo Saito, and Takeshi Suzumura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

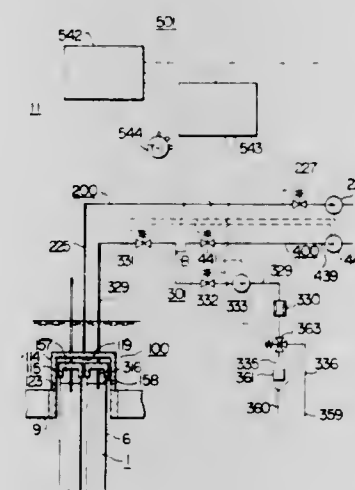
Filed Aug. 15, 1980, Ser. No. 178,596

Claims priority, application Japan, Aug. 20, 1979, 54-105041

Int. Cl.<sup>3</sup> G21C 7/00

U.S. Cl. 376—253

14 Claims



1. A device for the disassemblable fixing of a zircaloy guide tube of a fuel assembly of a nuclear reactor of the pressurized ordinary water type to the steel end plate of said assembly by means of a sleeve and an outer ferrule, wherein it comprises a ring nut having two threads with an opposite pitch, namely a first lower thread cooperating with the upper tucked part of the sleeve and ensuring the fixing of the latter in translation by gripping between two shoulders and a second upper thread cooperating with a tapped end fitting mounted at the end of a pole permitting its remote manipulation, a screwdriver sleeve with teeth, integral in rotation with the said pole, but mobile in translation by means of an elastic return system along the said pole between a first low position in which teeth on the screwdriver sleeve are located in recesses in the upper part of the ring which they in this way cause to rotate with the pole and the end fitting and a second high position where the said teeth are disengaged from the aforementioned recesses and where the ring and end fitting are independent in rotation, means for decelerating the rotation of the ring with respect to the sleeve and means for preventing any rotation of the sleeve and the guide tube with respect to the upper end plate during the fixing and disassembly operations.

4,416,849

**NUCLEAR POWER PLANT**

Raymond Magnin, Nanterre, France, assignor to Framatome, Courbevoie, France

Filed Oct. 6, 1980, Ser. No. 194,131

Claims priority, application France, Nov. 14, 1979, 79 28067

Int. Cl.<sup>3</sup> G21C 9/00

U.S. Cl. 376—296

3 Claims

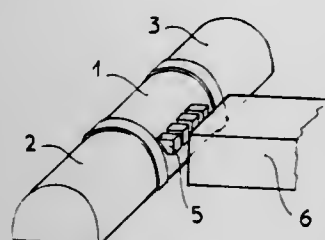
1. Nuclear power plant constructed on a foundation (28), comprising

- a reactor building (1) containing a reactor core and a primary cooling circuit between said core and at least one steam generator;
  - a fuel building (2) for processing new and used fuel;
  - ancillary buildings (3) for nuclear, electrical and safety equipment; and
  - an engine building (6) for turbogenerator units;
- (e) said buildings (1, 2, 3, 6) being arranged in the general shape of a T, said fuel building (2) and ancillary building (3) being arranged in line and adjacent either side of said reactor building (1) and perpendicular to the latter;

3. A method for detecting failure of nuclear fuel, which comprises a first step of projecting sampling conduits into fuel assemblies charged in a reactor core, a second step of stopping flow of cooling water passing through the fuel assemblies, a third step of keeping the fuel assemblies in a state of the flow of the cooling water being stopped for a predetermined period of time, a fourth step of supplying flushing water into the sampling conduits, thereby flushing the inside of the sampling conduits, a fifth step of discharging the flushing water existing in the sampling conduits therefrom at first discharge outlets after the fourth step, a sixth step of supplying the cooling water in the fuel assemblies into sample water receptacles from the sampling conduits at second discharge outlets, and a seventh step of setting the sample water receptacle to the second discharge outlets, the third, fifth and sixth steps being continuously carried out in this order, and the seventh step being carried out after completion of the fourth step and before starting of the sixth step.



(f) a protective enclosure for at least said reactor building (1), said enclosure having a vault rigidly united with said foundation (28) so as to constitute a monolithic tubular assembly the thick lower part of which constitutes said



foundation, and so as to permit prestressing of said vault on said foundation, said vault having the shape of a cylinder with horizontal generatrices parallel to the longitudinal axis of said reactor building (1) and said ancillary buildings (3).

4,416,850

# SYSTEM FOR COOLING THE ATMOSPHERE IN A PRIMARY CONTAINMENT VESSEL IN NUCLEAR REACTOR AND REMOVING WATER-SOLUBLE GASES AND DUSTS FLOATING THEREIN

Tasuku Kodama, and Yoshiaki Taruishi, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa and Nippon Genshiryoku Jigyo Kabushiki Kaisha, Tokyo, both of, Japan

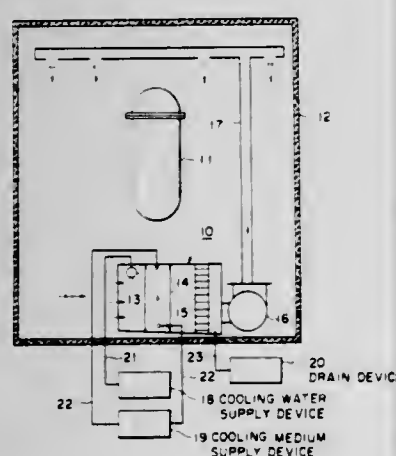
Continuation of Ser. No. 955,347, Oct. 27, 1978, abandoned. This application Jan. 28, 1981, Ser. No. 229,162

Claims priority, application Japan, Nov. 4, 1977, 52-132271

Int. Cl.<sup>3</sup> G21C 15/18

U.S. Cl. 376—310

10 Claims



1. A system for cooling the gaseous atmosphere in a primary containment vessel comprising:

casing means inside said primary containment vessel for controlling flow of gases within the primary containment vessel, said casing means having inlet means and outlet means;

means located adjacent said inlet means for spraying a first cooling liquid within said casing means;

heat exchanger means for cooling the gases positioned within said casing, said heat exchanger means being located downstream of said spraying means and spanning the interior of said casing means;

blower means connected to said casing means for causing gases to circulate through said casing means from said inlet means to said outlet means; and

means located downstream of said heat exchanger means for separating moisture and radioactive vapor from the gases; said spraying means operating to spray said first cooling liquid directly onto said heat exchanger means to form a thin liquid film on the surface of said heat exchanger means, said casing means comprising an unrestricted

opening between said spraying means and said heat exchanger means such that the first cooling liquid from said spraying means may form said thin liquid film on said heat exchanger means in a substantially unrestricted and unimpeded manner, said heat exchanger means having a second cooling liquid circulating there-through, said spraying means being supplied with said first cooling liquid from a first cooling liquid supply device and said heat exchanger means being supplied with said second cooling liquid from a second cooling liquid supply device, whereby the thin liquid film formed on the outer surface of said heat exchanger means operates both to cool the gases passing within said casing means and to absorb radioactive water-soluble gases.

4,416,851

# NUCLEAR FUEL FOR LIQUID METAL COOLED NUCLEAR REACTORS

Edward Duncombe, Hale; Charles P. Gratton, Dorchester, and John Adamson, Blanford, all of England, assignors to United Kingdom Atomic Energy Authority, England

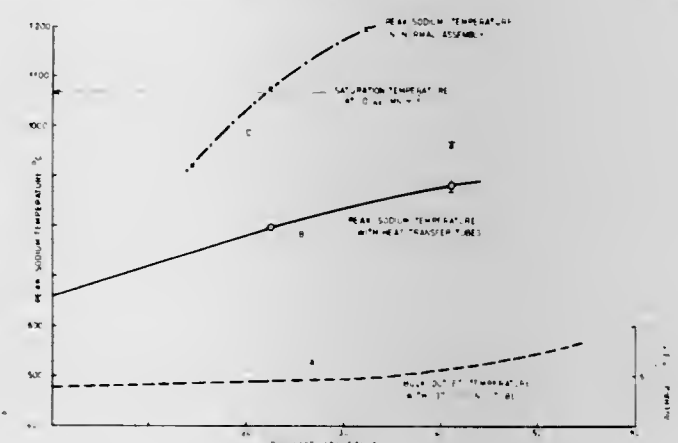
Filed Oct. 12, 1977, Ser. No. 841,568

Claims priority, application United Kingdom, Oct. 18, 1976, 43220/76

Int. Cl.<sup>3</sup> G21C 3/16

U.S. Cl. 376—399

3 Claims



3. A nuclear fuel assembly for a liquid metal cooled nuclear reactor, said assembly comprising a tubular-walled fuel element wrapper defining a channel for coolant flow, a plurality of nuclear fuel pins supported in said wrapper in a spaced parallel array and coaxial with the axis of the channel formed by the wrapper and defining sub-channels between the pins for coolant flow, a plurality of open-ended heat transfer tubes empty of fuel and dispersed among said sub-channels with the axis of said tubes coaxial with the channel axis, a coolant inlet at one end of the channel and a coolant outlet at the other, and a transducer means for monitoring the average outlet temperature of coolant leaving the channel.

4,416,852

# MULTI-ELEVATED NUCLEAR REACTOR SPACER GRID

Olov Nylund, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Mar. 3, 1981, Ser. No. 239,947

Claims priority, application Sweden, Mar. 17, 1980, 8002079

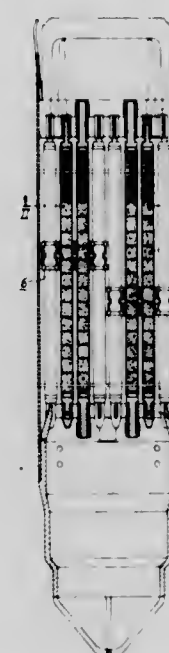
Int. Cl.<sup>3</sup> G21C 3/34

U.S. Cl. 376—438

6 Claims

1. A boiling water reactor fuel assembly comprising a plurality of vertical fuel rods, a fuel box having a rectangular cross-section, upper support means and lower support means for supporting said fuel rods within said box, a plurality of groups of spacer devices arranged between said upper and said lower support means, each of said groups of spacer devices positioning in said fuel box all of said fuel rods, each of said groups being composed of four separate spacer devices, each spacer device comprising a plurality of spacer grid cells, all spacer

grid cells of each spacer device being disposed at one and the same level, the total number of spacer grid cells in each of said spacer devices being less than one-half the number of said fuel



rods, the four separate devices of each of said groups being disposed at least at two different levels within said fuel box with each spacer device being at a corresponding corner of said fuel box.

4,416,853

# CU-AG BASE ALLOY BRAZING FILLER MATERIAL

Masaki Morikawa; Hideaki Yoshida, both of Kasukabe; Kunio Kishida, Ohmly, and Chuji Tanaka, Ageo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00189, § 371 Date Apr. 16, 1982, § 102(e) Date Apr. 16, 1982, PCT Pub. No. WO82/00790, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 25, 1981, Ser. No. 373,498

Claims priority, application Japan, Sep. 1, 1980, 55-120870; Sep. 1, 1980, 55-120871; Oct. 6, 1980, 55-139535

Int. Cl.<sup>3</sup> C22C 9/00

U.S. Cl. 420—469

8 Claims

1. A Cu-Ag alloy brazing filler material with low Ag content that exhibits excellent brazability and has a low vapor pressure consisting essentially of 5 to 35% by weight of Ag, 2.5 to 13% by weight of Si, with the balance being Cu and incidental impurities.

4,416,854

# METHOD FOR KILLING WATER BORNE MICROORGANISMS

James W. Nielsen, Newport, Oreg., assignor to Sharon G. Nielsen, Newport, Oreg., a part interest

Continuation of Ser. No. 346,735, Feb. 8, 1982, abandoned, which is a continuation of Ser. No. 164,238, Jun. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 69,291, Aug. 24, 1979, Pat. No. 4,276,732. This application Mar. 29, 1983, Ser. No. 479,192

Int. Cl.<sup>3</sup> A61L 2/16, 2/18; E03D 9/03; C02F 1/50

U.S. Cl. 422—29

4 Claims

1. A method for killing microorganisms including *E. coli* in a swimming pool, comprising:

intermixing chips of at least two electrolytically reactive elemental metals from a group including zinc, copper and lead;

immersing said chips in contact with one another into said pool;

admitting water into interstices between said chips to elec-

trolytically react the metals to produce a biocidal metal ion solution; and

releasing said solution into said pool to kill microorganisms therein, including *E. coli*.

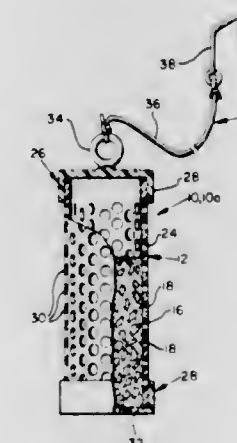
2. A method for killing microorganisms including *E. coli* in the bowl of a toilet, comprising:

intermixing chips of at least two electrolytically reactive elemental metals from a group including zinc, copper and lead;

immersing said chips in contact with one another into the tank of said toilet;

admitting water into interstices between said chips to electrolytically react the metals to produce a biocidal metal ion solution; and

releasing said solution into said toilet bowl to kill microorganisms therein, including *E. coli*.



4,416,855

# RADIOACTIVE WASTE TREATMENT APPARATUS

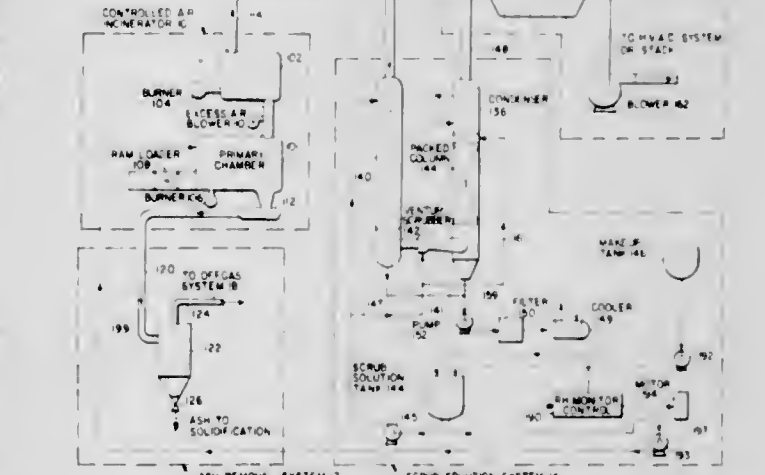
Richard F. Abrams, Westboro, Mass., and James G. Chellis, Centerport, N.Y., assignors to Koch Process Systems, Inc., Westborough, Mass.

Filed Feb. 9, 1981, Ser. No. 232,821

Int. Cl.<sup>3</sup> B01D 53/34; B01J 19/24; G21F 9/00

U.S. Cl. 422—111

4 Claims



1. Radioactive waste treatment apparatus in which the waste includes a substantial amount of polyvinylchloride (PVC) comprising:

(a) an incinerator for burning said waste to produce an acidic gas effluent and an ash residue, said incinerator having a primary chamber and an afterburner chamber;

(b) scrubbing apparatus in fluid communication with said afterburner chamber for washing said gas effluent with scrubbing solution to entrap radioactive particulates in the gas and to neutralize said gas effluent;

(c) a reservoir in fluid communication with a scrubbing







12. The method of claim 11 wherein the trace material is uranium and the body of water is seawater.

4,416,861

**TWO STAGE ODOR CONTROL SYSTEM**

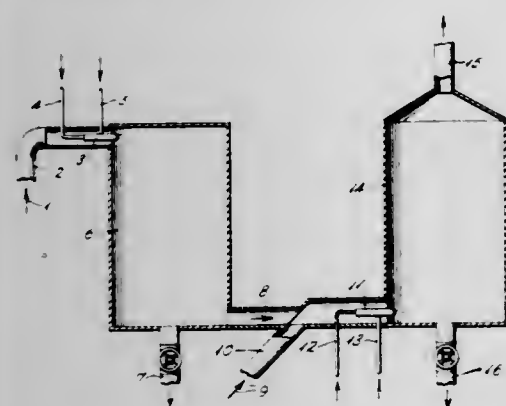
Egbert deVries, Kettering, Ohio, assignor to Quad Environmental Technologies Corp., Highland Park, Ill.

Filed Apr. 29, 1982, Ser. No. 373,250

Int. Cl.<sup>3</sup> B01D 53/34

U.S. Cl. 423—210

20 Claims



1. A method for treating vapors arising out of process operations containing offensive or foul smelling odor constituents, some of said vapors being of high intensity or concentrated odors and the remainder being of low intensity or dilute odors, conveying the high intensity odor vapors into the upper portion of a first treatment zone, treating the high intensity odor vapors with at least one first aqueous spray for a time sufficient to remove the odor constituents from said vapors, the first aqueous spray comprising droplets in the range of 5 to 20 microns in diameter and having a flow rate in the range of 0.5 to 1 gal/min to produce  $6 \times 10^6$  to  $1 \times 10^9$  droplets per cfm, removing aqueous liquid from the bottom of the first treatment zone, removing treated first vapors from the lower portion of the first treatment zone, combining the treated first vapors with the low intensity odor vapors, introducing the combined vapors into the lower portion of a second treatment zone via an inlet, contacting said combined vapors near the inlet with at least one second aqueous spray, treating the combined vapors in the second zone with said spray for a time sufficient to remove the odor constituents, the second aqueous spray comprising droplets in the range of 5 to 20 microns in diameter and having a flow rate in the range of 1 to 2 gal/min to produce  $1 \times 10^8$  to  $1 \times 10^9$  droplets per cfm, removing liquid from the bottom of the treatment zone, and removing the treated combined vapors from the top portion of the second treatment zone.

4,416,862

**PROCESS FOR THE PREPARATION OF ALUMINIUM TRICHLORIDE AND SILICON DIOXIDE BY CHLORINATION OF ALUMINA WITH SILICON TETRACHLORIDE**

Dinko Gencev, Sofia, Bulgaria; Katalin Szabo nee Mogyrosi, Tatabanya; Szilard Riederauer, Budapest, and Janos Szepvögyi, Tatabanya, all of Hungary, assignors to Tatabanyai Szénbányak, Tatabanya, Hungary

Filed Jan. 20, 1982, Ser. No. 340,997

Claims priority, application Hungary, Jan. 20, 1981, 116/81

Int. Cl.<sup>3</sup> C01F 7/56

U.S. Cl. 423—335

6 Claims

1. Process for the preparation of aluminium trichloride and

silicon dioxide by chlorination of an alumina containing material with silicon tetrachloride consisting essentially of reacting alumina or a material essentially consisting of alumina with silicon tetrachloride as a single chlorinating agent at a temperature exceeding  $400^\circ\text{C}$ , separating unreacted silicon tetrachloride from the aluminium trichloride obtained and recycling same into the chlorination step, isolating silicon dioxide from the solid residue essentially consisting of the unreacted alumina and silicon dioxide, by dissolving alumina and separating silicon dioxide by filtration, converting the dissolved alumina into alumina and recycling the so converted alumina into the chlorination step while continuously removing the aluminium trichloride obtained.

4,416,863

**METHOD FOR SYNTHESIZING AMORPHOUS SILICON NITRIDE**

Kimihiko Sato, Yokohama; Kunihiro Terasa, Tokyo; Hitoshi Kijimuta, Ebina, and Yukinori Ohta, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

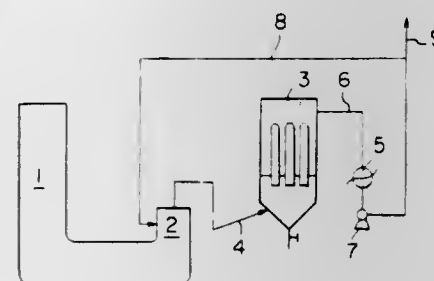
Filed Jul. 2, 1982, Ser. No. 394,862

Claims priority, application Japan, Jul. 21, 1981, 56-112971

Int. Cl.<sup>3</sup> C01B 21/06; B01D 59/08

U.S. Cl. 423—344

2 Claims



1. A two stage method for synthesizing amorphous silicon nitride, comprising reacting in the first stage silicon halide and ammonia in a reaction vessel for about 0.1 to 3 seconds at a temperature range of about  $400^\circ\text{C}$  to  $1600^\circ\text{C}$  in a molar ratio of ammonia to silicon halide of about 0.1 to 5 in the absence of oxygen to produce amorphous silicon nitride, and then separating in the second stage silicon nitride with ammonia halide which was produced in the first stage simultaneously with said amorphous silicon nitride, using a separating device wherein cool gas at a temperature of  $150^\circ\text{C}$  or below containing therein neither oxygen nor moisture is introduced resulting in the collection of solid amorphous silicon nitride and condensed ammonium chloride without adhering into the separating device and other component parts thereof in any substantial amount.

4,416,864

**PROCESS FOR CALCIUM HYPOCHLORITE**

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sep. 30, 1982, Ser. No. 429,754

Int. Cl.<sup>3</sup> C01B 11/06; C01F 11/24

U.S. Cl. 423—474

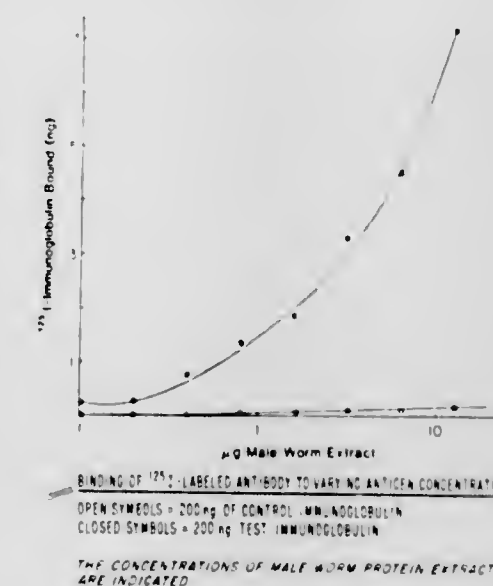
14 Claims

1. A process for preparing calcium hypochlorite from lime containing insoluble impurities which comprises:

- reacting an aqueous solution of hypochlorous acid with said lime to form a reaction mixture comprised of dibasic calcium hypochlorite crystals, said insoluble impurities and unreacted lime;
- separating coarse dibasic calcium hypochlorite crystals from a slurry comprised of an aqueous calcium hypochlorite solution containing fine insolubles comprised of fine crystals of dibasic calcium hypochlorite, said unreacted lime and said insoluble impurities;
- separating said fine insolubles from said aqueous calcium hypochlorite solution;

- washing said coarse dibasic calcium hypochlorite crystals with said aqueous calcium hypochlorite solution and recovering said wash solution;
- recombining said fine insolubles with said wash solution to form a slurry of fine insolubles;
- reacting said slurry of fine insolubles with an aqueous solution of hypochlorous acid to produce additional calcium hypochlorite in solution;
- separating the calcium hypochlorite solution from the remaining insoluble impurities;
- reacting said calcium hypochlorite solution and hypochlorous acid with the washed dibasic calcium hypochlorite crystals to produce an aqueous paste of hemibasic calcium hypochlorite crystals;
- reacting said aqueous paste of hemibasic calcium hypochlorite crystals with sufficient concentrated alkali metal hydroxide and sufficient chlorine to form a paste of neutral calcium hypochlorite dihydrate crystals; and
- drying said aqueous paste of calcium hypochlorite dihydrate crystals to produce dry granular calcium hypochlorite.

8. A method of combating fluke infection which comprises injecting a warm-blooded animal with a mixture of antibodies



corresponding to the antibodies produced by fused cell hybrids ATCC HB-8086, ATCC HB-8087 and ATCC HB-8088.

4,416,867

**ORAL COMPOSITIONS**

Thomas W. Ritchey, Norwood; John M. Weaver, Glen Rock, and Martin Sapone, Tenafly, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 235,247, Feb. 17, 1981, Pat. No. 4,339,432, which is a continuation-in-part of Ser. No. 50,392, Jun. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 50,393, Jun. 20, 1979, abandoned. This application Feb. 10, 1982, Ser. No. 347,597

Int. Cl.<sup>3</sup> A61K 7/16

U.S. Cl. 424—49

9 Claims

1. A toothpaste composition having a pH of about 4.5 to about 8.0 comprising a physiologically acceptable zinc salt or zinc glycinate in an amount sufficient to provide about 0.2% to about 3% by weight of the composition of soluble zinc ions wherein said zinc salts may have a tendency to produce the organoleptically displeasing effect of astringency; and glycine at a level of about 0.1% to about 4% by weight, based on the total weight of the composition as the essential effective agent reducing astringency or said glycine serving to effectively solubilize said zinc salts at a pH of about 8 or above.

4,416,868

**COSMETIC EXCIPIENT**

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Aug. 8, 1975, Ser. No. 602,962

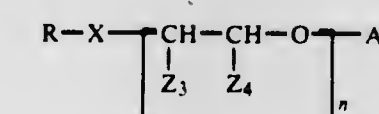
Claims priority, application Luxembourg, Aug. 12, 1974, 70720

Int. Cl.<sup>3</sup> A61K 7/042, 7/021, 7/025

U.S. Cl. 424—59

28 Claims

1. A compound in the form of an oil or wax having the formula



wherein

R is selected from the group consisting of alkyl having 7 to 20 carbon atoms, the hydrocarbon residue of lanolin when X is oxygen and the hydrocarbon residue of lanolic acid when X is

4,416,866

**DIAGNOSIS AND TREATMENT OF FLUKE INFECTIONS WITH MONOCLONAL ANTIBODIES**

Mette Strand, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 28, 1981, Ser. No. 297,290

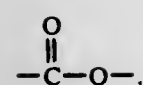
Int. Cl.<sup>3</sup> G01N 33/00

U.S. Cl. 424—1.1

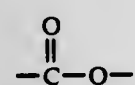
9 Claims

1. A screening method for the determination of a fluke infection of a warm-blooded animal which comprises testing a body component selected from the group consisting of serum, urine, milk and feces for the presence of glycoprotein molecules bound by antibodies produced by fused cell hybrid ATCC HB-8087 or fused cell hybrid ATCC HB-8086.

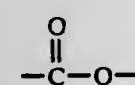




X represents a member selected from the group consisting of oxygen and carbonyloxy having the formula

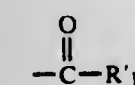


linked to R through the free bond of the carbon atom of the carbonyloxy group,  
one of Z<sub>3</sub> and Z<sub>4</sub> represents hydrogen and the other represents —CH<sub>2</sub>—Y<sub>1</sub>—R' where Y<sub>1</sub> represents a member selected from the group consisting of —CH<sub>2</sub>—, oxygen and carbonyloxy of the formula



linked to R' through the free bond of the carbon atom of the carbonyloxy group and R' represents alkyl having from 7 to 20 carbon atoms with the proviso that R' can have different values in the said repeating units of a given compound of said formula in (a);

A<sub>1</sub> is selected from the group consisting of hydrogen and when Y<sub>1</sub> is carbonyloxy a mixture of hydrogen and



wherein R' has the meaning given above; and n is a whole or decimal number greater than 1 and lower than or equal to 10.

4,416,869

# METHOD FOR ELIMINATING OR REDUCING THE DESIRE FOR SMOKING

Emanuel Revici, New York, N.Y., assignor to The Vinosen Company, New York, N.Y.

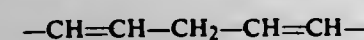
Continuation of Ser. No. 74,455, Sep. 11, 1979, abandoned, which is a continuation of Ser. No. 923,657, Jul. 11, 1978, abandoned, which is a continuation of Ser. No. 724,366, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,207, Sep. 22, 1975, abandoned. This application Nov. 20, 1981, Ser. No. 323,634

Int. Cl.<sup>3</sup> A61K 31/20, 31/23, 33/04

U.S. Cl. 424—164

15 Claims

1. A method for treating or aiding in the treatment of a tobacco habit or addiction in a human by controlling the craving for tobacco or controlling tobacco withdrawal symptoms, which comprises internally administering to said human an amount effective to control said craving or said withdrawal symptoms of an oxidized, sulfurized oil, produced by the process comprising heating in the presence of oxygen and elemental sulfur and at a temperature of from about 120° C. to about 130° C., an oil comprising at least one fatty acid or fatty ester having allylic unsaturation of at least one of the types



or



for a period of time sufficient to produce a peroxide titer substantially greater than the peroxide titer of said oil prior to oxidation.

## 4,416,870 ANTIBIOTIC COMPOUND, ITS PRODUCTION AND ITS MEDICINAL USE

Karl G. Metzger; Jörg Pfitzner; Delf Schmidt, all of Wuppertal; Horst Weyland, Bremerhaven; Günter Benz, Velbert, and Theo Schröder, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,418

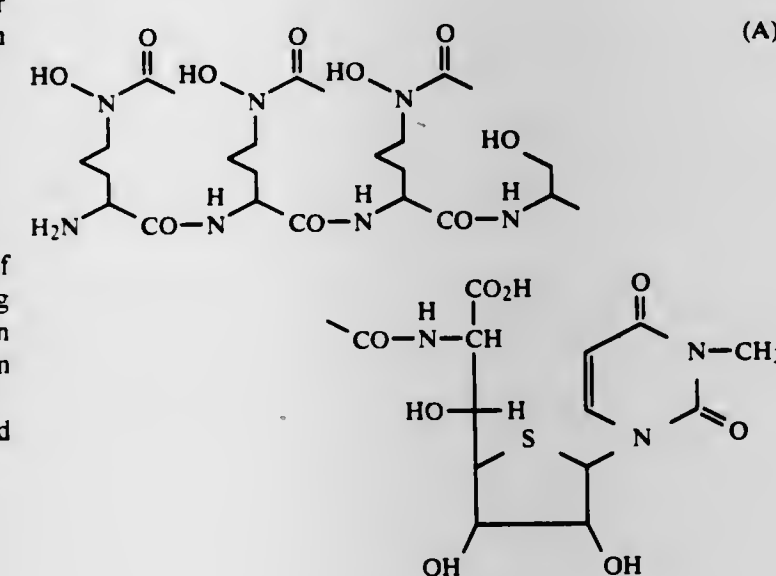
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102136

Int. Cl.<sup>3</sup> C07C 103/52; A61K 31/495

U.S. Cl. 424—172

10 Claims

1. An antibiotic compound which, in the iron-free form, is of the formula



## 4,416,871 INHIBITION BY PEPTIDES OF TOLERANCE TO AND PHYSICAL DEPENDENCE ON MORPHINE

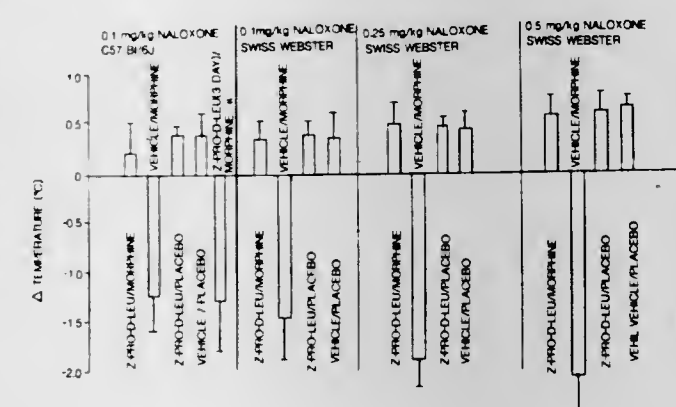
Roderich W. Walter, Chicago, Ill.; William A. Krivoy, Lexington, Ky.; Ronald F. Ritzmann, Chicago, and Hemendra N. Bhargava, Wheaton, both of Ill., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 124,676, Feb. 26, 1980, abandoned, which is a continuation of Ser. No. 46,701, Jun. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 923,187, Jul. 10, 1978, abandoned. This application Jan. 11, 1982, Ser. No. 338,537

Int. Cl.<sup>3</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177

10 Claims



1. An analgesic composition comprising morphine and a dipeptide selected from the group consisting of Pro-Leu, D-Pro-D-Leu, D-Pro-Leu, Pro-D-Leu, Pro-Gln, Pro-Ser, Pro-Met, Pro-ΔPhe, and Pro-Tyr, the dipeptide being present in amount sufficient to inhibit the development of tolerance to

and physical dependence on the morphine without substantial alteration of its analgesic properties.

## 4,416,872 TREATMENT OF MALARIA WITH LIPOSOMES CONTAINING 8-AMINOQUINOLINE DERIVATIVES AND GLYCOCONJUGATES

Carl R. Alving, Washington, D.C., and Edgar A. Steck, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 359,012

Int. Cl.<sup>3</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424—177

64 Claims

1. An antimalarial composition comprising a glycoconjugate selected from the group consisting of:

- a glycolipid having a terminal carbohydrate moiety selected from the group consisting of glucosyl, galactosyl and lactosyl;
- a glycolipid having a terminal carbohydrate moiety selected from the group consisting of glucosyl, galactosyl and lactosyl encapsulated within a liposome selected from the group consisting of a phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome;
- a glycoprotein selected from the group consisting of fetuin, asialofetuin, orosomucoid and asialoorosomucoid encapsulated within a liposome selected from the group consisting of phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome;
- a glycolipid having a terminal carbohydrate moiety selected from the group consisting of glucosyl, galactosyl and lactosyl encapsulated within a liposome selected from the group consisting of a phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome wherein each said liposome contains an 8-aminoquinoline selected from the group consisting of primaquine and a pharmaceutically-acceptable acid addition salt thereof; and
- a glycoprotein selected from the group consisting of fetuin, asialofetuin, orosomucoid and asialoorosomucoid encapsulated within a liposome selected from the group consisting of a phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome wherein each said liposome contains an 8-aminoquinoline selected from the group consisting of primaquine and a pharmaceutically-acceptable acid addition salt thereof.

4,416,873

## COMBINED ALLANTOIN-HYDROLYZED ANIMAL PROTEIN SKIN PREPARATION

Eugene Puchalski, Jersey City; Frances A. Donahue, Middletown, and Richard P. Dixon, Aberdeen, all of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Continuation of Ser. No. 383,404, Jun. 1, 1982, Pat. No. 4,374,766. This application Dec. 13, 1982, Ser. No. 449,117. The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 7/06, 7/15, 7/46, 7/48

U.S. Cl. 424—177

14 Claims

1. A stable soothing hydroalcoholic skin preparation comprising a combined allantoin-hydrolyzed animal protein product in an amount of at least about 0.5% by weight, and panthenol, urea, ethanol or isopropyl alcohol and water, and optionally one or more humectants, preservatives, fragrances and solubilizing agents for the fragrances, said allantoin remaining in solution, without crystallizing out, for extended periods of time.

## 4,416,874 INJECTABLE COMPOSITIONS OF BBM-928A

Murray A. Kaplan, Syracuse, and Edward C. Shinal, Manlius, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,998

Int. Cl.<sup>3</sup> A61K 37/02

U.S. Cl. 424—177

8 Claims

1. A pharmaceutical composition suitable for intravenous injection comprising a sterile aqueous solution containing from 1 mg. to 5 mg. of BBM 928A per milliliter, and sufficient of a pharmaceutically acceptable water soluble base to solubilize said BBM 928A and confer a pH value of from pH 11.0 to 11.5 upon said solution wherein said base is selected from the group consisting of sodium hydroxide, trisodium phosphate, sodium carbonate, pyrrolidine, triethylamine, piperidine, glucosamine, N-methylglucamine, and the sodium salt of an organic acid selected from the group consisting of glycine, aspartic acid, cysteine, phthalic acid, succinic acid, and tyrosine.

4,416,875

## ESTER DERIVATIVES OF DEOXYFLUOROURIDINE

Seturo Fujii, Toyonaka; Bompel Yasui, Ikoma; Mitsuo Nakamura, Kyoto; Tomohisa Miyamoto, Settsu; Kazuko Ando, Hirakata; Iwao Hashimoto, Osaka; Yoneichi Sawai, Kadoma; Naoki Umeda, Osaka, and Masahiro Kawasaki, Kashiwara, all of Japan, assignors to Funai Yakuhin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 6, 1981, Ser. No. 290,420

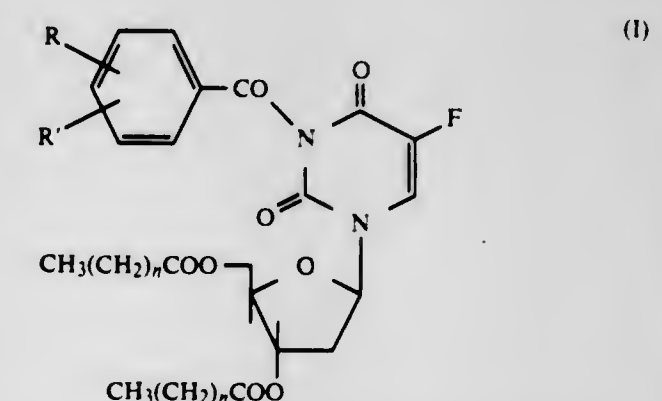
Claims priority, application Japan, Aug. 13, 1980, 55-112102

Int. Cl.<sup>3</sup> A61K 31/70; C07H 19/08

U.S. Cl. 424—180

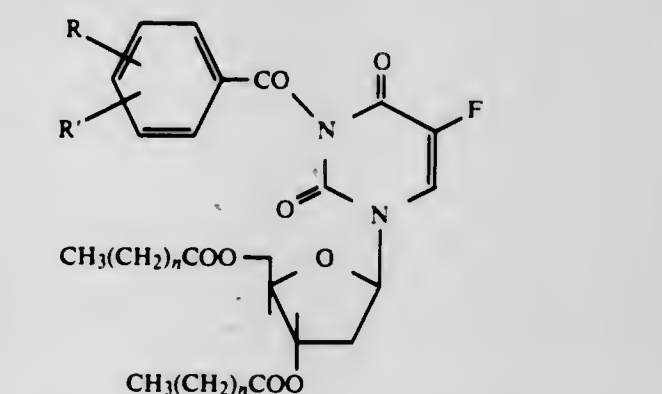
13 Claims

1. An ester derivative of deoxyfluorouridine of the general formula (I):



wherein R and R', which may be identical or different, are selected from the group consisting of a hydrogen atom, a halogen atom, and a methyl group and n is 3 or 4.

7. A pharmaceutical composition containing, as an active ingredient an effective anti-tumor amount of, an ester derivative of deoxyfluorouridine of the general formula:



wherein R and R', which may be identical or different, are selected from the group consisting of a hydrogen atom, a



halogen atom and a methyl group and n is 3 or 4 and a pharmaceutically acceptable carrier or diluent.

4,416,876

# PARA-AMINO BENZOIC AND PHENYLACETIC ACID DERIVATIVES

Sandor Barcza, and Faizulla G. Kathawala, both of Mt. Lakes, N.J., assignors to Sandoz, Inc., East Hanover, N.J.

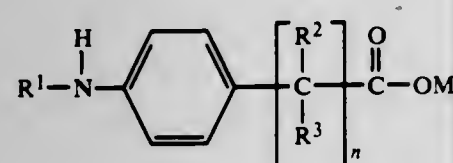
Filed May 19, 1982, Ser. No. 379,739

Int. Cl.<sup>3</sup> C07F 7/10

U.S. Cl. 424—184

35 Claims

1. A compound of the formula:



in which

R<sup>1</sup> is a mono-silicon-containing hydrocarbyl radical having up to 35 carbon atoms;

each of R<sup>2</sup> and R<sup>3</sup> is, independently, a hydrogen atom or lower alkyl having from 1 to 3 carbon atoms;

n is 0 or 1; and

M is a hydrogen atom, an equivalent of a cation which forms a non-toxic, pharmaceutically acceptable salt, or a non-toxic, pharmaceutically-acceptable monovalent radical which is hydrolyzable or saponifiable to an alkali metal cation.

4,416,877

# ANTI-ATHEROSCLEROTIC PHARMACEUTICAL COMPOSITIONS CONTAINING DIPHOSPHONATE COMPOUNDS

Craig L. Bentzen, Chavannes de Bogis; Lan N. Mong, Nyon, and Eric Niesor, Gland, all of Switzerland, assignors to Symphar S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 114,423, Jan. 22, 1980, Pat. No. 4,309,364. This application Oct. 9, 1981; Ser. No. 310,314

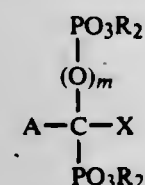
Claims priority, application United Kingdom, Feb. 13, 1979, 794992; Sep. 25, 1979, 7933157

Int. Cl.<sup>3</sup> A61K 31/66

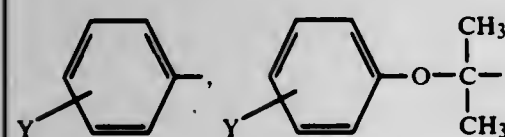
U.S. Cl. 424—204

12 Claims

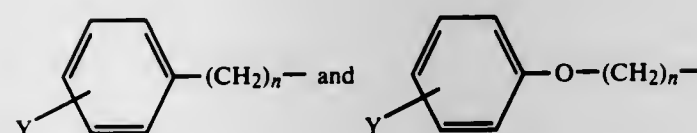
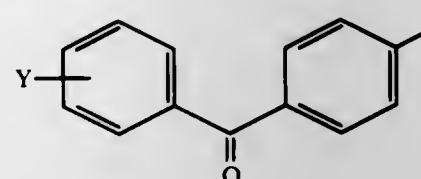
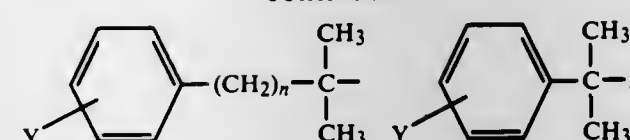
1. A pharmaceutical composition having anti-atherosclerotic activity by reducing tissue lipids and favorably altering plasma lipids, which comprises as active ingredient an antiatherosclerotic effective amount of a diphosphonate ester compound of the formula



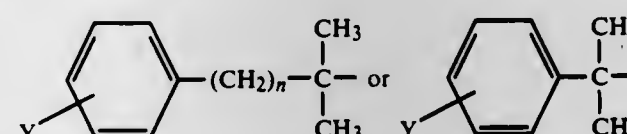
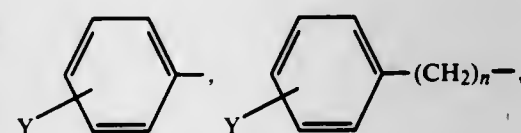
wherein X is H or OH; m is zero or 1, R is CH<sub>3</sub> or C<sub>2</sub>H<sub>5</sub> but when m is zero and X is OH then R is only CH<sub>3</sub>; and A is selected from the group consisting of



-continued



where n is an integer from 1 to 6 and Y is H, CH<sub>3</sub>, OCH<sub>3</sub> or halogen, A being other than



when m is zero, and a pharmaceutically acceptable excipient.

4,416,878

# [8-(DIALKYLAMINO ALKOXY)-CAFFEINE]-PLATINUM COMPLEXES COMPOUNDS AND PHARMACEUTICAL PRODUCTS CONTAINING THE SAME

Josef Klosa, Jänickestrasse 13, D-1000 Berlin, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,712

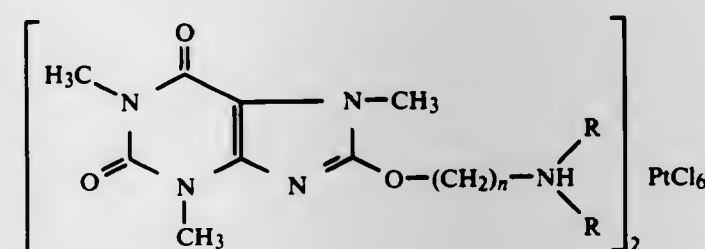
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046927

Int. Cl.<sup>3</sup> A61K 31/515; C07D 473/12

U.S. Cl. 424—245

2 Claims

1. Di-[8-(dialkylamino alkoxy)-caffeine]-hexachloroplatinates of the formula:



wherein n is 2 or 3 and R is a straight or branched alkyl having from 1 to 3 carbon atoms.

2. A pharmaceutical composition for the treatment of malignant tumors containing as the active ingredient a cytostatically effective amount of the compound of claim 1 together with a pharmaceutically acceptable carrier.

4,416,879

# CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Masayoshi Murata, Mino, and Hisashi Takasugi, Kohamashi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 27, 1981, Ser. No. 296,860

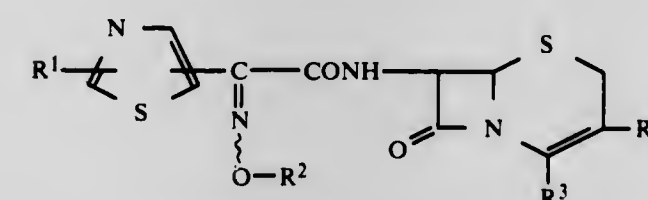
Claims priority, application United Kingdom, Sep. 8, 1980, 8028933

Int. Cl.<sup>3</sup> C07D 501/36; A61K 31/545

U.S. Cl. 424—246

21 Claims

1. A compound of the formula:



wherein R<sup>1</sup> is amino or a protected amino group;

R<sup>2</sup> is a saturated 4 to 8-membered heteromonocyclic group containing one sulfur atom selected from the group consisting of thietanyl, thiolanyl, thianyl, thiepanyl and thiocanyl;

R<sup>3</sup> is carboxy or a protected carboxy group, and

R<sup>4</sup> is hydrogen, lower alkyl, or a group of the formula:



wherein

R<sup>4a</sup> is alkanoyloxy, alkoxycarbonyloxy, alkanesulfonyloxy, benzenesulfonyloxy, tosyloxy, benzoyloxy, toluoyloxy, xyloxyloxy, naphthoyloxy, phthaloyloxy, indancarbonyloxy, phenyl(lower)alkanoyloxy, benzyl- and phenethyl- oxycarbonyloxy, a heterocyclicthio group wherein the heterocyclic group is selected from:

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 4 nitrogen atoms,

saturated 3 to 8-membered heteromonocyclic group containing 1 to 4 nitrogen atoms,

unsaturated condensed heterocyclic group containing 1 to 5 nitrogen atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 oxygen atoms and 1 to 3 nitrogen atoms,

saturated 3 to 8-membered heteromonocyclic group containing 1 to 2 oxygen atoms and 1 to 3 nitrogen atoms,

unsaturated condensed heterocyclic group containing 1 to 2 oxygen atoms and 1 to 3 nitrogen atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 sulfur atoms and 1 to 3 nitrogen atoms,

saturated 3 to 8-membered heteromonocyclic group containing 1 to 2 sulfur atoms and 1 to 3 nitrogen atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 sulfur atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing an oxygen atom,

unsaturated 3 to 8-membered heteromonocyclic group containing an oxygen atom and 1 to 2 sulfur atoms,

unsaturated condensed heterocyclic group containing 1 to 2 sulfur atoms, and

unsaturated condensed heterocyclic group containing an oxygen atom and 1 to 2 sulfur atoms,

said heterocyclicthio group substituted with lower alkyl, lower alkenyl or lower alkynyl, pyridinio, or pyridinio substituted with carbamoyl, with the proviso that R<sup>3</sup> is COO<sup>-</sup> when R<sup>4a</sup> is pyridinio or carbamoyl-substituted pyridinio, and pharmaceutically acceptable salts thereof.

4,416,880

# β-LACTAM ANTIBIOTICS AND COMPOSITIONS CONTAINING THE SAME

Michael Boberg, and Karl G. Metzger, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,280

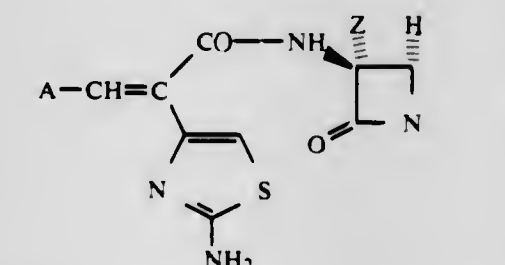
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037997

Int. Cl.<sup>3</sup> C07D 499/70; A61K 31/545, 31/43; C07D 501/22, 501/36

U.S. Cl. 424—246

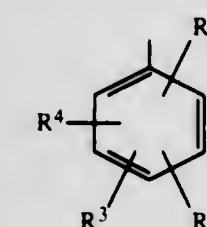
8 Claims

1. A β-lactam compound of the formula



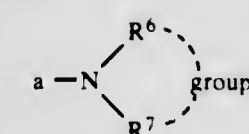
in which

A is a hydrogen atom, an alkyl, alkenyl, alkynyl or cycloalkyl group with up to 18 carbon atoms which may be substituted by double bonded oxygen, nitrogen, sulphur or by alkoxy with up to 2 carbon atoms or by dimethylamino; or naphthyl or a phenyl radical of the formula



wherein

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> independently of one another denote a hydrogen or halogen atom, an alkyl, alkenyl, alkynyl or cycloalkyl group with up to 6 carbon atoms, a —OCOR<sup>5</sup> group,

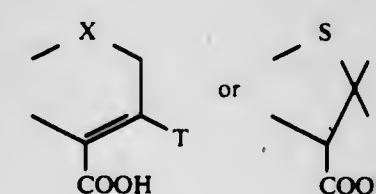


or a hydroxyl, trifluoromethyl, nitro, cyano, C<sub>1</sub> to C<sub>6</sub> alkoxy, C<sub>1</sub> to C<sub>6</sub> alkylthio, hydroxycarbonyl, (C<sub>1</sub> to C<sub>6</sub> alkoxy)-carbonyl, aminocarbonyloxy, sulphonyl or sulpho group, wherein

R<sup>5</sup> denotes a branched or unbranched alkyl, alkenyl or alkynyl group with up to 6 carbon atoms and wherein

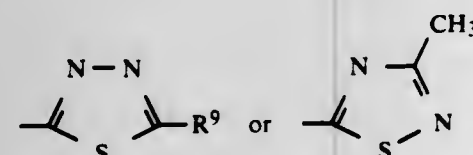
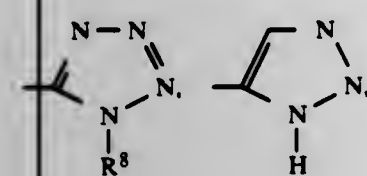
R<sup>6</sup> and R<sup>7</sup> independently of one another are a hydrogen atom, or together or independently of one another are an alkyl, alkenyl, alkynyl, cycloalkyl group or an alkanoyl group with 1-6 carbon atoms, or a heterocyclic 5-membered or 6-membered ring with 1-4 heteroatoms which may be substituted by methyl and wherein

Y is





X is a sulphur or oxygen atom,  
T denotes a hydrogen atom, a C<sub>1</sub> to C<sub>4</sub> alkyl group, a halogen atom or a C<sub>1</sub> to C<sub>4</sub> alkoxy, hydroxymethyl, formyloxymethyl, (C<sub>1</sub> to C<sub>4</sub> alkyl)-carbonyloxymethyl, aminocarbonyloxymethyl, pyridiniummethyl, 4-carbamoylpyridiniummethyl or heterocyclithiomethyl group, wherein "heterocyclithiomethyl" represents a radical of the formula



wherein  
R<sup>8</sup> denotes a hydrogen atom or a methyl, 2-dimethylaminoethyl, carboxymethyl, or sulphomethyl group and  
R<sup>9</sup> denotes a hydrogen atom or a methyl group and wherein  
Z denotes a hydrogen atom or a C<sub>1</sub> to C<sub>6</sub> alkoxy group, or an ester or salt thereof.

5. A method of combating bacterial illnesses in human and non-human animals which comprises administering to the animals an antibacterially effective amount of a compound according to claim 1.

4,416,881

#### INSECT REPELLENTS EMPLOYING CYCLOHEXANE-CARBONYL MORPHOLINE COMPOUNDS

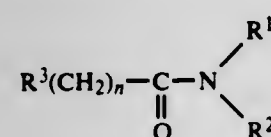
Terrence P. McGovern, Bowie, Md., and Carl E. Schreck, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 40,253, May 18, 1979, Pat. No. 4,298,612, which is a division of Ser. No. 8,814, Feb. 2, 1979, Pat. No. 4,291,041. This application Mar. 19, 1981, Ser. No. 245,464  
Int. Cl.<sup>3</sup> A01N 43/84

U.S. Cl. 424-248.54

5 Claims

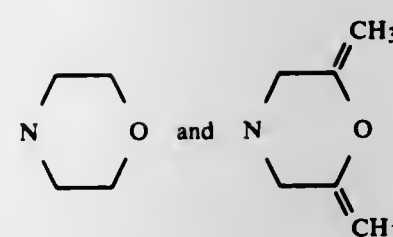
1. A method of providing clothing with effective repellency to mosquitoes comprising applying to clothing an effective mosquito repellent amount of a compound of the formula



wherein R<sup>3</sup> is one of the groups A or B



R<sup>1</sup> and R<sup>2</sup> taken together with the N is selected from the group consisting of



when R<sup>3</sup> is



and n is zero and when R<sup>3</sup> is

and n is the integer one, two, or three.

4,416,882

#### DI(ALKYLAMINO) DERIVATIVES OF CHLORONITROPYRAZINES USEFUL AS ADJUNCTS TO RADIATION THERAPY

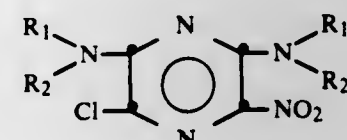
George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 194,091, Oct. 6, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,503  
Int. Cl.<sup>3</sup> C07D 241/16; A61K 31/495

U.S. Cl. 424-250

8 Claims

1. A compound of the formula:



wherein

R<sub>1</sub> is C<sub>1</sub>-C<sub>6</sub> hydroxyalkyl, C<sub>1</sub>-C<sub>6</sub> dihydroxyalkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy alkyl and  
R<sub>2</sub> is hydrogen or R<sub>1</sub>.

4,416,883

#### PENICILLIN DERIVATIVES

Peter H. Bentley, Horsham, England, assignor to Beecham Group Limited, England

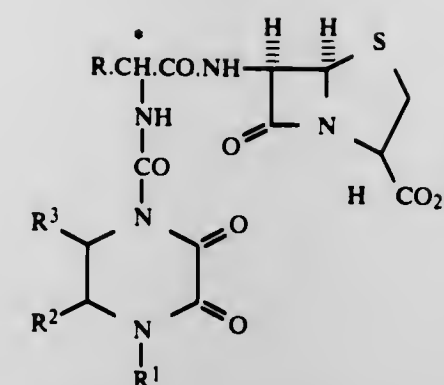
Filed Jun. 24, 1981, Ser. No. 277,031  
Claims priority, application United Kingdom, Jun. 26, 1980, 8020954

Int. Cl.<sup>3</sup> A61K 31/495; C07D 499/70

U.S. Cl. 424-250

9 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof:



wherein R is phenyl, 4-hydroxy phenyl, or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from oxygen, sulphur or nitrogen, optionally substituted with hydroxy, amino, halogen or C<sub>1-6</sub> alkoxy;

R<sup>1</sup> represents hydrogen or C<sub>1-6</sub> alkyl;

R<sup>2</sup> and R<sup>3</sup> are the same or different and represent hydrogen, C<sub>1-6</sub> alkyl, halogen, amino, hydroxy, or C<sub>1-6</sub> alkoxy.

8. A pharmaceutical composition having antibacterial activity comprising an antibacterially effective amount of a compound as claimed in claim 1 together with a pharmaceutical carrier or excipient.

4,416,884

#### PIPERAZINYL BENZOHETEROCYCLIC COMPOUNDS

Hiroshi Ishikawa, Fujio Tabusa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

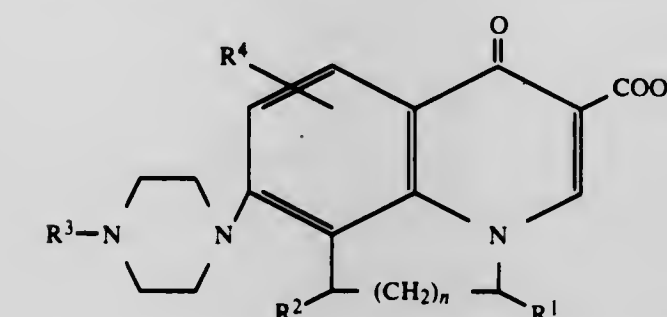
Continuation-in-part of Ser. No. 28,788, Apr. 10, 1979, abandoned. This application Oct. 9, 1980, Ser. No. 195,691  
Claims priority, application Japan, Apr. 12, 1978, 53-43624;

Sep. 7, 1978, 53-110464; Nov. 16, 1978, 53-141785; Nov. 24, 1978, 53-145638; Aug. 31, 1978, 53-107387; Nov. 6, 1978, 53-137157; Nov. 17, 1978, 53-142731; Oct. 11, 1979, 54-131630  
Int. Cl.<sup>3</sup> A61K 31/495; C07D 401/04

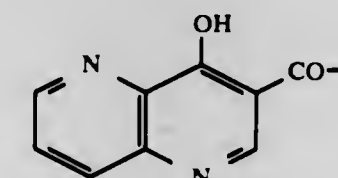
U.S. Cl. 424-250

64 Claims

1. A piperazinylbenzoheterocyclic compound represented by the formula (I)



wherein R<sup>1</sup> represents hydrogen or lower alkyl; R<sup>2</sup> represents hydrogen; R<sup>3</sup> represents hydrogen, lower alkyl, lower alkanoyl, lower alkylsulfonyl, phenylalkyl wherein the alkyl moiety contains 1 to 4 carbon atoms, benzoyl, p-toluenesulfonyl, a group represented by the formula



lower alkyl substituted with one to three of halogen and hydroxy, lower alkanoyl substituted with one to seven of halogen selected from the group consisting of fluorine, chlorine and bromine, phenylalkyl substituted with one to three of lower alkoxy on the phenyl ring, lower alkylsulfonyl substituted with one to three of halogen, lower alkenyl or lower alkynyl; R<sup>4</sup>

represents hydrogen or halogen, and n is an integer of 0 or 1, except that when n is 0, R<sup>1</sup> and R<sup>2</sup> together can represent the atoms necessary to form a cyclohexane ring, and when R<sup>3</sup> represents lower alkyl substituted with one to three of halogen and hydroxy, lower alkanoyl substituted with one to seven of halogen selected from the group consisting of fluorine, chlorine and bromine, phenylalkyl substituted with one to three of lower alkoxy on the phenyl ring, lower alkylsulfonyl substituted with one to three of halogen, lower alkenyl or lower alkynyl, n is 1; or a pharmaceutically acceptable salt thereof.

60. An antimicrobial composition comprising an antimicrobially effective amount of a piperazinylbenzoheterocyclic compound of claim 1.

4,416,885

#### USE OF ISOPROPYLAMINOPYRIMIDINE IN THE CHEMOTHERAPY OF MUSCULAR DYSTROPHY, MYOPATHY AND MYOTONIA

Pierre M. Huve, 3, rue Cernuschi, 75017 Paris, France

Continuation-in-part of Ser. No. 201,709, Oct. 29, 1980, Pat. No. 4,344,947. This application Mar. 22, 1982, Ser. No. 360,497

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/505

U.S. Cl. 424-251

5 Claims

1. A method for the chemotherapy of muscular dystrophy, myopathy, and myotonia which comprises: administering to an animal afflicted with a condition associated with muscular dystrophy, myopathy or myotonia 2-isopropylaminopyrimidine or therapeutically acceptable salts of the same in an amount effective to improve said condition.

4,416,886

#### METHOD OF TREATING PRURITIS AND COMPOSITION THEREFOR

Joel E. Bernstein, Deerfield, Ill., assignor to Dermall Limited, Northbrook, Ill.

Filed Jul. 29, 1981, Ser. No. 288,166

Int. Cl.<sup>3</sup> A61K 31/485

U.S. Cl. 424-260

9 Claims

1. A method for relieving severe itching in patients in need of such treatment, said method comprising topically administering a therapeutically effective amount of naloxone or a pharmaceutically acceptable salt thereof or naltrexone to a patient in need of such treatment.

4,416,887

#### 1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-HYDROXY-4-PHENYLPYRIDINES TO TREAT PAIN

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

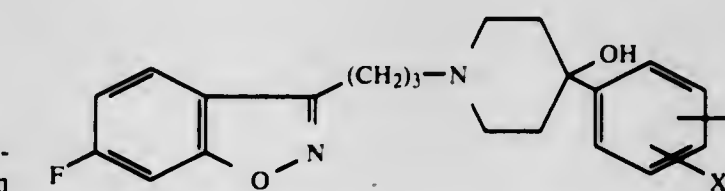
Division of Ser. No. 366,247, Apr. 9, 1982, Pat. No. 4,396,770. This application May 18, 1983, Ser. No. 495,559

Int. Cl.<sup>3</sup> A61K 31/445

U.S. Cl. 424-267

2 Claims

1. A method of alleviating pain comprising administering to a mammal in need of pain alleviation a pain alleviating effective amount of a compound of the formula



wherein X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, halogen or trifluoromethyl; Y is hydrogen or trifluoromethyl with the proviso that



Y is hydrogen when X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, or trifluoromethyl and Y is hydrogen or trifluoromethyl when X is halogen; the optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,416,888

### 3-(2-(4-PIPERIDYL)-1-ALKYL-ETHYL)-INDOLES AND THEIR USE AS MEDICAMENTS

Gerard R. Le Fur, Plessis Robinson, and Francois Audiau, Charenton, both of France, assignors to Pharmindus, Gennevilliers, France

Filed May 3, 1982, Ser. No. 374,365

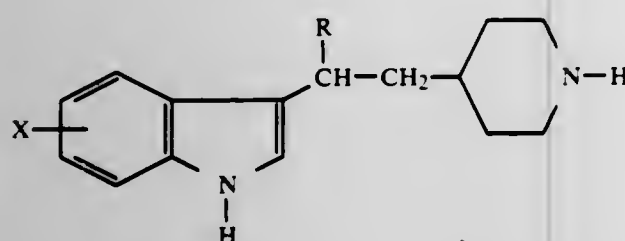
Claims priority, application France, May 22, 1981 [FR] France, 8110220

Int. Cl.<sup>3</sup> A61K 31/395; C07D 101/06

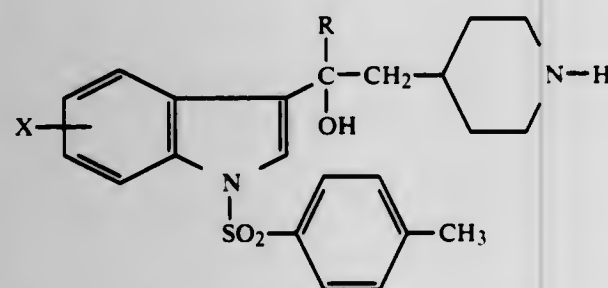
U.S. Cl. 424-267

4 Claims

1. A process for the preparation of a compound of the formula:

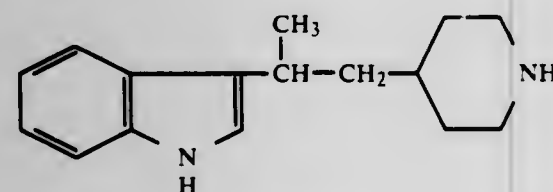


wherein R represents alkyl having 1 to 3 carbon atoms and X represents hydrogen or halogen which comprises reacting a compound of the formula:



with a metallic hydride in an ester or a mixture of an ether and a hydrocarbon, at a temperature between 0° C. and the boiling point of the solvent.

2. A medicament useful as an agent for inhibiting serotonin uptake and for serotonin release comprising an effective amount of a compound of the formula:



or its salt with a pharmaceutically acceptable acid together with a pharmaceutically effective carrier.

### 4,416,889 COMBATING FUNGI WITH N-ALLENYL-ACETANILIDES

Jörg Stetter; Winfried Lunkenheimer, both of Wuppertal, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 136,026, Mar. 31, 1980, Pat. No. 4,385,069.

This application Sep. 20, 1982, Ser. No. 420,682

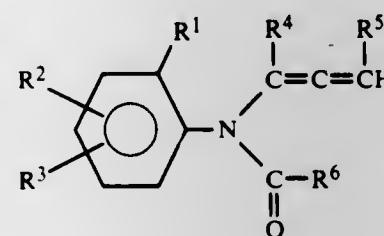
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916692

Int. Cl.<sup>3</sup> A01N 43/64, 43/80; C07D 249/08, 261/18

U.S. Cl. 424-269

7 Claims

1. An N-allenyl-acetanilide of the formula



in which

R<sup>1</sup> represents hydrogen, alkyl with up to 4 carbon atoms, or halogen,

R<sup>2</sup> represents hydrogen or alkyl with up to 4 carbon atoms,

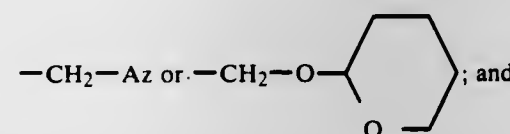
R<sup>3</sup> represents hydrogen or alkyl with up to 4 carbon atoms,

R<sup>4</sup> represents hydrogen or alkyl with up to 4 carbon atoms,

R<sup>5</sup> represents hydrogen or alkyl with up to 4 carbon atoms,

R<sup>6</sup> represents furyl, tetrahydrofuryl, thiophenyl or tetrahydrothiophenyl; isoxazolyl which is optionally substituted

by alkyl with up to 4 carbon atoms;



Az represents pyrazol-1-yl, 1,2,4-triazol-1-yl or imidazol-1-yl.

5. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,416,890

### BENZOTHIAZOLESULFONAMIDE DERIVATIVES FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

Otto W. Woltersdorf, Jr., Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

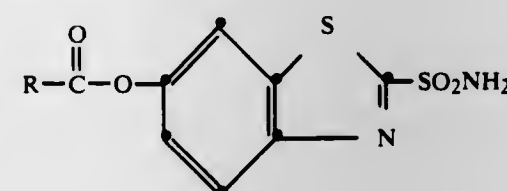
Continuation-in-part of Ser. No. 282,470, Jul. 13, 1981, abandoned, and Ser. No. 352,400, Feb. 25, 1982, abandoned. This application May 21, 1982, Ser. No. 380,571

Int. Cl.<sup>3</sup> C07D 277/80; A61K 31/425

U.S. Cl. 424-270

14 Claims

1. A compound of the formula:



where R is C<sub>1</sub> to C<sub>18</sub> alkyl; C<sub>3</sub> to C<sub>6</sub> cycloalkyl; C<sub>3</sub> to C<sub>6</sub> cycloalkyl C<sub>1</sub> to C<sub>18</sub> alkyl; C<sub>1</sub> to C<sub>18</sub> alkyl C<sub>3</sub> to C<sub>6</sub> cycloalkyl; C<sub>1</sub> to C<sub>18</sub> haloalkyl; aryl where the aryl group is selected from the group consisting of phenyl, naphthyl, pyridinyl, furanyl, and thiophenyl, and said aryl group can be substituted with one

or more substituents selected from the group consisting of C<sub>1</sub> to C<sub>10</sub> alkyl, halo, and C<sub>1</sub> to C<sub>4</sub> alkoxy; arylalkyl where the alkyl moiety has from 1 to 4 carbon atoms and the aryl moiety can be unsubstituted or substituted with halogen or C<sub>1</sub> to C<sub>3</sub> alkyl and said aryl moiety is selected from the group consisting of phenyl, naphthyl, pyridinyl, furanyl, and thiophenyl; C<sub>2</sub> to C<sub>18</sub> hydroxyalkyl; C<sub>2</sub> to C<sub>18</sub> amino alkyl; C<sub>2</sub> to C<sub>6</sub> alkenyl; C<sub>2</sub> to C<sub>6</sub> alkynyl and aryl C<sub>2</sub> to C<sub>6</sub> alkenyl.

4,416,891

ESTER OF

### 6-[(HEXAHYDRO-1H-AZEPIN-1-yl)METHYLENEAMINO]PENICILLANIC ACID, AND ITS USE AS ANTIBACTERIAL AGENT

Fumio Sakamoto, Osaka; Shoji Ikeda, Ibaraki, and Goro Tsukamoto, Toyonaka, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 399,132

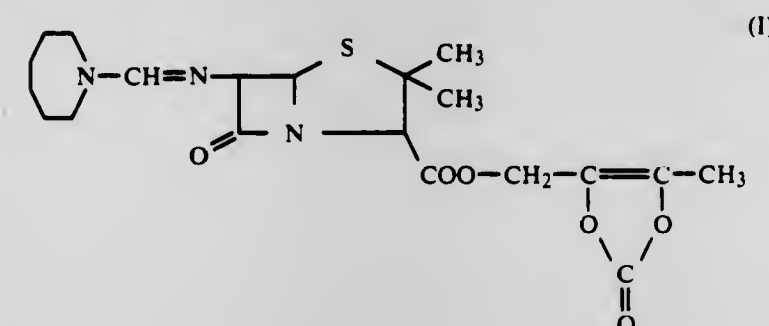
Claims priority, application Japan, Jul. 18, 1981, 56-112508

Int. Cl.<sup>3</sup> C07D 499/00; A61K 31/425

U.S. Cl. 424-270

2 Claims

1. (5-Methyl-2-oxo-1,3-dioxolen-4-yl)methyl 6-[(hexahydro-1H-azepin-1-yl)methyleneamino]penicillanate of the following formula (I)



or a pharmaceutically acceptable acid addition salt thereof.

4,416,892

### METHOD OF TREATING HYPERSENSITIVITY DISEASE WITH BENZOXAZOLE DERIVATIVES

William Dawson, Camberley, England, assignor to Lilly Industries Limited, London, England

Filed Apr. 14, 1982, Ser. No. 368,079

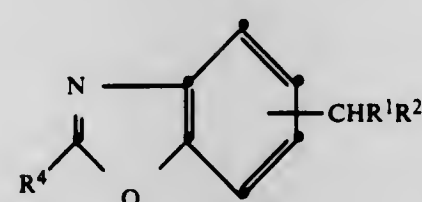
Claims priority, application United Kingdom, Apr. 23, 1981, 8112538

Int. Cl.<sup>3</sup> A61K 31/42

U.S. Cl. 424-272

3 Claims

1. A method for the therapeutic treatment of an immediate hypersensitivity disease, which comprises administering to a mammal, including a human, a compound of the following formula



in which the group -CHR<sup>1</sup>R<sup>2</sup> is in the 5- or 6- position of the benzoxazole nucleus, R<sup>1</sup> is hydrogen or C<sub>1-4</sub> alkyl, R<sup>2</sup> is selected from the group -COOH or a salt or ester thereof, the group -CONH<sub>2</sub> and the group -CH<sub>2</sub>OH, and in which R<sup>4</sup> is a phenyl group optionally substituted by one or two groups selected from halogen, C<sub>1-4</sub> alkoxy, C<sub>1-4</sub> alkyl and C<sub>1-4</sub> haloalkyl, or optionally substituted in two adjacent positions by methylenedioxy.

4,416,893

### SUBSTITUTED 1,2,5-OXADIAZOLE-2-OXIDES IN HUMAN CARDIOVASCULAR SYSTEM DISEASE

Karl Schönaufinger; Rudl Beyerle; Anton Mogilev, all of Frankfurt am Main; Helmut Bohn, Schöneck; Piero Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 246,954

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012862

Int. Cl.<sup>3</sup> A61K 31/42

U.S. Cl. 424-272

9 Claims

1. A pharmaceutical composition useful for treating or preventing human cardiovascular-system disease and comprising a pharmacologically-active component and physiologically-acceptable pharmacologically-inert excipient, the pharmacologically-active component comprising from 0.01 to 20 percent by weight, based on the total composition weight, of a 1,2,5-oxadiazole-2-oxide having the structure of (a) the 3-methyl ester of 1,2,5-oxadiazole-2-oxide-3,4-dicarboxylic acid, (b) 3-methyl-1,2,5-oxadiazole-2-oxide-4-carboxylic acid-anilide or (c) 4-methyl-1,2,5-oxadiazole-2-oxide-3-carboxylic acid-anilide.

4,416,894

### ORGANIC COMPOUNDS

Christopher R. J. Woodhouse, London, England, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 25, 1982, Ser. No. 342,064

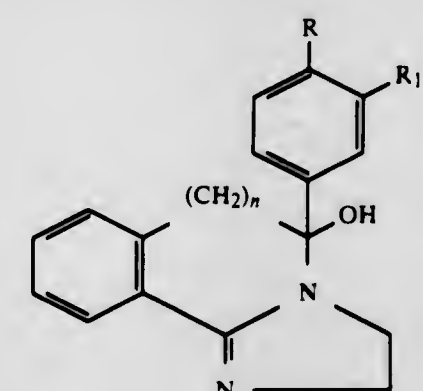
Claims priority, application United Kingdom, Jan. 30, 1981, 8102952

Int. Cl.<sup>3</sup> A61K 31/415, 31/435

U.S. Cl. 424-273 R

2 Claims

1. A method of treating urinary frequency, urgency or incontinence which comprises orally administering to a patient in need of such treatment an effective amount of a compound of formula I



in which n is 0 or 1 and R and R<sub>1</sub> which may be the same or different, are hydrogen, fluorine or chlorine, in free base form or in the form of a pharmaceutically acceptable acid addition salt.



4,416,895

# IMIDAZOLE DERIVATIVES AND SALTS THEREOF, THEIR SYNTHESIS AND INTERMEDIATES AND PHARMACEUTICAL FORMULATIONS

Peter B. Thorogood, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 67,109, Aug. 17, 1979, which is a continuation-in-part of Ser. No. 952,796, Oct. 19, 1978, abandoned, Ser. No. 952,774, Oct. 19, 1978, abandoned, and Ser. No. 8,101, Jan. 31, 1979, abandoned, said Ser. No. 952,796, is a continuation-in-part of Ser. No. 936,407, Aug. 24, 1978, abandoned, said Ser. No. 952,774, is a continuation-in-part of Ser. No. 936,406, Aug. 24, 1978, Pat. No. 4,284,641. This application Apr. 2, 1981, Ser. No. 250,454

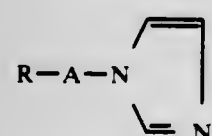
Claims priority, application United Kingdom, Feb. 1, 1978, 3984/78

Int. Cl.<sup>3</sup> A61K 31/415

U.S. Cl. 424—273 R

4 Claims

1. A method of, treatment or prophylaxis of angina pectoris in a mammal which comprises administering to the mammal an effective angina pectoris treatment or prophylaxis amount of a compound of the formula



wherein

(i) A is a straight or branched alkylene group having 1, 2, 3 or 4 carbon atoms or a straight or branched alkenylene group having 2, 3 or 4 carbon atoms and R is a naphthyl, tetrahydronaphthyl, heterocyclyl, arylthio, arylalkylthio, aryloxy, arylalkyloxy, arylhydroxymethylene, arylcarbonyl, arylalkylcarbonyl, alkyloxy, alkylthio, or cycloalkyl or cycloalkenyl group of from 4 to 9 carbon atoms substituted by hydroxy, alkoxy, halo or alkyl.

4,416,896

# 7-OXABICYCLOPHEPTANE SUBSTITUTED AMINO PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOLYTIC DISEASE

Masami Nakane, Plainsboro, N.J.; David L. Snitman, Boulder, Colo.; Joyce Reid, Dayton, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

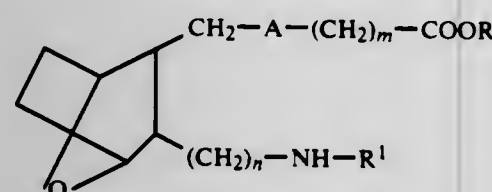
Filed May 17, 1982, Ser. No. 378,560

Int. Cl.<sup>3</sup> A61K 31/34; C07D 307/00

U.S. Cl. 424—285

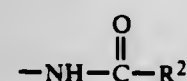
15 Claims

1. A compound having the structural formula



and including all stereoisomers thereof;

wherein A is CH=CH or (CH<sub>2</sub>)<sub>2</sub>; m is 1 to 8; n is 0 to 5; R is H or lower alkyl; and R<sup>1</sup> is lower alkyl, aryl, aryl-lower alkyl, lower alkoxy, aryl-lower alkoxy or



wherein R<sup>2</sup> is lower alkyl, lower alkoxy, aryl, aryl-lower alkyl, aryloxy, aryl-lower alkoxy, lower alkylamino, arylamino or aryl-lower alkylamino, the term "aryl" when defining an R<sup>1</sup> and/or R<sup>2</sup> substituent or when present as

part of an R<sup>1</sup> and/or R<sup>2</sup> substituent may be the same or different and is defined as phenyl, naphthyl, phenyl substituted with lower alkyl, halogen or lower alkoxy, or naphthyl substituted with lower alkyl, halogen or lower alkoxy.

4,416,897

# USE OF 8-ANILINO-1-NAPHTHALENESULFONATE IN THE UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 14, 1982, Ser. No. 398,300

Int. Cl.<sup>3</sup> A61K 31/185

U.S. Cl. 424—315

8 Claims

1. A method of preventing pregnancy in a female which comprises introducing an effective amount of the drug 8-anilino-1-naphthalenesulfonate directly into the uterus of the female after sexual intercourse.

4,416,898

# THERAPEUTIC USES OF METHIONINE

Gérard R. Le Fur, Plessis Robinson, France, assignor to Pharmuka Laboratoires, Gennevilliers, France

Filed Mar. 1, 1982, Ser. No. 353,469

Int. Cl.<sup>3</sup> A61K 31/195

U.S. Cl. 424—319

3 Claims

1. A method for the treatment of Parkinsonism which comprises orally administering to a patient suffering from Parkinsonism a pharmaceutically effective amount of L-methionine or DL-methionine.

4,416,899

# ANTIBIOTIC BMG162-AF2, A PROCESS FOR PRODUCTION THEREOF, AND ANTITUMOR DRUG CONTAINING SAID NEW ANTIBIOTIC AS ACTIVE INGREDIENT

Hamao Umezawa; Tomio Takeuchi; Hiroshi Naganawa; Hironobu Iinuma, and Setsuko Kunimoto, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,458

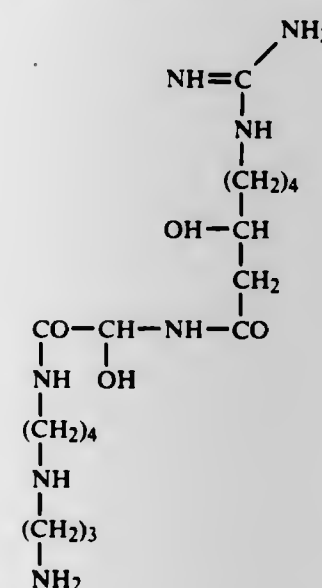
Claims priority, application Japan, Sep. 8, 1980, 55-123585

Int. Cl.<sup>3</sup> A61K 31/16; C12P 21/00; C12R 1/07

U.S. Cl. 424—320

10 Claims

1. A antibiotic BMG162-aF2 having the formula



or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition for inhibiting the growth of transplanted tumors sensitive to antibiotic BMG162-aF2

4,416,901

# PROCESS FOR PROLONGING THE SHELF LIFE OF COSMETICS

Margarete Bochkandl, New York, N.Y., assignor to American Frometics, Inc., New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,945

Int. Cl.<sup>3</sup> A61K 47/00, 35/78

U.S. Cl. 424—363

11 Claims

1. A process for prolonging the shelf-life and the period of resistance to micro-organisms of cosmetics comprising:

(a) subjecting said cosmetic to pasteurization while under vacuum or inert gas atmosphere by heating to a temperature of from about 60° C. to about 75° C. and  
(b) deep freezing said pasteurized cosmetic to a temperature of below about -100° C.

4,416,902

# FLAVORING WITH CYCLOHEXYNYL-BETA-METHYL ACROLEIN DERIVATIVES

Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Manfred H. Vock, Locust, and Michael J. Zampino, North Bergen, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

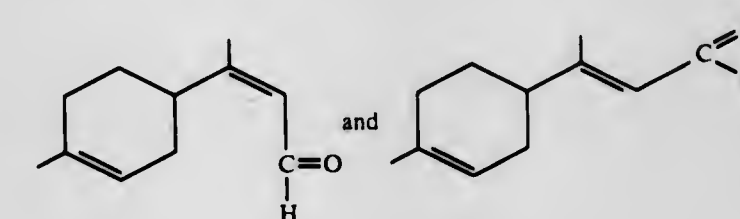
Filed Jul. 16, 1982, Ser. No. 399,012

Int. Cl.<sup>3</sup> A23L 1/226

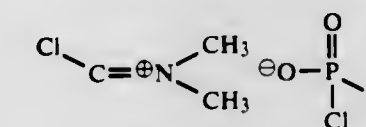
U.S. Cl. 426—3

2 Claims

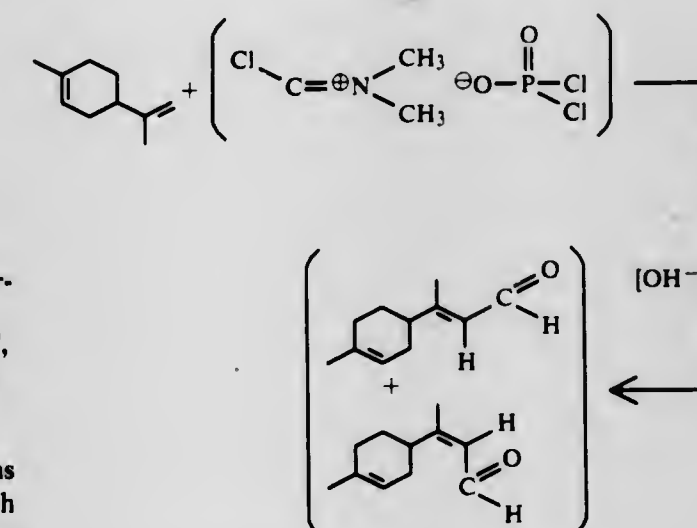
1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuffs and chewing gums comprising the step of adding to said consumable material from 0.2 ppm up to about 100 ppm based on total composition of a mixture of isomers in the ratio of 50:50 defined according to the structures:



prepared by reacting the salt having the structure:



with limonene to form a complex and reacting the resulting complex with aqueous base in accordance with the reaction sequence:



4,416,900

# USE OF N-PHENYL-1-NAPHTHYLAMINE IN THE UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 14, 1982, Ser. No. 398,299

Int. Cl.<sup>3</sup> A61K 31/135

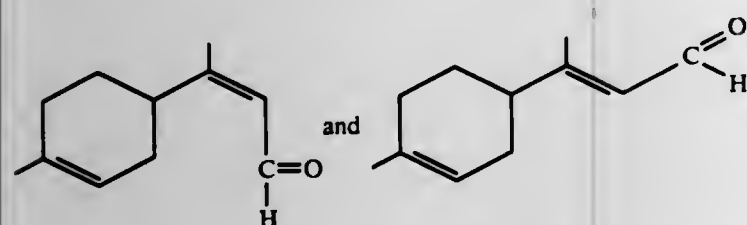
U.S. Cl. 424—330

8 Claims

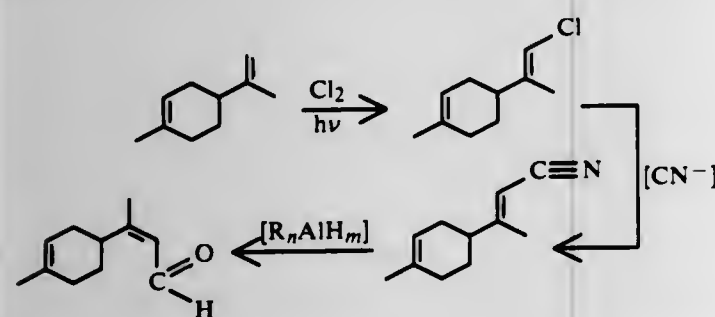
1. A method of preventing pregnancy in a female which comprises introducing an effective amount of the drug N-phenyl-1-naphthylamine directly into the uterus of the female after sexual intercourse.



of a consumable material selected from the group consisting of foodstuffs and chewing gums comprising the step of adding to said consumable material from 0.5 ppm up to about 100 ppm of a mixture of isomers in the ratio of 1:40 having the structures:



produced according to the process of first reacting limonene with chlorine in the presence of light to form limonene chloride; then reacting the limonene chloride with a nitrile to form a limonene nitrile; then reacting the limonene nitrile with a lower alkyl aluminum hydride according to the reaction sequence:



wherein R is lower alkyl, and wherein n is 1 or 2 and m is 1 to 2 and the sum of m+n is 3.

4,416,903

## ANTISTALING BAKING COMPOSITION

Morton S. Cole, 2506 Ivy La., Decatur, Ill. 62521  
Continuation-in-part of Ser. No. 862,653, Dec. 20, 1977, Pat. No. 4,320,151, which is a continuation-in-part of Ser. No. 693,356, Jun. 7, 1976, abandoned. This application Mar. 8, 1982, Ser. No. 355,908

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A21D 2/08

U.S. Cl. 426—18

5 Claims

1. A process of making a bakery product having improved softness retention over an extended shelf life period resulting from an incorporation of a combination of a fungal alpha amylase preparation which is resistant to temperatures incurred during baking and an edible emulsifier, said process comprising the steps of:

- mixing a dough containing an edible emulsifier taken from the group consisting of mono- or diglycerides, diacetyl tartaric acid esters of mono- and diglycerides, propylene glycol esters of mono- and diglycerides, ethoxylated monoglycerides, succinylated monoglycerides, polysorbate 60, calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, lactic esters of fatty acids, lecithin and mixtures of two or more of the above;
- preparing a fungal alpha amylase enzyme stabilized against thermal denaturation by dispersion in a concentrated aqueous solution of essentially mono- and disaccharides taken from the group consisting of dextrose, fructose, sucrose, invert syrup, corn syrups, high fructose corn syrup and mixtures of two or more of the above; said mono- and disaccharides being present in a concentration of between 50% and 80% based on the weight of the solution; said solution containing fungal alpha amylase enzyme in intimate solution with the mono- and disaccharides to provide between 10 and 5000 SKB units of fungal alpha amylase activity per 100 g. of flour in a bakery formulation, said dispersion enabling fungal alpha amylase

enzyme activity to be retained in the temperature range of 170°–180° F. (76°–82° C.); and

- adding said sugar dispersion of fungal alpha amylase to said formed dough in such manner that the protective enzyme solution remains substantially undiluted during subsequent dough mixing, handling and baking whereby said mono- and disaccharides form a protective medium which continues to protect the enzyme after its incorporation in the dough.

4,416,904

## SHELF STABLE PIZZA AND METHOD FOR PREPARING SAME

Edward L. Shannon, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed May 11, 1981, Ser. No. 262,191

Int. Cl.<sup>3</sup> A21D 8/00, 15/00

U.S. Cl. 426—19

7 Claims

1. A pizza food comprising in combination a baked crust component, a tomato based sauce component and a cheese topping component, each of the said components possessing shelf stability at ambient temperature;

- said baked crust component containing flour, yeast, fat, an anti-mycotic agent and an edible acid in an amount sufficient to afford a crust having a pH of not more than about 5.0,
- said tomato based sauce component having a pH not above about 4.6 and containing at least 5% of natural tomato soluble solids and an amount of an edible anti-mycotic sufficient to retard microbial growth, and
- said cheese component having a pH not above about 5.5 and containing an edible anti-mycotic in an amount sufficient to retard microbial growth.

4,416,905

## METHOD OF PREPARING CULTURED DAIRY PRODUCTS

Erik Lundstedt, Boca Raton, Fla., and Edgar A. Corbin, Jr., Manchester, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Aug. 24, 1981, Ser. No. 295,583

Int. Cl.<sup>3</sup> A23C 9/12

U.S. Cl. 426—34

28 Claims

1. A method for the production of a cultured dairy product from a liquid dairy medium comprising adding a starter culture at a concentration of about 4–6% by weight of the liquid dairy medium and fermenting said medium at a temperature of about 80°–90° F. to reduce the pH of the medium to a range of from about 5.2 to about 6.2 and to develop desirable flavors and aromas, and, prior to the development of off-tastes, cooling the medium to a fermentation rate-reducing temperature, and acidulating the medium with a food grade acid to a pH of 4.7 or below to produce a cultured dairy product.

4,416,906

## MICROWAVE FOOD HEATING CONTAINER

James D. Watkins, Golden Valley, Minn., assignor to Golden Valley Foods Inc., Eden Prairie, Minn.

Continuation of Ser. No. 33,972, Apr. 27, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 283,145

Int. Cl.<sup>3</sup> B65D 81/34

U.S. Cl. 426—107

5 Claims

1. A package of cold food heatable with an improved uniformity of temperature in a conventional microwave oven directly from a refrigerated or frozen condition, said package of cold food comprising:

- a sealed package including a disposable container comprising two main wall members, including one wall member comprising a cover formed from sheet material and another wall member comprising a dish body having a bottom wall and an internally rib-free, upwardly-directed peripheral sidewall at the outer periphery of said bottom

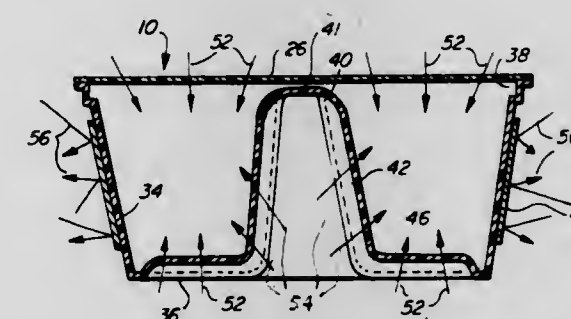
wall with an upper edge defining an upwardly-open wide mouth;

said cover being secured to said sidewall so as to close said mouth and provide a sealed cavity within said container; said dish body bottom wall having a centrally-disposed, upwardly-extending, upwardly-tapering hollow core positioned thereon and projecting vertically within said container;

said core comprising a finger-shaped member extending between said bottom wall and said cover and having a closed upper end positioned in proximity to said cover; said core including surface means thereon within said sealed cavity providing a perimetricaly-extending wall having a plurality of angularly-neighboring ribs extending longitudinally therealong;

said core being perimetricaly surrounded by a body of cold food;

said body of cold food in said sealed cavity containing water in liquid or frozen form, being in the range of about 40° F. and about 0° F. when said package is in said refrigerated or frozen condition, filling said sealed cavity at least to a



substantial depth within which said food is disposed for contact with said ribs of said core and with said rib-free sidewall, and existing as a unitary entity without partitionment into a multiplicity of unconnected entities;

said core wall and cover being substantially transmissive of microwave oven microwave energy for functioning in use as a microwave influx passage for entry of microwave energy into said food within said container;

said core including said ribs thereof being structured and arranged for functioning during microwave heating of said food as a guide means for directing the flow of fluid portions of said food in an upward direction in the vicinity of said core, whereby said core including said ribs thereof contributes to the distribution of heat in said container during microwave heating of said food in said container in a microwave oven by assisting in fluid convection and the absence of ribs on said sidewall within said cavity cooperates with the presence of said ribs on said core to balance microwave heating of said food throughout said cavity and provide more uniform heating of said food than would a similar package having ribs provided on its peripheral sidewall within its cavity.

4,416,907

## PROCESS FOR PREPARING FOOD PACKAGES FOR MICROWAVE HEATING

James D. Watkins, Golden Valley, Minn., assignor to Golden Valley Foods Inc., Eden Prairie, Minn.

Division of Ser. No. 283,145, Jul. 13, 1981, which is a continuation of Ser. No. 33,972, Apr. 27, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 430,045

Int. Cl.<sup>3</sup> B65B 29/08; A23L 1/01

U.S. Cl. 426—234

7 Claims

1. A process for preparing a sealable package of liquid-containing food to be heated in a microwave oven comprising: providing a disposable shipping container including a wall member comprising a dish body having a bottom wall and an internally rib-free, upwardly-directed peripheral side-

wall at the outer periphery of said bottom wall with an upper edge defining an upwardly-open wide mouth; said dish body bottom wall having a centrally-disposed, upwardly-extending, upwardly-tapering hollow core positioned thereon and projecting vertically within said container;

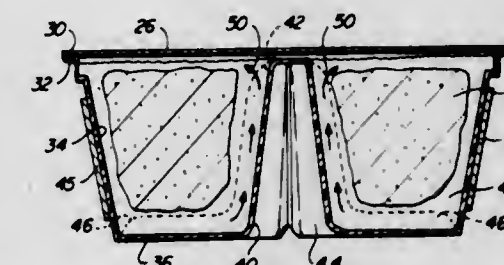
filling the container with a liquid-containing food capable of coupling with microwave energy and sealing the open mouth of the container by securing to said side wall a removable cover formed from sheet material;

said core comprising a finger-shaped member extending between said bottom wall and said cover and having a closed upper end positioned in proximity to said cover; said core including surface means thereon within said sealed cavity providing a perimetricaly-extending wall having a plurality of angularly-neighboring ribs extending longitudinally therealong;

said core being perimetricaly surrounded by said body of food;

chilling the container and the food therein;

said body of chilled food in said sealed cavity containing water in liquid or frozen form, being in the range of about 40° F. and about 0° F., and said body of chilled food filling



said sealed cavity at least to a substantial depth within which said food is disposed for contact with said ribs of said core and with said rib-free sidewall, and existing as a unitary entity without partitionment into a multiplicity of unconnected entities;

said core wall and cover being substantially transmissive of microwave oven microwave energy for functioning in use as a microwave influx passage for entry of microwave energy into said food within said container;

said core including said ribs thereof being structured and arranged for functioning during microwave heating of said food as a guide means for directing the flow of fluid portions of said food in an upward direction in the vicinity of said core, whereby said core including said ribs thereof contributes to the distribution of heat in said container during microwave heating of said food in said container in a microwave oven by assisting in fluid convection and the absence of ribs on said sidewall within said cavity cooperates with the presence of said ribs on said core to balance microwave heating of said food throughout said cavity and provide more uniform heating of said food than would a similar package having ribs provided on its peripheral sidewall within its cavity.

4,416,908

## INSECT DE-INFESTATION METHOD

Howard F. McKinney, Chesterfield, and Frederick C. Wear, St. Louis, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 167,687, Jul. 11, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,521

Int. Cl.<sup>3</sup> A23L 3/00; H05B 6/64

U.S. Cl. 426—241

9 Claims

1. A method of treating products such as grain and packaged foodstuffs containing insects, larvae, and eggs to kill said insects, larvae, and eggs in the products by microwave energy comprising the steps of:

- placing the product in an atmosphere of reduced pressure of about 5 to about 85 Torr, and



(b) subjecting the product to microwave energy of about  $10^2$  MHz to about  $10^4$  MHz frequency and a power density of at least about 4 watts/in<sup>3</sup> of product being treated for a time sufficient to kill any insects and larvae in the product without raising the temperature of the product substantially above 120° F. and without substantially injuring the grain or foodstuff.

4,416,909

## MEAT PRESERVATION METHOD

Ralph W. Aversano, 598 Benham St., Hamden, Conn. 06514  
Filed May 10, 1982, Ser. No. 376,414

Int. Cl.<sup>3</sup> A23B 4/02, 4/12

U.S. Cl. 426—265

7 Claims

1. A method for treating edible meat and meat products to maintain the desirable meat color thereof and to maintain freshness which comprises applying to said meat, from 1 ounce to 2 pounds per hundred pounds of meat, a composition consisting essentially of from 10 to 40% of each of the following components:

- a material selected from the group consisting of ascorbic acid, the sodium and potassium salts thereof and mixtures thereof;
- a material selected from the group consisting of citric acid, the sodium and potassium salts thereof and mixtures thereof;
- a material selected from the group consisting of sodium carbonate, potassium carbonate and mixtures thereof; and
- a material selected from the group consisting of sodium and potassium sulfite, bisulfite and metabisulfite and mixtures thereof.

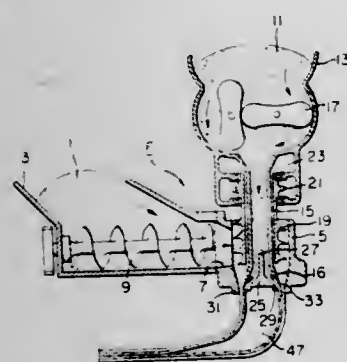
4,416,910

## METHOD OF CONTINUOUSLY MANUFACTURING MULTI-LAYERED DOUGH MATERIALS

Torahiko Hayashi, 3-4, Nozawa-machi Utsunomiya-shi Tochigi-ken; Minoru Kageyama, 48-1, Kamitomatsuri-cho, Utsunomiya-shi, Tochigi-ken, and Michio Morikawa, 67, 1-chome, Yosai-cho, Utsunomiya-shi, Tochigi-ken, all of Japan  
Division of Ser. No. 937,967, Aug. 30, 1978, Pat. No. 4,266,920, which is a division of Ser. No. 665,326, Mar. 9, 1976, Pat. No. 4,113,819. This application Sep. 2, 1980, Ser. No. 183,422  
Claims priority, application Japan, Mar. 10, 1975, 50-29355  
Int. Cl.<sup>3</sup> A21D 6/00; A23P 1/00

U.S. Cl. 426—502

1 Claim U.S. Cl. 427—13



1. A method of continuously manufacturing a strip of layered food material, comprising the steps of feeding continuously a plurality of food materials in the form of a hollow tube consisting of concentric layers of said food materials, transferring said hollow tube onto a continuously driven conveyor and collapsing said tube flat by its own weight on said conveyor, the outer layer of said food material being formed of a dough material and another food material forming an inner layer.

4,416,911

## GAS SENSOR ELEMENTS AND METHODS OF MANUFACTURING THEM

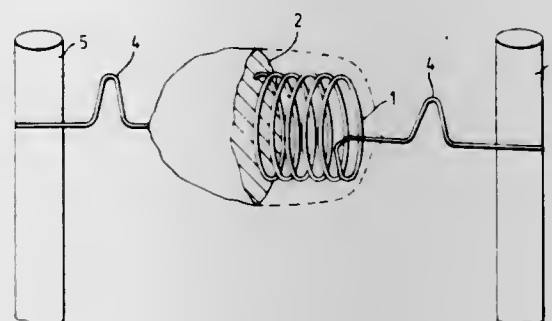
Gordon S. Wilkinson-Tough, Leeds, England, assignor to International Gas Detectors Limited, Wetherby, England  
Filed Dec. 30, 1980, Ser. No. 221,272

Claims priority, application United Kingdom, Jan. 2, 1980, 8000040

Int. Cl.<sup>3</sup> G01N 27/16

U.S. Cl. 427—12

11 Claims



1. A method of making a gas sensor element comprising the steps of:  
providing an electrical resistance filament;  
preparing a slurry from a mixture of alumina and at least one catalyst precursor in a substantially non-aqueous organic liquid, the mean particle size in the slurry being less than 20 nm;  
depositing said slurry on said electrical resistance filament; and  
removing said non-aqueous organic liquid and decomposing said at least one catalyst precursor whereby said filament is surrounded by a bead which includes an array of said alumina particles interspersed between and bound together only by particles of a catalyst for inducing catalytic oxidation of flammable gases to form an open porous gas diffusive skeletal matrix having a mean particle size of less than 20 nm.

4,416,912

## FORMATION OF COATINGS ON CUTTING EDGES

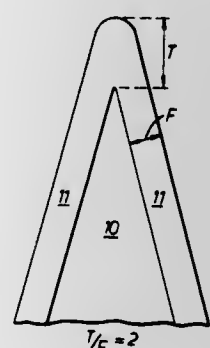
Roger J. Bache, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Oct. 15, 1980, Ser. No. 197,351

Claims priority, application United Kingdom, Oct. 13, 1979, 7935706

Int. Cl.<sup>3</sup> B05D 1/04

6 Claims



1. In a process for the formation of metal and metal compound coatings on cutting edges by chemical vapor deposition in a deposition chamber, the improvement wherein a static electric field is established between the cutting edge and a counter electrode positioned in the deposition chamber, the field potential and gas pressure being such that glow discharge does not take place and the field potential additionally being such that a dense adherent coating is obtained.

4,416,913

## ASCENDING DIFFERENTIAL SILICON HARVESTING MEANS AND METHOD

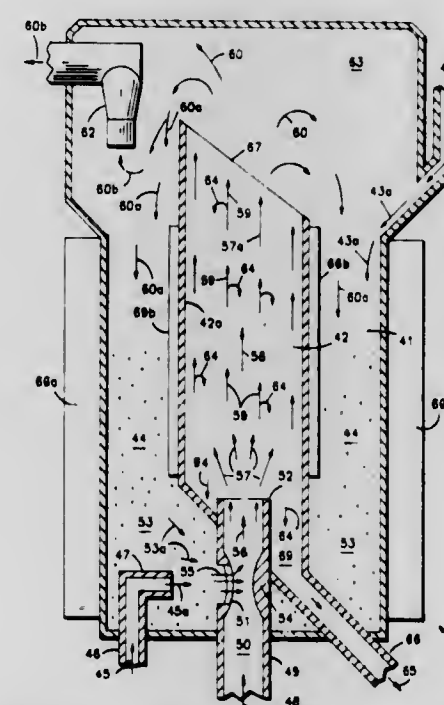
William M. Ingle; Robert D. Darnell, both of Phoenix, Ariz., and Stephen W. Thompson, Rosenberg, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1982, Ser. No. 425,832

Int. Cl.<sup>3</sup> C23C 11/00

U.S. Cl. 427—45.1

19 Claims



1. A recirculating reactor system for reacting seed particles with a source gas, comprising:  
a reservoir for receiving said seed particles and having an input and output;  
a reactor having an input and an output coupled to said reservoir, adapted to permit lifting and transport of particles of less than a first predetermined size which is larger than said seed particles, from said reactor input to said reactor output;  
first mixing means coupled to said output of said reservoir for receiving seed particles from said reservoir and for forming a first gas-particle mixture with an input non-source gas;  
second mixing means coupled to said input of said reactor for receiving said first gas-particle mixture and for forming a second gas-particle mixture by combining said first gas-particle mixture with a gas comprising said source gas while preventing feedback leakage of said source gas into said reservoir, and wherein said second gas-particle mixture is delivered to said input of said reactor;  
lifting gas inlet means coupled to said first mixing means, said second mixing means, or both mixing means for supplying a lifting gas of a velocity sufficient to produce, within said reactor, said lifting and transport of said particles of less than said first predetermined size;  
separator means coupled to said output of said reactor and said input of said reservoir for separating spent gas and transported particles ejected from said reactor and returning said ejected particles to said reservoir to be reused as seed particles;  
harvesting means coupled to said reactor for harvesting non-ejected particles which have remained in said reactor;  
gas extraction means coupled to said separator means for receiving spent gas from said separator means;  
seed particle injection means coupled to said reservoir for injecting new seed particles into said reservoir; and  
heating means for providing heat to said reactor to promote reaction between said seed particles and said source gas.  
12. A process for coating particles with a material reacted at least partially from a source gas, comprising:

introducing seed particles of less than a first predetermined size into a reservoir coupled to a reaction chamber;  
introducing into said reservoir a first gas, wherein said first gas is a non-source gas;  
agitating said seed particles in said reservoir by means of said first gas;  
mixing said first gas and a portion of said seed particles to form a first gas-particle mixture;  
injecting said first gas-particle mixture into a stream of a gas which comprises said source gas, to form a second gas-particle mixture, without substantial feedback of said source gas into said reservoir;  
flowing said second gas-particle mixture through said reaction chamber so as to have a first predetermined gas velocity in said reaction chamber;  
regulating said first predetermined gas velocity in said reaction chamber so that particles less than a second predetermined size greater than said first predetermined size are substantially carried through said reaction chamber toward an outlet end;  
heating said second gas-particle mixture in said reaction chamber to react said source gas so as to coat said particles with said material, thereby producing larger particles and spent gases;  
collecting in said reaction chamber said coated particles whose size is greater than said second predetermined size;  
ejecting from said outlet end of said reaction chamber said spent gases and said coated particles whose size is less than said second predetermined size;  
decelerating said ejected gases to reduce their velocity and separate said ejected particles from said spent gases;  
collecting said ejected particles in said reservoir to provide seed particles for subsequent reactions; and  
harvesting said collected particles by extracting said collected particles from said reaction chamber.

4,416,914

## ELECTRICAL CONDUCTORS ARRANGED IN MULTIPLE LAYERS AND PREPARATION THEREOF

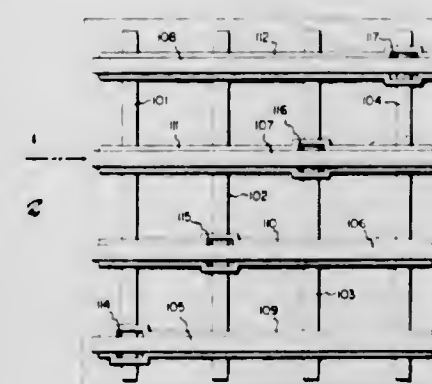
Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,341

Int. Cl.<sup>3</sup> H05K 3/18, 3/46

U.S. Cl. 427—54.1

20 Claims



1. A method of forming an electrical conductor pattern on a substrate, comprising the steps of:  
providing a design of a first metal conductor on said substrate;  
forming a contiguous layer of another metal on the first conductor;  
then applying a dielectric material to selected areas of both said substrate and the contiguous layer on said first conductor;  
applying a desired design to the substrate with a first ink composition comprising a metallic powder of finely divided second metal and a first polymer, with said first ink composition contacting said dielectric material and also



contacting the contiguous layer on said first conductor at an area thereof unprotected by said dielectric material; and

contacting said first ink composition with a first solution containing a salt of a third metal, said third metal being more noble than both said second metal and said another metal to cause the anion of said salt to form soluble salts with each of said second and another metals to cause a contiguous layer of said third metal to be formed on said ink composition and a contiguous layer of said third metal to be formed on adjacent portions of said first conductor layer at the unprotected areas thereof.

4,416,915

**METHOD OF MAKING CHALCOGENIDE CATHODES**  
David N. Palmer, Tolland, and Gary W. Ferrell, Collinsville, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 4, 1982, Ser. No. 345,605

Int. Cl.<sup>3</sup> B05D 5/12

U.S. Cl. 427—126.3

4 Claims

1. A method of making a chalcogenide cathode which comprises:

- forming a mixture containing at least one intercalatable layered transition metal chalcogenide cathode active material, a conductivity enhancing agent and a binding agent;
- forming a slurry containing the mixture and a vehicle therefor;
- treating a high porosity current collector substrate by applying an adhesion promoting agent thereon and drying the treated substrate;
- applying the slurry to the treated and dried substrate; and
- heating the substrate in an inert atmosphere to drive off the vehicle and coalesce the binding agent.

4,416,916

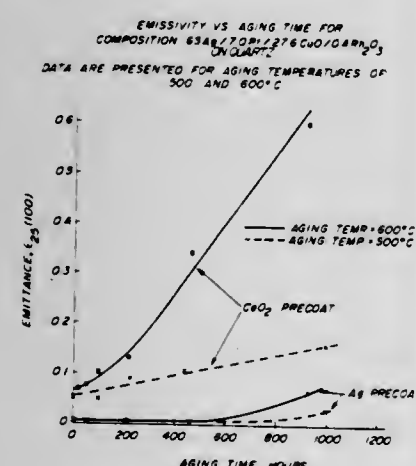
**THIN FILM SOLAR ENERGY COLLECTOR**  
Kamran Aykan, Monmouth Beach; Robert J. Farrauto, Westfield; Clinton F. Jefferson, Millburn, and Richard D. Lanam, Westfield, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Mar. 4, 1982, Ser. No. 354,831

Int. Cl.<sup>3</sup> B05D 1/38; B32B 17/06, 15/18, 15/04

U.S. Cl. 427—160

23 Claims



20. A method for preparing a solar energy collector of improved thermal stability, which comprises:

- uniformly depositing a thin silver-, or silver/platinum-interlayer onto a substrate selected from the group consisting of quartz, silicate glass, and stainless steel;
- drying and calcining the coated substrate, at a temperature up to about 800° C.;
- uniformly depositing silver, copper oxide, rhodium/rhodium oxide and 0-15% platinum onto the surface of the silver- or silver/platinum-coated substrate; and
- drying and calcining the coated substrate, to obtain the desired collector.

4,416,917

**COATING SUBSTRATES WITH HIGH SOLIDS COMPOSITIONS**

Haywood G. France, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 30, 1981, Ser. No. 230,297

Int. Cl.<sup>3</sup> B05D 3/10

U.S. Cl. 427—302

10 Claims

1. In the method of fabricating cured epoxy-coated substrates employing a two-package technique wherein an epoxy resin composition and catalyst are stored separately until use and mixed soon before application to said substrates, the improvement which comprises first treating said substrates by adhering thereto a curing amount of a sulfonic acid salt having the formula:



wherein  $R_x$  is a fluoroalkyl having 1 to about 18 carbons, M is selected from the group consisting of ammonium ( $NH_4^+$ ) cation, quaternary ammonium cations, cations of protonated amines, a mono- or polyvalent cation of a metal selected from the group consisting of metals of Groups I to V inclusive and VIII and subgroups VIB and VIIB of the Periodic Table and y is an integer equal to the valence of M, thereafter applying an aliphatic or cycloaliphatic liquid epoxy high solids resin composition, containing sufficient amounts of monofunctional carboxylic acids or sufficient amounts of polyols to provide an epoxy/carboxy or epoxy/hydroxy ratio respectively of from about 0.5 to about 5, to said treated substrates and heating the resultant composite at a temperature of about 50° to about 200° C. until a cured resin coating is obtained.

4,416,918

Patent Not Issued For This Number

4,416,919

**METHOD AND AN APPARATUS FOR REMOVING THICKENINGS IN COATINGS OCCURRING TRANSVERSELY TO THE DIRECTION OF TRAVEL OF THE WEB**

Wlfrid Beck, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,282

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019459

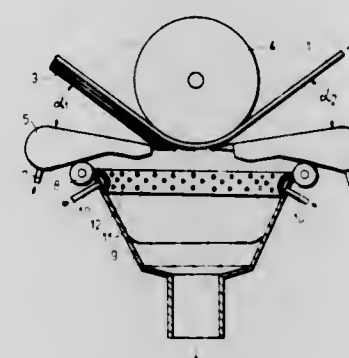
Int. Cl.<sup>3</sup> B05C 11/06

U.S. Cl. 427—296

9 Claims

8. A method for removing thickenings in layers which are produced transversely to the direction of travel of the web on

the web during the coating of photographic film and paper webs with photographic emulsions and layers, characterised in that the coated web is deflected by a web guide element and two air blades and air jets pointing towards each other are directed at a small angle  $\alpha$  towards the layer of the web from below at the deflecting point which are actuated when thicken-



ings appear in the layer and which scrape off the particles of the thickening in the layer and blow them into a vacuum tank which is sprinkled all over with water and which receives the particles, and the mixture of air, water and particles is supplied to a vacuum generating device which, in turn, is evacuated continuously by a jet suction device without interrupting the vacuum.

4,416,921

**COMPOSITION AND PROCESS FOR THE IMPREGNATION AND SEALING OF POROUS ARTICLES**

David J. Dunn, Twinsburg, Ohio, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Continuation of Ser. No. 112,777, Jan. 17, 1980, abandoned. This application Jul. 17, 1981, Ser. No. 284,284

Int. Cl.<sup>3</sup> B05D 3/12, 3/02; C08F 22/26

U.S. Cl. 427—353

6 Claims

1. A composition of matter which is useful in a process for impregnating and sealing of porous articles, the composition comprising:

- an azonitrile;
- a polymerizable acrylic monomer;
- a substituted, sterically-hindered phenol; and
- a metal ion chelator.

5. A method for impregnating and sealing a porous article which comprises the steps of:

- impregnating said article with the composition of claim 1; and
- curing said composition while in said porous article.

4,416,922

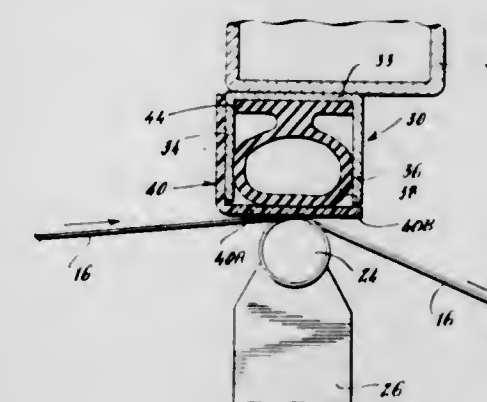
**APPARATUS AND METHOD FOR METERING A COATING APPLIED TO A MOVING WEB**  
Robert M. Fridhandler, Blauvelt, N.Y., assignor to St. Regis Paper Company, West Nyack, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,463

Int. Cl.<sup>3</sup> B05C 11/02

U.S. Cl. 427—361

7 Claims



4,416,920

**LOW TIN TERNE COATING**

Marvin B. Pierson, Franklin, and Frank C. Dunbar, Monroe, both of Ohio, assignors to Armeo Inc., Middletown, Ohio

Division of Ser. No. 118,073, Feb. 4, 1980, Pat. No. 4,315,056, which is a continuation of Ser. No. 793,624, May 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,622, Oct. 7, 1976, abandoned, which is a continuation of Ser. No. 490,917, Jul. 22, 1974, abandoned. This application Aug. 17, 1981, Ser. No. 293,365

Int. Cl.<sup>3</sup> B23B 15/04

U.S. Cl. 427—349

3 Claims

1. The method of producing a low-tin terne coated steel article, the weight of the coating being about 0.05 oz./ft.<sup>2</sup> (15.2 g./m.<sup>2</sup>), through the entire range of commercial coating weights and being the only metallic coating on said article, which includes the steps of passing the article through a bath consisting essentially of from about 2% tin to about 6.5% tin and the balance lead, with no other purposeful additions, and including only impurities normally present, in an amount less than 1%, and immediately upon its issuance from said bath subjecting it to a jet finishing operation.

6. A method for metering and smoothing a coating on the coated side of a moving web of material comprising:

feeding the web between a skirt of flexible sheet material and a rod for metering and smoothing the coating, the rod being disposed in rolling contact with the coating, the skirt extending across the web and having a portion extending in contact with and in the direction of movement of the uncoated side of the web, and creating a constant pressure web coating region across the web between the web and the rod by inflating an expandable tube along said skirt portion to cause said skirt portion to bear on the uncoated side of the web and on the rod to provide a layer of skimmed coating on the web of substantially uniform thickness.



4,416,923

# METHOD OF MANUFACTURING POLYESTER FIBERS WITH GOOD ADHESIVENESS TO RUBBER USING AMINOSILANES AND EPOXY COMPOUNDS IN A YARN FINISH

Shigemitsu Murase, Joyo, Japan, assignor to Unitika Ltd., Hyogo, Japan

Filed Sep. 13, 1982, Ser. No. 416,820

Claims priority, application Japan, Feb. 15, 1982, 57-23436  
Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427—387

17 Claims

1. A method of manufacturing polyester fibers with good adhesiveness to rubber comprising, in the process of making polyester fiber into yarn, yarn-making oil (spin finish) containing an epoxy compound and an alkylene oxide adduct of an amine compound containing an alkoxysilane group is added to the polyester fiber, and then heat-treating the yarn.

4,416,924

# POLYCARBONATE SIZING FINISH AND METHOD OF APPLICATION THEREOF

Howell L. Peterson, New Providence, and Paul E. McMahon, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,105

Int. Cl.<sup>3</sup> B05D 7/26

U.S. Cl. 427—388.1

10 Claims

1. In a method of applying a polycarbonate finish to a fiber whereby said fiber is contacted with a sizing composition comprising a polycarbonate dissolved in a solvent, said solvent subsequently being removed from said fiber, the improvement wherein said solvent comprises a major amount of N-methyl-2-pyrrolidone and a minor amount of an alcohol having from 1 to 4 carbon atoms.

4,416,925

# VARNISH AND A METHOD OF COATING PLASTIC WITH POLYVINYLIDENE FLUORIDE

Werner Goll, Hart, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 110,583, Jan. 9, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,936

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902095

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427—393.5

20 Claims

8. In a method of coating plastics with polyvinylidene fluoride, the steps of dispersing 20 to 60 wt % finely divided polyvinylidene fluoride in

(a) 25 to 65 wt-% of at least one high-boiling, organic solvent having a boiling point from about 125° C. to about 250° C., which dissolves polyvinylidene fluoride slightly or not at all, and

(b) 5 to 30 wt-% of at least one strongly polar latent organic solvent for polyvinylidene fluoride, and thereafter dissolving the dispersion obtained

(c) in 60 to 90 wt-% of at least one low-boiling polar organic solvent having a boiling point up to 126° C.,

coating the plastic surface with the solution and baking the coating on the surface at a temperature of 100° to 300° C.

4,416,926

# STYLIZED SURFACE FINISHES

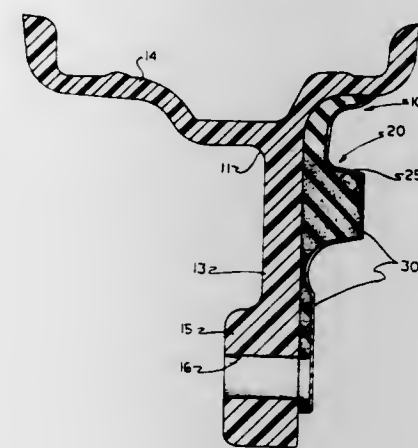
Ralph A. Maglio, Wadsworth, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 126,614, Mar. 3, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,142

Int. Cl.<sup>3</sup> B60R 13/00

U.S. Cl. 428—31

10 Claims



1. A stylized article, comprising:

a metal or plastic base material; said base material being a vehicle wheel,

a resin residing on said base material;

said resin containing a plurality of hollow spheres to form a syntactic foam, the specific gravity of said syntactic foam ranging from about 0.3 grams per cc to about 1.0 grams per cc; and

a stylized surface element, said stylized surface element residing on said syntactic foam and forming the stylized article.

4,416,927

# TUBULAR ARTICLE OF POLYETHYLENE TEREPHTHALATE HAVING A WALL OF AMORPHOUS MATERIAL WITH A PERIPHERAL GROOVE THEREIN OF MONOAXIALLY ORIENTED MATERIAL

Claes T. Nilsson, Löddeköpinge; Kjell M. Jakobsen, Skanör, and Las G. Larson, Höör, all of Sweden, assignors to PLM AB, Malmö, Sweden

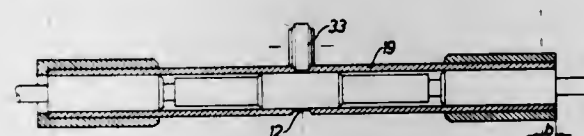
Filed May 26, 1981, Ser. No. 266,849

Claims priority, application Sweden, May 29, 1980, 8004003

Int. Cl.<sup>3</sup> F16L 11/06

U.S. Cl. 428—36

7 Claims



1. A tubular article made of polyethylene terephthalate or similar material, produced from a blank having a wall of a thickness (a) consisting essentially of amorphous material and provided with a peripheral groove in said wall, the material in the bottom of said groove having a thickness (d) corresponding to the thickness of a panel of said amorphous material initially of thickness (a) and drawn monoaxially until it yields at an initial temperature that is lower than the region of the glass transition temperature (TG) of the material.

4,416,928

# COVER STRUCTURE

Heinz Carl, D-8644; Pressig, Fed. Rep. of Germany

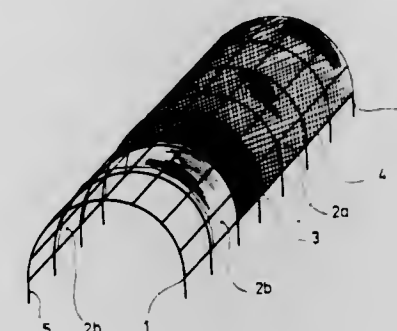
Filed May 10, 1982, Ser. No. 376,606

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142149; Feb. 16, 1982, 3205383

Int. Cl.<sup>3</sup> B32B 3/24; E04C 2/00

U.S. Cl. 428—38

7 Claims



1. A cover structure comprising:

A. a substantially rigid grid-like frame structure comprising two sets of rod-like members, the rod-like members of each set being in spaced apart substantially parallel relation to one another and in crosswise relation to the members of the other set; and

B. a pair of shrinkable plastic sheets, each covering one side of said frame structure and adhered thereto, said sheets (1) cooperating to substantially enclose the frame structure,

(2) being shrunk to be under edgewise tension between the members of the frame structure, and

(3) being bonded flatwise to one another through the spaces between the members of the frame structure.

4,416,930

# TREATING GLASS SHEETS TO HEAL VENTS THAT RESULT IN BREAKAGE DURING THERMAL TREATMENT

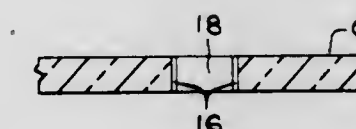
Joseph B. Kelly, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 210,100, Nov. 24, 1980, abandoned, which is a continuation of Ser. No. 971,607, Dec. 20, 1978, abandoned. This application Mar. 31, 1982, Ser. No. 364,144

Int. Cl.<sup>3</sup> B32B 17/06, 3/10; C03C 17/02

U.S. Cl. 428—137

10 Claims



1. In the art of heat treating a series of float glass sheets of soda-lime-silica composition having a scored region susceptible to breakage during thermal treatment during which said glass sheets (is) differing in thickness and in stress around the scored region are heated to elevated temperatures differing according to glass sheet thickness within a temperature range above (its) the strain point of float glass and rapidly cooled below (its) said strain point, which thermal treatment is more likely to develop said scored region into a break in those sheets of said series heated to a maximum temperature at the lower end of said temperature range and to cause some sheets in said series that are heated to a higher maximum temperature within said temperature range to tend to lose their shape before said rapid cooling, the improvement consisting of the one step of applying exclusively to the vicinity of said scored region, prior to said thermal treatment, a liquid composition adherent to said scored region, and containing as an essential ingredient sodium silicate, which composition is capable of flowing and healing said scored region and does not decompose into a composition that fails to protect said scored region during said thermal treatment, and subjecting said glass sheet with said composition applied to protect said scored region to said thermal treatment, whereby the frequency of breakage in said scored region is less than that experienced in the absence of said one step of applying said liquid composition and is less than the frequency of breakage experienced by glass sheets attaining equal maximum temperatures at the lower end of said temperature range after either no pretreatment with any composition or after pretreatment with a composition essentially free of sodium silicate.

4,416,929

# MULTILAYER STITCHED KNITTED FIBERGLASS COMPOSITE

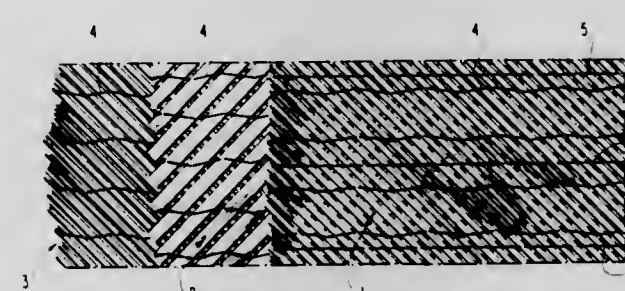
Ronald G. Krueger, Seguin, Tex., assignor to Proform, Inc., Minneapolis, Minn.

Filed Jul. 2, 1981, Ser. No. 279,649

Int. Cl.<sup>3</sup> B32B 3/06

U.S. Cl. 428—102

9 Claims



1. A structural fabric comprising:

a first layer of substantially parallel, structural fibers, aligned



8. A tempered glass article comprising a sheet of float glass of soda-lime-silica composition having a hole extending entirely through its thickness, said glass sheet having a given viscosity range in the temperature range of thermal treatment required for tempering said glass sheet and a coating bonded to the wall of said hole, said coating consisting essentially of a glassy sodium silicate composition adherent to the wall of said hole and having a lower viscosity than that of said glass sheet throughout said temperature range.

4,416,931

Patent Not Issued For This Number

4,416,932

## THICK FILM CONDUCTOR COMPOSITIONS

Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Division of Ser. No. 289,113, Aug. 3, 1981, Pat. No. 4,381,945.  
This application Sep. 27, 1982, Ser. No. 425,048  
Int. Cl.<sup>3</sup> B32B 3/10, 5/16; B05D 5/12

U.S. Cl. 428—209

6 Claims

1. A conductive element comprising a nonconductive ceramic substrate having a conductive pattern affixed thereon by
  - (a) printing thereon a patterned film of a screen-printable paste which is a dispersion in organic medium of a metallization comprising an admixture of finely divided particles of
    - (1) 30–80% by weight noble metal or alloy thereof,
    - (2) 1–20% by weight low melting, low viscosity glass,
    - (3) 0.1–10% by weight inorganic metal oxide capable of reacting with  $Al_2O_3$  under firing conditions to form a spinel structure, and
    - (4) organotitanate which is a source of positive titanium ions under firing conditions,
  - (b) drying, and
  - (c) firing the dried film to effect volatilization of the organic medium and liquid phase sintering of the glass.

4,416,933

## THIN FILM ELECTROLUMINESCENCE STRUCTURE

Jorma O. Antson; Sven G. Lindfors, both of Espoo; Arto J. Pakkala, Evtskog; Jarmo I. Skarp, Helsinki; Tuomo S. Suntola, and Markku A. Ylilampi, both of Espoo, all of Finland, assignors to Oy Lohja Ab, Virkkala, Finland

Filed Feb. 8, 1982, Ser. No. 346,872

Claims priority, application Finland, Feb. 23, 1981, 810547

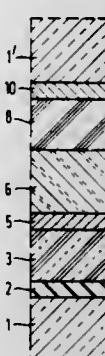
Int. Cl.<sup>3</sup> H05B 33/12; B32B 17/06

U.S. Cl. 428—216

6 Claims

1. A thin film structure including a substrate layer, said structure further comprising:
  - first and second electrode layers;
  - a luminescence layer disposed between the first and second electrode layers;
  - a first chemically protective layer made of an electrically conductive material and disposed between the luminescence layer and the first electrode layer in direct contact with the latter, and having a thickness of the order of about 50 to 1000 nm; and
  - a second chemically protective and current limiting layer made of a material selected from the group consisting of tantalum-titanium oxide (TTO), barium-titanium oxide

( $Ba_xTi_yO_z$ ), lead-titanium oxide ( $PbTiO_3$ ), and  $Ta_2O_5$  and disposed between and in direct contact with the lumines-



cence layer and the second electrode layer and having a thickness of the order of about 50 to 1000 nm, preferably about 100 to 300 nm.

4,416,934

## WOVEN OR KNITTED POLYESTER MULTIFILAMENT FABRIC

Akio Kimura, Ashiya; Osamu Wada, Takatsuki; Shinji Owaki, and Kozo Seimitsu, both of Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

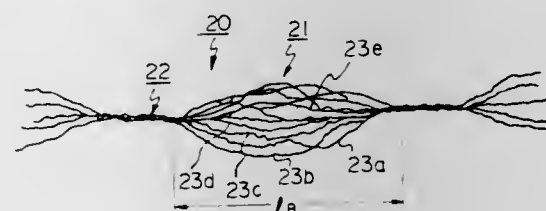
Filed Mar. 31, 1981, Ser. No. 249,427

Claims priority, application Japan, Apr. 7, 1980, 55-44708

Int. Cl.<sup>3</sup> D03D 3/00

U.S. Cl. 428—224

13 Claims



1. A woven or knitted polyester multifilament fabric having a silk like appearance and touch, comprising: polyester multifilament yarns each containing at least one type of porous polyester filaments, each filament having an irregular cross-sectional profile and numerous linear fine concave pores formed on the peripheral surface thereof and extending along the longitudinal axis of each filament, wherein at least 50% of the number of said concave pores has a length of at least 5 microns and a ratio of length to width of the concave pores of at least 5.

4,416,935

## BULKED EXTENSIBLE WEFT YARN SUITABLE FOR USE AS TIRE CORDS

Laurence N. Bascom, Amelia, Va., and Peter S. K. Leung, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 11, 1981, Ser. No. 330,003

Int. Cl.<sup>3</sup> D02G 3/04, 3/34, 3/48; D03D 15/08

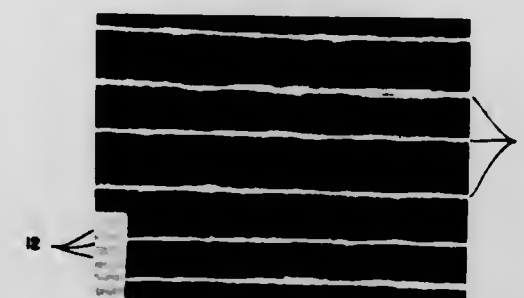
U.S. Cl. 428—229

10 Claims

1. An extensible bulked yarn consisting essentially of entangled, individually convoluted, undrawn, synthetic, continuous filaments of poly(hexamethylene adipamide) or poly(epsilon-caproamide) and characterized by a multitude of stable crunodal filament loops spaced along its surface and by a break elongation of at least 150%.

9. A woven greige fabric having a weft comprised of (1) an

extensible bulked yarn consisting essentially of entangled, individually convoluted, undrawn, synthetic, continuous filaments of poly(hexamethylene adipamide) or poly(epsilon-



caproamide) which form a multitude of stable crunodal filament loops persistently along the yarn surface and the yarn has a break elongation of at least 150% and (2) a warp comprised of tire cords.

4,416,936

## NONWOVEN FABRIC AND METHOD FOR ITS PRODUCTION

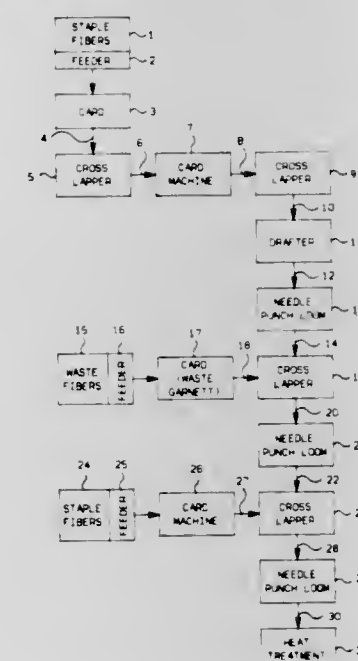
Wayne K. Erickson, and Lewis R. Mulligan, both of Seneca, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 170,305, Jul. 18, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,507

Int. Cl.<sup>3</sup> B32B 27/00

U.S. Cl. 428—286

24 Claims



1. A nonwoven fabric comprising

- (a) a first layer formed substantially of synthetic virgin staple fibers;
- (b) a second, intermediate layer comprising waste fibers; and
- (c) a third layer formed substantially of nonwoven staple fibers, the first, second and third layers being consolidated so as to form an integral, layered fabric.

4,416,937

## POLYMER BLENDS AND LAMINATES AND ADHESIVE FILMS PREPARED THEREFROM

Bruce A. Metzger, Newark, Ohio, assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 215,600, Dec. 12, 1980, Pat. No. 4,376,845. This application Mar. 8, 1983, Ser. No. 473,385

Int. Cl.<sup>3</sup> B32B 27/00

U.S. Cl. 428—286

14 Claims

1. A consolidated laminar structure comprising at least two dissimilar laminar layers, at least one of said layers being com-

posed essentially of a polymer blend composition comprising, based upon the total weight of said composition,

- (a) from about 5 to 90 weight percent of a first adhesive resin having a melt index of from about 50 to about 70 and comprising a random copolymer of a major proportion by weight of ethylene and from about 15 to about 25 weight percent, based upon said copolymer, of an ethylenically unsaturated carboxylic acid;
- (b) from about 5 to about 90 weight percent of a normally solid second adhesive resin having a melt index of from about 3 to about 15 and comprising a random copolymer of a major proportion by weight of ethylene with a minor proportion by weight of an ethylenically unsaturated carboxylic acid, a vinyl ester of an alkanolic acid or a lower alkyl or hydroxyalkyl ester of an ethylenically unsaturated carboxylic acid monomer; and
- (c) from about 5 to about 70 weight percent of a normally solid non-adhesive resin having a melt index of from about 3 to about 10 and comprising a homopolymer of ethylene or a copolymer of a major proportion by weight of ethylene and a minor proportion by weight of a  $C_4$ - $C_{12}$   $\alpha$ -olefin.

4,416,938

## INORGANIC FILMS WITH POLY(VINYL ALCOHOL)

Vernon C. Haskell, Circleville, Ohio, assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 301,515, Sep. 14, 1981, Pat. No. 4,376,183.

This application Sep. 29, 1982, Ser. No. 427,472

Int. Cl.<sup>3</sup> D04H 1/58

U.S. Cl. 428—289

6 Claims

1. A substantially continuous, gas-impermeable film of high barrier quality comprising a homogeneous combination of: (i) 85 to 98 weight percent metal orthophosphate wherein the atom ratio of metal to phosphorous is from 0.5 to 2.3 and the metal is more than 50 atom percent aluminum or iron and less than 50 atom percent tin, titanium, or zirconium; and (ii) 2 to 15 weight percent poly(vinyl alcohol) reacted with a dialdehyde having more than two and less than eight carbon atoms adherent to a shaped article.

4,416,939

## HEAT-SENSITIVE RECORDING PAPER

Akira Igarashi, and Sukenori Nakamura, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1982, Ser. No. 339,231

Claims priority, application Japan, Jan. 13, 1981, 56-3486

Int. Cl.<sup>3</sup> B41M 5/18

U.S. Cl. 428—323

6 Claims

1. A heat-sensitive recording paper, comprising:
  - a base paper wherein a value obtained by dividing a Stöckigt sizing degree determined by JIS-P-8122 by areal weight ( $g/m^2$ ) determined by JIS-P-8124 is  $3 \times 10^{-3}$  ( $S.m^4/g^2$ ) or more and the base paper having a Bekk smoothness determined by JIS-P-8119 of 90 seconds or more; and
  - an aqueous heat-sensitive developable layer coated on a surface of said base paper.

4,416,940

## SIMULATED WEATHERED-COPPER COATINGS FOR METAL

Kenneth Loye, Lakewood, and Gary Julian, Parma, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,653

Int. Cl.<sup>3</sup> B32B 5/16, 19/02, 27/20; B05D 5/06

U.S. Cl. 428—324

13 Claims

1. A two-step process for imparting a simulated weathered-copper appearance to a substrate which comprises first applying an opaque pigmented base coat containing a dominant patina-color-producing colorant to a primed or unprimed



substrate; curing said base coat; applying to the cured base coat a non-opaque top coat containing one or more copper-color-producing additives in an amount sufficient to impart a simulated weathered-copper appearance having both a copper metallic appearance by reflection of incident light from said top coat and a patina appearance by transmission of light to and reflection from the base coat; said top coat having sufficient transparency toward incident light to allow perception of the patina color of the base coat and simultaneously sufficient copper-color producing additives to allow the reflection of light from the copper-color-producing additives.

4,416,941

#### ADDITIVE FOR COATING COMPOSITIONS OF SILICA AND A FLUORINATED ETHYLENE OXIDE POLYMER

Robert J. Barsotti, Franklinville, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 30, 1982, Ser. No. 403,307

Int. Cl.<sup>3</sup> C08K 3/08, 3/36; C08G 12/32; B32B 27/42

U.S. Cl. 428—328 15 Claims

1. A coating composition comprising about 40–70% by weight of a binder of film forming constituents and about 30–60% by weight of a nonaqueous liquid carrier, wherein the binder comprises a film-forming acrylic polymer containing polymerized alkyl methacrylate and alkyl acrylate monomers and having reactive carboxyl groups, hydroxyl groups, amide groups, glycidyl groups or a mixture of any of these groups and an alkylated melamine formaldehyde crosslinking agent; and in addition the composition contains about 0.1–10% by weight, based on the weight of the binder, of a rheology control additive consisting essentially of about

- (1) 70–98% by weight, based on the weight of the rheology control additive, of colloidal hydrophilic fumed silica having a surface area of about 100–500 square meters per gram and a particle size of about 5–20 millimicrons and
- (2) 2–30% by weight, based on the weight of the rheology control additive, of a nonionic fluorocarbon polymer having ethylene oxide linkages and a weight average molecular weight of about 5,000–50,000 and containing about 2–25% by weight, based on the weight of the fluorocarbon polymer, of fluorine.

4,416,942

#### LAMINATES OF LAMELLAR ARTICLES AND POLYOLEFINS

Robert C. DiLuccio, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 21, 1982, Ser. No. 380,769

Int. Cl.<sup>3</sup> B32B 27/08; C08L 23/00

U.S. Cl. 428—332 12 Claims

1. An at least two layer laminate comprising:

- (a) a layer of a polymer comprising a base polyolefin, a condensation polymer incompatible with the base polyolefin, and an alkylcarboxyl-substituted polyolefin wherein the base polyolefin and the condensation polymer are present in the article as thin, substantially two-dimensional, parallel and overlapping layers of material and the alkyl-carboxyl substituted polyolefin is present between the layers and adheres the layers together, and
- (b) a layer of a polyolefin or polyolefin copolymer film, said layer comprising 10 to 90 percent of the thickness of the laminate;

said layers being melt bonded together such that the molecular networks of the layers at the lamination cite are adhered together.

4,416,943

#### MAGNETIC RECORDING MEDIUM

Seitoku Saito, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,289

Claims priority, application Japan, Sep. 1, 1980, 55-120969  
Int. Cl.<sup>3</sup> B32B 15/00

U.S. Cl. 428—333

2 Claims

1. A magnetic recording medium comprising a substrate layer and at least one magnetic layer consisting essentially of cobalt as a main component and zinc or iridium as an additional component wherein the ratio of Co:Ir is 90:10 and Co:Zn is 86:14 of an alloy of a magnetic layer wherein axes of easy magnetization of said components are substantially perpendicular to a surface of said magnetic layer and thickness of said magnetic layer is in a range of 500 Å to 3 μm.

4,416,944

#### COMPOSITE STRUCTURES

Ashok M. Adur, Rolling Meadows, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 363,894, Mar. 31, 1982, Pat. No. 4,394,485.

This application Dec. 23, 1982, Ser. No. 452,872

Int. Cl.<sup>3</sup> B32B 27/00

U.S. Cl. 428—349

37 Claims

1. A composite structure comprising:

- (A) a substrate, and adhered thereto
- (B) a modified polyolefin blend consisting essentially of:
  - (i) HDPE having a density of about 0.94–0.97 g/cc;
  - (ii) at least one polypropylene polymer or copolymer;
  - (iii) LDPE having a density of about 0.91–0.94 g/cc; and
  - (iv) a polyethylene polymer grafted with at least one grafting monomer polymerizable ethylenically unsaturated carboxylic acid or acid derivative.

4,416,945

#### MAGNETIC IMBIBER POLYMERS AND METHOD FOR THE PREPARATION THEREOF

Jitka Solc, Midland, and Daniel H. Haigh, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 3, 1982, Ser. No. 345,291

Int. Cl.<sup>3</sup> B32B 27/14, 32/00

U.S. Cl. 428—407

5 Claims

1. A magnetic oil imbibing particulate polymer comprising a plurality of oil-swellable oil-insoluble polymer particles having a diameter of from about 1 micron to about 3 millimeters, a plurality of magnetic particles on a surface of the polymer particles, the magnetic particles being about 50 angstroms to about 1 micron in diameter and being 1–20 weight percent of the polymer, with the further limitation that the polymer particles have a swelling index of at least 1.2, wherein the swelling index is determined by immersing a particular polymer to be evaluated in an organic liquid until the polymer has reached equilibrium swelling, and determining the volume per unit weight of the polymer after a period of 30 minutes in the organic liquid; wherein the ratio of the volume per unit weight with organic liquid to the volume per unit weight of the polymer provides the swelling index.

4,416,946

#### HIGH STABILITY POLARIZER

Lawrence Bolt, Van Nuys, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Apr. 5, 1982, Ser. No. 365,430

Int. Cl.<sup>3</sup> B32B 27/00, 27/08

U.S. Cl. 428—421

6 Claims

1. A polarizing element which comprises a sheet of a stained polyvinyl alcohol film which is adhered on one side thereof to a flexible transparent fluorine containing sheet, said fluorine containing sheet consisting essentially of a material selected from the group consisting of ethylene-chlorotrifluoroethylene,

polytetrafluoroethylene, polyvinylidene fluoride, ethylene tetrafluoroethylene, perfluoro alkoxy materials, fluorinated ethylene propylene, and polychlorotrifluoroethylene.

4,416,947

#### MAGNETIC RECORDING MEDIUM

Kuniichi Yoda, Saku, and Takehisa Ohkawa, Shimogoshi, both of Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,053

Claims priority, application Japan, Apr. 1, 1981, 56-47314

Int. Cl.<sup>3</sup> G11B 5/70; H01F 10/02

U.S. Cl. 428—447

10 Claims

1. A magnetic recording medium comprising a base material and a magnetic coating layer thereon, said magnetic coating layer containing a binder, a highly viscous silicone oil having a viscosity of at least 100,000 centistokes and a higher fatty acid ester composed of a higher fatty acid having a melting point of at least 44° C. and a monohydric alcohol containing 3 to 8 carbon atoms, said silicone oil in an amount of 0.2% to 2.0% by weight of said binder and said higher fatty acid ester in an amount of 0.5% to 3.0% by weight of said binder.

4,416,948

#### MAGNETIC RECORDING MEDIUM

Takehisa Ohkawa, Shimogoshi, and Kuniichi Yoda, Saku, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,054

Claims priority, application Japan, Apr. 1, 1981, 56-47316

Int. Cl.<sup>3</sup> G11B 5/70; H01F 10/02

U.S. Cl. 428—447

10 Claims

1. A magnetic recording medium comprising a base material and a magnetic coating layer thereon, said magnetic coating layer containing a binder, a highly viscous silicone oil having a viscosity of at least 100,000 centistokes and a higher fatty acid glycerine ester composed of a higher fatty acid having a melting point of at least 44° C. and glycerine, said silicone oil in an amount of 0.2% to 2.0% by weight of said binder and said glycerine ester in an amount of 0.2% to 2.0% by weight of said binder.

4,416,949

#### COMPOSITE PANEL COMPRISING A METAL FOIL AND A POLYOLEFINE SHEET

Rodolfo Gabellieri, and Rene Bouteille, both of Brussels, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 851,281, Nov. 14, 1977, abandoned.

This application Sep. 11, 1981, Ser. No. 301,320

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1977, 76197

Int. Cl.<sup>3</sup> B32B 15/08

U.S. Cl. 428—461

13 Claims

1. Composite panel comprising at least one metal foil combined, directly by hot pressing without any adhesive, with at least one polyolefine sheet, the polyolefine sheet comprising from 10 to 90% by weight of cellulose fibres and from 90 to 10% by weight of a polyolefine modified by polar monomer units derived from at least one organic compound containing at least one double bond and at least one carboxyl group, which may be in the form of an anhydride.

4,416,950

#### TRANSPARENT FIBROUS SHEETS

Peter Muller; Henry Mustacchi, both of Port Washington, and Leonard Kreicas, Syosset, all of N.Y., assignors to Andrews Paper & Chemical Co., Port Washington, N.Y.

Filed Apr. 29, 1982, Ser. No. 372,953

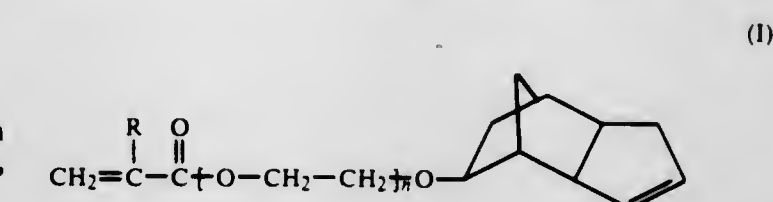
Int. Cl.<sup>3</sup> B32B 23/10

U.S. Cl. 428—537

17 Claims

1. A transparent, non-stratified, water and alcohol resistant,

resin reinforced cellulosic fibrous sheet having as the resin component, polymerized monomer of the formula:



wherein R is selected from the group consisting of hydrogen and lower alkyl and n is an integer of from 0 to 6.

4,416,951

#### EXTRUDED SEALING STRIP WITH FABRIC COVERED GRIPPING MEANS, PARTICULARLY FOR APPLICATION TO AUTOMOTIVE VEHICLES

Francois Mesnel, Neuilly-sur-Seine, France, assignor to Etablissements Mesnel, Carrieres-sur-Seine, France

Filed Mar. 16, 1982, Ser. No. 358,612

Claims priority, application France, Mar. 30, 1981, 81 06268;  
Jul. 7, 1981, 81 13329

Int. Cl.<sup>3</sup> B22F 37/00

U.S. Cl. 428—586

17 Claims



1. A sealing strip comprising a deformable body of extruded material; said body having a reinforcement for effecting gripping of said sealing strip to a base, at least part of said body having a covering thereon, said covering including:

- a light grade textile material having a loose structure;
- a coating of vinyl plastisol on said textile material, said coated textile material being embossed to provide a plurality of raised areas and a plurality of depressed areas between said raised areas, said raised areas being formed by a plurality of cells between said body and said textile material; and
- an adhesive between at least said depressed areas and said body, said adhesive bonding only said depressed areas of said textile material to said body, said textile material being unattached to said body in the regions of said raised areas;

whereby said covering of textile material is readily elastically deformable and does not interfere with the deformability of said body of the sealing strip.



4,416,952

**OXYNITRIDE FILM AND ITS MANUFACTURING METHOD**

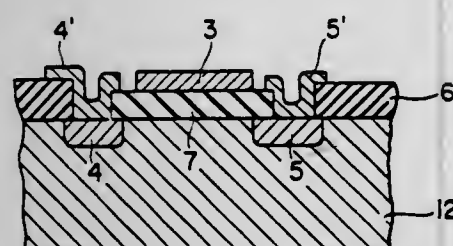
Jun-ichi Nishizawa, and Ikuo Shiota, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Division of Ser. No. 215,442, Dec. 11, 1980, Pat. No. 4,331,737, which is a continuation of Ser. No. 23,766, Mar. 26, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 351,618 Claims priority, application Japan, Apr. 1, 1978, 53-38580; Jul. 14, 1978, 53-86573

Int. Cl.<sup>3</sup> B32B 15/04; C01B 21/06

U.S. Cl. 428—698

9 Claims



1. An oxynitride film formed of an oxynitride of one substance selected from the group consisting of gallium, aluminum and their mixture, said oxynitride having a finite and non-zero molar ratio of oxygen to nitrogen.

4. An oxynitride film according to claim 1, in which said film is formed on an underlying substrate.

4,416,953

**SECONDARY BATTERY**

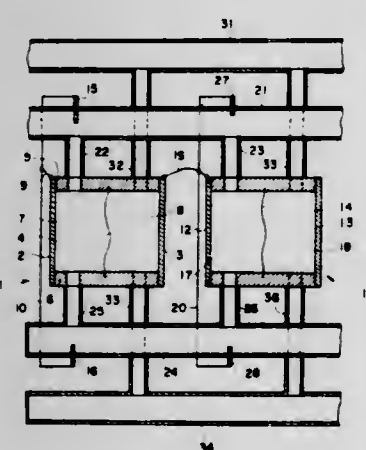
Takafumi Hashimoto, Asahimachi, and Yukio Kobari, Tokyo, both of Japan, assignors to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,818

Int. Cl.<sup>3</sup> H01M 8/24

U.S. Cl. 429—18

2 Claims



1. In an electrolyte circulation type cell stack secondary battery in which the negatively active material is a metal selected from the group consisting of cadmium, zinc and lead, the improvement wherein an electrode is projected fronting on each of a cathode electrolyte inlet and outlet of each of a plurality of secondary cells, and wherein said electrodes are connected electrically to a cathode of each said secondary cell by connecting means, thereby maintaining said electrodes at the same electric potential as said cathode during the charge and preventing the occurrence of abnormal electrodeposition.

2. In an electrolyte circulating type cell stack secondary battery in which the negatively active material is a metal selected from the group consisting of cadmium, zinc and lead, the improvement wherein each of two cathode electrolyte channels of each of a plurality of secondary cells is connected to an anode electrolyte channel by way of a separator, wherein an electrode is disposed in an area on the anode electrolyte side of each said separator, and wherein said electrodes are con-

nected electrically to a cathode of each said secondary cell and are held at the same electric potential as said cathode, thereby preventing the occurrence of abnormal electrodeposition.

4,416,954

**POWER GENERATION APPARATUS**

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 704,452, Jul. 12, 1976, Pat. No. 4,305,999, Ser. No. 20,967, Mar. 16, 1979, Pat. No. 4,218,520, which is a division of Ser. No. 843,155, Oct. 17, 1977, Pat. No. 4,150,197, and Ser. No. 80,185, Oct. 1, 1979, Pat. No. 4,254,190.

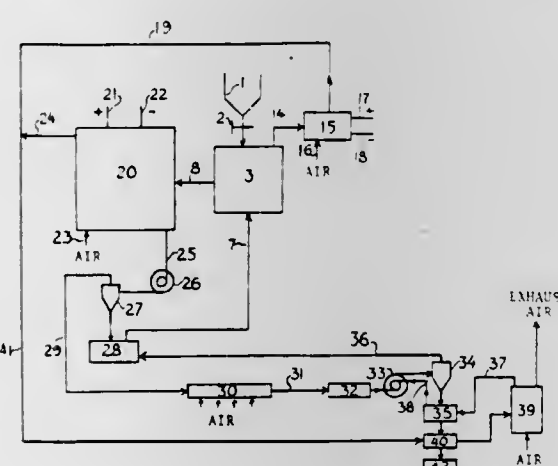
This application Aug. 18, 1980, Ser. No. 179,274

The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> H01M 8/06

U.S. Cl. 429—15

5 Claims



1. Apparatus for the generation of energy from the oxidation of aluminum or its alloys which comprises:

(a) means for breaking up the continuity of the passivating oxide layer on the aluminum surface by exposing said surface to a mercury-, indium-, or gallium-containing substance;

(b) a reaction chamber wherein the surface-treated aluminum is exposed to a fluid engaging in an oxidation reaction therewith, said fluid comprising a neutral saline, mildly alkaline or mildly acidic electrolyte; and

(c) means for withdrawing useful energy from said oxidation reaction,

wherein said energy-withdrawing means comprises an electrochemical cell, said cell comprises a solid or slurry-type aluminum-containing anode.

4,416,955

**FUEL CELL SUB-ASSEMBLY**

Chang V. Chi, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Jan. 11, 1982, Ser. No. 338,354

Int. Cl.<sup>3</sup> H01M 8/02

U.S. Cl. 429—26

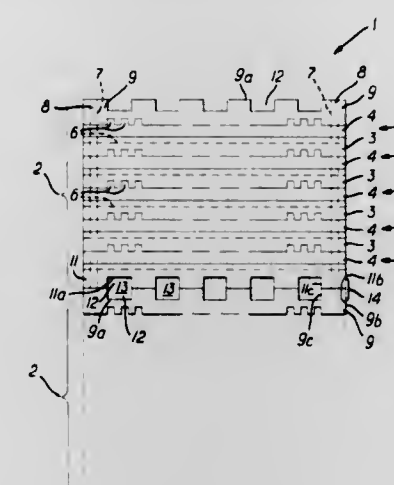
19 Claims

1. Apparatus comprising:

a first fuel cell assembly including:

a first plurality of fuel cells arranged one adjacent the other;

a first section of a cooling means arranged at an end of said first assembly;



and first means for holding said first fuel cells and said first section together to form a unitary structure.

4,416,956

**APPARATUS FOR CARRYING OUT A CHEMICAL OR PHYSICAL PROCESS**

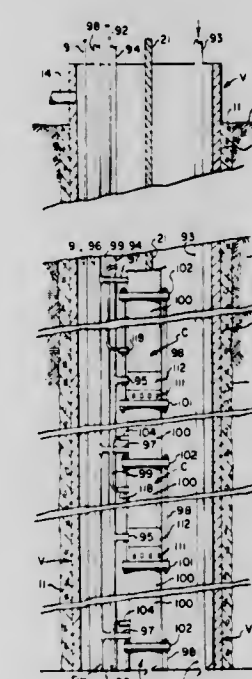
Harold L. Lawless, P.O. Box 1287, Rapid City, S. Dak. 57701

Continuation of Ser. No. 182,110, Sep. 20, 1971, and a division of Ser. No. 658,511, Aug. 4, 1967, Pat. No. 3,606,999. This application May 27, 1975, Ser. No. 580,697

Int. Cl.<sup>3</sup> H01M 8/02, 8/04

U.S. Cl. 429—15

15 Claims



1. Fuel cell apparatus comprising:

an enclosed space;

a first hollow electrode enclosure disposed in said space, said first enclosure being open at both ends, being electrically conductive and containing non-consumable, electrically conductive pellets;

screen means for retaining said pellets in said first enclosure; means for supplying water or a fluid electrolyte to one open end of said first enclosure;

means for supplying an oxygen containing gas to the said open end of said first enclosure;

a second hollow electrode enclosure open at both ends and spaced from said first enclosure in said space, said second enclosure being electrically conductive and containing electrically conductive pellets;

screen means for retaining said pellets in said second enclosure; means for supplying a fuel to the region between the two

electrodes to move inside said second enclosure, whereby ions produced in said first enclosure react with the fuel and release electrons from the ions to said electrically conductive pellets and enclosure;

flow of said electrolyte sequentially and axially through said enclosures transports ions from the first electrode to the second electrode; and

electrical connections for an external path for flow of said electrons from said second enclosure to said first enclosure.

4,416,957

**ELECTROCHEMICAL CELL**

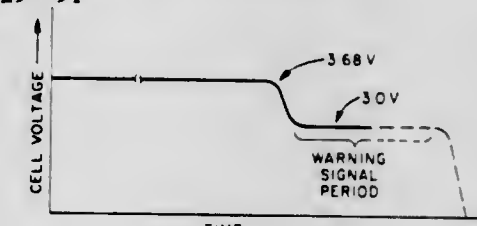
Franz Goebel, Sudbury, and Robert C. McDonald, Stow, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 3, 1982, Ser. No. 354,276

Int. Cl.<sup>3</sup> H01M 6/14

U.S. Cl. 429—91

12 Claims



1. An electrochemical cell comprising:

a housing;

an electrochemical system within the housing and including an electrolytic solution and a battery stack exposed to said electrolytic solution, said battery stack comprising:

a cathode; and

an anode structure spaced from the cathode and the housing, said anode structure comprising:

a first active element of a first material having a first oxidation potential within the cell, said first active element being consumed by electrochemical action within the cell during discharge of the cell and establishing a first value of operating voltage for the cell during discharge of the cell and the consumption of the first active element; and

a second active element of a second material having a second oxidation potential within the cell, said second active element being consumed by electrochemical action within the cell during discharge of the cell and establishing a second, different value of operating voltage for the cell during discharge of the cell and the consumption of the second active element;

said first and second active elements being arranged with respect to each other so that one of the active elements is consumed before the other whereby the value of operating voltage of the cell changes from one of its two values to the other of its two values;

wherein:

the electrolytic solution includes a catalytically-reducible soluble cathode;

the cathode of the battery stack is a porous carbon structure adjacent to an interior wall of the housing and operative during discharge of the cell to catalytically reduce the soluble cathode of the electrolytic solution; and

the first active element is of a material having a greater oxidation potential within the cell than that of the second active element and surrounds the second active element.



4,416,958

**THERMAL BATTERY CELLS UTILIZING  $\text{AgNO}_3$  IN  $\text{LiClO}_4$ - $\text{LiNO}_3$  MIXTURES**

Melvin H. Miles, and Aaron N. Fletcher, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,862

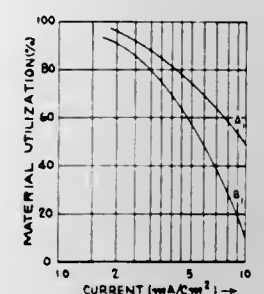
Int. Cl.<sup>3</sup> H01M 6/20, 6/36

U.S. Cl. 429—103

8 Claims

1. A thermally activated electrochemical cell including: a cathode composed of metallic nickel, where reduction occurs, an anode composed of metallic calcium, where oxidation occurs, and an electrolyte which is disposed between said cathode and said anode, is an electrically non-conductive solid at ambient temperatures, and is capable of becoming an ionically conductive liquid upon being heated above its melting point, said electrolyte comprising an electrolyte layer comprising a mixture of  $\text{LiClO}_4$  and  $\text{LiNO}_3$  adjacent to said anode, and an electrolyte layer comprising a mixture of  $\text{LiClO}_4$ ,  $\text{LiNO}_3$ , and  $\text{AgNO}_3$  adjacent said cathode and acting as the oxidizer.

having an aqueous pH equal to, or greater than, 6.00, comprising at least one solute of the general formula:



A, 1M  $\text{LiAsF}_6$  0.5M DME (80 to 100 V/g)  
T: 50 to 100 mA/cm²; 2: ANODE / CATHODE  
B, 1M  $\text{LiAsF}_6$  0.5M DME (20 to 40 V/g)  
T: 50 to 100 mA/cm²; 2: ANODE / CATHODE

wherein X is selected from a group consisting of B, P, Sb, and As, and wherein a is 4 for B and 6 for P, Sb, and As, in a solvent consisting of at least 1.3 dioxolane.

4,416,959

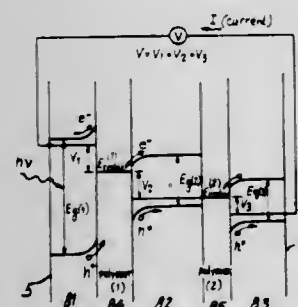
**PHOTOELECTROCHEMICAL CELLS FOR CONVERSION OF SOLAR ENERGY TO ELECTRICITY**

Terje Skotheim, 41 Bay Rd., East Patchogue, N.Y. 11772  
Continuation-in-part of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Oct. 19, 1981, Ser. No. 312,888

Int. Cl.<sup>3</sup> H01M 6/36

U.S. Cl. 429—111

14 Claims



1. A tandem photovoltaic device comprising a sandwich structure of at least three semiconductor layers each separated from one another by an intermediate layer of thin film dry solid polymer electrolyte, and electrodes connected to the outer faces of the outer semiconductor layers, one of said outer semiconductor layers adapted to receive incident light on its said outer face, said last mentioned semiconductor having a higher band gap than the adjacent semiconductor.

4,416,960

**Li/TiS<sub>2</sub> CURRENT PRODUCING SYSTEM**

Daniel J. Eustace, Scotch Plains, and Bhaskara M. L. Rao, Fanwood, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 115,997, Jan. 28, 1980, abandoned. This application Sep. 8, 1980, Ser. No. 184,772

Int. Cl.<sup>3</sup> H01M 6/14

U.S. Cl. 429—194

9 Claims

1. A current producing electrochemical cell comprising a lithium anode, a titanium disulfide cathode, and an electrolyte

having an aqueous pH equal to, or greater than, 6.00, comprising at least one solute of the general formula:

Filed Dec. 7, 1981, Ser. No. 328,107  
Claims priority, application Japan, Dec. 22, 1980, 55-182471  
Int. Cl.<sup>3</sup> G03G 5/082

U.S. Cl. 430—65

27 Claims

1. An electrophotographic image-forming member comprising a substrate for electrophotography and a photoconductive layer which is laid on said substrate and comprising an amorphous material containing at least one of hydrogen atom and halogen atom in a matrix of silicon atom, said substrate being constituted of aluminum oxide containing chemi-structurally water at least on the surface thereof.

4,416,961

**COLOR IMAGING DEVICES AND COLOR FILTER ARRAYS USING PHOTO-BLEACHABLE DYES**

Karl H. Drexhage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 186,105, Sep. 11, 1980, Pat. No. 4,345,011.  
This application Feb. 16, 1982, Ser. No. 349,282

Int. Cl.<sup>3</sup> G03F 5/00; G02B 5/18, 5/22

U.S. Cl. 430—7

5 Claims

1. In a color filter array comprising a layer of a transparent binder containing a planar array of filter elements, the improvement wherein: the layer has a thickness of less than 10 microns; at least some of said filter elements contain at least one cationic photo-bleachable dye which selectively absorbs radiation in at least one portion of the spectrum and said dye is present in said layer in an amount sufficient to impart a density to said layer of at least 0.5 in that portion of the spectrum in which it selectively absorbs.

4,416,962

**ELECTROPHOTOGRAPHIC MEMBER HAVING ALUMINUM OXIDE LAYER**

Shigeru Shirai, Yamato; Junichiro Kanbe, Yokohama, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,107  
Claims priority, application Japan, Dec. 22, 1980, 55-182471  
Int. Cl.<sup>3</sup> G03G 5/082

U.S. Cl. 430—65

27 Claims

1. An electrophotographic image-forming member comprising a substrate for electrophotography and a photoconductive layer which is laid on said substrate and comprising an amorphous material containing at least one of hydrogen atom and halogen atom in a matrix of silicon atom, said substrate being constituted of aluminum oxide containing chemi-structurally water at least on the surface thereof.

4,416,963

**ELECTRICALLY-CONDUCTIVE SUPPORT FOR ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MEDIUM**

Masaaki Takimoto; Takashi Saida, and Masataka Murata, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1981, Ser. No. 253,952

Claims priority, application Japan, Apr. 11, 1980, 55-47665  
Int. Cl.<sup>3</sup> G03G 5/10

U.S. Cl. 430—69

6 Claims

1. An electrically-conductive support for use in an electrophotographic medium, comprising: a support; and an electrically-conductive layer provided on the support wherein the electrically-conductive layer comprises a binder and electrically conductive metal oxide fine particles having an average grain size of 0.5  $\mu$  or less and a volume resistivity of  $10^9 \Omega$ -cm or less, dispersed in a binder, wherein said electrically-conductive metal oxide fine particles are selected from the group consisting of crystalline metal oxide particles and metal oxide particles containing an oxygen deficiency or small amounts of hetero atoms capable of forming a donor for the metal oxide used, wherein said electrically-conductive support is transparent such that it has a transmittance of light, having a wavelength range including visible light, of about 50% or more, and a light-scattering efficiency of about 50% or less.

4,416,964

**DRY MAGNETIC DEVELOPER CONTAINING A NON-PULVERIZING AGGLOMERATE OF CUBIC MAGNETITE PARTICLES**

Nobuhiro Miyakawa, Suita; Takashi Teshima, Amagasaki; Haruo Koyama, Hirakata; Kouji Maekawa, Kyoto, and Masanori Fujii, Suita, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 26, 1981, Ser. No. 296,505

Claims priority, application Japan, Sep. 2, 1980, 55-120689  
Int. Cl.<sup>3</sup> G03G 9/00

U.S. Cl. 430—106.6

1 Claim

1. A dry magnetic developer consisting essentially of a particulate shaped article of a composition comprising a binder resin medium and a powdery magnetic material dispersed in the binder resin medium, wherein said magnetic material comprises a non-pulverizing agglomerate of cubic magnetite particles in which fine particles of magnetite are so densely aggregated with one another that the particle size distribution is not substantially changed even by five hours' ball-milling treatment, said agglomerate having a number average particle size of 2 to 10 microns as measured by an electron microscope, an apparent density of 0.5 to 1.5 as measured according to the method of JIS K-5101, a saturation magnetization of 75 to 88 emu/g, a residual magnetization of 3 to 12 emu/g, a coercive force of 40 to 150 Oe and substantially the same configuration as that shown in the electron microscope photograph of FIG. 1 of the accompanying drawings, said agglomerate being present in an amount of 40 to 70% by weight based on the sum of amounts of the binder resin medium and the powdery magnetic material, said developer having a number average particle size of 5 to 35 microns, which is at least two times the number average particle size of the agglomerate.

4,416,965

**ELECTROSTATOGRAPHIC DEVELOPERS COMPRISING TONERS CONTAINING A POLYESTER HAVING P-HYDROXYBENZOIC ACID RECURRING UNITS**

M. Akram Sandhu, Kingsport, Tenn.; John F. Wright, Penfield, and Michel F. Molaire, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,138

Int. Cl.<sup>3</sup> G03G 9/08

U.S. Cl. 430—109

7 Claims

1. An electrographic developer composition containing

toner particles comprising a polyester having recurring units derived from diols and diacids and recurring units derived from p-hydroxybenzoic acid characterized in that from about 15-60 mole percent of the recurring units of said polyesters are derived from p-hydroxybenzoic acid.

4,416,966

**CAPSULAR IMAGING SYSTEM COMPRISING DECOLORIZING AGENT**

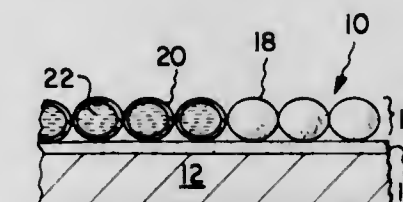
Frederick W. Sanders; Richard F. Wright, and Paul C. Adair, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 25, 1982, Ser. No. 411,721

Int. Cl.<sup>3</sup> G03C 7/00, 1/40; B41L 1/20

U.S. Cl. 430—138

16 Claims



1. An imaging system comprising: an imaging sheet and a background dye or a combination of a dye precursor and a dye developer which react to form a background dye, said imaging sheet including: a support, a plurality of capsules in a layer on one surface of said support, and an internal phase contained within said capsules comprising a decolorizing agent and a photodegradable or photosensitive radiation sensitive composition, wherein images can be formed by image-wise exposing said sheet to actinic radiation and rupturing said capsules such that said decolorizing agent is image-wise released from said capsules and reacts with said associated background dye to decolorize it or inhibits, prevents or reverses the color forming reaction of said dye precursor and dye developer to produce a color difference in the form of an image.

4,416,967

**DIAZO COPYING ELEMENT**

Tsutomu Matsuda, Tokyo; Takeo Hirabayashi, Numazu; Takeshi Yanagihara, and Shinjiro Sakurai, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,362

Claims priority, application Japan, Apr. 30, 1981, 56-66591  
Int. Cl.<sup>3</sup> G03C 1/52

U.S. Cl. 430—159

8 Claims

1. In a one-component or two-component diazotype copying element comprising a substrate, a precoat layer coating a surface of said substrate and a diazotype photosensitive layer coating said precoat layer, said diazotype photosensitive layer comprising a photosensitive diazonium compound capable of reacting with a coupler to form a developed visible color image on said diazotype photosensitive layer, the improvement which comprises: said precoat layer consists essentially of a blend of (A) finely divided silica particles, and (B) a copolymer having a glass transition temperature in the range of from -20° C. to 50° C., said copolymer having been prepared by emulsion polymerization of a mixture of monomers comprising (1) from 5 to 40% by weight of at least one first monomer selected from the group consisting of hydroxyalkylacrylates and hydroxyalkylmethacrylates, and (2) from 5 to 60% by weight of at least one second monomer selected from the group consisting of styrene and acrylonitrile, and said weight ratio of (A):(B) is 1:0.5-5.



4,416,968

**PREPARATION OF A PRINTING MASTER BY TONING A PHOTOPOLYMER FILM WITH MAGNETIC TONER**

Robert P. Held, Englishtown, N.J., assignor to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

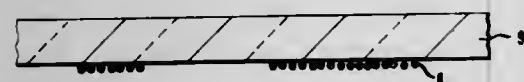
Division of Ser. No. 295,246, Aug. 24, 1981. This application

Ser. 9, 1982, Ser. No. 416,362

Int. Cl.<sup>3</sup> G03C 5/54, 5/00; B41F 7/00; G02B 7/06

U.S. Cl. 430—199

3 Claims

**1. A process of dry printing which comprises:**

- (1) preparing a magnetic printing master by exposing image-wise to actinic radiation a photopolymerizable layer on a support, so as to generate imagewise tacky and nontacky areas on said support, the tacky areas being those which did not receive radiation, and the nontacky areas being those areas which received radiation; applying to the exposed surface a first magnetic toner comprising ferromagnetic metal oxide particles; simultaneously subjecting the toned surface to a magnetic field, thereby aligning the ferromagnetic particles in the surface of said tacky areas; and then post-exposing said photohardenable element, overall; whereby a printing master is formed which can be dusted with a second magnetic toner which adheres to the first toner and is transferable to a receptor surface; and
- (2) preparing one or more copies of the image on the resulting magnetic printing master by toning said master with a second magnetic toner, with added polymer, which adheres to the first magnetic toner on the master, and (3) contacting the doubly toned surface with a receptor surface, while applying heat and pressure, causing the second toner with added polymer to adhere to the receptor surface.

4,416,969

**HYDRAZIDE COMPOSITIONS, METHODS EMPLOYING THEM AND PHOTOGRAPHIC MATERIALS CONTAINING THEM**

Paul M. Magee, Harrow, and Gareth B. Evans, Berkhamsted, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,903

Claims priority, application United Kingdom, Sep. 2, 1981, 8126621

Int. Cl.<sup>3</sup> G03C 5/54, 1/40, 1/28, 5/24

U.S. Cl. 430—217

11 Claims

**5. A photographic film unit comprising**

- (a) an integral imaging receiver element comprising a support, an internal latent image silver halide emulsion comprising a binder, internal latent image silver halide grains and a nucleating agent composition comprising a triazole substituted phenylhydrazide and a thiourea substituted phenylhydrazide wherein the molar ratio of said triazole substituted phenylhydrazide to said thiourea substituted phenylhydrazide is between 1:20 and 20:1, a redox dye-releasing compound associated with said emulsion, and a dye image receiving layer;
- (b) a cover sheet comprising a timing layer, a neutralizing layer and a support; and
- (c) means for discharging an aqueous alkaline processing composition between the integral imaging receiver element and the cover sheet.

4,416,970

**USE OF MANGANOUS COMPOUNDS IN IMAGE TRANSFER ELEMENTS**

Thomas O. Maier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,068

Int. Cl.<sup>3</sup> G03C 1/40, 1/10, 7/00, 5/54

U.S. Cl. 430—218

30 Claims

**1. In a photographic assemblage comprising:**

- (a) a photosensitive element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a redox dye-releasing material;
  - (b) a dye image-receiving layer; and
  - (c) an alkaline processing composition and means containing same for discharge within said assemblage;
- the improvement wherein said assemblage contains a manganous compound that is capable of diffusing to said emulsion layer and said redox dye-releasing material associated therewith only after processing and lowering of the pH of said assemblage, said manganous compound not being initially located in the photosensitive portion of said photosensitive element.

4,416,971

**NOVEL XANTHENE COMPOUNDS AND THEIR PHOTOGRAPHIC USE**

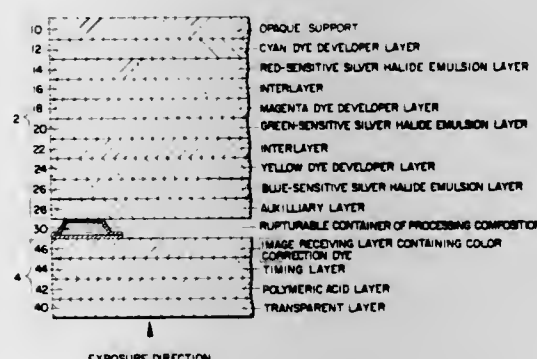
Alan L. Borror, Lexington; Louis Cincotta, Andover, and John W. Lee, Jr., Harvard, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1982, Ser. No. 454,092

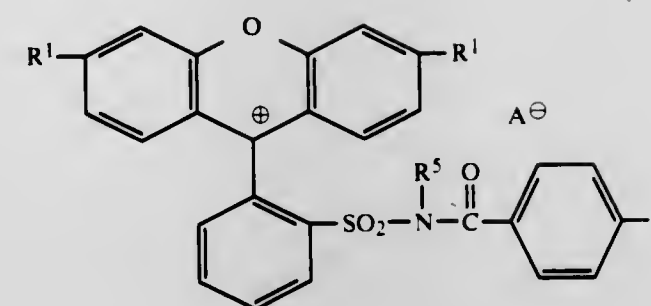
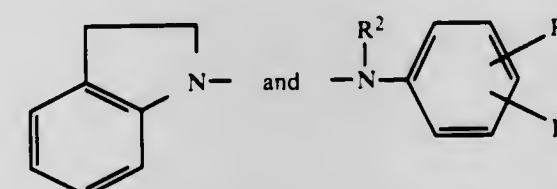
Int. Cl.<sup>3</sup> G03C 7/00, 1/40, 1/84, 5/54

U.S. Cl. 430—221

46 Claims



9. A photographic product for forming a multicolor diffusion transfer image, said product comprising a first sheet-like element comprising a first support carrying a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a blue-sensitive silver halide emulsion layer, said silver halide emulsion layers having associated therewith, respectively, a cyan dye-providing material, a magenta image dye-providing material and a yellow image dye-providing material; a second sheet-like element comprising a second support; said first and second sheet-like elements being in superposed relationship, or adapted to be brought into superposed relationship, with said supports being outermost; at least one of said supports being transparent to permit photoexposure of said silver halide emulsions therethrough; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being so positioned as to be capable of discharging said processing composition between a pair of predetermined layers carried by said supports; an image-receiving layer carried by one of said supports; and a colored xanthene compound being disposed in a processing composition permeable layer carried by one of said supports, said xanthene compound having the formula

wherein each R<sup>1</sup> is the same and is selected from

R<sup>2</sup> is alkyl, R<sup>3</sup> is an electron-withdrawing group positioned ortho, meta or para to said N atom, R<sup>4</sup> is hydrogen, alkyl or an electron-withdrawing group positioned ortho, meta or para to said N atom; R<sup>5</sup> is alkyl; X is hydrogen, an electron-withdrawing group or an electron-donating group; and A is an anion.

4,416,972

**ELECTROLYTIC GRADING OF ALUMINUM WITH NITRIC AND BORIC ACIDS**

John E. Walls, Annandale; Robert L. Dragon, Hazlet, and Thomas A. Dunder, High Bridge, all of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Jun. 26, 1981, Ser. No. 277,512

Int. Cl.<sup>3</sup> G03C 1/94; C25F 3/04

U.S. Cl. 430—278

11 Claims

1. A method of treating the surface of a sheet of aluminum or the alloys thereof which comprises electrolytically graining said sheet under electrolyzing conditions in an aqueous solution containing at least about 3 gram/liter of nitric acid and from about 1 gram/liter to about the saturation point of boric acid for a sufficient length of time to provide a finely grained surface topography to said sheet.

4,416,973

**RADIATION-SENSITIVE POLYIMIDE PRECURSOR COMPOSITION DERIVED FROM A DIARYL FLUORO COMPOUND**

David L. Goff, Springfield, Pa., assignor to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

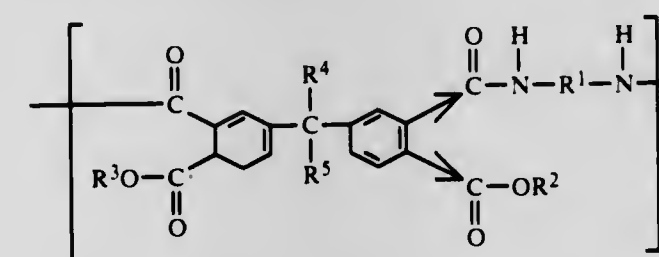
Continuation-in-part of Ser. No. 336,765, Jan. 4, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 427,415

Int. Cl.<sup>3</sup> G03C 1/68

U.S. Cl. 430—281

17 Claims

1. A radiation-sensitive polyimide precursor composition, comprising:
  - a. a polymer of the formula



wherein n is a positive integer corresponding to the number of units in the polymer and is sufficiently large to provide the polymer with a number average molecular weight of about 1500–15,000 as determined by vapor

- pressure osmometry, and wherein for any particular unit in the polymer: → denotes isomerism; R<sup>1</sup> is a divalent aromatic, aliphatic or cycloaliphatic radical containing at least 2 carbon atoms; R<sup>2</sup> and R<sup>3</sup> are selected from the group consisting of a hydrogen radical and any organic radical containing a photopolymerizable olefinic double bond, at least one of R<sup>2</sup> and R<sup>3</sup> being said organic radical; and R<sup>4</sup> and R<sup>5</sup> are selected from the group consisting of perfluoro and perhalofluoro aliphatic hydrocarbons having 1 to 8 carbons;
- b. a radiation sensitive polymerizable polyfunctional acrylate compound; and
- c. a photopolymerization initiator system comprising hydrogen donor initiator and aromatic biimidazole.

4,416,974

**RADIATION CURABLE CERAMIC PIGMENT COMPOSITION**

Bernard J. Scheve, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 217,975, Dec. 19, 1980, Pat. No. 4,306,012, which is a continuation-in-part of Ser. No. 100,609, Dec. 5, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,518

Int. Cl.<sup>3</sup> G03C 1/68

U.S. Cl. 430—288

7 Claims

1. A radiation curable solvent-free printing medium suitable for screen printing on glass, metal and ceramics, radiation curing and subsequent firing, comprising
  - (a) about 2 to 25% by weight of a polymerizable liquid prepolymer comprising hydroxyl terminated polyester, polyether or polyester-polyether backbones containing at least about two ethylenically unsaturated end groups and having a number average molecular weight of from about 15,000 to about 80,000;
  - (b) about 2 to 15% by weight of at least one ethylenically unsaturated, polymerizable monomer selected from acrylate and methacrylate containing a polar functional group;
  - (c) about 60 to 90% by weight of a ceramic frit; and
  - (d) about 0.02 to 2% by weight of a polymerization inhibitor.

4,416,975

**PHOTOPOLYMERIZATION PROCESS EMPLOYING COMPOUNDS CONTAINING ACRYLOYL GROUPS AND MALEIMIDE GROUPS**

George E. Green, Stapleford, England; Ewald Losert, Rheinfelden, Switzerland; John G. Paul, Stirlingshire, Scotland, and Hans Zweifel, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,702

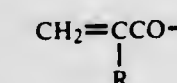
Claims priority, application United Kingdom, Feb. 4, 1981, 8110402

Int. Cl.<sup>3</sup> G03C 5/00

U.S. Cl. 430—327

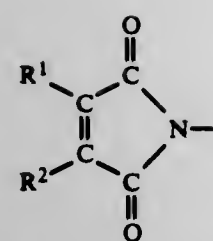
20 Claims

1. A process for production of an image which comprises
  - (1) exposing to actinic radiation a layer, supported on a carrier, of a liquid composition containing a photoinitiator, a triplet photosensitizer and a compound (A) having in the same molecule both at least one group of formula



and at least one group of formula





such that the layer solidifies and becomes essentially nontacky due to photopolymerisation of (A) through the group or groups of formula I but remains substantially photocrosslinkable, and subsequently,

- (2) exposing the layer so solidified through an image-bearing transparency consisting of substantially opaque and substantially transparent parts to a substantially greater amount of actinic radiation such that the further exposed part or parts of the photopolymerised layer undergo photocrosslinking through the group or groups of formula II, and
- (3) developing the image by dissolving in a solvent the part or parts of the layer which have not become photocrosslinked,

where

R denotes a hydrogen atom or a methyl group and R<sup>1</sup> and R<sup>2</sup> each denote the same or different alkyl group of 1 to 4 carbon atoms or together they denote a trimethylene or tetramethylene group which may be optionally substituted by a methyl group.

4,416,976

#### DEVELOPER SOLUTION FOR THE DEVELOPMENT OF EXPOSED NEGATIVE-WORKING DIAZONIUM SALT LAYERS

Loni Schell, Hofheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany  
Filed Mar. 31, 1981, Ser. No. 249,617  
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012522

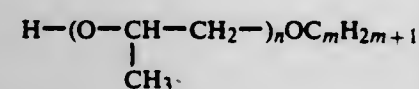
Int. Cl.<sup>3</sup> G03C 5/34, 5/00

U.S. Cl. 430—331

3 Claims

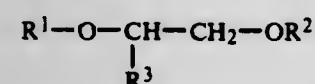
1. A developer solution for the development of exposed, light-sensitive reproduction layers which comprise a water-insoluble binder and a water-insoluble diazonium salt polycondensation product, the essential constituents of the solution being glycol ethers, glycol esters and water, and said solution consisting essentially of, by weight:

- (a) 30 to 80 percent of a compound of the formula



wherein n=1 to 4 and m=1 to 5,

- (b) 3 to 30 percent of a compound of the formula



wherein R<sup>1</sup> and R<sup>2</sup> are acyl groups containing 1 to 4 carbon atoms, or one of the two groups is a hydrogen atom and R<sup>3</sup> is a hydrogen atom or a methyl group,

- (c) 0 to 15 percent of 1,3-dioxolane-2-one or 4-methyl-1,3-dioxolane-2-one,
- (d) 0 to 20 percent of a polyhydric alcohol,
- (e) 0 to 10 percent of an organic or inorganic salt which is soluble in the solvent mixture, and
- (f) 5 to 45 percent of water.

#### 4,416,977 SILVER HALIDE PHOTOGRAPHIC PHOTOCROSSSENSITIVE MATERIAL

Minoru Ohashi; Kiyoshi Futaki, and Katsuaki Iwaosa, all of Nagakakyō, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,092

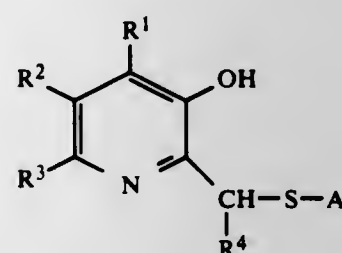
Claims priority, application Japan, Feb. 17, 1981, 56-21763

Int. Cl.<sup>3</sup> G03C 1/34

U.S. Cl. 430—446

12 Claims

1. In a silver halide photograph photosensitive material which comprises a support and at least one photographic layer provided thereon, the improvement which comprises including in at least one of silver halide emulsion layers and colloid layers permeable to water through to or out from said emulsion layer at least one development fog inhibiting compound represented by the following general formula (I):



(I)

wherein A represents the heterocyclic group of a mercapto-antifoggant; R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represent each a hydrogen atom, halogen atom, alkyl group, or phenyl group; R<sup>1</sup> and R<sup>2</sup>, or R<sup>2</sup> and R<sup>3</sup> may be bonded to each other to form a benzene ring; and R<sup>4</sup> represents a hydrogen atom, alkyl group, or phenyl group.

4,416,978

#### SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masakazu Morigaki; Morio Yagihara, and Takashi Ozawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 10, 1982, Ser. No. 387,128

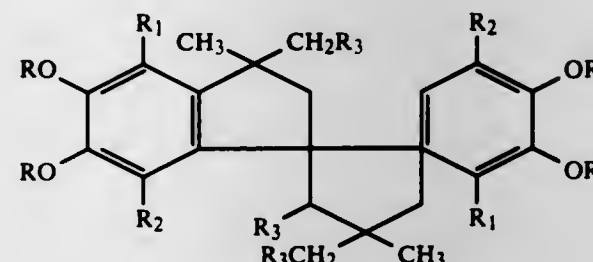
Claims priority, application Japan, Jun. 10, 1981, 56/89115

Int. Cl.<sup>3</sup> G03C 1/40

U.S. Cl. 430—548

26 Claims

1. A silver halide color photographic light-sensitive material, comprising:  
a support base;  
a light-sensitive silver halide emulsion;  
a magenta color image forming polymer coupler latex; and  
a compound represented by the following general formula (I)



wherein R represents an alkyl group, an alkenyl group, an aryl group, a heterocyclic group, a R<sub>4</sub>CO- group, a R<sub>5</sub>SO<sub>2</sub>- group or a R<sub>6</sub>NHCO- group; R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an alkoxy group or an alkenoxy group; R<sub>3</sub> represents a hydrogen atom, an alkyl group, an alkenyl group or an aryl group; and R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> each represents an alkyl group, an alkenyl group, an aryl group or a heterocyclic group.

4,416,979

#### PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT WITH NITROPHENYL-AZO METAL COMPLEXABLE DYE

Jiro Takahashi; Tawara Komamura, both of Hachioji, and Ryūchiro Kobayashi, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,545

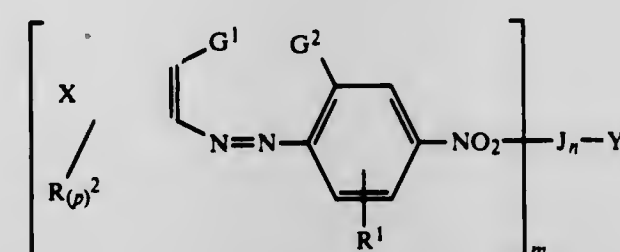
Claims priority, application Japan, May 8, 1981, 56-69879

Int. Cl.<sup>3</sup> G03C 7/00, 5/54, 1/40, 1/10

U.S. Cl. 430—562

6 Claims

1. A photographic light-sensitive element comprising a support having thereon at least one light-sensitive silver halide emulsion layer and a compound represented by the following formula (I):



(I)

wherein G<sup>1</sup> and G<sup>2</sup> independently represent an hydroxy group, an alkali salt thereof or a group which is capable of being hydrolyzed under alkaline conditions, R<sup>1</sup> represents a hydrogen atom, a halogen atom, an alkyl, alkoxy, sulfamoyl, carbamoyl, or alkoxy carbonyl, provided that said respective groups may be substituted, or cyano group; R<sup>2</sup> represents —NH<sub>2</sub>, —NHR<sup>4</sup>, —N(R<sup>4</sup>)<sub>2</sub>, —NHSO<sub>2</sub>NHR<sup>4</sup>, —NHSO<sub>2</sub>NHR<sup>4</sup>, —NHCOR<sup>4</sup>, —NHSO<sub>3</sub>R<sup>4</sup>, —OH, —OR<sup>4</sup>, —OCOR<sup>4</sup> or —OCO<sub>2</sub>R<sup>4</sup> wherein R<sup>4</sup> represents an alkyl or aryl provided that respective groups may be substituted; X represents a group of atoms necessary to complete a naphthalene or benzene ring provided that said respective rings may be substituted; Y represents a ballasting carrier portion which is capable of releasing a diffusible azo dye as a function of the development of the silver halide in said silver halide emulsion layer under alkaline conditions; J represents a divalent linking group; p is an integer of 1 or 2; m is an integer of 1 to 3; and n is 0 or an integer not more than m.

4,416,980

#### HIGH-CONTRAST LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Mitsuo Fujitwara; Syunji Matsuo; Toyooki Masukawa; Yutaka Kaneko, and Mikio Kawasaki, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 91,558, Nov. 5, 1979, abandoned, which is a continuation of Ser. No. 869,657, Jan. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 710,385, Aug. 2, 1976, abandoned. This application Sep. 4, 1980, Ser. No. 184,095

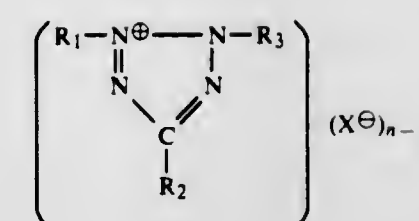
Claims priority, application Japan, Jan. 28, 1977, 52-7845

Int. Cl.<sup>3</sup> G03C 1/06

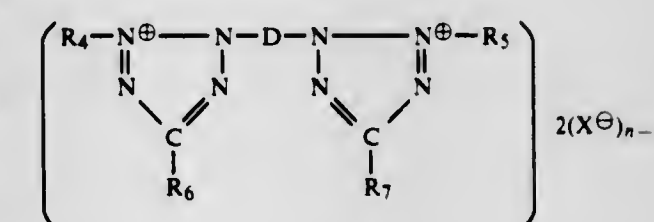
U.S. Cl. 430—567

10 Claims

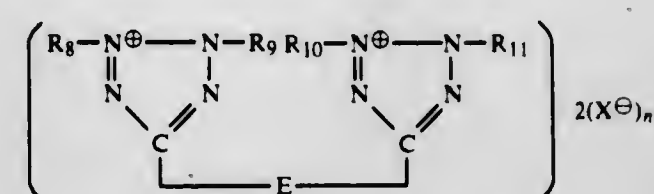
1. A high-contrast light-sensitive silver halide photographic material which comprises a support, a (i) silver halide emulsion containing silver halide grains, said silver halide grains in said silver halide emulsion having an average grain size between 0.25 and 0.5 μm and, at least 80% of said silver halide grains are of a grain size which falls within the range of from 0.6 times said average grain size to 1.4 times said average grain size, and (ii) another hydrophilic colloidal layer coated on the support, at least one layer selected from the group consisting of said silver halide emulsion layer and said another hydrophilic colloidal layer containing at least one substantially non-diffusible compound having oxidizing power on a hydroquinone developing agent and selected from the group consisting of:  
(a) a tetrazolium compound having the following formula:



I



II



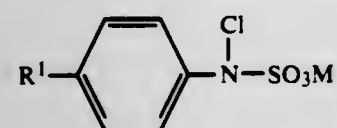
III

wherein R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub> and R<sub>11</sub> individually represent an alkyl group including alkyl and substituted alkyl, an allyl group including allyl and substituted allyl, a phenyl group including phenyl and substituted phenyl, a naphthyl group including naphthyl and substituted naphthyl, a heterocyclic group including heterocyclic and substituted heterocyclic or may be a group forming a metal chelate or complex; R<sub>2</sub>, R<sub>6</sub> and R<sub>7</sub> individually represent an allyl group including allyl and substituted allyl, a phenyl group including phenyl and substituted phenyl, a heterocyclic group including heterocyclic and substituted heterocyclic, an alkyl group including alkyl and substituted alkyl, an amino group including amino and substituted amino, hydroxyl, carboxyl or salt thereof, mercapto, nitro or hydrogen; D represents an arylene group; E represents an alkylene group including alkylene and substituted alkylene, an allylene group including allylene or substituted allylene or an aralkylene group including aralkylene and substituted aralkylene; X<sup>⊖</sup> represents an anionic surface active moiety having at least 9 carbon atoms; n represents an integer 1 or 2 providing that when the compound forms a molecular inner salt, n is 1,

- (b) a triazolium compound having the formula: [T]<sup>⊕</sup>(X<sup>⊖</sup>)<sub>n</sub> wherein [T]<sup>⊕</sup> represents triazolium cation selected from 1-Methyl-2-phenyl-2H-1,2,3-triazolium, 1-n-propyl-2-phenyl-2H-1,2,3-triazolium, 2-(4-Methoxyphenyl)-3-phenyl-2H-naphtho[1,2-d]-1,2,3-triazolium, 1,5-(9,10-anthraquinolyl)-bis-(2-[3-phenyl]-2H-naphtho-[1,2-d]-1,2,3-triazolium) and 2,3-di(4-Methoxyphenyl)-5-nitro-2H-naphtho-[1,2-d]-1,2,3-triazolium, n is 1, and X<sup>⊖</sup> represents an anionic surface active moiety having at least 9 carbon atoms,
- (c) a bipyridinium compound having the formula: [B]<sup>2+</sup>(X<sup>⊖</sup>)<sub>2</sub> wherein [B]<sup>2+</sup> represents a bipyridinium cation selected from 1,1'-Dimethyl-4,4'-bipyridinium, 1,1'-Diethyl-4,4'-bipyridinium and 1,1'-Dibenzyl-4,4'-bipyridinium, and X<sup>⊖</sup> represents an anionic surface active moiety having at least 9 carbon atoms,
- (d) a metal complex compound represented by the general formula: [M'-Z]<sup>n+</sup>(X<sup>⊖</sup>)<sub>n</sub> wherein M' represents a metal, n' is an integer of 2 to 4, Z represents ligands which form metal complex compound, [M'-Z]<sup>n+</sup> being selected from hexaammine cobalt (III), triethylenediamine cobalt (III), bis(diethanolamine) cobalt (III), hexaammine chromium (III), bis(dipropylamine) chromium (III), bis(ethylenediamine) trimethylenediamine cobalt (III) and ethylenediamine tetraacetic acid iron (III), and X<sup>⊖</sup> represents an anionic surface active moiety having at least 9 carbon atoms,
- (e) a non-diffusible inorganic oxidant selected from tetra-



phenylphosphonium bichromate, tetraphenylphosphonium permanganate and tetraphenylarsonium perchromate and (f) an N-chloroarylsulfonamide compound represented by the general formula;



wherein R¹ represents an alkyl group including alkyl and substituted alkyl having 6 to 12 carbon atoms, M represents an alkali metal atom, said substantially non-diffusible compound being a compound which when said photographic material is inserted into an aqueous developing solution will not diffuse from said photographic material in an amount greater than 2%, said at least one layer containing said substantially non-diffusible compound having the following swelling characteristics: when said at least one layer is dried at 23° C. in an atmosphere having a relative humidity of 55% and is then immersed in an aqueous solution having a temperature of 23° C. and the following composition

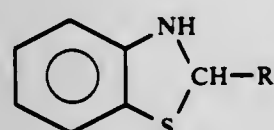
ethylenediaminetetraacetic acid disodium	0.1 g
sodium sulfite	30 g
potassium bromide	2.5 g
sodium carbonate monohydrate	30 g
sodium hydroxide	1 g
water to make a total of	1 l
pH	10.25

it will swell to a thickness which is from 1.2 to 4.5 times the thickness of said at least one layer when dried.

#### 4,416,981 BENZOTHAZOLINE DERIVATIVES AS SILVER HALIDE ANTIFOGGANTS

Joseph D. Overman, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.  
Filed Apr. 29, 1982, Ser. No. 373,280  
Int. Cl.³ G03C 1/34

U.S. Cl. 430—614 4 Claims  
1. A photographic element comprising a support containing a silver halide emulsion coated thereon, characterized in that said emulsion contains an antifogging amount of a benzothiazoline derivative of the formula



wherein R is H, alkyl, aryl, or substituted alkyl or aryl.

#### 4,416,982 COMPOSITION AND METHOD FOR DECOMPOSING HYDROGEN PEROXIDE

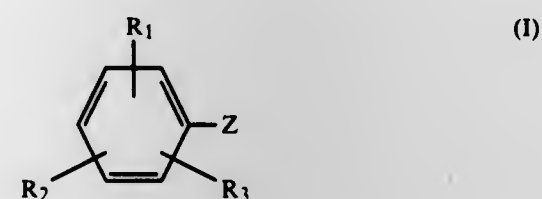
Mitsuru Tsuda, Mishima; Akira Miike; Yoshiaki Shimizu, both of Shizuoka; Yasuharu Yokote, Tokyo, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,603  
Claims priority, application Japan, Nov. 14, 1980, 55-159403  
Int. Cl.³ C12Q 1/60, 1/54, 1/52, 1/44, 1/42, 1/40, 1/26, 1/28, 1/00

U.S. Cl. 435—11 9 Claims  
1. A method for determination of an analyte which can be converted by the action of an enzyme (B) to the compound (A) which can be directly oxidized by the action of an oxidase

capable of oxidizing the compound (A), which comprises the following steps:

- (1) compound (A) in the original sample is oxidized by the action of the oxidase to form hydrogen peroxide;
- (2) the resultant hydrogen peroxide is decomposed by adding peroxidase and a compound represented by the formula (I)



wherein Z represents OH or NR₄R₅ wherein R₄ and R₅ are the same or different and represent hydrogen atom, alkyl, substituted alkyl or acyl, and R₁, R₂ and R₃ are the same or different and represent hydrogen atom, halogen atom, alkyl, alkoxy, amino, nitro, carboxyl or sulfonyl;  
(3) the analyte is converted to compound (A) by the action of enzyme (B);  
(4) the resultant compound (A) is oxidized by the action of the oxidase to form hydrogen peroxide; and  
(5) the resultant hydrogen peroxide is determined by a known method.

4,416,983  
DETERMINATION OF NAD(P)H OR SALICYLATE  
Albert Röder, Seeshaupt; Joachim Siedel, Bernried; Hans Möllering, Tutzing; Hans Seidel, Tutzing, and Helmgard Gauhl, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,312  
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046741  
Int. Cl.³ C12Q 1/26, 1/32, 1/38, 1/40, 1/14, 1/54, 1/56, 9/02

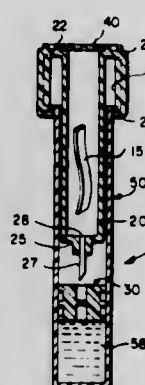
U.S. Cl. 435—25 8 Claims  
1. Method for the determination of NAD(P)H or of salicylate comprising:  
(a) decarboxylating salicylate by use of salicylate hydroxylase in a NAD(P)H dependent reaction in the presence of tyrosinase and of an appropriate chromogenic component selected from the group consisting of hydrazones and amines to form a colored material by oxidative coupling of the decarboxylation product with the said chromogenic component; and  
(b) determining the colored material formed photometrically.

4,416,984  
STERILIZATION INDICATOR  
Robert P. Wheeler, Jr., Keene, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Filed May 22, 1981, Ser. No. 266,184  
Int. Cl.³ C12Q 1/22; C12M 1/00, 1/24, 1/18  
U.S. Cl. 435—31 13 Claims

1. A sterilization indicator comprising:  
a first compartment having at least one open end;  
a gas-permeable, bacteria-impermeable closure covering said open end;  
said first compartment containing a number of viable microorganisms;  
a second compartment, said first and second compartments being moveable with respect to each other;  
said second compartment having a predetermined quantity of nutrient medium for promoting the growth of said microorganisms;  
separation means separating the nutrient medium in said second compartment from said microorganisms in said

first compartment until it is desired to contact said microorganisms with said nutrient medium;  
communication means for providing communication between said first compartment and said second compartment by penetrating said separating means when it is desired to contact said microorganisms with said nutrient medium;

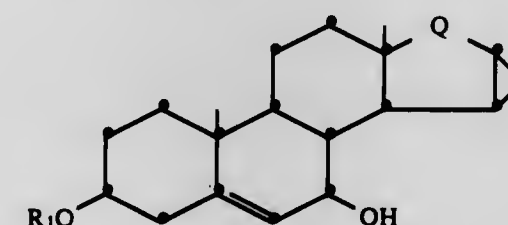


activation means for activating said communication means by relative movement between said first and second compartments to provide communication between said first compartment and said second compartment without breaking said second compartment by engaging and penetrating said separation means; and  
a detector composition contained in one of said compartments that is capable of undergoing a detectable change in response to the growth of said microorganisms.

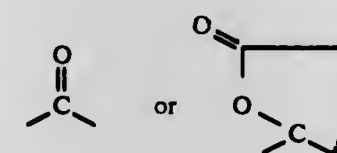
4,416,985  
PROCESS FOR PREPARING  
3β,7β-DIHYDROXY-Δ⁵-STEROIDS  
Karl Petzoldt; Rudolf Wiechert; Henry Laurent; Klaus Nickisch, and Dieter Bittler, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,822  
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3042136

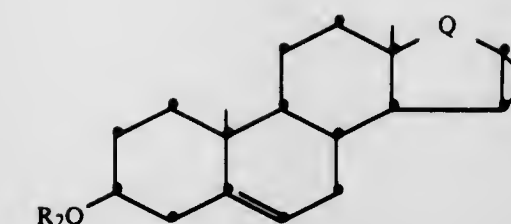
Int. Cl.³ C12P 33/06; C07J 7/00  
U.S. Cl. 435—58 5 Claims  
1. A process for preparing a 3β,7β-hydroxy-Δ⁵-steroid of the formula



wherein  
Q is



and  
R¹ is hydrogen, comprising fermenting a 3β-hydroxy-Δ⁵-steroid of the formula



wherein  
Q is as defined above, and  
R² is hydrogen or alkanoyl of 2-6 carbon atoms, with a culture of *Botryodiplodia malorum* to obtain the corresponding 3β,7β-dihydroxy-Δ⁵-steroid; and, isolating the 3β,7β-dihydroxy-Δ⁵-steroid.

4,416,986  
METHODS OF PRODUCING HBSAG  
Henry Z. Markus, Wyncote, and William J. McAleer, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.  
Filed Jan. 16, 1981, Ser. No. 225,555

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.  
Int. Cl.³ C12N 5/00, 5/02; C12P 21/00

U.S. Cl. 435—68 7 Claims  
1. A method for preparing hepatitis B surface antigen which comprises growing cells which shed hepatitis B surface antigen in the presence of a nutrient medium on hollow fiber capillary units having a molecular weight cut-off of about 10,000.

4,416,987  
METHOD OF SYNTHESIZING PROTEINS FROM  
METHANOL  
Bruno Cabane, Saint Cloud, and Pierre Galzy, Montpellier, both of France, assignors to PCUK - Produits Chimiques Ugine Kuhlmann, Courbevoie, France  
Continuation of Ser. No. 859,873, Dec. 12, 1977, abandoned.  
This application Nov. 18, 1981, Ser. No. 322,566  
Claims priority, application France, Dec. 14, 1976, 76 37604; May 27, 1977, 77 16283

Int. Cl.³ C12N 15/00 5 Claims  
U.S. Cl. 435—68  
1. A method for synthesizing proteins from methanol which comprises  
(a) culturing a *Pseudomonas stutzeri*, *Pseudomonas aeruginosa methylotrophus*, or a *Micrococcus varians methylotrophus* micro-organism on a medium containing methanol as the sole carbon source and glycine at a sufficient temperature, and pH, to produce glycine resistant methylotrophic mutant strains,  
(b) recovering said mutant strains, and  
(c) culturing said mutant strains at a sufficient temperature and pH to produce proteins.

4,416,988  
DETECTION AND ISOLATION OF ENKEPHALIN MRNA  
USING A SYNTHETIC OLIGODEOXYNUCLEOTIDE  
Harvey Rubin, 2560 First Ave., San Diego, Calif. 92103  
Division of Ser. No. 219,435, Dec. 23, 1980, Pat. No. 4,358,586.  
This application Sep. 17, 1982, Ser. No. 389,564  
Int. Cl.³ C12P 19/34; C07H 21/04

U.S. Cl. 435—91 4 Claims  
1. The method of isolating endorphin mRNA:cDNA from pancreas, brain, adrenal and pituitary tissue which comprises the steps of:  
extracting total RNA from brain, adrenal, pancreas or pituitary tissue;  
isolating A+ RNA from said total RNA;  
hybridizing under suitable conditions and temperatures said A+ RNA with a 15 base oligodeoxynucleotide CATx-AAyCCyCCGTA, wherein "A" represents adenine, "T"



represents thymine, "G" represents guanine, "C" represents cytosine, "x" represents guanine or adenine and "y" represents guanine, thymine, cytosine or adenine; copying the hybridized endorphin mRNA into complementary DNA; and isolating said complementary DNA, whereby substantially only endorphin mRNA:cDNA remains, substantially all other RNA fractions having been removed.

4,416,989

# METHOD OF CONTINUOUS TREATMENT OF GRAIN MASH FOR PRODUCING ETHANOL

Rolf H. Kretz, Singen, Fed. Rep. of Germany, assignor to Process Engineering Company S.A., Maennedorf, Switzerland  
Filed Nov. 16, 1981, Ser. No. 321,897

Claims priority, application Switzerland, Nov. 25, 1980, 8684/80

Int. Cl.<sup>3</sup> C12C 7/04; C12P 7/06

U.S. Cl. 435—93

10 Claims

1. A method of producing grain mash for producing ethanol, comprising the steps of comminuting a starch-containing raw material in a comminuting device with sieve openings of about 1-3 mm diameter to produce particles of the starch-containing raw material, enzymatic liquefying the starch-containing particles of raw material in a liquefying container in the form of a sedimentation container, continuously separating non-decomposed coarser ones of the particles of raw material in the container, continuously withdrawing the separated coarser particles of raw material from the container, continuously comminuting the withdrawn coarse particles in a wet comminuting device to a substantially smaller particle size, and continuously recirculating the smaller particles of raw material from the wet comminuting device into the liquefying container.

4,416,990

# ENZYMATIC CLARIFICATION PROCESS FOR IMPROVING THE INJECTIVITY AND FILTRABILITY OF XANTHAN GUMS

Marguerite Rinaudo, Grenoble; Michel Milas, Eybens, and Norbert Kohler, Le Chesnay, all of France, assignors to Institut Francais du Pétrole, Rueil-Malmaison, France  
Filed Oct. 6, 1981, Ser. No. 309,147

Claims priority, application France, Oct. 6, 1980, 80 21395

Int. Cl.<sup>3</sup> C12P 19/06; C13L 3/00; C12R 1/645

U.S. Cl. 435—104

14 Claims

1. A process for enzymatically purifying, an impure xanthan gum containing, as impurities, at least one of bacterial cell residues or microgels, which comprises contacting an aqueous dispersion of said impure xanthan gum with a polysaccharase enzyme preparation of Basidiomycetes Polyporaceae cellulose, said aqueous dispersion having a pH from 3 to 7 and a total concentration of alkali and/or alkaline-earth metal salts dissolved therein of at least 10<sup>-1</sup> equivalent/liter; wherein said contacting is effected at a temperature sufficient to allow the removal of said cell residues and microgels without substantially hydrolysing the xanthan gum; whereby the viscosity of said aqueous dispersion is not substantially decreased.

4,416,991

# METHOD FOR ENZYMATIC TRANSESTERIFICATION OF LIPID AND ENZYME USED THEREIN

Takaharu Matsuo; Norio Sawamura, both of Sennan; Yukio Hashimoto, Kishiwada, and Wataru Hashida, Osaka, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan  
Filed Mar. 9, 1981, Ser. No. 241,845

Claims priority, application Japan, Mar. 8, 1980, 55-29707; Mar. 8, 1980, 55-29708

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C12P 7/64; A23D 5/00

U.S. Cl. 435—134

13 Claims

1. A method for the enzymatic transesterification of a lipid which comprises continuously or repeatedly contacting an

enzyme or an enzyme preparation having transesterification activities with a fresh supply of a dried fatty ester substrate while maintaining the total amount of water in the reaction system at or below the solubility limit of water in the fatty acid ester used.

4,416,992

# SUPPORT MATRICES AND IMMOBILIZED ENZYME SYSTEMS

Blaise J. Arena, Des Plaines, and Ronald P. Rohrbach, Forest Lake, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 26, 1982, Ser. No. 362,206

Int. Cl.<sup>3</sup> C12N 11/14, 11/08, 11/06

U.S. Cl. 435—176

34 Claims

1. A method of preparing a support matrix comprising contacting a porous, refractory inorganic oxide selected from the group consisting of alumina, silica, titania, thoria, and combinations thereof, with titanium tetrahalide in the absence of a solvent for the titanium tetrahalide so as to produce a surface titanated inorganic oxide, removing excess and unreacted titanium tetrahalide, heating the titanated inorganic oxide at a temperature from about 80° to about 200° C. in an inert atmosphere of nitrogen, argon, helium, or in a vacuum, for a time sufficient to volatilize any remaining unreacted titanium tetrahalide, contacting the resulting material with a diamine, selected from the group of alkylene diamines containing from 2 to about 10 carbon atoms and phenylene diamine, or a polyamine of formula H<sub>2</sub>N(CH<sub>2</sub>CH<sub>2</sub>NH)<sub>x</sub>H, where x is an integer from 2 to about 2300, removing excess amine, treating the resulting material with an excess of a bifunctional reagent selected from the group consisting of phthalaldehyde, toluene diisocyanate, and X(CH<sub>2</sub>)<sub>p</sub>X, where X is an aldehyde, CHO, or isocyanate, NCO, functional group and p is an integer from 2 to about 8, removing the excess and unreacted bifunctional reagent, and recovering the resulting support matrix.

4,416,993

# APPARATUS WITH SEMI-PERMEABLE MEMBRANE, AND METHOD FOR CULTIVATING MICRO-ORGANISMS

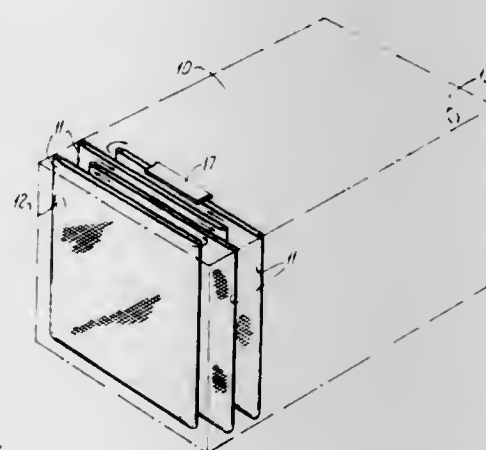
John B. McKeown, Bothwell, Scotland, assignor to McLeod & Miller (Engineers) Limited, Glasgow, Scotland

Filed Jun. 11, 1981, Ser. No. 272,547

Int. Cl.<sup>3</sup> C12N 1/00

U.S. Cl. 435—243

9 Claims



1. Apparatus for cultivation of micro-organisms comprising a first vessel capable of holding liquid a second vessel having semi-permeable walls which permit the passage of gas but not liquid, extending into the first vessel and providing therein an outwardly facing surface upon which a micro-organism can be cultivated, and means for delivering gas into the second vessel such that the gas can pass through the semi-permeable walls into the first vessel.

4,416,994

# PLASMID pEL7 AND RELATED CLONING VECTORS FOR USE IN STREPTOMYCES AND RELATED ORGANISMS

Walter M. Nakatsukasa; Jeffrey T. Fayerman, and James A. Mabe, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

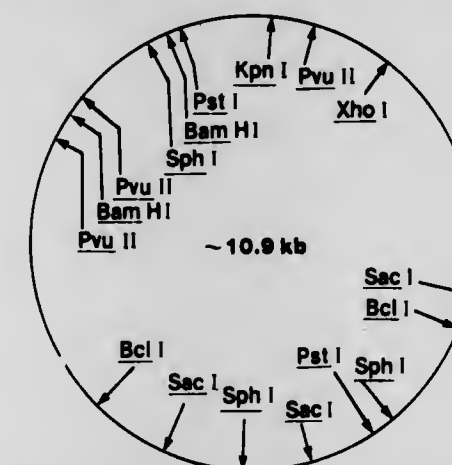
Filed Oct. 19, 1981, Ser. No. 312,446

Int. Cl.<sup>3</sup> C12N 1/20, 15/00, 1/00; C12P 21/00, 21/02; C12R 1/465

U.S. Cl. 435—253

70 Claims

## Restriction Site and Functional Map of Plasmid pEL7



1. A novel pair of recombinant DNA cloning vectors, said pair comprising:

- (a) novel plasmid pEL7, and
- (b) a second plasmid that is functionally dependent upon plasmid pEL7, said second plasmid comprising a restriction fragment of plasmid pEL7 and one or more different DNA segments that convey resistance to at least one antibiotic when transformed into a sensitive host cell, said host cell being susceptible to transformation, cell division, and culture.

33. A transformed restrictionless host cell selected from the group consisting of restrictionless cells of *Streptomyces*, *Streptopogon*, *Actinoplanes*, *Nocardia*, *Micromonospora*, *Bacillus*, and *Staphylococcus* comprising a pair of recombinant DNA cloning vectors of claim 1.

4,416,995

# METHOD AND APPARATUS FOR DETERMINING BACTERIAL SENSITIVITY

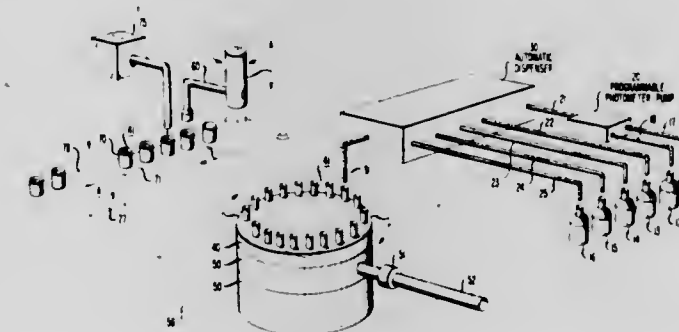
Leonard Amaral, Pound Ridge, N.Y., assignor to Bronx-Lebanon Hospital Center, Bronx, N.Y.

Filed Sep. 10, 1981, Ser. No. 300,943

Int. Cl.<sup>3</sup> C12M 1/34, 1/12; C12Q 1/18, 1/16

U.S. Cl. 435—291

16 Claims



1. A system for determining the activity of a select chemical upon a bacterial sample containing bacteria in a bacterial growth medium and the select chemical, the system comprising:

dispensing means for adding radioactively-labelled thymidine or thymidine analog to the bacterial sample; incubating means for maintaining a desired incubation environment for the bacterial sample before and after addition of radioactively-labelled thymidine or thymidine analog to the bacterial sample; separator means for separating said bacteria from said bacterial growth medium, said select chemical, and a portion of said radioactively-labelled thymidine or thymidine analog after incubation; and radioactivity measuring means for measuring radioactive radiation emanating from said separated bacteria.

4,416,996

# HYDROGEN BLISTERING CORROSIVITY METERING MEANS AND METHOD

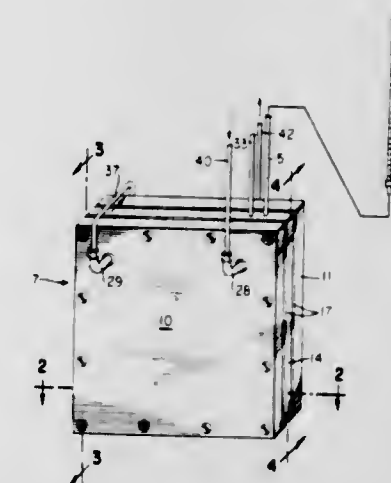
Byron von Klock, and Dinh-Cuong Vuong, both of Beaumont, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,720

Int. Cl.<sup>3</sup> G01N 17/00

U.S. Cl. 436—6

24 Claims



1. A method of monitoring hydrogen blistering corrosivity comprising

containing a predetermined volume of measuring liquid in a container having at least one steel membrane as a side, contacting a liquid to be tested with the steel membrane in a manner so that hydrogen atoms formed by the corrosive activity of the test liquid with the steel membrane passes through the steel membrane to the measuring liquid, and measuring a change in the volume of the measuring liquid resulting from the corrosive activity of the test liquid with the steel membrane.

4,416,997

# PYRIDINE-FREE KARL FISCHER REAGENT USEFUL IN DETERMINING WATER

Wolfgang Fischer, Darmstadt, and Karl-Dieter Krenn, Pfungstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 333,100

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048237

Int. Cl.<sup>3</sup> G01N 31/16, 27/42, 33/18; C09K 3/00

U.S. Cl. 436—42

12 Claims

1. An essentially pyridine-free Karl Fischer reagent useful in the determination of water, comprising a dissolving agent containing sulfur dioxide and a pyridine substitute in a Karl Fischer solvent, and a titrating agent containing iodine in a Karl Fischer solvent, wherein the pyridine substitute is an alkali or alkaline earth metal benzoate or ammonia, and the reagent is essentially free of pyridine.



4,416,998

**SILVER STAIN PROCEDURE AND KIT FOR SAME**

Lonnie D. Adams, Gobles, and David W. Sammons, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 250,512, Apr. 2, 1981, abandoned. This application Mar. 17, 1982, Ser. No. 359,339  
Int. Cl.<sup>3</sup> G01N 33/68

U.S. Cl. 436—86

13 Claims

1. A method for staining a substance which is capable of binding silver which is supported in a matrix which comprises the steps of treating said substance with a 2.5–25% glutaraldehyde solution, washing said substance with water, equilibrating said substance in an aqueous silver salt solution, subjecting said substance to a reducing solution, and immersing said substance in multiple and sequential aqueous carbonate or sulfate salt solutions.

4,416,999

**REFRACTORY POWDER FLAME PROJECTION MOLDINGS**

Fukuoka Hiromi, Fukuokaken; Masataka Matsuo, Nakamashi; Kazuo Hamai, Kitakyusyu; Tokuaki Hatta, Kitakyusyu, and Mituo Sugawara, Kitakyusyu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Kurosaki Yogyo Co., Ltd., Fukuokaken, both of Japan

Filed Aug. 5, 1981, Ser. No. 290,202  
Int. Cl.<sup>3</sup> C04B 35/02, 35/58

U.S. Cl. 501—94

7 Claims

1. A refractory powder flame projection molding comprising nonfused refractory particles having a particle size of 0.2 to 10 mm dispersed and embedded in the solidified structure of a fused refractory material formed by the flame projection of a refractory material having a particle size less than 0.2 mm.

4,417,000

**DIMETHYL ETHER PROCESS**

Lynn H. Slaugh, Cypress, and Robert C. Ryan, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 4, 1982, Ser. No. 405,112  
Int. Cl.<sup>3</sup> C07C 27/06, 41/01

U.S. Cl. 518—713

5 Claims

1. A process for the production of dimethyl ether in high yield from carbon monoxide and hydrogen which comprises contacting said carbon monoxide and hydrogen at a temperature between about 250° C. and about 350° C. and a pressure between about 30 to about 300 atmospheres with a catalyst comprising a physical mixture of two components; a first component comprising an alkali metal oxide promoted copper-zinc catalyst supported on an alumina carrier and a second component comprising tungsten oxide supported on a carrier selected from silica-alumina, silica or alumina wherein said first component comprises from about 25 to about 75 percent by volume of the total catalyst volume.

4,417,001

**LOW SMOKE ISOCYANURATE MODIFIED URETHANE FOAM AND METHOD OF MAKING SAME**

Glenn R. Svoboda, Grafton; William L. Carlstrom, and Richard T. Stoehr, both of West Bend, all of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Sep. 20, 1982, Ser. No. 419,748  
Int. Cl.<sup>3</sup> C08J 9/02

U.S. Cl. 521—114

12 Claims

1. An isocyanurate modified urethane foam formed by reacting an organic isocyanate and an organic polyol in the presence of a halogenated blowing agent, the —NCO/OH index of said reactants being between 1.3 and 3.0 and wherein as a catalyst for said reaction is employed one or more catalysts capable of causing the reaction of isocyanate and hydroxyl radicals to form a polyurethane and of causing a trimerization reaction of the excess isocyanate radicals to produce the isocyanurate modification of said urethane foam and wherein from

about 5%–100% of the polyol employed in said foam reaction consists of a digestion product obtained by digesting polyalkylene terephthalate in a reactive solvent selected from the class consisting of organic diols and triols having an average molecular weight of from 62–500.

4,417,002

**FOAM MANUFACTURE**

Bernhard Liessem, Eupen, Belgium, assignor to Kabel-und-Gummiwerke AG, Eupen, Belgium

Filed Jul. 7, 1982, Ser. No. 396,124

Claims priority, application United Kingdom, Jul. 9, 1981, 8121185; Aug. 22, 1981, 8125721

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—128

10 Claims

1. A method of manufacturing foam material in which such material is formed in the presence of a blowing agent, characterized in that the blowing agent comprises at least one substance, selected from formic acid and salts of formic acid, which is reacted with an isocyanate to liberate gas.

4,417,003

**FOAMABLE POLYMERIC STYRENE PARTICLES**

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 423,487, Sep. 24, 1982, Pat. No. 4,388,418. This application Apr. 8, 1983, Ser. No. 483,407

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C08J 9/20

U.S. Cl. 521—56

6 Claims

1. An expandable polymeric styrene particle having incorporated therein from about 0.1% to about 0.5% by weight of bis (allyl ether) of tetrabromobisphenol A and from about 0.5% to about 2.5% by weight of dibromoethylidibromocyclohexane, all percentages being based upon the weight of the polymeric styrene.

4,417,004

**PHENOL FORMALDEHYDE FOAMS**

Krishan K. Sudan, Laval, and Antoine Berchem, St. Hippolyte, both of Canada, assignors to Reichhold Limited, Islington, Canada

Continuation-in-part of Ser. No. 919,972, Jun. 28, 1978, Pat. No. 4,219,623. This application Dec. 5, 1979, Ser. No. 100,378

The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C08G 8/00, 14/04; C08J 9/04; C08G 65/38

U.S. Cl. 521—181

14 Claims

1. A two container pack for providing, on mixing of the two parts of the pack, a phenol-formaldehyde resin foam, which two part pack comprises:

in a first part, in stable combination, a phenolic resin, a blowing agent which is an inert low boiling liquid, an effective amount of a nitrogenous modifier capable of permitting dispersion of the blowing agent in the resin, and a surfactant; and

in a second container in stable combination an acid catalyst composition dispersed in a polyhydroxy compound, in a weight ratio of acid catalyst to polyhydroxy compound of at least 1:1.

4,417,005

**RUBBER COMPOSITIONS FOR TIRE TREADS**

Akinori Tokieda, Chigasaki, and Sumio Takasugi, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,558

Claims priority, application Japan, Feb. 13, 1981, 56-18904; May 29, 1981, 56-80722

Int. Cl.<sup>3</sup> C08J 3/18, 3/20; C08K 3/04; C08L 9/06

U.S. Cl. 523—351

4 Claims

1. A rubber composition for tire treads which comprises:  
(I) 20–80 parts by weight, calculated as the rubber ingredient, of an extender oil-extended styrene-butadiene copolymer rubber having a Mooney viscosity (ML<sub>1+4</sub>, 100° C.) of at least 53 prepared by extending a styrene-butadiene copolymer rubber having a styrene content of at least 20% by weight and up to 20% of 1,2-butadiene bonding units with an aromatic oil having a V.G.C. of 0.900–0.999 as the extender oil,  
(II) 80–20 parts by weight of at least one other diene rubber, the extender oil-free styrene-butadiene copolymer rubber and the at least one other diene rubber totalling 100 parts by weight, and  
(III) 40–70 parts of carbon black having an I<sub>2</sub> adsorption of 60–130 mgI<sub>2</sub>/g and a DBP absorption of up to 130 ml/100 g.

4,417,007

**ZINC RICH PAINT FORMULATIONS EMPLOYING MANGANOMANGANIC OXIDE FUME PIGMENT**

George A. Salensky, Whitehouse Station, N.J.; Kuldip S. Chopra, Grand Island, and Nicholas J. Pappas, Somers, both of N.Y., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 278,967, Jun. 30, 1981, abandoned. This application May 26, 1982, Ser. No. 381,790

Int. Cl.<sup>3</sup> C08K 3/22; C09D 3/58, 5/08

U.S. Cl. 523—442

11 Claims

1. A paint formulation comprising: from about 4 to 25% by weight of a resin binder comprising an epoxy resin compound derived from bisphenol A and epichlorhydrin which are hardened with polyamines selected from the group consisting of polyaminoamides, diethylene triamine, triethylene tetramine and coal tar amines; from about 43 to 90% by weight zinc dust; from about 3 to 38% by weight Mn<sub>2</sub>O<sub>4</sub> fume pigment; from 0 to about 35% by weight of additional pigments including pigment extenders and fillers; from 0 to 5% by weight of a pigment suspension agent; and the balance being a solvent in an amount required for proper application viscosity.

4,417,008

**IMPROVED COLOR PIGMENT FOR SOLVENT-BASE PAINT FORMULATIONS**

George A. Salensky, Whitehouse Station, N.J.; Kuldip S. Chopra, Grand Island, and Nicholas J. Pappas, Somers, both of N.Y., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 279,097, Jun. 30, 1981, abandoned. This application May 26, 1982, Ser. No. 381,791

Int. Cl.<sup>3</sup> C08K 3/22; C09D 3/58, 5/08

U.S. Cl. 523—442

6 Claims

1. A solvent base paint formulation comprising: from about 10 to 30% by weight of a resin binder comprising an epoxy resin compound derived from bisphenol A and epichlorhydrin which are hardened with polyamines selected from the group consisting of polyaminoamides, diethylene triamine, triethylene tetramine and coal tar amines; from about 20 to 35% by weight Mn<sub>2</sub>O<sub>4</sub> fume pigment; from about 2 to 25% by weight of additional pigments including pigment extenders, fillers and corrosion inhibitors; from about 0 to 1.5% by weight of a pigment suspension agent; and from about 30 to 90% by weight of a solvent.

4,417,006

**ORGANOPOLYSILOXANE COATING COMPOSITIONS**

Frank D. Graziano, Lake Bluff, and Edmund J. Kuziemka, Naperville, both of Ill., assignors to Material Sciences Corporation, Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 271,219, Jun. 8, 1981. This application Sep. 29, 1982, Ser. No. 427,508

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 5/15

U.S. Cl. 523—435

6 Claims

1. A fast-curing resin coating composition comprising:  
(i) 10–25 parts of an epoxy resin of molecular weight 50,000 to 200,000,  
(ii) 1–3 parts of an etherified resol phenolic resin,  
(iii) 1–3 parts of a silicone fluid comprised of methylphenylsiloxanes, dimethylsiloxanes and diphenyldimethylsiloxanes,  
(iv) 12–20 parts of an organopolysiloxane release resin prepared by  
(a) agitating a mixture comprising (A) an organohalosilane blend consisting essentially of about 60 mole percent methyltrichlorosilane, about 35 mole percent phenyltrichlorosilane, and about 5 mole percent dimethyldichlorosilane, (B) water, (C) acetone, and (D) a water-immiscible organic solvent, wherein there is present by weight in said mixture per part by weight of (A), about 1.7 to about 10 parts of (B), about 0.2 to about 5 parts of (C), and about 0.3 to about 5 parts of (D); and  
(b) separating the organic solvent solution of (F) from the resulting hydrolysis mixture of a step (i), wherein (F) is a silanol-containing organopolysiloxane resin having an average ratio of about 1.05 organic radicals per silicon atom,  
(vi) a catalytic amount of an zinc-iron organometallic curing agent, in a  
(vii) suitable solvent, all of the parts being parts by weight.

4,417,009

**PYROPHOSPHATO TITANATE ADDUCTS**

Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

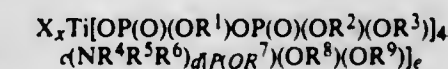
Division of Ser. No. 224,055, Jan. 12, 1981, Pat. No. 4,338,220, which is a division of Ser. No. 70,907, Aug. 29, 1979, Pat. No. 4,277,415. This application Mar. 26, 1982, Ser. No. 362,091

Int. Cl.<sup>3</sup> C08K 9/00

U.S. Cl. 523—451

6 Claims

1. A composition comprising an inorganic solid, a polymeric material and a titanate having the following formula



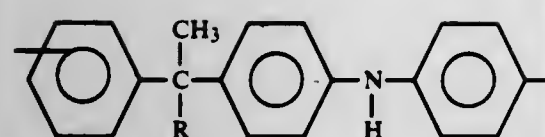
wherein c is 1 or 2; d is 0, 1 or 2; e is 0, 1 or 2; with the proviso that d plus e must be 1 or 2; with the proviso that if c is 1, X must be RO—; and with the proviso that when c is 2, X is either RO— or a group which taken together with the Ti to which it is attached forms a ring having the formula



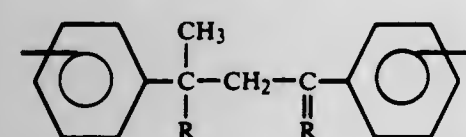




-continued

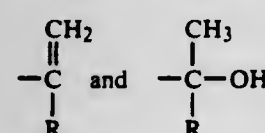


(VI)



(VII)

wherein Y is para or meta relative to Z, Y and Z are the same or different radicals selected from the group consisting of



and R is an alkyl radical of from 1 to 8 carbon atoms; said polymeric diphenylamine compound having a molecular weight between 425 to about 200,000.

4,417,018

## FLAME-RETARDANT RESIN COMPOSITION

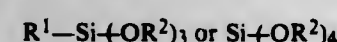
Yoshinari Ogawa; Noriyuki Akagi, both of Sagami; Kenji Ikeda, Tokyo, and Yoichi Nakamura, Hino, all of Japan, assignors to Teijin Limited, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,231

Claims priority, application Japan, May 25, 1981, 56-78014; Mar. 15, 1982, 57-39364

Int. Cl.<sup>3</sup> C08K 5/54

U.S. Cl. 524-261 10 Claims  
1. A flame-retardant resin composition comprising (A) a polymer resin comprised of a thermoplastic polyester and 0 to 100 parts by weight of a thermoplastic polycarbonate per 100 parts by weight of the thermoplastic polyester; and per 100 parts by weight of the polymer resin, (B) 0.1 to 30 parts by weight, as the weight of the halogen element, of an organic halogen compound, (C) 0.1 to 20 parts by weight, as the weight of the antimony element, of antimony trioxide surface modified with an alkoxysilane compound of the general formula,



wherein R<sup>1</sup> is a methyl or phenyl group, and R<sup>2</sup> is an aliphatic hydrocarbon group with 1 to 15 carbon atoms, and (D) up to 30 parts by weight of a carboxylic acid ester composition.

4,417,019

## POLYOLEFIN MOLDING COMPOSITION CONTAINING CARBOXYLIC ACID-MODIFIED POLYOLEFIN, GLASS FIBERS AND CALCIUM-SILICATE USEFUL FOR WELDING

Noboru Yamamoto, Tokyo; Keiichi Morikubo, Ooi; Masato Komatsu, Hannou, and Kazuo Sei, Yokohama, all of Japan, assignors to TOA Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,495

Claims priority, application Japan, Jul. 9, 1981, 56-139806  
Int. Cl.<sup>3</sup> C08L 23/26; C08K 7/10, 3/40, 7/14

U.S. Cl. 524-456 14 Claims

1. A molding composition comprising:  
(a) at least 50 wt.% of a polymer or copolymer of an alpha-olefin having from 2 to 4 carbon atoms, said polymer or copolymer being modified with an unsaturated carboxylic acid or derivative thereof;  
(b) between about 1 wt% and about 30 wt% of glass fiber; and  
(c) between about 5 wt% and about 40 wt% of fibrous

calcium silicate; the concentration of said glass fibers and fibrous calcium silicate in the modified polyolefin being sufficient to substantially improve the weld tensile strength of the composition when molded.

4,417,020

## PIPE COMPOSITIONS CONTAINING ANISOTROPIC MELT-FORMING POLYMERS

Derrick S. Bailey, Welwyn, and Brian P. Griffin, St. Albans, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 3, 1981, Ser. No. 317,854

Claims priority, application United Kingdom, Nov. 7, 1980, 8035800

Int. Cl.<sup>3</sup> C08L 27/18, 61/00, 67/04

U.S. Cl. 524-502 9 Claims

1. A composition formed from a blend of a polymer of PTFE and a polymer capable of exhibiting an anisotropic melt characterized in that the composition contains between 20 and 99.5% by weight of PTFE and 0.5 to 80% by weight of the polymer capable of forming an anisotropic melt.

4,417,021

## POLYESTER COMPOSITION AND PRODUCTION THEREOF

Katuyuki Nakamura, Nobeoka, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

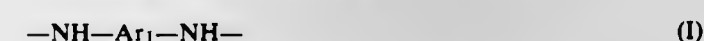
Filed Apr. 8, 1981, Ser. No. 252,500

Claims priority, application Japan, Apr. 8, 1980, 55-45954; Nov. 22, 1980, 55-164776; Nov. 22, 1980, 55-164777

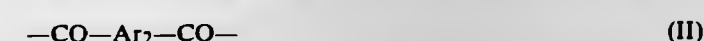
Int. Cl.<sup>3</sup> C08L 67/02

U.S. Cl. 524-538 29 Claims

1. A polyester composition comprising:  
(A) 100 parts by weight of a polyester comprising mainly polyethylene terephthalate and having a reduced specific viscosity ( $\eta_{sp}/c$ ) of at least 0.3; and  
(B) from 0.05 to 10 parts by weight of at least one polyamide compound having a melting point of at least 300° C. selected from (i) and (ii):  
(i) at least one polyamide compound selected from polyamidohydrazides having a structure such that organic groups are linked to each other through amido bonds and hydrazido bonds, polyhydrazides having a structure such that organic groups are linked to each other through hydrazido bonds, and polyamides having a structure such that organic groups are linked to each other through amido bonds wherein organic groups other than aromatic groups are contained therein at least in part; and  
(ii) at least one polyamide compound containing an aromatic polyamido moiety comprising at least one of (I) a diamine group represented by the formula (I)



wherein Ar<sub>1</sub> represents a divalent aromatic group;  
(2) a dicarboxylic acid group represented by the formula (II)



wherein Ar<sub>2</sub> represents a divalent aromatic group; and  
(3) an aminocarboxylic acid group represented by the formula (III)



wherein Ar<sub>3</sub> represents a divalent aromatic group; linked to each other through amido bonds, and wherein said aromatic polyamido moiety is bound to a polymer other than an aromatic polyamido moiety,

wherein said component (B) is uniformly dispersed in said component (A) in a substantial size of 50  $\mu\text{m}$  or less, and a half width of an exothermic peak of the polyester composition

measured in a crystallization temperature range by a differential scanning calorimeter at a cooling rate of 10° C./min. is 15° C. or less per 8 mg of said component (A).

4,417,022

## COATING COMPOSITIONS BASED ON POLYOL-CONTAINING FILM FORMING COMPONENTS AND ORGANIC ALCOHOLIC REACTIVE DILUENTS

Wen-Hsuan Chang; James B. O'Dwyer, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

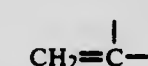
Division of Ser. No. 101,397, Dec. 7, 1979, Pat. No. 4,343,925.  
This application Apr. 2, 1982, Ser. No. 364,825

Int. Cl.<sup>3</sup> C08L 61/22

U.S. Cl. 524-598 17 Claims

1. A coating composition capable of liquid application to a substrate, the vehicle portion of the composition consisting essentially of:

(a) from about 60 percent to about 97 percent of a polyol-containing curable film forming component having a hydroxyl equivalent weight of from about 40 to about 500 and a hydroxyl functionality of at least 2.0, said component being an interpolymer of an unsaturated carboxylic acid amide with at least one other monomer having a



group and characterized in having amido hydrogen atoms replaced by  $\text{---RCHOR}_1$  wherein R is hydrogen or a saturated lower aliphatic hydrocarbon radical and R<sub>1</sub> is hydrogen or a lower alkyl radical; and

(b) from about 3 percent to about 40 percent of an organic reactive diluent capable of chemically combining with the curable film forming component, said reactive diluent having one primary or secondary hydroxyl group and selected from the group consisting of ethers having less than 5 ether groups, amides, esters, urethanes, ureas, sulfur-containing compounds and mixtures thereof, said amides being selected from the group consisting of a product of the reaction of a monoamine with a lactone, a product of the reaction of an alkanolamine with a monocarboxylic acid or its ester, a product of the reaction of a monoamine with a dicarboxylic anhydride followed by reaction with a monoepoxide, and a product of the reaction of an alkanolamine with a dicarboxylic anhydride, and further characterized by having a retained solids value of greater than about 80 percent, a hydroxyl equivalent weight of from about 180 to about 800 and a liquid viscosity of less than about 10 poises at 60° C.

4,417,023

## POLYSILOXANE STABILIZERS FOR FLATTING AGENTS IN RADIATION HARDENABLE COMPOSITIONS

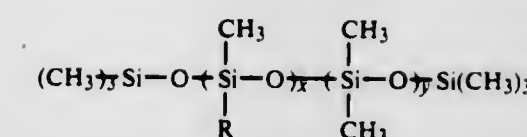
Joseph V. Sinka, Mendham, and Robert A. Lieberman, Hopatcong, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 341,301, Jan. 21, 1982, abandoned. This application Feb. 10, 1982, Ser. No. 347,512

Int. Cl.<sup>3</sup> C08F 2/48

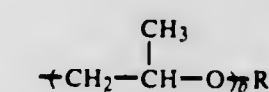
U.S. Cl. 524-731 2 Claims

1. In a radiation hardenable composition containing at least one radiation-hardenable oligomer and at least one flattening agent, at least one stabilizer present in an amount sufficient to reduce settling of said flattening agent, said stabilizer being alkyl-ene oxide adducts of siloxane copolymers having the following structure:



where x is about 3, y is about 11, the siloxane backbone has a molecular weight of about 1,000 and constitutes about 20% by weight of the total molecule,

R is  $\text{---CH}_2\text{---CH}_2\text{---O---CH}_2\text{CH}_2\text{---O---}$



where a and b are present in a ratio of about 1:1, R has a molecular weight of about 1200 and R' is H.

4,417,024

## FLUOROSILOXANE-CONTAINING COMPOSITIONS FOR THE TREATMENT OF FIBERS

Yoshinobu Koda, Chiba; Isao Ona, Sodegaura, and Atsushi Takeda, Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,677

Int. Cl.<sup>3</sup> C08L 83/04

U.S. Cl. 524-861 5 Claims

1. A composition for the treatment of fibers, said composition being obtained by mixing components comprising

(A) a siloxane component comprising  
(a) a substantially linear organohydrogenpolysiloxane which has at least 5 mol percent of  $\text{RQSiO}_{2/2}$  units and at least three silicon-atom-bound hydrogen atoms per molecule, wherein R denotes an unsubstituted monovalent hydrocarbon radical having from 1 to 6 carbon atoms and Q denotes a fluorinated monovalent hydrocarbon radical, or  
(b) a mixture comprising  
(b)(1) a substantially linear organopolysiloxane which consists of from 5 to 100 mol percent of  $\text{RQSiO}_{2/2}$  units and from 0 to 95 mol percent of  $\text{R'R''SiO}_{2/2}$  units and which has a silicon-atom-bound hydroxyl at each terminus, wherein R and Q are as denoted above and R' and R'' denote unsubstituted monovalent hydrocarbon radicals, and  
(b)(2) an organohydrogenpolysiloxane which has at least three silicon-atom-bound hydrogen atoms per molecule wherein the organic radicals are unsubstituted monovalent hydrocarbon radicals, and  
(B) a curing catalyst component for dehydrogenation condensation between silicon-atom-bound hydrogen atoms or between silicon-atom-bound hydrogen atoms and silicon-atom-bound hydroxyl radicals.

4,417,025

## RESIN COMPOSITION EMULSION

Hirota Toba, Ohimachi; Masatoshi Mikumo, Kamitabashi, and Masahiro Asami, Ohimachi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 6, 1982, Ser. No. 337,335

Claims priority, application Japan, Jan. 13, 1981, 56/3508; Jun. 16, 1981, 56/93647

Int. Cl.<sup>3</sup> C08G 59/02; C08L 1/08

U.S. Cl. 525-54.21 13 Claims

1. An aqueous emulsion of a polymer composition prepared by (1) effecting an intermolecular grafting reaction between a cellulose ester and a first vinyl polymer to obtain a vinyl polymer-grafted cellulose ester, said first vinyl polymer having a molecular weight in the range of from 300 to 200,000 and containing in the molecule at least one functional group selected from the group consisting of epoxy, carboxyl, acid



halide, acid anhydride, isocyanate, active halogen, N-methylol and N-methylol ether, (2) mixing said vinyl polymer-grafted cellulose ester with at least one radical-polymerizable, ethylenically unsaturated monomer, which monomer is adapted to form a second polymer compatible with said first vinyl polymer, whereby to obtain a reaction mixture, and then (3) subjecting said reaction mixture, in an aqueous medium, in the presence of a dispersion stabilizer, to emulsion polymerization effective to polymerize said monomer, in situ, to form said second polymer, and thereby obtain the aqueous emulsion.

4,417,026

**THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS HAVING IMPROVED TOUGHNESS**  
Christian Lindner, Cologne; Rudolf Binsack, Krefeld; Dieter Rempel, and Karl-Heinz Ott, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,147

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039115

Int. Cl.<sup>3</sup> C08L 51/00

U.S. Cl. 525—64

10 Claims

1. Thermoplastic polyester moulding compositions composed of:

- from 60 to 99%, by weight, (based on (A)+(B)) of at least one saturated polyester of an aromatic dicarboxylic acid and an aliphatic or cycloaliphatic diol; and
- from 1 to 40%, by weight, (based on (A)+(B)) of a granular graft product composed of:
  - a cross-linked diene rubber as core;
  - a cross-linked acrylate rubber as first shell; and
  - a polymer or copolymer of resin-forming monomers selected from the group consisting of styrene,  $\alpha$ -methyl styrene, acrylonitrile, methacrylonitrile, acrylic acid ester, methacrylic acid ester and mixtures thereof as second shell.

4,417,027

**RUBBER COMPOSITION FOR SIDE WALL OF TIRE**  
Masanori Kan, Amagasaki; Takuya Okazaki, Toyonaka, and Tatsuo Sakashita, Suita, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Jun. 18, 1982, Ser. No. 389,691

Claims priority, application Japan, Jun. 27, 1981, 56-100083

Int. Cl.<sup>3</sup> C08L 7/00, 9/00, 9/06, 53/02

U.S. Cl. 525—99

1 Claim

1. A rubber composition for tire side walls comprising: 30–70 parts by weight of solution polymerization star shaped SBR having a glass transition temperature of less than  $-50^{\circ}\text{C}$ ., said star shaped SBR further having a styrene content less than 20 percent by weight; and 70–30 parts by weight of a rubber selected from the group consisting of natural rubber, diene synthetic rubber and mixtures thereof, wherein said rubber and said star shaped SBR comprise 100 percent of the polymer material in the composition.

4,417,028

**PREAPPLIED PLASTIC FILM ADHESIVE COMPOSITION**

Max Azevedo, Wethersfield, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed May 11, 1981, Ser. No. 262,655

Int. Cl.<sup>3</sup> C08F 267/04

U.S. Cl. 525—285

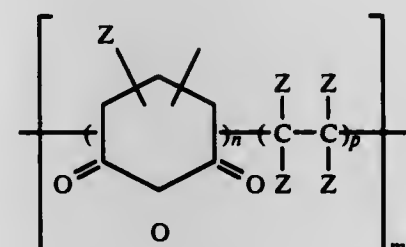
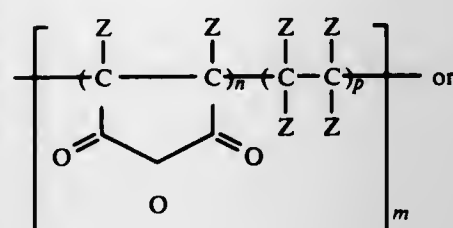
22 Claims

1. An aqueous based adhesive composition, being particularly useful for forming a preapplied adhesive coating or film on parts, especially threaded parts, the composition comprising a dispersion in water of:

- a polymerizable monomer;
- a binder at least partly soluble in water;

(c) an initiator; and

(d) an accelerator of polymerization; wherein the binder is a copolymer of the formula:



where Z is selected from the group consisting of: H;  $\text{C}_{1-10}$  alkyl, alkoxy, alkylene, cycloalkyl; cyano and halo; m is an integer from about 100–1,000; n is greater than 0 but less than 1; and p is 1–n.

4,417,029

**DERIVATIZATION OF STAR-BLOCK COPOLYMERS**  
Ralph Milkovich, Paoli, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 3, 1981, Ser. No. 289,556

Int. Cl.<sup>3</sup> C08F 297/04

U.S. Cl. 525—314

51 Claims

1. Star-block copolymers of from 25 to 90% by weight of a monovinyl aromatic compound and 10 to 75% by weight of a conjugated diene of 4 to 8 carbon atoms; said copolymers having at least three arms connected to a polyvinyl aromatic compound nucleus and having polar functional groups attached to said nucleus.

4,417,030

**MASS POLYMERIZATION PROCESS FOR ABS POLYBLEND**

Vincent A. Aliberti, Wilbraham; Robert L. Kruse, Belchertown, and Eduardo M. Valcarce, South Hadley, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 265,293, May 20, 1981,

abandoned. This application Feb. 12, 1982, Ser. No. 348,474

Int. Cl.<sup>3</sup> C08F 279/04

U.S. Cl. 525—316

16 Claims

1. A continuous mass polymerization process for preparing an ABS polymer having a matrix phase comprising a copolymer of a monoalkenyl aromatic monomer and an ethylenically unsaturated nitrile monomer and a dispersed phase comprising rubber particles having a weight average particle size of from about 0.1 to 10 microns, which process comprises:

- continuously charging a feed stream of a monoalkenylaromatic monomer having dissolved therein from 3 to 33% by weight of a diene rubber to a stirred reactor;
- simultaneously and continuously charging a separate feed stream of an ethylenically unsaturated nitrile monomer to the stirred reactor;
- both said feed streams being charged to a polymerizing mixture having a polymer solids level above that at which phase inversion occurs and up to about 70% by weight polymer solids based on the weight of the polymerization mixture, the total level of ethylenically unsaturated nitrile monomer in the feed to said mixture being sufficient to provide greater than about 25% by weight polymerized ethylenically unsaturated nitrile monomer in the ABS polymer;

- continuously polymerizing the mixture while maintaining stirring such that the polymerizing mixture has a substantially uniform composition and such that the rubber is dispersed in the polymerizing mixture as rubber particles having a weight average particle size of about 0.1 to 10 microns; and
- continuously separating the ABS polymer from the partially polymerizing mixture from step (iv).

4,417,031

**PROCESS FOR PREPARING GRAFT AND BLOCK COPOLYMERS**

Shaul M. Aharoni, Morris Plains, and Theodore Largman, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 7, 1982, Ser. No. 337,800

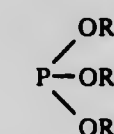
Int. Cl.<sup>3</sup> C08G 81/00, 81/02

U.S. Cl. 525—425

14 Claims

1. A process for preparing block and/or graft copolymers wherein said process comprises:

- forming an intimate mixture of two or more polymers selected from the group consisting of polyamides, polyesters, acid homopolymers of alpha beta unsaturated carboxylic acids and acid copolymers of alpha, beta unsaturated carboxylic acids and alpha beta unsaturated olefins, and an effective amount of one or more phosphite compounds of the formula



and symmetrical and asymmetrical diphosphite derivatives thereof; wherein  $\text{R}_1$  is alkyl, haloalkyl, or phenyl either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, haloalkyl, nitro, cyano, and isocyanato, with  $\text{R}_2$  and  $\text{R}_3$  being the same or different and being a metal cation, ammonium cation, hydrogen or  $\text{R}_1$ ; wherein at least one of said polymers includes one or more amino moieties and at least one of the remaining polymers includes one or more carboxylic acid moieties; and

- heating said mixture for a period of time between about 2 minute and about 30 minutes at a temperature at or above the melting point of said polymers to form said block and/or graft copolymer.

4,417,032

**QUASI-RANDOM COPOLYMERS FROM HOMOPOLYMERS**

Yash P. Khanna, Morristown; Edith A. Turi, Livingston; Shaul M. Aharoni, Morris Plains, and Theodore Largman, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 22, 1982, Ser. No. 370,885

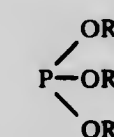
Int. Cl.<sup>3</sup> C08L 77/02

U.S. Cl. 525—432

10 Claims

1. A process for preparing random copolymers which comprises:

- forming a mixture of poly(caproamide) and poly(hexamethylene adipamide) and a phosphite promoter or combinations of phosphite promoters wherein said phosphite promoters are represented by the formula:



with  $\text{R}_1$  being alkyl, haloalkyl, phenyl or phenyl substituted with one or more substituents selected from the group con-

sisting of alkyl, haloalkyl, cyano, nitro, alkylcarbonyl, or isocyanato with  $\text{R}_2$  and  $\text{R}_3$  being the same or different, and are individually hydrogen, a metal cation, ammonium radical or  $\text{R}_1$ ;

- heating said mixture at a temperature between about  $265^{\circ}\text{C}$ . and about  $315^{\circ}\text{C}$ . for a period of time between about 2 and about 20 minutes in order to thereby produce a random copolymer having predominantly a single melting transition.

4,417,033

**DIGLYCIDYL ETHER OF DIMETHANOL CYCLOHEXANE AND REACTION PRODUCTS THEREOF**

W. Raymond Bowditch, West Chester, Pa., assignor to Wilmington Chemical Corporation, Wilmington, Del.

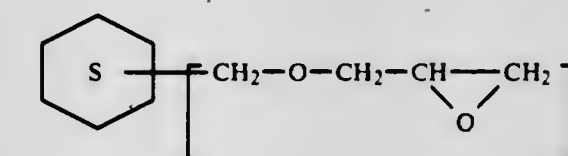
Filed Jun. 1, 1982, Ser. No. 383,480

Int. Cl.<sup>3</sup> C08G 59/24

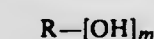
U.S. Cl. 525—481

3 Claims

1. An epoxy resin comprised of the reaction product of: (a) a diepoxide represented by the structural formula:



(b) a polyfunctional phenolic hydroxy compound represented by the structural formula:



wherein R is an aromatic residue and m is at least 2, and said reaction product is at least difunctional and said difunctionality being epoxide.

4,417,034

**LIVING POLYMERS AND PROCESS FOR THEIR PREPARATION**

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 279,025, Jun. 30, 1981,

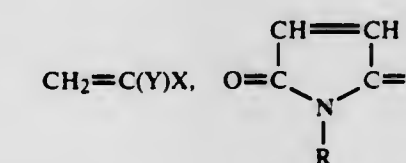
abandoned. This application Jun. 17, 1982, Ser. No. 389,110

Int. Cl.<sup>3</sup> C08F 4/16

U.S. Cl. 526—190

57 Claims

1. Process of polymerizing the monomer selected from the group consisting of



and mixtures thereof

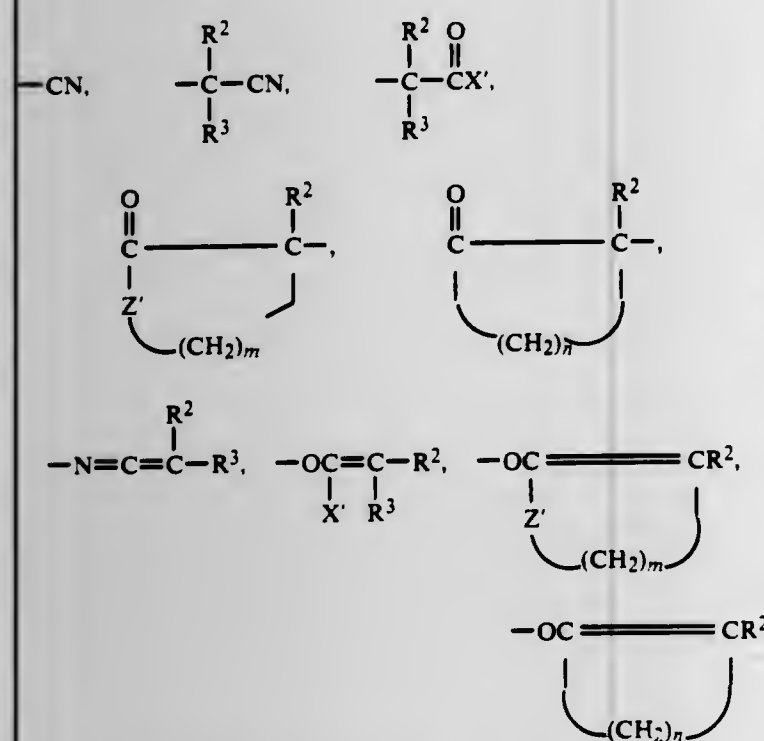
wherein:

X is  $-\text{CN}$ ,  $-\text{CH}=\text{CHC}(\text{O})\text{X}'$  or  $-\text{C}(\text{O})\text{X}'$ ;  
Y is  $-\text{H}$ ,  $-\text{CH}_3$ ,  $-\text{CN}$  or  $-\text{CO}_2\text{R}$ , provided, however, when X is  $\text{CH}=\text{CHC}(\text{O})\text{X}'$ , Y is  $-\text{H}$  or  $-\text{CH}_3$ ;  
X' is  $-\text{OSi}(\text{R}^1)_3$ ,  $-\text{R}$ ,  $-\text{OR}$  or  $-\text{NR}'\text{R}''$ ;  
each  $\text{R}^1$  is independently selected from  $\text{C}_{1-10}$  alkyl and  $\text{C}_{6-10}$  aryl or alkaryl;  
R is  $\text{C}_{1-20}$  alkyl, alkenyl, or alkadienyl;  $\text{C}_{6-20}$  cycloalkyl, aryl, alkaryl or aralkyl; any of said groups containing one or more ether oxygen atoms within aliphatic segments thereof; and any of all the aforesaid groups containing one or more functional substituents that are unreactive under polymerizing conditions; and  
each of  $\text{R}'$  and  $\text{R}''$  is independently selected from  $\text{C}_{1-4}$  alkyl

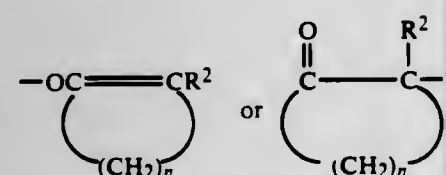


by contacting the one or more monomers under polymerizing conditions with:

- (i) the initiator of the formula  $(R^1)_3MZ$  wherein:  
 $R^1$  is as defined above;  
 $Z$  is an activating substituent selected from the group consisting of



and mixtures thereof wherein:  
 $X'$  is as defined above;  
each of  $R^2$  and  $R^3$  is independently selected from H;  $C_{1-10}$  alkyl and alkenyl;  $C_{6-10}$  aryl, alkaryl, and aralkyl; any of said groups except H containing one or more ether oxygen atoms within aliphatic segments thereof; and any of all the aforesaid groups except H containing one or more functional substituents that are unreactive under polymerizing conditions; and  
 $Z'$  is O or N;  
 $m$  is 2, 3 or 4;  
 $n$  is 3, 4 or 5; and  
 $M$  is Si, Sn, or Ge, provided, however, when  $Z$  is



$M$  is Sn or Ge; and  
(ii) a co-catalyst which is a source of fluoride, cyanide or azide ions or a suitable Lewis acid, to produce "living" polymer having repeat units of the one or more monomers.

#### 4,417,035 EMULSIFIABLE HARD WAXES CONSISTING OF COPOLYMERS OF ETHYLENE WITH UNSATURATED CARBOXYLIC ACIDS

Dieter Oeder, Weisenheim; Wolfram Dietsche, Frankenthal; Stefan Weiss, Neckargemuend; Walter Ziegler, Edingen-Neckarhausen; Peter Kneppers, Frankenthal, and Albert Hettche, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 320,976  
Int. Cl.<sup>3</sup> C08F 212/02, 220/06

U.S. Cl. 526—208

1 Claim

1. A water-emulsified hard wax comprising a homogeneous copolymer of ethylene with about 2.5 to 5% by weight, based

on copolymer, of acrylic acid or methacrylic acid and having the following characteristics:

Melt index=1,500 to 20 MPI units, measured at 160° C. under 325 g load  
Acid number=20–35  
Hoppler hardness=450–650 bar, measured at 23° C. by DGF standard method M-III 9a (57),

prepared by continuous copolymerization of ethylene with acrylic or methacrylic acid in the presence of a free radical initiator at about 150° to 300° C. under a pressure of from 1,000 to 3,000 bar, using a weight ratio of ethylene to acid of about 500:1 to 20:1, in a single-phase polymerization medium in which ethylene is present in supercritical state and acts as a solvent and in the presence of about 0.01 to 5% by weight, based on total monomers, of a regulator selected from the group consisting of an aliphatic aldehyde of 3–6 carbon atoms and an aliphatic ketone of 3–6 carbon atoms, thereby converting from about 3 to 25% by weight of ethylene and continuously removing the copolymer formed therefrom.

#### 4,417,036 PROCESS FOR THE POLYMERIZATION OF CHLOROPRENE

Wilfried Nolte, Leverkusen, and Heinz Esser, Burscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,019

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111138

Int. Cl.<sup>3</sup> C08F 2/22

U.S. Cl. 526—211

6 Claims

1. A process for the polymerisation of chloroprene, which may contain up to 50%, by weight, of a copolymerisable monomer, in aqueous alkaline emulsion containing emulsifiers and other conventional auxiliaries, polymerisation being carried out to a conversion of more than 80%, characterised in that the emulsion used contains from 0.1 to 2%, by weight, based on the quantity of monomers, of a primary or secondary hydroxy-alkylamine in which the OH-group is separated from the amino nitrogen atom by at least two carbon atoms.

#### 4,417,037 VINYL ACYLANHYDROCITRATES AND THEIR PREPARATION

Hans-Ferdinand Muisers; Dieter Arlt, both of Cologne; Manfred Jautelat, Burscheid; Heinrich Alberts, Odenthal, and Fritz Mietzsch, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 458,793

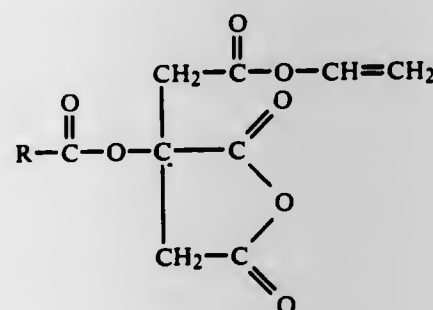
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204127

Int. Cl.<sup>3</sup> C08F 18/14, 118/14; C07D 307/32

U.S. Cl. 526—271

16 Claims

1. A vinyl acylanhydrocitrate of the formula



in which  
 $R$  denotes hydrogen or lower alkyl.

4,417,038  
ETHYLENE-ALKYNE COPOLYMERS, THEIR  
PREPARATION AND THEIR USE AS ADDITIVES TO  
PETROLEUM DISTILLATES  
Hans-Henning Vogel, Frankenthal; Manfred Schramm, Viernheim; Michael Werner, Mannheim, and Erich Schwartz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed Dec. 4, 1981, Ser. No. 327,727  
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046802

Int. Cl.<sup>3</sup> C08F 210/02, 238/00

U.S. Cl. 526—285

4 Claims

1. An ethylene-alkyne copolymer, useful as an additive for petroleum distillates, which has a number-average molecular weight, determined by vapor phase osmometry, of from 500 to 500,000 and which contains, as copolymerized units,  
(A) from 70 to 99% by weight of ethylene and  
(B) an acetylenically unsaturated compound of the general formula (I)



where  $R^1$  is  $(OCH_2CH_2)_nH$  or  $CH_2-R^2$ ,  $n$  is 1–20,  $R^2$  is  $-OH$ ,  $-OCOR^3$  or  $-COOR^3$  and  $R^3$  is a straight-chain or branched  $C_1-C_{10}$ -alkyl.

#### 4,417,039 CIS-ENYNE AROMATIC AND AROMATIC HETEROCYCLIC POLYMERS

Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

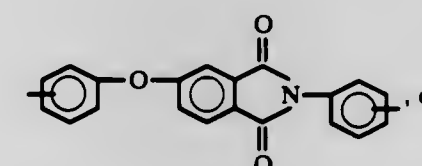
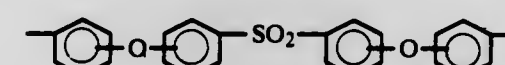
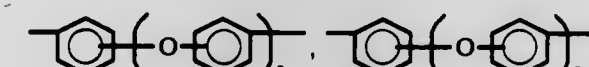
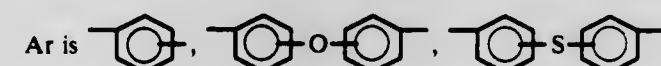
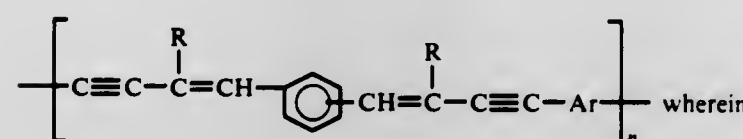
Filed Jul. 19, 1982, Ser. No. 399,661

Int. Cl.<sup>3</sup> C08F 38/04

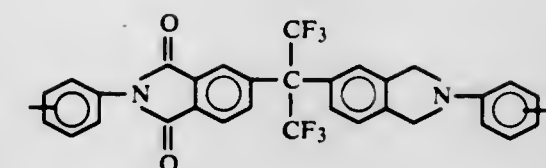
U.S. Cl. 526—285

16 Claims

1. A polymer having repeating units of the general formula:



-continued



and  $R$  is  $-H$  or  $-C_6H_5$

4,417,040  
ANAEROBICALLY CURABLE SEALING COMPOSITION  
Yasuhumi Okamura, Aritatsu Masaoka, and Kazutaka Kishita, all of Hachioji, Japan, assignors to Three Bond Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,777

Claims priority, application Japan, Nov. 13, 1980, 55-160032  
Int. Cl.<sup>3</sup> C08F 4/36, 20/20

U.S. Cl. 526—323.1

2 Claims

1. In an anaerobically curable sealing composition comprising a polymerizable monomer (A) consisting of an acrylic ester or a methacrylic ester, and a (B) polymerization initiator, an improvement wherein the said polymerization initiator comprises 3,6,6,9,9-penta-methyl-3-n-butyl-1,2,4,5-tetra-oxacyclopentene, thereby to provide the obtained composition better anaerobic characteristics and storage stability.

4,417,041  
PROCESS FOR SHAPING SOLID POLYBUT-1-ENE AND  
THE RESULTING SHAPED ARTICLES

Andre Kepes, Le Vesinet; Eric Weynant, Golfe Juan; Pierre Avenas, Sceaux, and Jean-Marc Haudin, Antibes, all of France, assignors to Societe Chimique des Charbonnages-CdF Chimie, Mazingarbe, France

Division of Ser. No. 85,949, Oct. 18, 1979, Pat. No. 4,324,756.

This application Jan. 13, 1982, Ser. No. 339,160

Claims priority, application France, Oct. 30, 1978, 78 30701

Int. Cl.<sup>3</sup> C08F 110/08

U.S. Cl. 526—348.6

12 Claims

1. A press-forged polybut-1-ene shaped article made by a process comprising preheating polybut-1-ene in the crystalline form II at a temperature between 20° and 90° C. and then press-forging it under a pressure between 8 and 100 kgf/mm<sup>2</sup> for a period of 1 to 40 seconds into a desired shape.

4,417,042  
SCAVENGERS FOR ONE-COMPONENT  
ALKOXY-FUNCTIONAL RTV COMPOSITIONS AND  
PROCESSES

John J. Dziark, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 17, 1982, Ser. No. 349,695

Int. Cl.<sup>3</sup> C08G 77/06

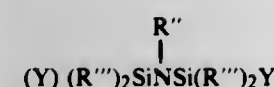
U.S. Cl. 528—18

90 Claims

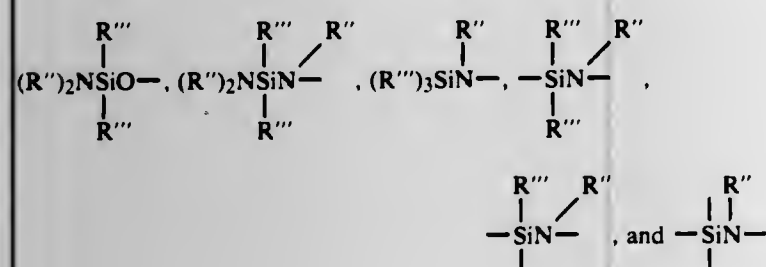
1. A stable, one-package, substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer comprising: (1) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least 2 alkoxy radicals; (2) an effective amount of a condensation catalyst; and (3) a stabilizing amount of silicone scavenger compound for hydroxy functional groups which is a silicon-nitrogen compound selected from the group consisting of

(A) a silicon-nitrogen compound having the formula

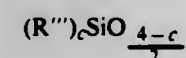




where Y is selected from R''' and R''N— and (B) a silicon-nitrogen polymer comprising (1) from 3 to 100 mole percent chemically combined structural units selected from the group consisting of units having the formula



and (2) from 0 to 97 mole percent chemically combined structural units represented by the formula



where the silicon atoms of said silicon-nitrogen polymer are joined to each other by a member selected from a SiOSi linkage and a SiNR''Si linkage, the free valences of said silicon atoms other than those joined to oxygen to form a siloxy unit and nitrogen to form a silazy unit are joined to a member selected from an R''' radical and an (R'')N radical, and where the ratio of the sum of said R''' radicals and said (R'')N radicals to the silicon atoms of said silicon-nitrogen polymer has a value of 1.5 to 3, inclusive, and R'' is a member selected from the group consisting of hydrogen, monovalent hydrocarbon radicals, and fluoroalkyl radicals, R''' is a member selected from the group consisting of hydrogen, monovalent hydrocarbon radicals and fluoroalkyl radicals, and c is a whole number equal to 0 to 3, inclusive.

4,417,043

## ANISOTROPIC MELT-FORMING POLYMER

Frederic N. Cogswell, Welwyn Garden City; Brian P. Griffin, St. Albans, and Clive P. Smith, Wheathampstead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 5, 1981, Ser. No. 222,685

Claims priority, application United Kingdom, Jan. 24, 1980, 8002476

Int. Cl.<sup>3</sup> C08G 63/18, 63/68, 69/44

U.S. Cl. 528—176

10 Claims

1. A polymer which is capable of forming an anisotropic melt characterised in that the polymer has been prepared in the presence of cross-linking reactants whereby the polymer chain includes residues derived from said cross-linking reactants, the residues being present at a concentration which is insufficient to give a fully cross-linked polymer as defined by having a melt viscosity of less than  $10^7$  Nsec/m<sup>2</sup> when measured using capillary rheometry at a temperature below the decomposition point of the polymer and at a shear stress of  $10^4$  N/m<sup>2</sup>.

4,417,044  
PROCESS FOR MAKING POLYETHERIMIDES  
Shashi L. Parekh, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

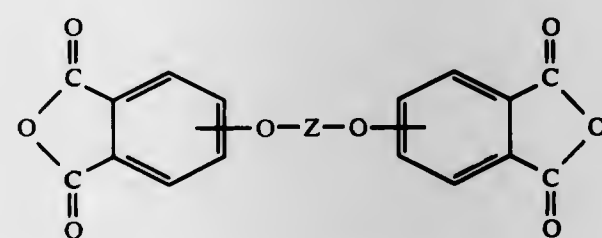
Filed May 25, 1982, Ser. No. 381,859

Int. Cl.<sup>3</sup> C08G 73/10

U.S. Cl. 528—179

18 Claims

1. A process for making polyetherimide, which comprises: (a) reacting an aromatic bis(ether anhydride) of the formula



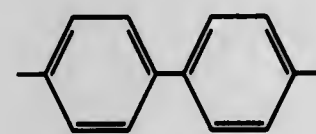
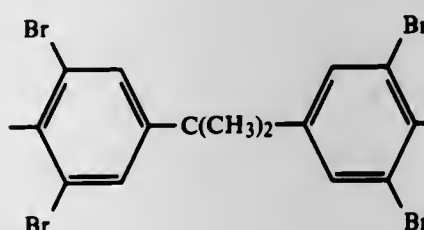
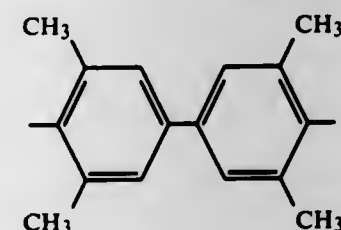
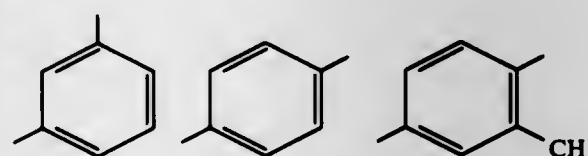
with an organic diamine of the formula



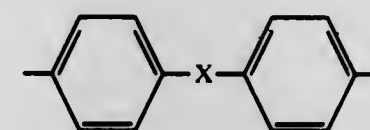
in an inert solvent under polyetherimide-forming conditions, which include a reaction temperature of from about 40° C. to about 200° C., to form a prepolymer-solvent mixture;

(b) forming a thin film of the prepolymer-solvent mixture under solvent-volatilizing conditions, which includes a temperature of from about 200° C. to about 450° C., to effect substantially complete removal of solvent and water of reaction from said mixture to form a prepolymer; and

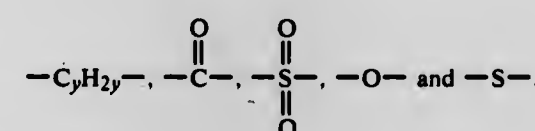
(c) heating the prepolymer to a temperature above the glass transition temperature of the final polyetherimide product and less than about 450° C. to form the polyetherimide; wherein, Z is a member selected from the class consisting of (A) divalent organic radicals having the following formulas



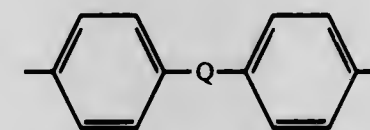
and (B) divalent organic radicals of the general formula



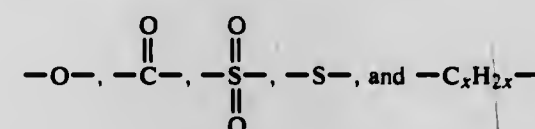
wherein X is a member selected from the group consisting of divalent radicals of the formulas



where y is an integer from 1 to about 5; and R is a divalent organic radical selected from the group consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from C<sub>2</sub> to about C<sub>8</sub> alkylene terminated polydiorganosiloxane, and divalent radicals of the general formula



where Q is a member selected from the class consisting of



and x is an integer from 1 to about 5.

4,417,045

## POLYIMIDES AND POLYIMIDE-AMIDES

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

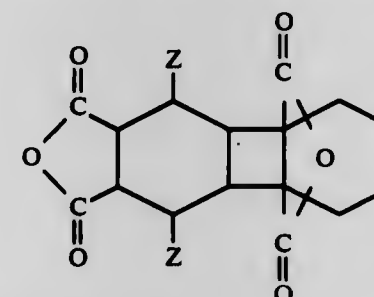
Continuation-in-part of Ser. No. 294,348, Aug. 19, 1981, Pat. No. 4,358,850. This application Sep. 29, 1982, Ser. No. 427,014. The portion of the term of this patent subsequent to Sep. 9, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08G 73/10, 73/14

U.S. Cl. 528—188

16 Claims

1. A polyimide prepared from an aromatic or aliphatic diamine and the dianhydrides of the following structure:



wherein Z is either hydrogen or a benzene radical and wherein the mole ratio of the aromatic, aliphatic or a mixture of aromatic and aliphatic diamines to the dianhydride is about 1.2:1 to about 1:1.

4,417,046

## PROCESS FOR ISOLATING OLIGONUCLEOTIDE PRODUCT FROM A COUPLING REACTION MIXTURE

Hansen M. Hsiung, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 24, 1981, Ser. No. 295,419

Int. Cl.<sup>3</sup> C07H 15/12, 17/00

U.S. Cl. 536—27

4 Claims

1. A process for recovering from a reaction mixture polynucleotide product produced by coupling in the presence of a coupling agent (1) a nucleotide or oligonucleotide having a blocked 5'-hydroxyl group and a 3'-phosphate diester group and (2) a nucleotide or oligonucleotide having a blocked 3'-hydroxyl or a blocked 3'-phosphate diester group and a free 5'-hydroxyl group, which comprises adding to the reaction mixture an organic solvent or a mixture of organic solvents comprising a substantially anhydrous ether thereby precipitating polynucleotide product from the reaction mixture while retaining coupling agent in solution.

4,417,047

## NOVEL TETRAZOLE-5-THIOL ESTER AND PROCESS FOR PREPARING CEFAMANDOLE USING SAME

Chisel Shibuya, Fuji; Masahiro Murakami, Nobeoka; Masateru Kobayashi, Nobeoka, and Takanori Sone, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 236,542, Feb. 20, 1981, Pat. No. 4,351,947.

This application Feb. 22, 1982, Ser. No. 350,805

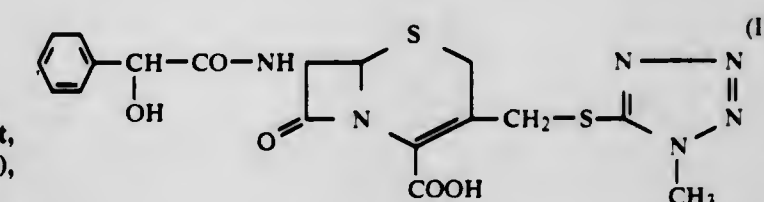
Claims priority, application Japan, Mar. 6, 1980, 55-27303; Mar. 7, 1980, 55-28043

Int. Cl.<sup>3</sup> C07D 501/04, 501/06

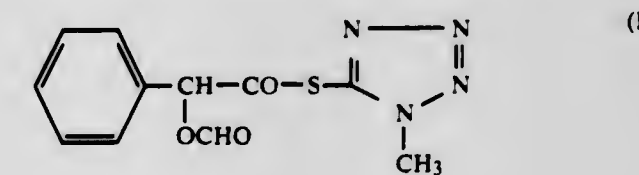
U.S. Cl. 544—26

12 Claims

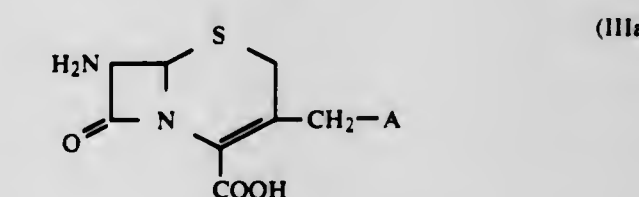
1. A process for preparing a cefamandole having D-configuration in the side chain of the formula:



which comprises reacting a O-formyl-D(-)-mandeloyl-1-methyl-1H-tetrazol-5-ylthio ester of the formula:

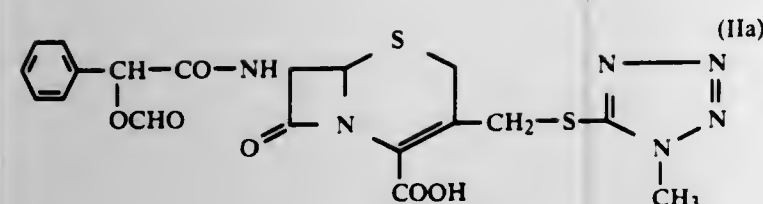


with a compound of the formula:



wherein A is a benzimidazol-2-ylthio group or a 1-methyl-1H-tetrazol-5-ylthio group, or its salt to produce a compound of the formula:





or its salt, and treating the compound of the formula (IIa) with an alkaline solution.

4,417,048

### N-ALKYLATION OF ORGANONITROGEN COMPOUNDS

Gerard Soula, Meyzien, and Maurice Balme, Saint Foy les Lyon, France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

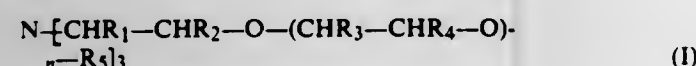
Filed Feb. 24, 1982, Ser. No. 351,867

Claims priority, application France, Mar. 11, 1981, 81 04823  
Int. Cl.<sup>3</sup> C07D 279/22

U.S. Cl. 544—38

17 Claims

1. In a process for the N-alkylation of an organonitrogen compound, comprising N-alkylating an organonitrogen compound bearing a labile hydrogen atom directly bonded to the nitrogen atom to be N-alkylated, with an N-alkylating agent, in the presence of an inorganic base, the improvement comprising conducting said N-alkylation in the presence of a sequestering agent having the structural formula:



wherein n is a number ranging from 0 to about 10, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, which may be identical or different, each represents a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms, and R<sub>5</sub> represents an alkyl or cycloalkyl radical having 1 to 12 carbon atoms, a phenyl radical, or a radical of the formula —C<sub>m</sub>H<sub>2m-φ</sub>, or C<sub>m</sub>H<sub>2m+1</sub>—φ—, m ranging from 1 to about 12 and φ being phenyl.

4,417,049

### SPIRO-QUATERNARY AMMONIUM HALIDES AND N-(2-PYRIMIDINYL)PIPERAZINYLALKYLAZAS-PIROALKANEDIONE PROCESS

Jack C. Sims, deceased, late of Elberfeld, Ind., by Donald R. Balser, administrator, assignor to Mead Johnson & Company, Evansville, Ind.

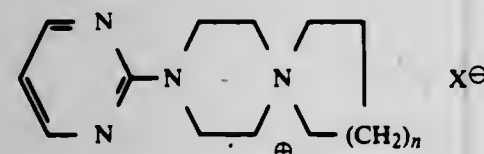
Division of Ser. No. 197,416, Oct. 16, 1980, Pat. No. 4,351,939.  
This application Jul. 19, 1982, Ser. No. 399,599

Int. Cl.<sup>3</sup> C07D 401/14, 487/10, 471/10

U.S. Cl. 544—231

5 Claims

1. A compound of Formula I



wherein  
n is 1 or 2; and  
X is chlorine, bromine or iodine.

### 4,417,050 FUNGICIDAL, HERBICIDAL AND PLANT GROWTH-REGULATING PYRIMIDYL-CONTAINING ETHERS

Richard E. Cherpeck, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

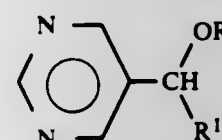
Filed Nov. 23, 1981, Ser. No. 323,833

Int. Cl.<sup>3</sup> C07D 239/26; A01N 43/54

U.S. Cl. 544—335

8 Claims

1. A compound of the formula:



wherein R is aryl of 6 to 10 carbon atoms; aryl of 6 to 10 carbon atoms substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens; arylalkyl of 7 to 12 carbons; arylalkyl of 7 to 12 carbons substituted on the aryl ring with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl, or lower alkyl substituted with 1 to 5 of the same or different halogens; biphenyl; biphenyl substituted with 1 to 6 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens; biphenylalkyl of 13 to 18 carbons; biphenylalkyl of 13 to 18 carbons substituted in the biphenyl rings with 1 to 5 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl, or lower alkyl substituted with 1 to 5 of the same or different halogens; or CH<sub>2</sub>R<sup>2</sup> wherein R<sup>2</sup> is lower alkenyl, lower alkenyl substituted with lower alkoxy or with 1 to 5 of the same or different halogens; lower alkynyl; lower alkynyl substituted with lower alkoxy or with 1 to 5 of the same or different halogens; R<sup>1</sup> is aryl of 6 to 10 carbons; aryl of 6 to 10 carbons substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl, lower alkyl substituted with 1 to 5 of the same or different halogens; biphenyl or biphenyl substituted 1 to 6 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens.

4,417,051

### PROCESS FOR THE PREPARATION OF 8α-SUBSTITUTED 6-METHYLERGOLINES

Gerhard Sauer, Berlin, Fed. Rep. of Germany, assignor to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

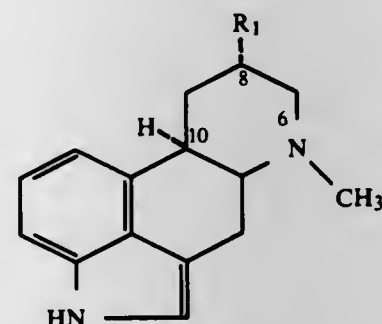
Filed May 12, 1981, Ser. No. 262,872

Int. Cl.<sup>3</sup> C07D 519/02

U.S. Cl. 546—67

14 Claims

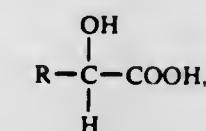
1. A process for preparing an 8α-substituted 6-methyl-10α-H-ergoline of the formula



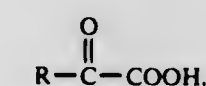
wherein R<sub>1</sub> is NH—CO—NX<sub>2</sub> (wherein X is hydrogen, methyl or ethyl), CO—NH—NX<sub>2</sub>, CO—NX<sub>2</sub>, or CH<sub>2</sub>OX, comprising

reducing the corresponding isolysergic compound, 8α-substituted-9,10-didehydro-6-methylergoline, with an alkali metal or alkaline earth metal dissolved in a nitrogen compound which is a C<sub>1-3</sub>-alkylamine, a hexa-C<sub>1-2</sub>-alkyl-phosphoric triamide or ammonia at a temperature of -70° to -30° C., thereby obtaining essentially only the 8α-substituted, 10α-H compound.

derivative, wherein an amide or ester of a hydroxy acid of the general formula:



wherein R represents an (possible substituted) aryl or heteroaryl group, is oxidized in the liquid phase with molecular-oxygen-containing gas, in the presence of a catalytic amount of a cobalt compound, and recovering the corresponding amide or the corresponding ester of glyoxylic acid having the general formula:



from the resulting reaction mixture.

4,417,054

### 2-(LOWER-ALKOXY)-1-(PYRIDINYL)ETHENYL LOWER-ALKYL KETONES

Karl O. Gelotte, Nassau, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

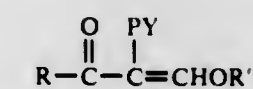
Filed May 24, 1982, Ser. No. 381,162

Int. Cl.<sup>3</sup> C07D 213/82, 213/85, 213/50

U.S. Cl. 546—340

4 Claims

1. A 2-(lower-alkoxy)-1-(pyridinyl)ethenyl lower-alkyl ketone of the formula



where R and R' are each lower-alkyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,417,055

### PROCESS FOR PRODUCING A β-TRIFLUOROMETHYLPYRIDINE

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Moriyama; Isao Yokomichi, Moriyama; Yasuhiro Tsujii, Moriyama, and Shigeyuki Nishimura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Mar. 9, 1982, Ser. No. 356,528

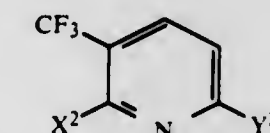
Claims priority, application Japan, Mar. 27, 1981, 56-44851

Int. Cl.<sup>3</sup> C07D 213/26

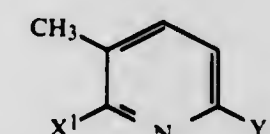
U.S. Cl. 546—345

10 Claims

1. A process for producing a pyridine derivative having the formula



wherein X<sup>2</sup> and Y<sup>2</sup> represents hydrogen atom or chlorine atom, which comprises reacting a pyridine compound having the formula



where X<sup>1</sup> and Y<sup>1</sup> represent hydrogen atom or chlorine atom

### 4,417,052 PHENYL-LOWER-ALKYL PIPERIDINES AND PYRROLIDINES

Bernard L. Zenitz, Rensselaer, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

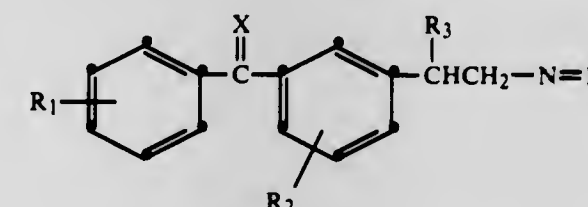
Division of Ser. No. 121,836, Feb. 15, 1980, Pat. No. 4,308,382, which is a continuation-in-part of Ser. No. 72,067, Sep. 4, 1979, abandoned, which is a division of Ser. No. 902,569, May 3, 1978, Pat. No. 4,216,326, which is a continuation-in-part of Ser. No. 813,167, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 641,511, Dec. 17, 1975, Pat. No. 4,069,256, which is a continuation-in-part of Ser. No. 542,553, Jan. 20, 1975, abandoned. This application Aug. 10, 1981, Ser. No. 291,262

Int. Cl.<sup>3</sup> C07D 211/06, 207/04

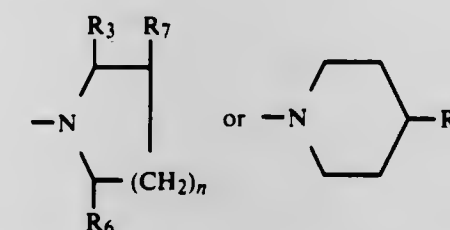
U.S. Cl. 546—246

23 Claims

1. A member of the group consisting of (A) compounds having the formula:



where R<sub>1</sub> represents hydrogen or from one to two, the same or different, lower-alkyl, hydroxy, lower-alkoxy, trifluoromethyl, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl or halogen selected from fluorine, chlorine and bromine; R<sub>2</sub> represents hydrogen or lower-alkyl in either of the 2-, 4-, 5- or 6-positions; R<sub>3</sub> represents hydrogen or lower-alkyl; the group >C=X represents >C=O, >C(R<sub>3</sub>)OH, >C(R<sub>3</sub>)H, >C=CH<sub>2</sub>, >C=NOH or >CHN(R<sub>3</sub>)<sub>2</sub>; and N=B represents one of the groups



where R<sub>6</sub> and R<sub>7</sub> each represent hydrogen, lower-alkyl, cyclohexyl, cyclohexylmethyl, 2-cyclohexylethyl, 3-cyclohexylpropyl or benzyl; R<sub>9</sub> represents lower-alkyl, cyclohexyl, cyclohexylmethyl, 2-cyclohexylethyl, 3-cyclohexylpropyl or benzyl; and n represents one of the integers 1, 2 and 3, and (B) acid-addition salts thereof.

4,417,053

### PROCESS FOR THE PREPARATION OF SUBSTITUTED GLYOXYLIC ACID DERIVATIVES

Antonius Corvers, Beek; Cornelis W. van den Broek, Schaasberg, and Geertrudes H. Suverkropp, Geleen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 12, 1981, Ser. No. 320,562

Claims priority, application Netherlands, Nov. 13, 1980, 8006192

Int. Cl.<sup>3</sup> C07C 69/76; C07D 213/50

U.S. Cl. 546—315

8 Claims

1. A process for the preparation of substituted glyoxylic acid derivatives by the oxidation of the corresponding hydroxy



with chlorine and anhydrous hydrogen fluoride by a vapor phase reaction in the presence of a catalyst at a temperature of 300° C. to 430° C. wherein, the catalyst is a fluoride of a metal selected from the group consisting of copper, vanadium, tin, bismuth, zirconium, magnesium, barium, zinc, calcium, potassium and sodium.

4,417,056

# PROCESS FOR PREPARING 2-(4-AMINOPHENYL)-5-AMINO-BENZIMIDAZOLE AND SUBSTITUTED DERIVATIVES

Jean-Marie Cognion, Saint-Genis-Laval, and Pierre Durual, Vernaison, both of France, assignors to P.C.U.K. Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Mar. 11, 1982, Ser. No. 357,108

Claims priority, application France, Mar. 20, 1981, 81 05587 Int. Cl.<sup>3</sup> C07D 235/18

U.S. Cl. 548—334

11 Claims

1. In a process for the preparation of 2-(4-aminophenyl)-5-amino-benzimidazole and substituted derivatives thereof by cycloreduction of starting material N-(4-nitrobenzoyl)-2,4-dinitroaniline or a substituted derivative thereof by means of hydrogen gas in the presence of a catalyst based on a metal belonging to Group VIII of the Periodic Classification of the elements, the improvement which comprises suspending said starting material in an aqueous solution of hydrochloric acid or phosphoric acid, the content (C) of starting material in said suspension ranging from 0.15 to 1.5 mole per liter and the molar ratio (A): acid/starting material ranging from 2 to 20, said reduction being conducted at a hydrogen pressure from 5 to 100 bars and at a temperature (T) from 20° to 150° C. selected whereby the product  $T \times A \times C$  is equal to or greater than 25.

4,417,057

# N-SUBSTITUTED IMIDES AND BIS-IMIDES

Dieter Lohmann, Muttentz; Martin Roth, Marly, and Marcus Baumann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 67,863, Aug. 20, 1979, Pat. No. 4,301,075.

This application Jun. 26, 1981, Ser. No. 277,555

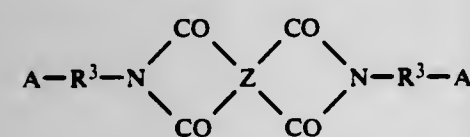
Claims priority, application Switzerland, Aug. 30, 1978, 9153/78

Int. Cl.<sup>3</sup> C07D 209/94

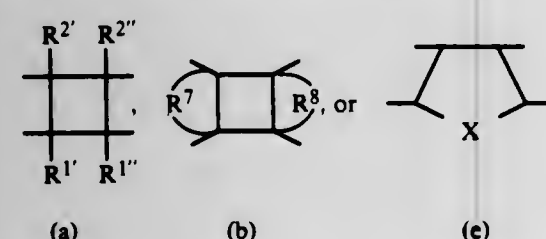
U.S. Cl. 548—429

7 Claims

1. A compound of the formula

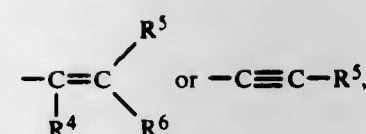


in which Z is a tetravalent radical of the formula



in which X is —O—, R<sup>1</sup>, R<sup>1'</sup>, R<sup>2</sup> and R<sup>2'</sup> independently of one another are methyl, phenyl, —CN or chlorine and R<sup>7</sup> and R<sup>8</sup> independently of one another are straight or branched chain alkylene or oxaalkylene having 3-4 C atoms, or said alkylene or oxaalkylene fused with a benzene ring.

A is a group



R<sup>3</sup> is a direct bond, alkylene having 1-8 C atoms, cyclohexylene, phenylene or —CH<sub>2</sub>—phenylene with the —CH<sub>2</sub> group bonded to the N atom, R<sup>4</sup> and R<sup>6</sup> independently of one another are hydrogen, methyl or ethyl and R<sup>5</sup> is hydrogen or alkyl having 1-9 C atoms.

4,417,058

# TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,235

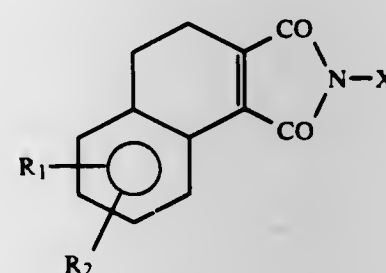
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.<sup>3</sup> C07D 709/66

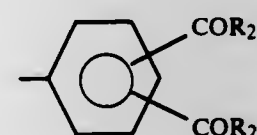
U.S. Cl. 548—451

6 Claims

1. A compound of the formula



in which R and R<sub>1</sub> independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, and X is a group of the formula



(II) the two —COR<sub>2</sub>s are bonded to the benzene ring in the meta- or para-position relative to one another and the R<sub>2</sub>s are each —OH, —Cl, alkoxy having 1 to 4 carbon atoms or phenoxy, or the two —COR<sub>2</sub>s are bonded to the benzene ring in the ortho-position relative to one another and the two R<sub>2</sub>s together are —O—.

4,417,059

# DIPHENYLAMINO AND INDOLYL SUBSTITUTED PYROMELLITIDES

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 182,717, Aug. 29, 1980, Pat. No. 4,343,493.

This application Aug. 19, 1981, Ser. No. 294,375

Int. Cl.<sup>3</sup> C07D 405/04, 405/14

U.S. Cl. 548—456

19 Claims

1. A compound selected from the group consisting of 3,7-bis-(Y)-3,7-bis[N-(R, R<sup>0</sup>-phenyl)-N-(R<sup>1</sup>, R<sup>2</sup>-phenyl)amino]pyromellitide having the formula

4,417,060

# AMINO-SUBSTITUTED 2-CUMARYL-(3)-CHROMENYLUM SALTS

Peter Czerney, Weimar; Horst Hartmann, and Jürgen Liebscher, both of Dresden, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Mar. 26, 1981, Ser. No. 247,954

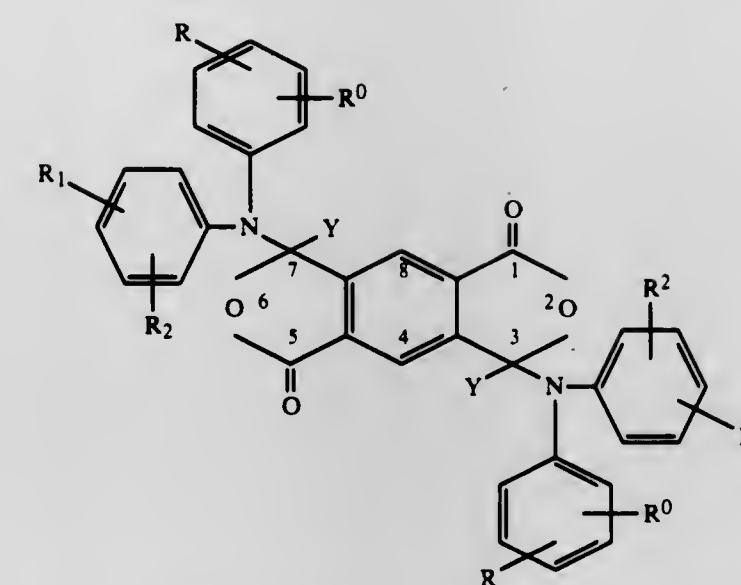
Claims priority, application German Democratic Rep., Apr. 1, 1980, 220109

Int. Cl.<sup>3</sup> C07D 405/14

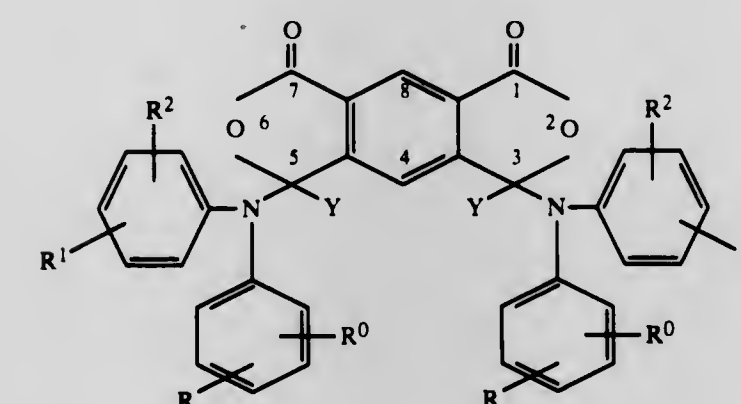
U.S. Cl. 548—525

11 Claims

1. Amino-substituted 2-cumaryl-3'-chromenylium salt of the formula

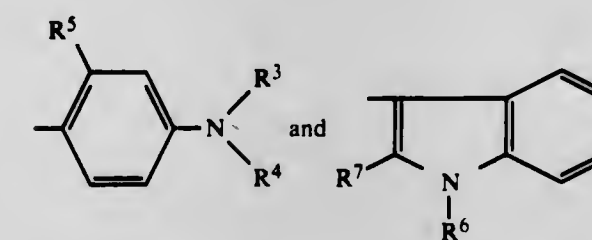


and 3,5-bis(Y)-3,5-bis[N-(R, R<sup>0</sup>-phenyl)-N-(R<sup>1</sup>, R<sup>2</sup>-phenyl)amino]pyromellitide having the formula



and mixtures thereof wherein:

R, R<sup>0</sup>, R<sup>1</sup> and R<sup>2</sup> are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, C<sub>1</sub> to C<sub>4</sub> alkoxy, non-tertiary C<sub>1</sub> to C<sub>9</sub> alkyl, COOZ and NZ<sup>1</sup>Z<sup>2</sup> where Z and Z<sup>1</sup> are hydrogen or non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl and Z<sup>2</sup> is hydrogen, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl, C<sub>5</sub> to C<sub>7</sub> cycloalkyl, C<sub>1</sub> to C<sub>4</sub> alkanoyl, phenylsulfonyl or phenylsulfonyl substituted by non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl; Y is a radical selected from the group consisting of



in which

R<sup>3</sup> and R<sup>4</sup> are the same or different and are selected from the group consisting of non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl, benzyl, and benzyl substituted by one or two of halo, C<sub>1</sub> to C<sub>4</sub> alkyl, C<sub>1</sub> to C<sub>4</sub> alkoxy or nitro; R<sup>5</sup> is selected from the group consisting of hydrogen, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl, halo and C<sub>1</sub> to C<sub>4</sub> alkoxy; R<sup>6</sup> is selected from the group consisting of hydrogen and non-tertiary C<sub>1</sub> to C<sub>12</sub> alkyl; and R<sup>7</sup> is selected from the group consisting of hydrogen, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl and phenyl.

wherein R<sup>3</sup> and R<sup>7</sup> are a dialkyl or cycloalkyl disubstituted amino group, hydrogen, or hydroxy group, provided that at least one of R<sup>3</sup> and R<sup>7</sup> is an amino group, R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>8</sup> are hydrogen, an alkoxy group, or two of these substituents together form an aromatic ring, provided that R<sup>1</sup>, R<sup>2</sup> and R<sup>4</sup> may be the same or different, and R<sup>5</sup>, R<sup>6</sup> and R<sup>8</sup> may be the same or different, and Y<sup>-</sup> is an acidic anion.

4,417,061

# PHOTOINITIATORS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 150,974, May 19, 1980, abandoned, which is a continuation of Ser. No. 13,116, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 833,146, Sep. 14, 1977, Pat. No. 4,161,478, which is a continuation-in-part of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Nov. 13, 1981, Ser. No. 320,996

Int. Cl.<sup>3</sup> C07F 9/80

U.S. Cl. 549—3

11 Claims

1. A sulfonium or selenonium salt having an MF<sub>6</sub> anion, where M is selected from the class consisting of phosphorus, arsenic and antimony, where the valence of the sulfonium or selenonium salt cation is satisfied by a C<sub>(6-12)</sub> arylacyl radical and a divalent aliphatic radical.



with chlorine and anhydrous hydrogen fluoride by a vapor phase reaction in the presence of a catalyst at a temperature of 300° C. to 430° C. wherein, the catalyst is a fluoride of a metal selected from the group consisting of copper, vanadium, tin, bismuth, zirconium, magnesium, barium, zinc, calcium, potassium and sodium.

4,417,056

# PROCESS FOR PREPARING 2-(4-AMINOPHENYL)-5-AMINO-BENZIMIDAZOLE AND SUBSTITUTED DERIVATIVES

Jean-Marie Cognion, Saint-Genis-Laval, and Pierre Durual, Vernaison, both of France, assignors to P.C.U.K. Produits Chimiques Ugine Kuhlmann, Courbevoie, France  
Filed Mar. 11, 1982, Ser. No. 357,108

Claims priority, application France, Mar. 20, 1981, 81 05587  
Int. Cl.<sup>3</sup> C07D 235/18

U.S. Cl. 548—334

11 Claims

1. In a process for the preparation of 2-(4-aminophenyl)-5-amino-benzimidazole and substituted derivatives thereof by cyclocondensation of starting material N-(4-nitrobenzoyl)-2,4-dinitroaniline or a substituted derivative thereof by means of hydrogen gas in the presence of a catalyst based on a metal belonging to Group VIII of the Periodic Classification of the elements, the improvement which comprises suspending said starting material in an aqueous solution of hydrochloric acid or phosphoric acid, the content (C) of starting material in said suspension ranging from 0.15 to 1.5 mole per liter and the molar ratio (A): acid/starting material ranging from 2 to 20, said reduction being conducted at a hydrogen pressure from 5 to 100 bars and at a temperature (T) from 20° to 150° C. selected whereby the product T×A×C is equal to or greater than 25.

4,417,057

# N-SUBSTITUTED IMIDES AND BIS-IMIDES

Dieter Lohmann, Muttentz; Martin Roth, Marly, and Marcus Baumann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 67,863, Aug. 20, 1979, Pat. No. 4,301,075.  
This application Jun. 26, 1981, Ser. No. 277,555

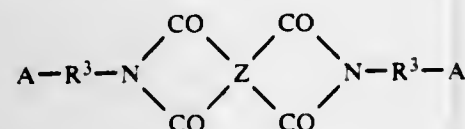
Claims priority, application Switzerland, Aug. 30, 1978, 9153/78

Int. Cl.<sup>3</sup> C07D 209/94

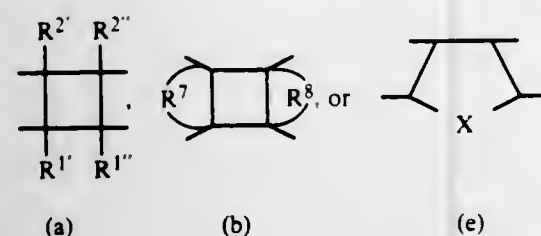
U.S. Cl. 548—429

7 Claims

1. A compound of the formula

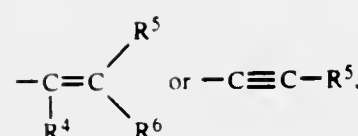


in which Z is a tetravalent radical of the formula



in which X is —O—, R<sup>1'</sup>, R<sup>1''</sup>, R<sup>2'</sup> and R<sup>2''</sup> independently of one another are methyl, phenyl, —CN or chlorine and R<sup>7</sup> and R<sup>8</sup> independently of one another are straight or branched chain alkylene or oxaalkylene having 3–4 C atoms, or said alkylene or oxaalkylene fused with a benzene ring.

A is a group



R<sup>3</sup> is a direct bond, alkylene having 1–8 C atoms, cyclohexylene, phenylene or —CH<sub>2</sub>—phenylene with the —CH<sub>2</sub> group bonded to the N atom, R<sup>4</sup> and R<sup>6</sup> independently of one another are hydrogen, methyl or ethyl and R<sup>5</sup> is hydrogen or alkyl having 1–9 C atoms.

4,417,058

# TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,235

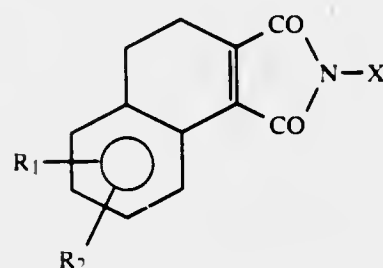
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.<sup>3</sup> C07D 709/66

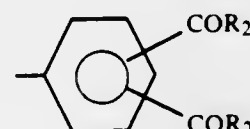
U.S. Cl. 548—451

6 Claims

1. A compound of the formula



in which R and R<sub>1</sub> independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, and X is a group of the formula



(II) the two —COR<sub>2</sub>s are bonded to the benzene ring in the meta- or para-position relative to one another and the R<sub>2</sub>s are each —OH, —Cl, alkoxy having 1 to 4 carbon atoms or phenoxy, or the two —COR<sub>2</sub>s are bonded to the benzene ring in the ortho-position relative to one another and the two R<sub>2</sub>s together are —O—.

4,417,059

# DIPHENYLAMINO AND INDOLYL SUBSTITUTED PYROMELLITIDES

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

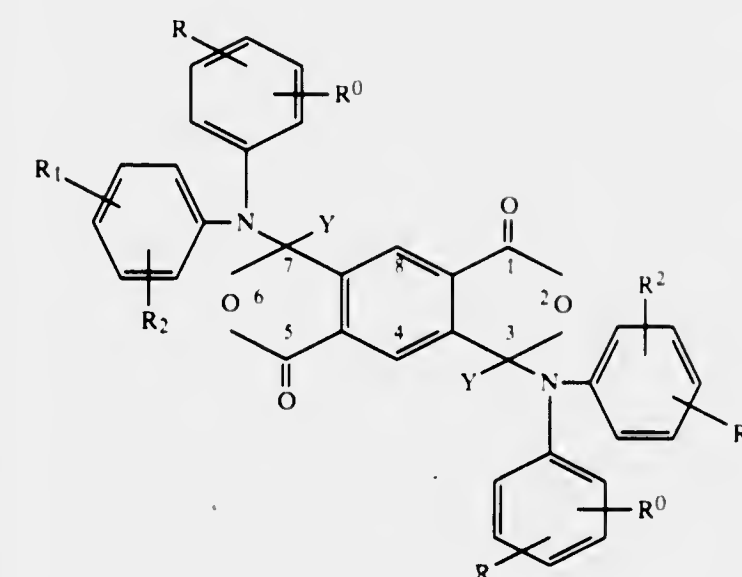
Division of Ser. No. 182,717, Aug. 29, 1980, Pat. No. 4,343,493.  
This application Aug. 19, 1981, Ser. No. 294,375

Int. Cl.<sup>3</sup> C07D 405/04, 405/14

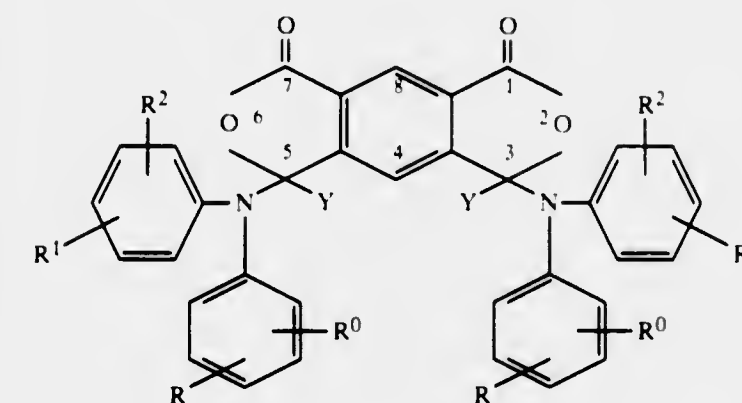
U.S. Cl. 548—456

19 Claims

1. A compound selected from the group consisting of 3,7-bis-(Y)-3,7-bis[N-(R, R<sup>0</sup>-phenyl)-N-(R<sup>1</sup>, R<sup>2</sup>-phenyl)amino]pyromellitide having the formula

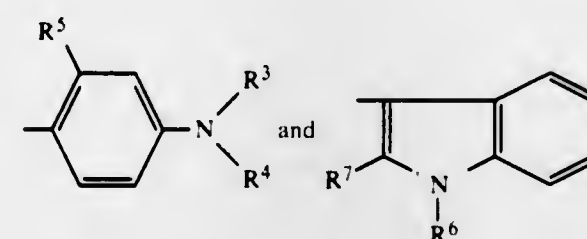


and 3,5-bis(Y)-3,5-bis[N-(R, R<sup>0</sup>-phenyl)-N-(R<sup>1</sup>, R<sup>2</sup>-phenyl)amino]pyromellitide having the formula



and mixtures thereof wherein:

R, R<sup>0</sup>, R<sup>1</sup> and R<sup>2</sup> are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, C<sub>1</sub> to C<sub>4</sub> alkoxy, non-tertiary C<sub>1</sub> to C<sub>9</sub> alkyl, COOZ and NZ<sup>1</sup>Z<sup>2</sup> where Z and Z<sup>1</sup> are hydrogen or non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl and Z<sup>2</sup> is hydrogen, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl, C<sub>5</sub> to C<sub>7</sub> cycloalkyl, C<sub>1</sub> to C<sub>4</sub> alkanoyl, phenylsulfonyl or phenylsulfonyl substituted by non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl; Y is a radical selected from the group consisting of



in which

R<sup>3</sup> and R<sup>4</sup> are the same or different and are selected from the group consisting of non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl, benzyl, and benzyl substituted by one or two of halo, C<sub>1</sub> to C<sub>4</sub> alkyl, C<sub>1</sub> to C<sub>4</sub> alkoxy or nitro; R<sup>5</sup> is selected from the group consisting of hydrogen, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl, halo and C<sub>1</sub> to C<sub>4</sub> alkoxy; R<sup>6</sup> is selected from the group consisting of hydrogen and non-tertiary C<sub>1</sub> to C<sub>12</sub> alkyl; and R<sup>7</sup> is selected from the group consisting of hydrogen, non-tertiary C<sub>1</sub> to C<sub>4</sub> alkyl and phenyl.

wherein R<sup>3</sup> and R<sup>7</sup> are a dialkyl or cycloalkyl disubstituted amino group, hydrogen, or hydroxy group, provided that at least one of R<sup>3</sup> and R<sup>7</sup> is an amino group, R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>8</sup> are hydrogen, an alkoxy group, or two of these substituents together form an aromatic ring, provided that R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may be the same or different, and R<sup>5</sup>, R<sup>6</sup> and R<sup>8</sup> may be the same or different, and Y<sup>-</sup> is an acidic anion.

4,417,060

# AMINO-SUBSTITUTED 2-CUMARYL-(3)-CHROMENYLUM SALTS

Peter Czerney, Weimar; Horst Hartmann, and Jürgen Liebscher, both of Dresden, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Mar. 26, 1981, Ser. No. 247,954

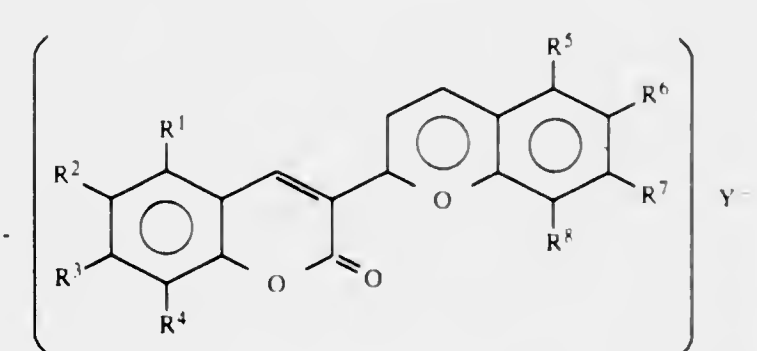
Claims priority, application German Democratic Rep., Apr. 1, 1980, 220109

Int. Cl.<sup>3</sup> C07D 405/14

U.S. Cl. 548—525

11 Claims

1. Amino-substituted 2-cumaryl-3'-chromenylum salt of the formula



wherein R<sup>3</sup> and R<sup>7</sup> are a dialkyl or cycloalkyl disubstituted amino group, hydrogen, or hydroxy group, provided that at least one of R<sup>3</sup> and R<sup>7</sup> is an amino group, R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>8</sup> are hydrogen, an alkoxy group, or two of these substituents together form an aromatic ring, provided that R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may be the same or different, and R<sup>5</sup>, R<sup>6</sup> and R<sup>8</sup> may be the same or different, and Y<sup>-</sup> is an acidic anion.

4,417,061

# PHOTOINITIATORS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 150,974, May 19, 1980, abandoned, which is a continuation of Ser. No. 13,116, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 833,146, Sep. 14, 1977, Pat. No. 4,161,478, which is a continuation-in-part of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Nov. 13, 1981, Ser. No. 320,996

Int. Cl.<sup>3</sup> C07F 9/80

U.S. Cl. 549—3

11 Claims

1. A sulfonium or selenium salt having an MF<sub>6</sub> anion, where M is selected from the class consisting of phosphorus, arsenic and antimony, where the valence of the sulfonium or selenium salt cation is satisfied by a C<sub>(6-12)</sub> arylacyl radical and a divalent aliphatic radical.



**4,417,062**  
**THIO-BIS-(ALKYL LACTONE ACID ESTERS) AND**  
**THIO-BIS-(HYDROCARBYL DIACID ESTERS) ARE**  
**USEFUL ADDITIVES FOR LUBRICATING**  
**COMPOSITIONS**

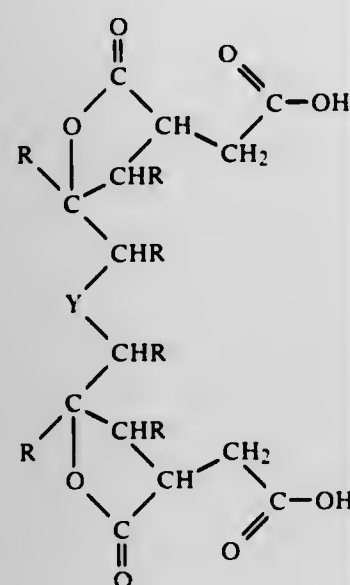
Stanley J. Brois, Westfield, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 954,051, Oct. 23, 1978, Pat. No. 4,239,636, which is a continuation-in-part of Ser. No. 768,265, Feb. 14, 1977, Pat. No. 4,123,373, and a continuation-in-part of Ser. No. 806,326, Jun. 13, 1977, Pat. No. 4,167,514, which is a division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Jul. 25, 1980, Ser. No. 173,299  
 Int. Cl.<sup>3</sup> C07D 307/32

U.S. Cl. 549—320

6 Claims

1. Thio-bis-(C<sub>4</sub>-C<sub>10,000</sub> alkyl lactone acid) being a compound of the formula



wherein R is selected for the group consisting of hydrogen, hydrocarbyl and substituted hydrocarbyl containing 1 to 10,000 carbon atoms, at least one R having at least 4 carbons, Y is selected from the group consisting of S, S—S, S=O, SO<sub>2</sub>, Se, S—(CH<sub>2</sub>)<sub>2</sub>S— where z is a number from 2-10.

**4,417,063**  
**PROCESS FOR PREPARATION OF**  
**6,11-DIHYDRO-11-OXODIBENZ[B,E]OXEPINACETIC**  
**ACIDS**

Thomas B. K. Lee, Whitehouse Station; George E. Lee, Somerville, and Gregory M. Jobin, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

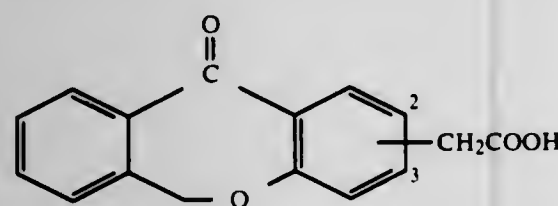
Filed May 18, 1981, Ser. No. 264,482

Int. Cl.<sup>3</sup> C07D 313/12

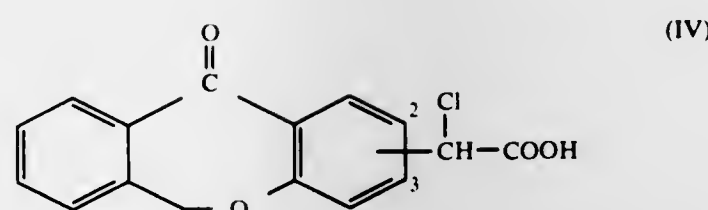
U.S. Cl. 549—354

10 Claims

1. A process for the preparation of a compound having the formula



wherein the -CH<sub>2</sub>COOH moiety is in the 2- or 3-position, said process comprising reacting a compound of the formula



in solution in an organic solvent with at least one equivalent of hydrogen as a reducing agent, in the presence of a palladium on carbon catalyst and a sufficient amount of a molecular sieve capable of scavenging HCl formed during reaction.

**4,417,064**  
**BIPHENYL COMPOUNDS AND METHOD OF**  
**PREPARING SAME**

Avinash C. Mehta, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

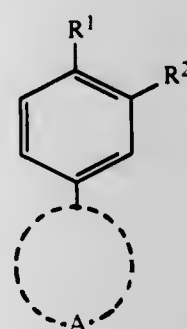
Continuation-in-part of Ser. No. 222,682, Jan. 5, 1981, abandoned. This application Oct. 22, 1981, Ser. No. 313,944

Int. Cl.<sup>3</sup> C07D 309/12; C07C 69/07; 43/205

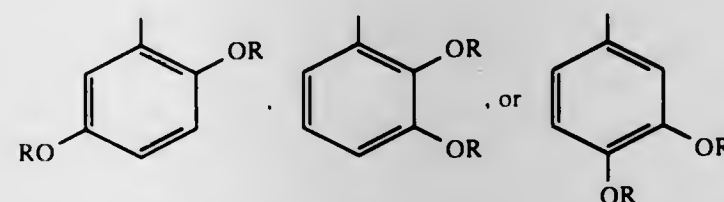
U.S. Cl. 549—415

16 Claims

1. A compound of the formula



wherein one of R<sup>1</sup> and R<sup>2</sup> is hydrogen and the other is CH<sub>3</sub>, mX<sub>m</sub> wherein X is chloro or bromo and m is an integer one or two, and the cyclic moiety A is a -2,5-; -2,3-; or -3,4-di-OR-l-phenyl moiety of the formula



wherein R is a hydroxy-protecting group capable of removal so as to regenerate the hydroxy group.

**4,417,065**  
**PROCESS FOR THE PREPARATION OF ISOSORBIDE**  
**2-NITRATE**

(V) Peter Stoss, Illertissen, Fed. Rep. of Germany, assignor to Heinrich Mack Nachf. Chem.-Pharmazeutische Fabrik, Illertissen, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,124

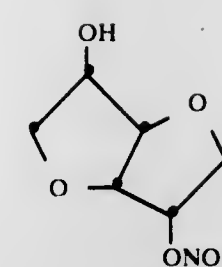
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124410

Int. Cl.<sup>3</sup> C07D 493/04

U.S. Cl. 549—464

9 Claims

1. A process for the preparation of isosorbide-2-nitrate of the formula



comprising:

- contacting isosorbide with 1 to 2 mole equivalents of carboxylic acid anhydride in the presence of 0.005 to 0.02 mole equivalents of a salt of a metal ion selected from groups 2, 3, 4, 5 or 8 of the periodic system;
- esterifying the resultant isosorbide-5-acylate with nitric acid; and
- converting the resultant isosorbide-5-acylate-2-nitrate to isosorbide-2-nitrate by treatment with an alkyl alcohol having from 1 to 3 carbon atoms in the presence of an alkali metal alcoholate of 1 to 3 carbon atoms.

**4,417,066**  
**SILOXANE QUATERNARY AMMONIUM SALT**  
**PREPARATION**

Stephen Westall, Barry, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed Sep. 22, 1982, Ser. No. 421,619

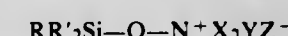
Claims priority, application United Kingdom, Oct. 3, 1981, 8129914

Int. Cl.<sup>3</sup> C07F 7/10

U.S. Cl. 556—425

6 Claims

1. A process for the preparation of organosiloxanes which comprises reacting together (A) a silanol-terminated polydiorganosiloxane wherein at least 50 percent of the total substituents are methyl groups, any remaining organic substituents being monovalent hydrocarbon or fluorinated hydrocarbon groups having from 2 to 20 carbon atoms, and (B) an organosilane represented by the general formula



wherein R represents a group selected from alkyl groups having from 1 to 5 carbon atoms, the phenyl group, a vinyl group and groups as defined for R', each R' represents independently a group having less than 9 carbon atoms selected from alkoxy groups and alkoxyalkoxy groups, Q represents a divalent group having from 1 to 18 carbon atoms the said group being composed of carbon, hydrogen and, optionally, oxygen, any oxygen present being in the form of ether linkages, hydroxyl groups, or both, each X represents independently a group having from 1 to 12 carbon atoms selected from alkyl, aryl, alkyl and alkaryl groups Y represents a monovalent hydrocarbon group having from 1 to 22 carbon atoms or the group (—OM)<sub>n</sub>OD, wherein M represents an alkylene group having 2 or 3 carbon atoms, a has a value of from 1 to 20 and D represents a hydrogen atom, an alkyl group or an acyl group, and Z represents a halogen atom.

**4,417,067**  
**METHOD OF CLEAVING ORGANOSILOXANES**

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Dec. 3, 1982, Ser. No. 446,756

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151677

Int. Cl.<sup>3</sup> C07F 7/08, 7/12

U.S. Cl. 556—467

10 Claims

1. A method of cleaving a liquid mono- and bifunctional organosiloxane of the formula (R<sub>3</sub>Si)<sub>2</sub>O or having [R<sub>2</sub>SiO]<sub>x</sub> units wherein each R represents an identical or different aryl, alkyl, alkenyl, halogen or aryl substituted alkyl, or halogen or

aryl substituted alkenyl; and x is the degree of polymerization; by using hydrogen chloride as the cleaving agent and with the formation of organochlorosilanes;

comprising the steps of  
 reacting the hydrogen chloride with the organosilane at temperatures below 20° C. and at atmospheric pressure;  
 allowing the hydrogen chloride hydrates formed by the reaction to settle as a bottom liquid phase; and removing the bottom liquid phase from the system.

**4,417,068**  
**PROCESS FOR THE ADDITION OF ORGANIC SILICON**  
**COMPOUNDS WITH SIH GROUPS TO COMPOUNDS**  
**WITH OLEFINIC DOUBLE BONDS**

Hans-Joachim Kollmeier, Essen, and Rolf-Dieter Langenhagen, Hattingen Niederwienigern, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,326

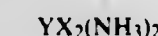
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133869

Int. Cl.<sup>3</sup> C07F 7/08, 7/10, 7/18

U.S. Cl. 556—479

7 Claims

1. In a process for the addition of silanes or siloxanes having SiH groups and are free of substituents which, after splitting off from the silicon atom, act as proton acceptors, to compounds with olefinic double bonds in the presence of an effective amount of a catalyst of the platinum group, the improvement which comprises said catalysts having the general formula



in which

Y is a platinum or palladium radical, and

X is a chlorine, bromine, iodine or the NO<sub>2</sub> group.

**4,417,069**  
**METHOD OF PREPARING**  
**β-PHENYLETHYLCHLOROSILANES**

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,115

Int. Cl.<sup>3</sup> C07F 7/08

U.S. Cl. 556—479

25 Claims

1. A method for producing β-phenylethylchlorosilanes comprising forming a mixture of styrene, a chlorosilane having at least one hydrogen atom bonded to silicon, a platinum metal or platinum metal complex catalyst and an amount of tertiary amine effective for causing formation of β-phenylethylchlorosilane isomer, and heating the mixture in order to effect addition of the chlorosilane to styrene.

**4,417,070**  
**PROCESS FOR PREPARING AN OPTICAL ACTIVE**  
**ESTER OF NAPHTHYLPROPIONIC ACID**

Kazutaka Arai, Yoshio Ohara, Yasuo Takakuwa, and Toyoko Iizumi, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 367,044

Claims priority, application Japan, Apr. 15, 1981, 56-731

Int. Cl.<sup>3</sup> C07B 19/00

U.S. Cl. 560—56

11 Claims

1. A process for preparing an optical active alkyl ester of α-(6-methoxynaphth-2-yl)propionic acid, which comprises dissolving in at least one organic solvent which is not directly involved in the reaction a racemic modification of an alkyl ester of α-(6-methoxynaphth-2-yl)propionic acid or a mixture containing one of the optical isomers in an amount greater than the other, and seeding seed crystals of one of the optical isomers to effect crystallization for optical resolution.



4,417,071

## PHENOLS USEFUL AS STABILIZERS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

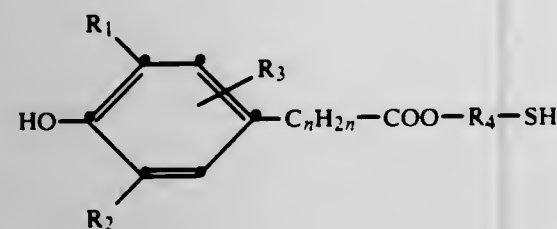
Continuation of Ser. No. 127,015, Mar. 4, 1980, abandoned. This application Mar. 11, 1982, Ser. No. 357,248

Int. Cl.<sup>3</sup> C07C 69/88

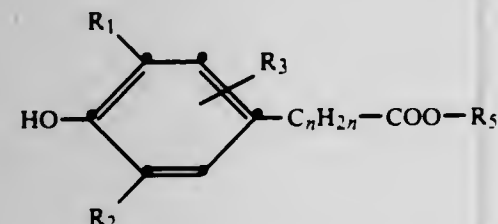
U.S. Cl. 560—67

8 Claims

1. A process for the manufacture of a phenol of the formula I



wherein R<sub>1</sub> is alkyl of 1 to 18 carbon atoms, cycloalkyl, phenyl, aralkyl or chlorine, R<sub>2</sub> is hydrogen or has the same meaning as R<sub>1</sub>, R<sub>3</sub> is hydrogen or alkyl of 1 to 12 carbon atoms, R<sub>4</sub> is alkylene of 2 to 18 carbon atoms which is unsubstituted or substituted by aryl or hydroxyl, and n is an integer from 0 to 4, which process comprises transesterifying a compound of the formula II



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are as defined for formula (I) and R<sub>5</sub> is alkyl of 1 to 4 carbon atoms, with a mercapto alcohol of the formula



wherein R<sub>4</sub> is as defined for formula (I), in the presence of a catalyst of the formula (R<sub>6</sub>O)<sub>3</sub>M, wherein R<sub>6</sub> represents alkyl radicals of 1 to 18 carbon atoms which can be the same or different, aryl or aralkyl, and M is an element selected from the group consisting of Ti, Ge, Zr, Sn or V.

4,417,072

## HYDROQUINONE DERIVATIVES AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Stephen R. Postle, Brentwood; Patrick D. P. Thomas, Chelmsford, and Brian R. D. Whitear, Brentwood, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sep. 29, 1981, Ser. No. 306,846

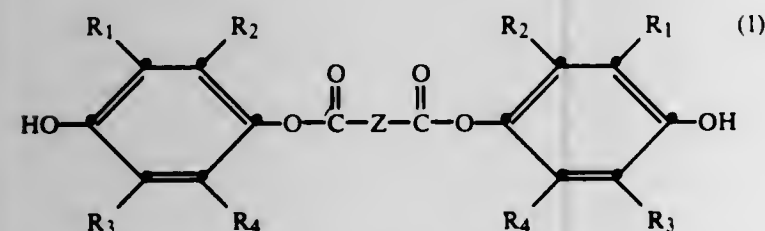
Claims priority, application United Kingdom, Oct. 2, 1980, 8031742

Int. Cl.<sup>3</sup> C07C 69/80, 69/82

U.S. Cl. 560—86

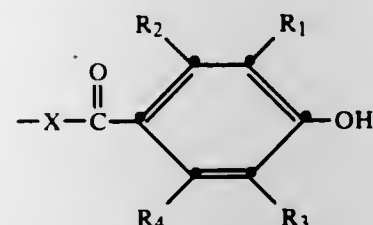
6 Claims

1. A substituted hydroquinone compound of formula



wherein R<sub>1</sub> to R<sub>4</sub> are each hydrogen or alkyl having from 1 to 4 carbon atoms, Z is an aromatic ring selected from the group consisting of furylene, thienylene, pyrrolylene, pyridinylene or 1,2- or 1,4-phenylene or is a group Z—Y—Z wherein Z is an

aromatic ring as defined above and Y is —SO<sub>2</sub>—, —SO—, —CO— or a group of the formula —PO—A, wherein A is alkyl or alkoxy each having 1 to 4 carbon atoms, phenyl, phenoxy or a group of the formula



wherein R<sub>1</sub> to R<sub>4</sub> and Z are as defined above.

4,417,073

## PROCESS FOR THE PREPARATION OF SUBSTITUTED ACETIC ACIDS AND DERIVATIVES THEREOF

Otto Ackermann, Troisdorf, and Gerhard Daum, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel A.G., Troisdorf, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,929

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045102

Int. Cl.<sup>3</sup> C07C 69/76

U.S. Cl. 560—105

15 Claims

1. A process for the preparation of substituted acetic acids and derivatives thereof, having the formula



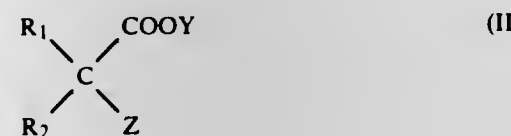
wherein

X is —COOH, —COOY or —CN,

Y is —CH<sub>3</sub> or —C<sub>2</sub>H<sub>5</sub>,

R<sub>1</sub> is a saturated, branched or unbranched aliphatic radical having from 1 to 6 carbon atoms, a phenyl radical, or a phenyl radical substituted by alkyl or alkoxy groups, and R<sub>2</sub> is hydrogen or a saturated, branched or unbranched aliphatic radical having from 1 to 6 carbon atoms, a phenyl radical, or a phenyl radical substituted by alkyl or alkoxy groups.

wherein R<sub>1</sub> and R<sub>2</sub> may be the same or different which process comprises converting the corresponding malonic or cyanoacetic ester of the formula



wherein

Z is —COOY or —CN, and

Y, R<sub>1</sub> and R<sub>2</sub> are identified as above, at a temperature ranging from 150° C. to 360° C. in the presence of a catalyst essentially free of heavy metals except for small amounts of iron oxide impurities and comprising substances of an oxidic or siliceous nature containing at least one of the elements Si and Al.

4,417,074

## ALLYLAMINES FROM ALLYL ALCOHOL

Randall J. Daughenbaugh, Longmont, Colo., and Dale D. Dixon, Kutztown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 22, 1981, Ser. No. 313,895

Int. Cl.<sup>3</sup> C07C 85/06

U.S. Cl. 564—479

17 Claims

1. A process for preparing allylic amines comprising: contacting an allylic alcohol of the formula CH<sub>2</sub>=C(R)—CH<sub>2</sub>OH wherein R is hydrogen or methyl with ammonia or an organic amine of the formula R<sub>1</sub>R<sub>2</sub>NH wherein R<sub>1</sub> and R<sub>2</sub> represent hydrogen or a lower C<sub>1</sub>—C<sub>5</sub> hydrocarbyl group in the presence of a catalytically effective amount of a phosphorus containing substance which is not a phosphorus containing ligand complexed with a metal at a temperature sufficient to effect a reaction between the allylic alcohol and the ammonia or organic amine to produce an allylic amine.

4,417,075

## DI-(SECONDARY AND TERTIARYALKYLAMINOALKOXY)ALKANES

Eugene L. Stogryn, Edison, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

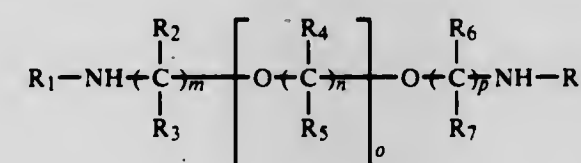
Filed Jan. 18, 1982, Ser. No. 339,899

Int. Cl.<sup>3</sup> C07C 93/04; B01D 53/54

U.S. Cl. 564—505

13 Claims

1. A di-secondary aminoether of the general formula:



wherein R<sub>1</sub> and R<sub>8</sub> are each independently selected from the group consisting of primary alkyl having 1 to 8 carbon atoms and primary hydroxyalkyl radicals having 2 to 8 carbon atoms, secondary alkyl and secondary hydroxyalkyl having 3 to 8 carbon atoms, tertiary alkyl and tertiary hydroxyalkyl, cycloalkyl and hydroxycycloalkyl radicals having 3 to 8 carbon atoms, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are each independently selected from the group consisting of hydrogen, C<sub>1</sub>—C<sub>4</sub> alkyl and hydroxyalkyl radicals, with the proviso that R<sub>2</sub>, R<sub>3</sub>, R<sub>6</sub> and R<sub>7</sub> bonded to the carbon atoms directly bonded to the nitrogen atoms are C<sub>1</sub>—C<sub>4</sub> alkyl or hydroxyalkyl radicals when R<sub>1</sub> and R<sub>8</sub> are primary alkyl or primary hydroxyalkyl radicals and that at least one of R<sub>2</sub> or R<sub>3</sub> and R<sub>6</sub> or R<sub>7</sub> bonded to the carbon atoms directly bonded to the nitrogen atoms are C<sub>1</sub> to C<sub>4</sub> alkyl or hydroxyalkyl radicals when R<sub>1</sub> and R<sub>8</sub> are secondary alkyl, secondary hydroxyalkyl, or cycloalkyl or hydroxycycloalkyl radicals, m, n and p are positive integers ranging from 2 to 4, and o is either zero or a positive integer ranging from 1 to 10.

4,417,076

## CATALYST AND PROCESS FOR DEHYDROGENATION OF OXYGEN-CONTAINING DERIVATIVES OF THE CYCLOHEXANE SERIES INTO CORRESPONDING CYCLIC KETONES AND/OR PHENOLS

Alexandr Y. Rozovsky, Rublevskoe shosse, 97, korpus 3, kv. 25; Valentin D. Stytsenko, ulitsa Musy Dzhaliya, 34, korpus 2, kv. 18; Svetlana A. Nizova, ulitsa Volgina, 27, kv. 144; Petr S. Belov, ulitsa Vavilova, 52, korpus 3, kv. 163, and Alexandr J. Dyakonov, ulitsa Begovaya, 32, kv. 71, all of Moscow, U.S.S.R.

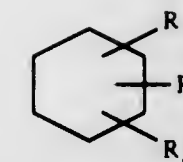
Division of Ser. No. 223,073, Jan. 7, 1981, Pat. No. 4,363,750. This application Aug. 9, 1982, Ser. No. 406,131

Int. Cl.<sup>3</sup> C07C 45/00, 37/06

U.S. Cl. 568—361

2 Claims

1. A process for dehydrogenation of oxygen-containing derivatives of the cyclohexane series of the formula:



wherein R<sub>1</sub> is a radical selected from the group consisting of hydrogen and C<sub>1</sub>—C<sub>4</sub> alkyls; R<sub>2</sub> and R<sub>3</sub> are radicals selected from the group consisting of —H, —OH and —O, R<sub>2</sub> and R<sub>3</sub> being not simultaneously hydrogen, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> being attached to different carbon atoms of the cycle, into corresponding cyclic organic compounds selected from the group consisting of cyclic ketones, phenols and mixtures thereof comprising contacting said oxygen-containing derivatives of the cyclohexane series of the above formula with a catalyst comprising an active component—nickel, a promoter selected from the group consisting of germanium, lead and mixtures of both, and an inert carrier selected from the group consisting of silica, kieselguhr, silicon carbide and magnesium oxide, the components being present in the catalyst composition in the following proportions, percent by weight:

nickel	15 to 55
promotor	0.2 to 8.0
inert carrier	84.8 to 37.0

and an atomic ratio between nickel and the promoter is from 15:1 to 410:1 respectively; said contacting being effected in the presence of a diluent selected from the group consisting of inert gases, C<sub>1</sub>—C<sub>4</sub> aliphatic hydrocarbons, nitrogen, carbon dioxide, steam, aliphatic C<sub>1</sub>—C<sub>3</sub> alcohols and different combinations thereof, at a temperature within the range of from 160° to 340° C., under a partial pressure of oxygen-containing derivatives of the cyclohexane series of from 0.003 to 0.1 atm and feed rates of said oxygen-containing derivatives of the cyclohexane series and the diluent equal to 0.5–5.0 kg/l.hr and 1–53 m<sup>3</sup>/l.hr respectively.

4,417,077

## HETEROGENEOUS ANIONIC TRANSITION METAL CATALYSTS

Russell S. Drago, Champaign, Ill., and Anton El A'mma, Bensalem, Pa., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 192,793, Oct. 1, 1980, Pat. No. 4,328,125, which is a continuation of Ser. No. 38,551, May 14, 1979, abandoned. This application Jan. 26, 1982, Ser. No. 342,689

Int. Cl.<sup>3</sup> C07C 45/50

U.S. Cl. 568—454

6 Claims

1. In a process for the catalytic hydroformylation of an olefin to produce the corresponding aldehyde or alcohol which comprises the reaction of an olefinic compound with carbon monoxide and hydrogen at elevated temperatures and pressures in the presence of a transition metal-containing catalyst, the improvement which comprises employing as said catalyst a heterogeneous anionic transition metal catalyst containing a catalytically effective amount of an anionic species having the formula



where M is selected from the transition metal block consisting of rhodium, cobalt, ruthenium, osmium, iridium, and iron; X is an anionic ligand selected from the group consisting of halide, hydride, and alkyl; n ranges from 1 to 12; m ranges from 1 to 34; p ranges from 0 to 2n+1 with the proviso that when n is 1, p is at least 1; and z integer charge ranging from 1 to 5; said anionic species being ionically bound to an insoluble cross-linked anion exchange resin containing a bound quarternary ammonium cation.



4,417,078

## PROCESS FOR PRODUCING

## (+)4-SUBSTITUTED-2-INDANOLS

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

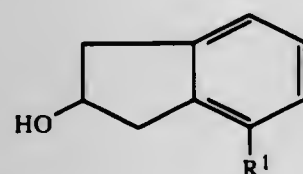
Division of Ser. No. 221,656, Dec. 31, 1980, Pat. No. 4,333,950, and a continuation-in-part of Ser. No. 42,372, May 24, 1979, which is a continuation of Ser. No. 927,198, which is a continuation of Ser. No. 870,973. This application May 17, 1982, Ser. No. 378,935

Int. Cl.<sup>3</sup> C07C 33/34

U.S. Cl. 568—808

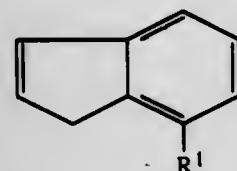
5 Claims

1. A process for producing a 4-substituted-2-indanol of the formula



wherein R¹ is phenyl which may be substituted with halogen or lower alkyl, and the isomer of S configuration at C-2 of the indanyl ring is present in an enantiomeric excess of at least 25% over the isomer of R configuration, which comprises

- (i) bringing together (+)- $\alpha$ -pinene and borane in the presence of an ether solvent and at a temperature in the range of about  $-50^{\circ}$  to  $35^{\circ}$  C., about 2 to 4 moles of (+)- $\alpha$ -pinene being used for each mole of borane employed, to produce an intermediate borane derivative having at least one active hydrogen atom,
- (ii) contacting the intermediate borane derivative with a 7-substituted-1H-indene of the formula



wherein R¹ is as defined above, in the presence of an ether solvent and at a temperature in the range of about  $-50^{\circ}$  to  $35^{\circ}$  C., so as to cause the indene to undergo a hydroboration reaction, and

- (iii) contacting the product of step (ii) with hydrogen peroxide in the presence of water and a base selected from sodium hydroxide and potassium hydroxide to produce the 4-substituted-2-indanol of formula Ia.

4,417,079

## PROCESS FOR PRODUCING NORMAL-OCTANOL

Noriaki Yoshimura, and Masuhiko Tamura, both of Okayama, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Feb. 10, 1982, Ser. No. 347,558

Claims priority, application Japan, Feb. 16, 1981, 56-21695

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C07C 31/125, 29/17

U.S. Cl. 568—903

15 Claims

1. A process for producing n-octanol which comprises the steps of:

- (i) reacting butadiene with water in a solution containing 25–55 wt % water, 5–30 wt % of a carbonate and/or bicarbonate salt of a monodentate tertiary amine having a basicity constant (pK<sub>a</sub>) of not less than 7, and 30–65 wt % of sulfonate based on the reaction mixture, in the presence of a palladium compound and a hydrophilic monodentate phosphine in an amount of at least 6 moles per gram atom of palladium, to form 2,7-octadien-1-ol;
- (ii) extracting 2,7-octadien-1-ol from at least part of the

reaction mixture obtained in step (i) with a saturated aliphatic hydrocarbon, a monoolefinic hydrocarbon or an alicyclic hydrocarbon, and recycling the extraction residue to the 2,7-octadien-1-ol synthesis step (i);

- (iii) subjecting the extract layer containing 2,7-octadien-1-ol as obtained in step (ii) to distillation at a liquid phase temperature of not higher than about  $100^{\circ}$  C. to distill off a large proportion of the extracting solvent therefrom, followed by distillation in the presence of water, whereby the extracting solvent remaining is distilled off in the form of an azeotropic mixture with water, to obtain a distillation residue;
- (iv) recovering 2,7-octadien-1-ol from the distillation residue obtained in step (iii) by distillation;
- (v) hydrogenating the 2,7-octadien-1-ol obtained in step (iv) in the presence of a hydrogenation catalyst to obtain n-octanol; and
- (vi) recovering n-octanol from the hydrogenation reaction mixture by distillation.

4,417,080

SOLVENT MODIFICATION OF NITRATIONS BY N<sub>2</sub>O<sub>4</sub>/METAL ACETYLACETONATE SYSTEMS

David S. Ross, Palo Alto; Robert M. Johnson, Jr., San Mateo, and Ripudaman Malhotra, Menlo Park, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 10, 1982, Ser. No. 386,857

Int. Cl.<sup>3</sup> C07C 79/10

U.S. Cl. 568—939

16 Claims

1. In a process for the nitration of an aromatic hydrocarbon, the method for mononitrating benzene which comprises reacting benzene with nitrogen tetroxide in an inert organic solvent containing an effective amount of a metal acetylacetonate at a temperature sufficient to effect nitration.

4,417,081

## SELECTIVE 2-CHLORINATION OF META-DIHALOBENZENES

Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Sep. 30, 1982, Ser. No. 428,451

Claims priority, application France, Oct. 2, 1981, 81 18585

Int. Cl.<sup>3</sup> C07C 17/12

U.S. Cl. 570—147

21 Claims

1. A process for the selective 2-chlorination of a meta-dihalobenzene, comprising reacting such meta-dihalobenzene with a chlorine donor in the presence of at least one alkali metal amide and at least one compound which complexes the cation of such at least one alkali metal amide.

4,417,082

## THERMAL TREATMENT OF OLEFIN OLIGOMERS VIA A BORON TRIFLUORIDE PROCESS TO INCREASE THEIR MOLECULAR WEIGHT

John M. Larkin, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,740

Int. Cl.<sup>3</sup> C10L 1/16

U.S. Cl. 585—10

29 Claims

1. A process for oligomerizing mono olefins comprising a. contacting a mixture of alpha mono olefins which consists essentially of

- (1) greater than 50 weight percent of at least one low molecular weight alpha olefin having 4 to 6 carbon atoms and
  - (2) less than 50 weight percent of at least one higher molecular weight alpha olefin having 8 to 18 carbon atoms,
- with a catalyst comprising boron trifluoride at a temperature between about  $25^{\circ}$  C. and  $60^{\circ}$  C., and

- b. subsequently holding the resulting mixture for at least two hours at a temperature between about  $60^{\circ}$  and  $150^{\circ}$  C.

4,417,083

## PROCESS FOR THE DEHYDROCYCLIZATION OF PARAFFINS AT LOW PRESSURE

Jean-Rene Bernard, Serezin du Rhone, and Michele Breyse, Villeurbanne, both of France, assignors to Elf France, Paris, France

Continuation of Ser. No. 256,087, Apr. 21, 1981, abandoned.

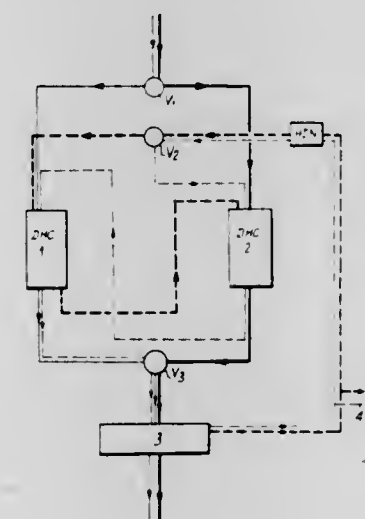
This application Dec. 21, 1982, Ser. No. 451,753

Claims priority, application France, May 9, 1980, 80 10411

Int. Cl.<sup>3</sup> C10C 5/24, 5/30

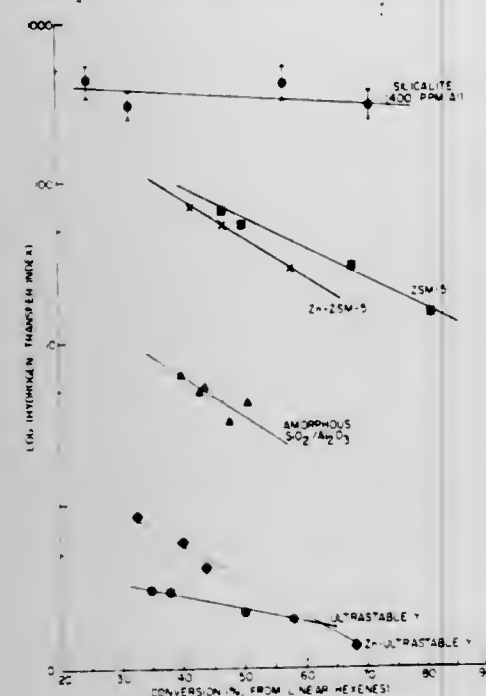
U.S. Cl. 585—419

8 Claims





lated between said first part and said second part, such that at least part of said olefins are oligomerized in said



first part and at least part of the olefin oligomers so produced are stripped from said catalyst in said second part.

4,417,087

## FLUIDIZED OLIGOMERIZATION

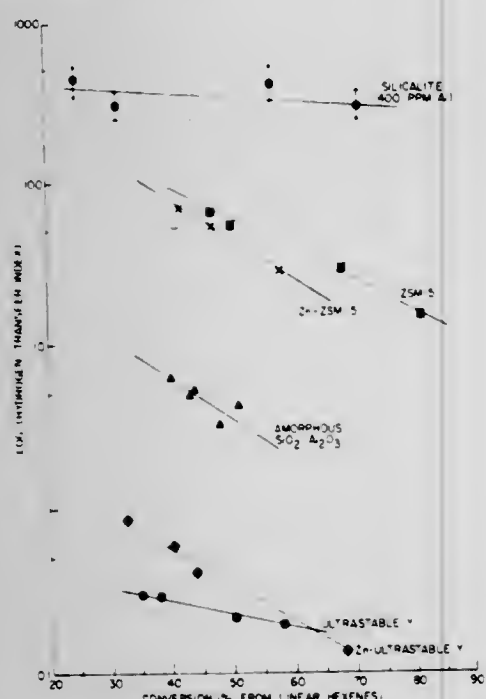
Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 30, 1982, Ser. No. 373,479

Int. Cl.<sup>3</sup> C07C 2/02

U.S. Cl. 585—530

15 Claims



1. A process for oligomerizing olefins comprising:
  - (a) fluidizing a fluidizable oligomerization catalyst comprising an essentially aluminum-free intermediate pore size siliceous crystalline molecular sieve having a silica:alumina mole ratio greater than about 200:1 with a feed including gaseous olefins in an oligomerization reaction zone; and
  - (b) converting at least 30% of said gaseous olefins to higher boiling olefins by maintaining oligomerization reaction zone at oligomerization conditions including a temperature of less than 400° C. and a gas hourly space velocity of said feed sufficient to fluidize at least a portion of said catalyst.

4,417,088

## OLIGOMERIZATION OF LIQUID OLEFINS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,678

Int. Cl.<sup>3</sup> C07C 2/02

U.S. Cl. 585—533

17 Claims

1. A process for oligomerizing alkenes, comprising:
  - (a) contacting under oligomerization conditions a feed comprising one alkene which is a liquid under said oligomerization conditions with a catalyst comprising an intermediate pore size siliceous crystalline molecular sieve substantially free of hydrogen transfer activity selected from silicalite, an organosilicate disclosed in Ser. No. RE 29,948 and CZM; and
  - (b) recovering an effluent comprising oligomerized alkene.

4,417,089

## HYDROISOMERIZATION

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1982, Ser. No. 413,646

Int. Cl.<sup>3</sup> C07C 5/25

U.S. Cl. 585—670

6 Claims

1. A process for converting terminal olefins to internal olefins comprising contacting at least one terminal olefin reactant with a catalyst in the presence of hydrogen wherein the catalyst consists essentially of
  - (a) a palladium component,
  - (b) a cerium component, and
  - (c) alumina.

4,417,090

## PROCESS FOR THE ISOMERIZATION OF PARAFFINS

Jacobus J. L. Heijerman, and Martin F. M. Post, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 430,470

Claims priority, application Netherlands, Nov. 2, 1981, 8104950

Int. Cl.<sup>3</sup> C07C 5/24, 5/30

U.S. Cl. 585—739

10 Claims

1. A process for the isomerization of paraffins, wherein one or more paraffins containing 4-7 carbon atoms is/are contacted with a catalyst in the presence of hydrogen, at a temperature between 150° and 330° C., which catalyst has been prepared by treating an at least partly crystalline metal silicate having a space lattice largely consisting of a triplex structure, containing in the central layer octahedral co-ordinated aluminum entirely or partly substituted by nickel and/or cobalt; and in the two outer layers tetrahedral co-ordinated silicon partly substituted by aluminum, with hydrogen at a temperature of at least 400° C.

4,417,091

## PROCESS FOR REMOVING FLUORINE FROM OLEFIN OLIGOMERS

Jean Gaillard, Lyons, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 29, 1982, Ser. No. 373,182

Claims priority, application France, Apr. 29, 1981, 81 08760

Int. Cl.<sup>3</sup> C07C 7/12

U.S. Cl. 585—823

6 Claims

1. A process for removing fluorine from a liquid olefin or from a liquid olefinic cut obtained by dimerizing or trimerizing at least one monoolefin having from 2 to 4 carbon atoms, in the presence of a catalyst obtained by contacting a bivalent nickel compound with a hydrocarbyl aluminum halide and trifluoroacetic acid, said process comprising percolating said olefin or olefinic cut through silica gel at an hourly flow rate of 0.1 to 100 volumes of said olefin or olefinic cut per volume of said silica gel and at a temperature of from -20° to +80° C.

## ELECTRICAL

4,417,092

## SPUTTERED PIN AMORPHOUS SILICON SEMI-CONDUCTOR DEVICE AND METHOD THEREFOR

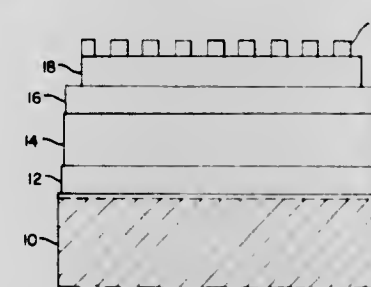
Theodore D. Moustakas, Berkeley Heights, and Robert A. Friedman, Milford, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 16, 1981, Ser. No. 243,754

Int. Cl.<sup>3</sup> H01L 31/06, 31/18

U.S. Cl. 136—258

18 Claims



17. A reactively sputtered hydrogenated amorphous silicon PIN photovoltaic device having increased photo-conversion efficiency and longevity, said device comprising:
  - a substrate having at least a surface region of which comprises an electronconductive material which forms an ohmic contact to n+ doped amorphous silicon;
  - a reactively sputtered layer of n+-doped hydrogenated amorphous silicon deposited on at least said ohmic contact;
  - a layer of intrinsic hydrogenated amorphous silicon, reactively sputtered onto said n+ layer;
  - a layer of p+-doped hydrogenated amorphous silicon ranging in thickness from about 50 to about 150 Angstroms, reactively sputtered onto said intrinsic layer in partial pressures of hydrogen, ranging from about  $5 \times 10^{-4}$  Torr to about  $2 \times 10^{-3}$  Torr, and argon, ranging from about  $3 \times 10^{-3}$  Torr to about  $1.5 \times 10^{-2}$  Torr, said argon containing diborane, B<sub>2</sub>H<sub>6</sub>; and
  - a layer of electroconductive material forming an ohmic contact to said layer of p+-doped amorphous silicon, sputter deposited onto at least a portion of said p+-doped layer, said sputtered layers being strongly adherent to contiguous layers and said substrate, said device having a sunlight conversion efficiency in excess of about three percent and further wherein said substrates are maintained during the sputtering of said layers at a temperature ranging from about 250° C. to about 400° C.

4,417,093

## HIGH VOLTAGE DIRECT CURRENT CABLE WITH IMPREGNATED TAPE INSULATION

Elio Occhini; Gianmario Lanfranconi, both of Milan, and Piero Metra, Varese, all of Italy, assignors to Societa Cavi Pirelli S.p.A., Milan, Italy

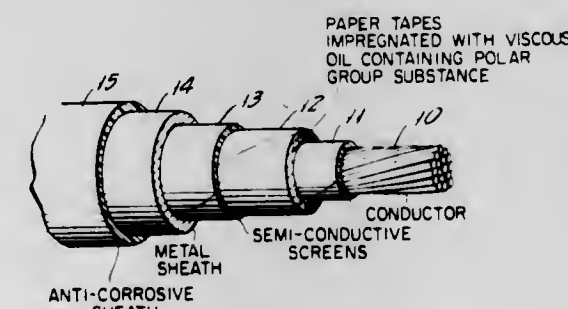
Filed Dec. 4, 1981, Ser. No. 327,353

Claims priority, application Italy, Jan. 14, 1981, 19115 A/81

Int. Cl.<sup>3</sup> H01B 7/14, 9/02, 9/06

U.S. Cl. 174—25 R

14 Claims



1. A direct current, electric, submarine cable for an operat-

ing voltage of at least 200 kilovolts and adapted for use in lengths of at least 100 kilometers and at substantial depths under water, said cable comprising:

- a conductor;
- an inner, semi-conductive screen around, and conductively connected to, said conductor;
- an outer, semi-conductive screen around and spaced from said inner semi-conductive screen;
- a metallic sheath around said outer semi-conductive screen; and
- solid insulation intermediate said inner semi-conductive screen and said outer semi-conductive screen; said insulation comprising insulating material which is impregnated with a compound comprising at least a viscous hydrocarbon oil and at least one substance containing polar groups, said compound having a resistivity in the temperature operating range of the cable at least 100 times lower than the resistivity of said insulating material impregnated with said compound;

said cable being characterized by a voltage breakdown resistance with voids in the insulation which is greater than the voltage breakdown resistance of the same cable without said compound.

4,417,094

## UNDERWATER GAS-INSULATED CABLE WITH PLURAL INTERNAL PRESSURES

Edward M. Spencer, Chalfont, Pa., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed Jun. 21, 1982, Ser. No. 390,274

Int. Cl.<sup>3</sup> H02G 5/06, 9/02; H01B 9/06

U.S. Cl. 174—28

12 Claims



1. A multi-pressure cable for transmission of electrical power at extremely high voltage; said cable comprising an elongated tubular central conductor and an outer coextensive sheath which is concentric with said central conductor and which encloses a gas-filled elongated annular volume; a plurality of support insulators spaced along the length of said cable for supporting said central conductor within said sheath; at least first and second adjacent lengths of said cable each adapted to be disposed in different ambient first and second pressures respectively; gas barrier means extending across said annular volume for isolating the portions of said elongated annular volume which are coextensive with said first and second lengths of said cable respectively; and gas at first and second different internal pressures filling the portions of said annular volume which are coextensive with said first and second lengths respectively; said first internal pressure and said



first ambient pressure each being lower than said second internal pressure and said second ambient pressure respectively.

4,417,095

## SUPPORT MEMBER FOR ELECTRONIC DEVICES

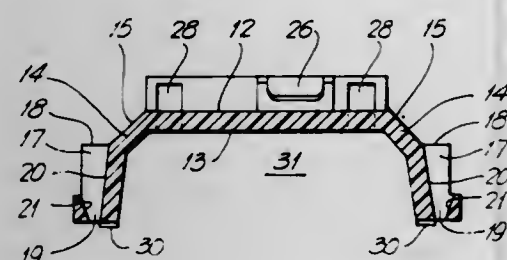
Roger A. Beun, Dunrobin, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 23, 1981, Ser. No. 314,099

Int. Cl.<sup>3</sup> H05K 5/00

U.S. Cl. 174—52 FP

15 Claims



1. A support member for an electronic device, comprising: a flat central web portion; a side member extending along opposite sides of said central web portion; an inclined web connecting a top edge of each side member with the related side of said central web portion, each said inclined web extending upward and inward from the side member to said central web portion; a plurality of slots extending downward from the top edge of each side member; and a plurality of apertures spaced along a bottom edge of each side member, an aperture aligned with each slot.

4,417,096

## METHOD FOR SPLICING A FLAT CONDUCTOR CABLE ENCLOSED WITHIN A SEALED ENVELOPE

Albert D. Willette, Pfafftown, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

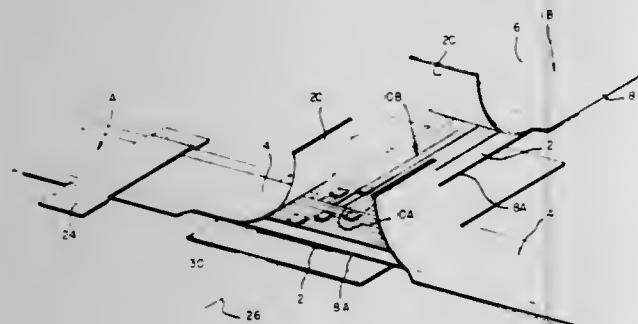
Continuation-in-part of Ser. No. 228,644, Jan. 26, 1981, Pat. No. 4,319,075. This application Jul. 10, 1981, Ser. No. 282,111

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 174—71 R

6 Claims



6. A resealed electrical splice of a first and a second flat cable assembly routed along a floor, in which each assembly includes a flat conductor cable and a metal shield layer within a sealed envelope having a top layer and a bottom layer, characterized in that, side margins of each of the assemblies include openings therein, in the first assembly, the shield layer and the top layer are severed transversely, the cables of the assemblies are spliced by electrical terminals, the bottom layers of the assemblies are interleaved, the shield layers and the top layers of the assemblies are interleaved, electrical terminals connect the interleaved shield layers and the interleaved top layers, and flat lengths of adhesive backed tape reseal the openings in the envelope and secure the assemblies to the floor.

# 4,417,097 HIGH TEMPERATURE, CORROSION RESISTANT COATING AND LEAD FOR ELECTRICAL CURRENT

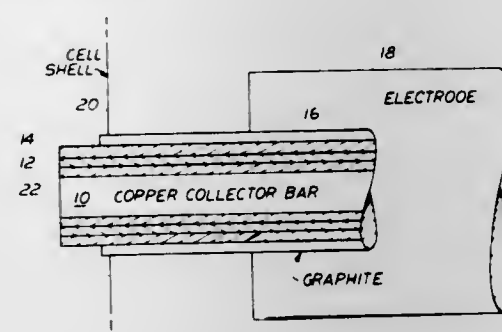
Subodh K. Das, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 4, 1981, Ser. No. 270,509

Int. Cl.<sup>3</sup> H01B 7/02; C25C 7/00; B32B 9/04; H01R 3/00

U.S. Cl. 174—110 A

2 Claims



2. A lead for conducting electrical current to or from an electrolytic cell for making aluminum from aluminum chloride, the lead comprising: an electrically conductive, low electrical resistance lead member adapted to extend into a chamber, the material of the lead member being highly susceptible to corrosive attack by the environment; a layer of steel located on the lead member; a first layer of metal disposed on the steel layer, and having a coefficient of thermal expansion that lies between that of the material of the lead member and that of a metal oxide layer disposed on the first layer; and a layer of metal oxide disposed on the first layer of metal, the metal oxide having (1) a coefficient of thermal expansion somewhat less than the metal layer, and (2) minimum solubility in the chlorine chloride environment, the metal oxide layer being a mixture or combination of any two or all three of the group of oxides consisting of titanium, magnesium and aluminum oxide, the layers of metal and metal oxide being resistant to corrosive attack by the environment and thereby capable of protecting the lead member from the environment.

4,417,098

## METHOD OF REDUCING THE ADAPTION TIME IN THE CANCELLATION OF REPETITIVE VIBRATION

George B. B. Chaplin, Colchester; Andrew R. Powell, Sheffield, and Roderick A. Smith, Colchester, all of England, assignors to Sound Attenuators Limited, Essex, England

PCT No. PCT/GB80/00128, § 371 Date Apr. 16, 1981, § 102(e)

Date Apr. 14, 1981, PCT Pub. No. WO81/00638, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 15, 1980, Ser. No. 253,923

Claims priority, application United Kingdom, Aug. 16, 1979, 7928570

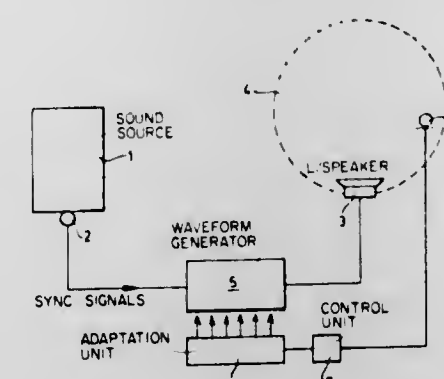
Int. Cl.<sup>3</sup> H04B 15/00

U.S. Cl. 381—94

9 Claims

1. A method of reducing the amplitude of primary vibration pulses received at a selected location from a source of recurring primary vibration, which method comprises feeding specially synthesised pulses of secondary vibration to said location, the generation of the said pulses of secondary vibration being triggered by a signal derived from the source, and the waveform of the said synthesised pulses of secondary vibration being adapted with respect to the time to improve the extent to which the secondary vibration nulls the primary vibration at the said location, characterised in that the time taken to evolve a successful adaption of the pulses of secondary vibration is reduced by monitoring the pulses of residual vibration at the said location which result from interaction between each primary vibration pulse and the respective pulse of secondary

vibration, and effecting the adaption of the waveform of the pulses of secondary vibration on the basis of the amplitude and/or the polarity of a pulse of the residual vibration cycli-



cally sensed in a plurality of successive time intervals, each separate sensing being used in the derived sequence to control the adaption of a different part of the waveform of a subsequent pulse of the secondary vibration.

4,417,099

## ELECTRO-OPTICAL ISOLATOR CIRCUIT FOR LINE POWERED MODEM

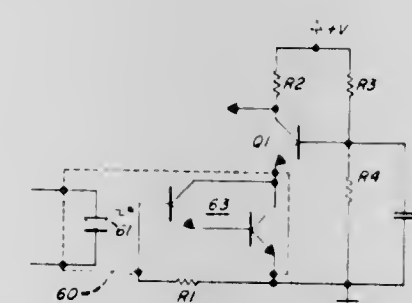
O. Leon Pierce, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Filed Nov. 3, 1980, Ser. No. 203,110

Int. Cl.<sup>3</sup> H03K 3/42

U.S. Cl. 179—2 DP

3 Claims



1. A telephone line powered modem comprising: a transmitter operative in response to binary data from a source to provide modulated data signals to the telephone lines; a receiver operative to provide binary data signals derived from signals received on the telephone line; a power source operative in response to telephone line power to provide operating power for the transmitter and receiver while maintaining the current drawn from the telephone line and the voltage drop across the telephone line within specified limits; output interface means including electro-optic isolators for coupling the binary data signals to be transmitted to the transmitter and for coupling the received binary data signals from the receiver to utilization equipment connected to the modem output, wherein said electro-optical isolators each include: a light emitting diode providing light signals in response to applied binary data signals; a phototransistor pair in light coupling relationship with the light emitting diode and providing a corresponding change in conduction in response to light signals from the light emitting diode; and a common base amplifier including: a bipolar transistor; a collector load connected to the collector of said bipolar transistor for developing an output signal thereacross; the emitter of said bipolar transistor being connected to said phototransistor which produces a change in the emitter

4,417,100

## EMERGENCY DIALER SYSTEM

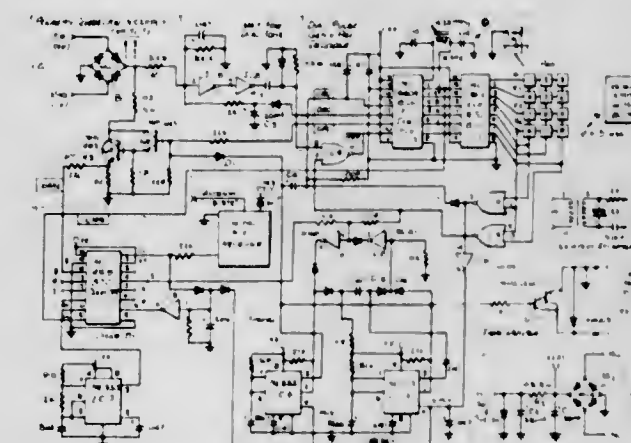
Alan J. Carlson, Smithtown, and Venerando J. Indelicato, Garden City, both of NY, assignors to Metro-Tel Corp., Syosset, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,529

Int. Cl.<sup>3</sup> H04M 11/04

U.S. Cl. 179—5 R

13 Claims



1. An emergency dialer system comprising an emergency circuit, means for triggering a start signal to activate said emergency circuit, means in said emergency circuit for automatically dialing a predetermined telephone number to cause the telephone at said predetermined telephone number to ring, means for applying a predetermined emergency signal on the telephone line of said predetermined number, first timing means for applying said emergency signal on said telephone line for a first predetermined time interval, means for connecting a busy circuit to said first timing means to inhibit further triggering of new start signals, said first timing means interrupting the emergency signal at the end of said first predetermined time interval to permit verification of an emergency, said verification interruption being for a second predetermined time interval, means for resuming the automatic dialing if there is no verification within said second predetermined time interval, said automatic dialing and subsequent verification interruption being repeated until verification occurs.



4,417,101

**PUBLIC TELEPHONE STATION TRAFFIC ANALYZING ARRANGEMENT**

Bernard M. Serres, 51, av. de la Paix, Fresnes, France (94260); Maurice S. Viale, 174, Bd Jean Mermoz, Chevilly-La-Rue, France (94150), and Edouard J. Jewiarz, 13, route de l'Abbaye, Gif-sur-Yvette, France (91160)

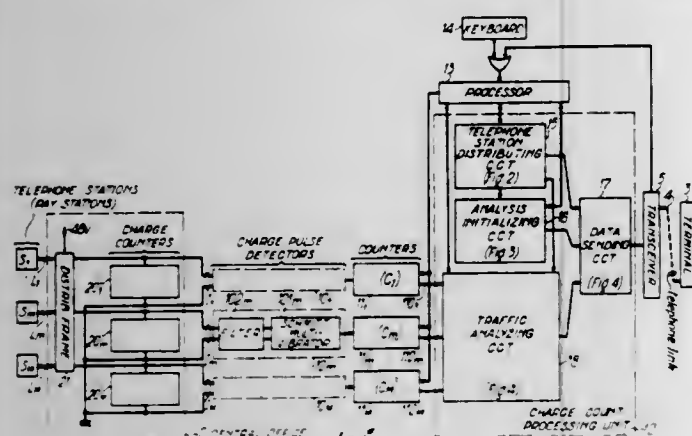
Continuation of Ser. No. 20,188, Mar. 13, 1979. This application Jan. 8, 1981, Ser. No. 223,504

Claims priority, application France, Mar. 14, 1978, 78 07329 The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> H04M 3/24

U.S. Cl. 179—8 R

6 Claims



1. A traffic analyzing arrangement for public telephone stations which are served from a telephone exchange equipped to transmit charging pulses to said telephone stations through telephone subscriber's lines, said arrangement comprising:  
means connected in parallel to each telephone line or telephone line input means of said telephone exchange for detecting charging pulses during telephone calls requested by the telephone station connected to said telephone line;  
means connected to said charging pulse detecting means for periodically counting the number of detected charging pulses during a predetermined observation period allocated to said telephone station;  
first means for storing the address of each telephone station, two predetermined charging pulse number values specific to said telephone station, and a predetermined observation period duration allocated to said telephone station;  
second means for storing predetermined average charging pulse numbers of each of said telephone stations during a long observation period;  
time recording means connected to said first storing means for determining the end of each observation period and in response thereto, reading-out the charging pulse number in said counting means for resetting said counting means;  
means responsive to the reading-out of said charging pulse number for comparing said charging pulse number to said two stored predetermined charging pulse number values specific to said telephone station;  
coding means connected to said comparing means for producing a coded signal indicating an operation failure of said telephone station when said charging pulse number is greater than one or less than the other of said predetermined charging pulse number values and for producing another coded signal indicating the normal operation state of said telephone when the charging pulse number lies between said two predetermined charging pulse number values;  
changing means connected to said first storing means for changing said predetermined charging pulse number values and said observation period of any telephone station when the average number of charges over a predetermined time of said telephone station has undergone a significant change;  
means for displaying the result of the number comparisons in

response to a further coded signal transmitted by said coding means;  
third means for storing data groups each of said data groups being assigned to telephone stations which have their average charging pulse numbers lying between two predetermined average values and the data of each group being two predetermined average values, two predetermined charging pulse number values specific to said telephone stations of said group and an observation period value;  
distributing means connected to said first, second and third storing means for successively comparing said average charging pulse number of each telephone station to two average values of each of said groups thereby distributing in each data group the addresses of the telephone stations which have average charging pulse numbers between said two average value of said group; and  
said two predetermined charging pulse number values and said predetermined observation period of each telephone station being those of the data group in which said telephone station is distributed.

4,417,102

**NOISE AND BIT RATE REDUCTION ARRANGEMENTS**

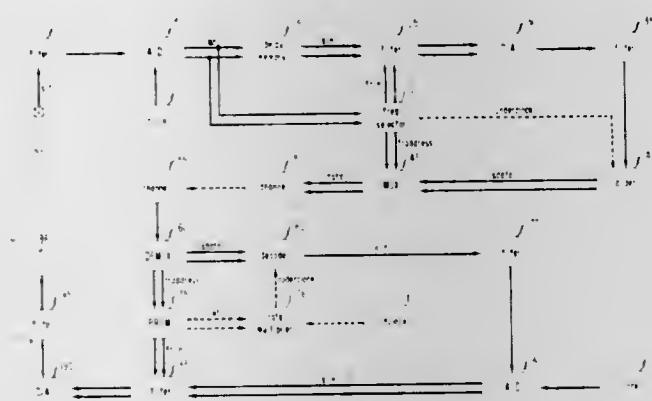
Jonathan B. Allen, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 4, 1981, Ser. No. 270,542

Int. Cl.<sup>3</sup> G10L 1/00

U.S. Cl. 364—513

18 Claims



1. A method for reducing bandwidth in a digital signal processing system comprising the steps of:  
partitioning an input signal into a succession of frames, generating signals representative of the spectral energy of the input signal in each frame,  
removing a portion of the input signal spectrum in each frame responsive to the spectral energy signals to form a modified input signal, said removing step comprising, attenuating a portion of the input signal spectrum in each frame corresponding to a predetermined percentage of the total spectral energy in the frame, and  
coding the modified input signal.

4,417,103

**STEREO REPRODUCTION WITH GAPLESS SPLICING OF PITCH ALTERED WAVEFORMS**

William G. Eppler, Jr., Norwalk, Conn.; Michael A. Klasco, New York, and Irwin H. Kornfeld, Brooklyn, both of N.Y., assignors to The Variable Speech Control Company ("VSC"), San Francisco, Calif.

Continuation-in-part of Ser. No. 262,046, May 11, 1981. This application Jan. 31, 1983, Ser. No. 462,230

Int. Cl.<sup>3</sup> G10L 1/00; G11B 31/00

U.S. Cl. 369—60

8 Claims

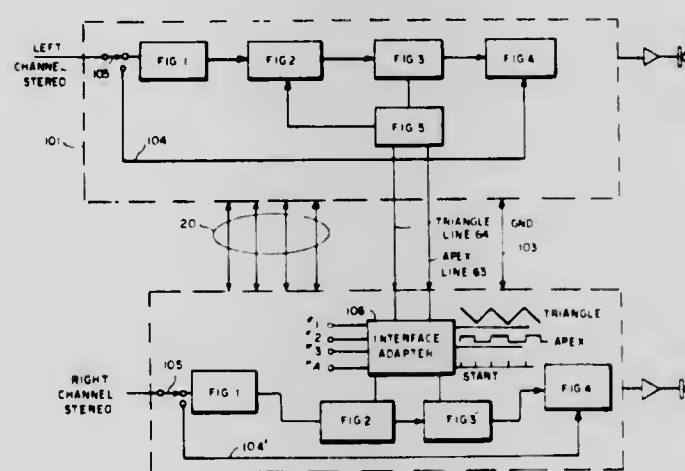
1. A stereo time compression/expansion system in which the playback speed for a recording is selected such that the frequencies of electric signals derived from playback of a recorded work are different than their original values and said

electric signals are processed to change their frequency by periodic variable time delay comprising:

separate processing means for the audio signal for each stereo channel including for each channel:

means for synchronously operating said separate processing means for both said stereo channels to obtain time coincidence between corresponding portions of the said substantially continuous pitch corrected output signal of each stereo channel;

dual variable time delay means for variably delaying said playback signal in response to a control signal;



control signal means for periodically varying said dual delay means inversely with alternate increasing and decreasing delay;  
switching means operable for alternately selecting the output of the delay means having the required pitch change during each period of delay variation; and  
means for combining the delayed signals detected by said switching means to provide a substantially continuous pitch corrected output signal.

4,417,104

**PLUG FOR MINIATURE RECEIVER**

Adolf Langer, Vienna, Austria, assignor to Viennatone Gesellschaft M.B.H., Vienna, Austria

Filed Jul. 15, 1982, Ser. No. 398,666

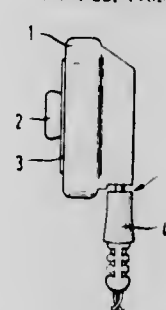
Claims priority, application Austria, Aug. 14, 1981, 3570/81

Int. Cl.<sup>3</sup> H04R 25/00

U.S. Cl. 179—107 R

3 Claims

Nov. 22, 1983



1. Plug for miniature receiver, especially for pocket hearing aids for the hard-of-hearing, with a plug body and at least one pin projecting from the plug body, characterized in that the plug body (7) is provided with a bulge (11, 14) running circumferentially around the plug pin (or pins) (9), of elastic material, which, when the plug is plugged into the receiver (1), acts as a gasket and lies on the receiver housing, whereby it acoustically seals the space between the receiver housing and the plugged in plug.

4,417,105

**MEMBRANE SWITCH ASSEMBLY WITH MODULAR SWITCH PORTIONS**

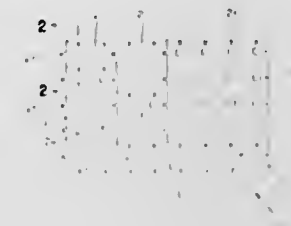
Nicholas W. Glaser, Jr., Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Oct. 26, 1981, Ser. No. 314,542

Int. Cl.<sup>3</sup> H01H 13/70

U.S. Cl. 200—5 A

4 Claims



1. A membrane switch assembly comprising a plurality of modular switch portions,  
one said modular switch portion including a plurality of switching zones arranged in at least two columns to form rows and columns, the center-to-center distance between adjacent said switching zones in a row and in a column being X, said modular portion having an edge spaced from adjacent said zones by a distance of X/2,  
another said modular switch portion having at least one column of switching zones spaced from adjacent zones by X, and having an edge spaced from adjacent said zones by a distance of X/2.

4,417,106

**SEALED ELECTRICAL CONTACT ASSEMBLY AND ELECTRICAL SWITCH MADE THEREFROM**

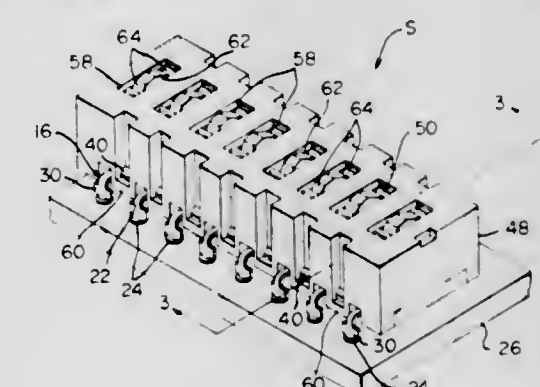
David J. Gingerich, Swatara; Patrick R. McCarty, New Cumberland, and David T. Shaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 2, 1981, Ser. No. 326,723

Int. Cl.<sup>3</sup> H01H 19/04

U.S. Cl. 200—5 R

21 Claims



1. An actuating mechanism comprising:  
housing means having a top, bottom and sides, said housing means having opening means in said top;  
actuating means mounted in said housing means;  
pivot means on said actuating means and said housing means



pivotal mounting said actuating means for reciprocal movement;  
 pivot member means on said bottom;  
 movable member means having embossment means with said embossment means engaging said pivot member means enabling said movable member means to pivot thereabout;  
 spring biased means mounted in said actuating means engaging said movable member means on one side of said embossment means to maintain said movable member means in one position, to maintain said movable member means in another position when said actuating means moves said spring-biased means to the other side of said embossment means in engagement therewith and urging said pivot means of said actuating means against said housing means to maintain said pivot means of said actuating means and housing means in engagement; and  
 operating means of said actuating means extending through said opening means of said top for operating said actuating means about said pivot means to move said spring-biased means along said movable member means from the one side of said embossment means to the other side thereof.

4,417,107

## SLIDE SWITCH

Jiro Terajima, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

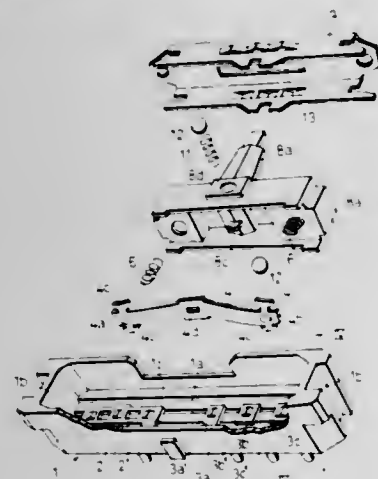
Filed Feb. 18, 1982, Ser. No. 349,754

Claims priority, application Japan, Feb. 18, 1981, 56-20727[U]

Int. Cl.<sup>3</sup> H01H 15/00

U.S. Cl. 200—16 C

2 Claims



1. A slide switch comprising: an insulating substrate; a plurality of stationary contact segments constituting a common stationary contact, and a plurality of switching contact segments arranged in a row on said insulating substrate; a movable contact having movable contact segments adapted to slide in contact with said stationary contact segments; and a groove formed in the lower portion of said insulating substrate so as to extend in the direction of the row of said stationary contact segments, said stationary contact segments each being raised to a height above said groove and straddling said groove, said movable contact segments each being of a width less than that of said groove so that they may fit within said groove to avoid contacting said insulating substrate.

4,417,108

## SWITCHGEAR SHUTTER

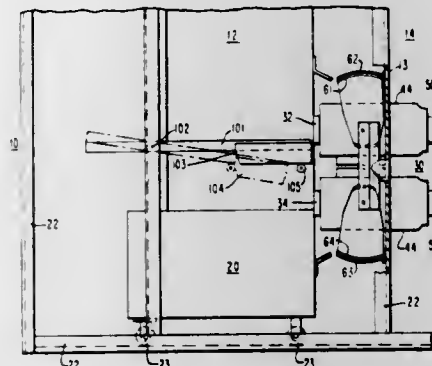
Ronald E. Vaill, Penn Township, Westmoreland County; Stephen S. Ciccotelli, Pitcairn, and Carl R. Merola, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 16, 1981, Ser. No. 302,880

Int. Cl.<sup>3</sup> H01H 9/22; H02B 1/14

U.S. Cl. 200—50 AA

12 Claims



1. Electrical apparatus, comprising:
  - (a) a housing means;
  - (b) stationary contact means disposed generally within said housing means;
  - (c) movable contact means disposed to engage said stationary contact means;
  - (d) a plurality of curvilinear displaced barrier means, each barrier means having at least two tandem and mechanically cooperating members disposed generally within said housing means having a first serial position for electrically shielding said stationary contact means from any electrical engagement and a second tandem position for allowing engagement of said stationary contact means with said movable contact means; and
  - (e) actuating means mechanically connected to said movable contact means and to at least one member of each of said plurality of curvilinear displaced barrier means for moving said curvilinear displaced barrier means between said first and second positions when the movable contact means is placed into engagement with the stationary contact means.

4,417,109

## SWITCH CONSTRUCTION

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

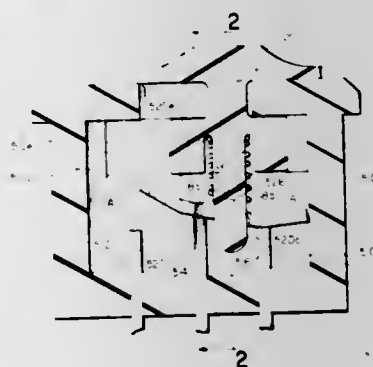
Continuation-in-part of Ser. No. 234,664, Feb. 11, 1981, Pat. No. 4,347,417. This application Jan. 22, 1982, Ser. No. 341,706

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> H01H 5/06

U.S. Cl. 200—68

5 Claims



1. A switch comprising a base of insulating plastic and defining an upwardly open cavity, a plurality of fixed contacts

spaced along the bottom wall of said base cavity, said switch having means defining actuator support regions, actuator means including support means cooperating with said support regions to slidably support said actuator, said actuator means including a depending portion, a movable contact element slidably received inside said switch base cavity for movement generally across the upper ends of certain of said spaced contacts to selectively bridge said certain fixed contacts, spring means retained by said depending actuator portion and engaging said movable contact element to bias said movable element in engagement with said fixed contacts, said movable contact element having at least one upwardly open recess to loosely receive the lowermost end of said depending actuator portion and said movable contact element having portions adjacent said recess for engaging said spring means during actuator movement, whereby said element is moved in response to such actuator movement.

4,417,110

## VACUUM INTERRUPTER

Hifumi Yanagisawa, Sagami-hara; Junichi Warabi, Shizuoka, and Shinzo Sakuma, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

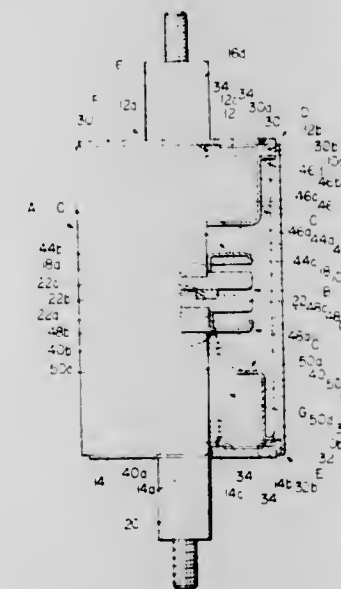
Filed Jul. 16, 1981, Ser. No. 283,867

Claims priority, application Japan, Sep. 21, 1980, 55-99694; Jul. 21, 1980, 55-99696

Int. Cl.<sup>3</sup> H01H 33/00

U.S. Cl. 200—144 B

13 Claims



1. A vacuum interrupter comprising in combination: an envelope including a cylindrical housing made of a metallic material, a disc-shaped upper end plate made of an inorganic insulating material having an aperture in the center portion thereof and a disc-shaped lower end plate made of an inorganic insulating material having an aperture in the center portion thereof; said housing having a different coefficient of thermal expansion from those of said upper and lower end plates; an electrical contact member including a stationary contact rod inserted into said envelope through said aperture of the upper end plate, a stationary electrical contact secured to said stationary contact rod, a movable contact rod inserted into said envelope through said aperture of the lower end plate and a movable electrical contact secured to said movable contact rod; shielding means for shielding the inner surface of said envelope and including first and second main shields and first and second auxiliary shields; first sealing means for sealing hermetically said upper end plate to said housing and including a first sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion pro-

vided between said first sealing member and said upper end plate;  
 second sealing means for sealing hermetically said lower end plate to said housing and including a second sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion provided between said second sealing member and said lower end plate;  
 first supporting means for supporting and securing hermetically said stationary contact rod to said upper end plate including a metallized portion provided between said upper end plate and said stationary contact rod, said stationary contact rod having different coefficient of thermal expansion from those of said upper and lower end plates; and  
 hermetic seal means for sealing movably and hermetically said movable contact rod to said lower end plate including a bellows for securing said movable contact rod to said lower end plate and a metallized portion provided between said lower end plate and said bellows;  
 said first sealing means comprises an end portion of said housing, said first sealing member is secured to said end portion of said housing and an outer peripheral edge portion of said upper end plate secured to said first sealing member via the metallized portion;  
 said second sealing means comprises another end portion of said housing, said second sealing member is secured to said another end portion of the housing and an outer peripheral edge portion of said lower end plate secured to said second sealing member via the metallized portion.

4,417,111

## THREE-PHASE COMBINED TYPE CIRCUIT BREAKER

Tuneo Kishi; Yasuhide Takeda; Toru Tsubaki, and Takeshi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

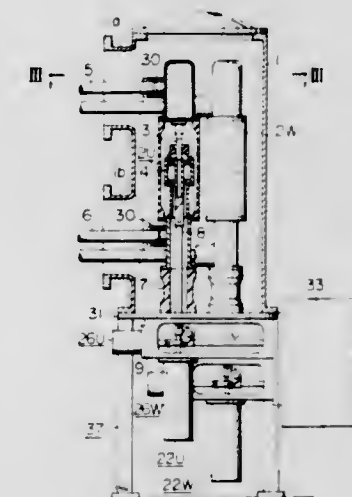
Filed Feb. 18, 1981, Ser. No. 235,597

Claims priority, application Japan, Feb. 20, 1980, 55-19122

Int. Cl.<sup>3</sup> H01H 33/42

U.S. Cl. 200—148 R

13 Claims



1. A three-phase combined type circuit breaker comprising a common hermetic housing filled with an insulating medium, three-phase interrupting units each having a contact system independently operable within said hermetic housing, three phase operating devices operable independently of each other from outside of said hermetic housing, three-phase link mechanisms for connecting output terminals of said operating devices and operating force input terminals of said interrupting units by phase for operating said contact systems respectively, and three-phase hermetic alloy holding means arranged in a middle portion of each of said link mechanisms respectively for holding the hermetic condition of said hermetic housing while allowing the link mechanisms for respective phases to operate.



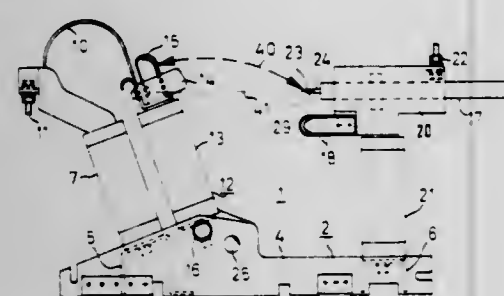
# 4,417,112 LOAD BREAK SWITCH WITH CURRENT QUENCHING DEVICE

Paul Kueenzle, Juergen Krysiak, and Hans-Karl Reuter, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany  
Filed Mar. 15, 1982, Ser. No. 358,275

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3111793

Int. Cl.<sup>3</sup> H01H 33/12

U.S. Cl. 200—146 R



1. In a load break switch of the "swivel post" type, having a fixed electrical contact carried on a stationary post and a movable electrical contact carried on a pivotal switching arm mounted on a switch shaft, and further having a current quenching means to cut off the load current when the switching arm swings into the open switch position, the improvement comprising the quenching means being arranged fixedly as a unit adjacent the fixed contact and including a switch pin mounted for rectilinear displacement and having a ratchet head at its outer end; and the switching arm including a sliding block type driver to which the ratchet head of the switch pin is coupled or uncoupled in dependence on the angular position of the switching arm.

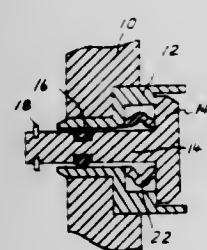
# 4,417,113 STRUCTURE OF PUSH-BUTTON DEVICE

Motoyuki Saito, and Satoru Fukutome, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan  
Filed Feb. 5, 1981, Ser. No. 231,822

Claims priority, application Japan, Feb. 5, 1980, 55-13232[U]

Int. Cl.<sup>3</sup> H01H 9/04, 3/12

U.S. Cl. 200—302



1. A push-button device comprising:  
a pipe having a first and a second shoulder;  
a button body having a head portion and a shaft portion extending from said head portion, said shaft portion being slidably received in said pipe;  
a waterproofing sealing ring disposed between an inner wall of said pipe and the shaft portion of said button body; and  
a non-metallic, resilient sleeve disposed between the head portion of said button body and the first shoulder of said pipe, said sleeve serving as means for restoring said button body to its original position and serving as means for preventing entry of dust toward said sealing ring, said second shoulder being engaged by said head portion when the button body is depressed thereby limiting the extent of depression of said resilient sleeve.

# 4,417,114 CONNECTOR FOR ATTACHING AN ELECTRICAL COMPONENT TO A FLAT SHEET

Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

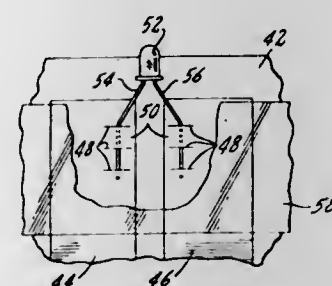
Continuation of Ser. No. 228,319, Jan. 26, 1981. This application  
Feb. 16, 1982, Ser. No. 348,998

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> H01H 9/02

5 Claims U.S. Cl. 200—317

2 Claims



1. A connector for attaching an electrical component to a piece of sheet material including conductive traces formed on the sheet material, at least two slits in the sheet, at least one lead of the electrical component being interlaced through the slits to hold the component on the sheet material, at least one lead of the electrical component being in electrical and mechanical contact with at least one conductive trace formed on the sheet material.

# 4,417,115 SWITCH ACTUATING ASSEMBLY HAVING IMPROVED CAMS AND PLURAL MODES

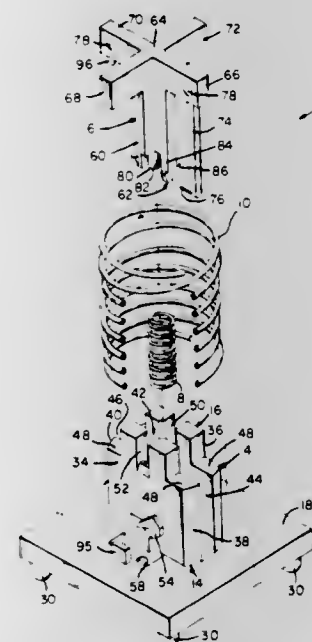
Mark R. Desmarais, Derry, and Mark A. Yates, Chelmsford, Mass., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1982, Ser. No. 354,318

Int. Cl.<sup>3</sup> H01H 3/12, 3/00

U.S. Cl. 200—340

13 Claims



1. A switch actuating assembly of the type comprising a frame having a fixed end and a free end, a plunger mounted on the frame, the plunger having a lower end which is proximate to the fixed end of the frame and a force-receiving end which is proximate to the free end of the frame, the plunger being slideably mounted on the frame and being movable from a normal position to a depressed position when force is applied to the force-receiving end, the force-receiving end being located beyond the free end of the frame when the plunger is in the normal position, the force-receiving end being moved towards the free end of the frame and the lower end being

moved towards the fixed end of the frame when the plunger is moved to the depressed position, and spring means which is resiliently stressed when the plunger is moved to the depressed position and which returns the plunger to the normal position when force is removed from the force-receiving end, the switch actuating assembly being characterized in that:

the plunger has a deflectable camming arm connected thereto proximate to the force-receiving end, the camming arm extending towards the lower end of the plunger and having a cam following free end.

a first cam and a second cam are provided on the frame, the first cam and the second cam being between the cam following free end and the fixed end of the frame when the plunger is in the normal position, the first cam and the second cam being spaced apart in an angular sense on the frame,

the plunger being capable of assembly to the frame while the plunger is in first or second angular orientation relative to the frame, the cam following free end of the camming arm being engageable with the first cam when the plunger is assembled to the frame while in the first angular orientation, the cam following free end of the camming arm being engageable with the second cam when the plunger is assembled to the frame while in the second angular orientation,

the second cam being contoured to permit movement of the cam following free end of the camming arm therethrough when the plunger is moved to the depressed position from the normal position and being contoured to arrest movement of the cam following free end when the plunger is moved from the depressed position to the normal position so that the plunger is held in an intermediate position, the second cam being contoured to permit passage of the cam following free end and return of the plunger to the normal position following movement of the plunger from the intermediate position to the depressed position,

the first cam being contoured to require an abrupt increase in force to depress the plunger and thereby provide a tactile effect to the operator.

# 4,417,116 MICROWAVE WATER HEATING METHOD AND APPARATUS

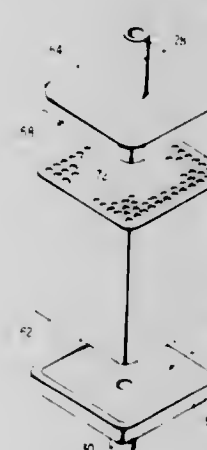
Jeremiah B. Black, P.O. Box 31774, 2065 Church Creek Dr., Charleston, S.C.

Filed Sep. 2, 1981, Ser. No. 298,533

Int. Cl.<sup>3</sup> H05B 6/78

U.S. Cl. 219—10.55 A

8 Claims



1. Apparatus for heating fluid, especially water, utilizing microwave energy comprising:

means for generating microwave energy;  
means for defining a microwave chamber for containing the microwave energy generated by said generating means; and

means in said microwave chamber means for conducting the fluid to be heated through the microwave energy, said fluid conducting means comprising a solid unitary block

formed of a substantially microwave-transparent material, said block having a plurality of fluid passages extending therethrough, said fluid flowing through said passages directly contacting the microwave-transparent material of the solid unitary block, said block further comprising a pair of end covers formed of a substantially microwave-transparent material and sealingly mounted to respective ends of said unitary block, each end cover having a cavity enclosing the ends of said fluid passages and a conduit extending into said cavity, the total cross-sectional flow area of said fluid passages being at least twice the cross-sectional flow area of each of said conduits whereby the flow velocity through said fluid passages is substantially less than the flow velocity through said conduits.

# 4,417,117 TRANSPORTING CAN BODIES FOR A FULLY AUTOMATED RESISTANCE WELDING MACHINE

Paul Opprecht, Im hinteren Bernold, 8962 Bergdietikon, Switzerland

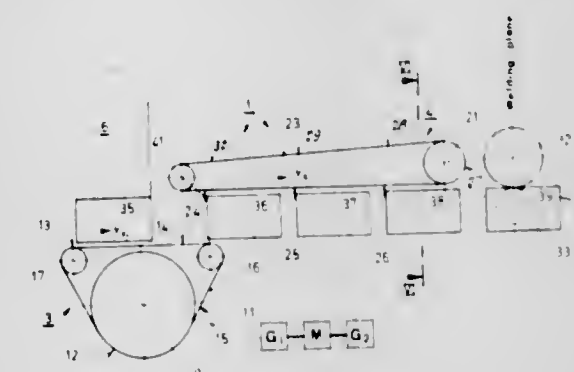
Division of Ser. No. 89,209, Oct. 29, 1979, Pat. No. 4,354,086, which is a continuation of Ser. No. 905,477, May 12, 1978, abandoned. This application Jan. 19, 1981, Ser. No. 226,227

Claims priority, application Switzerland, Jun. 10, 1977, 714377

Int. Cl.<sup>3</sup> B23K 11/06; B65G 47/31

U.S. Cl. 219—64

5 Claims



1. A method of transporting rolled cans from a roll former station to welding electrodes, comprising the steps of:

providing two transport systems respectively having a first can body transfer device and a second can body transfer device;

driving said first can body transfer device at a varying velocity represented by a first cyclic velocity curve such that said first can body transfer device periodically remains at least approximately stationary with a substantially zero velocity;

driving said second can body transfer device at a substantially sinusoidal velocity represented by a second, substantially sinusoidal velocity curve;

rolling blanks into can bodies at a roll former station;

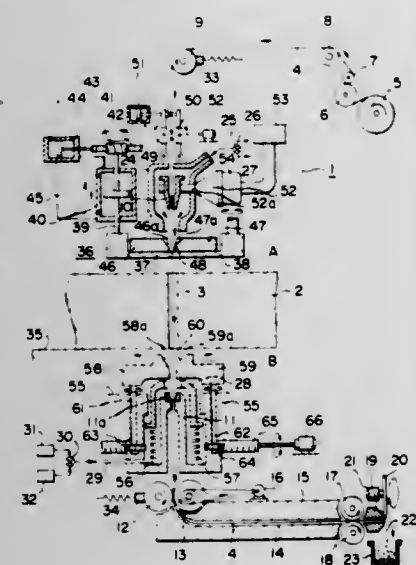
moving the first can body transfer device possessing said first cyclic velocity curve, during rolling of the blanks into can bodies, past the roll former station in a manner such that the first can body transfer device remains at least approximately stationary in order to enable rolling of the can bodies and engagement of a rolled can body at the roll former station;

transferring the can bodies in a smooth fashion from the first can body transfer device to the second can body transfer device moving with said substantially sinusoidal velocity while the first can body transfer device is at least approximately at the region of its lowest velocity course of its first cyclic velocity curve; and

engaging the thus transferred can bodies by the second transport device and moving the engaged can bodies towards the welding electrodes.



**4,417,118**  
**AUTOMATIC WIRE-SETTING OR -RESETTING**  
**METHOD AND APPARATUS IN A TRAVELING-WIRE**  
**ELECTROEROSION MACHINE**  
 Kastuyoshi Miyano, Kawasaki, Japan, assignor to Japax Inc.,  
 Kawasaki, Japan  
 Filed Jul. 27, 1981, Ser. No. 287,043  
 Claims priority, application Japan, Jul. 28, 1980, 55-102423  
 Int. Cl.<sup>3</sup> B23P 1/12  
 U.S. Cl. 219—69 W 16 Claims



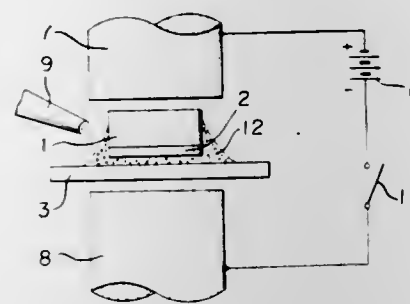
1. A method of automatically setting or resetting a machining electrode wire in an operating set-up on a traveling-wire electroerosion machine having a pair of guide members defining therebetween a straight line path for the electrode wire and drive means for axially displacing the electrode wire along the straight line path between wire supply means and wire takeup means, the method comprising the steps of:

- positioning a workpiece with a preformed straight through-hole between said guide members to locate said through-hole in alignment with said straight line path;
- disposing ahead of one of said guide members and spacedly juxtaposed with said through-hole of the workpiece, a broken free end portion of the electrode wire extending in alignment with said straight line path and leading to one of said supply means and said takeup means;
- vibrating said free end portion of the electrode wire with a small amplitude by imparting mechanical vibrations to said one guide member;
- threading said vibrating free end portion of the electrode wire by automatically advancing it into, through and out of said through-hole towards the other of said guide members by said drive means; and
- thereafter establishing a continuous stretch constituted at least in part by said threaded electrode wire between said supply means and said takeup means whereby to enable it to be continuously renewed from said supply means and collected onto said takeup means for electroerosion-machining of said workpiece.

**4,417,119**  
**LIQUID JOINT PROCESS**  
 Takio Okuda, and Junichi Sakai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
 Filed Jun. 22, 1981, Ser. No. 275,939  
 Int. Cl.<sup>3</sup> B23K 1/04, 35/38 4 Claims

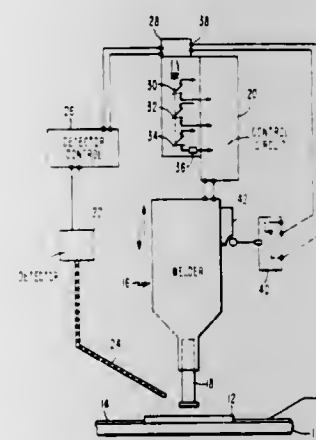
1. A liquid joint process for joining an electrical contact and a carrier having a clearance formed therebetween which comprises feeding a liquid in and around said clearance formed between said electrical contact and said carrier so as to form an arcuate shaped liquid surface which is in contact with both said electrical contact and said carrier;  
 holding said electrical contact and said carrier by an upper

electrode and a lower electrode from both sides under a predetermined pressure; and  
 feeding current between said electrical contact and said



carrier through said upper and lower electrode wherein said feeding of liquid comprises feeding liquid in an amount of 0.1 to 2 cc on and near an electrical contact interface between said contact and said carrier.

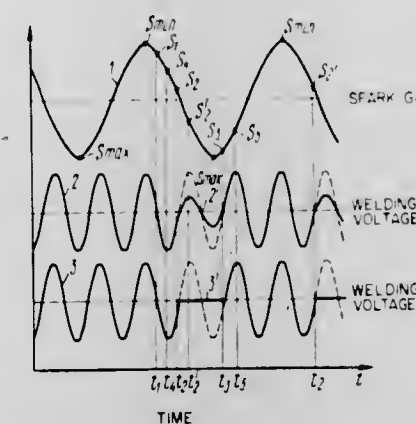
**4,417,120**  
**PERCUSSIVE ARC WELDING**  
 Douglas L. Lumbra, St. Albans; Douglas W. Phelps, Jr., Burlington; Sigvart J. Samuelsen, Burlington, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.  
 Filed Aug. 24, 1981, Ser. No. 295,476  
 Int. Cl.<sup>3</sup> B23K 9/10, 9/22 14 Claims



10. In the method of percussive arc welding a workpiece to a base piece wherein the welding cycle includes first applying an initiating voltage between the workpiece and the base piece to establish an arc therebetween, and thereafter a capacitive discharge is established between the workpiece and the base piece which will cause melting of the pieces, and the workpiece is plunged into the base piece to effect a weld between the two pieces, the improvement which comprises:

prior to the initiation of the welding cycle applying a test voltage between the workpiece and the base piece of no greater value than the initiating voltage of the welding cycle thereby generating an arc and, detecting whether an arc is established between the workpiece and the base piece by the test voltage, and thereafter inhibiting the performance of the weld cycle if the establishment of an arc by the test voltage is not detected.

**4,417,121**  
**METHOD OF FLASH BUTT WELDING**  
 Sergei I. Kuchuk-Yatsenko; Mikhail V. Bogorsky, and Sergei M. Samotryasov, all of Kiev, U.S.S.R., assignors to Institut Elektrosvariki, Imeni E.O. Patona, Kiev, U.S.S.R.  
 Filed Dec. 15, 1981, Ser. No. 330,805  
 Int. Cl.<sup>3</sup> B23K 11/04 2 Claims



1. A method of flash butt welding, which comprises fusing by an alternating current the ends of the parts being welded together, concurrently causing the parts to continuously approach each other, and imparting to at least one of the parts an oscillatory motion along the direction of approach, thereby causing additional relative movements of the parts being welded together towards each other and away from each other, reducing the welding voltage to within the range of 0.7 to 0 of its working value during the stage of a relative movement of the parts being welded together away from each other in a time interval of not less than  $\frac{1}{4}$  of the period of the oscillatory motion from the beginning of the relative movement of the parts away from each other, and restoring the voltage to its initial value at the stage of a relative movement of the parts being welded together towards each other in a time interval of not more than  $\frac{1}{4}$  of the period of the oscillatory motion from the beginning of the relative movement of the parts towards each other.

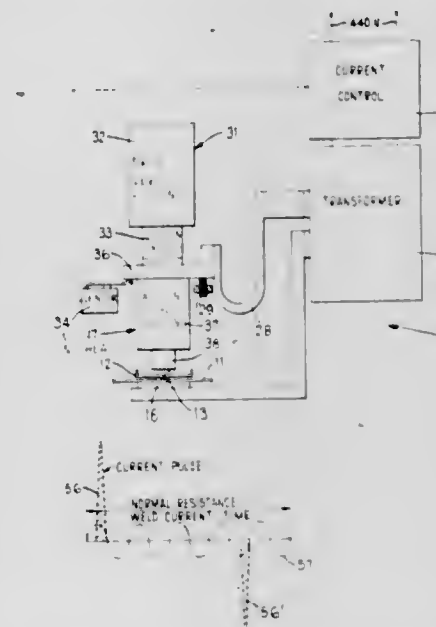
**4,417,122**  
**RESISTANCE WELDING SYSTEM FOR PROJECTION WELDING**  
 J. Paul Thorne, Bay City, Mich., assignor to Newcor, Inc., Bay City, Mich.  
 Filed Jul. 30, 1981, Ser. No. 288,424  
 Int. Cl.<sup>3</sup> B23K 9/09, 11/14 5 Claims

1. In a resistance welding apparatus for welding together two platelike workpieces and comprising:

a transformer unit having cooperating primary and secondary windings, electrical conductor means for connecting said primary winding to a source of alternating current electrical energy, a welding head connected to the secondary winding of said transformer unit, and control means including switch means interposed in said conductor means for permitting only a single pulse of electrical energy of duration less than one cycle of said alternating current source to be supplied therethrough to the primary winding of said transformer unit,

the improvement comprising means for projection welding of first and second metal sheets each having a thickness in the range of about 0.020 to 0.050 inch with the welding being at a beadlike projection in the first sheet in contact with the second sheet, including a stationary conductive back-up die supporting said second sheet, a welding head assembly which incorporates and supports said welding head for axial reciprocation with respect to said transformer unit, said welding head comprising an axially reciprocable low-inertia electrode and holder positioned

for pressing engagement of the electrode with the first sheet directly at the projection, means continuously biasing the low-inertia electrode holder toward the first sheet for rapid follow-up movement by the electrode holder of the collapsing projection to continue pressing of the first and second sheets together during a weld, said transformer unit being a single welding transformer of low mutual reactance and high secondary voltage relative to conventional multicycle resistance welding transformers, the primary of the welding transformer being connected to a conventional power line source of about 460 volt 60 hertz electrical energy through said switch means for energization by a single unipolarity pulse of the approximately 460 volt 60 hertz power line electrical energy, means triggering said switch means in each welding cycle for outputting at said secondary only a single unipolarity



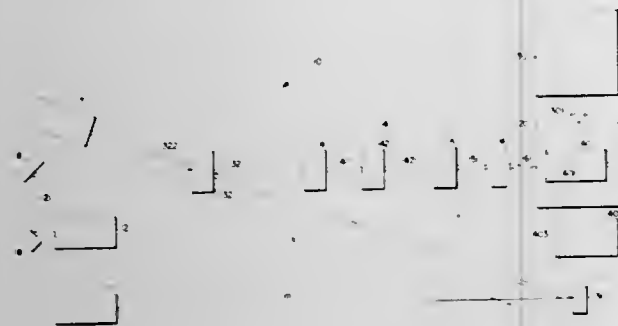
pulse of approximately 3 to 4 millisecond duration and of high current magnitude and fast rise time relative to conventional multicycle resistance welding transformers, said welding transformer being stationary and disposed adjacent said welding head assembly, the secondary of said stationary transformer being electrically connected to said reciprocating holder by an intermediate flexible electrical conductor and being electrically connected to and fixed with respect to said conductive back-up die, said welding head assembly being a conventional one of the kind including a drive device reciprocally driving the welding head between retracted sheet releasing and extended sheet engaging positions and in which the movable welding head includes an electrically conductive housing connected to and driven by the drive device with said holder being movably supported on said housing and in electrically conductive contact therewith.

**4,417,123**  
**LASER FORMED VIDEO TUBE CALIBRATION MARKERS**  
 Patrick N. Keller, Ridgecrest; Jerome B. Franck, China Lake, and George G. Silberberg, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Jul. 6, 1981, Ser. No. 280,767  
 Int. Cl.<sup>3</sup> B23K 27/00 15 Claims

1. An apparatus for forming fiducial marks on an imaging surface of a video tube, comprising:  
 a laser system for producing and directing an alignment focused beam and a pulsed focused beam, upon command, along an optical path;  
 a driven jig positioned for holding said imaging surface of said video tube on said optical path;

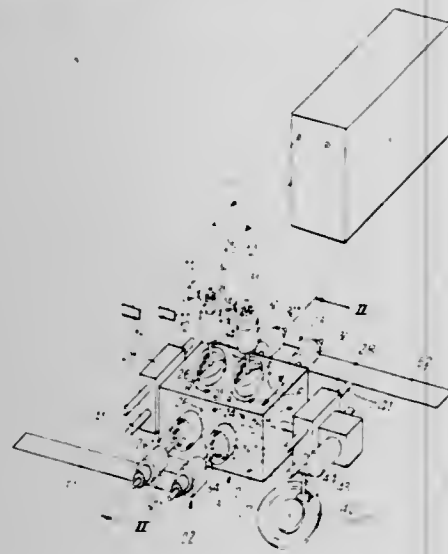


a controller connected to said driven jig and programmed to move said driven jig in a predetermined manner; and



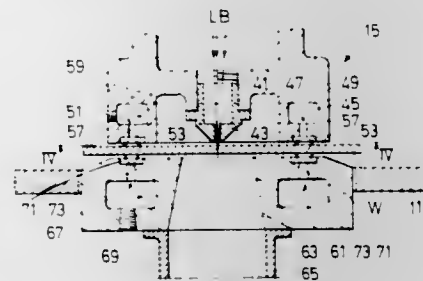
video monitoring means coupled to said video tube for observing said alignment focused beam and the effects of said pulsed focused beam on the imaging surface of said video tube.

**4,417,124**  
**PROCESS AND INSTALLATION FOR MACHINING BY RADIATION A COMPOSITE PART**  
Claude Benedite, Panazol; Marcel Lafaye, Nexon; Jean-Pierre Lenfant, Rochechouart, and Jacques Reynier, Bosmie L'Aiguille, all of France, assignors to Claude Benedite Laser Techniques Saint-Cyr, St-Laurent-sur-Gorre, France  
Filed Nov. 2, 1981, Ser. No. 317,406  
Claims priority, application France, Nov. 7, 1980, 80 23847  
Int. Cl.<sup>3</sup> B23K 27/00  
U.S. Cl. 219—121 LH



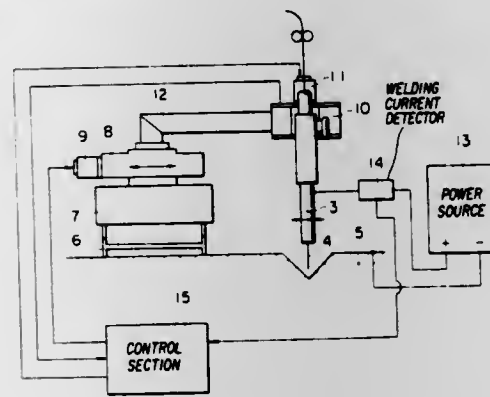
1. Process for treating, by electromagnetic radiation, a plane surface of a composite piece comprising a first material relatively more absorbent of this radiation and a second material relatively less absorbent of this radiation, these two materials appearing by zones at the surface, this composite piece being part of a mass located beyond an edge limiting the plane surface to be treated, according to which the radiation is given an inclination  $\alpha$  in relation to a perpendicular to this surface, the values of this inclination  $\alpha$  being determined so that the mass is protected by always remaining in the shadow limited by said edge of the treated surface and so that any beam reflected by the latter surface will be directed in a predetermined direction.

**4,417,125**  
**LASER PROCESSING MACHINE**  
Akira Tsutsumi, La Mirada, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.  
Filed Feb. 19, 1982, Ser. No. 350,416  
Claims priority, application Japan, Feb. 24, 1981, 56/25023  
Int. Cl.<sup>3</sup> B23K 27/00  
U.S. Cl. 219—121 LY



1. A laser processing machine, comprising:  
a table means for supporting a workpiece to be processed at a work area;  
a processing head assembly arranged above the table means;  
a nozzle means, connected at a lower end of the processing head assembly, for applying a laser beam to the workpiece together with an assisting gas at the work area; and  
means, provided at the work area, for supplying air to both sides of the workpiece in order to keep the workpiece to be processed in a floated position out of contact with the table means and with the processing head assembly while the laser beam is being applied to the workpiece together with the assisting gas.

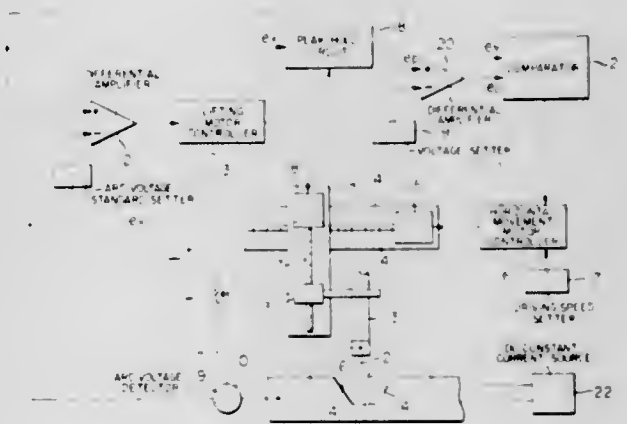
**4,417,126**  
**METHOD OF CONTROLLING A WEAVING PATH OF A WELDING TORCH IN ARC WELDING WITH A CONSUMABLE ELECTRODE**  
Kenji Kasahara, Fujisawa, and Yoshiaki Munezane, Kamakura, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan  
Filed May 4, 1982, Ser. No. 374,735  
Claims priority, application Japan, Sep. 24, 1981, 56-151553  
Int. Cl.<sup>3</sup> B23K 9/12  
U.S. Cl. 219—124.22



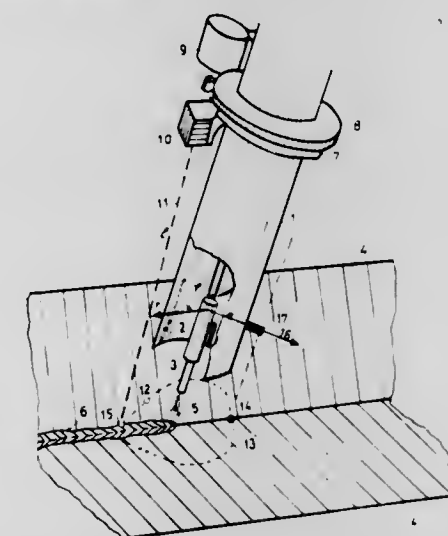
1. A method for controlling a weaving path of a welding torch to trace a welding line in consumable electrode arc welding, the comprising:  
detecting in a rightward weaving stroke of weaving motion a welding current level  $IL_1$  at the left end position of the weaving and a minimum current level  $IL_2$  during the period of the rightward weaving stroke and in a leftward weaving stroke of weaving a welding current level  $IR_1$  at the right end position of the weaving motion and a minimum current level  $IR_2$  during the period of the leftward weaving stroke;  
calculating the values of differential current  $(IL_1-IL_2)$  and

$(IR_1-IR_2)$  in the rightward and leftward weaving strokes, respectively;  
comparing and computing a disparity, if any, between said differential current values; and  
shifting the position of a median point of weaving motion according to the extent of said disparity in said differential current values.

**4,417,128**  
**ARC WELDING METHOD UTILIZING RECIPROCAL MOVEMENT OF A TORCH IN WIDTH DIRECTION OF GROOVE TO BE WELDED, AND CONTINUOUS MOVEMENT OF TORCH IN LONGITUDINAL DIRECTION OF GROOVE TO BE WELDED**  
Hirokazu Nomura; Yuji Sugitani, both of Tsu, and Yasuo Suzuki, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan  
Filed Feb. 3, 1982, Ser. No. 345,231  
Int. Cl.<sup>3</sup> B23K 9/12  
U.S. Cl. 219—125.12



**4,417,127**  
**METHOD AND APPARATUS FOR SEAM TRACKING IN ARC WELDING**  
Georgi N. Nachev; Angel S. Angelov, and Boryan I. Petkov, all of Sofia, Bulgaria, assignors to Institute Po Technicheska Kibernetika I Robotika, Sofia, Bulgaria  
Filed Apr. 14, 1981, Ser. No. 254,095  
Claims priority, application Bulgaria, May 19, 1980, 47828; Jul. 11, 1980, 48465  
Int. Cl.<sup>3</sup> B23K 9/12  
U.S. Cl. 219—124.34



1. A method of guiding an operating implement along a distinctive tracking line on a workpiece area, comprising the steps of:

- training a narrow beam of luminous radiation upon said workpiece area in the vicinity of said operating implement;
- shifting said beam around said operating implement to illuminate said workpiece area along a trace intersecting said tracking line at two crossover points forwardly and rearwardly of said operating implement;
- gathering rays from the illuminated trace by an objective with front and rear focal planes spaced from said workpiece area and with an optical axis including a small angle with said beam, said objective moving jointly with said beam for focusing images of illuminated scanning points of said trace upon a segment of a straight line slantingly intersecting said rear focal plane;
- detecting discontinuities in a curve interconnecting the images of said scanning points, said discontinuities representing said crossover points; and
- determining deviations of said operating implement from said tracking line on the basis of the locations of said discontinuities on said segment.

1. In an arc-welding method, which comprises:  
directing a welding torch substantially vertically toward a groove formed between objects of welding; directing a welding electrode through said torch toward said groove; feeding a welding current to said electrode to produce an arc between the tip of said electrode and said groove to weld said objects of welding together by means of the arc heat; moving said torch in the width direction of said groove; continuously detecting one of arc voltage and arc current of said arc; calculating the deviation of the thus detected value from a value of one of previously set arc voltage and arc current; moving said torch vertically up and down so that said deviation becomes null, thereby maintaining the distance between the tip of said electrode and said groove at a prescribed distance during the movement of said torch in the width direction of said groove; continuously detecting the vertical position of said torch as a value of voltage indicated by a potentiometer for each movement of said torch in the width direction of said groove; reversing the direction of the movement of said torch in the width direction of said groove at the moment when said value of voltage thus detected agrees with a previously set value of voltage; repeating the movement of said torch in the width direction of said groove, the movement of said torch in the vertical direction, and the reversal of the direction of the movement of said torch in the width direction of said groove; continuously moving said torch in the longitudinal direction of said groove; thereby reciprocally moving said torch in the width direction of said groove following the face of said groove while maintaining the distance between the tip of said electrode and said groove at said prescribed distance, and, at the same time, moving said torch in the longitudinal direction of said groove so as to weld said objects of welding in the longitudinal direction of said groove;  
the improvement characterized by:  
calculating, for one movement of said torch in the width direction of said groove, the value of the difference between said previously set value of voltage for the purpose of reversing the direction of movement of said torch in the width direction of said groove and the value of voltage detected by said potentiometer when said torch is at the lowest position thereof; and,  
reversing the direction of movement of said torch in the width direction of said groove at the moment when said



continuously detected value of voltage of said torch agrees with said calculated value of difference.

4,417,129

**POWER SOURCE FOR ARC WELDER**

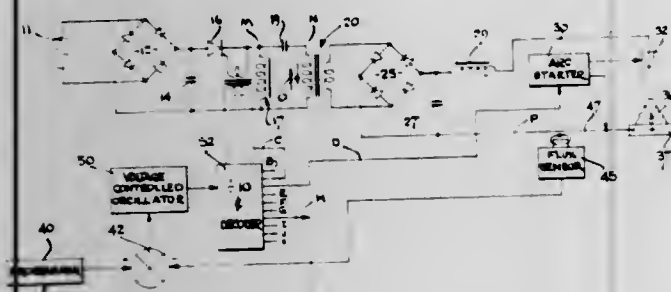
Russell D. Young, Redondo Beach, Calif., assignor to Creative Pathways, Incorporated, Torrance, Calif.

Filed Dec. 20, 1982, Ser. No. 451,466

Int. Cl.<sup>3</sup> B23K 9/10

U.S. Cl. 219—130.32

10 Claims



1. A power source for providing pulses welding current to the electrodes of an arc welder comprising:  
means for supplying DC power,  
electronic switching means having current carrying electrodes between which the DC power is fed and a switching control electrode,  
means for generating a series of sequential trigger pulses, each of said pulses appearing at a separate terminal, a first one of said trigger pulses being fed to the switching control electrode of the switching means to effect the firing thereof to cause current pulses to flow between the current carrying electrode,  
programmer means for generating a signal in accordance with a predetermined program representing the desired welding current,  
means for sensing the welding current and providing a feedback signal in accordance therewith,  
means for comparing the feedback signal with the programmer means signal and generating a signal in accordance with any difference therebetween, the output of the comparing means being fed to said trigger pulse generating means to control the frequency of the trigger pulses,  
arc starter means for starting the welding arc, said arc starter means being triggered in response to a second one of said trigger pulses,  
commutating inductor means for unfiring said electronic switching means a predetermined time after the firing thereof, and  
means for coupling the current pulses passing between the current carrying electrodes of the electronic switching means to the arc welder electrodes.

4,417,130

**TRANSISTOR TYPE PULSE WELDING DEVICE**

Toshio Banba, Masanori Mizuno, and Takai Mizuno, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 326,993

Claims priority, application Japan, Dec. 11, 1980, 55-177974[U]

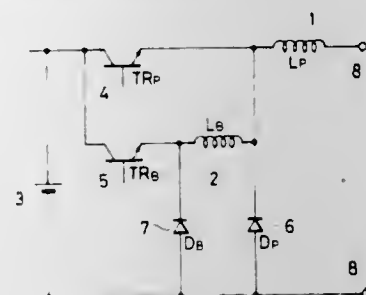
Int. Cl.<sup>3</sup> B23K 9/09

U.S. Cl. 219—130.51

9 Claims

1. A transistor type pulse welding circuit, comprising:  
a DC source;  
an output terminal;  
a first metal core;  
a second metal core separate from said first metal core;  
a first series circuit connected between said source and output terminal, said first series circuit comprising a first

switching element and first inductive coil connected in series, said first coil being wound on said first core;  
a second series circuit connected in parallel with at least said first switching element, said second series circuit including a second switching element and a second inductive coil wound on said second core;



a first diode coupled between said source and a first connection point between said first switching element and first inductive element; and  
a second diode coupled between said source and a second connection point between said second switching element and second inductive element.

4,417,131

**ALTERNATIVE HEATING APPARATUS FOR USE IN A HEATING SYSTEM HAVING A FUEL BURNER, PARTICULARLY A FORCED-AIR CENTRAL HEATING SYSTEM**

Douglas E. Carl, Burlington, Canada, assignor to Canada Thermofilm Limited, Concord, Canada

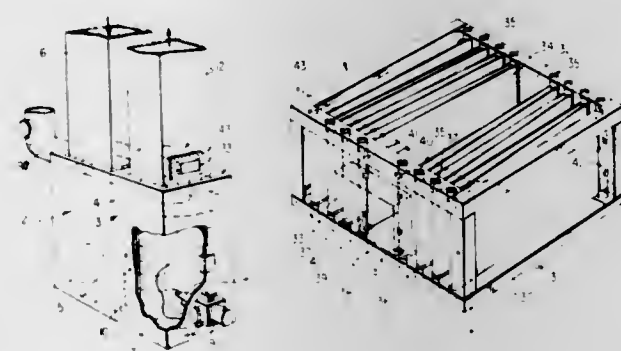
Filed Oct. 3, 1980, Ser. No. 193,848

Claims priority, application Canada, Oct. 12, 1979, 337446

Int. Cl.<sup>3</sup> F24D 5/00; H05B 3/14

U.S. Cl. 219—279

13 Claims



1. A forced-air heating system comprising a main furnace, an outlet duct for conveying air from the furnace to a space to be heated, a blower for forcing air through the furnace, an auxiliary electric heater disposed so that air flowing through the main furnace flows thereover, first temperature responsive means responsive to inside air temperature, second temperature responsive means responsive to outside air temperature, and control means operable, when the inside air temperature is below a first predetermined level, to activate only said auxiliary electric heater if the outside air temperature is above a second predetermined level and only said main furnace if the outside air temperature is below said second predetermined level, said second predetermined level being selected taking into account electricity demand-temperature dependency such that above said second predetermined temperature level electricity demand is generally at an off-peak level wherein:  
said auxiliary heater comprises a housing having opposed apertures forming an inlet and an outlet and defining a flow path therebetween, and a plurality of panels arranged to extend across said housing between said apertures and parallel to said flow path to define uninterrupted channels

between said inlet and said outlet such that air flows between said panels directly from said inlet to said outlet without passing through said panels.

4,417,132

**APPARATUS FOR HEATING ELECTRICALLY CONDUCTIVE FLOWABLE MEDIA**

David P. Simpson, Westminster Park, England, assignor to The Electricity Council, England

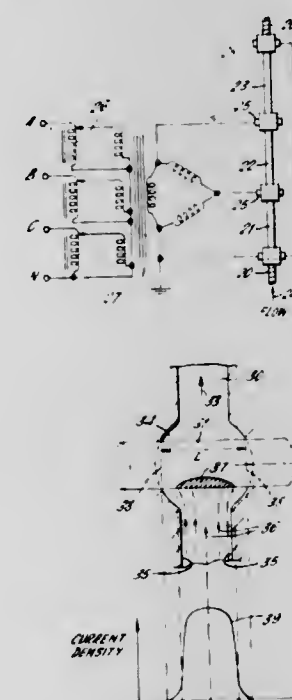
Filed Jan. 14, 1981, Ser. No. 225,073

Claims priority, application United Kingdom, Jan. 21, 1980, 8001995

Int. Cl.<sup>3</sup> H05B 3/60; A23L 3/32

U.S. Cl. 219—291

13 Claims



1. Apparatus for heating an electrically conductive flowable medium, comprising pipe means through which the medium can be arranged to flow, said pipe means having an internal surface of a material having an electrical conductivity no greater than that of the medium,  
at least two electrodes at spaced locations along the pipe means and having respective electrode surfaces exposed to medium flowing in the pipe means,  
and supply means for applying an alternating electrical supply across said electrodes so that alternating current can flow in the medium between the electrodes,  
each electrode being located and arranged in the pipe means such that, in use, substantially all the current flows between the medium and a predetermined surface portion only of the exposed electrode surface, said predetermined surface portion being smoothly curved without sharp edges to avoid current density distortions over the surface portion, said predetermined surface portion being entirely within the edges of the exposed surface.

4,417,133

**FUEL TANK HAVING AN IMMERSION HEATING ELEMENT ASSEMBLY**

Johnny W. Sanner, P.O. Box 216, Billings, Mont. 59103

Filed Feb. 24, 1981, Ser. No. 237,584

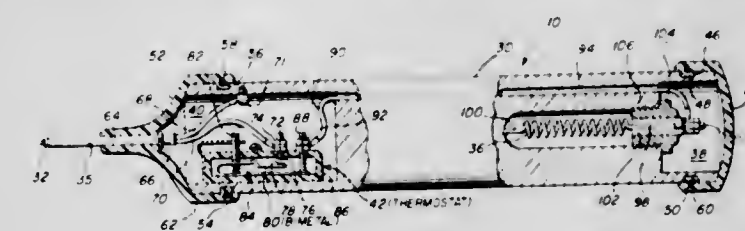
Int. Cl.<sup>3</sup> H05B 1/02, 3/82; F24H 1/20

U.S. Cl. 219—316

2 Claims

1. In combination, a fuel oil tank and an immersion heating element assembly, said tank including a peripheral wall including a curved bottom having a fuel oil outlet communicated with the bottommost area thereof, said peripheral wall of the tank including a filler pipe and closure in an upper area thereof, said heating element assembly including an elongated body having end caps removably secured thereto, said end caps being of non-metallic material and having a cylindrical periph-

eral surface supporting the elongated body in horizontal position on the curved bottom of the tank with the body being immersed in the fuel oil in the tank, said body including a longitudinally extending cavity in each end thereof with the end caps forming sealed closures for the cavities, an electric heating element in one of said cavities, an electrical circuit connected with said heating element, said electrical circuit including a thermostatic switch mounted in the other of said cavities for opening and closing the electrical circuit in response to the temperature of the fuel oil in which the body is immersed, said electrical circuit including electrical conductors extending from the cavity having the thermostatic switch therein out through the end cap on that cavity in sealed relation thereto to preclude entry of fuel oil into the cavity, said electrical conductors extending through the wall of the tank in sealed relation thereto for connection with a source of electrical energy, one of said conductors having the thermostatic switch incorporated therein and connected to the heating element, the other of said conductors being electrically connected to the heating element so that the heating element is electrically energized when the thermostatic switch is closed



and the conductors are connected to a source of electrical energy in order to heat the fuel oil in the tank in the area having the outlet associated therewith prior to the fuel oil leaving the tank, wherein said body is cylindrical and the cylindrical peripheral surface of each end cap includes a cylindrical flange telescoped over the cylindrical body at the end thereof and having a diameter greater than the body and being constructed of resilient plastic material and coacting rib and groove means extending peripherally of each end portion of the body and each end cap flange to provide a snap fit between the end cap and body, said thermostatic switch including adjustable contact means to vary the temperature at which the circuit is opened and closed, and wherein said body is constructed of conductive metal, said cavity receiving the heating element having an axial extension extending inwardly and receiving the heating element with one end of the heating element electrically connected to the body at the inner end of the extension with the conductor having the thermostatic switch therein being connected to the other end of the heating element, the other conductor being connected to said body within the cavity having the thermostatic switch therein.

4,417,134

**MECHANICAL FUEL PUMP COMPUTER CONVERSION MECHANISM**

Ronald M. Garland, Relgate, England, assignor to Veeder Industries Inc., Hartford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,395

Int. Cl.<sup>3</sup> B67D 5/22; F16H 3/22; G06C 15/04

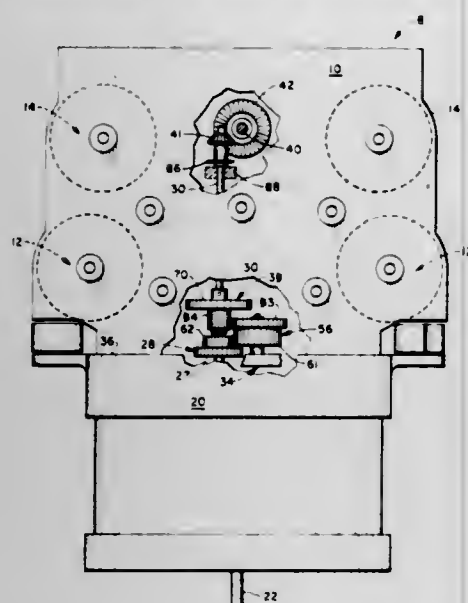
U.S. Cl. 235—61 L

21 Claims

1. In a mechanical computer for a fuel dispenser having a price variator with an input volume shaft to be rotated in accordance with the volume amount of fuel dispensed and settable for establishing the unit volume price of fuel, a volume counter rotary drive train rotated by the input volume shaft, at least one rotary volume counter, with a plurality of coaxial number wheels of increasing order of significance, rotated by the volume counter drive train for registering the volume amount of fuel dispensed, a cost counter rotary drive train rotated in accordance with the rotation of the input volume shaft and the unit volume price setting of the price variator, and at least one rotary cost counter, with a plurality of coaxial



number wheels of increasing order of significance, rotated by the cost counter drive train for registering the cost amount of fuel dispensed, the improvement wherein the cost counter drive train comprises a cost drive ratio selector mechanism for



selectively providing a plurality of different alternative cost counter drive ratios which include two drive ratios which differ by a factor of ten to provide for selectively shifting the decimal point in the unit volume price setting of the price variator and in the cost registration of the cost counter.

4,417,135

#### POWER SAVING ELECTRONIC COUNTER CIRCUIT FOR TAPE RECORDER

Kazuyasu Motoyama; Kenzi Furuta, and Katsumi Kanayama, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

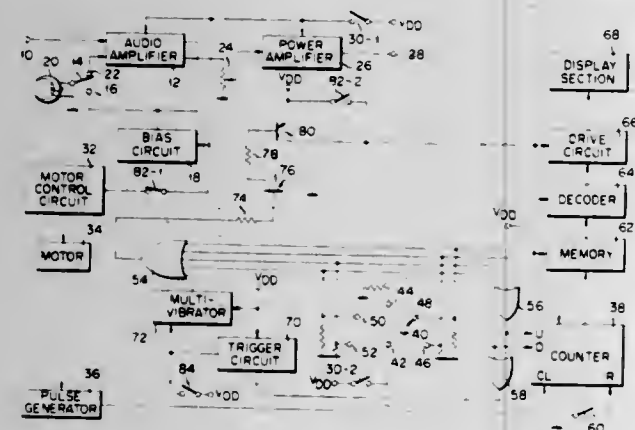
Filed May 9, 1980, Ser. No. 148,526

Claims priority, application Japan, May 28, 1979, 54-6583879; May 28, 1979, 54-7149479[U]

Int. Cl.<sup>3</sup> G11B 27/34; H03K 21/30

U.S. Cl. 377-18

9 Claims



1. In a tape recorder having a rotatable tape running means, mode setting means coupled to said tape running means for setting an operation mode of the tape recorder, and a source of electrical power, a device for displaying a tape running position of the tape in the tape recorder, comprising:  
means coupled to said tape running means and to said power source for generating pulses as a function of the rotation of said tape running means;  
electronic counter means coupled to said pulse generating means and to said power source for counting pulses of the output signal of said pulse generating means;  
display means coupled to said counter means and to said power source for displaying the count value of said counter means;  
signal producing means coupled to said mode setting means

and to said power source for producing a signal for a predetermined period of time upon detecting that the tape recorder is set in a non-operating mode;

power switching means coupled to said signal producing means for stopping power supply from said power source at least to said display means in response to the termination of the output signal from said signal producing means at the end of said predetermined period of time.

4,417,136

#### METHOD AND APPARATUS FOR IMPROVING BANK OPERATION PRODUCTIVITY

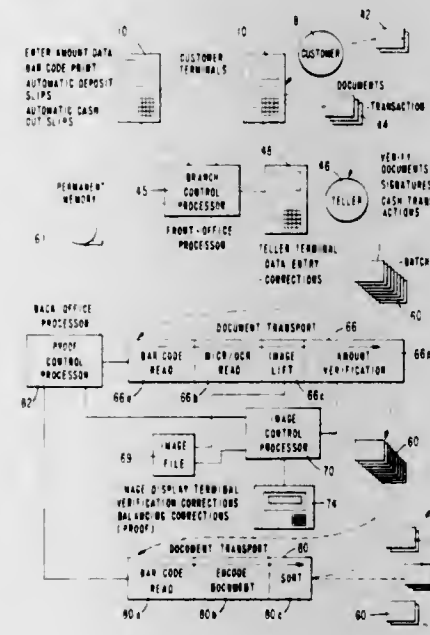
Robert J. Rushby, Waterloo, and Anthony B. Damms, Kitchener, both of Canada, assignors to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Aug. 5, 1981, Ser. No. 290,029

Int. Cl.<sup>3</sup> G06F 15/30

U.S. Cl. 235-379

19 Claims



1. A system for processing financial transactions, said system comprising:

first processing means;  
first terminal means, coupled to said first processing means, for permitting a customer to enter into said first processing means information obtained from a document of the customer, said document being contained in a financial transaction;  
second terminal means, coupled to said first processing means and said first terminal means, for enabling a teller to verify said customer-entered information;  
first storage means, coupled to said first processing means, for storing said customer-entered information subsequent to said teller verification;  
second processing means for receiving said teller-verified customer-entered information stored within said first storage means;  
document processing means for generating information from said document of the customer; and  
third processing means for automatically comparing information generated by said document processing means with said customer-entered information within said second processing means for correspondence therebetween.

4,417,137

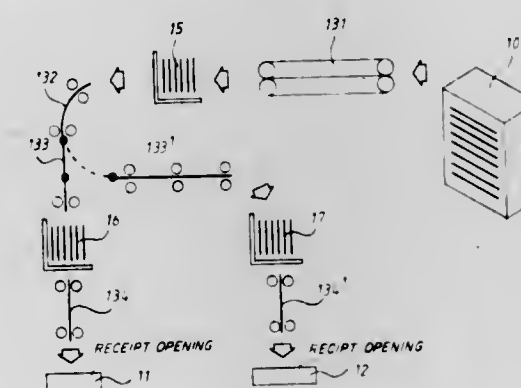
#### APPARATUS FOR DISPENSING SHEET-LIKE ELEMENTS FROM A STORE OF SUCH ELEMENTS, FOR EXAMPLE BANKNOTES, TO ONE OF A PLURALITY OF RECEIPT OPENINGS ACCESSIBLE TO, FOR EXAMPLE, CASHIER OR CUSTOMER

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden  
Filed Jun. 9, 1982, Ser. No. 386,813

Claims priority, application Sweden, Jul. 30, 1981, 8104600  
Int. Cl.<sup>3</sup> G06F 15/30

U.S. Cl. 235-379

7 Claims



1. An apparatus for dispensing sheet-like elements from a store (10) of such elements to a plurality of receipt openings (11,12) arranged in said apparatus and accessible to a plurality of individuals, comprising:

conveying means (131-134') for conveying said dispensed sheet-like elements from said store (10) to a predetermined one of said receipt openings;

means for electronically controlling said conveying means (131-134') in response to an order made by any one of said individuals for said sheet-like elements so that said conveying means conveys ordered sheet-like elements from said store (10) to said predetermined receipt opening (11) in a form of a bundle;

said conveying means comprising for each receipt opening retaining and holding means (16,17) which is individually allotted to said receipt openings (11,12) and which retains said ordered sheet-like elements for a time period determined by said electronic control means.

4,417,138

#### CREDIT CARD, PROCESS AND MARKING APPLIANCE FOR MANUFACTURING SAID CREDIT CARD, AND MARKING APPLIANCE FOR MARKING SAID CREDIT CARD IN ORDER TO EFFECT DEDUCTIONS FROM A CREDIT REPRESENTED BY THE CARD

Horst Pfeiffer, Aldingen, Fed. Rep. of Germany, assignor to J. Hengstler K.G., Aldingen, Fed. Rep. of Germany  
Filed Mar. 26, 1982, Ser. No. 362,062

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112664

Int. Cl.<sup>3</sup> G06K 19/06

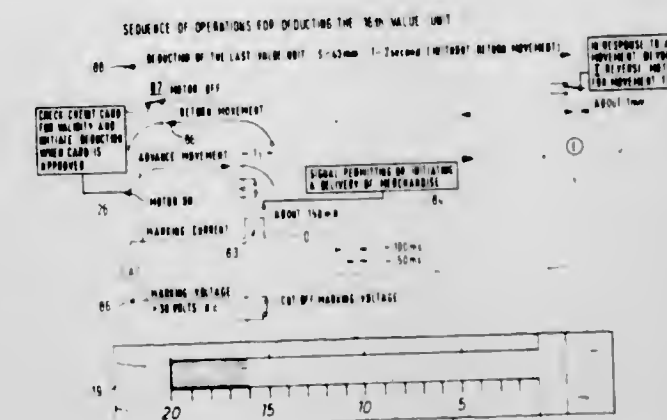
U.S. Cl. 235-492

36 Claims

1. In a credit card having at least one surface provided with an electrically conducting coating which is adapted to be marked by the action of an electric current flowing through said coating in a selected areas thereof, which surface comprises at least one credit-representing area adapted to be visibly marked in order to effect deductions from the credit represented by said card,

the improvement residing in that said coating includes a terminal area, said at least one credit-representing area, and at least one code-representing area, said credit-representing area is electrically conductively connected on one side to said terminal area, said code-representing area has a portion which is electrically conductively connected to said terminal area and at

least one isolated portion which is electrically disconnected from said terminal area, and said surface of said credit card has electrically non-conducting portions which are free from said coating and define



said at least one credit-representing area except on said one side and define said at least one isolated portion of said at least one code-representing area and which separate said at least one credit-separating area and said isolated portions from said terminal area.

4,417,139

#### FOCUS DETECTING APPARATUS

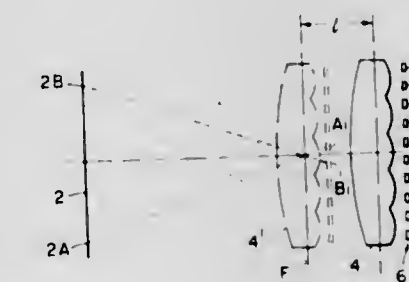
Yosuke Kusaka, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,317

Claims priority, application Japan, Dec. 26, 1980, 55-183695  
Int. Cl.<sup>3</sup> G01J 1/36

U.S. Cl. 250-204

5 Claims



1. An apparatus disposed in the light beam from an object passed through an imaging lens for producing an output variable with movement of the image of the object by said imaging lens in the direction of the optical axis, said apparatus producing, when the image of said object is formed on a predetermined imaging plane, an output corresponding to a critical value representative of the in-focus of said imaging lens to said object and producing, when the image of said object is formed at a position deviated from said predetermined imaging plane, an output corresponding to the amount of said deviation, said apparatus comprising:

(a) detector means disposed at a position biased in the direction of the optical axis from said predetermined imaging plane so as to produce an output corresponding to said critical value when the image of said object is formed on a plane biased by a predetermined amount in the direction of the optical axis from said predetermined imaging plane and to produce an output corresponding to said predetermined amount of bias when the image of said object is formed on said predetermined imaging plane;  
(b) memory means in which a data representative of said predetermined amount of bias is prerecorded; and  
(c) means for correcting the output of said detector means on the basis of said prerecorded data.



**4,417,140**  
**FIBRE OPTIC MEASURING DEVICE WITH**  
**ELECTRICALLY CONTROLLED**  
**PHOTOLUMINESCENCE**

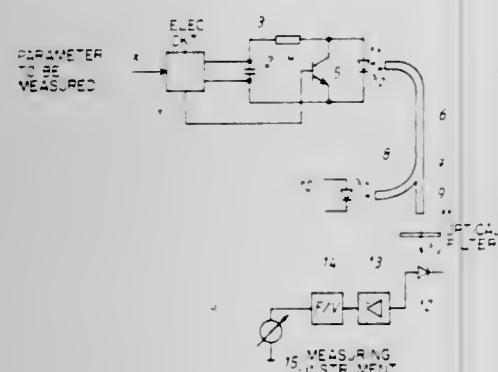
Morgan Adolfsson; Torgny Brogardh, and Christer Ovren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 22, 1981, Ser. No. 275,789

Claims priority, application Sweden, Jun. 23, 1980, 8004602  
 Int. Cl.<sup>3</sup> G01D 5/26

U.S. Cl. 250—227

22 Claims



1. A fiber optically coupled measuring device comprising, an optically energized transducer section for generating signal information in optical form from a body of photoluminescent material,
- a receiving section remote from the transducer section for producing a measuring signal from said signal information,
- means for producing excitation light for the said body in the transducer section, and
- fiber optic means for feeding excitation light to the transducer section and for passing signal information from the transducer section to the receiving section, wherein,
- the said body has electrically-dependent photo-luminescent properties such that the optical signal information it generates is modified by an electrical signal applied thereto, and
- said transducer section includes transducer means to produce an electrical signal which varies in dependence on a parameter to be measured and to feed said electrical signal to the body.

**4,417,141**  
**OPTICAL SHAFT ANGLE ENCODER**

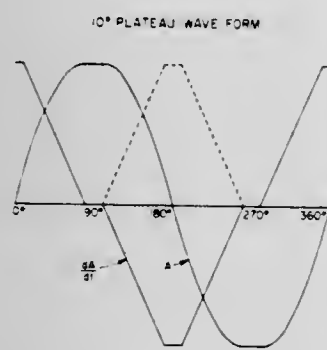
David T. Phillips, Santa Barbara, Calif., assignor to Electro-Craft Corporation, Hopkins, Minn.

Filed Jun. 10, 1981, Ser. No. 272,397

Int. Cl.<sup>3</sup> G01P 3/44

U.S. Cl. 250—231 SE

3 Claims



1. An optical encoder for providing an output signal indicative of relative motion between a scale and a frame, including illumination means and detector means mounted on a frame, said detector means constructed and arranged to receive illumination from said illumination means and producing an output

signal proportional to the amount of illumination received thereon and scale means having a pattern of transparent and opaque segments thereon, said pattern interposed between said illumination means and said detector means, the improvement comprising:

mask means mounted fixedly on said frame interposed between said illumination means and said detector means, said mask means characterized by at least one transparent segment aligned with the transparent and opaque segments of said scale means, the shape of said mask means selected to transmit illumination to said detector means as relative motion is introduced between said scale means and said frame, such that the waveform of the derivative of the output signal produced by said detector means is trapezoidal.

**4,417,142**  
**METHOD AND APPARATUS FOR DETECTING**  
**ALPHA-EMITTING SUBSTANCES**

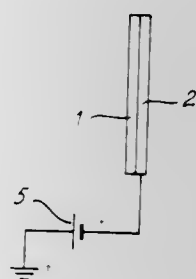
Erik L. Malmqvist, Skellefteå, and Krister Kristiansson, Lund, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed May 27, 1981, Ser. No. 267,693

Claims priority, application Sweden, Jun. 9, 1980, 8004273  
 Int. Cl.<sup>3</sup> G01V 5/00

U.S. Cl. 250—253

8 Claims



1. A method for detecting and measuring alpha-emitting substances, such as radon and/or daughter products of radon, by registering nuclear tracks on a detector, characterized by conducting away during the measuring any electrostatic fields which may have built up at the detector.

**4,417,143**  
**APPARATUS FOR DRIVING A RADIATION DETECTOR**

Werner J. Haas, Inverness, and Frank C. Scribano, Western Springs, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jun. 15, 1981, Ser. No. 273,446

Int. Cl.<sup>3</sup> G01T 1/20

U.S. Cl. 250—363 S

10 Claims



1. Supporting structure for driving a detector head of a radiation detector for emission computerized tomography, comprising an arm supporting the head adjacent an end thereof;

a base providing a fulcrum, the arm being moveably mounted on the base at the fulcrum;

means for counterbalancing the moment of the arm about the fulcrum due to the weight of the head; and means for driving the arm about the fulcrum so that the head traverses an arc with the head facing inward and so that a reference line drawn from the fulcrum to the head describes a conical surface having the fulcrum at its apex and the arc at its base.

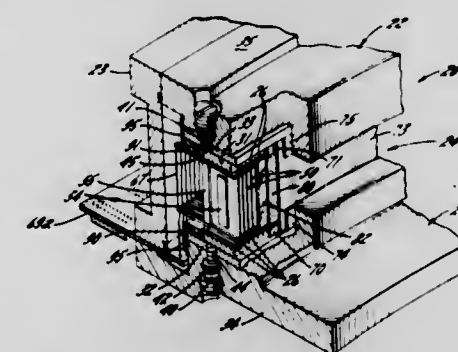
**4,417,144**  
**MODULAR SOLID-STATE DETECTOR CELL**

David M. Hoffman, New Berlin; Neil W. Loomis, Muskego; Ralph C. Ehler, Milwaukee, and Peter S. Shelley, Brookfield, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 23, 1981, Ser. No. 236,738  
 Int. Cl.<sup>3</sup> G01T 1/22

U.S. Cl. 250—367

8 Claims



1. In a scintillation detector for a CT scanner, the improvement comprising, a pair of opposed detector end members carrying a plurality of slots aligned to intercept a swath of radiation from an X-ray source in the scanner, a plurality of flat collimator plates dimensioned to closely fit in opposed slots in the end members to define a plurality of detector cells, a scintillator body and at least one photoresponsive semiconductor secured to each plate whereby each cell is independently provided on a single substrate with means to transform incident X-radiation into a measurable electrical signal.

**4,417,145**  
**APPARATUS FOR CONTROLLING MAGNETIC FIELD**  
**INTENSITY**

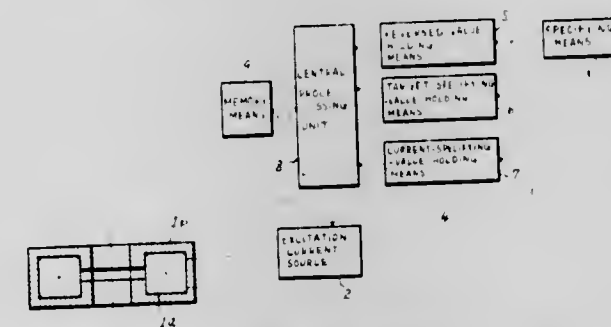
Settsuo Norioka, Akishimashi, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,404

Claims priority, application Japan, Sep. 26, 1980, 55-133888  
 Int. Cl.<sup>3</sup> G21K 1/08; H01J 37/00

U.S. Cl. 250—396 ML

4 Claims



1. In a device for producing a magnetic field comprising an electromagnetic coil and hysteretic yoke associated therewith, a control apparatus for receiving target signals indicative of a desired flux density and producing an output signal for controlling the current source to produce the desired flux density

defining the hysteretic characteristics of the yoke are stored;  
 means for holding a new target signal;  
 means for holding present and past target signals; and  
 means for collating the new target signal, the present and past target signals and comparing to the data in the memory to generate an output signal for controlling the current source.

**4,417,146**  
**X-RAY ATTENUATING APRON**

Linton M. Herbert, 14255 Rosemary Ln. #8104, Largo, Fla. 33540

Filed Jul. 10, 1981, Ser. No. 282,135  
 Int. Cl.<sup>3</sup> G21F 3/02

U.S. Cl. 250—516.1

14 Claims



1. An X-ray attenuating apron comprising:
  - a. an apron fabricated from a radiation attenuating material including a body section having first and second sides, a top, outer and inner surfaces and a vertically distributed weight transfer region, the apron further including first and second shoulder straps coupled to the top of the apron body section;
  - b. means for transferring substantially the entire weight of the shoulder straps to the weight transfer region, said means for transferring comprising first and second spaced apart vertical stiffeners coupled to and extending upward from the weight transfer region along the apron body section and through the first and second shoulder straps;
  - c. first and second tie straps; and
  - d. means for coupling one end of the first and second tie straps to the first and second sides of the apron body section at an adjustable vertical position within the weight transfer region to permit the tie straps to encircle the apron body section and secure the apron to the body of a wearer at a level within the weight transfer region and adjacent to the upper hip area of the wearer to thereby transfer the weight of the apron body section and shoulder straps to the wearer's hips.

**4,417,147**  
**METHOD AND APPARATUS FOR MEASURING**  
**RUNOUT IN A CYLINDRICAL OBJECT**

Paul E. Faville, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

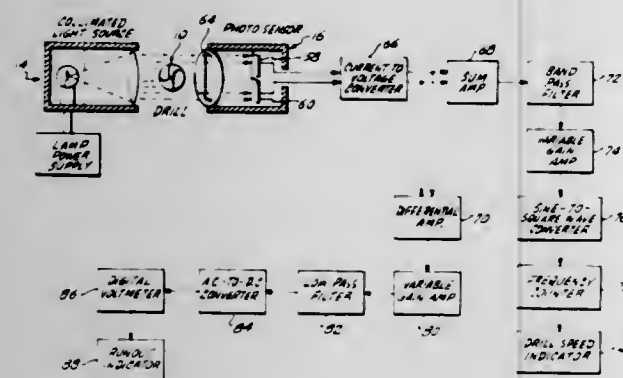
Filed Feb. 27, 1981, Ser. No. 238,854

Int. Cl.<sup>3</sup> G01N 27/86

1. An apparatus for determining runout in an elongated, cylindrical object having 2n radially extending profile variations in the cross-section geometry thereof, wherein n is a predetermined integer, said apparatus comprising:
  - a. drive means for holding an elongated, cylindrical object along a first portion of its length and rotating the object about the longitudinal axis of such first portion with a second portion of the length of said object extending



therefrom, said drive means including means for rotating said object at a rate of R revolutions per second; radiation source means for directing at least one beam of radiant energy transversely toward said second portion of said object from a location spaced apart from one side thereof, said radiation source means being positioned to direct said radiant energy on said second portion of said object with a portion of said beam passing tangentially across each of the two longitudinally extending, oppositely disposed surface regions of said object; first and second detectors positioned on the opposite side of said object from said radiation source means, said first detector being positioned for partial illumination by the portion of said beam passing across the first one of said two oppositely disposed surface regions of said object and being positioned for partial shadowing by said second portion of said cylindrical object throughout a complete revolution of said object, said second detector being positioned for partial illumination by the portion of said beam



passing across the second one of said two oppositely disposed surfaces of said object and being positioned for partial shadowing by said second portion of said cylindrical object throughout a complete revolution of said object, said first and second detectors respectively supplying first and second electrical signals representative of the area of said first and second detector that is partially illuminated by said beam; and circuit means connected for receiving said first and second electrical signals produced by said first and second detectors, said circuit means including signal processing means for supplying a difference signal representative of the difference between said first and second signals supplied by said first and second detectors, said circuit means further including filter means connected for receiving said difference signal, said filter means for supplying a signal representative of the runout of said object, said filter means configured and arranged for passing an electrical signal having a frequency substantially equal to R and for substantially attenuating signals at a frequency of 2nR.

#### 4,417,148 PHOTODETECTOR DEVICE FOR DETECTING THE FRONT AND REAR ENDS OF A MOVING SHEET

Eiji Otake, Kawaguchi, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

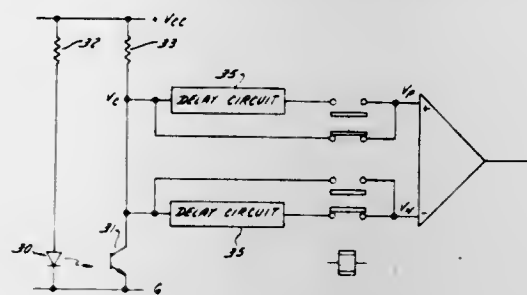
Continuation-in-part of Ser. No. 122,714, Feb. 19, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,409  
Claims priority, application Japan, Feb. 22, 1979, 54-19008  
Int. Cl.<sup>3</sup> G01N 21/86

U.S. Cl. 250—561

6 Claims

1. A photodetector device for photoelectrically detecting the presence of a moving body, comprising an operational amplifier receiving as a first input an electric signal which is in proportion to variations in the quantity of light; a delay circuit for delaying the electric signal by a predetermined period of time and changeover means for applying the delayed electric signal to the operational amplifier as a reference input with

respect to the first input, said changeover means for detection of the front and rear ends of the moving body in sequence,



whereby the information of the presence of the moving body is obtained as an output from the operational amplifier.

#### 4,417,149 APPARATUS FOR DETECTING AND MEASURING DEFECTS

Hideaki Takeuchi; Tsunehiko Takahashi, and Masaru Noguchi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

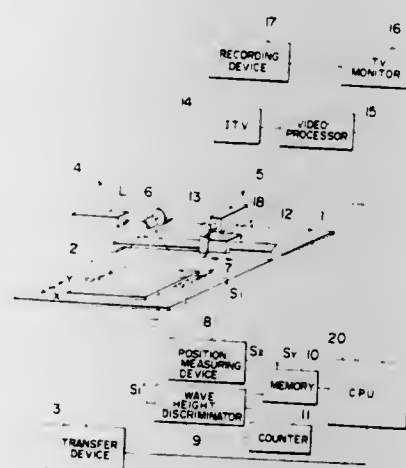
Filed Sep. 18, 1981, Ser. No. 303,684

Claims priority, application Japan, Sep. 25, 1980, 55-133321

Int. Cl.<sup>3</sup> G01N 21/72

U.S. Cl. 250—563

8 Claims



1. An apparatus for detecting and measuring defects comprising a defect detection means for detecting the position of minute defects in the material under inspection, means for scanning the material with a light beam, means for generating position information regarding the minute defects detected by the detection means, a defect size measuring means for measuring the area of the minute defects detected by the defect detection means, memory means for storing the position information regarding the minute defects detected by the defect detection means, and operating means, for using the position information stored by the memory means, to move the defect size measuring means to the position for measuring the defects.

#### 4,417,150 OPTICAL SYSTEM FOR DETERMINING PERIPHERAL CHARACTERIZATION AND DIMENSIONS OF A SHEET

Raymond D. Moran, Springdale, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1981, Ser. No. 292,566

Int. Cl.<sup>3</sup> G01N 21/88

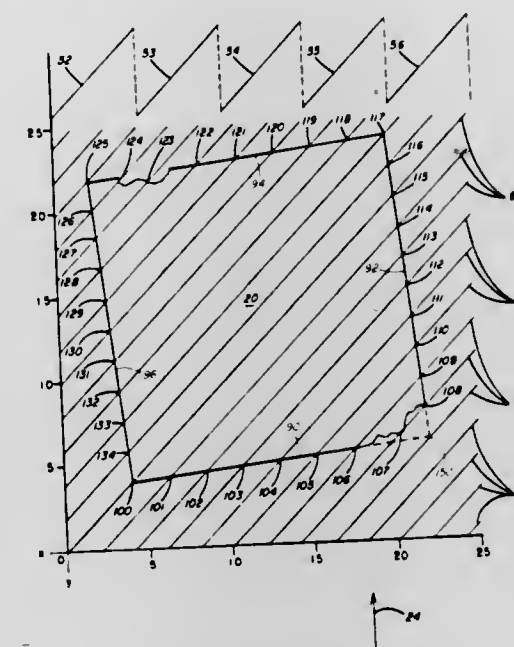
U.S. Cl. 250—572

17 Claims

1. A method of determining peripheral edge characteristics of a discrete sheet comprising steps of: directing energy beams toward a surface of the sheet to provide a scan path, the scan path extending beyond edge portions of the sheet;

moving the scan path and sheet relative to one another to

direct energy beams indicating edge portions of the sheet toward sensing means; generating by way of the sensing means, a plurality of discrete signals as a function of intersection between edge



portions of the sheet and the scan path defined as intersection points; and acting on the generated signals to determine peripheral edge characteristics of the sheet.

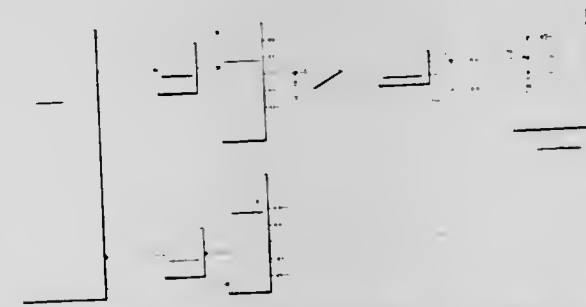
#### 4,417,151 UNIVERSAL INPUT-OUTPUT DEVICE

George Klein, Manhasset Hills; Solomon Manber, Sands Point, both of N.Y.; Marvin Sudhalter, North Bergen, N.J., and Alvin Taylor, Bayside, N.Y., assignors to Distributed Control Systems, Inc., Great Neck, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,058

Int. Cl.<sup>3</sup> H02J 1/10

U.S. Cl. 307—24



1. A universal input-output apparatus comprising: a plurality of controllable sources of electrical energy including at least one drive source having an output terminal and a return terminal; an electrical energy measuring means including at least one energy sensing means having an input terminal connected to the output terminal of one of said controllable sources of electrical energy; at least one line having a first lead and a second lead and having the first ends of said first and second leads connected to the output and return terminals of said drive source, respectively; and at least one integrity test means comprising a zener diode means connected across the second ends of said first and second leads respectively; a first terminal connected to one of said second ends, a second terminal, unidirectional conducting means interconnecting said one second end and said second terminal, a third terminal, and resistive means interconnecting said one second end and said third terminal.

#### 4,417,152 ELECTRIC SWITCHING DEVICE

Heinz Fleischmann, Nuremberg, and Helmut Steckmann, Schwanstetten, both of Fed. Rep. of Germany, assignors to Te Ka De Felten & Guillaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

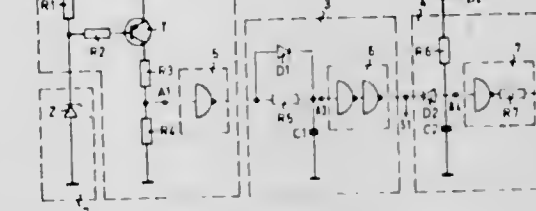
Filed Oct. 19, 1981, Ser. No. 312,853

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039408

Int. Cl.<sup>3</sup> H02J 9/00

U.S. Cl. 307—64

8 Claims



1. An electronic switching device for generating control signals for an electrical device which contains a current supply device and devices fed therefrom, comprising: an electronic switch controlled by: a threshold value circuit which switches: a supply voltage controlled by said threshold value circuit to; a switch on delay circuit having: a first control signal as an output, said first control signal being fed to: a switch off delay circuit having as an additional input at least one auxiliary voltage source and as an output a second control signal so that during the switching on, or switching off, or during voltage fluctuations of said supply voltage at least one of said devices is connectable with at least said second control signal, to the auxiliary voltage source.

#### 4,417,153 HIGH FREQUENCY SWITCHING CIRCUIT

Toshihiro Onodera, Kunitachi; Yoshio Masuda, Yokohama; Akira Nakajima, Yokosuka; Yoshio Takamura; Seiji Kajiura, both of Yokohama, and Shoichi Higo, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

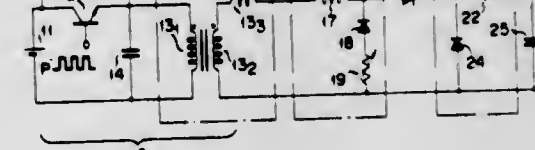
Filed Feb. 16, 1982, Ser. No. 349,094

Claims priority, application Japan, Feb. 17, 1981, 56-21938

Int. Cl.<sup>3</sup> H01H 47/00

U.S. Cl. 307—140

20 Claims



16. A switching circuit power supply comprising: a first switching element having a first terminal adapted to be coupled to a first terminal of a DC power source and a second terminal; means for ON/OFF operating said first switching element with predetermined frequency and conductive periods; a resonance capacitor coupling said second terminal of said first switching element to a second terminal of said DC power source; a first inductor in parallel with said resonance capacitor; a second switching element having a first terminal coupled to said second terminal of said first switching element and having a second terminal;



a transformer having primary and secondary windings, said primary winding coupling said second terminal of said second switching element to said second terminal of said DC power source;  
rectifying means coupled to said secondary winding; and means for filtering an output from said rectifier and supplying a filtered power signal to a load

4,417,154

# CIRCUIT FOR APPLYING A HIGH VOLTAGE SIGNAL TO A FUSIBLE LINK

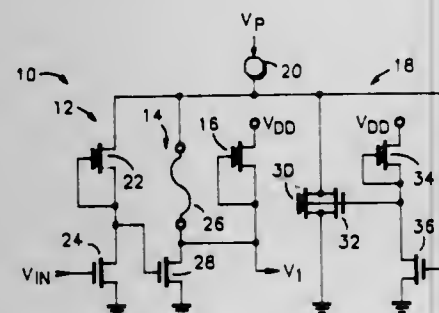
Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 8, 1982, Ser. No. 346,974

Int. Cl. G11C 17/00

U.S. Cl. 307—202.1

7 Claims



1. A circuit for applying a high voltage signal to a fusible link, comprising:

a transistor having a first current electrode coupled to a first power supply terminal, a second current electrode for providing an output signal, and a control electrode;  
a fusible link having a first terminal coupled to a high voltage terminal for receiving the high voltage signal and a second terminal coupled to the second current electrode of the first transistor;

selection means for selectively coupling the high voltage terminal to the control electrode of the first transistor;  
a load device having a first terminal coupled to a second power supply terminal, and a second terminal coupled to the second current electrode of the first transistor; and  
coupling means directly connected to the high voltage terminal for coupling the high voltage terminal to the first power supply terminal in response to the high voltage signal being absent from the high voltage terminal;

whereby in the absence of the high voltage signal, the output signal is provided via the fusible link at a voltage present at the first power supply terminal when the fusible link has not been opened; and the output signal is provided via the load device at a voltage present at the second power supply terminal when the fusible link has been opened.

4,417,155

# ANTI-CHATTER CIRCUIT FOR SMALL PORTABLE APPARATUS

Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Chuo, Japan

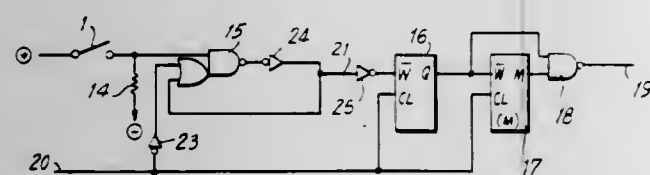
Filed Jun. 25, 1981, Ser. No. 277,293

Claims priority, application Japan, Jun. 26, 1980, 55-87058

Int. Cl. H03K 17/56

U.S. Cl. 307—247 A

11 Claims



1. An anti-chatter circuit for a small portable apparatus comprising:  
switch means for providing a signal output indicative of the

instantaneous open or closed condition of said switch means;

first memory means for storing the signal output of said switch, said first memory means being adapted to store and output an instantaneous closed switch signal when the occurrence of a first read signal is concurrent with said closed switch signal, said first read signal being input to said first memory means, said stored closed switch signal being maintained and output by said first memory means only so long as said switch is closed;

second memory means for storing the output of said first memory means, said second memory means being adapted to store an output upon the occurrence of a second read signal, said second read signal being input to said second memory means, said first read signal leading said second read signal;

differentiation circuit means for outputting a signal in response to the output of said second memory means, said signal from said differentiation circuit means occurs only when said switch closing signal persists for not less than the time between said first and second read signals.

4,417,156

# GATE CIRCUIT FOR THYRISTORS

Hiroshi Fukui, Shin Kimura, Kenichi Onda, and Hisao Amano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

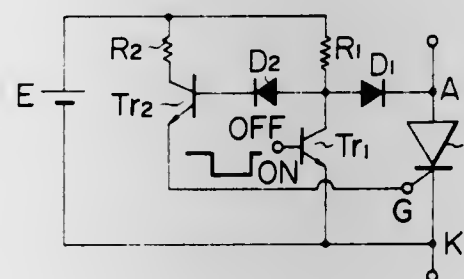
Filed Feb. 26, 1981, Ser. No. 238,605

Claims priority, application Japan, Feb. 28, 1980, 55-24849

Int. Cl. H03K 17/72

U.S. Cl. 307—252 C

6 Claims



1. A gate circuit for a thyristor comprising a power supply for feeding gate-on current through a gate and cathode of said thyristor, a switching circuit connected in series with the power supply to turn the gate-on current on or off, a diode connected between a gate ignition signal input terminal of said switching circuit and the anode of said thyristor with the cathode of said diode coupled to said anode of said thyristor and the anode of said diode coupled to said switching circuit.

4,417,157

# RADIO FREQUENCY SWITCH FOR COUPLING AN RF SOURCE TO A LOAD

David N. Gershberg, Rockville, Md.; Alexander Y. Lee, Jr., Arlington, and William B. Moore, Falls Church, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

Division of Ser. No. 74,502, Sep. 11, 1979, Pat. No. 4,286,260.

This application Feb. 27, 1981, Ser. No. 238,849

Int. Cl. H03K 17/74

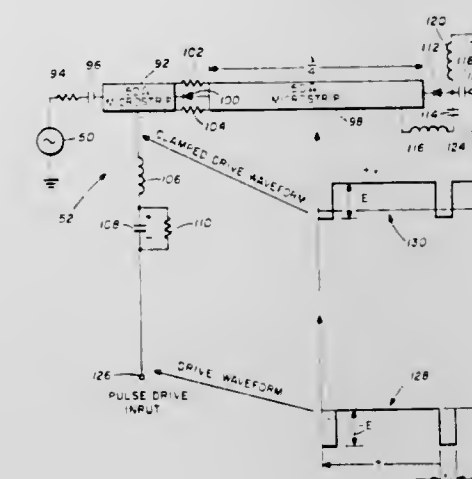
U.S. Cl. 307—256

20 Claims

1. A radio frequency switch for coupling an RF source to a load, the radio frequency switch comprising:

an input diode and an output diode,  
means for connecting said input diode to the RF source and to a switch drive signal, said switch drive signal including drive pulses for actuating said switch,  
means for connecting output diode to the load,  
a quarter wavelength RF impedance inverter interconnecting said input diode to said output diode, and  
means connected to said means for connecting said input diode to the RF source for clamping said switch drive

signal to a predetermined voltage between said drive pulses, whereby the impedance of said switch with respect



to said source remains substantially constant during the entire operation of said switch.

4,417,158

# CLOCK GENERATOR CIRCUIT

Akihiko Ito, Kawasaki; Hisami Tanaka, Yokohama; Yoshihisa Takayama, Kawasaki, and Seiji Kato, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

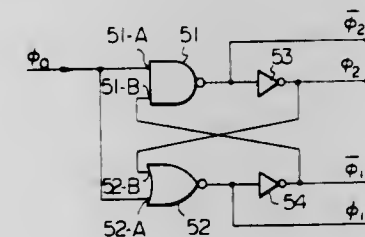
Filed Nov. 18, 1981, Ser. No. 322,720

Claims priority, application Japan, Nov. 20, 1980, 55-163607

Int. Cl. H03K 3/037

U.S. Cl. 307—269

3 Claims



1. A clock generator circuit for generating two pairs of clock signals by using a reference clock signal, comprising: first and second logic circuits, each having first and second input terminals and an output terminal, for generating first and second clock signals, respectively, the first input terminal of each of said first and second logic circuits receiving said reference clock signal;

a first delay circuit, connected between the output terminal of said first logic circuit and the second input terminal of said second logic circuit, for delaying and inverting said first clock signal so as to generate a third clock signal which forms a pair with said first clock signal;

a second delay circuit, connected between the output terminal of said second logic circuit and the second input terminal of said first logic circuit, for delaying and inverting said second clock signal so as to generate a fourth clock signal which forms a pair with said second clock signal;

said first logic circuit detecting a change of the potential of said fourth clock signal so as to change the potential of said first clock signal, when the potential of said reference clock is high; and

said second logic circuit detecting a change of the potential of said third clock signal so as to change the potential of said second clock signal, when the potential of said reference clock is low.

4,417,159

# DIODE-TRANSISTOR ACTIVE PULL UP DRIVER

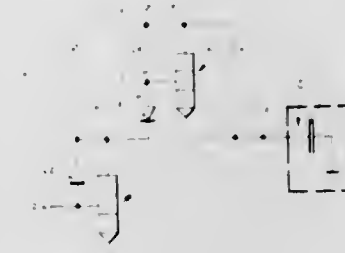
Jack A. Dorler, Wappinger Falls; Joseph M. Mosley, Hope vell Junction; Richard O. Seeger, Wappinger Falls, and Stephen D. Weitzel, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1981, Ser. No. 293,830

Int. Cl. H03K 5/00

U.S. Cl. 307—270

17 Claims



1. A driver for rapidly pulling up a capacitive load, comprising:

a driver transistor having a base, an emitter and a collector, the collector of which is connected to a predetermined voltage and the emitter of which is connected to said capacitive load,

a diode having an anode and a cathode, the anode of which is connected to the base of said driver transistor,

forward bias current providing means connected to said anode, for providing forward bias current through said diode when a forward bias voltage is applied thereto, and means for developing a forward diode voltage between said anode and said cathode to thereby cause forward bias current to flow through said diode from said forward bias current providing means and build up a diode diffusion capacitance between said anode and said cathode, and for connecting said predetermined voltage to said cathode, to thereby raise the base of said driver transistor above said predetermined voltage by an amount equal to said forward diode voltage,

whereby the emitter of said driver transistor, and said capacitive load connected thereto, are pulled up to a voltage, which differs from said predetermined voltage by less than the base-emitter voltage drop of said driver transistor.

4,417,160

# OFFSET COMPENSATION APPARATUS FOR BIASING AN ANALOG COMPARATOR

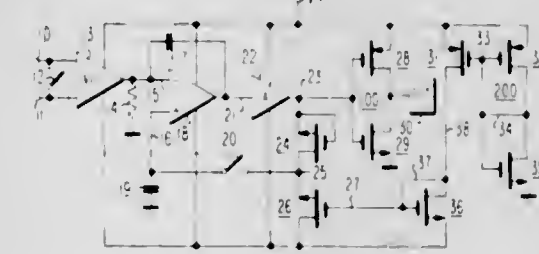
Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,626

Int. Cl. H03K 5/08; G06G 7/186; H03F 1/02

U.S. Cl. 307—353

10 Claims





as a reference potential during periods when said feedback loop is open, and including an inverter circuit having an input terminal connected to said output circuitry and an output terminal for producing an output potential, the output potential of said inverter changing from a first to a second state for a potential at its input terminal traversing a threshold value, said circuitry further comprising:

- potential offset means serially connected in said feedback loop, said potential offset means connected in the feedback loop at said output circuitry; and
- means for generating a current to bias said potential offset means to produce an offset potential equal to said inverter threshold level, said bias current varying in amplitude so that the offset potential produced thereby substantially tracks threshold potential drifts occurring in said inverter.

4,417,161

### COMPLEMENTARY CHANNEL TYPE MOS TRANSISTOR EXCLUSIVE OR/NOR LOGIC GATE CIRCUIT

Masaru Uya, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

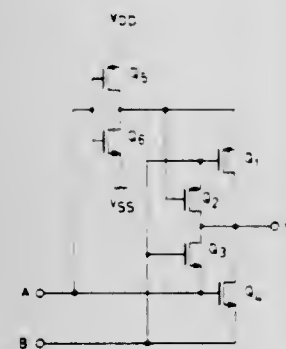
Filed Aug. 28, 1981, Ser. No. 297,501

Claims priority, application Japan, Sep. 4, 1980, 55-123154

Int. Cl.<sup>3</sup> H03K 19/21, 19/094

U.S. Cl. 307-471

3 Claims



1. A complementary transistor type logic gate circuit comprising:

- a first input terminal to which a first input signal is applied,
- a second input terminal to which a second input signal is applied,
- an output terminal,
- an inverter
- a first transistor and a second transistor of one conductivity type having gate, source and drain electrodes,
- a third transistor and a fourth transistor of a complementary conductivity type having gate, source and drain electrodes,
- said inverter being operatively connected to invert said first input signal and issue outputs to a source of said transistor and to a gate of said second transistor,
- said first input terminal being operatively connected to a source of said third transistor and a gate of said fourth transistor,
- said second input terminal being operatively connected to a gate of said first transistor, a source of said second transistor, a gate of said third transistor and a source of said fourth transistor, and
- all drains of said first, second, third and fourth transistors being connected in common to said output terminal.

4,417,162

### TRI-STATE LOGIC BUFFER CIRCUIT

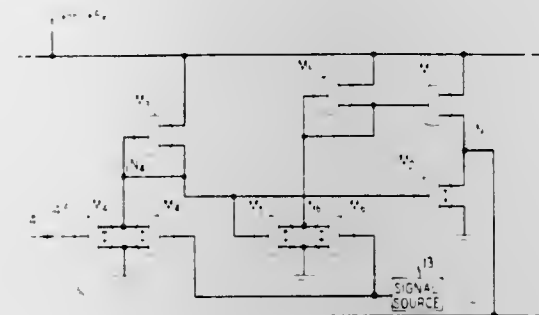
Jack K. Keller, Macungie, and Gilbert L. Mowery, Jr., Allentown, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 2,741, Jan. 11, 1979, abandoned. This application Sep. 9, 1981, Ser. No. 300,590

Int. Cl.<sup>3</sup> H03K 19/003, 19/094, 19/173, 19/20

U.S. Cl. 307-473

9 Claims



1. A tri-state MOS buffer circuit comprising first and second NOR-gates, respectively, responsive to input logic signals, and having first and second output nodes, respectively, connected to first and second input nodes, respectively, of an output MOS load device (M<sub>1</sub>, M<sub>2</sub>); said load device including a first MOS enhancement transistor (M<sub>1</sub>), having a relatively low threshold voltage under zero back-gate bias, whose high current path is connected in series with that of an output MOS enhancement mode driver transistor (M<sub>2</sub>), having a relatively high threshold voltage under zero back-gate bias, and wherein the series connection of said output MOS transistors is used to effect an output node connection: each NOR-gate including a relatively low  $\beta$  MOS depletion mode load transistor (M<sub>3</sub>, M<sub>5</sub>) each separately connected in series with a separate pair of relatively high  $\beta$  MOS enhancement mode driver transistors (M<sub>4</sub>, M<sub>4'</sub>; M<sub>6</sub>, M<sub>6'</sub>) connected in parallel with each other.

4,417,163

### BUFFER CIRCUITS

Yoshio Otsuki; Masaru Uesugi, both of Tokyo, and Nobuaki Ieda, Kodaira, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

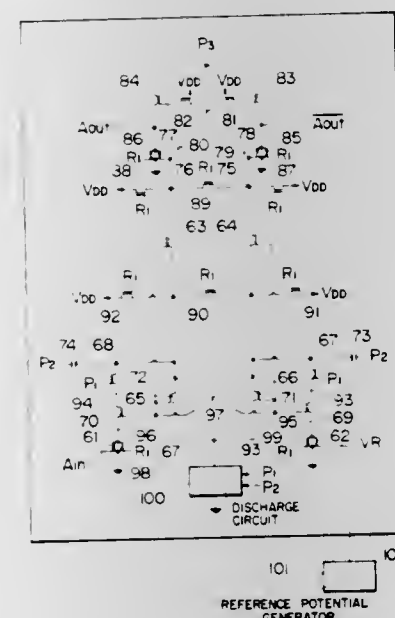
Filed Feb. 17, 1981, Ser. No. 235,035

Claims priority, application Japan, Feb. 20, 1980, 55-19042

Int. Cl.<sup>3</sup> H03K 19/092, 17/693; G11C 8/00

U.S. Cl. 307-475

8 Claims



1. A buffer circuit comprising:

a flip-flop circuit including a first MOS transistor having source and gate electrodes, and a drain electrode coupled to a first input/output terminal, and a second MOS transistor having a drain electrode coupled to said gate electrode of said first MOS transistor and a second input/output terminal and having a source electrode coupled to said source electrode of said first MOS transistor and having a gate electrode coupled to said first input/output terminal; a discharge circuit connected between the commonly connected source electrodes of said first and second MOS transistors of said flip-flop circuit and a first fixed source potential for discharging said source electrodes when a first start signal or a second start signal is inputted;

first and second capacitors for respectively AC coupling said first and second start signals to said first and second input/output terminals of said flip-flop circuit;

a first transfer gate circuit for executing a NOR logic function between a TTL level address input signal and a reset signal;

a second transfer gate circuit for executing a NOR gate logic function between said reset signal and a reference signal applied to a reference potential terminal;

a third transfer gate circuit coupled between an output terminal of said first transfer gate circuit and said first input/output terminal of said flip-flop circuit for selectively transmitting an output signal of said first transfer gate circuit to said first input/output terminal in accordance with a potential at said second input/output terminal of said flip-flop circuit and a first start signal;

a fourth transfer gate circuit coupled between an output terminal of said second transfer gate circuit and said second input/output terminal of said flip-flop circuit for selectively transmitting an output of said second transfer gate circuit to said second input/output terminal in accordance with a potential at said first input/output terminal of said flip-flop circuit and said first start signal; said first to fourth transfer gate circuits, said discharge circuit, said first and second capacitors and said flip-flop circuit constituting a sensing and amplifying circuit;

a fifth transfer gate circuit coupled between a first MOS level address signal output terminal and said first fixed source potential for executing a NOR logic function between a potential at a third input terminal and said reset signal;

a sixth transfer gate circuit coupled between a second MOS level address signal output terminal and said first fixed source potential for executing a NOR logic function between a potential at a fourth input terminal and said reset signal;

a first bootstrap circuit for selectively raising a potential at said first MOS level address signal output terminal according to a signal applied to said fourth input terminal and a third start signal;

a second bootstrap circuit for selectively raising a potential at said second MOS level address signal output terminal in accordance with a signal applied to said third input terminal and said third start signal;

said first and second bootstrap circuits constituting an output transmission circuit;

a seventh transfer gate circuit coupled between said third input terminal and said first input/output terminal of said flip-flop circuit and selectively enabled and disabled by a potential at said second input/output terminal of said flip-flop circuit;

an eighth transfer gate circuit coupled between said fourth input terminal and said second input/output terminal of said flip-flop circuit and selectively enabled and disabled by a potential at said first input/output terminal of said flip-flop circuit;

a first precharge circuit for charging said first and second input/output terminals of said flip-flop circuit by said reset signal;

a second precharge circuit for charging said third and fourth input/output terminals by said reset signal; and

a reference potential generator for applying a reference potential to said reference potential terminal of said sec-

ond transfer gate circuit of said sensing and amplifying circuit.

4,417,164

### MECHANICAL VALVE ANALOG

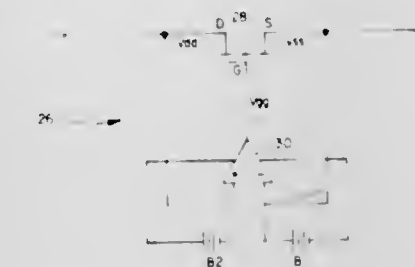
Carl E. Edlund, Castroville, Tex., assignor to Southern Gas Association, Dallas, Tex.

Filed Jun. 18, 1981, Ser. No. 275,068

Int. Cl.<sup>3</sup> H03K 4/00, 5/153, 3/26

U.S. Cl. 307-497

1 Claim



1. An apparatus for electrically simulating, in an electrical analog of a fluid pump, the action of a unidirectional mechanical valve, comprising:

- an input terminal which corresponds to the input of the mechanical valve;
- an output terminal which corresponds to the output of the mechanical valve;
- a field effect transistor having a gate, a drain and a source, wherein the drain and source are coupled to said input and output terminals;
- a voltage comparator having a positive input coupled to said input terminal, a negative input coupled to said output terminal, and an output coupled to the transistor gate; and
- a voltage supply having positive, negative and middle supply outputs, wherein the positive supply output is coupled only to a positive supply terminal of said comparator, and further wherein the negative supply output is coupled only to a negative supply terminal of said comparator, and further wherein the middle output is coupled only to the comparator negative input, whereby said voltage supply is referenced to whatever voltage may be present at said output terminal.

4,417,165

### MUTING CIRCUIT

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

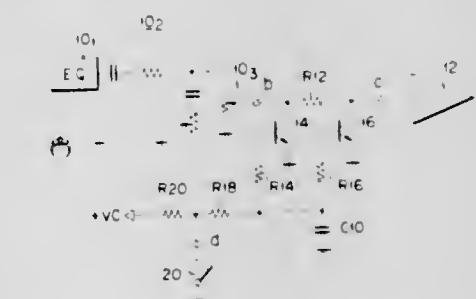
Continuation of Ser. No. 118,996, Feb. 6, 1980, abandoned. This application May 21, 1982, Ser. No. 380,950

Claims priority, application Japan, Mar. 26, 1979, 54-38924[U]

Int. Cl.<sup>3</sup> H03K 5/00, 17/60

U.S. Cl. 307-540

3 Claims



1. A muting circuit comprising: an input circuit which receives an input signal of the muting circuit and provides a first signal corresponding to said



input signal, said input circuit having a given circuit impedance;

a volume control circuit having a given circuit impedance, which is provided with an input terminal for receiving said first signal, an output terminal for providing a second signal and a ground terminal coupled to a circuit with zero AC potential, a ratio between the magnitude of said second signal to that of said first signal being varied under control of said volume control circuit;

an impedance element having two terminals, one terminal of which is coupled to the output terminal of said volume control circuit and the other terminal of which provides an output signal of said muting circuit;

a first bipolar transistor which has a collector coupled to the one terminal of said impedance element and an emitter coupled to said zero AC potential circuit;

a second bipolar transistor which has a collector coupled to the other terminal of said impedance element and an emitter coupled to said zero AC potential circuit; and

muting signal supply means coupled to each base of said first and second transistors for simultaneously supplying a DC muting signal, said muting signal supply means including a first resistor connected at one end to a base of said first transistor, and a second resistor connected at one end to a base of said second transistor, the other ends of said first and second resistors being connected to each other, and the resistance values of said first and second resistors being so selected that said first and second transistors are turned on substantially at the same time when said muting signal is supplied thereto.

4,417,166

## STATOR FOR A STEPPING MOTOR

Norberto Perucchi, St. Blaise, and Elmar Mock, Bienne, both of Switzerland, assignors to ETA A.G. Ebauches-Fabrik, Solothurn, Switzerland

Division of Ser. No. 124,275, Feb. 25, 1980, Pat. No. 4,312,119.

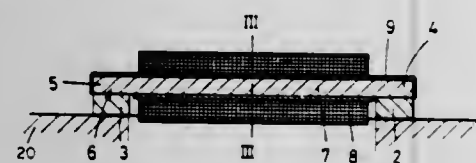
This application Jul. 28, 1981, Ser. No. 287,829

Claims priority, application Switzerland, Feb. 27, 1979, 1931/79

Int. Cl.<sup>3</sup> H02K 37/00

U.S. Cl. 310—49 R

6 Claims



1. A stepping motor for an electronic watch having a stator comprising a one-piece core of ferromagnetic metal including widened end portions having opposed faces and a center portion of rectangular cross-section coupled between said widened end portions, an elongated coil formed about said center portion such that said center portion passes axially through said coil, and two pole pieces coupled magnetically to said widened end portions by overlapping surface contact, wherein the improvement comprises:

a film of resin covering said center portion and one face of each of said widened end portions and forming reinforced zones of resin along edges of said core of rectangular cross-section, said coil being formed about said center portion such that turns of said coil rest directly upon said film.

4,417,167  
DC BRUSHLESS MOTOR

Hirohisa Ishii, Tokyo; Masami Shishikura, Yokohama, and Toshihiko Okamura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

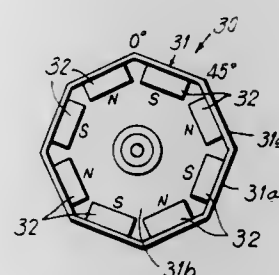
Continuation of Ser. No. 942,270, Sep. 14, 1978, abandoned. This application Dec. 11, 1981, Ser. No. 329,887

Claims priority, application Japan, Sep. 14, 1977, 52-111298

Int. Cl.<sup>3</sup> H02K 7/00

U.S. Cl. 310—67 R

20 Claims



1. In a DC brushless motor including a permanent magnet rotor assembly, a stator assembly having stator coils arranged in the magnetic field generated by said permanent magnet rotor assembly, and means for controlling energization of said stator coils so as to impart a rotational torque to said rotor assembly; said rotor assembly comprising a plurality of flat permanent magnets each having a flat side facing said stator coils across an air gap free of magnetic material and rotor yoke means having a substantially polygonal cross-section and a plurality of flat side walls to which said flat permanent magnets are attached and providing a path for magnetic flux emanating from the side of said magnets remote from said stator coils whereby said plurality of magnets forms an array thereof which is substantially a regular polygon in cross-section.

4,417,168

## PERMANENT MAGNET ROTOR FOR A DYNAMO ELECTRIC MACHINE

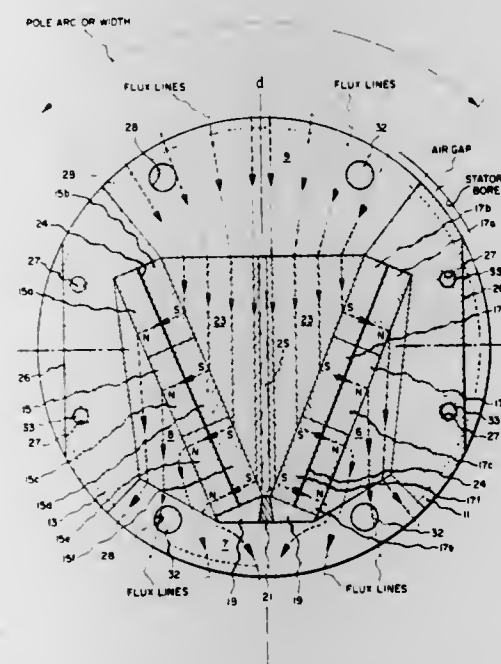
Timothy J. E. Miller, Schenectady, and Donald W. Jones, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,333

Int. Cl.<sup>3</sup> H02K 21/12

U.S. Cl. 310—156

14 Claims



1. A two pole permanent magnet rotor for a dynamo electric machine comprising:

two pole pieces of magnetic material;

two non-magnetic segments separating said pole pieces and

forming a cylinder, said cylinder having an aperture extending axially through the central portion thereof;

two magnets arranged in a "V" configuration polarized such that the inner faces of said "V" configuration magnets have like polarity, said magnets located in the aperture symmetrically about the d axis and asymmetrically located above and below the q axis, the q axis passing through the center of said cylinder and orthogonal to the d-axis;

means for holding said magnets in said aperture such that the outer faces of said "V" configuration magnets are adjacent to one of said pole pieces and for conducting flux between the inner magnet faces and the other of said pole pieces, said means for holding said magnets in the aperture comprising a prism of magnetic material positioned adjacent to the inner face of said "V" configuration magnets, said prism including said first and second prism sections separated along a plane parallel to a flux line, and a planar spring disposed between said sections; and

shaft means attached to both faces of said cylinder.

4,417,169

## PHOTOELECTRIC DRIVE CIRCUIT FOR A PIEZOELECTRIC BIMORPH ELEMENT

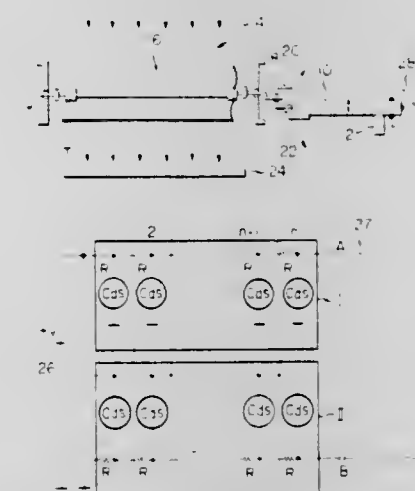
Minoru Toda, and Susumu Osaka, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,975

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—317

5 Claims



1. A photoelectric circuit arrangement for driving a piezoelectric bimorph element comprising:

a direct current voltage source having first and second terminals,

a first resistive means connected between said first source terminal and a first output terminal,

a first photoconductive means connected between said second source terminal and distributed points along said first resistive means,

a second resistive means connected between said second source terminal and a second output terminal,

a second photoconductive means connected between said first source terminal and distributed points along said second resistive means, and

means connecting said first and second output terminals to said bimorph element.

4,417,170  
FLEXIBLE CIRCUIT INTERCONNECT FOR PIEZOELECTRIC ELEMENT

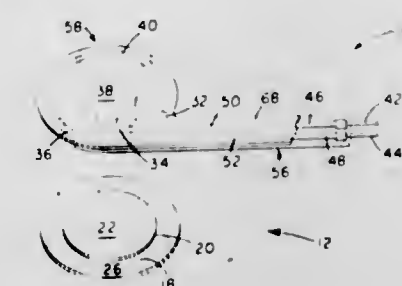
Timothy C. Benincasa, Bellevue, Ohio, assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Filed Nov. 23, 1981, Ser. No. 323,913

Int. Cl.<sup>3</sup> H01L 41/04

U.S. Cl. 310—345

3 Claims



1. A piezoelectric assembly comprising:

a piezoelectric element and a flexible interconnect for attachment to said element; said interconnect including an insulating base and spaced circuit traces laminated to said base in operation with electrical connection to said element, said element being generally disc-shaped and including a face for said attachment, said face being operatively connected to a first of said traces about a segment of the periphery of said face and operatively connected to a second of said traces generally centrally of said face, an insulating overlay sealing said circuit traces which are not electrically connected to the element, and means for connecting said traces to an electrical circuit.

4,417,171

## ROTARY ANODE X-RAY TUBE

Herbert Schmittmann, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

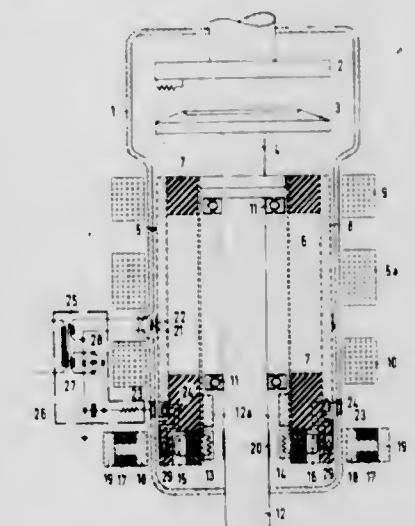
Filed Oct. 15, 1981, Ser. No. 311,622

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3043046

Int. Cl.<sup>3</sup> H01J 1/10, 61/52

U.S. Cl. 313—16

5 Claims



1. A rotary anode x-ray tube comprising an anode arrangement (3, 4, 5) mounted magnetically for rotation with respect to an anode rotary axis without contact, including an anode (3) and a part (5) rotating with the anode (3), a stationary part (12), and means (12, 13, 14, 20) for carrying off the anode current comprising at least one auxiliary cathode (13, 14) arranged on said part (5) rotating with the anode (3), and an auxiliary anode (20), arranged concentrically to the anode rotary axis on the stationary part (12), and operatively associated with said auxiliary cathode.



4,417,172

## LOW PRESSURE DISCHARGE LAMP

Makoto Touhou, Yawata; Shigeaki Wada, Osaka, and Minoru Yamamoto, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

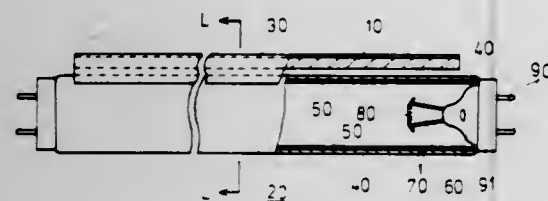
Filed Dec. 12, 1980, Ser. No. 215,664

Claims priority, application Japan, Dec. 29, 1979, 54-171283; Dec. 29, 1979, 54-171293; Oct. 8, 1980, 55-141314

Int. Cl.<sup>3</sup> H01J 1/50

U.S. Cl. 313-156

6 Claims





ceeding from the midportion of the interior of said cavity to at least one of said end wall portion of said cavity, said magnetic fields forming a resultant magnetic field having a value corresponding to a given electronic cyclotron frequency in the interior of said cavity, modifying the value of said resultant magnetic field in such a way that in said cavity there is at least one closed shell of substantially uniform magnetic field strength having no contact with said cavity walls, while at said shell said electronic cyclotron frequency is equal to said frequency of said exciting electromagnetic field, whereby ions and electrons are produced by ionization of the gas passing through said shell and said electrons and said ions are substantially confined in a zone defined within said shell, extracting said ions by means of electrodes at an exit from said cavity positioned in the vicinity of said shell and having no contact with said shell, and selectively sorting said ions with reference to their charge.

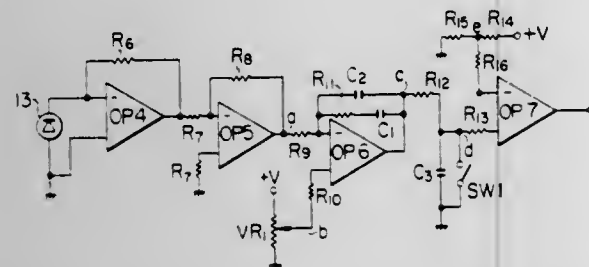
4,417,179

## LIGHT QUANTITY CONTROL DEVICE

Takashi Fujimura, Mobarra, and Kazuo Kato, Kitahassakumachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed May 7, 1982, Ser. No. 376,030  
Claims priority, application Japan, May 8, 1981, 56-68302  
Int. Cl.<sup>3</sup> H05B 37/02

U.S. Cl. 315-151

4 Claims



1. A light quantity control device for controlling the quantity of light emitted from a light source supplied with a.c. power through a switching element having a bidirectional controlled rectifier, comprising:

- a light receiving element for converting light from said light source into an electric signal;
- a processing circuit for processing said electric signal to generate an output signal corresponding to said electric signal;
- a first integrating circuit for integrating said output signal from said processing circuit to produce a light quantity signal, said light quantity signal having varied in accordance with a change in quantity of light emitted from said light source;
- a second integrating circuit for integrating said light quantity signal with a predetermined period; and
- a comparing circuit for comparing an output signal of said second integrating circuit with a reference signal to produce a control signal for said switching element in accordance with a result of comparison.

4,417,180

## LAMP FIRING APPARATUS

Morteza M. Chamran, Elmhurst, and Milan Dimovski, Country-side, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

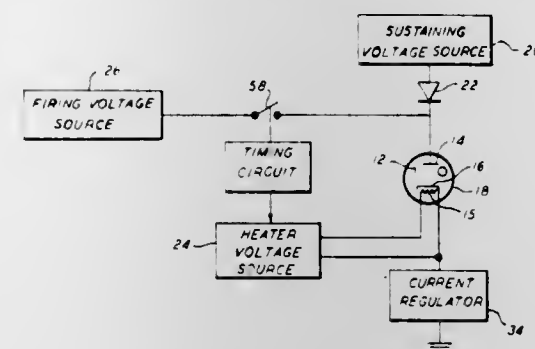
Filed Mar. 5, 1981, Ser. No. 240,650  
Int. Cl.<sup>3</sup> H05B 41/23

U.S. Cl. 315-175

9 Claims

9. A method for firing a discharge lamp without generating excessive transients comprising the following steps:

applying a voltage across said lamp having a potential less than the firing voltage;  
raising said voltage at a gradual rate until said lamp fires;



applying a sustaining voltage to said lamp;  
removing said voltage after applying said sustaining voltage and after said lamp fires.

4,417,181

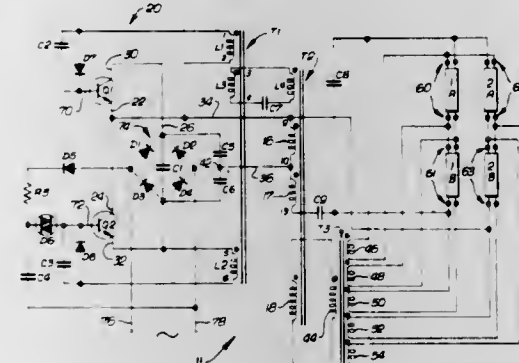
## ELECTRONIC BALLAST

Luis Leale, San Diego, Calif., assignor to Sonelt Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 55,239, Jul. 6, 1979, abandoned.  
This application Jun. 23, 1980, Ser. No. 159,903  
Int. Cl.<sup>3</sup> H05B 37/02, 39/04, 41/36

U.S. Cl. 315-209 R

12 Claims



1. An electronic ballasting system for illuminating electrical lamps comprising:

- a main power transformer having a primary winding and at least a first secondary winding,
- an electronic inverter coupled to drive current through said main power transformer primary winding sequentially in alternating directions characterized in that said electronic inverter has first and second transistors with the emitter of said first transistor coupled to the collector of said second transistor,
- and further comprising a pair of d.c. supply lines, one of which is coupled to the collector of said first transistor and the other of which is coupled to the emitter of said second transistor,
- a pair of charging capacitors series connected across said d.c. supply lines each coupled to at least partially turn on a single one of said transistors,
- a lead connecting said emitter of said first transistor to said main power transformer primary winding, and a lead connecting said main power transformer primary winding to a tap between said charging capacitors,
- means for driving said transistors in alternating sequence,
- a starting circuit for initially driving said electronic inverter and further characterized in that said starting circuit initially drives one of said transistors,
- an operating capacitor connected to said main power transformer first secondary winding,
- at least first and second lamp terminal means for receiving electrical discharge lamps having cathode elements therein,

said lamp terminal means being series connected to said operating capacitor and to said main power transformer first secondary winding, and  
a high impedance capacitor connected in parallel across at least one and less than all of said terminal means.

4,417,182

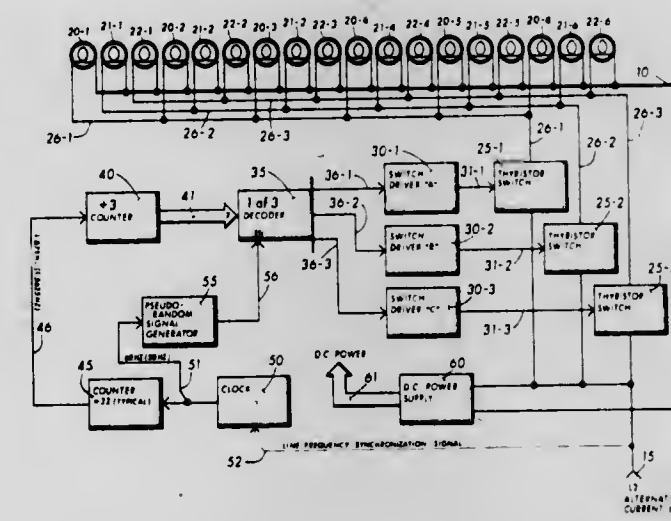
## MOVING FLUTTER ILLUSION ELECTRIC LIGHT CONTROLLER

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770  
Filed Aug. 4, 1980, Ser. No. 174,913

Int. Cl.<sup>3</sup> H05B 37/02, 39/04

U.S. Cl. 315-210

19 Claims



1. Electric controller means adapted for imparting the visual sense of illusory motion of an electric lighting means combined with the further visual sense of the flickering of the electric lighting elements, including in combination:

- a. a source of electric power;
- b. a plurality of electric lighting load circuit means usually arranged with seriate adjacency;
- c. a plurality of electric switch means each of which is effectively coupled between said source and effectively one of the said plurality of circuit load means;
- d. a source producing a plurality of sequential pulse first signals;
- e. a source of pseudorandom pulse second signals; and,
- f. a unitive means coupled at least with said first signal source and said second signal source to effectively combine the plural sequential pulses and the pseudorandom pulses therefrom received into a plurality of separately efficacious variative control pulse signals each of which couples with an effectively separate said electric switch means to effect the control thereof.

4,417,183

## INCANDESCENT LAMP DRIVER CIRCUIT

Earl E. Popard, LaPuente; Michael F. Sedlar, Walnut, and Gary W. Davidson, Upland, all of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1982, Ser. No. 394,062

Int. Cl.<sup>3</sup> H05B 39/02

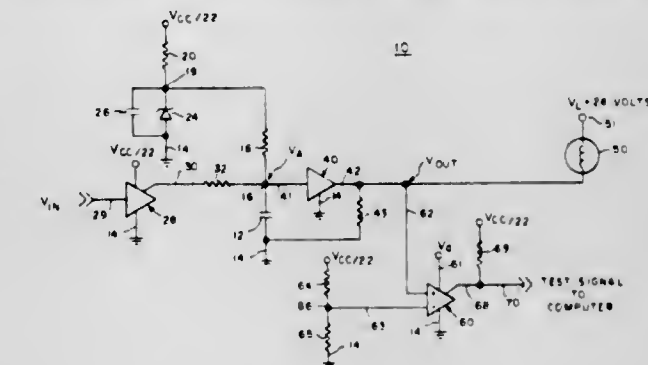
U.S. Cl. 315-291

7 Claims

1. Apparatus for supplying electrical energization to an incandescent lamp comprising:

- (a) a capacitor connected between a junction point and ground;
- (b) first resistor means connected between said junction point and a source of reference voltage;
- (c) first electronic switch means having a ground connection and including means for responding to an "on" signal applied to an input thereof for causing said switch means to have an "open" state at an output thereof and means for responding to an "off" signal for causing said switch

means to have a "closed" state, i.e., said output being connected to said ground connection;  
(d) means connecting the output of said first electronic switch means to said junction point; and  
(e) second electronic switch means having a ground connection, an input and an output, said input being connected to said junction point, and said output being connected via an incandescent lamp, to a source of lamp energizing voltage, said second electronic switch means having an "open" state when no signal is applied to said input thereof, and a



"closed" state, i.e., said output being connected to ground through said ground connection when a signal is applied to said input thereof.

whereby when an "on" signal is applied to the input of said first electronic switch means, said capacitor means begins charging through said first resistor means toward the voltage of said source of reference voltage, to thereby apply a signal to the input of said second electronic switch means so as to cause a connection to be established between the output thereof and ground so that current begins to flow through said incandescent lamp.

4,417,184

## PICTURE IMAGE DISPLAY APPARATUS

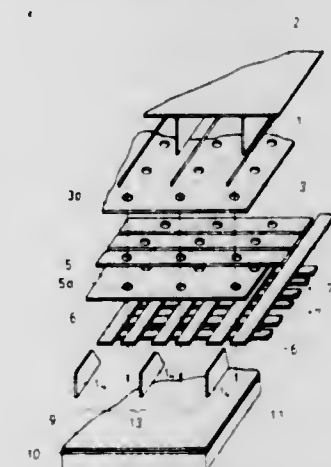
Yoshinobu Takesako, Neyagawa; Masanori Watanabe, Katano, and Kinzo Nonomura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan  
Filed Apr. 3, 1981, Ser. No. 250,714

Claims priority, application Japan, Aug. 4, 1980, 55-110896[U]

Int. Cl.<sup>3</sup> H01J 29/70, 29/72

U.S. Cl. 315-366

6 Claims



1. A picture image display apparatus comprising:  
a flat type vacuum enclosure having a transparent face panel,  
a row of linear thermionic cathodes disposed in parallel, electron beam forming electrode for producing a predetermined number of two dimensionally disposed electron beams out of the electron emission from said linear thermionic cathodes.



a row of control electrodes disposed in parallel in a direction perpendicular to those of said linear thermionic cathodes, a row of deflection electrodes, a phosphor screen formed on the inner face of said face panel, and an anode of thin metal film formed on the surface of said phosphor screen, wherein the improvement is that

(i) a row of deflection-aiding electrodes is disposed between said row of deflection electrode and said anode,

(ii) said deflection-aiding electrodes are provided with cut out portions on the side of said face panel so as to provide gaps 1 to 10 times the thickness of said deflection-aiding electrode, between lower edge of said deflection-aiding electrode and the surface of said anode, and

(iii) said deflection electrodes are adapted for impressing substantially constant positive potential with respect to said linear thermionic cathodes.

4,417,185

# DRIVING SYSTEM FOR ROLL-UP SHADES, BLINDS, ROLLING SHUTTERS AND THE LIKE

Jean Bullat, Bonneville, France, assignor to Somfy, France

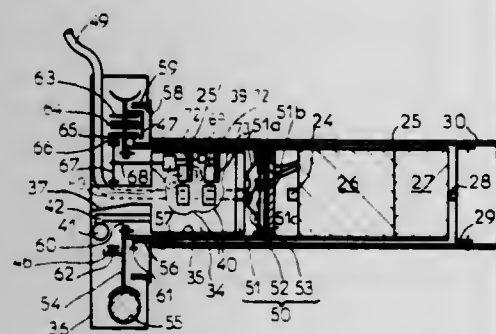
Filed Mar. 27, 1981, Ser. No. 248,223

Claims priority, application France, Apr. 18, 1980, 80 09168

Int. Cl.<sup>3</sup> H02K 7/00

U.S. Cl. 318—2

8 Claims



1. A driving system for roll-up shades comprising a rotatable winding tube on which the shade is wound, a tubular casing concentrically disposed in an end portion of the winding tube, an electric motor mounted in said tubular casing and having a shaft, first coupling means kinematically coupling said motor shaft with said winding tube to drive said winding tube in rotation relative to said tubular casing when said motor is energized and to fix said winding tube relative to said tubular casing when said motor is deenergized, manually operable means for rotating said tubular casing to rotate said winding tube when said motor is deenergized, said manually operable means comprising a drive wheel having a flange portion fixed to said tubular casing at an outer end thereof, a stationary housing for said drive wheel, rotary collector means for supplying energizing current to said motor, said rotary collector means being disposed in said tubular casing and comprising a rotatable portion fixed to said tubular casing and a stationary portion connected with said stationary housing, circuit means connecting said rotary collector means with said motor, said circuit means including automatic stop means for cutting off the supply of energizing current to said motor when said shade is fully wound on said winding tube or is fully unwound, said automatic stop means being disposed in said tubular casing and comprising a stationary member connected with said stationary housing and a movable member, and second coupling means coupling said movable member of said automatic stop means kinematically with said winding tube, said second coupling means comprising component elements disposed on opposite sides of said flange portion of said drive wheel in close vicinity thereof and means kinematically connecting said component elements with one another.

## 4,417,186 COMMUTATORLESS ELECTRICAL MOTOR HAVING SUB MAGNETIC POLES

Yukimi Hirose, Atsugi; Ken Enami, Kawasaki, and Kinzo Wada, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

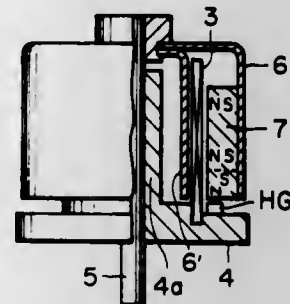
Filed Jan. 12, 1982, Ser. No. 338,997

Claims priority, application Japan, Jan. 13, 1981, 56-2415[U]

Int. Cl.<sup>3</sup> H02K 29/02

U.S. Cl. 318—254

5 Claims



1. A commutatorless electrical motor comprising:
  - (a) a stator equipped with polyphase armature windings;
  - (b) a cylindrical rotor having main magnetic poles including rotation driving magnets which have been formed by magnetization in such a manner that N and S poles thereof are alternately arranged in the circumferential direction, and an axis passing through the N and S poles of each magnet extends radially;
  - (c) a plurality of sub magnetic poles which have been formed on one end of said rotor by magnetization in such a manner that an axis passing through N and S poles thereof extends axially and that the magnetized area angle thereof with respect to the center axis of said rotor is much smaller than that of the main magnetic poles and is smaller than  $\pi/2$  radian in an electrical angle;
  - (d) a plurality of rotational position detecting elements provided for detecting the position of said sub magnetic poles of said rotor; and
  - (e) current switching means for changing over the currents flowing through said polyphase armature windings in accordance with signals from said plurality of rotational position detecting elements.

4,417,187

## CIRCUIT FOR CONTROLLING THE SPEED OF A MOTOR

Gediminas Bateika, Karlsruhe, Fed. Rep. of Germany, assignor to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

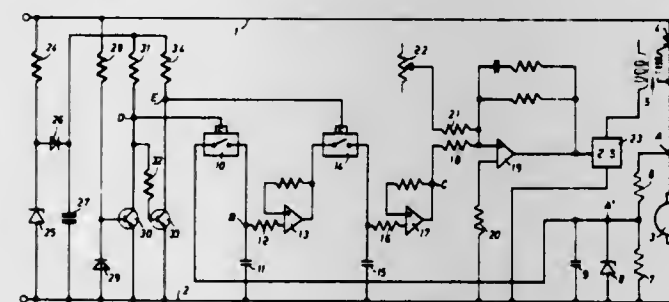
Filed Nov. 23, 1981, Ser. No. 324,074

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049022

Int. Cl.<sup>3</sup> H02P 5/12

U.S. Cl. 318—331

4 Claims



1. A circuit for controlling the speed of a motor having a constant magnetic field and supplied from an alternating current source having a line frequency through a controllable semiconductor rectifier, in which a generator action voltage corresponding to the speed of the motor controls the operating

time of the semiconductor rectifier, comprising two series connected switches for receiving the generator action voltage which are controlled in phase opposition by the line frequency, a voltage storage unit following each switch, a controller having an input connected to the output of the last storage unit in the series connected switches, the controller having an output, and a firing stage connected to the semiconductor rectifier for turning the semiconductor rectifier ON connected to the output of the controller.

4,417,188

## PULSE MOTOR DRIVING SYSTEM

Hachiro Makabe, Kanagawa; Haruhiko Tanaka, Mitaka, and Akira Orii, Sagami, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

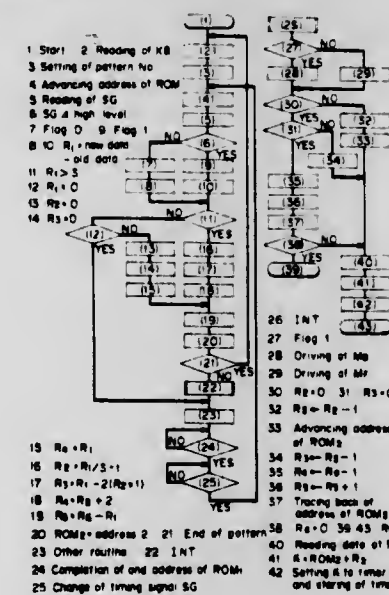
Filed Oct. 14, 1981, Ser. No. 311,303

Claims priority, application Japan, Oct. 16, 1980, 55-144706

Int. Cl.<sup>3</sup> G05B 19/40

U.S. Cl. 318—696

1 Claim



1. A pulse motor driving system, comprising a memory storing data for controlling time intervals between the adjacent pulses produced in a series to steppingly drive a pulse motor; means for designating a number of stepping pulses in a section from start to stop of the pulse motor; calculating means dividing the designated number of stepping pulses into a predetermined number of parts, said calculating means controlling the read-out order of the time interval control data in each of the divided parts of pulses to thereby repeatedly use the data to control the time intervals between the pulses in these divided parts, said calculating means being operated in accordance with calculating formulas in the form of functions of the number of stepping pulses, each being specific to the divided parts of pulses so as to modify the data read out to control the pulses in these divided parts; and pulse generating means operated in response to the output data of the calculating means to determine the time intervals of the pulses; said calculating means being operated in accordance with the calculating formulas to progressively increase and decrease the speed of pulses in the divided parts, said calculating formulas including coefficients to modify the degrees of progressive increase and decrease of the pulse speed in response to the number of stepping pulses.

4,417,189

## CONTROL CIRCUIT FOR STEPPER MOTOR

Dennis O. Overfield, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 29, 1982, Ser. No. 344,247

Int. Cl.<sup>3</sup> G05B 19/40

U.S. Cl. 318—696

6 Claims

1. A stepping motor control circuit comprising, in combination:

a control signal source;

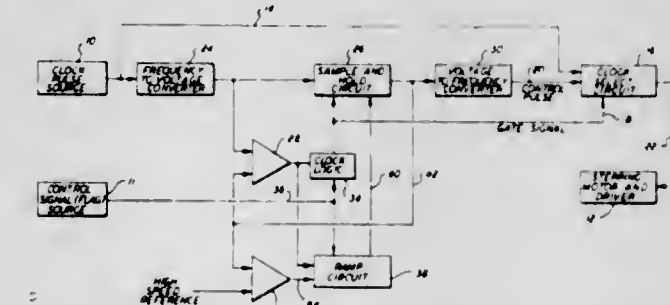
a source of clock pulses at a first pulse rate;

a voltage-to-frequency converter responsive to a voltage source for producing converter pulses at a rate controlled by said voltage source;

selecting circuit responsive to said control signal for coupling either said clock pulse source or said converter pulses to the stepping motor in response to said control signal changing from one state to another;

first control means, responsive to said control signal changing to the state where said converter pulses are gated to the stepping motor, for applying a gradually changing voltage to said voltage-to-frequency converter to cause the pulse frequency of the pulses produced thereby to start at the frequency of said clock pulses and rise gradually for a period of time  $T_1$ ;

second control means responsive to the ending of the time period  $T_1$  to gradually change the voltage at the input to said voltage-to-frequency converter to cause the pulse



rate produced by said voltage-to-frequency converter to rise gradually at a rate different from the rate of frequency change during time period  $T_1$ ;

third control means responsive to the voltage at the input to said voltage-to-frequency converter for maintaining said input voltage at a constant value once that value is reached, said input voltage remaining at said constant value until said control signal changes state;

fourth control means responsive to said control signal changing state to gradually change the voltage at the input to said voltage-to-frequency converter so as to cause the pulse frequency produced thereby to change from that produced by said constant value voltage until the frequency is the same as produced by said clock pulse source; and

fifth control means responsive to the pulse rate at the output of said voltage-to-frequency converter reaching that of said clock pulse source to actuate said selecting circuit to again apply said clock pulses to the stepping motor.

4,417,190

## CONTROL SYSTEM FOR AN INDUCTION MOTOR WITH ENERGY RECOVERY

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 243,683, Mar. 16, 1981, and Ser. No. 297,524, Aug. 28, 1981. This application Feb. 19, 1982, Ser. No. 350,472

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—729

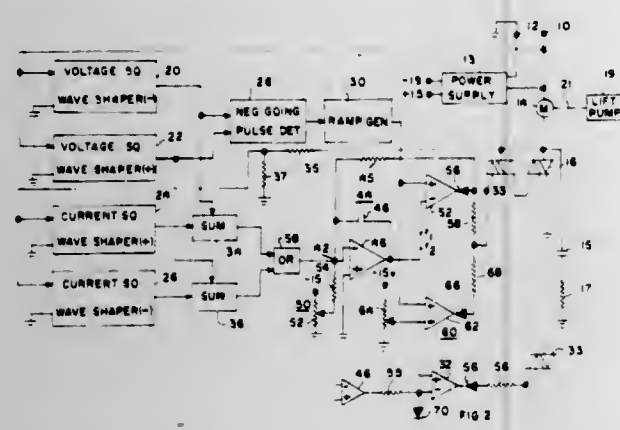
6 Claims

1. A power control for an induction motor powered by an A.C. line, and operated in both motor and generating modes, comprising:
  - detection means responsive to motor voltage and current for providing an output signal proportional to the power factor of operation of said motor;
  - a power factor command signal;
  - summing means responsive to said power factor command signal and said output signal of said detection means for providing an error signal;



signal means responsive to said error signal for providing at least one pulse each half cycle of A.C., including a pulse each half cycle which has a leading edge which is variable in time as a function of said error signal;

control means connected to an A.C. line and responsive to



the pulse output of said signal means for turning on current flow to said motor in each half cycle of A.C. upon receipt of a first pulse received during that half cycle; and second signal means in circuit with said signal means for limiting the latest time in a half cycle at which said first pulse is supplied to said control means.

4,417,191

# METHOD AND CIRCUIT FOR D.C. BRAKING A THREE-PHASE ASYNCHRONOUS MACHINE

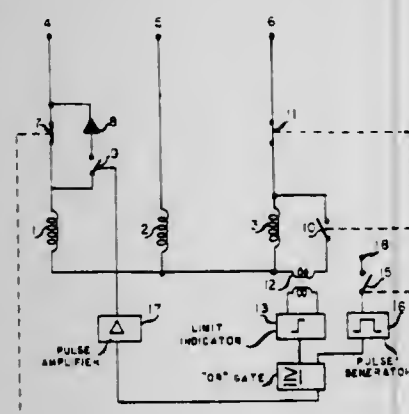
Helmut Schmidt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed May 29, 1981, Ser. No. 268,161

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1980, 3020850

Int. Cl.<sup>3</sup> H02P 3/24

U.S. Cl. 318—760

1 Claim



1. In a circuit for the direct current braking of a three-phase synchronous machine having first, second, and third Y-connected stator windings adapted to be connected to a three phase power supply by causing direct current to flow in the first and second windings when braking and, at the same time, short-circuiting the third winding, the circuit comprising:

a parallel circuit coupling the first stator winding to a first phase of the power supply, the parallel circuit comprising a normally closed first switch and a rectifier valve connected in series with a normally open second switch, a normally closed fourth switch coupling the third stator winding to a third phase of the power supply, and a normally open third switch coupled across the third stator winding,

the first, second, third, and fourth switches each having an operating input,

the improvement comprising:

a current sensor coupled between the third switch and the third stator winding and having an output;

a limit indicator having an input coupled to the output of the current sensor and having an output;

a tripping switch having an output coupled to the operating input of the first, third and fourth switches and to the input of the pulse generator;

a pulse generator having an input and an output; and

a digital logic member having OR logic, the logic member having an input coupled to the output of the limit indicator, an input coupled to the output of the pulse generator, and an output coupled to the operating input of the second switch.

4,417,192

# SECTIONAL MOTOR STARTING WINDING CIRCUIT FOR THREE-PHASE MOTORS

Shyamal-Krishna Ghosh, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

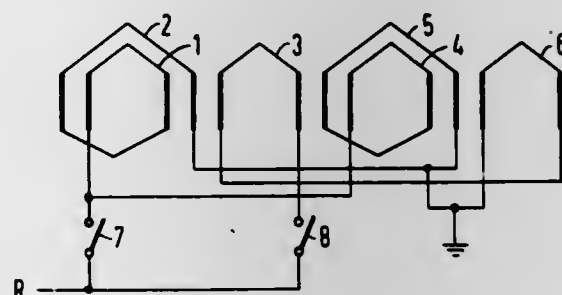
Filed Jan. 27, 1982, Ser. No. 343,276

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107654

Int. Cl.<sup>3</sup> H02P 1/42

U.S. Cl. 318—797

2 Claims



1. In a sectional winding for a three phase motor, the motor having a number of pole pairs  $p$  which is equal to or greater than two and an uneven number of slots  $q$  per pole and phase, which is greater than one and the motor having a single-layer winding which is divided into two winding sections for each phase, the winding sections of each phase adapted to be connected one after the other to the same phase of a supply network during start up of the motor, the improvement in which: each section of the winding for a given phase comprises a plurality of coils, the section to be connected first comprising more than one-half of the coils for the given phase and comprising at least two branches each comprising a like plurality of coils connected in series, the branches connected together in parallel and the coils in each branch spaced apart  $360^\circ$  per pole pair;

the section which is to be connected later comprises at least one additional branch of a like plurality of coils connected in series, the additional branch is adapted to be connected in parallel to the first section; and each branch in the winding has the same number of turns.

4,417,193

# METHOD AND APPARATUS FOR CONTROLLING ALTERNATING CURRENT MOTORS

Akio Hirata, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 5, 1981, Ser. No. 290,195

Claims priority, application Japan, Aug. 29, 1980, 55-118294

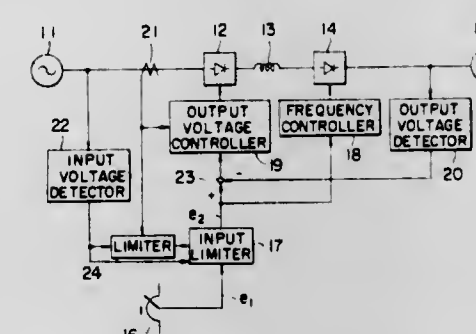
Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—803

6 Claims

1. In a method of controlling a speed of an AC motor energized by a source of alternating current through a frequency converter wherein the speed of said AC motor is controlled by controlling a primary frequency and a primary voltage of said

AC motor with said frequency converter, said primary voltage is controlled by a closed loop including a minor loop, primary current of said AC motor is controlled by said minor loop and said primary frequency is controlled by an open loop, the improvement which comprises the steps of decreasing said primary frequency with said frequency converter at a rate faster than a rate of decrease in a number of revolutions of said



AC motor when said source of alternating current is interrupted and then recovered after a short interval, and accelerating said AC motor to an original speed with said primary current limited to a predetermined value smaller than a value limited by said minor loop while maintaining said primary frequency and said primary current in a predetermined relation.

4,417,194

# INDUCTION GENERATOR SYSTEM WITH SWITCHED CAPACITOR CONTROL

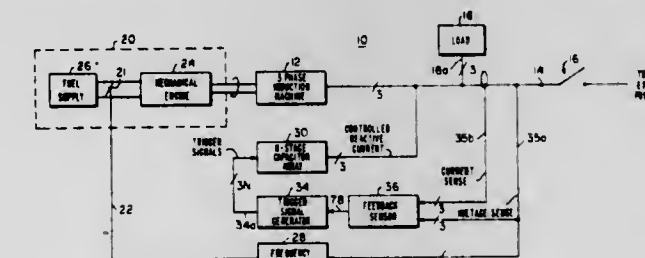
William P. Curtiss, Winthrop, and Donald E. Fulton, Stoneham, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 18, 1980, Ser. No. 188,306

Int. Cl.<sup>3</sup> H02P 9/46

U.S. Cl. 322—47

58 Claims



1. An induction generator system comprising:

- An  $n$ -phase induction machine having an input shaft and at least  $n$  output lines, where  $n$  is an integer, wherein each output line is coupled to an associated output terminal.
- Means for generating a frequency control signal representative of the difference between the frequency of the voltage of at least one of said output terminals and a reference value.
- Torque generating means responsive to said frequency control signal for applying a torque to said input shaft, said applied torque being related to said frequency control signal.
- An  $N$ -stage switched capacitor array, where  $N$  is an integer, each stage including  $n$  capacitor networks, each network being associated with a pair of said output lines, wherein the capacitor networks within each stage are each characterized by a predetermined capacitance for that stage, and wherein each of said capacitor networks includes an associated capacitor switch means, each switch means being responsive to a trigger signal for selectively coupling said capacitor network across its associated pair of output lines.
- Feedback means coupled to said output lines and including trigger means for generating said trigger signals, wherein the capacitor networks of  $X$  of said  $N$  stages are

characterized by binary weighted capacitance values from stage to stage, where  $X$  is an integer, and wherein the capacitor networks of  $N-X$  of said  $N$  stages are characterized by substantially equal capacitance values from stage to stage.

4,417,195

# MAGNETO BATTERY TRICKLE CHARGER

John N. MacLeod, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

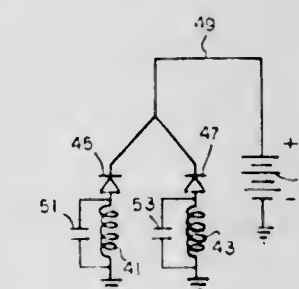
Division of Ser. No. 190,899, Sep. 25, 1980, Pat. No. 4,383,214.

This application Nov. 24, 1982, Ser. No. 444,319

Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 322—58

1 Claim



1. The method of providing periodic current surges to charge a storage battery in an internal combustion engine powered device having an engine flywheel with a single permanent magnet supported thereon and a high voltage ignition system having an ignition voltage induced therein by relative movement of the flywheel supported permanent magnet, the method comprising the steps of providing a charging coil about a magnetic core in which flux changes are normally occurring each time the permanent magnet passes the core as a part of the operation of the high voltage ignition system, connecting a capacitor directly in parallel with the charging coil of sufficient capacity relative to the charging coil to cause the current in the coil to lead the voltage thereacross so as to provide an increased effective charging current to the battery, and insuring that only unidirectional current flows from the parallel connected coil-capacitor circuit by an otherwise reactive component free path to the battery to thereby provide a single primary charging pulse to the battery during each revolution of the flywheel.

4,417,196

# CORD SETS WITH POWER-FACTOR CONTROL

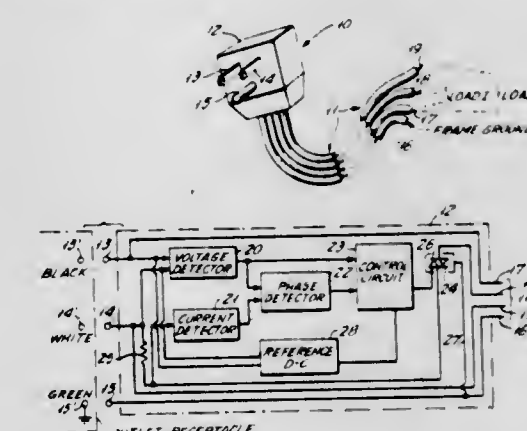
Agustin Cueto, Westport, Conn., and Daniel E. Robinson, Metuchen, N.J., assignors to GK Technologies, Incorporated, Greenwich, Conn.

Filed Dec. 10, 1981, Ser. No. 329,420

Int. Cl.<sup>3</sup> G05F 5/00

U.S. Cl. 323—210

6 Claims

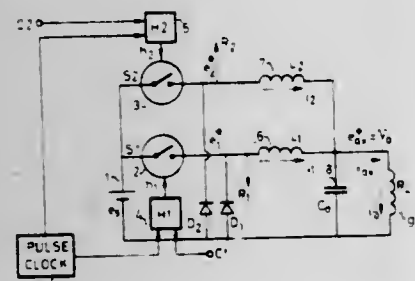


1. As an article of manufacture, an electrical cord set adapted for connection to supply a-c electric power to a utili-



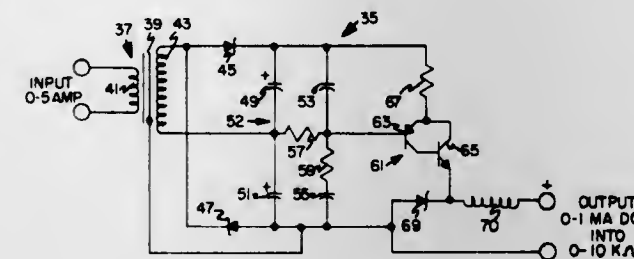
zation device having two different electrical-system components one of which is phase-reactive to load, said cord set comprising a flexible cord having at least four insulated conductors adapted at one end for connection to said utilization device, and a plug unit connected to the other end of said cord, said plug unit having a body with a three-prong inlet-conductor cluster of standard configuration for removable insertion in a conventional single-phase a-c power-outlet receptacle, the standard three-prong configuration providing within said body an inlet-ground connection, an inlet-common connection and an inlet-hot connection, first, second and third of said cord conductors being respectively connected within said body to different inlet connections, and a power-factor controller within said body and having first and second inlet connections respectively connected to said inlet-common and to said inlet-hot connections, said power-factor controller having an output connection to the fourth of said insulated conductors, whereby a phase-reactive system component such as an induction motor may be connected to run under power-factor control via said third and fourth conductors while a differently reactive system component such as an electrical heater and its control circuitry may be connected to run without power-factor control via said second and third conductors.

**4,417,197**  
**ELECTRONIC SYSTEM FOR SIMULTANEOUS CONTROL OF TWO OR MORE PULSE MODULATORS**  
Francis C. Schwarz, Round Hill Rd., Lincoln, Mass. 01773  
Filed Jul. 27, 1981, Ser. No. 286,891  
Int. Cl.<sup>3</sup> G05F 1/46; H02M 3/00  
U.S. Cl. 323-272



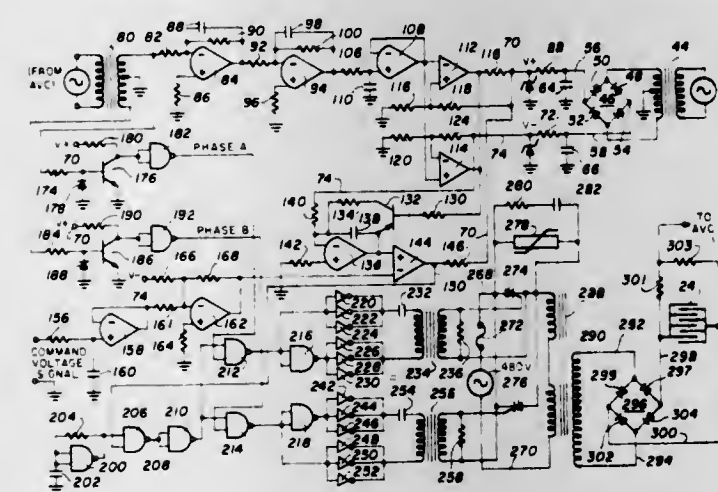
1. A circuit for controlling the transfer of energy from an input means to a single output, comprising in combination: a first pulse generator for transferring electrical energy from the input means to the output; a second pulse generator for transferring electrical energy from the input means to the output; first input signal means connected to said first pulse generator to produce a first input pulse to said first pulse generator; second input signal means connected to said second pulse generator to provide a second input pulse to said second pulse generator; said first and second input signal means sequentially energizing said first and second pulse generators to sequentially transfer electrical energy from the input means to the output; reference signal means for providing a reference signal; comparator means for comparing the output of said first and second pulse generators to the reference signal from said reference signal means; and gate means connected to said first and second input signal means for changing the next input pulse to one of said first and second pulse generators in accordance with the difference between said reference signal and the previous output of the other of said first and second pulse generators.

**4,417,198**  
**AVERAGE RESPONDING RMS INDICATING TYPE TRANSDUCER**  
Glenn A. Mayfield, West Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.  
Filed Aug. 31, 1981, Ser. No. 297,520  
Int. Cl.<sup>3</sup> G05F 3/08  
U.S. Cl. 323-315



1. A transducer of the average responding RMS indicating type, said transducer comprising: transformer means having a primary winding for receiving an AC input signal and a secondary winding; inductively compensated voltage divider means connected with said secondary winding of said transformer means; filter means connected with said inductively compensated voltage divider means; and output amplifier means connected with said active filter means and providing an output signal accurately indicative of the magnitude of the AC input signal received at said transformer means.

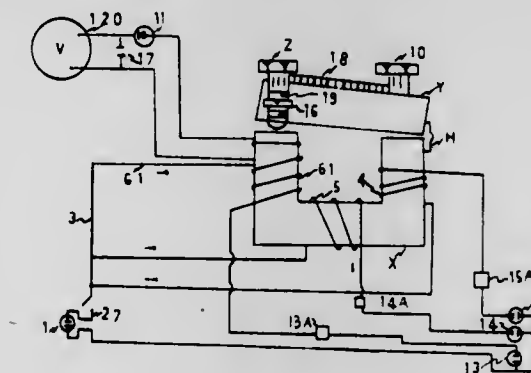
**4,417,199**  
**ZERO CROSSOVER TRIGGERING CIRCUIT FOR THYRISTOR**  
Thaddeus M. Jones, Mishawaka, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.  
Filed May 13, 1982, Ser. No. 377,744  
Int. Cl.<sup>3</sup> G05B 24/02  
U.S. Cl. 323-319



1. A circuit for triggering a thyristor relative to a zero crossover of a power signal, comprising: a low pass filter connected to receive said power signal and pass said power signal therethrough, said filter providing a predetermined phase shift and producing a filtered power signal; means connected to receive said filtered power signal to generate a pulse at the zero crossover of said filtered power signal; a waveform generator connected to receive said pulse for producing a sweeping voltage signal upon receipt of said pulse; a comparator circuit connected to receive a command signal and said sweeping voltage signal to generate a gate signal

upon detecting a comparison of said command signal and said sweeping voltage signal, and means responsive to said gate signal for triggering said thyristor.

**4,417,200**  
**CURRENT CONTROL**  
Morton Weintraub; Elliot Waxman, and Bernard Gendelman, all of Brooklyn, N.Y., assignors to Herman Rosman, Brooklyn, N.Y.  
Continuation-in-part of Ser. No. 798,261, May 18, 1977, Pat. No. 4,217,541. This application Mar. 26, 1980, Ser. No. 134,184  
The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.  
Int. Cl.<sup>3</sup> G05F 7/00  
U.S. Cl. 323-347

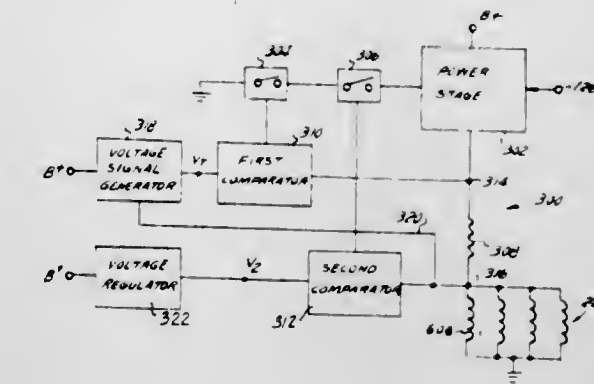


1. An apparatus for providing accurate control of an electrical condition for at least one output device, comprising:  
a. at least one reactor means having a magnetic core with at least one air gap,  
b. first wiring means for connection to at least one electrical output device,  
c. at least one moveable bar for precisely adjusting the opening and closing of said air gap,  
d. means for controlling the size of said gap by coarse i.e. unit tuning and fine or decimal tuning operations whereby control for an immediate or gradual increase or decrease of the reluctance path available through said reactor means is provided for said accurate control,  
e. input terminals for connection to a power supply with a second wiring means connecting said input terminals to said reactor means.

**4,417,201**  
**CONTROL MEANS FOR CONTROLLING THE ENERGY PROVIDED TO THE INJECTOR VALVES OF AN ELECTRICALLY CONTROLLED FUEL SYSTEM**  
Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.  
Continuation of Ser. No. 130,349, Apr. 1, 1971, abandoned. This application Jun. 14, 1973, Ser. No. 370,140  
Int. Cl.<sup>3</sup> F02M 51/00; F02D 5/02; H01F 7/18  
U.S. Cl. 123-490

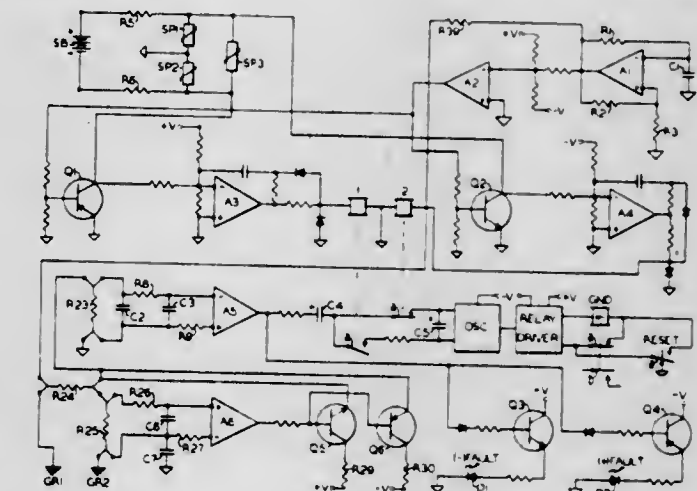
1. In combination with a fuel control system for internal combustion engines of the type having electrically actuable injector valve means for controlling fuel flow to the engine, a source of electric energy, engine operating parameter sensors, and computing means responsive to the sensors for intermittently applying electric energy from said source to actuate said injector valve means, the improvement comprising a circuit for controlling the energization level of the injector valve means having: voltage regulator means responsive to electric energy applied

to activate the injector valve means for regulating the voltage level of said electric energy; and



71 Claims  
current level regulating means responsive to the level of current flowing to the injector valve means for regulating said current flow.

**4,417,202**  
**VITAL DC SOURCE GROUND FAULT DETECTOR APPARATUS**  
Robert D. Pascoe, Upper St. Clair Township, Allegheny County, Pa., assignor to American Standard Inc., Swissvale, Pa.  
Filed Jan. 30, 1981, Ser. No. 230,146  
Int. Cl.<sup>3</sup> G01R 31/02  
U.S. Cl. 324-51



1. Detector apparatus for registering ground faults on either terminal of a direct current energy source, comprising:  
(a) a pair of switching means, each when active coupling a different terminal of said energy source to a common bus of said detector apparatus for producing a fault current signal having a level in accordance with the impedance of any ground fault on the opposite source terminal,  
(b) a pulse generating means coupled for alternately activating said pair of switching means at a preselected rate,  
(c) a current pump means controlled by said pulse generating means for alternately supplying a first and a second reference current signal, each having a preselected level and associated in time with a different one of said fault current signals alternately produced by said switching means,  
(d) a comparator means coupled for alternately receiving said first and second reference current signals, each jointly with the corresponding fault current signal, and responsive to each pair of received corresponding signals for generating a first or a second output signal in accordance with a predetermined comparison level of that pair to indicate the absence or presence, respectively, of a ground fault on the corresponding terminal of said energy source,  
(e) a register means normally occupying a first condition and operable to a second condition for registering a ground fault indication, and



(f) a synchronizing means jointly controlled by said switching means and said pulse generating means and coupled for applying the output signals of said comparator means to hold said register means in its first condition only when said comparator output is a sequence of first signals in synchronism with the operation of said pulse generating means.

4,417,203

# SYSTEM FOR CONTACTLESS ELECTRICAL PROPERTY TESTING OF MULTI-LAYER CERAMICS

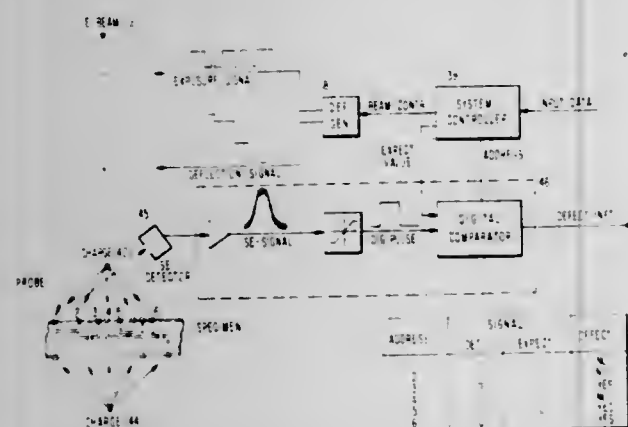
Hans C. Pfeiffer, Ridgefield, Conn.; Robert A. Simpson, Wappingers Falls, N.Y., and Werner Stickel, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,119

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—51

28 Claims



1. A method of testing electrical continuity of conductors where respective conductor ends are exposed at at least one surface of a specimen of insulating material having two surfaces, the method comprising the steps of:

pulsed irradiating a surface of said specimen with electrons to control the charge or electrostatic potential at said one surface and charge all conductors so exposed; and scanning a portion of at least one of said surfaces with an electron beam to selectively detect and change the potential of a conductor and thereby and all other conductors having continuity with said conductor.

4,417,204

# PRINTED CIRCUIT BOARD TESTER AND ADAPTER WITH MEMORY

Rudiger Dehmel, Laatzen; Martin Maelzer, Wunstorf, and Christian Seyb, Wennigsen, all of Fed. Rep. of Germany, assignors to Luther & Maelzer GmbH, Wunstorf, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,326

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013215

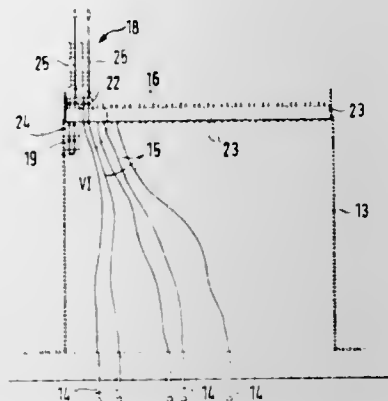
Int. Cl.<sup>3</sup> G01R 15/12

U.S. Cl. 324—73 PC

8 Claims

1. An adapter for use with a self-programming printed circuit board tester for scanning test points on printed circuit boards, said adapter comprising adapter contact pins for contacting test points on master printed circuit boards and printed circuit boards to be tested; an adapter connecting plug having connecting plug contacts conductively connected to said contact pins, the adapter connecting plug being constructed to be connected to interrogation connections of interrogation circuits contained in the printed circuit board tester, said interrogation circuits being capable of interrogating the test points of the printed circuit boards, storing the interrogation results and making available the interrogation results to a comparator arrangement so as to permit comparison of the interrogation results obtained from interrogation of a master printed circuit board with interrogation results obtained from interrogation of

a printed circuit board to be tested; and a memory preset with stored information representative of the results of a test of a master printed circuit board, said memory having read connections connected to selected contacts of the adapter connecting



plug for connecting said memory to special interrogation connections of the interrogation circuits of the printed circuit board tester and permitting the information contained in the memory to be interrogated and compared to information previously obtained from a master printed circuit board.

4,417,205

# DETECTION APPARATUS UTILIZING A HALL EFFECT DEVICE

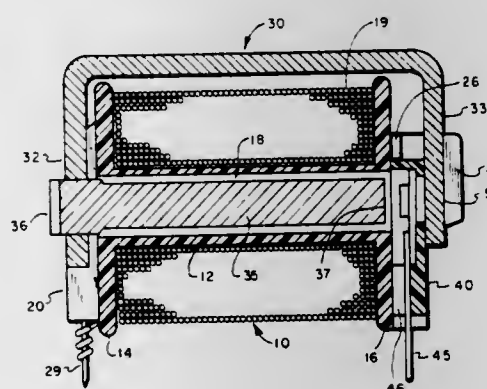
Robert J. Sabon, Chicago, and David L. Vonder, Addison, both of Ill., assignors to GTE Automatic Electric Labs. Inc., Northlake, Ill.

Filed Oct. 14, 1980, Ser. No. 196,942

Int. Cl.<sup>3</sup> G01R 19/15, 33/06; H01F 3/00

U.S. Cl. 324—133

3 Claims



1. A detection device connected to a source of electrical current operable to produce an output signal responsive to an electrical current of a specific value, said detection device comprising:

at least one coil encompassing a longitudinally oriented bore and connected to said source of electrical current, said coil disposed to produce a field of magnetic flux responsive to the presence of said electrical current;

a magnetic circuit for conducting said magnetic flux, said magnetic circuit including a return strap having first and second ends mounted in proximity to said coil and a manually adjustable core slidably located in said bore, said adjustable core having an end rotatably mounted to said return strap first end and an opposite end located adjacent said return strap second end forming an air gap, said adjustable core disposed to vary the density of said magnetic flux within said air gap; and

a Hall effect switch mounted within said air gap perpendicular to said field of magnetic flux, said Hall effect switch including an operating threshold and operable in response to a flux density greater than said operating threshold; whereby said core is manually adjusted to provide a mag-

netic flux greater than said Hall effect switch threshold, producing said output signal.

4,417,206

# ELECTRICAL CONTACT PROBE AND METHOD OF MANUFACTURING

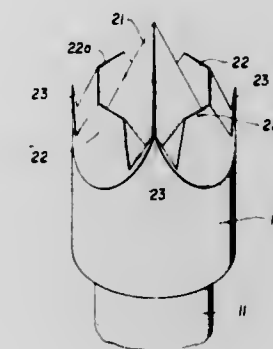
Jeffrey P. Stowers, Mt. Sidney, Va., assignor to Virginia Panel Corporation, Waynesboro, Va.

Filed Mar. 9, 1981, Ser. No. 241,681

Int. Cl.<sup>3</sup> G01R 1/06

U.S. Cl. 324—158 P

3 Claims



1. In an electrical contact probe, a cylindrical contact head, a center leading pyramid contact point on the head, two pairs of identical chisel contact points on the head in concentric surrounding relationship to the pyramid point and having their tips disposed in a common plane perpendicular to the longitudinal axis of the head and axially rearwardly of the tip of the center pyramid point, the chisel points lying in radial alignment with the four side faces of the pyramid point, and four additional contact points on the head disposed between the chisel points and being in radial alignment with the corners of the central pyramid point and surrounding the latter concentrically.

4,417,207

# CIRCUIT FOR INJECTING SIMULATING-NOISE SIGNALS IN A POWER LINE

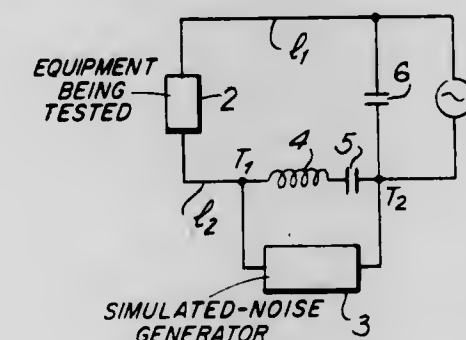
Yoshiro Sato, Tokyo, Japan, assignor to Tohoku Metal Industries, Ltd., Sendai, Japan

Filed Mar. 13, 1981, Ser. No. 243,458

Int. Cl.<sup>3</sup> H03K 3/53

U.S. Cl. 324—158 R

8 Claims



1. A circuit for injecting simulated-noise signals in an AC power line of electrical equipment under noise-simulating test, which comprises:

series resonance means having a resonance frequency equal to the frequency of the AC power supply and connected in said AC power line to be in series with said electrical equipment;

a capacitor means connected to said AC power line in parallel with the serial connection of said electrical equipment and said series resonance means; and

means for generating a simulating-noise signal, the output of which is connected across said series resonance means.

4,417,208

# APPARATUS FOR CONTACTLESS DISTANCE AND/OR SPEED MEASUREMENT

Hansjörg Hachtel, Weissach, and Klaus Dobler, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

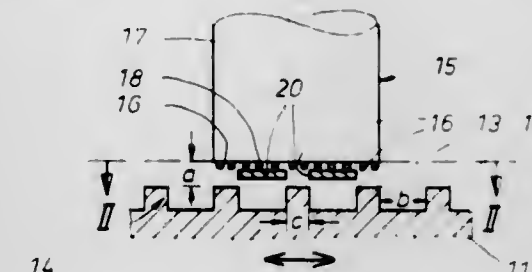
Filed Dec. 9, 1980, Ser. No. 214,743

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014137

Int. Cl.<sup>3</sup> G01P 3/46, 3/52

U.S. Cl. 324—164

20 Claims



1. An apparatus for contactless distance, or travel and/or speed measurement of bodies (11, 15) moving substantially uniformly, having zones (10-910) of electrically conductive material which are displaced in synchronism with the moving body and are disposed at a uniform distance (b) from one another in the direction of movement, and having a spatially fixed measuring transducer (15-915) disposed at a distance therefrom, which has coil means (18-918) located thereon facing said zones, and having alternating current flowing therethrough.

characterized in that

the measuring transducer (15-915) extends spatially over a multiplicity of zones (10-910) and has individual, interconnected, active measuring faces (16-916) which are spatially demarcated;

in that the distance between said measuring faces (16-916) viewed in the direction of movement of the zones (10-910) corresponds substantially to the distance (b) between adjacent zones and the width of said measuring face (16-916), viewed in the direction of movement of the zones (10-910), corresponds substantially to the width (c) of the zones (10-910);

and in that the coil means comprises at least one conductor (18-918) positioned on the zones and the conductors on the respective zones are connected together to form a single circuit.

4,417,209

# NUCLEAR MAGNETIC RESONANCE APPARATUS

Godfrey N. Hounsfield, Newark, England, assignor to Picker International Limited, Wembley, England

Filed May 19, 1981, Ser. No. 265,211

Claims priority, application United Kingdom, May 21, 1980, 8016809

Int. Cl.<sup>3</sup> G01R 33/08

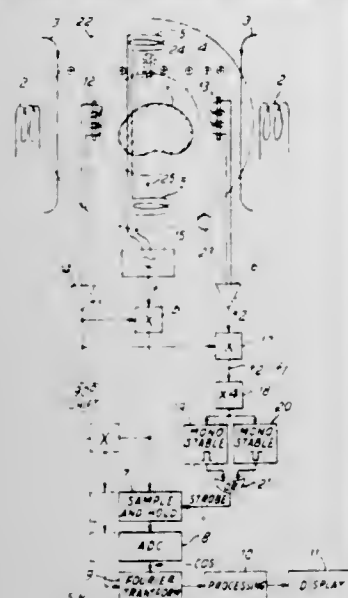
U.S. Cl. 324—309

6 Claims

1. A nuclear magnetic resonance apparatus including means for exciting resonance in nuclei in a substantially planar slice of the body of a patient, at the Larmor frequency for a magnetic field in said slice, means for imposing on said field an additional field having a gradient in a chosen direction in said slice, means for sensing a resonance signal from said slice in the presence of said gradient field, a first NMR probes for producing a signal of a frequency related to a local value of the field in the plane



of said slice, means for demodulating the resonance signal against the signal produced by said probe, and means for pro-



cessing the demodulated signal to produce a distribution of a quantity in said slice.

4,417,210

# METHOD OF GEOPHYSICAL PROSPECTION USING TRANSIENT CURRENTS

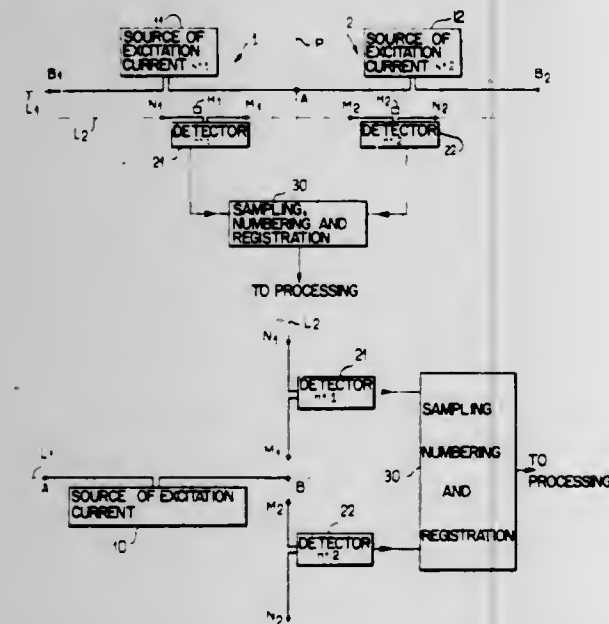
Jean-Pierre Rocroi, Massy, and Francois Gole, Meudon, both of France, assignors to Compagnie Generale de Geophysique, Massy, France

Filed Jul. 8, 1980, Ser. No. 166,893

Claims priority, application France, Jul. 9, 1979, 79 17766; Feb. 13, 1980, 80 03159

Int. Cl.<sup>3</sup> G01V 3/02, 3/08

U.S. Cl. 324—336



1. A method of geophysical prospecting by transient currents utilizing a plurality of prospecting stations, each of said stations comprising a transmitter dipole for transmitting an excitation impulse and a receiver dipole for receiving numerical signals representing a subsoil transient response to said excitation wherein said numerical signals are processed to obtain a figurative representation for geophysical interpretation of said subsoil responses attributable to the geographical positioning of the prospecting stations, said processing comprising:

- preprocessing said numerical signals to obtain a statistical composition of responses which are repeatedly registered for each of said plurality of prospecting stations;
- determining, for each statistically composed transient response associated with a prospecting station, a local

indicator function related to variations of a gradient of said transient response as a function of time;

- determining, for several prospecting stations, a regional indicator function representing as a function of time a common mode of the local indicator functions associated with each of said several prospecting stations;
- subtracting the regional indicator from each of the local indicators to determine a residual indicator for each of the stations concerned; and
- producing a representation of subsoil structure features from said residual indicators determined as a function of said geographical positioning of said stations.

4,417,211

# APPARATUS FOR DETERMINING THE ADVANCE OF A TIMING LIGHT

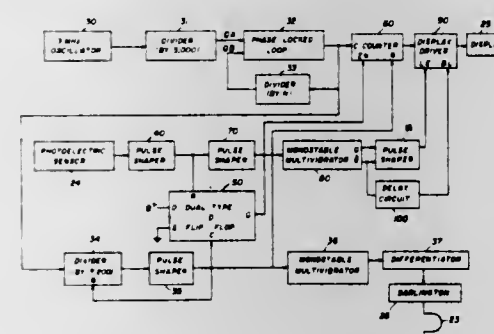
Patrick E. Ciriacks, Carpinteria, Calif., and Gary S. Gibson, Evanston, Ill., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jul. 6, 1981, Ser. No. 280,296

Int. Cl.<sup>3</sup> F02P 17/00

U.S. Cl. 324—392

16 Claims



11 Claims

1. Apparatus for determining the advance of a timing light that produces flashes of illumination in response to ignition firing voltage supplied by an engine being evaluated, the amount of advance between the firing voltages and the flashes resulting therefrom being adjustable in accordance with a setting means and indicating means on the timing light, the combination comprising means for generating a first pulse train, means for establishing the frequency of the first pulse train at a first high value related to a selected engine speed, means for dividing the frequency of the first pulse train by a predetermined number in order to generate a second pulse train having a frequency of a second lower value, a firing circuit coupled to said dividing means and responsive to the second pulse train for producing firing voltages for the timing light, a photoelectric sensor responsive to flashes from the timing light to produce a sensor signal, circuit means responsive to the second pulse train and the sensor signal to generate an enable signal commencing with a pulse from said dividing means and terminating with said sensor signal, a counter having a clock input coupled to said generating means and an enable input coupled to said circuit means and being operative to count pulses in the first pulse train during the presence of the enable signal, and display means coupled to said counter and being operative to depict a number representative of the pulses counted by the counter.

4,417,212

# METHOD FOR MEASURING THE AMOUNT OF OIL IN AN ESSENTIALLY NONCONDUCTIVE LIQUID

Robert A. Baum, 1932 Altura Dr., Corona Del Mar, Calif. 92625 Division of Ser. No. 20,719, Mar. 15, 1979, Pat. No. 4,313,086. This application Jul. 8, 1981, Ser. No. 281,268

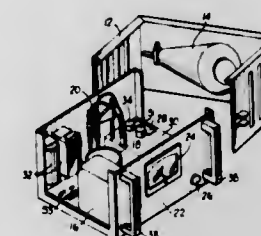
Int. Cl.<sup>3</sup> G01N 27/02, 27/42

U.S. Cl. 324—439

8 Claims

1. A method of measuring relatively small amounts of saturated hydrocarbon oil in an essentially nonconductive liquid comprising:

providing a conductivity additive which renders the hydrocarbon oil conductive but does not render the essentially nonconductive liquid conductive; mixing the conductivity additive, the oil and the essentially nonconductive liquid to form a mixture whereby the oil of



the mixture is rendered electrically conductive and the essentially nonconductive liquid remains essentially nonconductive; and passing an electric current through the mixture after the oil is rendered conductive to obtain an indication of the amount of oil in the mixture.

4,417,213

# DATA REGENERATIVE SYSTEM FOR NRZ MODE SIGNALS

Yasuo Ito, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

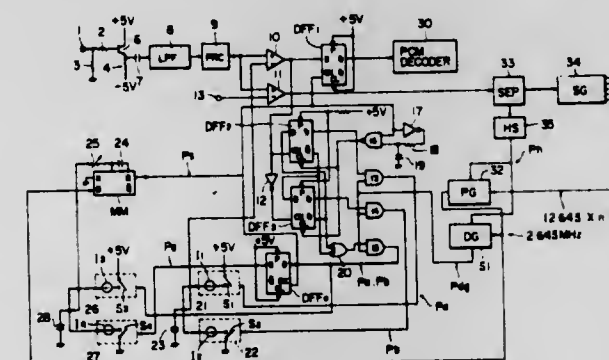
Filed Mar. 24, 1981, Ser. No. 247,184

Claims priority, application Japan, Mar. 27, 1980, 55-39213

Int. Cl.<sup>3</sup> H03K 5/01, 5/08

U.S. Cl. 328—164

10 Claims



1. A system for regenerating data from received Non-Return-to-Zero mode data, comprising:

a comparator having a first input receptive of said NRZ mode data and a second input receptive of a variable threshold voltage for comparison with the voltage of said NRZ mode data for generating a first or a second comparator output having first and second discrete values respectively depending on the relative value of the voltage applied to the first input to the voltage applied to the second input;

first means for generating data strobe clock pulses at a rate in conformance with the rate at which said NRZ mode data is received;

second means for generating an error signal in accordance with the difference between the time of occurrence of each of said first and second comparator outputs and the time of occurrence of said data strobe clock pulse, said error signal being applied to the second input of said comparator as said variable threshold voltage; and third means for generating an output pulse of the system initiating in response to the leading edge transition of said data strobe clock pulse in the presence of said first comparator output and terminating in response to the leading edge transition of said data strobe clock pulse in the presence of said second comparator output.

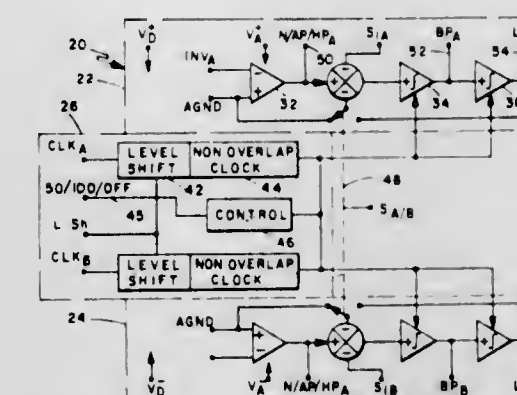
4,417,214  
MONOLITHIC IC GENERAL PURPOSE ACTIVE FILTER  
Stylanos G. Sevastopoulos, San Jose, and Sammy S. Lum, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 13, 1981, Ser. No. 253,233

Int. Cl.<sup>3</sup> H03F 1/34, 3/68

U.S. Cl. 330—84

3 Claims



1. A monolithic IC general purpose active filter comprising: a pair of filter building blocks each including a pair of serially connected summing and a pair of serially connected switched capacitor positive integrators connected to the serial output of the summing;

clock interface means for receiving and conditioning first and second external clock signals and for driving the switched capacitor positive integrators of each filter building block with a corresponding one of the first and second conditioned clock signals; and

input/output means interconnected between the summing, the integrators and the clock interface means for permitting each filter building block to be configured and the center frequency thereof tuned according to at least one of the resistance ratios of externally applied resistors and the frequency of one of the first and second clock signals.

4,417,215

# TUNED ANALOG NETWORK

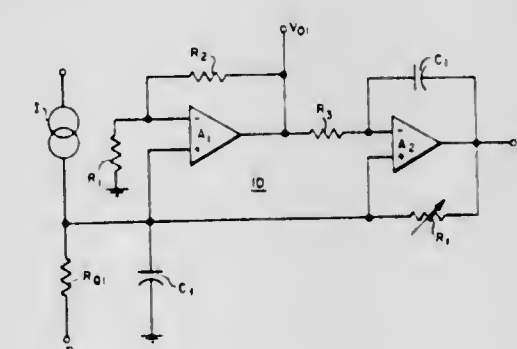
Leonard L. Kleinberg, Greenbelt, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 10, 1981, Ser. No. 301,077

Int. Cl.<sup>3</sup> H03F 1/34

U.S. Cl. 330—107

16 Claims



1. An active network, comprising: means for establishing an input junction with a common potential; means coupled to said input junction for providing a first order reactance; means coupled to said input junction for amplifying without phase shift a signal applied to said input junction; means coupled to said input junction for shifting the phase of said applied signal and cascaded with said amplifying



means to form an equivalent first order reactance at said input junction opposite in polarity to said providing means reactance, each of said amplifying and shifting means providing an output signal;

and means coupled across said phase shifting means for tuning said equivalent first order reactance to create a resonant circuit at said input junction.

4,417,216

## OPERATIONAL AMPLIFIER

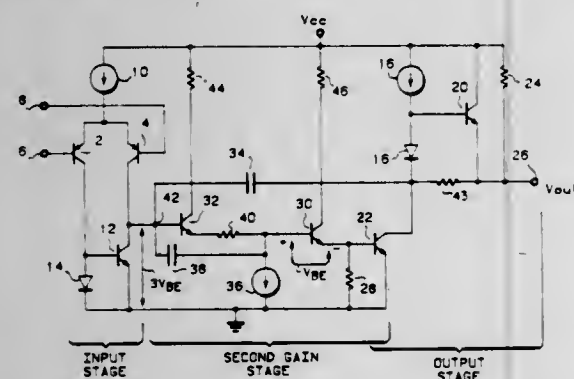
William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1981, Ser. No. 293,753

Int. Cl.<sup>3</sup> H03F 3/04

U.S. Cl. 330-294

7 Claims



1. An operational amplifier for providing load current to an external load, comprising:

an input stage having at least one input transistor and an output;

an output stage including first and second NPN output transistors each having base, emitter, and collector terminals, said first NPN output transistor having an emitter coupled to said load for conducting load current thereto and said second NPN transistor having a collector coupled to said load for sinking load current therefrom;

first and second emitter follower transistors coupled between the output of said input transistor stage and the base of said second NPN output transistor;

a first frequency stabilizing means coupled between the output of said input transistor stage and the collector of said second NPN output transistor for stabilizing said amplifier, said first frequency stabilizing means, said second NPN output transistor and said first and second emitter follower transistors forming a loop; and

second frequency stabilizing means coupled to said first and second emitter follower transistors and to said first frequency stabilizing means for stabilizing said loop.

4,417,217

## DISCHARGING ELEMENT ENERGIZING CIRCUIT FOR DISCHARGE-TYPE FIRE ALARM SENSOR UNIT

Mazuo Sugiyama, Mitaka, Japan, assignor to Shigeo Matsuda, Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 244,890

Claims priority, application Japan, Mar. 24, 1980, 55-037279

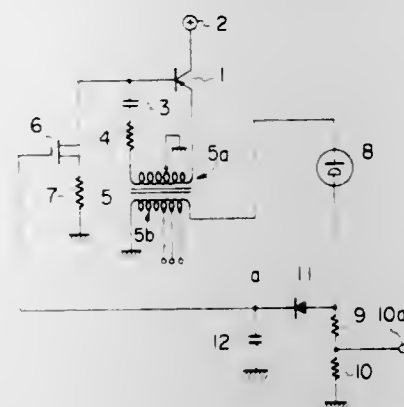
Int. Cl.<sup>3</sup> G08B 17/10

U.S. Cl. 331-66

3 Claims

1. A circuit for energizing a current discharge element of a discharge-type fire alarm sensor unit including a discharging element, comprising: a first circuit supplying a power voltage to said discharging element in the form of periodical output pulses making said discharging element ready to discharge a current; a second circuit supplying a feedback signal obtained from said discharging element to said first circuit so as to vary the interval of said output pulses, said first circuit comprising a third circuit generating reference pulses, a fourth circuit step-

ping up the voltage of said reference pulses to produce said output pulses, and a fifth circuit varying the interval of said



reference pulses depending on said feedback signal supplied from said second circuit.

4,417,218

## LINEARIZING CIRCUIT FOR A HIGH FREQUENCY VOLTAGE CONTROLLED OSCILLATOR

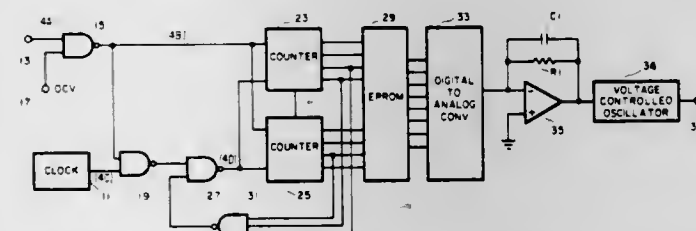
Herbert Berke, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1981, Ser. No. 275,474

Int. Cl.<sup>3</sup> H03B 23/00

U.S. Cl. 331-178

9 Claims



1. A linearizing circuit comprising, in combination: an input terminal adapted to receive a horizontal sync signal having a series of uniformly spaced horizontal sync pulses;

timing means having an input connected to said input terminal and a plurality of outputs, for producing a plurality of digital addresses, said plurality of digital addresses to be repetitive whenever said timing means receives at the input thereof one of the sync pulses of said horizontal sync signal, said timing means comprising;

a variable frequency clock having an output;

a first NAND gate having a first input connected to said input terminal, a second input, and an output;

a direct current voltage source having an output connected to the second input of said first NAND gate;

a second NAND gate having a first input connected to the output of said first NAND gate, a second input connected to the output of said variable frequency clock, and an output;

a third NAND gate having a first input connected to the output of said second NAND gate, a second input, and an output;

a first counter having a clock input connected to the output of said third NAND gate, a reset input connected to the output of said first NAND gate, an enable output, and four data outputs;

a second counter having a clock input connected to the output of said third NAND gate, a reset input connected to the output of said first NAND gate, an enable input connected to the enable output of said first counter, and four data outputs;

a fourth NAND gate having a first input connected to the second data output of said first counter, a second input connected to the first data output of said second counter, a third input connected to the second data output of said

second counter, and an output connected to the second input of said third NAND gate;

memory means having a plurality of inputs effectively connected to the outputs of said timing means and plurality of outputs, for providing, in response to each digital address produced by said timing means, a digital word;

means having a plurality of inputs effectively connected to the outputs of said memory means, and an output for converting each digital word provided by said memory means to an analog voltage; and

voltage controlled oscillator means having an input connected to the output of said converting means and an output, for providing at the output thereof a frequency signal in response to each of said analog voltages such that a linear oscillator sweep output frequency signal is formed at the output of said voltage controlled oscillator means between successive sync pulses of said horizontal sync signal.

4,417,219

## PHASE DISPLACEMENT MODULATOR

Pierre Brossard, 9 rue des Fleurs, Montigny-le-Bretonneux F-78190 Trappes, and Daniel Duponteil, 45, rue Anatole France, 92370 Chaville, both of France

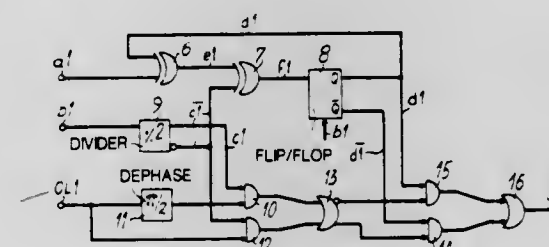
Filed Oct. 24, 1980, Ser. No. 200,471

Claims priority, application France, Oct. 31, 1979, 79 27519

Int. Cl.<sup>3</sup> H03K 7/06; H04L 27/20

U.S. Cl. 332-9 R

2 Claims



1. A binary phase-shift modulator for modulating by phase displacement in four phase-shifted states, the modulation comprising presenting four phase-shifted states which are different from  $\pi/2$ , transmitting the binary symbol "1" by a phase shift of  $+\pi/2$ , transmitting the binary symbol "0" by a phase shift of  $-\pi/2$ ; said modulator comprising first and second exclusive OR gate means, said first exclusive OR gate means having one input coupled to receive a modulating binary signal and having an output coupled to an input of said second exclusive OR gate means, flip-flop means having an input coupled to the output of said second exclusive OR gate means, means for coupling a first output of said flip-flop means to a second input of the first exclusive or gate means, divide-by-two means having direct and inverted outputs and having an input which is coupled to receive clock signals having a timing corresponding to the bit rate of the modulating binary signal, said divide-by-two means having an inverted output which is coupled to a second input of the second exclusive Or gate means, four AND gate means, the direct and inverted outputs of said divide-by-two means being respectively coupled to first inputs of first and second of said AND gate means, the outputs of said flip-flop means being respectively coupled to first inputs of third and fourth of said AND gate means, delay circuit means which delays by  $\pi/2$ , the input of said delay circuit means being coupled to receive a carrier frequency which is also applied to a second input of the second AND gate means, the output of the delay circuit means being coupled to a second input of the first AND gate means, OR gate means having a direct and an inverted output, the outputs of the first and second of the AND gate means being respectively coupled to inputs of said OR gate means, said direct and inverted outputs of said OR gate means being respectively coupled to a second input of the third and fourth AND gate means, an output OR gate means, the outputs of the third and fourth AND gate means being respectively coupled

to inputs of said output OR gate means, the output of which delivers the modulated signal.

4,417,220

## ADJUSTABLE AND SELECTIVE ELECTRICAL FILTERS AND METHODS OF TUNING THEM

Brian T. Holyman, and Charlton R. Baty, both of London, England, assignors to Decca Limited, London, England

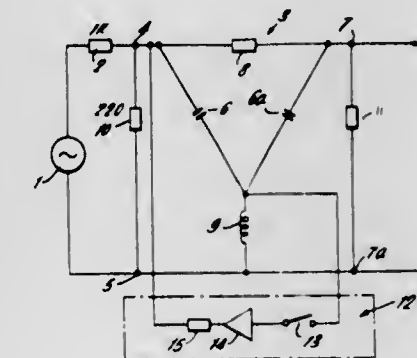
Filed Feb. 6, 1981, Ser. No. 232,180

Claims priority, application United Kingdom, Feb. 11, 1980, 8004490

Int. Cl.<sup>3</sup> H03H 7/07, 7/09, 11/04; H03B 5/26

U.S. Cl. 333-174

8 Claims



1. An electrical filter which has a normal operational mode in which it provides narrow-band rejection of signals centered on an adjustable frequency and a test mode in which it provides amplification of signals at said frequency, the electrical filter comprising:

(a) a filter network having a narrow band rejection characteristic centered on a particular frequency and including adjustable means for altering said frequency;

(b) an ancillary network including an amplifier; and

(c) means for completing a circuit which includes said ancillary network and at least part of said filter network, said means for completing permitting said electrical filter to function in said normal operational mode and in said test mode.

4,417,221

## SURFACE ACOUSTIC WAVE DEVICE HAVING IMPROVED MULTI-STRIP COUPLER

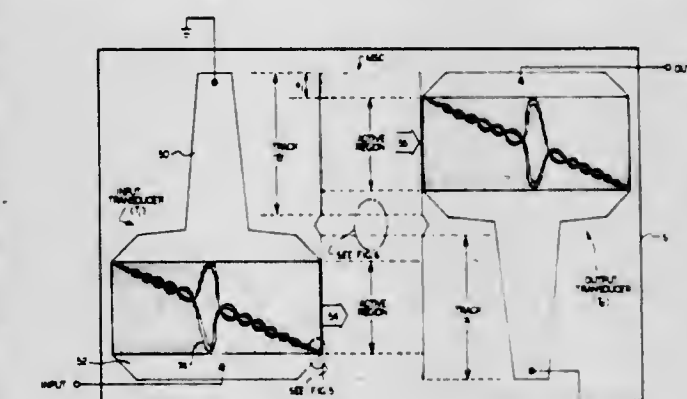
Bill J. Hunsinger, Mahomet, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 2, 1982, Ser. No. 364,924

Int. Cl.<sup>3</sup> H03H 9/42, 9/64, 9/145

U.S. Cl. 333-194

25 Claims



1. A surface acoustic wave device including a substrate upon which acoustic waves can be transmitted and received, means for transmitting an acoustic wave along a first track on said surface, a multi-strip coupler for coupling the acoustic wave from said first track to a second track, said acoustic wave in



said second track having an amplitude profile transversely across said second track which exhibits a peak near at least one longitudinally extending boundary of said second track, and receiving means disposed in said second track for receiving said acoustic wave in said second track, said receiving means being responsive to essentially only those acoustic waves which pass through a sensitive region of said receiving means, said region having a first dimension transverse to said second track, where said first dimension is shorter than the width of the acoustic wave beam provided in said second track by said multi-strip coupler and where said receiving means is transversely positioned in said track so that said sensitive region is transversely spaced from said peak in said acoustic wave amplitude profile, whereby said receiving means is substantially nonresponsive to said at least one peak in the amplitude profile of said acoustic wave.

4,417,222

## CIRCUIT BREAKER

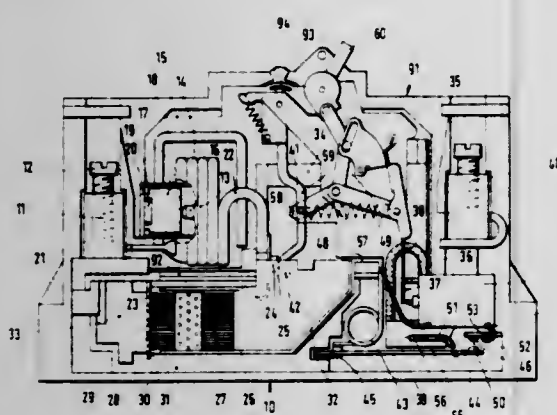
Herrmann Schmitt, Edingen-Neckarhausen; Rudolf Sellner, Eppelheim, and Klaus Greefe, Wilhelmsfeld, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Co. Aktiengesellschaft, Mannheim, Fed. Rep. of Germany  
Filed Jun. 10, 1981, Ser. No. 272,202

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021867

Int. Cl.<sup>3</sup> H01H 75/00, 77/00, 73/48

U.S. Cl. 335—6

33 Claims



1. Automatic switch comprising at least one main contact device having at least one stationary contact and at least one movable contact, a movably supported contact lever attached to said at least one movable contact, a switch latch connected to said main contact for opening said main contact, an overload current tripping device formed of a thermo-bimetal connected to said switch latch for causing said switch latch to open said main contact upon the occurrence of an overload current, a short-circuit current tripping device connected to said switch latch for causing said switch latch to open said main contact upon the occurrence of a short-circuit current, and an additional armature system having a magnet coil, a magnet core, a magnet armature and a striker pin, said striker pin being operable for directly striking said at least one movable contact lever and for lifting said at least one movable contact from said at least one stationary contact for a given limited time in the event of short-circuit currents.

4,417,223

## MULTIPOLE ELECTRIC CIRCUIT BREAKER WITH IMPROVED CURRENT LIMITING DEVICE

Jean Bancalari, Grenoble, France, assignor to Merlin Gerin, Grenoble, France

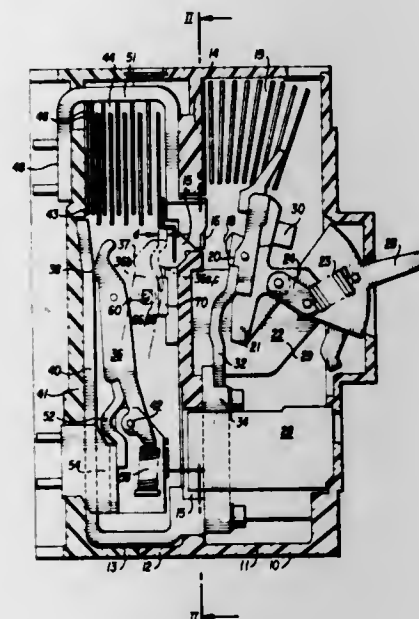
Filed Feb. 5, 1982, Ser. No. 346,139

Claims priority, application France, Feb. 11, 1981, 81 02800

Int. Cl.<sup>3</sup> H01H 77/10

U.S. Cl. 335—195

4 Claims



1. A multipole current limiting circuit breaker with an automatic tripping unit, each pole comprising: a plurality of movable parallel contact arms, electrodynamic auto-repulsive means for imparting a substantially equal opening force to each of said contact arms under the effect of a sudden increase in current whereby each of the contact arms are repulsed simultaneously, spring means to urge said arms in the closed position, a lost motion mechanical linkage connecting a first of said contact arms with a second of said contact arms, abutment means cooperating only with the second contact arm for preventing the movement of the second contact arm beyond a predetermined position, said first contact arm being free to continue the opening movement beyond said abutment means by said lost motion linkage so that the inertia of the first contact arm compensates for the impact of the second arm on the abutment means and prevents immediate reclosure of the contact arms until such time as the tripping device is actuated.

4,417,224

## TIME DELAY FUSE

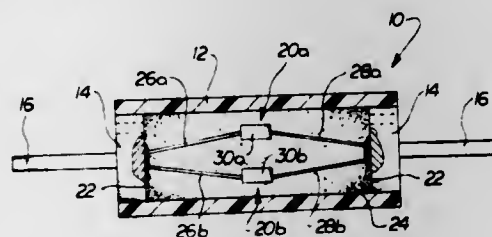
Michael E. Ross, Schaumburg, Ill., assignor to Federal Pacific Electric Co., Newark, N.J.

Filed Dec. 16, 1981, Ser. No. 331,248

Int. Cl.<sup>3</sup> H01H 85/04

U.S. Cl. 337—164

11 Claims



1. A fuse for providing short circuit and time delay overcurrent protection comprising: an insulating cartridge having a tubular shape with first and second ends, a pair of connector blocks each being sealingly attached at said first and second ends of said cartridge, two or more fusible links electrically

connected between said pair of connector blocks, said fuse links including first and second portions constructed of relatively high melting point electrically conductive material, said first and second portions being spaced apart with one end of each connected to one of said connector blocks, a third portion constructed of a relatively low melting point electrically conductive material, said third portion joining said first and second portions at the other ends of each, and a quantity of arc extinguishing material within said cartridge and surrounding said fusible link.

4,417,225

## FLAT FUSE AND PROCESS FOR PRODUCTION THEREOF

Wulf Müller, and Manfred Kaiser, both of Wuppertal, Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

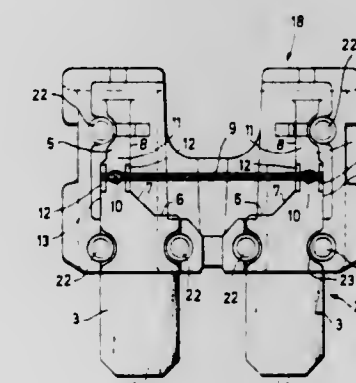
Filed Apr. 8, 1982, Ser. No. 366,766

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115435

Int. Cl.<sup>3</sup> H01H 85/02

U.S. Cl. 337—198

13 Claims



1. A flat fuse comprising two plug blades adjacently spaced from one another in a plane, said plug blades being stamped sheet metal parts, plug zones of said plug blades extending rearwardly in a one piece construction into adjacently spaced current-conducting straps, a fuse fusion element being arranged between said straps and being secured to said straps, said current-conducting straps and said fusion element being surrounded and enclosed by a plastic casing, said fusion element including a copper wire provided with a silver sheathing, said current-conducting straps and said plug blades being fabricated from brass, at least said current-conducting straps being superficially tinned, and said fusion element being welded in each case to a flat side of said current-conducting straps.

4,417,226

## ELECTRICAL FUSE

Norbert Asdollahi, and Christian Gutzmer, both of Witten, Fed. Rep. of Germany, assignors to Wickmann-Werke GmbH, Witten-Annen, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,172

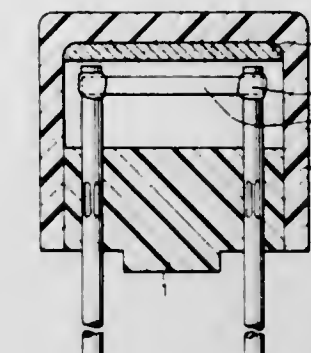
Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118943

Int. Cl.<sup>3</sup> H01H 85/38

U.S. Cl. 337—273

17 Claims

1. An electrical fuse comprising: a housing comprised of a plastic base, and a plastic cap connected to said base to define therewith the housing; two conductors extending through said base into the interior of said housing and being bridged across inside said housing by a fusible metal conductor; and a disc having a size which is slightly larger than the internal cross section of said cap and being inserted with a force fit into the interior of said cap to form a lining which at least partially lines the interior of said housing, the disc being composed of a ceramic-based insulating material effective to promote and effect the condensation thereon of metal vapor created by vaporization of the metal of the fusible metal conductor upon



blowing of the fuse during an excessive overload thereby preventing explosive separation of said cap and base which

could otherwise occur due to excessive pressure build up within the interior of said housing upon blowing of the fuse.

4,417,227

## VOLTAGE-DEPENDENT RESISTOR AND METHOD OF PRODUCING SUCH A RESISTOR

Detlev Hennings; Axel Schnell, and Herbert Schreinemacher, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

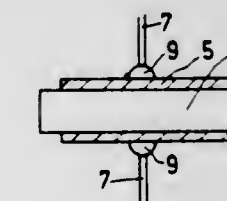
Filed May 13, 1981, Ser. No. 263,321

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019969

Int. Cl.<sup>3</sup> H01C 7/10

U.S. Cl. 338—21

8 Claims



1. A voltage-dependent resistor comprising a ceramic sintered body formed of a polycrystalline alkaline earth metal titanate doped with a small quantity of a metal oxide to produce an N-type conductivity and electrodes provided on opposing parallel surfaces of said sintered body, characterized in that said sintered body comprises a minor quantity of a lead germanate phase defined by the general formula  $(\text{PbO})_x \cdot (\text{GeO}_2)_y$  in the molar ratio  $x:y = 5:1$  to  $1:5$ .

4,417,228

## GAS COMPONENT DETECTOR

Akio Takami; Tsutomu Saito; Toshifumi Sekiya, and Kazutoshi Tanaka, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

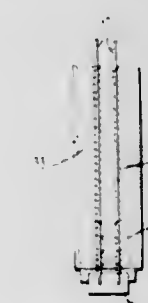
Filed May 6, 1982, Ser. No. 375,602

Claims priority, application Japan, May 8, 1981, 56-67178[U]

Int. Cl.<sup>3</sup> H01L 7/00

U.S. Cl. 338—34

6 Claims



1. In a gas component detector having: a gas component detecting element made of sintered metal oxide with a varying



electrical resistance according to the components of a gas to be detected; a pair of electrodes for transmitting the electrical resistance of said gas component detecting element; and a ceramic tube having through-holes into which said pair of electrodes are inserted, the improvement comprising a method of making said ceramic tube with a cylindrical ceramic heater comprising the steps of: forming on a green ceramic sheet a print pattern with metal paste for forming a heat generator; winding and bonding said sheet to the outer wall of said ceramic tube before sintering; and co-fired to integrate said heater with said ceramic tube.

4,417,229

# MEANS FOR USE ON A RAILROAD TO DISTINGUISH BETWEEN TRACTION CURRENT AND SIGNAL CURRENT

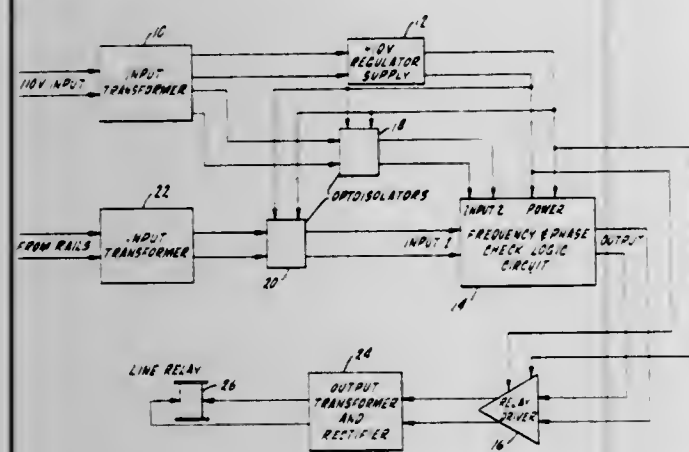
H. James Wilson, La Grange, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 197,281, Oct. 15, 1980. This application May 6, 1982, Ser. No. 375,393

Int. Cl.<sup>3</sup> B61L 21/00; G08C 19/28

U.S. Cl. 340—47

10 Claims



1. Means for distinguishing between non-signal current and signal current for use on a railroad including a first input means providing an input signal of the same frequency and phase as track signal current, a second input means connected to the track to provide a track signal, means for comparing the phase and frequency of said input signal and track signal, and means responsive to said comparison means for providing a relay driving signal when the input signal and the track signal have the same phase and frequency.

4,417,230

# GUIDE WHEEL ANGLE INDICATOR

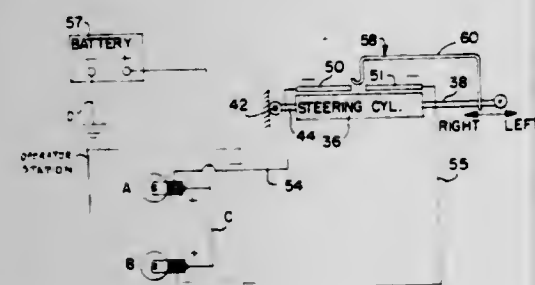
Robert M. Fachini, Naperville, Ill., and William D. Lester, Memphis, Tenn., assignors to International Harvester Co., Chicago, Ill.

Filed Apr. 6, 1981, Ser. No. 251,553

Int. Cl.<sup>3</sup> B60Q 1/00

U.S. Cl. 340—52 R

12 Claims



1. An indicator system informing a vehicle operator as to an angular position of a vehicle guide wheel assembly relative to a vehicle rectilinear line of travel and comprising:

a hydraulic steering cylinder pivotally connected with an associated vehicle chassis, said hydraulic cylinder having a piston rod pivotally connected with said guide wheel assembly, first and second contact plates mounted on and electrically insulated from said hydraulic cylinder, said first contact plate disposed at one end of said hydraulic cylinder and said second plate at another at a predetermined interval therebetween, wheel right and left direction light indicators displayed at an associated operator's station and energized by a vehicle mounted energy source, said right and left direction light indicators being independently and electrically connected respectively with said first and second contact plates, adjustable spring arm means rigidly attached to said piston rod and reciprocally movable therewith for contacting one of said contact plates, whereby when the guide wheel assembly is positioned off the vehicle rectilinear travel direction at a predetermined angle said spring arm means will contact one of said plates thereby grounding a respective electrical circuit and the direction light indicators associated therewith which will be lit and inform the vehicle operator about the direction in which the vehicle is steered.

4,417,231

# ENGINE OVER-TEMPERATURE AND OIL PRESSURE LOSS AUDIBLE WARNING DEVICE

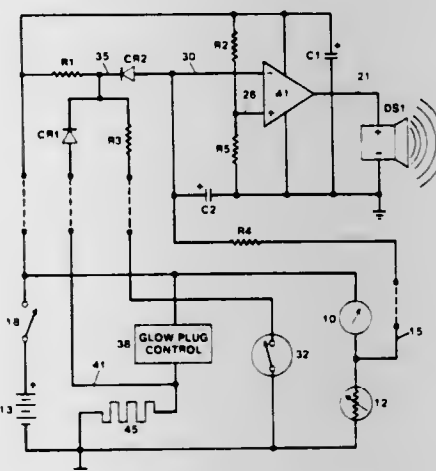
Richard E. Watt, 6384 Rockhurst Dr., San Diego, Calif. 92120

Filed Apr. 10, 1981, Ser. No. 253,031

Int. Cl.<sup>3</sup> G08B 19/00; B60Q 5/00

U.S. Cl. 340—52 F

6 Claims



1. An audible warning device for use with internal combustion engines having a temperature indicating means, a temperature sensor and battery power from an ignition switch, the warning device monitoring engine temperature and oil pressure and producing an audible warning if an over-temperature or oil pressure loss condition develops, the improvement comprising:

an electronic representation of a predetermined reference temperature and a predetermined reference oil pressure; an electronic oil pressure sensing means connected to the engine's oil pressure system; an electronic comparator responsive to the engine's temperature indicating and sensing system and said oil pressure sensing means, which compares a representation of the engine temperature, generated by the engine's temperature sensor, and a representation of oil pressure from said oil pressure sensing means, against said predetermined references and provides an output indication signal when the engine temperature becomes greater in magnitude or the oil pressure becomes less in magnitude than said predetermined references; an audible signal transducer connected to the output of said

electronic comparator, which produces an audio output at the presence of the output indication signal; first electronic circuitry means interposed between said electronic comparator's temperature sensor input and the engine's temperature indicating and sensing system, producing a momentary output indication signal from said electronic comparator when the engine's ignition switch is switched on, resulting in a momentary audio output from said audible signal transducer as a first self-test; and second electronic circuitry means interposed between said electronic comparator's oil pressure sensor input and the said oil pressure sensing means, producing a momentary output indication signal from said electronic comparator when engine startup occurs, prior to the buildup of engine oil pressure, resulting in a momentary audio output from said audible signal transducer as a second self-test.

4,417,232

# LIQUID VOLUME INDICATOR

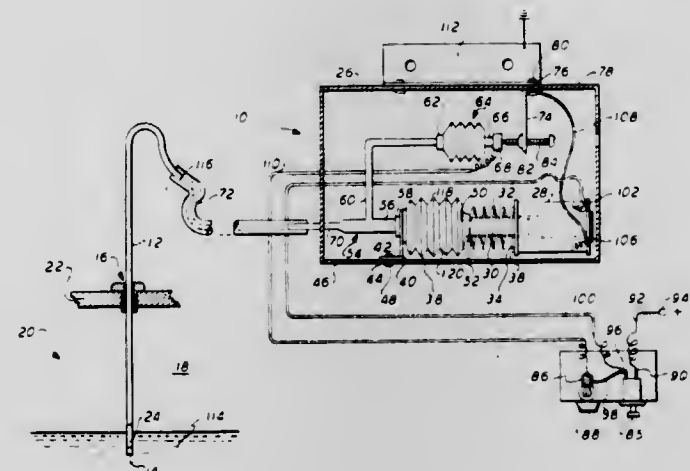
Farouk F. Tewfik, 33C Forest Dr., Garnerville, N.Y. 10923

Filed Apr. 16, 1979, Ser. No. 29,978

Int. Cl.<sup>3</sup> B60Q 1/00; G01F 23/00; G08B 21/00

U.S. Cl. 340—59

5 Claims



1. A device for indicating the presence or absence of a liquid in a vessel, the vessel being of the type used as a crankcase for an automobile or the like, said device comprising:

- a device housing;
- a tube for sampling liquid;
- a first hollow chamber housing coupled to said sampling tube; said first chamber housing comprises flexible chamber walls such that the volume of said first chamber may be selectively expanded or contracted; upon expansion of said first chamber housing volume a suction is created in said sampling tube so as to enable said tube to sample the liquid;
- a second chamber housing coupled to said sampling tube; said second chamber housing comprises flexible walls such that second chamber walls are capable of moving in response to the absence of the liquid in said tube upon said creation of said suction;
- means for expanding or contracting said first chamber volume; and
- means responsive to said movement of said second chamber housing to indicate the absence of sampled liquid in said tube; said responsive means comprises an electrical circuit; said electrical circuit comprises a pair of engageable electrical contacts and indicating means; said indicating means are coupled to said contacts for indicating whether said electrical contacts are engaged; one of said contacts being secured to said second housing chamber, said other contact being secured to said device housing such that said movement of said second housing chamber thereby causes said contacts to engage or disengage.

4,417,233

# FULLY PARALLEL THRESHOLD TYPE ANALOG-TO-DIGITAL CONVERTER

Michihiro Inoue, Ikoma; Toyoki Takemoto, Yawata, and Haruyasu Yamada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

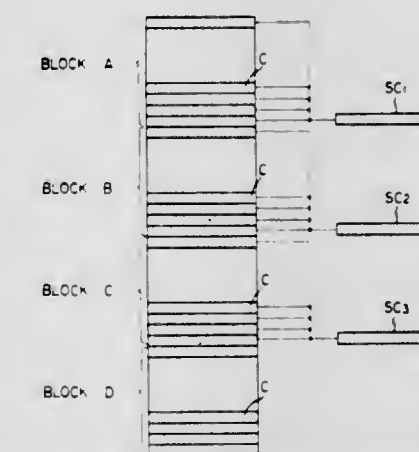
Filed Feb. 22, 1980, Ser. No. 123,646

Claims priority, application Japan, Feb. 28, 1979, 54-24005; Sep. 19, 1979, 54-121158; Sep. 19, 1979, 54-121159; Oct. 18, 1979, 54-134968

Int. Cl.<sup>3</sup> H03K 13/03

U.S. Cl. 340—347 AD

4 Claims



1. A fully parallel threshold type A/D converter for an input signal having a predetermined voltage range, comprising:

- A plurality of comparators each of which has a fixed reference voltage corresponding to a quantizing level and which are disposed in parallel with each other, said comparators being divided into a plurality of blocks; and
- a sub-comparator operatively associated with each of said comparator blocks, whereby the input signal is first compared by the sub-comparators and then compared by the comparators in one comparator block selected and supplied with power in response to the output from the associated sub-comparator, said reference voltages encompassing the full range of said input signal and remaining unchanged during the operation of both the sub-comparators and the comparators of said converter.

4,417,234

# MULTIPLEXED ANALOG TO DIGITAL CONVERTER HAVING A FEEDBACK STABILIZED RAMP

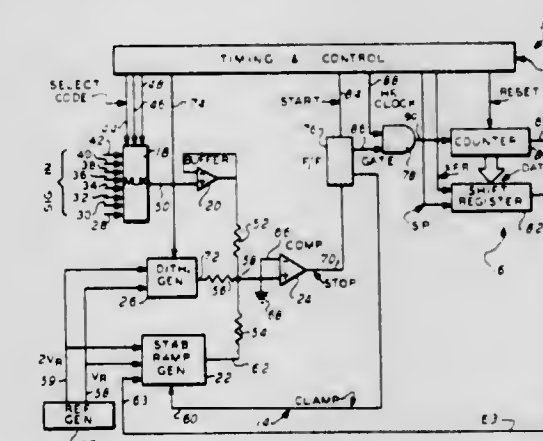
Joseph V. McKenna, Franklin Lakes, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Dec. 3, 1981, Ser. No. 326,874

Int. Cl.<sup>3</sup> H03K 13/20

U.S. Cl. 340—347 AD

3 Claims



1. An analog-to-digital converter for an inertial navigation system comprising:



an inertial navigation platform having a gyroscope and an accelerometer supplying a plurality of analog signals,  
 a multiplexer connected to the gyroscope and the accelerometer for receiving one analog input signal from the plurality of analog signals,  
 a timing unit coupled to the multiplexer for selecting the one analog input signal,  
 a comparator having an input connected to the multiplexer,  
 a feedback stabilized ramp generator having an output connected to the comparator input and having a feedback input,  
 a gated counter connected to and controlled by the comparator for supplying a digital output which is representative of the platform analog signal,  
 a feedback line connected between the gated counter and the feedback input of the stabilized ramp generator,  
 a dither generator connected to the comparator input,  
 a buffer having an input connected to the multiplexer and an output connected to the comparator, and  
 a reference generator connected to the stabilized ramp generator and connected to the dither generator.

4,417,235

## AUDIBLE ALARM NETWORK

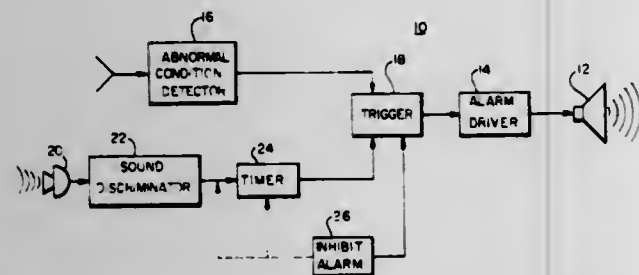
Donald J. Del Grande, 1832 Frankford Ave., Philadelphia, Pa. 19125

Filed Mar. 24, 1981, Ser. No. 247,003

Int. Cl.<sup>3</sup> G08B 1/00; G10K 11/00

U.S. Cl. 340—531

9 Claims



1. An alarm unit, for directly alerting persons to an abnormal condition, comprising:  
 means for detecting an abnormal condition;  
 means for automatically detecting presence of a predetermined audible alarm signal, the signal being a warning sound directly perceptible as such by the persons;  
 means for generating the same said predetermined perceptible audible alarm signal; and,  
 triggering means for activating the predetermined audible alarm signal generating means in response to said means for detecting an abnormal condition and also in response to said means for detecting an audible alarm signal.

4,417,236

## OVERLOAD DETECTING DEVICE

Michael Hung, 6th Fl., No. 683, Min-Sheng, East Rd., Taipei, Taiwan

Filed Nov. 6, 1981, Ser. No. 319,382

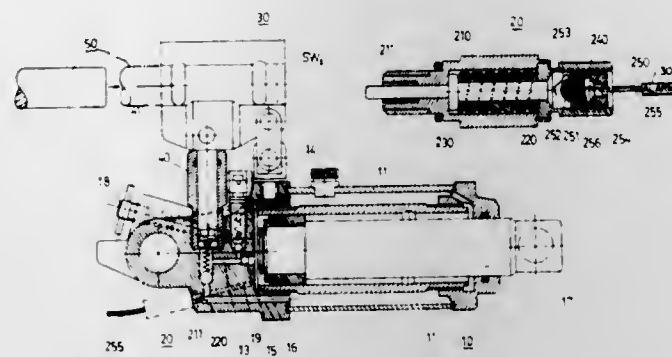
Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—626

6 Claims

1. An overload detecting and alarm device for a hydraulic jack having a coupling member receiving a removable pumping lever comprising,  
 an electronic alarm coupled with the hydraulic jack including power switching means installed in the lever coupling member and actuated by the pumping lever for applying power to the electronic alarm when the pumping lever is inserted in the coupling member;  
 a pressure sensitive switch operatively connected to the electronic alarm, the switch being inserted in the body of the hydraulic jack and communicating with a ram cylinder through a duct, said switch having a housing, a pressure actuated first electrical contact member extending

through one side of said housing into the duct and a second electrical contact member provided at the opposite side in said housing, said first electrical contact capable of



moving against a bias to contact said second electrical contact member when a fluid pressure in the second cylinder and duct acts thereon, thereby causing said electronic alarm system to produce an alarm signal.

4,417,237

## APPARATUS AND METHOD FOR DETECTING AND INDICATING MISALIGNMENTS OF VEHICLE WIRE SPOKE WHEELS

John K. Korth, 904 S. Lancaster St., Mount Prospect, Ill. 60056

Filed Jun. 4, 1981, Ser. No. 270,582

Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—686

10 Claims



1. An apparatus for detecting and indicating misalignments of the rim of a wire spoke wheel relative to its axle as the wheel rotates about its axis, comprising:  
 right sensing means (including electrical switch means mounted adjacent to one side of the wheel) for producing a right electrical signal by establishing a right electrical circuit path in response to relative movement of the wheel and said right sensing means toward one another through a right predetermined distance to a certain position and for alternatively terminating said right electrical signal by said right electrical circuit path in response to the wheel and said right sensing means moving backwardly past said certain position relative to one another;  
 left sensing means (including electrical switch means mounted adjacent to the other side of the wheel) for producing a left electrical signal by establishing a left electrical circuit path in response to relative movement of the wheel and said left sensing means toward one another through a left predetermined distance to a certain position and for alternatively terminating said left electrical signal by opening said left electrical circuit path in response to the wheel and said left sensing means moving backwardly past said certain position relative to one another;  
 electrical circuit means, including conductor means forming a portion of the electrical circuit paths, responsive to said sensors for conveying said pair of right and left electrical signal remotely therefrom; and  
 a pair of first and second indicating devices connected to

said electrical circuit means and closely spaced together remotely to at least one of said sensors for providing lateral misalignment information in response to either the respective right electrical signal or the left electrical signals or both of them simultaneously.

4,417,238

## ALARM MODIFICATION FOR METEOROLOGICAL INSTRUMENT

Beryl A. Lanterman, Timonium, Md., assignor to The Bendix Corporation, Southfield, Mich.

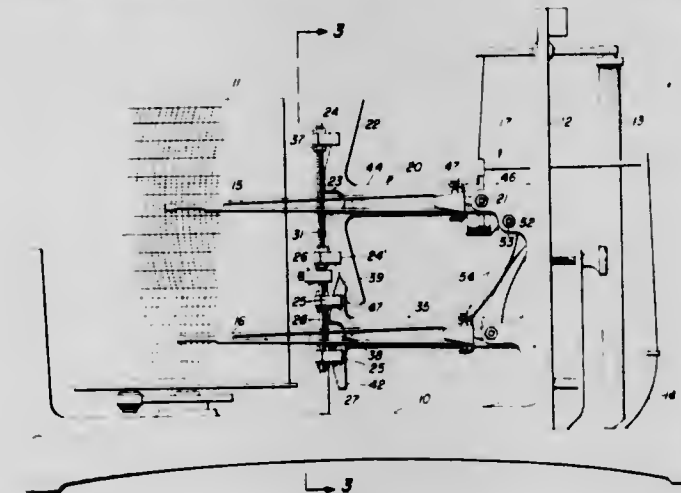
Continuation of Ser. No. 219,082, Dec. 22, 1980, abandoned.

This application Apr. 16, 1982, Ser. No. 368,796

Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—688

5 Claims



1. A modification kit for adding an electrical alarm feature to an instrument originally designed to provide only visual indication of a quantity being measured, said instrument including a sensor producing a motion in response to changes in the measured quantity, an output shaft, a linkage coupling motion of said sensor to said shaft and an indicating arm coupled to said shaft, said arm showing the value of the measured quantity, said modification kit comprising:

an elongated shutter arm one end of which defines an area the major portion of which is opaque and a minor portion of which is transparent;

means for securing the other end of said shutter arm to said instrument output shaft without disturbing said shaft in its mountings, said shutter arm extending generally parallel with said instrument indicating arm, said securing means including a hub member having a slot therein permitting said hub member to be fitted over said output shaft, means on said hub member for securing said output shaft in said slot, and means securing said hub member to said other end of said shutter arm;

a photo source-sensor including a light source and a photo sensor mounted in a unitary body with said light source separated from and facing said photo sensor; and  
 means including a shaft extending parallel to the plane of motion of said shutter arm and means for securing said source-sensor to said shaft at a selectable position along said shaft for adjustably supporting said photo source-sensor adjacent said shutter arm to permit motion of said shutter arm within the space separating said light source from said photo sensor, whereby said major opaque portion of said shutter prevents light transmission from said source to said photo sensor during movement of said output shaft for which no alarm signal is to be generated and further movement of said shaft to the alarm signal set point carries said minor transparent area of said shutter arm into the space separating said light source from said photo sensor permitting light transmission therebetween and causing said photo sensor to generate an electrical output signal.

4,417,239

## INTERACTIVE COMBINATION DISPLAY

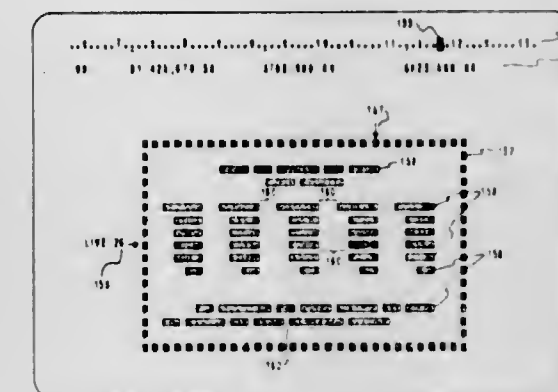
Kent R. Demke, and Joanne L. Mumolo, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,668

Int. Cl.<sup>3</sup> G09G 1/00

U.S. Cl. 340—709

4 Claims



1. In a processor driven word processing system including a memory, a display, means for performing operations including text entry and editing on at least one line of displayed data, and means for horizontally segmenting text lines wider than the display, the improvement comprising:  
 means for displaying simultaneously, with at least a portion of at least one cursor line of active text, a less than full size representation of a complete, full page of text;  
 means for indicating simultaneously the corresponding location of the active line of text in said less than full size page representation; and  
 wherein said means for displaying further includes means for displaying symbols indicating text character relative positions.

4,417,240

## PLURAL OUTPUT SWITCHED CURRENT AMPLIFIER AS FOR DRIVING LIGHT EMITTING DIODES

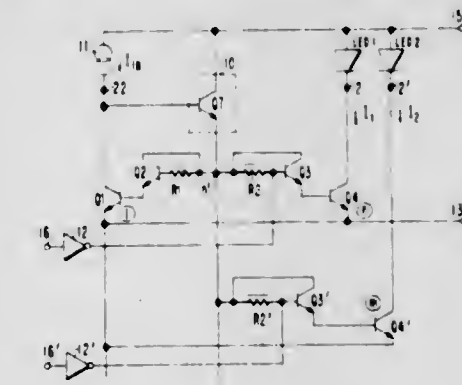
Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 153,629

Int. Cl.<sup>3</sup> G09G 3/00

U.S. Cl. 340—782

17 Claims



1. A switched current amplifier comprising:  
 a master transistor having respective emitter, base and collector electrodes;  
 a plurality of slave transistors, having respective emitter, base and collector electrodes;  
 an input terminal to which the collector electrode of said master transistor is connected;  
 a plurality of output terminals, each respective output terminal being connected to a respective one of the collector electrodes of said plurality of slave transistors;  
 a common terminal to which the emitter electrodes of said



master and plurality of slave transistors are each connected;

direct-coupled amplifier means for direct coupling the collector electrode of said master transistor to a circuit node;

a plurality of additional transistors having respective emitter electrodes, each except that of the last being connected to a respective one of all the base electrodes of said slave transistors and that of the last being connected to the base electrode of said master transistor, and having respective base and collector electrodes;

means for making forward biasing current available from said circuit node to the base electrodes of said additional transistors, including

a plurality of resistors having respective first ends connected to said circuit node and having respective second ends each being connected to a respective one of all the base electrodes of said plurality of additional transistors, and

means connected to the base electrodes of each of said additional transistors, except the last, for selectively diverting its forward biasing current from it.

4,417,241

# MAGNETICALLY OPERATED MATRIX DISPLAY PANEL AND ELEMENTS THEREFOR

Masayuki Wakatake, Tokyo, Japan, assignor to Yugen-Kaisha Wakatake Giken, Tokyo, Japan

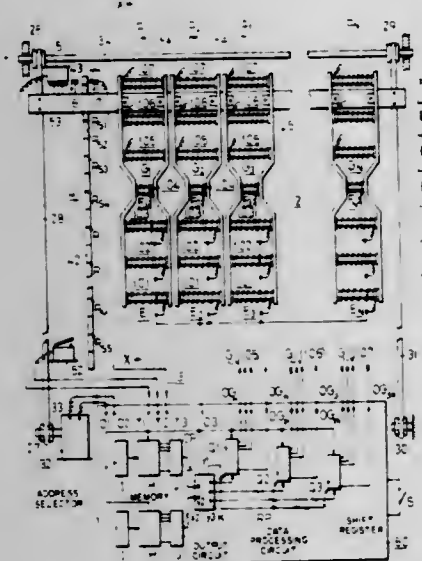
Filed Jun. 26, 1981, Ser. No. 277,828

Claims priority, application Japan, Jul. 1, 1980, 55-89332

Int. Cl.<sup>3</sup> G06K 15/18

U.S. Cl. 340—815.05

6 Claims



1. A display panel comprising:  
a display surface structure;  
a display switching unit; and  
a drive unit;  
in which, letting an arrangement of  $N$  vertical lines of arrangement spaced a predetermined distance from adjacent ones of them in a horizontal direction be represented by  $a_1, a_2, \dots, a_N$ , respectively, the display surface structure has  $M$  display elements  $D_{11}, D_{12}, \dots, D_{1M}$  disposed on the vertical line  $a_i$  ( $i=1, 2, \dots, N$ ) at predetermined intervals in a vertical direction;  
in which the display element  $D_{ij}$  ( $j=1, 2, \dots, M$ ) is formed with a block member with uniform cross section having an outer periphery forming a plurality of display surfaces of different colors to form a plurality of edges parallel to and around an axis extending in the horizontal direction, a magnetic piece of a first type disposed near each of the edges except one of them and a magnetic piece of a second type disposed near the remaining edge, the display element  $D_{ij}$  being supported by supporting means in a manner to be rotatable about the axis and to permit a selected one of the display surfaces to lie in a vertical plane;  
in which the display switching unit has a first erasing head  $E_i$ , a second erasing head  $F_j$  and a writing head  $G_j$  dis-

posed to be movable along each vertical line  $a_i$  in the vertical direction, the first erasing head  $E_i$  having magnets numbering one less than the edges of the block member, the second erasing head  $F_j$  having a magnet, the writing head  $G_j$  having electromagnets of the same number as the magnets of the first erasing head; and  
in which the drive unit has means for simultaneously moving down the first erasing heads  $E_1$  to  $E_N$ , the second erasing heads  $F_1$  to  $F_N$  and the writing heads  $G_1$  to  $G_N$  and means for driving the electromagnets of the writing heads  $G_1$  to  $G_N$  in synchronism with the movement of the writing heads  $G_1$  to  $G_N$ .

4,417,242

# METHOD FOR CONNECTING OR DISCONNECTING SELECTED STATIONS IN A RING COMMUNICATION SYSTEM, AND RING COMMUNICATION SYSTEM INCLUDING SELECTIVELY CONNECTABLE STATIONS

Urs Bapst, Kilchberg; Heinz Keller, Ruschlikon, both of Switzerland; Heinrich Meyr, Aachen, Fed. Rep. of Germany, and Hans R. Muller, Langnau, Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

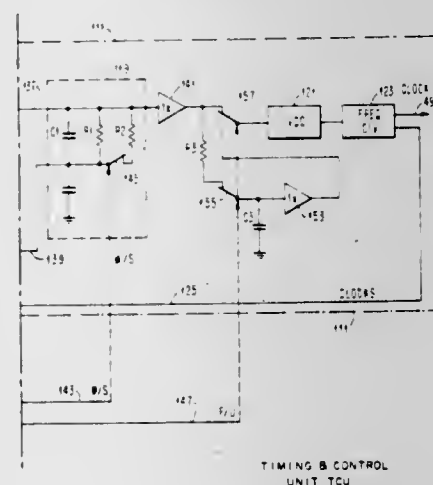
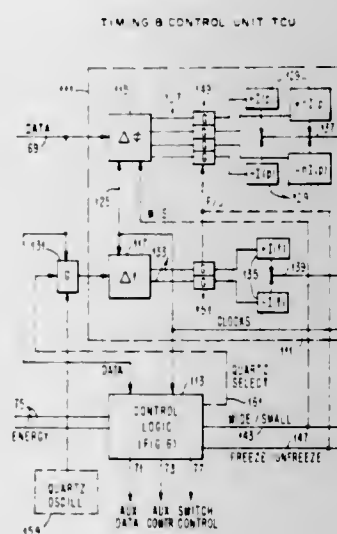
Filed Mar. 1, 1982, Ser. No. 353,746

Claims priority, application European Pat. Off., Mar. 12, 1981, 81 101 825.8

Int. Cl.<sup>3</sup> H04Q 9/00; H04L 7/08; H04J 3/08

U.S. Cl. 340—825.05

12 Claims



1. Method for connecting or disconnecting selected stations ( $T_1 \dots T_6$ , FIG. 1) in a communication system including a closed loop transmission ring to which a variable number of stations may be connected, connecting circuitry ( $A_1 \dots A_6$ , FIG. 1; FIG. 3) comprising phase-locked loop circuitry (FIGS. 5A, 5B) for synchronization being provided with each such station, characterized in that

the transmission ring is temporarily interrupted when a selected station is connected or disconnected,  
the resulting interruption of signal energy is detected in the connecting circuitry of the next station down the ring, and causes freezing the respective phase-locked loop circuitry at its current frequency and phase,  
reappearance of signal energy is detected in said connecting circuitry of said next station and causes defreezing and reactivation of the respective phase-locked loop circuitry.

4,417,243

Patent Not Issued For This Number

4,417,244

# AUTOMATIC PATH REARRANGEMENT FOR BLOCKING SWITCHING MATRIX

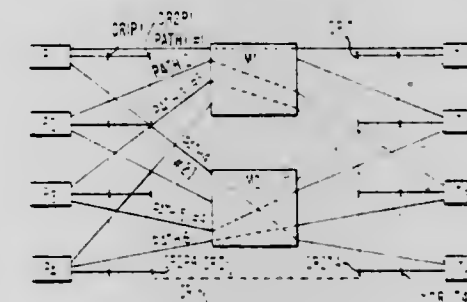
Constantin M. Melas, Los Gatos, Calif., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,398

Int. Cl.<sup>3</sup> H04Q 9/00

U.S. Cl. 340—825.8

4 Claims



1. A method of rearranging paths in a blocking switching network, said blocking switching network comprising at least primary, intermediate and tertiary stages, with at least two intermediate switching matrices in said intermediate stage, each said intermediate switching matrix with a number of inlets and outlets less than the total number of inlets of primary stage matrices or the total number of outlets of tertiary stage matrices, comprising the steps of:

- detecting a connection request for a path which is blocked;
- identifying a first intermediate matrix with an appropriate free primary link and a second intermediate matrix with an appropriate free tertiary link;
- naming paths, for rearrangement in said switching network associated with said first and second intermediate matrices, in sequential order beginning at a primary outlet or tertiary inlet forming part of said blocked path and proceeding from one end of one path at a primary outlet or a tertiary inlet to another path beginning at the same primary outlet or tertiary inlet at the other end of said one path until an unused primary outlet or tertiary inlet is identified;
- breaking a selected one of said named paths and making said blocked path;
- breaking another of said named paths and rearranging selected paths named prior to said another path to use an

intermediate matrix other than the one previously used to free links from intermediate matrices to primary outlets or tertiary inlets;  
(f) making a connection through said primary, intermediate and tertiary stages for one or another of said paths broken in steps (d) or (e);  
(g) repeating said steps (e) and (f) until all broken connections are made.

4,417,245

# DIGITAL SPACE DIVISION EXCHANGE

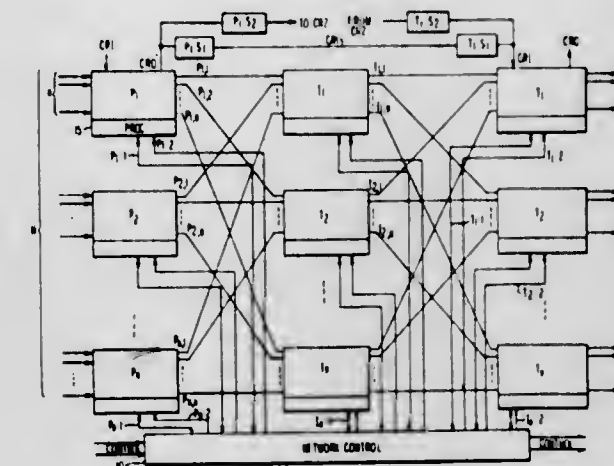
Constantin M. Melas, Los Gatos, Calif., and Michael A. Patten, Cary, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,705

Int. Cl.<sup>3</sup> H04Q 9/00, 3/00

U.S. Cl. 340—825.8

9 Claims



1. A switching network comprising:  
a plurality of intelligent crosspoint arrays, each with plural input and plural output conductors, for selectively connecting input and output lines in response to externally generated commands;  
network control means for generating said external commands and for monitoring the status of said arrays; and  
coupling means for coupling said network control means to said intelligent arrays, said coupling means including one multi-mode conductor and one single mode conductor for each said arrays, said multi-mode conductor being operable to transmit bidirectional sequential signals representative of a command and/or a response and said single mode conductor being operable to transmit unidirectional signal for changing the mode of operation of said multimode conductor.

4,417,246

# PAGING RECEIVER HAVING A SERIAL CODE PLUG

William C. Agnor, Lynchburg, and James H. Elder, Brookneal, both of Va., assignors to General Electric Company, Lynchburg, Va.

Continuation-in-part of Ser. No. 95,447, Nov. 19, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 204,277  
Int. Cl.<sup>3</sup> G08B 5/22

U.S. Cl. 340—825.44

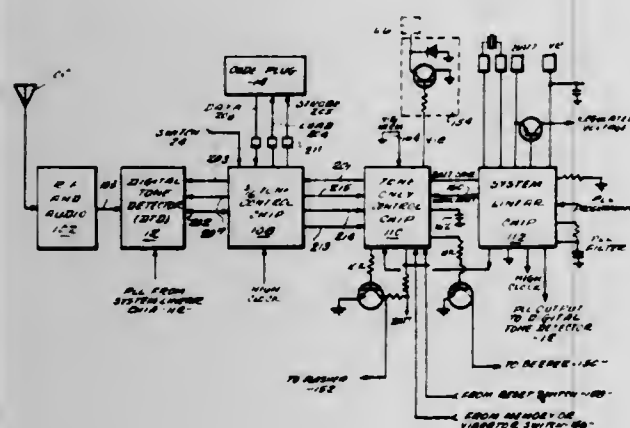
75 Claims

1. An improved paging radio receiver for producing a page output responsive to a predetermined preamble signal followed



by a predetermined sequence of N paging signals, where N is any integer greater than one, said receiver comprising:

- a means for receiving a radio signal modulated by said preamble signal and paging signals;
- b means for demodulating the preamble and N paging signals from the radio signal;
- c programmable signal detection means connected to said demodulating means for detecting demodulated preamble and paging signals;
- d control means, connected to said signal detection means, for first programming said signal detection means for



detecting said predetermined sequence of N paging signals, second programming said signal detection means for detecting said predetermined preamble signal, and third, in response to said predetermined preamble signal being detected by said signal detection means, programming said signal detection means for detecting said predetermined sequence of N paging signals; and

- e means, connected to said control means, for producing said page output in response to said predetermined sequence of N paging signals being detected by said signal detection means as programmed by said control means.

4,417,247

**CIRCUITRY CONTROLLED BY CODED MANUAL SWITCHING FOR PRODUCING A CONTROL SIGNAL**  
Daryl D. Dressler, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Oct. 29, 1981, Ser. No. 316,233  
Int. Cl.<sup>3</sup> H04Q 3/02

U.S. Cl. 340—825.31

9 Claims

1. Circuitry controlled by a series of switch actuations in accordance with a preselected switch code for providing a control signal including

- a plurality of flip-flop circuits, one for each digit of the preselected switch code; each of said flip-flop circuits having at least one output and at least two input terminals, one of said input terminals of one of said flip-flop circuits arranged for connection to a d.c. source;

means connecting said plurality of flip-flop circuits in series for series operation of said plurality of flip-flop circuits, said one flip-flop circuit connected as the first flip-flop circuit of said series, said series operation requiring the flip-flop circuit preceding a given flip-flop circuit to provide a signal from said one output of said preceding flip-flop circuit to one of said input terminals of said given flip-flop circuit to condition said given flip-flop circuit for providing a signal at said one output of said given flip-flop circuit in response to a signal presented to the other of said input terminals of said given flip-flop circuit, said means including a time delay

circuit portion for each given flip-flop circuit having a preceding flip-flop circuit, said time delay circuit portion for a given flip-flop circuit connected to said one input of the given flip-flop circuit and to said one output of the flip-flop circuit preceding the given flip-flop circuit;

- a plurality of manually operable switches actuatable in accordance with a preselected switch code, said code having a plurality of digits which are fewer in number than said



switches, said plurality of switches selectably connectable to said plurality of flip-flop circuits and when actuated providing a signal useable as a signal input to the other of said input terminals of said flip-flop circuits, said plurality of switches, when connected to said flip-flop circuits and actuated in accordance with said preselected switch code, providing for said series operation of said plurality of flip-flop circuits, said last flip-flop circuit of said series when operated providing said control signal.

4,417,248

**ADAPTIVE COLLISION THREAT ASSESSOR**  
Bruce D. Mathews, Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Jun. 30, 1981, Ser. No. 279,497  
Int. Cl.<sup>3</sup> G01S 13/00

U.S. Cl. 343—16 M

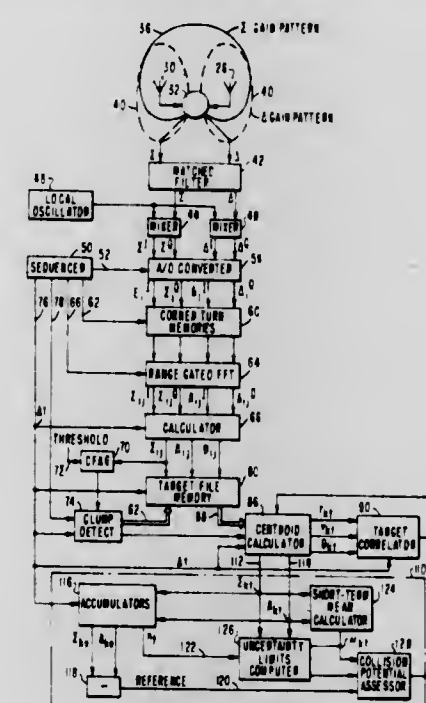
9 Claims

1. A monopulse radar operative to detect at least one potential threat and to track said threat through a sequence of time increments beginning with the detection thereof, wherein the improvement includes a system for assessing said detected threat adaptively in accordance with the relative bearing thereof with respect to said radar to determine the collision potential thereof with said radar, said system comprising:

- means for deriving a signal representative of said relative bearing of said detected threat for each time increment to generate a sequence of relative bearing representative signals respectively corresponding to said sequence of time increments;
- means for generating a first signal for each of a selected number of time increments based on a signal weighting function of said relative bearing representative signals derived for the sequence of time increments from threat

detection to said corresponding selected time increment, inclusively;

- means for generating a second signal for each of said selected number of time increments based on a signal weighting function of a predetermined number of most recently derived relative bearing representative signals with respect to said corresponding selected time increment;
- means for generating a third signal for each of said selected



number of time increments based on a function representative of the fluctuations in the relative bearing representative signals generated for the sequence of time increments from threat detection to said corresponding selected time increments, inclusively; and

- means for comparing, at each of said selected number of time increments, the deviation between said correspondingly generated first and second signals with said corresponding generated third signal to determine the collision potential of said detected threat with said radar.

4,417,249

**PHASE WEIGHTED ADAPTIVE PROCESSOR**  
John W. Zachele, Jr., Murray, Utah, assignor to Sperry Corporation, New York, N.Y.  
Filed Sep. 8, 1980, Ser. No. 184,741  
Int. Cl.<sup>3</sup> H04B 7/00

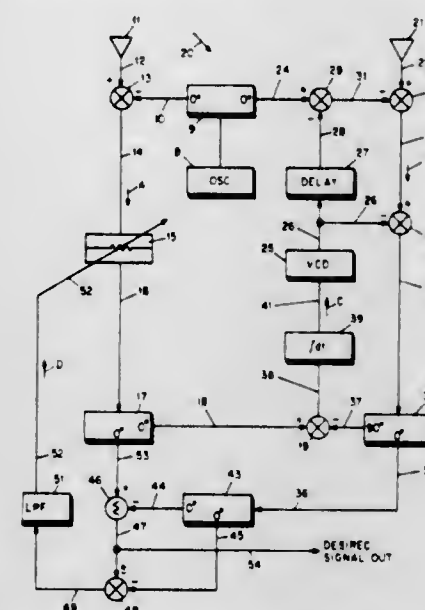
U.S. Cl. 343—379

13 Claims

1. An adaptive processor system of the type employed to eliminate undesired signals, comprising:

- a first signal path having an undesirable reference signal thereon,
- a second signal path having an attenuated and delayed replica of said undesired reference signal thereon, which is processed to track said reference signal,
- a phase tracking feedback path connected in parallel with said second signal path and adapted to shift the phase of said attenuated and delayed replica of said undesired reference signal in said second path to equal the phase of said reference signal,
- said phase tracking feedback path comprising therein, a voltage controlled oscillator and a delay coupled to the output of said voltage controlled oscillator,
- the output of said delay being phase shifted as a function of the frequency of said voltage controlled oscillator to provide a phase shifted oscillator output signal, and
- means in said second signal path for coupling said oscillator

output signal and said phase shifted oscillator output signal to the attenuated and delayed replica of said reference



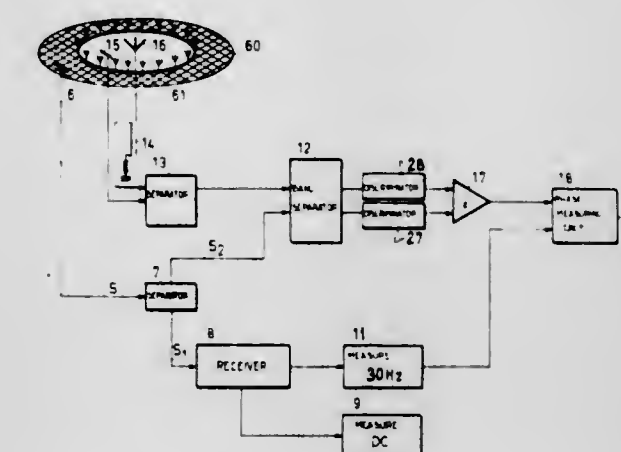
signal to provide a phase shifted attenuated and delayed replica signal in phase with said reference signal.

4,417,250

**MONITORING DEVICE FOR A RADIO NAVIGATION SYSTEM OF THE DOPPLER VOR TYPE**  
Alain Grousseau, Paris, France, assignor to Thomson-CSF, Paris, France  
Filed Feb. 18, 1981, Ser. No. 235,516  
Claims priority, application France, Feb. 26, 1980, 80 04212  
Int. Cl.<sup>3</sup> G01S 1/40

U.S. Cl. 343—405

5 Claims



1. A monitor device for a radio navigation system of the Doppler VOR type, which system comprises a central antenna radiating omnidirectionally a very high frequency carrier wave amplitude modulated by a first reference 30 Hz frequency sinusoidal signal and a circular network of antennae radiating two  $\pm 9960$  Hz side-bands of the amplitude modulation of the VHF carrier wave, said side-bands being themselves frequency modulated by a second variable 30 Hz frequency sinusoidal signal whose phase varies with respect to that of the first 30 Hz signal, comprising means for monitoring the signal emitted by said Doppler VOR system, said means comprising:

- a sensor placed in the vicinity of the transmitting antennae of said VOR system;
- a first device for processing the signal received by said sensor, said first processing device itself comprising:
- means for separating the two side-bands;
- means for providing said variable 30 Hz signal from said two side-bands;
- first means for measuring the modulation rate of said reference 30 Hz signal from the signal received by said sensor;



second means for measuring the continuous component of the signal received by said sensor; and  
third means for measuring the phase difference between said reference 30 Hz signal from said first measuring means and said variable 30 Hz signal from said providing means.

4,417,251

## INK JET HEAD

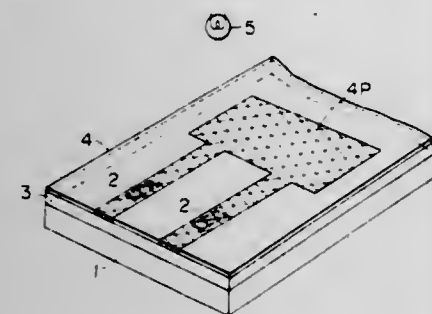
Hiroshi Sugitani, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1981, Ser. No. 238,422

Claims priority, application Japan, Mar. 6, 1980, 55-28654; Aug. 29, 1980, 55-120272

Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346-1.1



18. A method for manufacturing an ink jet head having at least one ink flow path through which ink droplets are produced which comprises: forming a photosensitive resin layer on a substrate provided with an ink discharging pressure-generating element therein, producing cured regions in said layer according to a predetermined pattern, and removing uncured resin from said layer to produce a groove in the surface of the substrate constituting said ink flow path.

4,417,252

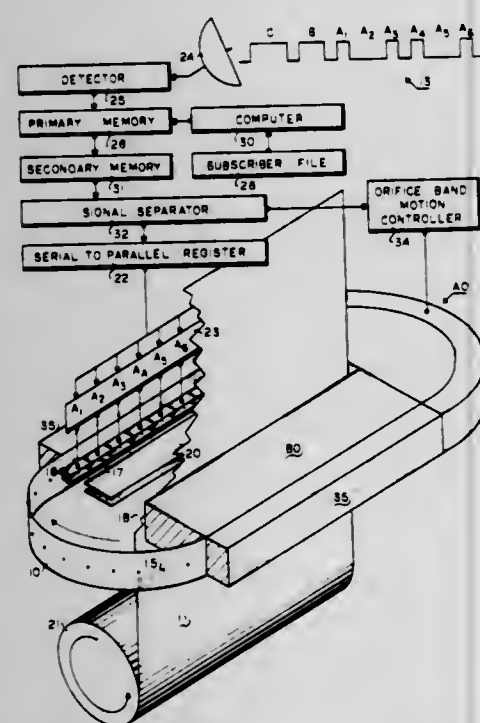
## FLUID DRIVE FOR AN ORIFICE BAND INK JET PRINTER

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 353,640, Mar. 1, 1982. This application Jun. 7, 1982, Ser. No. 385,915

Int. Cl.<sup>3</sup> G01D 9/00, 15/18

U.S. Cl. 346-1.1



1. A method for attaining a predetermined motion of an endless band, comprising the steps of:  
constraining the endless band to a path wherein the endless band is separate from solid structures,  
generating an error signal representing a difference between

actual motion of the endless band and predetermined reference motion thereof,  
regulating flow of a fluid which is adjacent to the endless band to exert a fluid force thereon in response to the error signal, and  
exerting an auxiliary force on the endless band so that the combination of the fluid force and the auxiliary force nulls the error signal.

4,417,253

## ARRANGEMENT FOR LASER PUMPING IN A COMBINED LASER RECORDING AND COLOR PROJECTION SYSTEM

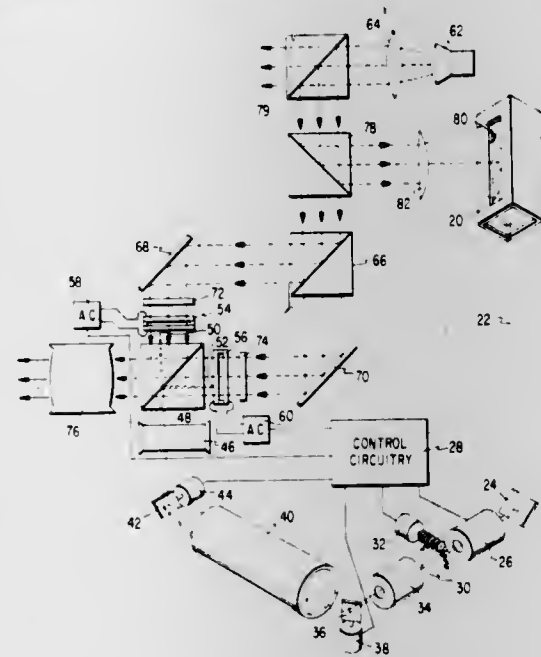
Herbert G. Jacks, Tujunga, Calif., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 16, 1981, Ser. No. 331,439

Int. Cl.<sup>3</sup> G01D 9/32; H01S 3/091

U.S. Cl. 346-17

6 Claims



1. In a recording and projection system which includes a laser utilized for recording an image and a source of projection light utilized for projecting the recorded image, the improvement comprising:  
means utilizing said projection light source for providing excitation energy for said laser.

4,417,254

## VALIDATOR FOR ELECTROCARDIAL DATA PROCESSING SYSTEM

Donald C. Woods, Lompoc, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Division of Ser. No. 88,105, Oct. 24, 1979, Pat. No. 4,339,800, which is a continuation-in-part of Ser. No. 957,527, Nov. 3, 1978.

This application Apr. 26, 1982, Ser. No. 371,783

Int. Cl.<sup>3</sup> G01D 9/26

U.S. Cl. 346-33 R

19 Claims

1. Apparatus for the high speed printing and plotting of alpha-numeric characters and incoming data signals respectively, comprising in combination:

a carriage, including marking means for producing marks on a medium in response to the applied data signal, said carriage movable back and forth along a path segment extending across the medium;

a servo connected to said carriage for controlling the velocity of said carriage along the path and tending to bring the velocity of said carriage into equality with an applied velocity command, and driving said carriage in a continuous uninterrupted motion from one end to the other of the path segment;

position logic means including sensing means operatively

4,417,255

## INK-JET PRINTER

Isokazu Furukawa, Sagami, Japan, assignor to Ricoh Company, Ltd., Japan

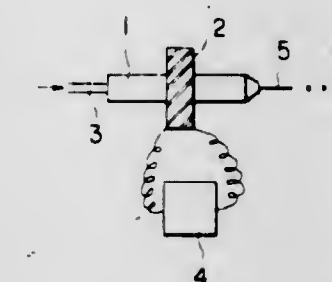
Filed Aug. 19, 1981, Ser. No. 294,142

Claims priority, application Japan, Aug. 20, 1980, 55-114293

Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346-75

9 Claims



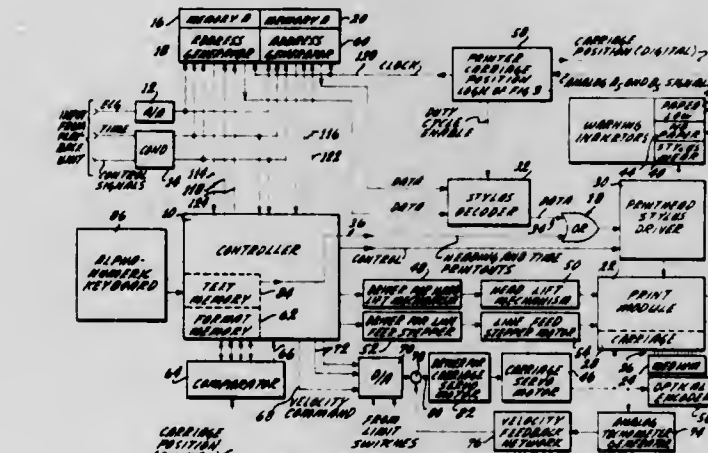
associated with said servo, for generating a position signal indicative of the location of said carriage along the path segment and for generating clock signals in relation to the movement of said carriage to various positions along the path segment;

control means connected to said servo and applying the velocity commands to said servo;

first memory means connected to a source of incoming data signals, connected to said position logic means to receive said clock signals, connected to said control means for selectively storing the incoming data signals in response to a first store enable signal generated by said control means, and connected to said marking means to supply the stored data signals to said marking means in timed relation to the clock signals generated by said position logic means and in response to a first print enable signal generated by said control means;

second memory means connected to the source of incoming data signals, connected to said position logic means to receive said clock signals, connected to said control means for selectively storing the incoming data signals in response to a second store enable signal generated by said control means, and connected to said marking means to supply the stored data signals to said marking means in timed relation to the clock signals generated by said position logic means;

1. An ink-jet printer for forming characters on a recording medium by ink droplets in a dot-matrix format comprising:  
an ink nozzle;  
ink supply means for supplying ink to said nozzle;  
vibrating means mounted on said nozzle for imparting vibration to the ink contained in said nozzle, said vibrating means having the resonant frequency of  $3f_0$ ; and  
driving means for driving said vibrating means with a driving signal having frequency  $f_0$ .



tion logic means and in response to a second print enable signal generated by said control means;

said control means connected to said first and said second memory means and receiving from them, respectively, first and second status signals indicative of the amount of storage capacity remaining unused in said first and said second memory means, connected to said position logic means and receiving said position signal from said position logic means and generating the velocity commands in response to said position signal and in response to said first and second status signals, said control means generating said first and said second store enable signals in an alternating sequence in relation to said first and said second status signals so that those portions of the incoming data signals which are not stored in said first memory means are stored in said second memory means, and generating said first and said second print enable signals in an alternating sequence timed with respect to the store enable signals such that when said first memory means is supplying the stored data signal to said marking means, said second memory means is storing the incoming data signals, and such that when said second memory means is supplying the stored data signal to said marking means, the first memory means is storing the incoming data signal.

4,417,256

## BREAK-OFF UNIFORMITY MAINTENANCE

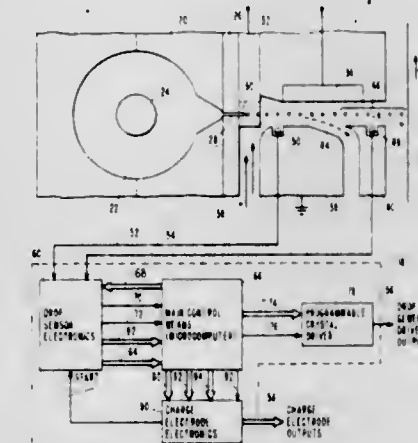
Gary L. Fillmore; Van C. Martin, both of Boulder, and Gregory L. Ream, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 148,472, May 9, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,280

Int. Cl.<sup>3</sup> G01D 18/00

U.S. Cl. 346-75

11 Claims



1. In a multinozzle ink jet printing system wherein streams of ink are generated from a multinozzle head and broken up into individual droplets of ink, and a trajectory characterizing means channels the droplets into a print flight path and a no-print flight path, the improvement comprising:

an excitation means associated with the multinozzle head and operable to generate a plurality of droplet streams therefrom;

a sensing means positioned downstream from the point at which streams are broken up into droplets and operable to sense a characteristic associated with said droplet streams, said characteristic being indicative of the distance from said sensing means to the droplet break-off point in each stream, and to output a first set of signals representative of said characteristic; and



a controller means operable to process the signals to determine the spread in break-off point distances from stream to stream and responsive to the spread to generate a drive signal for altering the magnitude of the excitation produced by the excitation means so that the spread in the distances at which droplets are detaching from the individual streams is maintained within a minimum range.

4,417,257

## PRINTING HEAD FOR THERMAL PRINTER

Yoshihiro Mitsui, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of Japan

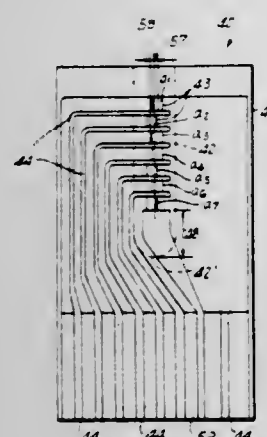
Filed Dec. 18, 1981, Ser. No. 332,125

Claims priority, application Japan, Dec. 22, 1980, 55-194390[U]; Dec. 24, 1980, 55-185806[U]

Int. Cl.<sup>3</sup> H05B 1/00

U.S. Cl. 346—76 PH

22 Claims



18. A printing head for a thermal printer, said thermal printer including means for laterally translating said printing head across a thermosensitive recording medium for thermally printing a row of characters across said thermosensitive medium comprising a substrate, first and second glaze layers formed on a portion of said substrate, said first and second glaze layers being spaced from one another in the lateral direction, a plurality of heating elements disposed on each said first and second glaze layers, and electrode means disposed on said substrate and extending proximate said heating elements on said first and second glaze layers for selectively activating said heating elements to form dots on said thermosensitive medium which define said characters.

4,417,258

## BI-DIRECTIONAL PEN CHANGER

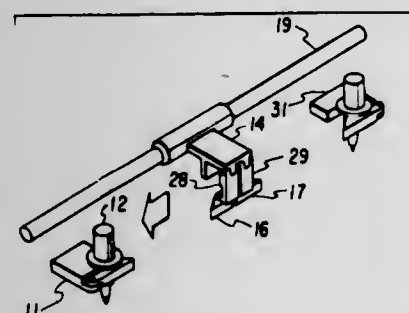
David C. Tribolet, San Diego, and Richard M. Kemplin, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 13, 1982, Ser. No. 339,212

Int. Cl.<sup>3</sup> G01D 15/00

U.S. Cl. 346—139 R

8 Claims



1. A pen holding and changing device for use in a plotter comprising:  
pen stable means mounted to said plotter for holding pens at

two fixed locations, one of said two fixed locations at each of two opposite sides of said plotter, when said pens are not in use for plotting;

pen holder/changer means mounted to said plotter for holding one of said pens during plotting, said pen holder/changer means having a first direction of motion defined by the line between said two fixed locations, said pen holder/changer means also for snatching said pen from said pen stable means from either of said fixed locations by moving only along said first direction of motion.

4,417,259

## METHOD OF PREVENTING INK CLOGGING IN INK DROPLET PROJECTING DEVICE, AN INK DROPLET PROJECTING DEVICE, AND AN INK JET PRINTER

Junji Maeda, Kyoto, Japan, assignor to Sanyo Denki Kabushiki Kaisha, Moriguchi, Japan

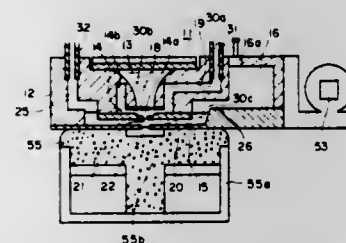
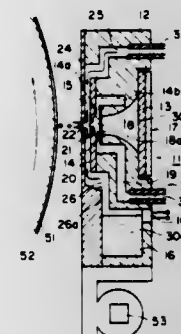
Filed Jan. 25, 1982, Ser. No. 342,646

Claims priority, application Japan, Feb. 4, 1981, 56-16180; Mar. 11, 1981, 56-35623; Jul. 6, 1981, 56-105960; Jul. 17, 1981, 56-112727; Sep. 19, 1981, 56-139314[U]

Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346—140 R

29 Claims



1. A method of preventing ink clogging in the ink droplet projecting device, in which an air cell is provided in front of the 1st orifice through which ink droplets are projected and the 2nd orifice facing said 1st orifice is provided in said air cell so that printing is performed by projection of ink droplets through said 2nd orifice, characterized in that liquid is introduced into said air cell for covering the 1st orifice during non-printing operation.

4,417,260

## IMAGE SCANNING SYSTEM

Yasuhiro Kawai; Yoshihiko Okamoto; Takaaki Yamamoto, and Hisatoyo Kato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1982, Ser. No. 397,443

Claims priority, application Japan, Jul. 23, 1981, 56-115664

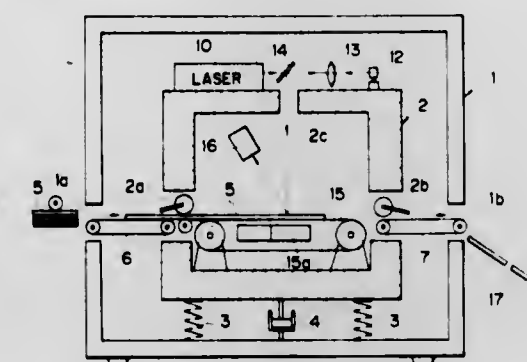
Int. Cl.<sup>3</sup> G01D 15/14

U.S. Cl. 346—160

8 Claims

1. An image scanning system for two-dimensionally scanning a light beam across a recording medium comprising a feeding and discharging means for feeding the recording medium to a scanning position and discharging it therefrom, a sub-scanning means for feeding the recording medium in the sub-scanning direction at the scanning position, and a light beam scanning means for scanning the light beam in the main scanning direction at the scanning position, the light beam scanning means including a light source for emitting the light

beam and a light deflecting means for deflecting the light beam to sweep the recording medium on the sub-scanning means in the main scanning direction,



characterized in that said light source, light deflecting means and the sub-scanning means are mounted on a single inner frame which is mounted by a vibration insulator on an outer frame on which said feeding and discharging means is mounted.

4,417,261

## TRANSFERRED ELECTRON DEVICES

Kenneth W. Gray; James E. Pattison, and Huw D. Rees, all of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 685,575, May 12, 1976,

abandoned. This application Sep. 6, 1977, Ser. No. 830,950

Claims priority, application United Kingdom, May 13, 1975, 20218/75

Int. Cl.<sup>3</sup> H01L 47/02, 47/00

U.S. Cl. 357—3

13 Claims



1. A transferred electron effect oscillator device comprising a cathode structure and an anode structure with a layer of n-type supercritically doped active material therebetween, said active material exhibiting the transferred electron effect by which electrons are scattered from states of high mobility to states of low mobility by the application of an electric field greater than a certain threshold level and thereby leading to a region of negative differential mobility in the functional dependence of mean electron velocity on electric field, wherein the cathode structure comprises a first zone next to the active layer, and a second zone providing a high electrical resistance to the first zone; said first zone comprising a layer of n+ semiconductor material of the same material as the active layer but having a doping concentration greater than that of the active material and a thickness less than 2 μm; said second zone comprising, next to the first zone, a layer of semiconductor material of the same material as the active layer but differently doped and of a thickness greater than 0.03 μm so that no appreciable amount of electrons can tunnel therethrough, and an outer metal layer.



1. A semiconductor device, comprising:  
a depletion type MOS field effect first transistor comprised of a substrate having formed thereon a gate, a source and a drain of said first transistor, wherein said first transistor gate is connected to said first transistor source and said first transistor source is connected to said first transistor substrate;  
a MOS field effect second transistor having the same conductivity type as said first transistor and comprised of a substrate having formed thereon a gate, a source and a drain of said second transistor, wherein said second transistor gate is connected to said second transistor drain and

4,417,262

## GREEN LIGHT EMITTING DEVICE

Masami Iwamoto, Tokyo; Makoto Tashiro, Yokohama; Tatsuro Beppu, Tokyo, and Akinobu Kasami, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 169,612, Jul. 17, 1980, which is a continuation of Ser. No. 950,049, Oct. 10, 1978. This application Apr. 6, 1981, Ser. No. 250,934

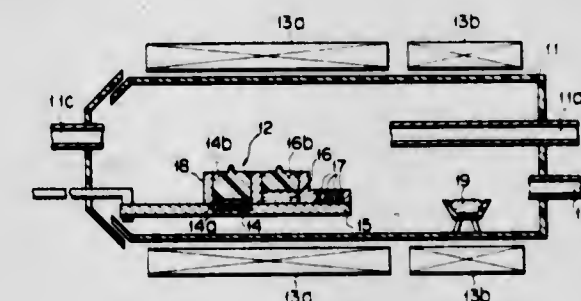
Claims priority, application Japan, Oct. 7, 1977, 52-120037; Oct. 7, 1977, 52-120039

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> H01L 33/00

U.S. Cl. 357—17

15 Claims



1. In a green light emitting device comprising an n-type GaP substrate, an n-type GaP layer formed on the substrate and a p-type GaP layer formed on the n-type GaP layer, the improvement wherein said n-type GaP layer includes a first layer formed on the GaP substrate and a second layer directly formed on the first layer, said second layer being closer to the p-type GaP layer, the net donor concentration in said first layer being higher than the net donor concentration in said second layer, the donor concentration in said first layer being abruptly decreased to that of said second layer, and said second layer containing nitrogen at a higher concentration than in said first layer.

4,417,263

## SEMICONDUCTOR DEVICE

Yoshiaki Matsura, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 16, 1981, Ser. No. 225,468

Claims priority, application Japan, Feb. 1, 1980, 55-011021

Int. Cl.<sup>3</sup> H01L 29/78

U.S. Cl. 357—23

2 Claims



said transistor source is connected to said second transistor substrate; and  
said first and said second transistors are connected with their respective source-drain channels in series, and a respective one of the source and drain of said second transistor defining a power terminal of the device.

4,417,264

# ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

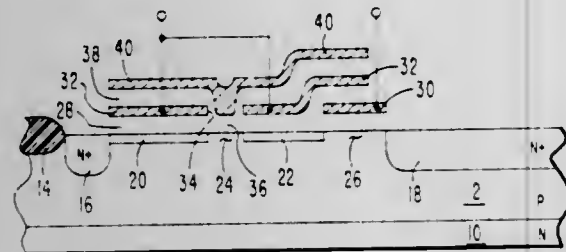
Rodney L. Angle, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,565

Int. Cl.<sup>3</sup> H01L 29/78, 27/02, 29/04; G11C 11/40

U.S. Cl. 357-23

6 Claims



1. In a floating gate memory device of the type including a body of semiconductor material of a first conductivity type having first and second doped regions of a second conductivity type formed in the semiconductor body at the surface thereof, the first and second doped regions spaced one from the other to define a channel region therebetween in the semiconductor body for supporting current flow between the doped regions, a first conductive layer insulated from the body of the semiconductor material, a second conductive layer positioned over both the channel region and the first conductive layer and insulated therefrom, the first conductive layer having a first aperture therein into which the second conductive layer extends, the improvement comprising:

- a first portion of the channel region, adjacent the first doped region having a pair of depletion type regions embedded in the semiconductor body at the surface thereof and spaced one from the other to define a first channel portion therebetween;
- a second aperture in the first layer of polysilicon, aligned with the first channel portion, into which a portion of the second conductive layer extends;
- a second channel portion adjacent the second doped region and occupying the remainder of the channel region; and
- a third conductive layer positioned over and insulated from the second channel portion.

4,417,265

# LATERAL PNP POWER TRANSISTOR

Judd R. Murkland, Santa Clara, Calif., and James S. Congdon, Maynard, Mass., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 26, 1981, Ser. No. 247,700

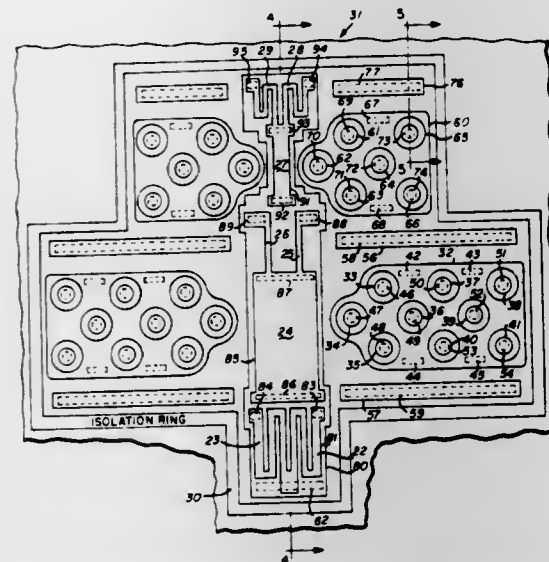
Int. Cl.<sup>3</sup> H01L 27/02

U.S. Cl. 357-51

9 Claims

1. A lateral power transistor suitable for construction into a semiconductor substrate having a planar surface oxide, said transistor comprising:  
a plurality of parallel connecting individual transistor elements arrayed in groups of elements located within the surface of a semiconductor having one conductivity type, each element having an emitter of the opposite semiconductor conductivity type confronted by a spaced apart collector of said opposite conductivity type, wherein the space between said emitter and collector constitutes a base region;

said groups being located on opposite sides of and disposed along a center region;  
means adjacent to each of said groups for making distributed contact to said transistor base regions therein, crossunder resistance means located within said center region for making resistance connections to said distributed contact



means whereby the base currents in said transistor elements are ballasted and equalized; and  
metalization located on top of said semiconductor oxide for interconnecting said transistor elements into a unitary device in which said metalization can be run directly over said center region thereby permitting said groups to be parallel connected without interfering with said base connections.

4,417,266

# POWER AND GROUND PLANE STRUCTURE FOR CHIP CARRIER

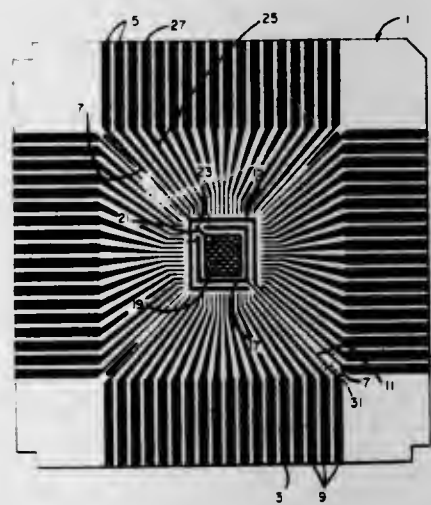
Dimitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 14, 1981, Ser. No. 293,052

Int. Cl.<sup>3</sup> H01L 39/02, 23/48, 29/44

U.S. Cl. 357-80

2 Claims



1. A system for carrying semiconductor chips and the like comprising:

- (a) an electrically insulating ceramic substrate,
- (b) a copper electrical conductor pattern having a copper oxide surface adjacent said substrate and fused to said substrate, said conductor pattern extending to plural locations at the edges of said substrate,
- (c) an electrically and thermally conductive pad at the center of said substrate for receiving a semiconductor chip thereon,
- (d) a first electrically conductive pattern on said substrate surrounding said pad and connected to a lead of said conductor pattern, and

(e) a second electrically conductive pattern on said substrate surrounding said pad within said first conductive pattern and connected to a lead of said conductor pattern.

4,417,267

# COOLING MEANS FOR SEMICONDUCTOR DEVICE

Hifumi Wada, and Mitsuaki Nanba, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

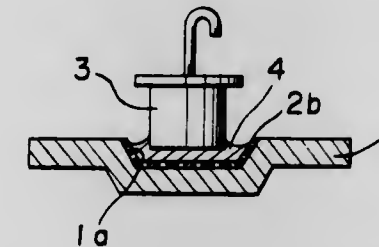
Filed May 13, 1981, Ser. No. 263,275

Claims priority, application Japan, Jun. 18, 1980, 55-86233[U]

Int. Cl.<sup>3</sup> H01L 23/02, 23/48, 29/46, 29/62

U.S. Cl. 357-81

2 Claims



1. A cooling means for a semiconductor device which comprises a heat radiating plate made of aluminum or aluminum alloy, having a fitted part for a semiconductor device; an alloy layer formed only at said fitting part of the heat radiating plate to allow easy soldering and a solder layer for bonding said semiconductor device to said alloy layer, wherein said alloy layer is formed by heating a metal halide dispersed on the fitting part.

4,417,268

# TELEVISION SIGNAL MONITORING DEVICE

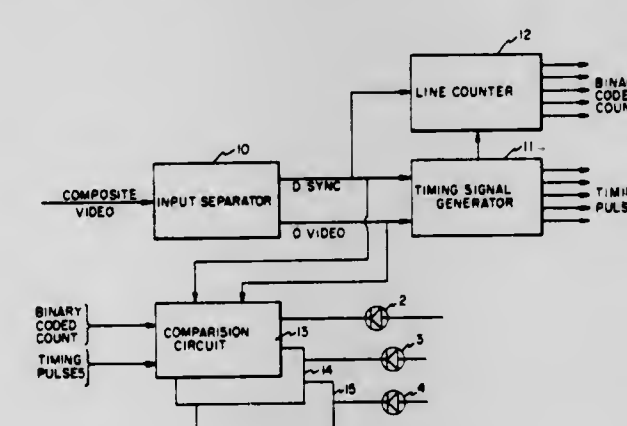
Richard W. LaSota, 1272 Rolling Meadow Rd., Pittsburgh, Pa. 15241

Filed Jan. 25, 1982, Ser. No. 342,666

Int. Cl.<sup>3</sup> H04N 9/62

U.S. Cl. 358-10

30 Claims



1. An apparatus for monitoring parameters of television signals comprising:

- input circuit means for receiving the composite video signal,
- separating circuit means for clamping the tips of the sync pulses at one reference level and repeatedly sampling the blanking level to establish a second reference level,
- means for generating a first pulse suitable for input to digital logic circuits corresponding to the horizontal and vertical sync pulse,
- and means for generating a second pulse suitable for input to digital logic circuits corresponding to the video signal exceeding a preselected threshold measured from the said second reference level.

4,417,269

# ADAPTIVE RECONSTRUCTION OF THE COLOR CHANNELS OF A COLOR TV SIGNAL

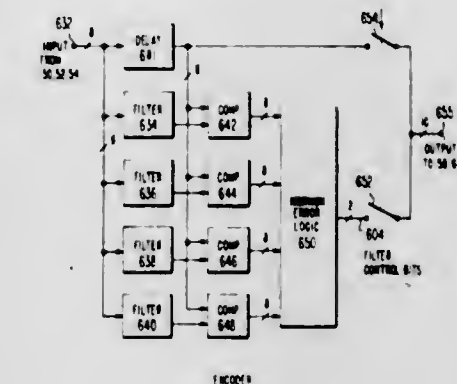
Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,447

Int. Cl.<sup>3</sup> H04N 9/32

U.S. Cl. 358-12

12 Claims



1. A method for removing aliases from at least a first component signal of a video signal using one alias free component of said video signal, said method comprising determining from said alias free component the direction of least resolution, and averaging said alias containing component in said direction.

4,417,270

# WIDE BAND CHROMINANCE DEMODULATOR WITH COLOR NOISE REDUCTION FUNCTION

Nobuya Nagao, and Takashi Inoue, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

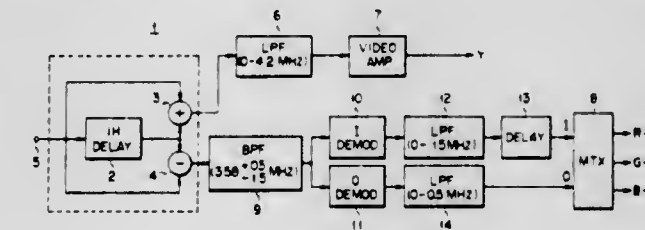
Filed Jan. 7, 1982, Ser. No. 337,753

Claims priority, application Japan, Jan. 28, 1981, 56-12075

Int. Cl.<sup>3</sup> H04N 5/37

U.S. Cl. 358-23

7 Claims



1. A wide band chrominance demodulator with color noise reduction function comprising:

- (a) circuit means responsive to a TV radio wave with a given field strength, for providing a composite color video signal contained in said TV radio wave, and generating a control signal corresponding to the field strength of said TV radio wave;
- (b) separator means coupled to said circuit means, for separating I and Q signals from said composite color video signal;
- (c) processor means coupled to said circuit means and separator means and responsive to said control signal and I signal, for providing a controlled I signal, wherein the frequency response characteristic between said I signal and said controlled I signal is changed according to said control signal; and
- (d) means coupled to said separator means and processor means and responsive to said Q signal and controlled I signal, for generating color difference signals.



4,417,271

**DEMODULATOR CIRCUIT FOR COLOR TELEVISION SIGNALS OF PAL SYSTEM**

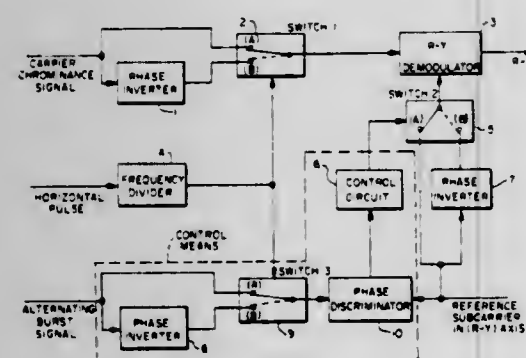
Yoshimori Nakase, Sakai, and Takayuki Sagishima, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 27, 1981, Ser. No. 286,756

Claims priority, application Japan, Jul. 30, 1980, 55-105464

Int. Cl.<sup>3</sup> H04N 9/50

U.S. Cl. 358—24



1. A color demodulating apparatus for PAL type color television signals, said apparatus comprising:

a frequency divider which is supplied with a horizontal pulse train and which outputs a switching pulse train having a frequency which is equal to one half of a horizontal scanning frequency;

a first switching means which is supplied with a carrier chrominance signal in the R-Y axis;

a first phase inverter which is supplied with said carrier chrominance signal in the R-Y axis, said first switching means being connected to one input of an R-Y demodulator used to demodulate R-Y color signals extracted from television signals, and said first switching means having a switch control terminal supplied with an output of said frequency divider, wherein said first switching means alternatively feeds said carrier chrominance signal in the R-Y axis and an inverted carrier chrominance signal with its polarity inverted from that of said carrier chrominance signal through said first phase inverter to said R-Y demodulator for each horizontal scanning period;

a second switching means which is supplied with a reference subcarrier in the R-Y axis;

a second phase inverter which is supplied with said reference subcarrier in the R-Y axis, wherein said second switching means alternatively feeds said reference subcarrier in the R-Y axis and the reference subcarrier with the polarity inverted from that of said reference subcarrier in the R-Y axis through said second phase inverter to another input of said R-Y demodulator; and

a control means connected to said second switching means to control second switching means, wherein the polarity of the reference subcarrier fed to one input of said R-Y demodulator is identical to the polarity of the R-Y signal fed to said other input of said R-Y demodulator.

4,417,272

**COLOR TELEVISION CAMERA HAVING A COLOR SEPARATION CROSSING STRIPED FILTER**

Yuzuru Inoue, Machida; Takashi Shinozaki, Yokohama; Yoshi-chi Otake, Kamakura, and Shinsuke Ono, Yokosuka, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 8, 1981, Ser. No. 309,805

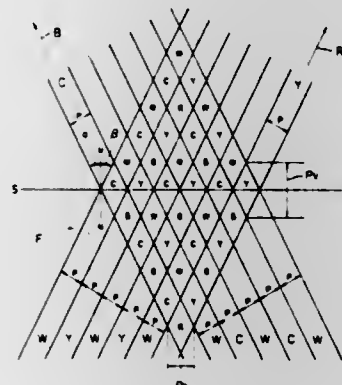
Claims priority, application Japan, Oct. 8, 1980, 55-140912;

Oct. 9, 1980, 55-141312; Oct. 12, 1980, 55-142269

Int. Cl.<sup>3</sup> H04N 9/07

U.S. Cl. 358—44

8 Claims



1. A color television camera for generating an electrical output signal indicative of an image of a subject, comprising:

(a) a lens system;

(b) a pickup element responsive to the light applied through said lens system for generating said electrical signal;

(c) a color separation crossing striped filter positioned in the light path of said color television camera, said color separation crossing striped filter having two sets of repetitive arrangements of parallel color stripes respectively extending in different directions, each of said two sets having repetitive color stripes of a plurality of given colors; and

(d) an optical filter positioned in said light path for defocusing said image on the photoelectric conversion surface of said pickup element, said optical filter being arranged such that a blur occurs in a direction substantially normal to the extending direction of an image of one color stripe and the width of said blur is a function of Ph, wherein Ph is the length of an image of one color stripe in the direction of the scanning line in said image of one of said repetitive arrangements of said color separation crossing striped filter.

4,417,273

**VIDEO PROJECTION SYSTEM**

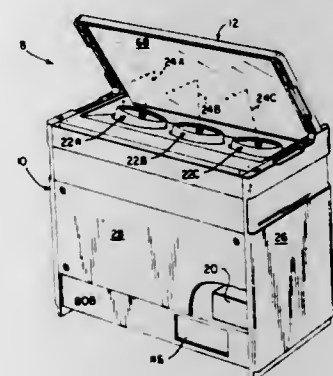
Henry E. Kloss, Cambridge, Mass., assignor to Kloss Video Corporation, Cambridge, Mass.

Filed Jan. 4, 1982, Ser. No. 336,727

Int. Cl.<sup>3</sup> H04N 9/31

U.S. Cl. 358—60

10 Claims



1. In a video image projection system including means for

4,417,275

**SELECTABLE RATE SYNC GENERATOR SYSTEM**

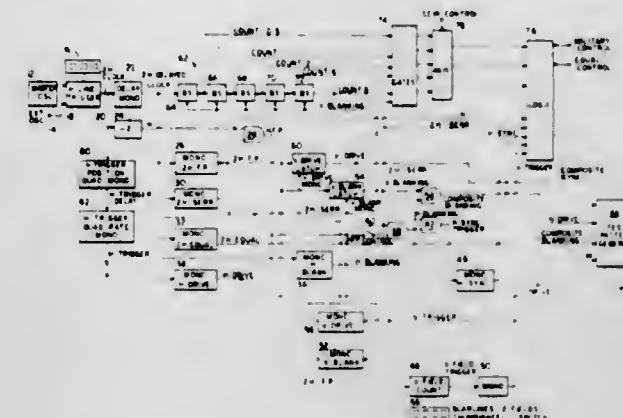
John H. Harshbarger, Xenia, and William M. Shorea, Dayton, both of Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Oct. 10, 1980, Ser. No. 196,154

Int. Cl.<sup>3</sup> H04N 5/06

U.S. Cl. 358—139

12 Claims



processing a video signal representative of a video image so as to provide a processed video signal, and at least one optical projection device responsive to said processed video signal for forming and projecting an image-forming beam of light along an optical axis so as to provide said video image on a viewing surface at a focal plane spaced a predetermined distance from said system along said axis, said system further comprising:

portable cabinet means including (1) a cabinet for supporting said projection device so as to project said image-forming beam in a substantially upward direction through an upper, open portion of said cabinet, and (2) a top including a specularly light-reflective surface disposed to face said projection device, said top being so dimensioned and movable between a first position wherein said top serves as a closure for said upper portion of said cabinet, and a second position wherein said light reflective surface is disposed to fold said optical axis so as to reflect said beam in a substantially horizontal direction; and

optical positioning means operable independently of said optical projection device and supported by said cabinet means for positioning said system so that said focal plane and said viewing surface may be brought into substantial congruence with one another.

8. A system according to claim 1, wherein said projection device includes three projection tubes responsive to said processed video signal, each of said tubes projecting along a corresponding separate optical axis, an image forming beam of light including said video image in a correspondingly different color, said tubes being supported by said cabinet so that each said tube projects said video image in said focal plane in registered relationship with the video images of the other tubes.

4,417,274

**ELECTRONIC MEASURING METHOD AND APPARATUS**

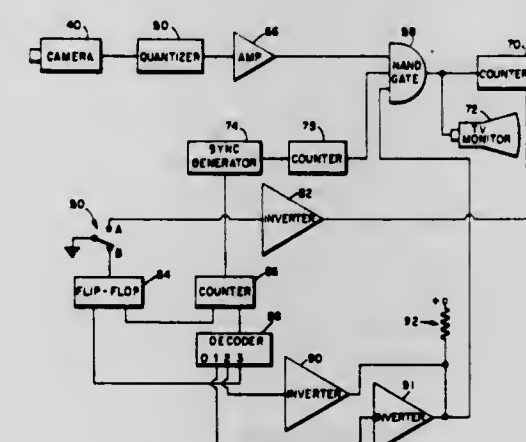
James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,806

Int. Cl.<sup>3</sup> H04N 7/18

U.S. Cl. 358—107

10 Claims



1. Method of making an area measurement of a bright portion of an object which comprises the steps of

(a) generating a video signal having a predetermined line scan frequency of at least a single frame duration which includes the bright portion,

(b) applying the video signal representing only the bright portion to a switching device, one input of which is supplied with a switching signal having a frequency of at least 10 times the line scan frequency of the video signal to divide the bright portion into a series of pulses, the duration of the pulse series being controlled by edges of the bright portion, and

(c) electrically applying an output signal from said switching device to a digital counter, whereby the area of said bright portion is measured in terms of number of pulses counted.

4,417,276

**VIDEO TO DIGITAL CONVERTER**

Matthew C. Bennett, Ann Arbor, and Donald R. Strange, Howell, both of Mich., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 16, 1981, Ser. No. 254,771

Int. Cl.<sup>3</sup> H04N 5/14

U.S. Cl. 358—160

16 Claims

**MICROFICHE APPENDIX INCLUDED**

(5 Microfiche, 312 Pages)

1. A system for digitizing a video signal of a plurality of horizontal scanning lines and storing the digitized signal in a computer memory comprising:

(a) means for converting an analog signal to digital form to establish digital values corresponding to relative luminance of the video signal;

(b) first counter means for establishing X-coordinates of a











a direct current motor for driving a magnetic disc; electrical braking means for regeneratively braking said motor; electro-mechanical braking means coupled to said motor and actuatable at a predetermined motor speed; control means for actuating said electrical braking means to produce regenerative braking of said motor and for actuating said electro-mechanical braking means when said motor has reached a motor speed at or below said predetermined motor speed.

4,417,289

**JACKET FOR FLOPPY PACK**

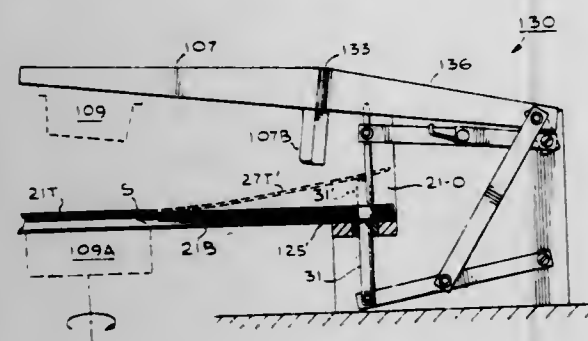
Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 1,978, Jan. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 711,579, Aug. 4, 1976, Pat. No. 4,134,144. This application Feb. 2, 1981, Ser. No. 230,217. The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> G11B 23/02, 25/04

U.S. Cl. 360—98

15 Claims



1. Jacket container means adapted to house a prescribed pack of flexible disk records and to accommodate the rotation and partition of the pack, within the jacket as well as accommodating the selectable introduction of transducer means to operate upon this pack, and also adapted to accommodate registration within associated automatic disk drive apparatus automatically so-rotating, partitioning and transducing this pack, this said container means comprising: a pair of like panel means joined along two opposing edges by a pair of like side-wall means and further joined along an intermediate bottom-edge by bottom-wall means; said wall means all being dimensioned and adapted to accommodate the full partitioned height of said pack when so operated in situ and also being configured and adapted to be automatically non-rotatably positioned in said apparatus for automatically carrying out said operations.

4,417,290

**MULTI-LAYER MAGNETO-OPTICAL RECORDING MEDIUM**

Shinsuke Tanaka, Kawasaki; Nobutake Imamura, Tokyo, and Chuichi Ota, Fuchu, all of Japan, assignors to Kokusai Denchadenwa Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,310

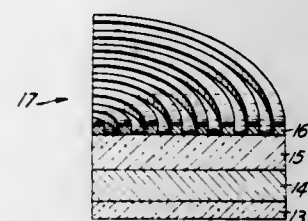
Claims priority, application Japan, Aug. 25, 1980, 55-115847 Int. Cl.<sup>3</sup> G11B 5/74

U.S. Cl. 360—131

1 Claim

1. A multi-layer magneto-optical recording medium comprising a magneto-optical recording substrate wherein an easy axis of magnetization is provided perpendicular to a film surface and the direction of magnetization is perpendicular to the film surface to take a binary code depending on whether the direction of magnetization is upward or downward, a transparent protective film placed upon said magneto-optical recording

substrate and a metal film having a melting point lower than that of both said transparent protective film and said magneto-



optical recording substrate is disposed upon said transparent protective film.

4,417,291

**RECORDING DISKETTE HAVING FLOCKED-FIBER WIPING FABRIC**

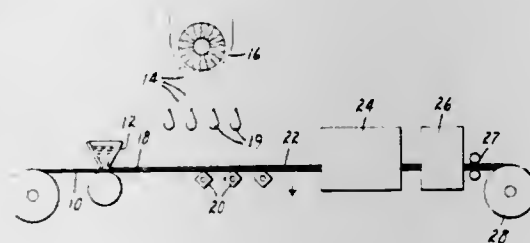
Richard L. Miklos, and Craig F. Lamphere, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 106,753, Dec. 26, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 302,293

Int. Cl.<sup>3</sup> G11B 23/02, 25/04

U.S. Cl. 360—133

10 Claims



1. Improved diskettes, each of which comprises a thin jacket containing a flexible recording disk and a wiping fabric bonded to the jacket in facing relationship to the disk, wherein the improvement comprises:

- the wiping fabric being comprised of a layer of short, closely-spaced fibers, one end of each fiber being bonded directly to the jacket; and
- diskette jacket walls which do not vary in thickness more than 3 mils.

4,417,292

**POWER AMPLIFIER PROTECTION CIRCUIT**

Valerio Borghese, Sedriano; Pietro Erratico, Milan, and Silvano Coccetti, Vittuone, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed May 13, 1982, Ser. No. 377,994

Claims priority, application Italy, May 28, 1981, 21999 A/81

Int. Cl.<sup>3</sup> H02H 3/26; H03F 3/04

U.S. Cl. 361—87

4 Claims

1. A circuit arrangement for the protection of the final stage of a monolithic integrated circuit power amplifier used for providing the vertical deflection of a television picture tube, said amplifier comprising a number of amplifying stages including a differential input stage and a current amplifier final stage, said differential input stage having a first input connected to an output of a sawtooth signal source and a second input connected to a reference voltage source, said final stage being connected to a flyback signal generator and connected to a load comprising a picture tube deflection control circuit, an output of the final stage and said first input of said differential amplifier stage being connected to each other by a feedback network, said circuit arrangement comprising:

- a circuit means for sensing any imbalance in currents flowing in said differential stage of opposite sign to an imbalance in

said currents due to a front portion of a sawtooth signal output from sawtooth signal source, said circuit means capable of generating, as its output, a protective signal at the beginning of said imbalance of opposite sign, and a controlled electronic switch, which is normally open, and which is connected across input terminals of a predeter-

mining bipolar charges over a distance to a region of space.

4,417,294

**CAPACITIVE KEYSWITCH**

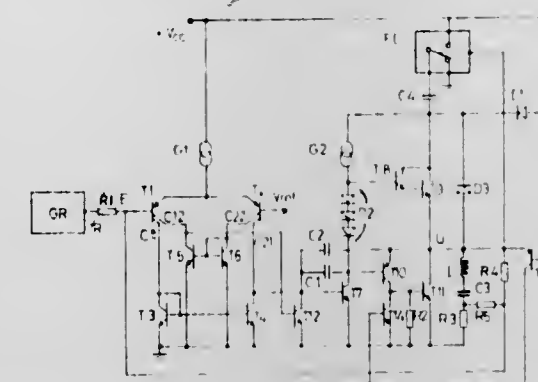
John R. Herron, Jr., Park Ridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 28, 1981, Ser. No. 297,439

Int. Cl.<sup>3</sup> H01G 5/01; H01H 3/12

U.S. Cl. 361—288

3 Claims



mined stage among said number of amplifying stages in said amplifier; wherein a control terminal of said switch is connected to the output of said circuit means so as to close during the appearance of said protective signal, thereby protecting said final stage of said amplifier.

4,417,293

**METHODS AND APPARATUS FOR TRANSFERRING ELECTRIC CHARGES OF DIFFERENT SIGNS INTO A SPACE ZONE, AND APPLICATION TO STATIC ELECTRICITY ELIMINATORS**

Serge Larigaldie, Chatenay Malabry, France, assignor to Office National d'Etudes et de Recherches Aerospatiales, France

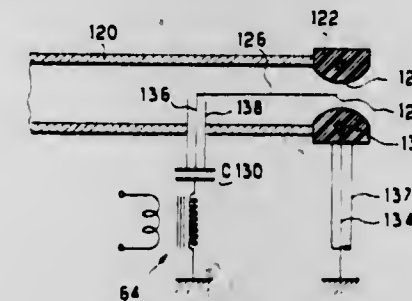
Filed Oct. 7, 1981, Ser. No. 309,374

Claims priority, application France, Oct. 14, 1980, 80 21977

Int. Cl.<sup>3</sup> H05F 1/00

U.S. Cl. 361—212

11 Claims



1. An apparatus for introducing bipolar charges into a region of space, comprising: an enclosure; means adapted to feed said enclosure with a pressurized gas, charged with a substance adapted to change phase by cooling when said gas is caused to expand; a body arranged in said enclosure for defining a nozzle to the exterior, said body comprising an electrically conducting member close to said nozzle, and the surface of said nozzle being electrically insulating; a tapered electrode, the apex of which is situated close to the neck of the nozzle; means for applying an AC high voltage between said electrically conducting member and said tapered electrode, said means for applying comprising a capacitor in series, thereby producing a corona discharge between said apex of the tapered electrode and said nozzle; whereby the gas is ionized with bipolar charges substantially equilibrating each other, and then expands past the nozzle, while said substance changes phase and carries said equi-

1. A capacitive keyswitch comprising a first circuit support, an electrically insulating spacer, a dielectric structure, a second circuit support, and actuating means for actuating the keyswitch; said first circuit support being flexible and carrying thereupon a first conductive circuit, said first conductive circuit including a first conductive land; said second circuit support carrying thereupon a second conductive circuit, said second conductive circuit including a second conductive land; said spacer having an aperture therethrough; said first conductive land, said second conductive land, and said aperture being substantially in register with said first conductive land and said second conductive land being in facing relation with respect to each other; said dielectric structure being interposed between said first and second conductive lands; said actuating means comprising a plunger and a pad; said pad being interposed between said plunger and said first circuit support whereby application of a force urging said plunger toward said first circuit support urges said pad against said first circuit support and through said pad, urges said first circuit support toward said second circuit support, whereby capacitance between said first conductive land and said second conductive land is varied as said force is varied.

4,417,295

**AIR JET POWERED COOLING SYSTEM FOR ELECTRONIC ASSEMBLIES**

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

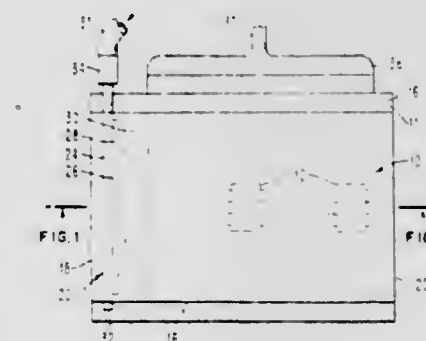
Continuation of Ser. No. 3,334, Jan. 14, 1979, abandoned, which is a continuation of Ser. No. 811,755, Jun. 30, 1977, abandoned.

This application Aug. 27, 1982, Ser. No. 412,340

Int. Cl.<sup>3</sup> H05K 7/20

U.S. Cl. 361—384

6 Claims



1. A cooling apparatus and a plurality of circuit cards, said cooling apparatus having cooling air driven only by compressed air and being characterized in that each circuit card



carries with it an individual cooling system driven entirely by compressed air, said individual compressed air cooling systems each comprising:

- a shroud mounted on a circuit card, said shroud and circuit card together forming an individual cooling air duct for cooling said circuit card, said cooling air duct having an inlet opening admitting cooling air, an outlet opening exhausting air warmed by said circuit card, and an air flow path connecting said inlet opening to said outlet opening;
- a compressed air nozzle mounted effectively within said individual air duct for common movement therewith and producing an air jet, said air jet driving cooling air along said air flow path; and
- compressed air tubing having an end connected to said compressed air nozzle for providing compressed air to said compressed air nozzle,

whereby said individual compressed air cooling systems may have different cooling capacities, each adapted to the individual cooling requirements of the circuit card carrying said individual cooling system, and whereby each said circuit card receives forced air cooling regardless of physical position so long as the individual cooling system it carries receives compressed air.

4,417,296

#### METHOD OF CONNECTING SURFACE MOUNTED PACKAGES TO A CIRCUIT BOARD AND THE RESULTING CONNECTOR

Robert L. Schelhorn, 270 Locust La., Cinnaminson, N.J. 08077

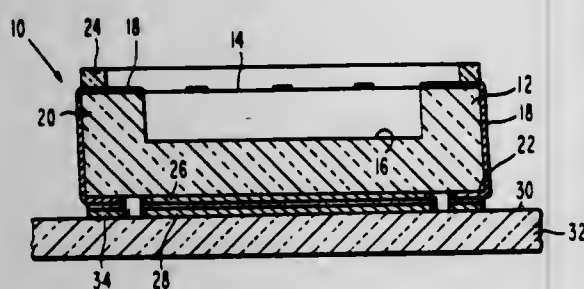
Continuation-in-part of Ser. No. 59,991, Jul. 23, 1979,

abandoned. This application Oct. 26, 1980, Ser. No. 190,985

Int. Cl.<sup>3</sup> H05K 1/18

U.S. Cl. 361—386

17 Claims



1. A connector, for securing a surface mounted package of the type having a first plurality of electrical contact pads on one surface thereof to a circuit board of the type having a second plurality of electrical contact pads on one surface thereof, said first plurality of electrical contact pads corresponding in size and relative location to said second plurality of electrical contact pads, when aligned for bonding, said connector being adapted for use with a surface mounted package having a different coefficient of thermal expansion than the circuit board to which it is attached and comprising:

- first thermal buffer pad means on said one surface of said surface mounted package;
- second thermal buffer pad means on said one surface of said circuit board, said first and second thermal buffer pads being configured to have their bonding areas aligned when said first and second pluralities of electrical contact pads are aligned and said first and second thermal buffer pad means each having a substantially larger bonding area than one of said plurality of electrical contacts;
- said thermal buffer pads have coefficients of thermal expansion which are intermediate those of said surface mounted package and said circuit board; and
- means between corresponding members of said first plurality of electrical contact pads and said second plurality of electrical contact pads and between said first thermal buffer pad means and said second thermal buffer pad means for bonding each pad of the surface mounted package to the aligned pad of the circuit board with the electri-

cal contacts on said package electrically connected to said corresponding electrical contacts on said circuit board.

4,417,297

#### PRINTED CIRCUIT BOARD

Kohei Oyama, and Hiroyuki Yokouchi, both of Soma, Japan,

assignors to Alps Electric Co., Ltd., Tokyo, Japan

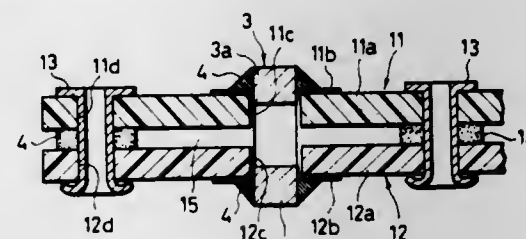
Filed Jul. 2, 1981, Ser. No. 279,687

Claims priority, application Japan, Jul. 8, 1980, 55-95812[U]

Int. Cl.<sup>3</sup> H05K 1/14

U.S. Cl. 361—412

6 Claims



1. A printed circuit board for mounting chip components, comprising first and second printed substrates stacked over one another and each having conductive wiring patterns formed on the surfaces thereof facing outwardly, said first and second printed substrates having aligned holes extending between respective conductive wiring patterns of each said substrate and receiving therein respective chip components, said chip components having a coefficient of thermal expansion different than that of said first and second printed substrates and being soldered to said wiring patterns, and means including spacer members located between said first and second printed substrates for providing a spacing between said first and second printed substrates around said holes so that thermal stresses developed between said printed substrates and any of said chip components can be relieved by relative movement between said printed substrates to vary said spacing.

4,417,298

#### CHIP TYPE TANTALUM CAPACITOR

Koreaki Nakata, 12-27, Mefugaoka, Takarazuka-shi, Hyogo-

ken; Tsunehiko Todoroki, 231-37, Matsukasa-cho,

Yamatokoriyama-shi, Nara-ken; Masahiro Oita, 3-4-18,

Kamiichi, Kashiwara, and Nobumasa Oshima, 3-19-5,

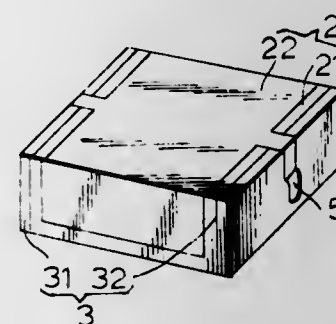
Hirakata, all of Japan

Filed May 16, 1980, Ser. No. 150,656

Int. Cl.<sup>3</sup> H01G 9/00

U.S. Cl. 361—433

3 Claims



1. A chip type tantalum capacitor comprising:

- an insulating resin frame;
- a pair of substantially flat metal foil terminals bonded to both sides of said frame, at least one of said frame sides having a slit therethrough an open to the outside of said metal foil terminal on said one frame side, said metal foil terminal on said one frame side being a metal selected from the group consisting of copper and nickel;
- a tantalum capacitor element having a pair of terminals and

enclosed in said frame, at least one of said element terminals being a lead wire made of tantalum, said lead wire extending through said slit and outside said metal foil terminal on said one side of said frame and being bent at the outside surface of said metal foil terminal with the bent portion of the lead wire outside said metal foil terminal extending along the surface of said metal foil terminal and being welded to said metal foil terminal surface for being fixed thereto, the other element terminal being electrically connected to the other metal foil terminal; and an insulating resin potted in the space inside said frame and around said capacitor element.

4,417,300

#### REFLECTOR FOR UNIFORMLY ILLUMINATING AN AREA, PARTICULARLY A FILM WINDOW OF A FILM OR SLIDE PROJECTOR, AND REFLECTOR LAMP

Albert Bodmer, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

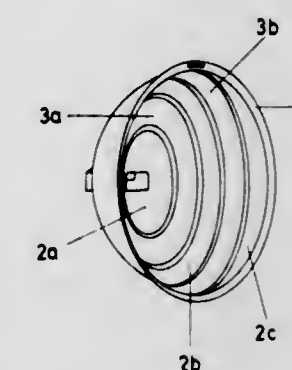
Filed Jun. 19, 1981, Ser. No. 275,151

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027719

Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362—304

13 Claims



1. A reflector for illuminating an area, wherein the reflector is essentially cup-shaped and has at least two contours forming a reflector system; each contour defines a circumferential band or strip rotation-symmetrical with respect to the optical axis of the total system; the generatrices of the said contours follow elliptical curves; the reflector is divided into zonal regions; successive zonal regions lie on different contours; and the area proportions  $F_A$  and  $F_B$  of the contours A and B of the entire reflective area F satisfy the equations  $F_A = x F$  and  $F_B = (1 - x) F$ , with  $0.2 \leq x \leq 0.8$ .

4,417,301

#### METHOD AND APPARATUS FOR ELECTRIC FISH TRAWLING

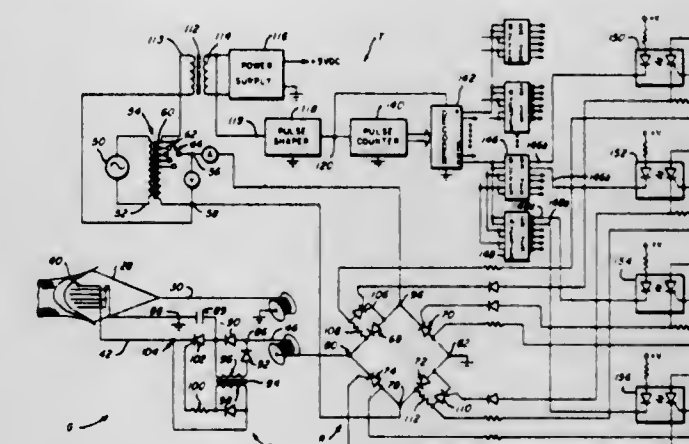
James L. Newman, 970 Stacewood, Beaumont, Tex. 77706

Filed Sep. 18, 1981, Ser. No. 303,353

Int. Cl.<sup>3</sup> H02M 7/155

U.S. Cl. 363—129

43 Claims



1. An electrical circuit for providing high voltage level electrical pulses to an electrode for electrical bottom fishing, comprising:

- means for storing electrical charge;
- a source of alternating polarity electrical power for charging said charge storing means, said source having a positive half-cycle and a negative half-cycle;
- full-wave rectifying means, between said power source and said charge storing means for rectifying power from said

4,417,299

#### FISHING POLE LIGHT

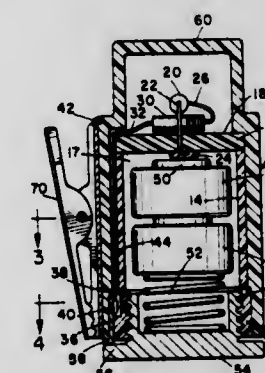
John W. Rupp, 3131 Central Ave., Spring Valley, Calif. 92077

Filed Mar. 22, 1982, Ser. No. 360,219

Int. Cl.<sup>3</sup> F21L 7/00

U.S. Cl. 362—186

7 Claims



1. A portable, small, long life, lightweight fishing pole light, comprising:

- a hollow, cylindrical central member of insulating material closed at one end by a disk of insulating material having a reflective outer face with a light emitting diode extending above said face, said light emitting diode having a first electric lead extending from one terminal centrally through said disk and forming a first electrical contact means for contacting one electrode of battery means and a second electric lead extending from the other light emitting diode terminal through a resistor to switch means;
- an outer case of insulating material extending over said central member and having at least its forward end portion transparent to provide a lens;
- the interior of said hollow central member forming a battery compartment for seating battery means therein;
- spring means in said battery chamber for urging said battery means to engage said first electrical contact means;
- cap means for closing said battery chamber;
- switch means for completing a circuit between said first electrical contact means and second electrical contact means positioned to contact the other electrode of said battery means; and
- fastening means on the outer case for fastening said light near the end of a fishing rod;
- whereby said light emitting diode is energized by actuating said switch means.



alternating polarity power source and providing charging current to said charge storing means during both the positive half-cycle and the negative half-cycle of said power source;

current reversing means for selectively reversing the direction of current to said charge storing means;

switching means responsive to said reversal of current to said charge storing means, for connecting said charge storing means to the electrode, thereby allowing said charge storing means to discharge through the electrode.

4,417,302

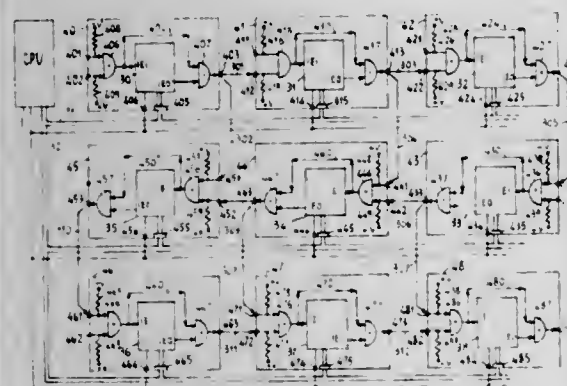
# BYPASS FOR PRIORITIZING INTERRUPTS AMONG MICROPROCESSORS

Domenico Chimienti, Vanzago, and Arturo Vercesi, Rho, both of Italy, assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 28, 1980, Ser. No. 182,163  
Claims priority, application Italy, Aug. 30, 1979, 25356 A/79  
Int. Cl.<sup>3</sup> G06F 15/16, 15/40, 9/22

U.S. Cl. 364—200

1 Claim



1. A multiprocessor system including a central processor and a plurality of peripheral processors coupled to said central processor through a common bus, said central processor providing an interrupt servicing signal on said bus in response to an interrupt request signal generated by any one of said peripheral processors and received by said central processor through an interrupt line connecting said peripheral processors and said central processor, each of said peripheral processors having an input for receiving an interrupt enable signal and an output for delivering an interrupt enable signal, each peripheral processor being enabled to generate an interrupt request when receiving said interrupt enable signal on said input, each peripheral processor delivering said interrupt enable signal on said output when both receiving said interrupt enable signal on said first input and not generating said interrupt request signal, said multiprocessor system comprising further a bypass network for prioritizing interrupts among processors, said bypass network comprising:

- a plurality of AND gating means, one for each peripheral processor, each one having a first and a second input and an output, said gating means output being connected to said input of the related peripheral processor; and
  - a plurality of connections of said peripheral processor outputs with said first and said second inputs of said gating means, said peripheral processors being logically ordered in a matrix of M lines and N columns, with a descending priority by line order, the peripheral processors in the odd lines having a descending priority by column order and the peripheral processors in the even lines having an increasing priority by column order;
- said plurality of connections connecting the output of each peripheral processor  $P_{ik}$  of a line  $i$  and column  $k$  of said matrix, with said first input of the gating means related to the peripheral processor  $P_{i,K \pm 1}$  of the same line, but of the contiguous  $K+1$  column, if  $i$  is odd,  $K-1$  column if  $i$  is even, and with said second input of the gating means

related to the peripheral processor  $P_{i+1,k}$  of the following line and column.

4,417,303

# MULTI-PROCESSOR DATA COMMUNICATION BUS STRUCTURE

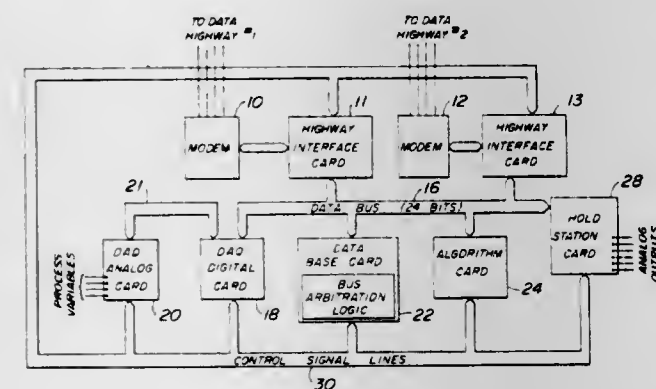
Simon Korowitz, Hatfield; Kurt R. Leichter, King of Prussia, and Felix J. Houvig, Wayne, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Feb. 25, 1981, Ser. No. 237,835

Int. Cl.<sup>3</sup> G06F 15/16

U.S. Cl. 364—200

3 Claims



1. A data communications system for transferring logically related pieces of information between the local buses connected to each of a plurality of independently operated processors and a resource, comprising:

- a data bus interconnecting the local buses of said processors and said resource, said data bus being capable of carrying in parallel a number of bytes each having bit length corresponding to that of the natural transfer mechanism of said processors;

reading latch means associated with each processor and connected between the processors' local bus and said data bus for storing all of the bytes being simultaneously transferred over said data bus; and

- control logic means including, means operable during a first part of a read from the data bus by a processor to cause the latch means for said processor to latch up all simultaneously transferred bytes from said data bus while allowing one of said simultaneously transferred bytes to go to the local bus connected to said latch means, and
- means operable during a subsequent part of a read to transfer latched data of another of said simultaneously transferred bytes to said local bus.

4,417,304

# SYNCHRONOUS CYCLE STEAL MECHANISM FOR TRANSFERRING DATA BETWEEN A PROCESSOR STORAGE UNIT AND A SEPARATE DATA HANDLING UNIT

John M. Dinwiddie, Jr., Loxahatchee, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 62,262, Jul. 30, 1979, abandoned. This application Nov. 13, 1981, Ser. No. 321,132

Int. Cl.<sup>3</sup> G06F 3/00

U.S. Cl. 364—200

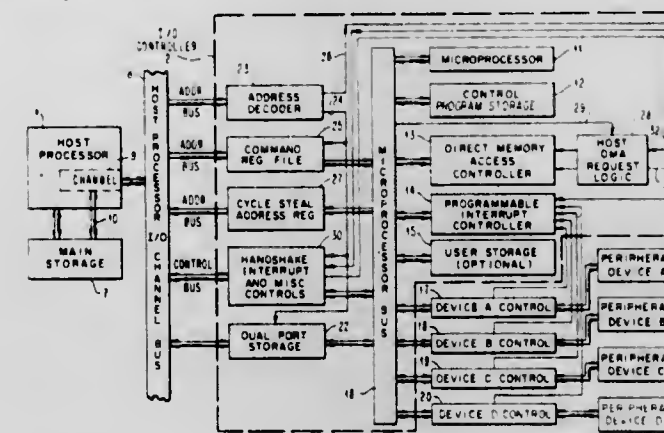
9 Claims

1. In a data processing system having a processor unit and a random access storage unit associated with and coupled to it and wherein the processor unit provides for each of its machine cycles an address set-up indicative pulse denoting the occurrence of a processor address set-up interval during a portion of each machine cycle, a cycle steal mechanism for transferring data between a separate data handling unit and the processor storage unit without interrupting a program being executed by the processor unit and comprising:

selectively operable signal transfer circuitry for transferring

address bits from the data handling unit to the address terminals of the processor storage unit and for providing a data transfer path between the data handling unit and the data terminals of the processor storage unit;

and cycle steal control circuitry responsive to the occurrence of both a transfer request indicative signal from the data handling unit and an address set-up indicative pulse from the



processor unit for activating during the processor address set-up interval of the processor machine cycle the selectively operable signal transfer circuitry for enabling the transfer of data from the data handling unit to the processor storage unit or vice versa during a portion of the processor machine cycle when the processor unit itself is not actually moving data to or from the processor storage unit.

4,417,305

# METHOD FOR EVALUATING BOOLEAN EXPRESSIONS

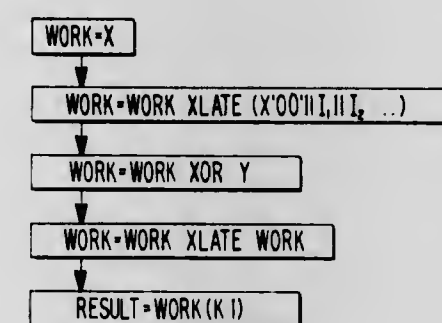
Viktors Berstis, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,133

Int. Cl.<sup>3</sup> G06F 7/00

U.S. Cl. 364—300

6 Claims



1. Method for evaluating boolean expressions in a computer system comprising:

- forming a first constant from the expression to specify rearrangement of the variables,
- setting said first constant into a work area,
- translating said first constant in said work area using the variables as a translate table,
- forming a second constant from the expressions where the second constant functions to change the values of the variables to position numbers having values one less and two less than the position number of the variable and where the second constant changes the zeros between variables into position numbers which point to previous positions in the result string containing values of previously evaluated subexpressions,
- logically combining said translated first constant with said second constant using an exclusive OR operation, and
- translating the result of the exclusive OR operation using the result as the translate table as the result is changing during the translation, the result from last translation in the result

being the value of the boolean expression being evaluated

4,417,306

# APPARATUS FOR MONITORING AND STORING UTILIZING A DATA PROCESSOR

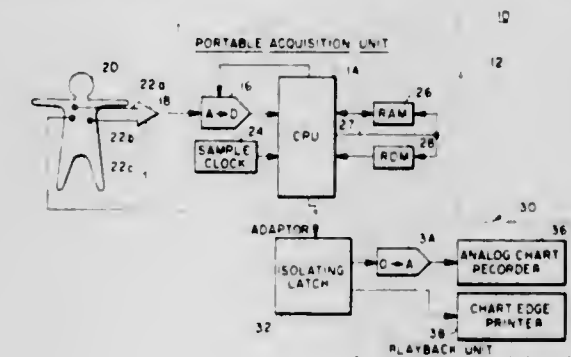
Paul Citron, New Brighton; Dennis G. Hepp, Coon Rapids, and Thomas L. Jirak, Plymouth, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 114,595, Jan. 23, 1980, abandoned. This application Jan. 7, 1982, Ser. No. 337,991

Int. Cl.<sup>3</sup> G06F 15/42; A61B 5/04

U.S. Cl. 364—415

39 Claims



1. Apparatus for monitoring and comparing electrical signals indicative of a patient's heart activity, with criteria indicative of regular heart activity comprising a defined relationship between one and a subsequent R-R interval, said apparatus comprising:

- (a) means for measuring in real time a patient's heart activity and for providing a sequence of discrete R-R interval signals, each signal indicative of the time interval between successive peaks of the patient's heart activity;
- (b) means coupled to said monitoring means for receiving the R-R interval signals and for storing a continuously updated set of the R-R interval signals; and
- (c) evaluating means for examining selected of said updated set of R-R intervals with each other in accordance with said defined relationship to provide a manifestation indicative that the patient's heart activity is regular or irregular.

4,417,307

# AUTOMATIC TRANSMISSION WITH ELECTRICAL OVERRIDE

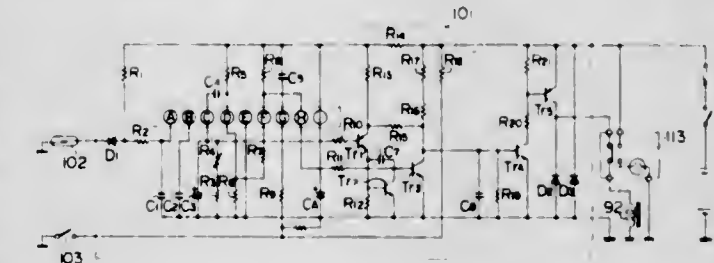
Seitoku Kubo; Yukio Terakura; Shinya Nakamura, all of Toyota, and Ken Asami, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 17, 1980, Ser. No. 169,637

Claims priority, application Japan, Aug. 21, 1979, 54-106790  
Int. Cl.<sup>3</sup> G05D 29/00; B60K 41/08, 41/22

U.S. Cl. 364—424.1

6 Claims



1. For an automatic transmission, for a vehicle including an engine, a gear transmission mechanism having several speed stages, a plurality of hydraulic fluid pressure actuated friction engagement devices, which according to selective engagement of said friction engagement devices selectively provides one or another of several speed stages, an automatic transmission control system, comprising:



- (a) a source of pressurized hydraulic fluid;
- (b) a line hydraulic fluid pressure control valve which regulates said pressurized hydraulic fluid to produce a controlled line pressure;
- (c) a throttle hydraulic fluid pressure control valve which regulates said line pressure to produce a throttle pressure having a pressure value corresponding to vehicle engine load;
- (d) a governor hydraulic fluid pressure control valve which regulates said line pressure to produce a governor pressure having a pressure value corresponding to vehicle road speed;
- (e) a plurality of speed shift valves which selectively supply actuating hydraulic fluid pressures to said hydraulic fluid pressure actuated friction engagement devices, according to the current values of said throttle pressure and said governor pressure which act in opposition on each of said speed shift valves;
- (f) a vehicle speed sensor which generates an electrical signal related to vehicle road speed;
- (g) a throttle sensor which generates an electrical signal related to vehicle engine load;
- (h) an electrically operated override valve which selectively outputs an override pressure, said override pressure being supplied to one of said speed shift valves so as partly to modify the performance thereof; and
- (i) an electrical computing device which supplies said electrical signal to said electrically operated override valve according to the electric signals produced by said vehicle speed sensor and said throttle sensor.

4,417,308

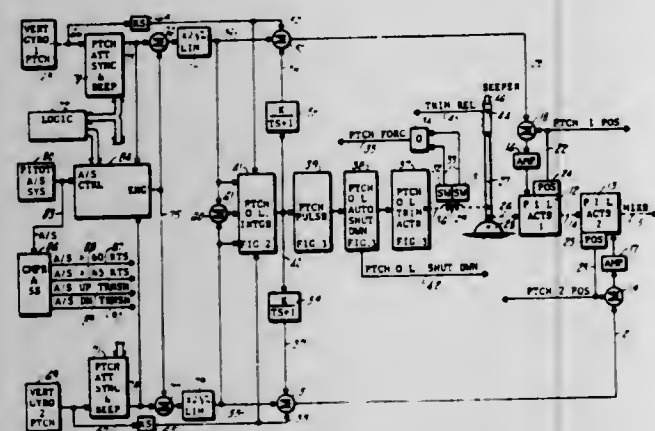
## DUAL INNER LOOP FAULT INHIBIT OF AIRCRAFT OUTER LOOP

Stuart C. Wright, Milford; Don L. Adams, Fairfield; William C. Fischer, Monroe, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,274  
Int. Cl.<sup>3</sup> G06F 15/50; G06G 7/70

U.S. Cl. 364-434

2 Claims



1. A system for automatically positioning aerodynamic surfaces in a control axis of an aircraft, comprising:
  - a sensor indicative of a parameter of aircraft flight related to said control axis for providing a parameter signal indicative of the magnitude thereof;
  - a pair of fast, inner loop actuators serially connected for changing the position of said aerodynamic surfaces across a limited authority range of positions which is a fraction of the total permissible range of positions thereof;
  - a position detector for each of said inner loop actuators, each providing a signal indicative of the position of the corresponding actuator;
  - an outer loop actuator connected to said inner loop actuators for adjusting the position of said inner loop actuators relative to the position of said control surfaces throughout a full authority range of positions equal to the total permissible range of positions thereof, to thereby reposition the center of said limited authority range relative to said full authority range; and
  - signal processing means, connected for response to said sensor, for providing a reference signal indicative of a desired magnitude of said parameter, for providing a proportional command signal indicative of the magnitude and sense of the difference between said parameter signal and said reference signal to adjust the position of said inner loop actuators and therefore of said control surfaces in a first direction, depending on the sense of said difference, to cause said parameter signal to approach equality with said reference signal, for providing, to said each of inner loop actuators, a rate command signal indicative of the magnitude and sense of the rate of change of said parameter signal to adjust the position of said control surfaces in a second direction, depending on the sense of said rate of change, to cause the rate of change of said parameter signal to approach nil, and for providing said proportional command signal to said inner loop actuators and to said outer loop actuator;

sible range of positions thereof, to thereby reposition the center of said limited authority range relative to said full authority range; and

signal processing means, connected for response to said sensor, for providing a reference signal indicative of a desired magnitude of said parameter, for providing a proportional command signal indicative of the magnitude and sense of the difference between said parameter signal and said reference signal to adjust the position of said inner loop actuators and therefore of said control surfaces in a first direction, depending on the sense of said difference, to cause said parameter signal to approach equality with said reference signal, for providing, to said each of inner loop actuators, a rate command signal indicative of the magnitude and sense of the rate of change of said parameter signal to adjust the position of said control surfaces in a second direction, depending on the sense of said rate of change, to cause the rate of change of said parameter signal to approach nil, and for providing said proportional command signal to said inner loop actuators and to said outer loop actuator;

characterized by said signal processing means comprising means for providing a shut down signal in response to the difference between said position signals being in excess of a predetermined magnitude, and for inhibiting provision of said proportional command signal to said outer loop actuator in response to said shut down signal.

4,417,309

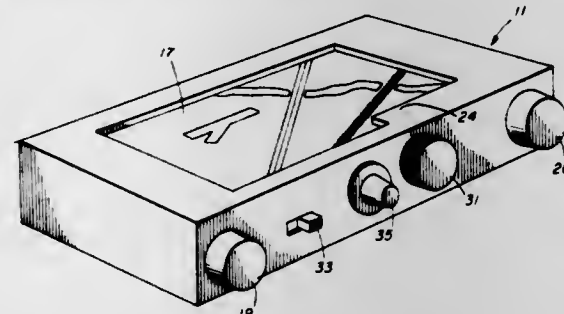
## AIRCRAFT NAVIGATION COMPUTER

Philip C. Harvey, 17 Michael Ave., Nashua, N.H. 03062  
Filed Feb. 13, 1981, Ser. No. 234,404

Int. Cl.<sup>3</sup> G06F 15/50

U.S. Cl. 364-450

14 Claims



1. Navigation apparatus comprising:
  - an enclosure;
  - a pair of manually driven rollers for receiving and scrolling a map strip from one point on said enclosure to another point;
  - intermediate said points, wheel means adapted to frictionally engage said map strip and be driven thereby;
  - translation means, driven by said wheel means, so that the setting of said translation means is varied by movement of said map strip thereby to generate a first voltage which is in proportion to the set position of said map strip;
  - means for generating a second voltage, which second voltage varies as a function of the passage of time; and
  - means for providing a perceptible indication of the relative values of said first and second voltages.

4,417,310

## APPARATUS FOR MEASURING DISTORTION FACTOR

Kiyoyuki Sugihara, Tokorozawa, Japan, assignor to Shibasaki Company Limited, Tokyo, Japan

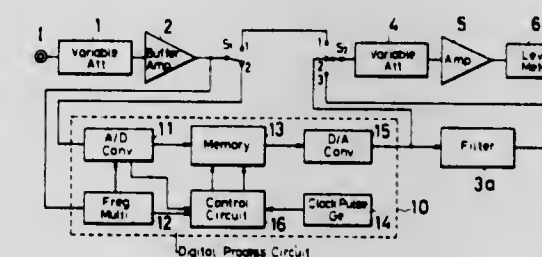
Filed Mar. 17, 1981, Ser. No. 244,560

Claims priority, application Japan, Mar. 29, 1980, 55-40815; Apr. 15, 1980, 55-49783

Int. Cl.<sup>3</sup> H04B 3/46; G06F 15/20

U.S. Cl. 364-481

29 Claims



1. An apparatus for measuring a distortion factor of an analog input signal comprising:
  - means for receiving the input signal and multiplying its frequency to produce a sampling signal;
  - analog to digital converting means for receiving the input signal and converting its instantaneous values into digital values each time the sampling signal is supplied from the frequency multiplying means;
  - memory means for receiving the converted digital values and storing them at given address positions;
  - means for controlling the writing and reading operation for the memory means;
  - means for reading the digital values stored in the memory means with a given time interval;
  - digital to analog converting means converting the read out digital values into analog signals;
  - filter means for receiving the converted analog signals and selectively eliminating a given frequency component of the analog signals to produce an output signal;
  - metering means for receiving said output signal from the filter means and detecting a level of the output signal; and
  - means for calibrating the gain of the metering means in accordance with the input signal level whereby the distortion factor of the input signal is measured as a ratio between the detected level of the output signal and a fundamental level of the input signal.

4,417,311

## FRACTIONAL DISTILLATION COLUMN CONTROL

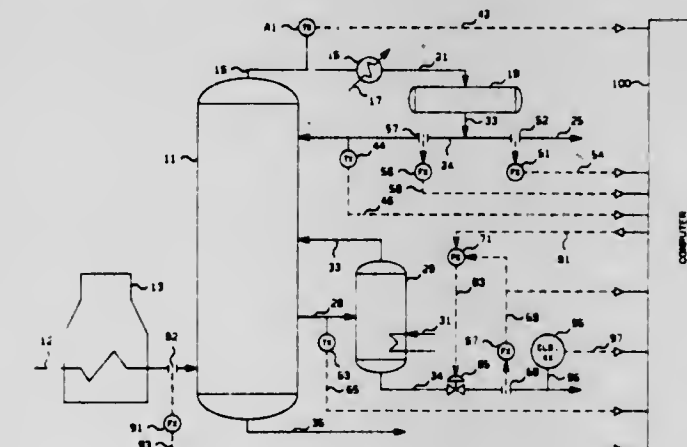
Lawrence A. Ryan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 29, 1982, Ser. No. 344,146

Int. Cl.<sup>3</sup> B01D 3/42

U.S. Cl. 364-501

5 Claims



1. Apparatus comprising:

a fractional distillation column;

means for providing a feedstream to said fractional distillation column;

means for withdrawing a side draw stream from an intermediate portion of said fractional distillation column, wherein at least a portion of said side stream is utilized to provide a side draw product stream;

computer means for enabling establishment of a first signal representative of the actual internal reflux to vapor ratio in said intermediate portion of said fractional distillation column;

computer means for enabling establishment of a second signal representative of the calculated actual cloud point of said side draw product stream in response to said first signal;

means for measuring the cloud point of said side draw product stream and for establishing a third signal representative of the measured actual cloud point of said side draw product stream;

computer means to enable utilization of said third signal to correct any error in the cloud point represented by said second signal to thereby establish a fourth signal representative of a corrected actual cloud point of said side draw product stream;

means for establishing a fifth signal representative of the desired cloud point of said side draw product stream;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal; and

means for controlling the cloud point of said side draw product stream in response to said sixth signal.

4,417,312

## ELECTRONIC CONTROLLER FOR VALVE ACTUATORS

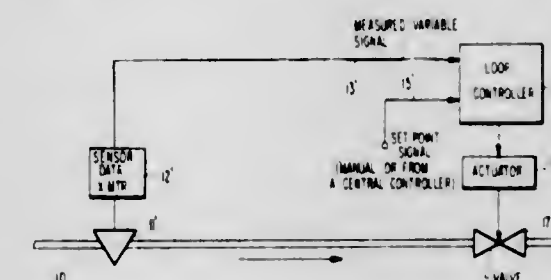
Gerald F. Cronin, Worcester, and Howard J. Fuller, Shrewsbury, both of Mass., assignors to Worcester Controls Corporation, West Boylston, Mass.

Filed Jun. 8, 1981, Ser. No. 271,306

Int. Cl.<sup>3</sup> G05B 11/00

U.S. Cl. 364-510

14 Claims



1. An electronic controller for use in a process control system to control the energization of an electrical actuator, said actuator being of the type having a first input which when energized causes said actuator to move in one direction and a second input which when energized causes the actuator to move in the opposite direction, and said actuator being adapted to be connected to a valve operative to vary the flow of a fluid in a controllable process thereby to control the magnitude of a predetermined parameter in said process, said controller comprising:
  - input means for receiving first and second electrical signals, said first signal being produced by a process sensor which monitors the existing magnitude of said predetermined parameter in the process being controlled and said first signal being representative of the instantaneous magnitude of the said process parameter, the said second signal being a set signal representative of a desired magnitude of said process parameter, said first and second signals each being substantially independent of the instantaneous positions of said valve and actuator;
  - comparison means coupled to said input means for producing a process parameter error signal when there is a difference between said first and second signals;
  - power supply means for



producing a train of power pulses, means responsive to the sense of said process parameter error signal for coupling said power supply means to a selected one of said actuator inputs thereby to determine the direction of movement of said actuator and to cause said actuator to move in said direction in a series of incremental steps during the application of each of said power pulses respectively, and means responsive to the magnitude of said process parameter error signal for controlling the time duration portion of each of said power pulses which energizes said selected actuator input as said actuator repositions said valve incrementally to reduce said process parameter error signal towards zero, said last-named means including means for adjusting the rate of movement of said actuator so that, as said process parameter error signal reduces toward zero, the movement of said actuator substantially matches the time constant of the process being controlled.

4,417,313

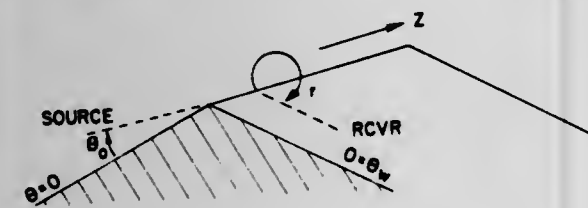
# METHOD FOR OPTIMIZING THE DESIGN OF A FINITE NOISE BARRIER

Herman Medwin, 4021 Sunridge Rd., Pebble Beach, Calif. 93953  
Filed May 18, 1981, Ser. No. 264,483

Int. Cl.<sup>1</sup> G06F 15/31

U.S. Cl. 364—524

2 Claims



1. A method for calculating the optimum response for design of a finite noise barrier comprising the steps of:
  - (a) defining the proposed edge sections of said finite noise barrier;
  - (b) calculating the times required for a pulse signal to go from a source to each of said proposed edge sections to a receiver located behind said barrier;
  - (c) identifying the diffracted contribution of each of said edge segments upon said pulse signal by the closed-form impulse solution of Biot-Tolstoy;
  - (d) determining the mathematical time series of said diffracted contribution for each of said proposed edge segments as received by said receiver, said time series formulated by taking the Fourier transform of said Biot-Tolstoy solution and a digital transform of the remainder of said Fourier transform and sampling said diffracted contribution a plurality of times according to said time series;
  - (e) adding said mathematical time series at equivalent times by superposition to obtain the diffracted impulse response received by said receiver for each of said proposed edge segments;
  - (f) calculating the impulse response integral for each of said added time series for each of said proposed edge segments;
  - (g) comparing said impulse response integrals to determine which of said proposed edge segments should be changed to obtain equal diffraction contributions by each of said proposed edge segments;
  - (h) using a digital computer to iteratively repeat the calculations of said impulse response integrals after changing said proposed edge segments until all of said impulse response integrals are equal;
  - (i) computing the total impulse response integral of all of said added time series to find the total diffracted impulse response received by said receiver for all of said proposed edge segments; and
  - (j) transforming by digital Fourier techniques said total diffracted impulse response to obtain the desired frequency response of said barrier.

## 4,417,314 PARALLEL OPERATING MODE ARITHMETIC LOGIC UNIT APPARATUS

David W. Best, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,263

Int. Cl.<sup>1</sup> G06F 7/50

U.S. Cl. 364—716

11 Claims



1. Arithmetic logic unit apparatus comprising, in combination:
  - first signal input means;
  - second signal input means;
  - carry signal input means;
  - AND, OR and Exclusive NOR (XNOR) gate means, connected to said first and second signal input means, for receiving first and second signals and providing parallel output AND, OR and XNOR signals responsive to said first and second signals;
  - ripple carry means, connected to receive AND, OR and carry signals from said AND gate means, said OR gate means and said carry signal input means respectively, for controlling passage of AND and OR signals therethrough in response to the logic value of carry input control signals, said ripple carry means providing carry output signals;
  - summing means, connected to said XNOR gate means and said carry signal input means, for receiving carry and XNOR signals whereby SUM output signal are provided in the form of carry and carry signals selectively passed by the logic value of said XNOR signals; and
  - means, connected to said XNOR means, for providing XOR output signals.

4,417,315

## METHOD AND APPARATUS FOR INCREMENTING A DIGITAL WORD

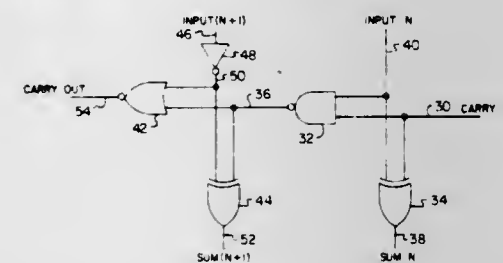
Jeffrey D. Russell, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,305

Int. Cl.<sup>1</sup> G06F 7/50

U.S. Cl. 364—770

9 Claims



1. Logic apparatus comprising, in combination:

carry input means for providing a carry input signal; input means for providing N stage input signals and (N + 1) stage input signals; NAND gate means and first exclusive OR gate means, each including output means, connected to said carry input signal means and to said input means for receiving carry input signals and N stage input signals respectively; N stage SUM output means connected to said output of said first exclusive OR gate means for providing N stage SUM output signals; inverter means connected to said input signals means for receiving said (N + 1) stage input signals and providing a logically inverted output therefrom at output means thereof; NOR gate means connected to said NAND means and to said inverter means for logically NORing the inputs and providing a carry output signal at an output means thereof; and second exclusive OR gate means connected to said inverter means and to said output of said NAND means for logically exclusively combining said inputs to provide an (N + 1) stage SUM output signal.

4,417,316

## DIGITAL BINARY INCREMENT CIRCUIT APPARATUS

David W. Best, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,267

Int. Cl.<sup>1</sup> G06F 7/50

U.S. Cl. 364—770

3 Claims



1. A ripple carry incrementer circuit comprising, in combination:
  - first means for providing a carry input signal to said increment circuit;
  - second means for inputting N bit position data bit signals;
  - NAND gate means including first and second input means and output means;
  - first inverter means including input and output means;
  - first, second and third gating means each including control means, input means and output means;
  - third means for providing N bit position data bit output signals;
  - fourth means for connecting said signal supplied by said first means to said control means of each of said first and second gating means and to said first input means of said NAND gate means as well as to said input means of said third gating means;
  - fifth means for connecting said second means to said input means of said first inverter means, to said second input means of said NAND gate means, said control means of said third gating means and to said input means of said first gating means for application of signals therethrough;
  - sixth means for connecting said output means of said inverter means to said control means of said third gating means and to said input means of said second gating means;
  - seventh means connecting said output means of each of said first, second and third gating means to said third means for supplying signals thereto as passed by said gating means;

fourth, fifth and sixth gating means each including input means, and output means and control means; eighth means for inputting (N + 1) bit position data bit signals; ninth means for outputting (N + 1) bit position data bit signals; second inverter means including input and output means; tenth means connecting said output of said NAND gate means to said control means of each of said fourth and fifth gating means as well as to said first input means of said NOR gate means and to said input means of said sixth gating means for supplying signals thereto; eleventh means connecting said eighth means to said input means of said second inverter means, said control means of said sixth gating means and said input means of said fourth gating means for supplying signals thereto; twelfth means connecting said output means of said second inverter means to said second input means of said NOR gate means, said control means of said sixth gating means and to said input means of said fifth gating means; and thirteenth means connecting said output means of each of said fourth, fifth and sixth gating means to said ninth means for outputting (N + 1) bit position signals.

4,417,317

## ADAPTIVE ANALOG PROCESSOR

Marvin H. White, Columbia, and Ingham A. G. Mack, Laurel, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 118,052, Feb. 4, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,075

Int. Cl.<sup>1</sup> H04B 3/04; H03H 21/00; G11C 11/40

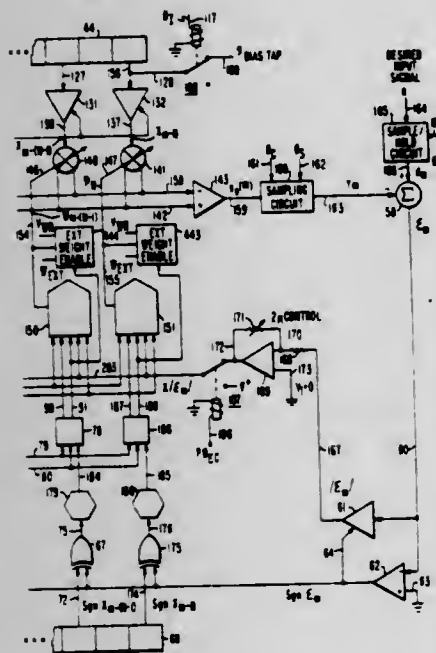
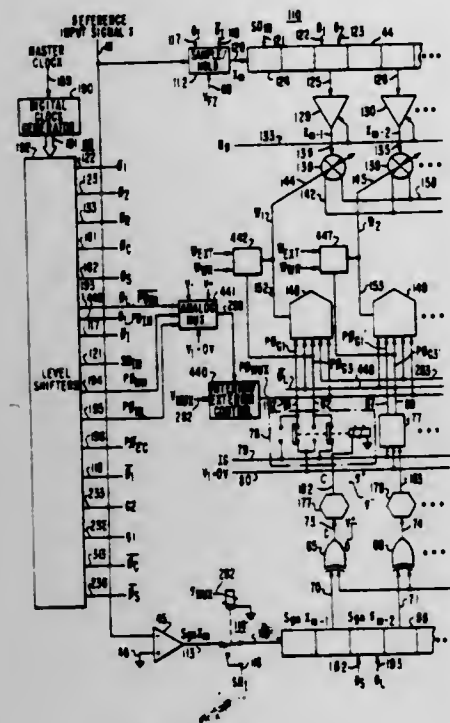
U.S. Cl. 364—825

7 Claims

1. Apparatus for processing a first analog input signal represented by a plurality of time spaced discrete analog data signals each having a single value comprising:
  - first means for storing a predetermined number of said successive discrete analog data signals including a charge coupled device shift register, selected ones of said analog data signals being available at taps;
  - second means for detecting and storing the polarity of said successive discrete analog data signals;
  - third means including a plurality of capacitors each for storing charge indicative of the weight assigned to a respective tap;
  - fourth means for multiplying each of said successive discrete analog data signals available at a tap by the weight assigned thereto to form a plurality of products, said fourth means for multiplying including a plurality of field effect transistors, each having its gate coupled to one side of one of said plurality of capacitors and its drain coupled to said respective tap;
  - said fourth means for multiplying further including fifth means for compensating direct current off-sets in said fourth means for multiplying, arising from temperature drift in circuit components causing changes in threshold voltages of field effect transistors, changes in junction leakage currents and from long term drift in said first analog input signal said fifth means for compensating including means for injecting an external voltage at a selected tap of said charge coupled device shift register;
  - sixth means for summing said products together to provide a sum signal;
  - a second analog input signal represented by a plurality of time spaced discrete analog data signals each having a single value;
  - seventh means for subtracting said sum signal from said second analog input signal to form a difference signal; and
  - eighth means for incrementing the value of each stored weight as a function of the magnitude and polarity of said



difference signal and the polarity of said successive discrete analog data signals including ninth means for modifying said charge on each said respective capacitor in response to the polarity of said first analog input signal at



said tap and the polarity of said difference signal and including tenth means for determining the magnitude of the change of said charge as a function of the absolute magnitude of said difference signal.

#### 4,417,318 ARRANGEMENT FOR CONTROL OF THE OPERATION OF A RANDOM ACCESS MEMORY IN A DATA PROCESSING SYSTEM

Shigeru Hirahata; Teruhiro Takezawa, both of Yokohama; Nobuo Onuki, Ebina; Shigeru Komatsu, and Tsuguji Tachiuchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1979, Ser. No. 35,237

Claims priority, application Japan, May 4, 1978, 53-53491

Int. Cl.<sup>3</sup> G06F 3/00; G11C 11/34

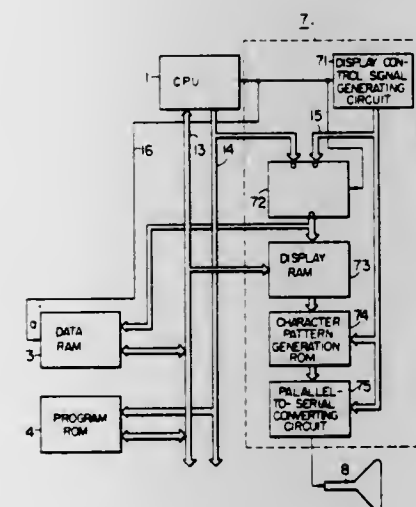
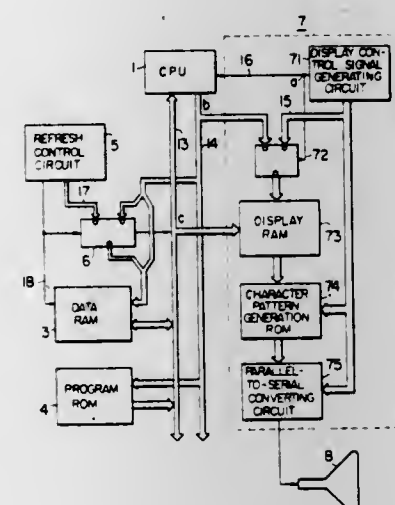
U.S. Cl. 364-900

8 Claims

1. In a data processing system including a first memory to be refreshed; a second memory for storing data to be successively read out during first periodic cycles; and a central processing unit for effecting transfer of data to and from said first and second memories during second periodic cycles which alter-

nate with said first periodic cycles; the improvement comprising

display control address generating means for producing addresses sequentially during said first periodic cycles to periodically read out the contents of said second memory; address selecting means which alternately and exclusively selects an address derived from said central processing unit or an address derived from said display control address generating means during said first and second periodic cycles and supplies the selected address in common to said first and second memories whereby, when said address selecting means selects an address from said cen-



tral processing unit, said central processing unit executes a data transfer to one of said first and second memories, and when said address selecting means selects the address from display control address generating means, said first memory is refreshed and said second memory reads out stored data; and

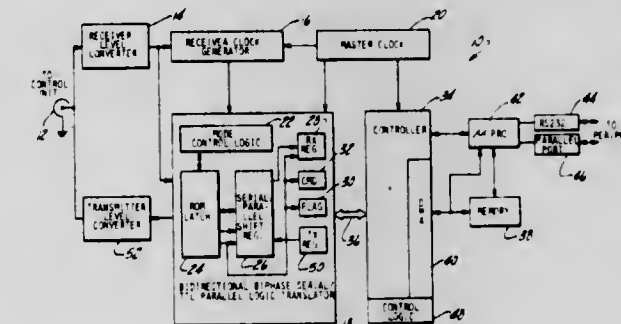
control signal generating means responsive to said display control address generating means generating an address for producing a control signal to cause said address selecting means to perform said selection operation in synchronism with the address generation of said display control address generating means.

#### 4,417,319 ELECTRONIC TRANSLATOR FOR PROVIDING DIRECTLY-TRANSLATED WORDS Masafumi Morimoto, Yamatokoriyama; Kunio Yoshida, and Tosaku Nakanishi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan Filed Apr. 8, 1981, Ser. No. 252,144 Claims priority, application Japan, Apr. 15, 1980, 55-51062 Int. Cl.<sup>3</sup> G06F 15/38 U.S. Cl. 364-900 4 Claims



1. An electronic translator wherein a plurality of first words represented in a first language are entered to obtain a plurality of second words represented in a second language equivalent to the first words, comprising:  
input means for entering the first words;  
memory means for storing the second words;  
access means operatively connected to and responsive to said input means for addressing said memory means for retrieving the second words and for providing the second words in an order which is identical to the order of the input first words; and  
indicating means responsive to said access means for indicating that the order of the second words is identical to the order of the first words.

#### 4,417,320 INTERFACE FOR DATA COMMUNICATION SYSTEMS USING SERIAL BIPHASE DATA TRANSMISSIONS David D. El, Ann Arbor, Mich., assignor to Interface Systems, Inc., Ann Arbor, Mich. Filed May 11, 1981, Ser. No. 262,722 Int. Cl.<sup>3</sup> G06F 3/04 U.S. Cl. 364-900 20 Claims

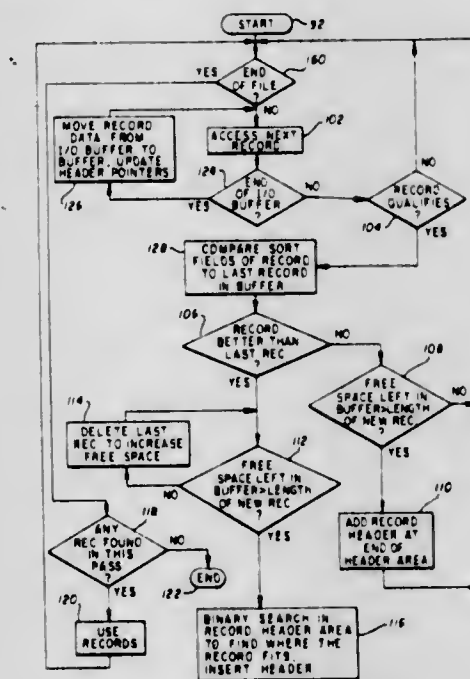


1. An interface for data communication systems using serial biphasic transmissions between a central control unit and a peripheral device, each transmission including a predefined header sequence followed by one or more data words in which each logical bit is defined by half bits of different voltage levels, said interface comprising:

bi-directional translator means for translating serial biphasic transmission from the control unit to TTL compatible parallel data used to control the operation of the peripheral device, said translator including means for detecting

the voltage levels of each half bit of the biphasic transmission, and sequencer means for generating an output as a function of current detected voltage levels and previously detected levels of the biphasic transmission, said translator being further operative to translate TTL compatible parallel data from the peripheral device into biphasic serial data for transmission to the control unit.

#### 4,417,321 QUALIFYING AND SORTING FILE RECORD DATA Philip Y. Chang, and Virginia M. Hoffman, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y. Filed May 18, 1981, Ser. No. 264,959 Int. Cl.<sup>3</sup> G06F 7/24 U.S. Cl. 364-900 9 Claims



1. A method of presorting file records in a storage means for temporary retention in a sort buffer in an order based on selected ranking, comprising the steps of:

- accessing each of said file records in said storage means;
- determining whether an accessed file record qualifies for transfer to the sort buffer;
- if said accessed file record qualifies, setting a record identifying bit from a first state to a second state;
- comparing the rank of the qualified file record data in the storage means with the rank of the lowest ranked file record in the sort buffer;
- if the rank of the qualified file record is higher than the rank of the lowest ranked file record, transferring the qualified file record in the storage means to unused space in the sort buffer;
- locating the qualified file record transferred to the sort buffer at a level based on said rank thereof; and
- resetting the record identifying bit to the first state for the qualified file record now located in the sort buffer.

#### 4,417,322 REPORT GENERATION CONTROL SYSTEM FOR TEXT PROCESSING MACHINES Richard E. Berry, Georgetown, and John H. Wilson, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y. Filed Jun. 16, 1981, Ser. No. 273,561 Int. Cl.<sup>3</sup> G06F 3/12 U.S. Cl. 364-900 9 Claims

1. A report generation control system for generating output reports containing inter-report summary data on a processor driven text processing system comprising:



a processor and memory;

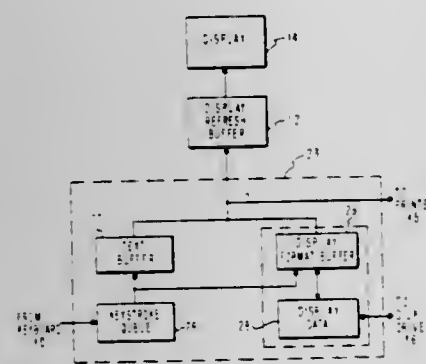
Input means connected to said processor including,

means for entering into the system an example report in the desired format including examples of fixed field text data and variable field file data,

means for editing the example report for replacing said variable field file data with file data control instructions,

means for editing said example report for inserting report summary instructions;

means responsive to said input means for displaying the edited example report as a replica of the desired output report;



processor control means stored in said memory including, means for scanning the edited example report for file data control instructions and report summary instructions, and means responsive to said means for scanning for executing said file data control instructions and said report summary instructions and merging said fixed field text data and the results from executing said file data control instructions and said report summary instructions into an output report.

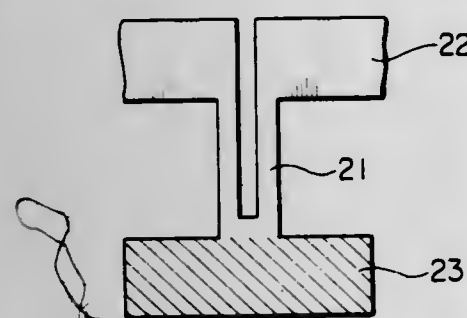
4,417,323  
BUBBLE MEMORY CONDUCTOR PATTERN WITH  
HEAT SINK

Atsushi Asano, Tokyo; Masatoshi Takeshita, Hachioji; Hideki Nishida, Hinodemachi; Ryo Suzuki, Kokubunji, and Toshio Futami, Mobarra, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 959,505, Nov. 13, 1978. This application Feb. 17, 1981, Ser. No. 234,630  
Claims priority, application Japan, Nov. 11, 1977, 52-134667  
Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-1

## 18 Claims

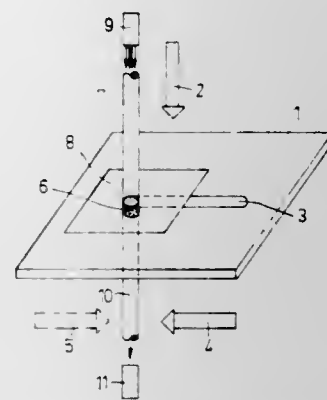


1. In a magnetic bubble memory device having a storage film capable of storing a magnetic bubble, an insulating film, a conductor pattern, and a transfer pattern successively provided on a non-magnetic substrate, the improvement comprising means for dissipating heat from said conductor pattern and including a heat discharge pattern formed of a thermally conductive substance thermally coupled with a fine line portion of said conductor pattern.

4,417,324  
MAGNETO-OPTIC TRANSDUCER  
Bo B. Wikström, Malmö, Sweden, assignor to SAB Industri AB,  
Landskrona, Sweden

Filed May 5, 1981, Ser. No. 260,757  
Claims priority, application Sweden, May 14, 1980, 8003639  
Int. Cl.<sup>3</sup> G11C 19/08, 13/06  
U.S. Cl. 365—10 3 Claims

### 3 Claims

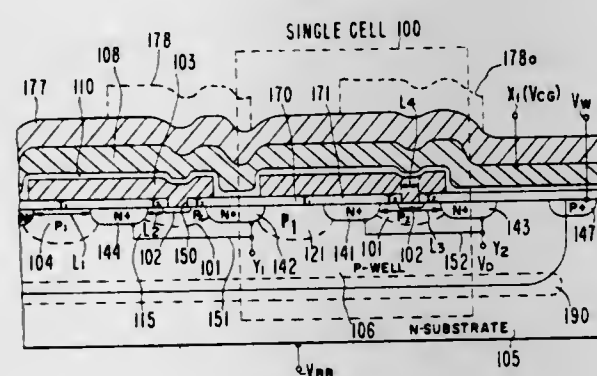


1. A magneto-optic transducer, comprising in combination, a thin planar sheet of magnetic material, means for producing a first magnetic field substantially perpendicular to said sheet, generating magnetic bubbles therein, a pattern of thin magnetic film applied to the surface of said sheet and defining a guide path for the magnetic bubbles, means for producing a second magnetic field in the plane of said sheet for moving the magnetic bubbles along said guide path, means for optically sensing the presence of the magnetic bubbles at least at one location in said path, characterized in that said second magnetic field comprises a constant component field and a variable component field in opposite direction to said constant component field.

## 4,417,325 HIGHLY SCALEABLE DYNAMIC RAM CELL WITH SELF-SIGNAL AMPLIFICATION

Eliyahou Harari, 2320 Friars La., Los Altos, Calif. 94022  
Filed Jul. 13, 1981, Ser. No. 282,882  
Int. Cl.<sup>3</sup> G11C 11/40; H01L 29/80, 29/78; B05D 5/12  
U.S. Cl. 365-185 24 Claims

## 24 Claims



1. A memory cell comprising:  
a substrate of a first conductivity type;  
a first region of second conductivity type formed on said substrate, said second conductivity type being opposite to said first conductivity type;  
second, third, and fourth regions of said first conductivity type formed in said first region of said second conductivity type, said second and third regions being separated by a first portion of said first region and said third and fourth regions being separated by a second portion of said first region;  
a fifth region of said first conductivity type formed in said second portion of said first region;  
a first electrode attached to said fifth region said first electrode

being electrically isolated from said second, third, and fourth regions, said first electrode extending on insulation over said first portion to said second region and also extending over said third region and a part of said second portion, said first electrode being covered by second insulation; and

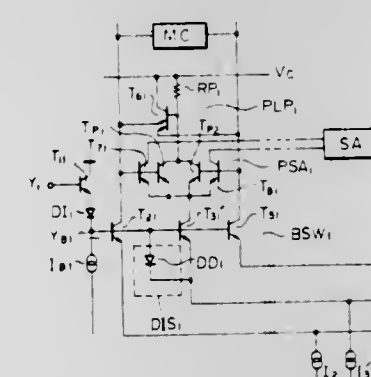
a word line formed over said second insulation so as to overlie said first electrode; said first electrode and said word line forming a dual electrode, said dual electrode structure forming a read transistor with channel length measured by the extent of said first portion, a write transistor with channel length measured by the separation between said third region and said fifth region, and a storage junction formed between said fifth region and said first region.

4,417,326  
**STATIC SEMICONDUCTOR MEMORY DEVICE**  
 Kazuhiro Toyoda, Yokohama, and Yasuhisa Sugo, Tokyo, both  
 of Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
 Filed Nov. 27, 1981, Ser. No. 325,381

Claims priority, application Japan, Nov. 28, 1980, 55-167472  
Int. Cl.<sup>3</sup> G11C 7/00

U.S. Cl. 365-190

## 6 Claims



1. A static semiconductor memory device, operatively connected to receive column selection signals, comprising:

- a plurality of memory cells arranged in a matrix having columns and rows, each of said plurality of memory cells comprising two driving transistors connected in intersection;
- a plurality of word lines connected to said plurality of memory cells and arranged in the row direction;
- a plurality of bit lines connected to said plurality of memory cells and arranged in the column direction, each bit line connectable to receive a current for reading information stored in or for writing information to be stored in said plurality of memory cells;
- a common current source;
- a plurality of bit selection circuits operatively connected to said common current source and operatively connected to respective ones of said columns of said matrix, each of said plurality of bit selection circuits operatively connected to receive a corresponding one of said column selection signals having a first reference potential, when the corresponding column is selected, and to supply a current from said common current source to said corresponding selected column;
- a plurality of bit driver circuits respectively, operatively connected to said columns of said matrix, each of said plurality of bit driver circuits connected to cause said column selection signal to have said first reference potential when the corresponding column is selected;
- a discharge current source; and
- means forming a plurality of discharge paths, each of said discharge paths being connected between a respective one of said plurality of bit selection circuits and said discharge current source, for functioning so that when a column in said matrix is switched from a selected state to a nonselected state, the potential of the corresponding column

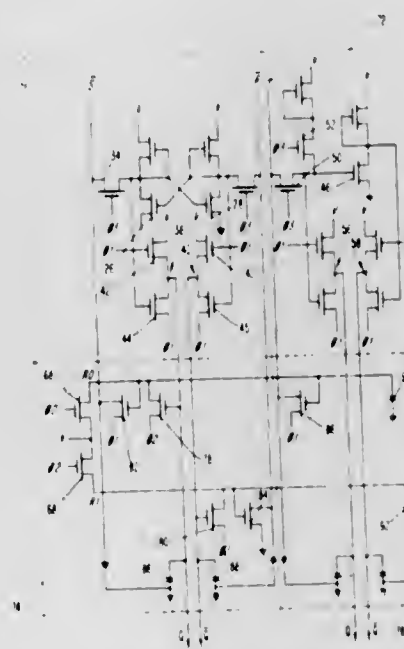
selection signal is changed to a second potential through said discharge path.

**4,417,327**  
**DYNAMICALLY OPERATED STRUCTURED LOGIC**  
**ARRAY**

Kent F. Smith, 1775 Grover La., Salt Lake City, Utah 84117  
Filed Sep. 9, 1980, Ser. No. 185,538  
Int. Cl.<sup>3</sup> G11C 13/00

U.S. Cl. 365-203

## 29 Claims



1. A structured logic array comprising a plurality of logical columns, each having at least one column input conductor and at least one column output conductor, and a plurality of row conductors disposed orthogonal to said column conductors, said logic array including:

means for generating at least two phase-displaced clocking signals;

a storage cell operatively associated with one of said logical columns and having a memory element, means for precharging the output conductor of the associated column to a predetermined value during a first one of said clocking signals and for causing said output conductor to assume a binary state determined by information stored in the memory element upon the termination of said first clocking signal, and means responsive to a second one of said clocking signals for operatively transmitting the information on the column input conductor to said memory element; and

a logic cell for interconnecting the logical columns and the row conductors and having means for precharging the row conductors during the first clocking signal, means for controlling the binary state of a row conductor upon termination of said first clocking signal, and means for transmitting the binary state of the row conductor to at least one column input conductor.

4,417,328  
RANDOM ACCESS SEMICONDUCTOR MEMORY  
DEVICE USING MOS TRANSISTORS

Kiyofumi Ochi, Yokohama, Japan, assignor to Tokyo Shibaura  
Denki Kabushiki Kaisha, Japan  
Filed Jan. 30, 1981, Ser. No. 230,000  
Claims priority, application Japan, Jan. 31, 1980, 55-10259;  
May 26, 1980, 55-69943

Int. Cl.<sup>3</sup> G11C 7/00

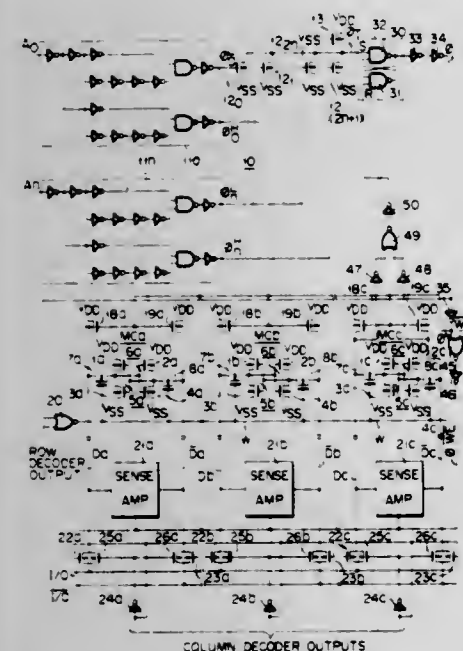
#### 4 Claims

1. A semiconductor memory device for outputting data in response to a state transition of an address signal supplied to the device, the device comprising:

a plurality of memory cells arranged in columns and rows;



a plurality of dummy memory cells arranged in a column;  
 a plurality of pairs of data lines, each of said pairs being connected to said memory cells arranged in a column, one of each of said pairs of data lines being discharged in response to data read out from one of said memory cells arranged in a column;  
 a dummy data line having substantially the same load capacitance as that of each of said data lines and being connected to said dummy memory cells, said dummy data line being discharged in response to the accessing of one of said dummy memory cells;  
 precharging means connected to said data lines and said dummy data line for precharging said data lines and said dummy data line prior to the read out of data from said memory cells and to the accessing of said dummy memory cells;  
 a plurality of first sense amplifiers, each of said first sense amplifiers being connected to a different one of said pairs of data lines and for discharging one of said data lines coupled thereto responsive to the read out of data from one of said memory cells connected to said one data line to amplify the data read out of the memory cell;  
 a second sense amplifier connected to said dummy data lines, said second sense amplifier for discharging said dummy data line responsive to the accessing of one of said dummy memory cells;



precharge detect circuit means connected to said dummy data line for detecting a precharging state of said dummy data line;  
 address signal state transition detector means for receiving the address signal and for detecting a state transition of said address signal; and  
 control circuit means connected to said state transition detector means and said precharge detect circuit means, said control circuit means for changing from a first state to a second state in response to a state transition of said address signal to cause said precharging means to precharge said data lines and said dummy data line, and to change state from said second state to said first state in response to the precharging of said dummy data line to a predetermined voltage level to disable said precharging means from precharging said data lines and said dummy data line.  
 2. A semiconductor memory device for outputting data in response to a state transition of an address signal supplied to the device, the device comprising:  
 a plurality of memory cells arranged in columns and rows;  
 a plurality of pairs of data lines, each of said pairs of data lines being connected to said memory cells arranged in a different one of said columns, one of each of said pairs of data lines being discharged in response to the read out of data from one of said memory cells arranged in a column;  
 precharging means connected to said data lines for precharg-

ing said data lines prior to the read out of data from said memory cells;  
 a plurality of first sense amplifiers, each of said first sense amplifiers being connected to a different one of said pairs of data lines to discharge said data line connected thereto responsive to the read out of data from one of said memory cells connected to said data line to amplify the data read out of said one memory cell;  
 precharge detect circuit means connected to a predetermined pair of said plurality of pairs of data lines for detecting a precharging state of said predetermined pair of data lines;  
 address signal state transition detector means for receiving the address signal and for detecting a state transition of said address signal; and  
 control circuit means connected to said state transition detector means and said precharge detect circuit means, said control circuit means for changing from a first state to a second state in response to a state transition of said address signal to cause said precharging means to precharge said data lines, and to change from said second state to said first state in response to the precharging of said predetermined pair of data lines to a predetermined voltage level to disable said precharging means from precharging said data lines.

4,417,329

## ACTIVE PULL-UP CIRCUIT

Tsutomu Mezawa, Aizuwakamatsu; Katsuhiko Kabashima; Shigeki Nozaki, both of Kawasaki, and Yoshihiro Takemae, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

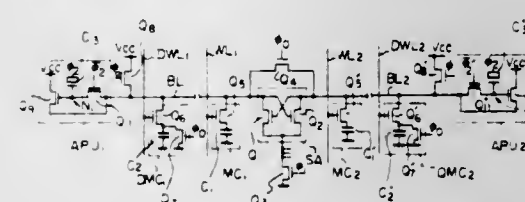
Filed Jul. 27, 1981, Ser. No. 287,104

Claims priority, application Japan, Jul. 29, 1980, 55-104123

Int. Cl.<sup>3</sup> G11C 7/00; H03K 5/05, 17/693

U.S. Cl. 365—203

10 Claims





4,417,333

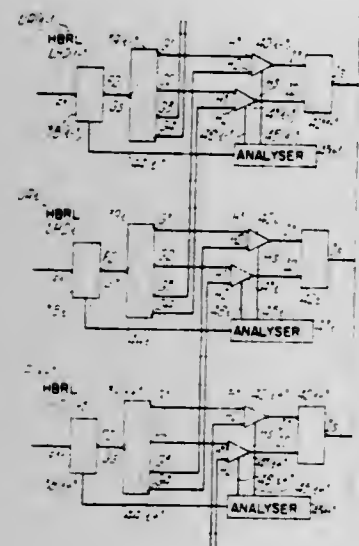
**SYSTEM TO INTERCONNECT SUBSCRIBER LINES TO A TELEPHONE AUTOMATIC TIME DIVISION SWITCH.**  
Jean-Yves Cochenec, Rue de Kernevez, F-22560 Trebeurden, France

Filed Nov. 12, 1981, Ser. No. 320,191

Claims priority, application France, Nov. 28, 1980, 80 26030  
Int. Cl.<sup>3</sup> H04Q 11/04

U.S. Cl. 370-66

2 Claims



1. A system provided for the interconnection telephone subscriber lines to an automatic telephone time division switch having, on the subscriber side, interconnection apparatus and, on the automatic switch side, interconnection units, which are connected in pairs to high bit rate links, each interconnection apparatus being associated with the 112 lines of a cable and having for each single subscriber line, an individual subscriber equipment which is comprised of means to fulfill the conventional line interface functions and in addition, a conventional 2-wire/4-wire differential coupler whose 4-wire output is connected to an analog-digital and digital-analog converter whose digital output is connected to an outgoing multiplex and whose digital input is connected to an entering multiplex, together forming a PCM multiplex, each individual subscriber equipment respectively having in the said PCM multiplex an allocated outgoing channel and an allocated return channel, a PCM multiplex thus serving sixteen individual subscriber equipments, in which seven PCM are provided to serve the 112 lines of a cable, characterized in that the high bit rate links have a capacity at least double that of the hook-up apparatus HAI and in that the hook-up apparatus HAI is comprised of a first multiplexor (30i) and a second multiplexor (31i) to which are connected, on one side, the seven PCM, and a first high bit rate link (HBRL'i or HBRL''i), on the other side, a third multiplexor (32i) to which is connected, on one side, the first high bit rate link HBRL'i of the first multiplexor (30i) and a second high bit rate link (ENTR(i-1)) provided from the neighboring interconnection apparatus HA(i-1) of immediate lower order, and, on the other side a third high bit rate link (cs-D1) which is connected to one terminal of a transmitter-receiver apparatus (33i) whose other terminal is connected to a high bit rate link (HBRLi), a coupler (34i) of which one terminal is connected to the high bit rate link (HBRL'i) of the second multiplexor and the other terminal by a second high bit rate link (ENTi) to a third multiplexor (32(i+1)) of the neighboring hook-up apparatus (HA(i+1)) of immediate higher rank.

4,417,334

**DATA PROCESSING SYSTEM HAVING DUAL-CHANNEL SYSTEM BUS**

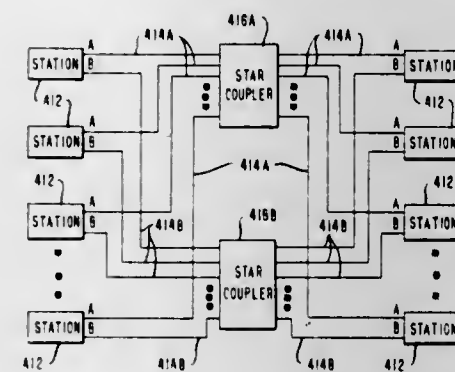
Robert O. Gunderson, Poway; James E. Kocol, and David B. Schuck, both of Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 254,850, Apr. 16, 1981. This application  
Apr. 16, 1981, Ser. No. 254,792

Int. Cl.<sup>3</sup> H04J 6/00

U.S. Cl. 370-85

17 Claims



1. A data processing system, comprising:  
a plurality of stations, wherein each station includes at least one data processor and a memory storing data for said processor;  
a first star coupler;  
a second star coupler; and  
first and second pairs of transmission lines associated with each station, said first pair of transmission lines connected between its associated station and said first star coupler, said second pair of transmission lines connected between its associated station and said second star coupler, with each of said first and second pairs of transmission lines including a first transmission line for carrying signals from its associated station and a second transmission line for carrying signals to its associated station, so that signals transmitted by any of said stations may be passed through either said first star coupler or said second star coupler and be received by all of said stations.

4,417,335

**DIGITAL SATELLITE TELEPHONE OFFICE**

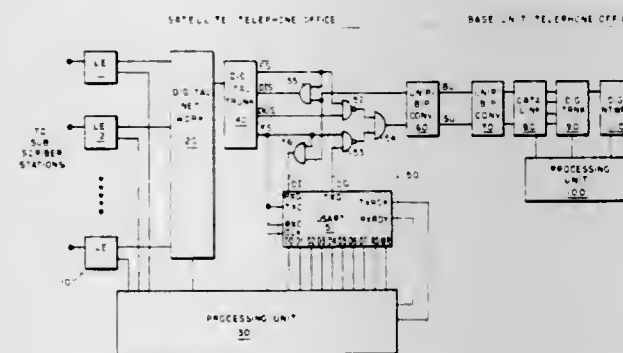
Michael J. Kelly, Scottsdale; Robert L. Lindsay, Phoenix, both of Ariz.; Alex W. Kobylar, Chicago, and David J. Stelte, Wheaton, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Continuation-in-part of Ser. No. 105,344, Dec. 19, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,345

Int. Cl.<sup>3</sup> H04J 3/12; H04Q 11/04

U.S. Cl. 370-110.1

10 Claims



1. A satellite digital telephone system including a satellite digital telephone office, said office including a plurality of line circuits, a first digital network operated to generate a first plurality of parallel data groups, and a first processing unit operated to generate digital data representative of the status

4,417,337

**ADAPTIVE MULTITONE TRANSMISSION PARAMETER TEST ARRANGEMENT**

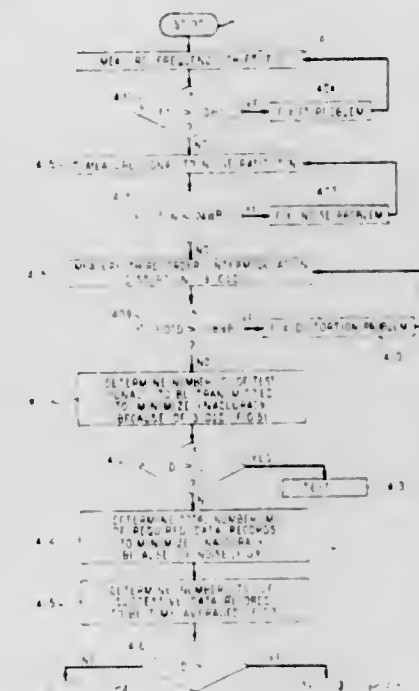
David L. Favin; Peter F. Lynn, both of Little Silver, and Paul J. Snyder, Linden, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 29, 1981, Ser. No. 278,884

Int. Cl.<sup>3</sup> H04B 3/46

U.S. Cl. 371-22

13 Claims



and identity of said line circuits, said satellite telephone system comprising:

a first digital trunk connected to said first digital network operated in response to said first parallel data groups to periodically generate alternately occurring first and second serial data streams, each comprising said first plurality of parallel data groups, said digital trunk further operated to generate a first terminal framing bit and concatenate said first terminal framing bit to each of said first plurality of data streams;  
first data link means connected to said processing unit and to said digital trunk, operated in response to said digital data from said processing unit to concatenate each successive one said second plurality of data streams; and  
first polarity conversion means connected to said first data link means operated in response to said first and second pluralities of data streams to generate bipolar signals representative of said first and second pluralities of data streams.

4,417,336

**METHOD OF TESTING WITH COMPUTERS**

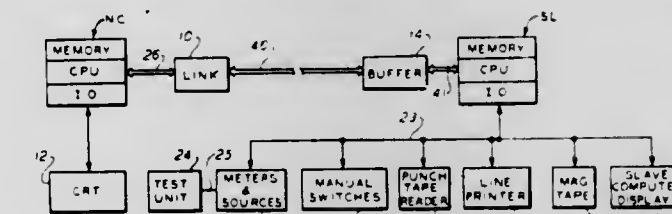
Thomas O. Weilbacker, Northvale, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 18, 1981, Ser. No. 274,952

Int. Cl.<sup>3</sup> G01R 31/28

U.S. Cl. 371-20

12 Claims



1. A method of testing a unit with a test instrument and with the aid of a master, an intermediate and a slave computer, the latter being connected to said test instrument for sensing its measurements, comprising the steps of:  
dispatching one of a plurality of instruction signals to said intermediate computer from said master computer;  
issuing to said slave computer, when it is not halted, a signal to halt from said intermediate computer after receipt by the latter of one of said instruction signals, said signal to halt being provided in response to one of said instruction signals;  
transmitting from said intermediate to said slave computer, after the latter has halted, that one of a plurality of command signals corresponding to the currently received one of said instruction signals;  
altering the state of said slave computer in response to that one of said command signals transmitted from said intermediate computer, the altering of the state of said slave computer being directed by said master computer without any change in direction originating from said intermediate computer;  
forwarding a go signal to said intermediate computer from said master computer;  
issuing to said slave computer from said intermediate computer a run signal signifying a request to run and sense measurements from said test instrument; and  
performing successive measurements with said slave computer without successive authorization through said intermediate computer.

1. A method for generating a measurement of at least one prescribed transmission parameter of a network or facility under evaluation, comprising the steps of,  
generating measurements of prescribed impairments on the network or facility under evaluation,  
utilizing said impairment measurements in accordance with predetermined relationships to dynamically determine test parameters including a number of test signals in a set of test signals to be generated, a required total number of measurements, a maximum number of consecutive measurements in each set of consecutive measurements to be time-averaged, and a number of time-averaged sets of measurements in an ensemble to be obtained,  
generating said set of test signals, each test signal having a plurality of tones, and each tone having predetermined amplitude, frequency and unique phase component values determined in accordance with a prescribed criterion,  
transmitting said set of test signals over said network or facility under evaluation,  
making said number of sets of consecutive measurements of a received version of each test signal in said set of test signals,  
time averaging the measurements in each individual set of said sets of measurements,  
obtaining said ensemble of said time-averaged sets of measurements, and  
utilizing said ensemble to generate the measurement of the at least one prescribed transmission parameter.

4,417,338

**CRYPTOGRAPHIC KEY SHARING CIRCUIT AND METHOD USING CODE CORRECTION**

George I. Davida, Tucker, Ga., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 13, 1981, Ser. No. 253,563

Int. Cl.<sup>3</sup> G06F 11/10

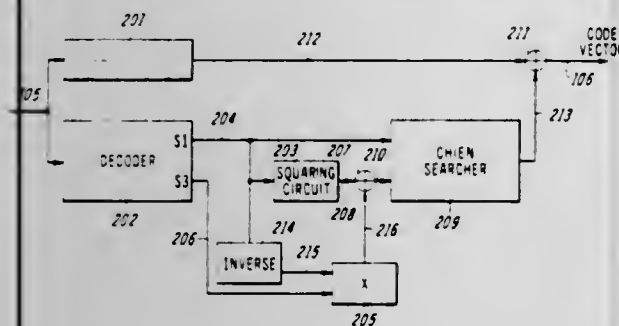
U.S. Cl. 371-37

5 Claims

1. A method for generating a certain number of secondary keys and for using some of said secondary keys in cooperation



with a corrupted code vector to reconstruct a code vector having a length of  $N$  digits, comprising the steps of:  
 choosing a certain number,  $n$ , of secondary keys to be distributed to  $n$  individuals;  
 assigning a subset of digit positions comprising  $e$  of said  $N$  digit positions of said code vector to each of said secondary keys in a random manner such that the total number of such digit positions assigned is equal to a certain number  $T = n \times e$ ;  
 calculating a corrupted code vector by creating errors in each of said  $T$  digit positions of said code vector assigned to said secondary keys and in  $e'$  randomly chosen digit positions;



choosing an error correcting code system comprising a set of code vectors, and a procedure for correcting code vectors which have been corrupted by errors, into the corresponding code vectors provided that there have been no more than  $t = (n - k)e + e'$  errors in the digits of an  $N$  digit code vector; and  
 reconstructing said code vector by using any  $k$  of said  $n$  secondary keys to correct the errors in  $k \times e$  of said  $N$  digit positions of said  $N$  digit corrupted code vector followed by using said error correcting code system to correct the remaining errors in no more than  $t$  digit positions.

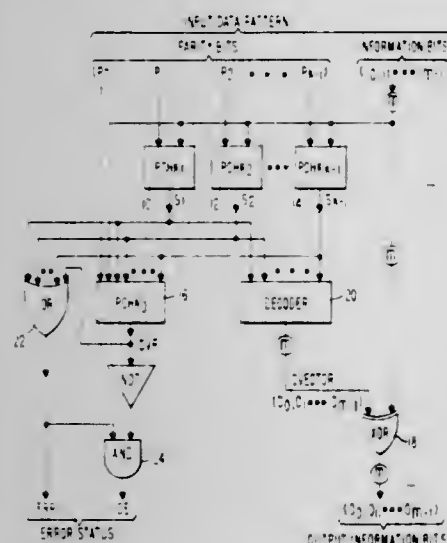
4,417,339

**FAULT TOLERANT ERROR CORRECTION CIRCUIT**  
 Robert G. Cantarella, Paoli, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 22, 1981, Ser. No. 275,563  
 Int. Cl.<sup>3</sup> G06F 11/10

U.S. Cl. 371—37

28 Claims



1. A fault tolerant circuit for correcting and detecting errors in an inputted data pattern, said inputted data pattern encoded in a modified Hamming type code, said inputted data pattern including a set of  $m$  input information bits,  $i_0, i_1, \dots, i_{m-1}$ , and a set of  $k$  parity bits,  $p_0, p_1, \dots, p_{k-1}$ , where  $m \geq k > 0$ , said circuit capable of tolerating a failure of any one of a plurality of elements included in said circuit without corrupting the information bits of a correct inputted data pattern, said circuit comprising:

$k-1$  parity check means, each of said  $k-1$  parity check means receiving a different one of  $k-1$  subsets of the set of  $m$  input information bits and one of a first subset of the

set of  $k$  parity bits, each of said  $k-1$  parity check means for producing a syndrome bit corresponding to its received parity bit;  
 decoder means, receiving said produced syndrome bits, for decoding said produced syndrome bits into a correction vector;  
 exclusive ORing means, receiving said correction vector and said set of  $m$  input information bits, for producing a set of  $m$  output information bits; and  
 error status means, responsive to a second subset of said set of  $k$  parity bits, a second subset of the set of  $m$  information bits and said produced syndrome bits, for providing error status indications including an indication that the set of  $m$  output information bits is correct in response to said circuit receiving said correct inputted data pattern and the occurrence of said failure of any one of said plurality of elements.

4,417,340

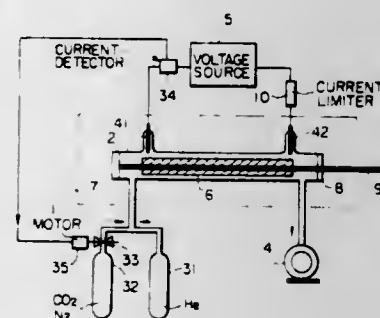
**METHOD FOR PRODUCING DISCHARGE IN GAS LASER AT LOW VOLTAGE**

Naoya Horiuchi, Kawasaki; Takafumi Ohhara, Tokyo, and Reiji Sano, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Apr. 3, 1981, Ser. No. 251,968  
 Claims priority, application Japan, Apr. 4, 1980, 55-44884  
 Int. Cl.<sup>3</sup> H01S 3/22

U.S. Cl. 372—58

8 Claims



1. A method for ionizing a mixture of first and second constituent gases in a laser tube under the influence of an electric field, comprising the steps of:  
 introducing the first constituent gas having a first ionization voltage into said tube until a predetermined partial pressure is reached to cause said first constituent gas to ionize under the influence of said field;  
 detecting an occurrence of ionization of the first constituent gas in the laser tube, and, in response;  
 introducing the second constituent gas having a second ionization voltage higher than the first ionization voltage into said tube until a normal operating pressure of the mixture is reached to allow the second constituent gas to ionize.

4,417,341

**GLASS LASER AMPLIFIER HAVING A NUMBER OF TRIGGER MEMBERS**

Chiyo Yamanaka, Ashiya; Yoshiaki Kato, Hirakata; Kunio Yoshida, Takatsuki, and Eiji Yoshida, Osaka, all of Japan, assignors to The President of Osaka University, Japan

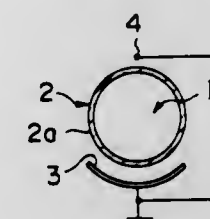
Filed Sep. 24, 1980, Ser. No. 190,485  
 Claims priority, application Japan, Feb. 25, 1980, 55-022366  
 Int. Cl.<sup>3</sup> H01S 3/093

U.S. Cl. 372—72

9 Claims

1. A glass laser amplifier comprising a laser glass in which lasing occurs; a number of flash lamps for emitting light to pump said laser glass arranged around said laser glass; a number of reflection mirrors disposed facing said laser glass and oriented for reflecting light from each of said flash lamps against said laser glass; and a number of trigger members arranged adjacent said flash lamps at the opposite side as said

reflection mirrors with each of said flash lamps being held between said trigger members and said reflection mirrors so as



to eliminate deflection of electric current in each of said flash lamps caused by said reflection mirrors.

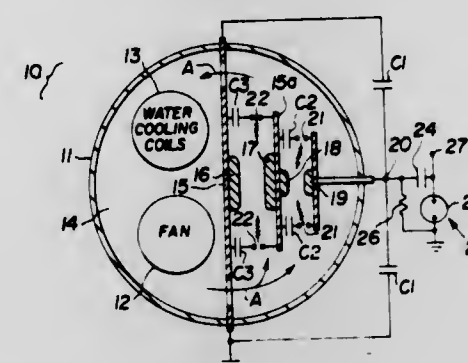
4,417,342

LASER

Terrence J. McKee, Nepean, Canada, assignor to Lumonics Inc., Kanata, Canada

Filed Mar. 3, 1981, Ser. No. 239,992  
 Int. Cl.<sup>3</sup> H01S 3/097

U.S. Cl. 372—87



1. A gas laser comprising  
 (a) an envelope,  
 (b) a gaseous medium in said envelope capable of lasing action,  
 (c) optical reflectors defining a main optical resonant cavity which extends along said envelope,  
 (d) a main pair of spaced-apart electrodes located in said envelope on respective sides of said main cavity to define a main lasing region in said cavity between said electrodes,  
 (e) a subsidiary pair of spaced-apart electrodes located in said envelope to define a discharge gap to act as a voltage sharpening gap,  
 (f) means connecting said main pair of electrodes in series with said subsidiary pair of electrodes to define a series circuit,  
 (g) means for subjecting said main lasing region and said sharpening gap to preionization radiation,  
 (h) a firing circuit connected across said series circuit for providing a rising voltage pulse to said series circuit,  
 (i) an impedance element connected across each of the pairs of electrodes, whereby, upon an application of said rising voltage pulse across said series circuit, a portion of the voltage of said pulse appears across the subsidiary electrodes until the sharpening gap breaks down to act as a low inductance switch and rapidly increase the voltage across the main electrodes until the region between them breaks down to initiate lasing action, and  
 (j) further optical reflectors defining a second optical resonant cavity which extends along said envelope,  
 (k) said subsidiary pair of electrodes being located on respective sides of said second cavity to define a second lasing region in said second cavity between said subsidiary electrodes for lasing action when the sharpening gap therebetween breaks down.

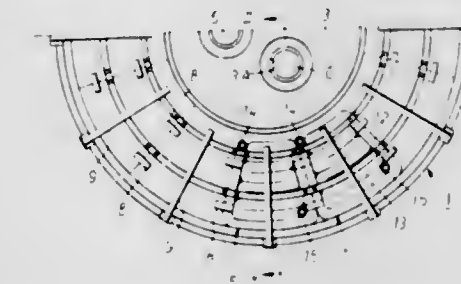
4,417,343  
**WATER-COOLED LID MADE OF STEEL TUBING FOR ELECTRIC FURNACE**

Seiji Yamamoto, Himeji, Japan, assignor to Nikko Co., Ltd., Hyogo, Japan

Filed Jun. 30, 1981, Ser. No. 279,083  
 Claims priority, application Japan, Oct. 1, 1980, 55-140711[U]; Oct. 1, 1980, 55-140712[U]  
 Int. Cl.<sup>3</sup> F27D 1/12

U.S. Cl. 373—73

3 Claims



1. A water-cooled lid made of steel tubing for an electric furnace comprising divided sectorial segments, each of the sectorial segments having a cooling water inlet and a cooling water outlet and being formed in its interior with a zigzag cooling water channel for holding the inlet in communication with the outlet, the lid being characterized in that the cooling water channel is formed by bending a single, partition-free, steel tube of circular cross section into zigzag portions folded together in intimate contact with one another and into a peripheral portion surrounding the zigzag portions in the form of a sector in intimate contact therewith, the sectorial segment being grouted with a refractory between the adjoining outer peripheral portions of the steel tube at least on one side of the segment exposed to the interior of the furnace.

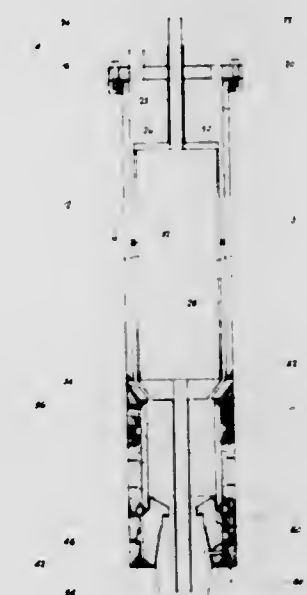
4,417,344

**COMPOSITE ELECTRODE FOR ARC FURNACE**  
 Grady R. Hogg, Jr., Elizabethton, and Nathan S. Tanner, Johnson City, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,828  
 Int. Cl.<sup>3</sup> H05B 7/101, 7/085

U.S. Cl. 373—93

7 Claims



1. An electrode for an electric arc smelting furnace comprising an upper liquid cooled section, a hollow threaded connecting nipple, and a graphite lower section,  
 (a) said upper section comprising:  
 1. a cylindrical main outer structure formed from metal tubing;



2. a head plate secured to the upper end of 1 having a cooling liquid inlet and outlet;
3. said inlet comprising tubing to be connected to an exterior liquid coolant supply and passing through said head plate, connected to a port in the top plate of a metal internal cylinder which is concentric with said main structure and separated therefrom by spacers;
4. said internal cylinder serving as a liquid reservoir, heat sink, and passageway for cooling liquid and occupying a majority of the internal volume of said main structure;
5. said main structure and said internal cylinder having a common lower end plate having a central cooling liquid port fitted with a outlet tube;
6. said lower outlet tube extending into the cavity of said nipple;
7. the periphery of said lower end plate being beveled;
8. cooling liquid passageways extending from top to bottom of said lower end plate approximately parallel to said bevel;
9. a cylindrical member comprising metal tubing defining a chamber depending from and having about the same diameter as the lower side of said lower end plate, and having attached thereto at its lower end a female socket for said nipple;
10. the socket and chamber areas being insulated by a series of superimposed exterior graphite rings having approximately the same interior diameter as the exterior of said socket and chamber and having about the same exterior diameter as said main structure, the top ring of said series being complementarily beveled to the beveled periphery of said lower end plate, each ring having a notch at its lower interior edge fitting a retaining ring attached to the exterior lower diameter of said socket;
11. said socket being hollow metal and having internal threads adapted to hold said correspondingly threaded nipple in place;
12. said inlet, internal cylinder, lower outlet tube, the annulus between said lower outlet tube and said nipple, said chamber, said passageways, the annulus between said main structure and said internal cylinder, and said outlets forming a continuous path for cooling liquid.

4,417,345

## HOLDER FOR AN ELECTRODE

Harald Krogsrud, Gjettem, Norway, assignor to Elkem a/s, Oslo, Norway

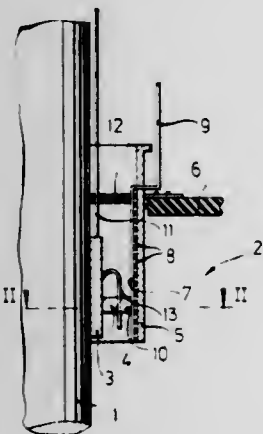
Filed Jul. 9, 1981, Ser. No. 281,720

Claims priority, application Norway, Jul. 25, 1980, 802263

Int. Cl.<sup>3</sup> H05B 7/10

U.S. Cl. 373-101

7 Claims



1. An electrode holder assembly for an electrode of an electrothermal smelting furnace comprising an external cooling shield operative also as a thrust member; a plurality of vertically-extending, current-conducting rails disposed on said cooling shield along an inner surface thereof; a plurality of contact clamps for clamping against an electrode; pressure producing means including a contact section slidable on said current-conducting rails;

ducting rails; said pressure producing means being arranged between said contact clamps and said current conducting rails wherein said pressure producing means are operative to transfer current to said contact clamps by contact of said contact sections against said current-conducting rails.

4,417,346

## HIGH TEMPERATURE MELTING FURNACE

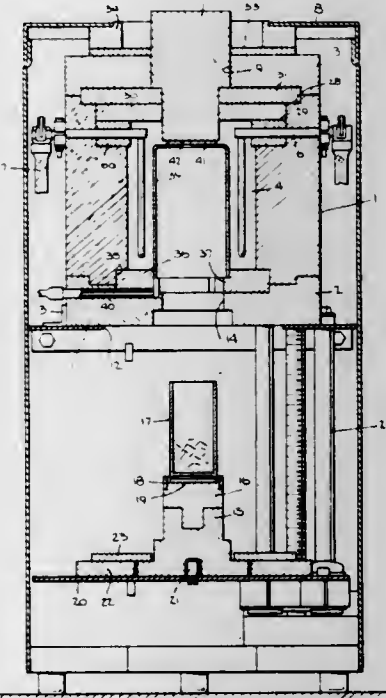
Roger R. Giler, Wilton, Conn., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Jun. 29, 1981, Ser. No. 278,053

Int. Cl.<sup>3</sup> H05B 3/00; F27D 1/00

U.S. Cl. 373-137

5 Claims



1. A high temperature melting furnace comprising a fibrous refractory vertical cylindrical shell, a fibrous refractory circular furnace top resting on the upper end of the shell, a plurality of molybdenum disilicide resistance wire loops depending inside the shell from right-angle molybdenum disilicide terminals which extend radially through the shell and hold the loops spaced from the inside of the shell, means for mounting the terminals on the shell so as to prevent concentrations of the terminals' weight on the shell, the furnace top having a vertical access hole provided with a fibrous refractory closure plug which is upwardly removable to permit access to the inside of the shell when the furnace is operating, a fibrous refractory furnace bottom on which the shell rests and the furnace bottom having a vertical charging hole provided with a refractory pedestal removably insertable in the charging hole and adapted to support a crucible for upward insertion into the furnace, the upper end of the shell being formed with internal recessed upper and lower annular shelves respectively of larger and smaller diameters and a small fibrous refractory disk resting on the smaller diameter shelf and a larger fibrous refractory disk resting on the larger diameter shelf and on top of the small disk, both of the disks being radially split with their respective slits circumferentially offset from each other and the disks having holes registered with the top's access hole and through which the access closure plug extends, the furnace top resting on the larger disk and the disks supporting the weight of the furnace top, said shell furnace bottom and furnace top being free from rigid horizontal and vertical restraint to thermal expansion and contraction and said split larger and smaller disks being free from rigid connection with each other and the shell, the outside of the shell having access to the ambient air and said fibrous refractory comprising interlocked refractory ceramic fibers.

4,417,347

## SEMICONDUCTOR PROCESSOR INCORPORATING BLACKBODY RADIATION SOURCE WITH CONSTANT PLANAR ENERGY FLUX

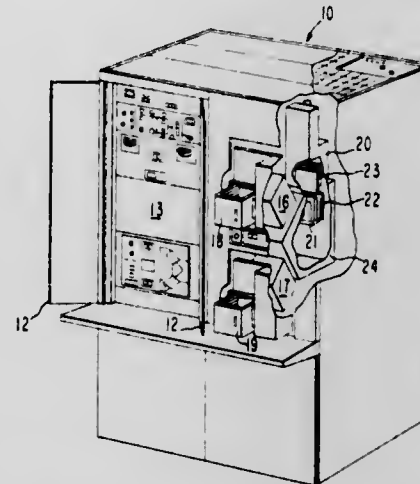
Richard S. Muka, Topsfield, and Carl J. Russo, Ipswich, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 12, 1981, Ser. No. 262,838

Int. Cl.<sup>3</sup> H05B 6/42

U.S. Cl. 373-158

8 Claims



1. An apparatus for thermally processing a semiconductor material, comprising:
  - a processing chamber;
  - vacuum generation means for controlling the pressure in said processing chamber;
  - means for introducing and removing said semiconductor material from said processing chamber;
  - a platen mounted within said processing chamber for receiving said material upon introduction, holding said material during thermal treatment and delivering said material for removal; and
  - a blackbody source having a constant planar energy flux characteristic, said source being positioned in opposition to said platen during said thermal treatment.

4,417,348

## ERRORLESS LINE PROTECTION SWITCHER

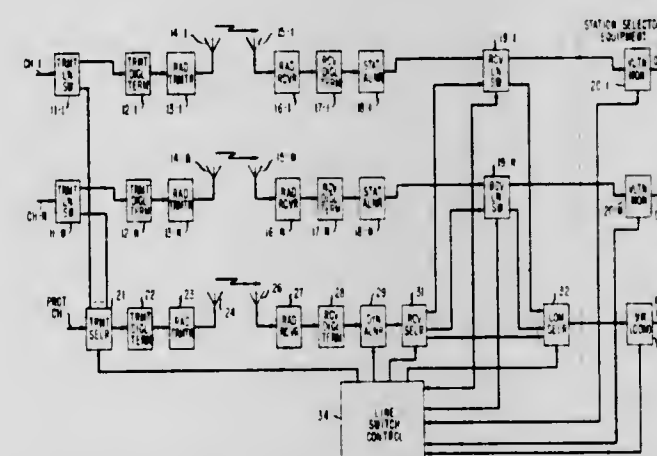
Charles R. Abbruscato, San Jose, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 30, 1981, Ser. No. 259,007

Int. Cl.<sup>3</sup> H04K 1/00

U.S. Cl. 375-40

11 Claims



1. In a digital radio system, a line protection switching arrangement comprising:
  - shifting means for adjusting the relative timing between digital signals of an impaired regular channel and of a spare channel when both channels are being provided the same digital signal for switching from the regular channel

to the spare channel, the shifting means comprising first and second stages serially connected together, each stage independently responsive to separate control signals, one stage providing signal shifts in fine discrete increments fractionally related to a bit increment of the digital signals and the other stage providing signal shifts in full bit increments of the digital signals;

detecting means connected to receive both digital signals and derived clocking signals via the shifting means for separately indicating channel signal alignment and clocking signal alignment;

switching means, connected to receive both digital signals of the spare and the impaired channel via the shifting means, for providing a signal path from either to its output; and controlling means for adjusting the shifting means responsive to the indications of the detecting means, the controlling means first aligning the clocking signals by adjusting the shifting means in fine discrete increments to vary the timing of one of the digital signals and its derived clocking signal and then aligning the bits of the digital signals by adjusting the shifting means in bit increments for one of the digital signals, and the controlling means directing the switching means to change the signal path to its output from the regular channel to the spare channel after the controlling means obtains channel signal alignment, thereby providing error free channel substitution.

4,417,349

## SCA DATA TRANSMISSION SYSTEM WITH A RAISED COSINE FILTER

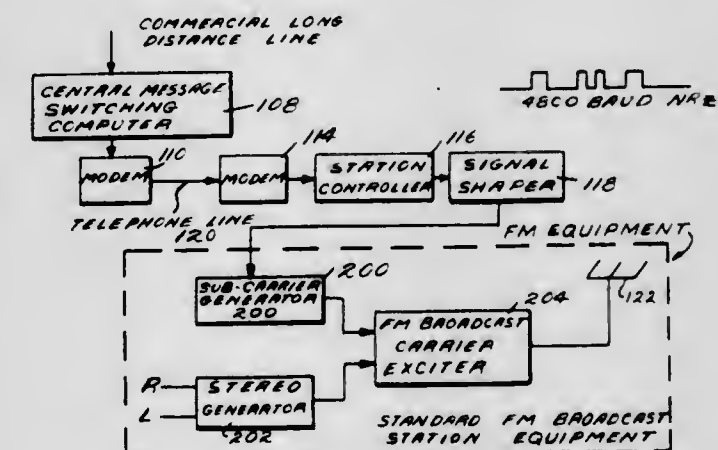
Michael Hills, McLean, Va.; Clay Durrett, Huntsville, Ala., and William Von Meister, McLean, Va., assignors to Digital Broadcasting Corporation, McLean, Va.

Filed Nov. 8, 1979, Ser. No. 92,463

Int. Cl.<sup>3</sup> H04H 5/00; H04L 25/03

U.S. Cl. 375-60

19 Claims



1. A method of transmitting data at a speed of at least about 4,800 bits per second comprising the steps of:

- generating digital data;
- containing the bandwidth of the transmitted data by converting said digital data to a bipolar line code format, said bipolar line code format including transitions in the absence of said generated digital data;
- shaping the converted digital data in the time domain to produce shaped digital data;
- frequency modulating a sub-carrier of a commercial broadcast channel with the shaped digital data to produce a modulated sub-carrier; and
- frequency modulating a carrier with the modulated sub-carrier.



4,417,350

**COUNTER CONTROL IN ELECTROPHOTOGRAPHIC COPIER**

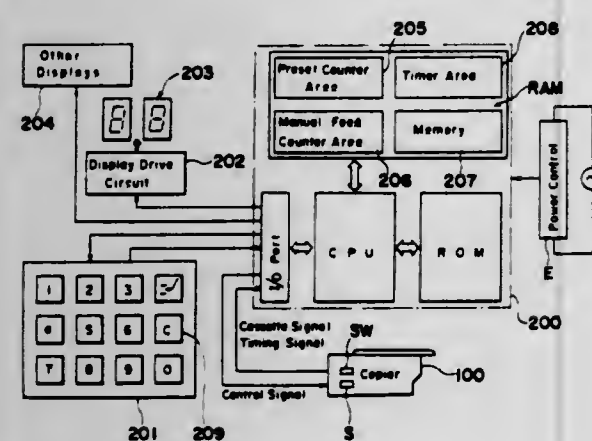
Hideo Ito; Masazumi Ito, both of Toyokawa; Kenzo Nagata, Okazaki, and Yutaka Irie, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1981, Ser. No. 246,318

Claims priority, application Japan, Mar. 28, 1980, 55-40982  
Int. Cl.<sup>3</sup> G06M 3/06

U.S. Cl. 377-8

12 Claims



1. In an electrophotographic copying machine comprising a preset counter device and which is selectively operable in one of a multi-copy mode wherein a copying operation is repeated to produce a plurality of copies while copying papers which are to have an image affixed thereto are automatically fed one at a time and a manual feed mode wherein said copying operation is carried out by the use of copying papers which are to have an image affixed thereto and which are fed manually one at a time, a counter control device which comprises:

- a counter means for adding or subtracting "1" each time one cycle of copying operation in the multi-copy mode is completed for displaying one of either the number of copies actually made or the number of copies left unfinished;
- display means for displaying count contents of said counter means;
- means for storing said count contents of said counter means;
- means for determining whether the machine is switched over to said multi-copy mode or said manual feed mode;
- display control means for causing said display means to display "0" and for transferring said count contents of said counter means to said storing means when said determining means determines that the machine is switched over to said manual feed mode and for adding "1" to the figure displayed by said display means each time one cycle of copying operation in said manual feed mode is completed; and
- means for retrieving said count contents stored in said storing means, and for causing said display means to display the thus retrieved count contents when said machine is switched over from said manual feed mode to said multi-copy mode.

4,417,351

**STACKED ARTICLE COUNTING APPARATUS**

Harry L. Williamson, Franklin, Ky.; Robert A. West, Portland, and Richard P. Manning, Nashville, both of Tenn., assignors to Intercontinental Data Corporation, Portland, Tenn.

Filed Jun. 3, 1981, Ser. No. 272,553

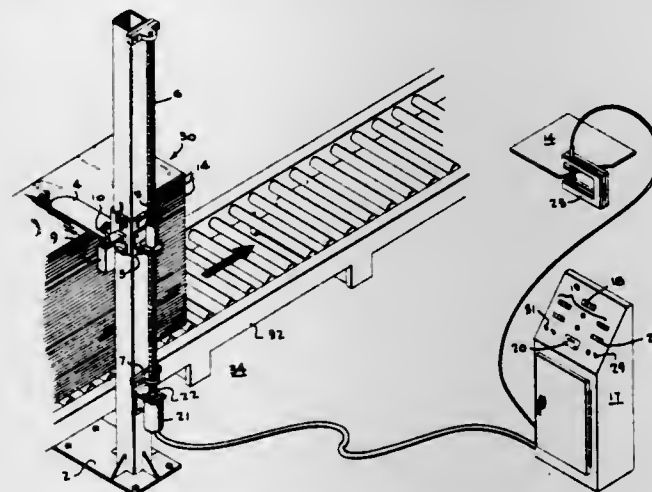
Int. Cl.<sup>3</sup> G06M 9/00

U.S. Cl. 377-8

8 Claims

1. Apparatus for determining the height of a stack of sheet-like elements, said apparatus comprising:  
(a) platen means movably suspended to sense the top of the stack for providing a terminating signal upon the sensing thereof;

- (b) means for providing a train of regular pulses;
- (c) drive means responsive to the regular pulses for driving said platen means from an initial position toward the stack; and
- (d) counter means responsive to the movement of said platen means from said initial position for initiating the counting of



the regular pulses, and responsive to the terminating signal for terminating the counting of the pulses, the number of pulses counted by said counter means being indicative of the height of the stack, whereby the number of sheet-like elements can be determined by said height of the stack.

4,417,352

**MICROPHASE STEPPER EMPLOYING IMPROVED DIGITAL TIMING INCREMENTER EMPLOYING A RATE MULTIPLIER**

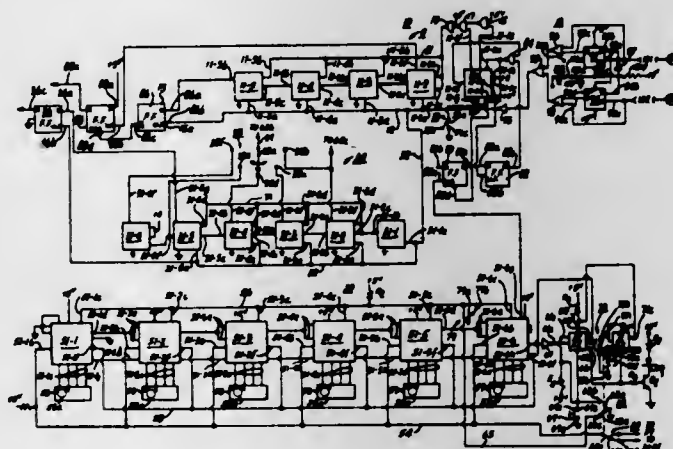
Leonard F. Shepard, Lake Grove, N.Y., assignor to ILC Data Device Corporation, Bohemia, N.Y.

Filed May 5, 1980, Ser. No. 146,512

Int. Cl.<sup>3</sup> H03K 5/15, 3/86, 17/28; H03H 7/18

U.S. Cl. 377-43

31 Claims



1. A digital time incrementer for offsetting the phase of an input signal comprising a counter having a plurality of counter stages, each designed to count in binary coded decimal fashion for dividing said input signal by  $10^N$  where  $N$ =number of said stages;

- at least one of said counter stages having loading means for inserting any desired binary coded decimal value into said one counter stage;
- the final stage of said counter producing an output signal;
- a high frequency pulse source;
- an input for coupling to said source of high frequency pulses;
- adjustable digital multiplier means coupled between said input and said counter;
- means for loading the predetermined binary coded decimal value applied to said loading means into said one counter stage in response to each output pulse passed by said digital multiplier means when said counter stage reaches a predetermined count;
- said digital multiplier means comprising settable means en-

abling said digital multiplier means to pass an output signal comprising a predetermined number of pulses generated by said high frequency pulse source as a function of the setting of said settable means whereby the total phase offset of the output signal of said counter relative to the input signal received by said counter is equal to the sum of the pulses applied to said pre-loading means.

4,417,353

**FAN BEAM CT SCANNER WITH COMPENSATING DETECTOR MOTION**

Gunther Groh; Hermann Weiss, both of Hamburg; Wolfgang Wagner, Norderstedt; Klaus Pasedach, Hamburg; Gunter Kowalski, Hamburg, and Dietrich Meyer-Ebrecht, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

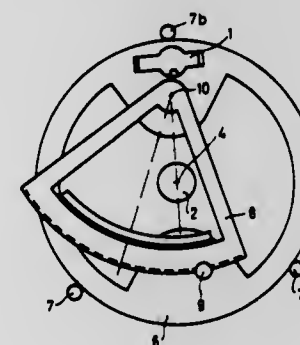
Filed Jan. 5, 1977, Ser. No. 756,856

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1976, 2600266

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378-4

10 Claims



1. In a device for measuring radiation absorption differences in a plane of a body wherein a source of radiation produces a fan-like beam of penetrating radiation which passes through the body and is measured by detectors in a detector group which is disposed on an arc of a circle; the source and detector group forming a system which rotates around the body so that the beam passes through the body from a plurality of angular orientations; the extent of the detector group being greater than the width of the fan-like beam whereby, at each angular orientation, a first subgroup of detectors in said group measure radiation which passes through said body and a second subgroup of detectors in said group do not measure radiation which passes through said body; the improvement wherein at each angular orientation the number of detectors in the second subgroup of detectors is substantially equal to or greater than the number of detectors in the first subgroup and further comprising means for pivoting the group about a center of curvature with a motion which is coupled to the rotation of the system so that individual detectors progressively move into and out of the radiation passing through the body at progressive angular positions and each detector in the detector group measures radiation passing through the body at some angular orientation.

4,417,354

**DIAGNOSTIC RADIOLOGY INSTALLATION**

Manfred Pfeller, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 6, 1981, Ser. No. 251,056

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017494

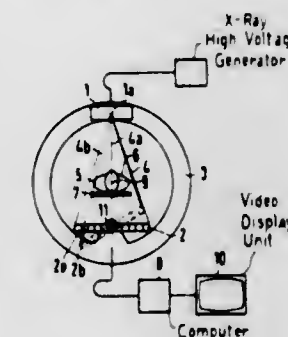
Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378-19

5 Claims

1. A diagnostic radiology installation comprising a patient support, a radiation measuring arrangement comprised of a radiation source, which generates a fan-shaped radiation beam lying in a fan-plane and penetrating the radiography subject,

and of a radiation receiver having an array of detectors, means for producing a relative movement between the patient support and the radiation measuring arrangement, and a measuring and processing circuit for the formation of an image of the body region scanned during the relative movement, the im-



4,417,355

**X-RAY FLUORESCENCE SPECTROMETER**

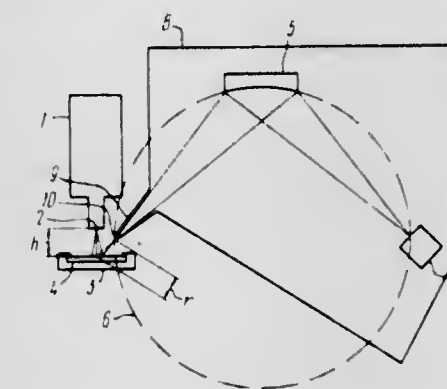
Kliment V. Anisovich; Nikolai I. Komyak, and Zaurbek K. Menbaev, all of Leningrad, U.S.S.R., assignors to Leningradskoe NPO "Burevestnik", Leningrad, U.S.S.R.

Filed Jan. 8, 1981, Ser. No. 223,268

Int. Cl.<sup>3</sup> G01N 23/22

U.S. Cl. 378-49

2 Claims



2. An X-ray fluorescence spectrometer comprising:  
an evacuated chamber;  
an X-ray source;

- a sample holder positioned across the radiation path of said source, said sample holder positioned at such a distance from the focus of said X-ray source that the specific illumination in the central region of the surface of a sample is not less than  $0.3 \text{ ZU erg/s.cm}^2\text{.w}$ , where  $Z$  is the atomic weight of the material of the anode of said X-ray source, and  $U$  is the voltage across said X-ray source in kilovolts;
- a curved analyzing crystal, the curvature of the planes of said crystal determining the diameter of a focus circle, said analyzing crystal focusing the fluorescent radiation of the sample arranged in said sample holder;
- an X-ray detector for recording the radiation focused by said analyzing crystal;
- said analyzing crystal and said detector being positioned in said evacuated chamber of the spectrometer and said X-ray source and said sample holder being positioned in the open air outside said evacuated chamber;
- said evacuated chamber having a vacuum sealed inlet window transparent to X-rays, said window forming an inlet slot of said spectrometer, said inlet slot being positioned



across the beam of fluorescent X-rays of said sample and arranged at said focus circle;  
said sample holder being positioned with respect to said inlet slot in such manner that the average distance between the region on the surface of the sample being analyzed and said inlet slot does not exceed the distance from that region of the sample to the focus of said X-ray source.

4,417,356

## MAGNETIC FRICTION DEVICE

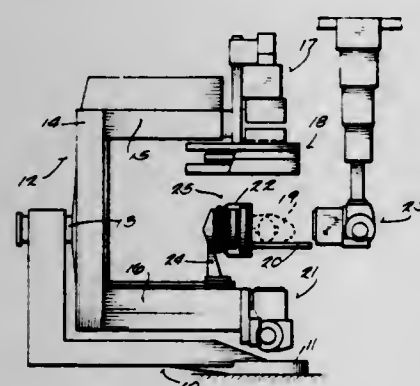
David L. Hoffman, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed May 14, 1981, Ser. No. 263,663

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378—181

12 Claims



1. Apparatus for x-ray examination of a body that is supported in a predetermined position including an x-ray source operative to project a beam of radiation into said body, support means, and image receptor means for receiving the x-ray image emergent from said body, and

improved means for mounting said receptor means to said support means in a manner that lets said receptor means be moved relative to the support means and x-ray source by applying a predetermined force and that holds said receptor means in a fixed position when said force is discontinued, comprising:

one member coupled to said receptor means and another member coupled to said support means,

means for holding said members in proximity with each other with a gap between them and permitting one member to move in parallelism with the other,

one of said members having a planar surface defined by a magnetic material,

the other member having a surface defined by a nonmagnetic material and having a recess presented toward the planar surface of the magnetic material,

permanent magnet element having a planar surface and being contained in the recess of the nonmagnetic material, said element being movable in a direction perpendicular to its planar surface for being attracted to the magnetic surface to develop a frictional force that must be overcome to move one member relative to the other, said magnet element being comprised of a polymer containing magnetized particles.

4,417,357

## SPACE-SAVING SELECTOR

Marcel Le Sonn, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 3, 1982, Ser. No. 384,750

Claims priority, application France, Jun. 5, 1981, 81 11222

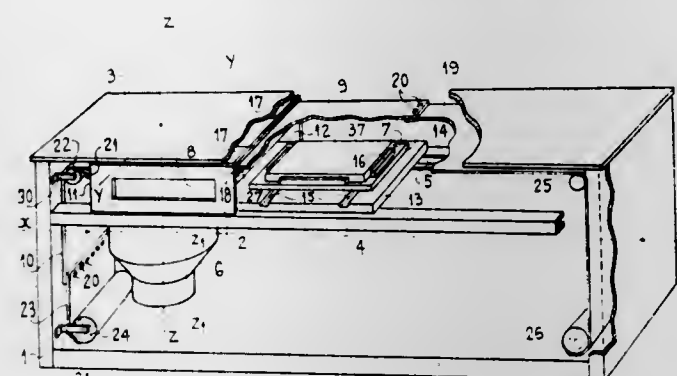
Int. Cl.<sup>3</sup> G03B 41/18

U.S. Cl. 378—177

10 Claims

1. In a space-saving selector equipping an examination table of a radiological apparatus in which it is contained, movable over the whole length of said table, comprising: a cassette-carrying plate supporting a radiographic cassette, first drive means for moving said cassette-carrying plate along axes trans-

versal to the examination table, a second plate supporting said cassette-carrying plate, second drive means for moving said second plate parallel to a longitudinal axis of said table, there are further provided apertures opening at the right and left of the selector on to zones comprising means for protecting said radiographic cassette against X-radiation; said second drive



means, in a first stage, transporting said second plate outside the selector, on one side or the other thereof, so as to place the radiographic cassette in a position sheltered from the X-rays and, in a second stage, re-introducing said second plate into the selector so as to place the radiographic cassette in the radiographic position.

4,417,358

## AMPLITUDE MODULATED TRANSMITTER FOR SINGLE SIDEBAND OPERATION

Jürgen Zeis, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

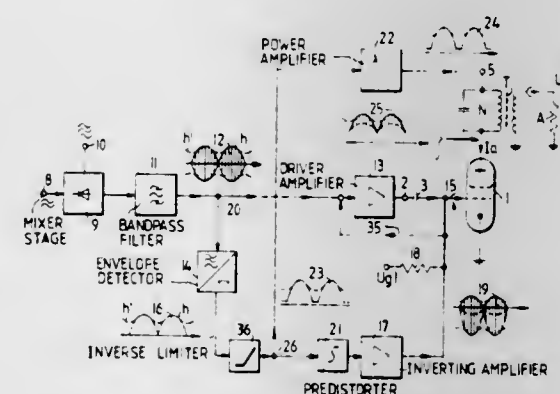
Filed Oct. 22, 1981, Ser. No. 314,046

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3040272

Int. Cl.<sup>3</sup> H04B 1/02

U.S. Cl. 455—109

9 Claims



1. In a transmitter of amplitude modulated single sideband signals, which transmitter includes an output stage having a control electrode connected to receive a single sideband input signal having an envelope curve, the output stage having a nonlinear gain characteristic and effecting substantial linear amplification of the single sideband input signal, and a reactance network tuned to the single sideband frequency and connected to the output of the output stage, the improvement wherein;

said transmitter further comprises control means connected to said output stage for controlling the current conduction angle at the output of the output stage in a manner to increase the current conduction angle as the amplitude of the input signal decreases;

said control means including signal conduction means for applying the single sideband input signal and a signal derived from the envelope curve of the single sideband

input signal to the control electrode of said output stage without any substantial relative phase shift and in a hysteresis free manner; and  
said control means further including current conduction angle varying means for varying the output current con-

duction angle down to values corresponding to class C amplifier operation for the highest single sideband input signal amplitudes.



## DESIGNS

NOVEMBER 22, 1983

271,439

### TWO COLOR CHEWING GUM

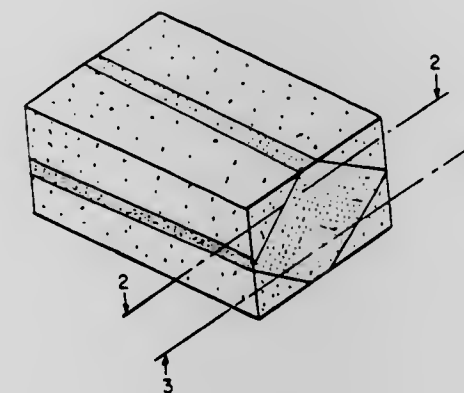
Robert W. Schumacher, Valley Stream, N.Y., assignor to Warner-Lambert Co., Morris Plains, N.J.

Filed Dec. 12, 1980, Ser. No. 215,985

Term of patent 14 years

Int. Cl. D01-01

U.S. Cl. D1-12



271,441

### ALPINE SKI BOOT

George Salomon, and Roger Pitiot, both of Annecy, France, assignors to Ets. Francois Salomon et Fils, Annecy, France

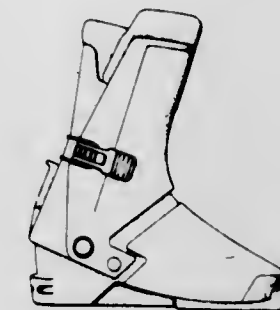
Filed Oct. 22, 1981, Ser. No. 313,919

Claims priority, application France, Apr. 27, 1981, 81 698

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-276



271,442

### COMBINED LITTER BASKET AND SNACK TRAY FOR A MOTOR VEHICLE

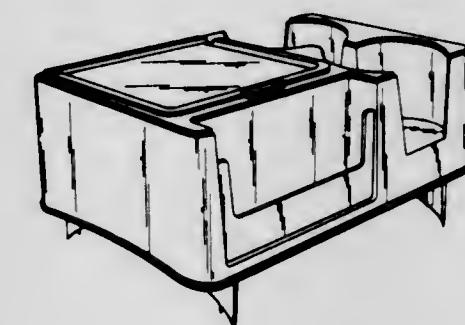
Daniel F. Lehner, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio

Filed Feb. 17, 1982, Ser. No. 349,606

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D3-40



271,440

### BRASSIERE

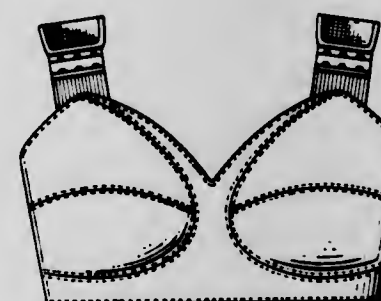
Eula M. Claridge, 112 S. Adelia, Overton, Nev. 89040

Filed Jul. 17, 1981, Ser. No. 284,368

Term of patent 14 years

Int. Cl. D2-01

U.S. Cl. D2-24



271,443

### KEY HOLDER

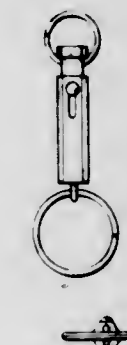
Sumner MacDonald, 326 Carpenter St., Providence, R.I. 02909

Filed Nov. 30, 1981, Ser. No. 326,170

Term of patent 14 years

Int. Cl. D3-01

U.S. Cl. D3-61

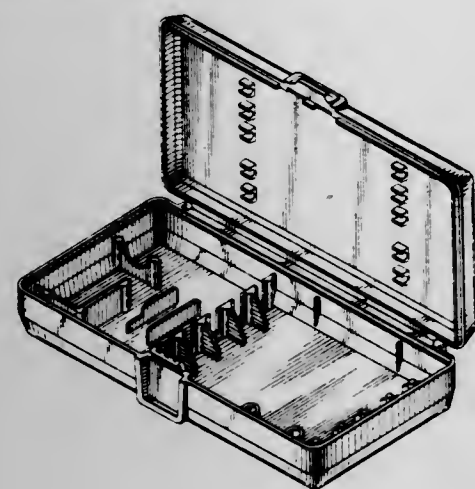




**271,444**  
**CARRYING CASE FOR KNIFE SHARPENING**  
**APPARATUS**

Arthur L. LeVine, P.O. Box 800, Williamsville, N.Y. 14221  
Filed Dec. 11, 1981, Ser. No. 329,817  
Term of patent 14 years  
Int. Cl. D3—02

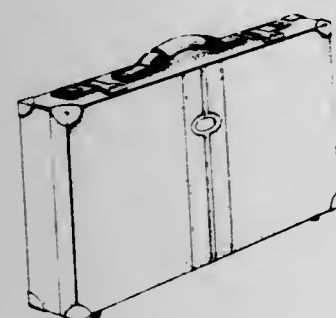
U.S. Cl. D3—74



**271,445**  
**ATTACHE CASE**

John Y. Kim, Glendale, Calif., assignor to Crown Luggage & Imports, Inc., Los Angeles, Calif.  
Filed Aug. 18, 1981, Ser. No. 293,868  
Term of patent 14 years  
Int. Cl. D3—01

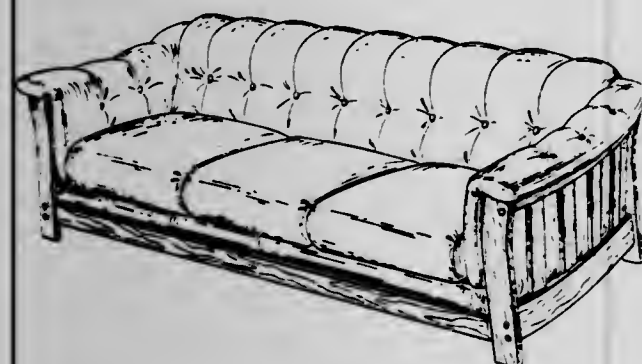
U.S. Cl. D3—76



**271,446**  
**SOFA**

Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.  
Filed Apr. 27, 1981, Ser. No. 257,721  
Term of patent 14 years  
Int. Cl. D6—01

U.S. Cl. D6—63

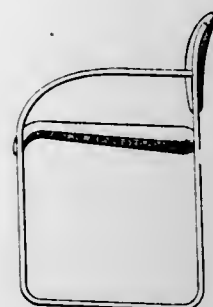


**271,447**  
**CHAIR**

Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904

Filed Feb. 25, 1981, Ser. No. 237,999  
Term of patent 14 years  
Int. Cl. D6—01

U.S. Cl. D6—69

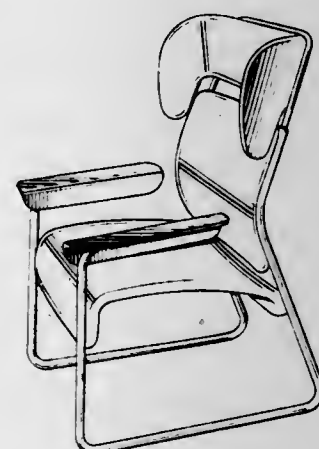


**271,448**  
**ARM CHAIR**

Arthur C. Crockett, Cincinnati, Ohio, assignor to Simmons Universal Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,698  
Term of patent 14 years  
Int. Cl. D6—01

U.S. Cl. D6—69

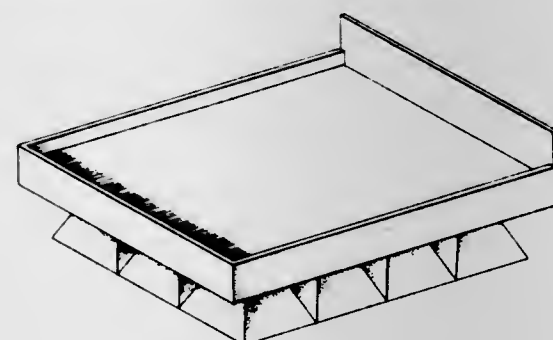


**271,449**  
**PLATFORM BED**

Joseph W. Dennis, 4054 Little Richmond Rd., Dayton, Ohio 45427

Filed Oct. 3, 1980, Ser. No. 194,181  
Term of patent 14 years  
Int. Cl. D6—01

U.S. Cl. D6—83

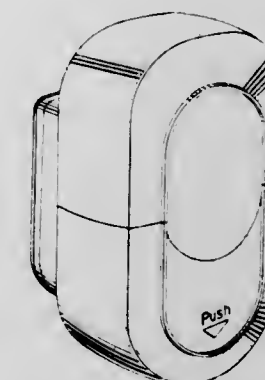


**271,450**  
**DISPENSER FOR FLUID OR SEMI-FLUID MATERIALS**

Gary B. Kleman, St. Louis, Mo., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 18, 1981, Ser. No. 275,007  
Term of patent 14 years  
Int. Cl. D23—02

U.S. Cl. D6—95

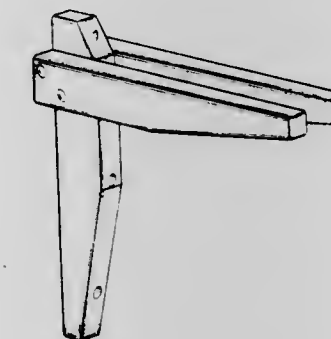


**271,451**  
**SKI RACK**

David B. Deima, 35 Greentree Rd., Chagrin Falls, Ohio 44022

Filed Mar. 12, 1979, Ser. No. 19,500  
Term of patent 14 years  
Int. Cl. D6—04

U.S. Cl. D6—125



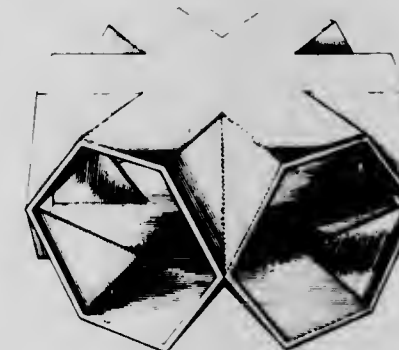
**271,452**  
**TABLE**

John W. Rozsnyai, 4272 Sheppard Dr., Las Vegas, Nev. 89121  
Continuation-in-part of Ser. No. 145,721, May 1, 1980. This application Mar. 24, 1982, Ser. No. 361,574

The portion of the term of this patent subsequent to Nov. 16, 1996, has been disclaimed.

Term of patent 14 years  
Int. Cl. D6—03

U.S. Cl. D6—149

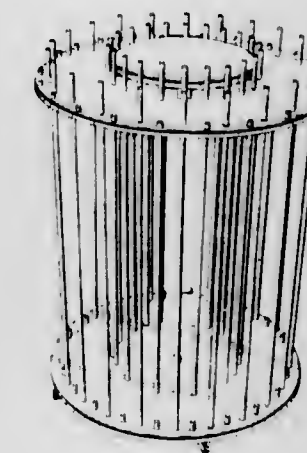


**271,453**  
**WINE RACK**

William Tucker, 1913 Dupont Ave., Minneapolis, Minn. 55405

Filed May 26, 1981, Ser. No. 266,752  
Term of patent 14 years  
Int. Cl. D06—04

U.S. Cl. D6—157

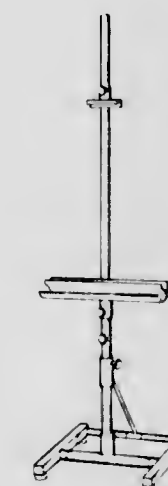


**271,454**  
**EASEL**

Bruno Forte, Spreziano, Italy, assignor to Northwest Blueprint & Supply Co., Livonia, Mich.

Filed Jun. 1, 1982, Ser. No. 383,540  
Term of patent 14 years  
Int. Cl. D6—99

U.S. Cl. D6—180





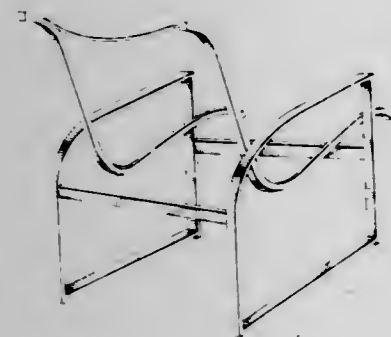
271,455  
CHAIR FRAME

Herbert C. Saiger, Troy, Ohio, assignor to Lee L. Woodard Sons, Inc., Owosso, Mich.

Continuation-in-part of Ser. No. 248,723, Mar. 30, 1981. This application Apr. 2, 1982, Ser. No. 365,018

Term of patent 14 years  
Int. Cl. D6—06

U.S. Cl. D6—191



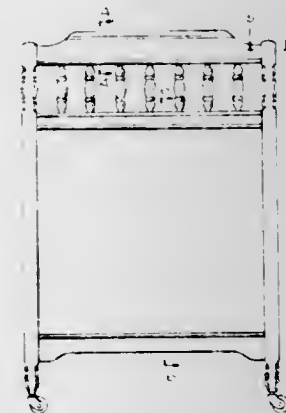
271,457  
CRIB FOOTBOARD

Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Aug. 7, 1981, Ser. No. 290,991

Term of patent 14 years  
Int. Cl. D6—06

U.S. Cl. D6—198



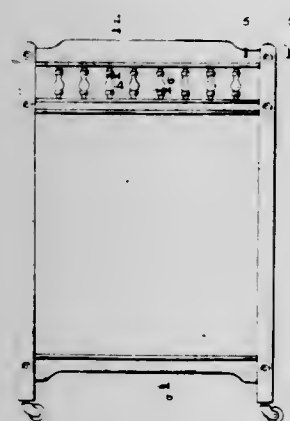
271,456  
CRIB FOOTBOARD

Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Aug. 7, 1981, Ser. No. 290,990

Term of patent 14 years  
Int. Cl. D6—06

U.S. Cl. D6—198



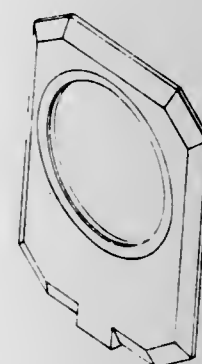
271,458  
PICTURE FRAME

George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002

Filed Jul. 6, 1981, Ser. No. 280,873

Term of patent 14 years  
Int. Cl. D6—07

U.S. Cl. D6—245



271,459  
GOBLET

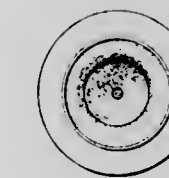
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland

Filed Nov. 30, 1981, Ser. No. 325,915

Claims priority, application Switzerland, May 29, 1981, 71465.

Term of patent 14 years  
Int. Cl. D07—01

U.S. Cl. D7—13



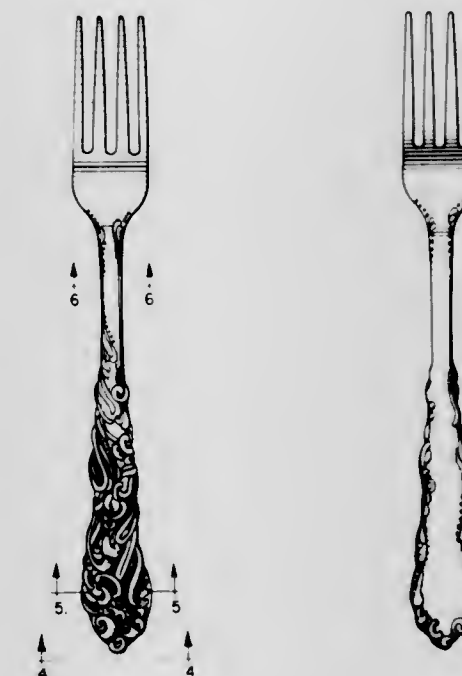
271,461  
FORK OR SIMILAR ARTICLE

Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,718

Term of patent 14 years  
Int. Cl. D07—03

U.S. Cl. D7—150



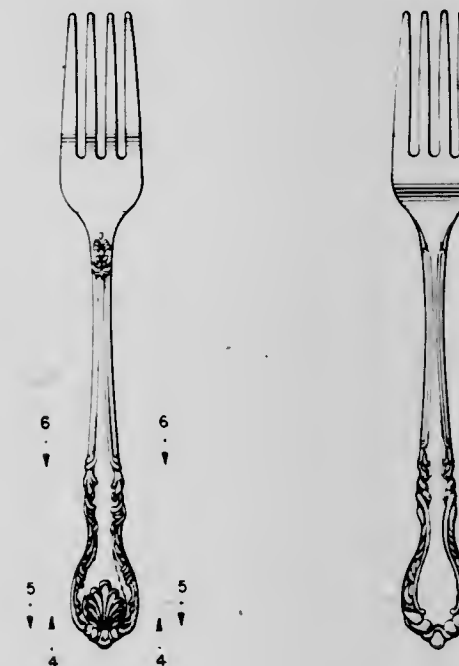
271,460  
FORK OR SIMILAR ARTICLE

Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,551

Term of patent 14 years  
Int. Cl. D07—03

U.S. Cl. D7—137



271,462  
SANITARY MACHINE FOR STORING AND  
DISPENSING PARTICULATE ICE AND FOR  
DISPENSING BEVERAGE

Charles M. Lents, Leon Valley, Tex., assignor to Stainless Ice-tainer Company, San Antonio, Tex.

Filed Mar. 23, 1981, Ser. No. 246,466

The portion of the term of this patent subsequent to Jun. 29, 1996, has been disclaimed.

Term of patent 14 years  
Int. Cl. D15—08

U.S. Cl. D7—305





271,463

**SANITARY COUNTERTOP MACHINE FOR STORING AND DISPENSING PARTICULATE ICE AND FOR DISPENSING BEVERAGE**Charles M. Lents, Leon Valley, Tex., assignor to Stainless Ice-  
tainer Company, San Antonio, Tex.

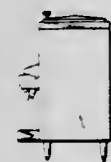
Filed Mar. 23, 1981, Ser. No. 246,467

The portion of the term of this patent subsequent to Jun. 29,  
1996, has been disclaimed.

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D7-305



271,465

**SAFETY HOOK**Michel Boissonnet, Thiers, France, assignor to S.A.R.L. Wich-  
ard, Thiers, France

Filed Apr. 7, 1981, Ser. No. 251,781

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-367



271,466

**SAFETY HOOK**Michel Boissonnet, Thiers, France, assignor to S.A.R.L. Wich-  
ard, Thiers, France

Filed Jul. 14, 1981, Ser. No. 283,293

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-367



271,464

**COMBINED KNOB AND ESCUTCHEON FOR CABINETS OR THE LIKE**Robert D. Carlson, Fullerton, Calif., assignor to Keystone Con-  
solidated Industries, Inc., Peoria, Ill.

Filed Sep. 28, 1981, Ser. No. 305,938

Term of patent 14 years

Int. Cl. D8-06, 09

U.S. Cl. D8-301



271,467

**SNAP-ACTION CLIP**Keizaburo Sakaguchi, Tokyo, Japan, assignor to Sakaguchi  
Plastic Industrial Co., Ltd., Tokyo, Japan

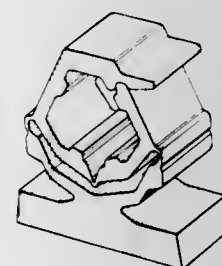
Filed Jun. 25, 1981, Ser. No. 276,908

Claims priority, application Japan, Dec. 25, 1980, 55-54277

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-382



271,468

**BOTTLE**Vilmos Soos, Toronto, Canada, assignor to S. C. Johnson & Son,  
Inc., Racine, Wis.

Filed Sep. 14, 1980, Ser. No. 301,710

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-377



271,469

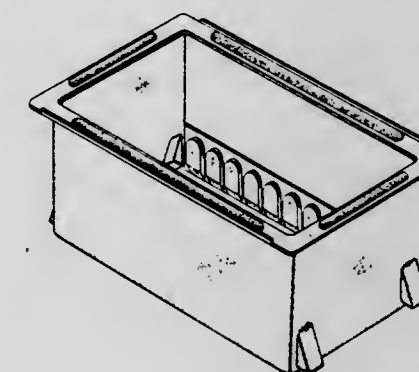
**STACKABLE BOX**Barry Dep, Castro Valley, Calif., assignor to United Plastics  
Corporation, Oakland, Calif.

Filed Jul. 13, 1981, Ser. No. 282,928

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-425



271,470

**PIERCED EAR-RING HOLDER**

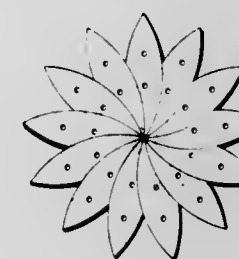
Howard Lauck, 17 Blossom Ct., Daly City, Calif. 94014

Filed Mar. 23, 1981, Ser. No. 246,900

Term of patent 14 years

Int. Cl. D09-99

U.S. Cl. D9-457



271,471

**COMBINED WRIST WATCH AND ARM BAND**Giovanni Bulgari, Rome, Italy, assignor to Anthos S.A., Geneva,  
Switzerland

Filed Oct. 1, 1981, Ser. No. 307,443

Claims priority, application Hague, Apr. 3, 1981, DM/000  
671

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-32



271,472

**WATCHCASE**Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T.  
Dupont, Paris, France

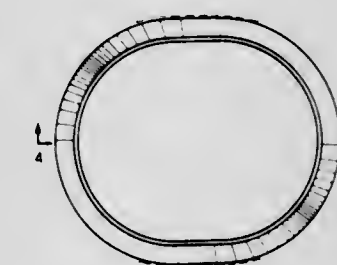
Filed Jul. 30, 1980, Ser. No. 173,771

Claims priority, application France, Feb. 1, 1980, 80 0188

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-38



271,473

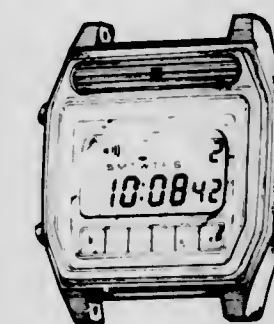
**WRISTWATCH**Toshiyuki Dobashi, Tokyo, Japan, assignor to Kabushiki Kaisha  
Daini Seikosha, Tokyo, Japan

Filed Oct. 1, 1981, Ser. No. 307,522

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-38





271,474

**THERMOREGULATOR**

Gustave J. Klein, Great Neck, N.Y., assignor to Revlon Realistic Professional Products, Inc., Cincinnati, Ohio  
 Filed Sep. 3, 1981, Ser. No. 298,851  
 Term of patent 14 years  
 Int. Cl. D10-04

U.S. Cl. D10-50

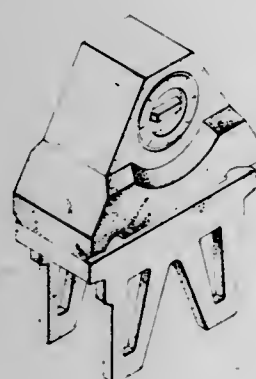


271,475

**HOUSING FOR A STOP MOTION**

Raymond L. Lagueux, Charlotte, N.C., assignor to IRO, Inc., South Windsor, Conn.  
 Filed Apr. 27, 1981, Ser. No. 257,799  
 Term of patent 14 years  
 Int. Cl. D10-07

U.S. Cl. D10-103

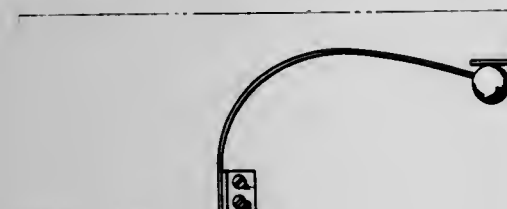


271,476

**INDICATOR FOR A RURAL MAILBOX**

Allen Gaudet, Sr., 1217 Blue Hills Ave., Bloomfield, Conn.  
 Filed Sep. 25, 1980, Ser. No. 190,940  
 Term of patent 14 years  
 Int. Cl. D10-06

U.S. Cl. D10-109

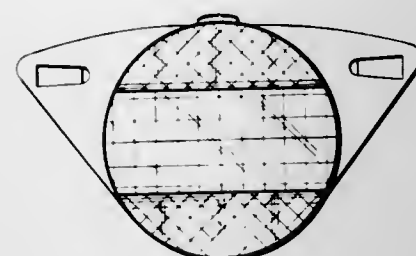


271,477

**DECORATIVE BICYCLE WHEEL LIGHT REFLECTOR**

David Kalish, 26 Westminster Ave., Venice, Los Angeles County, Calif. 90291  
 Filed Jul. 1, 1981, Ser. No. 279,463  
 Term of patent 14 years  
 Int. Cl. D10-06

U.S. Cl. D10-111



271,478

**NECKLACE OR THE LIKE**

Pepi G. Kelman, 19264 Pacific Coast Hwy., Malibu, Calif. 90265  
 Filed Mar. 22, 1982, Ser. No. 360,613  
 Term of patent 14 years  
 Int. Cl. D11-01

U.S. Cl. D11-6



271,479

**GRASSHOPPER FIGURE**

Tatsuya Kodaka, 25-6, Wakamiya 1-chome, Nakano-ku, Tokyo, Japan  
 Filed Nov. 12, 1981, Ser. No. 320,729  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-162

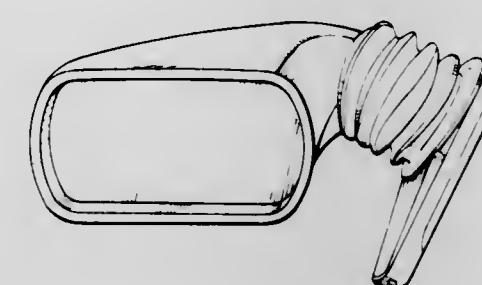


271,480

**REAR VIEW MIRROR**

Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Turin, Italy  
 Filed Mar. 3, 1981, Ser. No. 239,929  
 Claims priority, application Italy, Oct. 14, 1980, 53577/80[U]  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-187



271,481

**MAT FOR AN AUTOMOTIVE DASHBOARD**

Gerald Y. Sugai, 4304 East Springfield St., Simi Valley, Calif. 93063  
 Filed Aug. 17, 1981, Ser. No. 293,378  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-192

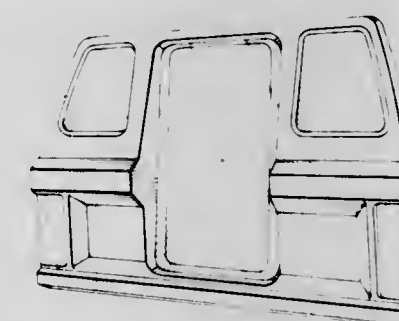


271,482

**PICK-UP TRUCK REAR PANEL**

John Collins, Elkhart, Ind., assignor to Leer, Inc., Elkhart, Ind.  
 Filed Jun. 17, 1981, Ser. No. 274,713  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-196



271,483

**BOAT**

Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.  
 Filed Jun. 5, 1981, Ser. No. 270,797  
 Term of patent 14 years  
 Int. Cl. D12-06

U.S. Cl. D12-300

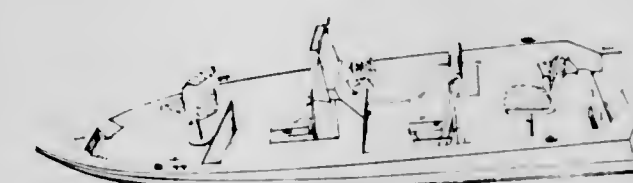


271,484

**BOAT**

Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.  
 Filed Jun. 5, 1981, Ser. No. 271,005  
 Term of patent 14 years  
 Int. Cl. D12-06

U.S. Cl. D12-300



271,485

**AIRCRAFT**

Morgan Z. Tucson, 920 Johnson Ave., #230, Arlington, Tex. 76011  
 Filed Dec. 12, 1980, Ser. No. 215,570  
 Term of patent 14 years  
 Int. Cl. D12-07

U.S. Cl. D12-332





271,486

## DICTATING MACHINE

Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

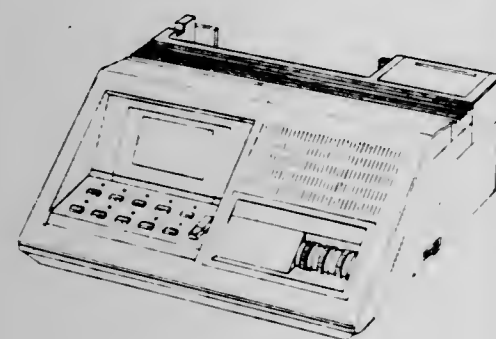
Filed Apr. 2, 1981, Ser. No. 250,369

Claims priority, application Benelux, Oct. 6, 1980, 55075-00

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-3



271,488

## DESK TELEPHONE

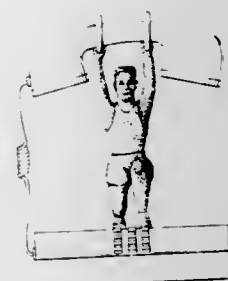
Ting H. Mak, 7816 Mulberry Bottom La., Springfield, Va. 22153

Filed Apr. 30, 1981, Ser. No. 259,116

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



271,487

## TELEPHONE INSTRUMENT

Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

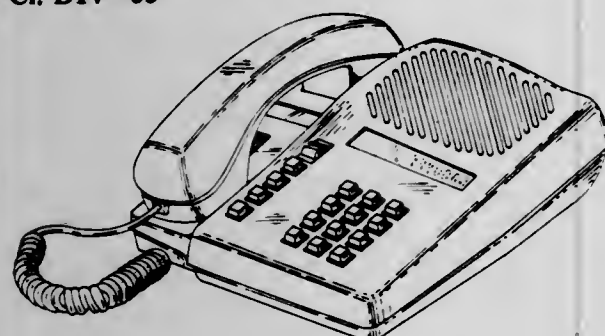
Filed Dec. 4, 1980, Ser. No. 213,009

Claims priority, application Sweden, Jun. 9, 1980, 801158

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



271,489

## TELEPHONE SET

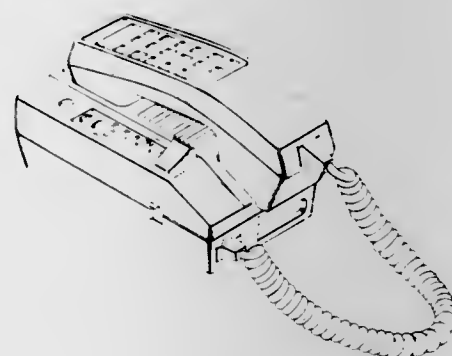
Hisao Fukushima, and Masaharu Tarao, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,284

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



271,490

## TELEPHONE SET

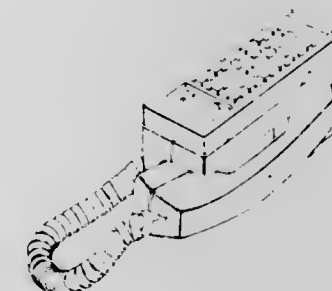
Hisao Fukushima, and Masaharu Tarao, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,285

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



271,492

## MERCHANDISING TERMINAL

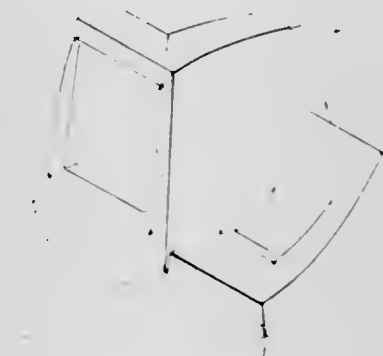
William E. Roberts, Rolling Hills Estates, Calif., assignor to Logicon, Inc., Torrance, Calif.

Filed Jul. 2, 1981, Ser. No. 279,796

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D14-106



271,493

## PUMP FOR TRANSFERRING SOLID MATERIAL AND THE LIKE

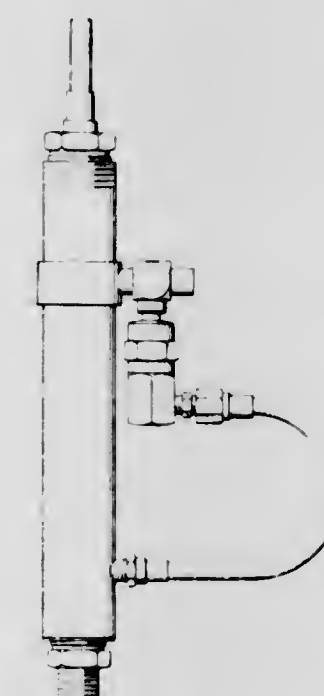
Sam D. McMullen, Houston, Tex., assignor to Matcote Company, Inc., Houston, Tex.

Filed Sep. 14, 1981, Ser. No. 302,137

Term of patent 14 years

Int. Cl. D15-02

U.S. Cl. D15-7



271,491

## CONTROL UNIT FOR A TWO-WAY RADIO OR SIMILAR ARTICLE

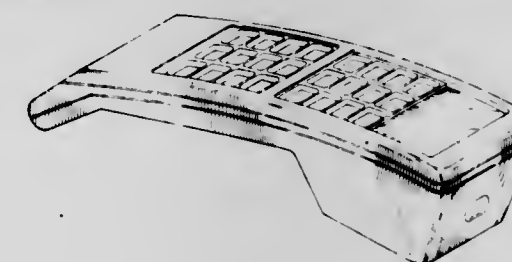
Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1981, Ser. No. 293,041

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-76





271,494

**SKIRT FOR AGRICULTURAL MACHINES FOR MOVING FODDER**

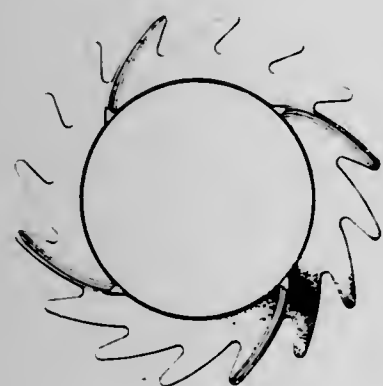
Pierre Kaetzel, Saverne, France, assignor to Belrecolt S.A., Marmoutier, France.

Division of Ser. No. 143,295, Apr. 24, 1980. This application  
Jun. 22, 1982, Ser. No. 390,862

Term of patent 14 years

Int. Cl. D15—03

U.S. Cl. D15—10



271,496

**SANITARY COUNTERTOP MACHINE FOR STORING AND DISPENSING PARTICULATE ICE**

Charles M. Lents, Leon Valley, Tex., assignor to Stainless Ice-tainer Company, San Antonio, Tex.

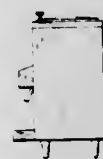
Filed Mar. 23, 1981, Ser. No. 246,465

The portion of the term of this patent subsequent to Jun. 29, 1996, has been disclaimed.

Term of patent 14 years

Int. Cl. D15—07

U.S. Cl. D15—80



271,495

**CUTTER TOOTH FOR SUCTION DREDGERS**

Torsten Larsson, and Arne Johansson, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

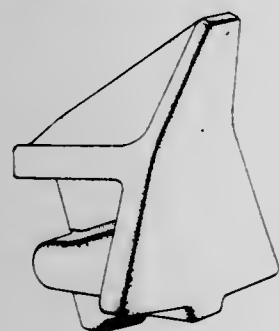
Filed Dec. 29, 1980, Ser. No. 220,384

Claims priority, application Sweden, Jul. 15, 1980, 80-1405

Term of patent 14 years

Int. Cl. D15—04

U.S. Cl. D15—29



271,497

**COMBINED CUTTING TOOLS AND HOLDER THEREFOR**

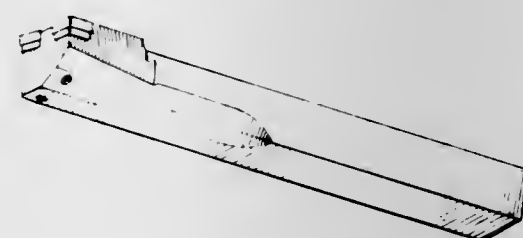
Charles L. Green, 7536 Atoll Ave., North Hollywood, Calif. 91605

Filed Jan. 21, 1981, Ser. No. 226,625

Term of patent 14 years

Int. Cl. D15—09

U.S. Cl. D15—139



271,498

**PHOTOGRAPHIC PROCESSOR**

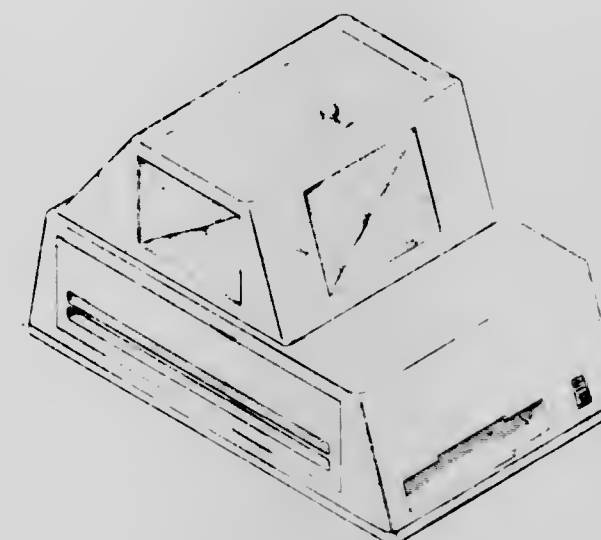
Montague Everett, Greenwich, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,464

Term of patent 14 years

Int. Cl. D16—04

U.S. Cl. D16—33



271,500

**READING MACHINE FOR ADVANCING AND DISPLAYING READING MATERIAL FOR PHYSICALLY HANDICAPPED PERSONS**

George A. Monick, 3075 N. Quincy St., Arlington, Va. 22207

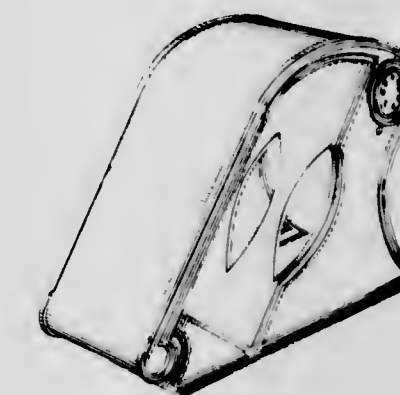
Filed May 5, 1981, Ser. No. 260,948

The portion of the term of this patent subsequent to Jan. 12, 1996, has been disclaimed.

Term of patent 14 years

Int. Cl. D19—07

U.S. Cl. D19—91



271,499

**PRINTED TYPE FONT**

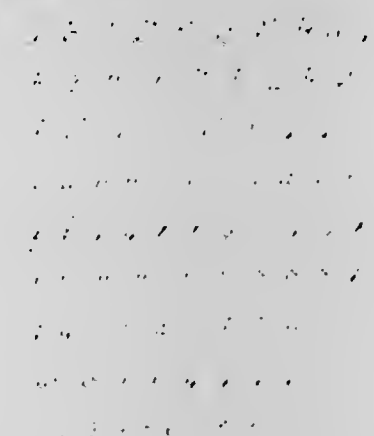
Marjorie L. Burns, New York, N.Y., assignor to Steck-Vaughn Company, Austin, Tex.

Filed Apr. 16, 1981, Ser. No. 254,863

Term of patent 14 years

Int. Cl. D18—03

U.S. Cl. D18—28



271,501

**ADJUSTABLE SUPPORT SURFACE FOR HOLDING REFERENCE OR PRINTOUT MATERIAL**

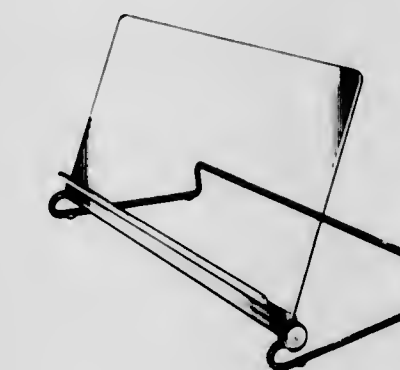
John B. Manning, Worcester, and David K. Crabbe, Millbury, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Aug. 31, 1981, Ser. No. 298,136

Term of patent 14 years

Int. Cl. D19—02

U.S. Cl. D19—91





271,502  
GAME BOARD

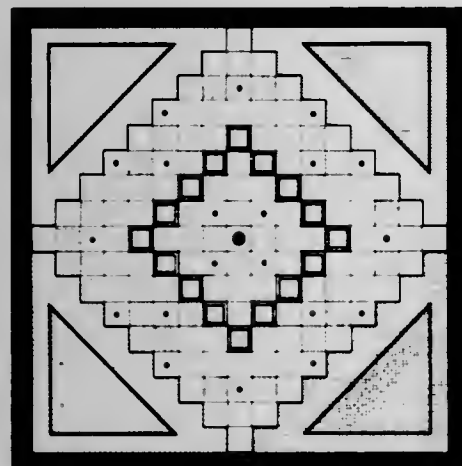
Sharon E. Zeldin, 38506 Calle de la Siesta, Murrieta Hot Springs, Calif. 92362

Filed Oct. 2, 1981, Ser. No. 307,797

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-24



271,504  
TOY VEHICLE

Marc Rivollet, Oyonnax, France, assignor to Etablissements Fernand Berchet, Oyonnax, France

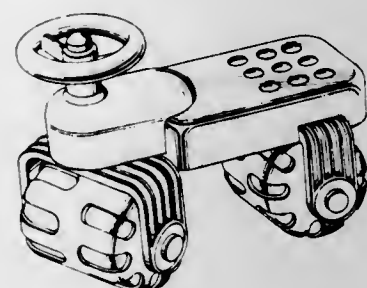
Filed Jul. 13, 1981, Ser. No. 282,749

Claims priority, application France, Jan. 12, 1981, 810082

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-76



271,505  
RING PUZZLE

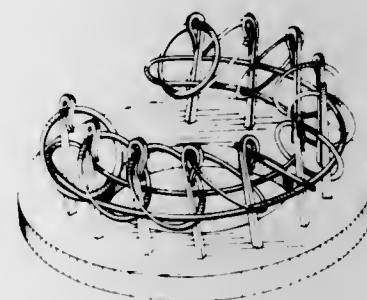
Charles M. Honeycutt, Rte. 1, Box 425, Mt. Pleasant, N.C. 28124

Filed Jan. 15, 1982, Ser. No. 339,400

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-106



271,503  
TOY ROCKING HORSE

Mark L. Brantingham, 1717 Hallock Young Rd. SW., Lordsburg, Ohio 44481

Filed Nov. 12, 1981, Ser. No. 320,344

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-75



271,506  
TOY FIGURE

James R. Lewis, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.

Filed Dec. 7, 1981, Ser. No. 328,292

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-171



271,507  
TENNIS BALL PRACTICE CATCH NET OR THE LIKE

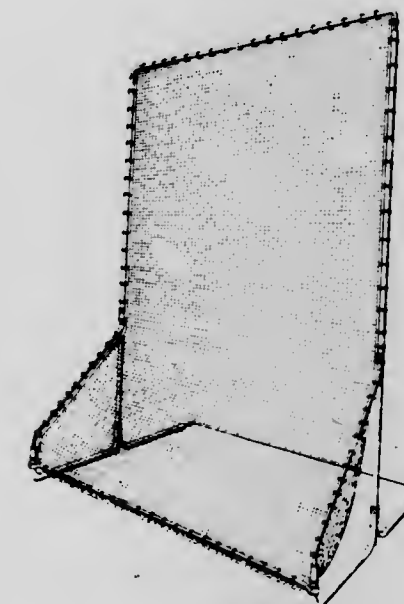
Vanice C. Phillips, 2401 Shady Grove, Bedford, Tex. 76021, and Glendale Phillips, R.R. 2, Box 708, Scurry, Tex. 75158

Filed Sep. 21, 1981, Ser. No. 304,118

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-200



271,509  
GOLF TEE

Richard W. Hanson, 9875 SW. Murdock St., Tigard, Ore. 97223

Filed Feb. 12, 1982, Ser. No. 348,601

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-208



271,510  
BAT

Ian G. Gormley, Durban, South Africa, assignor to Zimm-Zamm AG, Zug, Switzerland

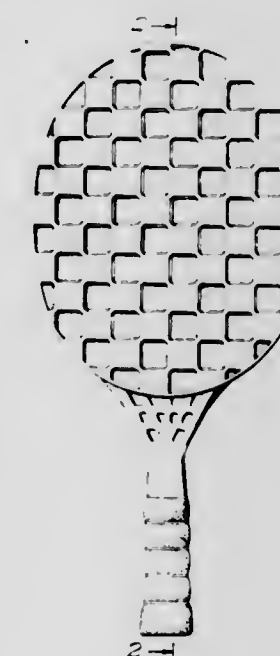
Filed Apr. 13, 1981, Ser. No. 253,353

Claims priority, application United Kingdom, Oct. 13, 1980, 997003

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-213



271,508  
RETURN CHUTE ATTACHMENT FOR BASKETBALL HOOPS

Gerald R. McGregor, P.O. Box 983, Kamuela, Hi. 96743

Filed May 7, 1981, Ser. No. 261,493

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-201





271,511

## SLING FOR A RIFLE

Thomas A. Horst, Lafayette, Colo., assignor to Crockett & Kelly, Inc., Westminster, Colo.

Filed Oct. 9, 1981, Ser. No. 309,903

Term of patent 14 years

Int. Cl. D22-01

U.S. Cl. D22-7

271,513  
FAUCET

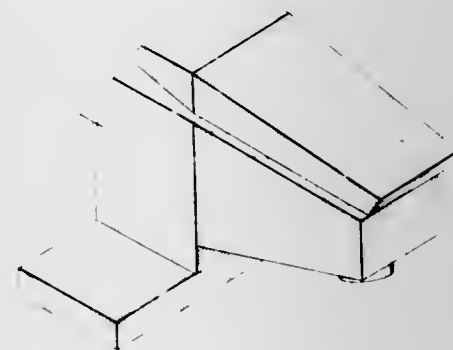
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,580

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-23

271,512  
RIFLE SLING

Thomas A. Horst, Lafayette, Colo., assignor to Crockett & Kelly, Inc., Westminster, Colo.

Filed Oct. 9, 1981, Ser. No. 309,904

Term of patent 14 years

Int. Cl. D22-01

U.S. Cl. D22-7

271,514  
FAUCET SET

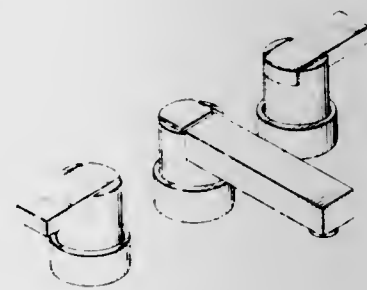
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,579

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-25



271,515

## SEWERLESS TOILET OR SIMILAR ARTICLE

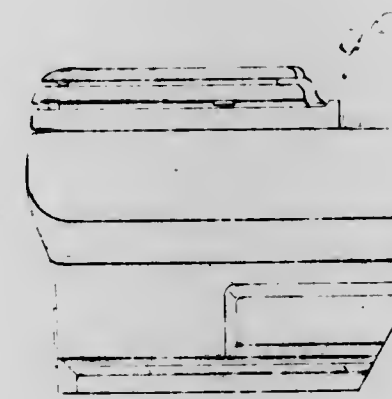
Kenneth J. DeGraw, Montvale, and Earl W. Nickerson, Ocean City, both of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,271

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-48



271,516

## SPLASH SHIELD

John H. Dose, deceased, late of Bradenton, Fla., and by Mildred V. Dose, executrix, 3113 S. 122nd Ave., Omaha, Nebr. 68144

Continuation-in-part of Ser. No. 96,139, Nov. 20, 1979, which is a continuation of Ser. No. 859,988, Dec. 12, 1977, abandoned.

This application Nov. 9, 1981, Ser. No. 319,790

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-69



271,517

## AIR FRESHENER DISPENSER OR SIMILAR ARTICLE

Yasuyuki Mori, Osaka, Japan, assignor to Duskin Franchise Co., Ltd., Osaka, Japan

Filed Feb. 20, 1981, Ser. No. 236,563

Claims priority, application Japan, Jun. 17, 1980, 55-24078

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-150



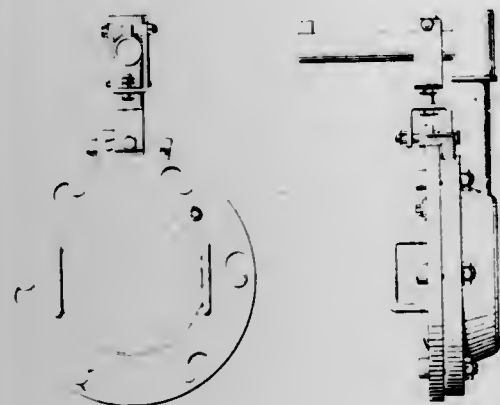


271,518

**CLOSURE FOR A PRESSURE DEVICE**

Robert J. Lankston, Shawnee, Kans., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.  
 Filed Apr. 8, 1981, Ser. No. 252,504  
 Term of patent 14 years  
 Int. Cl. D23—99

U.S. Cl. D23—1



271,519

**COMBINED INOCULATING LOOP WITH BREAKAWAY STOPPER THEREFOR**

LaVerne K. Baitz, Austin, Tex., assignor to K-Loops, Inc., Austin, Tex.  
 Filed Aug. 30, 1982, Ser. No. 413,174  
 Term of patent 14 years  
 Int. Cl. D24—02

U.S. Cl. D24—8

271,520

**DILUTION VESSEL**

Raymond J. Herrmann, Westlake, Ohio, assignor to Corning Glass Works, Corning, N.Y.  
 Filed Jul. 30, 1982, Ser. No. 404,582  
 Term of patent 14 years  
 Int. Cl. D24—02

U.S. Cl. D24—29



271,521

**PUMP HANDLE FOR USE WITH A BIOPSY SPECIMEN COLLECTOR**

James P. Ryan, Newton, and Roy W. Downing, Hingham, both of Mass., assignors to Ashbourne Development Corporation, Louisville, Ky.  
 Filed Aug. 11, 1980, Ser. No. 176,824  
 Term of patent 14 years  
 Int. Cl. D24—02

U.S. Cl. D24—30

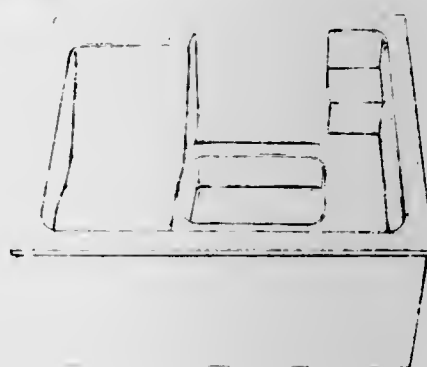


271,522

**WHIRLPOOL TUB**

Robert B. Wiley, 436 4th Ave. North, Tierra Verde, Fla. 33715  
 Filed May 5, 1981, Ser. No. 260,797  
 Term of patent 14 years  
 Int. Cl. D24—01; D23—02; D25—99

U.S. Cl. D24—38

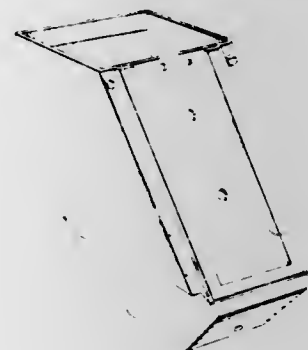


271,523

**SOAK TUB**

Ferne T. Richburg, 6033 N. Sheridan Rd., Chicago, Ill. 60660  
 Filed Jul. 8, 1981, Ser. No. 281,427  
 Term of patent 14 years  
 Int. Cl. D24—01; D23—02; D25—99

U.S. Cl. D24—38

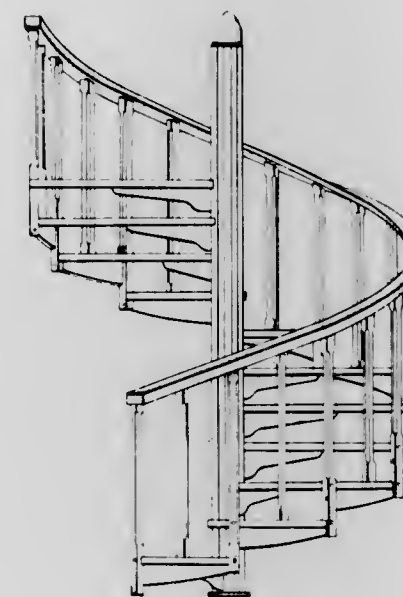


271,524

**SPIRAL STAIRWAY**

Abraham Suckno, 289 Friar La., Mountainside, N.J. 07092  
 Filed Feb. 17, 1981, Ser. No. 234,883  
 Term of patent 14 years  
 Int. Cl. D25—02

U.S. Cl. D25—63

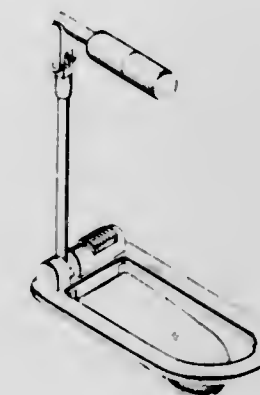


271,526

**PORTABLE READING LIGHT**

Noel E. Zeller, 95 Milford Point Rd., Milford, Conn. 06460  
 Filed Dec. 21, 1981, Ser. No. 332,291  
 Term of patent 14 years  
 Int. Cl. D26—05

U.S. Cl. D26—60

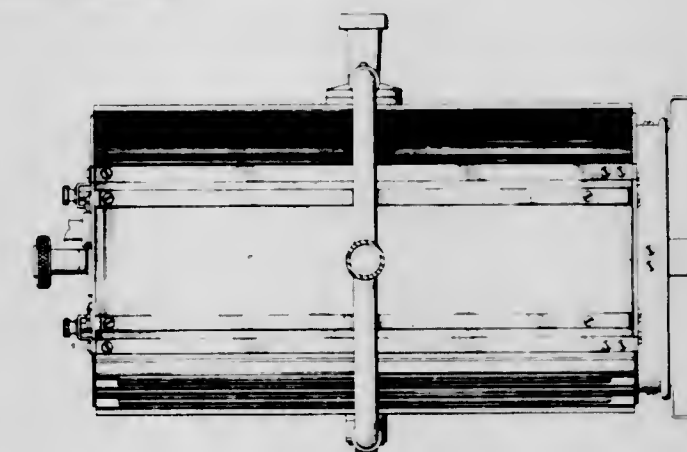


271,527

**LIGHTING FIXTURE**

Terry L. Hershey, Valencia, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.  
 Filed Nov. 17, 1980, Ser. No. 207,282  
 Term of patent 14 years  
 Int. Cl. D26—03

U.S. Cl. D26—63

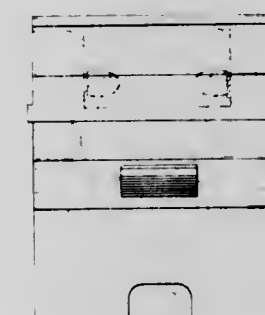


271,525

**FLASHLIGHT**

Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.  
 Filed Jun. 15, 1981, Ser. No. 274,060  
 Term of patent 14 years  
 Int. Cl. D26—02

U.S. Cl. D26—37





271,528  
LIGHTING FIXTURE

Henry Muller, Rego Park, N.Y., assignor to Lightolier Incorporated, Jersey City, N.J.

Filed Jul. 17, 1981, Ser. No. 284,241  
Term of patent 14 years  
Int. Cl. D26-05

U.S. Cl. D26-85

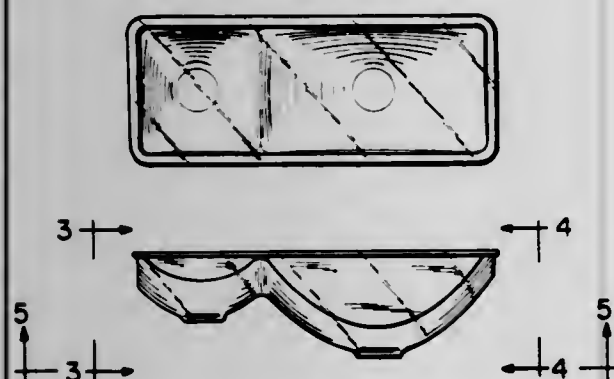


271,529  
GLASS REFLECTOR FOR DUAL HEADLIGHT ASSEMBLY

Garp M. Ziver, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,682  
Term of patent 14 years  
Int. Cl. D26-06

U.S. Cl. D26-118

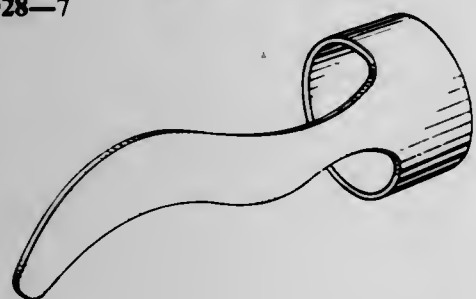


271,530  
MASCARA SMUDGE SHIELD

Beryl N. Watt, 15 Oak Ave., Tarrytown, N.Y. 10591

Filed Nov. 29, 1982, Ser. No. 444,838  
Term of patent 14 years  
Int. Cl. D28-03

U.S. Cl. D28-7



271,531  
DISPOSABLE RAZOR WITH SLIDING CAP

David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 5, 1982, Ser. No. 345,991  
Term of patent 14 years  
Int. Cl. D28-03

U.S. Cl. D28-46

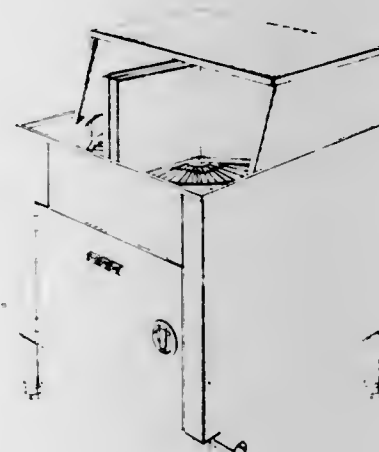


271,532  
GLASS WASHING MACHINE

Quarterman Lee, Jackson County, Mo., assignor to T.C.A., Inc., Va.

Filed Jan. 12, 1982, Ser. No. 338,832  
Term of patent 14 years  
Int. Cl. D15-05

U.S. Cl. D32-2

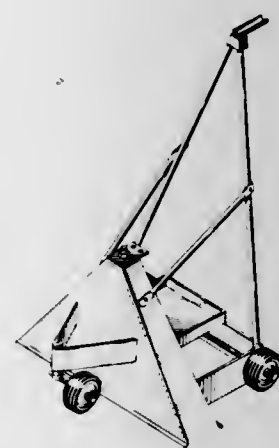


271,533  
SPRAY CART

Leon Kinder, P.O. Box 264, Jacksboro, Tex. 76201

Filed Jun. 29, 1981, Ser. No. 278,175  
Term of patent 14 years  
Int. Cl. D12-02

U.S. Cl. D34-18



## REEXAMINATIONS

NOVEMBER 22, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 29,221 (138th)

**ACCELERATION SENSITIVE MOTION SNUBBER**

Elmer C. Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Reexamination Request Nos. 90/000,180, Mar. 29, 1982 and 90/000,229, Jul. 19, 1982.

Reexamination Certificate for Reissue Patent Re. 29,221, issued May 17, 1977, Ser. No. 685,949, May 13, 1976.

Original No. 3,876,040, dated Apr. 8, 1975, Ser. No. 402,451, Oct. 1, 1973.

Int. Cl.<sup>3</sup> F16F 7/10

U.S. Cl. 188-378

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-26 and 33-35 is confirmed.

Claims 27, 29, 30 and 36 are determined to be patentable as amended:

Claims 28, 31 and 32, dependent on amended claims, are determined to be patentable.

1. A motion snubbing device comprising:  
a pair of members mounted for relative movement with respect to each other; and  
acceleration sensitive means connected to said members for limiting movement of either of the member relative to the other member in either of two opposite directions to a predetermined threshold acceleration rate while permitting continued relative movement at said threshold and including means for preventing operation of said limiting means below said predetermined acceleration thus permitting repeated or continuous relative movement below said predetermined threshold both before and after said predetermined acceleration has been reached.

B1 3,512,495 (137th)

**SELECTIVELY CONNECTABLE BOAT AND BARGE**

Edwin H. Fletcher, Jacksonville, Fla., assignor to United States Freight Company, New York, N.Y.

Reexamination Request Nos. 90/000,082, Oct. 9, 1981 and 90/000,287, Nov. 12, 1982.

Reexamination Certificate for Patent No. 3,512,495, issued May 19, 1970, Ser. No. 588,162, Oct. 20, 1966.

Int. Cl.<sup>3</sup> B63B 3/02, 21/00

U.S. Cl. 114-248

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 5, 7-15, 35, and 36 is confirmed.

Claims 3 and 6, having been finally determined to be unpatentable, are cancelled.

Claims 1, 4, 17-20, 25, 26, and 30-34 are determined to be patentable as amended:

Claims 2, 16, 21-24, and 27-29, dependent on amended claims, are determined to be patentable.

New claim 37 is added and determined to be patentable.

1. The combination comprising an independent powerless cargo carrying watercraft, an independent powered watercraft for pushing the cargo carrying watercraft, said cargo carrying watercraft comprising means defining an opened bottom well in its stern portion, the bow portion of said powered watercraft having a normal ship-shaped bow terminating in a stem and disposable in said well with said bow portion being adjacent to and spaced from said well-defining means, and selectively operable pivotal connecting means establishing a horizontal laterally extending pivot axis connecting between said stern portion and said bow portion for pivotally connecting said powered watercraft to said cargo carrying watercraft, said cargo carrying craft including means which receive the connecting means and which have a top and bottom portion which are located and extend above and below the connecting means received therein to contact top and bottom portions of the connecting means to restrain and limit movement of the connecting means in the vertical direction, said connecting means in said receiving means providing a positive force transmitting connection between said cargo carrying watercraft and said powered watercraft operable during both forward and reverse movement of said powered watercraft, said selectively operable connecting means permitting free pivotal motion about said axis between said cargo carrying watercraft and said powered watercraft and being selectively operable to disconnect said powered watercraft from said cargo carrying watercraft.

B1 4,134,769 (139th)

**OFFSET PRINTING PLATE**

Akio Yoshida, Akira Tanaka, and Yasuo Tsubai, all of Nagaoka-kyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Reexamination Request No. 90/000,306, Dec. 10, 1982.

Reexamination Certificate for Patent No. 4,134,769, issued Jan. 16, 1979, Ser. No. 822,192, Aug. 5, 1977.

Claims priority, application Japan, Aug. 10, 1976, 51-95274

Int. Cl.<sup>3</sup> G03C 5/54, 1/48; G03F 7/02; B41M 1/00

U.S. Cl. 430-199

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-8, having been finally determined to be unpatentable, are cancelled.

New claims 9-30 are added and determined to be patentable.

9. A method of printing which comprises printing in an offset printing machine with an offset printing plate comprising a support, a silver halide emulsion layer on the support containing at least one dye selected from the group consisting of betaine type cyanine sensitizing dyes and anion type cyanine sensitizing dyes and a surface layer containing nuclei for physical development on the emulsion layer, said surface layer having thereon an oleophilic ink-receptive silver deposited from said silver halide emulsion layer by exposing and subsequently developing with silver complex diffusion transfer developer.



# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. Ahlstrom Osakeyhtiö: *See—*  
Tinnis, Valentin, 4,416,422., Cl. 239-455.000.
- A. O. Smith Harvestore Products, Inc.: *See—*  
Kretschmer, Stephen L., 4,416,549., Cl. 366-190.000.
- Aanerud, Lars; and Balog, Georg, to International Standard Electric Corporation. Method for jointing cables. 4,416,061., Cl. 29-828.000.
- AB Asea-Atom: *See—*  
Nylund, Olov, 4,416,852., Cl. 376-438.000.
- Abbruscato, Charles R., to Bell Telephone Laboratories, Incorporated. Errorless line protection switcher. 4,417,348., Cl. 375-40.000.
- Abdel-Messeh, William, to Pratt & Whitney Aircraft of Canada Limited. Blade cooling for gas turbine engine. 4,416,585., Cl. 416-97.00R.
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- Adams, Don L.: *See—*  
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,417,308., Cl. 364-434.000.
- Adams, Lonnie D.; and Sammons, David W., to Upjohn Company, The. Silver stain procedure and kit for same. 4,416,998., Cl. 436-86.000.
- Adams, Robert W.; and Donohoe, Charles R. Rocket retention and ignition system. 4,416,183., Cl. 89-1.807.
- Adamson, John: *See—*  
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- Adecon, Inc.: *See—*  
Morrone, Joseph A., III, 4,416,038., Cl. 24-255.0SL.
- Adeka Argus Chemical Co., Ltd.: *See—*  
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- Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, to ASEA Aktiebolag. Fibre optic measuring device with electrically controlled photoluminescence. 4,417,140., Cl. 250-227.000.
- Adur, Ashok M., to Chemplex Company. Composite structures. 4,416,944., Cl. 428-349.000.
- Aerodyne Research, Inc.: *See—*  
Mueller, Peter F.; and Caulfield, H. John, 4,416,538., Cl. 355-67.000.
- Aeromotor Trading Company AB: *See—*  
Skogstrom, Lars; and Bergqvist, Bengt, 4,416,259., Cl. 126-429.000.
- Agfa-Gevaert Aktiengesellschaft: *See—*  
Beck, Wilfried; and Kauschus, Fritz, 4,416,918., Cl. 427-296.000.
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- Ahmed, Adel A. A., to RCA Corporation. Plural output switched current amplifier as for driving light emitting diodes. 4,417,240., Cl. 340-782.000.
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- Ahr, Nicholas A.: *See—*  
Moret, David M.; and Ahr, Nicholas A., 4,416,025., Cl. 2-49.00R.
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Stockman, Richard F.; and MacIer, Paul L., 4,416,044., Cl. 29-157.30R.
- Air Products and Chemicals, Inc.: *See—*  
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- Elton, Edward F.; and Magnotta, Vincent L., 4,416,727., Cl. 162-6.000.
- Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,417,080., Cl. 568-939.000.
- Aisin Seiki Co., Ltd.: *See—*  
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361., Cl. 192-107.00M.
- Aisin Seiki Kabushiki Kaisha: *See—*  
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- Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Anti-chatter circuit for small portable apparatus. 4,417,155., Cl. 307-247.00A.
- Akagi, Noriyuki: *See—*  
Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, 4,417,018., Cl. 524-261.000.
- Akase, Masazumi: *See—*  
Aoki, Susumu; Asaumi, Hiroshi; Take, Shigeo; and Akase, Masazumi, 4,416,043., Cl. 29-132.000.
- Akita, Sigeyuki: *See—*  
Kago, Yoshiyuki; and Akita, Sigeyuki, 4,416,150., Cl. 73-119.00A.
- Akiyama, Junichi, to Shimadzu Corporation. Electrophoretic apparatus. 4,416,762., Cl. 204-299.00R.
- Akzona Incorporated: *See—*  
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- Alben, Richard S.: *See—*  
Herrick, Carlyle S.; and Alben, Richard S., 4,416,264., Cl. 126-442.000.
- Albert-Frankenthal AG: *See—*  
Fischer, Rudolf; and Stab, Rudolf, 4,416,652., Cl. 493-399.000.
- Alberti, John, to Boeing Company, The. Power-actuated low profile cargo guide. 4,416,579., Cl. 414-534.000.
- Alberts, Heinrich: *See—*  
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- Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, to BBC Brown, Boveri & Company Limited. Process to produce and stabilize a reversible two-way shape memory effect in a Cu-Al-Ni or a Cu-Al alloy. 4,416,706., Cl. 148-11.50C.
- Alfa-Laval N.V.: *See—*  
Van Vlaenderen, Johannes M. H., 4,416,326., Cl. 165-120.000.
- Alfred University Research Foundation Inc.: *See—*  
Funk, James E., 4,416,666., Cl. 44-51.000.
- Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., to Monsanto Company. Mass polymerization process for ABS polyblends. 4,417,030., Cl. 525-316.000.
- Allen Industries, Inc.: *See—*  
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- Allen, Jonathan B., to Bell Telephone Laboratories, Incorporated. Noise and bit rate reduction arrangements. 4,417,102., Cl. 364-513.000.
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- Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., 4,416,787., Cl. 252-8.800.
- Allis-Chalmers Corporation: *See—*  
Zagar, Steven J.; and Shy, James L., 4,416,696., Cl. 106-100.000.
- Zagar, Steven J.; and Shy, James L., 4,416,697., Cl. 106-100.000.
- Alpha Poultry & Livestock Equip., Inc.: *See—*  
Novoy, Richard T., 4,416,221., Cl. 119-72.500.
- Alps Electric Co., Ltd.: *See—*  
Kamijo, Yoshimi; and Kawachi, Kazuhiko, 4,417,174., Cl. 313-502.000.
- Oyama, Kohei; and Yokouchi, Hiroyuki, 4,417,297., Cl. 361-412.000.
- Terajima, Jiro, 4,417,107., Cl. 200-16.00C.



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Das, Subodh K., 4,417,097, Cl. 174-110.00A.
- Alvero, Ernesto J.; and Kelly, William R., to RCA Corporation. System and method for determining the light transmission characteristics of color picture tube shadow masks. 4,416,521, Cl. 354-1.000.
- Alving, Carl R.; and Steck, Edgar A., to United States of America. Army. Treatment of malaria with liposomes containing 8-aminquinoline derivatives and glycoconjugates. 4,416,872, Cl. 424-177.000.
- Amada Engineering & Service Co., Inc.: See—  
Tsutsumi, Akira, 4,417,125, Cl. 219-121.0LY.
- Amano, Hisao: See—  
Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156, Cl. 307-252.00C.
- Amano, Takayoshi: See—  
Takimoto, Tadashi; Oishibashi, Hirotosugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158, Cl. 73-842.000.
- Amaral, Leonard, to Bronx-Lebanon Hospital Center. Method and apparatus for determining bacterial sensitivity. 4,416,995, Cl. 435-291.000.
- Ambrose, Michael F. J.: See—  
Clare, Kenneth D.; and Ambrose, Michael F. J., 4,416,385, Cl. 220-1.500.
- Ambrose, Roy A. Plastic pipe tester with feedback controlled pressurizer. 4,416,146, Cl. 73-49.500.
- American Can Company: See—  
Wilkinson, Harlen E.; and Wren, Fred W., 4,416,389, Cl. 220-269.000.
- American Frimetec, Inc.: See—  
Bochskandl, Margaret, 4,416,901, Cl. 424-363.000.
- American Hoechst Corporation: See—  
Bolt, Lawrence, 4,416,946, Cl. 428-421.000.
- Walls, John E.; Dragon, Robert L.; and Dunder, Thomas A., 4,416,972, Cl. 430-278.000.
- American Locker Security Systems, Inc.: See—  
Chester, Richard J., 4,416,413, Cl. 232-24.000.
- American Standard Inc.: See—  
Pascoe, Robert D., 4,417,202, Cl. 324-51.000.
- Ametek, Inc.: See—  
Lea, Alfred L.; and Votta, Frank A., Jr., 4,416,162, Cl. 73-862.620.
- AMP Incorporated: See—  
Desmarais, Mark R.; and Yates, Mark A., 4,417,115, Cl. 200-340.000.
- Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., 4,417,106, Cl. 200-5.00R.
- Grabbe, Dmitry G., 4,417,266, Cl. 357-80.000.
- Johnson, Tore R.; and Johnson, Keith, Jr., 4,416,506, Cl. 350-96.210.
- Willette, Albert D., 4,417,096, Cl. 174-71.00R.
- Amrine, Bruce A.: See—  
Carpenter, Walter L.; and Amrine, Bruce A., 4,416,280, Cl. 128-399.000.
- Anderson, Blair V.; Feldman, Morris; and Jacoby, Richard. Method and apparatus for recording gait analysis in podiatric diagnosis and treatment. 4,416,293, Cl. 128-782.000.
- Anderson, Douglas B., to NCR Corporation. Data window expander circuit in a data recovery system. 4,417,286, Cl. 360-51.000.
- Anderson, Raymond L. Twin outlet feed distributor. 4,416,568, Cl. 406-123.000.
- Anderson, William S., to United Technologies Corporation. Polynorbornene-based combustible compositions and processes for the fabrication thereof. 4,416,710, Cl. 149-19.910.
- Ando, Kazuko: See—  
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875, Cl. 424-180.000.
- Andrews Paper & Chemical Co.: See—  
Muller, Peter; Mustacchi, Henry; and Kreicas, Leonard, 4,416,950, Cl. 428-537.000.
- Angelov, Angel S.: See—  
Nachev, Georgi N.; Angelov, Angel S.; and Petkov, Boryan I., 4,417,127, Cl. 219-124.340.
- Angle, Rodney L., to RCA Corporation. Electrically alterable, nonvolatile floating gate memory device. 4,417,264, Cl. 357-23.000.
- Angus Chemical Company: See—  
Jacobs, Martin J., 4,416,734, Cl. 203-18.000.
- Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., to Leningradskoe NPO "Burevestnik". X-Ray fluorescence spectrometer. 4,417,355, Cl. 378-49.000.
- Aptos, George J.; and Chao, Tai-Hsiang, to UOP Inc. Acidic multimetallic catalytic composite. 4,416,804, Cl. 502-213.000.
- Aptson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilampi, Markku A., to Oy Lohja Ab. Thin film electroluminescence structure. 4,416,933, Cl. 428-216.000.
- Anzai, Masayasu: See—  
Tokunaga, Kazuyoshi; and Anzai, Masayasu, 4,416,533, Cl. 355-4.000.
- Anzai, Shunju: See—  
Itoh, Ikuo; Anzai, Shunju; and Ohashi, Kunio, 4,416,536, Cl. 355-14.00R.
- Apki, Keiji; and Mitsuyasu, Masaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and an apparatus for controlling the air-fuel ratio in an internal combustion engine. 4,416,237, Cl. 123-438.000.
- Aoki, Susumu; Asami, Hiroshi; Take, Shigeo; and Akase, Masazumi, to Nippon Asbestos Company, Limited. Disc roll. 4,416,043, Cl. 29-132.000.
- Apikos, Dominic A., to Atlantic Richfield Company. Metal cutting oil and method for using same. 4,416,788, Cl. 252-31.000.
- Arai, Hajime; and Haga, Shoji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission and sub-transmission with mutually contending helical gears. 4,416,168, Cl. 74-740.000.
- Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Iizumi, Toyoko, to Nissan Chemical Industries, Ltd. Process for preparing an optical active ester of naphthylpropionic acid. 4,417,070, Cl. 560-56.000.
- Arai, Kenichiro, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Serial printer. 4,416,557, Cl. 400-152.000.
- Archie, William A.: See—  
Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., 4,416,787, Cl. 252-8.800.
- Ardeo, Inc.: See—  
Niekraz, Frank M., 4,416,086, Cl. 49-388.000.
- Arena, Blaise J.; and Rohrbach, Ronald P., to UOP Inc. Support matrices and immobilized enzyme systems. 4,416,992, Cl. 435-176.000.
- Argenbright, Carl T. Precision work holder for machine tools. 4,416,570, Cl. 409-222.000.
- Arlt, Dieter: See—  
Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037, Cl. 526-271.000.
- Armstrong International, Inc.: See—  
Seeger, Richard E., 4,416,313, Cl. 144-193.00R.
- Armco Inc.: See—  
Pieron, Marvin B.; and Dunbar, Frank C., 4,416,920, Cl. 427-349.000.
- Armstrong, Maclay M., to Northwest Orthodontics, Inc. Orthodontic spring force adjustment and disconnectable connection. 4,416,625, Cl. 433-5.000.
- Arnold, Fred E.: See—  
Reinhardt, Bruce A.; and Arnold, Fred E., 4,417,039, Cl. 526-285.000.
- Asahi Glass Company Ltd.: See—  
Sato, Kimihiko; Terasa, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863, Cl. 423-344.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Kuroda, Toru; Takenaka, Yoshinori; and Tsuda, Nobuaki, 4,416,777, Cl. 210-446.000.
- Nakamura, Katuyuki, 4,417,021, Cl. 524-538.000.
- Noguchi, Kohji; and Kasai, Masao, 4,416,783, Cl. 210-635.000.
- Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047, Cl. 544-26.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Hama, Yoshihiro, 4,417,281, Cl. 358-287.000.
- Iomori, Yasumasa; and Shimoda, Mituhiko, 4,416,526, Cl. 354-198.000.
- Okura, Zenichi, 4,416,527, Cl. 354-272.000.
- Asami, Ken: See—  
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307, Cl. 364-424.100.
- Asami, Masahiro: See—  
Toba, Hiroaki; Mikumo, Masatoshi; and Asami, Masahiro, 4,417,025, Cl. 525-54.210.
- Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, to Hitachi, Ltd. Bubble memory conductor pattern with heat sink. 4,417,323, Cl. 365-1.000.
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- Asdollahi, Norbert; and Gutzmer, Christian, to Wickmann-Werke GmbH. Electrical fuse. 4,417,226, Cl. 337-273.000.
- Asea AB: See—  
Collin, Per H., 4,416,689, Cl. 75-11.000.
- ASEA Aktiebolag: See—  
Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, 4,417,140, Cl. 250-227.000.
- Askins, William E., to Woodstream Corporation. Jaw configuration for animal trap. 4,416,081, Cl. 43-90.000.
- Associated Enterprises, Inc.: See—  
Bender, Ernest S.; Ignasiak, Marty C.; and Jones, Michael H., 4,416,604, Cl. 425-183.000.
- Atlantic Richfield Company: See—  
Apikos, Dominic A., 4,416,788, Cl. 252-31.000.
- Milkovich, Ralph, 4,417,029, Cl. 525-314.000.
- Audi NSU Auto Union AG: See—  
Feucht, Klaus J.; Rossie, Egbert; and Bauer, Karl, 4,416,088, Cl. 49-502.000.
- Audiau, Francois: See—  
Le Fur, Gerard R.; and Audiau, Francois, 4,416,888, Cl. 424-267.000.
- Austin, Lowell W.; and Stoddart, James O., to National Steel Corporation. Process of electroplating a nickel-zinc alloy on steel strip. 4,416,737, Cl. 204-28.000.
- Australasian Training Aids Pty. Ltd.: See—  
Knight, Lindsay C., 4,416,456, Cl. 273-359.000.
- Autohaus Lorinser G.m.b.H. & Co.: See—  
Koch, Adolf, 4,416,483, Cl. 296-37.100.
- Automobiles Citroen: See—  
Barthelemy, Andre, 4,416,345, Cl. 180-79.100.
- Automobiles Peugeot: See—  
Barthelemy, Andre, 4,416,345, Cl. 180-79.100.

- Automotive Products Limited: See—  
Osborne, Duncan W., 4,416,356, Cl. 188-326.000.
- Avalon Industries, Inc.: See—  
Berman, Mort, 4,416,632, Cl. 434-84.000.
- Avenas, Pierre: See—  
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041, Cl. 526-348.600.
- Aversano, Ralph W. Meat preservation method. 4,416,909, Cl. 426-265.000.
- Aykan, Kamran; Farrauto, Robert J.; Jefferson, Clinton F.; and Lanam, Richard D., to Engelhard Corporation. Thin film solar energy collector. 4,416,916, Cl. 427-160.000.
- Azevedo, Max, to Loctite Corporation. Preapplied plastic film adhesive composition. 4,417,028, Cl. 525-285.000.
- Azoian, Stepan E.: See—  
Pelts, Boris B.; Tumasian, Benjamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Edward A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723, Cl. 156-608.000.
- B & H Manufacturing Company, Inc.: See—  
Hoffmann, Wolfgang, 4,416,714, Cl. 156-86.000.
- Baba, Keikichi: See—  
Takitani, Masaru; Baba, Keikichi; and Tomiyasu, Shizuo, 4,416,799, Cl. 502-156.000.
- Bacchus, Jean-Marie: See—  
Hugues, Edgar A.; Bacchus, Jean-Marie; and Haisma, Jan, 4,416,518, Cl. 350-427.000.
- Bache, Roger J., to Gillette Company. The Formation of coatings on cutting edges. 4,416,912, Cl. 427-13.000.
- Bachman, Mark S.: See—  
Vicino, Robert K.; and Bachman, Mark S., 4,416,073, Cl. 40-326.000.
- Baethke, Friedrich W.: See—  
Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., 4,416,563, Cl. 403-14.000.
- Bailey, Derrick S.; and Griffin, Brian P., to Imperial Chemical Industries PLC. Pipe compositions containing anisotropic melt-forming polymers. 4,417,020, Cl. 524-502.000.
- Bailey, Edmond I., to Smith International, Inc. Rotary drilling head. 4,416,340, Cl. 175-195.000.
- Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C.; deceased; and by Roesler, Johanna M., executrix, to Imperial Chemical Industries PLC. Treatment of biologically-degradable waste. 4,416,781, Cl. 210-629.000.
- Baker, Royce E.; and Singletary, Glennwood. Bit guidance device and method. 4,416,339, Cl. 175-61.000.
- Baldoni, Viscardo, to Firestone Tire & Rubber Company. The Tire forming drum. 4,416,720, Cl. 156-401.000.
- Bale, Neville R. Solar energy collector. 4,416,257, Cl. 126-427.000.
- Ball, Matthew C.; and Tomkins, Donald W., to National Research Development Corporation. Hydraulic cements. 4,416,695, Cl. 106-90.000.
- Balme, Maurice: See—  
Soula, Gerard; and Balme, Maurice, 4,417,048, Cl. 544-38.000.
- Balog, Georg: See—  
Aanerud, Lars; and Balog, Georg, 4,416,061, Cl. 29-828.000.
- Balser, Donald R., to Mead Johnson & Company. Spiro-quaternary ammonium halides and N-(2-pyrimidinyl)pipecrazinylalkylazaspiroalkanedione process. 4,417,049, Cl. 544-231.000.
- Balz, Josef: See—  
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409, Cl. 228-173.00R.
- Ban, Hiroshi: See—  
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361, Cl. 192-107.00M.
- Banba, Toshio; Mizuno, Masanori; and Mizuno, Takai, to Mitsubishi Denki Kabushiki Kaisha. Transistor type pulse welding device. 4,417,130, Cl. 219-130.510.
- Bancalari, Jean, to Merlin Gerin. Multipole electric circuit breaker with improved current limiting device. 4,417,223, Cl. 335-195.000.
- Bank of New York Inc., The, executor: See—  
Breski, Thomas A.; and Ryan, Robert A., deceased, 4,416,653, Cl. 493-412.000.
- Banno, Mitsuyuki: See—  
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235, Cl. 123-425.000.
- Bapst, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., to International Business Machines Corp. Method for connecting or disconnecting selected stations in a ring communication system, and ring communication system including selectively connectable stations. 4,417,242, Cl. 340-825.050.
- Barca, Sandor; and Kathawala, Faizulla G., to Sandoz, Inc. Para-amino benzoic and phenylacetic acid derivatives. 4,416,876, Cl. 424-184.000.
- Barisoff, Leonard M. Blowpipe type of burner. 4,416,613, Cl. 431-243.000.
- Barkhoudarian, Sarkis, to Rockwell International Corporation. Method and apparatus for measuring torque. 4,416,161, Cl. 73-862.360.
- Barrat, Christian R.; Walker, John R.; and Wevers, Jean, to Procter & Gamble Company. The Liquid detergent compositions containing amino-silanes. 4,416,793, Cl. 252-117.000.
- Barrat, Christian R.; Walker, John R.; and Wevers, Jean, to Procter & Gamble Company. The Rinse aid compositions containing amino-silanes. 4,416,794, Cl. 252-174.150.
- Barratt, Robert O.; and Franklin, Howard N., to Foster Wheeler Energy Corporation. Heat exchanger. 4,416,325, Cl. 165-47.000.
- Barsotti, Robert J., to Du Pont de Nemours, E. I., and Company. Additive for coating compositions of silica and a fluorinated ethylene oxide polymer. 4,416,941, Cl. 428-328.000.
- Barthelemy, Andre, to Automobiles Citroen; and Automobiles Peugeot. Rotary assistance mechanisms, more especially for vehicle steering. 4,416,345, Cl. 180-79.100.
- Bascom, Laurence N.; and Leung, Peter S. K., to Du Pont de Nemours, E. I., and Company. Bulkable extensible weft yarn suitable for use as tire cords. 4,416,935, Cl. 428-229.000.
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Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035, Cl. 526-208.000.
- Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, 4,417,038, Cl. 526-285.000.
- BASF Farben & Fasern AG: See—  
Batzi, Wolfgang; and Diefenbach, Horst, 4,416,753, Cl. 204-181.00C.
- Baski, Henry A. Pitless adapter. 4,416,328, Cl. 166-65.00R.
- Batchelder, David N.: See—  
Williamson, Roger J.; and Batchelder, David N., 4,416,159, Cl. 73-861.220.
- Bateka, Gediminas, to Pfaff Haushaltmaschinen GmbH. Circuit for controlling the speed of a motor. 4,417,187, Cl. 318-331.000.
- Bates, Richard L.: See—  
D'Antonio, Joseph V., 4,416,387, Cl. 220-93.000.
- Battista, Orlando A. Protein polymer hydrogels. 4,416,814, Cl. 260-117.000.
- Baty, Charlton R.: See—  
Holymann, Brian T.; and Baty, Charlton R., 4,417,220, Cl. 333-174.000.
- Batzill, Wolfgang; and Diefenbach, Horst, to BASF Farben & Fasern AG. Process for electrocoating an electrically conductive substrate. 4,416,753, Cl. 204-181.00C.
- Baucom, Robert M., to United States of America. National Aeronautics and Space Administration. Medical clip. 4,416,260, Cl. 128-325.000.
- Bauer, Karl: See—  
Fench, Klaus J.; Rossie, Egbert; and Bauer, Karl, 4,416,088, Cl. 49-502.000.
- Bauer, Ronald E. Illuminated cake decoration. 4,416,075, Cl. 40-546.000.
- Baum, Gerald A.: See—  
Hulyalkar, Ramchandra K.; Baum, Gerald A.; and Hotchandani, Kanayo, 4,417,015, Cl. 524-139.000.
- Baum, Robert A. Method for measuring the amount of oil in an essentially nonconductive liquid. 4,417,212, Cl. 324-439.000.
- Baumann, Marcus: See—  
Lohmann, Dieter; Roth, Martin; and Baumann, Marcus, 4,417,057, Cl. 548-429.000.
- Baxter Travenol Laboratories, Inc.: See—  
Cromie, Harry W., 4,416,595, Cl. 417-476.000.
- Bayer Aktiengesellschaft: See—  
Boberg, Michael; and Metzger, Karl G., 4,416,880, Cl. 424-246.000.
- Feyen, Peter; and Schmidt, Friedrich, 4,416,834, Cl. 260-979.000.
- Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832, Cl. 260-940.000.
- Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026, Cl. 525-64.000.
- Metzger, Karl G.; Pfizner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870, Cl. 424-172.000.
- Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037, Cl. 526-271.000.
- Nolte, Wilfried; and Esser, Heinz, 4,417,036, Cl. 526-211.000.
- Stetter, Jorg; Lunkenheimer, Winfried; and Brandes, Wilhelm, 4,416,889, Cl. 424-269.000.
- BBC Brown, Boveri & Company Limited: See—  
Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, 4,416,706, Cl. 148-11.50C.
- Menth, Anton; and Stucki, Samuel, 4,416,747, Cl. 204-129.000.
- Beach, Daryl R. Dental practice means. 4,416,634, Cl. 434-263.000.
- Beall, George H.; and Fehner, Francis P., to Corning Glass Works. Electrochromic devices including a mica layer electrolyte. 4,416,517, Cl. 350-357.000.
- Beall, Robert. Compartmented container. 4,416,370, Cl. 206-217.000.
- Beazley, William W. Orthodontic appliance. 4,416,627, Cl. 433-18.000.
- Bechtel International Corporation: See—  
Taylor, Allan D., 4,416,774, Cl. 210-236.000.
- Beck, Siegfried; and Urescher, Philipp, to Drescher GmbH & Co. KG. Device for obtaining accurate registration of handwritten impressions on continuous business form sets. 4,416,470, Cl. 281-7.000.
- Beck, Wilfried; and Kauschus, Fritz, to Agfa-Gevaert Aktiengesellschaft. Apparatus and a method for removing thickened borders after the coating of webs. 4,416,918, Cl. 427-296.000.
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- Becker, Udo; Schaich, Eugen; and Weigert, Manfred, to Boehringer Mannheim GmbH. Method of preparing tissue thromboplastin. 4,416,812, Cl. 260-112.00R.
- Becton Dickinson and Company: See—  
Kaufman, Joseph, 4,416,291, Cl. 128-766.000.
- Lutkowski, Lawrence, 4,416,290, Cl. 128-764.000.



Beecham Group Limited: See—  
Bentley, Peter H., 4,416,883., Cl. 424-250,000.  
Belhne, Hahn-Jürgen. Multi-story elevator-type garage. 4,416,578., Cl. 414-249,000.  
Bellart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, to ITT Industries, Inc. Pressure controlling arrangement for use in a vehicle brake system. 4,416,491., Cl. 303-113,000.  
Bell & Howell Company: See—  
Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., 4,416,563., Cl. 403-14,000.  
Bell Telephone Laboratories, Incorporated: See—  
Abbruscato, Charles R., 4,417,348., Cl. 375-40,000.  
Allen, Jonathan B., 4,417,102., Cl. 364-513,000.  
Beni, Gerardo; and Schiavone, Lawrence M., 4,416,516., Cl. 350-357,000.  
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,417,337., Cl. 371-22,000.  
Keller, Jack K.; and Mowery, Gilbert L., Jr., 4,417,162., Cl. 307-473,000.  
Bell, William R.: See—  
Rhodes, Buck A.; and Bell, William R., 4,416,865., Cl. 924-1,100.  
Bellavia, William D. Method for recapturing anterior displaced mandibular disc and orthopedic device therefor. 4,416,626., Cl. 433-7,000.  
Bell, Remo D.: See—  
Harry, Donald R.; and Bell, Remo D., 4,416,181., Cl. 84-272,000.  
Bellina, Joseph H. Signal balloon dispensing apparatus. 4,416,433., Cl. 244-33,000.  
Bellis, Robert D.; and Wood, Dennis, to Coin Controls Limited. Coin validating arrangement. 4,416,364., Cl. 194-100,00A.  
Bellus, Daniel: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058., Cl. 548-451,000.  
Belov, Petr S.: See—  
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076., Cl. 568-361,000.  
Bemis Manufacturing Company: See—  
Otte, Timothy J., 4,416,048., Cl. 29-526,00R.  
Bender, Ernest S.; Ignasiak, Marty C.; and Jones, Michael H., to Associated Enterprises, Inc. Universal molding system and method. 4,416,604., Cl. 425-183,000.  
Bender, Richard E.: See—  
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329., Cl. 166-68,000.  
Bendix Corporation, The: See—  
Frascatore, John F.; Nelson, Dean R.; and Marsh, Edward K., 4,416,499., Cl. 339-92,00M.  
Lanterman, Beryl A., 4,417,238., Cl. 340-688,000.  
Reddy, Junuthula N., 4,417,201., Cl. 123-490,000.  
Taft, Darwin O.; and Van Siclen, Howard E., Jr., 4,416,245., Cl. 123-613,000.  
Warren, Gilbert G., 4,416,745., Cl. 204-112,000.  
Weilbacker, Thomas O., 4,417,336., Cl. 371-20,000.  
Benedikt, Walter; Latsch, Reinhard; and Schlembach, Hans, to Robert Bosch GmbH. Separately ignited internal combustion engine with at least one main combustion chamber and an ignition chamber. 4,416,228., Cl. 123-268,000.  
Benedict, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques, to Claude Benedict Laser Techniques Saint-Cyr. Process and installation for machining by radiation a composite part. 4,417,124., Cl. 219-121,0LH.  
Beni, Gerardo; and Schiavone, Lawrence M., to Bell Telephone Laboratories, Incorporated. Matrix addressable electrochromic devices. 4,416,516., Cl. 350-357,000.  
Benincasa, Timothy C., to Imperial Clevite Inc. Flexible circuit interconnect for piezoelectric element. 4,417,170., Cl. 310-345,000.  
Bennett, Matthew C.; and Strange, Donald R., to Medtronic, Inc. Video to digital converter. 4,417,276., Cl. 358-160,000.  
Bennett, Peter H. E., to Chartwell House Group Limited, The. Centrifuges and centrifuge cleaning methods. 4,416,655., Cl. 494-40,000.  
Bentley, Peter H., to Beecham Group Limited. Penicillin derivatives. 4,416,883., Cl. 424-250,000.  
Bentzen, Craig L.; Mong, Lan N.; and Niesor, Eric, to Symphar S.A. Anti-atherosclerotic pharmaceutical compositions containing diphosphate compounds. 4,416,877., Cl. 424-204,000.  
Benz, Gunter: See—  
Metzger, Karl G.; Pfizner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870., Cl. 424-172,000.  
Beppu, Tatsuro: See—  
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,417,262., Cl. 357-17,000.  
Berchem, Antoine: See—  
Sudan, Krishan K.; and Berchem, Antoine, 4,417,004., Cl. 521-181,000.  
Berford, Saint Elmo B.: See—  
Guerrero, Benjamin G.; and Berford, Saint Elmo B., 4,416,074., Cl. 40-364,000.  
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, to Braun Aktiengesellschaft. Electrical ignition system for catalytically heated curling device. 4,416,298., Cl. 132-33,00R.  
Bergles, Eduard, to Fichtel & Sachs AG. Bicycle chain-shifting device. 4,416,646., Cl. 474-80,000.  
Berglund, Rickey T. Abdominal catheter implant. 4,416,657., Cl. 604-9,000.

Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., to Standard Duplicating Machines Corp. Sheet binding. 4,416,722., Cl. 156-578,000.  
Bergman, Charles T., to Brandt, Inc. Coin loader. 4,416,299., Cl. 133-1,00R.  
Bergqvist, Bengt: See—  
Skogstrom, Lars; and Bergqvist, Bengt, 4,416,259., Cl. 126-429,000.  
Berke, Herbert, to United States of America, Navy. Linearizing circuit for a high frequency voltage controlled oscillator. 4,417,218., Cl. 331-178,000.  
Berkowitz, Ami E.; and Walter, John L., to General Electric Co. Process for producing a ferrofluid. 4,416,751., Cl. 204-165,000.  
Berman, Mort, to Avalon Industries, Inc. Paint-by-numbers kit. 4,416,632., Cl. 434-84,000.  
Bernard, Jean-Rene; and Breyse, Michele, to Elf France. Catalyst for production of aromatic hydrocarbons and process for preparation. 4,416,806., Cl. 502-74,000.  
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Bernstein, Joel E., to Dermall Limited. Method of treating pruritis and composition therefor. 4,416,886., Cl. 424-260,000.  
Berry, Richard E.; and Wilson, John H., to International Business Machines Corporation. Report generation control system for text processing machines. 4,417,322., Cl. 364-900,000.  
Berstis, Viktors, to International Business Machines Corporation. Method for evaluating boolean expressions. 4,417,305., Cl. 364-300,000.  
Berthling, Hannes; and Leiber, Heinz, to Robert Bosch GmbH. Apparatus for propulsion control in a motor vehicle having an anti-locking system. 4,416,347., Cl. 180-197,000.  
Bertolacini, Ralph J.: See—  
Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., 4,416,803., Cl. 502-209,000.  
Best, David W., to Rockwell International Corporation. Parallel operating mode arithmetic logic unit apparatus. 4,417,314., Cl. 364-716,000.  
Best, David W., to Rockwell International Corporation. Digital binary increment circuit apparatus. 4,417,316., Cl. 364-770,000.  
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, to Degussa Aktiengesellschaft. Process for the resolution of the racemate (1RS,2SR)-2-amino-1-phenyl-propan-1-ol. 4,416,827., Cl. 260-501,120.  
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Bethlehem Apparatus Company, Inc.: See—  
Lawrence, James B.; and Lawrence, Bruce J., 4,416,382., Cl. 215-231,000.  
Betner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., to Northrop Corporation. Composite laminating method and product. 4,416,175., Cl. 83-29,000.  
Beun, Roger A., to Northern Telecom Limited. Support member for electronic devices. 4,417,095., Cl. 174-52,0FP.  
Beyerle, Rudi: See—  
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272,000.  
BFG GLASSGROUP: See—  
Derner, Paul; and Martin, Dietrich, 4,416,101., Cl. 52-398,000.  
Bhargava, Hemendra N.: See—  
Walter, Roderich W.; Krivoy, William A.; Ritzmann, Ronald F.; and Bhargava, Hemendra N., 4,416,871., Cl. 424-177,000.  
Bialobrzewski, Walter; and Sperry, Paul A. Child-proof latch. 4,416,477., Cl. 292-19,000.  
BICC Public Limited Company: See—  
Dey, Phillip; Fearn, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., 4,416,508., Cl. 350-96,230.  
Billet, Rene; and Renaud, Pierre, to Valeo. Hub and web assembly. 4,416,564., Cl. 403-282,000.  
Binsack, Rudolf: See—  
Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026., Cl. 525-64,000.  
Bittler, Dieter: See—  
Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, 4,416,985., Cl. 435-58,000.  
Bjurling, Anders, to Dynatrans AB. Tank container with mounting means. 4,416,384., Cl. 220-1,500.  
Blach, Josef A. Device for mixing, dispersing and homogenizing compounds with at least one viscous component. 4,416,544., Cl. 366-85,000.  
Black, Daniel A., to Textron Inc. Collapsible fastener with plastic sleeve. 4,416,572., Cl. 411-38,000.  
Black, Jeremiah B. Microwave water heating method and apparatus. 4,417,116., Cl. 219-10,55A.  
Blackstone, Paul C., to Lever Brothers Company. Iminodipropionate containing detergent compositions. 4,416,792., Cl. 252-110,000.  
Blank, Charles J., Jr. Apparatus for removing and transporting ashes. 4,416,252., Cl. 126-242,000.  
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., to Hoechst Aktiengesellschaft. Bis-betaine-amine oxides, process for their preparation, and cleaning agents containing them. 4,416,808., Cl. 252-547,000.

Blawert, Dieter: See—  
Knothe, Erich; Blawert, Dieter; and Schubart, Bernd, 4,416,343., Cl. 177-180,000.  
Bleckmann, Hans-Wilhelm: See—  
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,416,491., Cl. 303-113,000.  
Bloom, Terry R., to CTS Corporation. Vertical tunnel kiln. 4,416,624., Cl. 432-134,000.  
Boardman, Craig W.: See—  
Fouroux, Claude H.; and Boardman, Craig W., 4,416,143., Cl. 72-479,000.  
Boberg, Michael; and Metzger, Karl G., to Bayer Aktiengesellschaft.  $\beta$ -Lactam antibiotics and compositions containing the same. 4,416,880., Cl. 424-246,000.  
Bochskandl, Margarete, to American Prometics, Inc. Process for prolonging the shelf life of cosmetics. 4,416,901., Cl. 424-363,000.  
Boda, James, to Brunswick Corporation. Connector for vane steering of marine drive. 4,416,636., Cl. 440-51,000.  
Bodenseewerk Perkin-Elmer & Co., GmbH: See—  
Huber, Bernhard, 4,416,736., Cl. 204-1,00T.  
Bodkin, Robert E.: See—  
Rosen, Howard N.; Bodkin, Robert E.; and Gaddis, Kenneth D., 4,416,069., Cl. 34-13,800.  
Bodmer, Albert, to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH. Reflector for uniformly illuminating an area, particularly a film window of a film or slide projector, and reflector lamp. 4,417,300., Cl. 362-304,000.  
Boeckmann, Hugo: See—  
Scheffers, Richard W.; and Boeckmann, Hugo, 4,416,376., Cl. 206-554,000.  
Boehringer Mannheim GmbH: See—  
Becker, Udo; Schaich, Eugen; and Weigert, Manfred, 4,416,812., Cl. 260-112,00R.  
Roder, Albert; Siedel, Joachim; Möllinger, Hans; Seidel, Hans; and Gahl, Helmut, 4,416,983., Cl. 435-25,000.  
Boeing Company, The: See—  
Alberti, John, 4,416,579., Cl. 414-534,000.  
Faville, Paul E., 4,417,147., Cl. 250-560,000.  
Herrmann, Richard, Jr., 4,416,738., Cl. 204-32,00R.  
Jacobs, Loyd D., 4,416,349., Cl. 181-208,000.  
Bogan, William F.: See—  
Kulischenko, Walter; Bogan, William F.; and Ellis, William C., 4,416,644., Cl. 464-52,000.  
Bogorsky, Mikhail V.: See—  
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V., and Samotryasov, Sergei M., 4,417,121., Cl. 219-104,000.  
Bohm, Roland; and Hille, Martin, to Hoechst Aktiengesellschaft. Emulsion-breaking composition. 4,416,796., Cl. 252-338,000.  
Bohn, Helmut: See—  
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272,000.  
Bohnert, Jozsef: See—  
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291,000.  
Boliden Aktiebolag: See—  
Malmqvist, Erik L.; and Kristiansson, Krister, 4,417,142., Cl. 250-253,000.  
Bolt, Lawrence, to American Hoechst Corporation. High stability polarizer. 4,416,946., Cl. 428-421,000.  
Bomar Corporation: See—  
Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., 4,416,085., Cl. 49-340,000.  
Bone, Arnold R., to Dennison Manufacturing Company. Dispensing of fasteners with a pivoted and disengageable feed mechanism. 4,416,407., Cl. 227-67,000.  
Borghese, Valerio; Erratico, Pietro; and Coccetti, Silvano, to SGS-ATES Componenti Elettronici SpA. Power amplifier protection circuit. 4,417,292., Cl. 361-87,000.  
Borrer, Alan L.; Cincotta, Louis; and Lee, John W., Jr., to Polaroid Corporation. Novel xanthene compounds and their photographic use. 4,416,971., Cl. 430-221,000.  
Borruso, Marty: See—  
Goodman, Mark; Zeno, John R.; and Borruso, Marty, 4,416,145., Cl. 73-40,50A.  
Bortnik, Michael: See—  
Menke, Russell O.; and Bortnik, Michael, 4,416,785., Cl. 210-699,000.  
Bosne, Jacques G. P. E., to Hamon-Sobelco, S.A. Device for receiving a free falling liquid and the application thereof in a countercurrent liquid and gas cooling device. 4,416,835., Cl. 261-110,000.  
Bottger, Dieter, to Eglasstrek Patent Promotion & Awarding GmbH. Method and apparatus for making glass filament or fibers. 4,416,678., Cl. 65-2,000.  
Bouillon, Alain M. Potato harvesting apparatus. 4,416,334., Cl. 171-27,000.  
Bourbeau, Richard A.: See—  
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,416,722., Cl. 156-578,000.  
Bouteille, Rene: See—  
Gabbellieri, Rodolfo; and Bouteille, Rene, 4,416,949., Cl. 428-461,000.  
Bouvard, Andre: See—  
Hulin, Jean P.; Bouvard, Andre; and Le Maitre, Patrick, 4,416,507., Cl. 350-96,220.

Bowald, Staffan: See—  
Eriksson, Ingvar; Bowald, Staffan; and Busch, Christer, 4,416,028., Cl. 3-1,400.  
Bowditch, W. Raymond, to Wilmington Chemical Corporation. Diglycidyl ether of dimethanol cyclohexane and reaction products thereof. 4,417,033., Cl. 525-481,000.  
Bowen, Theodore: See—  
Hessemer, Robert A., Jr.; and Perper, Lloyd J., 4,416,552., Cl. 374-117,000.  
Bower, James F. Flexible one-way valve and method of producing. 4,416,308., Cl. 137-846,000.  
Bowman, Harold M.; and Kicher, Thomas P., to Bowman, Harold M. Ingot mold and method. 4,416,440., Cl. 249-82,000.  
Braas & Company GmbH: See—  
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094., Cl. 52-72,000.  
Brachert, Heinrich: See—  
Monch, Joachim; and Brachert, Heinrich, 4,416,712., Cl. 149-98,000.  
Bradford-White Corporation: See—  
Staats, Charles W., 4,416,222., Cl. 122-13,00R.  
Bradley, Harry S., to H. & K. Bradley (Trailer Equipment) Limited. Towing couplings. 4,416,467., Cl. 280-512,000.  
Braggins, Timothy T.: See—  
Thomas, Richard N.; and Braggins, Timothy T., 4,416,051., Cl. 29-572,000.  
Brand, Erich: See—  
Schurmann, Helmut; and Brand, Erich, 4,416,790., Cl. 252-62,000.  
Brandes, Wilhelm: See—  
Stetter, Jorg; Lunkenheimer, Winfried; and Brandes, Wilhelm, 4,416,889., Cl. 424-269,000.  
Brandsness, Gordon T.; Ebright, Robert L.; and Orosz, Alexander J., to Sperry Corporation. Spring clip electrical connector for strip conductor cable. 4,416,497., Cl. 339-17,00F.  
Brandt, Inc.: See—  
Bergman, Charles T., 4,416,299., Cl. 133-1,00R.  
Brandt, Timothy B.: See—  
Parr, Erwin W.; and Brandt, Timothy B., 4,416,399., Cl. 222-402,130.  
Braun Aktiengesellschaft: See—  
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, 4,416,298., Cl. 132-33,00R.  
Braun, Ernst; and Braun, Gert, to Halbach & Braun. Planar drive device. 4,416,643., Cl. 464-38,000.  
Braun, Gert: See—  
Braun, Ernst; and Braun, Gert, 4,416,643., Cl. 464-38,000.  
Braverman, Milton; and Zink, Leonard, to Medi-Dose, Inc. Computer print form cover sheet for multi-compartment medicinal dispensing device. 4,416,375., Cl. 206-534,100.  
Brefka, Paul E. Edge anchors for printed circuit board connectors. 4,416,496., Cl. 339-17,00C.  
Breski, Thomas A.; and Ryan, Robert A., deceased (by Bank of New York Inc., The, executor), to International Business Machines Corporation. Apparatus for stacking fan-folded paper. 4,416,653., Cl. 493-412,000.  
Breslau, Steven M.; and Grossman, M. Gary, to Sima Products Corporation. Camera lens accessory mounting construction. 4,416,528., Cl. 354-296,000.  
Bresler, Robert G., to McCormick Laboratories, Inc. Circuits for determining very accurately the position of a device inside biological tissue. 4,416,289., Cl. 128-737,000.  
Bresson, Clarence R.; and Parlman, Robert M., to Phillips Petroleum Company. Selective mineral recovery. 4,416,770., Cl. 209-167,000.  
Breyse, Michele: See—  
Bernard, Jean-Rene; and Breyse, Michele, 4,416,806., Cl. 502-74,000.  
Bernard, Jean-Rene; and Breyse, Michele, 4,417,083., Cl. 585-419,000.  
Brinkmann, Heinz, to Hermann Berstorff Maschinenbau GmbH. Apparatus for treating powdery rubber mixtures. 4,416,543., Cl. 366-80,000.  
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- Burton, Clement. See—
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- Eriksson, Ingvar; Bowald, Staffan; and Busch, Christer. 4,416,028. Cl. 3-1.400.
- Butler, James R. See—
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- Carson Products Company. See—
- Meyers, William E. 4,416,296. Cl. 132-7.000.
- Casio Computer Co., Ltd. See—
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- Dore, Charles F. G.; and Chambers, Geoffrey R. 4,416,662. Cl. 604-154.000.
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- Puchalski, Eugene; Donahue, Frances A.; and Dixon, Richard P. 4,416,873. Cl. 424-177.000.
- Charles Stark Draper Laboratory, Inc. The. See—
- Curtiss, William P.; and Fulton, Donald E. 4,417,194. Cl. 322-47.000.
- Charlon, Pierre. See—
- Durand, Pierre; Charlon, Pierre; and Jouffroy, Guy. 4,416,856. Cl. 422-131.000.
- Chartered Industries of Singapore Private Limited. See—
- Sullivan, Leroy J. 4,416,186. Cl. 89-198.000.
- Chartwell House Group Limited. The. See—
- Bennett, Peter H. E. 4,416,655. Cl. 494-40.000.
- Chellis, James G. See—
- Abrams, Richard F.; and Chellis, James G. 4,416,855. Cl. 422-111.000.
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- Wiberg, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H. 4,416,332. Cl. 166-246.000.
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- Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans. 4,416,975. Cl. 430-327.000.
- Lohmann, Dieter; Roth, Martin; and Baumann, Marcus. 4,417,057. Cl. 548-429.000.
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- Ciccotelli, Stephen S. See—
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- Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr. 4,416,971. Cl. 430-221.000.
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- Citizen Watch Company Limited. See—
- Saito, Motoyuki; and Fukutome, Satoru. 4,417,113. Cl. 200-302.000.
- Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L. to Medtronic, Inc. Apparatus for monitoring and storing utilizing a data processor. 4,417,306. Cl. 364-415.000.
- Clairol Incorporated. See—
- Wolfram, Leszek J.; Cohen, David; and Tehrani, Norman N. 4,416,297. Cl. 132-7.000.
- Clare, Kenneth D.; and Ambrose, Michael F. J. to Fairley Engineering Limited. Freight containers. 4,416,385. Cl. 220-1.500.
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- Benedite, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques. 4,417,124. Cl. 219-121.01H.
- Cline, Charles D.; and Mills, Thomas L. to Para-Chem Southern, Inc. Frothing aid composition. 4,417,016. Cl. 524-156.000.
- Coad, L. Dale. to Imperial Clevite Inc. Viscous spring damper. 4,416,445. Cl. 267-35.000.
- Coal Industry (Patents) Limited. See—
- McCaffrey, David J. A.; and Jones, William D. deceased. 4,416,769. Cl. 209-166.000.
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- Clark, Allen V.; Myers, Derek V.; and Hatch, Vaughn I. 4,416,700. Cl. 127-34.000.
- Cocetti, Silvano. See—
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- Cohen, David. See—
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- Bellis, Robert D.; and Wood, Dennis. 4,416,364. Cl. 194-100.00A.
- Cole, Morton S. Antistaling baking composition. 4,416,903. Cl. 426-18.000.
- Colgate-Palmolive Company. See—
- Wixon, Harold E. 4,416,811. Cl. 252-8.750.
- Collin, Per H. to Asea AB. Process for the manufacture of crude iron and energy-rich gases. 4,416,689. Cl. 75-11.000.
- Colotte, Guy E. P. See—
- McNaught, James B.; and Colotte, Guy E. P. 4,416,486. Cl. 296-190.000.
- Colucci, Eugene C. to Union Carbide Corporation. Hydraulic drive liquid transfer pump system. 4,416,590. Cl. 417-231.000.
- Combustion Engineering, Inc. See—
- Palmer, David N.; and Ferrell, Gary W. 4,416,915. Cl. 427-126.300.
- Cominco Ltd. See—
- Kerby, Robert C.; and Krauss, Clifford J. 4,416,746. Cl. 204-114.000.
- Commette, Denis S.; and Sundberg, Carl W., Jr. to Gusmer Corporation. Valved coupling for conduits. 4,416,305. Cl. 137-614.000.
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- Feutrel, Claude. 4,416,848. Cl. 376-260.000.
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- Lamy, Jacques E.; Michel, Dominique; and Serrano, Francisco D. M. 4,416,473. Cl. 285-41.000.
- Concord Laboratories, Inc. See—
- Wheeler, Robert P., Jr. 4,416,984. Cl. 435-31.000.
- Concord Scientific Corporation. See—
- Stevens, R. D. Samuel. 4,416,748. Cl. 204-157.10P.
- Condar Co. See—
- Cornelison, Richard C. 4,416,157. Cl. 73-747.000.
- Congdon, James S. See—
- Murkland, Judd R.; and Congdon, James S. 4,417,265. Cl. 357-51.000.
- Conoco Inc. See—
- Burke, Francis P. 4,416,424. Cl. 241-101.00B.
- Evens, David A. 4,416,323. Cl. 165-11.00R.



- Constantine, Albert: See—  
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Desmond, John D.; and Mesquida-Feirman, B., 4,416,411., Cl. 229-40.000.
- Helms, Charles R., 4,416,843., Cl. 264-152.000.
- Nauheimer, James F., 4,416,371., Cl. 206-289.000.
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Walter, John, 4,416,386., Cl. 220-67.000.
- Cowled Corporation: See—  
Fair, Timothy K., Sr., 4,416,718., Cl. 156-344.000.
- Conzelmann, Gerhard: See—  
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041., Cl. 28-255.000.
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- Cooper, Ronald C. E., to Ciba-Geigy AG. Web treatment apparatus. 4,416,426., Cl. 242-56.900.
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Hillberg, Robert L., 4,416,078., Cl. 42-69.00R.
- Corabellum A.G.: See—  
Rumble, Clive, 4,416,502., Cl. 339-103.00M.
- Corbin, Edgar A., Jr.: See—  
Lundstedt, Erik; and Corbin, Edgar A., Jr., 4,416,905., Cl. 426-34.000.
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Saulson, Stanley H.; and Tarjan, Peter P., 4,416,282., Cl. 128-419.0PG.
- Slocum, Chester D., 4,416,283., Cl. 128-419.0PG.
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Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving, 4,416,841., Cl. 264-102.000.
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- Cormier, William E., Jr.: See—  
Chester, Arthur W.; Cormier, William E., Jr.; and Stover, William A., 4,416,765., Cl. 208-120.000.
- Cornelson, Richard C., to Condar Co. Inclined manometer. 4,416,157., Cl. 73-747.000.
- Corning Glass Works: See—  
Beall, George H.; and Fehner, Francis P., 4,416,517., Cl. 350-357.000.
- Montierth, Max R., 4,416,675., Cl. 55-502.000.
- Montierth, Max R., 4,416,676., Cl. 55-523.000.
- Corsmeier, Robert J.: See—  
Lenahan, Dean T.; Corsmeier, Robert J.; and Sterman, Albert P., deceased, 4,416,111., Cl. 60-39.290.
- Corvers, Antonius; van den Broek, Cornelis W.; and Suverkropp, Geerttrudes H., to Stamicarbon B.V. Process for the preparation of substituted glyoxylic acid derivatives. 4,417,053., Cl. 546-315.000.
- Cosden Technology, Inc.: See—  
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- Watson, James M.; Forward, Cleve H.; and Butler, James R., 4,417,085., Cl. 585-440.000.
- Coutin, Pierre F.: See—  
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,416,437., Cl. 244-137.00R.
- CPI Products Corp.: See—  
Munson, Leo J.; Grauzde, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455., Cl. 273-272.000.
- Craig, Laurence B.; and Farina, Alfred J., to Thermocatalytic Corp. Porous ceramic combustion reactor. 4,416,619., Cl. 431-328.000.
- Cranston Machinery Co., Inc.: See—  
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- Creative Pathways, Incorporated: See—  
Young, Russell D., 4,417,129., Cl. 219-130.320.
- Crivello, James V., to General Electric Company. Method of coating a conducting substrate and coated substrates obtained thereby. 4,416,752., Cl. 204-181.00R.
- Crivello, James V., to General Electric Company. Photoinitiators. 4,417,061., Cl. 549-3.000.
- Cromie, Harry W., to Baxter Travenol Laboratories, Inc. Miniature rotary infusion pump with slide latch and detachable power source. 4,416,595., Cl. 417-476.000.
- Cronin, Gerald F.; and Fuller, Howard J., to Worcester Controls Corporation. Electronic controller for valve actuators. 4,417,312., Cl. 364-510.000.
- CIS Corporation: See—  
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- Cueto, Agustín; and Robinson, Daniel E., to GK Technologies, Incorporated. Cord sets with power-factor control. 4,417,196., Cl. 323-210.000.
- Cummings, John R. Self centering pipe cutting device. 4,416,062., Cl. 30-101.000.
- Cummings, Leslie L. Gas operated down hole pump. 4,416,593., Cl. 417-344.000.
- Cummins Engine Company, Inc.: See—  
McDonald, Ross W., 4,416,244., Cl. 123-577.000.
- Cunningham, Douglas J., to Britax (Wingard) Limited. Passive safety belt systems. 4,416,468., Cl. 280-802.000.
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- Cuomo, Jerome J.; Leary, Pamela A.; and Yee, Dennis S., to International Business Machines Corporation. Copper texturing process. 4,416,725., Cl. 156-635.000.
- Curole, Michael A.: See—  
Mundhenk, David L.; and Curole, Michael A., 4,416,333., Cl. 166-250.000.
- Curren, Arthur N.; Forman, Ralph; Sovey, James S.; and Wintucky, Edwin G., to United States of America, National Aeronautics and Space Administration. Ion sputter textured graphite electrode plates. 4,417,175., Cl. 315-5.380.
- Curtiss, William P.; and Fulton, Donald E., to Charles Stark Draper Laboratory, Inc. The Induction generator system with switched capacitor control. 4,417,194., Cl. 322-47.000.
- Custom Concepts, Incorporated: See—  
Kubiatowicz, James F., 4,416,083., Cl. 46-208.000.
- Cutter Laboratories, Inc.: See—  
Norman, Melvin H.; Manske, Reinhold R.; and Sheehan, Neil J., 4,416,661., Cl. 604-86.000.
- Czerney, Peter; Hartmann, Horst; and Liebscher, Jurgen, to Jenoptik Jena GmbH. Amino-substituted 2-cumaryl-(3)-chromenylium salts. 4,417,060., Cl. 548-525.000.
- Dafoe, Charles A. Method of transvaginal sterilization. 4,416,660., Cl. 604-55.000.
- Dahms, Francis A., to Emhart Industries, Inc. Glassware mold forming apparatus. 4,416,681., Cl. 65-264.000.
- Dai Nippon Insatsu Kabushiki Kaisha: See—  
Tachibana, Eiichi; and Hikosaka, Shinichi, 4,416,215., Cl. 118-642.000.
- Daiel Chemical Industries, Ltd.: See—  
Toba, Hirotsuka; Mikumo, Masatoshi; and Asami, Masahiro, 4,417,025., Cl. 525-54.210.
- Daimler-Benz Aktiengesellschaft: See—  
Scheurenbrand, Dieter, 4,416,303., Cl. 137-576.000.
- Daiwa Seiko Inc.: See—  
Kawai, Hiroshi, 4,416,427., Cl. 242-84.20R.
- Daloisio, Pasquale C.: See—  
Smith, Rush B.; and Daloisio, Pasquale C., 4,416,374., Cl. 206-507.000.
- Damiano, Joseph C. Lamp control device. 4,417,177., Cl. 315-73.000.
- D'Amico, John J.; and Schafer, Tann R., to Monsanto Company. 3,5-Bis (trifluoromethyl)phenoxy carboxylic acids and derivatives thereof. 4,416,687., Cl. 71-109.000.
- Damms, Anthony B.: See—  
Rushby, Robert J.; and Damms, Anthony B., 4,417,136., Cl. 235-379.000.
- D'Angelo, Charles: See—  
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,416,670., Cl. 51-295.000.
- Daniels, Fitz A. S. C. Belt type garment for carrying tennis balls and the like. 4,416,404., Cl. 224-224.000.
- D'Antonio, Joseph V., to Bates, Richard L., a part interest. Paint preserver. 4,416,387., Cl. 220-93.000.
- Dardoufas, Kimon C.: See—  
Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., 4,416,787., Cl. 252-8.800.
- Darnell, Robert D.: See—  
Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., 4,416,913., Cl. 427-45.100.
- Dart Industries Inc.: See—  
Hulyalkar, Ramechandra K.; Baum, Gerald A.; and Hotchandani, Kanayo, 4,417,015., Cl. 524-139.000.
- Das, Subodh K., to Aluminum Company of America. High temperature, corrosion resistant coating and lead for electrical current. 4,417,097., Cl. 174-110.00A.
- Datta, Pabitra; and Friel, Ronald N., to RCA Corporation. Conductive video discs. 4,416,807., Cl. 252-511.000.
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- Daum, Gerhard: See—  
Ackermann, Otto; and Daum, Gerhard, 4,417,073., Cl. 560-105.000.
- Davida, George I., to Wisconsin Alumni Research Foundation. Cryptographic key sharing circuit and method using code correction. 4,417,338., Cl. 371-37.000.
- Davidson, Gary W.: See—  
Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., 4,417,183., Cl. 315-291.000.

- Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-4-hydroxyl-4-phenylpiperidines to treat pain. 4,416,887., Cl. 424-267.000.
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Miller, Robert F.; and Davis, Paul K., 4,416,474., Cl. 285-47.000.
- Davis, Stephen H.; and Simpson, Daniel W., to Water Refining Company, Inc. Valve mechanism for multiple distributor fluid treatment system. 4,416,773., Cl. 210-289.000.
- Davis, Walter Z., to Helical Control Systems, Inc. Process and apparatus for monitoring length and diameter of helical corrugated pipe. 4,416,131., Cl. 72-12.000.
- Davis, William F., to Motorola, Inc. Operational amplifier. 4,417,216., Cl. 330-294.000.
- Davison, Charles F., to Norwood Marking & Equipment Co., Inc. Multicolor imprinter. 4,416,199., Cl. 101-193.000.
- Davy-Loewy Limited: See—  
Marshall, Robert, 4,416,137., Cl. 72-243.000.
- Dawson, Christopher R.; and Purkis, Ronald E., to United States of America, Navy. Small arms firing effects simulator. 4,416,631., Cl. 434-16.000.
- Dawson, William, to Lilly Industries Limited. Method of treating hypersensitivity disease with benzoxazole derivatives. 4,416,892., Cl. 424-272.000.
- Dayco Corporation: See—  
White, Jack D., Jr., 4,416,647., Cl. 474-134.000.
- Deardurff, Lawrence R., to Owens-Illinois, Inc. Apparatus for forming parisons. 4,416,608., Cl. 425-548.000.
- Decca Limited: See—  
Holyman, Brian T.; and Baty, Charlton R., 4,417,220., Cl. 333-174.000.
- Decker, Tracey Donaldson: See—  
Staten, Harold D., 4,416,045., Cl. 29-229.000.
- Degussa: See—  
Knorre, Helmut; Fischer, Joachim; and Stutzel, Klaus, 4,416,786., Cl. 210-746.000.
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Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,827., Cl. 260-501.120.
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- Del Mar Avionics: See—  
Woods, Donald C., 4,417,254., Cl. 346-33.00R.
- Delamontagne, Robert P. Management teaching game method. 4,416,454., Cl. 273-243.000.
- deLarosiére, Pierre J. Interlocking stackable bottles. 4,416,373., Cl. 206-432.000.
- Del Grande, Donald J. Audible alarm network. 4,417,235., Cl. 340-531.000.
- De Longchamp, Jacques H., to Dosapro Milton Roy. Diaphragm pump with compensation means in the hydraulic control chamber. 4,416,599., Cl. 417-386.000.
- Demark, Anthony M.; and Erhardt, William K., to Honeywell Inc. High pressure electrical feedthru. 4,416,156., Cl. 73-727.000.
- Demke, Kent R.; and Mumola, Joanne L., to International Business Machines Corp. Interactive combination display. 4,417,239., Cl. 340-709.000.
- DeMoss, Dean: See—  
Ragle, Herbert U.; and DeMoss, Dean, 4,417,289., Cl. 360-98.000.
- Dennison Manufacturing Company: See—  
Bone, Arnold R., 4,416,407., Cl. 227-67.000.
- Paradis, Joseph R., 4,416,838., Cl. 264-25.000.
- Deregibus, Alfio, to I.T.S. S.r.l. Apparatus for producing reinforced tubing. 4,416,721., Cl. 156-428.000.
- Dermal Limited: See—  
Bernstein, Joel E., 4,416,886., Cl. 424-260.000.
- Derner, Paul; and Martin, Dietrich, to BFG GLASSGROUP. Insulating glass window structure. 4,416,101., Cl. 52-398.000.
- Desmarais, Mark R.; and Yates, Mark A., to AMP Incorporated. Switch actuating assembly having improved cams and plural modes. 4,417,115., Cl. 200-340.000.
- Desmond, John D.; and Mesquida-Feirman, B., to Container Corporation of America. Sleeve-type carton for tapered articles. 4,416,411., Cl. 229-40.000.
- DeSoto, Inc.: See—  
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,416,750., Cl. 204-159.190.
- Desroches, Roger E.: See—  
Lindner, James A.; and Desroches, Roger E., 4,416,279., Cl. 128-314.000.
- Detweiler, Charles A., to Schmelzer Corporation. Valve assembly. 4,416,307., Cl. 137-625.660.
- deVries, Egbert, to Quad Environmental Technologies Corp. Two stage odor control system. 4,416,861., Cl. 423-210.000.
- Dey, Phillip; Fearn, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., to BICC Public Limited Company. Overhead electric and optical transmission cables. 4,416,508., Cl. 350-96.230.
- Diamond Shamrock Corporation: See—  
Sinka, Joseph V.; and Lieberman, Robert A., 4,417,023., Cl. 524-731.000.
- Dickson, LeRoy D., to International Business Machines Corporation. Method for making holographic optical elements with high diffraction efficiencies. 4,416,505., Cl. 350-3.710.
- Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, to Klein, Schanzlin & Becker Aktiengesellschaft. Submersible motor pump assembly. 4,416,586., Cl. 417-13.000.
- Diefenbach, Horst: See—  
Batziil, Wolfgang; and Diefenbach, Horst, 4,416,753., Cl. 204-181.00C.
- Diesel Kiki Co., Ltd.: See—  
Ishizuka, Yutaka, 4,416,190., Cl. 92-71.000.
- Sutoh, Shinji; Hara Toshiro; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324., Cl. 165-12.000.
- Dietrich, Herbert, to Pfaff Industriemaschinen GmbH. Feed device equipment for letting out hides. 4,416,125., Cl. 69-21.000.
- Dietsche, Wolfram: See—  
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035., Cl. 526-208.000.
- Digital Broadcasting Corporation: See—  
Hills, Michael; Durrett, Clay; and Von Meister, William, 4,417,349., Cl. 375-60.000.
- Dill, Terry A., to Jefferson Industries Company. Egg collecting system and method. 4,416,219., Cl. 119-48.000.
- DiLuccio, Robert C., to Du Pont de Nemours, E. I., and Company. Laminates of lamellar articles and polyolefins. 4,416,942., Cl. 428-332.000.
- Dimovski, Milan: See—  
Chamran, Morteza M.; and Dimovski, Milan, 4,417,180., Cl. 315-175.000.
- Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F. Adjustable leg assembly. 4,416,439., Cl. 248-188.600.
- Dinwiddie, John M., Jr., to International Business Machines Corporation. Synchronous cycle steal mechanism for transferring data between a processor storage unit and a separate data handling unit. 4,417,304., Cl. 364-200.000.
- DiPietro, Raymond B. Flue structure for domestic heating equipment. 4,416,254., Cl. 126-307.00A.
- Dischert, Robert A., to RCA Corporation. Adaptive reconstruction of the color channels of a color TV signal. 4,417,269., Cl. 358-12.000.
- Diselbeck, Dieter, to Hoechst Aktiengesellschaft. Method to upgrade sewage treatment plants overloaded in continuous operation. 4,416,780., Cl. 210-617.000.
- Distributed Control Systems, Inc.: See—  
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, 4,417,151., Cl. 307-24.000.
- Dixon, Dale D.: See—  
Daughenbaugh, Randall J.; and Dixon, Dale D., 4,417,074., Cl. 564-479.000.
- Dixon, Richard P.: See—  
Puchalski, Eugene; Donahue, Frances A.; and Dixon, Richard P., 4,416,873., Cl. 424-177.000.
- Dobler, Klaus: See—  
Hachtel, Hansjorg; and Dobler, Klaus, 4,417,208., Cl. 324-164.000.
- Dr. C. Otto & Comp. G.m.b.H.: See—  
Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, 4,416,732., Cl. 202-139.000.
- Dolin, Russell L.: See—  
Yono, Munim; and Dolin, Russell L., 4,416,120., Cl. 62-231.000.
- Donahue, Frances A.: See—  
Puchalski, Eugene; Donahue, Frances A.; and Dixon, Richard P., 4,416,873., Cl. 424-177.000.
- Donaldson, Helen: See—  
Staten, Harold D., 4,416,045., Cl. 29-229.000.
- Donaldson, Melody J.: See—  
Staten, Harold D., 4,416,045., Cl. 29-229.000.
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Adams, Robert W.; and Donohoe, Charles R., 4,416,183., Cl. 89-1.807.
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- Dorier, Jack A.; Mosley, Joseph M.; Seeger, Richard O.; and Weitzel, Stephen D., to International Business Machines Corporation. Diode-transistor active pull up driver. 4,417,159., Cl. 307-270.000.
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De Longchamp, Jacques H., 4,416,599., Cl. 417-386.000.
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Dougherty, Frank E., Sr., 4,416,400., Cl. 222-420.000.
- Dougherty, Frank E., Sr., to Dougherty Brothers Company. One piece dispenser. 4,416,400., Cl. 222-420.000.
- Dow Chemical Company, The: See—  
Killat, George R.; and Wilson, Larry R., 4,416,729., Cl. 162-164.300.
- Metzger, Bruce A., 4,416,937., Cl. 428-286.000.
- Poindexter, Graham S., 4,416,818., Cl. 260-239.30A.
- Sole, Jitka; and Haigh, Daniel H., 4,416,945., Cl. 428-407.000.
- Dow Corning Limited: See—  
Westall, Stephen, 4,417,066., Cl. 556-425.000.
- Doyle, Edward A., to E. A. Doyle Manufacturing Corporation. Automatic machine for finishing cookware body blanks. 4,416,133., Cl. 72-58.000.
- Doyon, Sandra F.: See—  
Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F., 4,416,439., Cl. 248-188.600.
- Draft Systems, Inc.: See—  
Totten, Roger, 4,416,430., Cl. 242-107.300.



- Drago, Russell S.; and El A'mma, Anton, to University of Illinois Foundation. Heterogeneous anionic transition metal catalysts. 4,417,077. Cl. 568-454.000.
- Dragon, Robert L.: See—  
Walls, John E.; Dragon, Robert L.; and Dunder, Thomas A., 4,416,972. Cl. 430-278.000.
- Drake, Charles A., to Phillips Petroleum Company. Hydrosomerization. 4,417,089. Cl. 585-670.000.
- Drescher GmbH & Co. KG: See—  
Beck, Siegfried; and Urescher, Philipp, 4,416,470. Cl. 281-7.000.
- Dresser Industries, Inc.: See—  
Jones, Thaddeus M., 4,417,199. Cl. 323-319.000.  
Lambke, Bernard J., Jr., 4,416,089. Cl. 49-502.000.  
Wilson, Herbert C., 4,416,152. Cl. 73-155.000.
- Dresler, Daryl D., to Minnesota Mining and Manufacturing Company. Circuitry controlled by coded manual switching for producing a control signal. 4,417,247. Cl. 340-825.310.
- Drexhage, Karl H., to Eastman Kodak Company. Color imaging devices and color filter arrays using photo-bleachable dyes. 4,416,961. Cl. 430-7.000.
- Duerig, Thomas: See—  
Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, 4,416,706. Cl. 148-11.50C.
- Duffy, Terrance W.: See—  
Nash, Richard C.; and Duffy, Terrance W., 4,416,842. Cl. 264-145.000.
- Dunbar, Frank C.: See—  
Pierson, Marvin B.; and Dunbar, Frank C., 4,416,920. Cl. 427-349.000.
- Duncan Electric Company, Inc.: See—  
Mayfield, Glenn A., 4,417,198. Cl. 323-315.000.
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- Dunder, Thomas A.: See—  
Walls, John E.; Dragon, Robert L.; and Dunder, Thomas A., 4,416,972. Cl. 430-278.000.
- Dunlop Limited: See—  
Clatworthy, Michael C.; Mack, William P. S.; and Major, Douglas J., 4,416,316. Cl. 152-209.00R.
- Dunn, David J., to Lucite (Ireland) Limited. Composition and process for the impregnation and sealing of porous articles. 4,416,921. Cl. 427-353.000.
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Barsotti, Robert J., 4,416,941. Cl. 428-328.000.  
Bascom, Laurence N.; and Leung, Peter S. K., 4,416,935. Cl. 428-229.000.
- DiLuccio, Robert C., 4,416,942. Cl. 428-332.000.
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- Goff, David L., 4,416,973. Cl. 430-281.000.
- Haskell, Vernon C., 4,416,938. Cl. 428-289.000.
- Held, Robert P., 4,416,968. Cl. 430-199.000.
- Jacobson, Howard W., 4,416,699. Cl. 106-300.000.
- Mahr, Tibor G.; and Subramanian, Pallathari M., 4,416,749. Cl. 204-159.140.
- Nair, Kumaran M., 4,416,932. Cl. 428-209.000.
- Ostermaier, John J., 4,416,825. Cl. 260-439.00R.
- Osterman, Joseph D., 4,416,981. Cl. 430-614.000.
- Reimer, Ronald A.; and Stowe, Gerald T., 4,416,824. Cl. 260-439.00R.
- Waller, Francis J., 4,416,801. Cl. 502-153.000.
- Webster, Owen W., 4,417,034. Cl. 526-190.000.
- Dupontell, Daniel: See—  
Brossard, Pierre; and Dupontell, Daniel, 4,417,219. Cl. 332-9.00R.
- Durand, Pierre; Charlon, Pierre; and Joffroy, Guy, to Societe Chimique des Charbonnages—CdF Chimie. Process for the polymerization and copolymerization of ethylene, using a gas injector device. 4,416,856. Cl. 422-131.000.
- Durret, Clay: See—  
Hills, Michael; Durret, Clay; and Von Meister, William, 4,417,349. Cl. 375-60.000.
- Durual, Pierre: See—  
Cognion, Jean-Marie; and Durual, Pierre, 4,417,056. Cl. 548-334.000.
- Dyakonov, Alexandr J.: See—  
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076. Cl. 568-361.000.
- Dyke, David L.: See—  
Stevenson, John; Machin, John; and Dyke, David L., 4,416,694. Cl. 106-84.000.
- Dynamit Nobel AG: See—  
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,417,067. Cl. 556-467.000.  
Monch, Joachim; and Brachert, Heinrich, 4,416,712. Cl. 149-98.000.
- Dynamit Nobel A.G.: See—  
Ackermann, Otto; and Daum, Gerhard, 4,417,073. Cl. 560-105.000.
- Dynatrans AB: See—  
Bjurling, Anders, 4,416,384. Cl. 220-1.500.
- Dyneer Corporation: See—  
Radocaj, Mijo, 4,416,648. Cl. 474-135.000.
- Dyson, Brian J.: See—  
Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F., 4,416,439. Cl. 248-188.600.
- Dziark, John J., to General Electric Company. Scavengers for one-component alkoxy-functional RTV compositions and processes. 4,417,042. Cl. 528-18.000.
- E. A. Doyle Manufacturing Corporation: See—  
Doyle, Edward A., 4,416,133. Cl. 72-58.000.
- E. M. I.-Varian Limited: See—  
Tuck, Richard A.; and Skinner, Heather B., 4,417,173. Cl. 313-346.00R.
- E/M Lubricants, Inc.: See—  
Sargent, Donald J., 4,416,132. Cl. 72-41.000.
- E. R. Squibb & Sons, Inc.: See—  
Karnewsky, Donald S.; and Petrillo, Edward W., Jr., 4,416,833. Cl. 260-941.000.  
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896. Cl. 424-285.000.  
Petrillo, Edward W., Jr., 4,416,831. Cl. 260-938.000.
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Gershberg, David N.; Lee, Alexander Y., Jr.; and Moore, William B., 4,417,157. Cl. 307-256.000.
- E. W. Buschman Company, The: See—  
Wilkins, John J., 4,416,650. Cl. 474-161.000.
- Eagle Industry Co., Ltd.: See—  
Kaze, Akira, 4,416,204. Cl. 112-68.000.
- East/West Industries, Inc.: See—  
Spinosa, Dominic J.; and Knoll, Frank, 4,416,641. Cl. 441-94.000.
- Eastman Kodak Company: See—  
Drexhage, Karl H., 4,416,961. Cl. 430-7.000.  
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Kissel, Thomas R., 4,416,735. Cl. 204-1.00T.  
Magee, Paul M.; and Evans, Gareth B., 4,416,969. Cl. 430-217.000.  
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Demark, Anthony M.; and Erhardt, William K., 4,416,156. Cl. 73-727.000.
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Nolte, Wilfried; and Esser, Heinz, 4,417,036. Cl. 526-211.000.
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Perucchi, Norberto; and Mock, Elmar, 4,417,166. Cl. 310-49.00R.
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Mesnel, Francois, 4,416,951. Cl. 428-586.000.
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Meier, Jacques, 4,416,448. Cl. 270-55.000.
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Bergles, Eduard, 4,416,646. Cl. 474-80.000.
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Maglio, Ralph A., 4,416,926, Cl. 428-31.000.
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Weber, Walter, 4,416,609, Cl. 431-2.000.
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Knorre, Helmut: Fischer, Joachim; and Stutzel, Klaus, 4,416,786, Cl. 210-746.000.
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Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,417,308, Cl. 364-434.000.
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Miles, Melvin H.; and Fletcher, Aaron N., 4,416,958, Cl. 429-103.000.
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Chmela, John F.; Fletcher, Carl R.; and Sarnoff, Norton, 4,416,171, Cl. 81-346R.
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Engel, John F., 4,417,078, Cl. 568-808.000.  
Kemp, David M., 4,416,194, Cl. 99-275.000.  
Le Devehat, Eugene R., 4,416,306, Cl. 137-615.000.
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Kramer, Klaus; and Huss, Rolf, 4,416,165, Cl. 74-70.000.
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Curren, Arthur N.; Forman, Ralph; Sovoy, James S.; and Wintucky, Edwin G., 4,417,175, Cl. 315-5.380.
- Forthmann, Frederick: Cutter assembly for cutting strip material, 4,416,176, Cl. 83-582.000.
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Watson, James M.; Forward, Cleve H.; and Butler, James R., 4,417,085, Cl. 585-440.000.
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Stevenson, John; Machin, John; and Dyke, David L., 4,416,694, Cl. 106-84.000.
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- Foster, Michael L.: See—  
Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., 4,416,338, Cl. 173-134.000.
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Barratt, Robert O.; and Franklin, Howard N., 4,416,325, Cl. 165-47.000.
- Fouroux, Claude H.; and Boardman, Craig W.: Connector straightening tool, 4,416,143, Cl. 72-479.000.
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Magnin, Raymond, 4,416,849, Cl. 376-296.000.
- France, Haywood G.; and Koleske, Joseph V., to Union Carbide Corporation: Coating substrates with high solids compositions, 4,416,917, Cl. 427-302.000.
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Keller, Patrick N.; Franck, Jerome B.; and Silberberg, George G., 4,417,123, Cl. 219-121.0LH.
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Barratt, Robert O.; and Franklin, Howard N., 4,416,325, Cl. 165-47.000.
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Svoboda, Glenn R.; Carlstrom, William L.; and Stoehr, Richard T., 4,417,001, Cl. 521-114.000.
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Pelts, Boris B.; Tumasian, Benjamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azolian, Stepan E.; and Kostandian, Kliment A., 4,416,723, Cl. 156-608.000.
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Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, 4,416,489, Cl. 299-94.000.
- Friedlund, Richard H.: See—  
Easton, Richard L.; and Friedlund, Richard H., 4,416,367, Cl. 198-496.000.
- Friedman, Robert A.: See—  
Moustakas, Theodore D.; and Friedman, Robert A., 4,417,092, Cl. 136-258.000.
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Datta, Pabitra; and Friel, Ronald N., 4,416,807, Cl. 252-511.000.
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Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, 4,416,795, Cl. 252-301.230.
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Nufel, Karl, 4,416,208, Cl. 112-240.000.
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Wilson, Raymond G.; and Froehbieter, Edwin H., 4,416,119, Cl. 62-149.000.
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Morozumi, Takuro; and Suzuki, Hitoshi, 4,416,236, Cl. 123-438.000.
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Yamada, Teruo, 4,416,104, Cl. 53-371.000.
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Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,416,991, Cl. 435-134.000.
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Igarashi, Akira; and Nakamura, Sukenori, 4,416,939, Cl. 428-323.000.
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Yokoyama, Tsuneo; and Tsuchiya, Kazumichi, 4,417,280, Cl. 358-227.000.
- Fujibayashi, Kenji, to Olympus Optical Co., Ltd.: Muting circuit, 4,417,165, Cl. 307-540.000.
- Fujii, Masanori: See—  
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, 4,416,964, Cl. 430-106.600.
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Ohkawa, Koue; Fujii, Shin; and Seino, Takashi, 4,417,011, Cl. 523-527.000.
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Katagiri, Masayoshi; Fujii, Takashi; and Ogura, Osamu, 4,416,188, Cl. 91-369.00B.
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Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055, Cl. 546-345.000.
- Fujikura Cable Works, Ltd.: See—  
Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichiro, 4,416,601, Cl. 425-68.000.
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Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606, Cl. 425-202.000.
- Fujimura, Takashi; and Kato, Kazuo, to Hitachi, Ltd.: Light quantity control device, 4,417,179, Cl. 315-151.000.
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Fukuda, Tsunehiko; Kobayashi, Shigeru; and Fujino, Masahiko, 4,416,820, Cl. 548-496.000.
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Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,416,879, Cl. 424-246.000.
- Fujishima, Hiroki: See—  
Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi; and Kominami, Yasuhiko, 4,416,709, Cl. 148-403.000.
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Inaba, Hajimu; and Nihei, Ryo, 4,416,577, Cl. 414-226.000.

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Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158, Cl. 307-269.000.
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Ikeda, Mikio; and Tomizawa, Takayuki, 4,416,813, Cl. 260-117.000.
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Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,416,962, Cl. 430-65.000.
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Saito, Motoyuki; and Fukutome, Satoru, 4,417,113, Cl. 200-302.000.
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Cronin, Gerald F.; and Fuller, Howard J., 4,417,312, Cl. 364-510.000.
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Curtiss, William P.; and Fulton, Donald E., 4,417,194, Cl. 322-47.000.
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Jessop, Harvey A.; and Funk, Albert G., 4,416,711, Cl. 149-42.000.
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Motoyama, Kazuyasu; Furuta, Kenji; and Kanayama, Katsumi, 4,417,135, Cl. 377-18.000.
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Yamada, Masatoshi; and Fuse, Takaji, 4,416,196, Cl. 100-7.000.
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Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, 4,416,977, Cl. 430-446.000.
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Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323, Cl. 365-1.000.
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Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819, Cl. 260-293.30B.
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Brown, Lloyd C.; and Klasen, Rudi, 4,416,859, Cl. 422-261.000.
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Rosen, Howard N.; Bodkin, Robert E.; and Gaddis, Kenneth D., 4,416,069, Cl. 34-13.800.
- Gaffal, Karl: See—  
Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, 4,416,586, Cl. 417-13.000.
- Gaillard, Jean, to Institut Francais du Petrole: Process for removing fluorine from olefin oligomers, 4,417,091, Cl. 585-823.000.
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Schaffer, Arnold M.; and Gallagher, Joseph G., Jr., 4,416,154, Cl. 73-571.000.
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Cabane, Bruno; and Galzy, Pierre, 4,416,987, Cl. 435-68.000.
- Garland, Ronald M., to Veeder Industries Inc.: Mechanical fuel pump computer conversion mechanism, 4,417,134, Cl. 235-61.00L.
- Garren, Lloyd R.; and Garren, Mary L.: Method and apparatus for treating obesity, 4,416,267, Cl. 128-1.00R.
- Garren, Mary L.: See—  
Garren, Lloyd R.; and Garren, Mary L., 4,416,267, Cl. 128-1.00R.
- Garrett, William R., to Onco Corporation: Intermediate weight drill stem member, 4,416,476, Cl. 285-286.000.
- Gaubert, Rene J. M.: Bulk liquid container, tap and tap assembly therefore, 4,416,395, Cl. 222-83.000.
- Gaull, Helmgard: See—  
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gaull, Helmgard, 4,416,983, Cl. 435-25.000.
- Gauthier, Yves; and Gravel, Robert: Training device for horses, 4,416,105, Cl. 54-71.000.
- Gaylard, Bernard: See—  
Dey, Phillip; Fearn, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., 4,416,508, Cl. 350-96.230.
- Geary, Carl H., Jr., to Elliott Turbomachinery Co., Inc.: Method and apparatus for cooling an expander, 4,416,581, Cl. 415-1.000.
- Gebruder Junghans GmbH: See—  
Wolber, Robert; and Maurer, Roland, 4,416,550, Cl. 368-88.000.
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- Gelotte, Karl O., to Sterling Drug Inc.: 2-(Lower-alkoxy)-1-(pyridinyl)-ethenyl lower-alkyl ketones, 4,417,054, Cl. 546-340.000.
- Gemmell-Murdoch, Andrew, to Murdoch Logging Industries Pty. Ltd.: Tree harvester, 4,416,311, Cl. 144-3.00D.
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- Gendelman, Bernard: See—  
Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,417,200, Cl. 323-347.000.
- General Dynamics, Convair Division: See—  
Stern, Theodore G., 4,416,052, Cl. 29-572.000.
- General Electric Company: See—  
Agnor, William C.; and Elder, James H., 4,417,246, Cl. 340-825.440.
- Berkowitz, Ami E.; and Walter, John L., 4,416,751, Cl. 204-165.000.
- Brown, Edgar D., Jr., 4,417,069, Cl. 556-479.000.
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- Crivello, James V., 4,416,752, Cl. 204-181.00R.
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- Dziark, John J., 4,417,042, Cl. 528-18.000.
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- Miller, Timothy J. E.; and Jones, Donald W., 4,417,168, Cl. 310-156.000.
- Parekh, Shashi L., 4,417,044, Cl. 528-179.000.
- General Motors Corporation: See—  
Kapp, Gerald E., 4,416,358, Cl. 192-3.320.
- George, David B.: See—  
Richards, Kenneth J.; and George, David B., 4,416,690, Cl. 75-26.000.
- Gerber Scientific Instrument Company, The: See—  
Webster, Ronald B., 4,416,522, Cl. 354-4.000.
- Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, to Dr. C. Otto & Comp. G.m.b.H.: Horizontal coke oven battery, 4,416,732, Cl. 202-139.000.
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- Gervais, Norman A.: See—  
Simpson, Barbara E.; and Gervais, Norman A., 4,416,659, Cl. 604-48.000.
- Gesellschaft für Biotechnologische Forschung mbH (GBF): See—  
Morr, Michael; and Kula, Maria-Regina, 4,416,830, Cl. 260-929.000.
- Gesellschaft für Schwerionenforschung mbH: See—  
Fischer, Bernd, 4,416,724, Cl. 156-628.000.
- Geurtsen, Alfonsus A., to Machinefabriek Geurtsen Deventer B.V.: Reel for a life-line, 4,416,351, Cl. 182-238.000.
- Ghandhi, Burzoe K., to Outboard Marine Corporation: Device for reducing evaporation loss from carburetors and fuel tanks, 4,416,108, Cl. 56-17.500.
- Ghatak, Paritosh K.: Door frame reinforcer, 4,416,087, Cl. 49-462.000.
- Ghosh, Shyamal-Krishna, to Siemens Aktiengesellschaft: Sectional motor starting winding circuit for three-phase motors, 4,417,192, Cl. 318-797.000.
- Gibbons, Everett E.: See—  
Klus, John P.; Gibbons, Everett E.; Brodsky, Eric L.; and Janule, Victor P., 4,416,148, Cl. 73-64.400.



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- Gibson, Gary S.; See—  
Ciriacks, Patrick E.; and Gibson, Gary S., 4,417,211. Cl. 324-392,000.
- Gikis, Benjamin J.; Jones, Abner Y.; and Elbrecht, Rudolf, to Natomas Energy Company. Method and apparatus for extracting tar sand. 4,416,764. Cl. 208-11,01E.
- Gler, Roger R., to Kanthal Corporation, The. High temperature melting furnace. 4,417,346. Cl. 373-137,000.
- Gillette Company, The; See—  
Bache, Roger J., 4,416,912. Cl. 427-13,000.
- Gilmer, Thomas C. Manageable safety dinghy. 4,416,639. Cl. 440-106,000.
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Likhogub, Evgeny P.; Sergeev, Stanislav S.; and Minasov, Alexander N., 4,416,733. Cl. 202-228,000.
- Grimes-Werke AG; See—  
Kerres, Bruno, 4,416,782. Cl. 210-634,000.
- GK Technologies, Incorporated; See—  
Cueto, Agustín; and Robinson, Daniel E., 4,417,196. Cl. 323-210,000.
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- Goebel, Franz; and McDonald, Robert C., to GTE Products Corporation. Electrochemical cell. 4,416,957. Cl. 429-91,000.
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- Golden Valley Foods Inc.; See—  
Watkins, James D., 4,416,906. Cl. 426-107,000.  
Watkins, James D., 4,416,907. Cl. 426-234,000.
- Gole, Francois; See—  
Rocroi, Jean-Pierre; and Gole, Francois, 4,417,210. Cl. 324-336,000.
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Gloth, Richard E.; and Tazuma, James J., 4,417,017. Cl. 524-255,000.
- Goto, Tukas; See—  
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukas, 4,416,226. Cl. 123-143,00B.
- Gottschalk, Juan M.; See—  
Chen, Tsu F.; and Gottschalk, Juan M., 4,416,144. Cl. 73-12,000.
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- Graber, Joseph V. Bicycle storage device. 4,416,379. Cl. 211-19,000.
- Graham Magnetics, Incorporated; See—  
Jackman, James E., 4,416,702. Cl. 134-6,000.
- Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., to Shell Oil Company. Fuel and lubricant compositions for octane requirement reduction. 4,416,669. Cl. 44-71,000.
- Gratton, Charles P.; See—  
Duncombe, Edward; Gratton, Charles P.; and Adamson, John, 4,416,851. Cl. 376-399,000.
- Gravel, Robert; See—  
Gauthier, Yves; and Gravel, Robert, 4,416,105. Cl. 54-71,000.
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- Gray, Lewis; See—  
McGinnis, Ralph E.; and Gray, Lewis, 4,416,457. Cl. 277-53,000.
- Graziano, Frank D.; and Kuziemka, Edmund J., to Material Sciences Corporation. Organopolysiloxane coating compositions. 4,417,006. Cl. 523-43,000.
- Great Lakes Carbon Corporation; See—  
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,417,344. Cl. 373-93,000.
- Greefe, Klaus; See—  
Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, 4,417,222. Cl. 335-6,000.
- Green, George E.; Lorent, Ewald; Paul, John G.; and Zweifel, Hans, to Ciba-Geigy Corporation. Photopolymerization process employing compounds containing acryloyl groups and maleimide groups. 4,416,975. Cl. 430-327,000.
- Green, Laddie L., to Stauffer Chemical Company. Trifluoroethyl-p-chlorophenylcarbamate herbicide antidote. 4,416,685. Cl. 71-95,000.
- Greene, Jeffrey L.; See—  
Halbach, Frank; and Greene, Jeffrey L., 4,416,775. Cl. 210-236,000.
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- Griauzde, Felix; See—  
Munson, Leo J.; Griauzde, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455. Cl. 273-272,000.
- Griff Williams Co.; See—  
Lecznar, Chester J.; and Williams, Griff E., 4,416,600. Cl. 425-7,000.
- Griffin, Brian P.; See—  
Bailey, Derrick S.; and Griffin, Brian P., 4,417,020. Cl. 524-502,000.
- Cogswell, Frederic N.; Griffin, Brian P.; and Smith, Clive P., 4,417,043. Cl. 528-176,000.
- Grimes, Jerry L. Connector valve assembly for endotracheal tubes. 4,416,273. Cl. 128-207,160.
- Grimshaw, Scott F.; See—  
Cesar, Gerald P.; and Grimshaw, Scott F., 4,416,755. Cl. 204-192,005.
- Gritschke, Martin; See—  
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,416,744. Cl. 204-95,000.
- Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, to U.S. Philips Corporation. Fan beam CT scanner with compensating detector motion. 4,417,353. Cl. 378-4,000.
- Gross, Siegfried; See—  
Hesse, Heinrich; Merkle, Anton; Gross, Siegfried; and Radtke, Gerhard, 4,416,139. Cl. 72-267,000.
- Grossman, M. Gary; See—  
Breslau, Steven M.; and Grossman, M. Gary, 4,416,528. Cl. 354-296,000.
- Grossmann, Hans, to Sandoz Ltd. 1:2 Chromium complex of 1-amino-2-(3,5-dinitro-2'-hydroxyphenylazo)-4-sulfonaphthalene and alkali metal salts thereof. 4,416,816. Cl. 260-151,000.
- Grote & Hartmann GmbH & Co. KG; See—  
Muller, Wulf; and Kaiser, Manfred, 4,417,225. Cl. 337-198,000.
- Grouseau, Alain, to Thomson-CSF. Monitoring device for a radio navigation system of the doppler VOR type. 4,417,250. Cl. 343-405,000.
- Grove Valve and Regulator Company; See—  
Brumm, Richard S., 4,416,301. Cl. 137-220,000.
- Grow, Robert M., to Burroughs Corporation. Write token regeneration in a timed token ring. 4,417,243. Cl. 340-825,050.
- Gruller, David L.; See—  
Fowler, John H.; and Gruller, David L., 4,416,472. Cl. 285-3,000.
- GTE Automatic Electric Labs Inc.; See—  
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., 4,417,335. Cl. 370-110,100.
- Sabon, Robert J.; and Vonder, David L., 4,417,205. Cl. 324-133,000.
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McCarthy, Jeremiah P.; and Tabasky, Marvin, 4,416,055. Cl. 29-577,00C.
- Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,416,670. Cl. 51-295,000.
- GTE Products Corporation; See—  
Goebel, Franz; and McDonald, Robert C., 4,416,957. Cl. 429-91,000.
- Guardline Disposables Limited; See—  
Cooper, Albert A.; El-Rayes, Mohamed; and Yates, Alan K., 4,416,281. Cl. 128-400,000.
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Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., 4,416,563. Cl. 403-14,000.
- Guerrero, Benjamin G.; and Berford, Saint Elmo B., to Mattel, Inc. Ring viewer. 4,416,074. Cl. 40-364,000.
- Gugel, George; See—  
Kastl, Hans; and Gugel, George, 4,416,846. Cl. 376-249,000.
- Gugliermotte, Francis; See—  
Geller, Richard; and Gugliermotte, Francis, 4,417,178. Cl. 315-111,810.
- Guhne, Wieland; See—  
Ahlf, Heinz-Jürgen; and Guhne, Wieland, 4,416,034. Cl. 15-354,000.
- Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, to Rieter Deutschland GmbH. Apparatus for threading a thread into a texturizing nozzle. 4,416,041. Cl. 28-255,000.
- Gulack, Max A. Educational and recreational mathematical device in the form of a band, ring or concentric rings. 4,416,633. Cl. 434-188,000.

- Guldenfels, Dieter; See—  
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041. Cl. 28-255,000.
- Gulf & Western Manufacturing Company; See—  
Horwinski, E. Robert, 4,416,591. Cl. 417-241,000.
- Gunderson, Robert O.; Koccol, James E.; and Schuck, David B., to NCR Corporation. Data processing system having dual-channel system bus. 4,417,334. Cl. 370-85,000.
- Gundlach, Robert W., to Xerox Corporation. Cleaning system. 4,416,537. Cl. 355-15,000.
- Gusmer Corporation; See—  
Commette, Denis S.; and Sundberg, Carl W., Jr., 4,416,305. Cl. 137-614,000.
- Gut, Edwin; See—  
Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiller, Gottfried, 4,416,489. Cl. 299-94,000.
- Gutierrez, Antonio; See—  
Brois, Stanley J.; and Gutierrez, Antonio, 4,417,062. Cl. 549-320,000.
- Gutzmer, Christian; See—  
Asdollahi, Norbert; and Gutzmer, Christian, 4,417,226. Cl. 337-273,000.
- Gyurics, Karoly; See—  
Szendrodi, Valer; and Gyurics, Karoly, 4,416,435. Cl. 244-114,00R.
- H. G. Enterprises; See—  
Nelkin, Nedwyn R., 4,416,272. Cl. 128-96,000.
- H. & K. Bradley (Trailer Equipment) Limited; See—  
Bradley, Harry S., 4,416,467. Cl. 280-512,000.
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- Habegger, Friedhelm; See—  
Bruning, Rolf; and Habegger, Friedhelm, 4,416,680. Cl. 65-144,000.
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Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,416,191. Cl. 92-165,00R.
- Hachtel, Hansjorg; and Dobler, Klaus, to Robert Bosch GmbH. Apparatus for contactless distance and/or speed measurement. 4,417,208. Cl. 324-164,000.
- Haemonetics Corporation; See—  
Schoendorfer, Donald W.; and Hansen, Lee E., 4,416,654. Cl. 494-10,000.
- Hafner, Udo; See—  
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238. Cl. 123-470,000.
- Krauss, Rudolf; and Hafner, Udo, 4,416,423. Cl. 239-585,000.
- Haga, Shoji; See—  
Arai, Hajime; and Haga, Shoji, 4,416,168. Cl. 74-740,000.
- Haga, Yukio; Kai, Tomeo; Shirayama, Akira; and Kanatani, Gengi, to Nippon Kokan Kabushiki Kaisha. Claw crane with pushers. 4,416,580. Cl. 414-626,000.
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- Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., to Westvaco Corporation. Pulsed regeneration of adsorption column. 4,416,798. Cl. 502-420,000.
- Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiller, Gottfried, to Swiss Aluminium Ltd. Chisel for a crust breaking facility. 4,416,489. Cl. 299-94,000.
- Hagino, Tadao, to Olympus Optical Co., Ltd. Endoscope having two detachable armour tubes. 4,416,268. Cl. 128-6,000.
- Hahn, Steven J.; See—  
Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F., 4,416,439. Cl. 248-188,600.
- Haigh, Daniel H.; See—  
Solc, Jitka; and Haigh, Daniel H., 4,416,945. Cl. 428-407,000.
- Haisma, Jan; See—  
Hugues, Edgar A.; Bacchus, Jean-Marie; and Haisma, Jan, 4,416,518. Cl. 350-427,000.
- Hakusan Seisaku-sho Co., Ltd.; See—  
Takimoto, Tadashi; Oishibashi, Hirotosugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158. Cl. 73-842,000.
- Halbach & Braun; See—  
Braun, Ernst; and Braun, Gert, 4,416,643. Cl. 464-38,000.
- Halbich, Frank; and Greene, Jeffrey L., to STD Filter Company, Inc. In-line filter and cartridge therefor. 4,416,775. Cl. 210-236,000.
- Halkey-Roberts Corporation; See—  
Zimmerly, Harry L., 4,416,393. Cl. 222-5,000.
- Hall, Robert M., to Steri-Pac, Inc. Self-sterilizing hypodermic syringe. 4,416,663. Cl. 604-163,000.
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- Hamai, Kazuo; See—  
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- Hammann, Ingeborg; See—  
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832. Cl. 260-940,000.
- Hamon-Sobelco, S.A.; See—  
Bosne, Jacques G. P. E., 4,416,835. Cl. 261-110,000.
- Hansen, Lee E.; See—  
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- Haq, Zia, to Lever Brothers Company. Packaging film and packaging of detergent compositions therewith. 4,416,791. Cl. 252-90,000.
- Hara, Shuji; See—  
Muramatsu, Tsuyoshi; and Hara, Shuji, 4,416,368. Cl. 198-604,000.
- Hara Toshizo; See—  
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- Harada, Yoshimichi; See—  
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- Harari, Eliyahou. Highly sealable dynamic ram cell with self-signal amplification. 4,417,325. Cl. 365-185,000.
- Harbison, William H.; See—  
Mohnach, Michael G.; and Harbison, William H., 4,416,032. Cl. 15-250,320.
- Hardy, Dorilyn Ann; See—  
Schramm, Arthur G.; and Shaffer, Jack C., 4,416,715. Cl. 156-210,000.
- Harra, David J.; Turner, Frederick T.; and Hutchinson, Martin A., to Varian Associates, Inc. Sputter system incorporating an improved blocking shield for contouring the thickness of sputter coated layers. 4,416,759. Cl. 204-298,000.
- Harris Corporation; See—  
Hunsinger, Bill J., 4,417,221. Cl. 333-194,000.
- Harshbarger, John H.; and Shores, William M., to Visual Information Institute, Inc. Selectable rate sync generator system. 4,417,275. Cl. 358-139,000.
- Hartley, Croydon R.; See—  
Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., 4,416,175. Cl. 83-29,000.
- Hartman, George D., to Merck & Co., Inc. Di(alkylamino) derivatives of chloronitroprazines useful as adjuncts to radiation therapy. 4,416,882. Cl. 424-250,000.
- Hartmann, Horst; See—  
Czerney, Peter; Hartmann, Horst; and Liebscher, Jürgen, 4,417,060. Cl. 548-525,000.
- Hartry, Donald R.; and Belli, Remo D., to Remo, Inc. Pretuned head for drum or the like. 4,416,181. Cl. 84-272,000.
- Harty, William E.; See—  
Shidlovsky, Igal; and Harty, William E., 4,416,789. Cl. 252-34,700.
- Harvey, Philip C. Aircraft navigation computer. 4,417,309. Cl. 364-450,000.
- Haseda, Satoshi; See—  
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- Hasegawa, Akira; See—  
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- Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ippai, 4,416,471. Cl. 282-27,500.
- Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichi, to Fujikura Cable Works, Ltd. Continuous vulcanizer. 4,416,601. Cl. 425-68,000.
- Hasha, Brian B. Apparatus and method for hydrostatically testing pipe. 4,416,147. Cl. 73-49,600.
- Hashida, Wataru; See—  
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,416,991. Cl. 435-134,000.
- Hashimoto, Akihiko; See—  
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- Hashimoto, Iwao; See—  
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- Hashimoto, Takafumi; and Kobari, Yukio, to Meidensha Electric Mfg. Co., Ltd. Secondary battery. 4,416,953. Cl. 429-18,000.
- Hashimoto, Yasuichi; See—  
Hattori, Toshiaki; and Hashimoto, Yasuichi, 4,417,288. Cl. 360-74,100.
- Hashimoto, Yukio; See—  
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- Hashizume, Kenichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Heat exchangers. 4,416,223. Cl. 122-367,00C.
- Haskell, Vernon C., to Du Pont de Nemours, E. I., and Company. Inorganic films with poly(vinyl alcohol). 4,416,938. Cl. 428-289,000.
- Haslanger, Martin F.; See—  
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896. Cl. 424-285,000.
- Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Safety lock for a carrying and jettisoning device for loads transported under aircraft. 4,416,437. Cl. 244-137,00R.
- Hatch, Vaughn I.; See—  
Clark, Allen V.; Myers, Dirck V.; and Hatch, Vaughn I., 4,416,700. Cl. 127-34,000.
- Hatta, Tokiaki; See—  
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- Hattori, Tadashi: See—  
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- Hattori, Toshiaki; and Hashimoto, Yasuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Brake for magnetic disc drive apparatus. 4,417,288, Cl. 360-74.100.
- Haudin, Jean-Marc: See—  
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041, Cl. 526-348.600.
- Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Percussor. 4,416,270, Cl. 128-53.000.
- Hawk, James L. Method and apparatus for removal of aquatic plant growth. 4,416,106, Cl. 56-8.000.
- Hayashi, Chihoro, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Process for manufacturing seamless metal tubes. 4,416,134, Cl. 7-68.000.
- Hayashi, Isao: See—  
Hayashi, Toshio; and Hayashi, Isao, 4,416,461, Cl. 280-5.00A.
- Hayashi, Motokazu: See—  
Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176, Cl. 315-59.000.
- Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio. Method of continuously manufacturing multi-layered dough materials. 4,416,910, Cl. 426-502.000.
- Hayashi, Toshio, to Nissan Motor Company, Limited. Fuel storage vessel supporting structure. 4,416,461, Cl. 280-5.00A.
- Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Muffler. 4,416,350, Cl. 161-272.000.
- Hays, Derek. Gripping or locating devices. 4,416,503, Cl. 339-220.00R.
- Hazel, Robert L.; and LaBude, Edward V., to Burroughs Corporation. Optical memory system providing improved focusing control. 4,417,330, Cl. 369-32.000.
- Hebert, Richard D.; and Lasky, Daniel J., to Ricoh Company, Ltd. Polarizing filters for enhancing contrast in xerographic copying machines. 4,416,530, Cl. 355-3.00R.
- Hedelberger Druckmaschinen AG: See—  
Rasenberger, Otto, 4,416,198, Cl. 101-3.00R.
- Herman, Frederic P., to Mars, Inc. Coin examination apparatus employing an RL relaxation oscillator. 4,416,365, Cl. 194-100.00A.
- Hernimger, Donald L. Bowling ball finger grip insert. 4,416,452, Cl. 273-63.00A.
- Herniman, Jacobus J. L.; and Post, Martin F. M., to Shell Oil Company. Process for the isomerization of paraffins. 4,417,090, Cl. 585-739.000.
- Hernie, Richard L.: See—  
Matalis, John A.; Hernie, Richard L.; and Wegerer, Duane E., 4,416,573, Cl. 411-378.000.
- Heinrich Mack Nachf. Chem.-Pharmazeutische Fabrik: See—  
Stoss, Peter, 4,417,065, Cl. 549-464.000.
- Heitkamp, Dieter, and Inden, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung. Method and apparatus for recovering raw material, especially uranium, from natural waters, especially from the sea. 4,416,860, Cl. 423-6.000.
- Held, Robert P., to Du Pont de Nemours, E. I., and Company. Preparation of a printing master by toning a photopolymer film with magnetic toner. 4,416,968, Cl. 430-199.000.
- Helfi, Alfred F.; and Muller, Jean-Claude H., to Societe Lorraine de Laminage Continu. Process and apparatus for detection of the stoppage of a tuiere for blowing a gas through the bottom of a refining converter. 4,416,443, Cl. 266-47.000.
- Helical Control Systems, Inc.: See—  
Davis, Walter Z., 4,416,131, Cl. 72-12.000.
- Hellman, Bert G. H.: See—  
Wiberg, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., 4,416,332, Cl. 166-246.000.
- Helm, Charles R., to Container Corporation of America. Method of forming composite display package. 4,416,843, Cl. 264-152.000.
- Henlan, Inc.: See—  
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329, Cl. 166-68.000.
- Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, to U.S. Philips Corporation. Voltage-dependent resistor and method of producing such a resistor. 4,417,227, Cl. 338-21.000.
- Henriques, Lance L. Mine ore concentrator. 4,416,771, Cl. 209-224.000.
- Henry, James W., to Eastman Kodak Company. Electronic measuring method and apparatus. 4,417,274, Cl. 358-107.000.
- Henry, John J., Sr.; and Stuckey, Buddy S., to Essex Group Incorporated. Apparatus for winding coils and inserting coils and wedges into stator cores. 4,416,058, Cl. 29-734.000.
- Hensleigh, Robert H.; Lacy, Charles M.; and Walton, Hardy H., Jr. Television receiver scrambling system. 4,417,278, Cl. 358-188.000.
- Hepp, Dennis G.: See—  
Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., 4,417,306, Cl. 364-415.000.
- Heraeus Quarzschmelze GmbH: See—  
Bruning, Rolf; and Habegger, Friedhelm, 4,416,680, Cl. 65-144.000.
- Herbert, Linton M. X-Ray attenuating apron. 4,417,146, Cl. 250-516.100.
- Hercules Incorporated: See—  
Johnson, Gary W., 4,416,112, Cl. 60-251.000.
- Scheve, Bernard J., 4,416,974, Cl. 430-288.000.
- Herion, Dieter: See—  
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041, Cl. 28-255.000.
- Herrmann Berstorff Maschinenbau GmbH: See—  
Brinkmann, Heinz, 4,416,543, Cl. 366-80.000.
- Herrick, Carlyle S.; and Alben, Richard S., to General Electric Company. Solar heat collector. 4,416,264, Cl. 126-442.000.
- Herrmann, Richard, Jr., to Boeing Company. The Chromium plating. 4,416,738, Cl. 204-32.00R.
- Herrmann, Ronald S. Sandpaper roll dispenser. 4,416,410, Cl. 229-38.000.
- Herron, John R., Jr., to Illinois Tool Works Inc. Capacitive keyswitch. 4,417,294, Cl. 361-288.000.
- Hesse, Heinrich; Merkler, Anton; Gross, Siegfried; and Radtke, Gerhard, to Mannesmann Aktiengesellschaft. Guiding a mandrel or punch for piercing or cold-extrusion. 4,416,139, Cl. 72-267.000.
- Hessemer, Robert A., Jr.; and Perper, Lloyd J., to Hessemer, Robert A., Jr.; Perper, Lloyd J.; and Bowen, Theodore. Correlation thermography. 4,416,552, Cl. 374-117.000.
- Hettche, Albert: See—  
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035, Cl. 526-208.000.
- Hewlett-Packard Company: See—  
Tribble, David C.; and Kemplin, Richard M., 4,417,258, Cl. 346-139.00R.
- Hickman, Clarence J.: See—  
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,416,628, Cl. 433-80.000.
- Higo, Shoichi: See—  
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiura, Seiji; and Higo, Shoichi, 4,417,153, Cl. 307-140.000.
- Hikosaka, Shinichi: See—  
Tachibana, Euchi; and Hikosaka, Shinichi, 4,416,215, Cl. 118-642.000.
- Hillberg, Robert L., to COP, Inc. Handgun. 4,416,078, Cl. 42-69.00R.
- Hille, Martin: See—  
Bohm, Roland; and Hille, Martin, 4,416,796, Cl. 252-338.000.
- Hills, Michael; Durret, Clay; and Von Meister, William, to Digital Broadcasting Corporation. SCA Data transmission system with a raised cosine filter. 4,417,349, Cl. 375-60.000.
- Hines, David A.: See—  
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C.; deceased; and Roesler, Johanna M., executrix, 4,416,781, Cl. 210-629.000.
- Hinson, Ashford J. Method and apparatus for raising the ram of a vertical milling machine. 4,416,042, Cl. 29-57.000.
- Hirabayashi, Takeo: See—  
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- Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsugui, to Hitachi, Ltd. Arrangement for control of the operation of a random access memory in a data processing system. 4,417,318, Cl. 364-900.000.
- Hirano, Takashi, to Yamata Scale Company, Ltd. Combination weighing machine. 4,416,341, Cl. 177-25.000.
- Hirasawa, Hidenao: See—  
Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, 4,416,442, Cl. 266-44.000.
- Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for controlling alternating current motors. 4,417,193, Cl. 318-803.000.
- Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokunaki; and Sugawara, Mituo, to Nippon Steel Corporation; and Kurosaki Yogyo Co., Ltd. Refractory powder flame projection moldings. 4,416,999, Cl. 501-94.000.
- Hirose, Yukimi; Enami, Ken; and Wada, Kinzo, to Victor Company of Japan, Limited. Commutatorless electrical motor having sub magnetic poles. 4,417,186, Cl. 318-254.000.
- Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, to Nippon Steel Corporation. Method and apparatus for removing slag. 4,416,442, Cl. 266-44.000.
- Hirotsu, Yasunari; and Tanaka, Yoshimitsu, to Toyo Kogyo Co., Ltd. Sliding roof structure for automobile bodies. 4,416,487, Cl. 296-222.000.
- Hirschberg, Eugene H.: See—  
Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., 4,416,803, Cl. 502-209.000.
- Hitachi Denshi Kabushiki Kaisha: See—  
Ishikura, Masao, 4,417,287, Cl. 360-71.000.
- Hitachi, Ltd.: See—  
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323, Cl. 365-1.000.
- Fujimura, Takashi; and Kato, Kazuo, 4,417,179, Cl. 315-151.000.
- Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156, Cl. 307-252.00C.
- Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsugui, to Hitachi, Ltd. Arrangement for control of the operation of a random access memory in a data processing system. 4,417,318, Cl. 364-900.000.
- Kishi, Tunes; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111, Cl. 200-148.00R.
- Saito, Shozo; and Suzumura, Takeshi, 4,416,847, Cl. 376-253.000.
- Shinkawa, Keiro; Matsura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279, Cl. 358-195.100.

- Tokunaga, Kazuyoshi; and Anzai, Masayasu, 4,416,533, Cl. 355-4.000.
- Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555, Cl. 384-415.000.
- Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, 4,417,277, Cl. 358-177.000.
- Hitachi Microcomputer Engineering, Ltd.: See—  
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, 4,417,277, Cl. 358-177.000.
- Hobby, William M.; and Valdespino, Joseph M. Internal combustion engine. 4,416,224, Cl. 123-3.000.
- Hobo, Nobuhito: See—  
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- Hodshire, Vincent B. Fishing apparatus. 4,416,079, Cl. 43-15.000.
- Hoechst Aktiengesellschaft: See—  
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,416,808, Cl. 252-547.000.
- Bohm, Roland; and Hille, Martin, 4,416,796, Cl. 252-338.000.
- Disselbeck, Dieter, 4,416,780, Cl. 210-617.000.
- Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, 4,416,795, Cl. 252-301.230.
- Schell, Loni, 4,416,976, Cl. 430-331.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—  
Davis, Larry; and Klein, Joseph T., 4,416,887, Cl. 424-267.000.
- Lee, Thomas B. K.; Lee, George E.; and John, Gregory M., 4,417,063, Cl. 549-354.000.
- Hoepke, Carl-Heinz: See—  
Huster, Heinrich; Meuser, Friedrich; and Hoepke, Carl-Heinz, 4,416,701, Cl. 127-68.000.
- Hoff, Stephen J., to Hoffco, Inc. Lawn mower blade control mechanism. 4,416,107, Cl. 56-11.300.
- Hoffco, Inc.: See—  
Hoff, Stephen J., 4,416,107, Cl. 56-11.300.
- Hoffman, David L., to General Electric Company. Magnetic friction device. 4,417,356, Cl. 378-181.000.
- Hoffman, David M.; Loomis, Neil W.; Ehler, Ralph C.; and Shelley, Peter S., to General Electric Company. Modular solid-state detector cell. 4,417,144, Cl. 250-367.000.
- Hoffman, Leslie J. Indicator device with calibration means. 4,416,211, Cl. 116-204.000.
- Hoffman, Virginia M.: See—  
Chang, Philip Y.; and Hoffman, Virginia M., 4,417,321, Cl. 364-900.000.
- Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Labeling machine for heat shrink labels. 4,416,714, Cl. 156-86.000.
- Hofmann, Peter, to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Closure for tire chains. 4,416,319, Cl. 152-213.00R.
- Hogg, Grady R., Jr.; and Tanner, Nathan S., to Great Lakes Carbon Corporation. Composite electrode for arc furnace. 4,417,344, Cl. 373-93.000.
- Hohn, Marlin W. Tool bar carrier with casting wheels. 4,416,336, Cl. 172-386.000.
- Hokkai Can Co., Ltd.: See—  
Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, 4,416,390, Cl. 220-273.000.
- Holland, Frank S., to Manchem Limited. Electrolysis using two electrolytically conducting phases. 4,416,743, Cl. 204-59.00R.
- Holyman, Brian T.; and Bary, Charlton R., to Decca Limited. Adjustable and selective electrical filters and methods of tuning them. 4,417,220, Cl. 333-174.000.
- Holz, Wolfgang. Process and apparatus for feeding poultry. 4,416,218, Cl. 119-18.000.
- Holzwarth, Dietmar H.: See—  
Rieger, Hansjorg; and Holzwarth, Dietmar H., 4,416,318, Cl. 152-213.00A.
- Homeyer, Bernhard: See—  
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hamann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832, Cl. 260-940.000.
- Honeywell Inc.: See—  
Demark, Anthony M.; and Erhardt, William K., 4,416,156, Cl. 73-727.000.
- Kim, Kwang-Yil, 4,416,551, Cl. 374-31.000.
- Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., 4,417,183, Cl. 315-291.000.
- Sanford, Herbert F., 4,416,355, Cl. 188-185.000.
- Honeywell Information Systems Inc.: See—  
Chimienti, Domenico; and Vercesi, Arturo, 4,417,302, Cl. 364-200.000.
- Hook, Richard G.: See—  
Greig, Colin C.; and Hook, Richard G., 4,416,295, Cl. 131-364.000.
- Hoover Company, The: See—  
Specht, Glenn E., 4,416,033, Cl. 15-339.000.
- Horch, Werner: See—  
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094, Cl. 52-72.000.
- Horiuchi, Naoya; Ohara, Takafumi; and Sano, Reiji, to Matsushita Electric Industrial Company, Limited. Method for producing discharge in gas laser at low voltage. 4,417,340, Cl. 372-58.000.
- Horiuchi, Tatsuo, to Ushio Denki Kabushiki Kaisha; and Kabushiki Kaisha Meiko Shokai. Apparatus for covering base sheet surface. 4,416,719, Cl. 156-359.000.
- Horn & Gladden Lint Cleaner Company, Inc.: See—  
Schwartz, Robert C., 4,416,035, Cl. 19-0.200.
- Horwinski, E. Robert, to Gulf & Western Manufacturing Company. Reciprocal pump with improved valve. 4,416,591, Cl. 417-241.000.
- Hosaka, Akio: See—  
Takase, Sadao; and Hosaka, Akio, 4,416,239, Cl. 123-478.000.
- Hoshimi, Susumu; and Kojima, Tadashi, to Sony Corporation; and Tokyo Shibaura Denki Kabushiki Kaisha. Digital signal processing system. 4,417,283, Cl. 358-310.000.
- Hotchandani, Kanayo: See—  
Hulyalkar, Ramchandra K.; Baum, Gerald A.; and Hotchandani, Kanayo, 4,417,015, Cl. 524-139.000.
- Hounsfield, Godfrey N., to Picker International Limited. Nuclear magnetic resonance apparatus. 4,417,209, Cl. 324-309.000.
- Houvig, Felix J.: See—  
Korowitz, Simon; Leichter, Kurt R.; and Houvig, Felix J., 4,417,303, Cl. 364-200.000.
- Howard, Thomas L. Rescue signal. 4,416,212, Cl. 116-210.000.
- Huang, Hansen M., to Eli Lilly and Company. Process for isolating oligonucleotide product from a coupling reaction mixture. 4,417,046, Cl. 536-27.000.
- Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Procedure for the enrichment of the element of interest from a solution for nonflame atomic absorption spectroscopy. 4,416,736, Cl. 204-1.00T.
- Hudson Lock, Inc.: See—  
Thimot, Robert P., 4,416,129, Cl. 70-369.000.
- Hudson Oxygen Therapy Sales Company: See—  
Havstad, Harold R., 4,416,270, Cl. 128-53.000.
- Huebscher, David A., to Noral, Inc. Temperature-sensing apparatus. 4,416,553, Cl. 374-165.000.
- Hughes Aircraft Company: See—  
Figueroa, Luis; and Yen, Huan-Wun, 4,416,053, Cl. 29-572.000.
- Hughes Tool Company: See—  
Regan, Albert M., 4,416,495, Cl. 339-16.00C.
- Hugues, Edgar A.; Bacchus, Jean-Marie; and Haisma, Jan, to U.S. Philips Corporation. Objective comprising aspherical surfaces, whose focal length is variable over a wide range. 4,416,518, Cl. 350-427.000.
- Hulett, Frederic M., III: See—  
Newton, David W.; Hulett, Frederic M., III; and Owens, Christopher, 4,416,277, Cl. 128-303.130.
- Hulin, Jean P.; Bouvard, Andre; and Le Maitre, Patrick, to Lignes Telegraphiques et Telephoniques. Method for in situ splicing optical fiber cables. 4,416,507, Cl. 350-96.220.
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- Humphrey, John W.; and Silbernagel, Raymond A., to Magnetic Controls Company. Wire insertion tool. 4,416,059, Cl. 29-751.000.
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Ichikawa, Takashi; and Moriyama, Sadao, 4,416,716, Cl. 156-245.000.
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Konno, Masashi; and Ikeda, Osamu, 4,416,605, Cl. 425-185.000.
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Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, 4,416,891, Cl. 424-270.000.
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- Illinois Tool Works Inc.: See—  
Herron, John R., Jr., 4,417,294, Cl. 361-288.000.
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Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, 4,417,290, Cl. 360-131.000.
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Carlson, Alan J.; and Indelicato, Venerando J., 4,417,100, Cl. 179-5.00R.
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Heitkamp, Dieter; and Inden, Peter, 4,416,860, Cl. 423-6.000.
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Rooklyn, Jack, 4,416,202, Cl. 104-88.000.
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Judge, Edward E., Jr., 4,416,130, Cl. 72-10.000.
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Williams, Robert C., 4,416,153, Cl. 73-295.000.
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Nagao, Nobuya; and Inoue, Takashi, 4,417,270, Cl. 358-23.000.
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Minagawa, Motonobu; Inoue, Tetsuyu; and Kurita, Naoyasu, 4,416,797, Cl. 252-400.00A.
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Gaillard, Jean, 4,417,091, Cl. 585-823.000.
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Nachev, Georgi N.; Angelov, Angel S.; and Petkov, Boryan I., 4,417,127, Cl. 219-124.340.
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Williamson, Harry L.; West, Robert A.; and Manning, Richard P., 4,417,351, Cl. 377-8.000.
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Ei, David D., 4,417,320, Cl. 364-900.000.
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Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J., 4,416,902, Cl. 426-3.000.
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Wilkinson-Tough, Gordon S., 4,416,911, Cl. 427-12.000.
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Fachini, Robert M.; and Lester, William D., 4,417,230, Cl. 340-52.00R.
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Abdoulil, Edgar; and Lidow, Alexander, 4,416,708, Cl. 148-187.000.
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Aanerud, Lars; and Balog, Georg, 4,416,061, Cl. 29-828.000.
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Jessop, Harvey A.; and Funk, Albert G., 4,416,711, Cl. 149-42.000.
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Nakamura, Kazuo; Mizorogi, Hirotosugu; and Isao, Akihiko, 4,416,216, Cl. 118-696.000.
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Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,416,123, Cl. 68-5.00E.
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Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055, Cl. 546-345.000.
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Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, 4,416,658, Cl. 604-48.000.

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Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi, and Kominami, Yasuhiko, 4,416,709, Cl. 148-403.000.
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Naito, Minikatu; Yano, Kiyotosi; and Itou, Kazuo, 4,416,243, Cl. 123-569.000.
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Belart, Juan; Burdorf, Jochem; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,416,491, Cl. 303-113.000.
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Pfeiffer, Horst, 4,417,138, Cl. 235-492.000.
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Kostinko, John A., 4,416,805, Cl. 502-67.000.
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Schiel, Christian, 4,416,730, Cl. 162-264.000.
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Anderson, Blair V.; Feldman, Morris; and Jacoby, Richard, 4,416,293, Cl. 128-782.000.
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Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Las G., 4,416,927, Cl. 428-36.000.
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Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, 4,417,188, Cl. 318-696.000.
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Susumu, Hanyu, 4,416,209, Cl. 112-266.100.
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Klus, John P.; Gibbons, Everett E.; Brodsky, Eric L.; and Janule, Victor P., 4,416,148, Cl. 73-64.400.
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Muramatsu, Tsuyoshi; and Hara, Shuji, 4,416,368, Cl. 198-604.000.
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Takimoto, Tadashi; Oshibashi, Hirotosugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158, Cl. 73-842.000.
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Miyano, Katsuyoshi, 4,417,118, Cl. 219-69.00W.
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Tseung, Alfred C. C.; and Jasem, Sameer M., 4,416,758, Cl. 204-258.000.
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Musers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Metzsch, Fritz, 4,417,037, Cl. 526-271.000.
- Jefferson, Clinton F.: See—  
Aykan, Kamran; Farrauto, Robert J.; Jefferson, Clinton F.; and Lanam, Richard D., 4,416,916, Cl. 427-160.000.
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Dill, Terry A., 4,416,219, Cl. 119-48.000.
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- Jewett, Phillip: See—  
Brown, Glenn E.; Karpetsky, Timothy P.; and Jewett, Phillip, 4,416,761, Cl. 204-299.00R.
- Jewiarz, Edouard J.: See—  
Serres, Bernard M.; Viale, Maurice S.; and Jewiarz, Edouard J., 4,417,101, Cl. 179-8.00R.
- Jirak, Thomas I.: See—  
Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas I., 4,417,306, Cl. 364-415.000.
- John, Gregory M.: See—  
Lee, Thomas B. K.; Lee, George E.; and John, Gregory M., 4,417,063, Cl. 549-354.000.
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Norioka, Sersuo, 4,417,145, Cl. 250-396.0MI.
- John Alan Enterprises: See—  
Towsley, John A., 4,416,040, Cl. 28-152.000.
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Strand, Mette, 4,416,866, Cl. 424-1.100.
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- Johnson, Keith, Jr.: See—  
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- Johnson, Robert M., Jr.: See—  
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,417,080, Cl. 568-939.000.
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Lacy, Ray S., Jr.; and Johnson, Thomas P., 4,416,210, Cl. 114-67.00A.
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- Jonasson, Bertil, to Landskrona Produktion AB. Belt sanding machine. 4,416,090, Cl. 51-138.000.
- Jones, Abner Y.: See—  
Gikis, Benjamin J.; Jones, Abner Y.; and Elbrecht, Rudolf, 4,416,764, Cl. 208-11.0LE.
- Jones, Barbara, legal representative: See—  
McCaffrey, David J. A.; and Jones, William D., deceased, 4,416,769, Cl. 209-166.000.
- Jones, Brian C.: See—  
Goodstine, Stephen L.; and Jones, Brian C., 4,416,418, Cl. 237-19.000.
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Miller, Timothy J. E.; and Jones, Donald W., 4,417,168, Cl. 310-156.000.
- Jones, Michael H.: See—  
Bender, Ernest S.; Ignasiak, Marty C.; and Jones, Michael H., 4,416,604, Cl. 425-183.000.
- Jones, Thaddeus M., to Dresser Industries, Inc. Zero crossover triggering circuit for thyristor. 4,417,199, Cl. 323-319.000.
- Jones, William D., deceased: See—  
McCaffrey, David J. A.; and Jones, William D., deceased, 4,416,769, Cl. 209-166.000.
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Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548, Cl. 366-168.000.



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Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094, Cl. 52-72,000.
- Jouffroy, Guy: See—  
Durand, Pierre; Charlon, Pierre; and Jouffroy, Guy, 4,416,856, Cl. 422-131,000.
- Judge, Edward E., Jr., to Industrial Metal Products Corporation. Pulsing impact straightener, 4,416,130, Cl. 72-10,000.
- Ju Paper Co., Ltd.: See—  
Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ipppei, 4,416,471, Cl. 282-27,500.
- Julian, Gary: See—  
Loye, Kenneth; and Julian, Gary, 4,416,940, Cl. 428-324,000.
- Kabashima, Katsuhiko: See—  
Mezawa, Tsutomu; Kabashima, Katsuhiko; Nozaki, Shigeki; and Takemae, Yoshihiro, 4,417,329, Cl. 365-203,000.
- Kabel-und-Gummiwerke AG: See—  
Liessem, Bernhard, 4,417,002, Cl. 521-128,000.
- Kabushiki Kaisha Daini Seikosha: See—  
Matsuura, Yoshiaki, 4,417,263, Cl. 357-23,000.
- Kabushiki Kaisha Kobe Seiko Sho: See—  
Kasahara, Kenji; and Munezane, Yoshiaki, 4,417,126, Cl. 219-124,220.
- Kanno, Masashi; and Ikeda, Osamu, 4,416,605, Cl. 425-185,000.
- Kabushiki Kaisha Komatsu Seisakusho: See—  
Nakada, Minoru, 4,416,344, Cl. 180-8,000.
- Kabushiki Kaisha Meidensha: See—  
Yanagisawa, Hifumi; Warabi, Junichi; and Sakuma, Shinzo, 4,417,110, Cl. 200-144,000.
- Kabushiki Kaisha Meiko Shokai: See—  
Horiuchi, Tatsuo, 4,416,719, Cl. 156-359,000.
- Kabushiki Kaisha Suwa Seikosha: See—  
Aizawa, Hitomi, 4,417,155, Cl. 307-247,000.
- Arai, Kenichiro, 4,416,557, Cl. 400-152,000.
- Mitsui, Yoshihiro, 4,417,257, Cl. 346-76,000.
- Kadija, Igor V., to Olin Corporation. Coated thermoplastic polymer diaphragms and a method for their preparation, 4,416,757, Cl. 204-252,000.
- Kadokawa, Shigeru: See—  
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michino, 4,417,277, Cl. 358-177,000.
- Kageyama, Minoru: See—  
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio, 4,416,910, Cl. 426-502,000.
- Kago, Yoshiyuki; and Akita, Sigeyuki, to Nippon Soken, Inc. Fuel injection timing detecting apparatus for diesel engines, 4,416,150, Cl. 73-119,000.
- Kai, Tomoe: See—  
Haga, Yukio; Kai, Tomoe; Shirayama, Akira; and Kanatani, Gengi, 4,416,580, Cl. 414-626,000.
- Kaiser, Manfred: See—  
Muller, Wulf; and Kaiser, Manfred, 4,417,225, Cl. 337-198,000.
- Kaji, Kiyokane: See—  
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235, Cl. 123-425,000.
- Kajiwara, Seiji: See—  
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153, Cl. 307-140,000.
- Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp, 4,417,176, Cl. 315-59,000.
- Kimijo, Yoshimi; and Kawachi, Kazuhiko, to Alps Electric Co., Ltd. Electroluminescent cell and method of producing the same, 4,417,174, Cl. 313-502,000.
- Kamimura, Tetsuro: See—  
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,416,432, Cl. 242-199,000.
- Kamyr, Inc.: See—  
Elmore, Carl L.; and Funk, Erwin D., 4,416,567, Cl. 406-63,000.
- Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, to Toyo Rubber Industry Co., Ltd. The rubber composition for side wall of tire, 4,417,027, Cl. 525-99,000.
- Kanatani, Gengi: See—  
Haga, Yukio; Kai, Tomoe; Shirayama, Akira; and Kanatani, Gengi, 4,416,580, Cl. 414-626,000.
- Kanayama, Katsumi: See—  
Motoyama, Kazuyasu; Furuta, Kenzi; and Kanayama, Katsumi, 4,417,135, Cl. 377-18,000.
- Kanazuka, Yasuo: See—  
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691, Cl. 75-60,000.
- Kanbe, Junichiro: See—  
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,416,962, Cl. 430-65,000.
- Kanebo Ltd.: See—  
Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, 4,416,891, Cl. 424-270,000.
- Kaneko, Yutaka: See—  
Fujiwara, Mitsuo; Matsuo, Syunji; Masukawa, Toyooki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980, Cl. 430-567,000.
- Kanthal Corporation, The: See—  
Giler, Roger R., 4,417,346, Cl. 373-137,000.
- Kanto Yakin Kogyo Kabushiki Kaisha: See—  
Takahashi, Susumu, 4,416,623, Cl. 432-36,000.
- Kaplan, Murray A.; and Shinal, Edward C., to Bristol-Myers Company. Injectable compositions of BBM-928A, 4,416,874, Cl. 424-177,000.
- Kapp, Gerald E., to General Motors Corporation. Electro-hydraulic control for a transmission having a torque converter clutch, 4,416,358, Cl. 192-3,320.
- Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Substituted carbonyl phosphinyl-alkanoyl compounds, 4,416,833, Cl. 260-941,000.
- Karlner, Rudolf, to Wagner Spray Tech Corporation. Air compressor for paint pumps, 4,416,588, Cl. 417-199,000.
- Karpetsky, Timothy P.: See—  
Brown, Glenn E.; Karpetsky, Timothy P.; and Jewett, Phillip, 4,416,761, Cl. 204-299,000.
- Kasahara, Kenji; and Munezane, Yoshiaki, to Kabushiki Kaisha Kobe Seiko Sho. Method of controlling a weaving path of a welding torch in arc welding with a consumable electrode, 4,417,126, Cl. 219-124,220.
- Kasai, Masao: See—  
Noguchi, Kohji; and Kasai, Masao, 4,416,783, Cl. 210-635,000.
- Kasami, Akinobu: See—  
Iwamoto, Masami; Tashiro, Makoto; Bepu, Tatsuro; and Kasami, Akinobu, 4,417,262, Cl. 357-17,000.
- Kashmerick, Gerald E.; and Zdanowicz, Lawrence E., to Outboard Marine Corporation. Marine steering mechanism and associated actuating and locking device, 4,416,637, Cl. 440-60,000.
- Kaster, Robert L. Trileaflet prosthetic heart valve, 4,416,029, Cl. 3-1,500.
- Kastl, Alfons, to AGFA-Gevaert Aktiengesellschaft. Racks for developing and/or fixing film, 4,416,529, Cl. 354-320,000.
- Kastl, Hans; and Gugel, Georg, to Kraftwerk Union Aktiengesellschaft. Nuclear power plant with cooling circuit, 4,416,846, Cl. 376-249,000.
- Katagiri, Masayoshi; Fujii, Takashi; and Ogura, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Brake booster, 4,416,188, Cl. 91-369,000.
- Katagiri, Nozomu: See—  
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691, Cl. 75-60,000.
- Kataoka, Keiichiro: See—  
Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichiro, 4,416,601, Cl. 425-68,000.
- Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, to Nissan Motor Company, Limited. Engine control apparatus, 4,416,230, Cl. 123-325,000.
- Kathawala, Faizulla G.: See—  
Barza, Sandor; and Kathawala, Faizulla G., 4,416,876, Cl. 424-184,000.
- Kato, Hirohisa: See—  
Kitamura, Hidetoshi; and Kato, Hirohisa, 4,416,149, Cl. 73-118,000.
- Kato, Hisatoyo: See—  
Kawai, Yasuhiro; Okamoto, Yoshihiko; Yamamoto, Takaaki; and Kato, Hisatoyo, 4,417,260, Cl. 346-160,000.
- Kato, Kazuo: See—  
Fujimura, Takashi; and Kato, Kazuo, 4,417,179, Cl. 315-151,000.
- Kato, Keigo; and Kuroiwa, Yosio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake heating apparatus of an internal combustion engine, 4,416,242, Cl. 123-549,000.
- Kato, Seiji: See—  
Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158, Cl. 307-269,000.
- Kato, Yoshiaki: See—  
Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, 4,417,341, Cl. 372-72,000.
- Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., to Texaco Inc. Methanol, ethanol, or gasoline fuel containing as a wear-inhibiting additive a reaction product of an ether-amine with a phosphate or a substituted phosphonic acid, 4,416,667, Cl. 44-56,000.
- Kaufman, Joseph, to Becton Dickinson and Company. Multiple sample needle assembly with vein entry indicator, 4,416,291, Cl. 128-766,000.
- Kauschus, Fritz: See—  
Beck, Wilfried; and Kauschus, Fritz, 4,416,918, Cl. 427-296,000.
- Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing system, 4,416,523, Cl. 354-25,000.
- Kawachi, Kazuhiko: See—  
Kamijo, Yoshimi; and Kawachi, Kazuhiko, 4,417,174, Cl. 313-502,000.
- Kawai, Hiroshi, to Daiwa Seiko Inc. Spinning reel for fishing, 4,416,427, Cl. 242-84,200.
- Kawai, Shizuo: See—  
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232, Cl. 123-357,000.
- Kawai, Yasuhiro; Okamoto, Yoshihiko; Yamamoto, Takaaki; and Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Image scanning system, 4,417,260, Cl. 346-160,000.
- Kawamata, Kiyoshi. Method of forming score in can end plate and method of attaching tab to the same for facilitating the opening of can, 4,416,576, Cl. 413-12,000.
- Kawasaki, Masahiro: See—  
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi;

- Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875, Cl. 424-180,000.
- Kawasaki, Mikio: See—  
Fujiwara, Mitsuo; Matsuo, Syunji; Masukawa, Toyooki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980, Cl. 430-567,000.
- Kawasaki, Shozo: See—  
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691, Cl. 75-60,000.
- Kaze, Akira, to Eagle Industry Co., Ltd. Automatic piping machine, 4,416,204, Cl. 112-68,000.
- Kehl, Charles W. Waste material compactor apparatus, 4,416,197, Cl. 100-214,000.
- Keiper Recaro GmbH: See—  
Wall, Helmut, 4,416,488, Cl. 297-411,000.
- Kelleher, Kevin C., to RCA Corporation. Turntable speed control, 4,417,332, Cl. 369-266,000.
- Keller, Heinz: See—  
Bapst, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., 4,417,242, Cl. 340-825,050.
- Keller, Jack K.; and Mowery, Gilbert L., Jr., to Bell Telephone Laboratories, Incorporated. Tri-state logic buffer circuit, 4,417,162, Cl. 307-473,000.
- Keller, Patrick N.; Franck, Jerome B.; and Silberberg, George G., to United States of America, Navy. Laser treated video tube calibration markers, 4,417,123, Cl. 219-121,01H.
- Kelly, Joseph B., to PPG Industries, Inc. Treating glass sheets to heal vents that result in breakage during thermal treatment, 4,416,930, Cl. 428-137,000.
- Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., to GTE Automatic Electric Labs Inc. Digital satellite telephone office, 4,417,335, Cl. 370-110,100.
- Kelly, William R.: See—  
Alvero, Ernesto J.; and Kelly, William R., 4,416,521, Cl. 354-1,000.
- Kemp, David M., to FMC Corporation. Beverage pasteurizing system, 4,416,194, Cl. 99-275,000.
- Kemplin, Richard M.: See—  
Tribolet, David C.; and Kemplin, Richard M., 4,417,258, Cl. 346-139,000.
- Kennecott Corporation: See—  
Richards, Kenneth J.; and George, David B., 4,416,690, Cl. 75-26,000.
- Sinek, Joachim R., 4,416,836, Cl. 261-112,000.
- Kenrich Petrochemicals, Inc.: See—  
Sugerman, Gerald; and Monte, Salvatore J., 4,417,009, Cl. 523-451,000.
- Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, to Societe Chimique des Charbonnages-CdF Chimie. Process for shaping solid polybut-1-ene and the resulting shaped articles, 4,417,041, Cl. 526-348,600.
- Kerby, Robert C.; and Krauss, Clifford J., to Cominco Ltd. Bipolar refining of lead, 4,416,746, Cl. 204-114,000.
- Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung: See—  
Heitkamp, Dieter; and Inden, Peter, 4,416,860, Cl. 423-6,000.
- Kerres, Bruno, to Girmes-Werke AG. Method for separating oil from aqueous or solvent dispersions, 4,416,782, Cl. 210-634,000.
- Kessler, John R., to Monarch Marking Systems, Inc. Ink roller assembly with capillary ink supply, 4,416,201, Cl. 101-348,000.
- Kessler Products Co., Inc.: See—  
Ullman, Myron E., 4,416,481, Cl. 294-87,200.
- Ketchum, Elmer, Jr. Fuel burner construction, 4,416,615, Cl. 431-285,000.
- Khanna, Yash P.; Turi, Edith A.; Aharoni, Shaul M.; and Largman, Theodore, to Allied Corporation. Quasi-random copolymers from homopolymers, 4,417,032, Cl. 525-432,000.
- Kicher, Thomas P.: See—  
Bowman, Harold M.; and Kicher, Thomas P., 4,416,440, Cl. 249-82,000.
- Kijimuta, Hitoshi: See—  
Sato, Kimihiko; Terasa, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863, Cl. 423-344,000.
- Killat, George R.; and Wilson, Larry R., to Dow Chemical Company, The. Ammonium polyamidoamines, 4,416,729, Cl. 162-164,300.
- Kilts, Harold J.; and Swaziek, Laurence J., to Madison Farm Structures, Inc. Material discharge apparatus with improved discharge tube, 4,416,362, Cl. 193-25,000.
- Kim, Kwang-Yil, to Honeywell Inc. Battery microcalorimeter, 4,416,551, Cl. 374-31,000.
- Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, to Teijin Limited. Woven or knitted polyester multifilament fabric, 4,416,934, Cl. 428-224,000.
- Kimura, Mitsutoshi: See—  
Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176, Cl. 315-59,000.
- Kimura, Shin: See—  
Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156, Cl. 307-252,000.
- Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, to Nippon Mining Co., Ltd.; and Nippon Metal Plating Co., Ltd. Process and electrolytic bath for making a rhodium-plated article having a black or blue color, 4,416,742, Cl. 204-47,000.
- King, James D.: See—  
Hagen, James M.; and King, James D., 4,416,630, Cl. 434-16,000.
- King, Richard J. Clothes hanger, 4,416,401, Cl. 223-88,000.
- King, Sterling J. Bottle holder, 4,416,438, Cl. 248-102,000.
- Kinjo, Yoshio: See—  
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742, Cl. 204-47,000.
- Kinoshita, Hidefumi: See—  
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819, Cl. 260-293,300.
- Kirby, Raymond L., to Buddy B. Simpson A/B Electronics. Electronic noise detectors, 4,416,155, Cl. 73-646,000.
- Kirchen, Michel; Solvi, Marc; and Burton, Clement, to Paul Wurth S.A. Dust collector for furnace charging installation, 4,416,673, Cl. 55-267,000.
- Kircher, Dieter: See—  
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,416,491, Cl. 303-113,000.
- Kirita, Yasuzo: See—  
Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, 4,416,772, Cl. 210-137,000.
- Kirsch, Johann: See—  
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094, Cl. 52-72,000.
- Kish, Paul. Paper roll dispenser, 4,416,425, Cl. 242-55,200.
- Kishi, Tunes; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, to Hitachi, Ltd. Three-phase combined type circuit breaker, 4,417,111, Cl. 200-148,000.
- Kishida, Kunio: See—  
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853, Cl. 420-469,000.
- Kishita, Kazutaka: See—  
Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, 4,417,040, Cl. 526-323,100.
- Kissel, Thomas R., to Eastman Kodak Company. Diluent and method for potentiometric assay of liquids, 4,416,735, Cl. 204-1,000.
- Kitamura, Akira: See—  
Tomioaka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555, Cl. 384-415,000.
- Kitamura, Hidetoshi; and Kato, Hirohisa, to Nissan Motor Co., Ltd. Method and device for detecting engine idling, 4,416,149, Cl. 73-118,000.
- Kitamura, Minoru: See—  
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691, Cl. 75-60,000.
- Klasco, Michael A.: See—  
Eppler, William G., Jr.; Klasco, Michael A.; and Kornfeld, Irwin H., 4,417,103, Cl. 369-60,000.
- Klasen, Rudi: See—  
Brown, Lloyd C.; and Klasen, Rudi, 4,416,859, Cl. 422-261,000.
- Kleemann, Axel: See—  
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,827, Cl. 260-501,120.
- Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,828, Cl. 260-501,120.
- Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, to Distributed Control Systems, Inc. Universal input-output device, 4,417,151, Cl. 307-24,000.
- Klein, Joseph T.: See—  
Davis, Larry; and Klein, Joseph T., 4,416,887, Cl. 424-267,000.
- Klein, Schanzlin & Becker Aktiengesellschaft: See—  
Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, 4,416,586, Cl. 417-13,000.
- Kleinberg, Leonard L., to United States of America, National Aeronautics and Space Administration. Tuned analog network, 4,417,215, Cl. 330-107,000.
- Klimowicz, Jerome R. Multiple piece bolt-type fastener, 4,416,574, Cl. 411-397,000.
- Klosa, Josef. [8-(Dialkylamino alkoxy)-caffeine]-platinum complex compounds and pharmaceutical products containing the same, 4,416,878, Cl. 424-245,000.
- Kloss, Henry E., to Kloss Video Corporation. Video projection system, 4,417,273, Cl. 358-60,000.
- Kloss Video Corporation: See—  
Kloss, Henry E., 4,417,273, Cl. 358-60,000.
- Kluger, Jacob N., to Xerox Corporation. Apparatus and method for registering copy sheets in a variable pitch reproduction machine, 4,416,534, Cl. 355-14,05H.
- Klus, John P.; Gibbons, Everett E.; Brodsky, Eric L.; and Janule, Victor P., to Madison-Kipp Corporation. Surface tensiometer, 4,416,148, Cl. 73-64,400.
- Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, to Robert Bosch GmbH. Fuel injection system, 4,416,238, Cl. 123-470,000.
- Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, to Robert Bosch GmbH. Mixture formation system for mixture-compressing internal combustion engines with externally supplied ignition, 4,416,241, Cl. 123-494,000.
- Knickerbocker, Michael G., to Sequist Valve Co., Div. of Pittway Corp. Variable spray overcap aerosol assembly, 4,416,398, Cl. 222-402,130.
- Knight, Lindsay C., to Australasian Training Aids Pty. Ltd. Trolleys for target ranges, 4,416,456, Cl. 273-359,000.
- Knoll, Frank: See—  
Spinosa, Dominic J.; and Knoll, Frank, 4,416,641, Cl. 441-94,000.



- Knopp, Hans: See—  
Geyer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041, Cl. 28-255,000.
- Knorre, Helmut; Fischer, Joachim; and Stutzel, Klaus, to Degussa. Process for the treatment of continuous waste water streams having changing contents of different oxidizable materials with hydrogen peroxide, 4,416,786, Cl. 210-746,000.
- Knorr, Erich; Blawert, Dieter; and Schubart, Bernd, to Sartorius GmbH. Electromechanical weigher, 4,416,343, Cl. 177-180,000.
- Kobari, Yukio: See—  
Hashimoto, Takafumi; and Kobari, Yukio, 4,416,953, Cl. 429-18,000.
- Kobayashi, Masateru: See—  
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047, Cl. 544-26,000.
- Kobayashi, Ryuichiro: See—  
Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryuichiro, 4,416,979, Cl. 430-562,000.
- Kobayashi, Shigeru: See—  
Fukuda, Tsunehiko; Kobayashi, Shigeru; and Fujino, Masahiko, 4,416,820, Cl. 548-496,000.
- Kobayashi, Shuichi: See—  
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606, Cl. 425-202,000.
- Kobayashi, Yuko, to Olympus Optical Co., Ltd. Objective for video disks, 4,416,519, Cl. 350-475,000.
- Kob Steel, Ltd.: See—  
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetsuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691, Cl. 75-60,000.
- Kobylar, Alex W.: See—  
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stietel, David J., 4,417,335, Cl. 370-110,100.
- Koch, Adolf, to Autohaus Lorinser G.m.b.H. & Co. Arrangement for storing tools and instruments in power vehicles, 4,416,483, Cl. 246-37,100.
- Koch Process Systems, Inc.: See—  
Abrams, Richard F.; and Chellis, James G., 4,416,855, Cl. 422-111,000.
- Kodakum Industri A.B.: See—  
Ostberg, Sven E., 4,416,312, Cl. 144-39,000.
- Kocol, James E.: See—  
Gundersen, Robert O.; Kocol, James E.; and Schuck, David B., 4,417,334, Cl. 370-85,000.
- Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, to Toray Silicone Company, Ltd. Fluorosilicone-containing compositions for the treatment of fibers, 4,417,024, Cl. 524-861,000.
- Kodama, Fumio: See—  
Nakao, Masaaki; and Kodama, Fumio, 4,416,784, Cl. 210-635,000.
- Kodama, Tasuku; and Tarushiki, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Genshikyoku Jigyō Kabushiki Kaisha. System for cooling the atmosphere in a primary containment vessel in nuclear reactor and removing water-soluble gases and dusts floating therein, 4,416,850, Cl. 376-310,000.
- Kohler, Norbert: See—  
Rinaudo, Marguerite; Milas, Michel; and Kohler, Norbert, 4,416,990, Cl. 435-104,000.
- Kohn, Robert C., to Uniroyal, Inc. Reduced noise positive drive power transmission system, 4,416,649, Cl. 474-153,000.
- Koivumaki, Markku: See—  
Pesonen, Jori; and Koivumaki, Markku, 4,416,731, Cl. 162-308,000.
- Kojima, Tadashi: See—  
Hoshimi, Susumu; and Kojima, Tadashi, 4,417,283, Cl. 358-310,000.
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Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324, Cl. 165-12,000.
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Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, 4,417,290, Cl. 360-131,000.
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France, Haywood G.; and Koleske, Joseph V., 4,416,917, Cl. 427-302,000.
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Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409, Cl. 228-173,000.
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Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryuichiro, 4,416,979, Cl. 430-562,000.
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Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019, Cl. 524-456,000.
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Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsugui, 4,417,318, Cl. 364-900,000.
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Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi; and Kominami, Yasuhiko, 4,416,709, Cl. 148-403,000.
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Gelfand, Yakov E.; Komova, Marina L.; Shtengel, Eduard G.; and Yakovis, Leonid M., 4,416,394, Cl. 222-55,000.
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Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., 4,417,355, Cl. 378-49,000.
- Kondo, Masakazu: See—  
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279, Cl. 358-195,100.
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Fujihara, Mitsuo; Matsuo, Syunji; Masukawa, Toyooki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980, Cl. 430-567,000.
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Wood, Douglas E.; Kooy, Wayne J.; and Unger, Lawrence C., 4,416,560, Cl. 400-705,100.
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Eppler, William G., Jr.; Klasco, Michael A.; and Kornfeld, Irwin H., 4,417,103, Cl. 369-60,000.
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Vedenpa, Timo; Lindstrom, Yngve; Eskelinen, Pekka; and Kotani, Jorma, 4,416,070, Cl. 34-114,000.
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Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566, Cl. 405-291,000.
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Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, 4,417,353, Cl. 378-4,000.
- Koyama, Haruo: See—  
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, 4,416,964, Cl. 430-106,600.
- Kraftwerk Union Aktiengesellschaft: See—  
Kastl, Hans; and Gugel, Georg, 4,416,846, Cl. 376-249,000.
- Kramer, Klaus; and Huss, Rolf, to Focke and Company. Stepping gear, 4,416,165, Cl. 74-70,000.
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Kerby, Robert C.; and Krauss, Clifford J., 4,416,746, Cl. 204-114,000.
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Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238, Cl. 123-470,000.
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Muller, Peter; Mustacchi, Henry; and Kreicas, Leonard, 4,416,950, Cl. 428-537,000.
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Fischer, Wolfgang; and Krenn, Karl-Dieter, 4,416,997, Cl. 436-42,000.
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Malmqvist, Erik L.; and Kristiansson, Krister, 4,417,142, Cl. 250-253,000.

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Walter, Roderich W.; Krivoy, William A.; Ritzmann, Ronald F.; and Bhargava, Hemendra N., 4,416,871, Cl. 424-177,000.
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Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566, Cl. 405-291,000.
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Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,417,030, Cl. 525-316,000.
- Krysiak, Juergen: See—  
Kueenzle, Paul; Krysiak, Juergen; and Reuter, Hans-Karl, 4,417,112, Cl. 200-146,000.
- Kubiatowicz, James F., to Custom Concepts, Incorporated. Moldable toy vehicle, 4,416,083, Cl. 46-208,000.
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- Kubota, Minoru: See—  
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606, Cl. 425-202,000.
- Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; and Samotryasov, Sergei M., to Institut Elektrovarki, Imeni E.O. Patona. Method of flash butt welding, 4,417,121, Cl. 219-104,000.
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Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035, Cl. 526-208,000.
- Kula, Maria-Regina: See—  
Morr, Michael; and Kula, Maria-Regina, 4,416,830, Cl. 260-929,000.
- Kulischenko, Walter; Bogan, William F.; and Ellis, William C., to Pennwalt Corporation. Flexible shaft assembly with universal adapter, 4,416,644, Cl. 464-52,000.
- Kunimoto, Setsuko: See—  
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Iinuma, Hironobu; and Kunimoto, Setsuko, 4,416,899, Cl. 424-320,000.
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- Kurabayashi, Katsuhiko: See—  
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hideo; and Takahashi, Toshio, 4,416,819, Cl. 260-293,000.
- Kuraray Co., Ltd.: See—  
Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, 4,416,772, Cl. 210-137,000.
- Yoshimura, Noriaki; and Tamura, Masuhiko, 4,417,079, Cl. 568-903,000.
- Kurasiewicz, Adam S.: See—  
Lee, Richard J.; Kurasiewicz, Adam S.; and Richardson, Eugene E., 4,416,829, Cl. 260-927,000.
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Nakao, Masaaki; and Kodama, Fumio, 4,416,784, Cl. 210-635,000.
- Kurita, Naoyasu: See—  
Minagawa, Motonobu; Inoue, Tetsuyu; and Kurita, Naoyasu, 4,416,797, Cl. 252-400,000.
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- Kuroiwa, Yosio: See—  
Kato, Keigo; and Kuroiwa, Yosio, 4,416,242, Cl. 123-549,000.
- Kurosaki Yogyo Co., Ltd.: See—  
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokunaki; and Sugawara, Mituo, 4,416,999, Cl. 501-94,000.
- Kusaka, Yosuke, to Nippon Kogaku K.K. Focus detecting apparatus, 4,417,139, Cl. 250-204,000.
- Kuwazuru, Yasumitsu: See—  
Takenaka, Akira; Shimazaki, Keiichi; and Kuwazuru, Yasumitsu, 4,416,458, Cl. 277-96,100.
- Kuzia, Stanley J. Combustion apparatus and refractory elements for use in combustion apparatus, 4,416,250, Cl. 126-146,000.
- Kuziemka, Edmund J.: See—  
Graziano, Frank D.; and Kuziemka, Edmund J., 4,417,006, Cl. 523-435,000.
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Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tanato, Toshio, 4,416,982, Cl. 435-11,000.
- LaBude, Edward V.: See—  
Hazel, Robert L.; and LaBude, Edward V., 4,417,330, Cl. 369-32,000.
- Lacy, Charles M.: See—  
Hensleigh, Robert H.; Lacy, Charles M.; and Walton, Hardy H., Jr., 4,417,278, Cl. 358-188,000.
- Lacy, Ray S., Jr.; and Johnson, Thomas P. Drill barge transport by surface effect vehicles, 4,416,210, Cl. 114-67,000.
- Lafaye, Marcel: See—  
Benedite, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques, 4,417,124, Cl. 219-121,01H.
- Lai, Min D. Low speed air bleed absorption reducer oil saving device for carburetor, 4,416,231, Cl. 123-327,000.
- Lambke, Bernard J., Jr., to Dresser Industries, Inc. Door and window arrangement, 4,416,089, Cl. 49-502,000.
- Lamphere, Craig F.: See—  
Miklos, Richard L.; and Lamphere, Craig F., 4,417,291, Cl. 360-133,000.
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Aykan, Kamran; Farrauto, Robert J.; Jefferson, Clinton F.; and Lanam, Richard D., 4,416,916, Cl. 427-160,000.
- Landskrona Produktion AB: See—  
Jonasson, Bertil, 4,416,090, Cl. 51-138,000.
- Lanfranco, Gianmario: See—  
Occhini, Elio; Lanfranco, Gianmario; and Metra, Piero, 4,417,093, Cl. 174-25,000.
- Langhein-Pfahner Werke AG: See—  
Schulze-Berge, Klaus, 4,416,740, Cl. 204-43,00N.
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- Langenhagen, Rolf-Dieter: See—  
Kollmeier, Hans-Joachim; and Langenhagen, Rolf-Dieter, 4,417,068, Cl. 556-479,000.
- Langer, Adolf, to Viennatone Gesellschaft M.B.H. Plug for miniature receiver, 4,417,104, Cl. 179-107,000.
- Lanterman, Beryl A., to Bendix Corporation. The Alarm modification for meteorological instrument, 4,417,238, Cl. 340-688,000.
- Lapeevic, Robert E.: See—  
Mozsary, Peter G.; and Lapeevic, Robert E., 4,416,629, Cl. 433-174,000.
- Largman, Theodore: See—  
Aharoni, Shaul M.; and Largman, Theodore, 4,417,031, Cl. 525-425,000.
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- Larigaldie, Serge, to Office National d'Etudes et de Recherches Aérospatiales. Methods and apparatus for transferring electric charges of different signs into a space zone, and application to static electricity eliminators, 4,417,293, Cl. 361-212,000.
- Larkin, John M.; and Watts, Lewis W., Jr., to Texaco Inc. Thermal treatment of olefin oligomers via a boron trifluoride process to increase their molecular weight, 4,417,082, Cl. 585-10,000.
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Frahm, Carl E.; Larson, Erick L.; and McAulay, John M. S., 4,416,383, Cl. 215-256,000.
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Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Las G., 4,416,927, Cl. 428-36,000.
- Larson, Willis A., to Oak Industries Inc. Connector for attaching an electrical component to a flat sheet, 4,417,114, Cl. 200-317,000.
- Lasky, Daniel J.: See—  
Hebert, Richard D.; and Lasky, Daniel J., 4,416,530, Cl. 355-3,000.
- LaSota, Richard W. Television signal monitoring device, 4,417,268, Cl. 358-10,000.
- Latsch, Reinhard: See—  
Benedikt, Walter; Latsch, Reinhard; and Schlembach, Hans, 4,416,228, Cl. 123-268,000.
- Laughinghouse, Gerald F.: See—  
Gibson, Donald B.; and Laughinghouse, Gerald F., 4,416,170, Cl. 76-107,000.
- Laurent, Henry: See—  
Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, 4,416,985, Cl. 435-58,000.
- Lawless, Harold L. Apparatus for carrying out a chemical or physical process, 4,416,956, Cl. 429-15,000.
- Lawrence, Bruce J.: See—  
Lawrence, James B.; and Lawrence, Bruce J., 4,416,382, Cl. 215-231,000.
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- Lea, Alfred L.; and Votta, Frank A., Jr., to Ametek, Inc. Gram beam force gauge, 4,416,162, Cl. 73-862,620.
- Leale, Luis, to Sonelt Corporation. Electronic ballast, 4,417,181, Cl. 315-209,000.
- Leary, Pamela A.: See—  
Cuomo, Jerome J.; Leary, Pamela A.; and Yee, Dennis S., 4,416,725, Cl. 156-635,000.
- Leczna, Chester J.; and Williams, Griff E., to Griff Williams Co.; and Ryan Metal Powder Technologies, Inc. Apparatus for producing high purity metal powders, 4,416,600, Cl. 425-7,000.
- Le Devehat, Eugene R., to FMC Corporation. Method and apparatus for controlling articulated fluid loading arms upon emergency disconnection, 4,416,306, Cl. 137-615,000.
- Lee, Alexander Y., Jr.: See—  
Gershberg, David N.; Lee, Alexander Y., Jr.; and Moore, William B., 4,417,157, Cl. 307-256,000.



- Lee, George E.: See—  
Lee, Thomas B. K.; Lee, George E.; and Jobin, Gregory M., 4,417,063, Cl. 549-354.000.
- Lee, John W., Jr.: See—  
Morrison, Alan L.; Cincotta, Louis; and Lee, John W., Jr., 4,416,971, Cl. 430-221.000.
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- Lee, Richard J.; Kurasiewicz, Adam S.; and Richardson, Eugene E., to Standard Oil Company (Indiana), Poly-hindered phenol-phosphites and process for preparation, 4,416,829, Cl. 260-927.00R.
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- Leeds & Northrup Company: See—  
Korowitz, Simon; Leichter, Kurt R.; and Houvig, Felix J., 4,417,303, Cl. 364-200.000.
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- Le Fur, Gerard R., to Pharmuka Laboratoires, Therapeutic uses of methionine, 4,416,898, Cl. 424-319.000.
- Leiber, Heinz: See—  
Berthling, Hannes; and Leiber, Heinz, 4,416,347, Cl. 180-197.000.
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Korowitz, Simon; Leichter, Kurt R.; and Houvig, Felix J., 4,417,303, Cl. 364-200.000.
- Le Maitre, Patrick: See—  
Hulin, Jean P.; Bouvard, Andre; and Le Maitre, Patrick, 4,416,507, Cl. 350-96.220.
- Lemke, Timothy A.: See—  
Fusselman, David F.; and Lemke, Timothy A., 4,416,501, Cl. 339-97.00R.
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- Lenfant, Jean-Pierre: See—  
Benedite, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques, 4,417,124, Cl. 219-121.0LH.
- Levingradskoe NPO "Burevestnik": See—  
Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., 4,417,355, Cl. 378-49.000.
- Le Sonn, Marcel, to Thomson-CSF, Space-saving selector, 4,417,357, Cl. 378-177.000.
- Lester, William D.: See—  
Fachini, Robert M.; and Lester, William D., 4,417,230, Cl. 340-52.00R.
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Bascom, Laurence N.; and Leung, Peter S. K., 4,416,935, Cl. 428-229.000.
- Lever Brothers Company: See—  
Blackstone, Paul C., 4,416,792, Cl. 252-110.000.  
Haq, Zia, 4,416,791, Cl. 252-90.000.  
Richey, Thomas W.; Weaver, John M.; and Sapone, Martin, 4,416,867, Cl. 424-49.000.
- Lewarchik, Ronald J.: See—  
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,416,750, Cl. 204-159.190.
- Lewers, William R.: See—  
Bulso, Joseph D., Jr.; and Lewers, William R., 4,416,140, Cl. 72-345.000.
- Ley, Hans: See—  
Panthofer, Rudolf; and Ley, Hans, 4,416,037, Cl. 24-665.000.
- Licentia Patent-Verwaltungs GmbH: See—  
Zeis, Jurgen, 4,417,358, Cl. 455-109.000.
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- Lidow, Alexander: See—  
Abdoulin, Edgar; and Lidow, Alexander, 4,416,708, Cl. 148-187.000.
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Sinka, Joseph V.; and Lieberman, Robert A., 4,417,023, Cl. 524-731.000.
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Czerney, Peter; Hartmann, Horst; and Liebscher, Jurgen, 4,417,060, Cl. 548-525.000.
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Hulin, Jean P.; Bouvard, Andre; and Le Maitre, Patrick, 4,416,507, Cl. 350-96.220.
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Sullivan, John; and Lillibridge, Harold R., 4,416,651, Cl. 493-12.000.
- Lilly Industries Limited: See—  
Dawson, William, 4,416,892, Cl. 424-272.000.
- Lilly, James A., to UOP Inc. Bimetallic well screen for use in injection wells and method of making same, 4,416,331, Cl. 166-236.000.
- Lindfors, Sven G.: See—  
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilampi, Markku A., 4,416,933, Cl. 428-216.000.
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Sjostedt, Bertil; Carlsson, Gunnar; and Lindholm, Hans, 4,416,121, Cl. 62-238.600.
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- Lindsay, Robert L.: See—  
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., 4,417,335, Cl. 370-110.100.
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Vedenpa, Timo; Lindstrom, Yngve; Eskelinen, Pekka; and Kotanen, Jorma, 4,416,070, Cl. 34-114.000.
- Lindtveit, Herbert E., to Sid Harvey, Inc. Liquid flow control apparatus, 4,416,592, Cl. 417-290.000.
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Magari, Teruo; Yazaki, Mitsuyoshi; and Nakamura, Masayoshi, 4,416,809, Cl. 252-557.000.
- Litton Business Systems, Inc.: See—  
Salkeld, Stephen A.; and Stock, Mark E., 4,416,093, Cl. 52-71.000.
- Lockheed Corporation: See—  
Wilson, Francis M., Jr., 4,416,436, Cl. 244-137.00R.
- Loctite Corporation: See—  
Azevedo, Max, 4,417,028, Cl. 525-285.000.
- Loctite (Ireland) Limited: See—  
Dunn, David J., 4,416,921, Cl. 416,177, Cl. 84-1.190.
- Loeb, Marvin. Data input for computer organ, 4,416,177, Cl. 84-1.190.
- Loeffler, Carolyn R., personal representative: See—  
Cunningham, Richard N.; and Loeffler, Romain E., deceased, 4,416,071, Cl. 34-155.000.
- Loeffler, Romain E., deceased: See—  
Cunningham, Richard N.; and Loeffler, Romain E., deceased, 4,416,071, Cl. 34-155.000.
- Lofgren, Stig-Gunnar; and Ekeborg, Bo G., to Mo och Domsjo Aktiebolag, Ground-clearing and mound-building scarifier, 4,416,335, Cl. 172-2.000.
- Logan, Russell J. Extensible steering, propulsion and skirting means for ground effect vehicles, 4,416,346, Cl. 180-119.000.
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- Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, to Metallgesellschaft AG, Process of electrolytically producing oxyacids of chlorine, 4,416,744, Cl. 204-95.000.
- Long, Alvin L. Multiple use: pontoon bridge section, 4,416,485, Cl. 296-188.000.
- Long, Olen R.: See—  
Merritt, David T.; Fish, David W.; and Long, Olen R., 4,416,330, Cl. 166-117.500.
- Loomis, Bernard: See—  
Munson, Leo J.; Griaude, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455, Cl. 273-272.000.
- Loomis, Neil W.: See—  
Hoffman, David M.; Loomis, Neil W.; Ehlert, Ralph C.; and Shelley, Peter S., 4,417,144, Cl. 250-367.000.
- Lord Corporation: See—  
Sherrick, James W., 4,416,203, Cl. 105-224.100.
- Losert, Ewald: See—  
Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans, 4,416,975, Cl. 430-327.000.
- Loye, Kenneth; and Julian, Gary, to SCM Corporation, Simulated weathered-copper coatings for metal, 4,416,940, Cl. 428-324.000.
- LubeCon Maintenance Systems, Inc.: See—  
Easton, Richard L.; and Friedlund, Richard H., 4,416,367, Cl. 198-496.000.
- Luigi Franchi S.p.A.: See—  
Ottolini, Leonardo, 4,416,076, Cl. 42-17.000.
- Lukach, Danil: See—  
Freese, Howard W.; and Lukach, Danil, 4,416,138, Cl. 72-263.000.
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Sevastopoulos, Stylianos G.; and Lum, Sammy S., 4,417,214, Cl. 330-84.000.
- Lumbra, Douglas L.; Phelps, Douglas W., Jr.; Samuelsen, Sigvart J.; and Ward, William C., to International Business Machines Corporation, Percussive arc welding, 4,417,120, Cl. 219-96.000.
- Lumonics Inc.: See—  
McKee, Terrence J., 4,417,342, Cl. 372-87.000.
- Lundblad, Leif. Apparatus for dispensing sheet-like elements from a store of such elements, for example banknotes, to one of a plurality of receipt openings accessible to, for example, cashier or customer, 4,417,137, Cl. 235-379.000.
- Lundstedt, Erik; and Corbin, Edgar A., Jr., to Mallinckrodt, Inc. Method of preparing cultured dairy products, 4,416,905, Cl. 426-34.000.
- Lunkenheimer, Winfried: See—  
Stetter, Jorg; Lunkenheimer, Winfried; and Brandes, Wilhelm, 4,416,889, Cl. 424-269.000.
- Luntz, Richard D.: See—  
Jacobsen, Stephen C.; and Luntz, Richard D., 4,416,274, Cl. 604-20.000.

- Luther & Maelzer GmbH: See—  
Dehmel, Rudiger; Maelzer, Martin; and Seyb, Christian, 4,417,204, Cl. 324-73.0PC.
- Lutkowski, Lawrence, to Becton Dickinson and Company, Multiple sample needle assembly with vein indication, 4,416,290, Cl. 128-764.000.
- Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., to Bomar Corporation, Automatic gate opener, 4,416,085, Cl. 49-340.000.
- Lynn, Peter F.: See—  
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,417,337, Cl. 371-22.000.
- Mabe, James A.: See—  
Nakatsukasa, Walter M.; Fayerman, Jeffrey T.; and Mabe, James A., 4,416,994, Cl. 435-253.000.
- Machin, John: See—  
Stevenson, John; Machin, John; and Dyke, David L., 4,416,694, Cl. 106-84.000.
- Machinefabrik Geurtsen Deventer B.V.: See—  
Geurtsen, Alfonsus A., 4,416,351, Cl. 182-238.000.
- Mack, Ingham A. G.: See—  
White, Marvin H.; and Mack, Ingham A. G., 4,417,317, Cl. 364-825.000.
- Mack, William P. S.: See—  
Clatworthy, Michael C.; Mack, William P. S.; and Major, Douglas J., 4,416,316, Cl. 152-209.00R.
- MacLeod, John N., to Tecumseh Products Company, Magneto battery trickle charger, 4,417,195, Cl. 322-58.000.
- Macler, Paul L.: See—  
Stockman, Richard F.; and Macler, Paul L., 4,416,044, Cl. 29-157.30R.
- Madison Farm Structures, Inc.: See—  
Kilts, Harold J.; and Swaziek, Laurence J., 4,416,362, Cl. 193-25.00C.
- Madison-Kipp Corporation: See—  
Klus, John P.; Gibbons, Everett E.; Brodsky, Eric L.; and Janule, Victor P., 4,416,148, Cl. 73-64.400.
- Maeda, Junji, to Sanyo Denki Kabushiki Kaisha, Method of preventing ink clogging in ink droplet projecting device, an ink droplet projecting device, and an ink jet printer, 4,417,259, Cl. 346-140.00R.
- Maekawa, Kouji: See—  
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, 4,416,964, Cl. 430-106.600.
- Maelzer, Rudiger: See—  
Dehmel, Rudiger; Maelzer, Martin; and Seyb, Christian, 4,417,204, Cl. 324-73.0PC.
- Magari, Teruo; Yazaki, Mitsuyoshi; and Nakamura, Masayoshi, to Lion Corporation, Granular detergent composition, 4,416,809, Cl. 252-557.000.
- Magee, Paul M.; and Evans, Gareth B., to Eastman Kodak Company, Hydrazide compositions, methods employing them and photographic materials containing them, 4,416,969, Cl. 430-217.000.
- Maglio, Ralph A., to Firestone Tire & Rubber Company, The Stylized surface finishes, 4,416,926, Cl. 428-31.000.
- Magnetic Controls Company: See—  
Humphrey, John W.; and Silbernagel, Raymond A., 4,416,059, Cl. 29-751.000.
- Magnin, Raymond, to Framatome, Nuclear power plant, 4,416,849, Cl. 376-296.000.
- Magnotta, Vincent L.: See—  
Elton, Edward F.; and Magnotta, Vincent L., 4,416,727, Cl. 162-6.000.
- Mahr, Tibor G.; and Subramanian, Pallatheri M., to Du Pont de Nemours, E. I., and Company, Crosslinked ethylene/vinyl acetate copolymer film and process for treating same, 4,416,749, Cl. 204-159.140.
- Maier, Erwin, to Maier-Unitas GmbH, Blind stitch sewing machine, 4,416,207, Cl. 112-178.000.
- Maier, Thomas O., to Eastman Kodak Company, Use of manganous compounds in image transfer elements, 4,416,970, Cl. 430-218.000.
- Maier-Unitas GmbH: See—  
Maier, Erwin, 4,416,207, Cl. 112-178.000.
- Major, Douglas J.: See—  
Clatworthy, Michael C.; Mack, William P. S.; and Major, Douglas J., 4,416,316, Cl. 152-209.00R.
- Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, to Janome Sewing Machine Co. Ltd. Pulse motor driving system, 4,417,188, Cl. 318-696.000.
- Malhotra, Ripudaman: See—  
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,417,080, Cl. 568-939.000.
- Mallinckrodt, Inc.: See—  
Lundstedt, Erik; and Corbin, Edgar A., Jr., 4,416,905, Cl. 426-34.000.
- Malmqvist, Erik L.; and Kristiansson, Krister, to Boliden Aktiebolag, Method and apparatus for detecting alpha-emitting substances, 4,417,142, Cl. 250-253.000.
- Maltby, Edgar W., to Eaton Corporation, Two-port thermally responsive valve, 4,416,416, Cl. 236-86.000.
- Malz Nominees Pty. Ltd.: See—  
Trihey, John M., 4,416,587, Cl. 417-52.000.
- Manber, Solomon: See—  
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, 4,417,151, Cl. 307-24.000.
- Manchem Limited: See—  
Holland, Frank S., 4,416,743, Cl. 204-59.00R.
- Mannesmann Aktiengesellschaft: See—  
Hesse, Heinrich; Merkle, Anton; Gross, Siegfried; and Radtke, Gerhard, 4,416,139, Cl. 72-267.000.
- Manning, Richard P.: See—  
Williamson, Harry L.; West, Robert A.; and Manning, Richard P., 4,417,351, Cl. 377-8.000.
- Manske, Reinhold R.: See—  
Norman, Melvin H.; Manske, Reinhold R.; and Sheehan, Neil J., 4,416,661, Cl. 604-86.000.
- Manville Service Corporation: See—  
Cunningham, Richard N.; and Loeffler, Romain E., deceased, 4,416,071, Cl. 34-155.000.
- Markus, Henry Z.; and McAleer, William J., to Merck & Co., Inc. Methods of producing HBsAg, 4,416,986, Cl. 435-68.000.
- Mars, Inc.: See—  
Heiman, Frederic P., 4,416,365, Cl. 194-100.00A.
- Marsh, Edward K.: See—  
Frascatore, John F.; Nelson, Dean R.; and Marsh, Edward K., 4,416,499, Cl. 339-92.00M.
- Marsh, Elizabeth A., executrix: See—  
Marsh, William E., Jr. deceased; and Marsh, Elizabeth A., executrix, 4,416,463, Cl. 280-79.300.
- Marsh, William E., Jr. deceased; and Marsh, Elizabeth A., executrix, Bulk storage cart, 4,416,463, Cl. 280-79.300.
- Marshall, Robert, to Davy-Loewy Limited, Roll construction, 4,416,137, Cl. 72-243.000.
- Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., to Allied Corporation, Soil resistant yarn finish for synthetic organic polymer yarn, 4,416,787, Cl. 252-8.800.
- Martens, Jurgen: See—  
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,827, Cl. 260-501.120.
- Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,828, Cl. 260-501.120.
- Martin, Frank A., to Inland Steel Company, Electrotreating apparatus with depletable anode roll, 4,416,756, Cl. 204-206.000.
- Martin, Henry, to Ciba-Geigy Corporation, 3,4-Dichlorophenylacetone-N-tert-butylcarbamoyloxy ether for the protection of crops against injury by herbicides, 4,416,686, Cl. 71-105.000.
- Martin, Van C.: See—  
Fillmore, Gary L.; Martin, Van C.; and Ream, Gregory L., 4,417,256, Cl. 346-75.000.
- Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, to Hoechst Aktiengesellschaft, Mixtures of optical brighteners, 4,416,795, Cl. 252-301.230.
- Martini, William R. Thermal regenerative machine, 4,416,114, Cl. 60-526.000.
- Martorana, Piero: See—  
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893, Cl. 424-272.000.
- Maruzen Sewing Machine Co., Ltd.: See—  
Matsumura, Nobuyoshi, 4,416,206, Cl. 112-158.00B.
- Maryland Cup Corporation: See—  
Winstead, Thomas W., 4,416,607, Cl. 425-325.000.
- Maryonovich, Michael; and Ebey, Edward, to Masco Corporation, Emergency stop mechanism, 4,416,366, Cl. 198-320.000.
- Masaoka, Aritatsu: See—  
Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, 4,417,040, Cl. 526-323.100.
- Masco Corporation: See—  
Maryonovich, Michael; and Ebey, Edward, 4,416,366, Cl. 198-320.000.
- Massey-Ferguson Services N.V.: See—  
McNaught, James B.; and Colotte, Guy E. P., 4,416,486, Cl. 296-190.000.
- Massey, Michael L.: See—  
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,416,798, Cl. 502-420.000.
- Masuda, Youichi: See—  
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwar, Seiji; and Higo, Shoichi, 4,417,153, Cl. 307-140.000.
- Masukawa, Toyooki: See—  
Fujiwhara, Mitsuo; Matsuo, Syunji; Masukawa, Toyooki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980, Cl. 430-567.000.
- Matalis, John A.; Heine, Richard L.; and Wegerer, Duane E., to International Harvester Co. Plow bolt, 4,416,573, Cl. 411-378.000.
- Material Sciences Corporation: See—  
Graziano, Frank D.; and Kuziemka, Edmund J., 4,417,006, Cl. 523-435.000.
- Mathews, Bruce D., to Westinghouse Electric Corp. Adaptive collision threat assessor, 4,417,248, Cl. 343-16.00M.
- Matsuda, Shigeo: See—  
Sugiyama, Kazuo, 4,417,217, Cl. 331-66.000.
- Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, to Ricoh Co., Ltd. Diazo copying element, 4,416,967, Cl. 430-159.000.
- Matsuhisa, Koh: See—  
Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556, Cl. 400-144.200.
- Matsumoto, Yosuke: See—  
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742, Cl. 204-47.000.



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- Matsumura, Shunichi: See—  
Hata, Hiroo; and Matsumura, Shunichi, 4,416,839, Cl. 264-49.000.
- Matsuo, Masanori: See—  
Tomoka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555, Cl. 384-415.000.
- Matsuo, Masataka: See—  
Miromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hata, Tokuaki; and Sugawara, Mituo, 4,416,999, Cl. 501-94.000.
- Matsuo, Syunji: See—  
Fujiwara, Mitsuo; Matsuo, Syunji; Masukawa, Toyoki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980, Cl. 430-567.000.
- Matsuo, Taisuke; and Ochiai, Michihiko, to Takeda Chemical Industries, Ltd. 3-Methoxy-2-oxazetidine derivatives and their production. 4,416,817, Cl. 260-239.00A.
- Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, to Fuji Oil Company, Limited. Method for enzymatic transesterification of lipid and enzyme used therein. 4,416,991, Cl. 435-134.000.
- Matuoka, Hiroki, to Toyota Jidosha Kabushiki Kaisha. Device and method for controlling fuel injected internal combustion engine providing hot deceleration enrichment. 4,416,240, Cl. 123-493.000.
- Matsumita Electric Industrial Company, Limited: See—  
Horiuchi, Naoya; Ohhara, Takafumi; and Sano, Reiji, 4,417,340, Cl. 372-58.000.
- Inoue, Michihiro; Takemoto, Toyoki; and Yamada, Haruyasu, 4,417,233, Cl. 340-347.00A.
- Nakase, Yoshimori; and Sagishima, Takayuki, 4,417,271, Cl. 358-24.000.
- Shimizu, Hideharu; and Hashimoto, Akihiko, 4,416,616, Cl. 431-325.000.
- Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, 4,417,184, Cl. 315-366.000.
- Uya, Masaru, 4,417,161, Cl. 307-471.000.
- Matsumita Electric Works, Ltd.: See—  
Touhou, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, 4,417,172, Cl. 313-156.000.
- Matsuura, Masataka: See—  
Funada, Fumaki; Matsuura, Masataka; and Wada, Tomio, 4,416,515, Cl. 350-350.00F.
- Matsuura, Shigeo: See—  
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279, Cl. 358-195.100.
- Matsuura, Yoshiaki, to Kabushiki Kaisha Daini Seikosha. Semiconductor device. 4,417,263, Cl. 357-23.000.
- Mattel, Inc.: See—  
Guerrero, Benjamin G.; and Berford, Saint Elmo B., 4,416,074, Cl. 40-364.000.
- Matthew, James Elton: See—  
Matthew, Lee M., 4,416,402, Cl. 224-42.240.
- Matthew, Lee M., to Matthew, James Elton. Spare tire mount for pickup truck. 4,416,402, Cl. 224-42.240.
- Mattox, Robert G. Spring assist drive for cycle. 4,416,464, Cl. 280-215.000.
- Maugweiler, Gottfried: See—  
Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, 4,416,489, Cl. 299-94.000.
- Maurer, Roland: See—  
Wolber, Robert; and Maurer, Roland, 4,416,550, Cl. 368-88.000.
- Mayer, Edward F., to Ricoh Company, Ltd. Electrophotographic copying apparatus and subsystems therefor. 4,416,531, Cl. 355-10TR.
- Mayfield, Glenn A., to Duncan Electric Company, Inc. Average responding RMS indicating type transducer. 4,417,198, Cl. 23-315.000.
- Maytag Company, The: See—  
Jordan, Lawrence J., 4,416,300, Cl. 134-108.000.
- McAleer, William J.: See—  
Markus, Henry Z.; and McAleer, William J., 4,416,986, Cl. 435-68.000.
- McAulay, John M. S.: See—  
Frahm, Carl E.; Larson, Erick L.; and McAulay, John M. S., 4,416,383, Cl. 215-256.000.
- McCaffrey, David J. A.; and Jones, William D., deceased (by Jones, Barbara, legal representative), to Coal Industry (Patents) Limited. Froth flotation. 4,416,769, Cl. 209-166.000.
- McCarthy, Barry, to Quinn Engineers Ltd. Union nut. 4,416,575, Cl. 411-432.000.
- McCarthy, Jeremiah P.; and Tabasky, Marvin, to GTE Laboratories Incorporated. Method of fabricating a monolithic integrated circuit structure. 4,416,055, Cl. 29-577.00C.
- McCarty, Patrick R.: See—  
Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., 4,417,106, Cl. 200-5.00R.
- McCormick Laboratories, Inc.: See—  
Bresler, Robert G., 4,416,289, Cl. 128-737.000.
- McCorsley, Clarence C., III, to Akzona Incorporated. Shaped cellulose article prepared from a solution containing cellulose dissolved in a tertiary amine N-oxide solvent and a process for making the article. 4,416,698, Cl. 106-163.00R.
- McCutchen, Hugh, Jr.: See—  
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329, Cl. 166-68.000.
- McDonald, Robert C.: See—  
Goebel, Franz; and McDonald, Robert C., 4,416,957, Cl. 429-91.000.
- McDonald, Ross W., to Cummins Engine Company, Inc. Control system for a dual fuel internal combustion engine. 4,416,244, Cl. 123-577.000.
- McDonnell Douglas Corporation: See—  
McKinney, Howard F.; and Wear, Frederick C., 4,416,908, Cl. 426-241.000.
- McElroy, David J., to Texas Instruments Incorporated. Semiconductor integrated circuit with vertical implanted polycrystalline silicon resistor. 4,416,049, Cl. 29-571.000.
- McGinnis, Ralph E.; and Gray, Lewis, to Westinghouse Electric Corp. Grooved honeycomb labyrinth seal for steam turbines. 4,416,457, Cl. 277-53.000.
- McGovern, Terrence P.; and Schreck, Carl E., to United States of America, Agriculture. Insect repellents employing cyclohexane-carbonyl morpholine compounds. 4,416,881, Cl. 424-248.540.
- McInerney, George P., to Technitrol, Inc. Document separating apparatus and method. 4,416,449, Cl. 271-122.000.
- McInroy, John W.; Waldo, Paul D.; and Webster, Harold R., to International Business Machines Corporation. Method of controlling a printer in an interactive text processing system to print records from stored files of spatially related data. 4,416,558, Cl. 400-279.000.
- McKee, Terrence J., to Lumonics Inc. Laser. 4,417,342, Cl. 372-87.000.
- McKenna, Joseph V., to Singer Company, The. Multiplexed analog to digital converter having a feedback stabilized ramp. 4,417,234, Cl. 340-347.00A.
- McKeown, John B., to McLeod & Miller (Engineers) Limited. Apparatus with semi-permeable membrane, and method for cultivating micro-organisms. 4,416,993, Cl. 435-243.000.
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- McLeod & Miller (Engineers) Limited: See—  
McKeown, John B., 4,416,993, Cl. 435-243.000.
- McMahon, Matthew A.; Wilson, Raymond F.; Eng, King D.; and Burns, Robert B., to Texaco Inc. Filter for treating a particle-carrying gaseous stream. 4,416,674, Cl. 55-485.000.
- McMahon, Paul E.: See—  
Peterson, Howell L.; and McMahon, Paul E., 4,416,924, Cl. 427-388.100.
- McNaught, James B.; and Colotte, Guy E. P., to Massey-Ferguson Services N.V. Vehicle cab. 4,416,486, Cl. 296-190.000.
- Mead Corporation, The: See—  
Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C., 4,416,966, Cl. 430-138.000.
- Mead Johnson & Company: See—  
Balsler, Donald R., 4,417,049, Cl. 544-231.000.
- Medford, William K.: See—  
Turpin, Raymond L.; and Medford, William K., 4,416,294, Cl. 130-30.00R.
- Medi-Dose, Inc.: See—  
Braverman, Milton; and Zink, Leonard, 4,416,375, Cl. 206-534.100.
- Medinger, Walter. Apparatus for automatically feeding screws to a screwing mechanism. 4,416,172, Cl. 81-57.370.
- Medtronic, Inc.: See—  
Bennett, Matthew C.; and Strange, Donald R., 4,417,276, Cl. 358-160.000.
- Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., 4,417,306, Cl. 364-415.000.
- Medwin, Herman. Method for optimizing the design of a finite noise barrier. 4,417,313, Cl. 364-524.000.
- Mehta, Avinash C., to Polaroid Corporation. Biphenyl compounds and method of preparing same. 4,417,064, Cl. 549-415.000.
- Meidensha Electric Mfg. Co., Ltd.: See—  
Hashimoto, Takafumi; and Kobari, Yukio, 4,416,953, Cl. 429-18.000.
- Meier, Jacques, to Ferag AG. Method and apparatus for the insertion of at least one insert or supplement into printed products. 4,416,448, Cl. 270-55.000.
- Melas, Constantin M., to International Business Machines Corp. Automatic path rearrangement for blocking switching matrix. 4,417,244, Cl. 340-825.800.
- Melas, Constantin M.; and Patten, Michael A., to International Business Machines Corp. Digital space division exchange. 4,417,245, Cl. 340-825.800.
- Menbaev, Zaurbek K.: See—  
Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., 4,417,355, Cl. 378-49.000.
- Menke, Russell O.; and Bortnik, Michael, to UOP Inc. Scale-inhibiting compositions of matter. 4,416,785, Cl. 210-699.000.
- Menth, Anton; and Stucki, Samuel, to BBC Brown, Boveri & Company Limited. Process for the synthetic production of ozone by electrolysis and use thereof. 4,416,747, Cl. 204-129.000.
- Merchant, Philip, Jr.; and Smith, Dean L., Jr., to Exxon Research and Engineering Co. Compositions and process for dedusting solids-containing hydrocarbon oils. 4,416,754, Cl. 204-190.000.
- Mercier, Olivier: See—  
Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, 4,416,706, Cl. 148-11.50C.
- Merck & Co., Inc.: See—  
Hartman, George D., 4,416,882, Cl. 424-250.000.
- Markus, Henry Z.; and McAleer, William J., 4,416,986, Cl. 435-68.000.
- Smith, Graham M., 4,416,635, Cl. 434-280.000.

- Woltersdorf, Otto W., Jr., 4,416,890, Cl. 424-270.000.
- Merck Patent Gesellschaft mit beschränkter Haftung: See—  
Fischer, Wolfgang; and Krenn, Karl-Dieter, 4,416,997, Cl. 436-42.000.
- Merkler, Anton: See—  
Hesse, Heinrich; Merkler, Anton; Gross, Siegfried; and Radtke, Gerhard, 4,416,139, Cl. 72-267.000.
- Merlin Gerin: See—  
Bancalari, Jean, 4,417,223, Cl. 335-195.000.
- Merola, Carl R.: See—  
Vaill, Ronald E.; Cicciotelli, Stephen S.; and Merola, Carl R., 4,417,108, Cl. 200-50.00A.
- Merritt, David T.; Fish, David W.; and Long, Olen R., to Otis Engineering Corporation. Side pocket mandrel. 4,416,330, Cl. 166-117.500.
- Martin, Dietrich: See—  
Derner, Paul; and Martin, Dietrich, 4,416,101, Cl. 52-398.000.
- Merz, Johann, to Zahnradfabrik Friedrichshafen, AG. Rotary vane pump with pressure biased flow directing end plate. 4,416,598, Cl. 418-132.000.
- Mes, Johannes A. M., to U.S. Philips Corporation. Stop motion system for playing back a program recorded on a disc-shaped record carrier. 4,417,285, Cl. 358-342.000.
- Mesnel, Francois, to Etablissements Mesnel. Extruded sealing strip with fabric covered gripping means, particularly for application to automotive vehicles. 4,416,951, Cl. 428-586.000.
- Mesquida-Feirman, B.: See—  
Desmond, John D.; and Mesquida-Feirman, B., 4,416,411, Cl. 229-40.000.
- Metallgesellschaft AG: See—  
Lohrborg, Karl; Pföhl, Rainer; and Gritschke, Martin, 4,416,744, Cl. 204-95.000.
- von Jordan, Wenzel; and Neulinger, Franz, 4,416,671, Cl. 55-4.000.
- Metra, Piero: See—  
Occhini, Elio; Lanfranconi, Gianmario; and Metra, Piero, 4,417,093, Cl. 174-25.00R.
- Metro-Tel Corp.: See—  
Carlson, Alan J.; and Indelicato, Venerando J., 4,417,100, Cl. 179-5.00R.
- Metzger, Bruce A., to Dow Chemical Co., The. Polymer blends and laminates and adhesive films prepared therefrom. 4,416,937, Cl. 428-286.000.
- Metzger, Karl G.; Pfizner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, to Bayer Aktiengesellschaft. Antibiotic compound, its production and its medicinal use. 4,416,870, Cl. 424-172.000.
- Metzger, Karl G.: See—  
Boberg, Michael; and Metzger, Karl G., 4,416,880, Cl. 424-246.000.
- Meuser, Friedrich: See—  
Huster, Heinrich; Meuser, Friedrich; and Hoepke, Carl-Heinz, 4,416,701, Cl. 127-68.000.
- Meyer-Ebrecht, Dietrich: See—  
Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, 4,417,353, Cl. 378-4.000.
- Meyers, William E., to Carson Products Company. Composition and method for hair treatment. 4,416,296, Cl. 132-7.000.
- Meyr, Heinrich: See—  
Bapt, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., 4,417,242, Cl. 340-825.050.
- Mezawa, Tsutomu; Kabashima, Katsuhiko; Nozaki, Shigeki; and Take-mae, Yoshihiro, to Fujitsu Limited. Active pull-up circuit. 4,417,329, Cl. 365-203.000.
- Michel, Dominique: See—  
Lamy, Jacques E.; Michel, Dominique; and Serrano, Francisco D. M., 4,416,473, Cl. 285-41.000.
- Mietzsch, Fritz: See—  
Musers, Hans-Ferdinand; Arit, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037, Cl. 526-271.000.
- Miike, Akira: See—  
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tanato, Toshio, 4,416,982, Cl. 435-11.000.
- Miki Corporation: See—  
Tabata, Hiromaro, 4,416,612, Cl. 431-131.000.
- Miklos, Richard L.; and Lamphere, Craig F., to Minnesota Mining and Manufacturing Company. Recording diskette having flocked-fiber wiping fabric. 4,417,291, Cl. 360-133.000.
- Mikolajczyk, Raymond F. Portable proportioning device. 4,416,547, Cl. 366-150.000.
- Mikumo, Masatoshi: See—  
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,417,025, Cl. 525-54.210.
- Milan, Drndarski. Universal reflector of electromagnetic waves mounted on a float. 4,416,509, Cl. 350-102.000.
- Milas, Michel: See—  
Rinaudo, Marguerite; Milas, Michel; and Kohler, Norbert, 4,416,990, Cl. 435-104.000.
- Miles, Melvin H.; and Fletcher, Aaron N., to United States of America, Navy. Thermal battery cells utilizing AgNO<sub>3</sub> in LiClO<sub>4</sub>-LiNO<sub>3</sub> mixtures. 4,416,958, Cl. 429-103.000.
- Milkovich, Ralph, to Atlantic Richfield Company. Derivatization of star-block copolymers. 4,417,029, Cl. 525-314.000.
- Miller, Donald L., to Facet Enterprises, Incorporated. Electromagnetic cone clutch with ball torque booster. 4,416,359, Cl. 192-54.000.
- Miller, Gregory E. Static diverter module. 4,416,378, Cl. 209-583.000.
- Miller, Joseph E. Bone plug cutter. 4,416,278, Cl. 128-305.000.
- Miller, Judith A. Artery or vein perforator. 4,416,039, Cl. 27-21.000.
- Miller, Robert F.; and Davis, Paul K. Pipe coupling. 4,416,474, Cl. 285-47.000.
- Miller, Stephen J., to Chevron Research Company. Efficient fluidized oligomerization. 4,417,086, Cl. 585-530.000.
- Miller, Stephen J., to Chevron Research Company. Fluidized oligomerization. 4,417,087, Cl. 585-530.000.
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- Miller, Timothy J. E.; and Jones, Donald W., to General Electric Company. Permanent magnet rotor for a dynamo electric machine. 4,417,168, Cl. 310-156.000.
- Miller, William T., to Cherokee Products Company. Pimento coring machine. 4,416,195, Cl. 99-544.000.
- Mills, David: See—  
Goddard, John; and Mills, David, 4,416,321, Cl. 164-80.000.
- Mills, Thomas L.: See—  
Cline, Charles D.; and Mills, Thomas L., 4,417,016, Cl. 524-156.000.
- Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Splicing apparatus for spun yarns. 4,416,110, Cl. 57-22.000.
- Minagawa, Motonobu; Inoue, Tetsuyu; and Kurita, Naoyasu, to Adeka Argus Chemical Co., Ltd. Chlorinated organic compounds having their resistance to deterioration enhanced by 1,3-dicarbonyl compounds. 4,416,797, Cl. 252-400.00A.
- Minasov, Alexandr N.: See—  
Likhogub, Evgeny P.; Sergeev, Stanislav S.; and Minasov, Alexandr N., 4,416,733, Cl. 202-228.000.
- Minnesota Mining and Manufacturing Company: See—  
Carpenter, Walter L.; and Amrine, Bruce A., 4,416,280, Cl. 128-399.000.
- Dressler, Daryl D., 4,417,247, Cl. 340-825.310.
- Miklos, Richard L.; and Lamphere, Craig F., 4,417,291, Cl. 360-133.000.
- Smith, Daniel D., 4,416,392, Cl. 221-45.000.
- Minolta Camera Kabushiki Kaisha: See—  
Ito, Hideo; Ito, Masazumi; Nagata, Kenzo; and Irie, Yutaka, 4,417,350, Cl. 377-8.000.
- Tottori, Takafumi, 4,416,535, Cl. 355-14.00D.
- Uesugi, Kyoze, 4,416,513, Cl. 350-255.000.
- Mita Industrial Co., Ltd.: See—  
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, 4,416,964, Cl. 430-106.600.
- Mitsubishi Denki Kabushiki Kaisha: See—  
Banba, Toshio; Mizuno, Masanori; and Mizuno, Takan, 4,417,130, Cl. 219-130.510.
- Okuda, Takio; and Sakai, Junichi, 4,417,119, Cl. 219-72.000.
- Sugimoto, Hiroshi, 4,416,160, Cl. 73-862.170.
- Wada, Hifumi; and Nanba, Mitsuaki, 4,417,267, Cl. 357-81.000.
- Mitsubishi Gas Chemical Company, Inc.: See—  
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606, Cl. 425-202.000.
- Mitsubishi Kinzoku Kabushiki Kaisha: See—  
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853, Cl. 420-469.000.
- Mitsubishi Paper Mills, Ltd.: See—  
Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, 4,416,977, Cl. 430-446.000.
- Mitsubishi Petrochemical Co., Ltd.: See—  
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269, Cl. 128-41.000.
- Mitsui Toatsu Chemicals, Inc.: See—  
Ohkawa, Koue; Fujii, Shin; and Seino, Takashi, 4,417,011, Cl. 523-527.000.
- Mitsui, Yoshihiro, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Printing head for thermal printer. 4,417,257, Cl. 346-76.0PH.
- Mitsumi Electric Company, Ltd.: See—  
Shimazu, Teruo, 4,416,164, Cl. 74-10.330.
- Mitsuyasu, Masaki: See—  
Aoki, Keiji; and Mitsuyasu, Masaki, 4,416,237, Cl. 123-438.000.
- Miura, Tadao: See—  
Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, 4,417,331, Cl. 369-111.000.
- Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, to Mita Industrial Co., Ltd. Dry magnetic developer containing a non-pulverizing agglomerate of cubic magnetic particles. 4,416,964, Cl. 430-106.600.
- Miyamoto, Tomohisa: See—  
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875, Cl. 424-180.000.
- Miyano, Katsuyoshi, to Japax Inc. Automatic wire-setting or -resetting method and apparatus in a traveling-wire electroerosion machine. 4,417,118, Cl. 219-69.00W.
- Miyazaki, Yoshihisa: See—  
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,416,191, Cl. 92-165.0PR.
- Mizorogi, Hirotugu: See—  
Nakamura, Kazuo; Mizorogi, Hirotugu; and Isao, Akihiko, 4,416,216, Cl. 118-696.000.
- Nakamura, Kazuo; Mizorogi, Hirotugu; and Isao, Akihiko, 4,416,217, Cl. 118-696.000.



- Mizuno, Masanori: See—  
Banba, Toshio; Mizuno, Masanori; and Mizuno, Takaii, 4,417,130, Cl. 219-130.510.
- Mizuno, Takaii: See—  
Banba, Toshio; Mizuno, Masanori; and Mizuno, Takaii, 4,417,130, Cl. 219-130.510.
- Mizuno, Toru: See—  
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasaka, 4,416,226, Cl. 123-143.00B.
- Moch Domsjo Aktiebolag: See—  
Lofgren, Stig-Gunnar; and Ekeborg, Bo G., 4,416,335, Cl. 172-2.000.
- Mobil Oil Corporation: See—  
Chester, Arthur W.; Cormier, William E., Jr.; and Stover, William A., 4,416,765, Cl. 208-120.000.
- Chu, Chin-Chiun, 4,417,084, Cl. 585-440.000.
- Mochizuki, Masahiko: See—  
Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, 4,417,331, Cl. 369-111.000.
- Mock, Elmar: See—  
Perucchi, Norberto; and Mock, Elmar, 4,417,166, Cl. 310-49.00R.
- Mogilev, Anton: See—  
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893, Cl. 424-272.000.
- Molnack, Michael G.; and Harbison, William H. Connector adaptor for pin-type blade, 4,416,032, Cl. 15-250.320.
- Molire, Michel F.: See—  
Sandhu, M. Akram; Wright, John F.; and Molire, Michel F., 4,416,965, Cl. 430-109.000.
- Mollering, Hans: See—  
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gaul, Helmut, 4,416,983, Cl. 435-25.000.
- Monarch Marking Systems, Inc.: See—  
Kessler, John R., 4,416,201, Cl. 101-348.000.
- Molich, Joachim; and Brachert, Heinrich, to Dynamit Nobel AG. Double-base solid propellants, 4,416,712, Cl. 149-98.000.
- Mong, Lan N.: See—  
Bentzen, Craig L.; Mong, Lan N.; and Niesor, Eric, 4,416,877, Cl. 424-204.000.
- Moniotte, Philippe G., to Monsanto Europe S.A. Organic thiosulphates and thiosulphonates useful as stabilising agents for rubber vulcanisates, 4,417,012, Cl. 524-83.000.
- Monsanto Company: See—  
Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,417,030, Cl. 525-316.000.
- D'Amico, John J.; and Schafer, Tann R., 4,416,687, Cl. 71-109.000.
- Monsanto Europe S.A.: See—  
Moniotte, Philippe G., 4,417,012, Cl. 524-83.000.
- Monte, Salvatore J.: See—  
Sugerman, Gerald; and Monte, Salvatore J., 4,417,009, Cl. 523-451.000.
- Montierth, Max R., to Corning Glass Works. High capacity solid particulate filter apparatus, 4,416,675, Cl. 55-502.000.
- Montierth, Max R., to Corning Glass Works. Honeycomb filter and method of making it, 4,416,676, Cl. 55-523.000.
- Moody, Albert L., to F. C. Brown Rentals, Inc. Asphalt heating kettle apparatus, 4,416,614, Cl. 431-278.000.
- Moody, Jack M., to Cranston Machinery Co., Inc. Pneumatic release for load hook, 4,416,480, Cl. 294-83.00R.
- Moorkherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J., to International Flavors & Fragrances Inc. Flavoring with cyclohexenyl-beta-methyl acrolein derivatives, 4,416,902, Cl. 426-3.000.
- Moradian, Gregory C., to United States of America, Navy. Night-time/daytime diffuse attenuation coefficient device for seawater, 4,416,542, Cl. 356-435.000.
- Moore, William B.: See—  
Gershberg, David N.; Lee, Alexander Y., Jr.; and Moore, William B., 4,417,157, Cl. 307-256.000.
- Moran, Raymond D., to PPG Industries, Inc. Optical system for determining peripheral characterization and dimensions of a sheet, 4,417,150, Cl. 250-572.000.
- Morawski, Lawrence V.: See—  
Morawski, Longine V.; and Morawski, Lawrence V., 4,416,459, Cl. 279-2.00R.
- Morawski, Longine V.; and Morawski, Lawrence V. Collet chuck for splined workpieces, 4,416,459, Cl. 279-2.00R.
- Morck, Charles W., to Selas Corporation of America. Larger capacity Vortex burner, 4,416,620, Cl. 431-348.000.
- Moret, David M.; and Ahr, Nicholas A., to Procter & Gamble Company. The Bib having segmented neck-aperture perimetric edge, 4,416,025, Cl. 2-49.00R.
- Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material, 4,416,978, Cl. 430-548.000.
- Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, to Mitsubishi Kinzoku Kabushiki Kaisha. Cu-Ag base alloy brazing filler material, 4,416,853, Cl. 420-469.000.
- Morikawa, Michio: See—  
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio, 4,416,910, Cl. 426-502.000.
- Morikubo, Keichi: See—  
Yamamoto, Noboru; Morikubo, Keichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019, Cl. 524-456.000.
- Morimoto, Masafumi; Yoshida, Kunio; and Nakanishi, Tosaku, to Sharp Kabushiki Kaisha. Electronic translator for providing additional sentences formed by directly-translated words, 4,417,319, Cl. 364-900.000.
- Moriyama, Sadao: See—  
Ichikawa, Takashi; and Moriyama, Sadao, 4,416,716, Cl. 156-245.000.
- Morozumi, Takuro; and Suzuki, Hitoshi, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system, 4,416,236, Cl. 123-438.000.
- Morr, Michael; and Kula, Maria-Regina, to Gesellschaft für Biotechnologische Forschung mbH (GBF). Polyether phosphonic acids or esters, 4,416,830, Cl. 260-929.000.
- Morris, Lionel G. Drive mechanisms, 4,416,460, Cl. 280-3.000.
- Morrisette, Lawrence E. Fish lure with an overlay, 4,416,080, Cl. 43-42.200.
- Morrone, Joseph A., III, to Adecon, Inc. Balloon clip, 4,416,038, Cl. 24-255.05L.
- Mosley, Joseph M.: See—  
Dorler, Jack A.; Mosley, Joseph M.; Seeger, Richard O.; and Weitzel, Stephen D., 4,417,159, Cl. 307-270.000.
- Motion Control, Inc.: See—  
Jacobsen, Stephen C.; and Luntz, Richard D., 4,416,274, Cl. 604-20.000.
- Motorola, Inc.: See—  
Davis, William F., 4,417,216, Cl. 330-294.000.
- Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., 4,416,913, Cl. 427-45.100.
- Kuo, Clinton C. K., 4,417,154, Cl. 307-202.100.
- Motoyama, Kazuyasu; Furuta, Kenji; and Kanayama, Katsumi, to Olympus Optical Co., Ltd. Power saving electronic counter circuit for tape recorder, 4,417,135, Cl. 377-18.000.
- Moustakas, Theodore D.; and Friedman, Robert A., to Exxon Research and Engineering Co. Sputtered pin amorphous silicon semi-conductor device and method therefor, 4,417,092, Cl. 136-258.000.
- Mowery, Gilbert L., Jr.: See—  
Keller, Jack K.; and Mowery, Gilbert L., Jr., 4,417,162, Cl. 307-473.000.
- Mozsary, Peter G.; and Lapcevic, Robert E. Osseointerfaced implanted artificial tooth, 4,416,629, Cl. 433-174.000.
- MTU Motoren-und Turbinen-Union Munchen GmbH: See—  
Huther, Werner, 4,416,621, Cl. 431-352.000.
- Mueller, Peter F.; and Caulfield, H. John, to Aerodyne Research, Inc. Image enhancement, 4,416,538, Cl. 355-67.000.
- Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Metzsch, Fritz, to Bayer Aktiengesellschaft. Vinyl acrylanhydrides and their preparation, 4,417,037, Cl. 526-271.000.
- Muka, Richard S.; and Russo, Carl J., to Varian Associates, Inc. Semiconductor processor incorporating blackbody radiation source with constant planar energy flux, 4,417,347, Cl. 373-158.000.
- Mukai, Makoto: See—  
Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, 4,416,772, Cl. 210-137.000.
- Mukainakano, Shinichi: See—  
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasaka, 4,416,226, Cl. 123-143.00B.
- Mulaskey, Bernard F., to Chevron Research Company. Hydrocarbon conversion with crystalline silicates, 4,416,766, Cl. 208-135.000.
- Mulawski, Walter J., to Sexton Can Company, Inc. Pressure relief device, 4,416,388, Cl. 220-207.000.
- Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, to Thyssen Industrie AG. Method for manufacturing a metal casing for gate valves used in nuclear reactors and the like, 4,416,409, Cl. 228-173.00R.
- Muller, Hans R.: See—  
Bapst, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., 4,417,242, Cl. 340-825.050.
- Muller, Jean-Claude H.: See—  
Helfi, Alfred F.; and Muller, Jean-Claude H., 4,416,443, Cl. 266-47.000.
- Muller, Peter; Mustacchi, Henry; and Kreicas, Leonard, to Andrews Paper & Chemical Co. Transparent fibrous sheets, 4,416,950, Cl. 428-537.000.
- Muller, Wulf; and Kaiser, Manfred, to Grote & Hartmann GmbH & Co. KG. Flat fuse and process for production thereof, 4,417,225, Cl. 337-198.000.
- Mulligan, Lewis R.: See—  
Erickson, Wayne K.; and Mulligan, Lewis R., 4,416,936, Cl. 428-286.000.
- Mullins, Keith M.: See—  
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,416,628, Cl. 433-80.000.
- Mumola, Joanne L.: See—  
Demke, Kent R.; and Mumola, Joanne L., 4,417,239, Cl. 340-709.000.
- Mundhenk, David L.; and Curolle, Michael A., to Shell Oil Company. Corrosion inhibiting process for a remotely located deep corrosive gas well, 4,416,333, Cl. 166-250.000.
- Munezane, Yoshiaki: See—  
Kasahara, Kenji; and Munezane, Yoshiaki, 4,417,126, Cl. 219-124.220.
- Munson, Leo J.; Griauzde, Felix; Okada, David T.; and Loomis, Bernard, to CPG Products Corp. Interlocking word game utilizing prismatic blocks and method of playing same, 4,416,455, Cl. 273-272.000.

- Murakami, Masahiro: See—  
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047, Cl. 544-26.000.
- Murakami, Masamitsu, to Nissan Motor Company, Limited. Vibration-attenuating coupling device, 4,416,446, Cl. 267-140.300.
- Muramatsu, Tsuyoshi; and Hara, Shuji, to Japan Tobacco & Salt Public Corporation. The Conveyor mechanism for cylindrical articles, 4,416,368, Cl. 198-604.000.
- Murase, Shigemitsu, to Unittika Ltd. Method of manufacturing polyester fibers with good adhesiveness to rubber using aminosilanes and epoxy compounds in a yarn finish, 4,416,923, Cl. 427-387.000.
- Murata Kikai Kabushiki Kaisha: See—  
Mima, Hiroshi, 4,416,110, Cl. 57-22.000.
- Murata, Masataka: See—  
Takimoto, Masaaki; Saida, Takashi; and Murata, Masataka, 4,416,963, Cl. 430-69.000.
- Murata, Masayoshi: See—  
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,416,879, Cl. 424-246.000.
- Murdoch Logging Industries Pty. Ltd.: See—  
Gemmill-Murdoch, Andrew, 4,416,311, Cl. 144-3.00D.
- Murkland, Judd R.; and Congdon, James S., to National Semiconductor Corporation. Lateral PNP power transistor, 4,417,265, Cl. 357-51.000.
- Murphy, Arthur B.: See—  
Dey, Phillip; Fearn, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., 4,416,508, Cl. 350-96.230.
- Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., to DeSoto, Inc. Ultraviolet curable basecoats for vacuum metallization, 4,416,750, Cl. 204-159.190.
- Murphy, Z. L.: See—  
Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., 4,416,669, Cl. 44-71.000.
- Mustacchi, Henry: See—  
Muller, Peter; Mustacchi, Henry; and Kreicas, Leonard, 4,416,950, Cl. 428-537.000.
- Myers, Dirck V.: See—  
Clark, Allen V.; Myers, Dirck V.; and Hatch, Vaughn I., 4,416,700, Cl. 127-34.000.
- N.B.F. Company, Inc.: See—  
Foley, Newman C., 4,416,315, Cl. 150-47.000.
- Nabisco Brands, Inc.: See—  
Burns, Edward P., 4,416,369, Cl. 206-45.290.
- Nachev, Georgi N.; Angelov, Angel S.; and Peikov, Boryan I., to Institute Po-Technicheska Kibernetika I Robotika. Method and apparatus for seam tracking in arc welding, 4,417,127, Cl. 219-124.340.
- Naganawa, Hiroshi: See—  
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Inuma, Hironobu; and Kunimoto, Setsuko, 4,416,899, Cl. 424-320.000.
- Nagao, Nobuya; and Inoue, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Wide band chrominance demodulator with color noise reduction function, 4,417,270, Cl. 358-23.000.
- Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hideo; and Takahashi, Toshio, to Tanabe Seiyaku Co., Ltd. Process for preparing 1,5-benzothiazepine derivatives, 4,416,819, Cl. 260-293.30B.
- Nagata, Kenzo: See—  
Ito, Hideo; Ito, Masazumi; Nagata, Kenzo; and Irie, Yutaka, 4,417,350, Cl. 377-8.000.
- Nagata, Shiro: See—  
Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, 4,416,772, Cl. 210-137.000.
- Nagel, Rudolf: See—  
Riesinger, Gustav; and Nagel, Rudolf, 4,416,047, Cl. 29-460.000.
- Nair, Kumaran M., to Du Pont de Nemours, E. I., and Company. Thick film conductor compositions, 4,416,932, Cl. 428-209.000.
- Naito, Mitikazu; Yano, Kiyotoshi; and Itou, Kazuo, to Nippondenso Co., Ltd. Vacuum control valve, 4,416,243, Cl. 123-569.000.
- Nakada, Minoru; Shimma, Yoshiro; Inoue, Osamu; and Suma, Sei, to Tokyo Shibaura Denki Kabushiki Kaisha. Casing for an interior unit of a split type air conditioning apparatus, 4,416,327, Cl. 165-122.000.
- Nakada, Minoru, to Kabushiki Kaisha Komatsu Seisakusho. Outrigger vehicle capable of crabwise translation, 4,416,344, Cl. 180-8.00R.
- Nakagawa, Kazuyuki: See—  
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,416,884, Cl. 424-250.000.
- Nakagawa, Toshiaki, to Yoshida Kogyo K. K. Slide fastener finishing machine, 4,416,060, Cl. 29-767.000.
- Nakajima, Akira: See—  
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwarra, Seiji; and Higo, Shoichi, 4,417,153, Cl. 307-140.000.
- Nakamura, Katuyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester composition and production thereof, 4,417,021, Cl. 524-538.000.
- Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, to Ulvac Seimaku Kabushiki Kaisha; and Nihon Shinku Gijutsu Kabushiki Kaisha. Apparatus for forming an inhomogeneous optical layer, 4,416,216, Cl. 118-696.000.
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- Nakamura, Mitsuo: See—  
Fumi, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yonechi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875, Cl. 424-180.000.
- Takimoto, Tadashi; Oshibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Anano, Takayoshi, 4,416,158, Cl. 73-842.000.
- Nakamura, Shinya: See—  
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307, Cl. 364-424.100.
- Nakamura, Sukenori: See—  
Igarashi, Akira; and Nakamura, Sukenori, 4,416,919, Cl. 428-323.000.
- Nakamura, Yoichi: See—  
Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, 4,417,018, Cl. 524-261.000.
- Nakane, Masamune; Shtman, David I.; Reid, Joyce; and Haslinger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted amino prostaglandin analogs useful in the treatment of thrombotic disease, 4,416,896, Cl. 424-285.000.
- Nakanishi, Tosaku: See—  
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- Nakao, Masaki; and Kodama, Fumio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Filling composition for use in liquid chromatography, 4,416,784, Cl. 210-635.000.
- Nakats, Yoshinori: See—  
Hiroshima, Soichi; Hirasawa, Hidenao; Nakats, Yoshinori; and Takayama, Kenchi, 4,416,442, Cl. 266-44.000.
- Nakase, Yoshimori; and Sagishima, Takayuki, to Matsushita Electric Industrial Co., Ltd. Demodulator circuit for color television signals of PAL system, 4,417,271, Cl. 358-24.000.
- Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa. Chip type tantalum capacitor, 4,417,298, Cl. 361-433.000.
- Nakatsun, Tadao: See—  
Abe, Kazunobu; and Nakatsun, Tadao, 4,416,800, Cl. 502-159.000.
- Nakatsukasa, Walter M.; Faverman, Jeffrey T.; and Mabe, James A., to Eli Lilly and Company. Plasmid pEL7 and related cloning vectors for use in streptomyces and related organisms, 4,416,994, Cl. 435-253.000.
- Nanba, Mitsuaki: See—  
Wada, Hifumi; and Nanba, Mitsuaki, 4,417,267, Cl. 357-81.000.
- Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazawa, Yasuo, to Kobe Steel, Ltd. Method for converter blow control, 4,416,691, Cl. 75-60.000.
- Nash, Richard C.; and Duffy, Terrance W., to Fabcon, Inc. Directed cracking in concrete panel manufacture, 4,416,842, Cl. 264-145.000.
- Nasman, Lars E.: See—  
Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548, Cl. 366-168.000.
- National Research Development Corporation: See—  
Ball, Matthew C.; and Tomkins, Donald W., 4,416,695, Cl. 106-90.000.
- National Semiconductor Corporation: See—  
Murkland, Judd R.; and Congdon, James S., 4,417,265, Cl. 357-51.000.
- Sevastopoulos, Stylianos G.; and Lum, Sammy S., 4,417,214, Cl. 330-84.000.
- National Steel Corporation: See—  
Austin, Lowell W.; and Stoddart, James O., 4,416,737, Cl. 204-28.000.
- Natoma Energy Company: See—  
Gikis, Benjamin J.; Jones, Abner Y.; and Elbrecht, Rudolf, 4,416,764, Cl. 208-11.0LE.
- Nauheimer, James F., to Container Corporation of America. Garment container, 4,416,371, Cl. 206-289.000.
- NCR Canada Ltd - NCR Canada Ltee: See—  
Rushby, Robert J.; and Damms, Anthony B., 4,417,136, Cl. 235-379.000.
- NCR Corporation: See—  
Anderson, Douglas B., 4,417,286, Cl. 360-51.000.
- Gunderson, Robert O.; Koccol, James E.; and Schuck, David B., 4,417,334, Cl. 370-85.000.
- Neckers, Douglas C. Peresters and use thereof, 4,416,826, Cl. 260-453.00Z.
- Neefe, Charles W. Spin casting of contact lenses, 4,416,837, Cl. 264-2.100.
- Nelkin, Nedwyn R., to H. G. Enterprises. Combination underpant and hernial truss, 4,416,272, Cl. 128-96.000.
- Nelson, Dean R.: See—  
Frascatore, John F.; Nelson, Dean R.; and Marsh, Edward K., 4,416,499, Cl. 339-92.00M.
- Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., to Snap-on Tools Corporation. Control mechanism for a pneumatic tool, 4,416,338, Cl. 173-134.000.
- Nelson, Robert T. Cleaning apparatus, 4,416,092, Cl. 51-425.000.
- Nemeth, Janos: See—  
Szebenyi, Ferenc; Nemeth, Janos; Bohner, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566, Cl. 405-291.000.



- Neodyte, Inc.: See—  
Rogers, Charles H., 4,416,778, Cl. 210-516,000.
- Nestor, Jack, and Shoemaker, William A., Jr. Golden proportion calipers, 4,416,063, Cl. 33-163,000.
- Neulinger, Franz: See—  
von Jordan, Wenzel, and Neulinger, Franz, 4,416,671, Cl. 55-4,000.
- Neumeister, Ernst, to Wilhelm Rogg Kunststoff-Metallisierung Injection molding apparatus for manufacturing articles from different types of plastic material, 4,416,602, Cl. 425-130,000.
- Newcor, Inc.: See—  
Thorne, J. Paul, 4,417,122, Cl. 219-103,000.
- Newman, James L. Method and apparatus for electric fish trawling, 4,417,301, Cl. 363-129,000.
- Newton, David W., and Paterson, William G., to Valleylab, Inc. Adaptive return electrode monitoring system, 4,416,276, Cl. 128-303,130.
- Newton, David W., Hulett, Frederic M., III, and Owens, Christopher, to Valleylab, Inc. Return electrode monitoring system for use during electrosurgical activation, 4,416,277, Cl. 128-303,130.
- NGK Spark Plug Co., Ltd.: See—  
Takami, Akio, Saito, Tsutomu, Sekiya, Toshifumi, and Tanaka, Kazutoshi, 4,417,228, Cl. 338-34,000.
- Nicholson, Peter. Apparatus and method for holographic contact copying, 4,416,540, Cl. 350-3,690.
- Nickisch, Klaus: See—  
Peizoldt, Karl, Wiechert, Rudolf, Laurent, Henry; Nickisch, Klaus, and Bittler, Dieter, 4,416,985, Cl. 435-58,000.
- Niedermeyer, William P. High ratio microwave energy concentrating collector, 4,416,262, Cl. 126-438,000.
- Niedermeyer, William P. High ratio solar energy linear type concentrating collector, 4,416,263, Cl. 126-438,000.
- Nielrasz, Frank M., to Ardeo, Inc. Adjustable door mounting arrangement for refrigerated display cabinets, 4,416,086, Cl. 49-388,000.
- Nielsen, James W., to Nielsen, Sharon G., a part interest. Method for killing water borne microorganisms, 4,416,854, Cl. 422-29,000.
- Nielsen, Sharon G.: See—  
Nielsen, James W., 4,416,854, Cl. 422-29,000.
- Nieser, Eric: See—  
Benzel, Craig L.; Mong, Lan N.; and Nieser, Eric, 4,416,877, Cl. 424-204,000.
- Nihet, Ryo: See—  
Inaba, Hajimu, and Nihet, Ryo, 4,416,577, Cl. 414-226,000.
- Nihon Shinku Gussu Kabushiki Kaisha: See—  
Nakamura, Kazuo; Mizorogi, Hirotsugu, and Isao, Akihiko, 4,416,218, Cl. 118-696,000.
- Nakamura, Kazuo; Mizorogi, Hirotsugu, and Isao, Akihiko, 4,416,217, Cl. 118-696,000.
- Nikko Co., Ltd.: See—  
Yamamoto, Seiji, 4,417,343, Cl. 373-73,000.
- Nilson, Claes T.; Jakobsen, Kjell M., and Larson, Las G., to PLM AB. Tubular article of polyethylene terephthalate having a wall of amorphous material with a peripheral groove therein of monoaxially oriented material, 4,416,927, Cl. 428-36,000.
- Nilson, Hans E., and Carlsson, Ake, to Infratek AB. Apparatus for surface treatment of objects, 4,416,068, Cl. 34-4,000.
- Nimry, Tayseer S., and Fields, Ellis K., to Standard Oil Company (Indiana). Polyimides and polyimide-amides, 4,417,045, Cl. 528-188,000.
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Nippert, Russell A., 4,416,141, Cl. 72-345,000.
- Nippert, Russell A., to Nippert Company, The. Method and apparatus for forming an electrical connector, 4,416,141, Cl. 72-345,000.
- Nippon Asbestos Company, Limited: See—  
Aoki, Susumu; Asami, Hiroshi; Take, Shigeo; and Akase, Masazumi, 4,416,043, Cl. 29-132,000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Wachi, Masatada, 4,416,179, Cl. 84-119,000.
- Nippon Genshiryoku Jigyo Kabushiki Kaisha: See—  
Kodama, Tasuku; and Tarushi, Yoshiaki, 4,416,850, Cl. 376-310,000.
- Nippon Kogaku K.K.: See—  
Kusaka, Yosuke, 4,417,139, Cl. 250-204,000.
- Nippon Kokan Kabushiki Kaisha: See—  
Haga, Yukio; Kai, Tomeo; Shirayama, Akira, and Kanatani, Gengi, 4,416,580, Cl. 414-626,000.
- Nomura, Hirokazu; Sugiani, Yuji; and Suzuki, Yasuo, 4,417,128, Cl. 219-125,120.
- Nippon Metal Plating Co., Ltd.: See—  
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742, Cl. 204-47,000.
- Nippon Mining Co., Ltd.: See—  
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742, Cl. 204-47,000.
- Nippon Soken, Inc.: See—  
Kago, Yoshiyuki; and Akita, Sigeyuki, 4,416,150, Cl. 73-119,00A.
- Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukas, 4,416,226, Cl. 123-143,00B.
- Nippon Steel Corporation: See—  
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, 4,416,999, Cl. 501-94,000.
- Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Kenchi, 4,416,442, Cl. 266-44,000.
- Nippon Telegraph and Telephone Public Corporation: See—  
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163, Cl. 307-475,000.
- Nippondenso Co., Ltd.: See—  
Naito, Mitukazu, Yano, Kiyotosi; and Ito, Kazuo, 4,416,243, Cl. 123-569,000.
- Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukas, 4,416,226, Cl. 123-143,00B.
- Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232, Cl. 123-357,000.
- Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235, Cl. 123-425,000.
- Nishida, Hideki: See—  
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Furumi, Toshio, 4,417,323, Cl. 365-1,000.
- Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukas, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Laser ignition apparatus for an internal combustion engine, 4,416,226, Cl. 123-143,00B.
- Nishimura, Shigeyuki: See—  
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055, Cl. 546-345,000.
- Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, to Ishihara Sangyo Kaisha Ltd. Process for producing a  $\beta$ -trifluoromethylpyridine, 4,417,055, Cl. 546-345,000.
- Nishizawa, Jun-ichi; and Shiota, Ikuo, to Zaidan Hojin Handotai Kenkyu Shinkokai. Oxynitride film and its manufacturing method, 4,416,952, Cl. 428-698,000.
- Nissan Chemical Industries, Ltd.: See—  
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Izumi, Toyoko, 4,417,070, Cl. 560-56,000.
- Nissan Motor Co., Ltd.: See—  
Fujishiro, Takeshi, 4,416,763, Cl. 204-412,000.
- Hayashi, Toshio; and Hayashi, Isao, 4,416,461, Cl. 280-5,00A.
- Hayashi, Yoshimasa, 4,416,350, Cl. 181-272,000.
- Ikeura, Kenji, 4,416,234, Cl. 123-424,000.
- Izumi, Masao; and Yoshida, Hiroshi, 4,416,192, Cl. 98-40,00N.
- Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, 4,416,230, Cl. 123-325,000.
- Kitamura, Hidetoshi, and Kato, Hirohisa, 4,416,149, Cl. 73-118,000.
- Murakami, Masamitsu, 4,416,446, Cl. 267-140,300.
- Takase, Sadao; and Hosaka, Akio, 4,416,239, Cl. 123-478,000.
- Nissin Kogyo Kabushiki Kaisha: See—  
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,416,191, Cl. 92-165,0PR.
- Nitta, Toshimi: See—  
Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, 4,416,390, Cl. 220-273,000.
- Nitz, Rolf-Eberhard: See—  
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero, and Nitz, Rolf-Eberhard, 4,416,893, Cl. 424-272,000.
- Nizova, Svetlana A.: See—  
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076, Cl. 568-361,000.
- Noakes, John E. Disposal of radioactive aromatic liquid wastes, 4,416,810, Cl. 252-628,000.
- Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel, 4,416,428, Cl. 242-84,21R.
- Noda, Masaki: See—  
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279, Cl. 358-195,100.
- Noguchi, Kohji, and Kasai, Masao, to Asahi Kasei Kogyo Kabushiki Kaisha. Liquid chromatography column, process for preparing the same and its use for fractionation, 4,416,783, Cl. 210-635,000.
- Noguchi, Masaru: See—  
Takeuchi, Hideaki; Takahashi, Tsunehiko; and Noguchi, Masaru, 4,417,149, Cl. 250-563,000.
- Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Control system for an induction motor with energy recovery, 4,417,190, Cl. 318-729,000.
- Noll, Istvan: See—  
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566, Cl. 405-291,000.
- Nolte, Wilfried, and Esser, Heinz, to Bayer Aktiengesellschaft. Process for the polymerization of chloroprene, 4,417,036, Cl. 526-211,000.
- Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, to Nippon Kokan Kabushiki Kaisha. Arc welding method utilizing reciprocal movement of a torch in width direction of groove to be welded, and continuous movement of torch in longitudinal direction of groove to be welded, 4,417,128, Cl. 219-125,120.
- Nonomura, Kinzo: See—  
Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, 4,417,184, Cl. 315-366,000.
- Noral, Inc.: See—  
Huebscher, David A., 4,416,553, Cl. 374-165,000.
- Nordin, Inge, to Olofsson, Roland. Ladder tape roll for venetian blinds, 4,416,320, Cl. 160-177,000.
- Nordson Corporation: See—  
Sharpless, John, 4,416,193, Cl. 98-115,0SB.
- Norioka, Setsuo, to JOEL Ltd. Apparatus for controlling magnetic field intensity, 4,417,145, Cl. 250-396,0ML.

- Norman, Melvin H.; Manske, Reinhold R., and Sheehan, Neil J., to Cutter Laboratories, Inc. Injection site for fluids, 4,416,661, Cl. 604-86,000.
- Norquest, Peter E. Ambient pressure water turbine, 4,416,584, Cl. 415-184,000.
- Northern Telecom Limited: See—  
Beun, Roger A., 4,417,095, Cl. 174-52,0FP.
- Northrop Corporation: See—  
Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., 4,416,175, Cl. 83-29,000.
- Northwest Orthodontics, Inc.: See—  
Armstrong, Maclay M., 4,416,625, Cl. 433-5,000.
- Norwood Marking & Equipment Co., Inc.: See—  
Davison, Charles F., 4,416,199, Cl. 101-193,000.
- Noweir, Sami S., to Quebec Cartier Mining Company. Ore beneficiation, 4,416,768, Cl. 209-3,000.
- Novoy, Richard T., to Alpha Poultry & Livestock Equip., Inc. Nipple waterer and valve, 4,416,221, Cl. 119-72,500.
- Nozaki, Shigeki: See—  
Mezawa, Tsutomu; Kabashima, Katsuhiko; Nozaki, Shigeki; and Takamae, Yoshihiro, 4,417,329, Cl. 365-203,000.
- Nufer, Karl, to Fritz Gegauf Ag Bernina-Naehmaschinenfabrik. Auxiliary device for a sewing machine, 4,416,208, Cl. 112-240,000.
- Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, to Senko Medical Instrument Mfg. Co. Blood suction device, 4,416,658, Cl. 604-48,000.
- Nyberg, Johan E. Thermally producing a high-speed atomized liquid jet, 4,416,117, Cl. 60-650,000.
- Nylund, Olov, to AB Asea-Atom. Multi-elevated nuclear reactor spacer grid, 4,416,852, Cl. 376-438,000.
- Nystrom Per H. G. On-off valve fluid governed servosystem, 4,416,187, Cl. 91-361,000.
- Oak Industries Inc.: See—  
Larson, Willis A., 4,417,114, Cl. 200-317,000.
- Oakley, Inc.: See—  
Jannard, James H.; and Tackles, George J., 4,416,166, Cl. 74-551,900.
- Oecchini, Elio; Lanfrancconi, Gianmario; and Metra, Piero, to Societa Cavi Pirelli S.p.A. High voltage direct current cable with impregnated tape insulation, 4,417,093, Cl. 174-25,00R.
- Occidental Chemical Corporation: See—  
Siemund, Gunter; and Oei, Han Y., 4,416,705, Cl. 148-6,15Z.
- Ochiai, Michihiko: See—  
Matsuo, Taisuke; and Ochiai, Michihiko, 4,416,817, Cl. 260-239,00A.
- Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Random access semiconductor memory device using MOS transistors, 4,417,328, Cl. 365-203,000.
- O'Dwyer, James B.: See—  
Chang, Wen-Hsuan; O'Dwyer, James B.; and Pepper, John R., 4,417,022, Cl. 524-598,000.
- Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Heitche, Albert, to BASF Aktiengesellschaft. Emulsifiable hard waxes consisting of copolymers of ethylene with unsaturated carboxylic acids, 4,417,035, Cl. 526-208,000.
- Oei, Han Y.: See—  
Siemund, Gunter; and Oei, Han Y., 4,416,705, Cl. 148-6,15Z.
- Office National d'Etudes et de Recherches Aeronautiques: See—  
Larigaldie, Serge, 4,417,293, Cl. 361-212,000.
- Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434, Cl. 244-35,00R.
- Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, to Teijin Limited. Flame-retardant resin composition, 4,417,018, Cl. 524-261,000.
- Ogura, Osamu: See—  
Katagiri, Masayoshi; Fujii, Takashi; and Ogura, Osamu, 4,416,188, Cl. 91-369,00B.
- Ohara, Muneyuki: See—  
Takimoto, Tadashi; Oshibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158, Cl. 73-842,000.
- Ohara, Yoshio: See—  
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Izumi, Toyoko, 4,417,070, Cl. 560-56,000.
- Ohashi, Kunio: See—  
Itoh, Ikuo; Anzai, Shunju; and Ohashi, Kunio, 4,416,536, Cl. 355-14,00R.
- Ohashi, Minoru; Futaki, Kiyoshi; and Iwao, Katsuki, to Mitsubishi Paper Mills, Ltd. Silver halide photographic photosensitive material, 4,416,977, Cl. 430-446,000.
- Ohhara, Takafumi: See—  
Horiuchi, Naoya; Ohhara, Takafumi; and Sano, Reiji, 4,417,340, Cl. 372-58,000.
- Ohkawa, Kou; Fujii, Shin; and Seino, Takashi, to Mitsui Toatsu Chemicals, Inc. Resin composition for bonding foundry sand, 4,417,011, Cl. 523-527,000.
- Ohkawa, Takehisa; and Yoda, Kuniichi, to TDK Electronics Co., Ltd. Magnetic recording medium, 4,416,948, Cl. 428-447,000.
- Ohkawa, Takehisa: See—  
Yoda, Kuniichi; and Ohkawa, Takehisa, 4,416,947, Cl. 428-447,000.
- Ohno, Ietsuo. Railway bed, 4,416,419, Cl. 238-89,000.
- Ohsawa, Michinao: See—  
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, 4,417,277, Cl. 358-177,000.
- Ohta, Yukinori: See—  
Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863, Cl. 423-344,000.
- Ohwada, Masatsugu: See—  
Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, 4,416,230, Cl. 123-325,000.
- Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi; and Kominami, Yasuhiko, to TDK Electronics Co., Ltd. Amorphous magnetic alloy material, 4,416,709, Cl. 148-403,000.
- Oshibashi, Hirotsugu: See—  
Takimoto, Tadashi; Oshibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158, Cl. 73-842,000.
- Ota, Masahiro: See—  
Nakata, Koreaki; Todoroki, Tsunehiko; Ota, Masahiro; and Oshima, Nobumasa, 4,417,298, Cl. 361-433,000.
- Oka, Takashi: See—  
Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, 4,416,230, Cl. 123-325,000.
- Okada, David T.: See—  
Munson, Leo J.; Griaudze, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455, Cl. 273-272,000.
- Okamoto, Yoshihiko: See—  
Kawai, Yasuhiro; Okamoto, Yoshihiko; Yamamoto, Takaaki; and Kato, Hisatoyo, 4,417,260, Cl. 346-160,000.
- Okamura, Toshihiko: See—  
Ishii, Hirohisa; Shishikura, Masami; and Okamura, Toshihiko, 4,417,167, Cl. 310-67,00R.
- Okamura, Yasuhiro; Masaka, Aritatsu; and Kishita, Kazutaka, to Three Bond Co., Ltd. Anaerobically curable sealing composition, 4,417,040, Cl. 526-323,100.
- Okano, Kinpei: See—  
Tomooka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555, Cl. 384-415,000.
- Okazaki, Takuya: See—  
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,417,027, Cl. 525-99,000.
- Oki Electric Industry Co., Ltd.: See—  
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163, Cl. 307-475,000.
- Okuda, Takio; and Sakai, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Liquid joint process, 4,417,119, Cl. 219-72,000.
- Okura, Zenichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus of preventing bound of diaphragm blades in camera, 4,416,527, Cl. 354-272,000.
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Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., 4,416,085, Cl. 49-340,000.
- Olin Corporation: See—  
Kadja, Igor V., 4,416,757, Cl. 204-252,000.
- Thorne-Thomsen, Thomas, 4,416,142, Cl. 72-348,000.
- Wojtowicz, John A., 4,416,864, Cl. 423-474,000.
- Olofsson, Roland: See—  
Nordin, Inge, 4,416,320, Cl. 160-177,000.
- Olympus Optical Co., Ltd.: See—  
Fujibayashi, Kenji, 4,417,165, Cl. 307-540,000.
- Hagino, Tadao, 4,416,268, Cl. 128-6,000.
- Kobayashi, Yuko, 4,416,519, Cl. 350-475,000.
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- Takayama, Syuichi, 4,416,524, Cl. 354-31,000.
- Omley, Herbert A. Apparatus for applying a urine receptacle to a male, 4,416,275, Cl. 128-303,00A.
- Ona, Isao: See—  
Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, 4,417,024, Cl. 524-861,000.
- Oncor Corporation: See—  
Garrett, William R., 4,416,476, Cl. 285-286,000.
- Onda, Kenichi: See—  
Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156, Cl. 307-252,00C.
- O'Neill, David, to O'Neill, Richard P., a part interest. Flat bed side assembly, 4,416,484, Cl. 296-43,000.
- O'Neill, Richard P.: See—  
O'Neill, David, 4,416,484, Cl. 296-43,000.
- Ono, Shinsuke: See—  
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272, Cl. 358-44,000.
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Hirahata, Shigeru; Takezawa, Teruhiko; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsugui, 4,417,318, Cl. 364-900,000.
- Opprecht, Paul. Transporting can bodies for a fully automated resistance welding machine, 4,417,117, Cl. 219-64,000.
- Origoeverken I Halmstad Aktiebolag: See—  
Ebbeson, Bengt E. O., 4,416,617, Cl. 431-326,000.
- Orii, Akira: See—  
Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, 4,417,188, Cl. 318-696,000.
- Orosz, Alexander J.: See—  
Brandsness, Gordon T.; Ebnright, Robert L.; and Orosz, Alexander J., 4,416,497, Cl. 339-17,00F.



- Osada, Kimio: See—  
Nabei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176, Cl. 315-59,000.
- Osaka, Susumu: See—  
Toda, Minoru; and Osaka, Susumu, 4,417,169, Cl. 310-317,000.
- Osaka University, The President of: See—  
Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, 4,417,341, Cl. 372-72,000.
- Osborne, Duncan W., to Automotive Products Limited. Hydraulic wheel cylinder assemblies and drum brakes incorporating same. 4,416,356, Cl. 188-326,000.
- Oshima, Hiroto: See—  
Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichi, 4,416,601, Cl. 425-68,000.
- Oshima, Nobumasa: See—  
Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa, 4,417,298, Cl. 361-433,000.
- Ostberg, Sven E., to Kockums Industri A.B. Guiding mechanism for timber cutting machines. 4,416,312, Cl. 144-39,000.
- Ostermaier, John J., to Du Pont de Nemours, E. I., and Company. Preparation of zerovalent nickel complexes. 4,416,825, Cl. 260-431,000.
- Ostlund, Ole C. Method and column for collection and separation of oil, gas and water from blowing wells at the sea bed. 4,416,565, Cl. 401-60,000.
- Ota, Chuichi: See—  
Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, 4,417,290, Cl. 360-131,000.
- Otake, Eiji, to Konishiroku Photo Industry Co., Ltd. Photodetector device for detecting the front and rear ends of a moving sheet. 4,417,148, Cl. 250-561,000.
- Otake, Yoshichi: See—  
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272, Cl. 358-44,000.
- Otis Engineering Corporation: See—  
Merritt, David T.; Fish, David W.; and Long, Olen R., 4,416,330, Cl. 166-117,500.
- Otsuka Pharmaceutical Co., Ltd.: See—  
Shikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,416,884, Cl. 424-250,000.
- Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, to Oki Electric Industry Co., Ltd. and Nippon Telegraph and Telephone Public Corporation. Buffer circuits. 4,417,163, Cl. 307-475,000.
- Ott, Karl-Heinz: See—  
Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026, Cl. 525-64,000.
- Otte, Timothy J., to Bemis Manufacturing Company. Toilet seat mounting arrangement. 4,416,048, Cl. 29-526,000.
- Ottolini, Leonardo, to Luigi Franchi S.p.A. Device for retaining cartridges in the magazine of a semi-automatic shotgun during a replacement of the cartridge in the firing chamber. 4,416,076, Cl. 42-17,000.
- Ousby, John C.: See—  
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C.; deceased; and Roesler, Johanna M., executrix, 4,416,781, Cl. 210-629,000.
- Outboard Marine Corporation: See—  
Ghandhi, Burzoe K., 4,416,108, Cl. 56-17,500.
- Kashmerick, Gerald E.; and Zdanowicz, Lawrence E., 4,416,637, Cl. 440-60,000.
- Ovens, Christopher: See—  
Newton, David W.; Hulet, Frederic M., III; and Ovens, Christopher, 4,416,277, Cl. 128-303,130.
- Overfield, Dennis O., to Perkin-Elmer Corporation. The Control circuit for stepper motor. 4,417,189, Cl. 318-696,000.
- Overman, Joseph D., to Du Pont de Nemours, E. I., and Company. Benzothiazoline derivatives as silver halide antifoggants. 4,416,981, Cl. 430-614,000.
- Ovren, Christer: See—  
Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, 4,417,140, Cl. 250-227,000.
- Owaki, Shinji: See—  
Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, 4,416,934, Cl. 428-224,000.
- Owens-Illinois, Inc.: See—  
Deardurff, Lawrence R., 4,416,608, Cl. 425-548,000.
- Owen, Paul J., to Century Specialties, Inc. Auxiliary support fixture for a steady rest. 4,416,174, Cl. 82-38,000.
- Oximetrix, Inc.: See—  
Shaw, Robert F.; and Sperinde, John, 4,416,285, Cl. 128-634,000.
- Oy, Lohja Ab: See—  
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilampi, Markku A., 4,416,933, Cl. 428-216,000.
- Oyama, Kohiei; and Yokouchi, Hiroyuki, to Alps Electric Co., Ltd. Printed circuit board. 4,417,297, Cl. 361-412,000.
- Ozawa, Takashi: See—  
Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, 4,416,978, Cl. 430-548,000.
- P.C.U.K. Produits Chimiques Ugine Kuhlmann: See—  
Cognion, Jean-Marie; and Durual, Pierre, 4,417,056, Cl. 548-334,000.
- Pahade, Ravindra F., to Union Carbide Corporation. Split shelf vapor air separation process. 4,416,677, Cl. 62-13,000.
- Pakkala, Arto J.: See—  
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilampi, Markku A., 4,416,933, Cl. 428-216,000.
- Palmer, David N.; and Ferrell, Gary W., to Combustion Engineering, Inc. Method of making chalcogenide cathodes. 4,416,915, Cl. 427-126,300.
- Panetti, Romolo, to Speno International S.A. Grinding device for the continuous and in situ reprofiling of a railroad track. 4,416,091, Cl. 51-178,000.
- Panthofer, Rudolf; and Ley, Hans, to Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH. Releasable connector in leashes for domestic animal, safety line or the like. 4,416,037, Cl. 24-665,000.
- Pappas, Nicholas J.: See—  
Salensky, George A.; Chopra, Kuldip S.; and Pappas, Nicholas J., 4,417,007, Cl. 523-442,000.
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- Para-Chem Southern, Inc.: See—  
Cline, Charles D.; and Mills, Thomas L., 4,417,016, Cl. 524-156,000.
- Paradis, Joseph R., to Dennison Manufacturing Company. Assemblages of fasteners and methods of manufacture stretching of fasteners using contact heat. 4,416,838, Cl. 264-25,000.
- Parekh, Shashi L., to General Electric Company. Process for making polyetherimides. 4,417,044, Cl. 528-179,000.
- Park, W. Sidney. Trailer hitch guide. 4,416,466, Cl. 280-477,000.
- Parkins, Malcolm F. Buoyancy-responsive device. 4,416,546, Cl. 366-102,000.
- Parlman, Robert M.: See—  
Bresson, Clarence R.; and Parlman, Robert M., 4,416,770, Cl. 209-167,000.
- Parr, Erwin W.; and Brandt, Timothy B., to Ziphron, Inc. Aerosol canister. 4,416,399, Cl. 222-402,130.
- Pascoe, Robert D., to American Standard Inc. Vital DC source ground fault detector apparatus. 4,417,202, Cl. 324-51,000.
- Paschedach, Klaus: See—  
Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Paschedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, 4,417,353, Cl. 378-4,000.
- Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH: See—  
Bodmer, Albert, 4,417,300, Cl. 362-304,000.
- Paterson, William G.: See—  
Newton, David W.; and Paterson, William G., 4,416,276, Cl. 128-303,130.
- Patten, Michael A.: See—  
Melas, Constantin M.; and Patten, Michael A., 4,417,245, Cl. 340-825,800.
- Patterson, Charles C., to Patterson, Willie Mae. Vehicle gate assembly. 4,416,482, Cl. 296-3,000.
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Patterson, Charles C., 4,416,482, Cl. 296-3,000.
- Pattison, James E.: See—  
Gray, Kenneth W.; Pattison, James E.; and Rees, Huw D., 4,417,261, Cl. 357-3,000.
- Paul Flumdeas, Inc.: See—  
Flum, Paul, 4,416,380, Cl. 211-49,000.
- Paul, John G.: See—  
Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans, 4,416,975, Cl. 430-327,000.
- Paul Wurth S.A.: See—  
Kirchen, Michel; Solvi, Marc; and Burton, Clement, 4,416,673, Cl. 55-267,000.
- PCUK - Produits Chimiques Ugine Kuhlmann: See—  
Cabane, Bruno; and Galzy, Pierre, 4,416,987, Cl. 435-68,000.
- Peffer, John R.: See—  
Chang, Wen-Hsuan; O'Dwyer, James B.; and Peffer, John R., 4,417,022, Cl. 524-598,000.
- Pelts, Boris B.; Tumasian, Benjamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azorian, Stepan E.; and Kostandian, Kliment A. Method for producing sapphire tubes. 4,416,723, Cl. 156-608,000.
- Peltsman, Israel D.: See—  
Peltsman, Michael I.; and Peltsman, Israel D., 4,416,603, Cl. 425-153,000.
- Peltsman, Michael I.; and Peltsman, Israel D. Low pressure hot molding machine. 4,416,603, Cl. 425-153,000.
- Pennsylvania Pacific Corporation: See—  
Smith, Rush B.; and Daloisio, Pasquale C., 4,416,374, Cl. 206-507,000.
- Pennwalt Corporation: See—  
Kulischenko, Walter; Bogan, William F.; and Ellis, William C., 4,416,644, Cl. 464-52,000.
- Shapiro, Leonard, 4,416,656, Cl. 494-53,000.
- Perkin-Elmer Corporation, The: See—  
Chamran, Morteza M.; and Dimovski, Milan, 4,417,180, Cl. 315-175,000.
- Overfield, Dennis O., 4,417,189, Cl. 318-696,000.
- Seibel, David, 4,416,354, Cl. 188-166,000.
- Perla, Henry L. Diving suit seam construction. 4,416,027, Cl. 2-275,000.
- Perper, Lloyd J.: See—  
Hessemer, Robert A., Jr.; and Perper, Lloyd J., 4,416,552, Cl. 374-117,000.
- Perry, John C. Vibration actuated liquid pump. 4,416,589, Cl. 417-211,000.

- Perucchi, Norberto; and Mock, Elmar, to ETA A.G. Ebauches-Fabrik. Stator for a stepping motor. 4,417,166, Cl. 310-49,000.
- Pesonen, Jori; and Koivumaki, Markku, to Valmet OY. Apparatus for controlling the position and location of a stationary device of a paper machine which acts on a paper web being manufactured therein. 4,416,731, Cl. 162-308,000.
- Peters, Dierk D. Plastic bushing for use with steel/wood truss structures. 4,416,102, Cl. 52-692,000.
- Peterson, Howell L.; and McMahon, Paul E., to Celanese Corporation. Polycarbonate sizing finish and method of application thereof. 4,416,924, Cl. 427-388,100.
- Petkov, Boryan I.: See—  
Nachev, Georgi N.; Angelov, Angel S.; and Petkov, Boryan I., 4,417,127, Cl. 219-124,340.
- Petrassy, Miklos: See—  
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566, Cl. 405-291,000.
- Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Amino and substituted amino phenylalkanoil compounds. 4,416,831, Cl. 260-938,000.
- Petrillo, Edward W., Jr.: See—  
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,416,833, Cl. 260-941,000.
- Petrolite Corporation: See—  
Thompson, Neil E. S., 4,416,668, Cl. 44-62,000.
- Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, to Schering, Aktiengesellschaft. Process for preparing 3β,7β-dihydroxy-Δ<sup>2</sup>-steroids. 4,416,985, Cl. 435-58,000.
- Petzoldt, Gert: See—  
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzoldt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409, Cl. 228-173,000.
- Pfaff Haushaltmaschinen GmbH: See—  
Bateika, Gediminas, 4,417,187, Cl. 318-331,000.
- Pfaff Industriemaschinen GmbH: See—  
Dietrich, Herbert, 4,416,125, Cl. 69-21,000.
- Pfeiffer, Hans C.; Simpson, Robert A.; and Stuckel, Werner, to International Business Machines Corporation. System for contactless electrical property testing of multi-layer ceramics. 4,417,203, Cl. 324-51,000.
- Pfeiffer, Horst, to J. Hengstler K.G. Credit card, process and marking appliance for manufacturing said credit card, and marking appliance for marking said credit card in order to effect deductions from a credit represented by the card. 4,417,138, Cl. 235-492,000.
- Pfeiler, Manfred, to Siemens Aktiengesellschaft. Diagnostic radiology installation. 4,417,354, Cl. 378-19,000.
- Pfitzer, Jorg: See—  
Metzger, Karl G.; Pfitzer, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theodor, 4,416,870, Cl. 424-172,000.
- Pfohl, Rainer: See—  
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,416,744, Cl. 204-95,000.
- Pharmindustrie: See—  
Le Fur, Gerard R.; and Audiau, Francois, 4,416,888, Cl. 424-267,000.
- Pharmaka Laboratoires: See—  
Le Fur, Gerard R., 4,416,898, Cl. 424-319,000.
- Phelps, Douglas W., Jr.: See—  
Lumbra, Douglas L.; Phelps, Douglas W., Jr.; Samuelsen, Sigvard J.; and Ward, William C., 4,417,120, Cl. 219-96,000.
- Phillips, Albert. Drill head assembly. 4,416,337, Cl. 173-57,000.
- Phillips, David T., to Electro-Craft Corporation. Optical shaft angle encoder. 4,417,141, Cl. 250-231,05E.
- Phillips Petroleum Company: See—  
Bresson, Clarence R.; and Parlman, Robert M., 4,416,770, Cl. 209-167,000.
- Drake, Charles A., 4,417,089, Cl. 585-670,000.
- Erickson, Wayne K.; and Mulligan, Lewis R., 4,416,936, Cl. 428-286,000.
- Ryan, Lawrence A., 4,417,311, Cl. 364-501,000.
- Schaffer, Arnold M.; and Gallagher, Joseph G., Jr., 4,416,154, Cl. 73-571,000.
- Picker International Limited: See—  
Hounsfield, Godfrey N., 4,417,209, Cl. 324-309,000.
- Pickup, Kenneth H.: See—  
Dey, Phillip; Fearn, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., 4,416,508, Cl. 350-96,230.
- Pierce, O. Leon, to Universal Data Systems, Inc. Electro-optical isolator circuit for line powered modem. 4,417,099, Cl. 179-2,0DP.
- Pierson, Marvin B.; and Dunbar, Frank C., to Armo Inc. Low tinterne coating. 4,416,920, Cl. 427-349,000.
- Pioneer Electronic Corporation: See—  
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,416,432, Cl. 242-199,000.
- Plessner, Karl W.: See—  
Dey, Phillip; Fearn, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., 4,416,508, Cl. 350-96,230.
- PLM AB: See—  
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Las G., 4,416,927, Cl. 428-36,000.
- Plummer, William T., to Polaroid Corporation. Color filter. 4,416,514, Cl. 350-335,000.
- Poindexter, Graham S., to Dow Chemical Company. The Preparation of N-alkoxycarbonyl-substituted cyclic lactams and ketones. 4,416,818, Cl. 260-239,30A.
- Polaroid Corporation: See—  
Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr., 4,416,971, Cl. 430-221,000.
- Mehta, Avinash C., 4,417,064, Cl. 549-415,000.
- Plummer, William T., 4,416,514, Cl. 350-335,000.
- Polk, Gary L. Drywall's tool box. 4,416,372, Cl. 206-372,000.
- Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., to Honeywell Inc. Incandescent lamp driver circuit. 4,417,183, Cl. 315-291,000.
- Popeney, Harry V. Vehicle luggage carrier. 4,416,406, Cl. 224-314,000.
- Porcari, Giuliano: See—  
Robinson, Lee F.; and Porcari, Giuliano, 4,416,858, Cl. 422-259,000.
- Portillo, Francisco. Internal expansion engine. 4,416,113, Cl. 60-513,000.
- Post, Martin F. M.: See—  
Heinerman, Jacobus J. L.; and Post, Martin F. M., 4,417,090, Cl. 585-739,000.
- Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., to Ciba-Geigy AG. Hydroquinone derivatives and their use in photographic materials. 4,417,072, Cl. 560-86,000.
- Pouradier, Jean-Marc E.: See—  
Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434, Cl. 244-35,000.
- Powell, Andrew R.: See—  
Chaplin, George B. B.; Powell, Andrew R.; and Smith, Roderick A., 4,417,098, Cl. 381-94,000.
- PPG Industries, Inc.: See—  
Chang, Wen-Hsuan; O'Dwyer, James B.; and Peffer, John R., 4,417,022, Cl. 524-598,000.
- Kelly, Joseph B., 4,416,930, Cl. 428-137,000.
- PPG Industries, Inc.: See—  
Moran, Raymond D., 4,417,150, Cl. 250-572,000.
- Pratt & Whitney Aircraft of Canada Limited: See—  
Abdel-Messih, William, 4,416,585, Cl. 416-97,000.
- Presto Lock, Inc.: See—  
Remington, Richard C., 4,416,126, Cl. 70-71,000.
- Pribbenow, Walter A., to Smith International, Inc. Thrust bearing for rock bits. 4,416,554, Cl. 384-95,000.
- Printek, Inc.: See—  
Wood, Douglas E.; Kooy, Wayne J.; and Unger, Lawrence C., 4,416,560, Cl. 400-705,100.
- Probst, Heinz: See—  
Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, 4,416,795, Cl. 252-301,230.
- Process Engineering Company S.A.: See—  
Kretz, Rolf H., 4,416,989, Cl. 435-93,000.
- Procter & Gamble Company, The: See—  
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,416,793, Cl. 252-117,000.
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- Moret, David M.; and Ahr, Nicholas A., 4,416,025, Cl. 2-49,000.
- Proctor, Budd L., to PSI Energy Systems, Inc. Solar heating system for greenhouses and the like. 4,416,260, Cl. 126-429,000.
- Proform, Inc.: See—  
Krueger, Ronald G., 4,416,929, Cl. 428-102,000.
- PSI Energy Systems, Inc.: See—  
Proctor, Budd L., 4,416,260, Cl. 126-429,000.
- Puchalski, Eugene; Donahue, Frances A.; and Dixon, Richard P., to Charles of the Ritz Group Ltd. Combined allantoin-hydrolyzed animal protein skin preparation. 4,416,873, Cl. 424-177,000.
- Purkis, Ronald E.: See—  
Dawson, Christopher R.; and Purkis, Ronald E., 4,416,631, Cl. 434-16,000.
- Quack, Jochen M.: See—  
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,416,808, Cl. 252-547,000.
- Quad Environmental Technologies Corp.: See—  
deVries, Eghert, 4,416,861, Cl. 423-210,000.
- Quaker Oats Company, The: See—  
Shannon, Edward L., 4,416,904, Cl. 426-19,000.
- Quebec Cartier Mining Company: See—  
Nosseir, Sami S., 4,416,768, Cl. 209-3,000.
- Quinn Engineers Ltd.: See—  
McCarthy, Barry, 4,416,575, Cl. 411-432,000.
- R. Alkan & Cie: See—  
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,416,437, Cl. 244-137,000.
- Rachels-Horton Industries, Inc.: See—  
Rachels, William H., Sr., 4,416,251, Cl. 126-201,000.
- Rachels, William H., Sr., to Rachels-Horton Industries, Inc. Thermoshield. 4,416,251, Cl. 126-201,000.
- Radocaj, Mijo, to Dyneer Corporation. Belt tensioner. 4,416,648, Cl. 474-135,000.
- Radtke, Gerhard: See—  
Hesse, Heinrich; Merkler, Anton; Gross, Siegfried; and Radtke, Gerhard, 4,416,139, Cl. 72-267,000.
- Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Jacket for floppy pack. 4,417,289, Cl. 360-98,000.
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Eustace, Daniel J.; and Rao, Bhaskara M. L., 4,416,960, Cl. 429-194,000.



Rasenberg, Otto, to Heidelberg Druckmaschinen AG. Drive for producing motion with dwells. 4,416,198. Cl. 101-3.00R  
 Rauch, Gary C. See—  
 Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R., 4,416,707. Cl. 148-111.000.  
 Raymond, Kaiser Engineers, Inc. See—  
 Greenwalt, Richard B., 4,416,688. Cl. 75-6.000.  
 RCA Corporation. See—  
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 Angle, Rodney L., 4,417,264. Cl. 357-23.000.  
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 Toda, Minoru; and Osaka, Susumu, 4,417,169. Cl. 310-317.000.  
 VanOrmer, David D., 4,416,642. Cl. 445-11.000.  
 Ream, Gregory L. See—  
 Fillmore, Gary L.; Martin, Van C.; and Ream, Gregory L., 4,417,256. Cl. 346-75.000.  
 Reibsh, Edward J., to Russell, Burdall & Ward Corporation. Wrench adapter. 4,416,173. Cl. 81-185.000.  
 Reddy, Junuthula N., to Bendix Corporation. The Control means for controlling the energy provided to the injector valves of an electrically controlled fuel system. 4,417,201. Cl. 123-490.000.  
 Redicon Corporation. See—  
 Bulsac, Joseph D., Jr.; and Lewers, William R., 4,416,140. Cl. 72-345.000.  
 Rees, Huw D. See—  
 Gray, Kenneth W.; Pattison, James E.; and Rees, Huw D., 4,417,261. Cl. 357-3.000.  
 Reflecta GmbH Foto Film Projektion. See—  
 Weinberg, Ulli, 4,416,511. Cl. 350-117.000.  
 Regan, Albert M., to Hughes Tool Company. Concentric electric connector for subsea well apparatus. 4,416,495. Cl. 339-16.000.  
 Reichhold Limited. See—  
 Sudan, Krishan K.; and Berchem, Antoine, 4,417,004. Cl. 52-181.000.  
 Reid, Joyce. See—  
 Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896. Cl. 424-285.000.  
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 Reinartz, Hans D., to ITT Midwest Patent Operations. Pressure control valve for a hydraulic brake system. 4,416,490. Cl. 303-6.000.  
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 Remo, Inc. See—  
 Harry, Donald R.; and Belli, Remo D., 4,416,181. Cl. 84-272.000.  
 Rempel, Dieter. See—  
 Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026. Cl. 525-64.000.  
 Renaud, Pierre. See—  
 Bille, Rene; and Renaud, Pierre, 4,416,564. Cl. 403-282.000.  
 Reng, Alwin. See—  
 Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,416,808. Cl. 252-547.000.  
 Research Corporation. See—  
 Rhodes, Buck A.; and Bell, William R., 4,416,865. Cl. 924-1.100.  
 Reuter, Hans-Karl. See—  
 Kuenzle, Paul; Kriysiak, Juergen; and Reuter, Hans-Karl, 4,417,112. Cl. 200-146.000.  
 Revici, Emanuel, to Vinosen Company. The Method for eliminating or reducing the desire for smoking. 4,416,869. Cl. 424-164.000.  
 Rexnord Inc. See—  
 Fredericks, Walter A., 4,416,645. Cl. 464-99.000.  
 Reynier, Jacques. See—  
 Bendite, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques, 4,417,124. Cl. 219-121.01H.  
 Reynolds, Howard R., deceased, and by Reynolds, Pauline N., executrix. Oven burner radiant. 4,416,249. Cl. 126-41.000.  
 Reynolds, Pauline N., executrix. See—  
 Reynolds, Howard R., deceased, and Reynolds, Pauline N., executrix, 4,416,249. Cl. 126-41.000.  
 Reynolds, Arturo S. Compact adjustable spa jet aerator. 4,416,030. Cl. 4-496.000.  
 Rheinmetall GmbH. See—  
 Schenk, Norbert, 4,416,185. Cl. 89-33.05F.  
 Rhodes, Buck A.; and Bell, William R., to Research Corporation. Radiopharmaceuticals for localization of thromboembolic disease. 4,416,165. Cl. 924-1.100.  
 Rhone-Poulenc Specialites Chimiques. See—  
 Soula, Gerard, 4,417,081. Cl. 570-147.000.  
 Rhone-Poulenc Specialites Chimiques. See—  
 Soula, Gerard; and Balme, Maurice, 4,417,048. Cl. 544-38.000.  
 Richards, Kenneth J.; and George, David B., to Kennecott Corporation. Solid matte-oxygen converting process. 4,416,690. Cl. 75-26.000.  
 Richardson, Eugene E. See—  
 Lee, Richard J.; Kurasiewicz, Adam S.; and Richardson, Eugene E., 4,416,829. Cl. 260-927.00R.

Ricoh Company, Ltd. See—  
 Furukawa, Isokazu, 4,417,255. Cl. 346-75.000.  
 Hebert, Richard D.; and Lasky, Daniel J., 4,416,530. Cl. 355-3.00R.  
 Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556. Cl. 400-144.200.  
 Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, 4,416,967. Cl. 430-159.000.  
 Mayer, Edward F., 4,416,531. Cl. 355-3.0TR.  
 Riebel, Hans-Jochem. See—  
 Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832. Cl. 260-940.000.  
 Riederauer, Szilard. See—  
 Gencey, Dinko; Szabo nee Mogyrosi, Katalin; Riederauer, Szilard; and Szepvolgyi, Janos, 4,416,862. Cl. 423-335.000.  
 Rieger, Hansjorg; and Holzwarth, Dietmar H., to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Anti-skid chain and making thereof. 4,416,318. Cl. 152-213.00A.  
 Riestler, Karlheinz, to Rudolf Riestler GmbH & Co., KG. Discharge valve for a blood pressure measuring device or the like. 4,416,287. Cl. 128-685.000.  
 Rietter Deutschland GmbH. See—  
 Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041. Cl. 28-255.000.  
 Rievinger, Gustav; and Nagel, Rudolf, to Tuerenwerke Rievinger GmbH & Co., KG. Method of manufacturing a shutter link. 4,416,047. Cl. 29-460.000.  
 Rinaldi, Gianfranco. See—  
 Albanesi, Giancarlo; and Rinaldi, Gianfranco, 4,416,728. Cl. 162-159.000.  
 Rinaudo, Marguerite; Milas, Michel; and Kohler, Norbert, to Institut Francais du Petrole. Enzymatic clarification process for improving the injectivity and filtrability of xanthan gums. 4,416,990. Cl. 435-104.000.  
 Rinklake, Manfred. See—  
 Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094. Cl. 52-72.000.  
 Ripl, Wilhelm K.; and Verner, Bo L. Method for producing an aqueous solution of high phosphorous content. 4,416,779. Cl. 210-603.000.  
 Risse, Friedrich. See—  
 Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409. Cl. 228-173.00R.  
 Ritchey, Thomas W.; Weaver, John M.; and Sapone, Martin, to Lever Brothers Company. Oral compositions. 4,416,867. Cl. 424-49.000.  
 Ritzmann, Ronald F. See—  
 Walter, Roderich W.; Krivoy, William A.; Ritzmann, Ronald F.; and Bhargava, Hemendra N., 4,416,871. Cl. 424-177.000.  
 Robert Bosch GmbH. See—  
 Benedikt, Walter; Latsch, Reinhard; and Schlembach, Hans, 4,416,228. Cl. 123-268.000.  
 Bertling, Hannes; and Leiber, Heinz, 4,416,347. Cl. 180-197.000.  
 Hachtel, Hansjorg; and Dobler, Klaus, 4,417,208. Cl. 324-164.000.  
 Jons, Claus, 4,416,562. Cl. 403-13.000.  
 Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238. Cl. 123-470.000.  
 Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, 4,416,241. Cl. 123-494.000.  
 Krauss, Rudolf; and Hafner, Udo, 4,416,423. Cl. 239-585.000.  
 Straubel, Max, 4,416,233. Cl. 123-383.000.  
 Robert Keith & Co., Inc. See—  
 Vicino, Robert K.; and Bachman, Mark S., 4,416,073. Cl. 40-326.000.  
 Robinson, Daniel E. See—  
 Cuetto, Agustin; and Robinson, Daniel E., 4,417,196. Cl. 323-210.000.  
 Robinson, Lee F.; and Porcari, Giuliano, to RTL Contactor Holding S.A. Contactor. 4,416,858. Cl. 422-259.000.  
 Robinson, Leon H., Jr. See—  
 Watkins, Larry A.; and Robinson, Leon H., Jr., 4,416,494. Cl. 339-15.000.  
 Rock-Tenn Company. See—  
 Wischusen, Henry, III, 4,416,412. Cl. 229-41.00R.  
 Rockwell International Corporation. See—  
 Barkhoudarian, Sarkis, 4,416,161. Cl. 73-862.360.  
 Best, David W., 4,417,314. Cl. 364-716.000.  
 Best, David W., 4,417,316. Cl. 364-770.000.  
 Russell, Jeffrey D., 4,417,315. Cl. 364-770.000.  
 Sarace, John C., 4,416,050. Cl. 29-571.000.  
 Rocequin, Camille J. Attachable carrier handle and pick-up apparatus. 4,416,479. Cl. 294-1.00B.  
 Rocroi, Jean-Pierre; and Gole, Francois, to Compagnie Generale de Geophysique. Method of geophysical prospecting using transient currents. 4,417,210. Cl. 324-336.000.  
 Rodde, Anne-Marie. See—  
 Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434. Cl. 244-35.00R.  
 Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gahl, Helmgard, to Boehringer Mannheim GmbH. Determination of NAD(P)H or salicylate. 4,416,983. Cl. 435-25.000.  
 Roesler, Frank C., deceased. See—  
 Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781. Cl. 210-629.000.

Roesler, Johanna M., executrix. See—  
 Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781. Cl. 210-629.000.  
 Rogers, Charles H., to Neocyte, Inc. Means for preparing neocyte enriched blood. 4,416,778. Cl. 210-516.000.  
 Rohrbach, Ronald P. See—  
 Arena, Blaise J.; and Rohrbach, Ronald P., 4,416,992. Cl. 435-176.000.  
 Rolls Royce Limited. See—  
 Goddard, John; and Mills, David, 4,416,321. Cl. 164-80.000.  
 Turner, Wallace, 4,416,739. Cl. 204-32.00R.  
 Romacker, Bertold, to Telefunken Electronic GmbH. Arrangement for orientation during journeys in land vehicles. 4,416,066. Cl. 33-318.000.  
 Romann, Peter. See—  
 Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, 4,416,241. Cl. 123-494.000.  
 Romano, Dennis J. See—  
 Eickenhorst, Jay P., 4,416,640. Cl. 441-81.000.  
 Romnow, Peter H. See—  
 Wiberger, Lars I.; Romnow, Peter H.; Tengblad, Per E.; and Hellman, Bert G. H., 4,416,332. Cl. 166-246.000.  
 Rooklyn, Jack, to Industrial Management Co. Conveyor bench/work station with shunt. 4,416,202. Cl. 104-88.000.  
 Rosati, Alfonso A., to International Business Machines Corporation. Latching and tensioning mechanism for closed-loop belt supporting capstan. 4,416,532. Cl. 355-3.0BE.  
 Rosen, Howard N.; Bodkin, Robert E.; and Gaddis, Kenneth D., to United States of America. Agriculture. Enhancement of color quality of lumber during drying. 4,416,069. Cl. 34-13.800.  
 Rosenberger, Siegfried, to Ciba-Geigy Corporation. Phenols useful as stabilizers. 4,417,071. Cl. 560-67.000.  
 Rosman, Herman. See—  
 Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,417,200. Cl. 323-347.000.  
 Ross, David S.; Johnson, Robert M., Jr.; and Mathotra, Ripudaman, to Air Products and Chemicals, Inc. Solvent modification of nitrations by  $N_2O_4$ /metal acetylacetonate systems. 4,417,080. Cl. 568-939.000.  
 Ross, Michael E., to Federal Pacific Electric Co. Time delay fuse. 4,417,224. Cl. 337-164.000.  
 Rossie, Egbert. See—  
 Feucht, Klaus J.; Rossie, Egbert; and Bauer, Karl, 4,416,088. Cl. 49-502.000.  
 Roth, Kurt. See—  
 Tappe, Horst; and Roth, Kurt, 4,416,665. Cl. 8-464.000.  
 Roth, Martin. See—  
 Lohmann, Dieter; Roth, Martin; and Baumann, Marcus, 4,417,057. Cl. 548-429.000.  
 Rottger, Wilhelm. See—  
 Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094. Cl. 52-72.000.  
 Rottmayr, Josef. See—  
 Fiergolla, Ulrich; and Rottmayr, Josef, 4,416,099. Cl. 52-319.000.  
 Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J. Catalyst and process for dehydrogenation of oxygen-containing derivatives of the cyclohexane series into corresponding cyclic ketones and/or phenols. 4,417,076. Cl. 568-361.000.  
 RTL Contactor Holding S.A. See—  
 Robinson, Lee F.; and Porcari, Giuliano, 4,416,858. Cl. 422-259.000.  
 Rubel, Frederick, Jr. See—  
 Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,416,798. Cl. 502-420.000.  
 Rubin, Harvey. Detection and isolation of encephalin mRNA using a synthetic oligodeoxynucleotide. 4,416,988. Cl. 435-91.000.  
 RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. See—  
 Hofmann, Peter, 4,416,319. Cl. 152-213.00R.  
 Rieger, Hansjorg; and Holzwarth, Dietmar H., 4,416,318. Cl. 152-213.00A.  
 Rudolf Riestler GmbH & Co., KG. See—  
 Riestler, Karlheinz, 4,416,287. Cl. 128-685.000.  
 Rumble, Clive, to Corabelmet A.G. Electrical connector. 4,416,502. Cl. 339-103.00M.  
 Rupp, John W. Fishing pole light. 4,417,299. Cl. 362-186.000.  
 Rushby, Robert J.; and Dams, Anthony B., to NCR Canada Ltd. NCR Canada Ltd. Method and apparatus for improving bank operation productivity. 4,417,136. Cl. 235-379.000.  
 Russell, Burdall & Ward Corporation. See—  
 Reibsh, Edward J., 4,416,173. Cl. 81-185.000.  
 Russell, Frank S., to Sleeper & Hartley Corp. Wire coiling machine. 4,416,135. Cl. 72-130.000.  
 Russell, Jeffrey D., to Rockwell International Corporation. Method and apparatus for incrementing a digital word. 4,417,315. Cl. 364-770.000.  
 Russo, Carl J. See—  
 Muko, Richard S.; and Russo, Carl J., 4,417,347. Cl. 373-158.000.  
 Ryan, Lawrence A., to Phillips Petroleum Company. Fractional distillation column control. 4,417,311. Cl. 364-501.000.  
 Ryan Metal Powder Technologies, Inc. See—  
 Lecznar, Chester J.; and Williams, Griff E., 4,416,660. Cl. 425-7.000.

Ryan, Robert A., deceased. See—  
 Breski, Thomas A.; and Ryan, Robert A., deceased, 4,416,653. Cl. 493-412.000.  
 Ryan, Robert C. See—  
 Slauch, Lynn H.; and Ryan, Robert C., 4,417,000. Cl. 518-713.000.  
 S. W. Hart & Co. Pty. Ltd. See—  
 Korwill, Ferdinand C., 4,416,256. Cl. 126-427.000.  
 SAB Industri AB. See—  
 Wikstrom, Bo B., 4,417,324. Cl. 365-10.000.  
 Sabon, Robert J.; and Vonder, David L., to GIE Automatic Electric Labs, Inc. Detection apparatus utilizing a hall effect device. 4,417,205. Cl. 324-133.000.  
 Sado, Ryoichi; and Tahara, Kazutoki, to Shim-Etsu Polymer Co., Ltd. Socket-type connectors for electric connectors. 4,416,498. Cl. 339-60.00R.  
 Safetran Systems Corporation. See—  
 Wilson, H. James, 4,417,229. Cl. 340-47.000.  
 Safta S.p.A. See—  
 Albanesi, Giancarlo; and Rinaldi, Gianfranco, 4,416,728. Cl. 162-159.000.  
 Sage, Paul, to Verdol S.A. Double-lift Jacquard mechanism. 4,416,310. Cl. 139-59.000.  
 Sagishima, Takayuki. See—  
 Nakase, Yoshimori; and Sagishima, Takayuki, 4,417,271. Cl. 358-24.000.  
 Saida, Takashi. See—  
 Takamoto, Masaki; Saida, Takashi; and Murata, Masataka, 4,416,963. Cl. 430-69.000.  
 St. Regis Paper Company. See—  
 Erdhandler, Robert M., 4,416,922. Cl. 427-361.000.  
 Saito, Hiroshi. See—  
 Takeda, Minoru; Nitta, Toshimi; and Saito, Hiroshi, 4,416,390. Cl. 220-273.000.  
 Saito, Motoyuki; and Fukutome, Satoru, to Citizen Watch Company Limited. Structure of push-button device. 4,417,113. Cl. 200-302.000.  
 Saito, Senoku, to IDK Electronics Co., Ltd. Magnetic recording medium. 4,416,943. Cl. 428-333.000.  
 Saito, Shozo; and Sazumura, Takeshi, to Hitachi Ltd. Method and apparatus for detecting failure of nuclear fuel. 4,416,847. Cl. 376-253.000.  
 Saito, Tsutomu. See—  
 Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228. Cl. 338-34.000.  
 Sakabe, Toshiaki. See—  
 Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Pyotchi; Sakabe, Toshiaki; Ben, Hiroshi; and Ishida, Nobuyasu, 4,416,361. Cl. 192-107.00M.  
 Sakai Chemical Industry Co., Ltd. See—  
 Abe, Kazunobu; and Nakatsun, Tadao, 4,416,800. Cl. 502-159.000.  
 Sakai, Junichi. See—  
 Okuda, Takio; and Sakai, Junichi, 4,417,119. Cl. 219-72.000.  
 Sakakibara, Yukio. See—  
 Usumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Hanno, Mitsuyuki, 4,416,235. Cl. 123-425.000.  
 Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, to Kanebo Ltd. Ester of 6-[hexahydro-1H-azepin-1-yl]methylencamino]pencillanic acid, and its use as antibacterial agent. 4,416,891. Cl. 424-270.000.  
 Sakashita, Tatsuo. See—  
 Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,417,027. Cl. 525-99.000.  
 Sakiya, Fumio, to Tazmo Co., Ltd. Rotary coating apparatus. 4,416,213. Cl. 118-52.000.  
 Sakuma, Shinzo. See—  
 Yanagisawa, Hifumi; Warabi, Junichi; and Sakuma, Shinzo, 4,417,110. Cl. 209-144.00B.  
 Sakurai, Shinjiro. See—  
 Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, 4,416,967. Cl. 430-159.000.  
 Salensky, George A.; Chopra, Kuldip S.; and Pappas, Nicholas J., to Elkem Metals Company. Zinc rich paint formulations employing manganomanganic oxide fume pigment. 4,417,097. Cl. 523-442.000.  
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 Salisbury, Winfield W., to Energy Profiles, Inc. Control for orbiting charged particles. 4,416,845. Cl. 376-107.000.  
 Salkeld, Stephen A.; and Stock, Mark E., to Litton Business Systems, Inc. Panel system interconnecting means. 4,416,093. Cl. 52-71.000.  
 Sami, Hiroshi. See—  
 Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tazuki, Yoshihiko; Kawan, Shizuo; and Sami, Hiroshi, 4,416,232. Cl. 123-357.000.  
 Sammons, David W. See—  
 Adams, Lonnie D.; and Sammons, David W., 4,416,998. Cl. 436-86.000.  
 Samotryasov, Sergei M. See—  
 Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; and Samotryasov, Sergei M., 4,417,121. Cl. 219-104.000.  
 Samuelsen, Sigvard J. See—  
 Lumbr, Douglas L.; Phelps, Douglas W., Jr.; Samuelsen, Sigvard J.; and Ward, William C., 4,417,120. Cl. 219-96.000.  
 Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C., to Mead Corporation. The Capsular imaging system comprising decolorizing agent. 4,416,966. Cl. 430-138.000.



- Sanders, George G.: See—  
Cunningham, Douglas J.; and Sanders, George G., 4,416,469, Cl. 280-804.000.
- Sanderson, Roger S.; and Whelchel, Robert C., to Sanderson, Roger S. Sterilized storage container, 4,416,417, Cl. 236-92.00R.
- Sandhu, M. Akram; Wright, John F.; and Molare, Michel F., to Eastman Kodak Company. Electrostaticographic developers comprising toners containing a polyester having p-hydroxybenzoic acid recurring units, 4,416,965, Cl. 430-109.000.
- Sando Iron Works Co., Ltd.: See—  
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,416,123, Cl. 68-5.00E.
- Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for wet heat treating a textile product, 4,416,123, Cl. 68-1.00E.
- Sandoz, Inc.: See—  
Barza, Sander; and Kathawala, Faizulla G., 4,416,876, Cl. 424-184.000.
- Sandoz Ltd.: See—  
Buecheler, Paul, 4,417,014, Cl. 524-90.000.  
Grossmann, Hans, 4,416,816, Cl. 260-151.000.  
Schuster, Johann, 4,417,013, Cl. 524-87.000.  
Woodhouse, Christopher R. J., 4,416,894, Cl. 424-273.00R.
- Sanford, Herbert F., to Honeywell Inc. Centrifugally controlled differential tape reel brake, 4,416,355, Cl. 188-185.000.
- Sanner, Johnny W. Fuel tank having an immersion heating element assembly, 4,417,133, Cl. 219-316.000.
- Sano, Reiji: See—  
Horuchi, Naoya; Ohara, Takafumi; and Sano, Reiji, 4,417,340, Cl. 372-58.000.
- Sanyo Denki Kabushiki Kaisha: See—  
Maeda, Junji, 4,417,259, Cl. 346-140.00R.
- Sapone, Martin: See—  
Ritchey, Thomas W.; Weaver, John M.; and Sapone, Martin, 4,416,867, Cl. 424-49.000.
- Sarace, John C., to Rockwell International Corporation. Method of fabrication of dielectrically isolated CMOS devices, 4,416,050, Cl. 29-171.000.
- Sargent, Donald J., to E/M Lubricants, Inc. Metal forming lubricant and method of use thereof, 4,416,132, Cl. 72-41.000.
- Sarini, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, to GTE Laboratories Incorporated. Carbide coated composite silicon nitride cutting tools, 4,416,670, Cl. 51-295.000.
- Sarkisian, Vahe, to Touchwood International S.A. Heel and sole assembly for an adjustable arch shoe, 4,416,072, Cl. 36-100.000.
- Sarnoff, Norton: See—  
Chmela, John F.; Fletcher, Carl R.; and Sarnoff, Norton, 4,416,171, Cl. 81-3.46R.
- Sarrafin, Jean-Michel, to Compagnie des Produits Industriels de l'Ouest. Seals-caps for fuel tanks, 4,416,391, Cl. 220-304.000.
- Sartorius GmbH: See—  
Knothe, Erich; Blawert, Dieter; and Schubart, Bernd, 4,416,343, Cl. 177-180.000.
- Sasso, Albert. Regular solid multi-colored puzzle, 4,416,453, Cl. 273-155.000.
- Sato, Ichitaro, to Sony Corporation. Gain control circuit for a video tape recorder wherein the chrominance is gain controlled in response to the luminance signal as well as the chrominance signal, 4,417,284, Cl. 358-316.000.
- Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, to Asahi Glass Company Ltd. Method for synthesizing amorphous silicon nitride, 4,416,863, Cl. 423-344.000.
- Sato, Shigeru: See—  
Inuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, 4,416,286, Cl. 128-663.000.
- Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kinta, Yasuzo, to Kuraray Co., Ltd. Apparatus for concentrating and filtering body cavity fluids, 4,416,772, Cl. 210-137.000.
- Sato, Tetuo: See—  
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- Sato, Yoshiro, to Tohoku Metal Industries, Ltd. Circuit for injecting simulating-noise signals in a power line, 4,417,207, Cl. 324-158.00R.
- Sauer, Gerhard, to Schering, Aktiengesellschaft. Process for the preparation of 8 $\alpha$ -substituted 6-methylergolines, 4,417,051, Cl. 546-67.000.
- Sauer, Rudolf: See—  
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238, Cl. 123-470.000.  
Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, 4,416,241, Cl. 123-494.000.
- Saulson, Stanley H.; and Tarjan, Peter P., to Cordis Corporation. Cardiac pacer with improved output circuitry, 4,416,282, Cl. 128-419.00G.
- Sawafuji Electric Company, Ltd.: See—  
Ichikawa, Kaoru, 4,416,594, Cl. 417-360.000.
- Sawai, Masanobu: See—  
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269, Cl. 128-41.000.
- Sawai, Yoneichi: See—  
Fuji, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875, Cl. 424-180.000.
- Sawamura, Norio: See—  
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,416,991, Cl. 435-134.000.
- Schade, Otto H., Jr., to RCA Corporation. Offset compensation apparatus for biasing an analog comparator, 4,417,160, Cl. 307-353.000.
- Schafer, Tann R.: See—  
D'Amico, John J.; and Schafer, Tann R., 4,416,687, Cl. 71-109.000.
- Schafer, Walter: See—  
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, 4,416,298, Cl. 132-33.00R.
- Schaffer, Arnold M.; and Gallagher, Joseph G., Jr., to Phillips Petroleum Company. Method for measuring the surface area of a solid, 4,416,154, Cl. 73-571.000.
- Schaich, Eugen: See—  
Becker, Udo; Schaich, Eugen; and Weigert, Manfred, 4,416,812, Cl. 260-112.00R.
- Scheffers, Richard W.; and Boeckmann, Hugo, to Signode Corporation. Bag package and related method, 4,416,376, Cl. 206-554.000.
- Schellhorn, Robert L. Method of connecting surface mounted packages to a circuit board and the resulting connector, 4,417,296, Cl. 361-386.000.
- Schell, Loni, to Hoechst Aktiengesellschaft. Developer solution for the development of exposed negative-working diazonium salt layers, 4,416,976, Cl. 430-331.000.
- Schenk, Norbert, to Rheinmetall GmbH. Alternate ammunition belt feeder of an automatic fire arm having a linear breech, 4,416,185, Cl. 89-33.05F.
- Scherer, Hartmut; and Thilo, Peer, to Siemens Aktiengesellschaft. Correction method and device for a magnetic field probe, 4,416,067, Cl. 33-336.000.
- Schering, Aktiengesellschaft: See—  
Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, 4,416,985, Cl. 435-58.000.  
Sauer, Gerhard, 4,417,051, Cl. 546-67.000.
- Scherzer, Hugo: See—  
Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, 4,416,586, Cl. 417-13.000.
- Scheurenbrand, Dieter, to Daimler-Benz Aktiengesellschaft. Motor vehicle fuel tank, 4,416,303, Cl. 137-576.000.
- Scheve, Bernard J., to Hercules Incorporated. Radiation curable ceramic pigment composition, 4,416,974, Cl. 430-288.000.
- Schiavone, Lawrence M.: See—  
Beni, Gerardo; and Schiavone, Lawrence M., 4,416,516, Cl. 350-357.000.
- Schiedel GmbH & Co.: See—  
Schurmann, Helmut; and Brand, Erich, 4,416,790, Cl. 252-62.000.
- Schiel, Christian, to J. M. Voith GmbH. Wire end section of a paper making machine, 4,416,730, Cl. 162-264.000.
- Schilling, Walter: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058, Cl. 548-451.000.
- Schinkel, Erich: See—  
Martini, Thomas; Frischkorn, Hans; Schinkel, Erich; and Probst, Heinz, 4,416,795, Cl. 252-301.230.
- Schlembach, Hans: See—  
Benedikt, Walter; Latsch, Reinhard; and Schlembach, Hans, 4,416,228, Cl. 123-268.000.
- Schlosser, Erich J., to Weber-Stephen Products Co. Ash disposal damper for barbecue kettle, 4,416,248, Cl. 126-9.00B.
- Schlumberger Technology Corporation: See—  
Ullo, John J., 4,416,151, Cl. 73-152.000.
- Schmelzer Corporation: See—  
Detweiler, Charles A., 4,416,307, Cl. 137-625.660.
- Schmidt, Delf: See—  
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870, Cl. 424-172.000.
- Schmidt, Friedrich: See—  
Feyen, Peter; and Schmidt, Friedrich, 4,416,834, Cl. 260-979.000.
- Schmidt, Helmut, to Siemens Aktiengesellschaft. Method and circuit for D.C. braking a three-phase asynchronous machine, 4,417,191, Cl. 318-760.000.
- Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Diphenylamino and indolyl substituted pyromellitides, 4,417,059, Cl. 548-456.000.
- Schmittmann, Herbert, to Siemens Aktiengesellschaft. Rotary anode x-ray tube, 4,417,171, Cl. 313-16.000.
- Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, to Brown, Boveri & Co. Aktiengesellschaft. Circuit breaker, 4,417,222, Cl. 335-6.000.
- Schnell, Axel: See—  
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,417,227, Cl. 338-21.000.
- Schoendorfer, Donald W.; and Hansen, Lee E., to Haemonetics Corporation. Pheresis apparatus, 4,416,654, Cl. 494-10.000.
- Schoepe, Adolf. Selectively foldable side inlet ballcock, 4,416,302, Cl. 137-315.000.
- Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. Substituted 1,2,3-oxadiazole-2-oxides in human cardiovascular system disease, 4,416,893, Cl. 424-272.000.
- Schramm, Arthur G.; and Shaffer, Jack C., to Hardy, Doralyn Ann. Method and apparatus for fabricating insulative panel, 4,416,715, Cl. 156-210.000.
- Schramm, Manfred: See—  
Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, 4,417,038, Cl. 526-285.000.

- Schreck, Carl E.: See—  
McGovern, Terrence P.; and Schreck, Carl E., 4,416,881, Cl. 424-248.540.
- Schreinemacher, Herbert: See—  
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,417,227, Cl. 338-21.000.
- Schroder, Theo: See—  
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870, Cl. 424-172.000.
- Schubart, Bernd: See—  
Knothe, Erich; Blawert, Dieter; and Schubart, Bernd, 4,416,343, Cl. 177-180.000.
- Schuck, David B.: See—  
Gunderson, Robert O.; Kocol, James E.; and Schuck, David B., 4,417,334, Cl. 370-85.000.
- Schulze-Berge, Klaus, to Langbein-Pfanhauser Werke AG. Method and bath for the electrodeposition of palladium/nickel alloys, 4,416,740, Cl. 204-43.00N.
- Schulze-Berge, Klaus, to Langbein-Pfanhauser Werke AG. Method and bath for the electrodeposition of palladium/nickel alloys, 4,416,741, Cl. 204-43.00N.
- Schurmann, Helmut; and Brand, Erich, to Schiedel GmbH & Co. Paste-like damping medium and method for its manufacture, 4,416,790, Cl. 252-62.000.
- Schuster, Allan C.; and Schuster, Georgia L. Insulating window insert, 4,416,096, Cl. 52-202.000.
- Schuster, Georgia L.: See—  
Schuster, Allan C.; and Schuster, Georgia L., 4,416,096, Cl. 52-202.000.
- Schuster, Johann, to Sandoz Ltd. Pigment compositions containing acrylate copolymers, 4,417,013, Cl. 524-87.000.
- Schutz, Hans U.; and Buhler, Arthur, to Ciba-Geigy Corporation. Fiber-reactive unsymmetrical 1:2 chromium complex azo dyes, 4,416,815, Cl. 260-145.00A.
- Schwartz, Erich: See—  
Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, 4,417,038, Cl. 526-285.000.
- Schwartz, Jack M. Yarn feeding apparatus, 4,416,205, Cl. 112-79.00R.
- Schwartz, Robert C., to Horn & Gladden Lint Cleaner Company, Inc. Safety bar cutoff and brake, 4,416,035, Cl. 19-0.200.
- Schwarz, Francis C. Electronic system for simultaneous control of two or more pulse modulators, 4,417,197, Cl. 323-272.000.
- Schwarz, Richard A., to Cosden Technology, Inc. Foamable polymeric styrene particles, 4,417,003, Cl. 521-56.000.
- Schwarze, Rigobert. Pipe-bending machine, 4,416,136, Cl. 72-157.000.
- SCM Corporation: See—  
Loye, Kenneth; and Julian, Gary, 4,416,940, Cl. 428-324.000.
- Scott, J. A. N.: See—  
Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., 4,416,669, Cl. 44-71.000.
- Scott, Paul R., to Shell Oil Company. System for removing debris from pipelines, 4,416,703, Cl. 134-8.000.
- Scribano, Frank C.: See—  
Haas, Werner J.; and Scribano, Frank C., 4,417,143, Cl. 250-363.00S.
- Seaguest Valve Co., Div. of Pittway Corp.: See—  
Knickerbocker, Michael G., 4,416,398, Cl. 222-402.130.
- Sebag, Henri: See—  
Vanlerberghe, Guy; and Sebag, Henri, 4,416,868, Cl. 424-59.000.
- Secamiglio, Anthony J.: See—  
Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., 4,416,255, Cl. 126-422.000.
- Secamiglio, Edward T.: See—  
Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., 4,416,255, Cl. 126-422.000.
- Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., to Sun Powered Inc. Wedge-shaped solar air heating device, 4,416,255, Cl. 126-422.000.
- Sedlar, Michael F.: See—  
Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., 4,417,183, Cl. 315-291.000.
- Seeger, Richard E., to Armatron International, Inc. Double acting log splitter, 4,416,313, Cl. 144-193.00R.
- Seeger, Richard O.: See—  
Dorier, Jack A.; Mosley, Joseph M.; Seeger, Richard O.; and Weitzel, Stephen D., 4,417,159, Cl. 307-270.000.
- Sei, Kazuo: See—  
Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019, Cl. 524-456.000.
- Seibel, David, to Perkin-Elmer Corporation. The Rotary feedthru control, 4,416,354, Cl. 188-166.000.
- Seidel, Hans: See—  
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gauhl, Helmgard, 4,416,983, Cl. 435-25.000.
- Seimitsu, Kozo: See—  
Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, 4,416,934, Cl. 428-224.000.
- Seino, Takashi: See—  
Ohkawa, Koue; Fujii, Shin; and Seino, Takashi, 4,417,011, Cl. 523-527.000.
- Seki, Kazuyuki: See—  
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691, Cl. 75-60.000.
- Sekiya, Toshifumi: See—  
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228, Cl. 338-34.000.
- Selas Corporation of America: See—  
Morck, Charles W., 4,416,620, Cl. 431-348.000.
- Sellner, Rudolf: See—  
Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, 4,417,222, Cl. 335-6.000.
- Senghaas, Karl A.: See—  
Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., 4,416,085, Cl. 49-340.000.
- Senko Medical Instrument Mfg. Co.: See—  
Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, 4,416,658, Cl. 604-48.000.
- Seo, Iwao: See—  
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269, Cl. 128-41.000.
- Seo, Yasutsugu: See—  
Inuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, 4,416,286, Cl. 128-663.000.
- Sergeev, Stanislav S.: See—  
Likhogub, Evgeny P.; Sergeev, Stanislav S.; and Minasov, Alexander N., 4,416,733, Cl. 202-228.000.
- Serrano, Francisco D. M.: See—  
Lamy, Jacques E.; Michel, Dominique; and Serrano, Francisco D. M., 4,416,473, Cl. 285-41.000.
- Serres, Bernard M.; Viale, Maurice S.; and Jewiarz, Edouard J. Public telephone station traffic analyzing arrangement, 4,417,101, Cl. 179-8.00R.
- Sevastopoulos, Stylianos G.; and Lum, Sammy S., to National Semiconductor Corporation. Monolithic IC general purpose active filter, 4,417,214, Cl. 330-84.000.
- Sexton Can Company, Inc.: See—  
Mulawski, Walter J., 4,416,388, Cl. 220-207.000.
- Seyb, Christian: See—  
Dehmel, Rudiger; Maelzer, Martin; and Seyb, Christian, 4,417,204, Cl. 324-73.00PC.
- SGS-ATES Componenti Elettronici SpA: See—  
Borghese, Valerio; Erratico, Pietro; and Coccetti, Silvano, 4,417,292, Cl. 361-87.000.
- Shaffer, David T.: See—  
Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., 4,417,106, Cl. 200-5.00R.
- Shaffer, Jack C.: See—  
Schramm, Arthur G.; and Shaffer, Jack C., 4,416,715, Cl. 156-210.000.
- Shahani, Chandru T.: See—  
Flowers, Thomas A.; Vinch, Samuel D.; and Shahani, Chandru T., 4,416,931, Cl. 428-159.000.
- Shannon, Edward L., to Quaker Oats Company. The Shelf stable pizza and method for preparing same, 4,416,904, Cl. 426-19.000.
- Shapiro, Leonard, to Pennwalt Corporation. Hard surfacing for a centrifuge conveyor, 4,416,656, Cl. 494-53.000.
- Sharp Kabushiki Kaisha: See—  
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,416,515, Cl. 350-350.00F.
- Itoh, Ikuo; Anzai, Shunju; and Ohashi, Kunio, 4,416,536, Cl. 355-14.00R.
- Morimoto, Masafumi; Yoshida, Kunio; and Nakanishi, Tosaku, 4,417,319, Cl. 364-900.000.
- Sharpless, John, to Nordson Corporation. System for vapor precipitation and recovery in a continuous coater, 4,416,193, Cl. 98-115.05B.
- Shaw, Robert F.; and Sperinde, John, to Oximetrix, Inc. Improved optical catheter and method for making same, 4,416,285, Cl. 128-634.000.
- Sheehan, Neil J.: See—  
Norman, Melvin H.; Manske, Reinhold R.; and Sheehan, Neil J., 4,416,661, Cl. 604-86.000.
- Shell Oil Company: See—  
Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., 4,416,669, Cl. 44-71.000.
- Heinerman, Jacobus J. L.; and Post, Martin F. M., 4,417,090, Cl. 585-739.000.
- Mundhenk, David L.; and Curole, Michael A., 4,416,333, Cl. 166-250.000.
- Scott, Paul R., 4,416,703, Cl. 134-8.000.
- Slaugh, Lynn H.; and Ryan, Robert C., 4,417,000, Cl. 518-713.000.
- Shelley, Peter S.: See—  
Hoffman, David M.; Loomis, Neil W.; Ehler, Ralph C.; and Shelley, Peter S., 4,417,144, Cl. 250-367.000.
- Shepard, Leonard F., to ILC Data Device Corporation. Microphase stepper employing improved digital timing incrementer employing a rate multiplier, 4,417,352, Cl. 377-43.000.
- Sherrick, James W., to Lord Corporation. Railway vehicle laminated mount suspension, 4,416,203, Cl. 105-224.100.
- Shibasaku Company Limited: See—  
Sugihara, Kiyoyuki, 4,417,310, Cl. 364-481.000.
- Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel tetrazole-5-thiol ester and process for preparing cefamandole using same, 4,417,047, Cl. 544-26.000.
- Shidlovsky, Igal; and Hart, William E., to RCA Corporation. High density information disc lubricants, 4,416,789, Cl. 252-34.700.
- Shimadzu Corporation: See—  
Akiyama, Junichi, 4,416,762, Cl. 204-299.00R.



- Shimano Industrial Company Limited: See—  
Noda, Hideo, 4,416,428., Cl. 242-84.21R.
- Shimazaki, Keiichi: See—  
Takenaka, Akira; Shimazaki, Keiichi; and Kuwazuru, Yasumitsu, 4,416,458., Cl. 277-96.100.
- Shimazu, Teruo, to Mitsumi Electric Company, Ltd. Push-button type tuning apparatus, 4,416,164., Cl. 74-10.330.
- Shimizu, Hideharu; and Hashimoto, Akihiko, to Matsushita Electric Industrial Co., Ltd. Wick for burning liquid fuel, 4,416,616., Cl. 431-325.000.
- Shimizu, Ipppei: See—  
Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ipppei, 4,416,471., Cl. 282-27.500.
- Shimizu, Yoshiaki: See—  
Tada, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, 4,416,982., Cl. 435-11.000.
- Shimma, Yashiro: See—  
Nakada, Minoru; Shimma, Yashiro; Inoue, Osamu; and Suma, Sei, 4,416,327., Cl. 165-122.000.
- Shimoda, Mituhiko: See—  
Iemori, Yasumasa; and Shimoda, Mituhiko, 4,416,526., Cl. 354-198.000.
- Shimp, David A., to Celanese Corporation. Polyol/imidazole curing agents for epoxy resins, 4,417,010., Cl. 523-466.000.
- Shin-Etsu Polymer Co., Ltd.: See—  
Sudo, Ryoichi; and Tahara, Kazutoki, 4,416,498., Cl. 339-60.00R.
- Shinal, Edward C.: See—  
Kaplan, Murray A.; and Shinal, Edward C., 4,416,874., Cl. 424-177.000.
- Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, to Hitachi, Ltd. FM Television signal receiving circuit, 4,417,279., Cl. 358-195.100.
- Shinozaki, Takashi: See—  
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272., Cl. 358-44.000.
- Shiota, Ikuo: See—  
Nishizawa, Jun-ichi; and Shiota, Ikuo, 4,416,952., Cl. 428-698.000.
- Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, to Nippondenso Co., Ltd. Electrical fuel injection pump governor, 4,416,232., Cl. 123-357.000.
- Shira, Shigeru; Kanbe, Junichiro; and Fukuda, Tadao, to Canon Kabushiki Kaisha. Electrophotographic member having aluminum oxide layer, 4,416,962., Cl. 430-65.000.
- Shirayama, Akira: See—  
Iaga, Yukio; Kai, Tomoe; Shirayama, Akira; and Kanatani, Genji, 4,416,580., Cl. 414-626.000.
- Shishikura, Masami: See—  
Shii, Hirohisa; Shishikura, Masami; and Okamura, Toshihiko, 4,417,167., Cl. 310-67.00R.
- Shoemaker, William A., Jr.: See—  
Nestor, Jack; and Shoemaker, William A., Jr., 4,416,063., Cl. 33-163.000.
- Shores, William M.: See—  
Harshbarger, John H.; and Shores, William M., 4,417,275., Cl. 358-139.000.
- Shtengel, Eduard G.: See—  
Gelfand, Yakov E.; Komova, Marina L.; Shtengel, Eduard G.; and Yakovis, Leonid M., 4,416,394., Cl. 222-55.000.
- Shui, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., to USM Corporation. Machine adapted for use in the manufacturing of shoes, 4,416,031., Cl. 12-127.000.
- Shy, James L.: See—  
Zagar, Steven J.; and Shy, James L., 4,416,696., Cl. 106-100.000.
- Zagar, Steven J.; and Shy, James L., 4,416,697., Cl. 106-100.000.
- Sid Harvey, Inc.: See—  
Lindqvist, Herbert E., 4,416,592., Cl. 417-290.000.
- Siedel, Joachim: See—  
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gauhl, Helmgard, 4,416,983., Cl. 435-25.000.
- Siemens Aktiengesellschaft: See—  
Ghosh, Shyamal-Krishna, 4,417,192., Cl. 318-797.000.
- Kuenzle, Paul; Krysiak, Juergen; and Reuter, Hans-Karl, 4,417,112., Cl. 200-146.00R.
- Pfeiler, Manfred, 4,417,354., Cl. 378-19.000.
- Scherer, Hartmut; and Thilo, Peer, 4,416,067., Cl. 33-356.000.
- Schmidt, Helmut, 4,417,191., Cl. 318-760.000.
- Schmittmann, Herbert, 4,417,171., Cl. 313-16.000.
- Siemens Gammasonics, Inc.: See—  
Haas, Werner J.; and Scribano, Frank C., 4,417,143., Cl. 250-363.00S.
- Siemund, Gunter; and Oei, Han Y., to Occidental Chemical Corporation. Composition and process for production of phosphate coatings on metal surfaces, 4,416,705., Cl. 148-6.15Z.
- Sigmode Corporation: See—  
Scheffers, Richard W.; and Boeckmann, Hugo, 4,416,376., Cl. 206-554.000.
- Silberberg, George G.: See—  
Keller, Patrick N.; Franck, Jerome B.; and Silberberg, George G., 4,417,123., Cl. 219-121.0LH.
- Silbernagel, Raymond A.: See—  
Humphrey, John W.; and Silbernagel, Raymond A., 4,416,059., Cl. 29-751.000.
- Silvey, Elmer R. Automatic saw chain grinder, 4,416,169., Cl. 76-25.00A.
- Sima Products Corporation: See—  
Breslau, Steven M.; and Grossman, M. Gary, 4,416,528., Cl. 354-296.000.
- Simplicity Manufacturing, Inc.: See—  
Slazas, John J., 4,416,109., Cl. 56-209.000.
- Simpson, Barbara E.; and Gervais, Norman A., to Eli Lilly and Company. Sustained release capsule for ruminants, 4,416,659., Cl. 604-48.000.
- Simpson, Daniel W.: See—  
Davis, Stephen H.; and Simpson, Daniel W., 4,416,773., Cl. 210-289.000.
- Simpson, David P., to Electricity Council, The. Apparatus for heating electrically conductive flowable media, 4,417,132., Cl. 219-291.000.
- Simpson, Robert A.: See—  
Pfeiffer, Hans C.; Simpson, Robert A.; and Stickel, Werner, 4,417,203., Cl. 324-51.000.
- Simson, Anton K.: See—  
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329., Cl. 166-68.000.
- Sinclair, Brett J. Non-mechanical electromagnetic scanning device, 4,416,512., Cl. 350-171.000.
- Sinek, Joachim R., to Kennecott Corp. Induced draft cooling tower, 4,416,836., Cl. 261-112.000.
- Singer Company, The: See—  
Jacks, Herbert G., 4,417,253., Cl. 346-17.000.
- McKenna, Joseph V., 4,417,234., Cl. 340-347.0AD.
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- Singletary, Glennwood: See—  
Baker, Royce E.; and Singletary, Glennwood, 4,416,339., Cl. 175-61.000.
- Sinka, Joseph V.; and Lieberman, Robert A., to Diamond Shamrock Corporation. Polysiloxane stabilizers for flattening agents in radiation hardenable compositions, 4,417,023., Cl. 524-731.000.
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- Skala, Stephen F. Fluid drive for an orifice band ink jet printer, 4,417,252., Cl. 346-1.100.
- Skarp, Jarmo I.: See—  
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilampi, Markku A., 4,416,933., Cl. 428-216.000.
- Skinner, Heather B.: See—  
Tuck, Richard A.; and Skinner, Heather B., 4,417,173., Cl. 313-346.00R.
- Skogstrom, Lars; and Bergqvist, Bengt, to Aeromotor Trading Company AB. Method and arrangement for heat conditioning of buildings, 4,416,259., Cl. 126-429.000.
- Skothelm, Terje. Photoelectrochemical cells for conversion of solar energy to electricity, 4,416,959., Cl. 429-111.000.
- SKW Trostberg Aktiengesellschaft: See—  
Goll, Werner, 4,416,925., Cl. 427-393.500.
- Slaugh, Lynn H.; and Ryan, Robert C., to Shell Oil Company. Dimethyl ether process, 4,417,000., Cl. 518-713.000.
- Slazas, John J., to Simplicity Manufacturing, Inc. Mower attachment draft linkage responding to ground contour, 4,416,109., Cl. 56-209.000.
- Sleeper & Hartley Corp.: See—  
Russell, Frank S., 4,416,135., Cl. 72-130.000.
- Slocum, Chester D., to Cordis Corporation. Programming and telemetry system for biomedical implantable device, 4,416,283., Cl. 128-419.0PG.
- Smith, Clive P.: See—  
Cogswell, Frederic N.; Griffin, Brian P.; and Smith, Clive P., 4,417,043., Cl. 528-176.000.
- Smith, Daniel D., to Minnesota Mining & Manufacturing Company. Dispenser for adhesive coated sheet material, 4,416,392., Cl. 221-45.000.
- Smith, Dean L., Jr.: See—  
Merchant, Philip, Jr.; and Smith, Dean L., Jr., 4,416,754., Cl. 204-190.000.
- Smith, Graham M., to Merck & Co., Inc. Molecular models, 4,416,635., Cl. 434-280.000.
- Smith International, Inc.: See—  
Bailey, Edmond L., 4,416,340., Cl. 175-195.000.
- Fowler, John H.; and Gruller, David L., 4,416,472., Cl. 285-3.000.
- Pribbenow, Walter A., 4,416,554., Cl. 384-95.000.
- Smith, Kent F. Dynamically operated structured logic array, 4,417,327., Cl. 365-203.000.
- Smith, Michael C. Multi-purpose mechanic's glove, 4,416,026., Cl. 2-161.00R.
- Smith, Roderick A.: See—  
Chaplin, George B. B.; Powell, Andrew R.; and Smith, Roderick A., 4,417,098., Cl. 381-94.000.
- Smith, Rush B.; and Dalosio, Pasquale C., to Pennsylvania Pacific Corporation. Nest and stack container, 4,416,374., Cl. 206-507.000.
- Smith, Thomas M. Gas-fired infra-red generators and use thereof, 4,416,618., Cl. 431-328.000.
- Snap-on Tools Corporation: See—  
Ciriacks, Patrick E.; and Gibson, Gary S., 4,417,211., Cl. 324-392.000.
- Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., 4,416,338., Cl. 173-134.000.

- Snead, Edwin D. Apparatus and method for weighing rolling railcars, 4,416,342., Cl. 177-163.000.
- Snitman, David L.: See—  
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896., Cl. 424-285.000.
- Snyder, Paul J.: See—  
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,417,337., Cl. 371-22.000.
- Sochor, Jerzy R. Contact with dual cantilevered arms with narrowed, complimentary tip portions, 4,416,504., Cl. 339-252.00P.
- Societa Cavi Pirelli S.p.A.: See—  
Oecchini, Elio; Lanfranco, Gianmarco; and Metra, Piero, 4,417,093., Cl. 174-25.00R.
- Societa' Pneumatici Pirelli S.p.A.: See—  
Caretta, Renato, 4,416,317., Cl. 152-209.00R.
- Societe Anonyme dite: L'Oreal: See—  
Vanlerberghe, Guy; and Sebag, Henri, 4,416,868., Cl. 424-59.000.
- Societe Chimique des Charbonnages-CdF Chimie: See—  
Kapes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041., Cl. 526-348.600.
- Societe Chimique des Charbonnages-CdF Chimie: See—  
Durand, Pierre; Charlon, Pierre; and Joffroy, Guy, 4,416,856., Cl. 422-131.000.
- Societe Lorraine de Laminage Continu: See—  
Helfi, Alfred F.; and Muller, Jean-Claude H., 4,416,443., Cl. 266-47.000.
- Societe Nationale Industrielle Aerospatiale: See—  
Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434., Cl. 244-35.00R.
- Sodeyama, Chuichi: See—  
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279., Cl. 358-195.100.
- Sole, Jitka; and Haigh, Daniel H., to Dow Chemical Company, The. Magnetic imbibor polymers and method for the preparation thereof, 4,416,945., Cl. 428-407.000.
- Solloway, Daniel S. Aquatic exercise assembly, 4,416,451., Cl. 272-116.000.
- Solvay & Cie.: See—  
Gabbellieri, Rodolfo; and Bouteille, Rene, 4,416,949., Cl. 428-461.000.
- Solvi, Marc: See—  
Kirchen, Michel; Solvi, Marc; and Burton, Clement, 4,416,673., Cl. 55-267.000.
- Solymos, Andras: See—  
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupansky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.
- Somfy: See—  
Bullat, Jean, 4,417,185., Cl. 318-2.000.
- Sone, Takanori: See—  
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047., Cl. 544-26.000.
- Sonell Corporation: See—  
Leale, Luis, 4,417,181., Cl. 315-209.00R.
- Sonnabend, Ferdinand: See—  
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409., Cl. 228-173.00R.
- Sonoco Products Company: See—  
Yon, William S., 4,416,200., Cl. 101-228.000.
- Sony Corporation: See—  
Hoshimi, Susumu; and Kojima, Tadashi, 4,417,283., Cl. 358-310.000.
- Ichigaya, Hiroshi, 4,416,180., Cl. 84-1.230.
- Ishii, Hirohisa; Shishikura, Masami; and Okamura, Toshihiko, 4,417,167., Cl. 310-67.00R.
- Sato, Ichitaro, 4,417,284., Cl. 358-316.000.
- Sopira, Michael M.: See—  
Thomas, Richard N.; and Sopira, Michael M., 4,416,054., Cl. 29-572.000.
- Sorenson, Richard W., to Carlingswitch, Inc. Switch construction, 4,417,109., Cl. 200-68.000.
- Soula, Gerard; and Balme, Maurice, to Rhone-Poulenc Specialties Chimiques. N-alkylation of organonitrogen compounds, 4,417,048., Cl. 544-38.000.
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- Sound Attenuators Limited: See—  
Chaplin, George B. B.; Powell, Andrew R.; and Smith, Roderick A., 4,417,098., Cl. 381-94.000.
- Source Technologies Corporation: See—  
Kramer, Milo G., 4,416,520., Cl. 353-101.000.
- Southern Gas Association: See—  
Edlund, Carl E., 4,417,164., Cl. 307-497.000.
- Southwest Research Institute: See—  
Wood, Charles D., 4,416,229., Cl. 123-304.000.
- Sovey, James S.: See—  
Curren, Arthur N.; Forman, Ralph; Sovey, James S.; and Wintucky, Edwin G., 4,417,175., Cl. 315-5.380.
- Specht, Glenn E., to Hoover Company, The. Full bag indicator, 4,416,033., Cl. 153-339.000.
- Spencer, Edward M., to Brown Boveri Electric Inc. Underwater gas-insulated cable with plural internal pressures, 4,417,094., Cl. 174-28.000.
- Speno International S.A.: See—  
Panetti, Romolo, 4,416,091., Cl. 51-178.000.
- Sperinde, John: See—  
Shaw, Robert F.; and Sperinde, John, 4,416,285., Cl. 128-634.000.
- Sperry Corporation: See—  
Brandsness, Gordon T.; Ebright, Robert L.; and Orosz, Alexander J., 4,416,497., Cl. 339-17.00F.
- Chen, Tsu F.; and Gottschalk, Juan M., 4,416,144., Cl. 73-12.000.
- Zscheile, John W., Jr., 4,417,249., Cl. 343-379.000.
- Sperry, Paul A.: See—  
Bialobrzski, Walter; and Sperry, Paul A., 4,416,477., Cl. 292-19.000.
- Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Anti-exposure jacket, 4,416,641., Cl. 441-94.000.
- Spring, Ernst. Solder removing device, 4,416,408., Cl. 228-19.000.
- Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie): See—  
van Wijngaarden, Hans, 4,416,450., Cl. 271-303.000.
- Staats, Charles W., to Bradford-White Corporation. Hot water heater circuitry, 4,416,222., Cl. 122-13.00R.
- Stab, Rudolf: See—  
Fischer, Rudolf; and Stab, Rudolf, 4,416,652., Cl. 493-399.000.
- Stacey, Ralph C., to Tarrant Manufacturing Company. Flexible coupling, 4,416,475., Cl. 285-229.000.
- Stacy, Aris J. Clutch drive differential, 4,416,167., Cl. 74-650.000.
- Stamcarbon B.V.: See—  
Corvers, Antonius; van den Broek, Cornelis W.; and Suverkropp, Geertrudes H., 4,417,053., Cl. 546-315.000.
- Standard Duplicating Machines Corp.: See—  
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,416,722., Cl. 156-578.000.
- Standard Oil Company (Indiana): See—  
Lee, Richard J.; Kurasiewicz, Adam S.; and Richardson, Eugene E., 4,416,829., Cl. 260-927.00R.
- Nimry, Tayseer S.; and Fields, Ellis K., 4,417,045., Cl. 528-188.000.
- Udovich, Carl A.; and Edwards, Robert C., 4,416,802., Cl. 502-209.000.
- Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., 4,416,803., Cl. 502-209.000.
- Staten, Harold D., to Donaldson, Helen, Donaldson, Melody J., and Decker, Tracey Donaldson. Snap ring removal tool, 4,416,045., Cl. 29-229.000.
- Stauffer Chemical Company: See—  
Green, Laddie L., 4,416,685., Cl. 71-95.000.
- Thiele, Gerald H., 4,416,684., Cl. 71-95.000.
- STD Filter Company, Inc.: See—  
Halbich, Frank; and Greene, Jeffrey L., 4,416,775., Cl. 210-236.000.
- Steck, Edgar A.: See—  
Alving, Carl R.; and Steck, Edgar A., 4,416,872., Cl. 424-177.000.
- Steckmann, Helmut: See—  
Fleischmann, Heinz; and Steckmann, Helmut, 4,417,152., Cl. 307-64.000.
- Steinbrink, Wilfried, to C. Ed. Schulte GmbH. Cylinder lock, 4,416,128., Cl. 70-364.00A.
- Steinhilber, Helmut. Apparatus, mountable on an office machine, for feeding single sheets from a paper stack stored in a magazine, 4,416,559., Cl. 400-629.000.
- Stelte, David J.: See—  
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., 4,417,335., Cl. 370-110.100.
- Stendel, Wilhelm: See—  
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832., Cl. 260-940.000.
- Stenz, Paul, to C. A. Weidmuller GmbH & Co. Screwless electrical terminal, 4,416,500., Cl. 339-95.00D.
- Steri-Pac, Inc.: See—  
Hall, Robert M., 4,416,663., Cl. 604-163.000.
- Sterling Drug Inc.: See—  
Gelotte, Karl O., 4,417,054., Cl. 546-340.000.
- Schmidt, Paul J.; and Hung, William M., 4,417,059., Cl. 548-456.000.
- Zenith, Bernard L., 4,417,052., Cl. 546-246.000.
- Sterman, Albert P.: See—  
Lenahan, Dean T.; Corsmeier, Robert J.; and Sterman, Albert P., deceased, 4,416,111., Cl. 60-39.290.
- Sterman, Florence G., executor: See—  
Lenahan, Dean T.; Corsmeier, Robert J.; and Sterman, Albert P., deceased, 4,416,111., Cl. 60-39.290.
- Stern, Theodore G., to General Dynamics, Convair Division. Method of making a thin-film solar cell, 4,416,052., Cl. 29-572.000.
- Stetter, Jorg; Lunkenheimer, Winfried; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with N-allyl-acetamides, 4,416,889., Cl. 424-269.000.
- Stevens, R. D. Samuel, to Concord Scientific Corporation. Process for reduction of the content of SO<sub>2</sub> and/or NO<sub>x</sub> in flue gas, 4,416,748., Cl. 204-157.10P.
- Stevenson, John; Machin, John; and Dyke, David L., to Fosco International Limited. Sand reclamation, 4,416,694., Cl. 106-84.000.
- Stickel, Werner: See—  
Pfeiffer, Hans C.; Simpson, Robert A.; and Stickel, Werner, 4,417,203., Cl. 324-51.000.
- Stock, Mark E.: See—  
Salkeld, Stephen A.; and Stock, Mark E., 4,416,093., Cl. 52-71.000.
- Stockman, Richard F.; and MacIver, Paul L., to Air Preheater Company, Inc. The. Cast recuperator tube, 4,416,044., Cl. 29-157.30R.



- Stoddart, James O.: See—  
Austin, Lowell W.; and Stoddart, James O., 4,416,737, Cl. 204-28.000.
- Stoehr, Richard T.: See—  
Stoboda, Glenn R.; Carlstrom, William L.; and Stoehr, Richard T., 4,417,001, Cl. 521-114.000.
- Stogryn, Eugene L., to Exxon Research and Engineering Co. Div. (Secondary and tertiaryalkylaminoalkoxy)alkanes, 4,417,075, Cl. 564-505.000.
- Stokes, Ronald E., to Xerox Corporation. Method of binding sheets using stitchers, 4,416,046, Cl. 29-417.000.
- Stork Brabant B.V.: See—  
van de Stree, Antonius T. H.; and van Mondfrans, Gerardus H., 4,416,704, Cl. 134-34.000.
- Stork, Sven, to Electrolux Siegen GmbH. Vending machine with separate interlocking sections, 4,416,363, Cl. 194-4.00D.
- Storni, Angelo: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058, Cl. 548-451.000.
- Stoss, Peter, to Heinrich Mack Nachf. Chem.-Pharmazeutische Fabrik. Process for the preparation of isosorbide 2-nitrate, 4,417,065, Cl. 549-464.000.
- Stover, William A.: See—  
Chester, Arthur W.; Cormier, William E. Jr.; and Stover, William A., 4,416,765, Cl. 208-120.000.
- Stowe, Gerald T.: See—  
Reimer, Ronald A.; and Stowe, Gerald T., 4,416,824, Cl. 260-439.00R.
- Stowers, Jeffrey P., to Virginia Panel Corporation. Electrical contact probe and method of manufacturing, 4,417,206, Cl. 324-158.00P.
- Strand, Mette, to Johns Hopkins University. The Diagnosis and treatment of fluke infections with monoclonal antibodies, 4,416,866, Cl. 424-1.100.
- Strange, Donald R.: See—  
Bennett, Matthew C.; and Strange, Donald R., 4,417,276, Cl. 358-160.000.
- Straupel, Max, to Robert Bosch GmbH. Control apparatus for internal combustion engines, 4,416,233, Cl. 123-383.000.
- Strobel, Charles, Marine animal trap, 4,416,082, Cl. 43-102.000.
- Struck, Carl-Heinz: See—  
Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, 4,416,732, Cl. 202-139.000.
- Stuckert, Paul E., to International Business Machines Corporation. Air jet powered cooling system for electronic assemblies, 4,417,295, Cl. 361-384.000.
- Stuckey, Buddy S.: See—  
Henry, John J. Sr.; and Stuckey, Buddy S., 4,416,058, Cl. 29-734.000.
- Stucki, Samuel: See—  
Menth, Anton; and Stucki, Samuel, 4,416,747, Cl. 204-129.000.
- Studer, Urs P., to Zumbach Electronic AG. Process and device for the measurement of a physical quantity of an extruded element, 4,416,541, Cl. 356-386.000.
- Stuhler, Rolf: See—  
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, 4,416,298, Cl. 132-33.00R.
- Stutzel, Klaus: See—  
Korner, Helmut; Fischer, Joachim; and Stutzel, Klaus, 4,416,786, Cl. 210-746.000.
- Stytsenko, Valentin D.: See—  
Kozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076, Cl. 568-361.000.
- Subramanian, Pallatheri M.: See—  
Mahr, Tibor G.; and Subramanian, Pallatheri M., 4,416,749, Cl. 204-159.140.
- Sudan, Krishan K., and Berchem, Antoine, to Reichhold Limited. Phenol formaldehyde foams, 4,417,004, Cl. 521-181.000.
- Sudhalter, Marvin: See—  
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, 4,417,151, Cl. 307-24.000.
- Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tanezo; and Kubota, Minoru, to Mitsubishi Gas Chemical Company, Inc. Apparatus for granulating sodium percarbonate, 4,416,606, Cl. 425-202.000.
- Sugawara, Mituo: See—  
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hattai, Tokuaki; and Sugawara, Mituo, 4,416,999, Cl. 501-94.000.
- Sugerman, Gerald; and Monte, Salvatore J., to Kenrich Petrochemicals, Inc. Pyrophosphato titanate adducts, 4,417,009, Cl. 523-451.000.
- Sugihara, Kiyoyuki, to Shibasaki Company Limited. Apparatus for measuring distortion factor, 4,417,310, Cl. 364-481.000.
- Sugimoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting torque in electric dynamometer, 4,416,160, Cl. 73-862.170.
- Sugitani, Hiroshi, to Canon Kabushiki Kaisha. Ink jet head, 4,417,251, Cl. 346-1.100.
- Sugitani, Yuji: See—  
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,417,128, Cl. 219-125.120.
- Sugura, Hiroyuki: See—  
Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324, Cl. 165-12.000.
- Sugiyama, Kazuo, to Matsuda, Shigeo. Discharging element energizing circuit for discharge-type fire alarm sensor unit, 4,417,217, Cl. 311-66.000.
- Sugo, Yasuhisa: See—  
Toyota, Kazuhiro; and Sugo, Yasuhisa, 4,417,326, Cl. 365-190.000.
- Sullivan, Frank E.: See—  
Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., 4,416,175, Cl. 83-29.000.
- Sullivan, John; and Lillibridge, Harold R., to Champion International Corporation. Envelope gummer cylinder clutch and brake, 4,416,651, Cl. 493-12.000.
- Sullivan, Leroy J., to Chartered Industries of Singapore Private Limited. Sear buffer, 4,416,186, Cl. 89-198.000.
- Suma, Sei: See—  
Nakada, Minoru; Shimma, Yoshiro; Inoue, Osamu; and Suma, Sei, 4,416,327, Cl. 165-122.000.
- Sumitomo Kinzoku Kogyo Kabushiki Kaisha: See—  
Hayashi, Chihiro, 4,416,134, Cl. 72-68.000.
- Sumner, Gary D. Wall mounted display case for stuffed animals, 4,416,493, Cl. 312-245.000.
- Sun-Ohio, Inc.: See—  
Jordan, Otis D., 4,416,767, Cl. 208-262.000.
- Sun Powered Inc.: See—  
Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., 4,416,255, Cl. 126-422.000.
- Sundberg, Carl W., Jr.: See—  
Commette, Denis S.; and Sundberg, Carl W., Jr., 4,416,305, Cl. 137-614.000.
- Sunds Defibrator Aktiebolag: See—  
Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548, Cl. 366-168.000.
- Sung, Rodney L.: See—  
Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., 4,416,667, Cl. 44-56.000.
- Suntola, Tuomo S.: See—  
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo J.; Suntola, Tuomo S.; and Ylilampi, Markku A., 4,416,933, Cl. 428-216.000.
- Suroff, Leonard W.: See—  
Kolt, Stanley, 4,416,415, Cl. 236-49.000.
- Susumu, Hanyu, to Janome Sewing Machine Industry Co., Ltd. Method for stitching ornamental letters by sewing machine, 4,416,209, Cl. 112-266.100.
- Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, to Diesel Kiki Company, Ltd. Vehicle temperature control apparatus, 4,416,324, Cl. 165-12.000.
- Suverkropp, Geertrudes H.: See—  
Corvers, Antonius; van den Broek, Cornelis W.; and Suverkropp, Geertrudes H., 4,417,053, Cl. 546-315.000.
- Suzuki, Hitoshi: See—  
Morozumi, Takuro; and Suzuki, Hitoshi, 4,416,236, Cl. 123-438.000.
- Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, to Aisin Seiki Co., Ltd. Friction facings reinforced with stitching, 4,416,361, Cl. 192-107.00M.
- Suzuki, Ryo: See—  
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323, Cl. 365-1.000.
- Suzuki, Takami: See—  
Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556, Cl. 400-144.200.
- Suzuki, Yasuo: See—  
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,417,128, Cl. 219-125.120.
- Suzumura, Takeshi: See—  
Saito, Shozo; and Suzumura, Takeshi, 4,416,847, Cl. 376-253.000.
- Svoboda, Glenn R.; Carlstrom, William L.; and Stoehr, Richard T., to Freeman Chemical Corporation. Low smoke isocyanurate modified urethane foam and method of making same, 4,417,001, Cl. 521-114.000.
- Swanberg, Robert H., to Union Camp Corporation. Controlled access package, 4,416,377, Cl. 206-602.000.
- Swartwout, Everett W. Bottle cap with integral measuring cup and bottle closure, 4,416,381, Cl. 215-228.000.
- Swaziek, Laurence J.: See—  
Kills, Harold J.; and Swaziek, Laurence J., 4,416,362, Cl. 193-25.00C.
- Sweeney, William M.: See—  
Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., 4,416,667, Cl. 44-56.000.
- Swift, Wayne M.: See—  
Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R., 4,416,707, Cl. 148-111.000.
- Swiss Aluminium Ltd.: See—  
Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, 4,416,489, Cl. 299-94.000.
- Symphar S.A.: See—  
Bentzen, Craig L.; Mong, Lan N.; and Niesor, Eric, 4,416,877, Cl. 424-204.000.
- Szabo nee Mogyrosi, Katalin: See—  
Gencev, Dinko; Szabo nee Mogyrosi, Katalin; Riederauer, Szilard; and Szepevolgyi, Janos, 4,416,862, Cl. 423-335.000.
- Szala, Lawrence E.: See—  
Lee, Minyoung; and Szala, Lawrence E., 4,416,840, Cl. 264-60.000.
- Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, to Tatabanyai Szebenyak. Supporting apparatus for the protection of mine gate crossings, 4,416,566, Cl. 405-291.000.

- Szendrodi, Valer; and Gyurics, Karoly, to Ikarus Karosszeria es Jarmugyar. Baggage-handling system for airports, 4,416,435, Cl. 244-114.00R.
- Szepevolgyi, Janos: See—  
Gencev, Dinko; Szabo nee Mogyrosi, Katalin; Riederauer, Szilard; and Szepevolgyi, Janos, 4,416,862, Cl. 423-335.000.
- Szysh, John A. Guide structure for trolley rail and flying pickup, 4,416,357, Cl. 191-23.00A.
- Tabasky, Marvin: See—  
McCarthy, Jeremiah P.; and Tabasky, Marvin, 4,416,055, Cl. 29-577.00C.
- Tahata, Hiromaro, to Miki Corporation. Cigarette lighter, 4,416,612, Cl. 431-131.000.
- Tabusa, Fujio: See—  
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,416,884, Cl. 424-250.000.
- Tachibana, Eiichi; and Hikosaka, Shinichi, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for fabricating gravure printing cylinders with synthetic resin surface, 4,416,215, Cl. 118-642.000.
- Tachiuchi, Tsuguy: See—  
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguy, 4,417,318, Cl. 364-900.000.
- Tackles, George J.: See—  
Jannard, James H.; and Tackles, George J., 4,416,166, Cl. 74-551.900.
- Taft, Darwin O.; and Van Siclen, Howard E., Jr., to Bendix Corporation. The Apparatus for distributing electrical signals, 4,416,245, Cl. 123-613.000.
- Tahara, Kazutoki: See—  
Sado, Ryoichi; and Tahara, Kazutoki, 4,416,498, Cl. 339-60.00R.
- Taiho Kogyo Kabushiki Kaisha: See—  
Takenaka, Akira; Shimazaki, Keichi; and Kuwazuru, Yasumitsu, 4,416,458, Cl. 277-96.100.
- Takada, Hiromi: See—  
Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556, Cl. 400-144.200.
- Takahashi, Akira: See—  
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,416,432, Cl. 242-199.000.
- Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryoichi, to Konishiroku Photo Industry Co., Ltd. Photographic light-sensitive element with nitrophenylazo metal complexable dye, 4,416,979, Cl. 430-562.000.
- Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. Muffle furnace, 4,416,623, Cl. 432-36.000.
- Takahashi, Takeshi: See—  
Kishi, Tanezo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111, Cl. 200-148.00R.
- Takahashi, Toshio: See—  
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819, Cl. 260-293.30B.
- Takahashi, Tsunehiko: See—  
Takeuchi, Hideaki; Takahashi, Tsunehiko; and Noguchi, Masaru, 4,417,149, Cl. 250-563.000.
- Takahashi, Yoshio, to Fujitsu Limited. Process for preparation of film coils, 4,416,056, Cl. 29-603.000.
- Takakuwa, Yasuo: See—  
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Izumi, Toyoko, 4,417,070, Cl. 560-56.000.
- Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, to NGK Spark Plug Co., Ltd. Gas component detector, 4,417,228, Cl. 338-34.000.
- Takamura, Yoshio: See—  
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153, Cl. 307-140.000.
- Takaoka, Michio: See—  
Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Takaoka, Keiichiro, 4,416,601, Cl. 425-68.000.
- Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Mura, Tadao, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing an optical disc, 4,417,331, Cl. 369-111.000.
- Takase, Sadao; and Hosaka, Akio, to Nissan Motor Company, Limited. Electronic control system for an internal combustion engine with correction means for correcting value determined by the control system with reference to atmospheric air pressure, 4,416,239, Cl. 123-478.000.
- Takashima, Toshiharu: See—  
Yamakage, Tetsuro; and Takashima, Toshiharu, 4,416,569, Cl. 408-4.000.
- Takasugi, Hisashi: See—  
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,416,879, Cl. 424-246.000.
- Takasugi, Sumio: See—  
Tokieda, Akinori; and Takasugi, Sumio, 4,417,005, Cl. 523-351.000.
- Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds, 4,416,879, Cl. 424-246.000.
- Takayama, Keiichi: See—  
Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, 4,416,442, Cl. 266-44.000.
- Takayama, Syuichi, to Olympus Optical Co., Ltd. Light source device for an endoscope, 4,416,524, Cl. 354-31.000.
- Takayama, Yoshihisa: See—  
Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158, Cl. 307-269.000.
- Take, Shigeo: See—  
Aoki, Susumu; Asaumi, Hiroshi; Take, Shigeo; and Akase, Masazumi, 4,416,043, Cl. 29-132.000.
- Takeda, Atsushi: See—  
Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, 4,417,024, Cl. 524-861.000.
- Takeda Chemical Industries, Ltd.: See—  
Fukuda, Tsunehiko; Kobayashi, Shigeru; and Fujino, Masahiko, 4,416,820, Cl. 548-496.000.
- Matsuo, Taisuke; and Ochiai, Michihiko, 4,416,817, Cl. 260-239.00A.
- Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, to Hokkai Can Co., Ltd. Closure arrangement for easy open type container, 4,416,390, Cl. 220-273.000.
- Takeda, Yasuhide: See—  
Kishi, Tanezo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111, Cl. 200-148.00R.
- Takemae, Yoshihiro: See—  
Mezawa, Tsutomu; Kabashima, Katsuhiko; Nozaki, Shigeaki; and Takemae, Yoshihiro, 4,417,329, Cl. 365-203.000.
- Takemoto, Toyoki: See—  
Inoue, Michihiko; Takemoto, Toyoki; and Yamada, Haruyasu, 4,417,233, Cl. 340-347.0AD.
- Takenaka, Akira; Shimazaki, Keichi; and Kuwazuru, Yasumitsu, to Taiho Kogyo Kabushiki Kaisha. Mechanical face seal with minute pores in sliding surface, 4,416,458, Cl. 277-96.100.
- Takenaka, Yoshinori: See—  
Kuroda, Toru; Takenaka, Yoshinori; and Tsuda, Nobuaki, 4,416,777, Cl. 210-446.000.
- Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, to Matsushita Electric Industrial Co., Ltd. Picture image display apparatus, 4,417,184, Cl. 315-366.000.
- Takeshita, Masatoshi: See—  
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323, Cl. 365-1.000.
- Takeuchi, Hideaki; Takahashi, Tsunehiko; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Apparatus for detecting and measuring defects, 4,417,149, Cl. 250-563.000.
- Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device, 4,416,191, Cl. 92-165.0PR.
- Takeuchi, Tomio: See—  
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Inuma, Hironobu; and Kunimoto, Seisuko, 4,416,899, Cl. 424-320.000.
- Takezawa, Teruhiro: See—  
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguy, 4,417,318, Cl. 364-900.000.
- Takimoto, Masaaki; Saida, Takashi; and Murata, Masataka, to Fuji Photo Film Co., Ltd. Electrically-conductive support for electrophotographic light-sensitive medium, 4,416,963, Cl. 430-69.000.
- Takimoto, Tadashi; Oshibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, to Japanese National Railways; and Hakusan Seisaku-sho Co., Ltd. Punching-shearing method for inspecting quality of butt welded joint, 4,416,158, Cl. 73-842.000.
- Takitani, Masaru; Baba, Keiichi; and Tomiyasu, Shizuo, to Toyo Stauffer Chemical Co., Ltd. Catalytic component for polymerizing  $\alpha$ -olefin and method for homo- or co-polymerization of  $\alpha$ -olefin, 4,416,799, Cl. 502-156.000.
- Tamura, Masuhiko: See—  
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,417,079, Cl. 568-903.000.
- Tanabe Seiyaku Co., Ltd.: See—  
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819, Cl. 260-293.30B.
- Tanaka, Chuji: See—  
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853, Cl. 420-469.000.
- Tanaka, Haruhiko: See—  
Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, 4,417,188, Cl. 318-696.000.
- Tanaka, Hisami: See—  
Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158, Cl. 307-269.000.
- Tanaka, Kazutoshi: See—  
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228, Cl. 338-34.000.
- Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, to Kokusai Denshidenwa Co., Ltd. Multi-layer magneto-optical recording medium, 4,417,290, Cl. 360-131.000.
- Tanaka, Yasuhinori; and Chikamasa, Hiroshi, to Fuji Photo Film Co., Ltd. Coating apparatus, 4,416,214, Cl. 118-410.000.
- Tanaka, Yoshimitsu: See—  
Hirotani, Yasunari; and Tanaka, Yoshimitsu, 4,416,487, Cl. 296-222.000.
- Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., to Henlan, Inc. Oil well setup and pumping apparatus, 4,416,329, Cl. 166-68.000.
- Tanner, Nathan S.: See—  
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,417,344, Cl. 373-93.000.



- Tanacetis, Inc.: See—  
Johnson, Robert A., 4,416,122, Cl. 62-448,000.
- Tappe, Horst; and Roth, Kurt, to Cassella Aktiengesellschaft. Water-insoluble azo dye stuff, for discharge printing. 4,416,665, Cl. 8-64,000.
- Tardy, John, to Western Electric Company, Inc. Methods of testing the integrity of an electrical coil as it is wound. 4,416,057, Cl. 29-605,000.
- Tarjan, Peter P.: See—  
Saulson, Stanley H.; and Tarjan, Peter P., 4,416,282, Cl. 128-419,0PG.
- Tarant Manufacturing Company: See—  
Stacey, Ralph C., 4,416,475, Cl. 285-229,000.
- Tarui, Jun: See—  
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232, Cl. 123-357,000.
- Taruishi, Yoshiaki: See—  
Kodama, Tasuku; and Taruishi, Yoshiaki, 4,416,850, Cl. 376-310,000.
- Tashiro, Hidetaka: See—  
Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, 4,416,658, Cl. 604-48,000.
- Tashiro, Makoto: See—  
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,417,262, Cl. 357-17,000.
- Tashlick, Irving: See—  
Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving, 4,416,841, Cl. 264-102,000.
- Tatabanyai Szebenyayak: See—  
Gencev, Dinko; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; and Szepvolgyi, Janos, 4,416,862, Cl. 423-335,000.
- Szebenyi, Ferenc; Kemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566, Cl. 405-291,000.
- Tatano, Toshio: See—  
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, 4,416,982, Cl. 435-11,000.
- Taylor, Allan D., to Bechtel International Corporation. Particle separating screen unit for agitation tank. 4,416,774, Cl. 210-236,000.
- Taylor, Alvin: See—  
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, 4,417,151, Cl. 307-24,000.
- Taylor, Raymond L.: See—  
Galasso, Francis S.; Veltri, Richard D.; and Taylor, Raymond L., 4,416,717, Cl. 156-242,000.
- Tazno Co., Ltd.: See—  
Sakiya, Fumio, 4,416,213, Cl. 118-52,000.
- Tazuma, James J.: See—  
Gloth, Richard E.; and Tazuma, James J., 4,417,017, Cl. 524-255,000.
- TDK Electronics Co., Ltd.: See—  
Ohkawa, Takehisa; and Yoda, Kunichi, 4,416,948, Cl. 428-447,000.
- Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Ito, Hiroshi; and Kominami, Yasuhiko, 4,416,709, Cl. 148-403,000.
- Saito, Seitoku, 4,416,943, Cl. 428-333,000.
- Yoda, Kunichi; and Ohkawa, Takehisa, 4,416,947, Cl. 428-447,000.
- Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH: See—  
Fleischmann, Heinz; and Steckmann, Helmut, 4,417,152, Cl. 307-64,000.
- Technitrol, Inc.: See—  
McInerney, George P., 4,416,449, Cl. 271-122,000.
- Tecumseh Products Company: See—  
MacLeod, John N., 4,417,195, Cl. 322-58,000.
- Tehrani, Norman N.: See—  
Wolfman, Leszek J.; Cohen, David; and Tehrani, Norman N., 4,416,297, Cl. 132-7,000.
- Tein Limited: See—  
Inata, Hiroo; and Matsumura, Shunichi, 4,416,839, Cl. 264-49,000.
- Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, 4,416,934, Cl. 428-224,000.
- Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, 4,417,018, Cl. 524-261,000.
- Teikoku Hormone Mfg. Co., Ltd.: See—  
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269, Cl. 128-41,000.
- Teledyne Industries, Inc.: See—  
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,416,628, Cl. 433-80,000.
- Telafunk Electronic GmbH: See—  
Romacker, Bertold, 4,416,066, Cl. 33-318,000.
- Tengblad, Per F.: See—  
Wiberg, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., 4,416,332, Cl. 166-246,000.
- Tenajima, Jiro, to Alps Electric Co., Ltd. Slide switch. 4,417,107, Cl. 200-16,000.
- Tenkura, Yukio: See—  
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307, Cl. 364-424,100.
- Terase, Kunihiko: See—  
Sato, Kimihiko; Terasa, Kunihiko; Kijimuta, Hiroshi; and Ohta, Yukinori, 4,416,863, Cl. 423-344,000.
- Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Method of locating abnormal originals. 4,416,539, Cl. 355-77,000.
- Teshima, Takashi: See—  
Miyakawa, Nobuhito; Teshima, Takashi; Koyama, Haruo; Miyakawa, Kouji; and Fujii, Masanori, 4,416,964, Cl. 430-106,600.
- Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH: See—  
Panthofer, Rudolf; and Ley, Hans, 4,416,037, Cl. 24-665,000.
- Tewfik, Farouk F. Liquid volume indicator. 4,417,232, Cl. 340-59,000.
- Texaco Inc.: See—  
Canup, Robert E., 4,416,246, Cl. 123-618,000.
- Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., 4,416,667, Cl. 44-56,000.
- Larkin, John M.; and Watts, Lewis W., Jr., 4,417,082, Cl. 585-10,000.
- McMahon, Matthew A.; Wilson, Raymond F.; Eng, King D.; and Burns, Robert B., 4,416,674, Cl. 55-485,000.
- von Klock, Byron; and Vuong, Dinh-Cuong, 4,416,996, Cl. 436-6,000.
- Texas Instruments Incorporated: See—  
McElroy, David J., 4,416,049, Cl. 29-571,000.
- Textron Inc.: See—  
Black, Daniel A., 4,416,572, Cl. 411-38,000.
- Th. Goldschmidt AG: See—  
Kollmeier, Hans-Joachim; and Langenhagen, Rolf-Dieter, 4,417,068, Cl. 556-479,000.
- Thermocatalytic Corp.: See—  
Craig, Laurence B.; and Farina, Alfred J., 4,416,619, Cl. 431-328,000.
- Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., to Societe Nationale Industrielle Aerospatiale; and Office National d'Etudes et de Recherches Aerospatiales. Blade section for rotating wings of an aircraft. 4,416,434, Cl. 244-35,000.
- Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,416,684, Cl. 71-95,000.
- Thilo, Peer: See—  
Scherer, Hartmut; and Thilo, Peer, 4,416,067, Cl. 33-356,000.
- Thimot, Robert P., to Hudson Lock, Inc. Cylinder lock with key removable plug. 4,416,129, Cl. 70-369,000.
- Thomas, Patrick D. P.: See—  
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,417,072, Cl. 560-86,000.
- Thomas, Richard N.; and Braggins, Timothy T., to Westinghouse Electric Corp. Restoration of high infrared sensitivity in extrinsic silicon detectors. 4,416,051, Cl. 29-572,000.
- Thomas, Richard N.; and Sopira, Michael M., to Westinghouse Electric Corp. Method of batch-fabricating flip-chip bonded dual integrated circuit arrays. 4,416,054, Cl. 29-572,000.
- Thomas, Roy L.: See—  
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,416,722, Cl. 156-578,000.
- Thompson, James G. Combination extractor and hold down mechanism for a bolt-action rifle. 4,416,077, Cl. 42-25,000.
- Thompson, Jeffrey W.: See—  
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,416,750, Cl. 204-159,190.
- Thompson, Judith D. Removeable cushion for a shopping cart. 4,416,462, Cl. 280-33,99B.
- Thompson, Neil E. S., to Petrolium Corporation. Antistatic agents for organic liquids. 4,416,668, Cl. 44-62,000.
- Thompson, Stanley C. Portable fountain for pools or spas. 4,416,420, Cl. 239-22,000.
- Thompson, Stephen W.: See—  
Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., 4,416,913, Cl. 427-45,100.
- Thomson-CSF: See—  
Grousseau, Alain, 4,417,250, Cl. 343-405,000.
- Le Sonn, Marcel, 4,417,357, Cl. 378-177,000.
- Thornburg, Donald R.: See—  
Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R., 4,416,707, Cl. 148-111,000.
- Thorne, J. Paul, to Newcor, Inc. Resistance welding system for projection welding. 4,417,122, Cl. 219-108,000.
- Thorne-Thomsen, Thomas, to Olin Corporation. Apparatus for simultaneously forming a cap member with internal threads. 4,416,142, Cl. 72-348,000.
- Thorogood, Peter B., to Burroughs Wellcome Co. Imidazole derivatives and salts thereof, their synthesis and intermediates and pharmaceutical formulations. 4,416,895, Cl. 424-273,000.
- Three Bond Co., Ltd.: See—  
Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, 4,417,040, Cl. 526-323,100.
- Thubeauville, Heinz: See—  
Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, 4,416,732, Cl. 202-139,000.
- Thyssen Industrie AG: See—  
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409, Cl. 228-173,000.
- Tillyard, Malcolm: See—  
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., 4,416,031, Cl. 12-127,000.
- Tinnis, Valentin, to Ekono Oy; and A. Ahlstrom Osakeyhtio. Steplessly adjustable device for injecting black liquor into a soda digester. 4,416,422, Cl. 239-455,000.
- TOA Nenryo Kogyo Kabushiki Kaisha: See—  
Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019, Cl. 524-456,000.
- Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, to Daicel Chemical Industries, Ltd. Resin composition emulsion. 4,417,025, Cl. 525-54,210.

- Toda, Minoru; and Osaka, Susumu, to RCA Corporation. Photoelectric drive circuit for a piezoelectric bimorph element. 4,417,169, Cl. 310-317,000.
- Todoroki, Tsunehiko: See—  
Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa, 4,417,298, Cl. 361-433,000.
- Tohoku Metal Industries, Ltd.: See—  
Sato, Yoshiro, 4,417,207, Cl. 324-158,000.
- Tokieda, Akinori; and Takasugi, Sumio, to Yokohama Rubber Co., Ltd., The Rubber compositions for tire treads. 4,417,005, Cl. 523-351,000.
- Tokunaga, Kazuyoshi; and Anzai, Masayasu, to Hitachi, Ltd. Nonimpact printer. 4,416,533, Cl. 355-4,000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—  
Hashizume, Kenichi, 4,416,223, Cl. 122-367,000.
- Hattori, Toshiaki; and Hashimoto, Yasuichi, 4,417,288, Cl. 360-74,100.
- Hirata, Akio, 4,417,193, Cl. 318-803,000.
- Hoshimi, Susumu; and Kojima, Tadashi, 4,417,283, Cl. 358-310,000.
- Iinuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, 4,416,286, Cl. 128-663,000.
- Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,417,262, Cl. 357-17,000.
- Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176, Cl. 315-59,000.
- Kodama, Tasuku; and Taruishi, Yoshiaki, 4,416,850, Cl. 376-310,000.
- Nagao, Nobuyasu; and Inoue, Takashi, 4,417,270, Cl. 358-23,000.
- Nakada, Minoru; Shimma, Yoshiro; Inoue, Osamu; and Suma, Sei, 4,416,327, Cl. 165-122,000.
- Ochii, Kiyofumi, 4,417,328, Cl. 365-203,000.
- Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshiro; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153, Cl. 307-140,000.
- Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, 4,417,331, Cl. 369-111,000.
- Yamamoto, Kazuhiko, 4,417,282, Cl. 358-296,000.
- Tolley, William K., to UOP, Inc. Recovery of titanium metal values. 4,416,693, Cl. 75-101,000.
- Tomikawa, Ryoichi: See—  
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361, Cl. 192-107,000.
- Tomioaka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, to Hitachi, Ltd. Bearing system for vertical type rotary machine. 4,416,555, Cl. 384-415,000.
- Tomita, Akitsu: See—  
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- Tomiyasu, Shizuo: See—  
Takitani, Masaru; Baba, Keiichi; and Tomiyasu, Shizuo, 4,416,799, Cl. 502-156,000.
- Tomizawa, Takayuki: See—  
Ikeda, Mikio; and Tomizawa, Takayuki, 4,416,813, Cl. 260-117,000.
- Tomkins, Donald W.: See—  
Ball, Matthew C.; and Tomkins, Donald W., 4,416,695, Cl. 106-90,000.
- Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Television receivers. 4,417,277, Cl. 358-177,000.
- Toray Silicone Company, Ltd.: See—  
Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, 4,417,024, Cl. 524-861,000.
- Totten, Roger, to Draft Systems, Inc. Load lowering device. 4,416,430, Cl. 242-107,300.
- Tottori, Takafumi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 4,416,535, Cl. 355-14,000.
- Touborg, Jorn, to F. L. Smith & Co. Method and plant such as a kiln plant for treating granular or pulverous raw material. 4,416,622, Cl. 432-14,000.
- Touchwood International S.A.: See—  
Sarkissian, Vah, 4,416,072, Cl. 36-100,000.
- Touhou, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, to Matsushita Electric Works, Ltd. Low pressure discharge lamp. 4,417,172, Cl. 313-156,000.
- Towsley, John A., to John Alan Enterprises. Weaving loom with interchangeable sections. 4,416,040, Cl. 28-152,000.
- Toyo Kogyo Co., Ltd.: See—  
Hirokuni, Yasunari; and Tanaka, Yoshimitsu, 4,416,487, Cl. 296-222,000.
- Iida, Koso, 4,416,115, Cl. 60-600,000.
- Toyo Rubber Industry Co., Ltd., The: See—  
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,417,027, Cl. 525-99,000.
- Toyo Stauffer Chemical Co., Ltd.: See—  
Takitani, Masaru; Baba, Keiichi; and Tomiyasu, Shizuo, 4,416,799, Cl. 502-156,000.
- Toyoda, Kazuhiro; and Sugo, Yasuhisa, to Fujitsu Limited. Static semiconductor memory device. 4,417,326, Cl. 365-190,000.
- Toyoda Koki Kabushiki Kaisha: See—  
Yamagake, Tetsuro; and Takashima, Toshiharu, 4,416,569, Cl. 408-4,000.
- Toyota Jidosha Kabushiki Kaisha: See—  
Matsuoka, Hiroki, 4,416,240, Cl. 123-493,000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Aoki, Keiji; and Mitsuyasu, Masaki, 4,416,237, Cl. 123-438,000.
- Arai, Hajime; and Haga, Shoji, 4,416,168, Cl. 74-740,000.
- Imamura, Noriaki, 4,416,227, Cl. 123-198,000.
- Katagin, Masayoshi; Fujii, Takashi; and Ogura, Osamu, 4,416,188, Cl. 91-369,000.
- Kato, Keigo; and Kuroiwa, Yosio, 4,416,242, Cl. 123-549,000.
- Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307, Cl. 364-424,100.
- Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235, Cl. 123-425,000.
- Trane Company, The: See—  
Eber, David H.; and Butterworth, Arthur L., 4,416,597, Cl. 418-55,000.
- Tremoux, Michel. Moulding machine, more especially a chill moulding machine comprising a framework and at least one core extraction jack mounted on a bearing element movable on the framework. 4,416,222, Cl. 164-340,000.
- Tribolet, David C.; and Kemplin, Richard M., to Hewlett-Packard Company. Bidirectional pen changer. 4,417,258, Cl. 346-139,000.
- Trihey, John M., to Malz Nominees Pty. Ltd. Heat operated pump. 4,416,587, Cl. 417-52,000.
- Troendle, Inc.: See—  
Troendle, Roy A., Sr., 4,416,100, Cl. 52-390,000.
- Troendle, Roy A., Sr., to Troendle, Inc. Modular wooden floor units and method of manufacture thereof. 4,416,100, Cl. 52-390,000.
- Truluck, Donovan. Support hanger kit for suspension ceilings and method of installation. 4,416,095, Cl. 52-173,000.
- Tseung, Alfred C. C.; and Jasem, Sameer M. Gas extraction. 4,416,758, Cl. 204-258,000.
- Tsubaki, Toru: See—  
Kishi, Taneo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111, Cl. 200-148,000.
- Tsuchiya, Kazumichi: See—  
Yokoyama, Tsuneo; and Tsuchiya, Kazumichi, 4,417,280, Cl. 358-227,000.
- Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, to Kyowa Hakko Kogyo Co., Ltd. Composition and method for decomposing hydrogen peroxide. 4,416,982, Cl. 435-11,000.
- Tsuda, Nobuaki: See—  
Kuroda, Toru; Takenaka, Yoshinori; and Tsuda, Nobuaki, 4,416,777, Cl. 210-446,000.
- Tsuji, Yasuhiro: See—  
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsuji, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055, Cl. 546-345,000.
- Tsukamoto, Goro: See—  
Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, 4,416,891, Cl. 424-270,000.
- Tsutsumi, Akira, to Amada Engineering & Service Co., Inc. Laser processing machine. 4,417,125, Cl. 219-121,01Y.
- Tsuzuki, Yoshihiko: See—  
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232, Cl. 123-357,000.
- Tuck, Richard A.; and Skinner, Heather B., to EMI-Varian Limited. Thermionic electron emitters and methods of making them. 4,417,173, Cl. 313-346,000.
- Tuerenwerke Riexinger GmbH & Co., KG: See—  
Riexinger, Gustav; and Nagel, Rudolf, 4,416,047, Cl. 29-460,000.
- Tumassian, Benjamin A.: See—  
Pelts, Boris B.; Tumassian, Benjamin A.; Egorov, Leonid P.; Zaslavsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azotian, Stepan E.; and Kostandian, Kliment A., 4,416,723, Cl. 156-608,000.
- Turi, Edith A.: See—  
Khanna, Yash P.; Turi, Edith A.; Aharoni, Shaul M.; and Largman, Theodore, 4,417,032, Cl. 525-432,000.
- Turner, Frederick T., to Varian Associates, Inc. Apparatus for asymmetrically contouring the thickness of sputter coated layers. 4,416,760, Cl. 204-298,000.
- Turner, Frederick T.: See—  
Harra, David J.; Turner, Frederick T.; and Hutchinson, Martin A., 4,416,759, Cl. 204-298,000.
- Turner, Wallace, to Rolls-Royce Limited. Electroplating of titanium and titanium base alloys. 4,416,739, Cl. 204-32,000.
- Turpin, Raymond L.; and Medford, William K. Leaf stripper. 4,416,294, Cl. 130-30,000.
- Tutt, Kingsley J.: See—  
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., 4,416,031, Cl. 12-127,000.
- Udovich, Carl A.; and Edwards, Robert C., to Standard Oil Co. (Indiana). Catalysts for the production of maleic anhydride by the oxidation of butane. 4,416,802, Cl. 502-209,000.
- Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., to Standard Oil Company (Indiana). Process for the manufacture of catalysts useful for the oxidation of butane to maleic anhydride. 4,416,803, Cl. 502-209,000.
- UE Systems, Inc.: See—  
Goodman, Mark; Zeno, John R.; and Borruso, Marty, 4,416,145, Cl. 73-40,50A.
- Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Automatic and manual focus control for objective lens assembly. 4,416,513, Cl. 350-255,000.



- Uesugi, Masaru: See—  
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163, Cl. 307-475,000.
- Ueyama, Katsuyoshi: See—  
Takimoto, Tadashi; Oshibashi, Hirotugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158, Cl. 73-842,000.
- Uhrek, Vladimir: See—  
Musson, Alan L.; and Uhrek, Vladimir, 4,416,352, Cl. 187-29,00R.
- Ullman, Myron E., to Kessler Products Co., Inc. Bottle carrier, 4,416,481, Cl. 294-87,200.
- Ullo, John J., to Schlumberger Technology Corporation. Method and apparatus for determining in situ hydrocarbon characteristics including hydrogen density, 4,416,151, Cl. 73-152,000.
- Ulvae, Seimaku Kabushiki Kaisha: See—  
Nakamura, Kazuo; Mizorogi, Hirotugu; and Isao, Akihiko, 4,416,216, Cl. 118-696,000.  
Nakamura, Kazuo; Mizorogi, Hirotugu; and Isao, Akihiko, 4,416,217, Cl. 118-696,000.
- Umeda, Naoki: See—  
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875, Cl. 424-180,000.
- Umetawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Inuma, Hironobu; and Kunitomo, Seisuko, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Antibiotic BMG162-aF2, a process for production thereof, and antitumor drug containing said new antibiotic as active ingredient, 4,416,899, Cl. 424-320,000.
- Underwood, Gene E. Degasser, 4,416,672, Cl. 55-190,000.
- Unger, Lawrence C.: See—  
Wood, Douglas E.; Kooy, Wayne J.; and Unger, Lawrence C., 4,416,560, Cl. 400-705,100.
- Union Camp Corporation: See—  
Greig, Colin C.; and Hook, Richard G., 4,416,295, Cl. 131-364,000.  
Swanberg, Robert H., 4,416,377, Cl. 206-602,000.
- Union Carbide Corporation: See—  
Colucci, Eugene C., 4,416,590, Cl. 417-231,000.  
France, Haywood G.; and Koleske, Joseph V., 4,416,917, Cl. 427-302,000.  
Pahade, Ravindra F., 4,416,677, Cl. 62-13,000.
- Uniroyal, Inc.: See—  
Kohn, Robert C., 4,416,649, Cl. 474-153,000.
- United Kingdom Atomic Energy Authority: See—  
Duncombe, Edward; Gratton, Charles P.; and Adamson, John, 4,416,851, Cl. 376-399,000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—  
Gray, Kenneth W.; Pattison, James E.; and Rees, Huw D., 4,417,261, Cl. 357-3,000.
- United States of America  
Agriculture: See—  
McGovern, Terrence P.; and Schreck, Carl E., 4,416,881, Cl. 424-248,540.  
Rosen, Howard N.; Bodkin, Robert E.; and Gaddis, Kenneth D., 4,416,069, Cl. 34-13,800.
- Air Force: See—  
Reinhardt, Bruce A.; and Arnold, Fred E., 4,417,039, Cl. 526-285,000.
- Army: See—  
Alving, Carl R.; and Steck, Edgar A., 4,416,872, Cl. 424-177,000.  
Vig, John R., 4,416,726, Cl. 156-643,000.
- Health and Human Services: See—  
Brown, Glenn E.; Karpetsky, Timothy P.; and Jewett, Phillip, 4,416,761, Cl. 204-299,00R.  
Dore, Charles F. G.; and Chambers, Geoffrey R., 4,416,662, Cl. 604-154,000.  
Walter, Roderich W.; Krivoy, William A.; Ritzmann, Ronald F.; and Bhargava, Hemendra N., 4,416,871, Cl. 424-177,000.
- National Aeronautics and Space Administration: See—  
Baucom, Robert M., 4,416,266, Cl. 128-325,000.  
Curren, Arthur N.; Forman, Ralph; Sovey, James S.; and Wintucky, Edwin G., 4,417,175, Cl. 315-5,380.  
Kleinberg, Leonard L., 4,417,215, Cl. 330-107,000.  
Lenahan, Dean T.; Corsmeier, Robert J.; and Sierman, Albert P., deceased, 4,416,111, Cl. 60-39,290.  
Nola, Frank J., 4,417,190, Cl. 318-729,000.
- Navy: See—  
Berke, Herbert, 4,417,218, Cl. 331-178,000.  
Dawson, Christopher R.; and Purkis, Ronald E., 4,416,631, Cl. 434-16,000.  
Hagen, James M.; and King, James D., 4,416,630, Cl. 434-16,000.  
Keller, Patrick N.; Franck, Jerome B.; and Silberberg, George G., 4,417,123, Cl. 219-121,0LH.  
Miles, Melvin H.; and Fletcher, Aaron N., 4,416,958, Cl. 429-103,000.  
Mooradian, Gregory C., 4,416,542, Cl. 356-435,000.
- U.S. Philips Corporation: See—  
Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasdach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, 4,417,353, Cl. 378-4,000.  
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,417,227, Cl. 338-21,000.  
Hugues, Edgar A.; Bacchus, Jean-Marie; and Haisma, Jan, 4,416,518, Cl. 350-427,000.
- Mes, Johannes A. M., 4,417,285, Cl. 358-342,000.  
van der Aa, Herman H. M., 4,416,261, Cl. 126-433,000.
- United Technologies Corporation: See—  
Anderson, William S., 4,416,710, Cl. 149-19,910.  
Galasso, Francis S.; Veltri, Richard D.; and Taylor, Raymond L., 4,416,717, Cl. 156-242,000.  
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,417,308, Cl. 364-434,000.
- Unitika Ltd.: See—  
Murase, Shigemitsu, 4,416,923, Cl. 427-387,000.
- Universal Data Systems, Inc.: See—  
Pierce, O. Leon, 4,417,099, Cl. 179-2,0DP.
- University of California, The Regents of the: See—  
Freeman, Walter J., 4,416,288, Cl. 128-731,000.
- University of Georgia Research Foundation, Inc.: See—  
Cormier, Milton J., 4,416,897, Cl. 424-315,000.  
Cormier, Milton J., 4,416,900, Cl. 424-330,000.
- University of Illinois Foundation: See—  
Drago, Russell S.; and El A'mma, Anton, 4,417,077, Cl. 568-454,000.
- UOP Inc.: See—  
Antos, George J.; and Chao, Tai-Hsiang, 4,416,804, Cl. 502-213,000.  
Arena, Blaise J.; and Rohrbach, Ronald P., 4,416,992, Cl. 435-176,000.  
Lilly, James A., 4,416,331, Cl. 166-236,000.  
Menke, Russell O.; and Bortnik, Michael, 4,416,785, Cl. 210-699,000.  
Tolley, William K., 4,416,693, Cl. 75-101,00R.
- Upjohn Company, The: See—  
Adams, Lonnie D.; and Sammons, David W., 4,416,998, Cl. 436-86,000.  
Campbell, J. Allan, 4,416,822, Cl. 260-397,400.  
VanRheenen, Verlan H., 4,416,821, Cl. 260-397,100.
- Urescher, Philipp: See—  
Beck, Siegfried; and Urescher, Philipp, 4,416,470, Cl. 281-7,000.
- Ushio Denki Kabushiki Kaisha: See—  
Horiuchi, Tatsuo, 4,416,719, Cl. 156-359,000.
- Uskert, Jerome C. Hacksaw blade connecting means, 4,416,314, Cl. 145-33,00R.
- USM Corporation: See—  
Freese, Howard W.; and Lukach, Danil, 4,416,138, Cl. 72-263,000.  
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., 4,416,031, Cl. 12-127,000.
- Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine, 4,416,235, Cl. 123-425,000.
- Uya, Masaru, to Matsushita Electric Industrial Co., Ltd. Complementary channel type MOS transistor exclusive OR/NOR logic gate circuit, 4,417,161, Cl. 307-471,000.
- Vahlensieck, Hans-Joachim: See—  
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,417,067, Cl. 556-467,000.
- Vaill, Ronald E.; Cicciotelli, Stephen S.; and Merola, Carl R., to Westinghouse Electric Corp. Switchgear shutter, 4,417,108, Cl. 200-50,0AA.
- Valcarce, Eduardo M.: See—  
Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,417,030, Cl. 525-316,000.
- Valdespino, Joseph M.: See—  
Hobby, William M.; and Valdespino, Joseph M., 4,416,224, Cl. 123-3,000.
- Valco: See—  
Billet, Rene; and Renaud, Pierre, 4,416,564, Cl. 403-282,000.
- Valleylab, Inc.: See—  
Newton, David W.; and Paterson, William G., 4,416,276, Cl. 128-303,130.  
Newton, David W.; Hulett, Frederic M., III; and Owens, Christopher, 4,416,277, Cl. 128-303,130.
- Valmet OY: See—  
Pesonen, Jori; and Koivumaki, Markku, 4,416,731, Cl. 162-308,000.  
Vedenpa, Timo; Lindstrom, Yngve; Eskelinen, Pekka; and Kotanen, Jorma, 4,416,070, Cl. 34-114,000.
- van den Broek, Cornelis W.: See—  
Corvers, Antonius; van den Broek, Cornelis W.; and Suverkrupp, Geertrudes H., 4,417,053, Cl. 546-315,000.
- van der Aa, Herman H. M., to U.S. Philips Corporation. Solar collector comprising an absorber plate which exchanges heat with the evaporator section of a heat pipe, 4,416,261, Cl. 126-433,000.
- van de Steeg, Antonius T. H.; and van Mondfrans, Gerardus H., to Stork Brabant B.V. Method and installation for cleaning a squeegee device, 4,416,704, Cl. 134-34,000.
- Vanlerberghe, Guy; and Sebag, Henri, to Societe Anonyme dite: L'Oreal. Cosmetic excipient, 4,416,868, Cl. 424-59,000.
- van Mondfrans, Gerardus H.: See—  
van de Steeg, Antonius T. H.; and van Mondfrans, Gerardus H., 4,416,704, Cl. 134-34,000.
- VanOrmer, David D., to RCA Corporation. Method for preventing blocked apertures in a cathode ray tube caused by charged particles, 4,416,642, Cl. 445-11,000.
- VanRheenen, Verlan H., to Upjohn Company, The. Process for preparing 16-methylene steroids, 4,416,821, Cl. 260-397,100.
- Van Sielen, Howard E., Jr.: See—  
Taft, Darwin O.; and Van Sielen, Howard E., Jr., 4,416,245, Cl. 123-613,000.

- Van Vlaenderen, Johannes M. H., to Alfa-Laval N.V. Apparatus for melting refrigerated butter, 4,416,326, Cl. 165-120,000.
- van Wijngaarden, Hans, to Staat der Nederlanden (Staatsbedrijf der Posten). Telegrafie en Telefonie). Letter conveyor switch drive, 4,416,450, Cl. 271-303,000.
- Van Winkle, Denzal W. Blowout preventer, 4,416,441, Cl. 251-1,00A.
- Variable Speech Control Company ("VSC"), The: See—  
Eppler, William G., Jr.; Klaseo, Michael A.; and Kornfeld, Irwin H., 4,417,103, Cl. 369-60,000.
- Varian Associates, Inc.: See—  
Harra, David J.; Turner, Frederick T.; and Hutchinson, Martin A., 4,416,759, Cl. 204-298,000.  
Muka, Richard S.; and Russo, Carl J., 4,417,347, Cl. 373-158,000.  
Turner, Frederick T., 4,416,760, Cl. 204-298,000.
- Vedenpa, Timo; Lindstrom, Yngve; Eskelinen, Pekka; and Kotanen, Jorma, to Valmet Oy. Air-directing device for multiple cylinder dryer of paper machine, 4,416,070, Cl. 34-114,000.
- Veeder Industries Inc.: See—  
Garland, Ronald M., 4,417,134, Cl. 235-61,001.
- Veltri, Richard D.: See—  
Galasso, Francis S.; Veltri, Richard D.; and Taylor, Raymond L., 4,416,717, Cl. 156-242,000.
- Verecsi, Arturo: See—  
Chiment, Domenico; and Verecsi, Arturo, 4,417,302, Cl. 364-200,000.
- Verdol S.A.: See—  
Sage, Paul, 4,416,310, Cl. 139-59,000.
- Verner, Bo L.: See—  
Ripl, Wilhelm K.; and Verner, Bo L., 4,416,779, Cl. 210-603,000.
- Verzella, David J.: See—  
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,417,308, Cl. 364-434,000.
- Viale, Maurice S.: See—  
Serres, Bernard M.; Viale, Maurice S.; and Jewiarz, Edouard J., 4,417,101, Cl. 179-8,00R.
- Vicino, Robert K.; and Bachman, Mark S., to Robert Keith & Co., Inc. Water-borne inflatable promotional device, 4,416,073, Cl. 40-326,000.
- Victor Company of Japan, Limited: See—  
Hirose, Yukimi; Enami, Ken; and Wada, Kinzo, 4,417,186, Cl. 318-254,000.  
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272, Cl. 358-44,000.  
Ito, Yasuo, 4,417,213, Cl. 328-164,000.
- Viennatone Gesellschaft M.B.H.: See—  
Langer, Adolf, 4,417,104, Cl. 179-107,00R.
- Vig, John R., to United States of America, Army. Method and apparatus for correcting the angles of cut of quartz plates, 4,416,726, Cl. 156-643,000.
- Vinch, Samuel D.: See—  
Flowers, Thomas A.; Vinch, Samuel D.; and Shahani, Cnandru T., 4,416,931, Cl. 428-159,000.
- Vinoxen Company, The: See—  
Revic, Emanuel, 4,416,869, Cl. 424-164,000.
- Virginia Panel Corporation: See—  
Stowers, Jeffrey P., 4,417,206, Cl. 324-158,00P.
- Visual Information Institute, Inc.: See—  
Harshbarger, John H.; and Shores, William M., 4,417,275, Cl. 358-139,000.
- VMEI "Ilenin": See—  
Ivanov, Vassil W., 4,416,353, Cl. 188-2,00A.
- Vock, Manfred H.: See—  
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J., 4,416,902, Cl. 426-3,000.
- Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, to BASF Aktiengesellschaft. Ethylene-alkyne copolymers, their preparation and their use as additives to petroleum distillates, 4,417,038, Cl. 526-285,000.
- Volkswagenwerk Aktiengesellschaft: See—  
Fiala, Ernst, 4,416,360, Cl. 192-0,076.
- Vonder, David L.: See—  
Sabon, Robert J.; and Vonder, David L., 4,417,205, Cl. 324-133,000.
- von Jordan, Wenzel; and Neulinger, Franz, to Metallgesellschaft AG. Method of optimizing the collection efficiency of an electrostatic precipitator, 4,416,671, Cl. 55-4,000.
- von Klock, Byron; and Vuong, Dinh-Cuong, to Texaco Inc. Hydrogen blistering corrosivity metering means and method, 4,416,996, Cl. 436-6,000.
- Von Meister, William: See—  
Hills, Michael; Durret, Clay; and Von Meister, William, 4,417,349, Cl. 375-60,000.
- Vorres, Karl S., to Institute of Gas Technology. Fluidized bed gasifier or similar device for simultaneous classification of ash and unreacted coal, 4,416,857, Cl. 422-145,000.
- Vorwerk & Co. Interholding GmbH: See—  
Ahlf, Heinz-Jurgen; and Guhne, Wieland, 4,416,034, Cl. 15-354,000.
- Votta, Frank A., Jr.: See—  
Lea, Alfred L.; and Votta, Frank A., Jr., 4,416,162, Cl. 73-862,620.
- Vsesojuzny Nauchno-issledovatel'sky i projektno-konstruktorsky institut po avtomatizatsii predpriyatij promyshlennosti stroitelnykh materialov: See—  
Gelfand, Yakov E.; Komova, Marina L.; Shstengel, Eduard G.; and Yakovis, Leonid M., 4,416,394, Cl. 222-55,000.
- Vuong, Dinh-Cuong: See—  
von Klock, Byron; and Vuong, Dinh-Cuong, 4,416,996, Cl. 436-6,000.
- W. H. Brady Co.: See—  
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- W. Haking Enterprises Limited: See—  
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- Wada, Kinzo: See—  
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- Wada, Osamu: See—  
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- Wagner Spray Tech Corporation: See—  
Karlner, Rudolf, 4,416,588, Cl. 417-199,00R.
- Wagner, Wolfgang: See—  
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- Waldo, Paul D.: See—  
McInroy, John W.; Waldo, Paul D.; and Webster, Harold R., 4,416,558, Cl. 400-279,000.
- Walker, Alan D.: See—  
Constantine, Albert B.; and Walker, Alan D., 4,416,225, Cl. 123-25,00E.
- Walker, John R.: See—  
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- Wall, Helmut, to Keiper Recaro GmbH. Arm rest for a vehicle seat, 4,416,488, Cl. 297-411,000.
- Wallace, John G. Solar collector, 4,416,265, Cl. 126-446,000.
- Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Toluic acid, 4,416,801, Cl. 502-153,000.
- Walloschek, Bernhard: See—  
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- Walter, John L.: See—  
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- Warabi, Junichi: See—  
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- Ward, Jackson G. Portable fuel and oil dispensing container, 4,416,396, Cl. 222-129,000.
- Ward, William C.: See—  
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- Warren, Gilbert G., to Bendix Corporation. The. Process for recovering nickel from spent electrolytic nickel plating solutions, 4,416,745, Cl. 204-112,000.
- Watanabe, Masanori: See—  
Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, 4,417,184, Cl. 315-366,000.
- Water Refining Company, Inc.: See—  
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- Watkins, Larry A.; and Robinson, Leon H., Jr., to Exxon Production Research Co. Apparatus for maintaining a coiled electric conductor in a drill string, 4,416,494, Cl. 339-15,000.
- Watson, James M.; Forward, Cleve H.; and Butler, James R., to Cosden Technology, Inc. Process for the production of vinyltoluene, 4,417,085, Cl. 585-440,000.



- Watt, Richard E. Engine over-temperature and oil pressure loss audible warning device. 4,417,231. Cl. 340-52.00F.
- Watts, Lewis W., Jr. See—
- Larkin, John M., and Watts, Lewis W., Jr., 4,417,082. Cl. 585-10.000.
- Waxman, Elliot. See—
- Weintraub, Morton; Waxman, Elliot, and Gendelman, Bernard. 4,417,200. Cl. 323-347.000.
- Wear, Frederick C. See—
- McKinney, Howard F.; and Wear, Frederick C. 4,416,908. Cl. 426-241.000.
- Weaver, John M. See—
- Richey, Thomas W.; Weaver, John M., and Sapone, Martin. 4,416,867. Cl. 424-49.000.
- Weber, Harold J. Moving flutter illusion electric light controller. 4,417,182. Cl. 315-210.000.
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- Weber, Walter, to Firm of Jorg Santer, The. Method and apparatus for burning waste oils. 4,416,609. Cl. 431-2.000.
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- Webster, Ronald B., to Gerber Scientific Instrument Company, The. Daylight photoplotting and film therefor. 4,416,522. Cl. 354-4.000.
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- Weibacker, Thomas O., to Bendix Corporation, The. Method of testing with computers. 4,417,336. Cl. 371-20.000.
- Weinberg, Ulli, to Reflecta GmbH Foto Film Projektion. Projection screen arrangement. 4,416,511. Cl. 350-117.000.
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- Weir, Richard L. Universal beam construction system. 4,416,097. Cl. 52-220.000.
- Weise, Lutz. See—
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- Weiss, Stefan. See—
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- Weitzel, Stephen D. See—
- Dorler, Jack A.; Mosley, Joseph M.; Seeger, Richard O., and Weitzel, Stephen D. 4,417,159. Cl. 307-270.000.
- Werkzeugmaschinenfabrik Oerlikon-Bührle AG. See—
- Jenny, Erich. 4,416,184. Cl. 89-33.00B.
- Werner, Michael. See—
- Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich. 4,417,038. Cl. 526-285.000.
- West, Robert A. See—
- Williamson, Harry L.; West, Robert A.; and Manning, Richard P. 4,417,351. Cl. 377-8.000.
- Westall, Stephen, to Dow Corning Limited. Siloxane quaternary ammonium salt preparation. 4,417,066. Cl. 556-425.000.
- Western Electric Company, Inc. See—
- Tardy, John. 4,416,057. Cl. 29-605.000.
- Westfalia Separator AG. See—
- Huster, Heinrich; Meuser, Friedrich; and Hoepke, Carl-Heinz. 4,416,701. Cl. 127-68.000.
- Westinghouse Electric Corp. See—
- Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R. 4,416,707. Cl. 148-111.000.
- Husson, Alan L.; and Uherek, Vladimir. 4,416,352. Cl. 187-29.00R.
- Mathews, Bruce D. 4,417,248. Cl. 343-16.00M.
- McGinnis, Ralph E.; and Gray, Lewis. 4,416,457. Cl. 277-53.000.
- Thomas, Richard N.; and Braggins, Timothy T. 4,416,051. Cl. 29-572.000.
- Thomas, Richard N.; and Sopira, Michael M. 4,416,054. Cl. 29-572.000.
- Vaill, Ronald E.; Ciccarelli, Stephen S., and Merola, Carl R. 4,417,108. Cl. 200-50.00A.
- White, Marvin H.; and Mack, Ingham A. G. 4,417,317. Cl. 364-825.000.
- Westvaco Corporation. See—
- Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr. 4,416,798. Cl. 502-420.000.
- Wevers, Jean. See—
- Barrat, Christian R.; Walker, John R.; and Wevers, Jean. 4,416,793. Cl. 252-117.000.
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- Metzger, Karl G.; Pfizner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo. 4,416,870. Cl. 424-172.000.
- Weynant, Eric. See—
- Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc. 4,417,041. Cl. 526-348.600.
- Wheeler, Robert P., Jr., to Concord Laboratories, Inc. Sterilization indicator. 4,416,984. Cl. 435-31.000.
- Whelchel, Robert C. See—
- Sanderson, Roger S.; and Whelchel, Robert C. 4,416,417. Cl. 236-92.00R.
- Whirlpool Corporation. See—
- Wilson, Raymond G.; and Frohbieter, Edwin H. 4,416,119. Cl. 62-149.000.
- White, Jack D., Jr., to Dayco Corporation. Belt tensioner. 4,416,647. Cl. 474-134.000.
- White, Marvin H.; and Mack, Ingham A. G., to Westinghouse Electric Corp. Adaptive analog processor. 4,417,317. Cl. 364-825.000.
- Whitear, Brian R. D. See—
- Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D. 4,417,072. Cl. 560-86.000.
- Whitefield, John T. See—
- Wise, Stephen A.; and Whitefield, John T. 4,416,182. Cl. 84-470.00R.
- Wiherger, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., to Chemical Dynamics Sweden AB. Method for increasing the pressure in oil-bearing geological structures. 4,416,332. Cl. 166-246.000.
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- Asdollahi, Norbert, and Gutzmer, Christian. 4,417,226. Cl. 337-273.000.
- Wiechert, Rudolf. See—
- Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bitler, Dieter. 4,416,985. Cl. 435-58.000.
- Wikstrom, Bo B., to SAB Industri AB. Magneto-optic transducer. 4,417,324. Cl. 365-10.000.
- Wilhelm Rögge Kunststoff-Metallisierung. See—
- Neumeister, Ernst. 4,416,602. Cl. 425-130.000.
- Wilkins, John J., to E. W. Buschman Company, The. Drive wheel and sprocket assembly. 4,416,650. Cl. 474-161.000.
- Wilkinson, Harlen E.; and Wren, Fred W., to American Can Company. Retained tab easy open end (small pour hole). 4,416,389. Cl. 220-269.000.
- Wilkinson-Tough, Gordon S., to International Gas Detectors Limited. Gas sensor elements and methods of manufacturing them. 4,416,911. Cl. 427-12.000.
- Willette, Albert D., to AMP Incorporated. Method for splicing a flat conductor cable enclosed within a sealed envelope. 4,417,096. Cl. 174-71.00R.
- Williams, Griff E. See—
- Lecznar, Chester J.; and Williams, Griff E. 4,416,600. Cl. 425-7.000.
- Williams, Robert C., to Innovative Medical Systems, Corp. Method of compensating a thermistor. 4,416,153. Cl. 73-295.000.
- Williamson, Harry L.; West, Robert A.; and Manning, Richard P., to Intercontinental Data Corporation. Stacked article counting apparatus. 4,417,351. Cl. 377-8.000.
- Williamson, Roger J., and Batchelder, David N., to ITT Industries, Inc. Vortex flow meter. 4,416,159. Cl. 73-861.220.
- Wilmington Chemical Corporation. See—
- Bowditch, W. Raymond. 4,417,033. Cl. 525-481.000.
- Wilson, Francis M., Jr., to Lockheed Corporation. Aerial transport of payloads with vertical pick up and delivery. 4,416,136. Cl. 244-137.00R.
- Wilson, H. James, to Safetran Systems Corporation. Means for use on a railroad to distinguish between traction current and signal current. 4,417,229. Cl. 349-47.000.
- Wilson, Herbert C., to Dresser Industries, Inc. Formation fluid testing and sampling apparatus. 4,416,152. Cl. 73-155.000.
- Wilson, John H. See—
- Berry, Richard E.; and Wilson, John H. 4,417,322. Cl. 364-900.000.
- Wilson, Larry K. See—
- Killat, George R.; and Wilson, Larry R. 4,416,729. Cl. 162-164.300.
- Wilson, Raymond F. See—
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- Wilson, Raymond G.; and Frohbieter, Edwin H., to Whirlpool Corporation. Variable capacity binary refrigerant refrigeration apparatus. 4,416,119. Cl. 62-149.000.
- Wilson, Richard A. See—
- Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J. 4,416,902. Cl. 426-3.000.
- Winecki, Henry. See—
- Winecki, Tadeus. 4,416,465. Cl. 280-290.000.
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- Winstead, Thomas W., to Maryland Cup Corporation. Apparatus for the continuous formation of biaxially oriented thermoplastic materials and forming articles therefrom by intermittent forming means interfaced therewith. 4,416,607. Cl. 425-325.000.

- Wintucky, Edwin G. See—
- Curren, Arthur N.; Fornan, Ralph; Sovey, James S.; and Wintucky, Edwin G. 4,417,175. Cl. 315-5.360.
- Wirz, Armin. See—
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- Wischusen, Henry, III, to Rock-Tenn Company. Collapsible carton with interior partitions. 4,416,412. Cl. 229-41.00R.
- Wisconsin Alumni Research Foundation. See—
- David, George I. 4,417,338. Cl. 371-37.000.
- Wise, Stephen A.; and Whitefield, John T., to Allen Organ Company. Keyboard instrument teaching device. 4,416,182. Cl. 84-470.00R.
- Wixon, Harold E., to Colgate-Palmolive Company. Detergent softener compositions. 4,416,811. Cl. 252-8.750.
- Wojnarowski, Robert J. See—
- Eichelberger, Charles W.; and Wojnarowski, Robert J. 4,416,914. Cl. 427-54.100.
- Wojtowicz, John A., to Olin Corporation. Process for calcium hypochlorite. 4,416,864. Cl. 423-474.000.
- Wolber, Robert; and Maurer, Roland, to Gebrüder Junghans GmbH. Drive assembly for a timepiece. 4,416,550. Cl. 368-88.000.
- Wolfram, Leszek J.; Cohen, David; and Tehrani, Norman N., to Clairrol Incorporated. Hair waving or straightening process and product. 4,416,297. Cl. 132-7.000.
- Woltersdorf, Otto W., Jr., to Terk & Co., Inc. Benzothiazolesulfonamide derivatives for the topical treatment of elevated intraocular pressure. 4,416,890. Cl. 424-270.000.
- Womack, Charles E. Catheter securing device. 4,416,664. Cl. 604-174.000.
- Wood, Charles D., to Southwest Research Institute. Fuel injection system for diesel engines. 4,416,229. Cl. 123-304.000.
- Wood, Dennis. See—
- Bellis, Robert D.; and Wood, Dennis. 4,416,364. Cl. 194-100.00A.
- Wood, Douglas E.; Kooy, Wayne J.; and Unger, Lawrence C., to Printek, Inc. Computer printer carriage control apparatus including an encoding disk. 4,416,560. Cl. 400-705.100.
- Woodhouse, Christopher R. J., to Sandoz Ltd. Organic compounds. 4,416,894. Cl. 424-273.00R.
- Woods, Donald C., to Del Mar Avionics. Validator for electrocardial data processing system. 4,417,254. Cl. 346-33.00R.
- Woodstream Corporation. See—
- Askins, William E. 4,416,081. Cl. 43-90.000.
- Worcester Controls Corporation. See—
- Cronin, Gerald F.; and Fuller, Howard J. 4,417,312. Cl. 364-510.000.
- Worthington, Paul A., to Imperial Chemical Industries PLC. 1,3-Bis-(azoly)propanols as fungicides and plant growth regulators. 4,416,682. Cl. 71-76.000.
- Wren, Fred W. See—
- Wilkinson, Harlen E.; and Wren, Fred W. 4,416,389. Cl. 220-269.000.
- Wright, John F. See—
- Sandhu, M.; Akram, Wright, John F.; and Molaire, Michel F. 4,416,965. Cl. 430-109.000.
- Wright, Richard F. See—
- Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C. 4,416,966. Cl. 430-138.000.
- Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., to United Technologies Corporation. Dual inner loop fault inhibit of aircraft outflow door. 4,417,308. Cl. 364-434.000.
- Wyman, Ransome J. Deflation-proof pneumatic tire and elastomeric fillings therefor. 4,416,844. Cl. 264-267.000.
- Xerox Corporation. See—
- Cesar, Gerald P.; and Grimshaw, Scott F. 4,416,755. Cl. 204-192.00S.
- Gundlach, Robert W. 4,416,537. Cl. 355-15.000.
- Kluger, Jacob N. 4,416,534. Cl. 355-14.05H.
- Stokes, Ronald E. 4,416,046. Cl. 29-417.000.
- Yagihara, Morio. See—
- Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi. 4,416,978. Cl. 430-548.000.
- Yakovis, Leonid M. See—
- Gelfand, Yakov E.; Komova, Marina L.; Shienget, Eduard G.; and Yakovis, Leonid M. 4,416,394. Cl. 222-55.000.
- Yamada, Haruyasu. See—
- Inoue, Michihito; Takemoto, Toyoki; and Yamada, Haruyasu. 4,417,233. Cl. 340-347.00A.
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- Yamada, Masatoshi; and Fuse, Takaji. 4,416,196. Cl. 100-7.000.
- Yamada, Masatoshi; and Fuse, Takaji, to Yamada Kikai Kogyo Kabushiki Kaisha. Tying machine. 4,416,196. Cl. 100-7.000.
- Yamada, Teruo, to Fuji Manufacturing Company Limited. Clamping mechanism for impulse sealer. 4,416,194. Cl. 53-371.000.
- Yamaguchi, Tomonobu. See—
- Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu. 4,416,269. Cl. 128-41.000.
- Yamaha Hatsudoki Kabushiki Kaisha. See—
- Fukui, Takumi. 4,416,348. Cl. 180-210.000.
- Yamakage, Tetsuro; and Takashima, Toshiharu, to Toyota Koki Kabushiki Kaisha. Tool position compensating mechanism. 4,416,569. Cl. 408-4.000.
- Yamamoto, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Document information filing system. 4,417,282. Cl. 353-296.000.
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- Yamamoto, Noboru; Morikubo, Kenichi; Komatsu, Masato; and Sei, Kazuo, to TOA Nenryo Kogyo Kabushiki Kaisha. Polyolefin molding composition containing carboxylic acid-modified polyolefin, glass fibers and calcium-silicate useful for welding. 4,417,019. Cl. 524-456.000.
- Yamamoto, Seiji, to Nikko Co., Ltd. Water-cooled lid made of steel tubing for electric furnace. 4,417,343. Cl. 373-73.000.
- Yamamoto, Takaaki. See—
- Kawai, Yasuhiro; Okamoto, Yoshiniko; Yamamoto, Takaaki; and Kato, Hisatoyo. 4,417,260. Cl. 346-160.000.
- Yamamoto, Yasunobu. See—
- Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu. 4,416,361. Cl. 192-107.00M.
- Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, to Osaka University. The President of. Glass laser amplifier having a number of trigger members. 4,417,341. Cl. 372-72.000.
- Yamashita, Mitsuo. See—
- Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao. 4,417,331. Cl. 369-111.000.
- Yamata Scale Company, Ltd. See—
- Hirano, Takashi. 4,416,341. Cl. 177-25.000.
- Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ipppei, to Jujo Paper Co., Ltd. Color-developing sheet for pressure-sensitive recording sheet. 4,416,471. Cl. 282-27.500.
- Yanagihara, Takeshi. See—
- Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro. 4,416,967. Cl. 430-159.000.
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- Yano, Kiyotoshi. See—
- Naito, Mitukazu; Yano, Kiyotoshi; and Itou, Kazuo. 4,416,243. Cl. 123-569.000.
- Yasui, Bompei. See—
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- Yates, Alan K. See—
- Cooper, Albert A.; El-Rayes, Mohamed; and Yates, Alan K. 4,416,281. Cl. 128-400.000.
- Yates, Mark A. See—
- Desmarais, Mark R.; and Yates, Mark A. 4,417,115. Cl. 200-340.000.
- Yazaki, Mitsuyoshi. See—
- Magari, Teruo; Yazaki, Mitsuyoshi; and Nakamura, Masayoshi. 4,416,809. Cl. 252-557.000.
- Yee, Dennis S. See—
- Cuomo, Jerome J.; Leary, Pamela A.; and Yee, Dennis S. 4,416,725. Cl. 156-635.000.
- Yen, Huan-Wun. See—
- Figuerola, Luis; and Yen, Huan-Wun. 4,416,053. Cl. 29-572.000.
- Yilammi, Markku A. See—
- Anson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Yilammi, Markku A. 4,416,933. Cl. 428-216.000.
- Yoda, Kunichi; and Ohkawa, Takehisa, to TDK Electronics Co. Ltd. Magnetic recording medium. 4,416,947. Cl. 428-447.000.
- Yoda, Kunichi. See—
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- Yokohama Rubber Co., Ltd., The. See—
- Tokieda, Akinori; and Takasugi, Sumo. 4,417,005. Cl. 523-351.000.
- Yokomichi, Isao. See—
- Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsuji, Yasuhiro; and Nishimura, Shigeyuki. 4,417,055. Cl. 546-345.000.
- Yokote, Yasuharu. See—
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- Yokoyama, Tsuneo; and Tsuchiya, Kazumichi, to Fuji Photo Optical Co., Ltd. Servo amplifier for television camera lens. 4,417,280. Cl. 358-227.000.
- Yon, William S., to Sonoco Products Company. Paper feed mechanism for rotary die cutter. 4,416,200. Cl. 101-228.000.
- Yono, Munim; and Dolin, Russell L. Spray assembly for refrigerated display cases. 4,416,120. Cl. 62-231.000.
- Yorgiadis, Alexander. Strain gage load cell insensitive to external pressure. 4,416,163. Cl. 73-862.650.
- Yoshida, Eiji. See—
- Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji. 4,417,341. Cl. 372-72.000.
- Yoshida, Hideaki. See—
- Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji. 4,416,853. Cl. 420-469.000.
- Yoshida, Hiroshi. See—
- Izumi, Masao; and Yoshida, Hiroshi. 4,416,192. Cl. 98-40.00N.
- Yoshida Kogeiha. See—
- Yoshida, Takashi. 4,416,247. Cl. 124-79.000.
- Yoshida Kogyo K. K. See—
- Nakagawa, Toshiaki. 4,416,060. Cl. 29-767.000.



- Yoshida, Kunio: *See—*  
Morimoto, Masafumi; Yoshida, Kunio; and Nakanishi, Tosaku, 4,417,319, Cl. 364-900,000.  
Yamanaka, Chiyo; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, 4,417,341, Cl. 372-72,000.
- Yoshida, Takashi, to Yoshida Kogisha. Domino toppling toy, 4,416,247, Cl. 124-79,000.
- Yoshimura, Noriaki; and Tamura, Masuhiko, to Kuraray Company, Limited. Process for producing normal-octanol, 4,417,079, Cl. 368-903,000.
- Young, Russell D., to Creative Pathways, Incorporated. Power source for arc welder, 4,417,129, Cl. 219-130,320.
- Yugen-Kaisha Wakatake Giken: *See—*  
Wakatake, Masayuki, 4,417,241, Cl. 340-815,050.
- Yui, Tomoyuki: *See—*  
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606, Cl. 425-202,000.
- Zagar, Steven J.; and Shy, James L., to Allis-Chalmers Corporation. Method for heat treating cement clinker raw materials, 4,416,696, Cl. 106-100,000.
- Zagar, Steven J.; and Shy, James L., to Allis-Chalmers Corporation. Method for preheating cement clinker raw materials, 4,416,697, Cl. 106-100,000.
- Zahnradfabrik Friedrichshafen, AG.: *See—*  
Merz, Johann, 4,416,598, Cl. 418-132,000.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*  
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Inuma, Hironobu; and Kunimoto, Setsuko, 4,416,899, Cl. 424-320,000.
- Zaidan Hojin Handotai Kenkyu Shinkokai: *See—*  
Nishizawa, Jun-ichi; and Shota, Ikuo, 4,416,952, Cl. 428-698,000.
- Zampino, Michael J.: *See—*  
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J., 4,416,902, Cl. 426-3,000.
- Zaromb, Solomon. Power generation apparatus, 4,416,954, Cl. 429-15,000.
- Zatulovsky, Lev M.: *See—*  
Pelts, Boris B.; Tumasian, Benjamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723, Cl. 156-608,000.
- Zdanowicz, Lawrence E.: *See—*  
Kashmerick, Gerald E.; and Zdanowicz, Lawrence E., 4,416,637, Cl. 440-60,000.
- Zeis, Jurgen, to Licentia Patent-Verwaltungs GmbH. Amplitude modulated transmitter for single sideband operation, 4,417,358, Cl. 455-109,000.
- Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., to Bell & Howell Company. Shaft coupling device, 4,416,563, Cl. 403-14,000.
- Zen, Giuseppe. Protective device, 4,416,084, Cl. 49-50,000.
- Zenith, Bernard L., to Sterling Drug Inc. Phenyl-lower-alkyl piperidines and pyrrolidines, 4,417,052, Cl. 546-246,000.
- Zeno, John R.: *See—*  
Goodman, Mark; Zeno, John R.; and Borruso, Marty, 4,416,145, Cl. 73-40,50A.
- Zetterqvist, Stig B. H.: *See—*  
Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548, Cl. 366-168,000.
- Ziegler, Walter: *See—*  
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035, Cl. 526-208,000.
- Zimmerly, Harry L., to Halkey-Roberts Corporation. Inflator guard, 4,416,393, Cl. 222-5,000.
- Zink, Leonard: *See—*  
Braverman, Milton; and Zink, Leonard, 4,416,375, Cl. 206-534,100.
- Ziphron, Inc.: *See—*  
Parr, Erwin W.; and Brandt, Timothy B., 4,416,399, Cl. 222-402,130.
- Zivny, Joseph C. Flue damper control, 4,416,611, Cl. 431-20,000.
- Zscheile, John W., Jr., to Sperry Corporation. Phase weighted adaptive processor, 4,417,249, Cl. 343-379,000.
- Zumbach Electronic AG: *See—*  
Studer, Urs P., 4,416,541, Cl. 356-386,000.
- Zuzinec, Raymond R.: *See—*  
Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., 4,416,338, Cl. 173-134,000.
- Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives, 4,417,058, Cl. 548-451,000.
- Zweifel, Hans: *See—*  
Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans, 4,416,975, Cl. 430-327,000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice)

- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*  
Kawasaki, Masahiro, Re. 31,446, Cl. 354-33,000.
- Attwood, Terence E.; and Farrant, Barry W., to Imperial Chemical Industries, Ltd. Coating compositions comprising a polysulfone and fluorocarbon polymer, Re. 31,448, Cl. 428-422,000.
- Baney, Ronald H.; and Gaul, John H., Jr., to Dow Corning Corporation. High yield silicon carbide pre-ceramic polymers, Re. 31,447, Cl. 264-65,000.
- Carter, James C., to ITT. Submerged pumping system, Re. 31,445, Cl. 222-333,000.
- Crider, William A. Fluid-driven rotary engine, Re. 31,449, Cl. 290-43,000.
- Dow Corning Corporation: *See—*  
Baney, Ronald H.; and Gaul, John H., Jr., Re. 31,447, Cl. 264-65,000.
- Farrant, Barry W.: *See—*  
Attwood, Terence E.; and Farrant, Barry W., Re. 31,448, Cl. 428-422,000.
- Gaul, John H., Jr.: *See—*  
Baney, Ronald H.; and Gaul, John H., Jr., Re. 31,447, Cl. 264-65,000.
- Imperial Chemical Industries, Ltd.: *See—*  
Attwood, Terence E.; and Farrant, Barry W., Re. 31,448, Cl. 428-422,000.
- ITT: *See—*  
Carter, James C., Re. 31,445, Cl. 222-333,000.
- Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Manual or automatic camera and electronic flash for use therewith, Re. 31,446, Cl. 354-33,000.

## LIST OF REEXAM PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Fletcher, Edwin H., to United States Freight Company. Selectively connectable boat and barge, B1 3,512,495, 11-22-83, Cl. 114-248,000.
- Mitsubishi Paper Mills, Ltd.: *See—*  
Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, B1 4,134,769, Cl. 430-199,000.
- Pacific Scientific Company: *See—*  
Yang, Elmer C., B1 1,029,221, Cl. 188-378,000.
- Tanaka, Akira: *See—*  
Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, B1 4,134,769, Cl. 430-199,000.
- Tsubai, Yasuo: *See—*  
Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, B1 4,134,769, Cl. 430-199,000.
- United States Freight Company: *See—*  
Fletcher, Edwin H., B1 3,512,495, Cl. 114-248,000.
- Yang, Elmer C., to Pacific Scientific Company. Acceleration sensitive motion snubber, B1 1,029,221, 11-22-83, Cl. 188-378,000.
- Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Offset printing plate, B1 4,134,769, 11-22-83, Cl. 430-199,000.

## LIST OF DESIGN PATENTEEES

- Aktiebolaget Bofors: *See—*  
Larsson, Torsten; and Johansson, Arne, 271,495, Cl. D15-29,000.
- American Home Products Corporation: *See—*  
Cassini, Oleg L., 271,460, Cl. D7-137,000.  
Cassini, Oleg L., 271,461, Cl. D7-150,000.
- American Standard Inc.: *See—*  
DeGraw, Kenneth J.; and Nickerson, Earl W., 271,515, Cl. D23-48,000.
- Anthos S.A.: *See—*  
Bulgari, Giovanni, 271,471, Cl. D10-32,000.
- Ashbourne Development Corporation: *See—*  
Ryan, James P.; and Downing, Roy W., 271,521, Cl. D24-30,000.
- Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight, 271,525, 11-22-83, Cl. D26-37,000.
- Bailey, Corey B.: *See—*  
Axton, Hoyt W.; and Bailey, Corey B., 271,525, Cl. D26-37,000.
- Baitz, LaVerne K., to K-Loops, Inc. Combined inoculating loop with breakaway stopper therefor, 271,519, 11-22-83, Cl. D24-8,000.
- Belrecolt S.A.: *See—*  
Kaetzel, Pierre, 271,494, Cl. D15-10,000.
- Berkline Corporation, The: *See—*  
Long, Stapleton, 271,446, Cl. D6-63,000.
- Boissonnet, Michel, to S.A.R.L. Wichard. Safety hook, 271,465, 11-22-83, Cl. D8-367,000.
- Boissonnet, Michel, to S.A.R.L. Wichard. Safety hook, 271,466, 11-22-83, Cl. D8-367,000.
- Brantingham, Mark L. Toy rocking horse, 271,503, 11-22-83, Cl. D21-75,000.
- Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument, 271,487, 11-22-83, Cl. D14-53,000.
- Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard, 271,456, 11-22-83, Cl. D6-198,000.
- Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard, 271,457, 11-22-83, Cl. D6-198,000.
- Bulgari, Giovanni, to Anthos S.A. Combined wrist watch and arm band, 271,471, 11-22-83, Cl. D10-32,000.
- Burns, Marjorie L., to Steck-Vaughn Company. Printed type font, 271,499, 11-22-83, Cl. D18-28,000.
- Byrne, David S., to Warner-Lambert Company. Disposable razor with sliding cap, 271,531, 11-22-83, Cl. D28-46,000.
- Calgon Corporation: *See—*  
Kleman, Gary B., 271,450, Cl. D6-95,000.
- Carlson, Robert D., to Keystone Consolidated Industries, Inc. Combined knob and escutcheon for cabinets or the like, 271,464, 11-22-83, Cl. D8-301,000.
- Cassini, Oleg L., to American Home Products Corporation. Fork or similar article, 271,460, 11-22-83, Cl. D7-137,000.
- Cassini, Oleg L., to American Home Products Corporation. Fork or similar article, 271,461, 11-22-83, Cl. D7-150,000.
- Claridge, Eula M. Brassiere, 271,440, 11-22-83, Cl. D2-24,000.
- Collins, John, to Leer, Inc. Pick-up truck rear panel, 271,482, 11-22-83, Cl. D12-196,000.
- Corning Glass Works: *See—*  
Herrmann, Raymond J., 271,520, Cl. D24-29,000.  
Ziver, Garo M., 271,529, Cl. D26-118,000.
- CPG Products Corp.: *See—*  
Lewis, James R., 271,506, Cl. D21-171,000.



- Crabbe, David K. See—  
Manning, John B. and Crabbe, David K., 271,501, Cl. D19-91,000.
- Crockett, Arthur C., to Simmons Universal Corporation. Arm chair, 271,448, 11-22-83, Cl. D6-69,000.
- Crockett & Kelly, Inc. See—  
Horst, Thomas A., 271,511, Cl. D22-7,000.  
Horst, Thomas A., 271,512, Cl. D22-7,000.
- Crown Luggage & Imports, Inc. See—  
Kim, John Y., 271,445, Cl. D3-76,000.
- DeGraw, Kenneth J., and Nickerson, Earl W., to American Standard Inc. Sewerless toilet or similar article, 271,515, 11-22-83, Cl. D23-48,000.
- Deima, David B. Ski rack, 271,451, 11-22-83, Cl. D6-125,000.
- Denis, Joseph W. Platform bed, 271,449, 11-22-83, Cl. D6-83,000.
- Dep, Barry, to United Plastics Corporation. Stackable box, 271,469, 11-22-83, Cl. D9-425,000.
- Dobashi, Toshiyuki, to Kabushiki Kaisha Daini Seikosha. Wristwatch, 271,473, 11-22-83, Cl. D10-38,000.
- Doodson, Peter J., to U.S. Philips Corporation. Dictating machine, 271,486, 11-22-83, Cl. D14-3,000.
- Dose, John H., deceased, and by Dose, Mildred V., executrix. Splash shield, 271,516, 11-22-83, Cl. D23-69,000.
- Dose, Mildred V., executrix. See—  
Dose, John H., deceased, and Dose, Mildred V., executrix, 271,516, Cl. D23-69,000.
- Downing, Roy W. See—  
Ryan, James P., and Downing, Roy W., 271,521, Cl. D24-30,000.
- Draheim, Harvey J. See—  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,456, Cl. D6-198,000.  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,457, Cl. D6-198,000.
- Duskin Franchise Co., Ltd. See—  
Mori, Yasuyuki, 271,517, Cl. D23-150,000.
- Etablissements Fernand Berchet. See—  
Rivollet, Marc, 271,504, Cl. D21-76,000.
- Ets. Francois Salomon et Fils. See—  
Salomon, George; and Pitiot, Roger, 271,441, Cl. D2-276,000.
- Everett, Montague, to North American Philips Corporation. Photographic processor, 271,498, 11-22-83, Cl. D16-33,000.
- Forte, Bruno, to Northwest Blueprint & Supply Co. Easel, 271,454, 11-22-83, Cl. D6-180,000.
- Fukushima, Hisao; and Tarao, Masaharu, to Oki Electric Industry Co., Ltd. Telephone set, 271,489, 11-22-83, Cl. D14-53,000.
- Fukushima, Hisao; and Tarao, Masaharu, to Oki Electric Industry Co., Ltd. Telephone set, 271,490, 11-22-83, Cl. D14-53,000.
- Gaidet, Allen, Sr. Indicator for a rural mailbox, 271,476, 11-22-83, Cl. D10-109,000.
- Gormley, Ian G., to Zimm-Zamm AG. Bat, 271,510, 11-22-83, Cl. D21-213,000.
- Green, Charles L. Combined cutting tools and holder therefor, 271,497, 11-22-83, Cl. D15-139,000.
- Gulf & Western Manufacturing Company. See—  
Lankston, Robert J., 271,518, Cl. D23-1,000.
- Harrison, Richard W. Golf tee, 271,509, 11-22-83, Cl. D21-208,000.
- Herrmann, Raymond J., to Corning Glass Works. Dilution vessel, 271,520, 11-22-83, Cl. D24-29,000.
- Hershey, Terry L., to Mole-Richardson Co. Lighting fixture, 271,527, 11-22-83, Cl. D26-63,000.
- Honeycutt, Charles M. Ring puzzle, 271,505, 11-22-83, Cl. D21-106,000.
- Hoover, Charles C. See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Horst, Thomas A., to Crockett & Kelly, Inc. Sling for a rifle, 271,511, 11-22-83, Cl. D22-7,000.
- Horst, Thomas A., to Crockett & Kelly, Inc. Rifle sling, 271,512, 11-22-83, Cl. D22-7,000.
- Interdica S.A. See—  
Kanou, Joseph, 271,459, Cl. D7-13,000.
- IRO, Inc. See—  
Lagueux, Raymond L., 271,475, Cl. D10-103,000.
- Jensen, Dale H. See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Johansson, Arne. See—  
Larsson, Torsten; and Johansson, Arne, 271,495, Cl. D15-29,000.
- K-Loops, Inc. See—  
Baitz, LaVerne K., 271,519, Cl. D24-8,000.
- Kabushiki Kaisha Daini Seikosha. See—  
Dobashi, Toshiyuki, 271,473, Cl. D10-38,000.
- Katzel, Pierre, to Belrecolt S.A. Skirt for agricultural machines for moving fodder, 271,494, 11-22-83, Cl. D15-10,000.
- Kaish, David. Decorative bicycle wheel light reflector, 271,477, 11-22-83, Cl. D10-111,000.
- Kanou, Joseph, to Interdica S.A. Goblet, 271,459, 11-22-83, Cl. D7-13,000.
- Kelman, Peppi G. Necklace or the like, 271,478, 11-22-83, Cl. D11-6,000.
- Keystone Consolidated Industries, Inc. See—  
Carlson, Robert D., 271,464, Cl. D8-301,000.
- Kim, John Y., to Crown Luggage & Imports, Inc. Attache case, 271,445, 11-22-83, Cl. D3-76,000.
- Kinder, Leon. Spray cart, 271,533, 11-22-83, Cl. D34-18,000.
- Klein, Gustave J., to Revlon Realistic Professional Products, Inc. Thermoregulator, 271,474, 11-22-83, Cl. D10-50,000.
- Kleman, Gary B., to Caigon Corporation. Dispenser for fluid or semi-fluid materials, 271,450, 11-22-83, Cl. D6-95,000.
- Kodaka, Tatsuya. Grasshopper figure, 271,479, 11-22-83, Cl. D11-162,000.
- Lagueux, Raymond L., to IRO, Inc. Housing for a stop motion, 271,475, 11-22-83, Cl. D10-103,000.
- Lankston, Robert J., to Gulf & Western Manufacturing Company. Closure for a pressure device, 271,518, 11-22-83, Cl. D23-1,000.
- Larsson, Torsten, and Johansson, Arne, to Aktiebolaget Bofors. Cutter tooth for suction dredgers, 271,495, 11-22-83, Cl. D15-29,000.
- Lauck, Howard. Pierced ear-ring holder, 271,470, 11-22-83, Cl. D9-457,000.
- Lee L. Woodard Sons, Inc. See—  
Saiger, Herbert C., 271,455, Cl. D6-191,000.
- Lee, Quarterman, to T.C.A., Inc. Glass washing machine, 271,532, 11-22-83, Cl. D32-2,000.
- Leer, Inc. See—  
Collins, John, 271,482, Cl. D12-196,000.
- Lehner, Daniel F., to Pretty Products, Inc. Combined litter basket and snack tray for a motor vehicle, 271,442, 11-22-83, Cl. D3-40,000.
- Lents, Charles M., to Stainless Ictainer Company. Sanitary machine for storing and dispensing particulate ice and for dispensing beverage, 271,462, 11-22-83, Cl. D7-305,000.
- Lents, Charles M., to Stainless Ictainer Company. Sanitary countertop machine for storing and dispensing particulate ice and for dispensing beverage, 271,463, 11-22-83, Cl. D7-305,000.
- Lents, Charles M., to Stainless Ictainer Company. Sanitary countertop machine for storing and dispensing particulate ice, 271,496, 11-22-83, Cl. D15-80,000.
- LeVine, Arthur L. Carrying case for knife sharpening apparatus, 271,444, 11-22-83, Cl. D3-74,000.
- Lewis, James R., to CPG Products Corp. Toy figure, 271,506, 11-22-83, Cl. D21-171,000.
- Lightolier Incorporated. See—  
Muller, Henry, 271,528, Cl. D26-85,000.
- Logicon, Inc. See—  
Roberts, William E., 271,492, Cl. D14-106,000.
- Long, Stapleton, to Berkline Corporation. The Sofa, 271,446, 11-22-83, Cl. D6-63,000.
- MacDonald, Sumner. Key holder, 271,443, 11-22-83, Cl. D3-61,000.
- Mak, Ting H. Desk telephone, 271,488, 11-22-83, Cl. D14-53,000.
- Malamoud, Jean G., to S. T. Dupont. Watchcase, 271,472, 11-22-83, Cl. D10-38,000.
- Manning, John B.; and Crabbe, David K., to Wright Line Inc. Adjustable support surface for holding reference or printout material, 271,501, 11-22-83, Cl. D19-91,000.
- Matcote Company, Inc. See—  
McMullen, Sam D., 271,493, Cl. D15-7,000.
- McGregor, Gerald R. Return chute attachment for basketball hoops, 271,508, 11-22-83, Cl. D21-201,000.
- McMullen, Sam D., to Matcote Company, Inc. Pump for transferring solid material and the like, 271,493, 11-22-83, Cl. D15-7,000.
- Mole-Richardson Co. See—  
Hershey, Terry L., 271,527, Cl. D26-63,000.
- Monick, George A. Reading machine for advancing and displaying reading material for physically handicapped persons, 271,500, 11-22-83, Cl. D19-91,000.
- Mori, Yasuyuki, to Duskin Franchise Co., Ltd. Air freshener dispenser or similar article, 271,517, 11-22-83, Cl. D23-150,000.
- Motorola, Inc. See—  
Taylor, Terrance N., 271,491, Cl. D14-76,000.
- Muller, Henry, to Lightolier Incorporated. Lighting fixture, 271,528, 11-22-83, Cl. D26-85,000.
- Nickerson, Earl W. See—  
DeGraw, Kenneth J.; and Nickerson, Earl W., 271,515, Cl. D23-48,000.
- North American Philips Corporation. See—  
Everett, Montague, 271,498, Cl. D16-33,000.
- Northwest Blueprint & Supply Co. See—  
Forte, Bruno, 271,454, Cl. D6-180,000.
- Oki Electric Industry Co., Ltd. See—  
Fukushima, Hisao; and Tarao, Masaharu, 271,489, Cl. D14-53,000.  
Fukushima, Hisao; and Tarao, Masaharu, 271,490, Cl. D14-53,000.
- Paul Associates, Inc. See—  
Paul, Stanley M., 271,513, Cl. D23-23,000.  
Paul, Stanley M., 271,514, Cl. D23-25,000.
- Paul, Stanley M., to Paul Associates, Inc. Faucet, 271,513, 11-22-83, Cl. D23-23,000.
- Paul, Stanley M., to Paul Associates, Inc. Faucet set, 271,514, 11-22-83, Cl. D23-25,000.
- Phillips, Glendale. See—  
Phillips, Vanice C.; and Phillips, Glendale, 271,507, Cl. D21-200,000.
- Phillips, Vanice C.; and Phillips, Glendale. Tennis ball practice catch net or the like, 271,507, 11-22-83, Cl. D21-200,000.
- Pitiot, Roger. See—  
Salomon, George; and Pitiot, Roger, 271,441, Cl. D2-276,000.

- Poley, Kenneth P. See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Pretty Products, Inc. See—  
Lehner, Daniel F., 271,442, Cl. D3-40,000.
- Revlon Realistic Professional Products, Inc. See—  
Klein, Gustave J., 271,474, Cl. D10-50,000.
- Richburg, Ferné T. Soak tub, 271,523, 11-22-83, Cl. D24-38,000.
- Rivollet, Marc, to Etablissements Fernand Berchet. Toy vehicle, 271,504, 11-22-83, Cl. D21-76,000.
- Roberts, William E., to Logicon, Inc. Merchandising terminal, 271,492, 11-22-83, Cl. D14-106,000.
- Roznyai, John W. Table, 271,452, 11-22-83, Cl. D6-149,000.
- Ryan, James P.; and Downing, Roy W., to Ashbourne Development Corporation. Pump handle for use with a biopsy specimen collector, 271,521, 11-22-83, Cl. D24-30,000.
- S.A.R.L. Wichard. See—  
Boissonnet, Michel, 271,465, Cl. D8-367,000.  
Boissonnet, Michel, 271,466, Cl. D8-367,000.
- S. C. Johnson & Son, Inc. See—  
Soos, Vilmos, 271,468, Cl. D9-377,000.
- S. T. Dupont. See—  
Malamoud, Jean G., 271,472, Cl. D10-38,000.
- Saiger, Herbert C., to Lee L. Woodard Sons, Inc. Chair frame, 271,455, 11-22-83, Cl. D6-191,000.
- Sakaguchi, Keizaburo, to Sakaguchi Plastic Industrial Co., Ltd. Snap-action clip, 271,467, 11-22-83, Cl. D8-382,000.
- Sakaguchi Plastic Industrial Co., Ltd. See—  
Sakaguchi, Keizaburo, 271,467, Cl. D8-382,000.
- Salomon, George; and Pitiot, Roger, to Ets. Francois Salomon et Fils. Alpine ski boot, 271,441, 11-22-83, Cl. D2-276,000.
- Schaffer, Michael J. See—  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,456, Cl. D6-198,000.  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,457, Cl. D6-198,000.
- Schumacher, Robert W., to Warner-Lambert Co. Two color chewing gum, 271,439, 11-22-83, Cl. D1-12,000.
- Sierra Survival Company, Inc. See—  
Axton, Hoyt W.; and Bailey, Corey B., 271,525, Cl. D26-37,000.
- Simmons Universal Corporation. See—  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,456, Cl. D6-198,000.  
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,457, Cl. D6-198,000.
- Crockett, Arthur C., 271,448, Cl. D6-69,000.
- Snodgrass, Warren H. Chair, 271,447, 11-22-83, Cl. D6-69,000.
- Soos, Vilmos, to S. C. Johnson & Son, Inc. Bottle, 271,468, 11-22-83, Cl. D9-377,000.
- Stainless Ictainer Company. See—  
Lents, Charles M., 271,462, Cl. D7-305,000.  
Lents, Charles M., 271,463, Cl. D7-305,000.  
Lents, Charles M., 271,496, Cl. D15-80,000.
- Steck-Vaughn Company. See—  
Burns, Marjorie L., 271,499, Cl. D18-28,000.
- Suckno, Abraham. Spiral stairway, 271,524, 11-22-83, Cl. D25-63,000.
- Sugai, Gerald Y. Mat for an automotive dashboard, 271,481, 11-22-83, Cl. D12-192,000.
- Sun, George C. Picture frame, 271,458, 11-22-83, Cl. D6-245,000.
- T.C.A., Inc. See—  
Lee, Quarterman, 271,532, Cl. D32-2,000.
- Tarao, Masaharu. See—  
Fukushima, Hisao; and Tarao, Masaharu, 271,489, Cl. D14-53,000.  
Fukushima, Hisao; and Tarao, Masaharu, 271,490, Cl. D14-53,000.
- Taylor, Terrance N., to Motorola, Inc. Control unit for a two-way radio or similar article, 271,491, 11-22-83, Cl. D14-76,000.
- Telefonaktiebolaget L. M. Ericsson. See—  
Bregger, Carl-Arne, 271,487, Cl. D14-53,000.
- Tucker, William. Wine rack, 271,453, 11-22-83, Cl. D6-157,000.
- Tueson, Morgan Z. Aircraft, 271,485, 11-22-83, Cl. D12-332,000.
- United Plastics Corporation. See—  
Dep, Barry, 271,469, Cl. D9-425,000.
- U.S. Philips Corporation. See—  
Doodson, Peter J., 271,486, Cl. D14-3,000.
- Vitaloni, Alberto, to Vitaloni S.p.A. Rear view mirror, 271,480, 11-22-83, Cl. D12-187,000.
- Vitaloni S.p.A. See—  
Vitaloni, Alberto, 271,480, Cl. D12-187,000.
- Warner-Lambert Company. See—  
Byrne, David S., 271,531, Cl. D28-46,000.  
Schumacher, Robert W., 271,439, Cl. D1-12,000.
- Watt, Beryl N. Mascara smudge shield, 271,530, 11-22-83, Cl. D28-7,000.
- Wiley, Robert B. Whirlpool tub, 271,522, 11-22-83, Cl. D24-38,000.
- Wilson, Gary L. See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Wood Manufacturing Company, Incorporated. See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Wood, Mickey C. See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,483, Cl. D12-300,000.  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,484, Cl. D12-300,000.
- Wright Line Inc. See—  
Manning, John B.; and Crabbe, David K., 271,501, Cl. D19-91,000.
- Zeldin, Sharon E. Game board, 271,502, 11-22-83, Cl. D21-24,000.
- Zeller, Noel E. Portable reading light, 271,526, 11-22-83, Cl. D26-60,000.
- Zimm-Zamm AG. See—  
Gormley, Ian G., 271,510, Cl. D21-213,000.
- Ziver, Garo M., to Corning Glass Works. Glass reflector for dual headlight assembly, 271,529, 11-22-83, Cl. D26-118,000.

## LIST OF PLANT PATENTEEES

- Avila, Rosendo, to Monrovia Nursery Company. *Ilex aquifolium* selection, 5,143, 11-22-83, Cl. 65,000.
- McGredy, Samuel D. Rose plant Maccanter, 5,142, 11-22-83, Cl. 20,000.
- Monrovia Nursery Company. See—  
Avila, Rosendo, 5,143, Cl. 65,000.
- Nor'East Miniature Roses, Inc. See—  
Saville, F. Harmon, 5,141, Cl. 8,000.
- Pan-American Plant Company. See—  
Shoesmith, Leonard H., 5,144, Cl. 78,000.
- Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant, 5,141, 11-22-83, Cl. 8,000.
- Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Treasure, 5,144, 11-22-83, Cl. 78,000.



# CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 22, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 44	CLASS 71	421	4,416.189	618	4,416.246	CLASS 139
49 R 4,416.025	51 4,416.666	76 4,416.682	CLASS 92	71 4,416.190	79 4,416.247	59 4,416.310	CLASS 144
161 R 4,416.026	56 4,416.667	90 4,416.683	165 PR 4,416.191	40 N 4,416.192	41 R 4,416.248	3 D 4,416.311	3 D 4,416.312
275 4,416.027	62 4,416.668	95 4,416.684	CLASS 98	115 SB 4,416.193	146 4,416.250	193 R 4,416.313	CLASS 145
CLASS 3	CLASS 46	CLASS 72	CLASS 99	CLASS 100	CLASS 101	CLASS 104	CLASS 105
1.4 4,416.028	208 4,416.083	10 4,416.130	275 4,416.194	214 4,416.196	3 R 4,416.198	88 4,416.202	CLASS 106
1.5 4,416.029	CLASS 49	12 4,416.131	544 4,416.195	7 4,416.197	193 4,416.199	224 1 4,416.203	CLASS 107
CLASS 4	50 4,416.084	41 4,416.132	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
496 4,416.030	340 4,416.085	58 4,416.133	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 8	388 4,416.086	68 4,416.134	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
464 4,416.665	462 4,416.087	130 4,416.135	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 12	502 4,416.088	157 4,416.136	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
127 4,416.031	CLASS 51	243 4,416.137	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 15	138 4,416.090	263 4,416.138	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
250.32 4,416.032	178 4,416.091	267 4,416.139	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
339 4,416.033	295 4,416.092	345 4,416.140	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
354 4,416.034	425 4,416.092	348 4,416.141	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 19	CLASS 52	479 4,416.143	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
0.2 4,416.035	71 4,416.093	CLASS 73	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 24	72 4,416.094	12 4,416.144	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
136 R 4,416.036	173 R 4,416.095	40.5 A 4,416.145	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
255 SL 4,416.038	202 4,416.096	49.5 4,416.146	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
665 4,416.037	220 4,416.097	49.6 4,416.147	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 27	309.16 4,416.098	64.4 4,416.148	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
21 4,416.039	319 4,416.099	118 4,416.149	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 28	390 4,416.100	119 A 4,416.150	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
152 4,416.040	398 4,416.101	152 4,416.151	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
255 4,416.041	692 4,416.102	155 4,416.152	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 29	371 4,416.104	295 4,416.153	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
57 4,416.042	517 4,416.105	571 4,416.154	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
132 4,416.043	CLASS 54	646 4,416.155	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
157.3 R 4,416.044	71 4,416.105	727 4,416.156	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
229 4,416.045	CLASS 55	747 4,416.157	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
417 4,416.046	4 4,416.671	842 4,416.158	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
460 4,416.047	190 4,416.672	862.17 4,416.159	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
526 R 4,416.048	267 4,416.673	862.17 4,416.160	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
571 4,416.049	485 4,416.674	862.62 4,416.161	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
572 4,416.050	502 4,416.675	862.65 4,416.162	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.051	523 4,416.676	862.65 4,416.163	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.052	CLASS 56	CLASS 74	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.053	8 4,416.106	10.33 4,416.164	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.054	11.3 4,416.107	70 4,416.165	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.055	17.5 4,416.108	551.9 4,416.166	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.056	209 4,416.109	650 4,416.167	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.057	CLASS 57	740 4,416.168	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.058	22 4,416.110	CLASS 75	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.059	CLASS 60	6 4,416.688	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.060	39.29 4,416.111	11 4,416.689	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4,416.061	251 4,416.112	26 4,416.690	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 30	513 4,416.113	60 4,416.691	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
101 4,416.062	526 4,416.114	63 4,416.692	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 33	600 4,416.115	101 R 4,416.693	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
163 4,416.063	641.8 4,416.116	CLASS 76	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
181 AT 4,416.064	650 4,416.117	25 A 4,416.169	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
203.15 4,416.065	CLASS 62	107 R 4,416.170	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
318 4,416.066	13 4,416.677	CLASS 81	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
356 4,416.067	66 4,416.118	3.46 R 4,416.171	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 34	149 4,416.119	57.37 4,416.172	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
4 4,416.068	231 4,416.120	185 4,416.173	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
13.8 4,416.069	238.6 4,416.121	CLASS 82	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
114 4,416.070	448 4,416.122	38 R 4,416.174	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
155 4,416.071	CLASS 65	29 4,416.175	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 36	2 4,416.678	582 4,416.176	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
100 4,416.072	118 4,416.679	CLASS 83	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 40	144 4,416.680	29 4,416.175	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
326 4,416.073	264 4,416.681	582 4,416.176	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
364 4,416.074	CLASS 68	CLASS 84	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
546 4,416.075	5 E 4,416.123	1.19 4,416.177	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 42	9 4,416.124	1.23 4,416.178	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
17 4,416.076	CLASS 69	272 4,416.181	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
25 4,416.077	21 4,416.125	470 R 4,416.182	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
69 R 4,416.078	CLASS 70	CLASS 89	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
CLASS 43	71 4,416.126	1.807 4,416.183	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
15 4,416.079	276 4,416.127	33 BB 4,416.184	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
42.2 4,416.080	364 A 4,416.128	33 SF 4,416.185	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
90 4,416.081	369 4,416.129	198 4,416.186	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
102 4,416.082		CLASS 91	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
		361 4,416.187	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106
		369 B 4,416.188	CLASS 100	CLASS 101	CLASS 104	CLASS 105	CLASS 106



## CLASSIFICATION OF PATENTS

61	CLASS 175	299 R	4,416,761	CLASS 227	239.3 A	4,416,818	CLASS 297	9 R	4,417,219	CLASS 332	3 TR	4,416,531	CLASS 368	502	4,416,910	CLASS 427	174	4,416,629	538	4,417,021
195	4,416,339	412	4,416,762	CLASS 228	293.3 B	4,416,819	4,416,488	CLASS 333	174	4,417,220	14 D	4,416,533	CLASS 369	226	4,416,577	CLASS 428	16	4,416,630	539	4,417,022
25	4,416,340	CLASS 206	4,416,763	CLASS 229	397.1	4,416,821	4,416,489	CLASS 334	194	4,417,221	14 R	4,416,534	CLASS 370	249	4,416,578	CLASS 429	16	4,416,631	540	4,417,023
163	4,416,341	45.29	4,416,369	CLASS 230	397.4	4,416,822	4,416,490	CLASS 335	195	4,417,222	14 SH	4,416,535	CLASS 371	534	4,416,579	CLASS 430	16	4,416,632	541	4,417,024
25	4,416,342	217	4,416,370	CLASS 231	410.9 R	4,416,823	4,416,491	CLASS 336	196	4,417,223	15	4,416,536	CLASS 372	626	4,416,580	CLASS 431	16	4,416,633	542	4,417,025
180	4,416,343	289	4,416,371	CLASS 232	439 R	4,416,824	4,416,492	CLASS 337	197	4,417,224	67	4,416,537	CLASS 373	111	4,416,581	CLASS 432	16	4,416,634	543	4,417,026
2	4,417,099	372	4,416,372	CLASS 233	453 R/Z	4,416,825	4,416,493	CLASS 338	198	4,417,225	77	4,416,538	CLASS 374	266	4,416,582	CLASS 433	16	4,416,635	544	4,417,027
5	4,417,100	432	4,416,373	CLASS 234	501.12	4,416,826	4,416,494	CLASS 339	199	4,417,226	386	4,416,541	CLASS 375	1	4,416,583	CLASS 434	16	4,416,636	545	4,417,028
8	4,417,101	507	4,416,374	CLASS 235	927 R	4,416,827	4,416,495	CLASS 340	200	4,417,227	435	4,416,542	CLASS 376	59	4,416,584	CLASS 435	16	4,416,637	546	4,417,029
107	4,417,102	534.1	4,416,375	CLASS 236	938	4,416,828	4,416,496	CLASS 341	201	4,417,228	3	4,417,261	CLASS 377	148	4,416,585	CLASS 436	16	4,416,638	547	4,417,030
8	4,417,103	554	4,416,376	CLASS 237	940	4,416,829	4,416,497	CLASS 342	202	4,417,229	17	4,417,262	CLASS 378	184	4,416,586	CLASS 437	16	4,416,639	548	4,417,031
107	4,417,104	602	4,416,377	CLASS 238	941	4,416,830	4,416,498	CLASS 343	203	4,417,230	23	4,417,263	CLASS 379	97 R	4,416,587	CLASS 438	16	4,416,640	549	4,417,032
8	4,416,344	11 LE	4,416,764	CLASS 239	942	4,416,831	4,416,499	CLASS 344	204	4,417,231	3	4,417,264	CLASS 380	13	4,416,588	CLASS 439	16	4,416,641	550	4,417,033
79	4,416,345	120	4,416,765	CLASS 240	61 L	4,416,832	4,416,500	CLASS 345	205	4,417,232	17	4,417,265	CLASS 381	52	4,416,589	CLASS 440	16	4,416,642	551	4,417,034
119	4,416,346	135	4,416,766	CLASS 241	379	4,416,833	4,416,501	CLASS 346	206	4,417,233	23	4,417,266	CLASS 382	199 R	4,416,590	CLASS 441	16	4,416,643	552	4,417,035
197	4,416,347	262	4,416,767	CLASS 242	492	4,416,834	4,416,502	CLASS 347	207	4,417,234	51	4,417,267	CLASS 383	211	4,416,591	CLASS 442	16	4,416,644	553	4,417,036
210	4,416,348	492	4,417,138	CLASS 243	49	4,416,835	4,416,503	CLASS 348	208	4,417,235	81	4,417,268	CLASS 384	211	4,416,592	CLASS 443	16	4,416,645	554	4,417,037
208	4,416,349	3	4,416,768	CLASS 244	49	4,416,836	4,416,504	CLASS 349	209	4,417,236	10	4,417,269	CLASS 385	211	4,416,593	CLASS 444	16	4,416,646	555	4,417,038
272	4,416,350	166	4,416,769	CLASS 245	86	4,416,837	4,416,505	CLASS 350	210	4,417,237	12	4,417,270	CLASS 386	211	4,416,594	CLASS 445	16	4,416,647	556	4,417,039
238	4,416,351	167	4,416,770	CLASS 246	92 R	4,416,838	4,416,506	CLASS 351	211	4,417,238	12	4,417,271	CLASS 387	211	4,416,595	CLASS 446	16	4,416,648	557	4,417,040
238	4,416,352	224	4,416,771	CLASS 247	105	4,416,839	4,416,507	CLASS 352	212	4,417,239	24	4,417,272	CLASS 388	211	4,416,596	CLASS 447	16	4,416,649	558	4,417,041
29 R	4,416,353	583	4,416,772	CLASS 248	145	4,416,840	4,416,508	CLASS 353	213	4,417,240	44	4,417,273	CLASS 389	211	4,416,597	CLASS 448	16	4,416,650	559	4,417,042
2	4,416,354	137	4,416,773	CLASS 249	152	4,416,841	4,416,509	CLASS 354	214	4,417,241	60	4,417,274	CLASS 390	211	4,416,598	CLASS 449	16	4,416,651	560	4,417,043
166	4,416,355	236	4,416,774	CLASS 250	267	4,416,842	4,416,510	CLASS 355	215	4,417,242	107	4,417,275	CLASS 391	211	4,416,599	CLASS 450	16	4,416,652	561	4,417,044
185	4,416,356	89	4,416,775	CLASS 251	44	4,416,843	4,416,511	CLASS 356	216	4,417,243	139	4,417,276	CLASS 392	211	4,416,600	CLASS 451	16	4,416,653	562	4,417,045
326	4,416,357	228	4,416,776	CLASS 252	47	4,416,844	4,416,512	CLASS 357	217	4,417,244	160	4,417,277	CLASS 393	211	4,416,601	CLASS 452	16	4,416,654	563	4,417,046
378	4,416,358	228	4,416,777	CLASS 253	47	4,416,845	4,416,513	CLASS 358	218	4,417,245	177	4,417,278	CLASS 394	211	4,416,602	CLASS 453	16	4,416,655	564	4,417,047
23 A	4,416,359	228	4,416,778	CLASS 254	47	4,416,846	4,416,514	CLASS 359	219	4,417,246	188	4,417,279	CLASS 395	211	4,416,603	CLASS 454	16	4,416,656	565	4,417,048
107	4,416,360	228	4,416,779	CLASS 255	47	4,416,847	4,416,515	CLASS 360	220	4,417,247	195	4,417,280	CLASS 396	211	4,416,604	CLASS 455	16	4,416,657	566	4,417,049
23 A	4,416,361	228	4,416,780	CLASS 256	47	4,416,848	4,416,516	CLASS 361	221	4,417,248	227	4,417,281	CLASS 397	211	4,416,605	CLASS 456	16	4,416,658	567	4,417,050
107	4,416,362	228	4,416,781	CLASS 257	47	4,416,849	4,416,517	CLASS 362	222	4,417,249	287	4,417,282	CLASS 398	211	4,416,606	CLASS 457	16	4,416,659	568	4,417,051
23 C	4,416,363	228	4,416,782	CLASS 258	47	4,416,850	4,416,518	CLASS 363	223	4,417,250	296	4,417,283	CLASS 399	211	4,416,607	CLASS 458	16	4,416,660	569	4,417,052
100 A	4,416,364	228	4,416,783	CLASS 259	47	4,416,851	4,416,519	CLASS 364	224	4,417,251	310	4,417,284	CLASS 400	211	4,416,608	CLASS 459	16	4,416,661	570	4,417,053
320	4,416,365	228	4,416,784	CLASS 260	47	4,416,852	4,416,520	CLASS 365	225	4,417,252	316	4,417,285	CLASS 401	211	4,416,609	CLASS 460	16	4,416,662	571	4,417,054
495	4,416,366	228	4,416,785	CLASS 261	47	4,416,853	4,416,521	CLASS 366	226	4,417,253	342	4,417,286	CLASS 402	211	4,416,610	CLASS 461	16	4,416,663	572	4,417,055
608	4,416,367	228	4,416,786	CLASS 262	47	4,416,854	4,416,522	CLASS 367	227	4,417,254	51	4,417,287	CLASS 403	211	4,416,611	CLASS 462	16	4,416,664	573	4,417,056
5 A	4,417,105	228	4,416,787	CLASS 263	47	4,416,855	4,416,523	CLASS 368	228	4,417,255	71	4,417,288	CLASS 404	211	4,416,612	CLASS 463	16	4,416,665	574	4,417,057
5 R	4,417,106	228	4,416,788	CLASS 264	47	4,416,856	4,416,524	CLASS 369	229	4,417,256	71	4,417,289	CLASS 405	211	4,416,613	CLASS 464	16	4,416,666	575	4,417,058
10 A	4,417,107	228	4,416,789	CLASS 265	47	4,416,857	4,416,525	CLASS 370	230	4,417,257	88	4,417,290	CLASS 406	211	4,416,614	CLASS 465	16	4,416,667	576	4,417,059
50 A	4,417,108	228	4,416,790	CLASS 266	47	4,416,858	4,416,526	CLASS 371	231	4,417,258	107	4,417,291	CLASS 407	211	4,416,615	CLASS 466	16	4,416,668	577	4,417,060
48	4,417,109	228	4,416,791	CLASS 267	47	4,416,859	4,416,527	CLASS 372	232	4,417,259	133	4,417,292	CLASS 408	211	4,416,616	CLASS 467	16	4,416,669	578	4,417,061
144 B	4,417,110	228	4,416,792	CLASS 268	47	4,416,860	4,416,528	CLASS 373	233	4,417,260	186	4,417,293	CLASS 409	211	4,416,617	CLASS 468	16	4,416,670	579	4,417,062
144 R	4,417,111	228	4,416,793	CLASS 269	47	4,416,861	4,416,529	CLASS 374	234	4,417,261	304	4,417,294	CLASS 410	211	4,416,618	CLASS 469	16	4,416,671	580	4,417,063
302	4,417,112	228	4,416,794	CLASS 270	47	4,416,862	4,416,530	CLASS 375	235	4,417,262	379	4,417,295	CLASS 411	211	4,416,619	CLASS 470	16	4,416,672	581	4,417,064
317	4,417,113	228	4,416,795	CLASS 271	47	4,416,863	4,416,531	CLASS 376	236	4,417,263	405	4,417,296	CLASS 412	211	4,416,620	CLASS 471	16	4,416,673	582	4,417,065
340	4,417,114	228	4,416,796	CLASS 272	47	4,416,864	4,416,532	CLASS 377	237	4,417,264	1	4,417,297	CLASS 413	211	4,416,621	CLASS 472	16	4,416,674	583	4,417,066
19	4,417,115	228	4,416,797	CLASS 273	47	4,416,865	4,416,533	CLASS 378	238	4,417,265	1.1	4,417,298	CLASS 414	211	4,416,622	CLASS 473	16	4,416,675	584	4,417,067
218	4,417,116	228	4,416,798	CLASS 274	47	4,416,866	4,416,534	CLASS 379	239	4,417,266	8	4,417,299	CLASS 415	211	4,416,623	CLASS 474	16	4,416,676	585	4,417,068
8	4,416,732	228	4,416,799	CLASS 275	47	4,416,867	4,416,535	CLASS 380	240	4,417,267	18	4,417,300	CLASS 416	211	4,416,624	CLASS 475	16	4,416,677	586	4,417,069
1	4,416,733	228	4,416,800	CLASS 276	47	4,416,868	4,416,536	CLASS 381	241	4,417,268	49	4,417,301	CLASS 417	211	4,416,625	CLASS 476	16	4,416,678	587	4,417,070
28	4,416,734	228	4,416,801	CLASS 277	47	4,416,869	4,416,537	CLASS 382	242	4,417,269	59	4,417,302	CLASS 418	211	4,416,626	CLASS 477	16	4,416,679	588	4,417,071
32 R	4,416,735	228	4,416,802	CLASS 278	47	4,416,870	4,416,538	CLASS 383	243	4,417,270	164	4,417,303	CLASS 419	211	4,416,627	CLASS 478	16	4,416,680	589	4,417,072
43 N	4,416,736	228	4,416,803	CLASS 279	47	4,416,871	4,416,539	CLASS 384	244	4,417,271	172	4,4								



## CLASSIFICATION OF DESIGNS

D1—	12	271,439		191	271,455	D10—	32	271,471		53	271,487		75	271,503	D24—	8	271,519
D2—	24	271,440		198	271,456		38	271,472			271,488		76	271,504		29	271,520
	276	271,441			271,457			271,473			271,489		106	271,505		30	271,521
D3—	40	271,442		245	271,458		50	271,474			271,490		171	271,506		38	271,522
	61	271,443	D7—	13	271,459		103	271,475		76	271,491		200	271,507			271,523
	74	271,444		137	271,460		109	271,476		106	271,492		201	271,508	D25—	63	271,524
	76	271,445		150	271,461		111	271,477		7	271,493		208	271,509	D26—	37	271,525
D6—	63	271,446		305	271,462	D11—	6	271,478		10	271,494		213	271,510		60	271,526
	69	271,447			271,463		162	271,479		29	271,495	D22—	7	271,511		63	271,527
		271,448	D8—	301	271,464	D12—	187	271,480		80	271,496		1	271,512		85	271,528
	83	271,449		367	271,465		192	271,481		139	271,497	D23—	1	271,513		118	271,529
	95	271,450			271,466		196	271,482		33	271,498		23	271,514	D28—	7	271,530
	125	271,451		382	271,467		300	271,483	D16—	28	271,499		25	271,515		46	271,531
	149	271,452	D9—	377	271,468			271,484	D18—	91	271,500		48	271,516			271,532
	157	271,453		425	271,469		332	271,485	D19—		271,501		69	271,517	D32—	2	271,533
	180	271,454		457	271,470	D14—	3	271,486	D21—	24	271,502		150	271,518	D34—	18	271,534

## CLASSIFICATION OF PLANTS

P—	8	5,141	20	5,142	65	5,143	78	5,144
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GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,416,296	9 : 4,416,151	4,416,582	4,416,955	4,416,563	4,417,314
4 : 4,416,913	4,416,211	4,416,589	4,417,028	4,416,573	4,417,315
4,417,177	4,416,297	4,416,627	4,417,103	4,416,611	4,417,316
4,417,216	4,416,596	4,416,629	4,417,203	4,416,637	4,416,265
4,417,335	4,416,649	4,416,651	4,417,243	4,416,750	4,416,272
6 : 4,416,073	4,417,109	4,416,661	4,416,267	4,416,802	4,416,571
4,416,103	4,417,189	4,416,684	4,416,699	4,416,803	4,416,064
4,416,143	4,417,196	4,416,685	4,416,749	4,416,804	4,416,466
4,416,161	4,417,308	4,416,688	4,416,801	4,416,829	4,417,010
4,416,163	4,417,346	4,416,708	4,416,942	4,416,857	4,417,229
4,416,166	4,416,155	4,416,710	4,416,974	4,416,871	4,417,351
4,416,175	4,416,664	4,416,759	4,416,981	4,416,886	4,416,100
4,416,202	4,417,099	4,416,766	4,416,904	4,416,903	4,416,284
4,416,221	4,416,275	4,416,774	4,416,872	4,416,904	4,416,333
4,416,285	4,416,429	4,416,844	4,416,027	4,416,944	4,416,405
4,416,378	4,416,552	4,416,946	4,416,063	4,416,992	4,416,433
4,416,395	4,416,715	4,416,958	4,416,224	4,417,006	4,416,479
4,416,417	4,416,798	4,416,988	4,416,282	4,417,045	4,416,547
4,416,425	4,416,845	4,417,050	4,416,283	4,417,077	4,416,313
4,416,438	4,416,039	4,417,080	4,416,393	4,417,114	4,416,478
4,416,464	4,416,271	4,417,087	4,416,700	4,417,143	4,417,266
4,416,493	4,416,396	4,417,088	4,416,905	4,417,180	4,416,026
4,416,495	4,416,445	4,417,123	4,417,146	4,417,205	4,416,095
4,416,504	Re.31,445	4,417,125	4,417,218	4,417,221	4,416,183
4,416,630	4,416,050	4,417,129	4,417,224	4,417,224	4,416,414
4,416,631	4,416,052	4,417,181	3,512,495	4,417,230	4,416,607
4,416,640	4,416,053	4,417,195	4,416,195	4,417,237	4,416,639
4,416,657	4,416,074	4,417,212	4,416,205	4,417,252	4,416,761
4,416,692	4,416,102	4,417,214	4,416,412	4,417,294	4,416,805
4,416,714	4,416,177	4,417,231	4,416,436	4,416,032	4,416,865
4,416,760	4,416,181	4,417,244	4,416,614	4,416,058	4,416,866
4,416,764	4,416,249	4,417,253	4,416,810	4,416,107	4,416,881
4,416,775	4,416,273	4,417,258	4,416,897	4,416,132	4,417,157
4,416,785	4,416,288	4,417,286	4,416,900	4,416,167	4,417,215
4,416,859	4,416,301	4,417,313	4,416,244	4,416,244	4,417,238
4,417,141	4,416,302	4,417,325	4,416,314	4,416,314	4,417,248
4,417,183	4,416,308	4,417,334	4,416,069	4,417,317	4,417,317
4,417,211	4,416,329	1,029,221	4,416,079	4,416,659	4,416,055
4,417,245	4,416,372	4,416,071	4,416,086	4,416,683	4,416,129
4,417,254	4,416,383	4,416,276	4,416,142	4,416,734	4,416,135
4,417,265	4,416,397	4,416,328	4,416,171	4,416,756	4,416,289
4,417,289	4,416,406	4,416,628	4,416,194	4,416,788	4,416,388
4,417,299	4,416,420	4,417,074	4,416,199	4,416,818	4,416,401
4,417,330	4,416,430	4,416,078	4,416,248	4,416,994	4,416,407
4,417,348	4,416,444	4,416,369	4,416,371	4,417,046	4,416,496
4,416,146	4,416,455	4,416,418	4,416,376	4,417,049	4,416,514
4,416,277	4,416,465	4,416,477	4,416,381	4,417,198	4,416,538
4,416,355	4,416,474	4,416,522	4,416,386	4,417,199	4,416,654
4,416,512	4,416,485	4,416,591	4,416,398	4,417,332	4,416,670
4,416,532	4,416,530	4,416,681	4,416,398	4,416,219	4,416,722
4,416,660	4,416,531	4,416,864	4,416,416	4,416,220	4,416,778
4,417,256	4,416,542	4,416,909	4,416,528	4,416,300	4,416,838
		4,416,915	4,416,549	4,416,399	4,416,855



## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,416,957	4,417,115	4,416,334	4,416,189	4,416,521	4,416,814
4,416,971	4,417,309	4,416,359	4,416,193	4,416,570	4,416,824
4,417,030	4,416,057	4,416,413	4,416,201	4,416,572	4,416,825
4,417,044	4,416,126	4,416,415	4,416,212	4,416,581	4,416,837
4,417,064	4,416,176	4,416,475	4,416,252	4,416,595	4,416,929
4,417,182	4,416,290	4,416,499	4,416,304	4,416,620	4,416,996
4,417,194	4,416,291	4,416,517	4,416,309	4,416,642	4,417,000
4,417,197	4,416,294	4,416,534	4,416,440	4,416,645	4,417,003
4,417,273	4,416,305	4,416,537	4,416,445	4,416,656	4,417,082
4,417,312	4,416,325	4,416,540	4,416,481	4,416,707	4,417,085
4,417,347	4,416,352	4,416,567	4,416,553	4,416,727	4,417,154
Re. 31,447	4,416,377	4,416,583	4,416,604	4,416,843	4,417,164
4,416,040	4,416,400	4,416,590	4,416,608	4,416,882	4,417,239
4,416,042	4,416,453	4,416,592	4,416,648	4,416,890	4,417,278
4,416,119	4,416,454	4,416,619	4,416,650	4,416,973	4,417,301
4,416,120	4,416,516	4,416,626	4,416,767	4,416,986	4,417,321
4,416,130	4,416,610	4,416,632	4,416,773	4,417,022	4,417,322
4,416,174	4,416,618	4,416,633	4,416,826	4,417,029	4,416,062
4,416,197	4,416,635	4,416,641	4,416,836	4,417,033	4,416,274
4,416,280	4,416,644	4,416,653	4,416,861	4,417,094	4,416,690
4,416,307	4,416,726	4,416,666	4,416,920	4,417,097	4,416,693
4,416,358	4,416,765	4,416,667	4,416,921	4,417,106	4,416,711
4,416,367	4,416,789	4,416,674	4,416,926	4,417,108	4,417,249
4,416,459	4,416,792	4,416,675	4,416,930	4,417,150	4,417,327
4,416,560	4,416,807	4,416,676	4,416,937	4,417,162	4,417,120
4,416,600	4,416,811	4,416,677	4,416,938	4,417,202	Re. 31,449
4,416,615	4,416,823	4,416,725	4,416,940	4,417,235	4,416,255
4,416,729	4,416,831	4,416,735	4,416,966	4,417,268	4,416,266
4,416,821	4,416,833	4,416,745	4,417,017	4,417,303	4,416,404
4,416,822	4,416,841	4,416,751	4,417,039	4,417,339	4,416,462
4,416,931	4,416,867	4,416,752	4,417,059	4,416,038	4,416,787
4,416,945	4,416,873	4,416,755	4,417,170	4,416,122	4,416,935
4,416,998	4,416,876	4,416,771	4,417,175	4,416,170	4,417,206
4,417,122	4,416,887	4,416,840	4,417,175	4,416,200	4,417,246
4,417,195	4,416,896	4,416,869	4,417,275	4,416,431	4,417,349
4,417,201	4,416,902	4,416,874	4,416,092	4,416,936	4,416,106
4,417,276	4,416,916	4,416,901	4,416,154	4,417,016	4,416,114
4,417,320	4,416,924	4,416,914	4,416,402	4,417,116	4,416,131
4,416,029	4,416,941	4,416,922	4,416,451	4,416,336	4,416,292
4,416,059	4,416,954	4,416,932	4,416,554	4,416,956	4,416,349
4,416,083	4,416,960	4,416,950	4,416,770	4,416,251	4,416,452
4,416,323	4,416,968	4,416,959	4,417,089	4,416,492	4,416,520
4,416,354	4,416,972	4,416,961	4,417,311	4,416,757	4,416,579
4,416,392	4,417,007	4,416,961	4,416,045	4,416,077	4,416,625
4,416,410	4,417,008	4,416,970	4,416,077	4,416,169	4,416,738
4,416,497	4,417,009	4,416,995	4,416,270	4,417,274	4,417,147
4,416,551	4,417,015	4,417,042	4,416,270	4,417,344	4,416,337
4,416,588	4,417,023	4,417,052	4,416,480	4,416,035	4,416,737
4,416,603	4,417,031	4,417,054	4,416,776	4,416,049	4,416,917
4,416,718	4,417,031	4,417,061	4,416,854	4,416,085	4,416,048
4,416,842	4,417,032	4,417,069	4,416,051	4,416,112	4,416,089
4,416,906	4,417,062	4,417,078	4,416,054	4,416,118	4,416,108
4,416,907	4,417,063	4,417,100	4,416,081	4,416,147	4,416,133
4,417,247	4,417,075	4,417,151	4,416,087	4,416,152	4,416,148
4,417,291	4,417,084	4,417,159	4,416,093	4,416,210	4,416,262
4,417,305	4,417,092	4,417,168	4,416,144	4,416,229	4,416,263
4,417,306	4,417,102	4,417,200	4,416,153	4,416,330	4,416,299
4,416,065	4,417,160	4,417,232	4,416,156	4,416,339	4,416,315
4,416,075	4,417,234	4,417,295	4,416,162	4,416,340	4,416,338
4,416,253	4,417,240	4,417,352	4,416,182	4,416,342	4,416,362
4,416,260	4,417,264	4,416,258	4,416,203	4,416,346	4,416,366
4,416,370	4,417,269	4,416,331	4,416,222	4,416,439	4,416,379
4,416,380	4,417,296	4,416,505	4,416,357	4,416,441	4,416,574
4,416,647	4,417,336	4,416,698	4,416,365	4,416,463	4,416,597
4,416,668	4,417,337	4,417,096	4,416,374	4,416,472	4,416,636
4,416,687	4,416,044	4,416,025	4,416,375	4,416,476	4,416,696
4,416,908	4,416,082	4,416,033	4,416,382	4,416,482	4,416,697
4,416,484	4,416,138	4,416,096	4,416,387	4,416,494	4,417,001
4,417,133	4,416,145	4,416,097	4,416,411	4,416,558	4,417,105
4,416,293	4,416,245	4,416,111	4,416,424	4,416,593	4,417,144
4,416,250	4,416,246	4,416,140	4,416,449	4,416,669	4,417,356
4,416,421	4,416,254	4,416,141	4,416,702	4,416,703	4,416,672
4,416,984	4,416,264	4,416,157	4,416,501	4,416,754	
	4,416,279	4,416,173	4,416,506		

## DESIGN PATENTS

05 : 271,483	271,525	20 : 271,518	36 : 271,439	271,505	48 : 271,462
271,484	271,527	25 : 271,501	271,444	39 : 271,442	271,463
271,445	271,511	271,521	271,460	271,448	271,485
271,447	271,512	27 : 271,453	271,461	271,449	271,493
271,464	271,476	29 : 271,450	271,474	271,451	271,496
271,469	271,498	271,532	271,499	271,455	271,507
271,470	271,526	32 : 271,440	271,513	271,503	271,519
271,477	271,516	271,452	271,514	271,506	271,533
271,478	271,522	34 : 271,458	271,528	271,520	271,488
271,481	271,508	271,515	271,529	41 : 271,509	271,500
271,492	271,491	271,524	271,530	44 : 271,443	271,456
271,497	271,523	271,531	271,475	47 : 271,446	271,457
271,502	271,482				
18 : 271,482					

## PLANT PATENTS

06 : 5,143	25 : 5,141				
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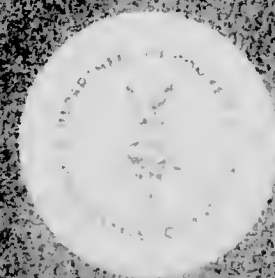




Vol 1036 Number 5

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE



PATENTS

November 24, 1963



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CONTENTS	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information .....	1036 OG 30
Board of Appeals Decisions .....	1036 OG 30
Reissue Applications Filed .....	1036 OG 30
Request for Reexamination Filed .....	1036 OG 30
Notice of Availability for Licensing .....	1036 OG 30
Service by Publication .....	1036 OG 31
Government-Owned Inventions Available for Licensing .....	1036 OG 31
PTO Status .....	1036 OG 35
Telephone Directory .....	1036 OG 37
Patent Certificates of Correction .....	1036 OG 51
Disclaimer .....	1036 OG 51
Disclaimers and Dedications .....	1036 OG 51
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries .....	1036 OG 52
Condition of Patent Applications .....	1036 OG 53
Reissue Patents Granted (31,450) .....	1717
Plant Patents Granted (5,145) .....	1719
Patents Granted	
General and Mechanical (4,417,359) .....	1721
Chemical (4,417,895) .....	1907
Electrical (4,418,238) .....	1997
Design Patents Granted (271,534) .....	2065
Reexaminations .....	2085
Index of Patentees .....	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees .....	PI 39
Classification of	
Patents (Including Reissues and Reexaminations) .....	PI 43
Designs and Plants .....	PI 45
Geographical Index of Residence of Inventors	
Patents (Including Reissues) .....	PI 46
Designs and Plants .....	PI 47
Change of Address Form and Subscription Order Form .....	Back Page

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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
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U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
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European Patent Office as Searching Authority	
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International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

Dec. 3, 1982.

### Board of Appeals Decisions Rendered in the Month of Oct. 1983

Affirmed	141
Affirmed in part	18
Reversed	48
Total	207

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,219,017, Re. S.N. 467,642, Filed Feb. 18, 1983, Cl. 128/204.26, PILOT REGULATOR, Ralph F. Osterhout, et al., Owner of Record: Bank of the West, Palo Alto, Calif., Attorney or Agent: David R. Murphy, Es. Gp.: 335

4,240,149, Re. S.N. 532,347, Filed Sept. 15, 1983, Cl. 344/483, MEASURING SYSTEM, David L. Fletcher, et al., Owner of Record: Leeds & Northrup Co., North Wales, Pa., Attorney or Agent: Harold Huberfeld, Es. Gp.: 232

4,289,138, Re. S.N. 499,803, Filed June 1, 1983, Cl. 128/803, ELECTRODE ASSEMBLY FOR TEMPORARY PACING AND HEART MEASUREMENTS,

Kenneth Halvorsen, Owner of Record: Mansfield Scientific, Inc., Mansfield, Mass., Attorney or Agent: Richard A. Wise, et al., Ex. Gp.: 355

4,369,727, Re. S.N. 533,442, Filed Sept. 19, 1983, Cl. 114/297, ANCHOR, Rudolph Fasco, Owner of Record: Inventor, Attorney or Agent: John H. Olman, et al., Ex. Gp.: 315

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,289,856, Reexam. No. 90/000,464, Requested: Oct. 28, 1983, Cl. 521/51, PROCESS FOR PREPARING NON-YELLOWING INTEGRAL-SKINNED POLYURETHANE FOAM USING A POLYOL HAVING A FUNCTIONALITY OF 4 TO 8, Masaki Yamamoto, et al., Owner of Record: Toyo Rubber Industry Co. Ltd., Osaka, Japan, Attorney or Agent: Sughrue, Mion, et al., Ex. Gp.: 143, Requester: Cushman, Darby & Cushman, Washington, D.C.

### National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS  
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents  
U.S. Department of Commerce  
P.O. Box 1423  
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,  
Program Coordinator,  
Office of Government Inventions and Patents  
National Technical Information Service  
U.S. Department of Commerce.

### DEPARTMENT OF AGRICULTURE

SN 6-509,091. SHIELDED SNIFFING DEVICE.

### DEPARTMENT OF THE AIR FORCE

SN 6-195,693 (4,392,775). FLAT WORKPIECE PICK-UP.

SN 6-201,860 (4,392,709). METHOD OF MANUFACTURING HOLOGRAPHIC ELEMENTS FOR FIBER AND INTEGRATED OPTIC SYSTEMS.  
SN 6-232,094 (4,392,624). IMPLANTED BOUNDARY LAYER TRIP.

NOVEMBER 29, 1983

U.S. PATENT AND TRADEMARK OFFICE

1036 OG 31

SN 6-283,245 (4,395,469). LOW PRESSURE NICKEL HYDROGEN BATTERY.

SN 6-300,761 (4,391,660). COPPER CONTAINING BALLISTIC ADDITIVES.

SN 6-300,762 (4,395,684). R.F. PRIMED PLASMA LIMITER FOR RADAR RECEIVER PROTECTOR.

SN 6-307,347 (4,393,198). COPOLYMERS FROM OCTAFLUORONAPHTHALENE.

SN 6-308,973 (4,394,223). TIN AND GOLD PLATING PROCESS.

SN 6-368,785 (4,393,997). REMOVABLE SECONDARY AIRCRAFT FUEL ENCLOSURE.

SN 6-387,580 (4,393,101). DIETHYNYLBENZENE-ETHYNYLPYRENE COPOLYMERS.

### DEPARTMENT OF THE ARMY

SN 4-578,938 (4,354,192). RADIO RANGING.

SN 5-953,292 (4,369,811). NULL BALANCING FOR FLUIDIC SENSORS AND AMPLIFIERS.

SN 6-074,634 (4,357,713). METHOD AND APPARATUS FOR REDUCTION OF MODAL NOISE IN FIBER OPTIC SYSTEMS.

SN 6-111,738 (4,373,553). BROAD BAND FLUERIC AMPLIFIER.

SN 6-133,735 (4,335,655). METHOD AND APPARATUS FOR DETONATING EXPLOSIVE IN RESPONSE TO DETONATION OF REMOTE EXPLOSIVE.

SN 6-142,548 (4,362,106). FLOW DEFLECTOR FOR AIR DRIVEN POWER SUPPLY.

SN 6-153,461 (4,350,315). DEVICE TO DE-SPIN OBJECTS WITH VERY HIGH SPIN.

SN 6-158,556 (4,345,460). MULTI-CALIBER PROJECTILE SOFT RECOVERY SYSTEM.

SN 6-169,004 (4,341,158). APPARATUS FOR ELIMINATING POWER SOURCE RISE TIME EFFECTS IN A TIME FUZE SYSTEM.

SN 6-175,543 (4,367,474). FREQUENCY-AGILE POLARIZATION DIVERSE MICROSTRIP ANTENNAS AND FREQUENCY SCANNED ARRAYS.

SN 6-176,319 (4,348,649). MICROWAVE POWER PULSE GENERATOR.

SN 6-198,673 (4,379,296). SELECTABLE-MODE MICROSTRIP ANTENNA AND SELECTABLE-MODE MICROSTRIP ANTENNA ARRAYS.

SN 6-216,232 (4,375,082). HIGH SPEED RECTANGLE FUNCTION GENERATOR.

SN 6-217,881 (4,381,002). FLUIDIC-CONTROLLED OXYGEN INTERMITTENT DEMAND FLOW DEVICE.

SN 6-230,177 (4,360,896). WRITE MODE CIRCUITRY FOR PHOTOVOLTAIC FERROELECTRIC MEMORY CELL.

SN 6-278,263 (4,382,678). MEASURING OF FEATURE FOR PHOTO INTERPRETATION.

SN 6-290,138 (4,392,348). DEVICE FOR BLEEDING MOTOR GASES THRU MOTOR POLE PIECE.

SN 6-311,368 (4,385,055). 2-ACETYL-AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES AS ANTIMALARIALS.

SN 6-316,574 (4,393,048). PROTECTIVE GEL COMPOSITION FOR WOUNDS.

SN 6-316,575 (4,391,799). PROTECTIVE GEL COMPOSITION FOR TREATING WHITE PHOSPHORUS BURN WOUNDS.

### DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-515,169. AUTOMATED SYSTEM FOR DETERMINING THE MOLECULAR WEIGHT AND/OR CONCENTRATION OF MACROMOLECULES VIA SEDIMENTATION EQUILIBRIUM.

### Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceed-

ings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.)

Wansco Paper Products Co., Inc., New York, N.Y., Reg. No. 408,838, for the mark "HIAWATHA PRODUCTS" and design, Canc. No. 13,870.

Wansco Paper Products Co., Inc., New York, N.Y., Reg. No. 408,837, for the mark "HIAWATHA BOND", Canc. No. 13,871.

Dream Merchant, Inc., Industry, Calif., Reg. No. 1,098,816, for the mark "DELTA", Canc. No. 13,880.

ERMA S. BROWN,

Deputy Clerk,  
Trademark Trial and  
Appeal Board.

For MARGARET M. LAURENCE,  
Assistant Commissioner  
for Trademarks.

### DEPARTMENT OF DEFENSE

Department of the Navy

Government-Owned Inventions  
Available for Licensing

The inventions listed below are assigned to the United States Government as represented by the Secretary of the Navy and are made available for licensing by the Department of the Navy.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for \$1.00 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), 5285 Port Royal Rd., Springfield, Va. 22161. Requests for copies of patent applications must include the patent application serial number. Claims are deleted from patent application copies sold to avoid premature disclosure.

For further information contact:

Dr. A. C. Williams  
Staff Patent Adviser  
Office of Naval Research (Code 305)  
800 N. Quincy St.  
Arlington, Va. 22217  
Telephone No. 202-696-4005

### U.S. DEPARTMENT OF THE NAVY

Patent application 649,614. Float Torjectory Projectile. Filed Jan. 14, 1976.

Patent application 142,951. Wavelength Multiplexer-Demultiplexer. Filed Apr. 23, 1980.

Patent application 189,428. Multi-Component Propellant Charges. Filed Sept. 22, 1981.

Patent application 241,952. GaAs FET Oscillator. Filed Mar. 9, 1981.

Patent application 250,471. Underwater Excavator. Filed Apr. 2, 1981.

Patent application 257,683. Visual Field Perimeter and Psychomotor Tracking Performance Measuring Apparatus. Filed Apr. 27, 1981.

Patent application 258,068. Handhole Seat Resurfacing Tool for Naval Fired Boilers. Filed Apr. 27, 1981.

Patent application 261,353. Low Susceptibility Proof Mass for a Single Axis Drag Compensation System. Filed May 7, 1981.



- Patent application 269,171. Quick Deployment Vehicle. Filed June 2, 1981.
- Patent application 269,182. Device for Economizing Data Bandwidth. Filed June 2, 1981.
- Patent application 278,785. Internal Tube Welding Apparatus. Filed June 29, 1981.
- Patent application 280,767. Laser Formed Video Tube Calibration Markers. Filed July 6, 1981.
- Patent application 308,310. Optical Fiber System for Measuring Magnetic Fields. Filed Oct. 5, 1981.
- Patent application 317,028. Underwater Depth Telemetry. Filed Nov. 2, 1981.
- Patent application 335,308. Cavity-Microstrip Multi-Mode Antenna. Filed Dec. 28, 1981.
- Patent application 338,356. Method and Apparatus for Determining Lubricant Stability. Filed June 14, 1981.
- Patent application 334,858. Phase Dependent Radio Navigation Apparatus with Balanced Active Voltage Probe Antenna and Impulse Noise Blanking. Filed Jan. 11, 1982.
- Patent application 338,787. Utilization of Entire Transmitted Bandwidth in Continuous Transmission FM Sonar. Filed Jan. 11, 1982.
- Patent application 341,410. 1,3-Diamino-5, Fluoro-2,4,6-Trinitrobenzene and Methods of Preparation. Filed Jan. 21, 1982.
- Patent application 342,543. Pneumatic Launcher System. Filed Jan. 25, 1982.
- Patent application 361,942. Refractory Ohmic Contacts to GaAs and the Method of Making Same. Filed Mar. 25, 1982.
- Patent application 364,818. Oil Filled Towed Array Hose Without Couplings. Filed Apr. 2, 1982.
- Patent application 365,816. Realtime Data Smoother and Significant Values Selector. Filed Apr. 5, 1982.
- Patent application 368,793. Apparatus and Method for Determining the Phase Sensitivity of Hydrophones. Filed Apr. 15, 1982.
- Patent application 374,557. Method for Measuring Particle Velocity Using Differential Photodiode Arrays. Filed May 3, 1982.
- Patent application 376,468. Serial Pipeline FFT Processor. Filed May 10, 1982.
- Patent application 387,633. Microbending Fiber Optic Acoustic Sensor. Filed June 6, 1982.
- Patent application 388,296. Continuous Contour Linear Assembly Press Joint. Filed June 14, 1982.
- Patent application 389,132. Wide-Band Distributed RF Coupler. Filed June 12, 1982.
- Patent application 389,133. Wide-Band Hyrotion Traveling-Wave Amplifier. Filed June 16, 1982.
- Patent application 391,786.  $\text{NF}_4\text{XeF}_7$  and  $(\text{NF}_4)\text{XeF}_8$ . Filed June 24, 1982.
- Patent application 393,949. Preparing of SiC/Al Composites from Scrap. Filed June 30, 1982.
- Patent application 394,194. Fiber Optic Hull Penetrator Insert. Filed July 1, 1982.
- Patent application 394,759. Fabrication of Graded SiC/Al and G/Al Composites For Use in the First Wall of a Controlled Thermonuclear Reactor. Filed July 1, 1982.
- Patent application 395,388. Low-Drag Body Conformal Acoustic Array. Filed July 6, 1982.
- Patent application 395,566. Tapered Seal for Flow-Through Module. Filed July 6, 1982.
- Patent application 398,500. Magnetic Bridge Proximity Sensor. Filed July 15, 1982.
- Patent application 402,016. Sampled Towed Array Telemetry. Filed July 26, 1982.
- Patent application 403,688. A Dual Channel Gate Peak Detector. Filed July 30, 1982.
- Patent application 404,684. Wideband Electrical/Optical Multiplexer. Filed Aug. 3, 1982.
- Patent application 406,428. Fast Granular Superconductive Bolometer. Filed Aug. 9, 1982.
- Patent application 410,229. Improved Permeable Base Transistor Structure. Filed Aug. 23, 1982.
- Patent application 411,164. Ceramic-Metal Airfield Runway Markings. Filed Aug. 25, 1982.
- Patent application 413,596. Zinc-Diffused Narrow Stripe AlGaAl/GaAs Double-Heterostructure Laser. Filed Aug. 31, 1982.
- Patent application 414,129. Quasioptical Gyrokystron. Filed Sept. 2, 1982.
- Patent application 415,639. W-Shaped Diffused Stripe GaAs/AlGaAs Laser. Filed Sept. 7, 1982.
- Patent application 417,815. Simulated Oxygen Breathing Apparatus. Filed Sept. 13, 1982.
- Patent application 417,826. Intensity Modulated Light Source. Filed Sept. 13, 1982.
- Patent application 418,870. Optical Fiber Directional Coupler Method. Filed Sept. 16, 1982.
- Patent application 419,257. Polarimetric Fabry-Perot Sensor. Filed Sept. 17, 1982.
- Patent application 419,364. A Deployment Mechanism. Filed Sept. 16, 1982.
- Patent application 420,209. Phase-Coded Pulse Expander-Compressor. Filed Sept. 20, 1982.
- Patent application 420,990. Laser Pumped by X-Band Microwave. Filed Sept. 21, 1982.
- Patent application 421,766. Pn Junction Controlled Field Emitter Array Cathode. Filed Sept. 23, 1982.
- Patent application 422,122. Frequency-Spreading Coupler. Filed Sept. 23, 1982.
- Patent application 423,335. Pressure Sensitive Valve Actuator. Filed Sept. 24, 1982.
- Patent application 423,889. Interferometric Hydrophone Reference Leg Low Frequency Compensation. Filed Sept. 27, 1982.
- Patent application 423,941. Complementary Interferometric Hydrophone. Filed Sept. 27, 1982.
- Patent application 427,027. A Planar Compound Semiconductor Insulated Gate Field Transistor and a Virtual Self-Aligned Process for Making the Same. Filed Sept. 29, 1982.
- Patent application 429,692. Gauge for Measuring High Transient Pressures. Filed Sept. 30, 1982.
- Patent application 430,097. System for Detection of Transducer Defects. Filed Sept. 30, 1982.
- Patent application 431,977. Method for Making Josephson Junctions with Contamination-Free Interfaces. Filed Sept. 30, 1982.
- Patent application 431,981. An Optical RB Downconverter. Filed Sept. 30, 1982.
- Patent application 432,215. Temperature-Insensitive Optical Fibers. Filed Oct. 1, 1982.
- Patent application 433,580. Thermal Sight Training Device. Filed Oct. 12, 1982.
- Patent application 433,765. Method of Producing a Piezoelectric Material. Filed Oct. 12, 1982.
- Patent application 435,155. Gyrotron Traveling-Wave Device Including Quarter Wavelength Anti-Reflective Dielectric Layer to Enhance Microwave Absorption. Filed Oct. 19, 1982.
- Patent application 435,156. Superlattice Ultrasonic Wave Generator. Filed Oct. 19, 1982.
- Patent application 437,083. Shock-Hardened Hydrophone. Filed Oct. 27, 1982.
- Patent application 437,092. System for Rapid Repair of Damaged Airfield Runways. Filed Oct. 27, 1982.
- Patent application 437,098. Fiber Optic Sensors Operating at DC. Filed Oct. 27, 1982.

- Patent application 437,708. Inflatable Boat with De-mountable Transom. Filed Oct. 29, 1982.
- Patent application 437,915. Improved Tunnel Diode and Method of Making. Filed Oct. 29, 1982.
- Patent application 438,211. Magneto-mechanical Energy Conversion. Filed Nov. 1, 1982.
- Patent application 438,239. Deep Submergence Vehicle (DSV) Lightweight Cable Cutter. Filed Nov. 1, 1982.
- Patent application 440,685. Controlled-Line-width Laser Source. Filed Nov. 16, 1982.
- Patent application 440,687. Novel Alloys and Method of Making. Filed Nov. 10, 1982.
- Patent application 442,410. Raster Shifting Delay Compensation System. Filed Nov. 17, 1982.
- Patent application 443,828. Technique Fabricating MnO<sub>2</sub> Structures Utilizing Hydrogen Ion Implantation. Filed Nov. 22, 1982.
- Patent application 444,139. Balanced System for Ranging and Synchronization Between Satellite Pairs. Filed Nov. 24, 1982.
- Patent application 444,639. CCD Head and Eye Position Indicator. Filed Nov. 26, 1982.
- Patent application 445,777. Semi-Active Notch Filter. Filed Nov. 30, 1982.
- Patent application 445,877. Single Zone Lighting Controller. Filed Dec. 1, 1982.
- Patent application 445,875. Underwater Sound Generator. Filed Dec. 1, 1982.
- Patent application 446,107. Pivoting Pipe Layer. Filed Dec. 2, 1982.
- Patent application 446,926. A Cable Deployment System. Filed Dec. 6, 1982.
- Patent application 450,693. Method for Eliminating Birefringence in a Fiber Optical Coupler and a Coupler Polarization Corrector. Filed Dec. 17, 1982.
- Patent application 451,893. Method for Bonding Insulator to Insulator. Filed Dec. 21, 1982.
- Patent application 453,025. A Fast Intense Pumping System for Generation of Vacuum Ultraviolet Laser Emission from Solid State Crystals. Filed Dec. 27, 1982.
- Patent application 453,631. Lightweight, Broadband Rayleigh Wave Transducer. Filed Dec. 27, 1982.
- Patent application 453,674. Dinitropropyl Fluorodinitroethyl Formal Plasticizer and Method of Preparation. Filed Dec. 27, 1982.
- Patent application 453,675. 3,3,3-Trinitropropanol and Method of Preparation. Filed Dec. 27, 1982.
- Patent application 454,308. High Frequency Ohmic Contact. Filed Dec. 29, 1982.
- Patent application 456,916. Bicolimated Dual Reflector Antenna. Filed Jan. 10, 1983.
- Patent application 462,493. Reversible Optical Waveguide Vapor Sensor. Filed Jan. 31, 1983.
- Patent application 462,860. Fiber Optic Interferometer Using Two Wavelengths or Variable Wavelength. Filed Feb. 1, 1983.
- Patent application 463,103. Test Device for Expendable Bathymograph Set (XBT). Filed Feb. 2, 1983.
- Patent application 467,421. Dual Scan Rate Radar. Filed Feb. 17, 1983.
- Patent application 467,430. Combined Microwave Parallel Amplifier-RF Attenuator/Modulator. Filed Feb. 17, 1983.
- Patent application 467,714. 1:1:3 and 1:3 "Mixed" Polymethacrylate Orthocarbonates Via "Mixed" Trialkoxymethyl Trichloromethyl Disulfides. Filed Feb. 18, 1983.
- Patent application 467,715. Derivatives of Energetic Orthoformates. Filed Feb. 18, 1983.
- Patent application 467,727. Radiation Source Shield and Calibration. Filed Feb. 18, 1983.
- Patent application 470,843. Compact Phased Array Fed Dual Reflector Antenna System. Filed Feb. 28, 1983.
- Patent application 471,942. Battlefield Friend or Foe Identification Trainer. Filed Mar. 3, 1983.
- Patent application 472,330. A Fixed Aperture, Rotating Feed, Beam Scanning Antenna System. Filed Mar. 4, 1983.
- Patent application 473,411. Free Electron Laser Injection Oscillator. Filed Mar. 9, 1983.
- Patent application 474,607. Magnetically Induced Laser. Filed Mar. 11, 1983.
- Patent application 477,208. Smoke Generator for Use with Water and Smoke Generant. Filed Mar. 21, 1983.
- Patent 3,434,551. Buoyant Coring Apparatus. Filed June 26, 1967. Patented Mar. 25, 1969.
- Patent 3,621,447. Electrical Connection For Deep Submergence Lights. Filed Dec. 22, 1969. Patented Nov. 16, 1971.
- Patent 3,998,223. Syringe Apparatus. Filed Oct. 24, 1975. Patented Dec. 21, 1976.
- Patent 4,092,858. Oceanographic Sensor with in-Situ Cleaning and Bio-Fouling Prevention System. Filed Mar. 11, 1977. Patented June 6, 1978.
- Patent 4,233,678. Serial Phase Shift Beam-former Using Charge Transfer Devices. Filed Mar. 12, 1979. Patented Nov. 11, 1980.
- Patent 4,229,832. Diver's Suit Excess Gas Exhaust Valve. Filed May 21, 1979. Patented Oct. 28, 1980.
- Patent 4,326,374. High Velocity Exhaust Diffuser and Water Baffle. Filed Mar. 18, 1980. Patented Apr. 27, 1980.
- Patent 4,241,427. Condition Responsive Cable with Bendable Coaxial Sensor Mount. Filed Oct. 27, 1978. Patented Dec. 23, 1980.
- Patent 4,241,898. Purge Valve for Diver's Mask. Filed Jan. 8, 1979. Patented Dec. 30, 1980.
- Patent 4,244,455. Rotary Shaft Decoupling Mechanism. Filed Oct. 17, 1978. Patented Jan. 13, 1981.
- Patent 4,244,456. Ejected Roller Shaft Disconnect Mechanism. Filed Sept. 21, 1978. Patented Jan. 13, 1981.
- Patent 4,246,671. Buoy Anchoring System. Filed Nov. 21, 1979. Patented Jan. 27, 1981.
- Patent 4,248,854. Production of Antibody Toward Asbestos and Immunoassay Therewith. Filed Aug. 27, 1979. Patented Feb. 3, 1981.
- Patent 4,251,794. Flexible Linear Thermal Array. Filed Dec. 10, 1979. Patented Feb. 17, 1981.
- Patent 4,293,339. Underwater Wax Formulation. Filed Feb. 28, 1980. Patented Oct. 6, 1981.
- Patent 4,295,212. Linear Acoustic Array. Filed Jan. 28, 1980. Patented Oct. 13, 1981.
- Patent 4,317,000. Contrahelically Laid Torque Balanced Benthic Cable. Filed July 23, 1980. Patented Feb. 23, 1982.
- Patent 4,330,812. Circuit Board Electronic Component Cooling Structure with Composite Spacer. Filed Aug. 4, 1980. Patented May 18, 1982.
- Patent 4,346,348. Laser Technique for Accurately Determining the Compensation Density in N-Type Narrow Gas Semiconductor. Filed Feb. 28, 1980. Patented Aug. 24, 1982.
- Patent 4,345,207. Method and Apparatus for Obtaining Enhanced NMR Signals. Filed Apr. 24, 1980. Patented Aug. 17, 1982.
- Patent 4,346,953. Antenna Coupling Assembly. Filed Apr. 10, 1980. Patented Aug. 31, 1982.
- Patent 4,347,474. Solid State Regulated Power Transformer with Waveform Conditioning Capability. Filed Sept. 18, 1980. Patented Aug. 31, 1982.
- Patent 4,347,485. Excimer-Pumped Blue-Green Laser. Filed May 23, 1979. Patented Aug. 31, 1982.



- Patent 4,347,517. Microstrip Backfire Antenna. Filed Jan. 26, 1981. Patented Aug. 31, 1982.
- Patent 4,347,580. Array Convolver/Correlator. Filed July 21, 1980. Patented Aug. 31, 1982.
- Patent 4,347,593. Piezoceramic Tubular Element With Zero End Displacement. Filed Dec. 7, 1979. Patented Aug. 31, 1982.
- Patent 4,347,891. Thermochemical Energy Transport Process. Filed May 6, 1980. Patented Sept. 7, 1982.
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## Status of PTO Services

The following is an update of the status of PTO services as of November 3, 1983:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual
Filing Receipts:		
Patents	22	23
Trademarks	30	29
Patent Copies:		
Window Coupons	5	98% within 5 days
Mail Coupons	29	100% within 22 days
Letter Orders	34	100% within 24 days
Certified Copies:		
Trademark Registrations	30	8
Applications-As-Filed	20	98% within 10 days
File-Wrapper/Contents	N/A	100% within 20 days
Walk-up Certification	1	100% within 1 day
Trademark Search Library:		
Filing Drawings	21	19
Filing Reg. Certificates	3	On schedule
Assignments:		
Patents	25	22
Trademarks	25	15
Avg. Days from Issue Fee Payment to Issue Date	90-100	92
Patent Official Gazette:		
In Bookstore	Issue Date	On schedule
Mailed	Issue Date	Avg. 1 day late
Patent Grants Mailed	Issue Date	Avg. 1 day late
Patent Copies Available	Issue Date	Avg. 5 days late
Trademark Official Gazette:		
In Bookstore	Issue Date	On schedule
Mailed	Issue Date	On schedule
Trademark Regs. Mailed	Issue Date	On schedule

## IMPROVEMENTS TO SERVICES

- *Patent and Trademark Copy Orders.* We understand there is a problem with unfilled patent and/or trademark copy orders. We are requesting our contractor to provide us with the date of the oldest order not filled. We plan to provide this statistic in future service statistics. If you currently have any old outstanding unfilled orders, send the appropriate information to:

Public Service Center  
U.S. Patent and Trademark Office  
CP3-2C24  
Washington, D.C. 20231  
(703) 557-5168

These orders will be completed as soon as possible.

- *Customer Service Inquires.* Effective October 1, 1983, the Office of Patent and Trademark Services was reorganized. All inquiries previously handled by the Customer Services Division on (202) 377-3937 will be handled as follows:

1. Certified Copies and Other Related Documents—(202) 377-4359

Nov. 3, 1983.

2. Subscriptions Services — (202) 377-5435
  3. Copy Fulfillment/MACRO Systems, Inc. — (202) 377-2535
- *Microfilming Active Trademark and Patent File Histories.* The request for Proposals (RFP) was issued by the Department of Commerce on September 14, 1983. Contract award is anticipated to be mid-December, with filming of current issues to begin in early January.
  - *Telephone and Location Directory* — Over the past several months, many PTO organizational units have been relocated to utilize newly acquired space in the most effective manner. Following is a directory with current telephone and location information. The directory is by organizational unit. As changes occur to this directory, they will be published.

THERESA A. BRELSFORD,  
Assistant Commissioner  
for Administration.



## Telephone Directory

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Circulation 2nd Floor CP34.....	557-2957
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177	Residual Phase Separation, Phase Change Chemical Apparatus Misc Indust Proc- ess Frank W. Lutter rm 5C17 CP3.....	557-3677

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210	Industrial Electronics Physics and Related Elements rm 9C17 CP4.....	557-2887
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216	Weighing Scales, Electrical Transmission and Interconnection Circuit Makers and Breakers Recorders and Electrical Protection Systems Elliott A. Goldberg rm 9C17 CP4.....	557-2887
217	Electric Motor Systems Prime Mover Dynamo Plants Elevators Music Electric Horology Computers and Data Processing Systems Gene Z. Rubinson rm 9C17 CP4..	557-5080
220/290	Special Laws Administration and Designs rm 10D19 CP4.....	557-2478
	Director Kenneth L. Cage rm 10D19 CP4.....	557-2877
	Secretary Diana J. Langer rm 10D19 CP4.....	557-2877
	Clerk Cecelia J. Krider rm 10C17 CP4.....	557-2478
	Licensing and Review Edward M. Drazdowsky rm 10C24 CP4.....	557-2167
221	Mechanical Richard E. Schafer rm 10C17 CP4.....	557-2894
222	Electrical M. R. Wilbur rm 10C17 CP4.....	557-2897
223	Chemical B. R. Padgett rm 10C17 CP4.....	557-2037
290	Designs rm 3C17 CP3.....	557-2476
	Clerical and Services Section Stella Reid rm 3C17 CP3.....	557-2476
291	Industrial Arts Wallace R. Burke rm 3B18 CP3.....	557-2172
292	Household Personal and Fine Arts (Vacant) rm 3B36 CP3.....	557-2265

230	Information Transmission Processing Storage and Retrieval.....	557-2878
	Director Earl Levy rm 11C17 CP4.....	557-5088
	Secretary Laura Dorsey rm 11C17 CP4.....	557-5088
	Clerk Katherine A. Nelson rm 11C17 CP4.....	557-2878
231	Television, Facsimile and Image Analysis John C. Martin rm 11C17 CP4.....	557-2801
232	General and Special Purpose Data Processing System (Measuring Testing & Monitoring) James D. Thomas rm 11C17 CP4.....	557-2881
233	Radio, Pulse Communications Multiplexing and Computer System Robert L. Griffin rm 11C17 CP4.....	557-2801
234	Miscellaneous Signaling and Speech Synthesis John W. Caldwell rm 11C17 CP4...	557-2863
235	Information Storage and Retrieval System Bernard Konick rm 11C17 CP4.....	557-2867
236	General and Special Purpose Data Processing System Including Control Error Detection and Miscellaneous Applications Jerry Smith rm 11A01 CP4.....	557-2871
237	General & Special Purpose Data Processing System including Vehicle Control & Navigation G. D. Shaw rm 11C17 CP4.....	557-2881
240	Receptacles, Cleaning, Winding and Measuring rm 7C17 CP4.....	557-2900
	Director Gerald M. Forlenza rm 7D19 CP4.....	557-2906
	Secretary Deborah P. Leeper rm 7D19 CP4.....	557-2906
	Clerk Doretha A. Bailey rm 7C17 CP4.....	557-2900
241	Receptacles, Packages William I. Price rm 7C17 CP4.....	557-3214
242	Fluid Treating, Presses, Foods Treating, General Cleaning, Agitating, Centrifuges Harvey C. Hornsby rm 7C17 CP4.....	557-3451
243	Plumbing Fixtures, Conduits, Cleaning by Fluid Fluent Material Handling, Electrical Switches, Impellers, Rotary Fluid Motors or Pumps Stephen Marcus rm 7C17 CP4.....	557-7617
244	Measuring and Testing Gerald Goldberg rm 7C17 CP4.....	557-2913
245	Textile Machinery, Flexible Shaft Couplings, Pushing and Pulling, Winding and Reeling, Web Feeding, Bearings Stuart S. Levy rm 7C17 CP4.....	557-3451
246	Thermal and Fluid Level Measuring and Testing, Geometric Instruments, Indicators, Image Projection, Sound Recordings, Joint Packing Charles Frankfort rm 7C17 CP4.....	557-7617
250	Electronic Systems and Devices rm 8C17 CP4.....	557-2671
	Director Samuel S. Matthews rm 8C17 CP4.....	557-2671
	Secretary Maclovio E. Sanchez rm 8D19 CP4.....	557-2671
	Clerk JoAnn Davis rm 8C17 CP4.....	557-2671
251	Electric Lamp and Discharge Devices and Circuits Fiber Optic Devices and Systems David K. Moore rm 8C17 CP4.....	557-2671
252	Electrical Measuring and Testing Amplifiers Michael J. Lynch rm 8C17 CP4.....	557-2671
253	Semiconductor Devices Andrew J. James rm 8C17 CP4.....	557-2671
254	Oscillators, Modulators, Demodulators, Antennas, Miscellaneous Vacuum Tube and Semiconductor Circuits and Systems Stanley D. Miller rm 8C17 CP4.....	557-2671
255	Lasers, Optical Measuring and Testing Systems, Photocell Circuits and Systems William L. Sikes rm 8C17 CP4.....	557-2671
256	Transmission Lines, Taners, Radiant Energy Systems Alfred E. Smith rm 8C17 CP4.....	557-2671
257	Optical Systems and Elements, Vision Testing and Correction John K. Cobin rm 8C17 CP4.....	557-2671



## MECHANICAL EXAMINING GROUPS

310	Handling and Transporting Media rm 3C17 CP3.....	557-3211
	Director Bobby R. Gray rm 6C17 CP4.....	557-2921
	Secretary Betty Rasmussen rm 6C17 CP4.....	557-2921
	Clerk Margaret Stevens rm 6C17 CP4.....	557-3211
311	Dispensing Vending Coin Handling and Elevators Joseph J. Rolla rm 6C17 CP4...	557-3311
312	Assorting Vehicles and Railways Equipment Robert B. Reeves rm 6C17 CP4.....	557-3204
313	Fire Extinguishing, Fluid Spraying, Handling Implements John J. Love rm 6C17 CP4.....	557-3305
314	Brakes, Spring and Sheet Feeding Bruce H. Stoner rm 6C17 CP4.....	557-3303
315	Aeronautics, Boats, Ships, and Marine Equipment T.M. Blix rm 6C17 CP4.....	557-3222
316	Land and Motor Vehicles Joseph F. Peters Jr. rm 6C17 CP4.....	557-3205
317	Material or Article Handling, Power Driven Conveyors Robert J. Spar rm 6C17 CP4.....	557-3301
320	Material Shaping Article Manufacturing Tools rm 5D17 CP4.....	557-3320
	Director Stephen G. Kunin rm 5D19 CP4.....	557-1890
	Secretary Iyone L. Miles rm 5D19 CP4.....	557-3371
	Clerk Vivian C. Harris rm 5D21 CP4.....	557-3371
321	Metal Deforming, Turning and Woodworking Francis S. Husar rm 5B02 CP4.....	557-3321
322	Electrical Connectors, Gear Cutting, Milling and Chucks Gil Weidenfield rm 5E02 CP4.....	557-3317
323	Abrading, Workholders and Tools Fred R. Schmidt rm 5D01 CP4.....	557-3357
324	Cutting, Outlery Tools and Book Making Edward R. Kazenske rm 5D13 CP4.....	557-3357
325	Metal Founding, Fishing and Vermin Trapping and Welding Nicholas P. Godici rm 5E16 CP4.....	557-3357
326	Metal Working, Comminution and Wire Working Howard N. Goldberg rm 5B30 CP4...	557-3317
330	Amusement, Husbandry Personal Treatment Information rm 4C17 CP4.....	557-3125
	Director Richard E. Aegerter rm 4D17 CP4.....	557-3330
	Secretary Theresa R. Godfrey rm 4D19 CP4.....	557-3330
	Clerk Clara S. Desmukes rm 4C17 CP4.....	557-3131
331	Plants, Plant Culture, Toys, Earth Working Robert A. Hafer rm 4A13 CP4.....	557-3131
332	Tobacco, Exercising Toiletry Richard J. Apley rm 4A07 CP4.....	557-3137
333	Denistry, Animal Husbandry, Harvesting and Sign Exhibiting Louis G. Mancene rm 4D01 CP4.....	557-3131
334	Amusement Games Education Richard C. Pinkham rm 4B02 CP4.....	557-3137
335	Surgery Diagnostic Kyle L. Howell rm 4E02 CP4.....	557-3144
336	Surgery Instruments, Medicators and Receptors C. Fred Rosenbaum rm 4B22 CP4..	557-3144
337	Printing, Typewriting and Excavating Edgar S. Burr rm 4E16 CP4.....	557-3501
340	Heat Power and Fluid Engineering rm 3C17 CP4.....	557-3340
	Director Donley J. Stocking rm 3C17 CP4.....	557-3340
	Secretary Sherry K. Bratlie rm 3C17 CP4.....	557-3340
	Clerk Mary M. Reed rm 3C17 CP4.....	557-3128
341	Power Plants, Fluid Motors Robert E. Garrett rm 3C17 CP4.....	557-0900
342	Internal Combustion Engines Charles J. Myhre rm 3C17 CP4.....	557-0900
343	Combustion Power, Plant Reaction, Motors, Pumps, Rotary Expansible Chamber Devices and Plural Expansible Chamber Type Motors Carlton R. Croyle rm 3C17 CP4.....	557-3464
344	Heat Generation, Drying, Vaporizing, Ventilation, Refrigeration Albert J. Makay rm 3C17 CP4.....	557-0900
345	Stoves and Combustion Samuel Scott rm 3C17 CP4.....	557-3468
346	Heat Exchangers, Rotary Engines and Power Plant William R. Cline rm 3C17 CP4.....	557-5721
347	Fluid Handling and Valves Martin P. Schwadron rm 3C17 CP4.....	557-3401

350	General Constructions, Petroleum and Mining Engineering, Gearing, Joints and Fasteners, Textiles rm 4C17 CP3.....	557-3000
	Director Al Lawrence Smith rm 4C17 CP3.....	557-3000
	Secretary Carol M. Sinclair rm 4C17 CP3.....	557-3000
	Clerk Joyce G. Hill rm 4C17 CP3.....	557-3002
351	Joints and Connections, Pipe Couplings, Fences, Earth & Hydraulic Engineering Cornelius J. Husar rm 4C17 CP3.....	557-1300
352	Gearing, Machine Elements, Power Transmissions Leslie A. Braum rm 4C17 CP3...	557-1300
353	Textile and Leather Manufacture, Apparel, Textiles Werner H. Schroeder rm 4C17 CP3.....	557-3411
354	Building Structures and Components Price C. Faw, Jr. rm 4C17 CP3.....	557-0570
355	Supports, Racks, Fire Escapes, Scaffolds, Flexible Partitions Ramon S. Britts rm 4C17 CP3.....	557-0540
356	Petroleum, Mining and Highway Engineering James A. Leppink rm 4C17 CP3.....	557-0540
357	Tables, Chairs, Cabinets, Windows, Doors, Buckles, Buttons, Clasps William E. Lyddane rm 4C17 CP3.....	557-0540
358	Fasteners, Locks, Closure Fasteners, Beds Gary L. Smith rm 4C17 CP3.....	557-1300

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 IKE & Assembly Team Portia Taylor rm 4D29 CP2..... 557-5253  
 Post-Registration Supervisor Catherine R. Hill rm 4C24 CP2..... 557-1986  
 Publication & Issue Supervisor Donald Perritt rm 4C23 CP2..... 557-5247  
 Search Room Supervisor Leon Jackson rm 2C06 CP2..... 557-3281  
 Affidavit Examiners rm 4C24 CP2..... 557-1988  
 Renewal Examiners rm 4C24 CP2..... 557-1988

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 Program Analyst Cynthia Thane rm 9D23 CP3..... 557-3030

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 Secretary (Vacant) Lobby CP1..... 557-0183  
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 Deputy Willie Bowman rm 1A03 CP2..... 557-3233  
 Outgoing Mail Lawrence Ford rm 1A05 CP2..... 557-3233  
 Incoming Mail Sallye Rayford rm 1B03 CP2..... 557-3232  
 Correspondence Branch Mary Allen rm 1A03 CP2..... 557-3226  
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 Support Services Branch Chief Luther Campbell FERN..... 557-3560

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 Secretary Barbara Evans rm 1A03 CP3..... 557-2276  
 Patent Search Room rm 1A03 CP3..... 557-2277  
 Micrographics Branch (Commerce)..... 377-4968  
 Micrographics Branch (Crystal)..... 557-3079  
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 Secretary Rebecca Faulkins rm 7E30 CP2..... 557-3717  
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 Special Handling Unit Arthur Stephens rm 7C20 CP2..... 557-3831  
 Data Input, Quality Control, and Assembly Unit  
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 Deputy Annie Harrell rm 7D13 CP2..... 557-3266  
 Secretary Voilet A. McCoy rm 7D13 CP2..... 557-3236  
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 Digest and Recording Unit Fred L. Bennett rm 7D13 CP2..... 557-3259  
 Title Unit (Vacant) rm 2C32 CP4..... 557-3826  
 Certification Branch Aberdeen Cutler 1627 DOC..... 377-2270



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Patent Copy Inspection Section Annie Kelly rm 10C22 CP2.....	557-3917
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Jean E. Buckhout rm 921 CM2.....	557-5825

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 Production Control Branch Betty J. Wilson rm 100 North CM1..... 557-1071  
 Computer Operations Branch Louise Hill rm 100 North CM1..... 557-1071  
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## Office Of Search Systems

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CM1 Crystal Mall 1, 1911 Jefferson Davis Highway  
 CM2 Crystal Mall 2, 1921 Jefferson Davis Highway  
 CP1 Crystal Plaza 1, 2001 Jefferson Davis Highway  
 CP2 Crystal Plaza 2, 2011 Jefferson Davis Highway  
 CP3 Crystal Plaza 3, 2021 Jefferson Davis Highway  
 CP4 Crystal Plaza 4, 2121 Jefferson Davis Highway  
 CP6 Crystal Plaza 6, 2221 Jefferson Davis Highway  
 CP34 Crystal Plaza 34, 2021 Jefferson Davis Highway  
 CS4 Crystal Square 4, 1745 Jefferson Davis Highway  
 CS5 Crystal Square 5, 1755 Jefferson Davis Highway  
 CG2 Crystal Gateway 2, 1225 Jefferson Davis Highway  
 EADS 1232 South Eads Street  
 FERN 1411 South Fern Street  
 WNY Washington Navy Yard, 2 & M. Street, S.E., Bldg. 159

## PATENT NOTICES

## Certificates of Correction for the Week of Nov. 29, 1983

3,906,463	4,377,574	4,390,611	4,400,518
4,170,958	4,377,787	4,390,688	4,401,174
4,251,261	4,379,342	4,391,263	4,401,697
4,296,125	4,379,691	4,391,977	4,402,033
4,301,487	4,380,053	4,392,013	4,402,064
4,308,849	4,380,064	4,392,093	4,402,072
4,313,670	4,380,514	4,392,621	4,402,128
4,319,241	4,380,555	4,392,686	4,402,311
4,321,362	4,381,254	4,393,472	4,402,540
4,326,599	4,383,926	4,393,653	4,403,035
4,334,192	4,384,682	4,394,333	4,403,671
4,336,572	4,384,918	4,394,777	4,403,757
4,342,440	4,385,177	4,395,327	4,404,508
4,355,592	4,385,536	4,395,389	4,404,552
4,358,421	4,386,618	4,395,474	4,404,879
4,360,460	4,386,663	4,396,530	4,405,412
4,362,870	4,386,929	4,396,927	4,405,701
4,363,094	4,387,149	4,397,181	4,405,705
4,364,088	4,387,200	4,397,857	4,405,726
4,368,689	4,387,505	4,398,134	4,405,917
4,371,846	4,387,615	4,398,460	4,406,037
4,372,461	4,388,049	4,398,577	4,406,877
4,374,350	4,388,994	4,398,946	4,407,741
4,375,734	4,389,773	4,399,071	4,408,100
4,375,834	4,389,788	4,399,259	
4,376,984	4,390,206	4,400,024	
4,377,222	4,390,215	4,400,147	

## Disclaimer

3,671,726.—James Richard Kerr, Tigard, Ore. ELEC-TRO-OPTICAL APPARATUS FOR PRECISE ON-LINE MEASUREMENT OF THE THICK-NESS OF MOVING STRIP MATERIAL. Patent dated June 20, 1972. Disclaimer filed June 17, 1981, by the assignee, *The Coe Manufacturing Co.*

Hereby enters this disclaimer to claims 14-16 of said patent.

## Disclaimers and Dedications

3,320,999.—Charles J. Stalego, Newark, Ohio. INTER-NAL COMBUSTION BURNER. Patent dated May 23, 1967. Disclaimer and Dedication filed, Oct. 11, 1983, by the assignee, *Owens-Corning Fiberglas Corp.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

3,520,186.—George Leslie Adams, Bay Shore and Irwin S. Landow, East Meadow, N.Y. ULTRASONIC FLUID INTERFACE SENSING. Patent dated July 14, 1970. Disclaimer and Dedication filed Nov. 19, 1981, by the assignee, *National Sonics Corp.*

Hereby disclaims and dedicates to the Public claims 1 and 3 through 12 of said patent.



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Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
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Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Philadelphia: Franklin Institute Library	(215) 448-1321**
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## PATENT EXAMINING CORPS RENE D. TEGMEYER, Assistant Commissioner WILLIAM FELDMAN, Deputy Assistant Commissioner CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

### PATENT EXAMINING GROUPS

	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
<b>GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director</b>	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
<b>GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director</b>	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
<b>HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director</b>	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
<b>COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director</b>	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
<b>SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director</b>	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
<b>INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director</b>	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
<b>SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director</b>	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	
<b>INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director</b>	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
<b>RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director</b>	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
<b>ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director</b>	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
<b>DESIGN, GROUP 290—KENNETH L. CAGE, Director</b>	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
<b>HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director</b>	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
<b>MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director</b>	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
<b>AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director</b>	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
<b>HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director</b>	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
<b>GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director</b>	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents . . . . . Numbers 2,616 to 2,627 inclusive



## REISSUES

NOVEMBER 29, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

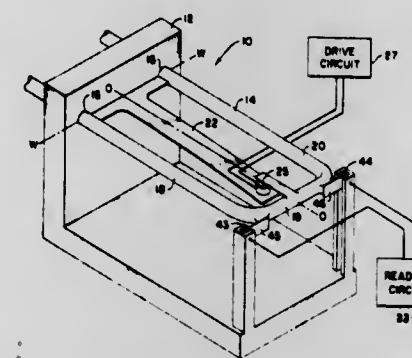
### Re. 31,450 METHOD AND STRUCTURE FOR FLOW MEASUREMENT

James E. Smith, Boulder, Colo., assignor to Micro Motion, Inc., Boulder, Colo.  
Original No. 4,187,721, dated Feb. 12, 1980, Ser. No. 926,468, Jul. 20, 1978. Continuation-in-part of Ser. No. 818,475, Jul. 25, 1977, abandoned. Application for reissue Feb. 11, 1982, Ser. No. 348,071

Int. Cl.<sup>3</sup> G01F 1/86

U.S. Cl. 73—861.38

55 Claims



51. A method for measuring mass flow rate of a material comprising:

flowing the material through a "U" shaped conduit; oscillating the conduit [around] about an axis of oscillation passing through the legs of the conduit at substantially [equal] right angles; and measuring the [forces tending to deflect the "U" shaped conduit around a deflection axis perpendicular to the oscillation axis and symmetrical to the conduit] material mass flow rate by determining the time lag between the passage of one side of the conduit through a plane substantially at the midpoint of oscillation and the passage of the other side of the conduit through such plane.

### Re. 31,451 MANUAL TRANSMISSION SHIFTER FOR OPERATING A TRANSMISSION WITH ELONGATED ACTUATORS SUCH AS FLEXIBLE CABLES

Charles Osborn, Spring Lake, Mich., assignor to JSJ Corporation, Grand Haven, Mich.

Original No. 4,245,521, dated Jan. 20, 1981, Ser. No. 905,123, May 12, 1978. Application for reissue Sep. 28, 1982, Ser. No. 425,329

Int. Cl.<sup>3</sup> G05G 9/16; F16H 57/06

U.S. Cl. 74—476 66 Claims

1. In a shifter for operating a manual transmission with a pair of flexible cables comprising:  
a gear selecting shift lever;  
a pivotable shift lever carrier;  
first and second generally orthogonal axes;  
a stationary base for mounting the transmission shifter to an automotive vehicle;  
said shift lever being pivotable relative to said [carrier] base about said first axis;  
said carrier being pivotable relative to said base about said second axis;  
means for translating rotation of said shift lever about said first axis to a cable displacement of one of said cables; and  
means for translating rotation of said shift lever and said carrier about said second axis to a cable displacement of said other of said cables the improvement comprising:  
said means for translating rotation of said shift lever and said carrier about said second axis to the cable displacement of

said other cable comprises a member pivotably mounted on said base about an axis offset from said first and second axes;  
joint connection means for operatively connecting said car-



rier to said member, said joint connection means providing for articulated motion between said carrier and said member with minimal lost motion; and  
means for securing the said other of said flexible cables to said member.

### Re. 31,452 QUICK-ACTING ELECTRIC CIGAR LIGHTER

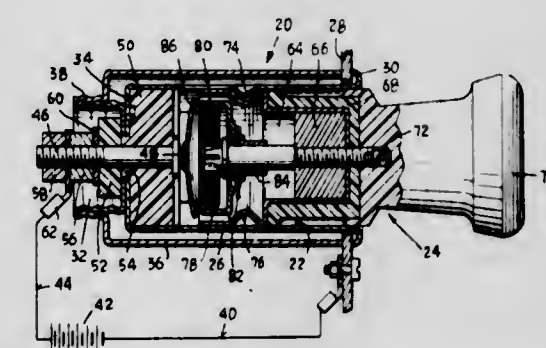
Lawrence E. Fenn, Bridgeport, and Charles R. Sperry, Westport, both of Conn., assignors to Casco Products Division of Sun Chemical Corporation, Bridgeport, Conn.

Original No. 4,236,061, dated Nov. 25, 1980, Ser. No. 12,882, Feb. 16, 1979. Continuation of Ser. No. 252,400, Apr. 9, 1981, abandoned. Application for reissue Jul. 19, 1982, Ser. No. 399,764

Int. Cl.<sup>3</sup> F23Q 7/02

U.S. Cl. 219—265

13 Claims



1. An instant electric cigar lighter of the type having a heating coil energized from a source of current, comprising in combination:  
(a) a holder device presenting a socket,  
(b) an igniting unit plug receivable in and removable from the socket of the holder device,  
(c) said igniting unit plug having an electrical resistance



heating coil adapted to be electrically energized and presenting an exposed face for igniting cigarettes, cigars and the like,

- (d) a snap-type bimetallic member of dished configuration, said member having flexing portions and being adapted to be disposed in close heating-receiving relation to the heating coil of the igniting unit plug, said member being disposed in the socket of the holder device and having a

laterally offset mounting portion which is surrounded by the flexing portions of the member,  
(e) a mounting stud carried by the holder device, having a head portion which is welded against the laterally offset portion of the bimetallic member at locations which are spaced from the bends of the laterally offset portion whereby flexing and snapping of the bimetallic member is characterized by reduced strains and stresses at the weld areas, by virtue of the existence of said bends at the laterally offset portion of the member.

## PLANT PATENTS

GRANTED NOVEMBER 29, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,145

### ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Aug. 25, 1982, Ser. No. 411,358

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—7

1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright lemon yellow flowers edged with Dutch vermilion red borne singly and in large clusters on a vigorous, upright growing plant.

herein described and illustrated, characterized particularly by its bearing of large uniquely colored double flowers.

5,148

### RED MAPLE TREE NAMED VASE

Cornelius A. Millane, 604 Main St., Cromwell, Conn. 06416

Filed Aug. 26, 1982, Ser. No. 412,022

Int. Cl.<sup>3</sup> A01H 5/12

U.S. Cl. Plt.—51

1 Claim

1. A new and distinct variety of red maple tree as herein shown and described.

5,146

### ALMOND TREE (GARDEN PRINCESS)

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Feb. 8, 1982, Ser. No. 346,607

Int. Cl.<sup>3</sup> A01H 5/03

U.S. Cl. Plt.—30

1 Claim

1. A new and distinct variety of almond tree, as illustrated and described, characterized by the tree being small size, upright in growth, and a heavy regular bearer of medium size, sweet kernel nuts harvesting at the same time as Mission; the tree is further characterized by its heavy set of dark pink bloom, blooming 4 to 5 days after Merced, and being self-fertile.

5,149  
RHODODENDRON PLANT 'GOLDILOCKS'  
Howard Kerrigan, 24249 Second St., Hayward, Calif. 94541  
Filed Mar. 22, 1982, Ser. No. 360,618  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—55

1 Claim

1. A new and distinct variety of rhododendron plant substantially as herein shown and described primarily characterized by: Compact growth with deep yellow blooms borne in profusion.

5,150

### POINSETTIA PLANT NAMED R-13

Paul Ecke, Jr., Encinitas, Calif. 92024

Filed Jan. 15, 1982, Ser. No. 339,783

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—86

1 Claim

1. A new and distinctive red poinsettia cultivar, substantially as herein shown and described, characterized by its bright dark red bract color and its early, eight to ten week, blooming characteristic at a low growing temperature, generally in the range of 15° to 17° C.

5,147

### PEACH TREE "PEPPERMINT"

Sam S. Skrbak, Rte. 2, Box 116P, McGregor, Tex. 76657

Filed Jun. 28, 1982, Ser. No. 392,957

Int. Cl.<sup>3</sup> A01H 5/03

U.S. Cl. Plt.—43

1 Claim

1. A new and distinct variety of peach tree substantially as



# PATENTS

GRANTED NOV. 29, 1983

## ERRATA

For	See
CLASS	PATENT NO.
037-002 .....	4,417,416
084-001 .....	4,417,494
604-081 .....	4,417,577
502-209 .....	4,418,003
502-182 .....	4,418,004
502-217 .....	4,418,005
502-073 .....	4,418,006
502-312 .....	4,418,007
502-340 .....	4,418,008
381-024 .....	4,418,243
377-033 .....	4,418,275
318-341 .....	4,418,298



# PATENTS

GRANTED NOVEMBER 29, 1983

## GENERAL AND MECHANICAL

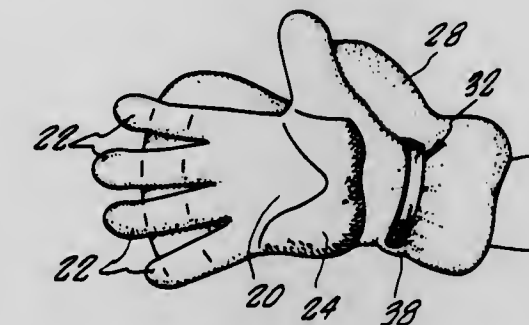
4,417,359

### KARATE GLOVE

Johnnie L. Johnson, 1455 W. 94th St., Los Angeles, Calif. 90047  
Continuation-in-part of Ser. No. 792,135, Apr. 29, 1977,  
abandoned. This application Jun. 6, 1979, Ser. No. 46,183  
Int. Cl.<sup>3</sup> A41D 19/00

U.S. Cl. 2—161 A

4 Claims



1. A protective glove for use in the martial arts comprising an inner glove adapted to fit over the wearer's hand, said inner glove defining a palm portion, individual finger receiving portions and a thumb receiving portion, said finger receiving portions and said thumb receiving portion being closed at their extended ends; a flexible padded backing secured to and disposed over the backside of said inner glove and extending over said finger receiving portions; and means for securing said backing to said finger receiving portions at locations spaced from the closed extended ends thereof such that said finger receiving portions are restrained from relative lateral movement while the extended ends of said finger receiving areas are freely moveable from said backing to cooperate with said thumb receiving portion for gripping an opponent.

4,417,360

### NONTRAUMATIC PROSTHETIC VALVE WITH MAGNETIC CLOSURE

Manoutchehr Moasser, 16005 Crain Hwy., Brandywine, Md. 20613

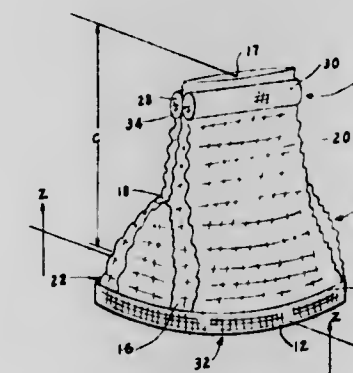
Filed Jul. 31, 1981, Ser. No. 288,941

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A61F 1/22

U.S. Cl. 3—1.5

10 Claims



1. A prosthetic valve for causing unidirectional flow of a pulsatory fluid, comprising  
(a) mounting means positionable upstream within the flow of pulsatory fluid for forming an inlet through which the pulsatory fluid may flow into the valve,  
(b) valve outlet means for moving from a first configuration in which fluid flow through said inlet is cut off to a second configuration in which fluid may freely flow through said inlet from the upstream side to the downstream side of the

valve in response to the fluid pressure upstream of the valve increasing above the fluid pressure downstream of the valve, said valve outlet means including a valve element moving from a first position in which said inlet is closed off when said valve outlet means is in said first configuration and a second position in which said inlet is open for passage of fluid therethrough when said valve outlet means is in said second configuration, said valve outlet means further including a stop for engaging said valve element in one of said positions, wherein said stop includes opposed wall segments and said wall segments are extended laterally and are joined to form a tubular element, said joined wall segments being formed of non-resilient, biologically non-reactive fabric; and

(c) valve impact preventing means for preventing traumatic impact of said valve element with said stop, said valve impact preventing means including magnetic means for forming a magnetic repulsive force which tends to repel said valve element from said stop with a force which increases as said valve element comes closer to said stop.

4,417,361

### GRAB BAR

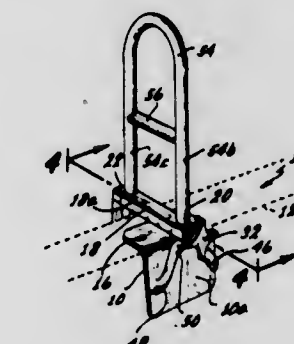
Alfred A. Smith, Van Nuys, Calif., assignor to Guardian Products Company, Inc., North Hollywood, Calif.

Filed May 17, 1982, Ser. No. 379,253

Int. Cl.<sup>3</sup> A47K 3/022

U.S. Cl. 4—577

4 Claims



1. Gripping means mountable by means of a single torquing screw to provide hand support for a person stepping over a wall, such as the side wall of a bathtub, said means comprising:  
A. a rigid angle plate, said plate having a horizontal area to be disposed on a portion of the top rim of said wall, and an area extending down along a portion of the outside of said wall below the said rim;  
B. a rigid hollow member fixedly secured onto the top of the horizontal area of said plate and extending transversely of the rim of said wall said plate extending to either side of said hollow member to stabilize said hollow member relative to a tub wall, said hollow member being open at a first end distal from the downwardly extending portion of said plate, and closed at its second and opposite end except for a central orifice therethrough; said hollow member further having fixedly secured thereto a pair of upwardly extending members spaced from each other along said hollow member and fixedly joined thereabove by a continuous arcuate member lying in a plane parallel to said rigid hollow member to provide a hand grip extending transversely to a tub wall and allowing smooth uninterrupted sliding movement of a person's hand from one to another of said upwardly extending members without need to release the hand's grip during said sliding movement;  
C. a slidable member configured in cross section to fit closely and slidably axially within, and relative to, said



hollow member, and extending in such a manner that a first end of said slidable member projects beyond the said open first end of the hollow member, said slidable member having internal female threading extending coaxially at least partially into its second opposite end with at least a portion of the remainder of said slidable member also being hollow to permit passage therethrough of a male threaded element;

D. a male threaded element extending through the orifice in said second closed end of said hollow member, said threaded element being matingly fitted into the internal threading of said slidable member, and said threaded element terminating outside said orificed end of a single torquing handle; and

E. a clamping member fixedly secured to and extending downwardly from the first end of the slidable member, said clamping member carrying plate means for facing engagement with the inside of said wall;

whereby when said rigid plate is disposed on the top rim of, and in abutment with, an upper portion of the outside of said wall, the plate means of the clamping member is disposed in facing abutment with the inside of said wall, and said torquing handle is turned to cause said threaded element to rotate in the proper direction within the female threading of said slidable member, the latter is caused to move axially into the hollow member and draw together the clamping member and its plate means tightly against the inside of the wall and in opposition to the rigid plate on the outside of the wall, thereby to provide rigid support for said hand grip.

4,417,362

**BATHROOM FIXTURE**

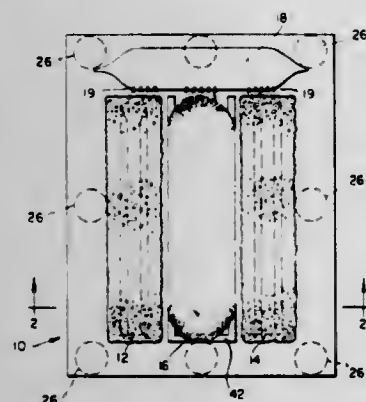
Frank S. Walker, 40 Cedar Ave., Natick, Mass. 01760

Filed Dec. 24, 1981, Ser. No. 334,167

Int. Cl.<sup>3</sup> A47K 7/02

U.S. Cl. 4-606

1 Claim



1. In a bathroom fixture a base member and a plurality of cleansing elements detachably secured to said base member in a predetermined relation to said base member and extending outwardly therefrom for engagement with the body of a bather, said base member having means for mounting the same on a wall of a shower for enabling the cleansing elements to be readily engaged by the body of the bather, said means said means for cleansing the body of the bather comprising a plurality of sponges and a brush, said sponges being mounted in spaced parallel V-shaped grooves formed in said base member with a portion of said sponges inserted into said grooves to extend through the grooves on both sides of the base member, a U-shaped channel formed on a surface of said base member between said V-shaped grooves into which a brush is inserted such that the bristles of the brush extend outwardly forming a discontinuous surface against which the bather may rub his body, a liquid soap dispenser mounted at the upper end of said base member for dispensing soap onto the surface of said sponges and brush as the bather presses his body against the surface of said sponge-brush assembly, said means for detachably securing the fixture to the shower wall comprising suction cups enabling said fixture to be positioned on the shower wall

in various desired positions to facilitate the engagement of the body of the bather relative to the cleansing surface.

4,417,363

**METHOD OF SUPPORTING PIPE DURING MACHINING**

Roy Lee, Jr., 10134 Briar Dr., Houston, Tex. 77042

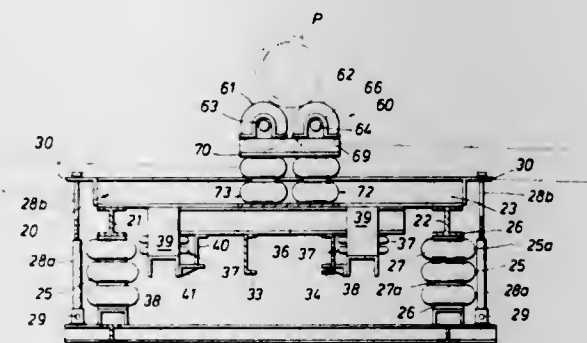
Division of Ser. No. 257,185, Apr. 24, 1981. This application

Dec. 9, 1982, Ser. No. 448,395

Int. Cl.<sup>3</sup> B23G 1/22

U.S. Cl. 10-107 PH

1 Claim



1. A method of machining pipe at high cutting speeds comprising the steps of moving a pipe from a pipe rack onto a conveyor, raising the conveyor to substantially align the longitudinal axis of the pipe with the center of the chuck on a machine tool, moving the pipe axially to position its end in the chuck, closing the chuck, transferring the pipe from the conveyor to a steady rest, supporting the steady rest by air pressure confined in a container having flexible side walls to allow limited lateral movement of the steady rest and the rotating pipe, rotating the pipe at the desired speed for tungsten carbide cutting tools, and machining the pipe while said pipe is being rotatably supported on said steady rest.

4,417,364

**MOP HOLDER**

Dennis A. Hammond, Ottawa, Canada, assignor to Dustbane Products Limited, Ottawa, Canada

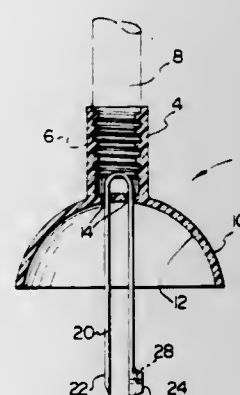
Filed Jun. 24, 1982, Ser. No. 391,516

Claims priority, application Canada, Jan. 4, 1982, 393556

Int. Cl.<sup>3</sup> A47L 13/24

U.S. Cl. 15-147 R

8 Claims



1. A holder for receiving the handle and securing the yarn of of mop or brush comprising:

- a sleeve to receive in one end the handle of the mop or brush;
- a base having a concave interior surface against which the yarn is to be held, the base being centrally secured to the other end of the sleeve;
- a pair of spaced slots in the base extending through the base and located in the portion thereof circumscribed by the sleeve; and

(d) a flexible bundling strap having an elongated body portion, one end of which is a tail end and the other end of which is a clinching eyelet, through which the tail end of the strap is to pass and which is to securely hold the strap against unpurposeful disengagement, the strap being fitted in the slots so that its tail end and clinching eyelet are positioned on the concave interior side of the base, the yarn to be circumscribed by the strap and securely held thereby within the concave interior of the base.

4,417,365

**CLEANING APPARATUS**

Hiroshi Murasaki, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 23, 1983, Ser. No. 371,483

Claims priority, application Japan, Apr. 30, 1981, 56-66248

Int. Cl.<sup>3</sup> D01H 11/00

U.S. Cl. 15-256.51

4 Claims



1. A cleaning apparatus for cleaning a surface of a member by scraping residual particles off the surface, said apparatus comprising: a blade having a forward edge adapted to be in pressing contact with the surface;

means movably supporting the blade for movement from a position in which it is in pressing contact with the surface of the member to be cleaned to a position in which it is retracted from the surface of the member;

a cleaning member for removing particles from the forward edge of the blade when the blade is in the contact position; and

means for supporting said cleaning member in pressing contact with the blade in the vicinity of said forward edge on the side of the blade facing the uncleaned area of the surface and on which particles are deposited when the blade is in the contact position and for causing said cleaning member to move with the blade during the movement of the blade from the contact position to the retracted position and, while remaining in pressing contact with said one side of the blade, to move from the vicinity of said forward edge to said forward edge during the movement of the blade toward the retracted position, whereby when the blade is retracted, the particles deposited on the forward edge of the blade are scraped off by said cleaning member moving in sliding pressing contact with said forward edge.

4,417,366

**HINGE BRACKET MOUNTING PLATE ASSEMBLY HAVING A SPRING BIASED LOCKING MECHANISM**

Luciano Salice, Carimate, Italy, assignor to Arturo Salice S.p.A., Novedrate, Italy

Filed Jun. 16, 1982, Ser. No. 389,048

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1980, 3043334

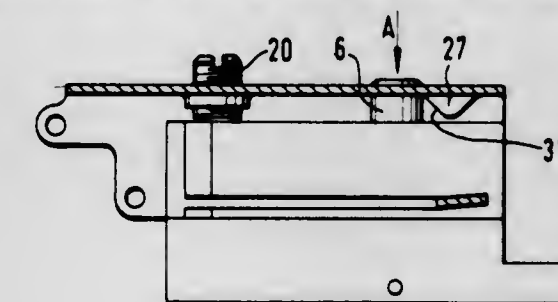
Int. Cl.<sup>3</sup> E05D 5/02, 7/12

U.S. Cl. 16-258

8 Claims

1. A hinge bracket-mounting plate assembly, wherein the hinge bracket-mounting plate assembly comprises a mounting plate, wherein the mounting plate has a track for slidably guiding the hinge bracket in an axial direction and a bore for longitudinally slidably guiding a spring-loaded detent pin, said

detent pin includes a free end and protrudes from the bore and is held captive therein by at least one stop in the bore, and wherein the hinge bracket has a first sloping surface arranged to force the detent pin into the bore as the hinge bracket is slidably moved onto the mounting plate, and the hinge bracket also has a second sloping surface which as the hinge bracket is pushed over the detent pin holds the detent pin in a depressed position until the second sloping surface slides past the detent pin, the detent pin then snaps into a detent opening in the hinge bracket so that the detent pin is releasably fixed, said hinge bracket-mounting plate assembly having a locking mechanism of the type used in a retractable ball point pen, said locking



mechanism comprising the spring loaded detent pin and a slider, said locking mechanism is adapted to lock the detent pin in two different positions, said positions including a partly extended position and a fully extended position so that the detent pin is moved from one of said positions to another of said positions when the detent pin is depressed into the bore and then released, the free end of the detent pin lies in the path of the first sloping surface when the detent pin is in the partly extended position, and the detent pin which has been depressed by the first sloping surface snaps into the detent opening and is urged into said detent opening by the spring toward the fully extended position after the second sloping surfaces slides past the detent pin.

4,417,367

**MID-SECTION SKINNING APPARATUS**

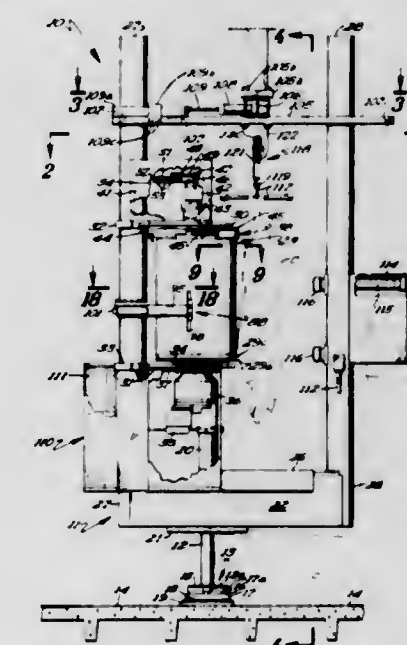
Lyndon R. Lelning, Austin, Minn., assignor to Geo. A. Hormel &amp; Company, Austin, Minn.

Continuation-in-part of Ser. No. 43,041, May 29, 1979, Pat. No. 4,351,088. This application Mar. 1, 1982, Ser. No. 353,526

Int. Cl.<sup>3</sup> A22B 5/16; A22C 17/12

U.S. Cl. 17-21

11 Claims



1. An apparatus for removing the mid-section portion of the skin from the carcass of an animal such as a hog, comprising: a vertically disposed support frame,



a revolvable cylindrical drum revolvably mounted on said frame,  
drive means drivingly connected with said drum for revolving the same,  
an elongate skinning blade extending longitudinally of and positioned in close proximity to said drum,  
a flap forming blade on said drum and extending longitudinally thereof and making a longitudinal cut in the mid-section portion of the carcass when the carcass is positioned against said drum, gripping means on said drum engaging a longitudinal cut edge of the skin pulling a portion of the skin against the flap forming blade to form and grip the flap of the skin, whereby when said drum is revolved, the skinning blade will progressively remove the mid-section portion of the skin from the carcass,  
a skin removing assembly including an elongate arm, means mounting one end portion of said arm on said frame, a blade on the other end of said arm, means for shifting said arm between operative and inoperative positions, said arm when in the operative position positioning the blade in close proximity to the drum to remove carcass-disengaged skin therefrom, and said arm when in the inoperative position disposing said blade in spaced relation to said drum.

4,417,368

# APPARATUS FOR AND PROCESS OF CONTROLLED SUB-VOLUME FILLING OF CASINGS

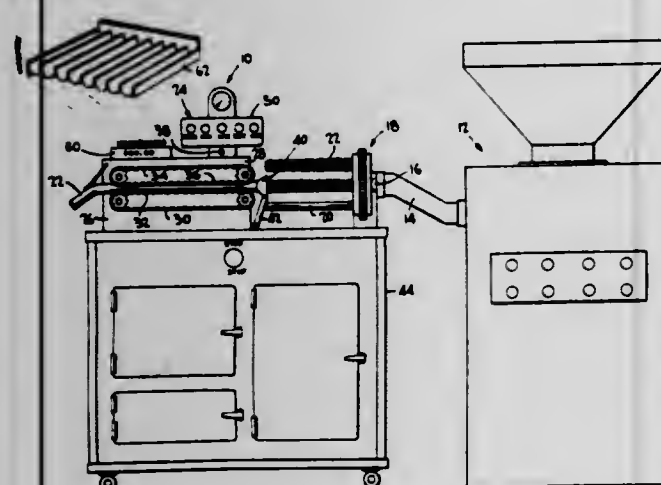
Harry G. Washburn, Mt. Prospect, Ill., assignor to Teepak, Inc., Chicago, Ill.

Filed Jul. 24, 1981, Ser. No. 286,316  
Int. Cl.<sup>3</sup> A22C 11/02

U.S. Cl. 17-49

12 Claims

U.S. Cl. 24-3 L

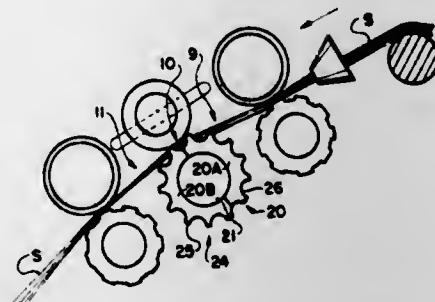


1. An apparatus for the automatic controlled sub-volume filling of a casing, said apparatus comprising in combination a filling machine including filling tube means for supplying a product under pressure into a tubular casing, and a combined casing feed device and cross section shaping device, said combined casing feed and cross section shaping device including conveyor means having opposed spaced runs for receiving therebetween a casing having a filling therein, said conveyor runs defining an elongated casing receiving space having an entrance adjacent said filling tube, said apparatus being particularly adapted to receive a casing normally generally circular in cross section when filled, and said conveyor runs spacing being less than the nominal diameter of the intended casing as to effect a temporary change in casing cross section with the cross-sectional area of said modified cross section is on the order of 85 to 95 percent of the area of said circular cross section.

4,417,369  
CONTROL ROLL FOR STAPLE FIBERS  
Donald R. Hoover, Rte. 3, Ratchford Rd., Gastonia, N.C. 28052  
Filed Nov. 9, 1981, Ser. No. 319,319  
Int. Cl.<sup>3</sup> D01H 5/00

U.S. Cl. 19-258

7 Claims



1. In a fiber processing machine having at least two sets of calendar rolls rotating at different speeds and with the nips of the calendar rolls lying in a common plane, the combination of a control roll positioned between the sets of calendar rolls and mounted against relative rotation on a driven shaft with the circumference of the control roll extending above the said plane, a circumferentially textured surface on the control roll including a plurality of teeth projecting radially from the control roll at a negative angle, and having a plurality of axially spaced circumferentially extending grooves between the teeth.

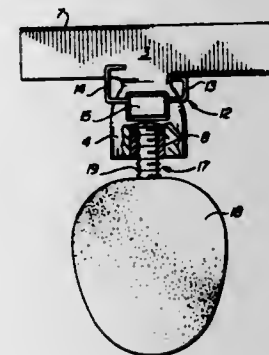
4,417,370

# POCKET HANDKERCHIEF CLIP

Shawn D. Lewis, P.O. Box 1965, Ruston, La. 71270  
Filed Aug. 23, 1982, Ser. No. 410,319  
Int. Cl.<sup>3</sup> A47L 25/08; A44B 21/00

U.S. Cl. 24-3 L

9 Claims



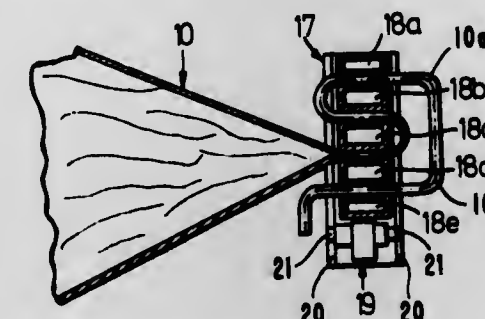
1. A pocket handkerchief clip for supporting a handkerchief decoration accessory in a pocket comprising:

- (a) a base frame having an elongated top portion; a base frame handle extending from said base frame and a fulcrum on one side of said base frame handle;
- (b) a pivot frame substantially coextensive with said base frame and having an elongated top portion and a pivot frame handle extending from said pivot frame adjacent said base frame handle and engaging said fulcrum on said base frame;
- (c) bias means engaging said base frame handle and said pivot frame handle and biasing at least a portion of said base frame against said pivot frame and said pivot frame handle against said fulcrum to close at least a portion of said pivot frame against said base frame; and further comprising a lint pad rigidly secured closely adjacent said base frame handle at the end opposite of said elongated top portions for supporting said pocket handkerchief clip in the pocket.

4,417,371  
CLOSURE FOR FLEXIBLE CONTAINERS  
Kurt Krosenberg, Mühlenbergweg 10, 5485 Sinzig, Fed. Rep. of Germany  
Filed Jan. 29, 1981, Ser. No. 229,395  
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004884

Int. Cl.<sup>3</sup> B65D 77/10; A44B 21/00  
U.S. Cl. 24-30.5 R

2 Claims



1. In a closure for flexible containers of semi-finished products adapted for transportation and storage of flowable or pourable goods with several clamp members which are arranged one on top of the other in lateral supports and are securable to one another in their position, and one end of the semi-finished product can be led through separation places of the clamp members, the improvement wherein said supports surround ends of said clamp members, said clamp members are arranged displaceable relative to one another in the supports, clamping means insertable into each of said supports for clamping said clamp members relative to each other, said clamping means each comprises an eccentric member having lateral pins insertable into said bores of said arms of said supports, said eccentric member comprises a two-piece case which is axially telescopic, and compression spring means for biasing said two-piece case.

4,417,372

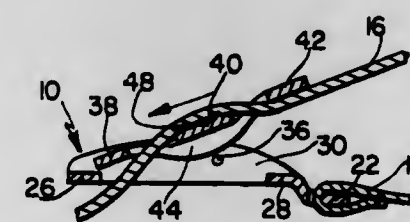
# ADJUSTABLE BUCKLE CONSTRUCTION

Fernando M. Ronci, Providence, R.I., assignor to F. Ronci Company, Inc., No. Providence, R.I.

Filed Sep. 29, 1982, Ser. No. 432,545  
Int. Cl.<sup>3</sup> A44B 11/00

U.S. Cl. 24-163 R

1 Claim



1. An adjustable buckle construction comprising:

- (a) first strap end portion;
- (b) a base member having spaced first and second cross elements with an open interior area therebetween, a loop element adjacent said second cross element and a pair of spaced side walls which extend upwardly adjacent opposite side edges of said open area;
- (c) means securing said first strap end portion to said loop element;
- (d) a second strap end portion;
- (e) a clasp member having spaced first, second and third transverse cross bars, said clasp member being of slightly smaller transverse dimension and slightly greater longitudinal dimension than said base member open area, and

having a pair of spaced side walls which extend downwardly between said cross bars on the sides of said clasp member, said second strap end portion being received in interwoven relation on said clasp member so that it extends upwardly between said first and second cross bars, downwardly between said second and third cross bars, across the underside of said third cross bar and outwardly therefrom, said clasp member being received on said base member through said open area from the underside of said base member so that said first cross bar overlies said first cross element and so that the free end of said second strap end portion overlies said second cross element and is interposed between said second cross element and said third cross bar and extends outwardly therefrom; and  
(f) detent means on said base member side walls engaging the upper edges of said clasp member side walls between said second and third cross bars thereof and thereby releasably locking said clasp member on said base member.

4,417,373

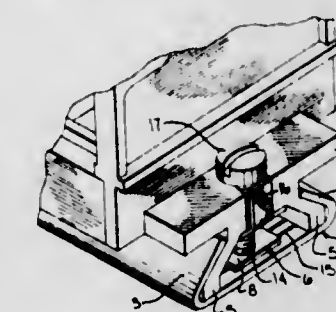
# CHANNEL CLAMP

Josef Keglweitsch, Bowling Green, Ohio, assignor to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Oct. 26, 1981, Ser. No. 314,852  
Int. Cl.<sup>3</sup> A44B 21/00; F16D 1/00

U.S. Cl. 24-458

6 Claims



1. An U-shaped clamp having overlapping members defining a clamping opening for securing an electrical connector support member to a base member, which comprises a lower leg extending over the base member when the clamp is applied thereto and terminating at the inner end in a reverse bend which joins the lower leg to an upper leg which overlies the lower leg, said upper leg being located in opposed relation to the support member, and the upper leg extends on a taper from the reverse bend to a flat portion extending over the lower leg, a threaded hole provided in the flat portion, and threaded means provided to extend through said threaded hole and into engagement with the lower leg and operable to move the upper leg into clamping engagement with the support member to secure the clamp and connector to the base member.

4,417,374

# APPARATUS FOR SIMULTANEOUSLY SIZING OF A LARGE NUMBER OF LONG FIBER YARNS

Susumu Kuroda, Nagoya, and Tadashi Komori, Fukui, both of Japan, assignors to Kawamoto Industrial Co., Ltd., Nagoya, Japan

Filed Mar. 11, 1981, Ser. No. 242,430  
Claims priority, application Japan, May 9, 1980, 55-61885  
Int. Cl.<sup>3</sup> D02H 5/02, 13/20

U.S. Cl. 28-181

9 Claims

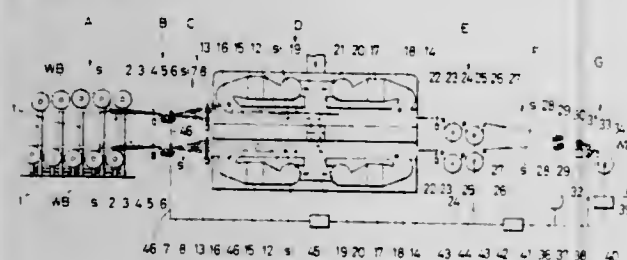
1. An apparatus for the simultaneous sizing of a large number of yarns, comprising:  
beam stand sections having several beam stands;  
sizing sections having first reeds, guide rollers, sizing devices having immersion rollers to immerse warps in sizing solutions and squeezing rollers;  
water pipe wet dividing sections having a number which is one less than a multiple number of several times that of the



number of said beam stands, a half of said dividing water pipes being spaced substantially evenly extending upwardly and diagonally from a base-end water pipe and another half of said dividing water pipes being spaced substantially evenly extending downwardly and diagonally also from said base-end water pipe;

hot air drying sections having second reeds and hot air drying chambers in which hot air generating devices are incorporated;

cylinder drying sections having heating cylinders and guide rollers placed in front and back of said heating cylinders; at least two systems of warp sizing and drying mechanisms in which the relative positions of said sizing sections, said wet dividing sections, said hot air drying sections, and said cylinder drying sections are placed substantially identically and vertically;



a winding section having an adjustable reed and a winding device which comprises a measuring roller, a beaming roller, and a driving shaft for a weaver's beam;

dividing sections having driving rods positioned between said winding section and said cylinder drying section of said warp sizing and drying mechanism of each system, the length of said dividing section being equal for each system;

a driving motor connected to said beaming roller of said winding section through a transmitting shaft;

said driving motor being connected through a draft adjusting device to said heating cylinders of each system by transmitting shafts; and

said heating cylinders being connected through a draft adjusting device to said squeezing rollers of each system by transmitting shafts.

4,417,375

# APPARATUS FOR INTERLACING MULTIFILAMENT YARN BY FLUID

Takao Sano, Masafumi Ogasawara, both of Otsu, and Hiroshi Tsubakimori, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 888,666, Mar. 21, 1978, abandoned.

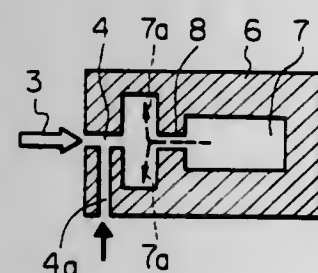
This application Apr. 28, 1980, Ser. No. 144,031

Claims priority, application Japan, Mar. 30, 1977, 52-34658; Mar. 30, 1977, 52-34660

Int. Cl.<sup>3</sup> D02G 1/16; D02J 1/08

U.S. Cl. 28—272

8 Claims



1. An apparatus for interlacing a multifilament yarn by fluid comprising:

- (a) a yarn treating member;
- (b) a rectangular yarn passage provided through the yarn

treating member, through which the yarn to be treated is passed in a continuous running state;

- (c) a fluid supply nozzle provided in the yarn treating member for continuously feeding a jet stream of fluid, one end of the fluid supply nozzle being connected to a fluid supply source, the other end of the fluid supply nozzle being opened to the yarn passage and, the axis of the fluid supply nozzle intersecting the axis of the yarn passage at a substantially right angle;
- (d) a fluid introduction aperture provided in the yarn treating member, one end of the fluid introduction aperture being connected to an introduction fluid source and the other end of the fluid introduction aperture being opened to the fluid supply nozzle;
- (e) fluid exit ports provided only at the inlet and outlet of the yarn treating passage;
- (f) a resonance tube provided in the yarn treating member, one end of the resonance tube being closed, the other end of the resonance tube being opened to the yarn passage with a throttled neck portion and, the resonance tube being disposed coaxially with the fluid supply nozzle through the yarn passage;
- (g) a wall substantially enclosing said yarn passage provided for contact with the moving yarn during the treating of the yarn in the yarn passage with the fluid; and
- (h) a valve for adjusting the quantity of fluid flow to the fluid introduction aperture is provided for controlling the yarn treating fluid to an oscillation of resonance sharpness of at least 2 at the position of the outlet of the yarn passage.

4,417,376

# ADJUSTABLE CYLINDER HEAD HOLDER

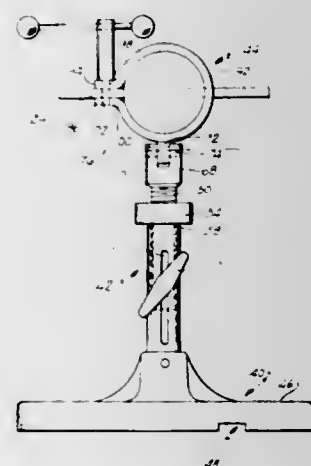
James A. Kammeraad, Holland, Mich., and Ronald L. Tiger, Joplin, Mo., assignors to K-Line Industries, Inc., Holland, Mich.

Continuation of Ser. No. 94,453, Nov. 15, 1979, abandoned. This application Feb. 1, 1982, Ser. No. 344,866

Int. Cl.<sup>3</sup> B23P 7/00; B23Q 3/04

U.S. Cl. 29—26 A

5 Claims



1. A cylinder head stand usable to support a cylinder head of an internal combustion engine during valve guide reworking and the like and being usable with a positioning means which includes an elongated member, said stand comprising:

- a base having a transverse slot adapted to receive said elongated member;
- a generally vertically oriented pedestal extending from said base;
- a post telescopically disposed within said pedestal;
- vertical adjustment means operatively engaging said post for vertically positioning said post relative to said pedestal;
- a cylinder head support plate having means for supporting the cylinder head; and
- angular and rotational adjustment means on said post for permitting angular and rotational adjustment of the head

support plate about two perpendicularly related axes and in the same vertical plane, said angular and rotational adjustment means comprising:

- a rotational member, said head support plate being mounted on said rotational member;
- clamp means on said post and engaging said rotational member for clamping the rotational member in a plurality of positions, said clamp means permitting said rotational member to be rotated about a rotational axis through an angle of 360°; and
- a knuckle joint means carried by said post including a first member and a second member for permitting limited angular adjustment of said head support plate, said second member being pivotal about an axis in a plane parallel to the axis of rotation of said rotational member and perpendicular to the axis of rotation of said rotational member.

4,417,377

# TOOL PROVIDING FOR THE AUTOMATIC EXCHANGE OF DIFFERENT WORKING FIXTURES

Josef Brezina, Rokycany, Czechoslovakia, assignor to SKODA, Pilsen, Czechoslovakia

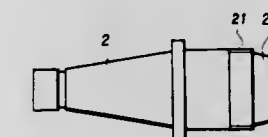
Filed Mar. 13, 1981, Ser. No. 243,585

Claims priority, application Czechoslovakia, Mar. 13, 1980, 1731-80; Mar. 13, 1980, 1732-80; Mar. 13, 1980, 1733-80

Int. Cl.<sup>3</sup> B23Q 3/157

U.S. Cl. 29—26 A

12 Claims



1. Apparatus for the automatic exchange of different tool fixtures particularly adapted for digitally controlled coordinate machine tools having a driven spindle, comprising a number of tool fixtures, a main holder forming a unit with the spindle of a machine tool, and a storage container for tool fixtures, each tool fixture being provided with a clamping thread and concentrically therewith a side-tracking thread of opposite hand, the main holder being provided with a clamping thread adapted to be positioned in axial alignment with the clamping thread of the tool fixture, the clamping thread on the main holder being of the same hand as the clamping thread on the tool fixture, and the side-tracking thread on the tool fixture being of the same hand as the side-tracking thread on the storage container.

4,417,378

# APPARATUS FOR APPLYING HEAT SHRINKABLE TUBING

Christopher K. Brown, Camp Hill; Willard L. Busler, and Donald A. Wion, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1981, Ser. No. 239,968

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—33 M

6 Claims

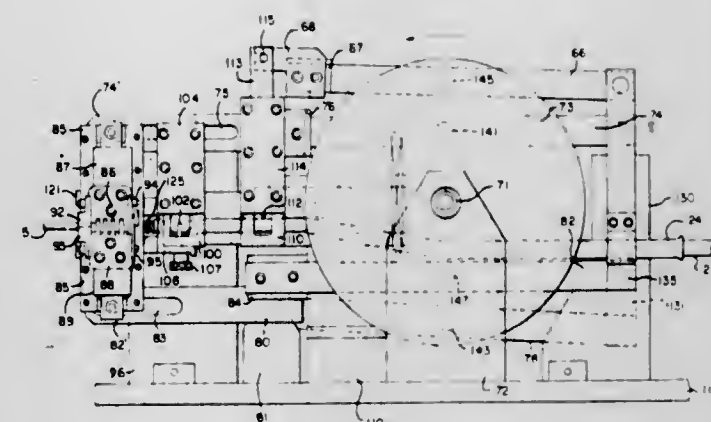
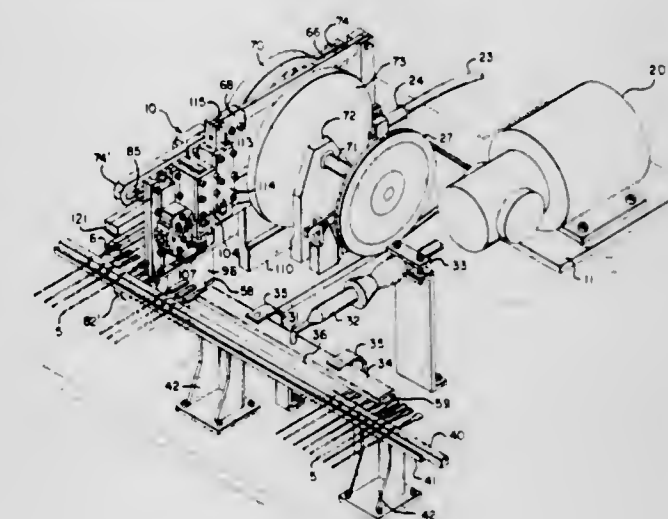
1. Apparatus for applying heat shrinkable tubing to the leading end of a wire comprises:

- feed means for feeding a continuous length of tubing axially through a shear zone, said feed means comprising a feed clamp and a stationary clamp, said first clamp being arranged to clamp said tubing and advance it through said shear zone while said stationary clamp is in the open position, said stationary clamp being arranged to hold said

tubing stationary while said feed clamp is in the open position and retreating over said stationary tubing, shear means for shearing a section of said tubing at said shear zone, said shear means comprising an upper blade and a lower blade, said blades being adapted to move together to shear said section of tubing from said continuous length of tubing,

positioning means for holding said section of tubing and advancing said section to an application zone where said section is applied to the leading end of a wire, said positioning means comprising an upper jaw fixed to said upper shear blade and a lower jaw fixed to said lower shear blade, said jaws being profiled to hold said section of tubing therebetween when said jaws are in the closed position, said upper jaw and upper blade being fixed with respect to said first clamp,

drive means for imparting motion to said feed means, shear



means, and positioning means, said drive means comprising an upper jaw lever, a lower jaw lever, and a stationary clamp lever, each said lever having a pivot end, a component end, and a cam follower mounted therebetween, each said cam follower riding in a respective continuous groove profiled in a disc, said disc being carried by a cam shaft driven by a motor, said grooves being profiled to effect the opening and closing motions of said jaws and clamps as said shaft rotates, said upper jaw and feed clamp being carried in a slot at the component end of said upper jaw lever, said lower jaw being carried in a slot at the component end of said lower jaw lever, said jaws and first clamp being reciprocally slidable in said slots to advance said tubing through said shear zone toward said application zone, said jaws and feed clamp being reciprocated by a tubing advance shaft, said advance shaft carrying a cam follower which rides in a continuous cam groove in a disc carried by said cam shaft.



4,417,379

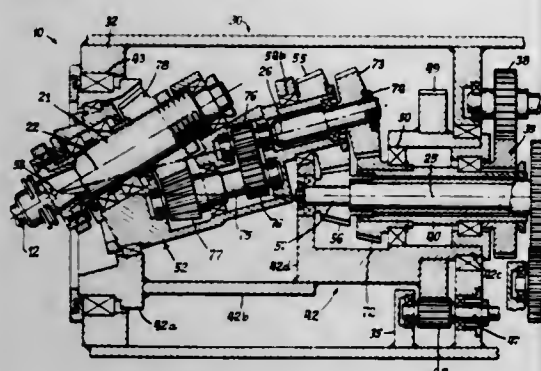
**MACHINE TOOL HEAD HAVING NUTATING SPINDLE**  
Keith F. Goode, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Nov. 12, 1982, Ser. No. 440,832

Int. Cl.<sup>3</sup> B23Q 5/22; B23C 1/12

U.S. Cl. 29—35.5

2 Claims



1. A nutatable-spindle machine-tool head comprising a head frame in the form of a housing having a front face, an elongated first rotary slide mounted for rotation in said head frame by a front face hub journaled in the front face of the head frame and by an axially remote, stabilizing tail bearing in the head frame,
- a second rotary slide mounted for rotation in the first rotary slide by a front face hub journaled in the front face hub of the first slide and by an axially remote, stabilizing tail bearing in the first slide,
- a spindle journaled in the face hub of said second slide and by an axially remote stabilizing tail bearing in the second slide,
- the axes of rotation of said spindle and of said two slides intersecting in a single point at the front of the spindle and closely adjacent the front face of the head frame with a common acute angle between the spindle axis and that of the second slide and between the axes of two slides, whereby the axis of a tool carried by the spindle can assume any position within a conical envelope having its apex at said point and having an apex angle four times the said common angle,
- a planetary gear train for driving the spindle and having a drive gear coaxial with said first rotary slide and a driven gear on the spindle and including at least two meshing pairs of bevel gears, and
- separate power means for turning said spindle drive gear and for positioning said rotary slides rotatively about their respective axis,
- the major part of the radial cutting load on said spindle being transmitted from slide to slide and to the head frame essentially in the plane of the front face of the head frame.

4,417,380

**METHOD OF FORMING METAL RING IN A BEARING**  
Jose Rosan, Jr., Newport Beach, Calif., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Sep. 24, 1981, Ser. No. 305,134

Int. Cl.<sup>3</sup> B23P 11/00; F16C 13/00, 35/00

U.S. Cl. 29—148.4 R

1 Claim

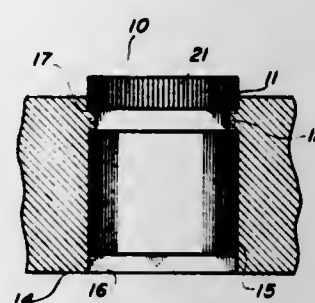
1. A method of inserting a bushing means into a soft non-ferrous material such as aluminum comprising the steps of:
  - (a) first preparing a special bushing means which contains an upper portion having an area about 25% of the distance from the top which is about  $\frac{1}{4}$  a millimeter greater in diameter than the lower portion; this greater diameter area ends in a forming shoulder;
  - (b) adding serrations to the upper portion of said bushing means;
  - (c) preparing an annular groove about  $\frac{1}{4}$  millimeter deeper than said lower portion and about 1 millimeter in length between said upper portion and said lower portion;
  - (d) preparing a bore in a workpiece of said soft non-ferrous

material generally equal in diameter to the lower portion of said bushing means;

(e) inserting said bushing means into the bore;

(f) forming a metal ring within the annular groove by the swaging action of the forming shoulder upon said workpiece; and

(g) locking said bushing means into said workpiece by the forming action of the metal ring of the workpiece material, the annular groove of the bushing means and the serrations in the upper portion.



4,417,381

**METHOD OF MAKING GAS TURBINE ENGINE BLADES**  
Gordon J. S. Higginbotham, Darley Abbey, England, assignor to Rolls-Royce Limited, London, England

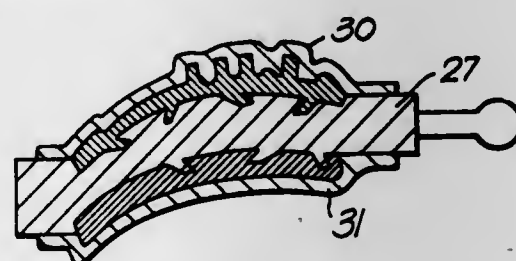
Filed Mar. 8, 1982, Ser. No. 355,620

Claims priority, application United Kingdom, Apr. 14, 1981, 8111778

Int. Cl.<sup>3</sup> B23P 17/02

U.S. Cl. 29—156.8 H

4 Claims



1. A method of manufacturing a gas turbine engine blade or vane comprising two halves includes the steps of providing a first female mould the interior mould surface of which defines the internal surface of one blade half, providing a second female mould, the interior mould surface of which defines the external surface of the one blade half, providing a common intermediate member interposed between the first and second moulds, injecting wax to form patterns within the two mould cavities formed by the first and second moulds together with the common intermediate member, removing the first and second moulds from the common intermediate member to leave the wax patterns attached to the common intermediate member, applying a layer or layers of ceramic material to the wax patterns, firing the ceramic such as to rigidify it and remove the wax therefrom, removing the ceramic portions from the common intermediate member and locating them together to define a casting cavity therebetween, providing a runner system to communicate with the casting cavity and applying a further ceramic layer or layers to the exterior surfaces of the two ceramic portions to secure them together, subsequently firing the assembly and thereafter casting it with liquid metal to form a blade half and furthermore forming a second blade half portion using a further set of moulds and a common, intermediate member by repeating the above steps, and thereafter securing the two completed blade halves together to form a blade.

4,417,382

**METHOD OF THERMALLY INSULATING VESSELS**  
Lothar Schillf, Am Freibad 9, 2807 Achim, Fed. Rep. of Germany Division of Ser. No. 133,408, Mar. 24, 1980, Pat. No. 4,349,051.

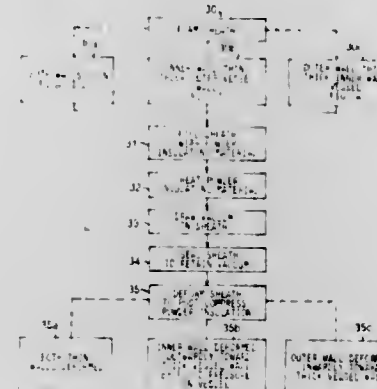
This application Mar. 4, 1982, Ser. No. 354,706

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911416

Int. Cl.<sup>3</sup> B23P 17/00; B21D 22/10

U.S. Cl. 29—421 R

7 Claims



1. A method of thermally insulating the pressure containing side of high pressure vessels and pipes, comprising the steps of forming a sheath having spaced walls, filling the sheath with a powder insulating material comprising powder particles with open pores and irregular form, drawing a vacuum in said sheath through an opening in the sheath, heating said insulating material, sealing said opening while maintaining the vacuum, and irreversibly deforming the inside wall portion of the sheath after sealing the sheath to postcompress the insulating material, wherein said step of forming the sheath comprises forming the sheath with a thick wall and a thinner deformable wall, and irreversibly deforming the thinner wall toward the thick wall after sealing the sheath, and wherein the thick wall is a vessel with a rigid wall and the thinner wall is within the vessel, and said step of irreversibly deforming comprises deforming the thinner wall radially toward the thicker wall to postcompress the insulating material.

4,417,383

**METHOD OF ASSEMBLING PIPE JOINT**

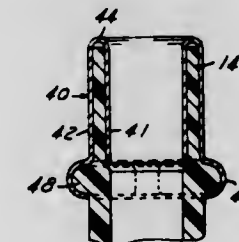
David L. Anderson, Muskegon, and A. David Joseph, North Muskegon, both of Mich., assignors to Sealed Power Corporation, Muskegon, Mich.

Division of Ser. No. 132,875, Mar. 24, 1980, Pat. No. 4,351,550, which is a division of Ser. No. 52,667, Jun. 27, 1979, Pat. No. 4,224,161, which is a continuation-in-part of Ser. No. 906,256, May 15, 1978, abandoned. This application Mar. 22, 1982, Ser. No. 360,245

Int. Cl.<sup>3</sup> B21D 39/00; B23P 11/00

U.S. Cl. 29—511

5 Claims



1. A method of forming an air tight metal-to-plastic pipe joint for use in an oil filtering system which includes a metal pump housing having an opening, and an inlet screen assembly having a plastic pipe adapted at one end to communicate with said opening, said method comprising the steps of (a) providing

a metal eyelet having inner and outer cylindrical portions connected at one eyelet end with said outer portion having a flanged portion remote from said one eyelet end, (b) placing said eyelet over said one pipe end, and (c) forming said flanged portion of said eyelet over a rib on said pipe such that said rib acts to retain said eyelet on said pipe end.

4,417,384

**MEMBERS FOR SUPPORTING A MOVABLE LOAD**  
Thomas Wilkinson, Andover, England, assignor to Hancock Cutting Machines Limited, England

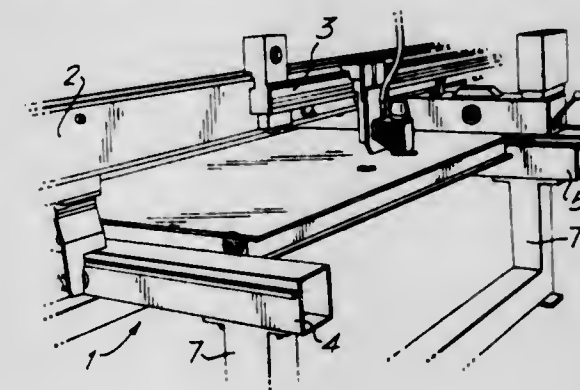
Filed Sep. 1, 1981, Ser. No. 298,419

Claims priority, application United Kingdom, Oct. 2, 1980, 8031824

Int. Cl.<sup>3</sup> B23P 19/04

U.S. Cl. 29—526 R

8 Claims



1. An elongated member for supporting and locating a load movable along the length of said elongated member, said elongated member comprising a first relatively rigid elongated part for supporting the weight of said movable load, a second relatively resilient elongated part for locating the movable load on said elongated member, a plurality of spaced dowels extending along the length of said elongated member, said dowels engaging said first and second parts for locating said second part at a predetermined position with respect to said first part, and means for fastening said first and second parts together.

4,417,385

**PROCESSES FOR MANUFACTURING INSULATED-GATE SEMICONDUCTOR DEVICES WITH INTEGRAL SHORTS**

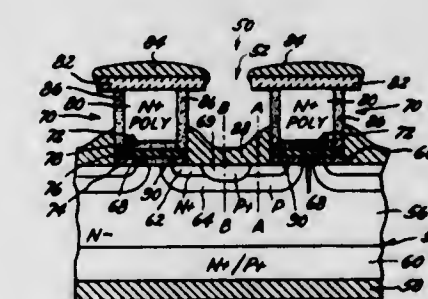
Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,731

Int. Cl.<sup>3</sup> H01L 21/265

U.S. Cl. 29—571

35 Claims



1. A self-aligned process for manufacturing an insulated-gate semiconductor device including an integral short, said process comprising:

providing a semiconductor wafer including a first region of one conductivity type having a principal surface, and preparing the wafer by forming on the principal surface a gate insulating region layer, forming on the gate insulating region layer a conductive gate electrode layer, and form-



ing on the conductive gate electrode layer an overhang layer;  
forming an etch resist mask having openings defining the ultimate location of upper electrode regions, and then etching in areas defined by the mask openings through the overhang layer and through the conductive gate electrode layer at least to the gate insulating region layer, with lateral etching of the conductive gate electrode layer to undercut the overhang layer, thereby defining gate electrodes extending upwardly from and spaced along the first region principal surface, with overhanging portions of the overhang layer on the upper surfaces of the gate electrodes;

oxidizing at least the conductive gate electrode sidewalls; introducing into the first region between the gate electrodes impurities appropriate to form a base region of opposite conductivity type and an upper electrode region of the one conductivity type within the base region, the gate electrodes serving as masks during the introduction of impurities, and diffusing the impurities introduced to appropriately locate and configure the base and upper electrode regions such that at the principal surface the base region exists as a band of opposite conductivity type between the upper electrode region and the first region, with active portions of the band underlying at least a portion of at least one gate electrode and being separated therefrom by portions of the gate insulating region layer; forming a shorting extension of the base region up through and to a portion of the surface of the upper electrode region intermediate and spaced from the gate electrodes to facilitate an ohmic connection between the base and upper electrode regions, the forming of the shorting extension being accomplished by employing the overhang of the overhang layer as a mask to define said portion of the surface of the upper electrode region; and forming a metallized gate terminal in electrical contact with the conductive gate electrodes, and forming a metallized upper electrode region terminal in electrical contact with the upper electrode region and with the shorting extension.

**4,417,387**  
**GOLD METALLIZATION IN SEMICONDUCTOR DEVICES**

Christopher J. Heslop, Woodbridge, England, assignor to The Post Office, London, England

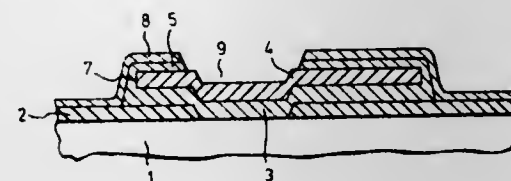
Filed Apr. 15, 1981, Ser. No. 254,513

Claims priority, application United Kingdom, Apr. 17, 1980, 80 12688

Int. Cl.<sup>3</sup> H01C 17/28

U.S. Cl. 29—591

9 Claims



1. In a method of preparing a semiconductor device including the steps of providing a semiconductor substrate, depositing a layer of titanium over at least part of said substrate, and covering at least part of said titanium layer with a metallization layer of gold, the improvement wherein all of said gold metallization layer including its side edges is covered with a second layer of titanium to encase said gold metallization layer in said titanium.

**4,417,388**  
**METHOD OF MAKING A MULTIPLE OPEN TURN LAP WOUND DYNAMOELECTRIC MACHINE**

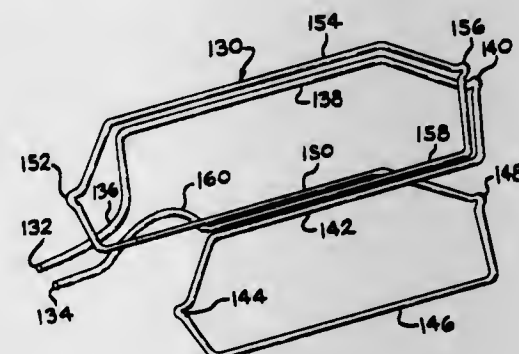
Jeffrey T. Major, Cygnet, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 28, 1980, Ser. No. 211,483

Int. Cl.<sup>3</sup> H02K 15/06

U.S. Cl. 29—598

2 Claims



1. A method for placing a winding on an armature of a four pole lap wound direct current machine, said armature including a plurality of commutator segments and a laminated core with a plurality of slots formed therein, comprising:

free forming a continuous elongated conductor having two ends into a plurality of open turns with each said turns having two sides, said formed conductor having substantially a final shape of said conductor on said core and having four said sides spaced to engage four different slots in said core spaced 90° apart; then spreading said sides apart and positioning said formed conductor about said armature core; then positioning said four sides in said four different slots in said core; and then attaching said conductor ends to two different commutator segments disposed substantially adjacent each other.

**4,417,386**  
**METHOD FOR MOUNTING A SEMICONDUCTOR DEVICE IN A HOUSING**

Klaus D. Exner, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,498

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001613

Int. Cl.<sup>3</sup> H01L 7/24

U.S. Cl. 29—590

9 Claims

1. Method of mounting a semiconductor device in a housing, which comprises first providing a chromium layer on a part of the surface of the monocrystalline silicon semiconductor body of the semiconductor device to be connected to the housing, covering the chromium layer with a silver layer, subsequently permanently connecting the silver layer on the chromium layer on the monocrystalline silicon semiconductor body to a part of the housing being in the form of a substrate with an adhesive to which silver particles have been added, and connecting electrodes of the semiconductor device with wire connections to terminals disposed in the housing.

**4,417,389**  
**METHOD OF TERMINATING CARBON CERAMIC COMPOSITION RESISTORS FOR USE IN HIGH PEAK POWER AND PEAK VOLTAGE ENERGY DISSIPATION APPLICATION**

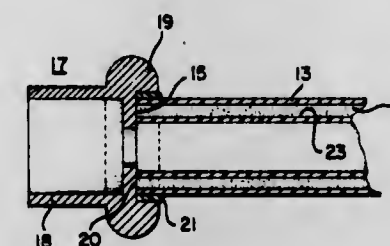
John B. Lopacki, North Tonawanda, and Harry R. Ems, Niagara Falls, both of N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Filed Feb. 26, 1982, Ser. No. 352,962

Int. Cl.<sup>3</sup> H01C 17/28

U.S. Cl. 29—619

5 Claims



1. A method of producing an electrical resistor comprising the steps of:

- forming a resistance core member of conductive material in a dielectric matrix material having end and side portions;
- forming an end cap member having an internal contact surface and a receiving portion, said receiving portion adapted to spacedly receive said core member allowing a space between about 0.08 and about 0.64 cm. between the side portion of said core member and said receiving portion, said cap member having an outward-extending radial portion thereon adapted to extend outward from about 0.16 to about 1.27 cm. from the side of said core when said cap member is mounted on said core;
- spacedly mounting said core member within the receiving portion of said cap member, placing the contact surface of said cap member into electrical contact with the end of said core member; and
- filling said space between the side portion of said core member and the receiving portion of said cap member with an electrically insulating material.

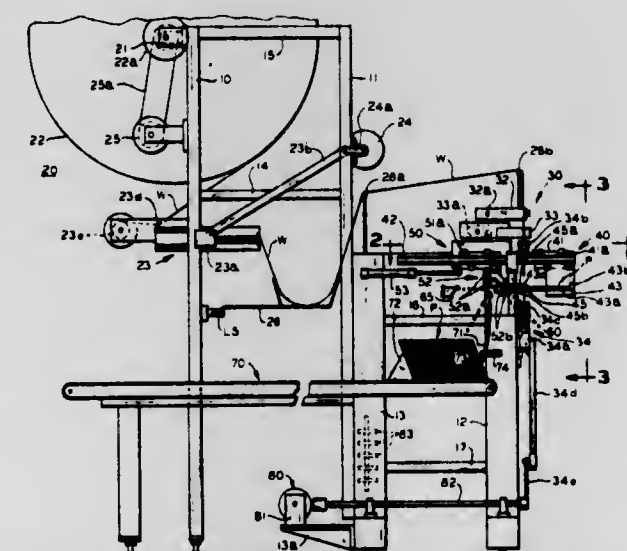
**4,417,390**  
**BATTERY PLATE WRAPPER MACHINE**  
Robert D. Simonton, Fremont, Ohio, assignor to Mac Engineering and Equipment Co., Inc., Benton Harbor, Mich.

Filed Jul. 15, 1977, Ser. No. 815,814

Int. Cl.<sup>3</sup> H01M 2/14

U.S. Cl. 29—730

16 Claims



1. A machine for wrapping electrical storage battery plates comprising a fixture for supporting individual battery plates

and moveable between a first plate loading position and a second wrapper folding position; means for positioning individual sheets adapted to be wrapped around individual plates in a sheet station with their longitudinal center aligned generally with and intersected by the path of movement of said fixture and proximate to said fixture and a side of a fixture supported plate; a pair of spaced members defining an aperture in registry with the path of movement of said fixture and of a width to receive the sheet and leading edge of a fixture supported plate and to constrain said sheet against said fixture and plate, said members being located on the side of said sheet positioning means opposite said first position of said fixture, said fixture movement displacing a portion of a fixture supported plate enfolded in a sheet beyond the side of said spaced members remote from said sheet positioning means when said fixture is in said second wrapper folding position; gripper means for gripping the leading edge of a fixture supported plate and a plate enfolded sheet on the side of said spaced members opposite said sheet positioning means; means for actuating said gripper means to grip said plate and enfolded sheet while said fixture supports said plate; traversing means for said gripper means to carry said gripper means and a sheet enfolded plate gripped thereby along a path between a third position in said aperture between said spaced members and a fourth position freeing said sheet enfolded plate from said spaced members; and bonding means located along said path for bonding together the overlapping edge of the plate enfolded sheet portions.

**4,417,391**  
**METHOD FOR FORMING A STAGGERED RECORDING HEAD**

Sherman L. Rutherford, Sudbury, Mass.; Arthur E. Bliss, Sunnyvale, and Noel J. Schmidt, Palo Alto, both of Calif., assignors to Benson, Inc., San Jose, Calif.

Division of Ser. No. 155,937, Jun. 3, 1980. This application Jun. 8, 1982, Ser. No. 386,173

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—825

3 Claims



1. A method for forming an electrostatic printer recording head containing four rows of staggered styli comprising; winding a first row of wires on a cylindrical drum the surface of which is double threaded, said drum having a flat formed on a portion of the surface along the length of the drum parallel to the axis of rotation of the drum, said first row of wires occupying every other groove on the drum surface; placing a spacer along the flat and over the wires in the first row; winding a second row of wires in the groove between the first row of wires and over said spacer; placing a spacer along said flat and over said second row of wires; winding a third row of wires in the groove formed between said first row and said second row of wire leaving a space between the wires in said third row; placing a spacer along the flat over said third row of wires; winding a fourth row of wires in the space between said third row of wires; thereby to form four rows of wires wherein said second row of wire is offset from said first row of wire by approximately one wire diameter, said third row of wire is offset from said first row of wire by approximately one-half wire diameter and said fourth row of wire is offset from said first row of wire by approximately one and one-half wire diameter.



4,417,392

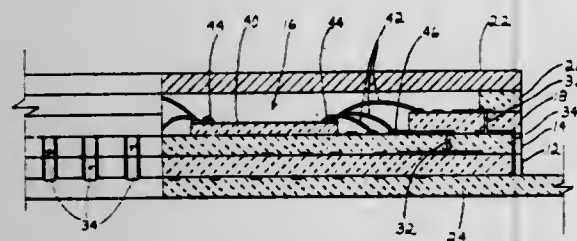
## PROCESS OF MAKING MULTI-LAYER CERAMIC PACKAGE

Shawki S. Ibrahim, and James E. Elmer, both of Lafayette, Ind., assignors to CTS Corporation, Elkhart, Ind.  
Division of Ser. No. 149,968, May 15, 1980, Pat. No. 4,320,438.  
This application Oct. 19, 1981, Ser. No. 312,729

Int. Cl.<sup>3</sup> H05K 3/34

U.S. Cl. 29—840

6 Claims



1. In a process for producing a high component density multi-layer monolithic LSI ceramic package, comprising the steps of forming metalized conductor patterns on the surfaces of a plurality of laminas, bonding together the plurality of laminas including a lamina adapted to receive individual chips of a chip array, disposing at least one chip on said lamina, the conductive patterns disposed on respective ones of said laminas with the ends of the conductive patterns spaced at least 10 mil apart and the conductive pattern ends of one lamina disposed in alternating relationship relative to the ends located on an adjacent lamina, selected laminas having metallized conductive means comprising metalized-filled openings forming conductive paths between conductive patterns on selected ones of the laminas forming the ceramic package and edge-formed metalized conductive paths interconnecting conductive patterns on the multi-layer ceramic laminas, forming wire bonds on selected ones of said conductive pattern ends, and forming alternating wire connections from said chip to said wire bonds so that said wire connections maintain the not less than 10 mil spacing of said wire bonds respectively by extending between said chip at one end to wire bonds of selected ones of the alternative conductive pattern ends of the adjacent levels of laminas at the other end to provide electrical connections from the chip to said conductive patterns, whereby a high component density chip array may be mounted in said LSI ceramic package.

4,417,393

## METHOD OF FABRICATING HIGH DENSITY ELECTRONIC CIRCUITS HAVING VERY NARROW CONDUCTORS

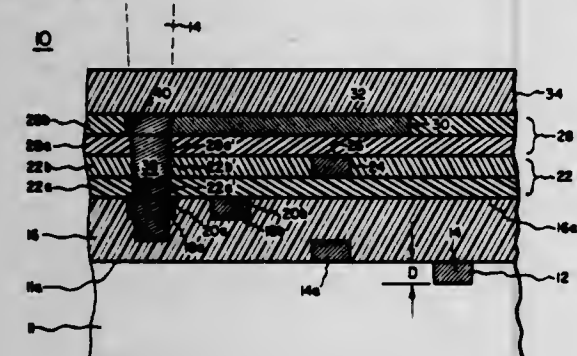
Charles A. Becker, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,599

Int. Cl.<sup>3</sup> H05K 3/46

U.S. Cl. 29—846

14 Claims



1. A method for fabricating a conductive circuit for interconnecting a plurality of locations, comprising the steps of:

providing an insulative material substrate, having a first surface;  
fabricating by laser machining at least one channel into said substrate through said first surface;  
positioning each of the at least one channel to interconnect preselected ones of the plurality of locations;  
filling the at least one channel with conductive material to provide at least one conductor each interconnecting pre-selected locations;  
fabricating a first solid sublayer of an insulative and relatively non-laser-machineable material upon said substrate first surface;  
fabricating a second solid sublayer of an insulative and relatively laser-machineable material upon that surface of said first sublayer furthest from said substrate;  
fabricating by laser machining at least one other channel at least partially through the thickness of only said second sublayer;  
filling the at least one other channel with conductive material to provide at least one other conductor each interconnecting other preselected locations; and  
so positioning the at least one other channel as to insulate the additional conductor material therein from the conductive material in the at least one channel.

4,417,394

## METHOD AND APPARATUS FOR POSITIONING AN EXPANDABLE INSULATING SLEEVE ON A CONNECTOR

Roy A. Moody, Flossmoor; John J. Bulanda, New Lenox; Cezmir M. Guzay, Des Plaines, all of Ill., and David R. Schoenfeld, Salt Lake City, Utah, assignors to Panduit Corp., Tinley Park, Ill.

Division of Ser. No. 709,845, Jul. 29, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,907

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—882

22 Claims

1. Apparatus for insulating a connector mechanically joined to one end of an electrical conductor by positioning a radially expandable resilient insulating sleeve, having an inside diameter in its non-expanded condition smaller than the largest cross-sectional dimension of said connector about said connector, said sleeve in its non-expanded condition having a generally uniform wall thickness and a generally constant inside diameter throughout its length, said connector including one end portion mechanically joined to said conductor and a terminal end portion for connection to another electrical component, said apparatus comprising:

expansion means for radially expanding said sleeve sufficiently to receive said connector prior to association of the connector with said apparatus, said expansion means increasing every inside cross-sectional dimension of said sleeve and simultaneously radially expanding substantially the entire length of said sleeve; and

holding means for maintaining said sleeve in its expanded condition and for permitting said connector to be received, terminal end portion first, into said expanded sleeve; and

release means operable to release said sleeve from its expanded condition whereby after said sleeve is held expanded and said connector inserted therein, operation of said release means frees said sleeve to become disposed about and compressively hold said connector, said sleeve is an end portion of a length of radially expandable resilient insulating tubing, said apparatus further comprising cutter means for severing said sleeve in its expanded condition from the remainder of said length of tubing.

21. A method of insulating a connector mechanically joined to one end of an electrical conductor by positioning a radially expandable resilient insulating sleeve, having an inside diameter in its non-expanded condition smaller than the largest cross-sectional dimension of said connector about said connector, said sleeve in its non-expanded condition having a generally

4,417,395

## METHOD OF MAKING AN ELECTRICAL CONDUCTOR HAVING AN INTEGRAL ELECTRICAL CONTACT

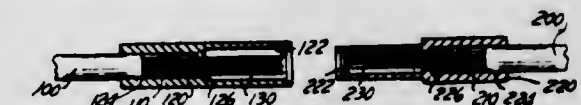
James R. Hall, Bainbridge, and William P. Whallon, Jr., Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 90,198, Nov. 1, 1979, abandoned, which is a division of Ser. No. 890,339, Mar. 27, 1978, Pat. No. 4,206,958. This application Nov. 12, 1982, Ser. No. 440,913  
The portion of the term of this patent subsequent to Jun. 10, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> H01R 11/11

U.S. Cl. 29—882

2 Claims



1. A method of making an integral electrical contact at a forward end of an electrical cable, the contact being of the type having a plurality of conductive strands aligned for intermingling mating with a mateable electrical contact having a plurality of aligned conductive strands in close bundled relation and the cable being of the type having a plurality of spirally wound conductive strands surrounded by an insulating sheath, the steps of the method comprising:

removing the insulation from the forwardmost end portion of the electrical cable to expose the plurality of conductive strands therein at the forward end thereof;  
mounting a sleeve around the exposed forwardmost end portion of the strands at a location spaced rearwardly from their forward ends and forwardly of the insulation, said mounting maintaining the forwardmost end portion of end of the strands in close bundled relation;

cutting the exposed strands along an acute angle to the cable axis such that each strand end has its end face disposed at an acute angle relative to its axis; and

aligning the exposed spirally wound conductive strands so that their axes are parallel and their ends define a plane substantially perpendicular to the cable axis, the strand ends being radially spreadable for intermingling mating with the aligned strands of said mateable electrical contact;

whereby the sleeve and forwardmost end portion of said conductive strands provide the cable with an integral electrical contact for mating with the aligned strands of said mateable electrical contact.

4,417,396

## METHOD FOR MANUFACTURING INTEGRATED CIRCUIT CONNECTORS

J. Preston Ammon; Harry R. Weaver, both of Dallas, and Evan J. Evans, Plano, all of Tex., assignors to Elfab Corporation, Dallas, Tex.

Filed Nov. 2, 1981, Ser. No. 316,998

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—884

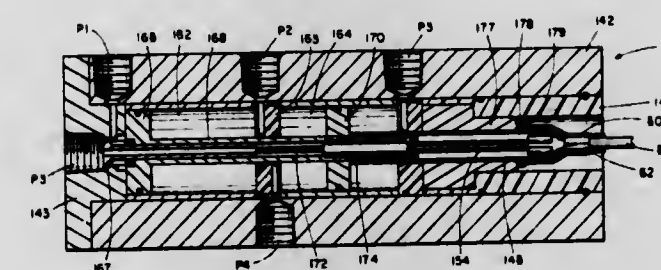
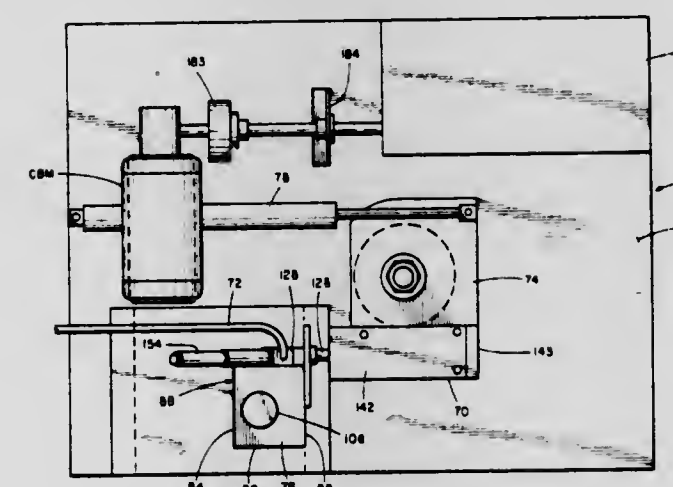
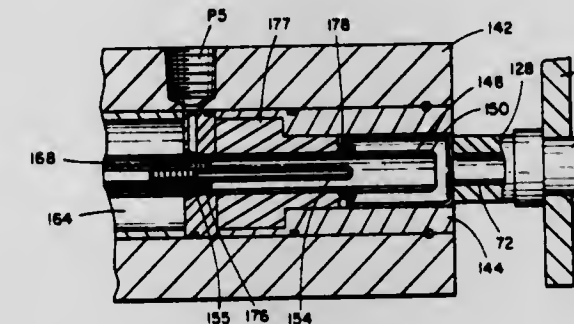
18 Claims

10. A method of assembling integrated circuit connectors of the type having contacts secured within an insulator, said contacts having an upper socket portion for receiving an integrated circuit lead and a lower tail portion depending from said insulator said method comprising the steps of:

providing a generally horizontal surface having a plurality of generally parallel channels formed longitudinally hereacross;

providing a plurality of integrated circuit contacts equally spaced along a plurality of carrier strips, said contacts having tails extending transversely away from the carrier strips;

providing an array of integrated circuit connector insulators



holding said sleeve in its expanded condition;  
inserting said connector, terminal end portion first, into said expanded sleeve; and

releasing said sleeve from its expanded condition whereby said sleeve contracts about and effectively insulates said connector, said sleeve is the end portion of a length of radially expandable resilient insulating tubing, said method further comprising the step of severing said sleeve from the remainder of said length of tubing after expanding said tubing and before inserting said connector into said sleeve.

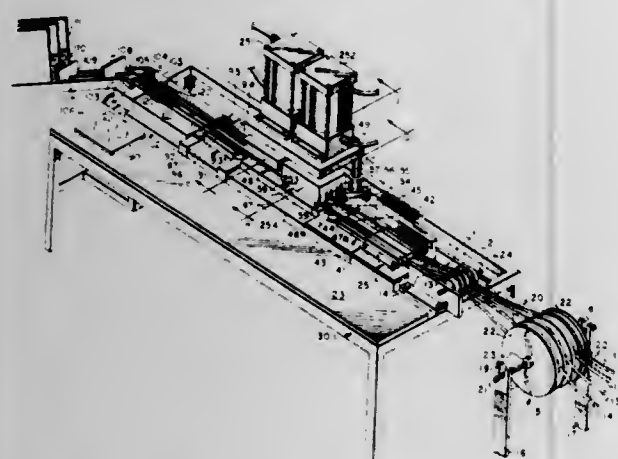


having contact receiving apertures formed in linear rows therein, said apertures being spaced from one another a distance equal to the spacing of the contacts upon said carrier strips;

providing an advancing mechanism upon said generally horizontal surface for engaging said carrier strips and advancing the contacts in intermittent movement a predefined, longitudinal distance thereupon;

mounting the insulator array upon said contacts of said carrier strip by inserting the contact tails into the apertures in the insulators;

advancing said carrier strips and said insulator array secured thereto upon said surface;



pressing said insulators upon said contacts of said carrier strip to cause interference engagement between said contacts and said insulators and the rigid mounting of the contacts therein;

advancing said carrier strips and said insulator array secured thereto upon said surface;

separating individual insulators of said array one from the other upon said carrier strips and providing individual integrated circuit connector assemblies;

advancing said connector assemblies upon said surface; and separating said connector assemblies from said carrier strips to provide individual integrated circuit connectors.

4,417,397

## ELECTRIC SHAVER

Masami Kitamura, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan

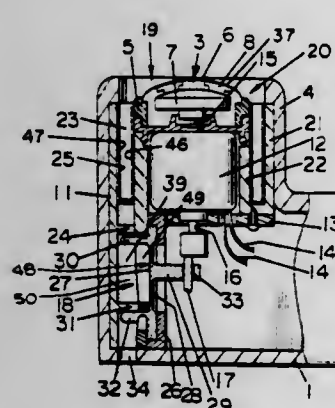
Filed Jun. 4, 1982, Ser. No. 384,981

Claims priority, application Japan, Jun. 15, 1981, 56-92711

Int. Cl.<sup>3</sup> B26B 19/44

U.S. Cl. 30—34.2

16 Claims



1. In an electric shaver comprising a housing with a powered shaving head for severing whiskers, the improvement comprising:

(a) a raised area in the housing surrounding the shaving head to form a channel around the shaving head; and

(b) powered suction pump means disposed in said housing and communicating with said channel for creating a sucking force within said channel when the shaver is positioned

against the skin for shaving to draw the skin into said channel such that the skin is stretched across and against the shaving head.

4,417,398

## TOOL FOR HANDLING WIRE

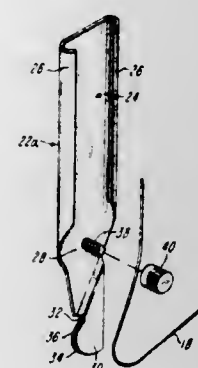
Mark A. Steck, Miamisburg, Ohio, assignor to Steck Manufacturing Co., Inc., Dayton, Ohio

Filed May 4, 1981, Ser. No. 260,062

Int. Cl.<sup>3</sup> B25B 27/14

U.S. Cl. 30—116

4 Claims



1. A wire handling tool comprising a handle, means on said handle for anchoring a wire to said handle, said guide blade means projecting from one end of said handle, said guide blade means having a wall portion for supporting a wire extending outwardly of said handle from said anchor means, said wall portion having a groove extending therealong for cradling said wire, and including shelf means disposed between said anchor means and said blade means for guiding a wire anchored by said anchor means into said groove, and wherein said blade means is one piece with said shelf means, the major surfaces of said blade means being parallel to but spaced from the major surfaces of said shelf means.

4,417,399

## DEVICE FOR THE CALCULATION OF THE CHARACTERISTICS OF RECTILINEAR GEOMETRIC SHAPES

Mardick Ballozian, Feucherolles, France, assignor to Tekno AG, Zurich, Switzerland

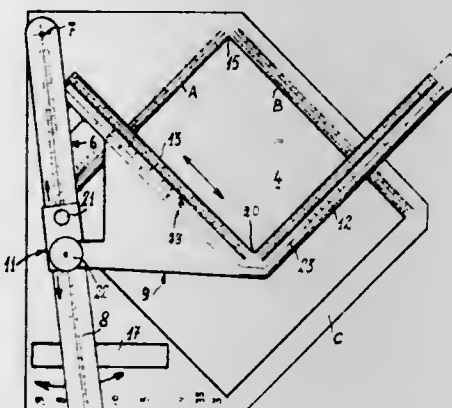
Filed Mar. 30, 1982, Ser. No. 363,434

Claims priority, application France, Apr. 3, 1981, 81 06732

Int. Cl.<sup>3</sup> B43L 7/00

U.S. Cl. 33—448

6 Claims



1. Device for the calculation of the characteristics of rectilinear geometric shapes comprising:

(a) a plate having two perpendicular adjacent edges in which there is formed a rectilinear aperture and which carries at least one graduation indicating a series of ratios between the sides of corresponding rectangles,

(b) a ruler mounted pivotably at one of its extremities on the

plate and the length of which is at least equal to the diagonal of the aperture formed in the plate, the extremity of this ruler being able to intersect the ratio graduation, and (c) an element mounted rotatably on a slider capable of movement on the ruler, and provided with two perpendicular arms having lengths equal to those of the sides of the aperture of the plate, (d) at least two sides of the aperture of the plate, the arms of the pivoting element and the ruler being graduated in length.

4,417,400

## GAUGE FOR CHECKING LINEAR DIMENSIONS OF MECHANICAL PIECES

Carlo Dall'Aglio, Volta Reno di Argelato, Italy, assignor to Finike Italiana Marposse S.p.A., S. Marino di Bentivoglio, Italy

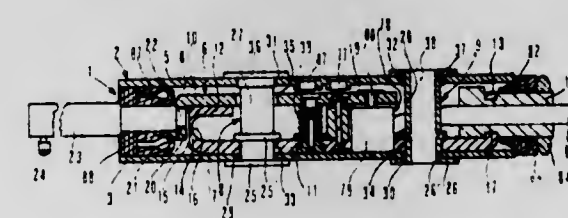
Filed Jul. 16, 1981, Ser. No. 283,876

Claims priority, application Italy, Jul. 22, 1980, 3478 A/80

Int. Cl.<sup>3</sup> G01B 7/02

U.S. Cl. 33—172 E

10 Claims



1. A gauge for the dimensional checking of mechanical pieces, comprising: support means including an outer support casing and an elongated support element arranged in a longitudinal direction within the casing, the support element being fastened to the casing and defining a longitudinal axis; a gauging arm connected to the support element for rotational measurement displacements, substantially about an axis perpendicular to said longitudinal axis; detection means having elements coupled to the support element and the gauging arm for detecting the position of the gauging arm; and limiting means for limiting in an adjustable way the displacements of the gauging arm, said limiting means including a member fixed to the support element and having an abutment surface adapted to abut against a first zone of the gauging arm to limit displacements along a first direction and an adjustable element fixed to the member for adjustment in a direction substantially perpendicular to the longitudinal axis and to said axis perpendicular to the longitudinal axis, this adjustable element having an abutment surface adapted to cooperate with a second zone of the gauging arm opposite to the first zone, in order to limit the gauging arm displacements in the opposite direction with respect to the first.

4,417,401

## GARMENT MEASURING DEVICE

Noboru Aisaka; Shigeru Nishikawa, both of Ibaraki; Atsuo Shibuya, Tokyo; Yasuo Bessho, Ibaraki; Hitoshi Akami, Ibaraki, and Shigeo Ogawa, Yatabemachi, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,543

Claims priority, application Japan, Mar. 31, 1981, 56-48830

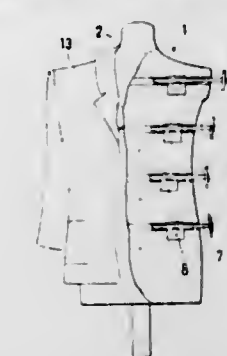
Int. Cl.<sup>3</sup> G01B 5/20

U.S. Cl. 33—175

4 Claims

1. A device for the measurement of a garment, which comprises a standard body resembling a human body, a plurality of contact pieces provided at stated positions of said standard body, said contact pieces being formed in shapes conforming to the corresponding portions of the contour of the human

body, means for protruding said contact pieces from said positions, and sensor means provided on said contact pieces and



Control device 10

Arithmetic device 11

Display device 12

used for detecting contact pressure exerted by the garment on said contact pieces.

4,417,402

## GAUGING OF THREAD DIAMETERS

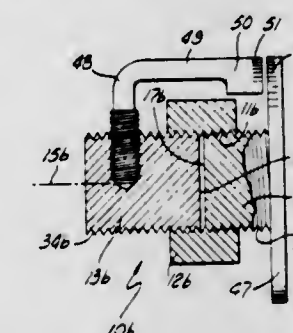
Mark Hattan, Orange, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Filed Nov. 5, 1981, Ser. No. 318,557

Int. Cl.<sup>3</sup> G01B 3/48, 5/12

U.S. Cl. 33—199 R

2 Claims



2. A gauge for measuring an internal thread formed within a passage in a member, comprising: first and second gauge elements which have similar external threads adapted to project into said passage along an axis from opposite ends of the passage and engage different portions of said internal thread; said gauge elements being free for rotation about said axis relative to one another and being retained against axial movement relative to one another beyond a predetermined relative axial position; said first gauge element having an indicator portion carried thereby at a first end of said passage; said second gauge element having an indicator portion carried thereby at the second end of said passage; said indicator portions extending externally of said passage to locations at which the rotary setting of one can be read against the rotary setting of the other, as a measurement of the size of the internal thread.

4,417,403

## BOW SIGHT

Ronald L. Strange, Rte. 1, Box 752, Elizabethtown, Ky. 42701

Filed Apr. 5, 1983, Ser. No. 482,230

Int. Cl.<sup>3</sup> F41G 1/00, 1/46

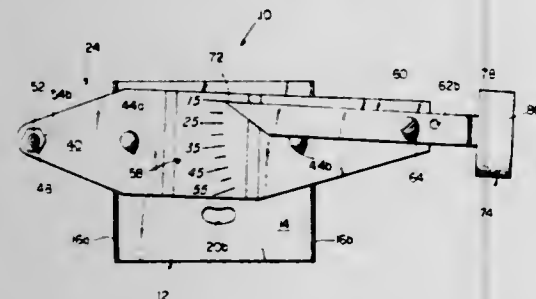
U.S. Cl. 33—265

8 Claims

1. An adjustable sight for aiming an archery bow at a target where said bow is disposed in a vertical plane, comprising:



a bow bracket which is attached to the bow above an arrow rest;  
 an elongate planar sight bracket disposed in a plane generally parallel to the vertical plane of the bow, said sight bracket being attached to said bow bracket;  
 a first sight mounted at one end of said sight bracket, said first sight extending perpendicularly away from said planar sight bracket;  
 an elongate distance member disposed generally parallel and adjacent to said sight bracket, said distance member including a distance pivot means located adjacent the other end of said sight bracket for pivotally mounting said distance member to said sight bracket about a horizontal axis perpendicular to the plane of said sight bracket;



a second sight mounted to said distance member, said second sight extending horizontally away from said distance member and aligning with said first sight to define an aimed line of sight at the target;  
 a distance member holding means for preventing free rotation of said distance member relative to said sight bracket about said distance pivot means;  
 range indicia located on one of said sight bracket or said distance member; and  
 a reference mark located on the other of said sight bracket or said distance member and adjacent said range indicia whereby the aimed line of sight is adjusted for distance of the target from the bow by pivoting said distance member relative to said sight bracket about said distance pivot means to bring said reference mark in alignment with an appropriate range indicia.

4,417,404

## METHOD AND APPARATUS FOR MEASURING DISTANCES

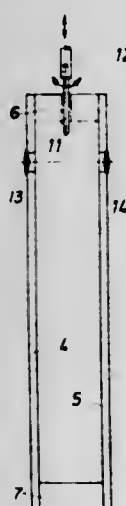
Reiner Doberschütz, Kolpingstrasse 7, 5462 Bad Hönningen, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 286,824

Int. Cl.<sup>3</sup> G01C 21/00

U.S. Cl. 33—277

8 Claims



1. A device for measuring the distance of an object from an observer comprising a first transparent plate having a reference line and a sequence of scale lines parallel to and spaced below or above said reference line so that when said reference

line is aligned in a first line of sight between the observer's eye and an observed skyline or other reference point at or beyond the distant object, when another observed point at the bottom of the distant object lies in a second line of sight through one of said scale lines, and when said first plate is parallel to an imaginary straight line connecting said observed points at the distant object such that said first and second lines of sight are cut into proportional segments by the plane of said first plate and said imaginary line, then the separation between said scale line and said reference line is inversely proportional to the distance from the observer's eye to the distant object and proportional to the distance between said two observed points along said imaginary line, said imaginary line distance and the distance from the observer's eye to said first plate each being of a predetermined value; means for vertically adjusting said first plate so as to move said reference line to the height of the observer's eye and into alignment with said first line of sight; indicia marking said scale lines with values of various distances from the observer's eye to a distant object corresponding to the separations of said scale lines from said reference line; and a second transparent plate parallel to said first plate and having at least a reference line arranged relative to the reference line of said first plate such that when said reference lines are superimposed in the observer's line of sight the planes of said first and second plates are perpendicular to said first line of sight.

4,417,405

## ARTICLE OF MANUFACTURE AND PROCESS

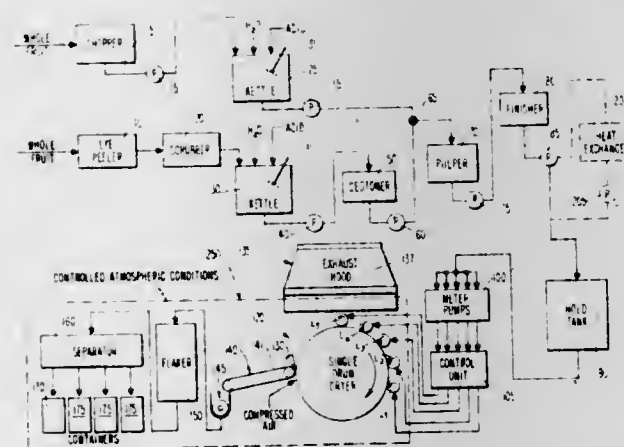
John F. Fuller, Jr., Verona, Pa., assignor to H. J. Heinz Company, Pittsburgh, Pa.

Filed Aug. 22, 1980, Ser. No. 180,470

Int. Cl.<sup>3</sup> F26B 3/24

U.S. Cl. 34—39

28 Claims



1. The process for drum drying a fruit puree on a drum dryer, which comprises the steps of:

- applying said fruit puree at a rate of at least about 1.2 gal/ft<sup>2</sup> hr to said drum dryer forming a film in a controlled environment of cooling-dehumidified air;
- drum drying said puree in said controlled environment of cooling-dehumidified air to form a drum dried product; and
- flaking said drum dried product whereby the resultant flaked product has a moisture content of not more than about 1% and said flaked product is readily reconstitutable to natural consistency.

4,417,406

## ARRANGEMENT FOR DRYING PLATE-SHAPED WOOD PRODUCTS

Peter Elblich, Bad Hersfeld, Fed. Rep. of Germany, assignor to Babcock-BSH Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

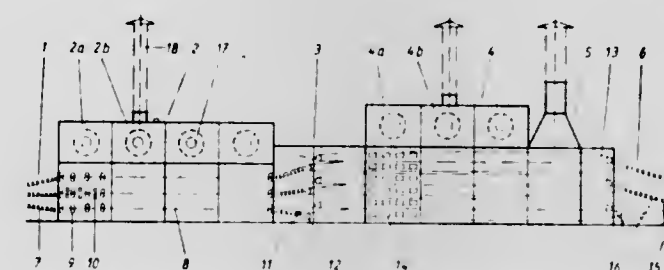
Filed Aug. 3, 1981, Ser. No. 290,793

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030272

Int. Cl.<sup>3</sup> F26B 13/04

U.S. Cl. 34—155

6 Claims



1. In an arrangement for drying plate-shaped wood products, especially veneers and plywood plies, in a continuous operation during their passage in a predetermined path through the drying arrangement, a combination comprising means for advancing the products in an upstream drying portion of the path, including a roller conveyor which has a plurality of pairs of rollers arranged so that the rollers of each pair confine the respective wood product between themselves during advancement; first drying means for partially drying the respective product in the upstream drying portion of the path to a moisture content less than that at which cracking of the product would occur; means for advancing the wood products in a downstream drying portion of the path, including a belt conveyor which has at least one pair of conveyor belts having a support conveyor belt and a cover conveyor belt confining the respective wood product between themselves during advancement so as to allow for shrinkage of said product; and second drying means for finishing the drying of the respective product in the downstream drying portion of the path, so that the respective wood products is smoothed during drying both in the upstream drying portion and in the downstream drying portion of the path.

4,417,407

## FOOTWEAR

Sadao Fukuoka, Tokushima, Japan, assignor to Fukuoka Kagaku Kogyo, Tokushima, Japan

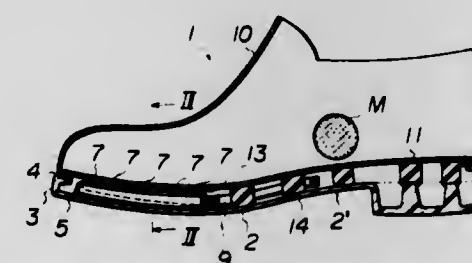
Filed Mar. 11, 1982, Ser. No. 356,953

Claims priority, application Japan, Mar. 31, 1981, 51-45751[U]; Mar. 31, 1981, 51-45752[U]; Jun. 10, 1981, 51-84180[U]

Int. Cl.<sup>3</sup> A43B 7/06, 7/08, 13/20

U.S. Cl. 36—3 B

14 Claims



1. A shoe comprising an inner sole, an outer sole, said inner sole and outer sole delimiting a hollow portion having a marginal area of a predetermined height, hollow pumping means disposed along the marginal area of said hollow portion for drawing in and expelling air, first air flow-through means provided on said pumping means for communicating the interior and exterior of said pumping means, and second air flow-

through means provided on said inner sole for communicating said hollow portion with the interior of the shoe, the compression and relaxation of said pumping means upon the application and removal of the wearer's weight causing the circulation of air particularly along the marginal area of said hollow portion between said inner sole and outer sole.

4,417,408

## ADJUSTABLE MECHANICALLY CUSHIONED HEEL FOR A SHOE

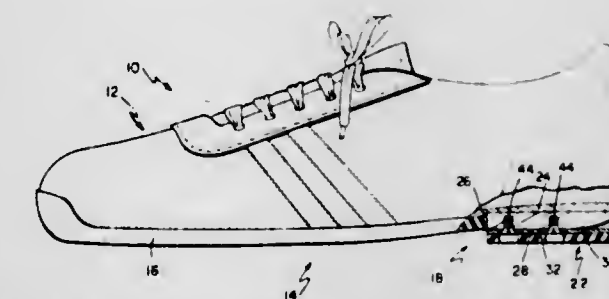
Robert D. Metro, 848 Roxbury Ln., Noblesville, Ind. 46060

Filed Oct. 21, 1981, Ser. No. 313,454

Int. Cl.<sup>3</sup> A43B 21/36, 21/47

U.S. Cl. 36—36 R

7 Claims



7. In a shoe including an upper portion and a lower portion having a sole and a heel area, the improvement comprising a generally planar spring element for cushioning the heel area, the heel area including means providing a fulcrum for flexion of the spring element, means for coupling the spring element to the heel area so that a portion of the spring element extends beyond the fulcrum to cushion the heel area, and adjustment means for varying the length of the portion of the spring element which extends beyond the fulcrum to alter the spring constant and vary the cushioning effect thereof.

4,417,409

## NEEDLEWORK FRAME FOR HANDWORK

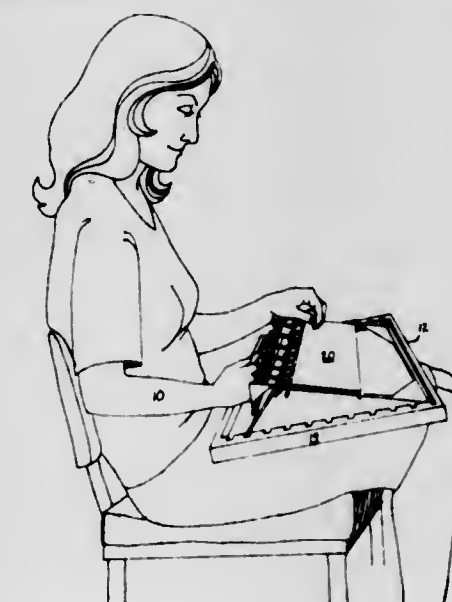
Lydia A. Bell, 363 Mayflower Blvd., Columbus, Ohio 43213

Filed Oct. 30, 1981, Ser. No. 316,950

Int. Cl.<sup>3</sup> D06C 3/08

U.S. Cl. 38—102.91

6 Claims



1. An apparatus to support a canvas as a strand is stitched into the canvas, which comprises: a lap-sized rack unit having a substantially flat base, and a frame portion that is inclined relative to the base, the top part of the frame portion being bent downward toward the base, the side profile of the inclined frame portion, the downward bend portion, and the base being in the general shape



of a triangle, the frame portion having a substantially open area therein located at the top of the frame portion; and means for securely mounting the canvas over the rack unit so that the strand can be stitched into the canvas over the substantially open area while the rack unit holds the canvas in place.

4,417,410

## INDICIA MEANS FOR KEYS

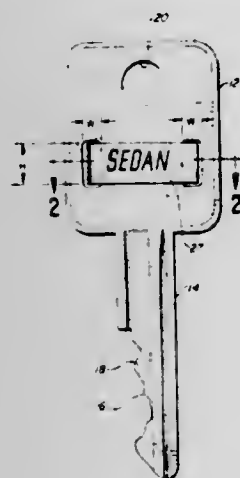
John Freedom, 17100 S. Harlem Ave., Tinley Park, Ill. 60477

Filed Oct. 23, 1981, Ser. No. 314,098

Int. Cl.<sup>3</sup> G09F 3/00

U.S. Cl. 40—330

17 Claims



1. Key identifying means comprising an identifying tag having a surface area compatible with receiving for display identifying indicia, the identifying tag being substantially rectangular and having opposite ends with latching means on one of the ends, and latch receiving means on the other end thereof, the latching means being located adjacent one of the shortest sides of the tag and the latch receiving means being located adjacent the other shortest side of the tag, the latching means projecting at a substantially 90° angle relative to the surface area of the key, and being formed by a barbed member, the latch receiving means comprising a complementary barb retaining member, one of the opposite ends being dimensioned to be received by and passed through at least two receiving holes in a key, whereby when the latching means is engaged with the latch receiving means the identifying tag is securely retained to the key.

4,417,411

## INFORMATION DISPLAY DEVICE

Naoki Miyagishima, Yokohama, and Shigeru Nakagawa, Fujisawa, both of Japan, assignors to Marui Industry Co., Ltd., Japan

Filed Nov. 24, 1981, Ser. No. 324,634

Claims priority, application Japan, Nov. 29, 1980, 55-167380

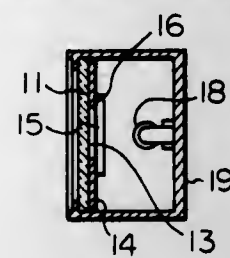
Int. Cl.<sup>3</sup> G09F 13/00

U.S. Cl. 40—443

8 Claims

3. An information display device comprising:
  - (1) a plate made of a transparent material and having the following layers on the rear surface thereof:
    - (a) an undercoating of transparent organic based paint, said undercoating containing a flattening agent,
    - (b) a metal coating on said undercoating and
    - (c) a transparent protective coating on said metal coating,
  - (2) an image provided behind said protective coating, and
  - (3) a light source behind said image, said light source being

strong enough to make said image visible when viewed from the front of said plate when said light is activated,



and visible from the front of said plate when said light is not activated.

4,417,412

## FIBER OPTIC DISPLAY DEVICE

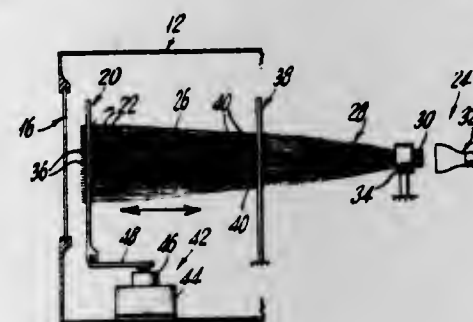
William L. Sansom, 103 W. 27th St., New York, N.Y. 10001

Filed Aug. 6, 1981, Ser. No. 290,424

Int. Cl.<sup>3</sup> G09F 13/00

U.S. Cl. 40—547

6 Claims



1. A fiber optic display device comprising:
  - (a) a plurality of flexible elongated optical fiber elements each of said optical fiber elements having a light receiving end and a light emitting end;
  - (b) a source of illumination constructed and arranged to illuminate said light receiving ends of said optical fiber elements; and
  - (c) image forming means constructed and arranged to place said light emitting ends of said optical fiber elements into two or more image displays including:
    - (i) a moveable panel member provided with a plurality of apertures therethrough, said apertures being in a pattern substantially corresponding to a first image to be displayed said optical fibers freely passing through said apertures; and
    - (ii) displacement means constructed and arranged to move said panel member between a first position proximate the light emitting ends of said optical fiber elements whereby said light emitting ends of said optical fiber elements conform substantially to the pattern of said apertures in said panel and a second position wherein said panel members is spaced from said light emitting ends in the direction of said light receiving ends whereby said light emitting ends of said flexible optical fiber elements, conform to a second image pattern.

4,417,413

## IDENTIFICATION CARD WITH IC CHIP AND A METHOD FOR MANUFACTURING THE SAME

Joachim Hoppe, and Yahya Haghi-Tehrani, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 148,612, May 12, 1980, abandoned.

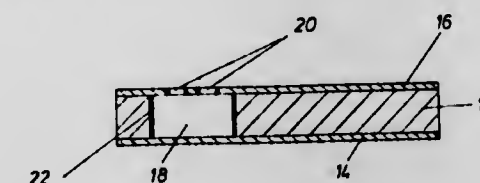
This application Nov. 29, 1982, Ser. No. 444,964

Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2920012

Int. Cl.<sup>3</sup> G06K 7/06, 19/00

U.S. Cl. 40—630

11 Claims U.S. Cl. 47—1.4



1. An identification card comprising a flexible substrate; an IC module for the processing of electrical signals; a separate carrier element to which said IC module is attached; contact surfaces located on said carrier element for engaging electrodes exteriorly disposed of said card; leads interconnecting said IC module and said contact surfaces; said substrate having a window for reception of said carrier element; said carrier element being substantially as thick as said identification card and completely surrounding said IC module; said window being slightly larger than said carrier element whereby a gap surrounds the periphery of said carrier element; resilient means for supporting said carrier element in said window and bridging such gap; said resilient means effecting bonds supporting said carrier element in said window which bonds remain unbroken during flexing of said card in the normal course of card use; said carrier element having greater resistance to bending than said card portions surrounding said carrier element, whereby said carrier element may extend beyond a surface of said card when the card portions surrounding said carrier element are flexed into a nonplanar configuration.

4,417,414

## FISHING LINE RELEASE MECHANISM

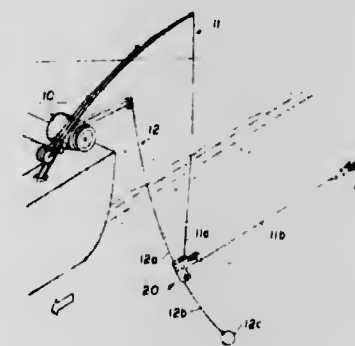
Robert A. Hood, 23265 Lago Mar Cir., Boca Raton, Fla. 33432, and Peter Lindgren, 4491 Crystal Lake Dr., Pompano Beach, Fla. 33064

Filed Feb. 19, 1981, Ser. No. 236,123

Int. Cl.<sup>3</sup> A01K 91/06

U.S. Cl. 43—43.12

6 Claims



1. A fishing line release mechanism comprising support means, first clip means, first tensioning means, second clip means, second tensioning means and connection means; said first clip means being held by said first tensioning means so as to engage a first fishing line segment; said second clip means being held by said second tensioning means so as to engage a second fishing line segment; said clip means and said connection means being so connected that disengagement of either said clip means from its said line segment results in disengagement of the other clip means from its said line segment so that said entire fishing line is free of said mechanism.

ment of said other clip means from its said line segment so that said entire fishing line is free of said mechanism.

4,417,415

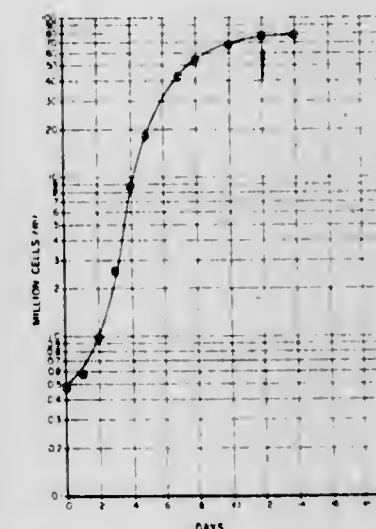
## PROCESS FOR CULTURING A MICROALGA, AND EXTRACTING A POLYSACCHARIDE THEREFROM

Gerry R. Cysewski, Snoqualmie, and Daniel B. Anderson, Pasco, both of Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Apr. 26, 1982, Ser. No. 371,868

Int. Cl.<sup>3</sup> A01G 7/00

38 Claims



16. A process for culturing *Porphyridium cruentum* which comprises:

- (a) establishing a growth medium comprising seawater having added thereto sufficient soluble nitrate and phosphate to make the solution at least about 0.015 M in nitrate and 0.0012 M in phosphate, said growth medium having a pH in the range of about 7.3 to about 8.3;
- (b) adding to said growth an inoculum of *P. cruentum* sufficient to provide an initial cell concentration of at least about 100,000 cells/ml. of said growth medium; and
- (c) culturing said inoculated growth medium at a temperature in the range of about 18° to about 24° C. and in the presence of light while passing through said medium an oxygen-containing gas containing a minor proportion of carbon dioxide.

4,417,416

## TREE TRANSPLANTING MACHINE

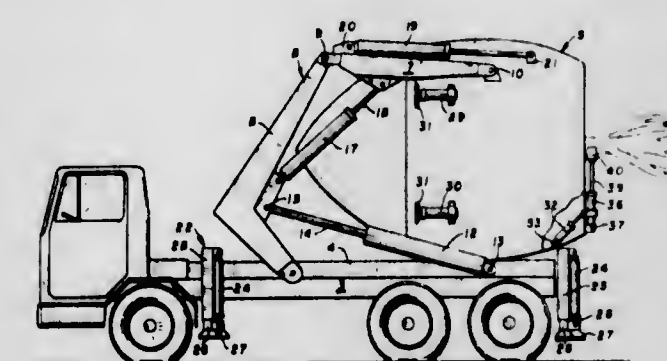
Clifton E. Johnson, Red Lake Falls, N. Mex., assignor to Halla Nursery, Inc., Chaska, Minn.

Filed Jul. 21, 1982, Ser. No. 383,546

Int. Cl.<sup>3</sup> A01G 13/00

U.S. Cl. 37—2 R

6 Claims

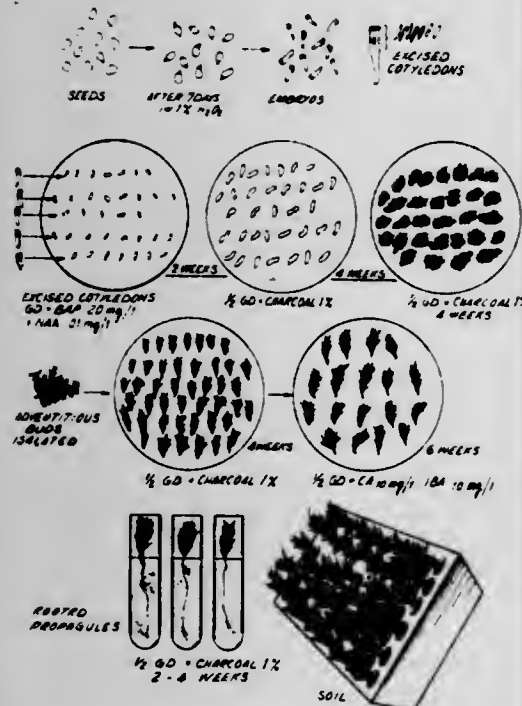


1. A tree transplanting machine comprising in combination:
  - (a) a truck-type vehicle having a wheel supported frame defining a truck bed;



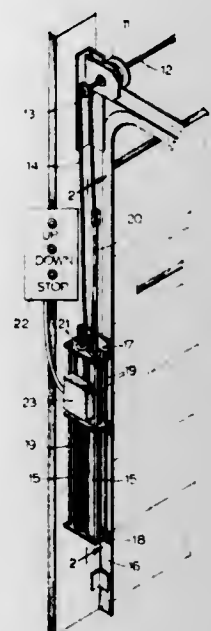
- (b) a tree digging pod having a plurality of spade members reciprocally movable with respect to a toroidal, tree-encircling stand, the spade members being shaped and positioned relative to one another such that when extended relative to such stand, they encase a volume of earth, said pod being positionable between a first disposition wherein said pod is at least partially disposed in the ground and a second disposition on said truck bed;
- (c) articulated arm members having first and second segments pivotally coupled together, said first segment being pivotally attached at one end thereof to said frame on opposed sides of said vehicle, said second segment being pivotally attached to said pod at the other end thereof;
- (d) first linear motor means coupled between said frame and said articulated arm members for rotating said arm members relative to said frame;
- (e) second linear motor means coupled between said articulated arm members and said pod for controlling the rotation of said pod relative to said arm members; and
- (f) third linear motor means coupled between said first and second segments of said articulated arm members, or rotating said pod substantially 90° with the upper end of said pod oriented rearward relative to said truck frame following activation of said first and second linear motor means by which said pod is elevated substantially vertically a predetermined distance above ground level.

**4,417,417**  
**CLONAL PROPAGATION OF GYMNASPERMS**  
 Asha Mehra-Palta, Monsey, N.Y., assignor to International Paper Company, New York, N.Y.  
 Filed Oct. 1, 1981, Ser. No. 307,635  
 Int. Cl.<sup>3</sup> A01G 1/00  
 U.S. Cl. 47—58 22 Claims



1. A method of inducing formation of adventitious buds on excised gymnosperm tissue comprising pulse treating said tissue on a nutrient medium containing at least about 10 mg/L of a cytokinin for a time sufficient to induce formation of adventitious buds on said tissue, and then transferring the pulse treated tissue to a nutrient medium free of exogenous growth factors.

**4,417,418**  
**AIR POWERED DOOR OPERATOR**  
 Norman E. Warning, 5408 Williams St., White Bear Lake, Minn. 55110  
 Filed Feb. 12, 1982, Ser. No. 348,185  
 Int. Cl.<sup>3</sup> E05F 11/00  
 U.S. Cl. 49—199 4 Claims



1. In a system for operating an overhead door in which the door is raised and lowered by operation of a torsion bar rotated by a chain-driven sprocket, an air-powered operator for driving said chain, comprising:
- (a) a pair of air cylinders, each having an internal piston member and an outward extending elongated rod attached at one end to the piston member;
- (b) means for attaching the other end of each of said rods to an opposite end of said sprocket chain;
- (c) valve means for selectively feeding pressurized air into one end of one of said cylinders to drive the piston toward the other end of the cylinder to raise or lower the door;
- (d) an air bleeder opening to atmosphere in each cylinder through the cylinder wall near its other end, said bleeder opening being closed off by the piston when the piston reaches it; and
- (e) an adjustable needle valve opening to atmosphere in said other end of each cylinder.

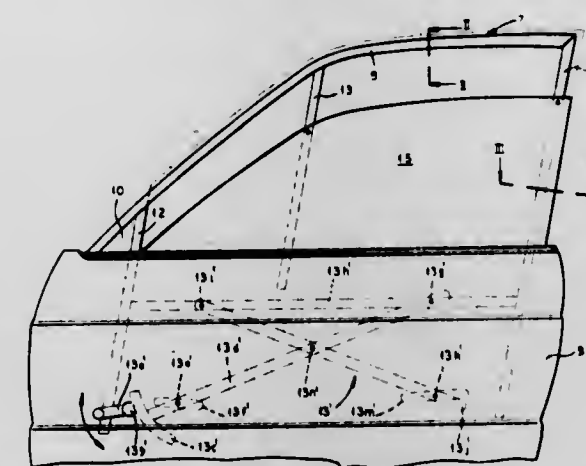
**4,417,419**  
**WINDOW ASSEMBLY FOR AUTOMOTIVE VEHICLES**  
 Egbert Rossie, Ingolstadt; Michael Hahn, Koesching, and Lutz Schemperg, Kipfenberg, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG, Neckarsulm, Fed. Rep. of Germany  
 Filed Jun. 13, 1980, Ser. No. 159,398  
 Claims priority, application Fed. Rep. of Germany, Jun. 14, 1979, 2924309  
 Int. Cl.<sup>3</sup> E05F 11/48 10 Claims

1. A window assembly for an automotive vehicle having a body, comprising:
- a window pane adapted to be raised and lowered into said body and having at least one substantially vertical edge and a substantially horizontal top edge;
- a substantially vertical guide rail mounted on said body and disposed along said vertical edge;
- at least one guide member directly fixed to said pane along a face thereof turned toward the interior of said vehicle and disposed inwardly of said vertical edge, whereby a continuous zone on said face and along said vertical edge outwardly of said guide member is formed without obstruction, said guide member being at least partially surrounded

by said rail and slidably mounted therein for vertical reciprocation;

first sealing means including a first elongate seal on said body for directly engaging said zone of said face at least in a closed state of the window assembly;

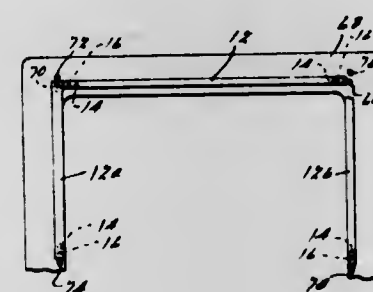
second sealing means including a second elongate seal extending horizontally on said body for engaging said pane



along said top edge in said closed state, said second sealing means including a guide surface extending below and parallel to said second elongate seal and facing toward the exterior of said vehicle for directing said pane toward a position of engagement with said second elongate seal upon an upward stroke of said pane; and

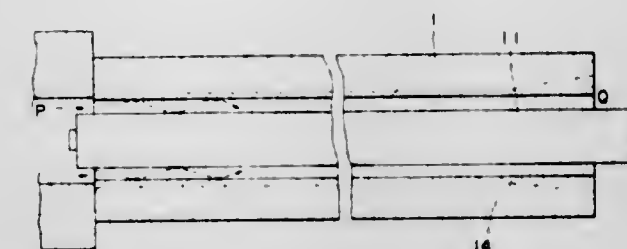
actuating means on said body for raising and lowering said pane with said guide member guided by said rail.

**4,417,420**  
**DOOR SEAL**  
 Richard B. Marsh, Grosse Pointe Farms, Mich., assignor to Marsh Industries, Inc., Mt. Clemens, Mich.  
 Filed Feb. 11, 1981, Ser. No. 233,383  
 Int. Cl.<sup>3</sup> F24C 15/02 15 Claims



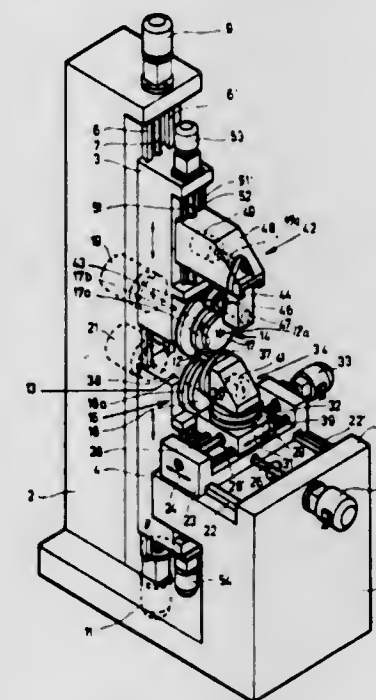
1. In combination with a door having a surface and having at least two spaced apart apertures along said surface, an improved door seal comprising
- means for sealing said door,
- retainer hook means, including a body portion and a hook portion, and
- eyelet means for securing said retainer hook means to said sealing means, said sealing means including sealing flange means substantially isolating said door surface from direct contact with said eyelet means,
- wherein said sealing means is secured to said door by said retainer hook means at said apertures.

**4,417,421**  
**APPARATUS FOR POLISHING INTERIOR SURFACES OF PIPES OR THE LIKE**  
 Kazuo Akagi, Akihiro Fukuda, and Tomio Saito, all of Shimono-seki, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan  
 Filed Oct. 1, 1981, Ser. No. 307,673  
 Claims priority, application Japan, Aug. 28, 1981, 56-135854  
 Int. Cl.<sup>3</sup> B24C 3/16 3 Claims



1. A pipe polishing apparatus comprising:
- a polisher pipe extractably inserted into a pipe to be polished; and
- means for injecting polishing grains into a gap formed between the polisher rod and pipe and for simultaneously rotating the polisher rod and pipe in opposite directions to thereby polish the interior surface of said pipe, wherein said polisher rod has an outside diameter which is progressively reduced in the direction of polishing grain injection.

**4,417,422**  
**GRINDING MACHINE**  
 Werner Redeker, Escheburg, and Uwe Uhlig, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany  
 Filed Feb. 6, 1981, Ser. No. 232,250  
 Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005606  
 Int. Cl.<sup>3</sup> B24B 19/14, 41/06 43 Claims



1. In a grinding machine, particularly in a numerically controllable machine for surface grinding of complex workpieces, such as turbine blades, the combination of at least one grinding tool including a rotary grinding spindle having an outer end portion and a plurality of coaxial grinding wheels on said spindle, said wheels including a smaller-diameter wheel nearer to and a larger-diameter wheel more distant from said outer



end portion; means for rotating said spindle; means for dressing said wheels; a table; work holding means movably mounted on said table and including a support; a work holder movably mounted on said support; means for rotating said support relative to said table about an axis which is normal to the axis of said spindle; means for rotating said work holder relative to said support about an axis which is parallel, at least at times, to the axis of said spindle; and at least one work gripping device mounted on said work holder.

4,417,423

## STYLUS MANUFACTURING METHOD

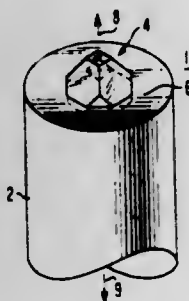
Eric F. Cave, and James J. Cowden, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,857

Int. Cl.<sup>3</sup> B24B 1/00

U.S. Cl. 51—283 R

10 Claims



1. A method for forming four faces on a diamond having anisotropic crystallographic hardness during the formation of a tapering tip end comprising the steps of:

- orienting the diamond for rotation about the {100} crystallographic direction of the diamond corresponding to the four-fold axis of symmetry of the diamond;
- contacting the diamond with an abrasive surface having a loosely-bound charge of abrasive particles while maintaining relative motion between the diamond and the abrasive surface such that the {100} crystallographic direction is at an acute angle with the abrasive surface; and
- isotropically coning the diamond by continuously rotating the diamond and applying a force between the diamond and the abrasive surface which allows four faces to be formed in the diamond because of its anisotropic crystallographic hardness, the form of the diamond thereby being a symmetric four-faced square pyramid.

4,417,424

## SEGMENTED EXTENDIBLE BOOM

Darwin J. Jacobson, P.O. Box 962, Port Angeles, Wash. 98362  
Continuation of Ser. No. 110,173, Jan. 7, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 390,639

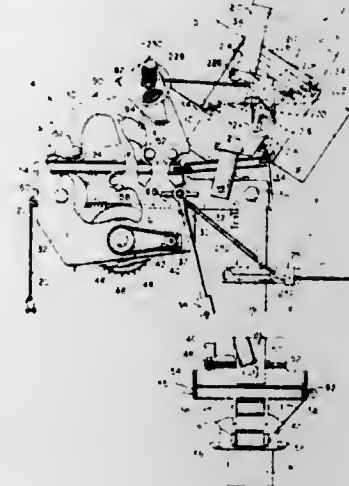
Int. Cl.<sup>2</sup> E04H 12/00

U.S. Cl. 52—106

20 Claims

1. A segmented extendible boom comprising:
- a plurality of elongated, trough-like segments having truncated, V-shaped, transverse cross-sections of uniform size, each segment having a bottom and a pair of diverging sidewalls, the sidewalls projecting upwardly and outwardly from spaced-apart locations on the bottom to form the truncated, V-shaped cross-sections, each segment having an open end opposite the bottom, each segment having a longitudinal end at each longitudinally distant portion of the segment, the segments being connected longitudinal end to longitudinal end such that the open ends of the segment face in the same direction, the segments being aligned longitudinally to form a projecting boom arm when the boom is extended, the segments being progressively shorter in longitudinal length from the outer end to the inner end of the projecting boom arm, means pivotally interconnecting each segment to the next adjacent segment for pivoting the longitudinal axis of an adjacent segment about a transverse axis located at the abut-

ting longitudinal ends of the segments near the open ends of the segments, thereby permitting segments not needed for the boom arm to be nested about one another with the bottoms of nested segments lying close together; side flanges extending transversely outwardly from the upper end of the sidewalls opposite the bottom;



flexible tensional means fixedly interconnected to each of the side flanges for providing structural support to the boom segments for resisting pivotal downward movement of the segments about the transverse pivot axes when extended; roller means engaging the side flanges above and below the side flanges for cantilevering the segments in an extended position; and means for extending and retracting the segments.

4,417,425

## APPARATUS FOR ERECTING CONCRETE WALL PANELS

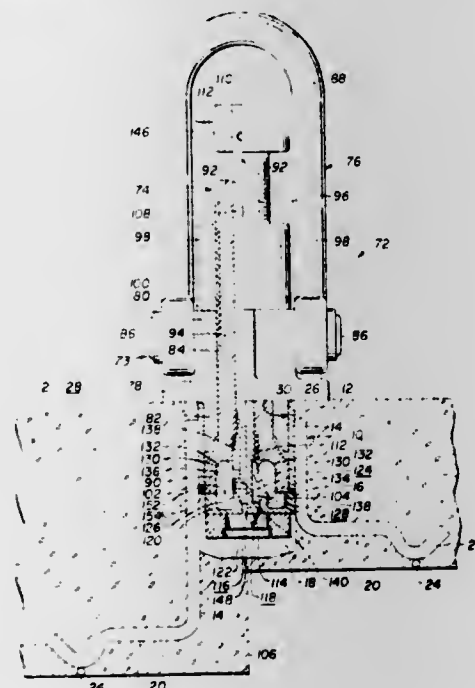
James E. Case; Richard L. Ruppert, both of Sparks, and Lindley Manning, Reno, all of Nev., assignors to Dayton Superior Corporation, Miamisburg, Ohio

Filed Feb. 11, 1977, Ser. No. 767,880

Int. Cl.<sup>3</sup> E04D 15/00

U.S. Cl. 52—125.5

25 Claims



1. Apparatus for the releasable connection to a tubular member embedded in an object, the member defining an opening in the object and including an inwardly facing shoulder disposed interiorly of the opening, the apparatus comprising:
- plate means adapted to be placed across the opening and including an aperture for alignment with the opening;

an elongated housing extending through the aperture and having an axial bore, the inner end of the housing being adapted for positioning in said opening, and including a laterally extending cutout, a locking lug carried by the housing for lateral movement within the cutout from a first position in which the lug is out of engagement with the shoulder to a second position in which a portion of the lug protrudes laterally from the housing into engagement with the shoulder; actuating means comprising an elongated plunger slidably disposed in the bore for moving the lug between the first and second positions responsive to movement of the actuating means longitudinally in the bore between corresponding first and second positions; the actuating means including means for positively and mechanically locking the lug in its second position when the actuating means is in its second position; and a pivoted pawl disposed interiorly of the housing, the pawl having means engaging the lug and means engaging the plunger during plunger movement from its second position to its first position so that such plunger movement is translated into corresponding movement of the lug from its second position to its first position.

4,417,426

## SUPPORT SYSTEM

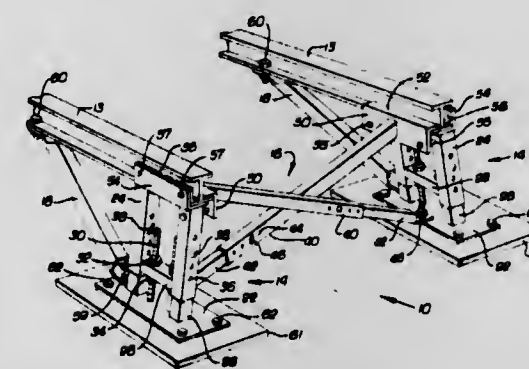
Donald L. Meng, Simi Valley, Calif., assignor to Quakebrace, Inc., Simi Valley, Calif.

Filed Mar. 23, 1981, Ser. No. 246,440

Int. Cl.<sup>3</sup> E04D 15/00

U.S. Cl. 52—126.7

2 Claims



1. A foundation support system for structures such as mobile homes, trailers and the like having generally parallel frame members on the underside thereof comprising:

- two generally vertical main support members, each having a base disposed at the bottom thereof and means for gripping and supporting one of said frame members on the underside of said structure disposed at the top thereof, each said support member further comprising:
- two or more generally vertical tubular legs slideably disposed on an equal number of support legs which extend upwardly from said base, wherein said gripping means is disposed across the top ends of said tubular legs, and a generally horizontal member disposed between said tubular legs, said horizontal member having one or more holes disposed vertically therethrough;
- two diagonal cross-braces each having a means at one end thereof configured to be secured to the gripping means disposed at the top of one of said support members, each said cross-brace extending from said base of one of said support members to the gripping means which is disposed at the top of the other support member; and
- means for adjusting the height of said support members without removing said structure from said support system said height adjusting means comprising one or more threaded bolts extending upwardly from said base through said holes in said horizontal member and two nuts disposed on each said bolt, one nut being disposed beneath said horizontal member and the other nut being disposed above said horizontal member, said horizontal member

being supported by said nuts which are disposed therebelow such that by rotating said nuts, the height at which said horizontal member and thus said tubular members is secured may be adjusted.

4,417,427

## METHOD AND APPARATUS FOR DAMPING VIBRATIONS IN LARGE STRUCTURES, SUCH AS BUILDINGS

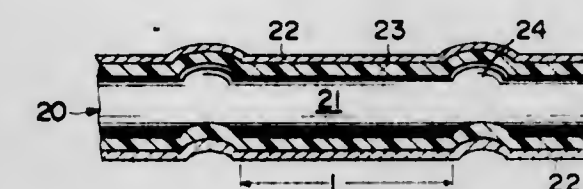
Oskar Bschorr, Keplerstr. 11, 8000 Muenchen 80, Fed. Rep. of Germany

Filed Apr. 6, 1981, Ser. No. 251,475

Int. Cl.<sup>3</sup> E02D 27/34

U.S. Cl. 52—167

20 Claims



1. A method for damping vibrations in a large structure including poured concrete components, comprising the following steps: covering at least a portion of a metal member with a vibration damping material, and securing the metal member in a force transmitting manner in or to said concrete components in such a manner that vibration causing force components must travel at least partially through said vibration damping material, using as said metal member concrete reinforcing rod means, enveloping said reinforcing rod means with a layer of vibration damping material, encasing the enveloped reinforcing rod means and the vibration damping material in a sheet metal jacket, and embedding the enveloped and encased rod means in the concrete components when the concrete is being poured.

4,417,428

## INTEGRAL PURGED MULTI-LAYER INSULATION DESIGN

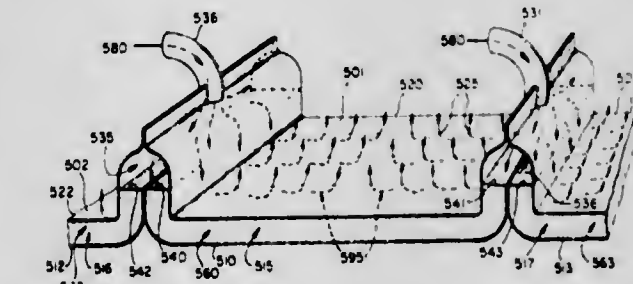
Calvin L. Wilkinson, Renton, Wash., assignor to Boeing Aerospace Company, Seattle, Wash.

Filed Feb. 19, 1981, Ser. No. 235,853

Int. Cl.<sup>3</sup> E04B 1/74

U.S. Cl. 52—172

22 Claims



1. An insulation system for a cryogenic vessel comprising:
- a plurality of substantially rectangular, adjacent segments of multi-layer insulation placed on the outer surface of said vessel, said segments comprising a plurality of layers of thin, reflective sheets, separated from each other by spaces through which a purge gas having boiling point below the temperature of said vessel flows, and each of said substantially rectangular segments having two opposing edges referred to as ends, and two other opposing edges referred to as sides, said plurality of segments having outwardly bent portions including said ends wherein the end surfaces of said bent portions are exposed, said bent por-



tions of adjacent segments also being adjacent and positioned in an abutting relationship;  
gas inlet channels for introducing said purge gas into said segments, said gas inlet channels enclosing the exposed end surfaces of some of the abutting end portions of each segment such that one of the ends of each of said segments is covered by one of said gas inlet channels, the top of said gas inlet channels being formed from extensions of the outermost layers of said adjacent segments joined together above abutting end portions enclosed by said inlet channels;  
sections of multi-layer insulation forming caps over said abutting end portions including said gas inlet channels, said caps being attached to the outermost layers of said segments and said caps over said end surfaces not enclosed by said gas inlet channels being attached to allow purge gas in said spaces in said segments to escape from said spaces; and  
seals at said sides to prevent the flow of purge gas through said sides.

4,417,429

## FREESTANDING STAIR ASSEMBLY AND RISER THEREFOR

Hans Stassi, R.R. #1, Cochrane, Alberta, Canada T0L 0W0

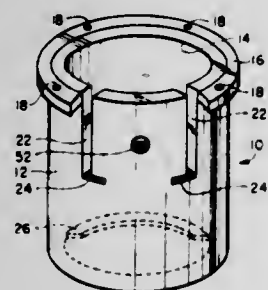
Filed Sep. 9, 1981, Ser. No. 300,550

Claims priority, application Canada, Sep. 12, 1980, 360198

Int. Cl.<sup>3</sup> E04F 11/00, 19/10

U.S. Cl. 52—182

14 Claims



1. A riser for a freestanding stair assembly comprising a tubular link member having an annular wall portion, tread securing means at one end of said wall portion, and a pair of axially extending parallel slots formed in said wall portion, said slots being open at said one end, being spaced apart circumferentially and being dimensioned to receive the other end of the wall portion of a superjacent riser, wherein said tread securing means comprises a tread securing flange extending outwardly from said annular wall portion, said flange extending circumferentially about said annular wall portion along a major portion thereof between said slots and being provided with fastener receiving means.

4,417,430

## DIRECT DRIVE POSITIVE LOCKING PANEL FASTENER

Frank F. Lofkitt, Middletown, N.J., assignor to Standard Kell Hardware Manufacturing Co., Allenwood, N.J.

Filed Mar. 13, 1981, Ser. No. 243,327

Int. Cl.<sup>3</sup> F16B 2/18

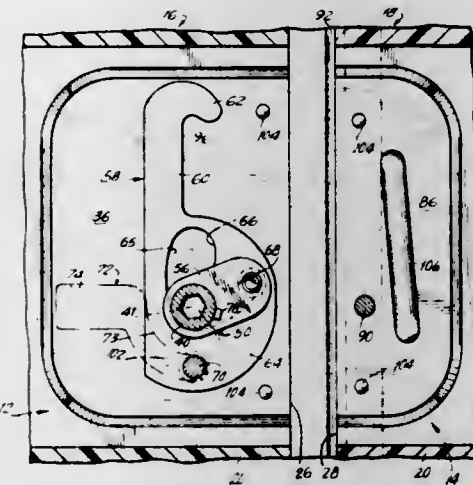
U.S. Cl. 52—584

20 Claims

1. A panel fastener for drawing together and joining a first and second panel at an interface, comprising:  
a moving member movably connected to said first panel, said moving member having a length adapted to extend a portion of said moving member across said interface;  
a crank shaft and a crank connected for rotation with said crank shaft;  
first cam means connected to said crank for rotary motion therewith and first cam follower means for engaging said moving member with said crank, rotation of said crank causing one of direct rotary drive of said moving member

and relative motion between said first cam means and said first cam follower means, said moving member moving in a first prescribed motion determined directly by said crank;

a first fixed member connected to said first panel;  
second cam means and second cam follower means for engaging said moving member with said first fixed member, motion of said moving member causing relative motion between said second cam and said second cam follower means, said moving member moving in a second



prescribed motion determined in part by said second cam means and the contours of said second cam follower means and in part by said first cam means and the contours of said first cam follower means;

a second fixed member connected to said second panel;  
means for releasably engaging said second fixed member with said portion of said moving member when said portion extends across said interface, said extending across said interface being a portion of said first prescribed motion of said moving member.

4,417,431

## CLIP FOR RETAINING SHEET METAL ROOFING OR SIDING

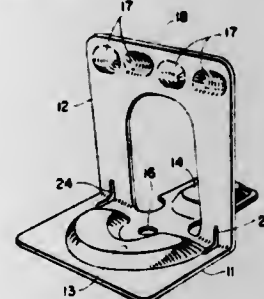
Alfred D. Commins, Livermore, and Frederick T. Kindelich, Orinda, both of Calif., assignors to Zip-Rib, Inc., Burlington, N.J.

Filed Jun. 23, 1980, Ser. No. 162,226

Int. Cl.<sup>3</sup> E04C 5/00

U.S. Cl. 52—715

6 Claims



1. A nestable sheet metal clip for retaining sheet metal roofing or siding panels on a structure comprising:

a base portion, said base portion being comprised of first and second sections, said first section being substantially rectangularly shaped, said second section being smaller than said first section and lying in substantially the same plane therewith;

an upright portion substantially perpendicular with said base portion and being integral therewith, said upright portion including a pair of spaced apart legs, the bottom of each of said legs being integrally connected to the first section of said base portion at a point adjacent to the juncture be-

tween said first and second sections but lying laterally to either side of said second section, the top of said legs being connected together by an upper section having a top edge thereby leaving an opening defined by said legs and said top section, said opening being substantially of the same shape but slightly larger than the second section of said base portion;

a plurality of smooth bulbous projections adjacent to but spaced from said top edge of the upper section of said upright portion, whereby the top edge is substantially straight;

the entire clip being comprised of a single piece of sheet metal and having the same thickness throughout which thickness is equal to the thickness of said sheet metal from which the clip is comprised.

4,417,432

## POWER POST FOR FILM FRAME FOR SKIN PACKAGING MACHINE

Cleve L. Lee, Anderson, S.C., assignor to Nordson Corporation, Amherst, Ohio

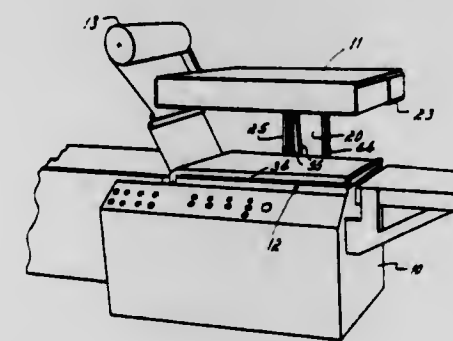
Continuation-in-part of Ser. No. 252,140, Apr. 8, 1981. This

application Jun. 8, 1981, Ser. No. 268,885

Int. Cl.<sup>3</sup> B65B 57/00, 53/02

U.S. Cl. 53—77

9 Claims



1. In a skin packaging machine, a single post mount for a film frame comprising,

a base,

a single vertical post mounted at its lower end on said base

at the center of one side of said base,

an oven mounted on the upper end of said post,

sprockets mounted at the upper and lower ends of said post,

a chain passing around said sprockets,

a vertical shaft mounted between said base and said oven,

a carriage assembly slidably mounted on said shaft, a film

frame mounted on said carriage assembly,

said chain being connected to said carriage assembly to raise

and lower said film frame as said sprockets are rotated,

a drive motor connected to one of said sprockets,

a one-way clutch interposed between said drive motor and

one of said sprockets to permit application of a driving

force to said sprocket only to raise said carriage assembly,

and means for preventing rotating of said carriage assembly

with respect to said shaft,

said single post leaving substantial area around the machine

for access to the machine from front and rear for maintenance and the like.

4,417,433

## METHOD OF MAKING INFUSION PACKAGE

Robert M. Mitchell, Norwalk, Conn., assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Division of Ser. No. 74,260, Sep. 10, 1979, Pat. No. 4,290,521.

This application Apr. 28, 1981, Ser. No. 258,527

Int. Cl.<sup>3</sup> B65B 29/04

U.S. Cl. 53—413

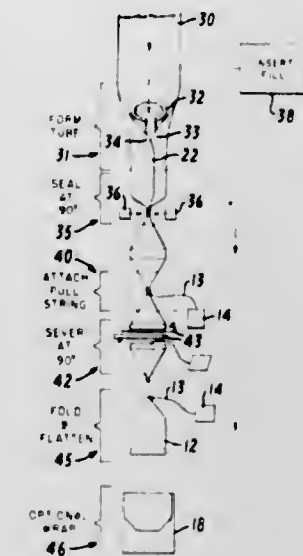
6 Claims

1. A method of making an infusion package including:

(a) forming a generally tetrahedral package of liquid permeable material,

(b) introducing a quantity of fill,

(c) folding the package inwardly to flatten the package after introducing the fill; and



(d) affixing a pull means to the package at a location moved inward by the fold so as to provide unfolding of the fold outward by pulling the pull means.

4,417,434

## METHODS AND APPARATUS FOR PRODUCING ENCASED MEAT AND MEAT FOR ENCASING

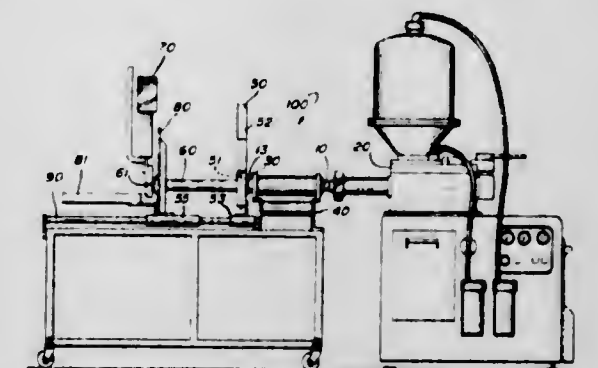
Ludwig Piereder, 153 Windmill Crescent, Pointe Claire, Quebec, Canada H9R 4Y6

Filed Oct. 26, 1981, Ser. No. 314,991

Int. Cl.<sup>3</sup> A22C 11/06

U.S. Cl. 53—469

19 Claims



15. A method of producing encased meat or the like comprising the steps of:

(1) feeding meat to be encased under pressure to a first chamber;

(2) continuing to feed meat thereto, under pressure, whereby it applies a force to said fed meat, sufficiently to move a second chamber in a first linear direction telescopically of said first chamber, thereby substantially filling up said first and second chambers with meat;

(3) opening said second chamber to permit discharge of the meat therefrom to a third chamber;

(4) discharging said meat from said second chamber to said third chamber by moving said second chamber in a second and opposite linear direction to said first linear direction;

(5) severing the fed meat at a point intermediate said second and third chambers and reclosing said second chamber;

(6) feeding further meat to be encased under pressure to said



- first chamber whereby it applies a force to said fed meat, sufficiently to again move said second chamber telescopically of said first chamber, substantially filling up with meat said first and second chambers;
- (7) re-opening said second chamber to permit discharge of the meat therefrom into a casing;
- (8) discharging said meat from said second chamber into said casing by moving said second chamber in said second and opposite direction; and
- (9) crimping said casing to close said casing over said severed and discharged meat.

4,417,435

# APPARATUS FOR AUTOMATICALLY PACKING END CLOSURES FOR CANS IN PAPER BAGS

Atsuyuki Wakamatsu, Shimizu, and Haruo Tsumano, Shizuoka, both of Japan, assignors to Daiwa Can Company, Tokyo, Japan

Continuation of Ser. No. 37,694, May 10, 1979, Pat. No. 4,251,977. This application Nov. 6, 1980, Ser. No. 204,622  
Claims priority, application Japan, Feb. 24, 1979, 54-21190  
Int. Cl.<sup>3</sup> B65B 35/50, 43/30

U.S. Cl. 53—532



1. Apparatus for handling can end closures advanced sequentially to the apparatus comprising:
- (a) a structure defining a horizontally-extensive passage having forward and rearward ends;
- (b) a pair of rolls;
- (c) means for supporting said rolls on parallel, vertically-extensive axes so that a peripheral portion of each of said rolls protrudes into said passage adjacent the rearward end thereof and said rolls define a gap therebetween within said passage;
- (d) means for rotating said rolls on said axes so that said peripheral portions move forwardly within said passage;
- (e) means for defining a lower suction port open to said passage rearwardly of said rolls adjacent the bottom of said passage and an upper suction port open to said passage in the vicinity of said rolls adjacent the top of said passage;
- (f) an inclined chute, the lower end of said chute being disposed adjacent the rearward end of said passage so that each closure slid down said chute will be discharged into said passage in an inclined disposition immediately rearwardly of said rolls, with the lower portion of such closure forward of said lower suction port;
- (g) means for applying suction through said ports so that the lower portion of each closure discharged from said chute will be displaced rearwardly, the upper portion of each such closure will be displaced forwardly and each such closure will be pivoted to an upright disposition within said passage and engaged with said rolls, whereby each such closure will be forced forwardly through the gap between said rolls;
- (h) a pair of opposed pawls, means for resiliently supporting said pawls so that said pawls protrude into said passage and said pawls define a gap smaller than the diameter of

one of the closures to be handled, and means for controllably reciprocating said pawls along said passage between a rearward position in which said pawls are immediately adjacent to said rolls and a forward position in which said pawls are forward of said rolls and remote therefrom, when said pawls are in said rearward position, each closure engaged by said rolls being forced forwardly through the gap defined by said pawls during the engagement of such closure by said rolls and accumulating forwardly of said pawls, said reciprocating means being operative to move said pawls forwardly upon the passage of a preselected lot number of closures through said chute to advance such accumulated lot of closures along said passage; and

(i) means for opening a series of bags, means for loading a lot of closures advanced by said pawls into each such opened bag, and means for closing each such bag after introduction of a lot of closures.

4,417,436

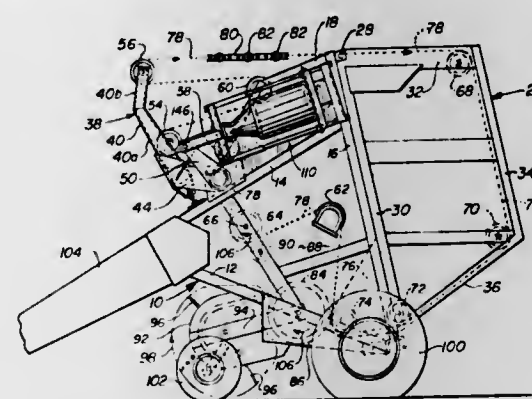
# METHOD OF ADJUSTING APRON TENSION IN ROLL BALING MACHINES

Willis R. Campbell, Ephrata, Pa., assignor to Sperry Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 333,002, Dec. 21, 1981. This application Mar. 25, 1982, Ser. No. 361,687  
Int. Cl.<sup>3</sup> A01D 39/00; B30B 5/06

U.S. Cl. 56—341

3 Claims



1. In a roll baling machine having apron means defining an expandable bale chamber, said apron means moving from a first position to a second position during formation of a roll bale in said expandable bale chamber, air pressure spring means for maintaining tension in said apron means, said air pressure spring means including an air bag for containing air under pressure and a piston movable into said air bag to increase the air pressure therein, means for picking up crop material and for delivering said crop material to said expandable bale chamber, a method of adjusting the tension in said apron means comprising:
- adjusting the air pressure in said air bag to any level within a predetermined range to adjust the density of said roll bale.

4,417,437

# WATCHBAND FORMED OF TUBULAR METAL RODS AND METHOD OF MANUFACTURING SAME

Katsuo Museki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,843  
Claims priority, application Japan, May 19, 1980, 55-68465[U]

Int. Cl.<sup>3</sup> B21L 11/00; F16G 13/18

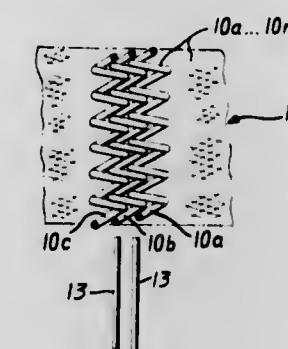
U.S. Cl. 59—20

14 Claims

1. A method of manufacturing a watchband comprised of a plurality of interconnected segments comprising the steps of: providing at least one hollow tubular metal rod; winding the hollow tubular metal rod on a mandrel into a

generally helical shape, the use of the hollow tubular metal rod enabling the winding step to be satisfactorily carried out without the need for annealing the hollow tubular metal rod either before or after winding thereof into a generally helical shape;

cutting the helically-wound hollow tubular metal rod to predetermined segment lengths; and



connecting together the lengths of helically-wound hollow tubular metal rod so that the coils of one length partly overlap the coils of adjoining lengths to thereby form a watchband comprised of interconnected hollow tubular metal rod segments.

4,417,438

# CONTROL SYSTEM FOR CHENG DUAL-FLUID CYCLE ENGINE SYSTEM

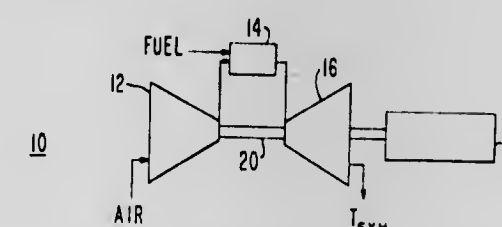
Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Sunnyvale, Calif.

Division of Ser. No. 59,591, Jul. 23, 1979, Pat. No. 4,297,841. This application Jun. 12, 1981, Ser. No. 273,269

Int. Cl.<sup>3</sup> F02C 7/00, 7/10

U.S. Cl. 60—39.05

4 Claims



1. A method of operating a Cheng parallel compound Brayton/Rankine cycle engine under partial load conditions comprising following a control path defined by the locus of peak efficiency points, where the control path results in a declining turbine inlet temperature as the load decreases, by
- (a) controlling the Brayton cycle part of the dual-fluid cycle engine by means of a first control system;
- (b) controlling the Rankine cycle part of the dual-fluid cycle engine by means of a second control system; and
- (c) setting the desired operating points of said first and second control systems by providing predetermined settings for each of the two control systems for all load conditions, said settings comprising at least fuel flow rates and water flow rates.

4,417,439

# STARTING MEANS FOR A GAS TURBINE ENGINE

Domingo Sepulveda, Vernon, and Edmund E. Striebel, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 29, 1981, Ser. No. 287,852

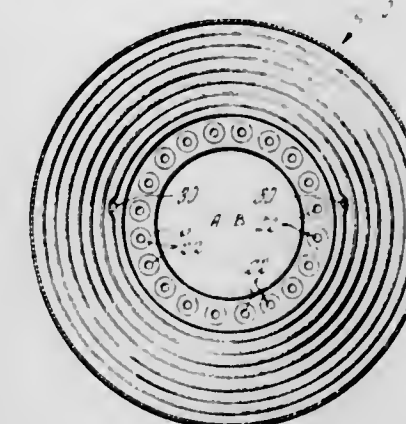
Int. Cl.<sup>3</sup> F02C 7/264

U.S. Cl. 60—39.141

3 Claims

1. For a gas turbine engine having an annular combustor and a fuel system including a plurality of circumferentially spaced dual fuel nozzles for leading fuel into the combustor, each nozzle having a primary fuel system for continuously flowing

fuel to the combustor during the entire engine operating envelope and a secondary fuel system for flowing fuel solely during the higher thrust regimes of the engine operating envelope, at least one igniter in said annular combustor and one of said dual fuel nozzles associated with said igniter to feed a predeter-



mined amount of fuel thereto for starting of said engine, means for asymmetrically distributing a predetermined amount of fuel to each of said fuel nozzles for delivering fuel to the primary fuel system of said dual fuel nozzle associated with said igniter at an amount different than all the other primary fuel systems of all of said other dual fuel nozzles.

4,417,440

# FUEL CONTROL APPARATUS FOR A GAS TURBINE ENGINE

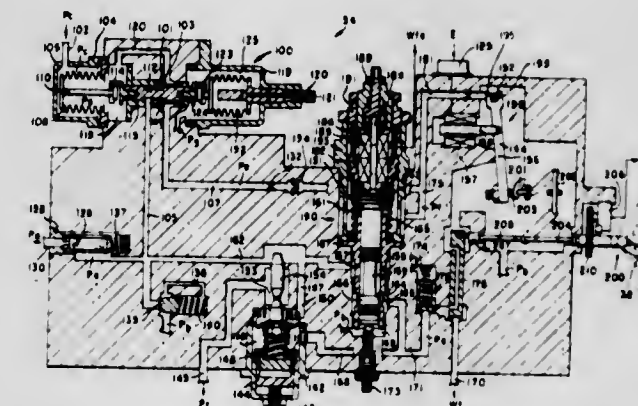
David J. Hawes, Pierrefonds, Canada, assignor to Aviation Electric Ltd., Montreal, Canada

Filed May 12, 1981, Ser. No. 262,867

Int. Cl.<sup>3</sup> F02C 9/28

U.S. Cl. 60—39.281

16 Claims



1. A backup arrangement for a fuel control apparatus which meters fuel to a gas turbine engine in response to an electrical signal indicative of a desired fuel/air ratio of the engine comprising:
- a metering valve, positioned by a hydraulic control pressure, whose position is indicative of the fuel flow therethrough; and
- means for modulating the hydraulic control pressure by means of an electrical control and a manual control; said electrical control comprising a means for positioning said modulating means over a predetermined electrical control range, said manual control including means for positioning said modulating means over a predetermined manual control range, wherein said manual control range is related to said electrical control range such that upon failure of the electrical control the modulating means automatically fails to a position controlled by the manual control.



4,417,441

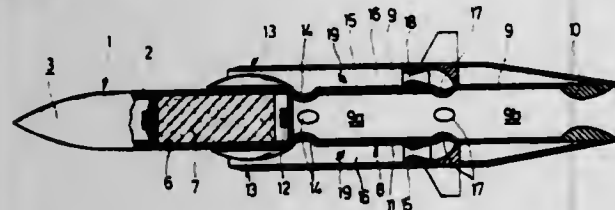
## RAM JET ENGINE

Brunhart Crispin; Nobert Voss, both of Taufkirchen; Wulf-Dieter Pohl, Zorneding, and Dieter Thomaier, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 27,715  
Int. Cl.<sup>3</sup> F02K 7/18

U.S. Cl. 60—251

7 Claims



1. Ram jet engine, for operation with fuels including boron and like energy-rich materials of high melting and evaporating temperature in particulate form, comprising an axially elongated tubular combustion chamber having a forward end and a rearward end, a flame chamber located within said combustion chamber and extending from the forward end toward the rearward end and terminating intermediate the forward and rearward ends, a mixing chamber located within said combustion chamber and extending from the end of said flame chamber spaced from the forward end of said combustion chamber toward the rearward end of said combustion chamber, intake diffusers distributed over the outside circumference of said combustion chamber for conducting a ram air supply to the combustion chamber, said intake diffusers arranged to divide the total ram air from the intake diffusers into combustion air for the supply thereof into said flame chamber and into channelled secondary air conveyed through at least certain of said intake diffusers exteriorly of said combustion chamber for the supply thereof inwardly through said combustion chamber wall directly into said mixing chamber spaced from the supply of combustion air into said flame chamber, while maintaining an aerodynamically favorable contour.

4,417,442

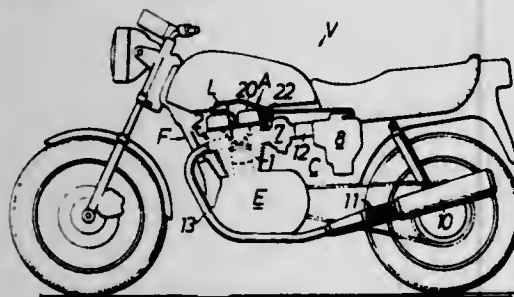
## EXHAUST GAS CLEANING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yasuo Ikemura, Kawagoe; Makoto Hirano, Asaka; Yoji Shimizu, Wako, and Masaki Matsura, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,281  
Claims priority, application Japan, Jun. 30, 1980, 55-88948  
Int. Cl.<sup>3</sup> F01N 3/34

U.S. Cl. 60—293

7 Claims



1. An exhaust gas cleaning system for an internal combustion engine comprising a plurality of cylinders with respective cylinder heads, a plurality of sets of exhaust valve ports provided in said cylinder heads, each set opening into a common combustion chamber of each of the cylinders, exhaust passage means in communication with respective exhaust valve ports, exhaust valves for opening and closing the exhaust valve ports, said exhaust passage means comprising a plurality of externally open manifold exhaust ports and a plurality of sets of branch

exhaust ports each set of which branch from a related manifold exhaust port and communicate with a related set of exhaust valve ports, and secondary air passage means directly connected to respective branch exhaust ports for supplying secondary air thereto, said secondary air passage means including a passage in each of said cylinder heads composed of a manifold secondary air passage opening externally of the related cylinder head and a set of branch secondary air passages branching from said manifold secondary air passage and communicating with the related set of branch exhaust ports, each of said exhaust valves extending into a respective one of said branch exhaust ports, said branch secondary air passages opening into said branch exhaust ports at locations in proximity to the respective exhaust valves, said secondary air passage means further including reed valves each coupled to a related manifold secondary air passage for supplying secondary air to the related set of branch exhaust ports for mixture with exhaust gases thereat.

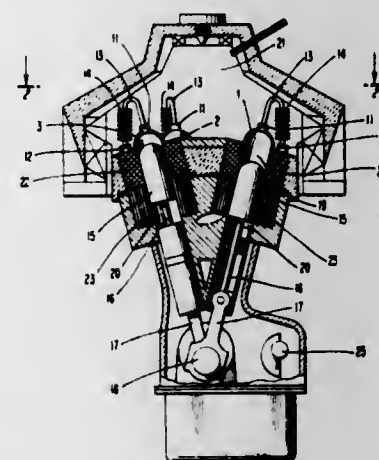
4,417,443

## MULTI-CYLINDER, DOUBLE-ACTING HOT GAS ENGINE

Stefan Lörant, Oxie, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) A.B. & Co., Malmö, Sweden  
Filed Aug. 13, 1981, Ser. No. 292,704  
Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—525

2 Claims



1. An improved multi-cylinder double-acting hot gas engine of the kind in which each cylinder is surrounded by a ring-shaped regenerator housing, the top of each said cylinder being connected to the top of its surrounding regenerator housing by a number of heater tubes, said cylinders containing pistons connected to a single common crankshaft via connecting rods, the improvement comprising five such cylinders disposed symmetrically relative a plane perpendicular to said single crankshaft, a first cylinder and its two neighbouring cylinders along the crankshaft axis being disposed in a V-configuration, and the remaining two cylinders being arranged outside said two neighbouring cylinders with their axes disposed in a plane containing the axis of the crank shaft, said plane forming an angle with the axis of said first cylinder being less than 50% of the angle between the axis of said first cylinder and a plane containing the axes of said two neighbouring cylinders.

4,417,444

## STIRLING CYCLE ENGINE

Gunnar Lundholm, Lund, Sweden, assignor to Mechanical Technology Incorporated, Latham, N.Y.  
Filed Oct. 5, 1981, Ser. No. 308,251  
Int. Cl.<sup>3</sup> F02G 1/00

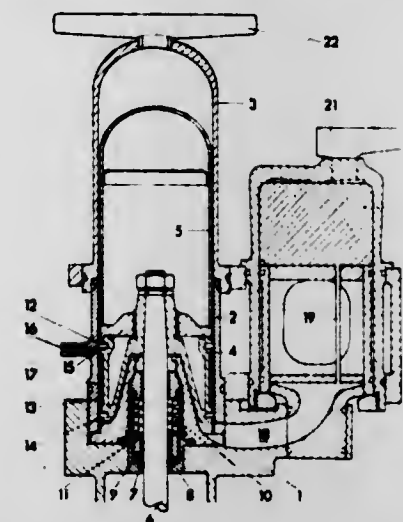
U.S. Cl. 60—525

11 Claims

1. A multi-cylinder double-acting Stirling cycle engine of the kind in which each cylinder contains a piston mounted to reciprocate therein, separating a low temperature working

space from a high temperature working space in the cylinder, and in which each piston separates two different charges of working gas from each other, wherein the improvement comprises:

at least two axially spaced piston rings disposed on each of said pistons, with an axial spacing between said piston rings being at least equal to the stroke of said piston;



each of said cylinders is defined by a cylinder wall provided with a duct opening having such axial position that it will not be passed by either of said piston rings during their reciprocating movement, said duct opening belonging to a duct leading to a source of working gas at an extreme working cycle gas pressure.

4,417,445

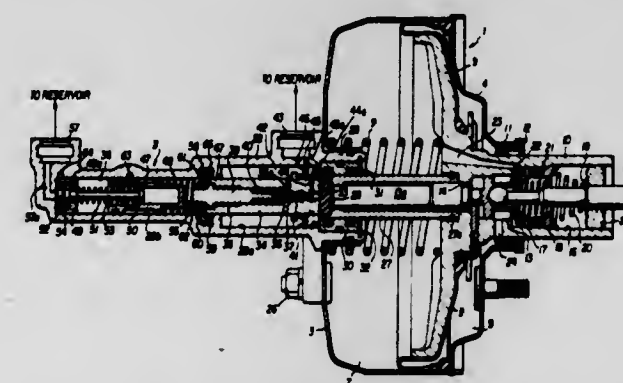
## BRAKE MASTER CYLINDER WITH ATTACHED BRAKE BOOSTER

Yoshiichi Furuta, Gifu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 69,518, Aug. 23, 1979, abandoned. This application Oct. 6, 1981, Ser. No. 309,084  
Claims priority, application Japan, Aug. 26, 1978, 53-117141  
Int. Cl.<sup>3</sup> B60T 13/20

U.S. Cl. 60—554

3 Claims



1. A brake master cylinder with an attached brake booster for communication with at least one wheel brake cylinder and with a reservoir comprising:

a master cylinder body;  
a booster housing connected to said master cylinder body;  
a power piston positioned in said booster housing and dividing said housing into first and second chambers;  
a first valve mechanism mounted in said power piston wherein said first valve mechanism further comprises a brake pedal, a control valve and an air valve operatively connected to said brake pedal, said control valve being operable with said air valve and said first valve mechanism generating pressure differences between said first and second chambers in accordance with brake pedal depression force;  
a hollow output member having a shoulder portion and a

first end thereof being connected to said power piston and a second end thereof being slidably mounted in said master cylinder body;

a primary piston, a first end thereof being slidably mounted in said second end of said output member and a second end of said primary piston being slidably mounted in said master cylinder body;

a first hydraulic pressure chamber formed within said master cylinder body by said output member and said primary piston;

a second hydraulic pressure chamber formed within said master cylinder body by said primary piston;

a rod member unitarily formed with said air valve of said first valve mechanism, said rod member extending through said output member toward said primary piston;

a resilient member disposed in said shoulder portion of said hollow output member between said first end of said primary piston and a first end of said rod member for transmitting force to said primary piston;

first passage means for continuously communicating said second hydraulic chamber with said at least one wheel brake cylinder;

second passage means for communicating said first hydraulic chamber with said reservoir;

a second valve mechanism for opening said second passage means to establish communication between said first hydraulic chamber and said reservoir when said output member is positioned in a rest position and for closing said second passage means when said output member is moved to an active position;

third passage means for connecting said second hydraulic pressure chamber with said first hydraulic pressure chamber;

a third valve mechanism for opening said third passage means to establish communication between said first and second hydraulic pressure chambers when said primary piston is in a rest position and for closing said third passage when said primary piston is moved to an active position;

a check valve mechanism for allowing fluid flow from said first hydraulic pressure chamber to said second hydraulic pressure chamber upon said third passage means being closed;

fourth passage means provided in said primary piston for connecting said first hydraulic pressure chamber with said reservoir upon said second passage means being closed; and

a fourth valve mechanism mounted in said primary piston for controlling communication of said fourth passage means, wherein said fourth valve mechanism further comprises a rod portion extending through said primary piston toward said resilient member, a first end of said rod portion contacting with said resilient member and a spring loaded valve head for closing said fourth passage means such that said fourth valve mechanism is seated only by the force of said resilient member and is unseated by the internal pressure generated in said resilient member.

4,417,446

## COMBINATION POWER PLANT

Yasunobu Nakamoto, and Toshiro Terayama, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 17, 1982, Ser. No. 359,089  
Claims priority, application Japan, Mar. 20, 1981, 56-41239  
Int. Cl.<sup>3</sup> F03G 7/04

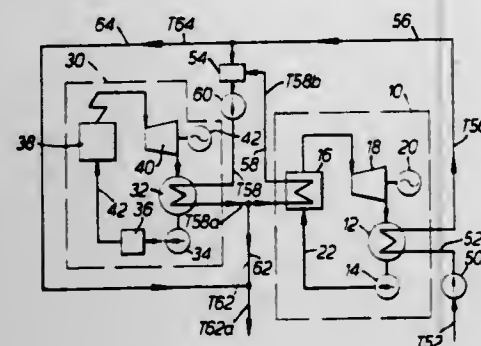
U.S. Cl. 60—641.7

4 Claims

1. A combination power plant comprising:  
an ocean thermal energy conversion power plant including a condenser and an evaporator;  
a steam power generation plant including a condenser;  
a cold water pipe for passing cooling water through the



condenser in said ocean thermal energy conversion power plant;  
mixing means for receiving at least a part of said cooling water from said condenser through said cold water pipe; and



a circulating water pipe for circulating water from said mixing means serially through the condenser in said steam power generation plant and then a portion of the water to the evaporator in said ocean thermal energy conversion power plant and back into said mixing means.

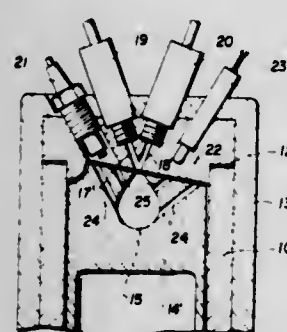
4,417,447

# COMBINED INTERNAL COMBUSTION AND STEAM ENGINE

Luther B. Thomas, 159 Herndon Ave., Shreveport, La. 71101  
Filed May 3, 1982, Ser. No. 374,271  
Int. Cl.<sup>3</sup> F01B 29/04

U.S. Cl. 60—712

4 Claims



1. A combined internal combustion and steam engine of the injected type comprising a cylinder including a cylinder head and cylinder chamber, a ringless piston formed of high temperature resisting material operably mounted in the cylinder chamber and having an end face opposing a surface of the cylinder head whereby a combustion space is formed between the piston end face and the cylinder head opposing surface, the piston having an axially thick piston head rearwardly of said end face and having formed therein centrally and axially a single bulbous axially forwardly tapering piston head chamber including a constricted mouth opening through said end face centrally thereof, a multiplicity of circumferentially and radially spaced inclined axis narrow passages leading outwardly from said single piston head chamber and opening through said end face and being widely distributed in spaced relationship over the piston end face, separate fuel and water injection means on the cylinder head centrally and having convergent axes and having outlets which open through said surface of the cylinder head substantially in intersecting relationship and in registration with the constricted mouth of the tapering piston head chamber, an igniter and heat sensor means on the piston head with at least the igniter means communicating with said combustion space between the piston end face and the opposing cylinder head surface.

4,417,448

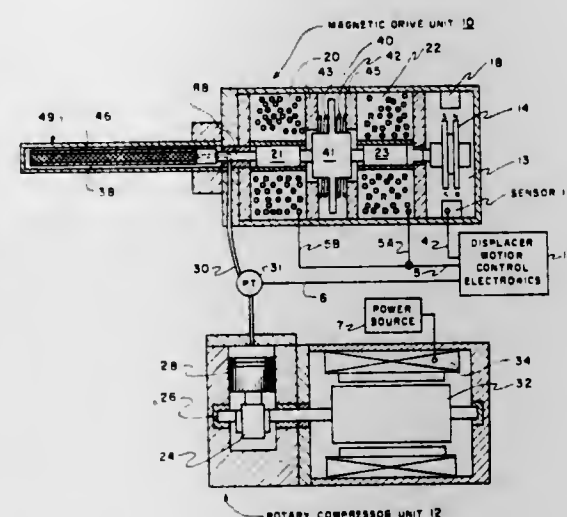
# MEANS FOR PRODUCING AN OPTIMIZED COOLER EXPANDER WAVEFORM

Stuart B. Horn, Fairfax; Richard A. Wright, Falls Church, and Mark S. Asher, Blacksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 20, 1982, Ser. No. 341,028  
Int. Cl.<sup>3</sup> F25B 9/00; H02K 33/14

U.S. Cl. 62—6

6 Claims



1. A means for producing an optimized cooler expander waveform for a closed cycle cryogenic cooler having reciprocating displacer-expander cooling, said means comprising:  
a driving means comprised of a combined magnetic drive means and a spring biasing means in the ambient end of said cooler for driving the displacer of said cooler, wherein said magnetic driving means is further comprised of a magnetic material disc which is hard connected to said displacer between two opposing solenoids and wherein said spring biasing means is comprised of two biasing springs with one on each side of said disc; and  
control means for selectively controlling said magnetic drive means wherein motion of said displacer is maintained in said optimized cooler expander waveform in which said two opposing solenoids provide control of said displacer in opposite directions according to the amount of current generated therethrough by said control means, said optimized cooler expander waveform having four portions thereto comprising about 25% each of one total cycle with a constant velocity of said displacer during the first portion of the forward stroke caused by surge current in said two opposing solenoids resulting in an acceleration time of about 1% of the total cycle, an upper flat dwell time second portion provided by extended current flow through said solenoids, an equal constant velocity of said displacer during the third portion of the return stroke caused by reverse and equal surge current with an acceleration time of about 1% of the total cycle, and a lower flat dwell time fourth portion provided by extended reverse current flow through said solenoids.

4,417,449

# PROCESS FOR SEPARATING CARBON DIOXIDE AND ACID GASES FROM A CARBONACEOUS OFF-GAS

William P. Hegarty, Wescosville, and William P. Schmidt, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 15, 1982, Ser. No. 339,360  
Int. Cl.<sup>3</sup> F25J 3/00

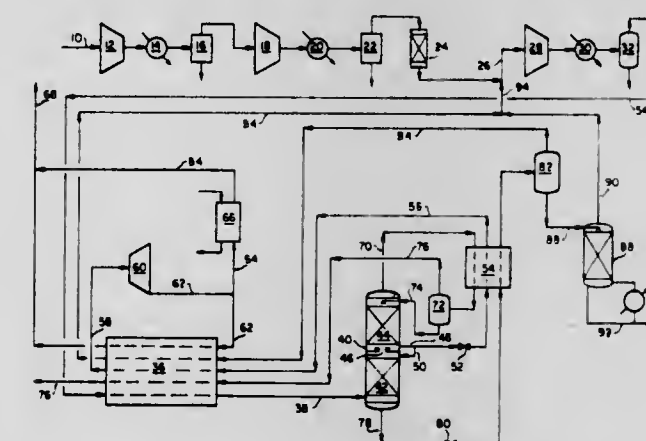
U.S. Cl. 62—28

14 Claims

1. A process for the low temperature distillation separation of a carbonaceous off-gas stream containing a quantity of acid gases, such as carbon dioxide, hydrogen sulfide and carbonyl sulfide by separating said off-gas stream into an essentially

sulfur free, light fuel gas, an acid gas and a heavy hydrocarbon stream, comprising the steps of:

- (a) compressing and aftercooling an off-gas containing acid gases, light fuel gases and heavy hydrocarbons;
- (b) drying the compressed and aftercooled off-gas to remove moisture therefrom;
- (c) subcooling the combined off-gas and a recycle stream against product streams in a heat exchanger;
- (d) separating the subcooled off-gas in a distillation column into an initial fuel gas stream as an overhead fraction, a carbon dioxide and sulfide stream as a liquid sidestream containing the major portion of said quantity of acid gases and an initial heavy hydrocarbon and carbon dioxide stream as a bottom liquid fraction;
- (e) expanding the carbon dioxide and sulfide liquid side stream in an auto refrigeration cycle for the subcooling of the off-gas in the heat exchanger of step (c) before releasing the stream as a carbon dioxide and sulfide product stream;
- (f) cooling and separating said initial fuel gas stream into a final fuel gas stream containing a minor portion of said quantity of acid gases and a carbon dioxide stream which is recycled to said column as reflux to the distillation column;
- (g) separating said initial heavy hydrocarbon and carbon dioxide stream into a carbon dioxide stream containing the balance of said quantity of acid gases which is recycled to the compression stage of the process and a substantially pure heavy hydrocarbon stream which is a product stream of said process.



3. A process for the low temperature distillation separation of a carbonaceous, pressurized off-gas stream containing a quantity of acid gases, such as carbon dioxide, hydrogen sulfide and carbonyl sulfide by separating said off-gas stream into an essentially sulfur free, light fuel gas, an acid gas and a heavy hydrocarbon stream, comprising the steps of:

- (a) subcooling a pressurized off-gas containing acid gases, light fuel gases and heavy hydrocarbons and a recycle stream combined with said off-gases against product streams in a heat exchanger;
- (b) separating the subcooled off-gas in a distillation column into an initial fuel gas stream as an overhead fraction, a carbon dioxide and sulfide stream as a liquid sidestream containing the major portion of said quantity of acid gases and an initial heavy hydrocarbon and carbon dioxide stream as a bottom liquid fraction;
- (c) expanding the carbon dioxide and sulfide liquid side-stream in an auto refrigeration cycle for the subcooling of the off-gas in the heat exchanger of step (a) before releasing the stream as a carbon dioxide and sulfide product stream;
- (d) cooling and separating said initial fuel gas stream into a final fuel gas stream containing a minor portion of said quantity of acid gases and a carbon dioxide stream which is recycled to said column as reflux to the distillation column;
- (e) separating said initial heavy hydrocarbon and carbon dioxide stream into a carbon dioxide stream containing the

balance of said quantity of acid gases which is recycled to the compression stage of the process and a substantially pure heavy hydrocarbon stream which is a product stream of said process.

14. A process for recycling a portion of an oil shale retort off-gas stream containing a quantity of acid gases, such as carbon dioxide, hydrogen sulfide and carbonyl sulfide by low temperature distillation separation of said off-gas stream into an essentially sulfur free, light fuel gas, an acid gas and a heavy hydrocarbon stream, comprising the steps of:

- (a) compressing and aftercooling an off-gas from an oil shale retort containing acid gases, light fuel gases and heavy hydrocarbons;
- (b) drying the compressed and aftercooled off-gas to remove moisture therefrom;
- (c) subcooling the combined off-gas and a recycle stream against product streams in a heat exchanger;
- (d) separating the subcooled off-gas in a two tiered distillation column into an initial fuel gas stream as an overhead fraction, an initial carbon dioxide and sulfide acid gas stream as a liquid sidestream containing the major portion of said quantity of acid gases and an initial heavy hydrocarbon and carbon dioxide stream as a bottom liquid fraction;
- (e) expanding the initial carbon dioxide and sulfide stream in order to cool the initial fuel gas stream in a heat exchanger;
- (f) cooling and separating said initial fuel gas stream into a final fuel gas stream containing a minor portion of said quantity of acid gases and a carbon dioxide stream which is recycled to said column as reflux to the distillation column;
- (g) further expanding the carbon dioxide and sulfide side stream in an expander turbine to produce auto refrigeration for the subcooling of the off-gas in the heat exchanger of step (c);
- (h) separating said initial heavy hydrocarbon and carbon dioxide stream into a carbon dioxide stream containing the balance of said quantity of acid gases which is recycled to the compression stage of the process and a substantially pure heavy hydrocarbon stream which is a product stream of said process;
- (i) recycling said carbon dioxide and sulfide stream to an oil shale retort as a product stream.

4,417,450

# ENERGY MANAGEMENT SYSTEM FOR VENDING MACHINES

Annis R. Morgan, Jr., and Eddie W. King, both of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.  
Continuation-in-part of Ser. No. 198,172, Oct. 17, 1980. This application Mar. 31, 1982, Ser. No. 363,961

Int. Cl.<sup>3</sup> F25B 49/00; G05D 23/32; F25D 17/06

U.S. Cl. 62—126

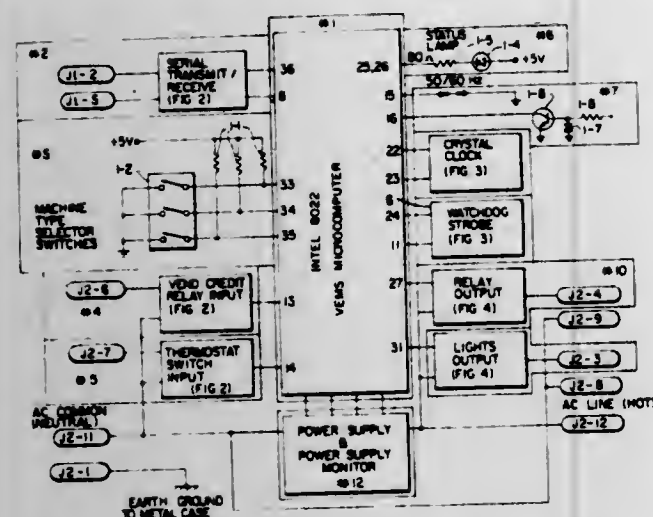
10 Claims

1. In a chilled product vending machine including a refrigeration compressor, temperature sensor means for detecting the temperature within said vending machine and turning said compressor ON and OFF to define a compressor cycle in response to the detection of predetermined temperature limits, an evaporator coil and evaporator fan means for blowing air across said evaporator coil and circulating said air throughout said vending machine, an energy management system comprising:

control means for cycling said evaporator fan means ON simultaneously with said compressor for a time period at least as long as said compressor cycle;  
delay means for cycling said evaporator fan means OFF at the end of a predetermined delay period after said compressor is turned OFF, said period of time being long enough to permit the temperature of said evaporator coil to temperature stabilize above the freezing temperature of water;  
memory means for storing a plurality of predetermined



delay periods of different durations related to cooling characteristics of refrigeration systems of different types of vending machines; and selector switch means for selectively generating coded signals related to the respective different types of vending



machines and applying said signals to said memory means for selectively retrieving an appropriate one of said delay periods for implementation by said delay means; whereby different types of vending machines with different cooling characteristics can be readily retrofitted with said energy management system.

4,417,451

#### VAPOR COMPRESSION REFRIGERANT SYSTEM MONITOR AND GAS REMOVAL APPARATUS

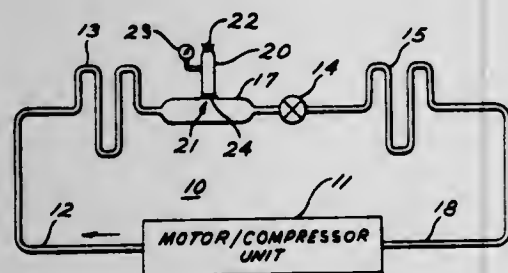
Hans O. Spachsch, Atlanta, Ga., assignor to Hilliard-Lyons Patent Management, Inc.

Continuation-in-part of Ser. No. 147,691, May 7, 1980, Pat. No. 4,316,364. This application Jan. 18, 1982, Ser. No. 339,855

Int. Cl.<sup>3</sup> F25B 43/04; G01K 13/00

U.S. Cl. 62-129

9 Claims



1. Condition monitoring apparatus for a halocarbon vapor compression refrigerant system having a refrigerant flow circuit including a compressor, a condenser, fluid expansion means and an evaporator, said monitoring apparatus comprising:

- gas accumulating means positioned in the refrigerant circuit at a high point in the high pressure side to which non-condensable contaminant gases in the refrigerant stream migrate during operation of the system;
- an inlet port coupling the gas accumulating means in fluid communication with the refrigerant circuit;
- a purge valve secured to the gas accumulating means for exhausting unwanted contaminant gases accumulated therein;
- a perm-selective membrane positioned across the inlet port to selectively admit predetermined contaminant gases into the gas accumulating means without significant loss of halocarbon vapor;
- and indicia means coupled to the gas accumulating means for providing indicia representative of the degree of accumulation of the contaminant gases therein, whereby an in-situ

indication of the onset of a system malfunction is provided.

4,417,452

#### HEAT PUMP SYSTEM DEFROST CONTROL

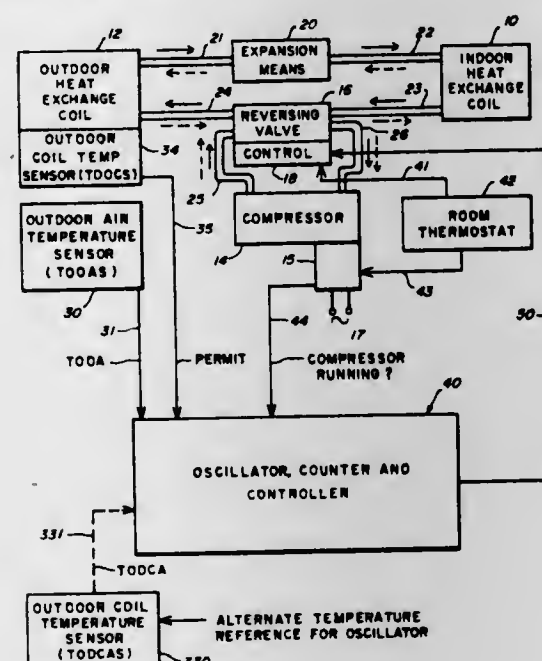
Robert T. Ruminaky, Bloomington, and Stephen L. Serber, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 109,743, Jan. 4, 1980, abandoned. This application Jun. 30, 1981, Ser. No. 278,942

Int. Cl.<sup>3</sup> F25D 21/06

U.S. Cl. 62-155

3 Claims



1. An outdoor coil defrost control system (hereinafter "defrost control system") for a reverse cycle refrigeration system (hereinafter "system") for heating and cooling a building wherein said system comprises refrigerant compression means, an indoor coil, an outdoor coil, and refrigerant conduit means connecting said compression means and said coils, said defrost control system comprising:

- first outdoor coil temperature sensing means (hereinafter "TODCSA") having an output indicative of outdoor air temperature (hereinafter "TODCA");
- second outdoor coil temperature sensing means (hereinafter "TODCS") having an output indicative of the temperature of said outdoor coil (hereinafter "TODC");
- means (hereinafter "COM") operatively associated with said compression means and adapted to have an output indicative of the operation of said compression means; and
- controller means having operative connections to said TODCSA, TODCS, and COM so as to receive the outputs thereof, said controller having a TODCA monitoring function which is initiated upon (i) TODC being at or below a preselected value and (ii) said compression means being operated, said controller means further comprising (1) a variable frequency electronic oscillator having an input connected to TODCSA by means so as to receive a signal indicative of TODCA and an output signal the frequency of which is maximum at a preselected value of TODCA and continuously decreases as the value of TODCA deviates either above or below said preselected value; (2) a counter means having an input connected to receive the output signal of said variable frequency oscillator; and (3) means for connecting said counter means to said system, and being adapted, upon said counter means counting a preselected number of pulses, to place said system into an outdoor coil defrost mode of operation.

4,417,453

#### LIQUID SEPARATOR FOR USE IN A REFRIGERATING AIR CONDITIONING APPARATUS

Yoshio Sasaki, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

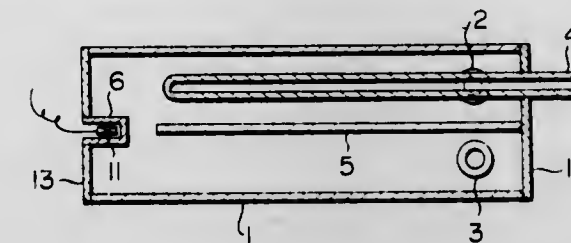
Filed Mar. 15, 1982, Ser. No. 358,606

Claims priority, application Japan, Apr. 17, 1981, 56-56071[U]

Int. Cl.<sup>3</sup> F25B 43/00

U.S. Cl. 62-503

2 Claims



1. A liquid separator for use in a refrigerating apparatus and adapted to be provided in a refrigerant gas pipeline connecting the evaporator and the compressor of the refrigerating apparatus, said separator comprising: a container having a generally cylindrical form with end plates closing the ends thereof, a partition plate in said container and dividing the inside of said container into two spaces which are in communication with each other at one of the longitudinal ends of said container, a liquified refrigerant coil disposed within one of said spaces and extending longitudinally along said partition plate in a zig-zag fashion and substantially filling said one space and having both end portions extending through the container at one of the ends of said container for receiving liquified refrigerant from the compressor, a refrigerant gas inlet in said container and opening into said one of said spaces at the other longitudinal end of said container, a refrigerant gas outlet in said container and opening out of the other of said spaces at said other longitudinal end of said container.

4,417,454

#### NEEDLE FOR KNITTING MACHINES AND METHOD FOR MAKING SAME

Hardo Berentzen, Albstadt, Fed. Rep. of Germany, assignor to Theodor Groz & Sohne and Ernst Becker & Nadelfabrik Commandit-Gesellschaft, both of Albstadt, Fed. Rep. of Germany

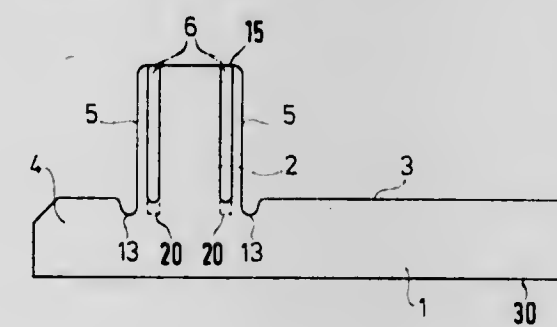
Continuation-in-part of Ser. No. 126,046, Feb. 29, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,520

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911195

Int. Cl.<sup>3</sup> D04B 35/02

U.S. Cl. 66-123

5 Claims



1. In a knitting machine needle of the type having a flat elongated, longitudinally-extending shank having an upper and lower edge and an integrally-formed foot which extends generally transversely to the longitudinal axis of said needle shank and projects above its upper edge, said foot having a generally rectangular cross sectional shape and two opposite side faces and two opposite front faces, the improvement comprising: an elongated, longitudinally-extending groove in at least one

of the side faces of said foot extending in a direction from the upper edge of said needle shank to the upper edge of said needle foot.

4,417,455

#### MACHINE FOR THE PRODUCTION OF KNITTED GOODS AND METHOD OF THE MACHINE

Gerard Durville, Sisseln, Switzerland, assignor to Textilma AG, Switzerland

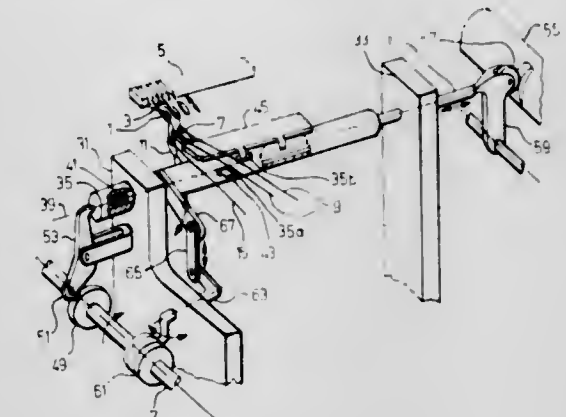
Filed Jul. 3, 1980, Ser. No. 165,498

Claims priority, application Switzerland, Jul. 4, 1979, 6236/79; Fed. Rep. of Germany, Jul. 30, 1979, 2930824

Int. Cl.<sup>3</sup> D04B 23/00

U.S. Cl. 66-207

14 Claims



1. A knitting machine comprising: a frame;

a plurality of needles;

a needle carrier connected to said frame for movably carrying said needles, said plurality of needles including at least one needle at an end of said needle carrier and a plurality of intermediate needles, said needles reciprocally movable on said carrier to form stitches with each movement of said needles;

two elongated members mounted to said frame and pivotable about a common pivot axis, said elongated members being axially displaceable along the pivot axis relative to each other;

connecting means interconnecting said elongated members for securing them against rotational movement relative to each other;

a first row of thread guides mounted to one of said elongated members for guiding a first plurality of warp threads;

a second row of thread guides mounted to the other of said elongated members for guiding a second plurality of warp threads;

first drive means connected to said elongated members for pivoting said elongated members about the pivot axis to move said first and second row of thread guides with respect to said plurality of needles for lifting the first and second plurality of warp threads above and lowering the first and second plurality of warp threads below said plurality of needles; and

second drive means connected to said first and second elongated members for moving said first and second elongated members axially on the pivot axis and relative to each other;

said first and second drive means interengaged for synchronous operation so that two different warp threads of the first and second plurality of warp threads are laid around respective ones of said plurality of intermediate needles during each movement of said needles for forming a stitch with warp threads of one of the first and second plurality of warp threads being alternately laid around one of said intermediate needles and another one of said intermediate needles during a successive movement of the needles to form a successive stitch.



4,417,456

**THREAD POSITIONING APPARATUS FOR A WARP KNITTING MACHINE**

Gerhard Bergmann, Frankfurter Strasse 41, 6053 Obertshausen, and Erhard Henz, Friedhofstrasse 56, 6056 Heusenstamm, both of Fed. Rep. of Germany

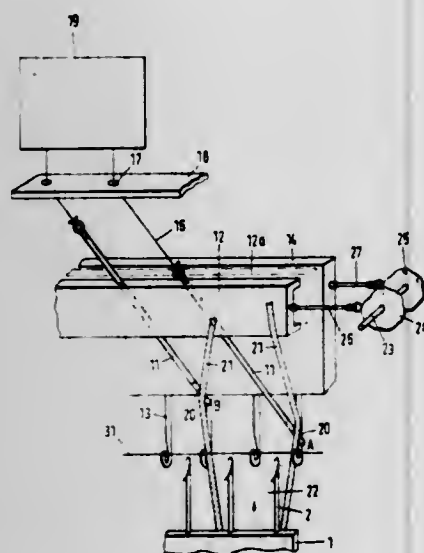
Filed Jun. 22, 1981, Ser. No. 275,703

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023952

Int. Cl.<sup>3</sup> D04B 27/02

U.S. Cl. 66—214

10 Claims



1. A warp knitting machine having a needle bed and a jacquard arrangement for producing from a plurality of threads, patterned wear, comprising:

- (a) a thread positioning bar;
- (b) a plurality of thread positioning sinkers mounted on said thread positioning bar and spaced to allow said sinkers to pass between the needles of said bed;
- (c) at least one guide bar; and
- (d) a plurality of thread guides mounted on said guide bar for separately guiding said threads, said thread guides being operable by said jacquard arrangement to move longitudinally relative to said guide bar and with a component of motion in a plane alongside said needle bed, said component being sized to allow each of said threads to reciprocate between and be pulled against the interior sides of a corresponding, neighboring pair of said sinkers.

4,417,457

**AGITATOR MOUNTED DISPENSER AND SHOWER SPRAY DEVICE FOR AUTOMATIC WASHER**

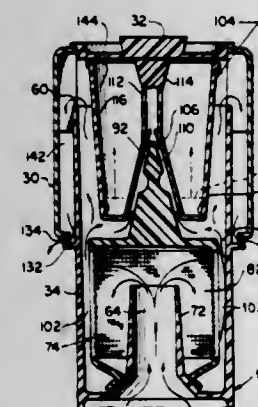
Robert A. Brenner, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 14, 1982, Ser. No. 417,839

Int. Cl.<sup>3</sup> D06F 39/02

U.S. Cl. 68—17 A

9 Claims



1. In an automatic washer having a clothes containing basket and an upright agitator including an outer barrel adapted to

pump washing liquid through a passage formed internally of the agitator, a wash additive dispenser comprising:

- a cup for containing wash additive to be dispensed;
- a mounting means for said cup for positioning the cup for floatation within said outer barrel;
- opening means exposed by floatation of said cup for allowing wash liquid to enter said cup;
- a terminal lip on said outer barrel over which liquid pumped by said agitator will overflow during a wash operation of said washer;
- a sleeve, spaced outwardly of and forming an annular chamber with said outer barrel, said sleeve having upper and lower terminal portions extending toward said outer barrel;
- stop means associated with said sleeve for restraining said cup during floatation in a position wherein said opening means is at a level allowing wash liquid to enter said cup when wash liquid overflows said terminal lip;
- shower spray opening means defined by said sleeve and said barrel at a location spaced below said terminal lip and sized to restrict the flow of wash liquid from said shower spray openings to allow accumulation of wash liquid in said annular chamber and the creation of a liquid head at a level above said terminal lip; and
- means for centrifugally spinning said agitator and said cup to expel wash additive from said cup and into said annular chamber whereby the wash additive is retained in said chamber until the centrifugal spinning is terminated at which time the wash additive is allowed to drain into said basket through said shower spray opening means.

4,417,458

**PATTERN MATRIX FOR SKIVING SHOE PARTS**

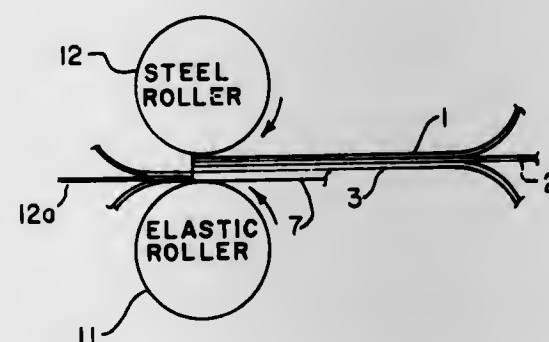
Robert F. Goellner, Creve Coeur, Mo., assignor to Manufacturers Supplies Co., St. Louis, Mo.

Filed Sep. 14, 1981, Ser. No. 301,880

Int. Cl.<sup>3</sup> A43D 8/28, 8/48; C14B 1/02

U.S. Cl. 69—13

17 Claims



1. A pattern matrix for use in conjunction with a splitter machine for skiving select marginal edges of shoe parts in preparation for their folding and fabrication into a shoe, comprising, a pattern matrix formed of a sheet of material and having at least one select edge shaped substantially in the configuration of the shape to be obtained for the intended shoe part to obtain its alignment, relief means provided contiguously along one matrix edge to assure skiving of any overlying shoe part at least at the location of the said relief means, and means provided substantially aligned with the relief means and providing for skiving at a greater depth at the location of said means that can be obtained at the relief means for assuring a weakened fold line along the length of the select skived edge for the shoe part.

4,417,459

**AUTOFRETTAGE PROCESS**

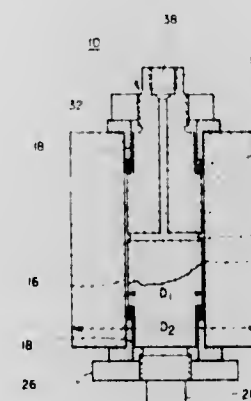
Nobuya Tomita, Fairfield, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,432

Int. Cl.<sup>3</sup> B21D 26/02

U.S. Cl. 72—56

29 Claims



1. A process of subjecting a generally thickwalled, hollow cylindrical member to autofrettage including sealing the inner bore of said cylindrical member, and pressurizing said inner bore; comprising the steps of:

- a. imparting a predetermined pressure to the entire length of said inner bore for a period of time; and
- b. cyclically repeating the application of the same pressure so as to plastically deform the inner bore of said cylindrical member and produce residual tangential compressive stresses in said bore.

4,417,460

**HYPODERMIC SYRINGE DESTRUCTION DEVICE**

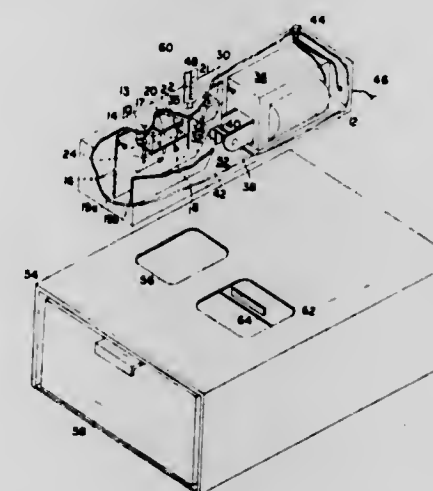
Dario J. Moriconi, 6616 La Milroda Dr., Apt. #1, Jacksonville, Fla. 32117

Filed Mar. 9, 1981, Ser. No. 241,561

Int. Cl.<sup>3</sup> B21D 28/00

U.S. Cl. 72—325

1 Claim



1. A hypodermic syringe destruction device for severing a syringe portion and bending a needle of a hypodermic syringe comprising:

- a housing having an upper side and an opening in said upper side through which the needle end region of a hypodermic syringe may be generally vertically inserted downward, said opening having an axis with the syringe being insertable through said opening parallel to said axis;
- a movable support within said housing and immediately below said upper side and supported by said housing for linear movement generally horizontally and transverse to said axis of said opening;
- a blade attached to said movable support and lying in a generally horizontal plane and having an oblique edge which

passes across and just under said opening in said upper side of said housing;

a hammer supported on said movable support and spaced below said blade, said hammer and support being generally L-shaped in cross section with said support forming a generally vertical wall facing the axis of said opening and with said hammer comprising a lower, generally horizontal plate extending outward from said generally vertical wall; an anvil having a horizontal upper surface fixedly attached to the inside of said housing on the opposite side of said opening from said movable support and having a sloping surface which generally faces the vertical axis of said opening but slopes downward toward said vertical axis and having a generally horizontal lower surface at an elevation just above the upper surface of said lower plate of said hammer with said horizontal lower surface being spaced from the upper surface of said lower plate sufficient to bend the syringe needle therebetween, said anvil being opposite said support such that said anvil horizontal upper surface is coplanar with said blade lying in a horizontal plane and said sloping surface extends in a continuous manner from said horizontal upper surface to said horizontal lower surface;

operating means for selectively moving said movable support toward said anvil comprising a solenoid having a body region attached to said housing and a movable arm attached to said movable support, whereby, when a hypodermic syringe needle is inserted into said opening and said solenoid is operated, said L-shaped portion of said hammer bends the needle around said lower surface of said anvil, and a portion of the syringe holding said needle is supportable against the sloping surface of said anvil and is severed by said edge of said blade; and

a container positioned to receive the severed needle end region of a hypodermic syringe.

4,417,461

**DEVICE FOR MANUFACTURING, BY EXTRUSION, A PIECE HAVING A RECESSED PORTION IN ITS PERIPHERAL SURFACE**

Jean Buffon, Corbell, and Edouard Trome, Aulnay-sous-Bois, both of France, assignors to Societe Anonyme dite: Ulmic France, Rungis, France

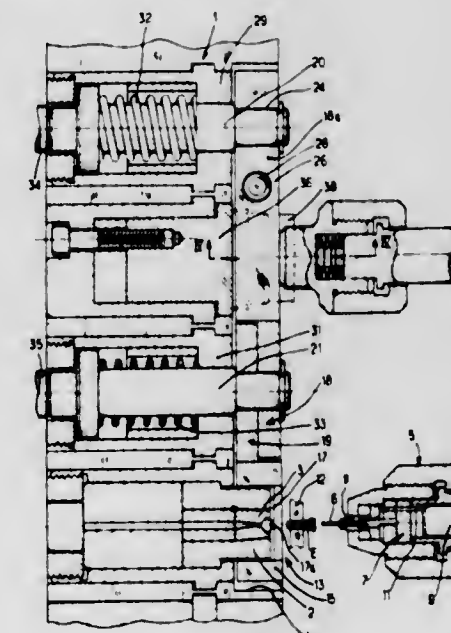
Filed Jan. 22, 1981, Ser. No. 227,360

Claims priority, application France, Jan. 21, 1980, 80 01235

Int. Cl.<sup>3</sup> B21D 45/00

U.S. Cl. 72—345

17 Claims



1. A device for extruding a piece having a recessed portion in its lateral surface, comprising a fixed die holder containing a die, a punch borne by a mobile support, means for axially displacing said punch to engage said punch in said die and disengage it therefrom, means for ejecting an extruded piece,



and in front of said fixed die holder, a coaxial mobile die holder, means for opening and closing said mobile die holder, means for displacing said mobile die holder in translation parallel to the axis of said punch and of said die, said mobile die holder having two jaws applied against each other when said mobile die holder is closed, said jaws being provided respectively at the ends of two arms mounted to pivot on each other about a first pin passing through opposite holes made in said arms, whereby said mobile die holder forms a clamp.

4,417,462

# AXLE SPINDLE AND METHOD FOR MAKING THE SAME

John Palovcik, Kenton, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

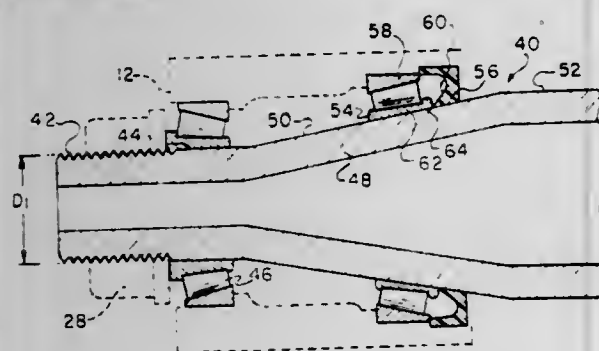
Continuation of Ser. No. 182,283, Aug. 28, 1980, abandoned, which is a division of Ser. No. 62,713, Aug. 1, 1979, abandoned.

This application Dec. 4, 1981, Ser. No. 327,313

Int. Cl.<sup>3</sup> B21D 41/00, 51/10; B60B 35/00

U.S. Cl. 72—367

3 Claims



1. A method of forming an axle spindle and bearing assembly for a vehicle wheel of the type to be utilized in heavy duty truck and trailer applications, said vehicle wheel being subjected to normal operating forces which require a pair of tapered roller bearings for its support and produce primary stresses in said axle spindle at an inwardly position tapered roller bearing of said pair, said method comprising: providing a hollow tubular blank having a central axis, a generally uniform external diameter and wall thickness and a first open end; reducing said tubular blank at a first region including said first end concentric with said central axis to provide a first diameter therefor; forming a transition region with a relatively uniform thickness having a frusto-conical outer surface between said first region and a portion of said tubular blank which is free of said reducing and remote from said first end; machining an area of said first region and an area of said frusto-conical outer surface for respectively receiving first and second tapered roller bearings of said pair thereon for rotatably supporting said wheel on said spindle, said second tapered roller bearing being said inwardly positioned tapered roller bearing of said pair; providing said first tapered roller bearing with an inner race having a cylindrical inner surface matching said area of said first region and providing said second tapered roller bearing with an inner race having a frusto-conical inner surface matching said area of said frusto-conical outer surface to provide the only contact between said second tapered roller bearing and said axle spindle.

4,417,463

RAM ASSEMBLY FOR ELECTROMAGNETIC RIVETER  
Paul E. Nelson, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1981, Ser. No. 305,817

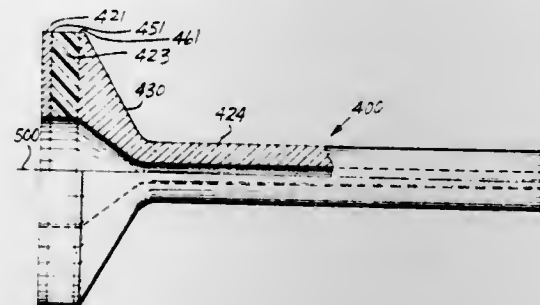
Int. Cl.<sup>3</sup> B21J 7/30, 15/24

U.S. Cl. 72—430

1 Claim

1. In combination, for use in an electromagnetic work tool: a ram assembly comprising a ram shaft, conductive driving

plate, and insulator plug fastened together to provide an integral structure;  
said ram shaft having a flange-like end portion providing a flat major surface area;  
said insulator plug comprising a cylinder-like composite structure of glass fibers in an epoxy matrix, said glass



fibers disposed in parallel relationship with said central axis of said ram shaft;  
said cylinder-like composite structure having two major surface areas, a bond line between a first of said two major surface areas and said conductive driving plate, and a further bond line between a second of said two major surface areas and said flat major surface area.

4,417,464

# NIB FOR FORMING TOOL FOR BOLT HEADS OR NUTS

Akio Tosa, Gifu, Japan, assignor to Mitsutoyo Kiko Co., Ltd., Kasugai, Japan

PCT No. PCT/JP81/00057, § 371 Date Nov. 4, 1981, § 102(e)

Date Nov. 4, 1981, PCT Pub. No. WO81/02697, PCT Pub. Date Oct. 1, 1981

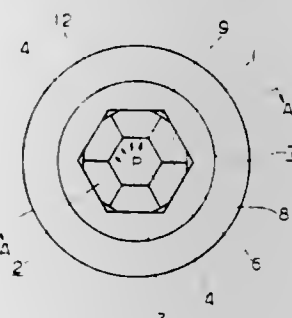
PCT Filed Mar. 13, 1981, Ser. No. 320,963

Claims priority, application Japan, Apr. 18, 1980, 55-34622

Int. Cl.<sup>3</sup> B21J 13/02; B21K 1/46, 1/64

U.S. Cl. 72—478

8 Claims



1. A nib for a forming tool used to form bolt heads or nuts, said nib comprising:

- (a) a plurality of nib segments each one of which has a surface perpendicular to the axis of the tool in the shape of a symmetric trapezoid:
  - (i) the shorter parallel side of which defines one edge of a central work-receiving volume the cross-sectional shape of which perpendicular to the axis of the tool is a first regular polygon,
  - (ii) the longer parallel side of which defines one edge of the outer circumference of a segment combination nib the cross-sectional shape of which perpendicular to the axis of the tool is a second regular polygon which is similar to, concentric with, and angularly congruent to the first regular polygon, and
  - (iii) the non-parallel sides of which are radial to the axis of the tool and
- (b) a bush intimately fitted around said segment combination nib, said bush having a central opening parallel to the axis of the tool the cross-sectional shape of which perpendicular to the axis of the tool is the same as said second polygon,
- (c) a stress-absorbing hole being defined at the intersection

of each of the non-parallel sides of said nib segments with the vertices of said second polygon, said stress-absorbing holes extending axially parallel to the axis of the tool and being symmetrical with respect to the plane defined by adjacent ones of the non-parallel sides of said nib segments.

4,417,465

# PORTABLE TEST UNIT, FOR HIGH PRESSURE TESTING OF TUBES

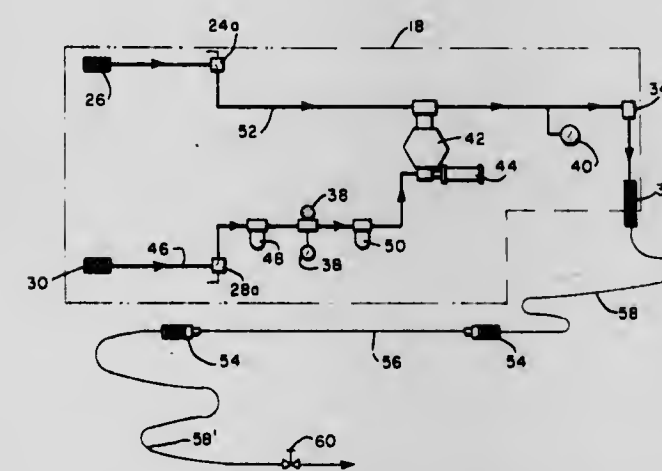
Renato R. Noe, 1609 West St., Union City, N.J. 07087, and Michael C. Catapano, 422 St. Pauls Ave., Jersey City, N.J. 07306

Filed Nov. 30, 1981, Ser. No. 325,961

Int. Cl.<sup>3</sup> G01M 3/28

U.S. Cl. 73—49.5

4 Claims



1. A portable test unit, for high-pressure testing of tubes, comprising:

- a chassis;
- an enclosure removably coupled to said chassis;
- said enclosure having an external control panel;
- said control panel being breached by only three apertures;
- a compressed-air-operative, hydraulic pump confined within said enclosure;
- a first conduit communicating one of said apertures with said pump, within said enclosure;
- a second conduit communicating another of said apertures with said pump, within said enclosure; and
- a third conduit communicating said pump with the third of said apertures, within said enclosure; wherein said first and second conduits communicate with said pump in parallel;
- said third conduit communicates with said pump and said third aperture in series with one of said first and second conduits;
- said first conduit defining means for conducting operative compressed air to said pump;
- said second conduit defines means for conducting hydraulic fluid to said pump; and
- said third conduit defines means for conducting hydraulic fluid, under pressure, from said pump to said third aperture; and further including
- valving means, in communication with said first and second conduits, for controlling compressed air and hydraulic fluid conduct between said one and another apertures and said first and second conduits; wherein
- said valving means comprises manual control means, mounted on said control panel, for operating said valving means.

4,417,466

# MEASURING METHOD AND DEVICE FOR MEASURING AT LEAST ONE GEOMETRICAL CHARACTERISTIC OF THE HEAD OF THE RAILS OF A RAILWAY TRACK

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

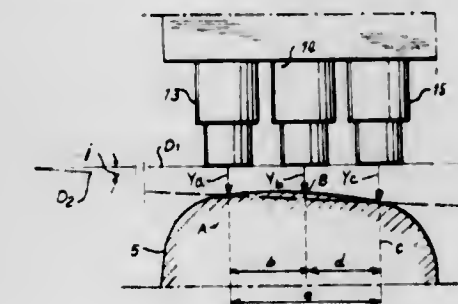
Filed Jun. 23, 1981, Ser. No. 277,201

Claims priority, application European Pat. Off., Dec. 15, 1980, 80107901; Switzerland, Jul. 24, 1980, 5659/80; Jul. 24, 1980, 5660/80

Int. Cl.<sup>3</sup> G01B 7/28

U.S. Cl. 73—105

11 Claims



1. Measuring method of at least one geometrical characteristic of the transverse profile of the head of at least one rail of a railway track having two parallel lines of rails, comprising determining a reference base perpendicular to the axis of the track and parallel to a tangent line to the rolling surfaces of the two lines of rails; determining the distances separating at least two longitudinal side lines of the tracing of the head of a rail from said reference base; and calculating from these distances at least one characteristic of the actual transverse profile of the head as a function of its position with respect to the other line of rails.

6. Device for the measurement of at least one characteristic of the transverse profile of the head of at least one rail of a railway track having two parallel lines of rails, comprising a measuring carriage resting laterally and vertically against the two lines of rails of a railway track defining a reference base perpendicular to the longitudinal axis of the track and parallel to a tangent line to the rolling planes of the two lines of rails; at least two detectors delivering signals representative of distances separating at least two longitudinal side lines of the tracing of the head of a rail from the reference base; and an electronic device comprising a calculating unit determining by the signals delivered by the detectors a characteristic of the actual transverse profile of the rail as a function of its position with respect to the other line of rails.

4,417,467

# GRAPHICAL DISPLAY OF ENGINE CYLINDER PARAMETERS

Raymond J. Higgs, and Leslie W. Palmer, both of West Suffield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 29, 1982, Ser. No. 363,362

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73—117.3

8 Claims

1. Apparatus for measurement of cylinder performance in an internal combustion (IC) engine, comprising: sensor means for providing sensed signals of the actual values of selected parameters indicative of cylinder performance over a selected set of engine cycles; signal processing means, responsive to said sensed signals for each cylinder and including memory means for storing signals, said processing means calculating and storing in said memory means a mean value signal and a mean deviation value signal for each set of sensed parameter signal data acquired from each cylinder; as characterized by:







said elements so that each capacitive plate thereof defines with a capacitive plate of the next adjacent capacitor element a dielectric space therebetween whereby said mounted capacitor elements together form four dielectric spaces; and

(c) material of known constant dielectric value within two of the dielectric spaces thereby forming with their respective space defining capacitive plates two capacitors of fixed electrical capacitive value,

the remaining two dielectric spaces being open to receive varying levels of the fluid within said storage vessel thereby forming with their respective capacitive plates two capacitors of variable electrical capacitive value.

4,417,473

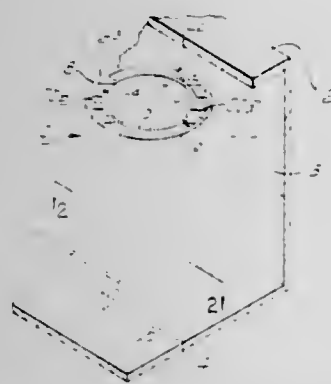
## MULTI-CAPACITOR FLUID LEVEL SENSOR

Emanuel Tward, Northridge, and Philip D. Junkins, Los Angeles, both of Calif., assignors to Tward 2001 Limited, Los Angeles, Calif.

Filed Feb. 3, 1982, Ser. No. 345,353  
Int. Cl.<sup>3</sup> G01F 23/26

U.S. Cl. 73—304 C

10 Claims



1. A tubular shaped capacitive type fluid level sensor for mounting in a fluid storage vessel for sensing the level of the fluid within said vessel over a predetermined height range comprising:

(a) a first pair of electrically conductive capacitor elements each formed to present two electrically connected capacitive plate areas, said first pair of capacitor elements and their respective plate areas having a length at least equal to said height range and shaped to generally define together the outer periphery of said tubular sensor;

(b) a second pair of electrically conductive capacitor elements each formed to present two electrically connected capacitive plate areas, said second pair of capacitor elements and their respective plate areas having a length at least equal to said height range and shaped to generally define together the inner periphery of said tubular sensor;

(c) means formed of electrically insulating material located between the capacitor elements defining the outer periphery of said sensor and the capacitor elements defining the inner periphery of said sensor for mounting said capacitor elements in fixed spaced relationship from one another and for positioning said elements so that each capacitive plate area thereof defines with a capacitive plate area of the next adjacent capacitor element a dielectric space therebetween whereby said mounted capacitor elements together form four like dielectric spaces; and

(d) material of known constant dielectric value within two of the dielectric spaces thereby forming with their respective space defining capacitive plate areas two capacitors of fixed electrical capacitive value,

the remaining two dielectric spaces being open to receive varying levels of fluid thereby forming with their respective capacitive plate areas and fluid within said spaces two capacitors of variable capacitive value.

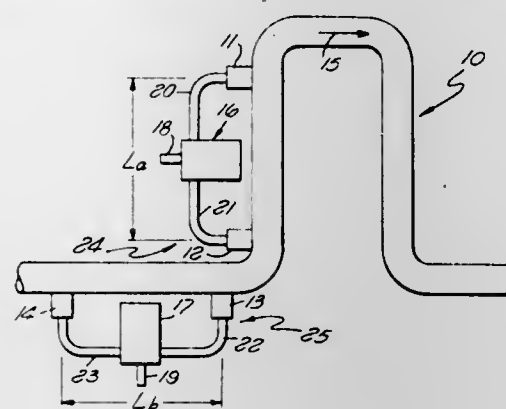
4,417,474  
DENSITOMETER

Peter P. Elderton, Fountain Valley, Calif., assignor to ITT, New York, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,662  
Int. Cl.<sup>3</sup> G01N 9/26

U.S. Cl. 73—438

13 Claims



1. A densitometer comprising: a pipeline having a vertical portion and a horizontal portion; first means for producing a first electrical output signal proportional to the difference between the pressures at two different respective elevations in said vertical portion; second means for producing a second electrical output signal proportional to the difference between the pressures at two different respective locations along the length of said horizontal portion inside thereof; third means for producing a third electrical output signal proportional to the difference between the magnitudes of said first and second electrical output signals, said third means including an electrical analog adder-subtractor; and utilization means connected to receive said third electrical output signal.

4,417,475

## ULTRASONIC DIAGNOSING APPARATUS

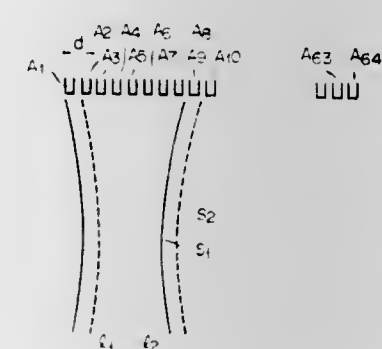
Takahisa Okazaki, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 24, 1981, Ser. No. 247,153

Claims priority, application Japan, Mar. 29, 1980, 55-40708  
Int. Cl.<sup>3</sup> G01N 2900

U.S. Cl. 73—606

10 Claims



1. An ultrasonic diagnosing apparatus comprising:  
a probe means for radiating a plurality of ultrasonic wave beams toward a target from which an ultrasonic echo data is reflected;  
means for controlling said probe means to radiate a plurality of consecutive, spaced ultrasonic wave beams in predetermined ultrasonic field patterns in which each wave beam has substantially the same ultrasonic intensity distribution including a wave beam axis and in which the wave beam axis of a wave beam is spaced from the wave beam axis of the adjacent wave beam by a pre-selected distance, whereby the intensity level of the ultrasonic echo data reflected from the target is maximum for the wave beam

having a wave beam axis which is the smallest lateral distance from the target and the intensity level of the ultrasonic echo data reflected from the target corresponding to the other wave beams becomes progressively lower, by multiples of decreasing correlation coefficients, as the lateral distance between the target and the wave beam axes of the respective wave beams increases;  
means for converting the ultrasonic echo data reflected from the target into electrical signals indicative of a tomogram of the target;  
means for processing the electrical signals representing the reflected ultrasonic echo data and correcting the tomogram by eliminating signal components of the tomogram which are correlation coefficient-multiplied signals;  
means for displaying a corrected tomogram of the target in response to output signals of said processing means; and  
means for generating and supplying a system synchronizing pulse to said controlling means and said processing means.

4,417,477

## TRAIN GAGE MEASUREMENT CIRCUIT FOR HIGH TEMPERATURE APPLICATIONS USING HIGH VALUE COMPLETION RESISTORS

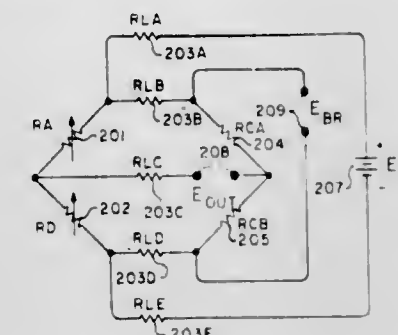
Ronald I. Poff, West Covina, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1981, Ser. No. 259,563

Int. Cl.<sup>3</sup> G01B 7/18

U.S. Cl. 73—766

3 Claims



1. A bridge circuit for a strain gage of the type having an active, a dummy, and two completion resistors wherein one terminal of the active and the dummy resistors are joined at a first junction, and one terminal of each of the completion resistors are joined at a second junction, the remaining terminals of the active and dummy resistors are each separately connected to one of the unconnected terminals of one of the completion resistors, at a third and fourth junction, respectively, power being supplied to bridge across the third and fourth junctions and output voltage being measured across the first and second junctions, said bridge circuit being characterized in that the resistance of the completion resistors substantially exceeds the value of any other resistance in the bridge circuit.

4,417,476

## CHARGE CONVERTER FOR VIBRATION MONITORING INSTRUMENTATION

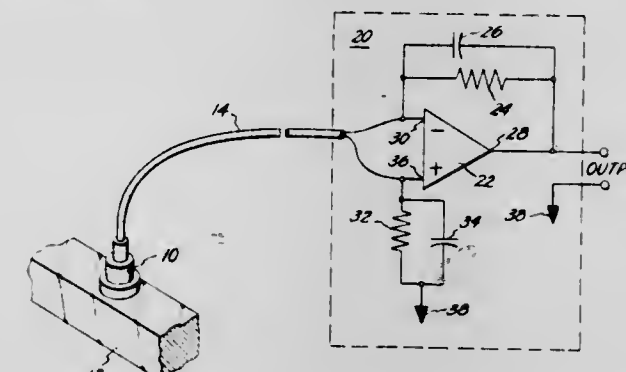
William K. Knowlton, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,468

Int. Cl.<sup>3</sup> G01H 1/00

U.S. Cl. 73—660

7 Claims



1. Apparatus for monitoring mechanical vibrations in a component part of an operating machine under conditions producing severe electrical interference, comprising:

a transducer affixed to said component part and responsive to said vibrations to generate a first signal, in the form of electrical charge, characteristic of said vibrations;

a charge converter network, located within the machine but relatively remote from said transducer, for converting said first signal from the electrical charge form to a voltage and current signal characteristic of said vibrations, said converter including an operational amplifier having an output port, an inverting input port, and a non-inverting input port; a first resistor and capacitor pair connected in parallel between the inverting input port and the output port; and a second resistor and capacitor pair connected in parallel between the non-inverting input port and a common connection point; and wherein

said first signal is applied between said inverting input port and said non-inverting port to produce said voltage and current signal at said output port substantially free of electrical interference.

4,417,478

## METHOD FOR DETERMINING LEAD FRAME FAILURE MODES USING ACOUSTIC EMISSION AND DISCRIMINANT ANALYSIS TECHNIQUES

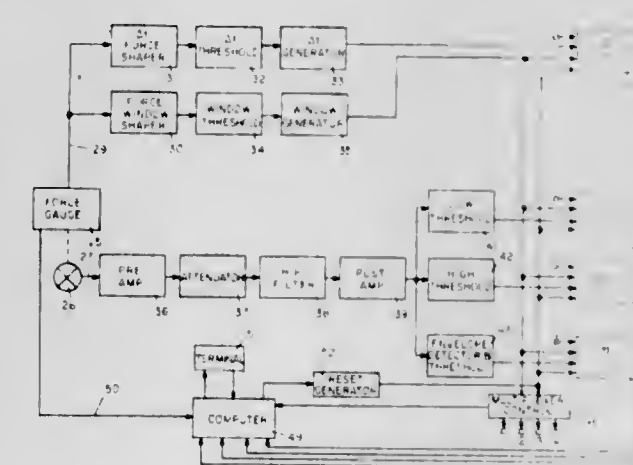
Min-Chung Jon, East Windsor Township, Mercer County; Vito Palazzo, Hamilton Township, Mercer County, and George W. Sturm, Ewing Township, Mercer County, all of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,940

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—801

10 Claims



1. A destructive testing method for determining the failure mode of articles, bonded together, comprising the steps of applying a destructive pulling force to one of the bonded articles; measuring at least one variable associated with the destruc-



tive test, the variable being selected from a group comprising:

- (a) first acoustic emission signals emanating from the bonded articles during the destructive test and having amplitudes above a first threshold,
  - (b) second acoustic emission signals emanating from the bonded articles during the destructive test and having amplitudes above a second threshold,
  - (c) elapsed time until failure,
  - (d) number of acoustic emission bursts above said first threshold during the destructive test, and
  - (e) peak load applied to the bonded articles until failure;
- incorporating said at least one measured variable into a plurality of predetermined discriminant functions, each one of said discriminant functions corresponding to one failure mode of a plurality of failure modes; and selecting out of said plurality of discriminant functions the discriminant function having the highest value thereby determining the corresponding failure mode of the articles.

4,417,479

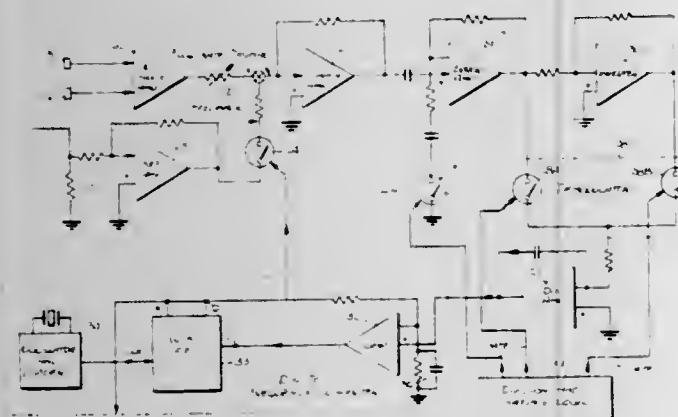
# **ELECTROMAGNETIC FLOWMETER SYSTEM HAVING A FEEDBACK LOOP**

Roy F. Schmoock, Yardley, and Herbert A. Shauger, Doylestown, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Sep. 1, 1981, Ser. No. 298,457  
Int. Cl.<sup>3</sup> G01F 1/60

U.S. Cl. 73—861.16

7 Claims



1. An electromagnetic flow-meter system comprising:
  - A a primary provided with a flow tube through which the fluid to be metered flows to intersect a magnetic field established by an electromagnet excited by a low-frequency drive current which also passes through a resistor to produce a reference voltage that depends on the intensity of the magnetic field, the flowing fluid inducing a signal in the tube electrodes whose amplitude depends on the flow rate of the fluid; and
  - B a secondary to measure the ratio of the signal to the reference voltage, said secondary including a summing amplifier to whose input is applied said signal and the reference voltage, a demodulator coupled to the output of the summing amplifier, and yielding a d-c output, and a feedback loop between the demodulator output and the input to the summing amplifier, the loop including a converter to charge the d-c output of the demodulator into pulses of constant width and having a frequency which varies with the flow rate of the fluid, and means a pulse-modulate the reference voltage applied to the input of said summing amplifier with the variable frequency pulses, said pulses having a duty cycle that is sufficient to cancel the signal applied to the input of said summing amplifier whereby the pulse-modulated reference voltage is equal in magnitude and opposite in phase to the input signal and the resultant pulse frequency is accurately indicative of the flow rate.

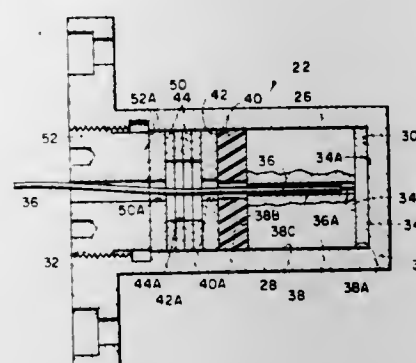
## **4,417,480 DAMPENED ULTRASONIC TRANSDUCER**

Ellis M. Zacharias, Jr., Tulsa, Okla., assignor to Mapco, Inc., Tulsa, Okla.

Filed Jun. 2, 1981, Ser. No. 269,647  
Int. Cl.<sup>3</sup> G01F 1/66

U.S. Cl. 73—861.18

5 Claims



1. A damped ultrasonic transducer for imparting sonic energy to or receiving sonic energy from fluid comprising:
  - a housing having a cylindrical cavity therein providing a closed end wall at one end and an opening in the opposite end, the housing having internal threads adjacent the open end;
  - a piezoelectric crystal of cylindrical dimension slightly less than the diameter of said housing cavity and of short axial length, having front and rear faces, the crystal being positioned within said housing cavity with the front face thereof contiguous to said housing closed end wall;
  - a cylindrical damping member of external dimension slightly less than the diameter of said housing cavity and having a front and rear face and having an axial opening therethrough, the damping member being positioned within said cavity with the front face thereof contiguous to said crystal rear face;
  - a plurality of cylindrical spring washers each of diameter slightly less than the diameter of said housing cavity and each having an axial opening therethrough, the forward-most washer arranged to apply force against the rear face of said damping member;
  - an externally threaded cylindrical plug member positioned in said housing threaded open end and having an axial opening therethrough, the plug member being threadably advanced to apply selectable force against said plurality of spring washers which, in turn, apply such selectable compressive resilient force against said damping member to thereby maintain a selectable force of contact of said damping member with said crystal and said crystal with said housing closed end wall; and
  - a conductor received in the aligned axial openings in said damping member, said spring washers, and said plug member and being electrically secured to said crystal rear face, whereby the conductor extends externally of said housing.

4,417,481

# **APPARATUS FOR MEASURING THE SPEED OF FLOW OF A FLOWABLE MEDIUM BY DETERMINING THE TRANSIT TIME OF SOUND WAVES THEREIN**

Gerhard Krause, Rosenheim, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 200,166, Oct. 24, 1980, Pat. No. 4,389,899. This application May 1, 1981, Ser. No. 259,401  
Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016968

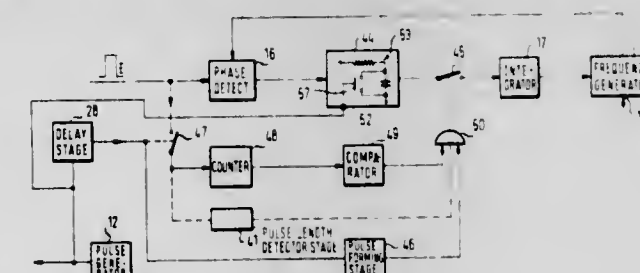
Int. Cl.<sup>3</sup> G01F 1/66

U.S. Cl. 73—861.28

16 Claims

1. Apparatus for measuring the speed of flow of a flowable medium by determining the transit time of sound waves therein wherein first and second sound transmitter/receivers in the

form of electroacoustic converters are spaced apart in the medium with an imaginary line joining said first and second transmitter/receivers having a component in the direction of the flow to be measured, and wherein sound pulses of predetermined length are alternately transmitted in a first direction from said first transmitter/receiver to said second transmitter/receiver and in a second direction opposite to said first direction from said sound/transmitter/receiver to said first transmitter/receiver, said sound pulses being converted into electrical measuring pulses on arrival at said transmitter/receivers, there being processing circuitry for processing electrical measurement pulses to determine the speed of flow from the transit times of the sound pulses in said first and second directions, said processing circuitry comprising controllable frequency generator means for generating first and second frequencies related to said transit times, and operating to process only electrical measurement pulses arriving within a predetermined interval defining the expected time of arrival of a measuring pulse, and having prevention means for excluding measurement pulses, or signals derived therefrom, from further processing if at least one of the following conditions applies:



- (a) more than one electrical measurement pulse arrives in said predetermined interval,
  - (b) no measurement pulse arrives in said predetermined interval,
  - (c) the electrical measurement pulse exceeds a predetermined length,
  - (d) the electrical measurement pulse falls short of a predetermined length,
- wherein said prevention means comprises intermediate store means connected to said controllable frequency generator means for temporarily storing control signals, main switch means disposed between said intermediate store means and said controllable frequency generator means, and means for closing said switch means after the expiry of said predetermined interval, in order to pass control signals stored in said intermediate store means to said controllable frequency generator means, but for keeping said switch means open if at least one of the conditions (a) to (d) applies.

4,417,482

# **DIAPHRAGM MOUNTED GEAR DRIVE DETUNER**

Ronald A. Witt, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

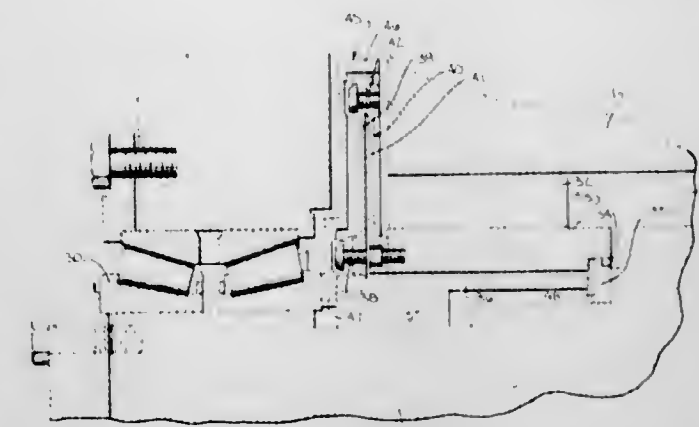
Filed Feb. 8, 1982, Ser. No. 346,741  
Int. Cl.<sup>3</sup> F16H 55/18, 55/00, 55/14

U.S. Cl. 74—409

6 Claims

1. A detuner for a gear drive including a helical driven gear and a helical pinion which idles in mesh with the driven gear, comprising:
  - a detuner pinion having helical teeth in mesh with the driven gear and disposed at one end of said helical pinion;
  - a ring coaxial with said helical pinion and supporting the end of said detuner pinion adjacent said helical pinion; and
  - a diaphragm assembly including two thin wall diaphragm discs disposed transverse to the axis of the helical pinion

and being joined together adjacent their outer perimeters, one of said discs being operatively connected to said



helical pinion and the other disc being connected to the other end of said detuner pinion to support such other end.

4,417,483

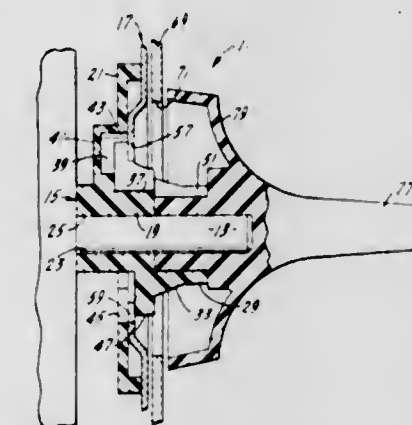
# **CALIBRATABLE DIAL**

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigolet Company, Decatur, Ill.

Filed Nov. 27, 1981, Ser. No. 325,326  
Int. Cl.<sup>3</sup> G05G 1/10

U.S. Cl. 74—553

4 Claims



1. A calibratable dial for mounting on a control shaft, said dial including:
  - a hub and a skirt frictionally fastened to each other for rotational movement in unison, the hub having a generally cylindrical portion and a disc portion,
  - a shaft receiving socket formed in the generally cylindrical portion of the hub,
  - a central opening formed in the skirt and sized to fit over and receive the generally cylindrical portion of the hub when the skirt and hub are frictionally fastened to each other,
  - an arcuate toothed sector formed in the skirt along one portion of the central opening of the skirt at a location overlying the disc portion of the hub, and
  - an instrument receiving socket formed in the hub in alignment with the central opening in the skirt and positioned to extend under the arcuate toothed sector of the central opening of the skirt so that an instrument inserted in the socket will engage the hub and the toothed sector of the skirt and upon twisting will overcome the frictional engagement between the hub and skirt to rotate them relative to each other through a limited arcuate extent.



4,417,484

## PLANETARY CHANGE-SPEED TRANSMISSION FOR AUTOMOTIVE VEHICLES

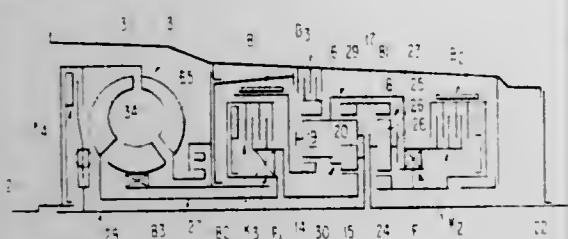
Hermann Gaus, Stuttgart; Wolfgang Zaiser, Steinheim-Sonthem; Jürgen Pickard, Wernau, and Georg Eltze, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany  
Filed Nov. 7, 1980, Ser. No. 204,900

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979 2944884

Int. Cl.<sup>3</sup> F16H 47/68, 57/10

U.S. Cl. 74—688

22 Claims



1. A change-speed transmission for a motor vehicle, the transmission comprising a planetary gear transmission means having a plurality of transmission members including a pair of sun gears, a pair of ring gears, and a double-webbed planetary gear carrier means supporting at least one primary planet gear meshing with one of the sun gears and at least one secondary planet gear meshing with the primary planet gear and the other of said sun gears, means for respectively fixedly braking one of the sun gears and one of the ring gears, means for drivingly connecting one of the sun gears to an input shaft of the transmission, and means for enabling the planetary gear carrier means to act upon an output shaft of the transmission, characterized in that the primary planet gear meshes with both of the ring gears, the enabling means includes a planetary gear coupling transmission means having a first transmission member, means are provided for bringing one of the ring gears and the planetary gear carrier means respectively into driving connection with the first transmission member and the input shaft, and in that a further transmission member of said plurality of transmission members of the gear coupling transmission means is connected to the output shaft.

4,417,485

## COUPLED PLANETARY GEAR SPEED REDUCER FOR USE IN INDUSTRIAL VEHICLES

Frank H. Boor, Fort Meyers, Fla., assignor to Fairfield Manufacturing Co., Inc., Lafayette, Ind.

Continuation-in-part of Ser. No. 73,391, Sep. 7, 1979, abandoned. This application Feb. 19, 1981, Ser. No. 235,773

Int. Cl.<sup>3</sup> F16H 3/44

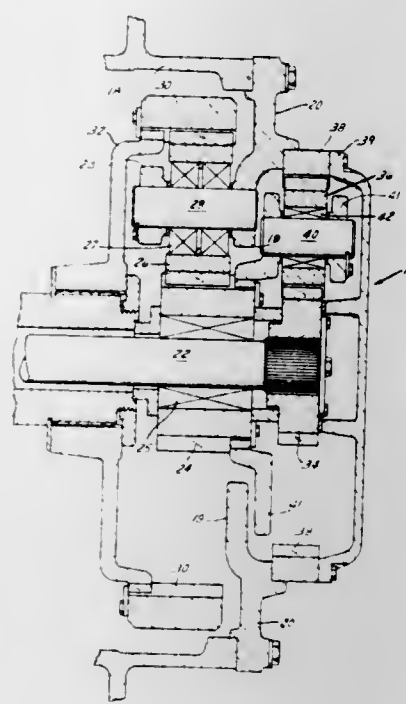
U.S. Cl. 74—785

4 Claims

1. In a vehicle having a speed reduction planetary gear drive system located adjacent a wheel assembly housing rotatably mounted on an axle, said gear system comprising:

- (a) a frame extension fixedly secured to the vehicle;
- (b) a rotatable input shaft means extending from a source of rotary power and being capable of high speed rotation;
- (c) a secondary planetary gear drive comprising a secondary sun gear mounted rotatably with respect to said input shaft means, a group of secondary planet gears each rotatably mounted on a shaft secured to the wheel assembly housing, and a secondary ring gear fixedly secured to the frame extension; and
- (d) a primary planetary gear drive positioned outwardly from said secondary gear drive and having a primary sun gear fixedly secured to and for rotation with said input shaft, a primary ring gear rotatable with respect to said

frame extension and secured to said wheel assembly housing, and a group of primary planet gears driving said



secondary sun gear and rotatably mounted between said primary sun gear and said primary ring gear.

4,417,486

## APPARATUS FOR ANGULARLY POSITIONING

Yoshihiro Tsukiji; Haruo Maeda, both of Komatsu, and Mikio Araki, Kaga, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

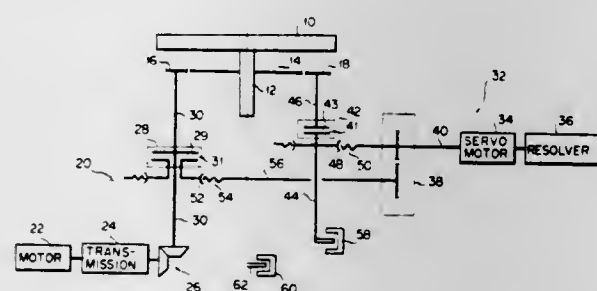
Filed May 14, 1981, Ser. No. 254,268

Claims priority, application Japan, Apr. 23, 1980, 55-52847

Int. Cl.<sup>3</sup> B23Q 17/00; B23B 29/24

U.S. Cl. 74—813 R

5 Claims



1. An apparatus for angularly positioning a rotary member, comprising:

- first drive means connectible to rotate said rotary member in a work operation;
- power transmission means operable to connect said first drive means with said rotary member for rotating said rotary member in a work operation;
- second drive means connectible to rotate said rotary member in an angular positioning movement;
- coupling means actuatable to connect said second drive means to said rotary member for rotating said rotary member while said first drive means is disconnected from said rotary member, said coupling means including a pair of complementary clutch members adapted to be engageable at a predetermined single position and normally biased to a disengaged position relative to each other;
- first detector means for detecting a predetermined angular reference position of one of said clutch members which is positioned to the side of said second drive means and generating a signal upon detection;
- a controller responsive to the signal of said first detector means for controlling the movement of said second drive

means so as to stop said one clutch member at said predetermined angular reference position; and

second detector means for detecting a predetermined angular position of said rotary member and allowing the other clutch member to engage with said one clutch member at said predetermined single position upon detection of the predetermined angular position of said rotary member, said second detector means being operated by the rotary movement of said rotary member when the same is being rotated by said first drive means.

4,417,487

## TOOL FOR CLEANING OR CHANGING MIG-CONTACT-TIPS

Vernon E. Stephens, 7422 Cherokee Dr., Downey, Calif. 90241  
Filed Jan. 15, 1982, Ser. No. 339,392

Int. Cl.<sup>3</sup> B25B 13/50

U.S. Cl. 81—53.2

2 Claims



1. A tool for cleaning or changing MIG contact tips comprising a handle member having a cylindrical bore therein and an aperture in a side wall communicating with the cylindrical bore, a shaft extending parallel with respect to the cylindrical bore and across the aperture, a rotatable member eccentrically mounted on the shaft and having teeth for adjustably engaging the side of the contact tip when a contact tip is inserted into the cylindrical bore, and an annular insert concentrically located in the outer end of the cylindrical bore having teeth for cleaning splatter from the side of the contact tip when a contact tip is inserted into the cylindrical bore, wherein the handle member is of cylindrical shape and wherein the axis of the cylindrical bore in the handle member is offset from the cylindrical axis of the handle member on the side opposite said shaft and the rotatable member, thereby causing the handle member to provide eccentric movement when the handle member is rotated about a contact tip.

4,417,488

## TELESCOPING NUT DRIVER

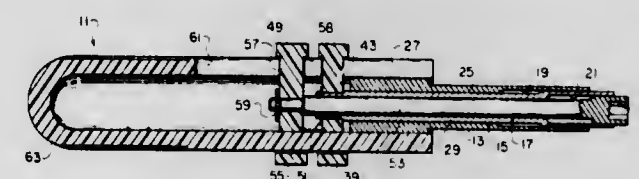
Samuel Gentry, La Mesa, Calif., assignor to Paul W. Green and Wayne R. Green, both of San Diego, Calif., part interest to each

Continuation-in-part of Ser. No. 159,765, Jun. 16, 1980, Pat. No. 4,307,634. This application Jun. 5, 1981, Ser. No. 267,801

Int. Cl.<sup>3</sup> B25B 13/58

U.S. Cl. 81—185

8 Claims



1. A telescoping hexagonal nut driver tool having a plurality of hexagonally shaped heads, each forming a socket of a different size and adapted to engage correspondingly sized hexagonal

nuts for driving said nuts by rotational movement, comprising:

- a first hexagonal socket means having a hollow shank;
- a cylindrical handle surrounding a portion of said shank on said first socket means, said handle having an axial slot open at the forward end and notch means in the side of said slot;
- a second hexagonal socket means smaller than said first hexagonal socket means for positioning within said first socket means in sliding engagement with the inner side walls of said first socket means, said second socket means having a shank and telescoping outwardly beyond said first socket means;
- a first circular positioning means in sliding engagement on said handle with a neck extending through said handle slot behind said first socket means shank;
- an inner ring on said neck and having an opening in the center thereof for surrounding said second socket means shank;
- retaining means for retaining said inner ring on said second socket means shank for preventing axial movement and permitting rotational movement of said ring on said shank for seating said neck in said notch means;
- a third hexagonal socket means smaller than said second hexagonal socket means for positioning within said second socket means in sliding engagement with the inner side walls of said second socket means, said third socket means having a shank and telescoping outwardly beyond said second socket means;
- a second circular positioning means in sliding engagement on said handle with a neck extending through said handle slot behind said second socket means shank;
- an inner ring on said neck and having an opening in the center thereof for surrounding said second socket means shank; and
- retaining means for retaining said inner ring on said second socket means shank for preventing axial movement and permitting rotational movement of said ring on said shank for seating said neck in said notch means.

4,417,489

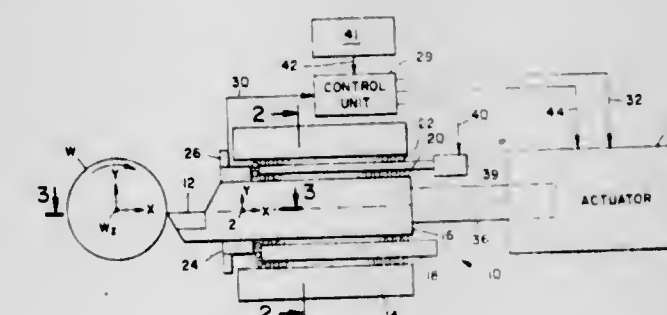
## METHOD AND APPARATUS FOR MACHINING A WORKPIECE BY VARYING THE TOOL GEOMETRY

Chunghong R. Liu, 212 Pawnee Dr., W. Lafayette, Ind. 47906  
Filed Dec. 21, 1979, Ser. No. 106,150

Int. Cl.<sup>3</sup> B23B 3/00, 29/00

U.S. Cl. 82—1 C

27 Claims



1. A method of machining a workpiece with a cutting tool, comprising:

- (a) placing the tool in a tool holder, the tool then having a tool geometry with respect to the workpiece;
- (b) cutting the workpiece with the tool in the tool holder; and
- (c) varying the tool geometry to sense tool wear.



4,417,490

**LATHE TOOL CALIBRATOR AND METHOD**

Mihoru Mochizuki, Indianapolis, Ind., assignor to Hurco Mfg. Co., Inc., Indianapolis, Ind.

Filed Jun. 9, 1981, Ser. No. 272,022  
Int. Cl.<sup>3</sup> B23B 1/00, 7/00

U.S. Cl. 82—2 B

16 Claims



12. A method for determining relative position of a cutting tool on a numerical control lathe, comprising the steps of:

- chucking a surface on a gauge head in a workpiece holder on the lathe, the gauge head including a plurality of surfaces for contacting a cutting edge on the tool and sensing means for detecting the contacts and relaying the contacts to the numerical control circuitry of the lathe for automatically determining the position of the tool cutting edge; and
- bringing the cutting edge of the tool into contact with a contact surface on the gauge head, the tool being mounted in a tool holder on the lathe.

4,417,491

**AUTOMATIC BAR MATERIAL FEEDING APPARATUS**

Sukehiro Uehara, Ueda, and Akio Saiki, Sakaki, both of Japan, assignors to Kabushiki Kaisha Miyano Tekkosho and Kabushiki Kaisha Alps Tool, both of Nagano, Japan

Filed Mar. 15, 1982, Ser. No. 358,408

Claims priority, application Japan, Mar. 23, 1981, 56-41883  
Int. Cl.<sup>3</sup> B23B 15/00

U.S. Cl. 82—2.7

4 Claims



1. In an apparatus for automatically feeding into a machine tool bar stock material for machining thereof, the apparatus having: a stock table for holding thereon a number of bars; openable and closeable bearing means; means for supplying the bars, one at a time, from the stock table to the bearing means to be rotatably borne thereby in coaxial alignment with the main spindle of the machine tool, the bearing means extending from one end to the other end thereof over most of the length of the bar thus borne; and a feed pipe with a feed chuck for gripping the end remote from the machine tool of the bar thus borne and successively feeding the bar into the machine tool as the machining progresses, the bearing means comprising a plurality of bearing clamps disposed sequentially at intervals along the borne bar and each comprising a pair of openable and closeable clamping jaws each having an endless belt rotatably supported

on rotatable pulleys, the borne bar being elastically clamped between the two belts of the clamping jaws of each bearing clamp, the improvement comprising:

- a first mechanism provided for each bearing clamp for varying the angular position of the clamp about the borne bar and functioning to cause the directions of the clamping forces of the bearing clamps on the borne bar to be respectively different; and
- a second mechanism for opening and closing the clamping jaws of each bearing clamp and functioning so that, as the feed chuck advances, the bearing clamps successively approached thereby are successively opened to release the bar, the first and second mechanisms being unitized for each bearing clamp.

4,417,492

**APPARATUS FOR CUTTING USED TIRES**

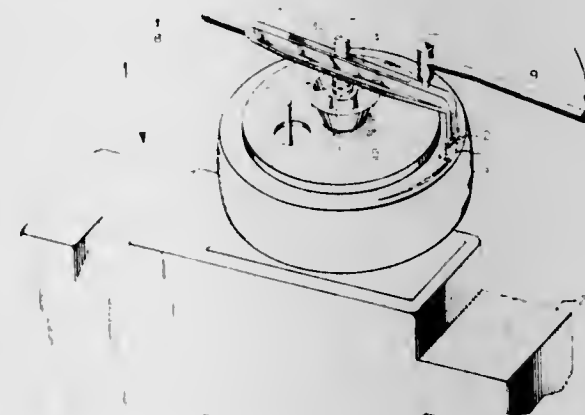
John E. Winecoff, Rte. 1, Box 861, Rockwell, N.C. 28138

Filed Sep. 8, 1981, Ser. No. 300,009

Int. Cl.<sup>3</sup> B23B 5/14

U.S. Cl. 82—46

6 Claims



1. An apparatus for cutting tire casing having sidewalls and a tread portion comprising:

- a base member;
- first and second upstanding shafts supported by and connected to said base and means for rotatably supporting said first shaft;
- first and second plates, each having a center hole through which said first shaft is disposed and upstanding teeth for grasping the tire casing sidewalls, said first plate having an off-center hole therein in which said second shaft is received and thereby interlocked therewith and an upstanding member affixed thereto on the same side the teeth are so affixed; and
- a cutter bar and a means thereon for affixing same to said first shaft.

4,417,493

**METHOD FOR CUTTING OFF STEEL PLATE**

Chiaki Ohuchi, Yoji Kohsaka, and Hiroyoshi Suenaga, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 251,729

Claims priority, application Japan, Apr. 28, 1980, 55-56983  
Int. Cl.<sup>3</sup> B26D 7/10

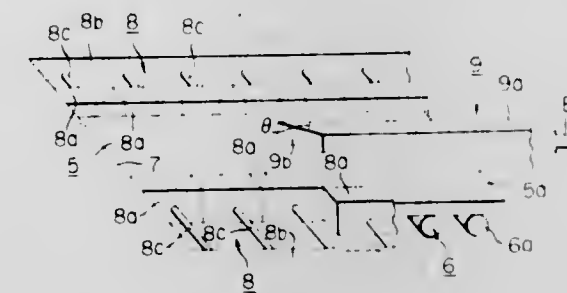
U.S. Cl. 83—15

5 Claims

1. A method for cutting off a steel plate, comprising: heating a steel plate to a temperature within the range of from 950° to 1,400° C. at the time of cutting off the thus heated steel plate, said steel plate having side edges and opposing faces;

placing said heated steel plate on a roller table extending

horizontally with said opposing faces extending horizontally; and then cutting off said heated steel plate by means of a cutting knife having a cutting edge, the cutting edge angle of said cutting knife being within the range of from 10° to 45°; said cutting off step comprising moving one of said cutting knife and heated steel plate relative to the other of said



cutting knife and heated steel plate, in the horizontal direction and substantially perpendicular to one of said side edges of said heated steel plate, such that said cutting edge cuts through said steel plate at a cutting speed of from 10 to 1,000 cm/minute; thereby cutting off said heated steel plate in the horizontal direction by means of said at least one cutting knife.

4,417,494

**AUTOMATIC PERFORMING APPARATUS OF ELECTRONIC MUSICAL INSTRUMENT**

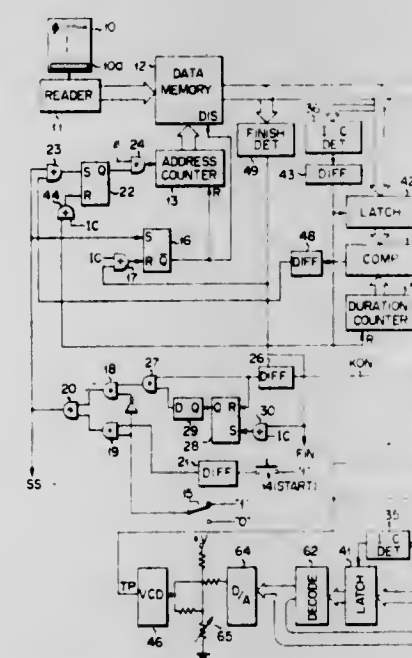
Akira Nakada, Hamamatsu; Eisaku Okamoto, Hamakita, and Kiyoshi Yoshida, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 21, 1981, Ser. No. 304,009

Claims priority, application Japan, Sep. 19, 1980, 55-130139  
Int. Cl.<sup>3</sup> G10F 1/00

U.S. Cl. 84—1.03

2 Claims



1. An automatic performing apparatus of an electronic musical instrument comprising:

memory means for storing performance data read out from a recording medium external to said performing apparatus, said data representing a progression of music to be played and comprising pitch sub-data representing pitches of notes of said music, duration sub-data representing durations of said notes and control sub-data for controlling a generation mode of the music to be played which pertains to at least one of a tone color, a modulation effect, a rhythm and a tempo, said sub-data each having an identifying code which distinguishes between the respective

sub-data wherein said control sub-data is stored at memory locations which allows the control sub-data to be read out from said memory means only at a time when the tone generation mode is to be changed;

read-out means for successively reading out the performance data from said memory means in accordance with the progression of the music wherein said read-out means comprises means responsive to said identifying code for distinguishing the respective sub-data in the performance data and means responsive to the duration sub-data of each note to read out the pitch sub-data of the next note every time the duration of each note lapses after the pitch sub-data is read out;

first latch means for latching the pitch sub-data and the duration sub-data both read out from said memory means, the sub-data latched in the first latch means being updated every time new pitch sub-data and new duration sub-data are read out from memory means;

second latch means for latching said control sub-data read out from said memory means, the control sub-data latched in the second latch means being updated only when the generation mode of the music is changed;

tone signal generating means for generating musical tone signals in response to the pitch sub-data and the duration sub-data latched in said first latch means; and

means for controlling the generation mode of the music in response to the control sub-data latched in said second latch means.

4,417,495

**WEB DISPENSER**

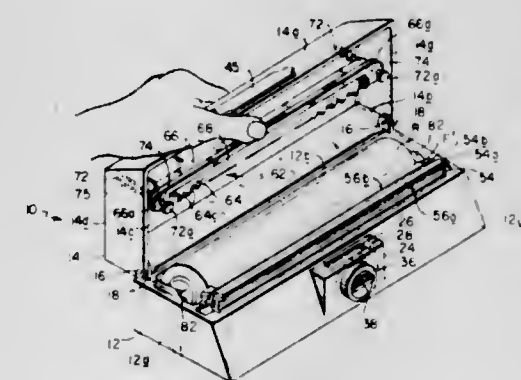
Marc J. Gordon, Boston, Mass., and Stanley Ruff, New Rochelle, N.Y., assignors to RGG, Inc., Boston, Mass.

Filed Feb. 12, 1982, Ser. No. 348,515

Int. Cl.<sup>3</sup> B26D 7/14; A47K 10/36

U.S. Cl. 83—175

12 Claims



1. In a web dispenser of the type having a roll container, means in the container for rotatively supporting a web roll, a swing-down cover hinged to the container, shelf means positioned just inside the front wall of the container extending substantially the entire length thereof, a long lateral gap formed in the shelf, a knife blade mounted in the cover adjacent the front wall thereof, said knife blade extending parallel to said gap and being of commensurate length, and a retractable sheath engaged under the knife blade, said sheath being movable between an extended position wherein it conceals the knife blade edge and a retracted position wherein it exposes said edge, characterized in that the sheath is constructed of a flexible resilient material and is downwardly bowed so that, when the cover is swung down toward said container, the sheath engages the shelf at the midportion thereof and then flexes so that it engages the shelf at points therealong progressively further away from the midportion by a rolling clamping action until, when the cover is almost fully closed, the sheath engages the shelf along substantially its entire length and is urged thereby to its retracted position whereby the blade edge projects into the shelf gap after cutting any web draped across the shelf.



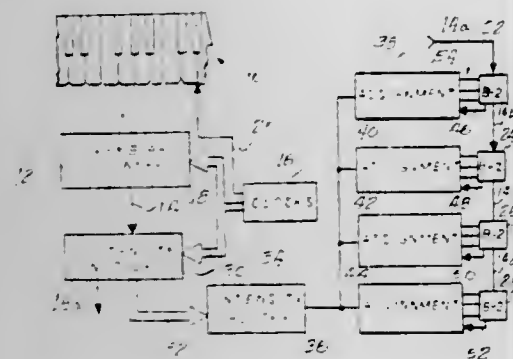
4,417,496

# **VELOCITY SENSITIVE KEYSER CONTROL CIRCUIT FOR AN ELECTRONIC MUSICAL INSTRUMENT** William V. Machanian, DeKalb, Ill., assignor to The Wurlitzer Company, DeKalb, Ill.

Filed Jun. 15, 1981, Ser. No. 273,627  
Int. Cl.<sup>3</sup> G10H 1/02

U.S. Cl. 84—1.27

16 Claims



1. In an electronic musical instrument having a multiplexed keyboard, a plurality of assignable tone generating means, each being assignable to produce a single note of one or more notes corresponding to one or more actuated keys of said keyboard and keying means associated with each tone generating means for keying the generated tone with controlled attack time and decay rate and a controllable peak amplitude, a peak amplitude control system responsive to the intensity of actuation of each key for keying the associated tone with a peak amplitude corresponding to said intensity and comprising: a single encoding means common to all of the keys of said keyboard and responsive to the intensity of actuation of each actuated key for producing an encoded intensity signal corresponding to said intensity of actuation, a single decoding means common to all of said tone generators and responsive to each encoded intensity signal for producing a corresponding analog peak amplitude control signal, memory means for storing the peak amplitude control signal, gate means connected to said memory means, and assigning means interconnected with said tone generating means and responsive to the assignment of a given tone generator for production of a note corresponding to an actuated key for operating said gate means to gate the corresponding peak amplitude control signal to said given tone generator at the onset of attack for controlling the peak amplitude of the note keyed thereby in accordance with the intensity of actuation of the corresponding key.

4,417,497

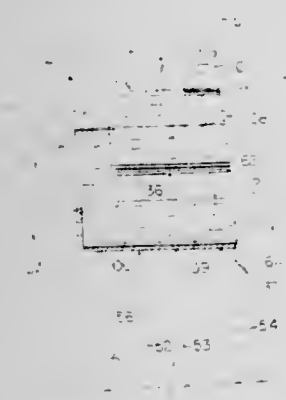
# **STRINGED MUSICAL INSTRUMENT TEACHING DEVICE AND PROCESS**

Helen C. Nicklaus, 4308 Charles, Amarillo, Tex. 79106  
PCT No. PCT/US80/00647, §371 Date Jun 9, 1980, §102(e)  
Date Jun. 9, 1980. This PCT application filed June 9, 1980,  
Ser. No. 252,973

Int. Cl.<sup>3</sup> G09B 15/08

U.S. Cl. 84—485 R

10 Claims



1. A teaching device for stringed musical instruments used by a player thereof to identify, practice and make changes

between notes of scales of different keys, comprising a simulated fingerboard and a set of structurally like note index units, the fingerboard comprising a rigid elongated support surface having a length and a width, with magnetically permeable members extending along the length of said surface and said magnetically permeable members are spaced apart from each other along a direction extending across the width of said support surface, said note index units of said set each comprising an upper rigid panel and a lower magnetic element, each said lower magnetic element having a lower surface that matches the upper surface of said support surface and each said upper panel having a greater length than said lower surface and spaced therefrom, said upper surface bearing musical note indicia.

4,417,498

# **FIRING MECHANISM FOR ROCKET LAUNCHERS**

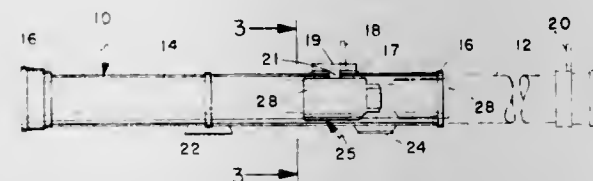
Dean E. Dissmeyer, Claremont, and David F. Mohlman, Fullerton, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Sep. 14, 1981, Ser. No. 301,610

Int. Cl.<sup>3</sup> F41F 3/04

U.S. Cl. 89—1.814

8 Claims



1. A firing mechanism for an operator-portable rocket launcher having a battery, activated by a percussion primer, for arming and igniting a rocket loaded within said launcher, comprising:

- a housing attachable to a launcher,
- a housing cover pivotably mounted on said housing,
- firing means for storing the energy needed to activate a battery when said housing cover is opened,
- trigger means for releasing the energy stored in said firing means,
- sear means comprising a spring biased pivotable sear for restraining the release of the energy stored in the firing means until said sear is rotated by the trigger means,
- switch means in cooperative relationship with said trigger means for electrically isolating the output of said battery until the operation of said trigger means,
- repositionable safety means for simultaneously blocking the operation of said trigger means and said firing means in a first position, and permitting the operation of said trigger means and said firing means in a second position.

4,417,499

# **WEAPON MOUNT FOR ARMORED VEHICLE**

Heinrich Grosser, Hermann Dierkes, both of Vellmar; Hubertus Lütke, Lohfelden, and Klaus Schreckenberger, Kassel, all of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Mar. 16, 1975, Ser. No. 577,210

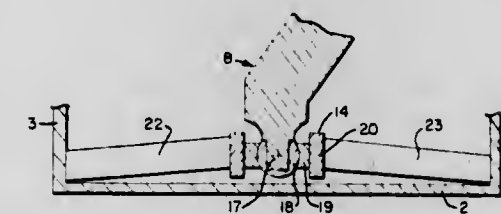
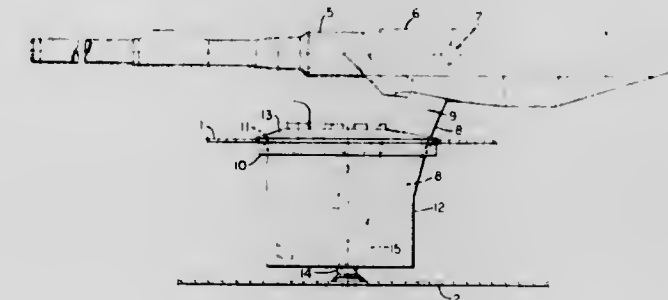
Int. Cl.<sup>3</sup> F41F 23/06

U.S. Cl. 89—36 K

11 Claims

1. In an armored vehicle including a turret, a large diameter azimuth bearing having its outer race mounted in the roof of said vehicle and its rotatable inner race connected to and supporting the roof of said turret to provide for azimuth alignment of said turret, a weapon having a pair of trunnions extending from opposite sides thereof, and a weapon mount on said vehicle for supporting said weapon above said vehicle so that said weapon is adjustable both as regards azimuth and elevation, the improvement wherein: a support bearing which

is coaxial with said azimuth bearing is disposed adjacent the floor of said vehicle; said support bearing is a ball joint bearing; means are provided for supporting said ball joint bearing a small distance above said floor of said vehicle to provide a gap therebetween, said means including a plurality of laterally extending support arms which are connected to said ball joint bearing and bear against the side walls of said vehicle; said weapon mount has a pair of trunnion arms at its upper end which engage the respective trunnions of said weapon, whereby said weapon is adjustable about the elevation axis;



said trunnion arms are joined at their lower ends to form a one piece lower end for said weapon mount; said weapon mount extends through said turret roof into said turret, is connected to said rotatable inner race of said azimuth bearing for rotation therewith, and has its said lower end supported on said support bearing whereby said weapon mount is adjustable about the azimuth axis; and, the portion of said weapon mount disposed between said azimuth bearing and said support bearing is non-coaxial with the rotational axes of said bearings and generates a surface of revolution when the turret and weapon are rotated about said rotational axes.

4,417,500

# **AIR PRESSURE SERVOMOTOR**

Yoshihiro Hayashida, Kawasaki, Japan, assignor to Tokico Ltd., Kanagawa, Japan

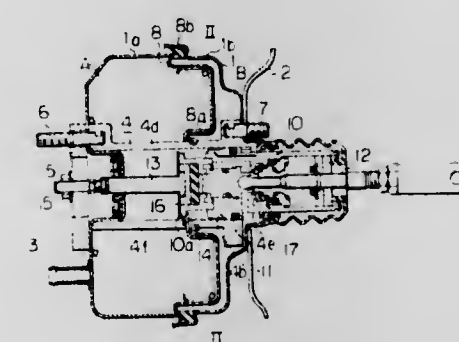
Filed May 31, 1979, Ser. No. 44,104

Claims priority, application Japan, May 31, 1978, 53-65493

Int. Cl.<sup>3</sup> F15B 9/10; F01B 19/00; F16J 3/02

U.S. Cl. 91—369 A

12 Claims



1. A brake booster for a braking system comprising a housing having first and second spaced opposing housing walls, a movable wall disposed in the housing between said spaced housing walls and dividing said housing into two chambers, axially aligned input and output members, means interconnecting said movable wall to said output member, a control valve assembly operated by said input member for controlling a

4,417,501

# **STEERING BOOSTER SYSTEM**

Dieter Elser, Essingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

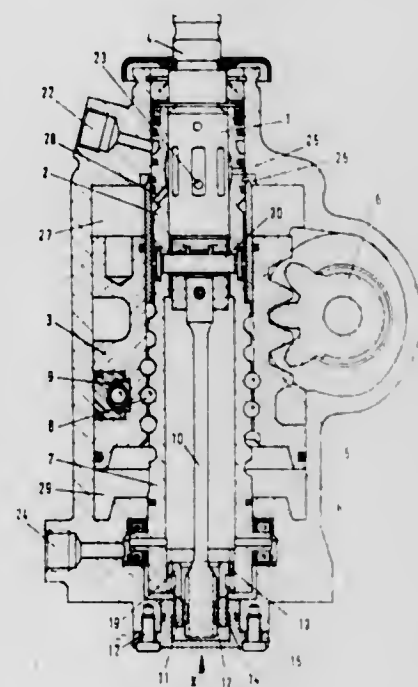
Filed Jul. 15, 1981, Ser. No. 283,470

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028176

Int. Cl.<sup>3</sup> F15B 9/10

U.S. Cl. 91—375 A

20 Claims



1. In a hydraulic booster steering system for motor vehicles having a housing (H) with a control valve therein comprising a rotary valve plug (1) encompassed by a valve sleeve member (2) wherein said rotary valve plug and valve sleeve member have relative rotation in opposite directions from a neutral position up to a predetermined limit and have coaxial flow control grooves for pressure and exhaust of a servomotor having a piston (3) operative for vehicle wheel steering and intermediate pressure chambers (27, 29); including a torque rod member (10) having one end fixedly connected to the rotary valve plug with the other end having a connection (7, 11) to the valve sleeve member;

the improvement wherein the connection between said other end of said torque rod member and said valve sleeve member comprises a coupling sleeve (11); said coupling sleeve having a cam means connection (13) with one of said members and a sliding guide connection (12) with the other of said members; said coupling sleeve having a threaded connection (14) with said housing;

whereby steering rotation of said rotary valve plug effects a twisting of said torque rod member at said one end during relative rotation between said rotary valve plug and said valve sleeve member up to said predetermined limit after which rotation of said valve sleeve member causes rotation of said coupling sleeve and axial movement thereof on said threaded connection to effect rotation of said torque rod member at said other end through said sliding guide connection in a direction opposite to the direction of



said first mentioned twisting of said torque rod member to thereby increased the stress therein so that, upon release of steering force, the unstressing of said torque rod member reverses the rotation of said rotary valve plug beyond said neutral position relative to said valve sleeve member for reversely pressurizing said servomotor for the returning of vehicle wheels to straight ahead position.

4,417,502

# LOAD SUPPORTING HYDRAULIC CIRCUIT WITH EMERGENCY AUTOMATIC LOAD RESTRAINT

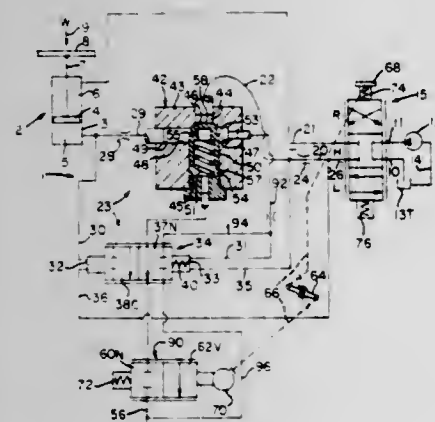
Daniel B. Shore, Niles, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

PCT No. PCT/US80/01552, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO82/01749, PCT Pub. Date May 27, 1982

PCT Filed Nov. 17, 1980, Ser. No. 273,876  
Int. Cl.<sup>3</sup> F15B 11/08, 13/042

U.S. Cl. 91—447

12 Claims



1. In a fluid circuit system comprising a fluid motor (2) for raising and supporting a load having a load supporting chamber (5) in the motor, a master directional control valve (15) for selectively communicating pressurized fluid between a pressure fluid source (10,11) and said motor in correspondence with raise, lower, and load hold positions of the valve first named, and a second load check (42) valve hydraulically disposed between the first named valve and said motor for affording free flow of fluid from the first named valve to said motor and having a normal fluid blocking position for blocking flow of fluid from said motor to the first named valve, the improved combination with the first (15) and second (42) valves of:

service connections including a flexible transfer line (22) to carry the flow afforded by the first named valve between it and the second valve and loaded motor and essential thereto in raising, lowering, and holding the load; said second valve having a control chamber (54) which, when vented, effects opening of said second valve to afford a routing of fluid of said load supporting chamber for its flow to and thru the flexible transfer line and which includes restriction means (55) in communication with said load supporting chamber, and said second valve being responsive to fluid pressure in said load supporting chamber to bias said second valve to said fluid blocking position thereby obstructing all flow to the flexible transfer line; and means (34) connected to said transfer line responsive to a flow characteristic attendant with line rupture to cancel venting of said control chamber for affording fluid biasing the second valve to said fluid blocking position.

4,417,503

# CYLINDER DEVICE

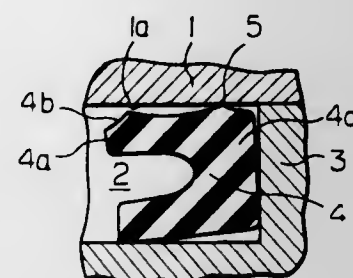
Shinichi Izumi, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 933,318, Aug. 21, 1978, abandoned.  
This application Aug. 6, 1980, Ser. No. 175,860

Claims priority, application Japan, Aug. 20, 1977, 52-111671  
Int. Cl.<sup>3</sup> F16J 9/20

U.S. Cl. 92—240

2 Claims



1. A cylinder device comprising a main body having a bore, a piston slidably fitted in the bore to partition the interior of the bore into an oil space having oil therein and an air space communicating with the atmosphere, said piston having a peripheral recess therein for receiving a packing, and a U-packing or U-cup packing type seal fitted in said peripheral recess in the piston in a normally unstressed condition to seal the oil space from the air space, said seal having the open end of the U-shape facing the oil space, said seal having an annular lip on the outside of the outer leg of the seal adjacent to the oil space and the outermost portion thereof having a diameter larger than the inside diameter of said bore and engaging the inner wall of the bore in sealing relationship therewith, and an additional lip on the outside of the outer leg of the seal at a location spaced from the first mentioned lip in the direction toward the air space and the outer periphery of said seal between said lips having a diameter less than the diameter of said bore, said seal being movable between a first position in which said seal is seated with the inner peripheral surface firmly against the outer peripheral surface of said piston in said recess, in which first position said annular lip is in sealing contact with the inner periphery of said bore and said additional lip is spaced from the inner periphery of said bore, said first position being the position of said seal when a differential pressure is present across said seal with the higher pressure on the oil space side, and a second position in which said seal is rolled toward said oil space and part of the inner periphery separates from the outer peripheral surface of said piston in said recess, in which second position said additional lip is in sealing contact with the inner periphery of said bore, said second position being the position of said seal when a differential pressure exceeding a predetermined pressure is present across said seal with the higher pressure on the air space side thereof.

4,417,504

# REGULAR COFFEE SET

Noboru Yamamoto, Yokohama, Japan, assignor to Mitsumoto Coffee Co., Ltd., Japan

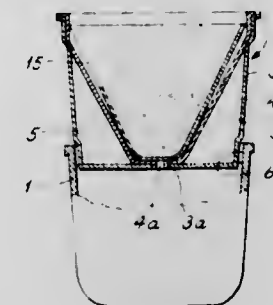
Filed Apr. 2, 1981, Ser. No. 250,397  
Int. Cl.<sup>3</sup> A47J 31/02

U.S. Cl. 99—306

1 Claim

1. A regular coffee set, comprising:  
a coffee cup having an open top, said open top having an inside diameter and an outside diameter;  
a dripping container including an outer case and a dripping body spaced from said outer case to define a heat insulation area therebetween;  
said outer case being generally cylindrical and having an open top and a first opening centrally disposed in its bottom;  
said dripping body being fittable inside said outer case and

having a generally conical cross sectional shape, an open top and a second opening centrally disposed in its bottom, said second opening being aligned with said first opening; a plurality of grooves on said dripping body effective for expediting filtering a coffee through a filter placed within said dripping body;  
an outside diameter of a bottom of said outer case being supportably fittable into said inside diameter of said open top of said coffee cup;



means on said outside diameter of said bottom of said outer case effective to impart resiliency to said outer diameter for easy fitting into said inside diameter of said open top of said coffee cup;

an inside of a top of said dripping container having a diameter for fitting top to top over said outside diameter of said coffee cup to function as a cap and to form a volume therein for containing supplies.

4,417,505

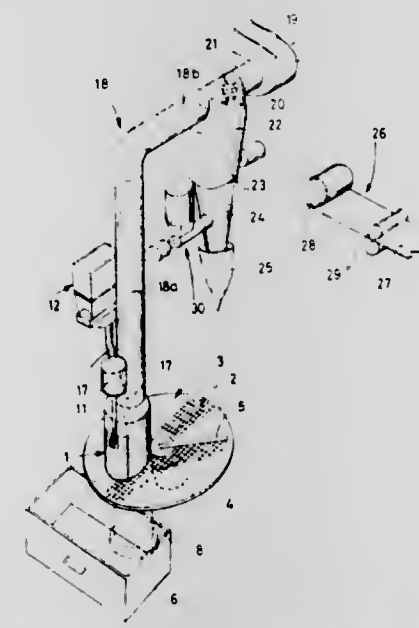
# POP CORN PREPARING AND DISPENSING MACHINE

Silvio Pietrobelli, Via Firenze 9, Schlo (Vicenza), Italy  
Filed Aug. 28, 1981, Ser. No. 297,463

Claims priority, application Italy, Apr. 6, 1979, 41550 A/79  
Int. Cl.<sup>3</sup> H23L 1/18

U.S. Cl. 99—323.6

11 Claims



1. An automatic machine for producing and dispensing pop corn, comprising a cooking chamber, first metering means for feeding said chamber with a metered amount of corn kernels, a movable grid adapted to close said cooking chamber at the bottom, a heating resistor arranged beneath said grid, a conduit for withdrawing the ready cooked product connected at its top to said cooking chamber and opening into a temporary storage bin for the cooked product, an exhaustor adapted to produce in said conduit an air stream directed towards said bin from said chamber, second metering means at the outlet of said bin for dispensing dosage units of the cooked product, salting means for salting the product as it is being dispensed, means for checking the start of cooking and consequentially actuating said exhaustor, means for stopping the metered feed of corn seeds to the cooking chamber as said temporary storage bin has

been filled, grid-cleaning means, and means for dispensing a no-return bag for receiving the ready cooked product as distributed by said second metering means.

4,417,506

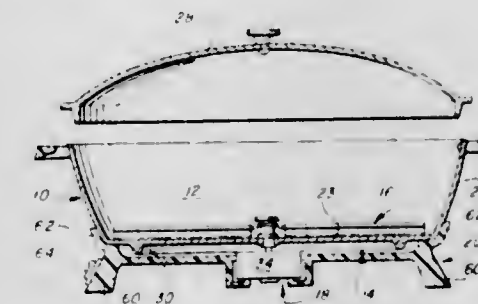
# HOME COOKING APPLIANCE

Walter B. Herbst, Evanston, and John Wolens, Chicago, both of Ill., assignors to Housewares Research Associates, Chicago, Ill.

Filed Sep. 23, 1981, Ser. No. 304,806  
Int. Cl.<sup>3</sup> A47J 27/00

U.S. Cl. 99—348

7 Claims



1. A home cooking appliance comprising:  
a vessel for containing food to be cooked and having a bottom wall and an upstanding side wall;  
means for heating said vessel to raise food within said vessel to cooking temperatures;  
an elongated stir member removably disposed within said vessel adjacent said bottom wall;  
drive means for rotating said stir member in a plane parallel and adjacent to said bottom wall; and  
a stand to removably receive and support said vessel, said stand also housing said drive means and being configured to align said vessel and said drive means when said vessel is properly positioned within said stand.

4,417,507

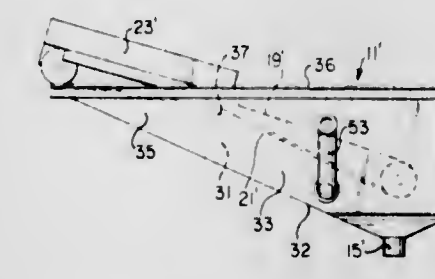
# SHRIMP PROCESSING SYSTEM

Jesse A. Shotwell, P.O. Box 414, Bay Center, Wash. 98527  
Filed Oct. 9, 1981, Ser. No. 310,041

Int. Cl.<sup>3</sup> A47J 27/16

U.S. Cl. 99—352

6 Claims



1. An improvement for a feed tank portion of a shrimp processing apparatus, wherein the shrimp processing apparatus in operation moves raw shrimp on a feed belt or the like from the feed tank to a shrimp cooker, and from there to a shrimp peeler, the improvement comprising:  
means dividing the feed tank into forward and rear sections, the rear tank section having a sufficient capacity to function as a feed tank for the shrimp processing apparatus; means for treating the water in the rear tank section such that the water has at least one of the following characteristics: (a) a selected temperature which is lower than ambient and (b) a desired concentration of a selected chemical; wherein the dividing means is positioned so that the liquid condensate from the shrimp cooker and substantially any



other untreated liquid runoff from the apparatus collects in the forward tank section, the liquid condensate and untreated liquid being thereby prevented from mixing with the water in the rear tank section.

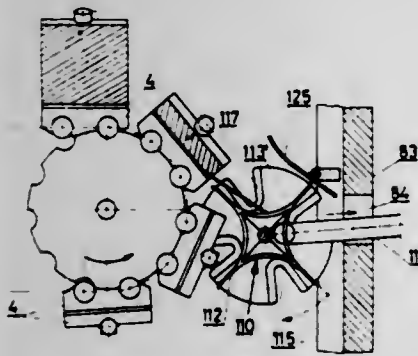
4,417,508

## WAFER BAKING OVEN

Franz Haas, Sr., Gerstlgasse 25, A-1210 Wien; Franz Haas, Jr., Kreuzgasse, A-2100 Leobendorf, and Johann Haas, Seitweg 4, A-3400 Klosterneuburg, all of Austria  
Filed May 11, 1982, Ser. No. 376,953  
Claims priority, application Austria, May 11, 1981, 2092/81  
Int. Cl.<sup>3</sup> A47J 37/00

U.S. Cl. 99—355

64 Claims



1. A wafer baking oven for making, from batter, baked wafers such as flat wafers, low hollow wafers, sugar cones, wafer cups, wafer figures and the like, the baking oven comprising:

- a baking chamber defined by a thermally insulated baking chamber enclosure, the baking chamber having a front end and a rear end;
- a front port adjoining the baking chamber at the front end of the baking chamber;
- a plurality of baking tongs in the baking enclosure, the baking tongs being movable through the baking chamber and into and out of the front port in a running direction;
- a batter pouring station and a discharge station, both located adjacent the front port, the discharge station having a discharge chute and at least one discharge spider, the batter pouring station cooperating with the baking tongs for filling the baking tongs with batter prior to movement of the baking tongs through the baking chamber, the discharge station receiving from said baking tongs, via the discharge spiders, wafers which have been baked during movement of the baking tongs through the baking chamber and discharging, via the chute, the baked wafers which have been handled by the discharge spider;
- a housing enclosing the front port, the housing thereby also enclosing the discharge spider, part of the discharge chute and at least part of the batter filling station, the baking tongs being movable into and out of the housing;
- the housing including a frame and a housing enclosure fastened to the frame, the housing having one side facing the baking chamber;
- the housing having a pair of passage openings at said one side through which passage openings the baking tongs may pass;
- the housing also having an outlet opening through which the baked wafers discharged from the baking tongs may pass.

4,417,509

## TIERABLE AND NESTABLE RECEPTACLE

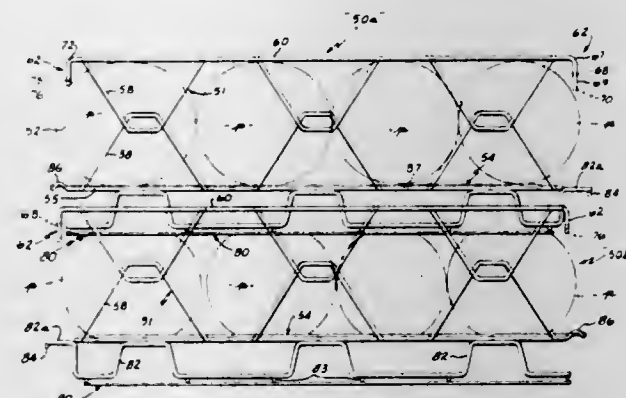
Christopher J. Deibel, Rocky River, and Edward W. Massey, Parma, both of Ohio, assignors to Bliss & Laughlin Industries Incorporated, Oak Brook, Ill.

Filed Aug. 6, 1981, Ser. No. 290,439

Int. Cl.<sup>3</sup> A22C 7/00; B30B 7/02; B65D 21/02

U.S. Cl. 99—467

6 Claims



1. A receptacle of a tier or stack of like receptacles for smoke processing of meat products and the like and wherein each receptacle in the tier comprises a body of generally parallelepiped configuration having connecting side walls and end walls and a rectangular-shaped product support tray connected to the bottom edge of each said side walls, plate means disposed below said tray, bracket means attaching said plate means in spaced relation to and below said tray, said plate means being of rectangular configuration and wherein its transverse dimension is less than the transverse dimension of the tray, the end walls of said body having bar means disposed at the upper edges thereof, at least one surface portion of said bar means defining support means lying in a plane that is vertically displaced from the plane of the remaining portion of said bar means, abutment means at the opposed ends of said tray and projecting outwardly beyond the adjacent ends of the underlying plate means, meat products or the like adapted to be disposed onto the tray of a selected receptacle of said tier and onto the tray of the next receptacle in said tier above said selected receptacle, the plate means of said next receptacle resting upon the meat products in said selected receptacle whereby as the meat products are smoked sufficiently to cause shrinkage of said products said next receptacle moves toward and into partially nested relation with said selected receptacle whereupon the abutment means on the tray of said next or supported receptacle seats upon the support means of said selected receptacle.

4,417,510

## SHEAR BALER

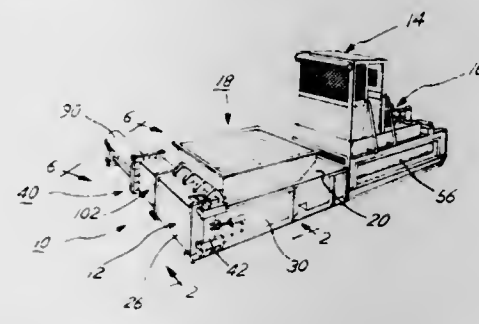
Allen B. Sharp, Ottumwa, Iowa, assignor to Al-Jon, Inc., Ottumwa, Iowa

Filed Sep. 28, 1981, Ser. No. 306,160

Int. Cl.<sup>3</sup> B30B 9/32

U.S. Cl. 100—98 R

16 Claims



1. In an improved shear baler which is adapted to efficiently process large volumes of disparate scrap metals into discrete,

high density, compact bundles and which comprises: a housing including a bottom wall, a first side wall, a second side wall, an end wall, and a top wall which define a compression chamber having a first end and a second end and having a uniform, transverse cross-section perpendicular to a longitudinal axis that extends between the first and second ends of the compression chamber and that is perpendicular to the plane of the end wall; a shear ram which has a leading face congruent to and substantially the same size as the cross-section of the compression chamber, which has a shear blade means mounted on and along the upper, transverse edge of the leading face, and which is movable, along a path of movement parallel to the longitudinal axis, between a first position wherein the leading face is adjacent to the first end of the compression chamber and a second position wherein the leading face is adjacent to the second end of the compression chamber and spaced a predetermined distance from the end wall; the top wall having an opening therein adjacent to the first end of the compression chamber through which scrap metal to be processed can be introduced into the compression chamber when the shear ram is in its first position; fixed shear blade means mounted on and along the edge of the top wall opening adjacent to the first end of the compression chamber and adapted to cooperate with the shear blade means on the shear ram to shear metal therebetween when the shear ram moves from its first position to its second position; the first side wall having a first opening therein adjacent to the second end of the compression chamber and the end wall, the first side opening having a width in the direction parallel to the longitudinal axis, substantially equal to the predetermined distance; the second side wall having a second side opening therein adjacent to the second end of the compression chamber and the end wall, the second side opening being aligned with and being congruent to and substantially the same size as the first side opening; a side mounted ram mounted adjacent to the first side wall so that its central axis is aligned with first and second side openings and is perpendicular to the longitudinal axis, the side mounted ram having a ram head which is substantially congruent to and substantially the same size as the first side opening and which is movable, along a path of movement parallel to its central axis, between a first position wherein the ram head is disposed within the first side opening so that the leading face of the ram head forms a continuation of the first side wall and second position wherein the ram head is disposed adjacent to the second side opening; a side gate mounted exterior to the compression chamber and adjacent to the second side opening, the side gate being movable between a first position wherein it overlies and closes the second side opening and a second position wherein it is disposed remote from the second side opening; first means for moving the shear ram between its first and second positions; second means for moving the side mounted ram between its first and second positions; third means for moving the side gate between its first and second positions; and means for controlling the operation of the first, second, and third moving means; the improvement comprising:

the shear ram including a body having a cut away portion in and along the upper, transverse edge of the leading face, with the plane of the leading face being spaced a certain distance from the fixed shear blade means on and along the edge of the top wall when the shear ram is in its second position; a blade block mounted in the cut away portion, the blade block having a cut away portion in and along its upper, transverse edge, with the length of the blade block, in the direction parallel to the longitudinal axis, being greater than said certain distance; at least one shear blade, with each shear blade having more than one shearing edge thereon; means for removably mounting and securing each shear blade in the cut away portion of the blade block so that one of its shearing edges is disposed along and defines at least a portion of the upper transverse edge of the leading face, so that each of the other shearing edges of the shear blade are spaced from the upper, transverse edge of the leading face, and so that each shear blade may be shimmed with respect to the blade block; and means for removably mounting and securing the blade block on the shear ram body so that the

blade block may be shimmed with respect to the shear ram body.

4,417,511

## MOVING BOLSTER ARRANGEMENT

Naoaki Ikeoka, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,320

Int. Cl.<sup>3</sup> B30B 15/06

U.S. Cl. 100—229 R

1 Claim

1. A moving bolster arrangement for a transfer press having a bed and a first, a second and a third upright defining a first and a second press station therebetween, comprising:

- a first left side moving bolster adapted to be moved into and out of said first press station;
- a second left side moving bolster adapted to be moved into and out of said second press station;
- a first right side moving bolster adapted to be moved into and out of said first press station;
- a second right side moving bolster adapted to be moved into and out of said second press station;
- a first motor mounted on said first left side moving bolster for driving the same;
- a second motor mounted on said second left side moving bolster for driving the same;
- a third motor mounted on said second right side moving bolster for driving the same;
- a fourth motor mounted on said first right side moving bolster for driving the same;
- a first controller mounted on said first left side moving bolster;
- a second controller mounted on said second right side moving bolster;
- a first cable reel mounted on said bed at a left end portion thereof;
- a second cable reel mounted on said second left side moving bolster;
- a third cable reel mounted on said bed at a right end portion thereof;
- a fourth cable reel mounted on said first right side moving bolster;
- a first cable winding round said first cable reel and having one end connected to a first power source and the other end connected to said first controller;
- a second cable interconnecting said first controller and said first motor;
- a third cable winding round said second cable reel and having one end connected to said first controller and the other end connected to said second motor;
- a fourth cable winding round said third cable reel and having one end connected to a second power source and the other end connected to said second controller;
- a fifth cable interconnecting said second controller and said third motor; and
- a sixth cable winding round said fourth cable reel and having one end connected to said second controller and the other end connected to said fourth motor.



4,417,512

## CAN CRUSHER

Henry C. Engelke, 1701 S. Walker La., Stockton, Calif. 95205

Filed Nov. 13, 1981, Ser. No. 321,111

Int. Cl.<sup>3</sup> B30B 9/32

U.S. Cl. 100—266

11 Claims



1. A disposable container crushing device comprising:
  - a receiver shaped to hold a collapsible, disposable container, said receiver having a sidewall and an endwall extending at a substantially right angle from one end of said sidewall, said sidewall having a substantially circular curvature about an axis perpendicular to said endwall,
  - piston at the other end of said sidewall, said piston having a surface substantially parallel to said endwall and movable within said receiver from said other end of said sidewall to said one end thereof,
  - first elongated operating shaft attached to and extending from said receiver in an operating direction substantially parallel to said sidewall and the direction of travel of said piston,
  - second elongated operating shaft attached to and extending from said piston in said operating direction, and operating means for manually moving one of said operating shafts in said operating direction with respect to the other of said shafts,
  - one of said operating shafts being tubular, said shafts both extending in the same direction from said receiver and said piston, the other of said operating shafts being an inner shaft telescoped within said tubular shaft,
  - one of said shafts extending farther from said receiver than said other such that a portion of said one distal from said receiver extends beyond the end of said end of said other which is distal from said receiver,
  - said operating means comprising (a) a pair of foot pedals extending perpendicularly out from said other of said shafts at the end thereof distal from said receiver in respectively opposite directions, and (b) a pair of handholds extending perpendicularly out from the portion of said device adjacent said receiver in respectively opposite directions corresponding to the respective directions in which said foot pedals extend, the distance between said foot pedals and said handholds being sufficiently great that a human can operate said device with his or her foot on one of said foot pedals while holding said handholds with his or her hands.

4,417,513

## PRINTING APPARATUS AND METHOD

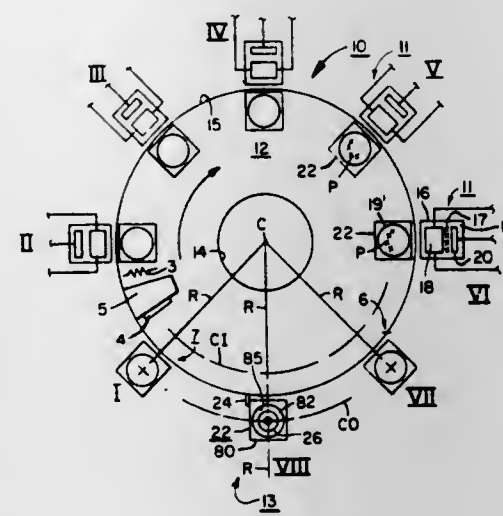
Bruce A. Milliman, Big Flats, and Harris G. Rodgers, Sr., Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 17, 1982, Ser. No. 419,471

Int. Cl.<sup>3</sup> B41F 17/00

U.S. Cl. 101—41

5 Claims



1. A printing apparatus for decorating articles comprising:
  - a circular turret rotatable about its center, said turret having an outer peripheral edge;
  - a plurality of collectors mounted on said turret at arcuately spaced intervals and equally spaced from said center and lying in a plane; each collector including a frame having an aperture therein; and a membrane stretched across the frame over the aperture, the membrane having a design carrying side;
  - a plurality of print stations including a gravure surface having engravings thereon, the gravure surface forming a portion of a design; a squeegee for spreading ink across the gravure surface; a doctor blade for doctoring the ink; a support bar mounted on an axis carrying the squeegee and doctor blade in opposition about the axis; means coupled to the support bar for rotating the same about the axis for engaging the squeegee with the gravure surface and rotating the support bar about the axis for withdrawing the squeegee from the gravure surface and engaging the doctor blade therewith; means for reciprocally moving the support bar relative to the gravure surface when one of the squeegee and the doctor blade is engaged with the gravure surface; a transfer roll adapted to be rolled in the plane across the gravure surface and the collector for picking up the ink from the gravure surface and depositing it on the collector; a print trolley reciprocally mounted between respective inboard and outboard positions and a pivotal support mounted thereon; a support arm mounted in said pivotal support, the transfer roll being rotatably mounted to said support arm and being carried about said pivotal support; pivoting means coupled to the support arm for actuating the same and moving the transfer roll tangentially into the plane at the outboard position and out of the plane at the inboard position; means for moving the trolley from the outboard to the inboard position for rollably engaging the transfer roll with the gravure surface and the collector while in the plane and for moving the transfer roll out of the plane while the trolley moves from the inboard to the outboard position; belt means responsive to the position of the trolley for rollably driving the transfer roll to thereby maintain the same in a repeatedly registerable position relative to each collector;
  - print transfer means including a flexible plunger for engaging a side of the collector opposite the design carrying side thereof and driving the same into engagement with the articles to be decorated for transferring the complete design to the articles by intimate contact with the collec-

tor; means for rotatably indexing the turret so that each collector is sequentially aligned with each print station and the print transfer station in registration with a portion of the design produced at each other print station to thereby produce a complete design; hinge means coupling each collector to the turret near a peripheral edge thereof; and means for deploying the collector between the respective positions inboard and outboard of the peripheral edge of the turret, the design carrying side of the collector facing in one direction while receiving the design and in an opposite direction for engaging the articles to be decorated.

4,417,514

## PRINTING PLATE EXCHANGE SYSTEM

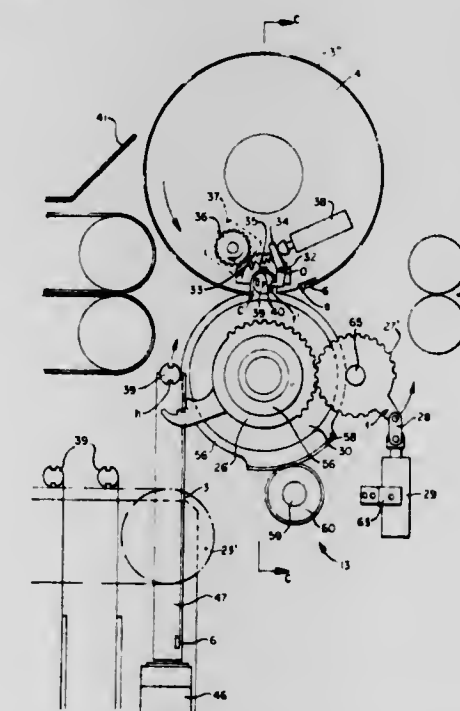
Noriyuki Hoshino, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,784

Int. Cl.<sup>3</sup> B41L 45/08

U.S. Cl. 101—54

1 Claim



1. A printing plate exchange system comprising a unit box holding therein a plurality of plates each mounted to a fixture rod and capable of being disposed under a printing cylinder, said fixture rod having a slot adapted to engage with a fixture strip of the plate and a holding member for preventing the fixture strip from disengaging therefrom, and plate mount/dismount means disposed under said printing cylinder for mounting and dismounting the plate in said unit box onto and from said printing cylinder by the intermediary of said fixture rod.

4,417,515

## LATERAL SUPPORT FOR SQUEEGEE

Mathias Mitter, Falkenstr. 57, 4815 Schloss Holte, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,165

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032345

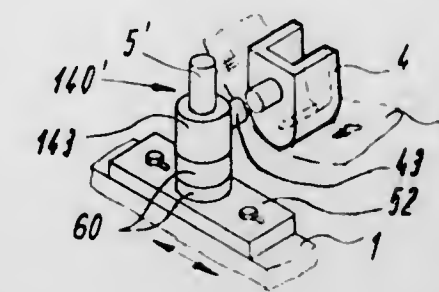
Int. Cl.<sup>3</sup> B41L 13/06

U.S. Cl. 101—120

29 Claims

1. A lateral support for a squeegee of a printing mechanism of a screen printing machine, comprising at least one supporting element arranged to support each end portion of a squeegee independent of the screen support so that the squeegee lies on an object to be printed solely under its own weight; and at least one substantially upright upwardly open guiding element arranged to slidably guide each said supporting element for free movement in a substantially upright direction and formed to limit movement of said supporting element downwardly but to allow unlimited movement of said supporting element up-

wardly so that said supporting element can unobjectionably move upwardly along said guiding element under the action of the object running under the squeegee and solely by the up-



4,417,516

## ROTARY PRINTING MACHINE SYSTEM

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

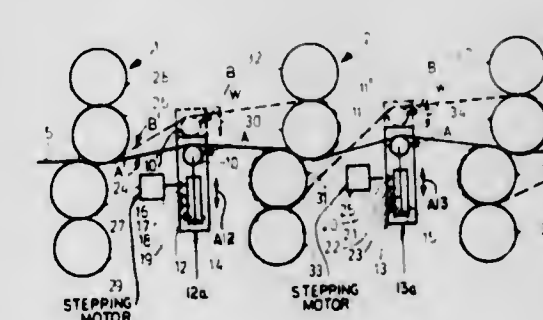
Filed Apr. 29, 1982, Ser. No. 372,999

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119398

Int. Cl.<sup>3</sup> B41F 11/00, 5/14

U.S. Cl. 101—181

9 Claims



1. Rotary printing machine system having at least two printing stations (1, 2, 3, 4) for sequential printing on a web (5) of substrate, guided from one station (1, 2, 3) to the next neighboring station (2, 3, 4) said printing stations being operative in selected different printing modes resulting in different operating conditions of the printing stations and requiring different length web paths through said stations; each station having at least one paired rubber blanket cylinder and plate cylinder, and means forming an impression cylinder; web deflection means for guiding the path of the web, located between adjacent printing stations and for compensating for different lengths of the web between said stations when the stations are operated in the said different modes; said web deflection means comprising:
  - a web deflection roller (10, 11, 51, 51, 63); means (12a, 13a, 24, 25, 53, 54, 55) for applying a positioning force on said roller operative to move the roller between predetermined defined positions (A, B), in which each predetermined position is associated one of the predetermined printing modes and a predetermined path length of the web through the stations of the machine;
  - prasettable web tension control means (14-19, 20-23, 24, 25; 53-55) acting on the force applying means operative to apply a superimposed tensioning force on said roller, and hence on the web, to deflect the web by a distance which is small with respect to the distance between said predetermined positions and which is effective to control the tension of the web between adjacent stations as a function



of predetermined operating parameters, including web path length arising upon printing in the selected mode; and adjustment control means coupled to and controlling said presettable web tension control means to permit repetitive preset application of the same tensioning force by said web deflection means on the web subsequent to interruption of printing operation of the printing machine system.

4,417,517

# PRINTER WITH MOVEABLE PAPER STRIP GUIDE ROLLS

Susumu Matsuda; Nobuaki Matsukura, both of Shizuoka; Masataka Suzuki, Oohito, and Tsugio Narushima, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

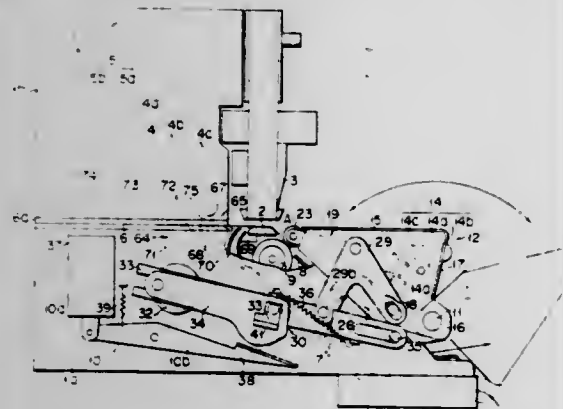
Filed Jun. 9, 1982, Ser. No. 386,800

Claims priority, application Japan, Jun. 19, 1981, 56-94611; Jun. 19, 1981, 56-90785; Jun. 19, 1981, 56-90787

Int. Cl.<sup>3</sup> B41F 1/08; B41J 11/50

U.S. Cl. 101-288

9 Claims



1. An apparatus with a printer for a printing paper strip, comprising:
  - a) an apparatus housing;
  - a) a platen provided to the apparatus housing;
  - a) a paper feed guide having an outlet on one side of the platen, through which the printing paper strip is guided to the platen;
  - a) a paper discharge guide having an inlet on the other side of the platen, through which the printing paper strip is guided from the platen;
  - a) a unit frame attached to the apparatus housing to be able to rock between an open position where the paper discharge guide is exposed and a closed position where the paper discharge guide is covered and the printing paper strip is allowed to be guided;
  - a) a drive roller provided to the apparatus housing located on the other side of the platen;
  - a) a pinch roller mechanism provided to the unit frame and having a pinch roller which goes away from the drive roller when the unit frame is located in the open position, and approaches the drive roller when the unit frame is located in the closed position, so that the printing paper strip is held between the pinch roller and the drive roller when the pinch roller is brought close to the drive roller; and
  - a) a rotation drive mechanism for rotating the drive roller to carry the printing paper strip from the paper feed guide to the paper discharge guide via the platen.

4,417,518

# DETONATING ARRANGEMENT FOR MISSILES

Rainer Siebert, Schwaig; Dietmar Stützel, Lauf/Pegn, and Peter Weidner, Breitenbrunn, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

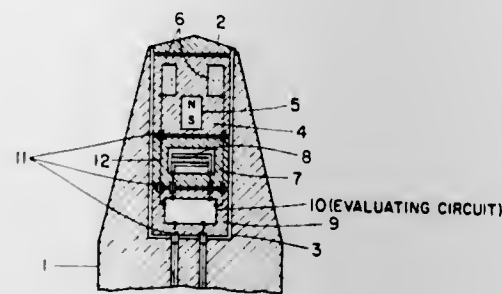
Filed Mar. 8, 1979, Ser. No. 24,428

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 7806953[U]

Int. Cl.<sup>3</sup> F42C 13/08

U.S. Cl. 102-212

5 Claims



1. Detonating arrangement for missiles in which a voltage is inducible in an induction element responsive to a change of the magnetic field of a permanent object at the approach to a ferromagnetic object, the voltage being conductable to the control input of an electronic evaluating circuit addressing a detonating medium; characterized in that the detonating arrangement includes an impact sensor (8) adapted to be coupled to the electronic evaluating circuit (10) in addition to a magnetic proximity sensor constituted of a permanent magnet (5) and an adjointly located coil serving as the induction element.

4,417,519

# EXPLOSIVE SWITCH

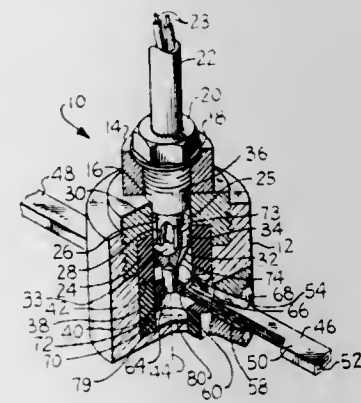
Harry O. Lutz, Cocoa Beach, Fla., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 4, 1981, Ser. No. 270,508

Int. Cl.<sup>3</sup> F42C 15/40

U.S. Cl. 102-263

10 Claims



1. A fast operating, normally open single actuation switch including:
  - a) a body defining a chamber therein having first and second end portions with a central portion therebetween;
  - a) means to supply pressurized medium into said first end portion of said chamber;
  - a) at least two electrical conductors having end portions constructed from flat wire extending into said central portion of said chamber;
  - a) swaging means adapted for movement in said chamber positioned in said chamber between said means to supply pressurized medium and said at least two electrical conductor end portions; and
  - a) means for releasably retaining said swaging means in position between said means to supply pressurized medium and said end portions of said at least two electrical con-

ductor end portions until said means to supply pressurized medium does so to force said swaging means into said end portions of said at least two electrical conductors to complete an electrical circuit therebetween including:

a) a toroidal member having:

a) an inner surface; and

a) an outer surface, said outer surface including:

a) a ring shaped slot in which said end portions of said at least two conductors are positioned, said swaging means including a swaging member having first and second end portions and a conductive central wedge portion therebetween, said first end portion being shaped to slide along said chamber central portion, said second end portion being adapted to engage said means for releasably retaining said swaging means by extending through said toroidal member for support thereby, and said central wedge portion being adapted to swage into said end portions of said at least two electrical conductors to complete an electrical circuit therebetween, said swaging member central portion being frusto-conical in shape having a large diameter end and a small diameter end, said swaging member first end portion being cylindrical in shape and connecting to said large diameter end of said swaging member central portion.

4,417,520

# SEQUENTIAL TIME DISCRIMINATION SYSTEM FOR SUB-DELIVERY SYSTEMS

Inge Maudal, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Apr. 14, 1980, Ser. No. 139,947

Int. Cl.<sup>3</sup> F41G 7/22; F42B 13/50

U.S. Cl. 102-489

11 Claims



1. A sub-vehicle control system for independently targetable sub-vehicles comprising:
  - a) an independent sub-vehicle control system for directing the sub-vehicle to a target;
  - a) sensor means capable of locating and identifying previously hit targets;
  - a) target locating means;
  - a) discrimination means for receiving data from the sensor means and from the target locating means to eliminate targets identified by the locating means which have also been identified by said sensor means; and
  - a) selection means for sensing the output from the discrimination means, selecting a target other than one identified by the sensor means and causing the control system to direct the sub-vehicle to said selected target.

4,417,521

# BULLET FOR MUZZLE LOADING GUNS

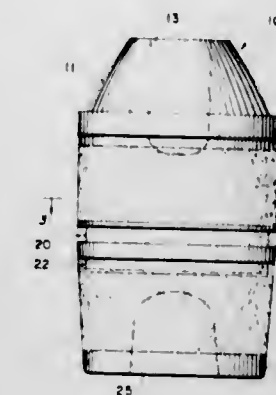
Ronald R. Dahlitz, Whittier, Calif., assignor to Buffalo Bullet Company, Whittier, Calif.

Filed Oct. 26, 1981, Ser. No. 315,060

Int. Cl.<sup>3</sup> F42B 11/20

U.S. Cl. 102-511

7 Claims



1. A bullet for firearms, said bullet comprising:
  - a) a generally cylindrical-shaped body terminating at its upper end with a generally hemi-spherical point having a truncated upper end;
  - a) a first gas seal comprising a cylindrical portion adjacent the point and extending to the outer surface of the body;
  - a) a first knurled portion having a plurality of open depressions having walls which extend to about the surface of the cylindrical body;
  - a) a second gas seal positioned below the first knurled portion and comprising a cylindrical portion extending to the outer surface of the body, said gas seal having at least one grease groove adjacent thereto, said grease groove being an annular groove extending below the surface of the body;
  - a) a second knurled portion positioned below the second gas seal having a plurality of open depressions having walls which extend to about the surface of the cylindrical body; and
  - a) a solid lubricant located in the grease groove and in the depressions of the knurled portions.

4,417,522

# MOBIL TRACK CORRECTION MACHINE

Josef Theurer, Vienna, and Gernot Böck, Aschach, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industrie-Gesellschaft m.b.H., Vienna, Austria

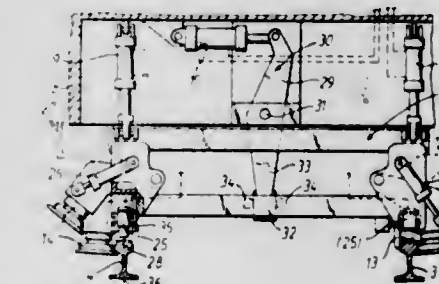
Filed May 7, 1981, Ser. No. 261,572

Claims priority, application Austria, Jun. 4, 1980, 2975/80

Int. Cl.<sup>3</sup> E01B 29/04, 35/00

U.S. Cl. 104-7 B

8 Claims



1. A mobile track correction machine mounted for mobility on the rails of the track and comprising
  - (a) a machine frame,
  - (b) a tool carrier mounted on the machine frame for vertical adjustment in relation thereto and for guidance along the track,
  - (c) track lining and lifting tools mounted on the carrier and engageable with the track rails, whereby the carrier is engaged with the track,

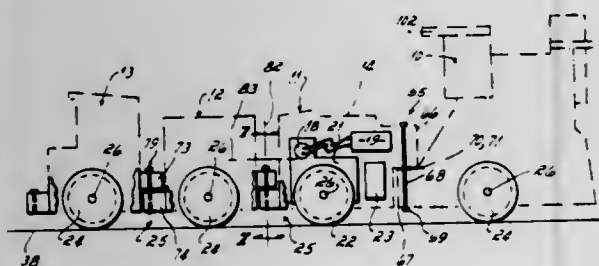


- (d) power drive means linking the tool carrier to the machine frame, the power drive means including
- (1) a lining drive and
  - (2) a lifting drive,
- (e) a control circuit controlling actuation of the power drive means and including
- (1) a switching element operable to terminate actuation of the lifting drive, and
  - (2) a safety arrangement for terminating the actuation on disengagement of the tool carrier from the track, the safety arrangement including
- (1) an electronic, inductive proximity fuse affixed to the tool carrier and mounted above and at a nominal distance from the running face of a respective rail engageable by a respective lifting tool, the proximity fuse being connected to the switching element and capable of transmitting an operating signal thereto without touching the running face when the distance between the proximity fuse and the running face is more than the nominal distance, and
  - (2) a mechanism for vertically adjustably mounting the proximity fuse on the tool carrier.

4,417,523

**RIDEABLE MOTOR-DRIVEN TOY TRAIN**

James F. Mariol, 481 Deanview Dr., Cincinnati, Ohio 45224  
Division of Ser. No. 185,158, Sep. 8, 1980, Pat. No. 4,357,877.  
This application Nov. 2, 1981, Ser. No. 316,975  
Int. Cl.<sup>3</sup> A63H 21/00; B61G 1/20  
U.S. Cl. 105—1 T 12 Claims



1. A rideable, motor driven toy train assembly comprising,
- a first car having the appearance of a locomotive, said locomotive appearing car having a single axle and a pair of wheels mounted upon said locomotive appearing car axle,
  - a tender car having a single axle and a pair of wheels mounted upon said tender car axle, said tender car being connected to said locomotive appearing car by a connection pivotable about a vertical axis,
  - a seat defined on the top surface of said tender car, handles upon said locomotive appearing car for steering said train assembly,
  - a battery for driving said electric motor,
  - transmission means in said tender car for drivingly connecting at least one of said pair of wheels of said tender car to said electric motor, and
  - said locomotive appearing first car having a cabin appearing section near the rear thereof, and said handles for steering said train assembly being located on said cabin appearing section.

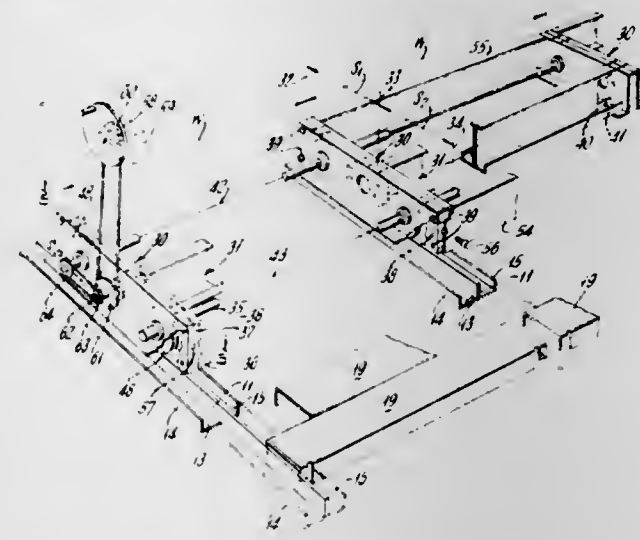
4,417,524

**MODULAR FILE OR THE LIKE SYSTEM**

David A. Quinn, Tuxedo, and Mladen Peros, Astoria, both of N.Y., assignors to Supreme Equipment & Systems Corp., Brooklyn, N.Y.  
Continuation-in-part of Ser. No. 954,098, Oct. 24, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,703  
Int. Cl.<sup>3</sup> A47B 53/02  
U.S. Cl. 105—101 9 Claims

1. A modular rollable base adapted to support two like front-access cabinets or the like modules in back-to-back relation, the base including a modular frame comprising at least one pair of elongated channels arranged parallel with one

another and downwardly open at longitudinal ends of the frame; an elongated longitudinal beam secured at its ends to respective midpoints of said pair of elongated channels, said longitudinal beam and said elongated channels being of substantially the same height and establishing an H-pattern of continuous cabinet-module support in a horizontal plane, said elongated channels each having a pair or substantially parallel side walls, each side wall having at least one pair of shaft-mounting openings, said pairs of shaft-mounting openings in said side walls being aligned with each other and arranged to be on opposite ends of said elongated channels with respect to said respective midpoints, corresponding aligned shaft-mounting openings in respective elongated channels being in alignment with each other; a plurality of axle elements each extending through a respective aligned pair of said shaft-mounting openings in said elongated channel; a plurality of rotational support means each arranged in said shaft-mounting openings



of each channel wall for rotationally supporting said axle elements, each of said axle elements having a projecting end extending outward of its associated rotational support means; a wheel secured to each axle element between the locations of its associated rotational support means, said wheel having a radius which is sufficiently long so that a portion of said wheel extends beneath said frame; first and second tubular shaft elements extending longitudinally between respective opposite ends of said elongated channels for engaging with said projecting ends of respective ones of said axle elements extending through said aligned shaft-mounting openings in said respective ones of said elongated channels, and a plurality of rigid connection means for rigidly connecting said first and second tubular shaft elements to said projecting ends of said respective ones of said axle elements whereby respective ones of said axle elements are rotatively and axially coupled to one another, and thereby provide enhanced structural integrity for the modular rollable base.

4,417,525

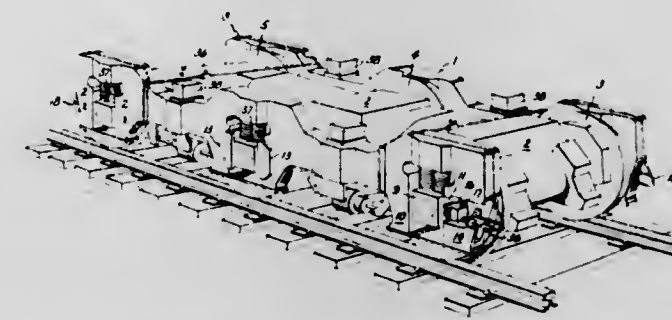
**FLUID SELF-STEERING RAILWAY VEHICLE TRUCK**

Samuel Levy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Continuation of Ser. No. 125,509, Feb. 28, 1980, abandoned.  
This application Jun. 18, 1982, Ser. No. 389,727  
Int. Cl.<sup>3</sup> B61C 3/00, 9/50; B61F 5/38  
U.S. Cl. 105—166 6 Claims

1. In a railway vehicle truck having a longitudinal axis in its direction of travel and comprising a rigid truck frame, multiple wheel set assemblies including a leading wheel set assembly and a trailing wheel set assembly disposed aft of said leading wheel set assembly along said longitudinal truck axis, said wheel set assemblies each comprising an axle, a pair of flanged wheels having wheel tread conicity and mounted on said axle, and two journal boxes mounted adjacent opposite ends of said axle and operatively disposed in said truck frame so that each

corresponding wheel set assembly is operatively positioned in said truck, each of said journal boxes including:

- a bearing mounted about a section of said axle, said bearing supporting said axle and providing a means of rotation of said axle relative to said journal box,
  - longitudinal load bearing surfaces disposed in planes substantially perpendicular to said longitudinal axis, said planes being disposed forward and aft of said axle along a line parallel to said longitudinal axis, and
  - at least one lateral load bearing surface disposed substantially orthogonal to said longitudinal load bearing surfaces, the improvement comprising:
- means for repositioning said journal boxes of said leading and trailing wheel set assemblies with respect to said truck frame, said means including a plurality of sets of hydraulic force transmitting means each having at least two fluid



- containing force transmitting means, each of said force transmitting means being positioned on said truck frame adjacent and movable relative to one of said journal box load bearing surfaces of said leading wheel set assembly and each of said force transmitting means including a rub plate portion adjacent and engageable with one of said journal box load bearing surfaces,
- first and second ones of said sets including force transmitting means engageable with said lateral and said forward-disposed longitudinal load bearing surfaces of each of said journal boxes of said leading wheel set assembly,
- a third one of said sets including force transmitting means engageable with said aft-disposed longitudinal load bearing surfaces of both of said journal boxes of said leading wheel set assembly; and
- conduits interconnecting the force transmitting means in each of said sets in flow communication.

4,417,526

**GONDOLA CAR CONSTRUCTION**

Walter J. Marulic, Dunwoody, and Kent N. Johnson, Atlanta, both of Ga., assignors to United-American Car Co., Atlanta, Ga.

Filed Jun. 22, 1981, Ser. No. 275,610

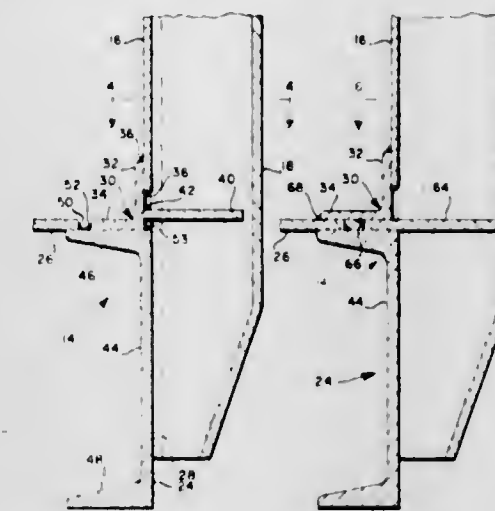
Int. Cl.<sup>3</sup> B61D 3/08, 17/08, 49/00

U.S. Cl. 105—406 R

21 Claims

1. A railroad gondola car comprising:
- a subframe assembly including a side sill channel member, a side structure including a side sheet having inner and outer surfaces and a plurality of vertical side posts secured to said outer surface of said side sheet, said side posts comprising channel-shaped members wherein the channel opens toward said side sheet,
  - a longitudinally extending angle member secured to said side sheet surface and adjacent the lower edge of said side sheet,
  - a structural reaction plate member transverse of said side post secured to said side posts within the channel thereof and having one end extending outwardly of the channel a distance at least as great as the thickness of said side sheet, and said structural reaction plate member being secured to said angle member and said outwardly extending end of

said structural reaction plate member being adjacent said side sill channel member, and



said side posts extending below said side sheet and being secured to said side sill channel member and said angle member being secured to said subframe assembly.

4,417,527

**AUTOMATIC TELLER SECURITY APPARATUS**

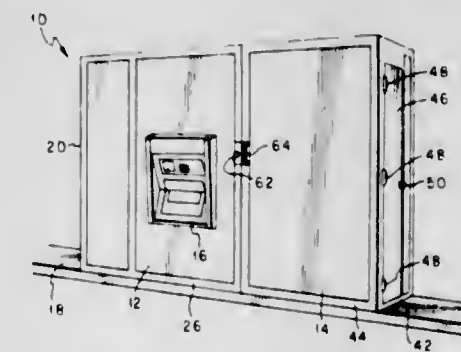
Waymon D. Williams, 7206 La Manga, Dallas, Tex. 75248, and Edward A. Moore, 3305 Heathercrest Dr., Garland, Tex. 75042

Filed Aug. 17, 1981, Ser. No. 293,501

Int. Cl.<sup>3</sup> E04H 1/12; E04B 1/346; A47B 43/00

U.S. Cl. 109—2

12 Claims



1. For use in association with an automatic teller machine having a cash box and internal mechanical and electrical parts and having an exposed control panel, a security apparatus comprising:

- (a) a first enclosure;
- (b) a second enclosure;
- (c) a stationary platform;
- (d) securing means for securing said first enclosure to said stationary platform;
- (e) pivot means connecting said first and second enclosures so that said second enclosure is rotatable about a substantially vertical axis between a first position and a second position which is distinct from the first position wherein the second enclosure is in substantial abutment with the first enclosure when in the second position;
- (f) mounting means on said first enclosure for mounting said automatic teller machine so that said control panel of said automatic teller machine is exposed and said cash box and internal parts of said automatic teller machine are concealed within said first enclosure;
- (g) service entry means for gaining entry to said second enclosure when said second enclosure is in said second position;
- (h) portal means for providing access into the first enclosure by a user located in the second enclosure only when said second enclosure is in said second position.



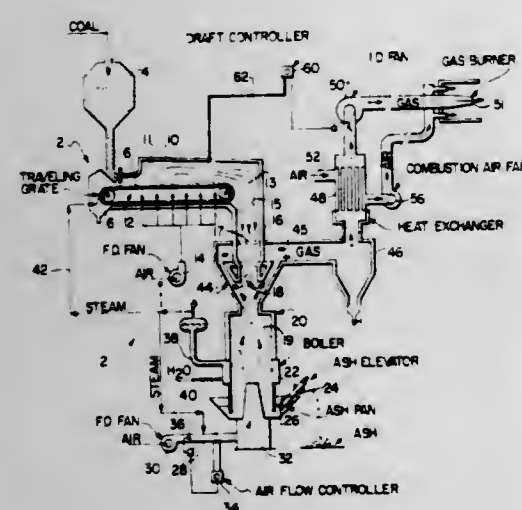
4,417,528

**COAL GASIFICATION PROCESS AND APPARATUS**  
Paul H. Vining, Nashville, and Jimmy B. Smith, Columbia, both of Tenn., assignors to Mansfield Carbon Products Inc., Nashville, Tenn. and Peabody Development Company, St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 427,442  
Int. Cl.<sup>3</sup> F23G 5/00

U.S. Cl. 110—229

8 Claims



1. In combination a traveling grate reactor having a chamber with input and output ends, means for feeding coal into the input end, means for moving said coal from the input end to the output end, means for feeding gases selected from the group comprised of air, oxygen and steam into the reactor chamber, a shaft furnace having a chamber with upper and lower ends, the lower end disposed below the output end of the reactor chamber for receiving coal gravity discharged therefrom, means for receiving coal discharged from the lower end of the shaft furnace chamber, and gas take-off means connected to the lower end of the shaft furnace chamber, said gas take-off means including gas drafting means for down drafting gas from the traveling grate reactor chamber through the coal in said shaft furnace chamber and into the gas take-off means.

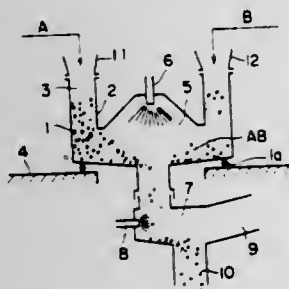
4,417,529

**METHOD FOR MELTING AND TREATING WASTE**  
Taduo Fujimoto, Kobe; Hiroyuki Fujiuchi, Ibaraki; Kenichi Shimizu, Yokohama, and Seichiro Ueda, Kobe, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Feb. 19, 1982, Ser. No. 350,318  
Claims priority, application Japan, Oct. 5, 1981, 56-157467  
Int. Cl.<sup>3</sup> F23G 7/04

U.S. Cl. 110—346

9 Claims



1. A method for melting and treating waste to be treated such as waste water treatment sludge and incinerated ash of garbage, comprising the following steps; mixing the waste to be treated with an auxiliary fuel in powder, granular or solid form or in the form of a mixture of powder, granular and solid

fuel components, which has its own calorific value, further mixing said waste to be treated with an additive so that said waste to be treated has the composition ratio of 40~60% of  $\text{SiO}_2$ , 5~25% of  $\text{Al}_2\text{O}_3$  and 15~55% (by weight) of material consisting of the substances selected from the classes containing  $\text{FeO}$ ,  $\text{CaO}$ ,  $\text{K}_2\text{O}$  and  $\text{Na}_2\text{O}$  and melting the resulting mixture.

4,417,530

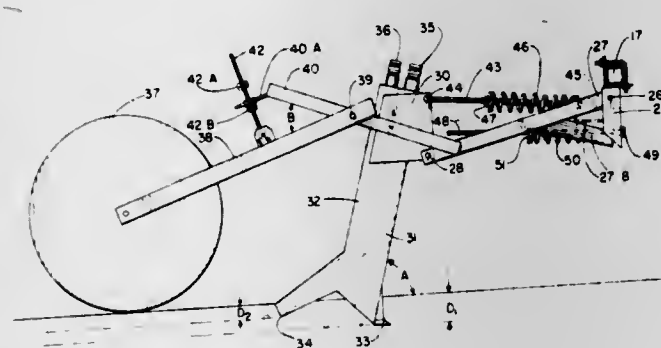
**PLANTING APPARATUS**

Ivyl D. Kopecky, Ypsilanti, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Continuation-in-part of Ser. No. 184,664, Sep. 8, 1980, abandoned. This application Feb. 12, 1982, Ser. No. 348,588  
Int. Cl.<sup>3</sup> A01C 5/00

U.S. Cl. 111—73

5 Claims



1. A planting apparatus comprising: a shank assembly having a housing defining a pair of upright tubular sections, a first of said sections having an outlet at the lower end generally centered on the shank assembly and at a first predetermined depth when the shank assembly is in a working position; a spear point having a center portion and laterally extending wing portions, the center portion opening a furrow of maximum depth; means to provide a granular fertilizer material to said first tubular section for depositing the fertilizer in the ground generally centered on the shank and directly behind the center portion of the spear point; a pair of tubes mounted on the housing having first ends opening into the second tubular section adjacent the lower end of the second tubular section, the first ends of said tubes being adjacent each other and the tubes diverging outwardly and downwardly from the shank assembly housing in rearward direction, second ends of said tubes being spaced apart laterally and terminating rearwardly of the housing and forming outlet ports at a level above the center portion of the spear point and deposited fertilizer and above and behind the lateral portions of the spear point, the tubes having solid walls that diverge sideways in rearward direction and which tend to divide the furrow to be wider than the housing immediately ahead of the outlet ports; means to provide seed grain to said second tubular section; and guide wall means for guiding the seed grain from the second tubular section into the two tubes and dividing the seed grain from said second tubular section into two portions, one of which portions is provided to one of the pair of tubes, and the other of which portions is provided to the other of the pair of tubes.

4,417,531

**SEWING MACHINE WITH ELECTRONIC CONTROLLED STITCH PATTERN GENERATOR**  
Umeo Doyama, Tokyo, Japan, assignor to Riccar Company, Ltd., Tokyo, Japan

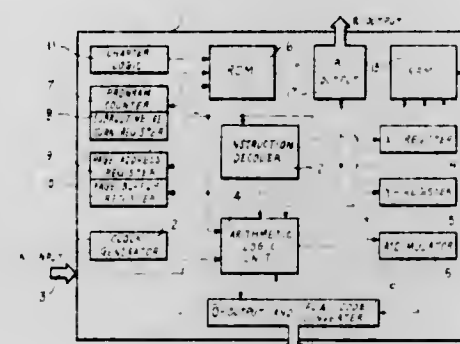
Filed Feb. 23, 1979, Ser. No. 14,487

Claims priority, application Japan, Mar. 2, 1978, 53-22778; Jun. 14, 1978, 53-80363; Jul. 24, 1978, 53-89498

Int. Cl.<sup>3</sup> D05B 3/02

U.S. Cl. 112—158 E

8 Claims



6. In a sewing machine having a memory for storing stitch pattern data, a plurality of pattern selection switches, each corresponding to at least one of said stored patterns, and a microprocessor for accessing said stitch patterns in accordance with a selected pattern switch, the improvement comprising:

- a. a plurality of data words independently accessible from the memory and representing each stitch in a stitch pattern stored in said memory beginning with a starting address,
- b. means coupled to said memory for selecting the starting address of a selected, stored stitch pattern, and
- c. means coupled to said memory for successively gating each data word of each stitch of the selected stitch pattern to said stitch forming mechanism to form each stitch of said selected stitch pattern.

4,417,532

**SUTURING INSTRUMENT FOR SURGICAL OPERATION**

Eguchi Yasukata, Kunitachi, Japan, assignor to Janome Sewing Machine Industry Co., Ltd., Japan

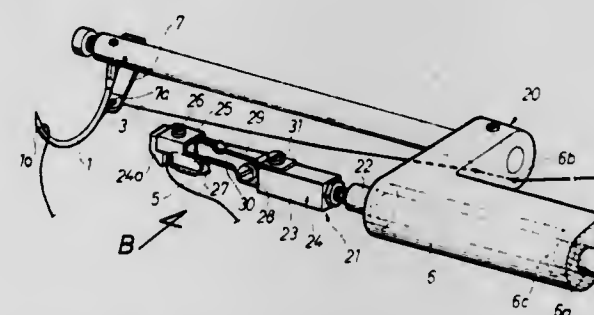
Filed Jun. 5, 1981, Ser. No. 270,726

Claims priority, application Japan, Jun. 6, 1980, 55-75587

Int. Cl.<sup>3</sup> D05B 1/00

U.S. Cl. 112—169

4 Claims



1. A suturing instrument for surgical operation comprising: (a) a support gripped by an operator, (b) a needle bar fixedly secured at one end thereof to the support, (c) a curved needle removably attached to the other end of the needle bar and supplied with a needle thread, (d) a holder bar mounted on the support and axially movable irrespective of the stationary needle bar to and away from a thread loop formed at the curved needle during the stitching operation,

- (e) a shuttle holder mounted on one end of the holder bar, (f) a shuttle loosely received in a space defined by the shuttle holder and supplied with a shuttle thread, (g) means for detaining the shuttle in the space defined by the shuttle holder, said shuttle being of a streamlined structure pointed at one end thereof for guiding the thread loop therearound, said shuttle being positioned in the space in such manner that the pointed end thereof is directed to the support opposite from the curved needle, said shuttle holding bar being operated when said needle bar is kept standstill after the thread loop is formed so that the shuttle may traverse on the outside of the thread loop formed at the curved needle as the shuttle holding bar advances toward the needle, and may traverse the thread loop on the inside thereof as the shuttle holding bar returns to the support, thereby forming lock stitches with the needle and shuttle threads for suturing an incision under the surgical operation.

4,417,533

**SPRING BIASED PRESSER FOOT**

Nobuyasu Oshima, and Tetsuya Tsumura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

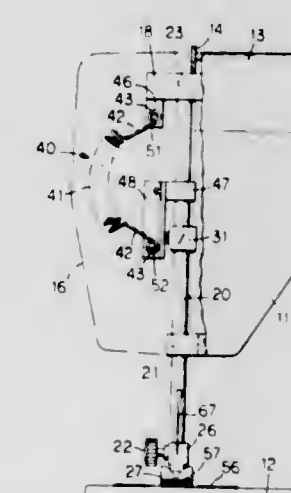
Filed Jan. 12, 1981, Ser. No. 225,031

Claims priority, application Japan, Jan. 31, 1980, 55-10769; Feb. 8, 1980, 55-14943

Int. Cl.<sup>3</sup> D05B 29/00

U.S. Cl. 112—235

4 Claims



1. A work presser device for a sewing machine provided with a feed mechanism having a feed dog operative through a throat plate to engage a work piece for advancing the latter, said work presser device including a presser bar mounted on a machine frame for axial movement, a presser foot attached to the lower end of said presser bar and means for urging said presser bar downwardly toward said throat plate and said feed dog,

wherein the improvement comprises said urging means including a constant-force spring whose resilient force remains substantially constant within a certain range of deflection thereof, said constant-force spring having a closely wound intermediate coil portion and a pair of arm portions extending outwardly from the ends of said coil portion, said arm portions being pivotally connected at free end thereof to said presser bar and said machine frame, respectively, said constant-force spring having an arcuate shape so as to provide a constant force within said certain range of deflection in its connected state, said constant-force spring causing said presser foot to press the work piece with a substantially constant pressure irrespective of the axial movement of said presser bar due to variation in thickness of the work piece during a sewing operation.



4,417,534

## LUBRICANT SENSING DEVICE FOR SEWING MACHINES

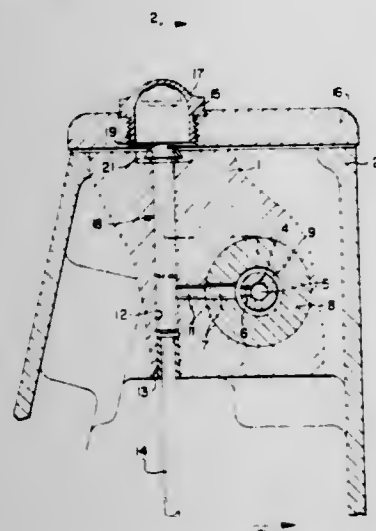
Hermann Gauch, Moglingen, and Wolf R. von Hagen, Hemmingen, both of Fed. Rep. of Germany, assignors to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany  
Filed Jun. 25, 1981, Ser. No. 277,432

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028456

Int. Cl.<sup>3</sup> D05B 71/00

U.S. Cl. 112—256

13 Claims



1. In a sewing machine having a frame including an upper arm, a pressurized lubrication system arranged within said frame including a series of interconnecting lubricant passageways and a lubricant sensing device comprising:

indicator means arranged for free sliding movement within the upper arm of said machine, said indicator means having a rod like stem portion with a cap arranged at one end thereof, said stem portion being cooperatively arranged in said passageway such that it is positionally sensitive to fluid pressures therein and is adapted to position said cap so as to indicate the fluid flow and pressure in said system.

4,417,535

## SEWING MACHINE BELT FEEDER WITH TENSIONER

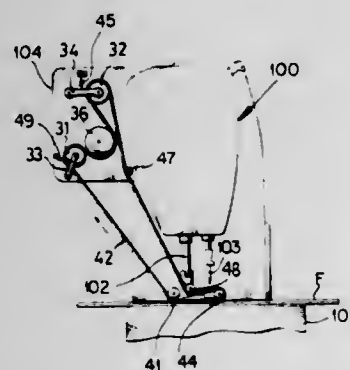
Franz Hannemann, Detmold, Fed. Rep. of Germany, assignor to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany  
Filed Dec. 17, 1981, Ser. No. 331,919

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048012

Int. Cl.<sup>3</sup> D05B 27/04

U.S. Cl. 112—304

4 Claims



1. A transporter for moving a workpiece layer past a reciprocating needle of a sewing machine, comprising:  
an endless belt having a stretch adjoining the path of a workpiece layer to be advanced thereby in a predetermined transport direction;  
a rotating sheave partly enveloped by said belt at a location remote from said stretch for entraining same in a sense consistent with said transport direction;  
a plurality of deflecting rollers engaged by said belt for

guiding same around said sheave and along said stretch, said deflecting rollers including a first roller closely approaching an upstream side of said sheave, a second roller downstream of said sheave and a third roller upstream of said first roller;

a first lever having a fixed first fulcrum and a free end carrying said first roller, said first fulcrum defining with the axes of said first roller and of said sheave a triangle lying in the plane of belt motion and having an obtuse angle at the axis of said first roller, said third roller lying between the sides of said triangle including said obtuse angle for exerting upon said first roller a force tending to move the latter closer to said sheave in response to a slowing of said belt by an obstacle along said stretch with resulting clamping of said belt between said first roller and said sheave;  
a second lever having a fixed second fulcrum and a free end carrying said second roller; and  
spring means engaging said second lever for placing said belt under a tension insufficient to clamp same between said first roller and said sheave in the absence of a belt-slowng obstacle along said stretch.

4,417,536

## LATERALLY PIVOTABLE UPPER FEED DOG

Kengo Shiomi, Tokyo, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

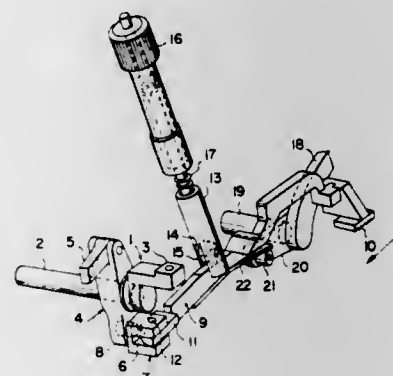
Filed Dec. 22, 1981, Ser. No. 333,317

Claims priority, application Japan, Dec. 25, 1980, 55-184830

Int. Cl.<sup>3</sup> D05B 27/06

U.S. Cl. 112—311

4 Claims



1. A cloth feed mechanism for sewing machines comprising a lower feed dog which moves in and out as well as moves longitudinally to a throat plate and a support member having an upper feed dog fixed thereon adapted to move, interlocked with a driving member, in four directions above an upper surface of the throat plate with a phase in the vertical movement being opposite to that in the vertical movement of the lower feed dog and with a phase in the longitudinal movement being identical to that in the longitudinal movement of the lower feed dog for feeding the cloth in synchronism with the the lower feed dog, wherein said support member is rotatably supported around a vertical shaft so that the upper feed dog can be moved sideways from a position opposite to the sewing area, and further, a base portion of said support member is supported in a manner to be rotatable about a horizontal axis perpendicularly intersecting a direction of feeding cloth so that said upper feed dog can move in four directions.

4,417,537

## MOORING BUOY FOR TANKER SHIPS

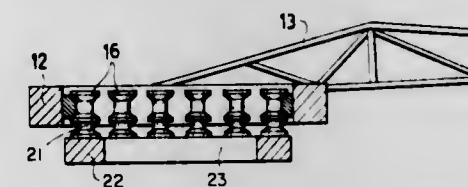
Vincenzo Di Tella, Padua; Dario Falbo, Campalto; Paolo Minardi, Mestre, and Roberto Tinebra, Lido di Venezia, all of Italy, assignors to Tecnomare S.p.A., Venice, Italy  
Continuation of Ser. No. 173,294, Jul. 29, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 402,034

Claims priority, application Italy, Aug. 10, 1979, 84133 A/79

Int. Cl.<sup>3</sup> B63B 21/00

U.S. Cl. 114—230

3 Claims



1. A combination offshore terminal and submerged mooring device for tanker ships, comprising:

a block anchored on the sea bed;

an assembly at the sea bottom removably secured onto said anchoring block, including:

an annular support member releasably connected to said anchoring block,

a plurality of stationary pins angularly spaced apart on said annular supporting member and removably secured thereto,

a plurality of rollers mounted on and about said pins for rotation thereon,

wherein each roller and pin forms a chamber therebetween to be filled with lubricant which balances the pressure with the surrounding environment to inhibit the seepage of water thereinto, and wherein bearing means are mounted in each chamber in contact with said pin and roller to facilitate rotation of said roller relative to said pin and adapted to be lubricated by the lubricant which fills said chamber, and said pin has inlet and outlet bores for conveying lubricant to and from said chamber and for maintaining said chamber filled with lubricant,

an annular race for engaging said rollers for rotation therewith as said race is rotated, and

a rigid mooring arm connected to said annular race for horizontal rotation therewith and for vertical movement relative thereto to provide the proper vertical angular trim relative to the ship being moored to the device and to permit the lowering of said arm toward the bottom of the sea when said arm is not being used; and

an offshore terminal buoyant body universally connected to said anchoring block.

4,417,538

## MARINE ANCHOR WITH RELEASE CAPABILITY

Thomas A. El-Ramey, Rte. 2, Box 813, Pompano Beach, Fla. 33067

Filed Aug. 27, 1981, Ser. No. 296,959

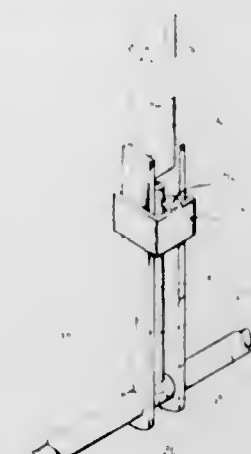
Int. Cl.<sup>3</sup> B63B 21/44

U.S. Cl. 114—298

8 Claims

1. An anchor comprising a cylindrical tube, a pair of generally flat fluke means having one edge coupled to said tube, said fluke means being spaced apart and lying generally in the same plane with one another, an anchor shaft rotatably coupled to said tube intermediate said fluke means, an opening in said tube intermediate said fluke means and a first rod means within said tube, elongate trigger means secured perpendicularly to said rod means and extending through said opening and means for releasably securing said trigger means to said anchor shaft, said securing means being breakable when the force applied to

separate said trigger means and said shaft exceeds a preselected value, said opening permitting said fluke means to move in an



4,417,539

## UNIVERSAL CHOCK

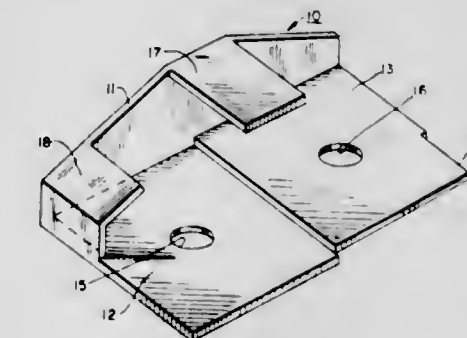
David M. Thompson, 803 Mantoloking Rd., Brick Town, N.J. 08723

Filed Aug. 31, 1981, Ser. No. 297,780

Int. Cl.<sup>3</sup> B63B 23/66

U.S. Cl. 114—381

1 Claim



1. A universal chock comprising a first unit having a first side portion and a first base portion with an upper end and a lower end rigidly secured to the bottom of said first side portion, said upper and lower ends being of the same size and extending perpendicularly from said bottom of said first side portion; a second unit having a second side portion and a second base portion with an upper end and a lower end rigidly secured to the bottom of said second side portion, said upper and lower ends being of the same size and extending perpendicularly from said bottom of said second side portion; said upper and lower end of said first base portion being identical to said upper and lower ends of said second base portion; said upper end of said first base portion fitting over said lower end of said second base portion to reach said bottom of said second side portion, and said upper end of said second base portion fitting over said lower end of said first base portion to reach said bottom of said first side portion to form said chock; means extending between said first and second side portions to secure gear comprising a projection extending from the central top of said first side portion towards, and abutting against, a projection extending from the central top of said second side portion; at least one hole in each of said upper ends of said first and second base portions aligned with corresponding holes in said lower ends of said first and second base portions, to accommodate a means for securing said upper and lower ends of said first and second base portions to a given surface; and having an additional projection being V-shaped and being directly attached to one end of the top of said first side portion and said first base portion and extending towards and abutting against a



similar projection from the top of the same end of said second side portion and said second base portion.

#### 4,417,540 COATING APPARATUS WITH AIR-NOZZLE ARRANGEMENT

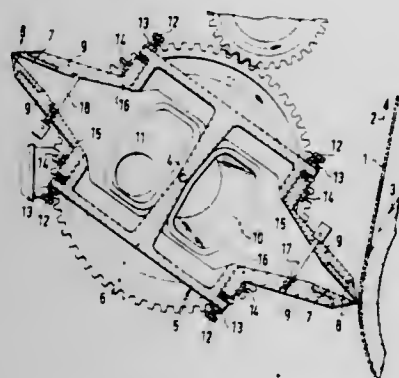
Gerhard Wohlfeil, Monheim, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany  
Filed Dec. 7, 1981, Ser. No. 327,875

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048133

Int. Cl.<sup>3</sup> B05C 11/06

U.S. Cl. 118—63

4 Claims



1. In an apparatus for the continuous, uniform coating with a liquid coating material of a web passing over a counter roll, comprising an air-nozzle arrangement for the removal of excess coating material and the smoothing of a coating, said air-nozzle arrangement being rotatable about its longitudinal center axis, being disposed adjacent to the counter roll and comprising two slot nozzles disposed symmetrically about its longitudinal center axis and displaced 180 degrees relative to each other, each nozzle extending at least over the width of the web, each nozzle including upper and lower lips seated on nozzle-lip holders mounted on the casing of the air-nozzle arrangement and sloping downwardly toward one another to form the nozzle opening, the improvement which comprises imparting to the nozzle-lip holders an angular construction and mounting them on the casing in such a way that they can be positioned and adjusted in the direction of the nozzle-slot width; the nozzle-lip holder which is uppermost in operative position being thinner along a line extending transversely of its angled downwardly sloping area than the lower nozzle-lip holder; the nozzle-lip holders of each slot nozzle being interconnected through traction screws and thrust screws exerting a pulling and pushing action and which are distributed over the length of the slot nozzle, the apparatus further including adjusting screws with lock nuts distributed over the length of the air-nozzle arrangement and operatively connected to the nozzle-lip holders for positioning thereof, and setscrews disposed at right angles to said adjusting screws for fixing the nozzle-lip holders to the casing.

#### 4,417,541 APPARATUS FOR SPRAYING WORKPIECES AND INTERCEPTING OVERSPRAY

Gerhard Schäfer, Nunkirchen-Salchendorf, Fed. Rep. of Germany, assignor to Fritz Schäfer Gesellschaft mit beschränkter Haftung, Neunkirchen-Salchendorf, Fed. Rep. of Germany  
Filed May 21, 1982, Ser. No. 380,952

Claims priority, application Fed. Rep. of Germany, May 23, 1981, 8115387[U]

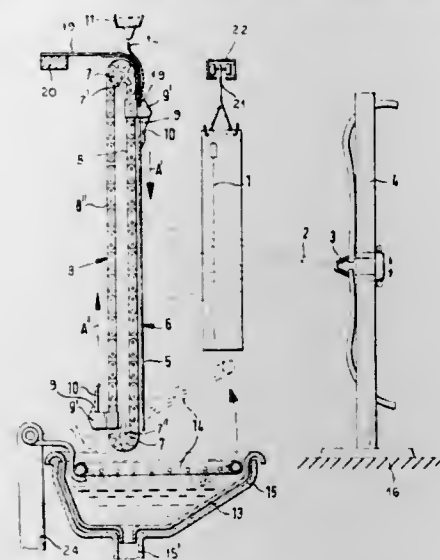
Int. Cl.<sup>3</sup> B05B 13/00, 15/00

U.S. Cl. 118—326

7 Claims

1. An apparatus for the surface-coating of a series of workpieces with a hardenable liquid, comprising:  
a booth;  
nozzle means in said booth connected to a source of coating

liquid and adapted to discharge same in a spray cone centered on a substantially horizontal axis;  
transport means in said booth for carrying a series of generally vertical workpieces along a predetermined path past said nozzle means across said spray cone;  
a stationary screen with a substantially vertical front surface facing said nozzle means at a location in said booth behind the path of said workpieces, said front surface being large



enough to intercept any excess coating material in said spray cone bypassing the workpieces to be coated;  
screen-cleaning means including a substantially horizontal wiper movably extending across said front surface;  
drive means coupled with said screen-cleaning means for vertically displacing said wiper along said front surface to scrape said excess coating material therefrom; and  
a receptacle below said screen for receiving the excess coating material scraped off said front surface.

#### 4,417,542 APPARATUS FOR COATING NARROW VERTICAL ELONGATED SPACES

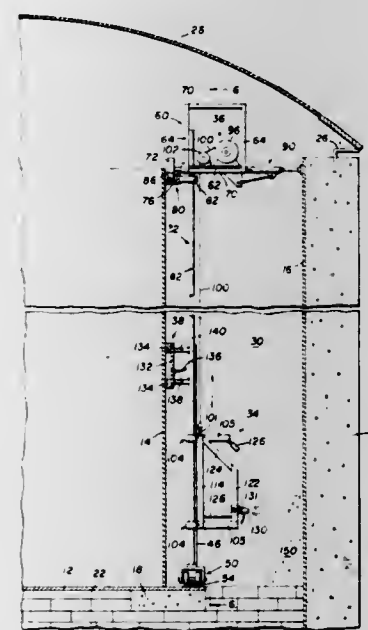
Francis V. Bellafiore, Joliet, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 5, 1982, Ser. No. 405,162

Int. Cl.<sup>3</sup> B05B 13/06, 13/00

U.S. Cl. 118—306

10 Claims



1. Apparatus for applying a coating to one of two walls forming a narrow vertical elongated space, comprising:  
a vertical guide track supporting a vertically displaceable carriage thereon adapted to removeably fit in the said narrow vertical elongated space;

power driven means for vertically displacing the carriage; and means supported by the guide track for releasably securing the guide track against movement lateral to the two walls and sideways in the narrow vertical elongated space.

#### 4,417,543 APPARATUS FOR INDIVIDUALLY ENCAPSULATING MAGNETIC PARTICLES

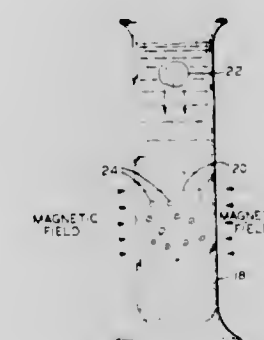
Lawrence L. Lee, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Division of Ser. No. 106,793, Dec. 26, 1979, Pat. No. 4,283,438.  
This application Jul. 27, 1981, Ser. No. 287,023

Int. Cl.<sup>3</sup> B05B 5/02

U.S. Cl. 118—620

25 Claims



1. Apparatus for dispersing a preselected average number of magnetic particles in discrete amounts of liquid internal phase and microencapsulating said amounts, comprising:  
first means for forming drops of liquid internal phase having a relatively large number of the magnetic particles immersed substantially in each drop of said drops;  
second means for receiving said drops; said second means adapted to confine a liquid continuous phase having a consistency to suspend said drops;  
third means operatively associated with said second means for dispersing said particles and forming successively smaller drops with corresponding successively reduced number of particles in each said smaller drop; said third means comprising means for applying a varying magnetic field to said second means, the frequency of said field variations being selected according to the desired number of particles in said smaller drops, the characteristics of the particles and the internal and continuous phases.

#### 4,417,544 DEVELOPING DEVICE

Fuminobu Nishimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 2, 1982, Ser. No. 404,492

Claims priority, application Japan, Aug. 5, 1981, 56-116514[U]; Aug. 5, 1981, 56-116515[U]

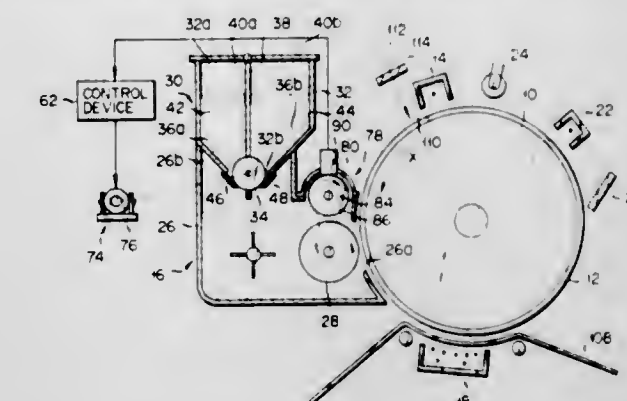
Int. Cl.<sup>3</sup> B05B 7/06

U.S. Cl. 118—688

6 Claims

1. A developing device which supplies first and second developers to a photosensitive layer formed on the surface of a photosensitive body, comprising:  
a receptacle facing the photosensitive layer to store the first and second developers therein;  
supply means in the receptacle for supplying the first and second developers to the photosensitive layer; and  
developer resupply means attached to the receptacle to replenish selectively the shortage of the first or second developer in the receptacle corresponding to a consumption thereof, said developer resupply means including:  
a housing having a connecting port connecting with the receptacle, said housing having first and second storage chambers to store therein the first and second developers,

respectively, said first and second storage chambers connected with the connecting port;  
a rotating body for resupply rotatably disposed at the connecting port, said rotating body having a first portion located inside the first storage chamber, a second portion located inside the second storage chamber, and a third portion located inside the receptacle; and



first drive means connected with the rotating body for driving the rotating body selectively to rotate in one direction or in the other direction opposite thereto, said rotating body supplying the first developer from the first storage chamber to the receptacle when rotated in said one direction, and supplying the second developer from the second storage chamber to the receptacle when rotated in said other direction.

#### 4,417,545 PACKAGE FOR THE TRANSPORTATION OF NEMATODES

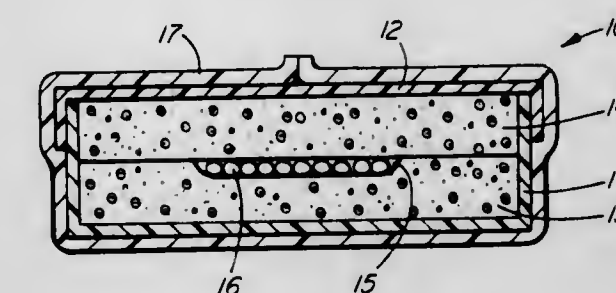
Jean R. Finney, St. John's, Canada, assignor to Memorial University of Newfoundland, Newfoundland, Canada

Filed Feb. 11, 1982, Ser. No. 347,769

Claims priority, application Canada, Sep. 21, 1981, 386306  
Int. Cl.<sup>3</sup> A01K 67/00

U.S. Cl. 119—1

10 Claims



1. A shipping and/or storage package for shipping and/or storing nematodes and/or nematode eggs in their dormant state, consisting essentially of

- (1) a water-impervious container having a removable cover;
- (2) at least one pair of discrete, formed, substrates, each comprising an open celled, light weight foam having wicking action, said substrates substantially filling, and disposing in said container and below the cover, said foam being capable of retaining water within said foam, and when soaked in distilled water, of providing distilled water having a pH of about 5 to about 7, said pair of substrates being disposed in face-to-face relationship; and
- (3) at least one storage cavity at the interface between said pair of substrates for the placement therein of nematodes and/or nematode eggs in their dormant state, said wicking action of said foam serving to maintain said nematodes and/or nematode eggs moist.



4,417,546

**HEAT RECOVERY SYSTEM FOR AN INCINERATOR**  
Gordon H. Hoskinson, 186 Mayfair Rd., Floral Park, N.Y. 11001Filed Sep. 14, 1981, Ser. No. 302,132  
Int. Cl.<sup>3</sup> F22B 33/00

U.S. Cl. 122—20 B

9 Claims



1. A heat recovery system, comprising an incinerator defining a combustion chamber to burn waste material and having a stack connected to the combustion chamber for discharging hot flue gases, a heat exchanger associated with the stack, hot water heating means including a main hot water line for circulating heated water, first pumping means disposed in said main hot water line for continuously flowing water through said line, an auxiliary hot water line connected to the heat exchanger, second pumping means to continuously flow water through the auxiliary hot water line, and valve means connected in said main line and said auxiliary line and operable during periods when the incinerator is operating to connect said main line to said auxiliary line whereby water will pass from said main line through said auxiliary line to the heat exchanger and will be returned to said main line, said valve means being operable during periods when the incinerator is not operating to disconnect said main line from said auxiliary line whereby water will circulate separately in each of said lines.

4,417,547

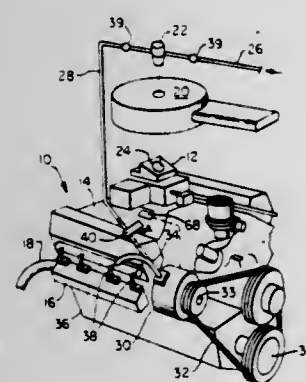
**ENGINE SPEED AND ENGINE LOAD RESPONSIVE FLUID INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE**

Toronto P. Goodman, Summit Point, W. Va., and Bruce W. Everling, Fairfax, Va., assignors to Goodman System Company, Inc., Armonk, N.Y.

Filed Nov. 17, 1981, Ser. No. 322,194  
Int. Cl.<sup>3</sup> F02M 25/02

U.S. Cl. 123—25 J

23 Claims



1. A system for injecting fluid into a cylinder of an internal combustion engine, said system comprising fluid injection means for introducing air to said fluid for injecting said fluid into said cylinder at a rate proportional to the flow of said air, means for supplying pressurized ambient air to said fluid injection means, control means in a responsive relation to the intake

manifold of said engine for controlling the flow of air to said fluid injection means in response to pressure variations in said intake manifold, and means for varying the pressure of said air to said fluid injection means in response to pressure variations in the exhaust manifold of said engine.

4,417,548

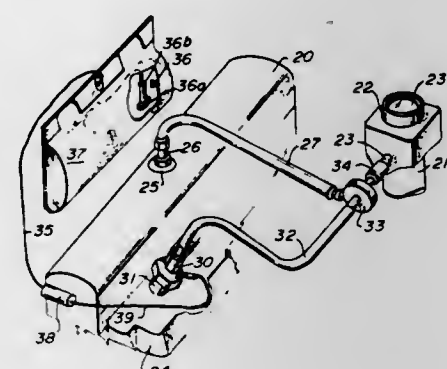
**COMBUSTION CONTROL SYSTEM AND IMPROVED ELEMENTS THEREFOR**

John E. Lindberg, Point Richmond, Calif., assignor to U.S.A. 161 Developments Ltd., Berkeley, Calif.

Filed Feb. 16, 1982, Ser. No. 348,867  
Int. Cl.<sup>3</sup> F02M 25/02, 25/06

U.S. Cl. 123—25 E

36 Claims



1. A combustion control system for an engine having an intake manifold, a gas inlet opening into said intake manifold, and an exhaust conduit, including in combination:

a vortex device having a vortex chamber with a tangential inlet connected to a gas supply at substantially atmospheric pressure, a second inlet, and an axial outlet connected directly to said gas inlet opening of said intake manifold,

a reactor device having a gas inlet connected directly to said exhaust conduit for drawing gas therefrom and an outlet spaced well apart from said vortex device and connected to said second inlet of said vortex device by a conduit, said reactor device comprising

first ejector means for drawing in atmospheric air and mixing it with gas from said exhaust conduit, and second ejector means for drawing in liquid from a source of liquid and sending it into the atmospheric air drawn in by said first ejector means.

4,417,549

**SEALING ARRANGEMENT FOR WET CYLINDER LINERS**

Ulrich Kazenmaier, Wendeburg, and Günter Quast, Brunswick, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 354,143

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108412

Int. Cl.<sup>3</sup> F01P 3/02

U.S. Cl. 123—41.84

2 Claims

1. In a wet cylinder liner used with an internal combustion engine, wherein the cylinder liner has a flange which abuts the cylinder head deck of the crankcase of the engine along a contact surface disposed in spaced relation to a cooling space defined between the crankcase and liner and positioned in spaced relation with respect to the contact surface, a sealing arrangement comprising:

a straight cylindrical wall integral with and on the crankcase facing inwardly toward the cylinder liner;

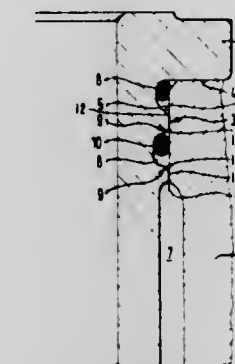
a first annular groove in the cylinder liner starting at the junction of the flange and extending toward the cooling

space, the first annular groove opening toward the straight cylindrical wall of the crankcase and terminating at a first line of contact defining a diameter equal to the diameter of the straight cylindrical wall;

a first sealing ring in the first annular groove and being compressed between the groove and straight cylindrical wall;

a guiding portion on the cylinder liner having a diameter equal to that of the straight cylindrical wall and extending a first distance from the first line of contact toward the cooling space to a second line of contact to define a guiding surface which engages the straight cylindrical wall;

a second annular groove extending from the second line of contact toward the cooling space, the second annular



groove opening toward the straight cylindrical wall and terminating at a third line of contact with the straight cylindrical wall, the second annular groove approaching the second and third lines of contact along convex surfaces;

a second sealing ring positioned in the second groove and being compressed between the surface defining the second groove and the straight cylindrical wall to isolate the first sealing ring from the cooling space, and

a second guiding portion on the cylinder liner having a diameter equal to that of the straight cylindrical wall and extending a second distance from the third line of contact toward the cooling space to a fourth line of contact to define a second guiding surface which engages the straight cylindrical wall proximate the cooling space.

4,417,550

**ENGINE PREHEATING APPARATUS**

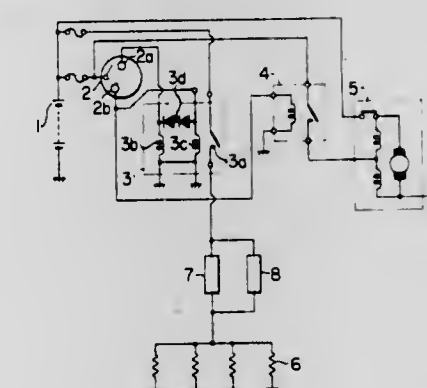
Akihiro Kobayashi, Aichi; Masashi Kida, Okazaki; Novuel Ito, Okazaki, and Yoji Kato, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 21, 1981, Ser. No. 294,821

Claims priority, application Japan, Aug. 28, 1980, 55-119556  
Int. Cl.<sup>3</sup> F02P 19/02

U.S. Cl. 123—145 A

8 Claims



1. An engine preheating apparatus comprising a glow plug mounted on the engine, an actuation circuit for flowing current through said glow plug, a starting resistor of barium titanate as a main component connected to said actuation circuit, said starting resistor having a positive temperature coefficient of

resistance and a Curie point of a specific temperature where the resistance value thereof sharply increases, a normal-operation resistor connected in parallel to said starting resistor, a heat receiver placed in proximity to said starting resistor for receiving the heat from said starting resistor, and a heat conductor having a predetermined thermal conductivity for connecting said heat receiver and said starting receiver to each other.

4,417,551

**VEHICLE ENGINE**

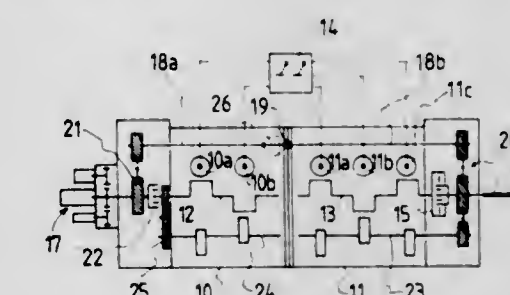
Sven-Olof Kronogard, Karstorpövägen 31, Lomma, Sweden 23400; Clas-Olof Kronogard, Gråbo, Sweden, and Hakan Kronogard, Lund, Sweden, assignors to Sven-Olof Kronogard, Lomma, Sweden

Filed Aug. 7, 1981, Ser. No. 290,936

Claims priority, application Sweden, Sep. 29, 1980, 8006807  
Int. Cl.<sup>3</sup> F02D 17/02

U.S. Cl. 123—198 F

10 Claims



1. A vehicle engine having a number of cylinders arranged in at least one row and provided with a fuelling system permitting selective supply of fuel to two distinct groups of cylinders within said at least one row, and further comprising:

(A) first and second aligned crank shafts each associated with the cylinders in one of said two groups,

(B) first clutch means for selectively connecting said first crank shaft with a power take-off shaft from the engine,

(C) transmission means including a shaft running in parallel to said at least one row of cylinders and engageable with said first crank shaft,

(D) second clutch means for selectively connecting said second crank shaft with said transmission, and

(E) whereby either one, or both, of said two groups of cylinders can be selectively connected to said power take-off shaft to drive the same.

4,417,552

**SOUND-INSULATED INTERNAL-COMBUSTION ENGINE**

Horst Walter, Gross-Denkter; Werner Ebbinghaus, and Hermann Danckert, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk A.G., Wolfsburg, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,505

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046602

Int. Cl.<sup>3</sup> F02F 7/00

U.S. Cl. 123—198 E

4 Claims

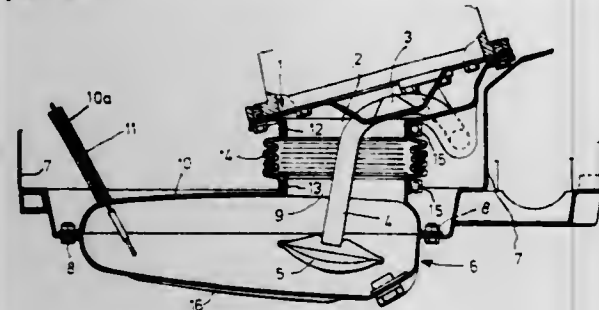
1. In an internal combustion engine including an engine block, an oil pan, a sound insulating capsule and a sealing gasket connecting said oil pan to an underside of said engine block; said sealing gasket having folds for permitting a relative displacement between said engine block and said oil pan during operation of said engine; said sealing gasket being supported on a lower portion of said capsule as a component thereof; said capsule being supported externally of said engine; the improvement comprising

(a) a closure plate sealingly secured to said engine block for covering said underside of the engine block;

(b) means defining an oil return opening in said closure plate;



the dimensions of said opening being small relative to length and width dimensions of said closure plate and said oil pan; and



(c) a first nipple mounted on said closure plate and a second nipple mounted on said oil pan; said nipples being in alignment with one another; said sealing gasket having end portions sealingly secured to said nipples.

4,417,553

# **METHOD AND APPARATUS FOR CONTROLLING THE IDLING SPEED OF AN ENGINE WHEREIN THE AMOUNT OF AIR PROVIDED TO THE ENGINE IS INCREASED BY A PREDETERMINED AMOUNT WHEN THE ENGINE SPEED BECOMES EQUAL TO ZERO**

Nobuhisa Ohkawa, Toyota, and Hiroshi Itoh, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 15, 1981, Ser. No. 302,390

Claims priority, application Japan, Jan. 5, 1981, 56-000038  
Int. Cl.<sup>3</sup> F02D 1/04

U.S. Cl. 123—339

3 Claims



1. A method of controlling the idling speed of an engine comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branched off from the main intake passage upstream of the throttle valve and connected to the main intake passage downstream of the throttle valve, a control valve arranged in the bypass passage, and a stepper motor actuating the control valve for controlling the amount of air flowing within the bypass passage, wherein said method comprises:

detecting the idling speed at which the engine is driven; controlling a step position of the stepper motor so that said idling speed approaches a desired idling speed, and; rotating the stepper motor by a predetermined step number in a rotating direction wherein the flow area of the control valve is increased only the first time the speed of the engine returns to zero after one of the two following events: (1) an ignition switch is turned to an off position and then to an on position and (2) a vehicle speed exceeds a predetermined value.

2. An apparatus for controlling the idling speed of an engine

comprising a main intake passage and a throttle valve arranged in a main intake passage comprising:

an ignition switch for energizing said engine having on and off positions;

a bypass passage connected to the main intake passage upstream of the throttle valve and downstream of the throttle valve;

a control valve arranged in the bypass passage;

a stepper motor for actuating the control valve for controlling the amount of air flowing within the bypass passage;

means for detecting the actual idling speed of said engine;

means for controlling a step position of the stepper motor in response to said detecting means such that said actual idling speed approaches a desired idling speed; and

means for rotating the stepper motor by a predetermined step number in a rotating direction in response to said control means such that the flow area of the control valve is increased only the first time the speed of the engine returns to zero after one of the two following events: (1) said ignition switch is turned to said off position and then to said on position, and (2) a vehicle speed exceeds a predetermined value.

4,417,554

# **ELECTRONICALLY CONTROLLED FUEL INJECTION TIMER**

Hans Dinger, Friedrichshafen, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

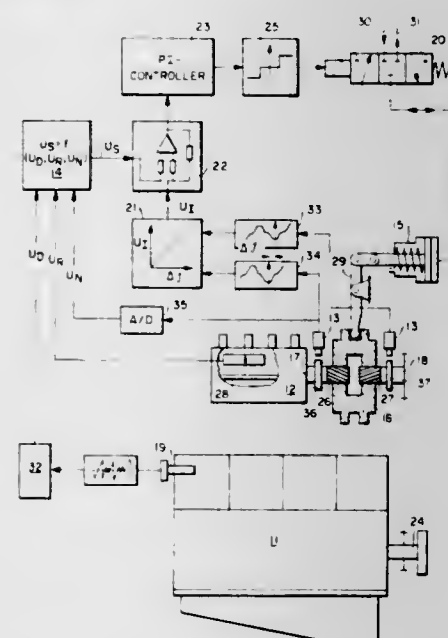
Filed Jan. 18, 1982, Ser. No. 340,216

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101167

Int. Cl.<sup>3</sup> F02M 59/20

U.S. Cl. 123—357

10 Claims



1. An electronically controlled fuel injection timer means for a fuel injection pump of a piston internal combustion engine, the timer means includes control means for controlling an instant of fuel injection, means for generating a desired value of an injection setting in dependence upon operating parameters of the engine, and for providing a control signal to the control means, characterized in that

at least one sensor means is provided for sensing a measurable operating parameter relating to the combustion pressure for a working stroke of the engine and for providing an output control signal to the means for generating a desired value, whereby the generating means is controlled in dependence upon the output control signal of the at least one sensor means, and in that

the operating parameter is proportional to a rate of increase in combustion pressure in a cylinder of the engine.

4,417,555

# **FUEL INJECTION PUMP ARRANGEMENT**

Herbert Deutschmann, and Ewald Kamlettner, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

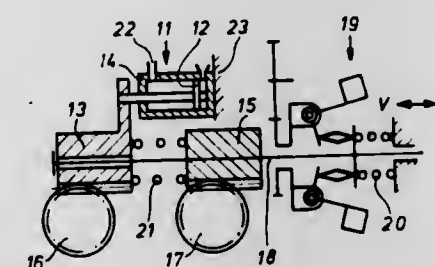
Filed Oct. 24, 1980, Ser. No. 200,383

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001162

Int. Cl.<sup>3</sup> F02D 17/00

U.S. Cl. 123—372

12 Claims



1. A fuel injection pump arrangement for an internal combustion engine, the arrangement comprising adjustable regulator rod means for controlling a fuel delivery setting to the internal combustion engine, the regulator rod means including a first and second regulator rod part, means for mounting the first and second regulator rod parts so as to be axially movable toward and away from each other, spring means acting upon the first and second regulator rod parts so as to provide a reactive effect on a setting member of the fuel injection pump arrangement, and means for selectively stopping one of the first and second regulator rod parts from moving, characterized in that means are provided for selectively removing a force effect of the spring means acting upon the first and second regulator rod parts,

the force effect removing means is an independent power source,

the selective stopping means includes a first cylinder piston means adapted to cooperate with one of the first and second regulator rod parts and a housing, and in that the power source includes a second cylinder piston means cooperating with the first cylinder piston means and with the spring means,

the first cylinder piston means includes an annular piston guided in the housing and connected with one of the first and second regulator rod parts and a piston means guided interiorly of the annular piston and slidable with respect to the other of the first and second regulator rod parts, and in that the other of the first and second regulator rod parts is operatively associated with the second cylinder piston means,

means are provided for enabling the first and second cylinder piston means to be simultaneously acted upon by a pressure medium,

the enabling means includes overflow openings provided in the annular piston,

spring means are disposed between the annular piston and the piston means, and

a cylindrical sleeve is disposed so as to float in the housing, a check ring is disposed so as to float in the housing coaxially to the cylindrical sleeve, and in that the cylindrical sleeve and check ring form a cylinder for the annular piston.

4,417,556

# **METHOD FOR CLOSED-LOOP CONTROL OF THE INSTANT OF IGNITION**

Reinhard Latsch, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

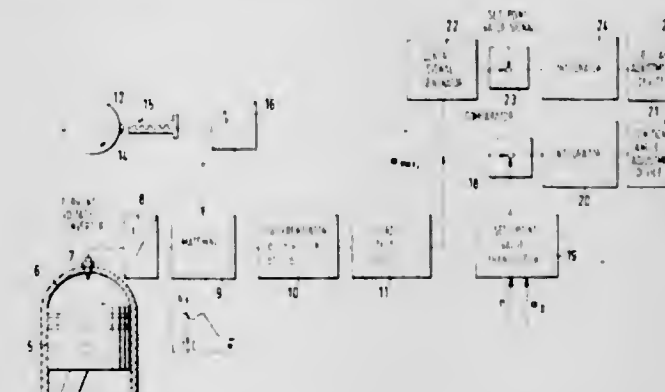
Filed Sep. 29, 1980, Ser. No. 191,742

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939580

Int. Cl.<sup>3</sup> F02D 37/02

U.S. Cl. 123—425

15 Claims



1. A method for the closed-loop control of the instant of ignition in an internal combustion engine to which an operational mixture is delivered, comprising the steps of:

ascertaining the occurrence of the top dead center in sequential work cycles of at least one combustion chamber of the engine;

measuring the ionic current released during combustion of the operational mixture in the combustion chamber by an ionic current sensor;

detecting the occurrence relative to said occurrence of the top dead center of the peak of the first rising portion of a curve resulting from successively measured ionic current values within a crankshaft angle range of 0°-90° subsequent to when the ascertained top dead center occurrence in sequential work cycles of said at least one combustion chamber occurs;

generating an actual value signal corresponding to the occurrence of said peak;

generating a set-point value signal for the actual value signal; comparing the generated actual value signal to the generated set-point value signal and generating a difference signal; and

adjusting the instant of ignition in accordance with the generated difference signal.

4,417,557

# **FEED AND DRAIN LINE DAMPING IN A FUEL DELIVERY SYSTEM**

Richard P. Walter, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 31, 1981, Ser. No. 289,012

Int. Cl.<sup>3</sup> F02B 3/00

U.S. Cl. 123—467

4 Claims

1. A fuel delivery system having metering and injection modes of operation, including at least one fuel injector having a metering chamber for injecting fuel into the combustion chambers of an engine from a reservoir comprising:

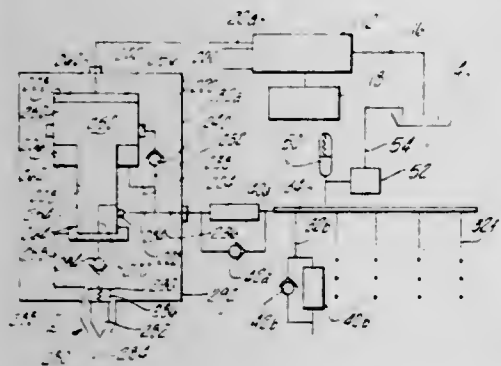
pump means for selectively applying pressurized fuel from the reservoir to at least one fuel injector during an injection mode and for selectively depressurizing during a metering mode, said pressurizing and depressurizing are performed in correspondence with the combustion process within the engine;

a feedline interconnecting the fuel injector with said pump means, wherein said feedline is characterized as having a determinable impedance;

pressure source means for establishing a pressure level of fuel intermediate the pressurizing and depressurizing pres-



sure levels applied to the fuel injector and for supplying a determinable quantity of fuel to the metering chamber; and  
 drain line means for carrying fuel between the fuel injector and said pressure source means including a fuel carrying conduit having an impedance which bears a preselected relationship to and different from the impedance of said feedline and having located therein flow restricting means



for restricting the flow therethrough, said flow restricting means has an impedance level to flow which bears a preselected relationship to and different from the impedance of said conduit wherein said drain line means further includes valve means, connected in parallel across said flow restricting means, for diverting fuel flow from said flow restricting means during intervals of time when fuel is flowing from said pressure source means towards a particular one of said fuel injectors.

4,417,558

# FUEL FEEDING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Minoru Osuga, Hitachi; Yoshishige Oyama, Katsuta, and Mamoru Fujida, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

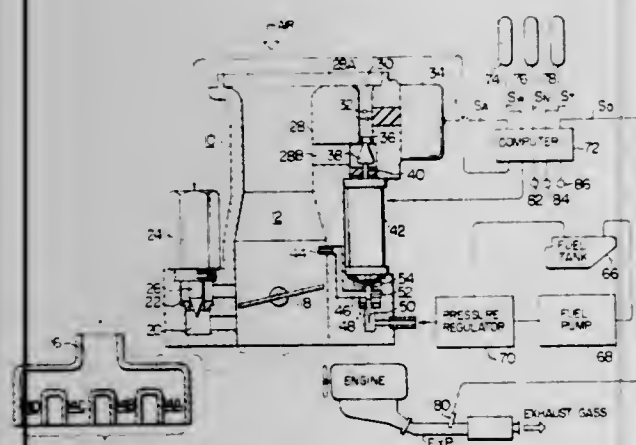
Filed Mar. 18, 1982, Ser. No. 359,512

Claims priority, application Japan, Mar. 25, 1981, 56-40821 [U]

Int. Cl.<sup>3</sup> F02D 5/00

U.S. Cl. 123—489

11 Claims



1. A fuel feeding apparatus for an internal combustion engine comprising:

- (a) a main intake air path connected to an upstream side of a manifold portion of intake pipes;
- (b) a Venturi portion formed in said main air-intake path;
- (c) a throttle valve disposed in said main air-intake path at a position downstream of said Venturi portion;
- (d) a bypass air path disposed adjacent to said main air-intake path to supply bypass air from a point upstream of said Venturi portion to said Venturi portion;
- (e) an air flow meter disposed in said bypass air path to

detect the quantity of air flowing through said bypass air path;

- (f) an air-metering valve disposed in said bypass air path at a position downstream of said air flow meter;
- (g) a fuel path feeding fuel continuously from a fuel pump into said main air-intake path during operation of the engine;
- (h) a fuel-metering valve disposed in said fuel path;
- (i) drive means for controlling the opening of said air-metering valve and said fuel-metering valve in such a manner that said fuel-metering valve is displaced to increase the quantity of fuel flowing through said fuel path when said air-metering valve is displaced to decrease the quantity of air flowing through said bypass air path;
- (j) control signal generating means applying a control signal to said drive means for controlling the opening of said air-metering valve so that the output signal of said air flow meter attains coincidence with a pre-set level;
- (k) an oxygen sensor disposed in an engine exhaust gas path; and
- (l) closed-loop control means for modifying the value of said pre-set level in response to the output signal of said oxygen sensor so that the rate of excess air in the engine exhaust gases can be maintained to be always equal to unity.

4,417,559

# SUPERCHARGER APPARATUS FOR INTERNAL COMBUSTION ENGINE

Minoru Matsuda, Chofu; Kentaro Kato, Niiza, and Masatoshi Suzuki, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

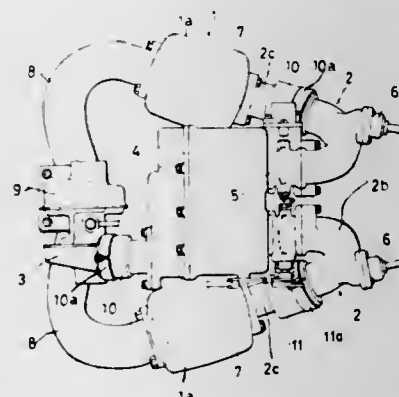
Filed Jun. 3, 1981, Ser. No. 269,984

Claims priority, application Japan, Jun. 25, 1980, 55-85163

Int. Cl.<sup>3</sup> F02D 23/00

U.S. Cl. 123—559

4 Claims



1. A supercharger apparatus for an internal combustion engine for a vehicle having an intake passage means coupled to said internal combustion engine, said intake passage means comprising a compressor, a pre-chamber on the downstream side of said compressor, two throttle valves on the downstream side of said pre-chamber, a first heat insulating elastic means coupled between said compressor and said pre-chamber and two second heat insulating elastic means coupled between each of said throttle valves and a corresponding intake port of said engine, wherein said throttle valves are disposed closer to said second elastic means than said first elastic means, and wherein the portion of the intake passage that has said pre-chamber and each of said throttle valves is supported in a floating condition by said first and second elastic means on both ends thereof.

4,417,560

# INTAKE AIR BOOSTER FOR AN INTERNAL COMBUSTION ENGINE

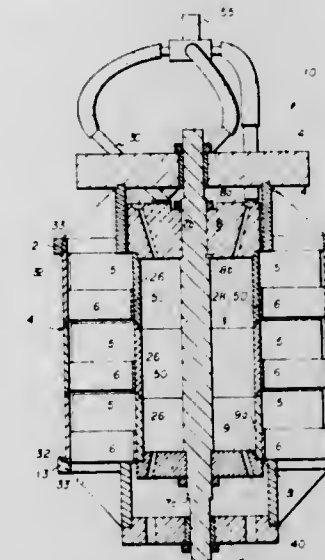
Eugene O. Frank, Box 64, Caldwell, Id. 83605

Filed Jul. 9, 1981, Ser. No. 281,908

Int. Cl.<sup>3</sup> F02B 33/40

U.S. Cl. 123—559

11 Claims



1. An intake air booster for increasing air flow for an internal combustion engine having an intake manifold or the like comprising, in combination:

- a first air passageway communicating ambient air with the engine's intake manifold,
  - first means for introducing air in said first passageway,
  - a second air passageway communicating with said intake manifold and second means including compressed air means for simultaneously and selectively increasing the air flow rate in both said first and second passageways wherein said first air passageway is concentrically disposed about said second air passageway, impeller means on said second air passageway defining said second means, rotary and stationary vane means on said first air passageway defining said first means, said impeller means connected to said rotary vane means whereby rotation of said impeller means drives said rotary vane means wherein said impeller means comprise caps disposed on top and bottom portions of said second air passageway, apertures extending through said caps from top to bottom surfaces thereof and said apertures angled relative to said top and bottom surfaces whereby air impinging therethrough causes a rotative reaction by said cap
- whereby upon demand, the air flow rate is increased in the manifold.

4,417,561

# METHOD AND APPARATUS FOR AUTOMATICALLY CHANGING AND DISPOSING OF USED ENGINE OIL

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 27, 1980, Ser. No. 153,666

Claims priority, application Japan, May 26, 1979, 54-64586; Jul. 11, 1979, 54-86830

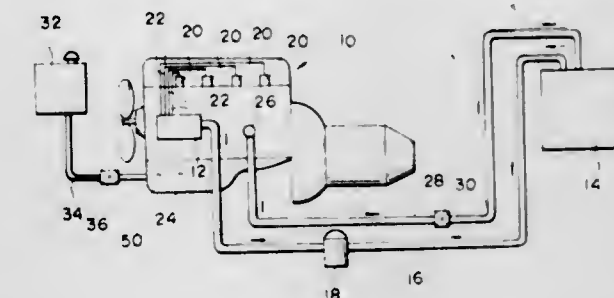
Int. Cl.<sup>3</sup> F02B 13/00

U.S. Cl. 123—575

11 Claims

1. In an internal combustion engine for an automotive vehicle which can operate on a fuel/oil mixture, the engine including an oil pan containing oil therein, a lubricant system which is so constructed and arranged as to use oil in the oil pan to lubricate moving parts of the engine, and a fuel system having a fuel tank, a system for automatically changing oil and disposing of used oil comprising: an oil conduct means, including an oil conduct conduit having one end communicating with a portion of the lubricant system and the other end communicating with the fuel tank,

for conducting a portion of used oil flowing through the lubricant system during engine operation, including the time when the automotive vehicle is running, to the fuel tank, the portion of used oil conducted from the lubricant system



being mixed with fuel within the fuel tank to form a fuel/oil mixture on which the automotive vehicle can operate; an oil tank for storing new oil; and oil supply means responsive to the level of oil in said oil pan for supplying new oil from said oil tank to said oil pan.

4,417,562

# CARBURETOR MIXTURE CONTROL APPARATUS

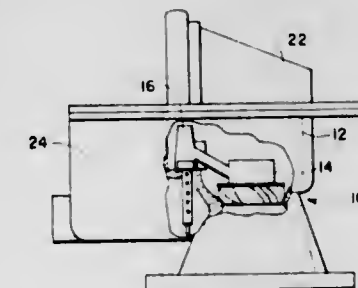
Arthur E. Dalke, 11814 E. 36th St., Tulsa, Okla. 74145

Filed Jun. 8, 1981, Ser. No. 271,701

Int. Cl.<sup>3</sup> F02M 29/02; F02B 31/00

U.S. Cl. 123—592

2 Claims



1. A carburetor comprising:

- (a) at least one venturi tube;
- (b) a booster venturi located within said venturi tube; and
- (c) a vane means associated with said booster venturi to produce centrifugal motion in the air passing between the outside of said booster venturi and the inside of the venturi tube, wherein said vane means is a plurality of radial vanes sloped at about 45° angle to the direction of the air flow and located within the annulus formed by said booster venturi and said venturi tube.

4,417,563

# IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Durvis W. Brodie, 225 West 1st Street, Winkelman, Ariz. 85292

Filed Aug. 17, 1981, Ser. No. 293,227

Int. Cl.<sup>3</sup> H05B 37/02, 39/04

U.S. Cl. 123—606

4 Claims

1. In combination with an internal combustion engine including

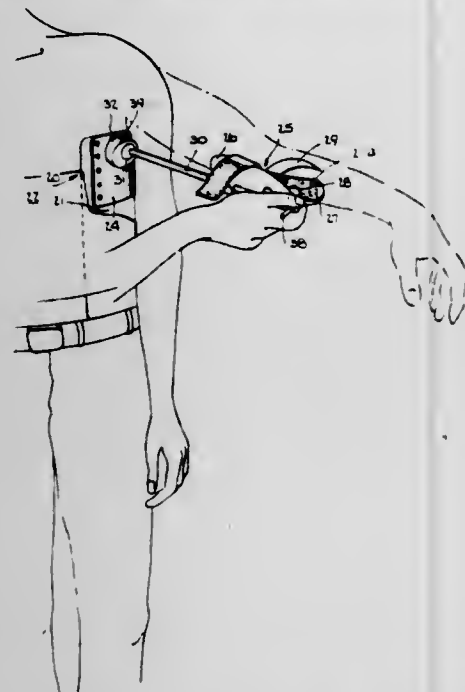
- a housing,
- at least a pair of combustion chambers formed in said housing,
- passage means formed in said housing for communicating a combustible mixture to said combustion chambers and for transporting exhaust gases therefrom,
- spark plugs carried by said housing for intermittently igniting said combustible mixture in said combustion chambers,
- a distributor for accepting and intermittently applying igni-







tudinal position of said elbow supporting means on said rod when applied to the patient whereby to control needed pressure application to the projecting portion of said olecranon process for stabilizing a malfunctioning arm by transmission of pressure proximally to and axially of the arm to provide for and render full elbow flexion,



full forearm supination and pronation, and functional forearm extension in said locked longitudinal position; and  
(e) second control means between said rod and elbow supporting means to releasably lock said adjusted and locked longitudinal position of the elbow supporting means on said rod against rotary movement.

4,417,570

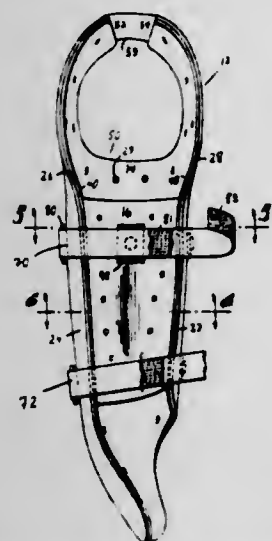
**LOWER ARM BRACE**

Alan Finnieston, 2480 W. 82 St., Hialeah, Fla. 33016

Filed Dec. 15, 1981, Ser. No. 330,801

Int. Cl.<sup>3</sup> A61F 5/04

U.S. Cl. 128—87 R



1. A lower arm brace comprising an elongate, outer member, having a base portion and curved side walls to form a generally U-shaped cross section, one end of the base portion being extended to form a wrist extension being angled with respect to the base portion so as to maintain the hand of the wearer at an angle with respect to the forearm, the hand being turned inwardly towards the body of the wearer, the other end of the base portion extending to a point adjacent the elbow of the wearer said other end of the base having extensions on the side walls which project above the lateral side edges of the side walls, and curve inwardly

towards each other, said extensions being of a reduced width so as to partially surround the upper arm above the elbow without surrounding the elbow with the ends of said extensions being in closely spaced relation, said extensions being flexible to fit various sized upper arms and serving to prevent the brace from sliding with respect to a predetermined position on the arm, an inner member having a base portion and curved side walls to form a generally U-shaped cross section, said inner and outer members interfitting to be positioned in embracing relation of the inner and outer surface of the lower arm between the elbow and wrist and means to hold the members releasably and adjustably about the lower arm in clamping sleeve-like relation.

4,417,571

**PROSTHETIC CEMENT SPACER AND METHOD FOR USING SAME**

Carl L. Nelson, 4301 W. Markham, Little Rock, Ark. 72201; Darrel W. Haynes, 11200 Bainbridge Dr., Little Rock, Ark. 72212, and Michael J. Weber, Rte. 3, Box 410B, Little Rock, Ark. 72211

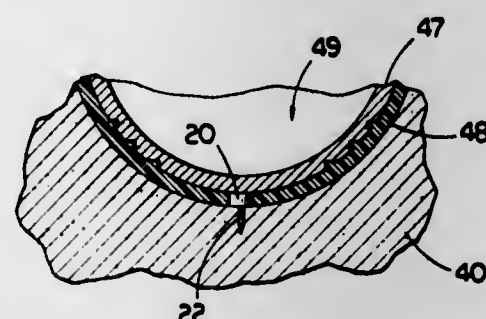
Division of Ser. No. 54,027, Jul. 2, 1979, Pat. No. 4,285,071.

This application Nov. 10, 1980, Ser. No. 205,455

Int. Cl.<sup>3</sup> A61F 1/24

U.S. Cl. 128—92 B

1 Claim



1. A prosthetic cement spacer for controlling the thickness of cement applied between a prosthetic insert and a supporting member to which the insert is to be secured, such as a natural bone, said prosthetic cement spacer comprising:  
a standoff body fabricated from biocompatible acrylic bone cement which is solid and substantially cylindrical and having a top surface and a base surface; and  
means for anchoring said standoff body to said supporting member, said anchoring means including a pointed wire having a received portion secured within said standoff body and an extending portion free of said standoff body, the length of said free portion being at least as great as the length of said received portion, said extending portion extending outwardly from said base surface, and being substantially concentric to said standoff body.

4,417,572

**RESTRAINED PATIENT EXCESSIVE MOVEMENT INDICATING SAFETY DEVICE**

Frank H. Green, Rushville, Ind., assignor to David L. Green, Bratenahl, Ohio, a part interest

Filed Dec. 31, 1980, Ser. No. 221,893

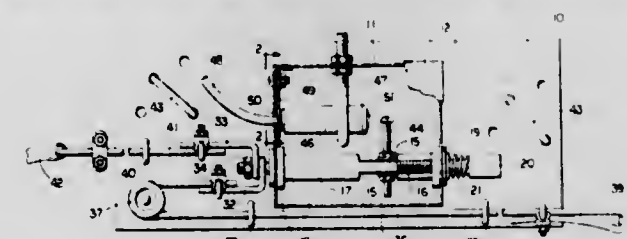
Int. Cl.<sup>3</sup> A61F 13/00; A61B 5/10

U.S. Cl. 128—134

2 Claims

1. An apparatus for detecting body movements of abnormal amplitude by patients restrained in bed with conventional strap or harness members, said apparatus comprising a base, a moveable member mounted for movement on the base, a push-button actuated switch means operable to activate an alarm when its push-button is depressed, said means including a switch being mounted on said base adjacent said moveable member with the axis of motion of its push-button parallel to the axis of

motion of said moveable member, an abutment carried by said moveable member intermediate its ends and positioned to engage and depress said push-button upon a predetermined movement of said moveable member, resilient means biasing said moveable member in a direction spacing said abutment from the push-button, and attaching means for joining said moveable member to said conventional strap or harness members to thereby exert a motion producing force on said moveable member which is resisted by said resilient means and which motion is a direct function of the tensional force applied to the strap or harness members by the movement of the patient; said push-button actuated switch being a conventional,



hand-held push-button, call switch, said moveable member having a threaded portion, and a correspondingly threaded element received upon said threaded portion, said resilient means being a compression spring that encircles said threaded portion and is bottomed on a portion of said base and biases said threaded element from said base portion, the position of said element on said threaded portion thus determining the biasing force exerted by said spring on said moveable member; said switch having a cable extending therefrom which is removably mounted on said base, said base further including a sidewall having a cable receiving slot, said sidewall further including a moveably mounted gate, adjacent said slot, that lockingly engages said cable.

4,417,573

**PATIENT ADAPTOR FOR MEDICAL VENTILATOR**

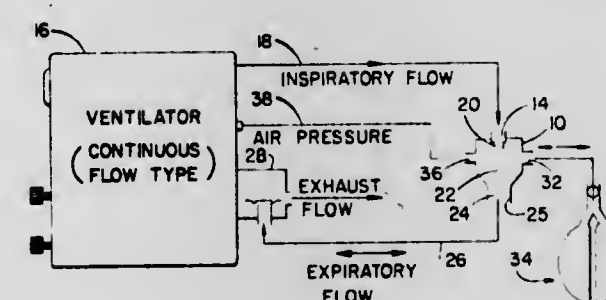
Douglas F. De Vries, Redlands, Calif., assignor to Bear Medical Systems, Inc., Riverside, Calif.

Filed Jul. 2, 1981, Ser. No. 279,957

Int. Cl.<sup>3</sup> A61M 16/00

U.S. Cl. 128—204.25

1 Claim



1. A ventilator of the type having an inspiratory flow path, an expiratory flow path, a patient adaptor connected thereto and supply means for providing a substantially continuous flow of respiratory gas therethrough, said patient adaptor having an inlet fluidically connected to said inspiratory flow path, an outlet fluidically connected to said expiratory flow path, and patient connection means fluidically connected to said inlet and said outlet for fluidly coupling the patient adaptor to the breathing passages of a patient, wherein the improvement comprises:

- a gas flow accelerating nozzle in said patient adaptor within said inlet such that substantially all gas flow through said inlet passes through said nozzle;
- a chamber in said adaptor having an inlet opening and an outlet opening, said nozzle fluidly connected to said inlet opening, said chamber being in fluid communication with said patient connection means;
- a throat in said adaptor downstream of said chamber and in

alignment with said nozzle coupling said chamber outlet opening to said outlet;  
said supply means providing said substantially continuous flow of gas within a range that would provide a depressed pressure in said chamber equal and opposite to a back pressure at said outlet opening caused by the pneumatic resistance of said continuous supply gas flow through said expiratory flow path; and  
whereby said nozzle and said throat are internally dimensioned and said continuous flow of said supply means is selected such that said back pressure is substantially completely offset by the depressed pressure in said chamber created by the accelerated flow of gas through said nozzle.

4,417,574

**LIQUID DRAIN FOR PATIENT BREATHING APPARATUS**

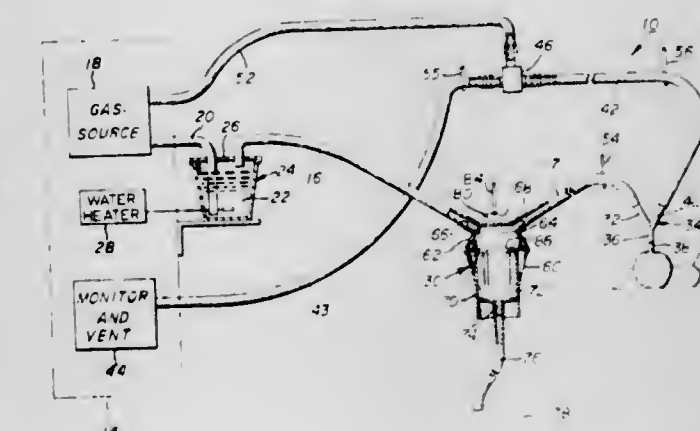
Daniel A. Talonn, University City, Mo.; Robert E. Phillips, Studio City, Calif., and Alan B. Ranford, Des Peres, Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed May 3, 1982, Ser. No. 373,940

Int. Cl.<sup>3</sup> A61M 16/00

U.S. Cl. 128—205.12

12 Claims



1. A liquid drain for a patient breathing system in which gas is supplied to a patient comprising housing means including an upper hollow portion adapted for connection in fluid communication with said breathing systems and for receiving liquid precipitation from the system, a lower hollow portion adapted to receive liquid precipitation from said upper portion, and liquid permeable, gas impermeable barrier means including a first layer of hydrophilic material which is gas permeable when dry and liquid permeable and gas impermeable when wetted by a liquid, and a water soluble second layer on a side of said first layer which is substantially gas impermeable to prevent gas to flow through said barrier when said second layer is dry but is dissolvable when precipitated liquid contacts it, said barrier means being disposed between said upper and lower portions so that liquid precipitation is flowable through said barrier means to said lower portion from said upper portion but said barrier means prevents gas flow to said lower portion.

4,417,575

**RESPIRATORS**

Joseph R. Hilton, Surrey, and John D. Wood, Hertfordshire, both of England, assignors to Racal Safety Limited, Middlesex, England

Filed Jun. 22, 1981, Ser. No. 276,190

Claims priority, application United Kingdom, Jul. 30, 1980, 8021879

Int. Cl.<sup>3</sup> A62B 7/10

U.S. Cl. 128—206.19

18 Claims

1. A generally cup-shaped filtering facepiece (100) formed of



flexible filtering material adapted to cover the nose and mouth of a user, said facepiece comprising

- (a) convergent generally frusto-conical side wall means (105, 106) having at its large end a peripheral free edge (104);
- (b) end wall means (108) closing the smaller end of said side wall portion, thereby to define a pocket for receiving the nose and mouth of the user with said peripheral edge extending over the nose and under the chin of the user, said end wall means including
- (1) a plurality of end wall panels (108a, 108b) foldably connected with said side wall means by four first fold lines (107a, 107b) that are interconnected by four apices



- (X, Y, Z), respectively, said end wall panels being connected with each other by central fold line means (109a, 109b) that extend between a pair of opposite apices (X, Z), thereby to define between said four interconnected fold lines a generally pyramidal quadrilateral region (108) having four triangular panels;
- (2) said end wall panels being folded inwardly about said four interconnected fold lines to cause said generally pyramidal quadrilateral region to extend reversely within said pocket at the closed end of the facepiece; and
- (c) means (114) for attaching said facepiece to the wearer's head.

4,417,576

## DOUBLE-WALL SURGICAL CUFF

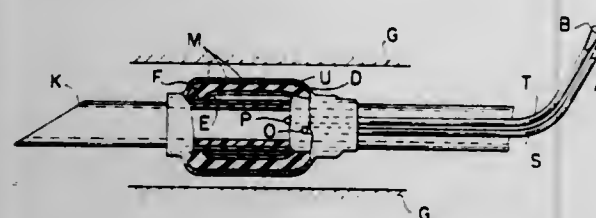
Ostap E. Baran, 219 E. 12th St., New York, N.Y. 10003

Filed Feb. 25, 1982, Ser. No. 352,124

Int. Cl.<sup>3</sup> A61M 25/00

U.S. Cl. 128—207.15

7 Claims



1. A surgical cuff for introduction into an integral body passage comprising:

- (A) A tubular base member;
- (B) An imperforate flexible inflatable tubular inner cuff member having its outer ends connected to said tubular base member;
- (C) a flexible distensible tubular outer cuff member having its outer ends connected to said tubular base member, the proximal outer end of said outer cuff member being connected to said tubular base member at a given distance from the proximal outer end of said inner cuff member and the distal outer end of said outer cuff member being connected to said tubular base member at a distance from the distal outer end of said inner cuff member which is substantially the same as said given distance, the wall of said outer cuff member being multiperforated at spaced points;
- (D) A sponge-like material in the space between said inner and outer cuff members and adapted to absorb a surgical

fluid and then expel said fluid when compressed, said sponge-like material comprising a layer having a substantially uniform thickness;

- (E) First passage means communicating with the space between said inner cuff member and outer cuff member for introducing a surgical fluid into said space for absorption for said sponge-like material; and
- (F) Second passage means communicating with the space between said inner cuff member and said tubular base member for inflating said inner cuff member to displace wall portions thereof toward the wall of said outer cuff member;
- (G) Whereby the spacing between the opposed walls of the inner and outer cuff members is reduced to uniformly compress said sponge-like material and thereby transmit absorbed surgical fluid outwardly through the perforations of the wall of said outer cuff member; and
- (H) Whereby said flexible inner cuff member may be further expanded to gently press said flexible outer cuff member, via said sponge-like material, against the wall of the integral body passage to close the passage; and
- (I) Whereby said sponge-like material also functions like a buffer and smooths out the application of the pressure against said wall of the body passage and thereby reduces the possibility of ischemic necrosis of the integral body passage; and
- (J) Whereby when said inner cuff member is deflated said perforations of the wall of said outer cuff member are closed preventing backflow of said surgical fluid and thereby precisely controlling the amount of said surgical fluid transmitted around said outer cuff member.

4,417,577

## GRAVITATIONAL FLOW SYSTEM FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS

Joseph N. Genese, Waukegan, and Andrew J. Muettterties, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

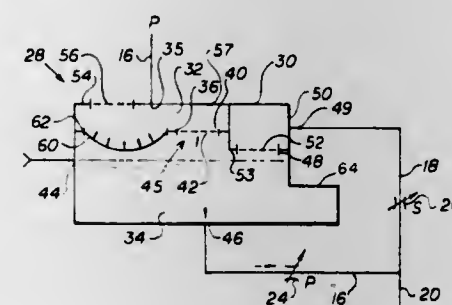
Continuation-in-part of Ser. No. 167,948, Jul. 14, 1980, Pat. No. 4,316,460, which is a continuation-in-part of Ser. No. 16,461, Feb. 28, 1979, Pat. No. 4,256,104. This application Jan. 9, 1981, Ser. No. 223,642

The portion of the term of this patent subsequent to Feb. 28, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—81

9 Claims



1. A combined air barrier and liquid sequencing valve for the sequential administration of a primary liquid and a secondary liquid comprising:

- a housing divided into three or more chambers by a plurality of partition members;
- one of said partition members being disposed substantially horizontally within said housing so as to divide said housing into first and second chambers and to seal said first chamber from said second chamber;
- said first chamber in said housing having an inlet port incorporated therein for the passage of primary liquid into said first chamber, and an outlet port incorporated therein for the passage of said primary liquid from said first chamber

into the second chamber, said outlet port from said first chamber including a hydrophilic membrane incorporated therein and covered thereby for the prevention of air movement between said first chamber and said second chamber when said hydrophilic membrane is moistened; an inlet port to said second chamber for the admission of secondary liquid and a plurality of outlet ports from said second chamber for the passage of primary and secondary liquid; and

an air capturing pocket proximate said hydrophilic membrane covering said outlet port from said first chamber to said second chamber, said air capturing pocket being constructed and arranged for the reception of residual air within said second chamber proximate said hydrophilic membrane when said secondary liquid is dispensed into said second chamber whereby the flow of said primary liquid is interrupted for so long as the pressure of said secondary liquid is greater than that of said primary liquid; said air capturing pocket being defined as the area below said outlet port from said first chamber to said second chamber, enclosed on one side by a third chamber extending at least partially downward below said horizontal partition, said third chamber having an inlet port from said second chamber incorporated at its base and sealed by a hydrophilic membrane whereby air may be entrapped below said outlet between said first and second chambers during dispensing of said primary liquid, said third chamber further having an outlet port positioned above said inlet port and opening out of said housing whereby secondary liquid may pass upwardly through said inlet port into said third chamber and out of said outlet port during dispensing of said secondary liquid.

4,417,578

## ULTRASONIC TRANSDUCER WITH ENERGY SHIELDING

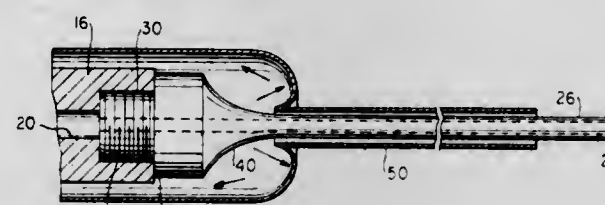
Anton Banko, The Bronx, N.Y., assignor to Surgical Design, Long Island City, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,707

Int. Cl.<sup>3</sup> A61B 17/00

U.S. Cl. 128—303 R

9 Claims



1. In an ultrasonic instrument comprising for converting electrical energy into vibratory mechanical energy, acoustic impedance transformer means connected to said energy converting means and an elongated work piece having a non-linear transition region at one end which is connected to said transformer means and a work tip at the other end, the transformer means and the transition region converting the vibratory energy into longitudinal motion which is transmitted along the work piece to the work tip with there being mechanical energy radiating outwardly from the transition region, and shield means located adjacent and surrounding said transition region and at least a portion of said elongated work piece toward said work tip and spaced away from the entirety thereof, said shield means being generally concentric with said portion of the elongated work piece which it surrounds to form a passage therebetween and having a non-linear region opposing said non-linear transition region for reflecting the mechanical energy radiated from said transition region back toward said converting means and in a direction away from the work piece and the passage between the elongated portion of the work piece and the shield means.

4,417,579

## DEVICE FOR MARKING OUT THE CORNEA IN OPHTHALMOSURGICAL OPERATIONS

Sergel A. Soloviev; Svyatoslav N. Fedorov; Vitaly P. Osetskyy, all of Moscow, U.S.S.R., and Valery V. Durnev, deceased, late of Moscow, U.S.S.R. by Tamara S. Durneva, administratrix, assignors to Moskovsky Nauchno-Issledovatel'skiy Institut Mikrokhirurgii Glaza, Moscow, U.S.S.R.

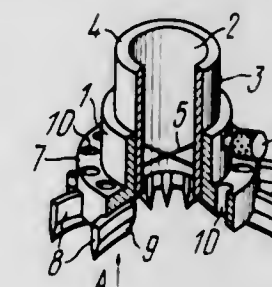
PCT No. PCT/SU80/00140, § 371 Date Apr. 16, 1982, § 102(e) Date Apr. 16, 1982, PCT Pub. No. WO82/00584, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 22, 1980, Ser. No. 373,492

Int. Cl.<sup>3</sup> A61F 9/00

U.S. Cl. 128—303 R

6 Claims



1. Means for marking out the cornea in ophthalmosurgical operations, characterized in that said means contains a body 1 in the form of a bush having a central hole 2, said central hole accommodating a sighting aligning device 3, and plate means 8 provided at one of the bush ends in the planes square with the plane of said sighting device 3 and further said plate means adapted to contour to the cornea being marked out, while the face edges 9 of the plates 8 are curved and their thickness is so selected that, upon applying a preset force thereto, said edges would cause elastic non-destructive deformation of the cornea, whereas the mutual arrangement of the plates depends upon the required arrangement of incisions made during operation.

4,417,580

## TISSUE PERFORATOR

Alfons Birchmeier, Zürcherstrasse 8, CH-8952 Schlieren, Switzerland

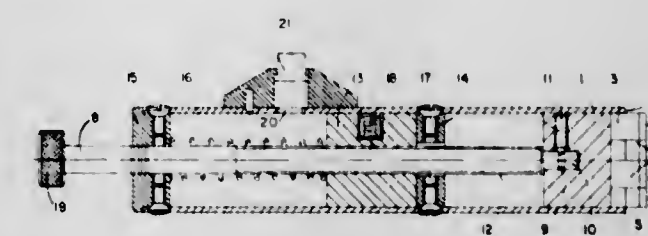
Filed Dec. 23, 1980, Ser. No. 220,168

Claims priority, application Switzerland, Dec. 21, 1979, 11370/79

Int. Cl.<sup>3</sup> A61B 17/32

U.S. Cl. 128—315

2 Claims



1. A tissue perforating device, for use in the treatment of body injuries of a person resulting from bites or stings of poisonous animals, comprising in combination, an elongated hollow holding member, a knife head normally disposed inside said holding member and being movable in opposite directions along said holding member, and operable to be rapidly advanced in one of said directions to project out of said holding member and adapted to move towards said body, and including at least two knives arranged side by side in with other knives off-set in relation to them, all the knives being substantially parallel to each other,



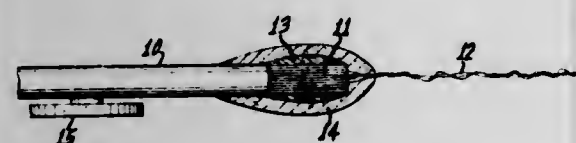
a compression spring,  
a tensioning arrangement for placing the knife head under tension against the action of said spring thereby keeping it in the tensioned condition and a releasing arrangement operative for releasing the tensioned knife head so that it is abruptly moved in said one direction under the action of the compression spring,  
the cutting edge of each knife being substantially rectilinear and substantially perpendicular to said one direction whereby, when said knife head is rapidly moved in said one direction, the knives will penetrate the tissue of the body and make therein a plurality of substantially parallel incisions.

#### 4,417,581 CORNEAL ELECTRODE FOR ELECTRORETINOGRAPHY

William W. Dawson, Gainesville, Fla., assignor to The University of Florida, Gainesville, Fla.  
Continuation of Ser. No. 41,777, May 23, 1979, abandoned. This application Oct. 7, 1980, Ser. No. 194,936  
Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—639

10 Claims



1. Corneal electrode for use in electroretinography comprising a yarn of electrically conductive fibers, means for electrically conductively attaching one end of said yarn to a device for measuring electrical potential, and the other end of said yarn comprising separate independent free ends of said fibers said free ends being unconnected to each other and of such dimension and material to permit contact with a surface film of a cornea without substantial abrasive effect thereon.

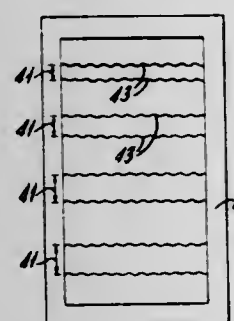
#### 4,417,582 RESOLUTION MEASURING DEVICE FOR ACOUSTICAL IMAGING SYSTEMS AND METHOD OF USE

William S. N. Trimmer, Belle Mead, and David H. R. Vilkomerson, Princeton, both of N.J., assignors to Technicare Corporation, Solon, Ohio

Filed Aug. 5, 1981, Ser. No. 290,266  
Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—660

8 Claims



1. A sonically imaged device for the measurement of acoustical resolution of a sonic transducer which receives acoustical energy of a given wave length comprising:  
a housing which contains the said sonic transducer, at least a first contorted filament which reflects acoustical energy of said given wave length; and  
means for supporting said first contorted filament.

#### 4,417,583 APPARATUS AND METHOD OF INTERNAL EXAMINATION OF GASTRO INTESTINAL TRACT AND ADJACENT ORGANS

Nabil R. Bechal, 65 Knighton Dr., Toronto, Ontario, Canada M4A 1V9, and Alan J. Cousin, 186 Johnson Ave., Toronto, Ontario, Canada M2N 1H3

Continuation of Ser. No. 135,391, Mar. 31, 1982, abandoned.

This application Jun. 30, 1982, Ser. No. 393,938

Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—660

8 Claims



1. A probe suitable for use in internally inspecting a gastro intestinal tract and adjacent organs comprising a head connected to a flexible cable, first means on said probe to provide an image of the tract in advance of said probe, an ultrasound array mounted on said head and including a plurality of transducers circumferentially spaced around said head, transmitting means to transmit signals between said array and a processing device to produce an ultrasound image of said tract and fluid outlet means on said head to deliver fluid directly to said tract surrounding said head to acoustically couple said array to said wall and enable displacement of said probe along said tract whilst maintaining said acoustic coupling.

#### 4,417,584 REAL-TIME MEASURING METHOD AND APPARATUS DISPLAYING FLOW VELOCITIES IN A SEGMENT OF VESSEL

Dominique Cathignol, Genas, and Jean-Yves Chapelon, Saint-Etienne, both of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed May 19, 1982, Ser. No. 379,978

Claims priority, application France, May 25, 1981, 81 10833

Int. Cl.<sup>3</sup> A61B 10/00

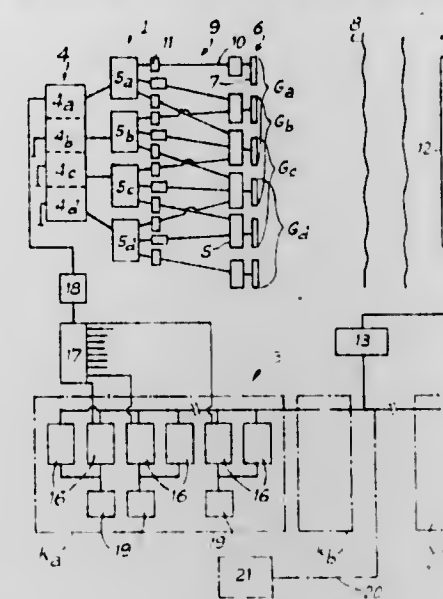
U.S. Cl. 128—663

12 Claims

1. A method of real-time measurement and display of flow velocities using a Doppler effect ultrasonic velocimeter comprising the steps of:

simultaneously generating from noise generator means a number m of pseudorandom noise signals, coded independently one from the other,  
applying said noise signals simultaneously to a transmitter composed of physically separated transducers to transmit m ultrasonic beams,  
interposing, between said noise generator means and the transducers, means for separating the different beams, to define m measuring lines pointed in the direction of the area to be scanned,

collecting reflected echos from said area to be scanned on a receiver,  
applying signals representing said reflected echos to amplifier means having m groups of dual correlators, each of said m groups of dual correlators being associated with a corresponding one of said m noise signals,



applying to said dual correlators the noise signal corresponding to the group associated therewith, said noise signal being applied from the noise generator means and transmitted by a time-delay circuit in order to obtain for each line n separate measurement points, and  
applying said n measurement points of the m measuring lines to display means for displaying an image of nxm points.

#### 4,417,585 LIQUID MONITOR

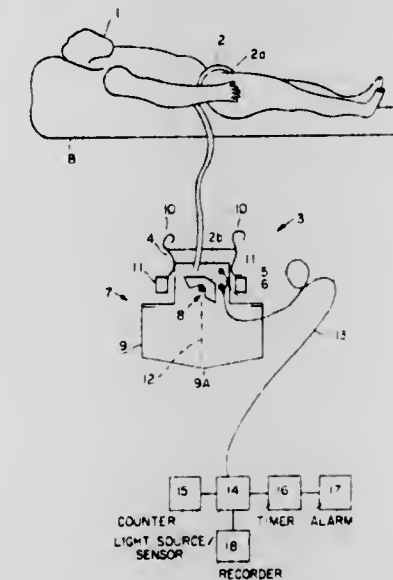
Ulrich A. Frank, 945 Stuart Rd., Princeton, N.J. 08540

Filed Jul. 30, 1981, Ser. No. 288,658

Int. Cl.<sup>3</sup> A61B 5/00; G01F 3/24

U.S. Cl. 128—668

8 Claims



1. Apparatus for measuring a liquid comprising:  
a conduit having an inlet for receiving the liquid and having an outlet;  
a pivotally mounted bistable receptacle assembly having first and second open ended liquid-receiving recesses, spaced from one another;  
said bistable receptacle assembly having first and second stable positions wherein said first and second recesses are respectively positioned beneath the outlet of said conduit; the recess positioned beneath said outlet being retained in the liquid receiving position by the recess displaced from said outlet until a predetermined quantity of liquid is

collected therein and having a configuration which moves the receptacle to position the recess displaced from said outlet to the position beneath said outlet and displace the recess presently containing liquid away from said outlet when the quantity of liquid surpasses said predetermined level, whereby the last-mentioned recess dispenses its contents, each of said recesses having a first portion for initially receiving liquid which first portion is shaped to locate the center of gravity of the liquid filling said first portion to be coincident with an imaginary vertical line passing through the pivotal mounting of said bistable receptacle assembly, so that the liquid filling said first portion is prevented from tilting the bistable receptacle as the first portion of the recess is being filled and regardless of the weight of its contents;

each of said recesses further having a second portion for receiving liquid once the first portion thereof is filled, said second portion being shaped to displace the center of gravity of the liquid away from said imaginary line as said second portion is being filled to permit the bistable receptacle to tilt and thereby move the recess being filled away from said outlet.

#### 4,417,586

#### BLOOD PRESSURE MEASURING DEVICE

Warren R. Jewett, Tucson, Ariz., assignor to Vit Vet Research Group, Inc., Marion, Ind.

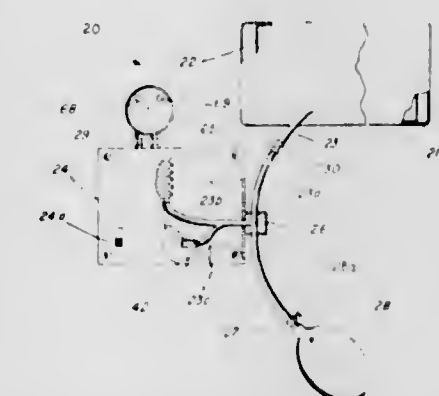
Division of Ser. No. 905,795, May 15, 1978, Pat. No. 4,290,434.

This application Feb. 18, 1981, Ser. No. 235,569

Int. Cl.<sup>3</sup> A61B 5/02

U.S. Cl. 128—680

9 Claims



1. A blood pressure measuring device for identifying the pressure of a subject's blood at systolic and diastolic conditions which comprises:

aneroid manometer means for indicating blood pressure measurements;  
a compression cuff having an inflatable bladder therein;  
a first length of flexible tubing flow coupled to said inflatable bladder;  
a second length of flexible tubing flow coupled to said aneroid manometer means; and  
a quick disconnect bleed valve disposed coaxially with and between said first length of flexible tubing and said second length of flexible tubing and being arranged with tube connection means at each end.



4,417,587

**BLOOD PRESSURE MEASURING APPARATUS**

Tsutomu Ichinomiya; Toshio Kusunoki, and Tomohiro Kami, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

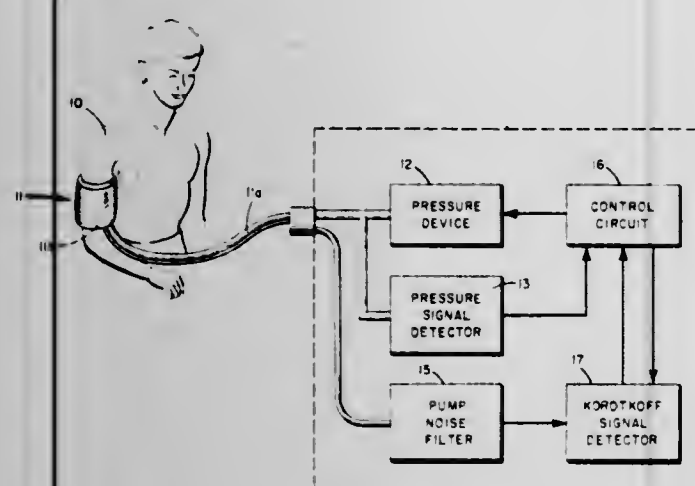
Filed Aug. 20, 1981, Ser. No. 294,620

Claims priority, application Japan, Aug. 25, 1980, 55-116777

Int. Cl.<sup>3</sup> A61D 5/02

U.S. Cl. 128—682

14 Claims



1. An automatic blood pressure measuring apparatus comprising:

- a pressurizable cuff for restricting the flow of blood through an artery;
- a microphone adapted to be attached to said cuff for detecting sound emanating from said artery;
- a pump means connected to said cuff to cyclically pressurize and depressurize said cuff in response to an electrical signal;
- a circuit connected to receive a signal from said microphone comprising:
  - a first filter for passing low frequency signals in the sounds detected by said microphone;
  - a second filter for passing high frequency signals in the sounds detected by said microphone;
  - means for combining output signals from said filters to provide a first detection signal;
  - relay means having a normally closed contact and a normally open contact selectively connected to a movable contact in response to a control signal, said normally closed contact receiving a signal from said means for combining indicating that high or low frequency signals have been received;
  - means for recording the pressure of said cuff in response to an enabling signal;
  - a control circuit connected to said pump means including a signal analyzing means connected to said movable contact, said signal analyzing means comparing the pressure of said cuff at a time each of successive signals are received from said means for combining, said control circuit providing a signal to said pump means for cyclically pressurizing said cuff between an initial maximum pressure and a minimum pressure, said cuff pressure decreasing from said maximum pressure until said means for combining produces an output signal whereby said cuff is re-pressurized to a pressure level intermediate said maximum pressure and a pressure which produced said means for combining output signal, said pressure thence decreasing to said minimum level so that additional signals are produced, said control circuit switching and movable arm into contact with said open contact when two successive pressures occurring at the time successive signals are produced by said means for combining are determined to be less than a predetermined amount and simultaneously supplying an enabling signal to said means for recording whereby a systolic blood pressure is recorded; said control circuit further including means for storing the pres-

sure of said cuff when said second filter supplies a first signal after said movable arm is connected to said open contact, said control means thereafter repressurizing said cuff to a pressure intermediate said diastolic blood pressure and said maximum blood pressure, thence decreasing said cuff pressure until a second signal is received from said second filter, said control circuit comparing the pressure of said cuff at the time said second signal is received, said control circuit providing an enabling signal to said means for recording when said stored cuff pressure is substantially equivalent to the pressure of said cuff at the time said second signal is received.

4,417,588

**APPARATUS AND METHOD FOR INITIATING CARDIAC OUTPUT COMPUTATIONS**

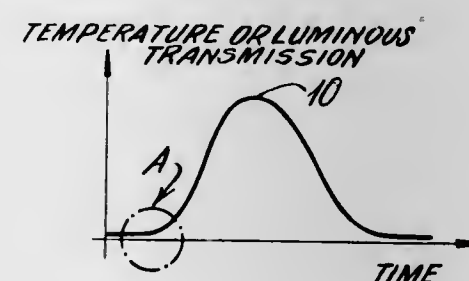
Richard B. Houghton, Irvine, Calif., and David J. Lentz, Salt Lake City, Utah, assignors to Critikon, Inc., Tampa, Fla.

Filed Mar. 22, 1982, Ser. No. 360,942

Int. Cl.<sup>3</sup> A61B 5/02

U.S. Cl. 128—713

9 Claims



1. In an apparatus for measuring cardiac output flow rate by introducing a predetermined amount of an indicator at a known temperature into the blood stream of a subject and monitoring the temperature of the blood at a location downstream from the point of introduction, including blood temperature sampling means for generating time dependent signals representative of the varying blood temperature at said location as said indicator travels through the bloodstream relative to said location, said signals defining a thermomodulation curve, computing means for estimating the area bounded by said thermomodulation curve and a baseline temperature subsequent to a first point in time, the improvement comprising:

- (a) comparing means for comparing successive signals;
- (b) means responsive to said comparing means for designating as said baseline temperature the temperature that corresponds to the first signal that is followed by a predetermined plurality of signals each representing a successively decreasing blood temperature, said first signal representing blood temperature at said first time; and
- (c) means for initiating said computing means in response to designating said baseline temperature.

4,417,589

**RESPIRATION MONITOR FOR MAMMALS**

William E. Favaloro, 2029 Fern St., New Orleans, La. 70118

Filed Jun. 18, 1981, Ser. No. 275,038

Int. Cl.<sup>3</sup> A61B 5/08

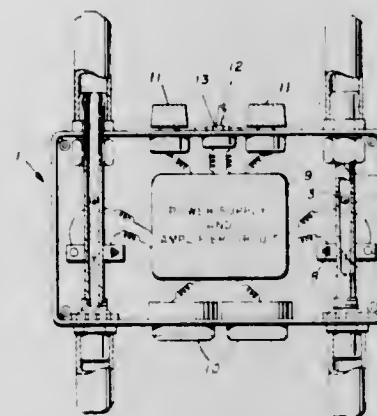
U.S. Cl. 128—716

10 Claims

1. A system for assisting and monitoring the breathing of mammals comprising in combination:

- (1) a breathing machine having means for supplying a breathing gas and means for exhausting an oxygen-depleted breathing gas, said supplying and exhausting means each comprising at least one gas conduit for an intermittent essentially unidirectional main stream conduit gas flow; having in conjunction with at least one of the gas conduits a gas flow monitor comprising a tapered in line generally vertically disposed double ended through-flow gas flow indicator tube

having an entry end and an exit end and having a taper between the entry end and the exit end from a lower smaller diameter to an upper larger diameter, connected on both ends with the gas conduit and containing a gas flow-indicator ball having a diameter generally less than the diameter of at least a portion of the length of the tube disposed to rest directly against and rise with the main stream conduit gas



flow, means for stopping the ball at a given bottom position when there is no gas flow, light emission and detection means at said bottom no-flow position whereby a light is directed through the tube and its rays are detected when not obstructed by the ball, and monitor signal means responsive to the light detection means whereby a signal is provided when the ball is moved from the bottom no-flow position, and an alarm responsive to said signal.

4,417,590

**ELECTROENCEPHALOGRAPH**

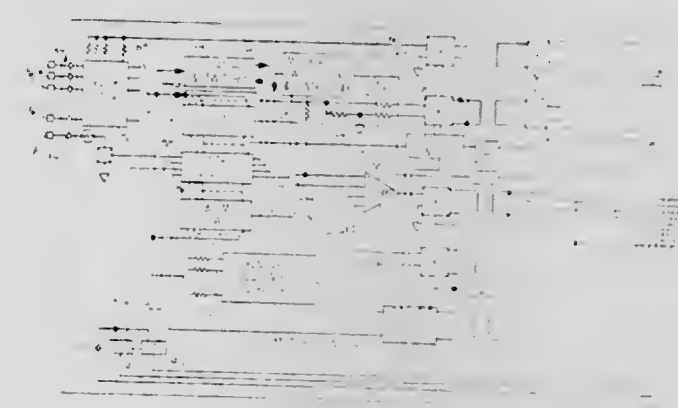
Leland B. Smith, Englewood, Colo., and Robert A. McIntyre, Skokie, Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 914,272, Jun. 9, 1978, abandoned. This application Nov. 6, 1980, Ser. No. 204,396

Int. Cl.<sup>3</sup> A61N 5/04

U.S. Cl. 128—731

30 Claims



1. In an EEG system, a plurality of patient electrodes, a portable head box adapted to be placed near the patient to be tested, a multi-channel recording apparatus located remotely from said head box, a multi-conductor transmission link connecting said head box and said recording apparatus; said head box having (i) a plurality of input terminals individually corresponding to said plurality of patient electrodes, (ii) an output terminal coupled to said link and having (iii) a ground point that is electrically isolated from said link and from said recording apparatus; control means in said head box for selectively connecting predetermined ones of said input terminals to said output terminal during each of successive time periods which recur in repetitive time position frames and thereby applying a multiplexed signal to said link, means in said recording apparatus for demultiplexing said multiplexed signal, and a plurality

of low-pass input filters individually connected between said patient electrodes, said input terminals and said ground point.

4,417,591

**APPARATUS AND METHOD FOR TOPOGRAPHIC DISPLAY OF MULTICHANNEL EEG DATA**

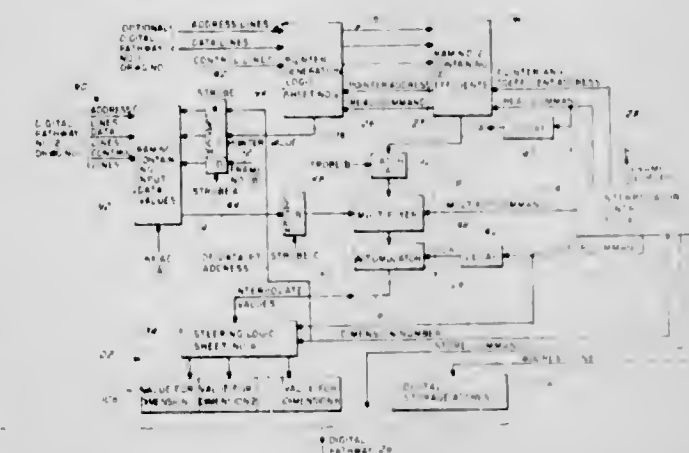
Norman D. Culver, Spotswood, N.J., assignor to Braintech, Inc., Spotswood, N.J.

Filed Dec. 31, 1980, Ser. No. 221,830

Int. Cl.<sup>3</sup> A61F 0/4

U.S. Cl. 128—731

18 Claims



1. A system for displaying input data derived from the electrical activity of the brain comprising a source of multichannel input data signals derived from a plurality of brain electrical activity sensors and a video display for providing a topographic display at a display rate of at least one frame per second, the number of display elements within each frame being at least an order of magnitude greater than the number of sensors, the system further comprising:

- an electronic interpolator for receiving the multichannel input data signals from the source of multichannel input data signals at a rate at least as great as the display rate and operating on the data signals to generate expanded display data signals, the expanded display data signals being a weighted combination of input data signals from selected electrodes for each element of the display, the interpolator including means for generating a fresh set of display data signals after receiving a fresh set of input data signals at a rate at least as great as the display rate; and
- display circuitry for providing a topographic display of the expanded display data signals.

4,417,592

**DIGITAL ELECTROENCEPHALOGRAPHIC INSTRUMENT AND METHOD**

E. Roy John, 930 Greacen La., Mamaroneck, N.Y. 10546

Filed May 11, 1981, Ser. No. 262,395

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—731

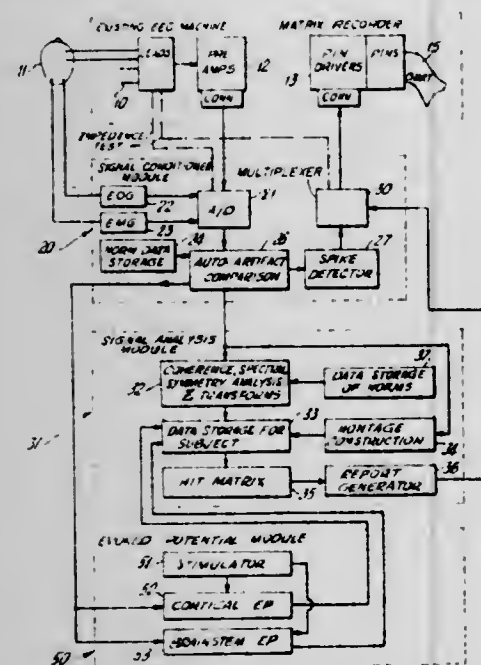
12 Claims

1. An electroencephalographic system for the on-line conditioning of signals representing brain waves and representing muscle artifact, comprising a plurality of electrodes adapted to be removably attached to the head of a patient, a plurality of amplifiers each connected to a different pair of said electrodes, a matrix multi-channel display and recorder which in response to digital signals displays a copy of a plurality of the brain wave signals simultaneously in the form of a plurality of visible wavy lines on a recording surface, each wavy line being a series of dots which is the record of a different pair of said electrodes;

- a digital signal conditioning means connected between said amplifiers and said multi-line channel display and recorder to reduce the adverse effects of said muscle artifact signals, said digital signal conditioning means including:
- A/D means to convert the analog signals from each of said



amplifiers into digital signals representing samples of the patient's brain waves;  
digital data storage means for the containing of brain wave norms;  
digital comparison means to compare said brain waves with brain wave norms in said data storage means;  
said comparison means including means to compare the samples of the patient's brain waves with a norm for the amplitude of the sample stored in said storage means, means to detect said samples representing brain waves at a selected level above said norm, means to detect said sam-



ples representing brain waves at a selected level below said norm and means to analyze said samples for spikes and sharp waves;  
connection means to connect said A/D means, digital data storage means and comparison means to provide said signal conditioning;  
multiplexer means connected to said digital signal conditioning means and said recorder to distribute digital data from said digital signal conditioning means to the various channels of the recorder so that artifact-free brain waves and the said spikes and sharp waves are recorded by said recorder.

4,417,593

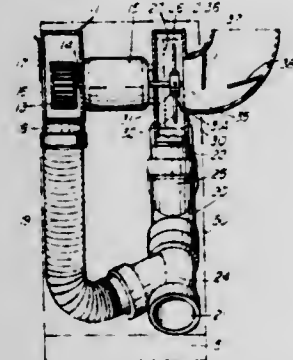
**HAND PORTABLE GRAIN THRESHING APPARATUS**  
Garth A. Brebon, 7-1216 Morgan Ave., Saskatoon, Saskatchewan, Canada S7H 2R7

Filed Mar. 22, 1982, Ser. No. 360,188

Claims priority, application Canada, Nov. 25, 1981, 390885  
Int. Cl.<sup>3</sup> A01F 5/00, 12/48

U.S. Cl. 130—27 HF

14 Claims



1. A portable hand carryable grain threshing device for use in obtaining samples of grain for test purposes, said device comprising:

- (a) a housing having a chamber therein;
- (b) a foraminous wall within said chamber and spaced from selected walls thereof separating said chamber into respective first and second areas;
- (c) a driven beater within said first area and an inlet for feeding heads of grain to the beater in such area;
- (d) an outlet from said second area;
- (e) an air flow passage means having first and second outlets spaced apart from one another axially therealong, one of said outlets being at a higher elevation than the other during use of the device;
- (f) passage means connecting the outlet from said second area to said air flow passage means at a position between the outlets therefrom; and
- (g) means to cause air flow through said air flow passage means in a direction from said lower one of said pair of outlets to the other of such outlets past said connecting passage means.

4,417,594

# **APPARATUS FORMING A CONTINUOUS CUT TOBACCO BRAID IN A CIGARETTE MAKING MACHINE**

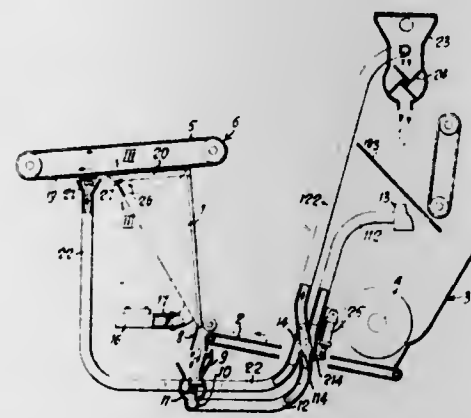
Franco Garrone, Bologna, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Nov. 18, 1981, Ser. No. 322,725

Claims priority, application Japan, Nov. 21, 1980, 12731 A/80  
Int. Cl.<sup>3</sup> A24C 5/14, 5/39

U.S. Cl. 131—110

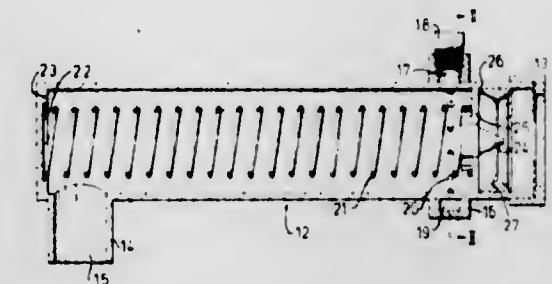
3 Claims



1. Apparatus for forming a continuous cut tobacco braid in a cigarette making machine, comprising:
  - a transfer duct (1) for transferring by means of a suitable air stream the cut tobacco from the delivery end of a cut tobacco feeder (2, 3) to an endless braid-forming suction tape (5);
  - a first pneumatic collecting duct (12, 112) which receives the greater and heavier tobacco particles, such as tobacco ribs, from the said delivery end of the said tobacco feeder, and conveys them into a collecting box (13);
  - a second pneumatic collecting duct (22, 122) which receives the excess tobacco trimmed from the tobacco braid being formed on the underside of the said braid-forming suction tape (5) by suitable trimmers (21) arranged along the path of the said suction tape (5) downstream of the said transfer duct (1), for conveying said trimmed excess tobacco into the feeding hopper (103) of said cut tobacco feeder (2, 3);
  - a deflector valve (14) arranged between the said first pneumatic duct (12, 112) for the tobacco ribs and the said second pneumatic duct (22, 122) for the trimmed excess tobacco, said deflector valve (14) being switchable from a first position in which the tobacco ribs are conveyed through the first pneumatic duct from the delivery end of the tobacco feeder into the collecting box, and the trimmed excess tobacco is conveyed through the second pneumatic duct from the trimmers to the feeding hopper of the cut tobacco feeder, to a second position in which the cut tobacco delivered by the delivery end of the cut

tobacco feeder, including the tobacco ribs, is returned into the feeding hopper (103) of the cut tobacco feeder, while the suction is stopped in the duct (22) receiving the trimmed excess tobacco, and the suction is also stopped in the duct (112) leading to the tobacco ribs collecting box (13);

sensor means (27, 28) arranged at the interior of the tobacco transfer duct (1) said sensor means being sensitive to the formation of tobacco obstructions or concentrations at the interior of the said transfer duct (1), said sensor means being operatively associated with a control circuit for actuating control means for switching the said deflector valve (14) and for interrupting the air stream at the interior of the transfer duct (1).



**4,417,596**  
**PORTABLE APPARATUS FOR CLEANING RE-USABLE FILTERS**  
Bo Pahlen, Älvhagsvägen 11, S-194 53 Upplands Väsby, Sweden  
Filed Sep. 10, 1981, Ser. No. 300,930  
Claims priority, application Sweden, Sep. 15, 1980, 8006448  
Int. Cl.<sup>3</sup> B08B 9/00

U.S. Cl. 134—152

4 Claims

1. An apparatus for cleaning a re-usable filter, particularly a filter of tubular configuration and exhibiting pleated or bellows-like filter surfaces, said apparatus comprising a hollow body within which the filter is intended to be cleaned and the interior of which is arranged to receive a cleaning fluid, such as water, from an external source, and which body is provided with means for discharging used cleaning fluid during a filter cleaning operation, characterized in that the hollow body is provided with at least one transversally and peripherally extending flange having a circular cross section, so arranged as to form a space between the inner wall of the flange and the outer wall of said body, and that the flange is provided with a through-passing opening which forms an inlet for cleaning liquid and that the hollow body is provided around its periphery with a plurality of openings through which said space communicates with the interior of the hollow body so that a tubular filter cartridge can be cleaned by the action of said flowing cleaning fluid, by moving said cartridge manually axially with in the hollow body by means of a detachable handle.

4,417,595

# **HAIRBRUSH**

Takeo Okumura, Sakura, and Miho Imai, Ichikawa, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

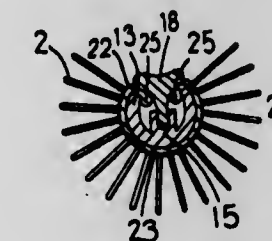
Filed May 11, 1981, Ser. No. 262,356

Claims priority, application Japan, May 16, 1980, 55-67300[U]; Apr. 14, 1981, 56-53573[U]

Int. Cl.<sup>3</sup> A45D 44/18

U.S. Cl. 132—85

9 Claims



1. A hairbrush comprising an elongated, substantially straight, hairbrush body having a longitudinally extending handle and an elongated bristle-implanted portion extending longitudinally from one longitudinal end of said handle, said bristle-implanted portion comprising an elongated central core having an arcuate peripheral surface portion and a relatively thin sheet wrapped around and secured to said arcuate peripheral surface portion of said core and conforming to the curvature thereof, said handle and said bristle-implanted portion being longitudinally aligned with each other, said hairbrush body having a longitudinal central axis which extends through the central portions of said handle and said core, the outer surface of said sheet being spaced a uniform distance from the longitudinal central axis of said hairbrush body, a multitude of bristles affixed to said sheet and projecting from the outer surface thereof in a radially outward direction with respect to the longitudinal central axis of said hairbrush body, each of said bristles consisting of a single strand of bristle material, said single strands of bristle material being independent and discrete from one another and being spaced-apart from each other longitudinally and laterally on said outer surface of said sheet, all of said single strands of bristle material lying within and being distributed throughout a single continuous region wherein imaginary radial lines drawn from the longitudinal central axis of said hairbrush body through the respective opposite longitudinal edges of said region define a reflex angle of from 210° to 270°, the remainder of said bristle-implanted portion being free of bristles.

4,417,597

# **AWNING STRUCTURE**

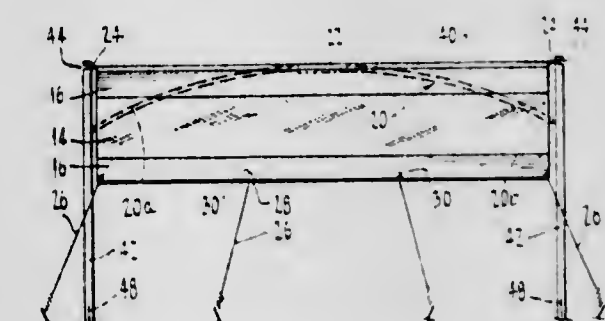
Rodney L. Montgomery, P.O. Box 37194, Winnellie, N.T., Australia

Filed Aug. 19, 1980, Ser. No. 179,468

Int. Cl.<sup>3</sup> E04F 10/04

U.S. Cl. 135—102

8 Claims



1. A method of erecting an awning comprising the steps of connecting a resilient beam at its mid-section to a mid-section of said awning;  
connecting the ends of said resilient beam to an intermediate portion of a pair of substantially straight and substantially rigid uprights;  
connecting the awning to the tops of said uprights; and forming the beam into a bow configuration by drawing the bottoms of the uprights toward one another as the uprights are brought into an upright position which at the same time stretches the awning outwardly to place the awning under tension.



4,417,598

## PNEUMATIC VALVE

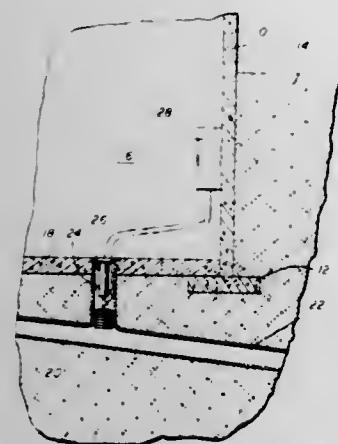
Mario DePirro, 330 E. Roosevelt, Lombard, Ill. 60148

Filed Feb. 2, 1983, Ser. No. 463,070

Int. Cl.<sup>3</sup> F17D 3/00; G05D 9/12

U.S. Cl. 137—2

15 Claims



1. A method for sealing off the flow of liquid at the intersection of two pipes, one of the pipes positioned at least partially vertical to the other pipe and an expandable bladder means disposed therein the method comprising:

- (a) sensing the presence or absence of liquid at an established height in the vertical pipe;
- (b) generating a control signal in response to the sensing means detecting the presence of liquid at the established height;
- (c) repositioning the expandable bladder means in the other pipe in response to the control signal generated detecting the presence of liquid;
- (d) inflating the expandable bladder means after it is repositioned in the other pipe in response to the sensing means detecting the presence of the liquid at the established height and
- (e) sealing off the flow of liquid at the intersection of the two pipes.

4,417,599

## VACUUM SIGNAL INTEGRATOR

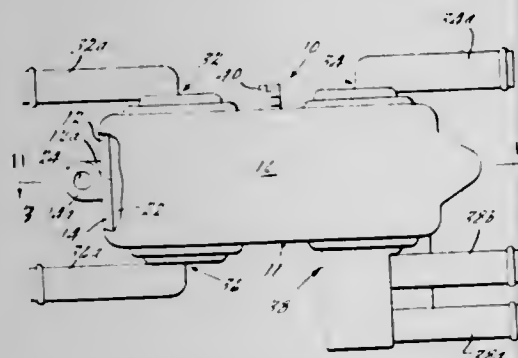
Andrew A. Kenny, Roselle, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 3, 1981, Ser. No. 289,545

Int. Cl.<sup>3</sup> G05D 16/00

U.S. Cl. 137—85

13 Claims



1. A device for integrating a plurality of fluid pressure input signals comprising:

- (a) housing means defining a plurality of spaced fluid pressure ports each adapted to receive a fluid pressure input signal;
- (b) a plurality of pressure responsive means each disposed to receive fluid pressure from one of said ports, and to provide a mechanical force output in response to said pressure signal;
- (c) idler means mounted for pivotal movement with respect

to said housing means and operative to receive said mechanical forces and to provide in response thereto a single resultant output force;

- (d) modulator valve means operative, upon connection to a source of fluid pressure, to provide a modulated output pressure signal in response to force biasing by said single resultant force;
- (e) said housing means comprises an upper and lower shell joined for opening and closing on a parting line, wherein said modulator valve means is mounted on one of said upper and lower shell and certain of said pressure responsive means are mounted on the other of said upper and lower shell; and,
- (f) means for latching said upper and lower shell closed on said parting line.

4,417,600

## SAFETY VALVE

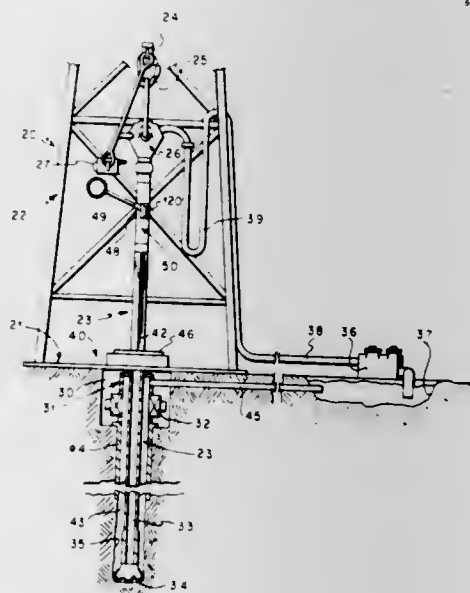
Gary A. Kohn, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 131,793, Mar. 19, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 332,927

Int. Cl.<sup>3</sup> F16K 37/00, 31/44

U.S. Cl. 137—553

27 Claims



1. A valve comprising:

- a. housing means;
- b. a longitudinal flow passage extending through the housing means;
- c. valve closure means, disposed within the housing means, having a first position allowing fluid flow through the longitudinal flow passage and a second position blocking fluid flow through the longitudinal flow passage;
- d. an operating sleeve means slidably disposed within the longitudinal flow passage and engaging the valve closure means to shift the valve closure means between its first and second positions;
- e. a first longitudinal slot formed in the housing means and communicating between the interior and the exterior of the housing means;
- f. a first pin means projecting through the first slot and engaging the operating sleeve means;
- g. the first pin means being slidable within the first slot and a portion of the pin means extending exterior from the first slot; and
- h. means for engaging the first pin means with a shifting tool to move the first pin means and operating sleeve means longitudinally with respect to the housing means.

4,417,601

## VARIABLE PROPORTIONING VALVE FOR BALANCED PRESSURE PROPORTIONING SYSTEMS, AND SYSTEM CONTAINING THE VALVE

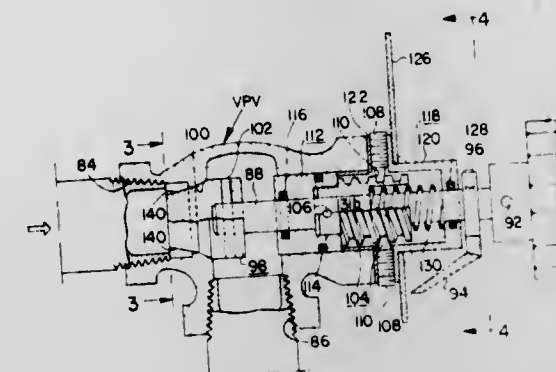
Robert W. Bennett, Downingtown, Pa., assignor to National Foam Systems, Inc., Lionville, Pa.

Filed Dec. 19, 1980, Ser. No. 218,066

Int. Cl.<sup>3</sup> F16K 1/04, 1/12

U.S. Cl. 137—556.6

5 Claims



1. A liquid proportioning valve comprising a hollow open upper end valve body, a removable cap and securement means on said open upper end, said cap having an opening therethrough, a rotatable stem extending through said opening and operably reciprocally mounted in said valve body, said valve body having spaced inlet and outlet openings, a valve plug body attached to the lower end of said stem, a valve seat in said valve body coactable with said valve plug body, grooved barrel cam means on said stem, adjustable pins extending through the valve cap at radially spaced positions therearound, said pins having wedge-shaped inner ends tightly operatively engaged in the groove of said cam means to positively control movement thereof upon rotation of the valve stem, said radial spaced pins serving to positively position said cam means in said valve body and operable upon stem rotation for movement of said cam means and said valve plug body to effect spaced relationship of said valve plug body and said valve seat for opening and closing said valve by withdrawal of said valve plug body from valve seat contact to thereby control flow of liquid through said valve, said cam means being operable for quickly effecting a complete valve opening, a compression spring in said valve body surrounding said stem and engaged between said cam drive means and the underside of said cap, said spring normally maintaining positions of the stem, and therethrough the valve plug body, within the valve body, and adjustable damper plugs inserted through said cap into adjustable frictional engagement with the circumferential outer surface of said cam, said stem cam means and said valve plug body being conjointly removable from within said valve body subsequent to removal of said cap from said valve body.

4,417,602

## ZERO INTERNAL PRESSURE CARTRIDGE

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Nov. 6, 1981, Ser. No. 318,743

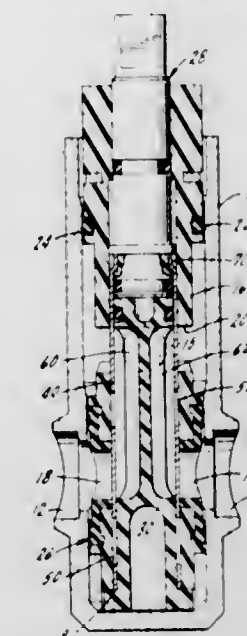
Int. Cl.<sup>3</sup> F16K 11/02

U.S. Cl. 137—625.17

4 Claims

1. A mixing valve including a sleeve having hot and cold water inlets and an outlet, a stem movable within said sleeve for controlling the volume and temperature of water discharged from said sleeve outlet, a pressure member positioned within said sleeve and coaxial with said stem, said stem including a cylindrical piston extending coaxially about said pressure member and having inlet and outlet means therein, valve closing seal means at said sleeve inlets, which seal means have portions extending into sealing engagement with said movable piston, said pressure member being fixed relative to said sleeve and being within the path of flow from said sleeve inlets to said sleeve outlet and downstream of said valve closing seal means, said pressure member having an interior partition defining one

flow path from said hot water inlet and a second flow path from said cold water inlet, a seal positioned between said stem and pressure member preventing the application of inlet pres-



4,417,603

## FLEXIBLE HEAT-INSULATED PIPE-LINE FOR IN PARTICULAR CRYOGENIC FLUIDS

Gilles Argy, La Queue Les Yvelines, France, assignor to Technigaz, France

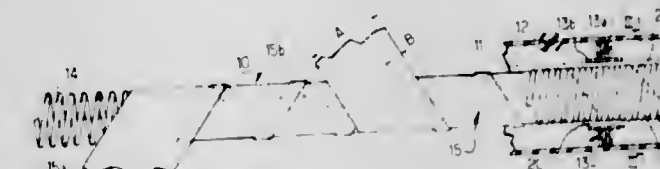
Filed Feb. 2, 1981, Ser. No. 230,892

Claims priority, application France, Feb. 6, 1980, 80 02614

Int. Cl.<sup>3</sup> F16L 11/00

U.S. Cl. 138—149

34 Claims



1. A flexible fluid-conveying pipe, of the kind comprising: an inner tubular duct, a layer of heat-insulating material surrounding in closely engaging relationship said inner tubular duct, and an outer protective casing surrounding in closely engaging relationship said heat-insulating layer, said protective casing consisting of a tough flexible fluid-tight tubular conduit connected to said inner tubular duct by retaining distance-pieces made in particular of relatively rigid cellular material and longitudinally spaced from each other and distributed at discrete locations while bearing against said inner tubular duct; said inner tubular duct consisting of at least three layers radially overlying in closely engaging relationship and including one single inner layer consisting of a metal wire helically wound with mutually spaced turns; and intermediate layer of yielding composite material surrounding said inner layer; and a single outer layer consisting of a metal wire helically wound about said intermediate layer but having its turns longitudinally offset by one half winding pitch with respect to those, respectively, of said inner wire layer so as to be located between the turns, respectively, of the latter, said single outer layer being substantially identical in particular in at least its own diameter and winding diameter and its winding pitch with said inner wire layer; wherein the improvement consists in that a blanket of relatively soft material is interposed between each



aforesaid distance-piece and said inner tubular duct while being slightly compressed therebetween.

18. A flexible fluid-conveying pipe, of the type comprising: an inner tubular duct, a layer of heat-insulating material surrounding in closely engaging relationship said inner tubular duct and an outer protective casing surrounding in closely engaging relationship said heat-insulating layer, said inner tubular duct consisting of at least three layers radially overlying in closely engaging relationship and including one single inner layer consisting of a metal wire helically wound with mutually spaced turns; an intermediate layer of yielding composite material surrounding said inner layer; and a single outer layer consisting of a metal wire helically wound about said intermediate layer but having its turns longitudinally offset by one half winding pitch with respect to those, respectively, of said inner wire layer so as to be located between the turns, respectively, of the latter, said single outer layer being substantially identical in particular in at least its own diameter and winding diameter and its winding pitch with said inner wire layer, wherein the improvement consists in that both opposite respectively inner and outer end sides of said intermediate layer which are engaging said metal wire are each one faced with a flexible liner promoting slipping between said metal wire while providing for the cohesion and protection of said sides, said liner being in particular made from a polyurethane elastomer with a thickness in particular of about 0.3 mm.

4,417,604

# METHOD AND DOBBY FOR SYNCHRONIZING ALL HEDDLE FRAMES OF A WEAVING MACHINE

Walter Kleiner, Hirzel-Zurich, Switzerland, assignor to Staebli Ltd., Horgen-Zurich, Switzerland

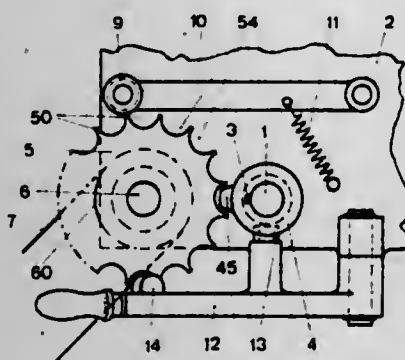
Filed Aug. 11, 1981, Ser. No. 292,107

Claims priority, application Switzerland, Aug. 18, 1980, 6202/80

Int. Cl.<sup>3</sup> D03C 15/04, 1/00

U.S. Cl. 139—329

18 Claims



1. A method for synchronizing all heddle frames of a weaving machine controlled by a dobby having a rotatably supported drive cylinder, a drive mechanism operatively coupled to said drive cylinder and adapted to successively index it to a plurality of predetermined angular positions, a pattern card operatively driven by said drive cylinder and having a plurality of rows of control points, said pattern card having perforations at a plurality of said control points, and a plurality of reading needles which are each supported for movement by said drive mechanism between a retracted position spaced from said pattern card and a reading position sensing a respective said control point of a said row of control points thereon, a respective said row of control points being aligned with said reading needles in each said predetermined angular position, movement of each said heddle frame being controlled by a respective said reading needle, comprising the steps of uncoupling said drive mechanism from said drive cylinder when said drive cylinder is between two said predetermined positions; activating a locking mechanism which prevents rotation of said drive cylinder; thereafter operating said drive mechanism so that said reading needles move to said reading position, each said reading needle engaging said pattern card at a location which is between two said rows of control points and is thus

free of perforations, which causes all said heddle frames to be moved to a common position; returning said reading needles to said retracted position; and thereafter deactivating said locking mechanism and recoupling said drive mechanism to said drive cylinder.

9. In a dobby for synchronizing all heddle frames of a weaving machine, including a pattern card supported for movement in a first direction, having a plurality of rows of control points extending in a second direction transverse to said first direction, and having perforations at a plurality of said control points; a plurality of reading needles which are each supported for movement between a retracted position spaced from said pattern card and a reading position sensing a respective said control point of a said row of control points thereon; and first means for successively indexing said pattern card to a plurality of predetermined positions, each of said reading needles being aligned with a respective said control point of a respective one of said rows of control points in each said predetermined position, said reading needles moving into and out of said reading position when said pattern card is positioned at each of said predetermined positions, said heddle frames being operatively coupled to respective said reading needles and moving in responsive thereto, the improvement comprising second means for selectively moving said pattern card relative to said reading needles to a further position in which each said reading needle is aligned with a respective location on said pattern card which is spaced from said control points and is free of perforations, said reading needles moving into and out of said reading position when said pattern card is in said further position and causing all said heddle frames to move to a common position.

4,417,605

# FABRIC WEAVING METHOD

Shoji Miyashita, No. 3809, Koasumi, Fujiyoshida, Yamanashi Pref., Japan

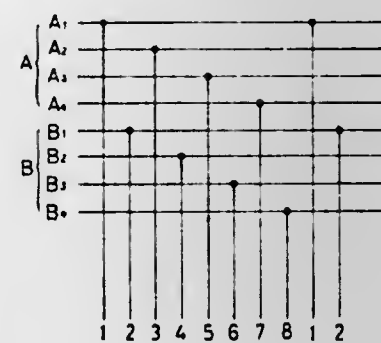
Filed Sep. 11, 1981, Ser. No. 301,894

Claims priority, application Japan, Sep. 25, 1980, 55-133527

Int. Cl.<sup>3</sup> D03D 23/00; D03C 13/00

U.S. Cl. 139—383 R

4 Claims



1. In a process for weaving fabrics whereby warp yarns in different yarn groups are alternately raised and lowered to permit passage of weft yarns by causing corresponding heddle frames in different frame groups, to which heddles are operatively linked, alternately to be raised and lowered, the process comprising the steps of:

- (1) connecting each individual succeeding warp yarn in one yarn group alternately to a corresponding heddle frame in the different frame groups according to a predefined pattern of connections of the warp yarns to the heddles;
- (2) connecting each individual succeeding warp yarn in the remaining succeeding groups according to the same pattern as in step (1); and
- (3) causing one frame in one frame group to be raised or lowered and then one frame in another frame group to be raised or lowered, the raising or lowering being repeated for the frames in the different frame groups according to the predefined pattern of connections of the warp yarns to the respective heddles.

4,417,606

# WEFT PROPELLING GRIPPERS FOR TEXTILE LOOMS

Luciano Corain, Vicenza, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

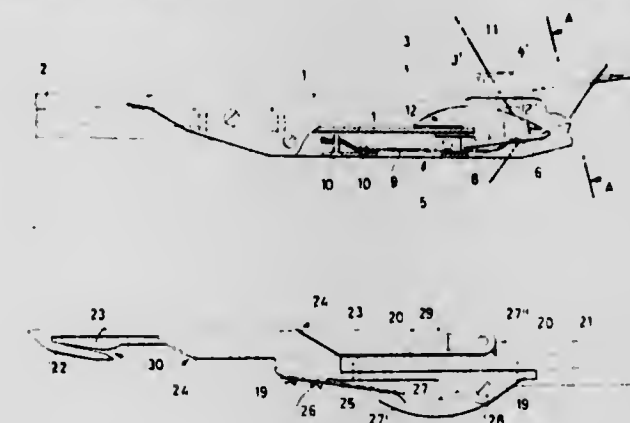
Filed Aug. 25, 1981, Ser. No. 296,211

Claims priority, application Italy, Sep. 15, 1980, 24661 A/80

Int. Cl.<sup>3</sup> D03D 47/20

U.S. Cl. 139—448

5 Claims



1. Weft inserting and withdrawing grippers for a shuttleless loom, each comprising a gripper body provided with weft yarn gripping and clamping members, characterized in that said weft yarn gripping and clamping members of the weft inserting gripper are constituted by a vertical blade-type foot which is hinged upperly to a rotation pivot supported by the inserting gripper body and disposed parallel to an underlying horizontal gripping surface, and cooperates with said gripping surface present longitudinally on the outer side of the inserting gripper, said blade-type foot having a height greater than the distance of said rotation pivot from said gripping surface, and such as to cause it to form with the gripping surface an angle approximately equal to the complementary of the angle of friction between the yarn and gripping surface, and being kept resting against said gripping surface and inclined outwards from the outer side of the inserting gripper by means of a thrust spring which is supported by the inserting gripper body and presses against its inclined face, and an arcuate deflector for the weft yarn, which descends inside the inserting gripper body until it reaches the level of said horizontal gripping surface.

4,417,607

# APPARATUS AND METHOD FOR ASEPTICALLY FILLING FLEXIBLE CONTAINERS

William R. Scholle, Corona Del Mar; William J. Scholle, Irvine, and Michael J. Gunning, Cerritos, all of Calif., assignors to Scholle Corporation, Irvine, Calif.

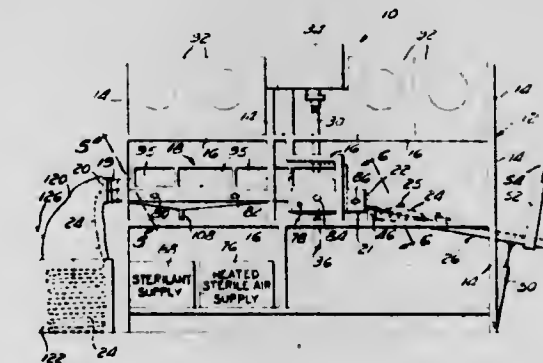
PCT No. PCT/US81/00614, § 371 Date Jun. 29, 1981, § 102(e) Date Jun. 29, 1981, PCT Pub. No. WO82/03832, PCT Pub. Date Nov. 11, 1982

PCT Filed May 7, 1981, Ser. No. 278,344

Int. Cl.<sup>3</sup> B65B 3/04; B67C 1/16, 3/34

U.S. Cl. 141—1

39 Claims



1. In a container filling apparatus comprising (a) feed means for serially advancing containers connected in a continuous web, from an entry port to a dispensing port, and (b) an aseptic

filling compartment between said ports having a filling means for filling said containers, a method for introducing said containers into said apparatus and dispensing them from said apparatus without introducing contaminants into said aseptic filling compartment, said method comprising:

- applying a positive pressure to said aseptic filling compartment, to maintain an aseptic environment in said compartment, by introducing a sterile gas therein;
- providing said web of containers prepackaged in a sealed overwrap container and presterilized in said overwrap container;
- applying a positive pressure within said overwrap container by introducing sterile gas therein;
- forming an opening in said overwrap container to permit connection of said overwrap container to said entry port; operably connecting one end of said continuous web of containers to said feed means to permit said feed means to advance said continuous web of containers through said apparatus from said entry port to said dispensing port;
- sealing said opening in said overwrap container to said entry port;
- spraying said containers with an antiseptic liquid, as they are advanced from said entry port to said filling means by said feed means;
- heating said containers, prior to reaching said filling means; advancing said containers to said aseptic filling means, by said feed means, after said containers are heated, to permit said containers to be filled by said filling means; and dispensing said containers, after they are filled, through said dispensing port.

4,417,608

# METHOD OF MAKING A LEAD-ACID STORAGE BATTERY PLATE

Charles P. McCartney, Jr., Yorktown, and Ellis G. Wheadon, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

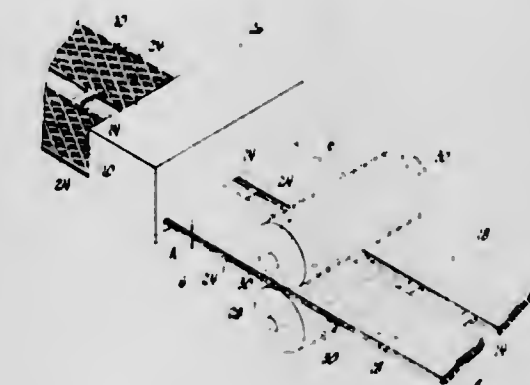
Division of Ser. No. 250,412, Apr. 2, 1981, Pat. No. 4,351,891.

This application Jun. 23, 1982, Ser. No. 391,087

Int. Cl.<sup>3</sup> B65B 3/04; H01M 4/30

U.S. Cl. 141—1.1

1 Claim



1. A process for making Pb-acid storage battery plates comprising the steps of:

- embedding a conductive grid in a leady active material paste such as to provide a plate having opposing faces and a predetermined thickness of paste between said faces, said grid comprising a network of criss-crossing interconnected grid wires defining a plurality of interstitial openings between said grid wires, said paste residing primarily in said openings; and
- depressing the paste in substantially the centers of said openings such as to cause said paste to exude substantially radially from said centers to zones of said plate more proximate said grid wires surrounding said openings and to provide a plurality of dimples in at least one of said faces at the centers of said openings, said paste thereafter having a thickness at the bottom of said dimples which is



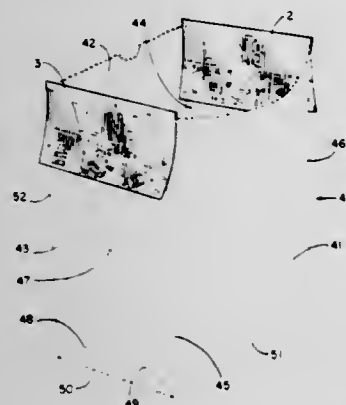
less than said predetermined thickness and a thickness at said zones which is greater than said predetermined thickness.

#### 4,417,609 COMBINATION COUPON CARRIER AND BAG STIFFENER

Tom W. Sherwood, 1698 Raindance Way, Las Vegas, Nev. 89109  
Continuation-in-part of Ser. No. 255,540, Apr. 20, 1981, Pat. No. 4,379,519. This application Nov. 2, 1981, Ser. No. 317,323  
Int. Cl.<sup>3</sup> B65B 1/04

U.S. Cl. 141—98

8 Claims



1. In combination, a bag stiffener/coupon carrier device comprising at least one flat strengthening member having a lower edge, means to attach the strengthening member to a side panel of a paper bag, and at least one coupon member removably attached to the lower edge of the strengthening member, and

a bag adapted to be maintained in an open position or a folded position, the bag having front, rear, and opposing side bag panels defining a rectangular horizontal cross-section when the bag is in the open position, upper edges of said bag panels defining a bag mouth, the opposing side bag panels having intermediate vertical creases therein.

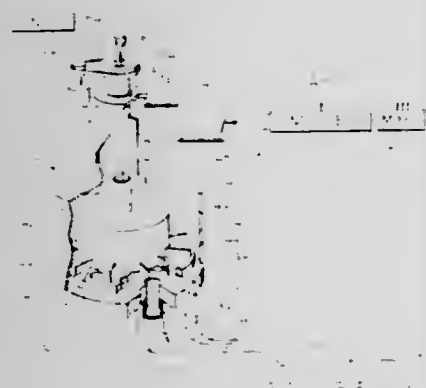
#### 4,417,610 DISPENSER SYSTEMS

Ejvind Waldström, Hundslund, and Gerhard Kaufmann, Viby J., both of Denmark, assignors to O.G. Hoyer A/S, Højbjerg, Denmark

Filed Mar. 31, 1981, Ser. No. 249,413  
Int. Cl.<sup>3</sup> B65B 3/10

U.S. Cl. 141—91

15 Claims



1. A system for dispensing a viscid medium from a supply medium flow to a plurality of receptacles, the system comprising a filling station and a distributor having an inlet for a pressurized supply medium flow and a plurality of outlets individually connected to a series of dispenser openings located in said

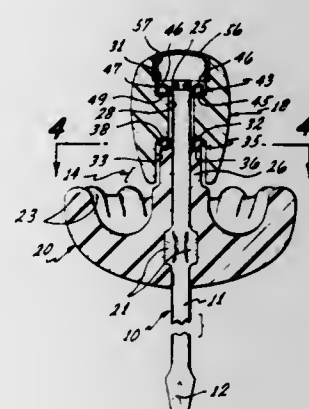
filling station, support means for sequentially moving consecutive groups of receptacles through said filling station to align the single receptacles of each group with the respective dispenser openings, outlet valve means located in the path of the medium flow upstream of said dispenser openings, and valve control means operable to repeatedly open and close said valve means to allow concurrent medium outlet from the dispenser openings during an opening time interval corresponding to a predetermined medium volume being dispensed for the required filling of the receptacles of the respective consecutive groups; pressure sensing means located upstream of said valve means for sensing the pressure of said pressurized medium, and means operatively connected with said pressure sensing means and said valve control means for effectively adjusting the length of said opening time interval as a function of a variation of the average medium pressure between consecutive operation cycles of said valve means, whereby the consecutive receptacles are caused to receive substantially uniform volumes of medium irrespective of general gradual changes of the pressure of the viscid medium.

#### 4,417,611 SCREWDRIVER

Jung S. Kim, 7414 Denny Ave., Sun Valley, Calif. 91352  
Filed Feb. 26, 1982, Ser. No. 352,776  
Int. Cl.<sup>3</sup> B25G 1/00

U.S. Cl. 145—61 EA

2 Claims



1. A screwdriver comprising:  
a shank having a wedged-shaped lower end;  
a handle for said shank including a head member and a wheel member;  
said head member provided with an axial hole therethrough having a diameter larger than said shank and having enlarged central openings on the upper and lower end portions thereof;  
said wheel member having a relative large diameter with upwardly extending spaced projections on the outer periphery thereof and having a hub portion on the upper end thereof;  
said wheel member anchored on said shank so as to be positioned below the upper end portion thereof;  
a lower ball bearing assembly seated within the central opening on the lower end portion of said head member;  
an upper ball bearing assembly seated within the central opening on the upper end portion of said head member;  
said head member positioned with its axial hole surrounding the upper end portion of said shank and with said lower ball bearing assembly rotatably jouralling the lower end portion of said head member on the top surface of the hub portion of said wheel member and with said upper ball bearing assembly rotatably jouralling the upper end portion of said head member on the upper end of said shank;  
whereby an axial force can be applied by the palm of the hand of a user on the head member to hold the wedge-shaped lower end of the shank in a slot on a screwhead

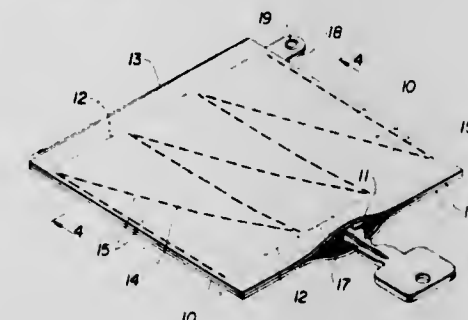
while the fingers of the hand can be used to grip the projections on the periphery of the wheel member to thereby rotate the shank to advance or retract said screw.

#### 4,417,612 POCKET KEY HOLDER

Michael V. Couture, 228 Pine St., Holyoke, Mass. 01040, and Ronald Keklak, 637 Church St., Amston, Conn. 06231  
Filed May 18, 1982, Ser. No. 379,366  
Int. Cl.<sup>3</sup> A45C 11/32

U.S. Cl. 150—40

9 Claims



1. A pocket key holder comprising a pair of outer flexible sheets of like size having opposite parallel edges adapted to register when the outer sheets are in superposed relationship, an intermediate flexible sheet between said outer sheets in sandwiched relationship and having opposite parallel edges spaced inwardly from the corresponding edges of the outer sheets so that said outer flexible sheets will form closure flaps along opposite ends of the key holder, connecting means for all of said sheets following a zigzag path across the sheets and forming on the key holder multiple tapering and interfitting key pockets on each side of the intermediate sheet and between it and said outer sheets, said pockets having open ends facing said parallel edges of the outer sheets, the open ends of the key pockets on opposite sides of the intermediate sheet facing in opposite directions toward opposite ends of the key holder, and coacting flexible closure strips on the interior surfaces of the closure flaps between the parallel edges of the outer and intermediate sheets, said closure strips being of a type which form a secure continuous closure when pressed together and may be pulled apart to separate the closure flaps.

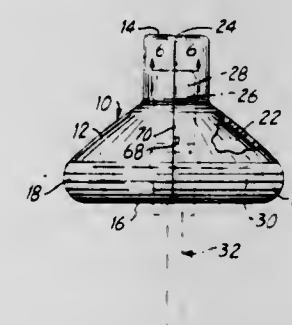
#### 4,417,613 UNIVERSAL PACIFIER CASE

Kathryn A. Ryan, and Gregory F. Ryan, both of 77 Erie St., Dumont, N.J. 07628

Filed Mar. 29, 1982, Ser. No. 363,305  
Int. Cl.<sup>3</sup> B65D 85/00, 65/06; A61J 17/00

U.S. Cl. 150—52 R

14 Claims



1. A pacifier case for providing a sanitary enclosure for a pacifier of the type having a nipple extending axially from one side of a radial guard flange and a handle extending from the other side of the guard flange, the pacifier case comprising:  
a unitary shell-like housing of molded synthetic resin extending axially between a first end and a second end, said housing establishing an enclosed chamber having a first portion, adjacent the first end, for receiving and enclosing

the nipple of the pacifier and a second portion, adjacent the second end, for receiving and enclosing the guard flange of the pacifier;  
the housing including a pair of half-shell-like wall members having peripheral edges for engaging one another when in a closed position to establish said enclosed chamber;  
hinge means joining the wall members along a limited length of the peripheral edges for enabling parting of the wall members at the peripheral edges for selective movement of the wall members to an open position to open the chamber;  
the housing including radially-extending end wall portions adjacent the second end thereof; and  
an aperture in the end wall portions for enabling the handle of the pacifier to project axially through the aperture and outside the chamber beyond the end wall portions, when the wall members are in the closed position.

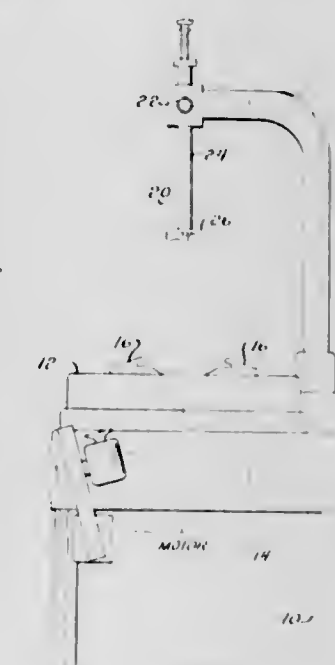
#### 4,417,614 ABRASION ELIMINATING TIRE CHANGING TOOL

Charles L. Cunningham, Nashville, and Robert E. Gwaltney, Brentwood, both of Tenn., assignors to Hennessy Industries, Inc., La Vergne, Tenn.

Filed May 29, 1981, Ser. No. 268,199  
Int. Cl.<sup>3</sup> B60C 25/08

U.S. Cl. 157—1.24

10 Claims



1. In a tire changer including a base, a wheel receiving and holding table on the base, a tire changing tool including a head having a first surface for engagement with a tire to be mounted and/or demounted and a second surface facing a wheel when a wheel is mounted on a table, and means for effecting relative movement between the table and the tool, the improvement wherein said tool includes a magazine for receipt of a solid plastic-like abrasion eliminating material, an aperture in said second surface extending to said magazine so that abrasion eliminating material in said magazine may be conveyed to said second surface, and means for feeding abrasion eliminating material in said magazine to said aperture.

#### 4,417,615 CAST IRON RECUPERATOR

Richard F. Stockman, Friendship, N.Y., assignor to Air Pre-heater Company, Inc., Wellsville, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,892  
Int. Cl.<sup>3</sup> B22D 19/04

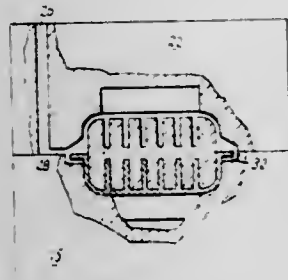
U.S. Cl. 164—94

6 Claims

1. The method of making an envelope for a recuperative type heat exchanger comprising the steps of casting a bottom



half of an envelope to form a concave wall that has a peripheral surface extending along a pair of opposite sides of said envelope, preparing a convex mold for a top half of said envelope that includes elongate slits on opposite sides thereof adapted to confront the internal surfaces on the top and bottom halves of the envelope, pouring a quantity of molten metal into



the mold to form the top half of the envelope that includes a portion that confronts the slits and is contiguous with the peripheral surface on the bottom half of the envelope, and cooling the casting to fuse the molten metal of the top half of the envelope to the peripheral surface of the bottom half of the envelope thereby forming a fluid-tight bond therebetween.

4,417,616

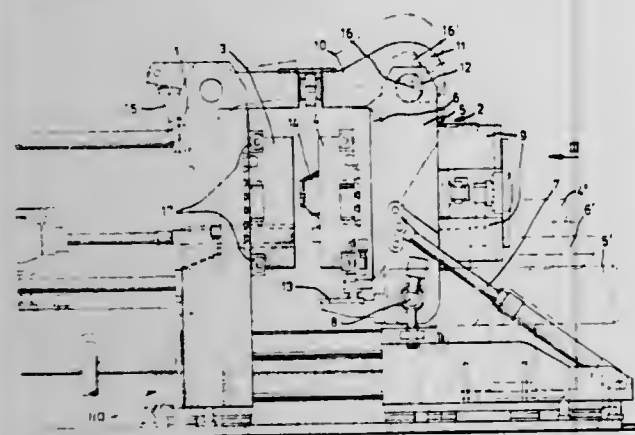
# **HORIZONTAL PRESSURE DIE-CASTING MACHINE**

Horst Seitz, Pestalozzistrasse 21, 3500 Kassel, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,490  
Int. Cl.<sup>3</sup> B22D 33/04, 17/00

U.S. Cl. 164—113

18 Claims



1. A horizontal pressure die-casting machine comprising:  
a frame;  
a first and second die part;  
a substantially vertically extending stationary first fixing plate connected to said frame for supporting said first die part;  
a movable fixing plate pivotally mounted to said frame for supporting said second die part;  
second plate drive means connected to said second fixing plate for moving said second fixing plate from a substantially horizontal mounting position away from said first fixing plate, to a substantially vertical working position facing and spaced from said first fixing plate;  
said second fixing plate comprising a base plate part pivotally mounted to said frame, a mounting plate part for supporting said second die part movably mounted on said base plate part, and mounting plate drive means connected to said base plate and mounting plate parts for displacing said mounting plate part with respect to said base plate part to move said second die part toward said first die part with said second fixing plate in its substantially vertical position.

15. A method of operating a horizontal pressure die-casting machine which includes a frame, a vertical stationary first

fixing plate connected to the frame for supporting a first die part, a movable second fixing plate pivotally mounted to the frame for supporting a second die part, and second plate drive means connected to the second fixing plate for moving the second fixing plate, with the movable second fixing plate itself including a base plate pivotally mounted to the frame and a mounting plate movably mounted to the base plate and movable by mounting plate drive means, the method comprising:  
activating said first plate drive means for moving said first fixing plate from a substantially horizontal mounting position into a substantially vertical working position facing and spaced from said first fixing plate to align the first and second die parts; and  
activating said mounting plate drive means to move the second die part toward and into engagement with the first die part.

4,417,617

# **APPARATUS FOR VACUUM CASTING OF RODS**

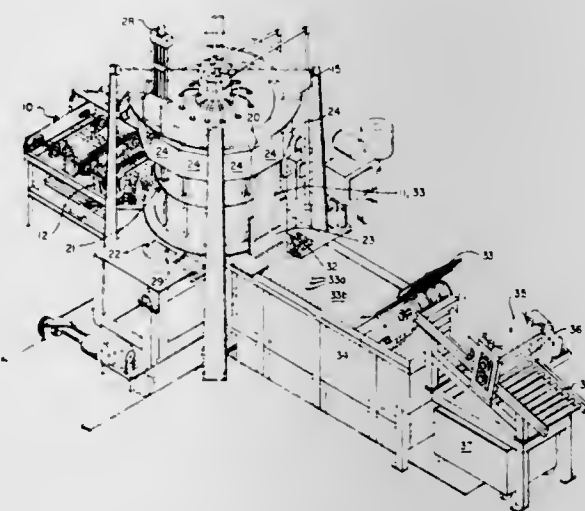
Sankar P. Iyer, Kokomo, Ind.; Roy D. Lewis, Lachine, Canada; H. Joseph Klein, Kokomo; William C. Hord, Greentown, both of Ind., and James C. Ailor, Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Division of Ser. No. 874,849, Feb. 3, 1978. This application Mar. 9, 1979, Ser. No. 18,886

Int. Cl.<sup>3</sup> B22D 27/16, 33/00

U.S. Cl. 164—254

1 Claim



1. An apparatus for aspiration casting of metals and the like comprising a mandrel having a plurality of vertically movable side by side vacuum heads, mold engaging means on each said head adapted to engage one end of each of a plurality of frangible molds under vacuum, means for delivering a plurality of molds to said head for engagement by said engaging means, means for moving said mandrel stepwise over a molten bath of metal, indexing means stopping said mandrel with a head over said bath of metal, means on said mandrel for lowering and raising said head and appended molds so that the other end of said molds is immersed in the metal, means connected to said head for applying vacuum thereto when the molds are immersed, cooling means for cooling the molds and contained metal, and mold removal means breaking the mold on the metal into small pieces and removing the same, said means for delivering a plurality of molds to said head including a guide means delivering elongate molds on a horizontal axis in a single layer thickness, a horizontally movable feed chain spaced from said guide means, toothed wheel means receiving said molds one at a time and delivering the same to said feed chain, lift arm means having spaced fingers equal in number to the plurality of molds engaged by said vacuum heads and each receiving and engaging a mold in the horizontal axis and means rotating said lift arm and molds to a vertical axis position beneath a vacuum head.

4,417,618

# **AIR-CONDITIONER CONTROL SYSTEM FOR VEHICLES**

Akiro Yoshimi, Kariya; Michihiko Kamiya, Handa, and Mitutoshi Moriya, Gamagori, all of Japan, assignors to Nippon-denso Co., Ltd., Kariya, Japan

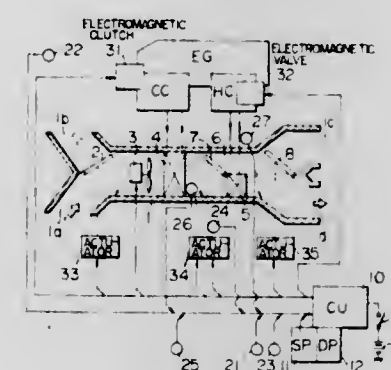
Filed Jun. 19, 1981, Ser. No. 275,508

Claims priority, application Japan, Jun. 27, 1980, 55-88412

Int. Cl.<sup>3</sup> F28D 21/00; F28F 27/00

U.S. Cl. 165—12

6 Claims



1. An air conditioning system for a vehicle compartment of an automotive vehicle comprising:

an air duct having an inlet for receiving air to be conditioned and a first and a second outlets for supplying conditioned air into the vehicle compartment, said first and second outlets being directed to an upper and a lower portion of the vehicle compartment, respectively;

an air conditioner for cooling and heating air received through said inlet of said air duct to supply conditioned air through said first and second outlets of said air duct;

an air distributing damper positioned in said air duct downstream of and in cascade with said air conditioner to be movable to a first, second and third positions, said damper substantially closing said second outlet of said air duct at said first position thereof to supply conditioned air of a comparatively low temperature through said first outlet of said air duct, said damper substantially closing said first outlet of said air duct at said second position thereof to supply conditioned air of a comparatively high temperature through said second outlet of said air duct, and said damper further permitting, at said third position thereof, said first and second outlets of said air duct to supply conditioned air of comparatively low and high temperatures through said first and second outlets of said air duct, respectively;

first means for setting a desired temperature in the vehicle compartment;

second means sensing an actual temperature in the vehicle compartment;

third means sensing an insulation level in the vehicle compartment;

first control means controlling the rate of cooling and heating of said air conditioner to effect a temperature of the conditioned air on the basis of the desired temperature along with other conditional temperature information including an output signal of said third means; and

second control means controlling the position of said air distributing damper in relation to the controlled rate of cooling and heating of said air conditioner, said second control means controlling said air distributing damper to move from said second position to said third position when insulation of a level higher than a predetermined level in the vehicle compartment is sensed by said third means and said air distributing damper is at said second position thereof.

4,417,619

# **AIR-COOLED HEAT EXCHANGER**

Kunihiko Minami, Sakai, Japan, assignor to Sasakura Engineering Co., Ltd., Osaka, Japan

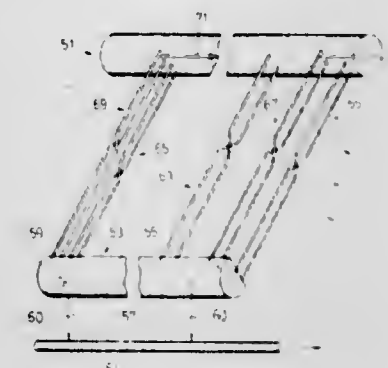
Filed Dec. 8, 1980, Ser. No. 214,086

Claims priority, application Japan, Jun. 5, 1978, 53/068186; Jan. 20, 1979, 54-5940; Jan. 20, 1979, 54-5941

Int. Cl.<sup>3</sup> F28B 9/10, 1/06

U.S. Cl. 165—113

2 Claims



1. An air-cooled heat exchanger comprising at least one set of first tubes and second tubes extending generally in parallel to each other through which fluid being cooled flows in the same direction and across which air flows to cool the fluid within said tubes, said first tubes having a first longitudinal portion and a second longitudinal portion downstream of said first portion with respect to the air flow, and said second tubes having a first longitudinal portion adjacent to and downstream with respect to the air flow from said first portion of said first tubes and a second longitudinal portion adjacent to said second portion of said first tubes and upstream with respect to the air flow of said first portion of said second tubes and also upstream of said second portion of said first tubes, said first and second portions of said tubes being connected by intermediate bent portions, an inlet header and an outlet header lying generally in parallel to each other, means dividing said outlet header into at least two chambers, one set of said first and second tubes extending between said inlet header and one of said two chambers, another set of said first and second tubes extending downstream of said one set with respect to the air flow between said outlet header and the other chamber, and a further set of said first and second tubes extending downstream of said another set with respect to the air flow from each chamber, and a gas extractor communicating with said further set.

4,417,620

# **METHOD OF RECOVERING OIL USING STEAM**

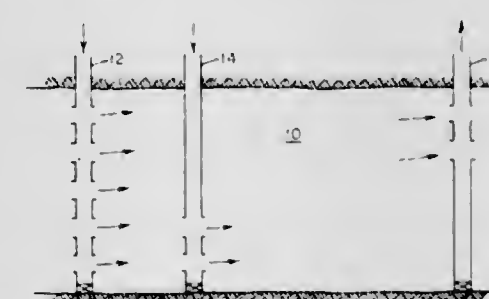
Eleonora G. Shafir, Garland, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,234

Int. Cl.<sup>3</sup> E21B 43/24, 43/30

U.S. Cl. 166—245

2 Claims



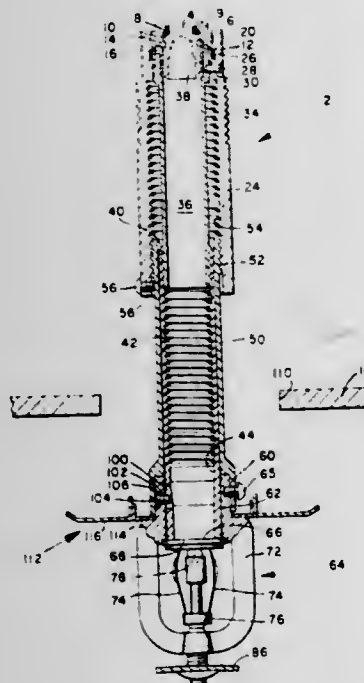
1. A method for the recovery of oil from a subterranean, viscous oil-containing formation, said formation penetrated by at least three wells, a first injection well being in fluid communication with a substantial portion of the formation, a spaced







an inner sleeve mounted in the tube for axial movement only and spaced above the sprinkler head with its upper end holding the releasable means against release, an intermediate sleeve threaded to the inner sleeve and having its lower end supported by said releasable cap to releasably support the assembled inner and intermediate sleeves,



said work shaft is divided into hollow pocket-like sections with the radially outer circumferential surface of said pocket-like sections being closed, flail-like parts mounted on and extending radially outwardly from the radially outer circumferential surface of said work shaft and spaced across the axial direction thereof and disposed offset to one another around the circumference of said work shaft, each said flail-like part is mounted in one said pocket-like section within said work shaft and extends generally radially outwardly from the closed radially outer circumferential periphery of said pocket-like section, a drum located under said hood-like housing and mounted for rotation about an axis extending in generally parallel relation with the axis of said work shaft and having a circumferential periphery extending around the axis of rotation thereof, said drum is spaced rearwardly from said work shaft relative to the direction of movement of the apparatus, prongs mounted on and extending outwardly from the circumferential periphery of said drum, said prongs travel in a circular path around the axis of said drum and the radially outer edge of said circular path is located lower than the outer edge of the circular path of said flail-like parts rotating about the axis of said work shaft, and the outer edges of the circular paths of said prongs and said flail-like parts are approximately tangent to one another at the closest point therebetween where material is transferred from said prong to said flail-like parts.

said inner and intermediate sleeves having inner diameters greater than the outer diameter of the plug to provide for passage of the plug therethrough on its release, and means for connecting the intermediate sleeve to the sprinkler head and tube assembly for rotational movement therewith and relative axial movement with respect thereto, for a given amount of rotation said intermediate sleeve and said outer sleeve moving the same axial distance.

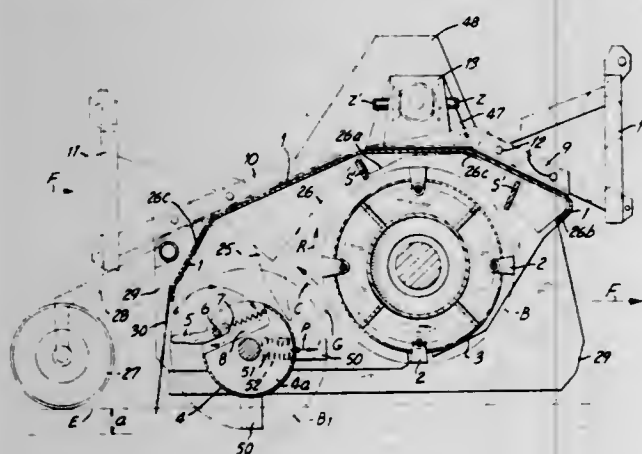
#### 4,417,627 APPARATUS FOR BREAKING ROCK LOCATED IN A FIELD

Josef Willibald, D-7771 Frickingen 2 (Altheim), Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,830  
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1980, 3039553

Int. Cl.<sup>3</sup> A01B 43/00  
U.S. Cl. 172-45

8 Claims



1. Apparatus for breaking rock found in soil such as in a field used for farming or for cutting sub-surface obstructions in the field, comprising a hood-like housing having a forward end and a rearward end relative to the direction of movement of the apparatus over a field, a work shaft rotatably mounted under said hood and the axis of said work shaft extending transversely of the direction of movement of the apparatus,

1. A boring apparatus having a rotatably driven auger for use in combination with a bucket pivotally attached to a movable boom of a vehicular means, comprising:
  - (a) an open upstanding frame means including a pair of spaced upright members and an upper bucket attaching means;
  - (b) means for detachably connecting said upper bucket attaching means to the bucket with said pair of spaced upright members extending outwardly of the bucket;
  - (c) a mounting plate extending between said pair of upright members;
  - (d) means for removably affixing said mounting plate to said pair of spaced upright members whereby said mounting plate can be installed in one of two positions;
  - (e) coupling means affixed to said mounting plate; and
  - (f) power drive means affixed to said mounting plate for rotatingly driving said coupling means whereby said mounting plate can be installed to operate the auger for producing a bore hole in either axial direction with respect to the bucket.

4,417,628

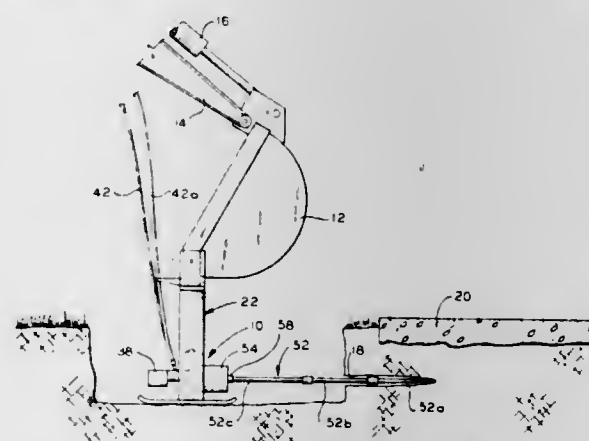
#### EARTH BORING APPARATUS

Richard W. Gessner, 1038 Eleventh St. NE., Massillon, Ohio 44646

Filed Oct. 5, 1981, Ser. No. 308,280  
Int. Cl.<sup>3</sup> E21B 7/02

U.S. Cl. 173-29

7 Claims



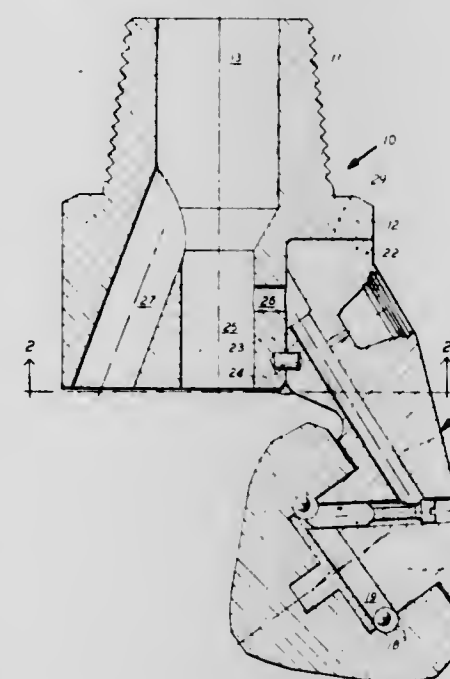
4,417,629

#### DRILL BIT AND METHOD OF MANUFACTURE

Duane W. Wallace, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed May 13, 1981, Ser. No. 263,333  
Int. Cl.<sup>3</sup> B21K 5/02; E21B 9/08  
U.S. Cl. 175-365

8 Claims



#### 5. A rolling cutter drill bit comprising:

a body member having a threaded upper portion and at least one recess in its side adjacent the lower end thereof, the recess being defined by an arcuate side wall configured as a portion of a surface of revolution with its axis generally parallel to the central longitudinal axis of the body member, and by an upper end surface extending generally perpendicular to the central longitudinal axis of the body member; and

at least one lug assembly comprising a lug member having side and upper end surfaces corresponding in size and configuration to said side and upper end surfaces defining said recess, with the lug member fitted in the recess in surface-to-surface engagement, the lug member further having a bearing journal at the lower end thereof, the lug assembly further comprising a roller cutter rotatably mounted on the bearing journal; whereby, during assembly of the bit, when the lug member is to be secured in the recess, the angular position of the lug member in the recess and thus the skew angle between the axis of the journal and a radial line emanating from the central axis of the body member and extending through the journal may be set at a predetermined position and a predetermined angle, respectively.

4,417,630

#### METHOD AND APPARATUS FOR CHECKING THE WEIGHT OF CONSIGNMENTS ASSEMBLED IN CONTAINERS

Otto Weber, Kurpfalzstr. 21, D-6945 Hirschberg; Klaus Ohnsmann, Leharstr. 32, D-6040 Weinheim, and Ferdinand Christ, Heidelberger Str. 7, D-6831 Brühl, all of Fed. Rep. of Germany

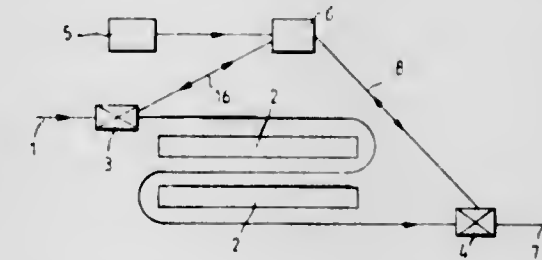
Filed Oct. 1, 1981, Ser. No. 307,505  
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042902

Int. Cl.<sup>3</sup> G01G 19/52, 13/14; G06K 9/00  
U.S. Cl. 177-1

2 Claims

1. A method for checking the weight of consignments assembled in containers, comprising the steps of measuring the net weight of an empty container being introduced for passage on a conveyor belt and transmitting the weight to a consignment computer, measuring the weight of said container filled with

the articles of the consignment during passage and transmitting the weight to said computer, determining the difference of said two weights as the actual weight of the consignment and comparing the actual weight against the fed-in normal weight of the consignment in question, whereupon in case of a deviation of said actual weight from said nominal weight above a predetermined tolerance boundary the container in question is sorted out and the other containers are conveyed on, reading a



recognition code associated with each of said containers during the weighing process and transmitting said code to said computer, transmitting said measured weights to said consignment computer as soon as the empty and filled weights are determined, comparing said empty weight with said filled weight of the same container to each other in relation to a recognition code, and determining the proper comparison of the weights.

4,417,631

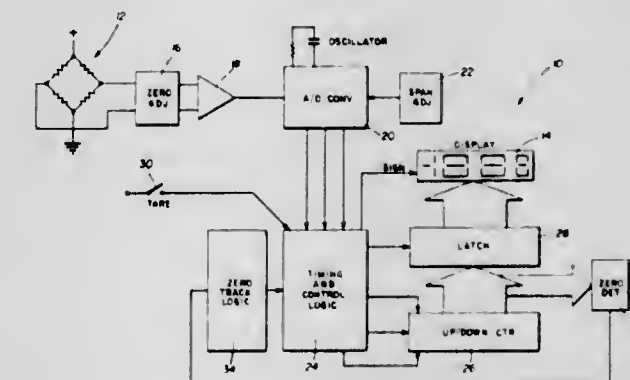
#### ZERO TRACKING CIRCUIT FOR ELECTRONIC WEIGHING SCALE

James Johnson, Webster, Tex., assignor to Sensor Development, Inc., Lake Orion, Mich.

Filed Dec. 28, 1981, Ser. No. 335,110  
Int. Cl.<sup>3</sup> G01G 3/14, 13/14

U.S. Cl. 177-210 FP

10 Claims



1. In a weighing device including a weight transducer for developing an analog electrical signal proportional to an applied weight, converter means for converting the analog weight signal to a corresponding digital output signal, said converter means including resettable counter means for accumulating a count as a function of said weight signal, and a digital display for displaying said output count, the improvement comprising:

a zero tracking circuit including decoder means responsive to an output of said counter means for detecting a low magnitude counter output that is characteristic of drift and means responsive to said decoder means for resetting said counter means,

said resetting means including means responsive to said decoder means for generating reset pulses identifying low magnitude counter outputs characteristic of drift, accumulator means for accumulating said reset pulses and means responsive to a predetermined number of reset pulses in said accumulator means for resetting said counter means.



4,417,632

**AUTOMATIC WEIGHING METHOD AND DEVICE**  
 Peter Lohberg, Friedrichsdorf, Fed. Rep. of Germany, assignor to Battelle Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

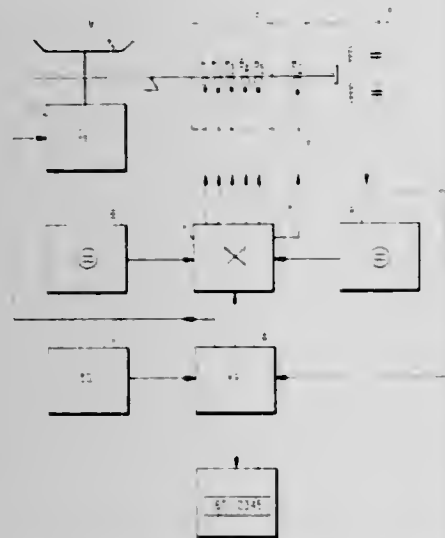
PCT No. PCT/EP80/00132, § 371 Date Jul. 13, 1981, § 102(e)  
 Date Jul. 13, 1981, PCT Pub. No. WO81/01463, PCT Pub. Date May 28, 1981

PCT Filed Nov. 14, 1980, Ser. No. 285,086  
 Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945940

Int. Cl.<sup>3</sup> G01G 7/00, 1/26

U.S. Cl. 177—212

11 Claims



1. Process for the automatic weighing, in case of which the deviation of the balance beam from the rest position is compensated within the scope of a regulating process electromagnetically and the compensation force needed for this is used as a measure for the mass to be determined, characterized in that compensating forces are used which are graded according to decreasing power of a decadal numerical system, whereby, starting out from larger to smaller compensation force the weight-value of each power is always compensated by (n-1) quantization steps, whereby n signifies that number of quantization steps within the used decadal system which causes an overcompensation, in that the weight is determined from the sum of the compensation forces of all powers, and in that the weighing result is determined from the addition of the sum of the compensation forces of all powers and the sum of numerically and electronically stored correction values, whereby the correction values correspond to the compensation errors which were determined once within the scope of one calibrating process for each compensation step.

4,417,633

**HYDRAULIC SYSTEM FOR PREVENTING LEAK DOWN OF HYDRAULIC IMPLEMENTS**

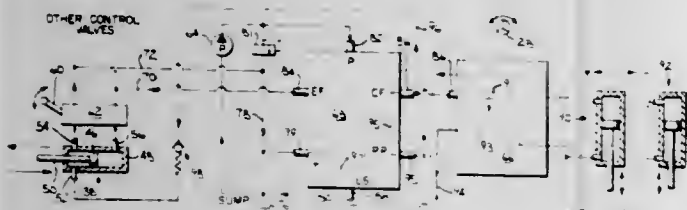
Donnell L. Dunn, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 18, 1981, Ser. No. 245,092

Int. Cl.<sup>3</sup> B62D 5/06

U.S. Cl. 180—132

1 Claim



1. A hydraulic power steering system for selectively effecting actuation of a steering motor to pivot one or more of the wheels supporting a tractor and for actuating at least one hydraulic motor carried by the frame of the tractor and having

a piston, a cylinder, and a piston rod, said hydraulic motor being pivoted between the frame of said tractor and the free end of an arm pivoted at one of its ends to the tractor frame so that when actuated said hydraulic motor pivots said arm between raised and lowered positions, said system being adapted to pressurize said one hydraulic motor during transport of said tractor attendant to actuation of said steering motor and, comprising:

- a source of pressurized fluid for operating the steering motor and the hydraulic motor;
- a closed-center steering control valve having a center-neutral position, disposed in series flow relationship between said source of pressurized fluid and the steering motor, defining a variable orifice operable to establish a fluid flow rate from said steering control valve to the steering motor;
- selectively operable control valve means, disposed in series flow relationship between said source of pressurized fluid and said hydraulic motor, for operating said hydraulic motor; to pivot said arm between said raised and lowered positions
- pressure compensating valve means, disposed in series flow relationship between said source of pressurized fluid and said control valve means and said steering control valve respectively, for controlling the flow of fluid from said source to said steering control valve and said control valve means to maintain a generally constant pressure drop across said variable orifice, said pressure compensating valve means, including
  - an inlet port in fluid communication with said source of pressurized fluid,
  - a controlled flow steering outlet port in direct fluid communication with the inlet of said variable orifice on said steering control valve,
  - an excess flow loader outlet port in fluid communication with the inlet of said control valve means through which pressurized fluid is supplied for operating said hydraulic motor, and
  - a load sensing port in fluid communication with the outlet of said variable orifice of said steering control valve; and
- an additional hydraulic connection line bypassing said control valve means, said additional hydraulic line interconnecting said steering outlet port on said pressure compensating valve with a flow port on said cylinder on that one side of the piston in said cylinder which if leaked would pivot said arm away from its raised position, said additional hydraulic line directing hydraulic fluid flow from said pressure compensating valve to said hydraulic motor to replenish leakage from said one side of said piston whenever said steering control valve is operated to produce flow through said first variable orifice, thereby preventing said piston rod from repositioning due to leaking during transport of said tractor to maintain said arm in raised position, said additional hydraulic line including a one-way flow check valve to prevent reverse fluid flow in said additional hydraulic line from said motor directly to said pressure compensating valve means.

4,417,634

**ELEVATING TRANSPORTER WITH MECHANICAL DRIVE**

Manfred W. Quack, Redmond, and Douglas Ross, Woodinville, both of Wash., assignors to CTEC Company, Bellevue, Wash.

Filed Feb. 9, 1981, Ser. No. 232,561

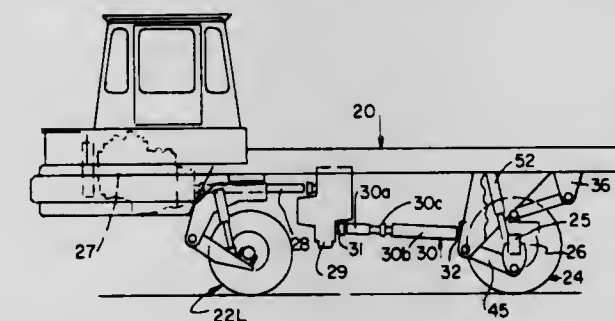
Int. Cl.<sup>3</sup> B62D 63/00

U.S. Cl. 180—22

5 Claims

1. An elevating transport vehicle for raising and lowering heavy loads and transporting them, said vehicle comprising:
- an elongated transport frame assembly,
  - a first axle assembly with a first differential and a set of wheels,
  - a second axle assembly in tandem with the first axle assembly

- and having a set of wheels and a second differential aligned with the first differential,
- a central telescopic drive shaft extending between said differential and having universal joint connections therewith, power means carried by the vehicle frame and operatively connected with one of said differentials,
- said first axle assembly having a first axis of wheel rotation, and said second axle assembly having a second axis of wheel rotation parallel to the first axis,
- a first tie rod pivotally connected at an inner end to the frame assembly at a pivot axis equidistant from said wheel rotation axes and above the level thereof, and pivotally connected at an outer end to the first axle assembly at a pivot axis located above the first wheel rotation axis,
- a second tie rod pivotally connected at an inner end to the frame assembly at a pivot axis transversely aligned with the pivot axis at the inner end of the first tie rod, and pivotally connected at an outer end to the second axle assembly at a pivot axis located above the second wheel rotation axis,
- a first pair of depending frame legs provided by the vehicle frame assembly at opposite sides of the first differential, and a second pair of depending frame legs provided by the vehicle frame assembly at opposite sides of the second differential,
- a first pair of swing arms located on opposite sides of said first differential and a second pair of swing arms located on opposite sides of said second differential, said first and second pairs of swing arms having respective pivotal connections on the underside of the first and second axle



- assemblies and extending in opposite directions from one another and making pivotal connections with said first and second pairs of legs, respectively,
- a first pair of elevating hydraulic cylinder units depending from pivotal connections with the vehicle frame assembly to pivotal connections with said first pair of swing arms, and a second pair of elevating hydraulic cylinder units depending from pivotal connections with the vehicle frame assembly to pivotal connections with said second pair of swing arms,
- said first tie rod and first pair of frame arms sloping downwardly from their pivotal connections with the vehicle frame assembly when the first pair of cylinder units are fully extended, and sloping upwardly from such pivotal connections when the first pair of cylinder units are fully retracted, and said second tie rod and second pair of frame arms sloping downwardly from their pivotal connections with the vehicle frame assembly when the second pair of cylinder units are fully extended, and sloping upwardly from such pivotal connections when the second pair of cylinder units are fully retracted, to thereby minimize angulation of said universal joint connections and telescopic movement of said central drive shaft,
- a first pair of idler bogie units swivel-mounted for steering beneath the vehicle frame assembly at opposite sides, and a second pair of idler bogie units also swivel-mounted for steering beneath the vehicle frame assembly at opposite sides, said first and second pairs of idler bogie units having steering axes located at opposite ends of the vehicle frame assembly from one another, each of said bogie units hav-

ing a pair of wheels and an elevating hydraulic cylinder unit, steering means for selectively turning said first and second pairs of idler bogie units in opposite directions to steer the vehicle, and hydraulic means carried by the vehicle frame for operating all of said elevating hydraulic cylinder units for evenly raising and lowering the entire vehicle frame assembly.

4,417,635

**RAPID FIXING DEVICE CONSISTING OF A SPRING UNIT**

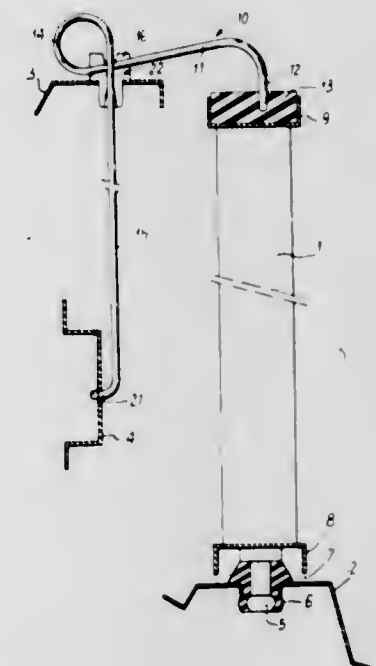
Yves Thepault, Velizy, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 19, 1981, Ser. No. 294,217

Claims priority, application France, Aug. 22, 1980, 80 18384  
 Int. Cl.<sup>3</sup> B60K 11/04

U.S. Cl. 180—68 R

17 Claims



1. An arrangement for mounting a cooling system radiator in the engine compartment of an automobile vehicle, said radiator comprising a base portion and a top portion and said engine compartment comprising a beam structure including a horizontal bottom beam member for supporting and positioning said base portion of said radiator, a horizontal top beam member and a horizontal intermediate stiff beam member, said top and intermediate beam members being transversely offset on the same side with respect to said bottom beam member, said arrangement comprising:

- a one-piece spring wire unit including a first leg and a second leg connected together at one end thereof so as to extend substantially perpendicular to one another when the spring wire unit is not strained, said spring wire unit being mounted under strain so that said first leg extends from a connection with said second leg from above said top beam member substantially horizontally over said radiator, a free end of said first leg being pressed downwardly on said top portion of said radiator, and said second leg extending from a connection with said first leg from above said top beam member substantially vertically downwardly through said top beam member while being movable and guided vertically in said top member, wherein a free end of said second leg further comprises means for fixing the free end of said second leg to said spring wire unit so as to transfer to said intermediate beam member a compression force supplied by the free end of the first leg of the spring wire unit to the top portion of the radiator.



4,417,636

## COOLING FAN DUCTING

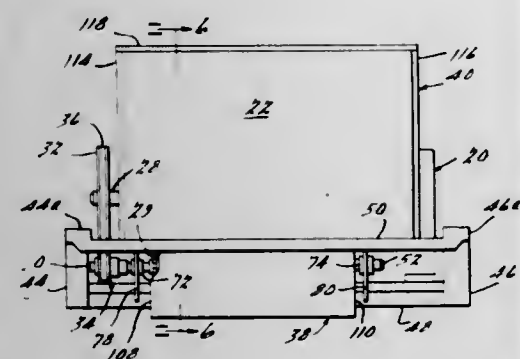
Joseph S. Mazur, Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 22, 1981, Ser. No. 276,109

Int. Cl.<sup>3</sup> B60H 1/24

U.S. Cl. 180—68 R

11 Claims



1. In a vehicle of the type including a liquid-cooled engine having a housing and a crankshaft mounted therein for rotation about an axis, a radiator disposed in a plane substantially parallel to the axis and spaced from the housing for cooling the liquid by air directed therethrough, a cross-flow fan assembly for pulling air through the radiator toward the engine housing, the improvement comprising:

an air inlet duct assembly for directing the cooling air to the cross-flow fan inlet, said duct assembly having an inlet defined by the radiator, by members extending from the radiator to the engine housing, and additionally by a portion of the engine housing.

4,417,637

## AIR CUSHION VEHICLE

Derek J. Hardy, and Michael W. Eldridge, both of Cowes, England, assignors to British Hovercraft Corporation Ltd., Yeovil, England

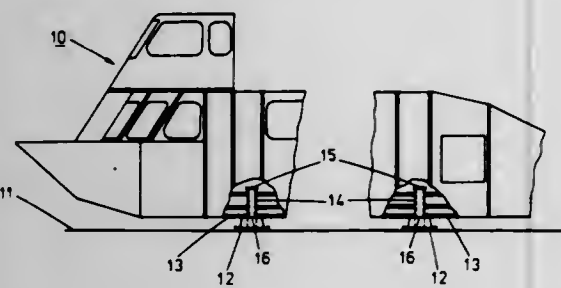
Filed Feb. 17, 1982, Ser. No. 349,610

Claims priority, application United Kingdom, Feb. 20, 1981, 8105518

Int. Cl.<sup>3</sup> B60V 1/18

U.S. Cl. 180—116

7 Claims



1. An air cushion vehicle (A.C.V.) including a rigid base structure having an under surface facing towards a ground surface over which the vehicle operates and an upper surface facing away from said ground surface, a plurality of sleeve members built into the rigid base structure and each extending between an upper end which opens at the upper surface of the rigid base structure and a lower end which opens at the under surface of the rigid base structure and which is co-axial with a bore through a landing pad structure attached to the under surface of the rigid base structure, each sleeve member being adapted to receive a support leg passed into the upper end of the sleeve member so as to extend therethrough and project from the lower end of the sleeve member, and locking means for securing each support leg in its projected position relative to the sleeve member.

4,417,638

## AIR INLET AND AIR DISPERSION GROMMET AND IMPROVED AIR PALLET BEARING SAME

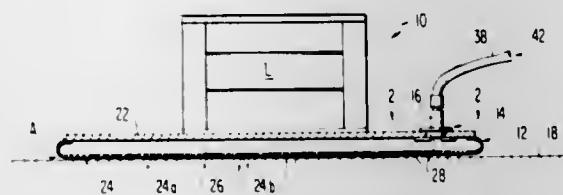
Bruce F. Harvey, Newark, Del., assignor to American Industrial Research, Newark, Del.

Filed Oct. 14, 1981, Ser. No. 311,227

Int. Cl.<sup>3</sup> B60V 1/04

U.S. Cl. 180—125

15 Claims



1. An air inlet and air dispersion grommet for a planar air pallet materials handling system or the like, said system comprising:

a planar, generally rigid backing member,  
a thin flexible sheet member including a bottom portion bearing perforations underlying said backing member,  
said backing member supporting a load,  
means including at least said thin flexible sheet member forming a plenum chamber for retaining pressurized air between the bottom portion of said sheet and said backing member and for creating a thin air film between the bottom portion of said sheet and an underlying support surface for allowing frictionless movement of said load over said underlying supporting surface,  
said grommet being mounted to one of said members and comprising a hollow annular body sealably fixed to said one member and opening to said plenum chamber,  
said body including at least one radially outwardly projecting inner flange over a portion of its periphery, within said plenum chamber and functioning to space said members apart,  
said body also including slot means within a peripheral portion of said body opening to said plenum chamber and to the interior of said hollow body, to the side of said inner flange, and  
means for insuring air flow from a tubular air supply nozzle bearing air under pressure when inserted into said annular body through said slot means,  
whereby, insertion of the end of said tubular air supply nozzle bearing air under pressure into said hollow annular body permits rapid jacking of said load, dispersion of the air throughout said plenum chamber, and creation of said thin film air bearing.

4,417,639

## DYNAMIC GAS PRESSURED JACKING STRUCTURE WITH IMPROVED LOAD STABILITY AND AIR PALLET EMPLOYING SAME

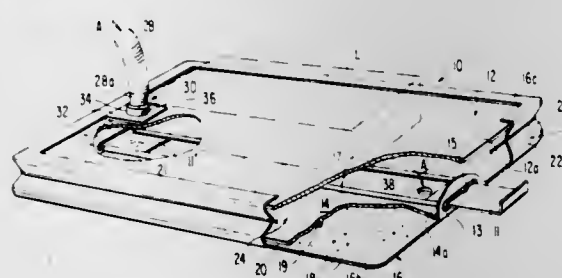
Jack Wegener, 830 Chambers Ave., Gloucester City, N.J. 08030

Filed Nov. 16, 1981, Ser. No. 322,035

Int. Cl.<sup>3</sup> B60V 1/04

U.S. Cl. 180—125

18 Claims



1. A dynamic air pressure jacking structure with improved load stability for a load carried thereby and jacked vertically

upwardly from an underlying relatively rigid support surface, said structure comprising:  
flexible film means forming a jacking plenum chamber and bearing said load,  
an air inlet hole leading to said jacking plenum chamber to one side of the load,  
an air outlet hole leading from said jacking chamber and laterally to the side of said inlet hole and to the opposite side of said load from said air inlet hole,  
means for supplying compressed air fluid to said inlet hole, for flow through said jacking plenum chamber and for discharge through said outlet hole, and wherein the cross-sectional area of the outlet hole is substantially less than the cross-sectional area of said inlet hole such that the load is jacked vertically upwardly without danger of tipping,  
and wherein said air outlet hole functions as least partially to provide an anti-ballooning effect to said dynamic fluid pressure jacking structure.

4,417,640

## ELECTRICALLY DRIVEN OIL PRESSURED POWER STEERING APPARATUS

Michio Abe, Kasugai, and Naoyuki Maeda, Inuyama, both of Japan, assignors to Tokai TRW &amp; Co., Ltd., Aichi, Japan

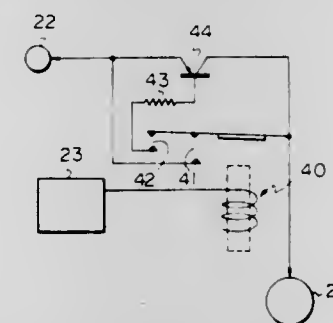
Filed Jul. 20, 1981, Ser. No. 284,539

Claims priority, application Japan, Oct. 3, 1980, 55-138340; Dec. 8, 1980, 55-172789

Int. Cl.<sup>3</sup> B62D 5/06

U.S. Cl. 180—142

16 Claims



1. An apparatus for operating a power steering motor and turning a steerable vehicle wheel in response to rotation of a steering wheel, said apparatus comprising a hydraulic pump, electric motor means connected with said pump for driving said pump to supply hydraulic fluid to the power steering motor, a vehicle speed sensor, and control means connected with said electric motor means and vehicle speed sensor for energizing said motor means, said control means comprising an electrical circuit having a first circuit portion for conducting electrical energy to energize said motor means to drive said pump at a first angular velocity while the vehicle is traveling at a first speed, a second circuit portion connected in parallel with said first circuit portion for conducting electrical energy to energize said motor means to drive said pump at a second angular velocity which is less than the first angular velocity while the vehicle is traveling at a second speed which is greater than the first speed, and means for rendering said first circuit portion ineffective to conduct electrical energy to said motor means while the vehicle is traveling at the second speed.

4,417,641

## SYSTEM FOR CONTROLLING TWO-WHEEL AND FOUR-WHEEL DRIVES

Hayashi Kageyama, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,326

Claims priority, application Japan, Jun. 27, 1980, 55-88331

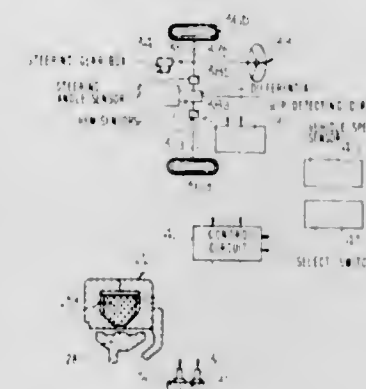
Int. Cl.<sup>3</sup> B60K 17/34

U.S. Cl. 180—247

13 Claims

7. A system for controlling driving with two wheels or four

wheels, respectively in a vehicle powered by an internal combustion engine comprising  
transmission means for transmitting power from said engine to two main wheels of said vehicle,  
an electromagnetic clutch means having a magnetizing coil for selectively transmitting said power to two auxiliary wheels of the vehicle,  
a select switch means for energizing said magnetizing coil with clutch current for engaging said electromagnetic clutch means.



means for detecting steering angle for producing an output signal with a level which increases with an increase of the steering angle, and  
control circuit means for controlling the clutch current applied to said magnetizing coil of said electromagnetic clutch means by decreasing said clutch current with an increase in the level of said output signal when said output signal of said steering angle detecting means is applied to said control circuit means when driving with the power transmission to the four wheels.

4,417,642

## FOUR-WHEEL-DRIVE SYSTEM FOR AUTOMOTIVE VEHICLE

Kunihiko Suzuki, Fujisawa, and Akihiko Muraoka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

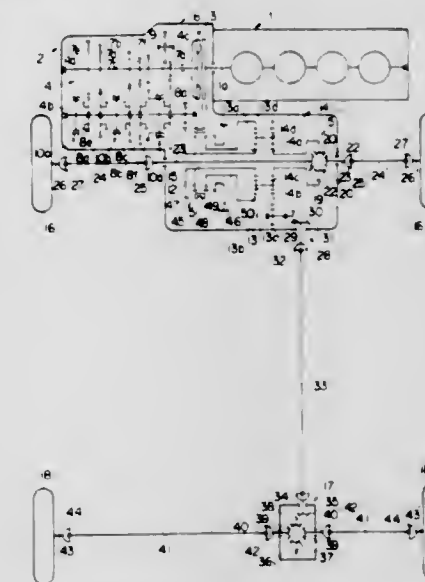
Filed Mar. 31, 1981, Ser. No. 249,418

Claims priority, application Japan, Apr. 25, 1980, 55-55733

Int. Cl.<sup>3</sup> B60K 17/34

U.S. Cl. 180—249

11 Claims



1. A four-wheel-drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road wheels and a pair of rear road wheels, comprising  
a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;  
a power transmission gear unit including transmission input



and output shafts each having an axis of rotation substantially parallel with the axis of rotation of the output shaft of the power unit, and gears mounted on the transmission input and output shafts and arranged to be capable of selectively producing a plurality of ratios between the speeds of rotation of the transmission input and output shafts;

a speed reduction gear with which the transmission output shaft is held in driving engagement for driving the reduction gear to rotate about an axis of rotation thereof;

a first final reduction gear unit including gears arranged to split an input driving power into two output components to be transmitted to one of said two pairs of road wheels;

a second final reduction gear unit including gears arranged to split an input driving power into two output components to be transmitted to the other of said two pairs of road wheels;

first and second planetary gear assemblies each including an externally toothed sun gear rotatable about an axis of rotation thereof, an internally toothed ring gear coaxially encircling the sun gear and rotatable about the axis of rotation of the sun gear, at least two planet pinions each held in mesh with the sun gear and the ring gear and rotatable about an axis of rotation substantially parallel with the axis of rotation of the sun gear, and a pinion carrier interconnecting the planet pinions together so that the planet pinions are revoluble together around the axis of rotation of the sun gear, the speed reduction gear being held in driving engagement with one of the sun gear and the pinion carrier of the first planetary gear assembly, the other of the sun gear and the pinion carrier of the first planetary gear assembly being connected to and rotatable with the pinion carrier of the second planetary gear assembly, one of the sun gear and the ring gear of the second planetary gear assembly being in driving connection to one of the first and second final reduction gear units and the other of the sun gear and the ring gear of the second planetary gear assembly being in driving connection to the other of said first and second final reduction gear units;

a stationary member to be held stationary in the vehicle; and

low-high-speed shifting clutch means operative to provide coupling selectively between said speed reduction gear and the ring gear of the first planetary gear assembly and between said stationary member and the ring gear of the first planetary gear assembly.

4,417,643

# WHEEL HUB ASSEMBLY FOR AN AUTOMOBILE VEHICLE

Pierre Guimbretiere, Neauphle le Chateau, France, assignor to Glanzer Spicer, Poissy, France

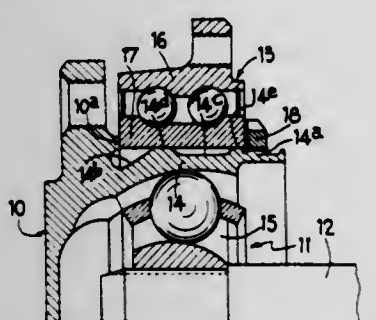
Filed Aug. 19, 1981, Ser. No. 294,354

Claims priority, application France, Sep. 8, 1980, 80 19336

Int. Cl.<sup>3</sup> B60K 17/32

U.S. Cl. 180—254

16 Claims



1. A wheel hub assembly comprising a wheel flange, a rolling bearing comprising an inner race in contact with the flange, an outer race, and rolling elements interposed between said races, and a transmission joint disposed radially inside the rolling bearing and having an outer element which is connected to rotate with the flange and with the inner race of the

bearing, the wheel flange and the inner race of the bearing being formed by two distinct members, an axial connection between axially adjacent end surfaces of said two members being limited to a ring portion which is on at least one of said two members, has a radial extent of less than the radial extent of said adjacent end surface of said inner race of the bearing and is located adjacent the radially outer periphery of the inner race and an axially-extending surface of contact between the outer element of the joint and the inner race of the bearing, said surface of contact being interrupted by at least one empty recess in the outer element of the joint.

4,417,644

# ANTI-THEFT DEVICE AND METHOD FOR DETERRING THEFT OF MOBILE EQUIPMENT

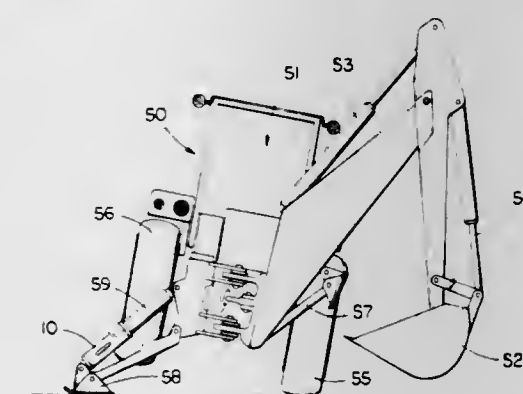
Paul D. Brogard, 3425 E. Mt. Ebal Rd., Bloomington, Ind. 47401

Filed Jun. 15, 1981, Ser. No. 273,853

Int. Cl.<sup>3</sup> B60R 25/04

U.S. Cl. 180—287

23 Claims



1. An anti-theft device for mobile equipment, the mobile equipment including propelling means for moving the equipment about, the equipment further including at least one telescoping support member extensible to a position in which the telescoping support member renders the equipment immobile, the telescoping support member including a cylinder and a shaft extensible therefrom, said device comprising:

- a hollow strut, said strut having an external longitudinal surface and having a cavity along its length which is dimensioned to receive the shaft of the telescoping support member, said strut being of sufficient length to maintain the telescoping support member in said equipment immobilizing position;
- mounting means for mounting said strut lengthwise about the shaft, said means including means for creating an open condition in which there is a full length passageway between said longitudinal external surface and said cavity, said passageway being adapted to receive the shaft through said passageway and into said cavity, and means for creating a closed condition in which the shaft is completely enclosed by said strut;
- anti-theft locking means for locking said strut in said closed condition about the shaft, said locking means including an anti-theft locking mechanism;
- lock concealment means for concealing said anti-theft locking mechanism whenever said strut is engaged with the retracted cylinder and shaft.

4,417,645

# PORTA CLIMB CLIMBING TREE STAND

Reese E. Untz, Rte. 7, Box 665J, Charlotte, N.C. 28213

Filed Apr. 20, 1981, Ser. No. 255,829

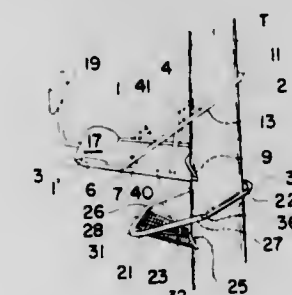
Int. Cl.<sup>3</sup> A45F 3/26; A47C 9/10; A01M 31/02

U.S. Cl. 182—135

9 Claims

1. An apparatus for climbing a tree or like columnar member comprising seat frame means for disposition about a tree for

selective engagement therewith for supporting a user's main body and selective disengagement therefrom for sliding vertically therealong and foot frame means for disposition about a tree below said seat frame means for selective engagement therewith for supporting the user's feet and selective disengagement therefrom for sliding vertically therealong, said seat frame means and said foot frame means being operable by alternate engagement and disengagement, respectively, with the tree for alternating incremental movement thereof upwardly and downwardly along the tree, said seat frame means including a main seat frame member for engaging the tree at one side thereof and a seat bracing frame member for engaging the tree at the opposite side thereof, said main seat frame member including a unitary length of tubing formed into a generally U-shaped providing spaced seat frame arms and tree-engaging brace means rigidly welded to each said seat frame arm and extending therefrom in generally the same direction thereof for bracing engagement with said one side of the tree and said seat bracing frame member including a unitary length of tubing formed into a generally U-shape providing spaced seat bracing frame arms, said spaced seat frame arms and said spaced seat bracing frame arms being telescopically engageable for encircling disposition about the tree, and means selectively engageable with said seat frame arms and said seat bracing frame arms for rigidly affixing them in telescoping relation, whereby said main seat frame member and said seat bracing frame member respectively have substantially no points of increased susceptibility to stress and whereby in disposition about the tree increased stress is created in said seat frame means substantially only at said affixing means at said telescoping seat frame arms



and seat bracing frame arms for maximized strength of said seat frame means and only compressive stress is exerted on the weld locations between said tree-engaging brace means and said main seat frame member, and said foot frame means including a main foot frame member for engaging the tree at said one side thereof and a foot bracing frame member for engaging the tree at the opposite side thereof, said foot frame member including a unitary length of tubing formed into a generally U-shaped providing spaced foot frame arms, tree-engaging platform brace means rigidly welded to said main foot frame member and extending therefrom in generally the same direction as said foot frame arms for bracing engagement with said one side of the tree, and bracing struts extending convergently from said foot frame arms to a central location on said platform brace means for engagement by the feet of the user for manipulating movement of said foot frame means upward and downward along the tree, and said foot bracing frame member including a unitary length of tubing formed into a generally U-shape providing spaced foot bracing frame arms, said spaced foot frame arms and said spaced foot bracing frame arms being telescopically engageable for encircling disposition about the tree, and means selectively engageable with said foot frame arms and said foot bracing frame arms for rigidly affixing them in telescoping relation, whereby said main foot frame member and said foot bracing frame member respectively have substantially no points of increased susceptibility to stress and whereby in disposition about the tree increased stress is created in said foot frame means substantially only at said affixing means at said telescoping foot frame arms and foot bracing frame arms for maximized strength of said foot frame means and only compressive stress is exerted on the weld location

between said tree-engaging platform brace means and said main foot frame member.

4,417,646

# COUNTERWEIGHT SYSTEM

Charles Lindbergh, 104 N. Star Ave., Panama City, Fla. 32401

Continuation of Ser. No. 934,402, Aug. 17, 1978, abandoned.

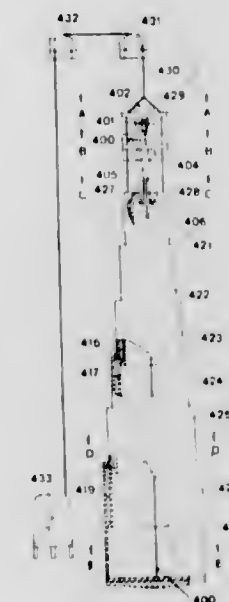
This application Dec. 2, 1980, Ser. No. 212,292

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737493; Dec. 28, 1977, 2758383

Int. Cl.<sup>3</sup> B66B 17/12

U.S. Cl. 187—94

3 Claims



1. A counterweight system to enable cyclic movements of a load by the application of low external power to the system comprising a counterweight connected in counter-balancing relationship to a load, said counterweight being divided into two separate groups of separately formed counterweight segments of graduated size, a first movement means connected between the load and one group of counterweight segments and being operable to elevate and lower in succession the counterweight segments in said one group one relative to another, and a second movement means independent from the first movement means connected between the other group of counterweight segments and an external power means, the second movement means being operable under influence of the external power means to elevate and lower the counterweight segments in said other group relative to the counterweight segments in said one group.

4,417,647

# DISC BRAKES AND FRICTION PAD ASSEMBLIES THEREFOR

Edmund Cotter, Birmingham; Francis Whatley, Uplands, both of England, and Heinz W. Baum, Saarbrücken-Dudweiler, Fed. Rep. of Germany, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 27, 1981, Ser. No. 239,123

Claims priority, application United Kingdom, Mar. 1, 1980, 8007044; Apr. 19, 1980, 8012977

Int. Cl.<sup>3</sup> F16D 65/40

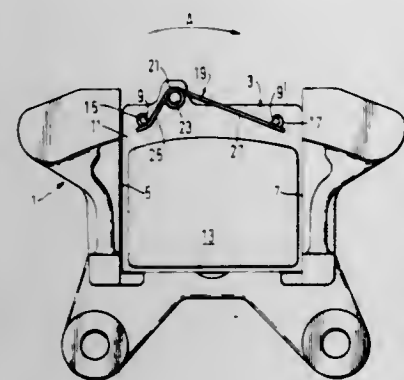
U.S. Cl. 188—73.38

14 Claims

1. A friction pad assembly for a disc brake, comprising a backing plate and a pad of friction material secured thereto, the backing plate having at least one hole offset from the central axis of the assembly, through which a pad support pin can pass to engage a wire spring attached to and positively supported on the backing plate at one position only which position is nearer to one side edge of the backing plate than the other, said



wire spring having two arms oppositely directed from the spring's position of attachment to produce an asymmetric load-



ing effect on the pad assembly when installed in a disc brake such that one arm of said spring engages said pin.

4,417,648

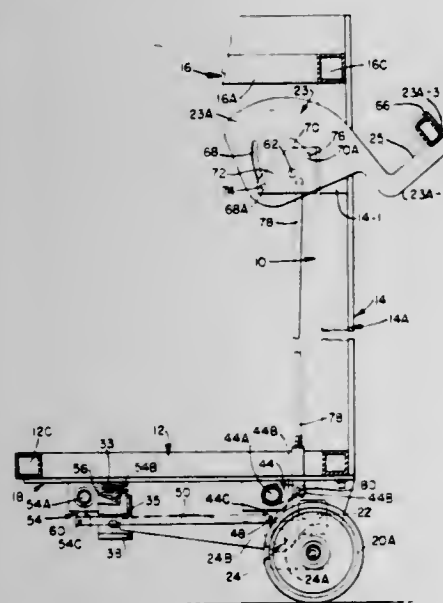
## BRAKING ARRANGEMENT FOR VEHICLES

Brenda L. Anderson, Sutter Creek, and Ronald J. Boyd, Sacramento, both of Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Jul. 14, 1981, Ser. No. 283,170  
Int. Cl.<sup>3</sup> B60T 7/10

U.S. Cl. 188-119

19 Claims



1. In a vehicle comprising a framework and at least one wheel supported for rotation by said framework, a brake surface carried by said at least one wheel, a brake shoe mounted for movement into or out of braking engagement with said brake surface, a support means mounted on said framework for angular pivotal movement about a substantially horizontal axis which lies substantially transverse of the longitudinal axis of said vehicle, said brake shoe being mounted on said support means for pivotal movement with said support means, a spring means mounted to normally exert force against said support means to cause said support means to pivotally move in a direction which moves said brake shoe into engagement with said brake surface whereby to normally provide a "dead man" brake, an actuator member for effecting movement of said brake shoe out of engagement with said brake surface, means connecting said actuator member to said support means whereby a predetermined movement of said actuator member moves said support means against the force of said spring means to move said brake shoe out of engagement with said brake surface, a brake control handle mounted on said framework, a first cam means including a cam element and a second cam means including a cam follower element, one of said cam means being carried by said control handle, the other of said cam means being connected to said actuator member and

engageable with said cam means carried by said handle, whereby movement of said control handle to a predetermined position is effective to cause said predetermined movement of said actuator member due to the cooperative interaction of said first and said second cam means with each other, whereby to move said brake shoe out of engagement with said brake surface.

4,417,649

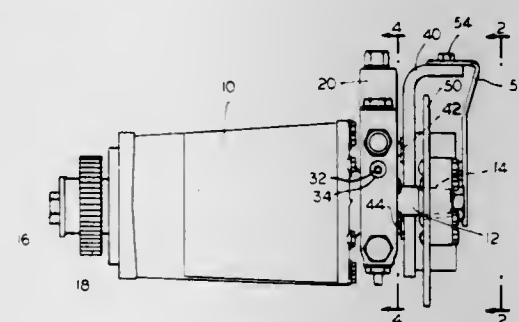
## ARRANGEMENT FOR THE BRAKE SYSTEM OF A HYDROSTATIC LOADER INCLUDING A VALVE PORT BLOCK

Charles W. Frost, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 6, 1981, Ser. No. 251,438  
Int. Cl.<sup>3</sup> B60K 41/20

U.S. Cl. 192-3 R

6 Claims



1. A brake system for a hydrostatic loader comprising an improved arrangement of components including:  
a hydrostatic drive motor having an output shaft extending from both ends of the motor;  
a multi-function valve port block fixedly mounted on one end of the motor, the output shaft of the motor passing therethrough;  
brake means mounted on the output shaft of the motor adjacent the valve port block; and  
drive means mounted on the end of the output shaft opposite the valve port block and the brake means, said drive means engageable with a drive mechanism.

4,417,650

## SAFETY CLUTCH

Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,486

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012783

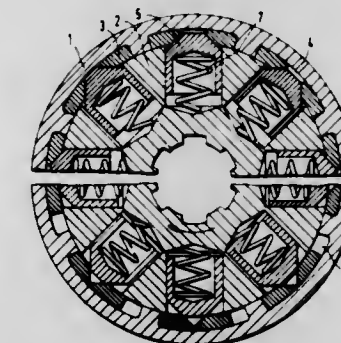
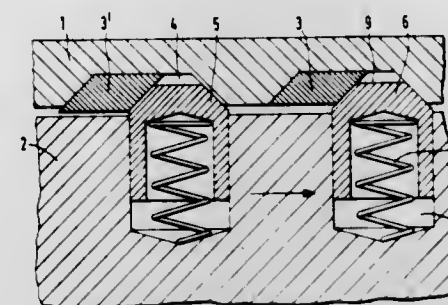
Int. Cl.<sup>3</sup> F16D 43/20

U.S. Cl. 192-56 R

7 Claims

1. A clutch for machine drives particularly suitable for agricultural implements comprising a clutch hub, a clutch sleeve, tapered recesses in said clutch sleeve, and spring loaded dog members having wedged engagement heads with a flattened face for engagement in said recesses for transmitting torque between said hub and said sleeve, said recesses having a circumferential dimension larger than the circumferential dimension of said wedged engagement heads of said dog members such that when said dog members are in torque transmitting position within said recesses, a remaining space is provided which is occupied by movable control strips and such that

when said dog members are not engaged in torque transmitting position within said recesses the distance of movement of said



control strips in the circumferential direction is equal to or smaller than the head width of said flattened face.

4,417,651

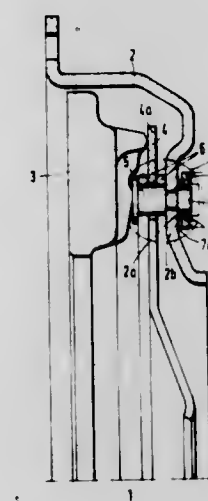
## BALANCED FRICTION CLUTCH SYSTEM AND METHOD OF MAKING SAME

Phong Lu, Wooster, Ohio, assignor to Luk Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

Filed May 6, 1981, Ser. No. 260,975

Int. Cl.<sup>3</sup> F16D 19/00, 25/00; B21D 39/00; B23P 11/00  
U.S. Cl. 192-89 B

6 Claims



1. Method of balancing a friction clutch which comprises slipping a centrally recessed slug-like balancing weight of metal, wherein the central recess is bounded by a collar-like shoulder projecting in direction toward a friction clutch disposed opposite further regions of the balancing weight, onto a rivet head of the friction clutch so that the projecting shoulder makes contact with regions of the friction clutch adjacent to the rivet head, and shifting the balancing weight farther in direction toward the friction clutch so as to force the collar-like shoulder in radial direction of the central recess onto the rivet head and clamp it to the rivet head by reducing the diameter of the central recess.

3. A balanced friction clutch system, said system including a friction clutch having a portion projecting therefrom; and a slug-like metal balancing weight having a central recess which is slipped over the projecting portion of said clutch, said

weight including a collar-like shoulder surrounding the central recess and extending from the weight in a direction in which the weight is to be slipped over the projecting portion of the clutch, said shoulder being engageable with contact regions of the clutch adjacent the projecting portion thereof after the weight has been slipped over the projecting portion of the clutch, a region of said weight initially set back from said shoulder thereof being bringable over the travel path of said weight relative to the clutch and into contact with further contact regions of the clutch and, during mutual travel of said weight and said clutch, regions of the collar of said weight being shifted radially inwardly so as to force the shoulder in the radial direction of the central recess onto the projecting portion and clamp it onto the projecting portion by reducing the diameter of the central recess.

4,417,652

## SCRAPER ARM

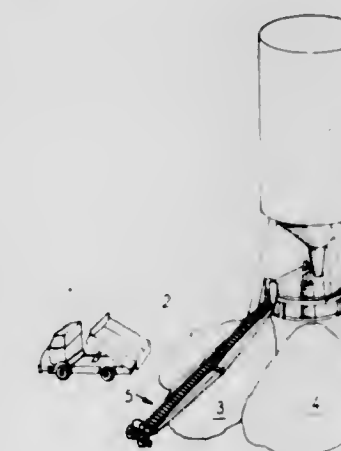
Gaston Grandmenil, 61 Rue de la Liberation, Le Mans, Sarthe, France

Filed May 12, 1980, Ser. No. 136,106

Claims priority, application France, Mar. 29, 1979, 79 08577  
Int. Cl.<sup>3</sup> B65G 65/06

U.S. Cl. 198-511

6 Claims



1. A scraper arm apparatus for transporting aggregate material to a container having a vertical longitudinal axis and at least a partial cylindrical wall extending vertically above the ground level from the ground adjacent to said container, said apparatus comprising:

a first support member rotatably connected within said container, said first support member extending upwardly approximately along said longitudinal axis of said container and rotatable thereabout;  
a second elongated support member pivotally fastened to said first support member so as to be selectively pivotable about an axis perpendicular to said longitudinal axis, said second support member having one end and an opposite end, said one end of said support member being disposed above said wall of said container and further extending vertically downwardly and horizontally away from said wall of said container to the ground level, said opposite end being positioned at a lower level than said one end and adjacent to the aggregate material on the ground level;  
a predetermined path around the periphery of said second elongated support member extending from said one end, around said opposite end and back to said one end to form a continuous circuit around said second elongated support member;

an endless chain slidably mounted to said periphery of said second elongated support member;  
a plurality of spaced apart scraper members oriented to travel along said predetermined path around said periphery of said second elongated support member;  
means for driving said endless chain around said predetermined path and for effecting the lateral movements of said



plurality of spaced apart scraper members around said periphery of said second elongated support member to engage the aggregate material on the ground level and to transport the aggregate material to the top of said wall of said container;

means for vertically elevating at least one of said one and said opposite ends of said second elongated support member from the ground level so as to render said scraper plurality of spaced apart members incapable of engaging the aggregate material on the ground level, said elevating means comprising:

at least one winch rotatably interconnected with said first support member;

a drum for said winch having a cable winding surface therearound;

a pulley mounted to said first support member at a location above said wall; and

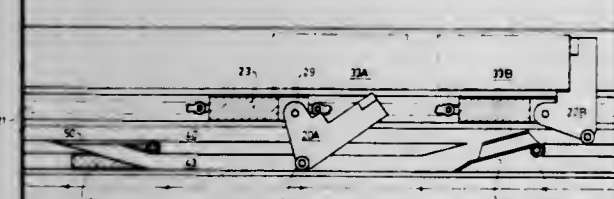
a cable having a first end and a second end, said first end of said cable being wound around said cable winding surface of said drum and said second end of said cable being directed upwardly from said drum to pass over said pulley and being attached to said one end of said second elongated support member such that, upon selective operation of said winch, said cable lowers and raises said one end of said second elongated support member.

#### 4,417,653 CONVEYOR

Johannes C. W. Zwezerynen, Auckland, New Zealand, assignor to Aico Manufacturing Co. Limited, Auckland, New Zealand  
Filed May 26, 1981, Ser. No. 267,293  
Int. Cl.<sup>3</sup> B65G 19/00

U.S. Cl. 198—718

6 Claims



1. A conveyor including a conveying surface along which articles can be conveyed; a plurality of spaced retractable pushers capable of moving along a path substantially parallel to said conveyor surface, each said pusher being provided with guide means; means for moving the pushers along said conveyor path, a plurality of guide tracks capable of guiding said guide means; a plurality of spaced means for switching said guide means between said guide tracks to control the extension or retraction of each pusher relative to the conveyor surface, the pushers being spaced greater than the spacing of the switch means to enable articles to be stacked on said conveyor surface in an out-of-phase relationship with said pushers, whereby during start up the pushers sequentially engage a plurality of stationary articles one by one.

#### 4,417,654

TENSIONING DEVICE FOR A VERTICAL CONVEYOR  
Heinz Lauhoff, Beckum, and Alfons Bökamp, Oelde-Stromberg, both of Fed. Rep. of Germany, assignors to Bernhard Beumer Maschinenfabrik KG, Beckum, Fed. Rep. of Germany  
Filed May 11, 1981, Ser. No. 262,476  
Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3017969

Int. Cl.<sup>3</sup> B65G 23/44

U.S. Cl. 198—815

13 Claims

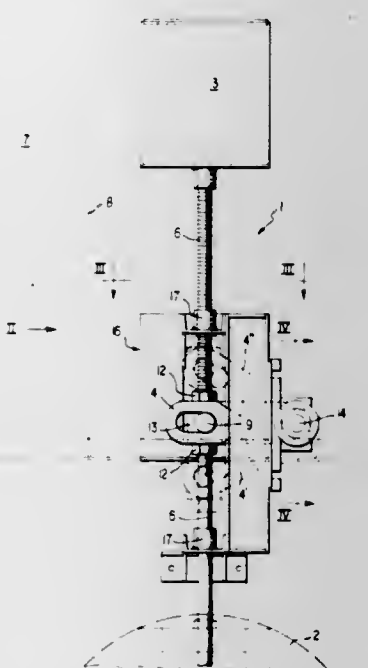
1. A vertical conveyor comprising  
(a) a driving drum;  
(b) power means for rotating said driving drum;  
(c) a tensioning drum spaced vertically from said driving drum and supported shiftably for varying its distance from

said driving drum; said tensioning drum being supported for rotation on a tensioning drum shaft having an axis;

(d) a vertically oriented endless carrier trained about said driving drum and said tensioning drum;

(e) a tensioning weight situated spaced from and in vertical alignment with said tensioning drum;

(f) coupling elements situated between and in vertical alignment with said tensioning weight and said tensioning drum; said coupling elements being secured to said tensioning weight and to said tensioning drum for directly transmitting forces from said tensioning weight to said



tensioning drum urging said tensioning drum vertically away from said driving drum, whereby said endless carrier is tensioned;

(g) a support frame situated between said tensioning weight and said tensioning drum and supporting said coupling elements;

(h) a support shaft horizontally spaced from said coupling elements; and

(i) levers mounted on said support shaft and connected to said coupling elements for operatively connecting said support shaft with said coupling elements for equalizing misalignments of said tensioning drum shaft.

#### 4,417,655 SHIPPING AND DISPLAY CARTON

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 13, 1982, Ser. No. 408,002

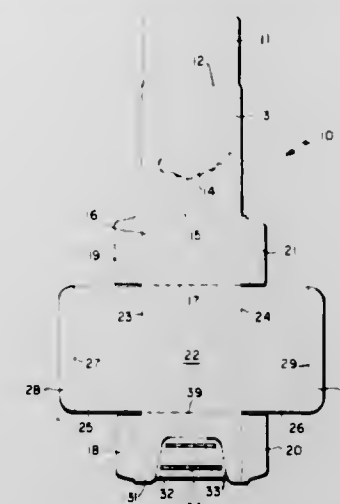
Int. Cl.<sup>3</sup> B65D 5/52

U.S. Cl. 206—45.25

2 Claims

1. A shipper/display carton prepared from an elongated blank of foldable sheet material comprising, in order, front, bottom, rear and top panels foldably connected together, said top panel including an integral display riser section cut from a portion of the top panel which normally lies in the plane of the top panel, a front closure flap foldably attached to said top panel and tucked behind and adhered to the inside of said front panel, minor flaps foldably attached to the side edges of said front and rear panels, a pair of side closure panels including tuck flaps foldably attached to the side edges of said bottom panel and adhered to said minor flaps, a detachable cut out portion in said front panel formed by an arcuate release line that extends from an upper edge of said front panel downwardly and across said front panel and then upwardly back to the upper edge of said front panel, means adhering the front closure flap to the inside surface of said detachable cut out to form the manufacturers joint for said carton in its shipper configuration, and means for opening said carton for its display

configuration wherein the detachable cut out portion of said front panel is separated from the front wall and said front closure flap with the detachable cut out attached is folded

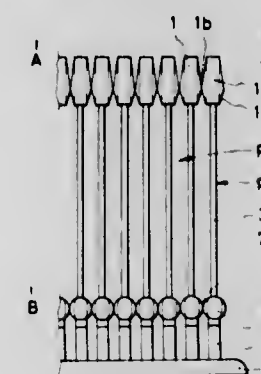


adjacent to the rear panel to open the carton and automatically elevate the display riser section of said top panel into its display condition.

4,417,656  
CLUSTER TYPE TAG PIN ASSEMBLY  
Masami Kato, Nagoya, Japan, assignor to Toska Co., Ltd., Tokyo, Japan  
Filed Apr. 16, 1981, Ser. No. 254,755  
Claims priority, application Japan, Sep. 11, 1980, 55-125275  
Int. Cl.<sup>3</sup> A44B 9/00; B65D 85/24; G09F 3/12

U.S. Cl. 206—346

10 Claims

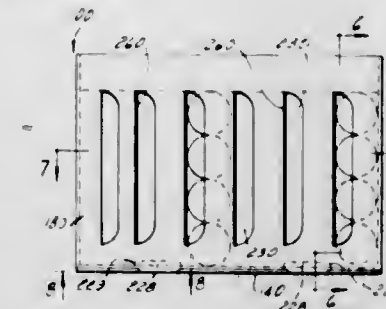


1. A cluster type tag-pin assembly comprising a plurality of tag pins, each said tag pin having a head portion, a cross bar and a filament portion which joins said head portion to said cross bar, each said cross bar including a connecting neck which extends therefrom in a direction opposite to said filament portion, said tag pins being connected through their respective connecting necks to a connecting bar at substantially right angles to said connecting neck to form an assembly of joined tag pins; said assembly of tag pins being integrally formed from a synthetic resin into a comb-like assembly as a whole, each said cross bar having opposing expanded portions defining apices formed on opposite central parts of each side face thereof, adjacent expanded portions of said cross bars being connected to each other through said apices of their respective expanded portions whereby all cross bars in the tag pin assembly are arranged in a sheet-like form, said expanded portions being separated when a shearing force is applied thereto, adjacent head portions of said tag pins being spaced with a gap smaller than the thickness of the head portion.

4,417,657  
BEVERAGE CAN CONTAINER  
David T. Thibodeau, 126 Stephens Rd., Grosse Pointe Farms, Mich. 48236  
Filed Nov. 27, 1981, Ser. No. 325,300  
Int. Cl.<sup>3</sup> B65D 71/00

U.S. Cl. 206—427

1 Claim

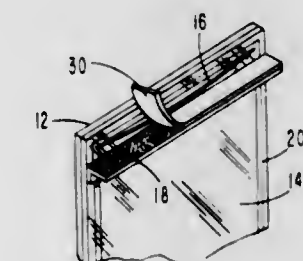


1. An open top container for beverage cans and the like of predetermined length and diameter, said container being formed from a single sheet folded to provide an elongated bottom wall, end walls extending upwardly from opposite ends of said bottom wall at right angles thereto, side walls extending upwardly from opposite sides of said bottom wall at right angles thereto, said side walls being spaced apart a distance approximating the length of a beverage can, and a plurality of dividers extending vertically from a point adjacent said bottom wall to a point adjacent the top of said container, said dividers being spaced from one another and from said end walls a distance approximating the diameter of a beverage can to provide chambers each adapted to support a stack of beverage cans introduced through the open top of said container, each divider comprising a pair of flaps extending toward one another from the two side walls in opposed, laterally spaced relation, one flap of each pair being cut from one side wall and the other being cut from the other side wall, each flap extending continuously between said points adjacent said bottom wall and top of said container, said flaps being joined to said side walls by lines of weakness and folded inward at substantially right angles to said side walls leaving openings in the side walls to expose the contents of the container, whereby when a can is inserted into each chamber and rests upon the bottom wall of said container, said flaps will be retained in their inwardly folded positions by such inserted cans thereby facilitating the insertion of additional cans in stacked relation in each of said chambers.

4,417,658  
SELF-SEALING STERILIZATION BAG  
Donald E. Gardner, East Islip, N.Y., and David T. Smith, Montville, N.J., assignors to Surgicot, Inc., Smithtown, N.Y.  
Filed Mar. 22, 1982, Ser. No. 360,127  
Int. Cl.<sup>3</sup> B65D 33/20

U.S. Cl. 206—438

4 Claims



1. A sterilizable pouch comprising a plastic web and a paper web marginally heat sealed around all sides thereof, a slit in one of said webs for receiving the package contents and an adhesive strip adhered to the web; said adhesive strip being positioned to cover and seal both lips of the slit, and along with

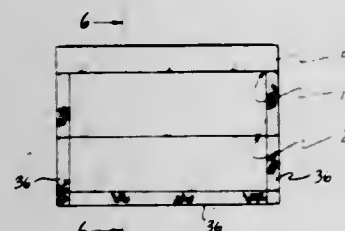


the web to which it is attached forming an assembly which acts as means for opening the slit for insertion of an article.

4,417,659

**X-RAY FILM AND MEDICAL RECORD ORGANIZER**  
J. W. Hatchell, P.O. Box 90684, Nashville, Tenn. 37209  
Filed Apr. 6, 1981, Ser. No. 250,924  
Int. Cl.<sup>3</sup> B65D 27/04, 27/06, 27/08, 85/30  
U.S. Cl. 206—455

1 Claim



1. An improved medical records organizer comprising the combination of:

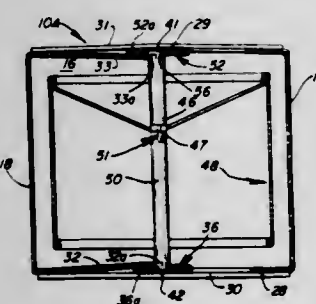
- a generally rectangular opaque back portion;
- a first generally rectangular sheet of transparent vinyl material substantially superimposed over at least three adjoining edges of said back portion and bonded thereto along said three adjoining edges to form a first envelope portion having bonded sides and bottom and an open top;
- a second generally rectangular sheet of transparent vinyl material substantially superimposed over said first transparent sheet and bonded thereto along said three adjoining bonded edges to form a second envelope portion having bonded sides and bottom and an open top;
- reinforcing strips of nylon mesh impregnated flexible vinyl material wrapped around said three bonded edges and adhesively secured to said back portion and to said first and second transparent sheet; and
- seams sewn along the two of said bonded edges forming the sides of said envelope portions and stitched through said back portion, said first and second transparent sheets, and said reinforcing strips along said bonded sides, whereby tearing and separation of said envelope portions at the sides thereof is prevented.

4,417,660

**CARTON FOR PACKAGING LAMP SHADES OR THE LIKE**

James J. Mason, Olympia Fields, Ill., assignor to Cameo Container Corporation, Chicago, Ill.  
Continuation-in-part of Ser. No. 299,859, Sep. 8, 1981. This application Mar. 17, 1982, Ser. No. 359,103  
Int. Cl.<sup>3</sup> B65D 85/62  
U.S. Cl. 206—500

17 Claims



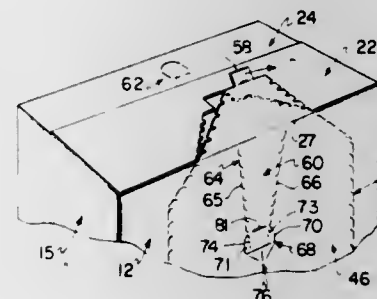
1. A shipping carton formed from an integral blank of foldable paperboard material comprising, a plurality of sidewall panels hinged together, one of said sidewall panels having a hinged manufacturer's joint extending therefrom for securement to another sidewall panel to form a rectangular enclosure, said sidewall panels having opposite edges along which a respective end flap member is hingedly secured, the

pair of end flap members hingedly secured to one of said sidewall panels having integral anchoring flap means hingedly connected along a hinge line parallel to and spaced from the hinge line connection of the end flap to the sidewall panel, said anchoring flap means including apertures therethrough aligned along a vertical axis on the interior of the carton when the end flaps are inwardly folded to form the respective top and bottom walls of the carton, wherein said anchoring flap means are positioned in generally back-to-back configuration with said end flaps to which they are respectively connected and a portion of each of said anchoring flap means generally overlaps a respective opposing one of said end flaps, at least one of said opposing end flaps includes a clearance passageway therethrough, said passageway being generally aligned with the aperture in said respective anchoring flap means, said anchoring flap means being located to engage protuberances of a packaged product for preventing shifting of the product during shipment of the carton.

4,417,661

**RECLOSABLE CARTON AND BLANK THEREFOR**  
Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.  
Filed Jul. 5, 1979, Ser. No. 54,867  
Int. Cl.<sup>3</sup> B65D 5/54  
U.S. Cl. 206—625

2 Claims



1. A unitary blank for a carton formed of paperboard comprising:

- (a) a front panel, a rear panel, and two side panels connected along generally parallel fold lines;
- (b) a top closure flap hingedly extending along a fold line from the top of each of said front, rear, and two side panels;
- (c) a bottom closure flap hingedly extending along a fold line from the bottom of each of said front, rear, and two side panels;
- (d) an interior flap area in at least one of said panels and closure flaps defined by the intersection of a first perforated line and a first interior fold line;
- (e) a tab area located in said interior flap and defined by the intersection of a second perforated line and a second interior fold line, said second perforated line defining an enlarged distal end on said tab area, said tab folding about said second interior fold line such that said tab and said interior flap fold in opposite directions; and
- (f) a slot area located outside said interior flap area and defined by the intersection of a third perforated line and a third interior fold line, said slot area receiving said folded tab and having a width less than the width of said enlarged distal end whereby said flap is interlocked to said body thereby securely reclosing said body.

4,417,662

VIAL INSPECTION MACHINE

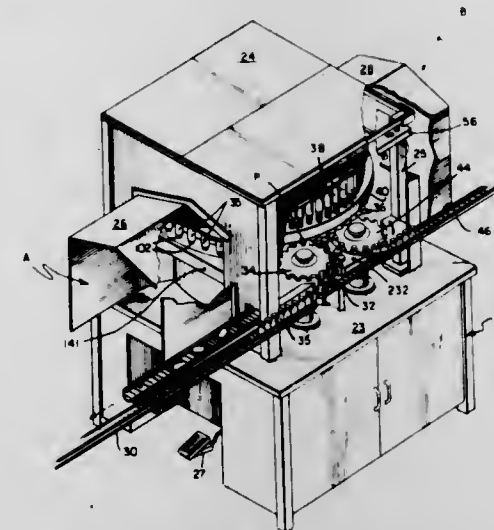
David W. Nicholson, Indianapolis; Larry G. Smith, Plainfield; Harold B. Dinius, Mooresville, and Ronald R. Oberle, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 4, 1981, Ser. No. 260,003

Int. Cl.<sup>3</sup> B07C 5/02

U.S. Cl. 209—522

57 Claims



1. Apparatus for inspecting objects, such as medicinal vials and the like, having surfaces at their ends by which the objects may be gripped to expose their sides and opposite ends, comprising

- a series of chucks for gripping such objects at their said surfaces to carry them for inspection, and means to move such chucks to carry the objects along an inspection path in a continuously moving, closely spaced sequence across an inspection station at which a substantial number of objects are simultaneously exposed for inspection,
- means for feeding objects to said chucks ahead of said inspection station,
- means for illuminating each object with an individual beam of light directed toward the object and moving with the object as it traverses said inspection station,
- the number of continuously moving objects simultaneously exposed for inspection at said inspection station being sufficient to permit comparative or pattern inspection thereof during their travel across the inspection station.

4,417,663

**APPARATUS FOR DETERMINING THE SEX OF A CHICK**

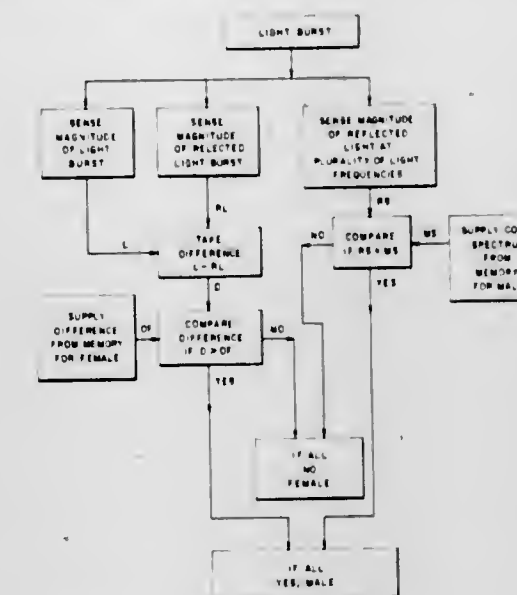
Kiyonobu Suzuki, 5 Weaver Dr., Salisbury, Md. 21801  
Filed Jun. 16, 1981, Ser. No. 274,227  
Int. Cl.<sup>3</sup> B07C 5/342

U.S. Cl. 209—587

6 Claims

- 1. A means for determining the sex of a chick comprising: means for sensing certain characteristics of a chick and producing output values corresponding to each of the sensed characteristics, said means for sensing certain characteristics of a chick comprises:
  - a means for generating a burst of light;
  - a means for applying the burst of light to an anal region of the chick;
  - a means for sensing the magnitude of said burst of light; and
  - a means for sensing the magnitude of the light reflected from said anal region of said chick;
- means for comparing said output values with preset characteristic values and for producing affirmative signals when-

ever each of said output values correspond to said preset characteristic values; and



a means for indicating the sex of said chick in response to said affirmative values.

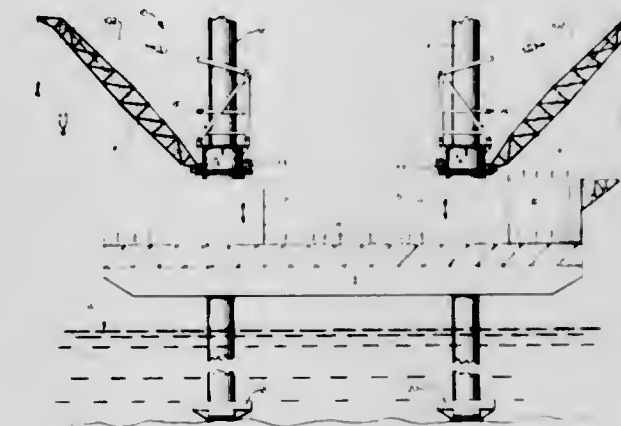
4,417,664

**METHOD AND APPARATUS FOR MOUNTING LIFT CRANE ON OFFSHORE STRUCTURES**

John C. Gordon, Jefferson, La., assignor to Nautilus Crane & Equipment Corporation, Reserve, La.  
Filed Jul. 31, 1981, Ser. No. 288,978  
Int. Cl.<sup>3</sup> B66C 23/52

U.S. Cl. 212—192

15 Claims



15. A lift crane support assembly for use on jackup rigs having a barge platform supported by a plurality of telescoping, vertically movable legs, each operated by an associated jacking structure secured to the barge platform, comprising:

- a. a hollow base positioned upon and anchored to one of the jacking structures, and surrounding one of the legs so that the surrounded leg can freely pass therethrough;
- b. a crane superstructure attached to the base, the crane superstructure unencumbering vertical movement of the leg.

4,417,665

**MEANS FOR MOUNTING A CRANE ON A LOAD CARRYING PLATFORM**

Joseph B. Adeline, 6 Hurlston Way, Koondoola, Australia  
Filed Aug. 3, 1981, Ser. No. 289,412

Claims priority, application Australia, Oct. 30, 1980, 63873/80

Int. Cl.<sup>3</sup> B66C 7/02

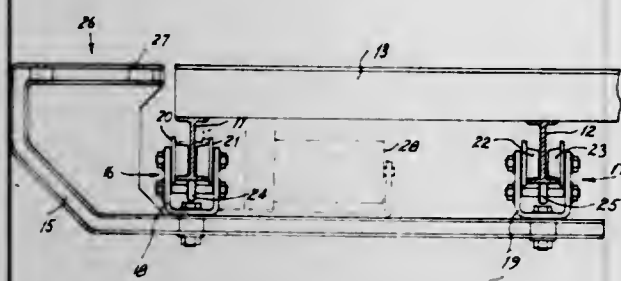
U.S. Cl. 212—224

6 Claims

- 1. Means for mounting a crane on a load carrying platform comprising guide means mounted on the underside of the platform and extending at least the full length of one side of the platform, a carriage having a first portion mounted on said guide means for movement therealong and beneath said plat-



form and having a cantilevered portion projecting beyond the adjacent edge of the platform, and a crane mounted on said



cantilevered projecting portion and extending upwardly beyond the load carrying platform.

4,417,666

# CONTAINER AND CLOSURE HAVING TAMPER-PROOF FEATURE

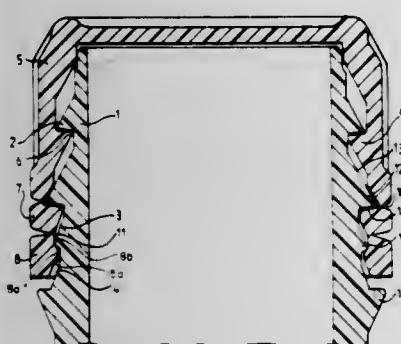
Derek C. Roberts, London, England, assignor to Johnsen & Jorgensen (Plastics) Limited, London, England

Filed Feb. 22, 1982, Ser. No. 350,581

Int. Cl.<sup>3</sup> B65D 41/34

U.S. Cl. 215—256

5 Claims



1. A container and closure assembly wherein the closure comprises a cap part with an internal discontinuous multi-start screw thread, a tear-away tamper-evident band connected to the cap part by a first line of weakness, a captive band connected to the tamper-evident band by a second line of weakness and internal annular projecting bead means on the captive band and wherein the container has a neck defining an open mouth, a discontinuous multi-start external screw thread around the mouth, an external annular nose-shaped bead below the screw thread and with an inclined upper surface and a substantially horizontal lower surface, an annular recess around the neck of the container for engagement by said projecting bead means on the captive band and annular ledge means disposed around the neck of the container below said annular recess suitably adapted and disposed to receive said captive band after said tamper-evident band has been torn away from said assembly.

4,417,667

# LIGHTWEIGHT CONTAINER

Donald J. Roth, Westport; Charles S. Kubis, Weston, both of Conn., and John Walter, Evergreen Park, Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 191,225, Sep. 26, 1980, and Ser. No. 191,226, Sep. 26, 1980. This application Sep. 25, 1981, Ser. No. 305,668

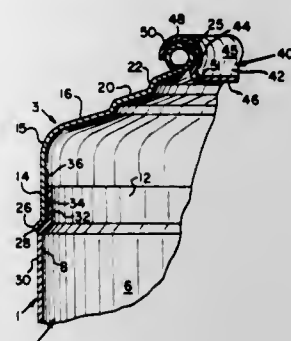
Int. Cl.<sup>3</sup> B65D 8/08, 8/22

U.S. Cl. 220—67

23 Claims

1. A metal can comprising a body, a dome, and a lapped joint including an adhesive layer between said body and said dome, and the relationship between said body and said dome being one wherein when said can is filled with a liquid packaged under pressure said dome in the general area of said lapped joint radially inwardly deforms and said body in the general

area of said lapped joint radially outwardly deforms with the combined deformation of said dome and said body compressing said adhesive layer, said relationship between said dome and said body including said dome having a lower cylindrical lip, said lip merging at its upper edge into a toroidal curve which merges into a conical radially inner and axially upper portion, said body having an axially upper portion telescoped



within said lip with an axially upper free edge of said body terminating within said lip adjacent said toroidal curve, and wherein under internal pressure said conical portion is deformed generally axially upward and said toroidal curve is deformed radially inward with an associated tilting of said lip including a radially inward deformation of at least an axially upper portion of said lip and compression of an upper part of said adhesive layer.

4,417,668

# EASY OPEN CAN END WITH PULL TAB HAVING RETAINED TEAR STRIP WITH STRESS RELIEF MEANS

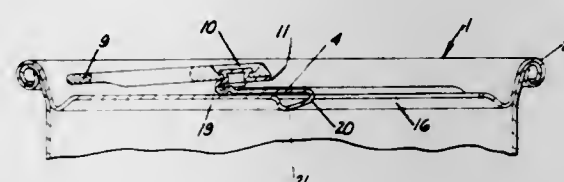
Ralph J. Stolle, Lebanon, Ohio, assignor to Stolle Research and Development Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 298,924, Sep. 3, 1981, abandoned. This application Nov. 23, 1981, Ser. No. 323,749

Int. Cl.<sup>3</sup> B65D 17/34

U.S. Cl. 220—269

19 Claims



1. In a can end having a retained tear strip extending radially from approximately the center of the can end to near the can end rim, said tear strip being defined by a score line of keyhole shape having a rounded portion adjacent the can end rim, and a relatively narrow portion defined by two portions of the score line terminating in spaced relation to each other so as to make said tear strip captive when torn open, said score line becoming shallower as it approaches the end of said portions, and disappearing entirely at the said ends, a pull tab secured to said tear strip by means of a rivet or the like adjacent the rounded end thereof within said score line, and having a nose to initiate a tear along said score line upon lifting of said pull tab, said pull tab, when raised, causing said tear strip to bend downwardly along a transverse line behind said rivet, initiating a tear in said score line and forming a first bend in said tear strip, said pull tab, when retracted, completing the opening of the end and forming a reverse bend in said tear strip adjacent said end, and said pull tab, if desired, when depressed against the top of said can end, causing said first bend to be flattened, and causing said second bend to form a third bend extending below the surface of the can end and having a radius of curvature greater than that of said second bend, said third bend providing a relief for said second bend to prevent breaking of said tear strip when flexed.

4,417,669

# MULTIPLE BAG DISPENSER

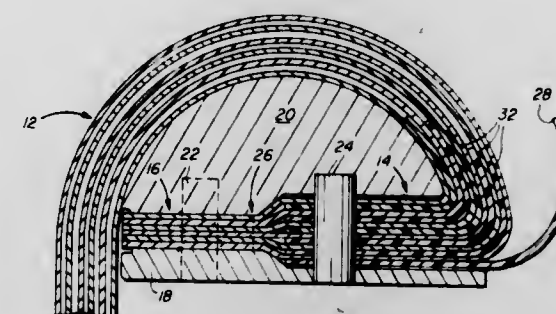
Henry L. Knowles, 1030 E. Bethany Home Rd., Phoenix, Ariz. 85014, and James P. Winningham, 3043 N. 36th St., Apt. #1, Phoenix, Ariz. 85018

Filed Nov. 30, 1981, Ser. No. 325,986

Int. Cl.<sup>3</sup> B65H 3/58

U.S. Cl. 221—26

19 Claims



1. A multiple bag dispenser comprising:  
a. a plurality of nested bags sequentially positioned one inside another and having an exposed inner bag, each of said bags including  
i. a detachable lip;  
ii. a bag body having a mouth coupled to said lip;  
b. a retaining ring assembly including an upper ring and a lower ring for gripping the lips of said nested bags and for maintaining an opening at the mouth of each of said nested bags; and  
c. a tearing pin extending between said upper ring and said lower ring and passing through an aperture in the mouth of each bag for separating the lip of an exposed bag from the body of said bag to permit removal of said exposed bag from said retaining ring assembly.

4,417,670

# DEVICE FOR DISPENSING TISSUE PAPER AND SHEET MATERIAL

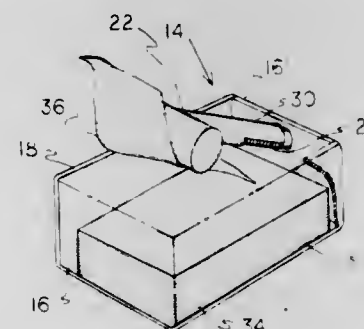
Homer L. Booher, 5114 Island Date, Sarasota, Fla. 33579

Filed Jan. 12, 1981, Ser. No. 224,653

Int. Cl.<sup>3</sup> B65G 59/02

U.S. Cl. 221—210

3 Claims



1. A device for simultaneously dispensing two sheets of paper or similar sheet material, comprising:  
(a) an essentially rectangular container for two identical stacks of tissue paper or similar sheet material, said container having a pair of ends, a pair of sides, a bottom, and a separate compartment for each of said identical stacks of tissue paper or similar sheet material;  
(b) a pick-up head having a rigid shaft connected thereto, said pick-up head being configured for simultaneously contacting the top sheet of each of said identical stacks of tissue paper or similar sheet material when pressed downward by the user of the device;  
(c) a coil spring having one of its ends fitted over the free end of said rigid shaft and the other of its ends rigidly

connected at a positive angle to a top center location on one of said ends of said container; and  
(d) a non-drying, pressure sensitive, tacky adhesive secured to said pick-up head for simultaneously contacting the top sheet of each of said identical stacks of tissue paper or similar sheet material when said pick-up head is pressed downward by the user of the device and for retaining the top sheet of each of said identical stacks of tissue paper or similar sheet material when said pick-up head is released by the user of the device.

4,417,671

# AUTOMATIC VENDING MACHINE WITH ICE PREPARATION

Kikuo Kawasaki, Yokohama; Kazuo Yoshida, Hachioji; Nobuo Nonoyama; Toshitomi Yamaguchi, both of Yokkaichi; Toshio Hasegawa, Suzuka, and Jitsuo Okamura, Yokkaichi, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 15, 1981, Ser. No. 311,759

Int. Cl.<sup>3</sup> B67D 5/14

U.S. Cl. 222—56

3 Claims



1. In an automatic vendor having an ice machine with a storage chamber in which the produced ice is stored and from which the ice is supplied during vending, and which is provided with a sensor producing a signal when the ice quantity in the chamber reaches a predetermined full storage level, the improvement comprising:  
means for producing digital signals representative of quantities of ice makeup to and ice discharge from the storage chamber;  
counting means for receiving said digital signals and for storing a count value indicative of the quantity of ice in said storage chamber, and for producing an output signal when its count value is not less than a predetermined minimum value, and for producing an auxiliary output signal when the count value is at least a predetermined intermediate value less than the full count;  
a vend control responsive to the counting means output signal, to deactivate the vending operation of the vendor in response to cessation of said counting means output signal; and  
means responsive to said auxiliary output signal for starting operation of said ice machine to make ice upon interruption of said auxiliary output signal.

4,417,672

# DISPENSER FOR FLOWABLE MATERIAL

Lawrence C. Eppenhach, 419 Kennedy St., Juneau, Ak. 99801

Filed Dec. 7, 1981, Ser. No. 327,942

Int. Cl.<sup>3</sup> B67B 7/26

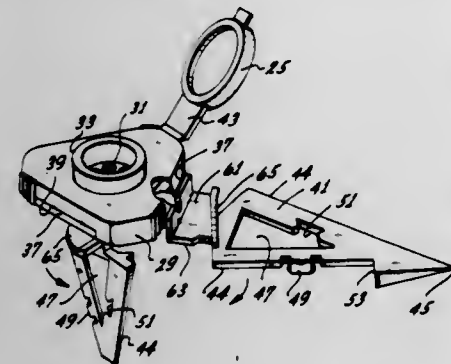
U.S. Cl. 222—81

14 Claims

1. A dispenser for penetrating a container and dispensing a flowable material from the container, said dispenser comprising:  
a penetrator for puncturing a wall of the container and folding back regions of the wall to form an opening in the wall of a size to receive the penetrator, said penetrator having a puncturing end portion configured to facilitate



puncturing of the wall of the container and an inner end portion remote from the puncturing end portion;  
a cap sized to cover the opening formed by the penetrator; connecting means for attaching the penetrator to the cap whereby the cap can be on the exterior of the wall of the container when the penetrator is within the container and the connecting means can project through the opening in the wall of the container to join the penetrator to the cap;



said penetrator including a plurality of sections hinged to said cap and means for joining said sections together; means for engaging the wall of the container to hold the cap against the exterior of the wall of the container; and passage means at least partially in said cap for providing communication between the interior of the container and the exterior of the dispenser when the dispenser is in position on the container.

4,417,673

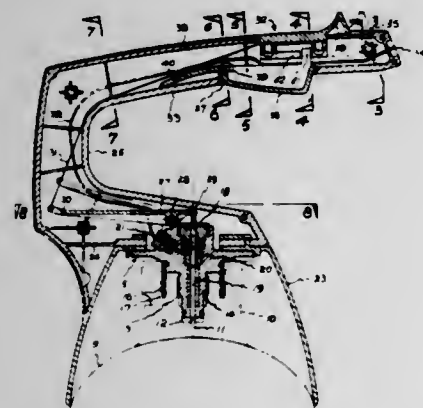
#### SPRAY DISPENSER FOR A CONTAINER OF A FLUID UNDER PRESSURE

Warren J. Hancock, Clayton, Australia, assignor to The Commonwealth Industrial Gases Limited, Surry Hill, Australia  
Filed Aug. 5, 1981, Ser. No. 290,235

Claims priority, application Australia, Aug. 13, 1980, PE5007  
Int. Cl.<sup>3</sup> B65D 83/14

U.S. Cl. 222-153

7 Claims



1. A sprayable-fluid dispenser for a container of the kind having a body having a contents discharge neckpiece fitted with a normally-closed depressible-stem discharge valve; comprising:

- (a) a skirt adapted for removable attachment to the container neckpiece;
- (b) a handpiece comprising:
  - (1) a neck portion extending vertically above said skirt and having its lower end contiguous with said skirt; and
  - (2) a grip portion contiguous with said upper end of said neck portion and spaced above and extending transversely across said skirt;
- (c) an operating trigger on said handpiece, movable between an "off" position and an "on" position;
- (d) a fluids issue nozzle on said handpiece;
- (e) mechanism within said handpiece and said skirt whereby placement of said trigger in its on position causes depres-

sion of said stem thereby to put said nozzle in communication with the interior of said body;

- (f) interlock means on said handpiece having a locked position in which movement of said trigger from its off position is obstructed, and an unlocked position in which such movement is unobstructed;
- (g) first spring-loading means which influence said trigger to remain in its off position; and
- (h) second spring-loading means which influence said interlock means to remain in locked position.

4,417,674

#### VALVE FOR THE ADMIXTURE OF FLUIDS AND DELIVERY OF THE RESULTING MIXTURE

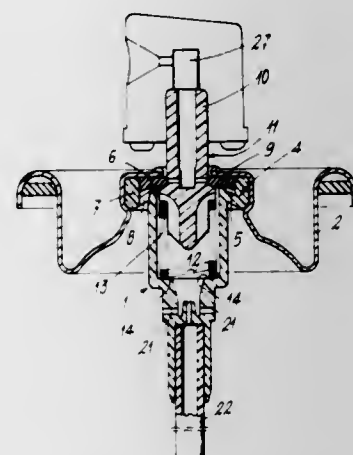
Giancarlo Giuffredi, Milan, Italy, assignor to Coster Tecnologie Speciali S.p.A., Milan, Italy

Filed Apr. 2, 1979, Ser. No. 26,001

Claims priority, application Italy, Apr. 13, 1978, 22268 A/78  
Int. Cl.<sup>3</sup> B65D 83/14

U.S. Cl. 222-402.18

5 Claims



1. A valve for admixture, during dispensing of a liquid stored under gas pressure with a controlled portion of the pressurizing gas, said valve being of the type including: a hollow body with upper and lower ends, said lower end being connected to a suction tube, said valve having integral gasketed sealing means at the upper end, said body having at least one transverse hole for gas transport, said valve also including a valve plunger movable within the body and resilient bias means between the valve plunger and the body, the valve having a hollow stem for dispensing the mixture, said valve further comprising:

- a nozzle formed integrally with the body, said nozzle being located at said lower end of the body and connected to the suction tube; and
- a passageway within the body, said passageway having an annular portion surrounding said nozzle and a portion extending beyond the nozzle, the cross-sectional area of said passageway being greater in said extended portion beyond the nozzle than the cross-sectional area in the annular portion of said passageway surrounding said nozzle, the annular portion of said passageway communicating with the transverse gas transport holes, said nozzle, said passageway, and said transverse holes forming a venturi-effect ejector whereby liquid flowing through the nozzle entrains gas flowing through said transverse holes, with mixing of the gas and the liquid during expansion in the extended portion of the passageway.

4,417,675

#### MELTING AND APPLICATION DEVICE FOR MELTING ADHESIVES

Anton Abt, Oberboihingen; Alfred Dettelbach, Stuttgart, and Gerhard Gresser, Oberboihingen, all of Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

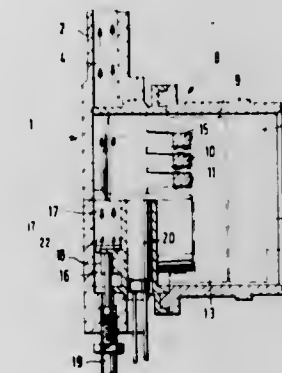
Filed Feb. 23, 1981, Ser. No. 236,678

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008779

Int. Cl.<sup>3</sup> B67D 5/62; F27B 14/00

U.S. Cl. 222-146 HE

7 Claims



1. An apparatus for melting and applying meltable adhesives, comprising an application device (1) for delivering melted adhesive to a work piece, melting chamber means (9) located adjacent to said application device, melting insert means (10) comprising heatable melting wall means (11) arranged for insertion between and removal from between the melting chamber means (9) and the application device (1), said heatable melting wall means (11) having channel openings (21) therethrough, and feed piston means (12) operatively located for displacement in said melting chamber means, said feed piston means being constructed and arranged for pressing meltable adhesive against the melting wall means, whereby the meltable adhesive is at least partially melted and supplied under pressure to the application device, said apparatus further comprising a storage chamber (16) for storing melting adhesive, said storage chamber being operatively arranged between the melting insert means (10) and the application device (1), said channel openings (21) connecting said storage chamber (16) through the melting wall means (11) with the melting chamber (9) for transporting melted adhesive into said storage chamber, said apparatus further comprising adhesive supply channel means (4) formed between the storage chamber (16) and the application device (1), said supply channel means (4) comprising lands (17) which extend said supply channel means into the lower portion of the storage chamber, said lands (17) being slightly spaced from the lower end of the storage chamber means (16) for assuring the transfer of all adhesive in the storage chamber into the application device by avoiding a dead space in the adhesive path from said channel openings (21) to said supply channel means (4).

4,417,676

#### METHOD AND APPARATUS FOR PARTITIONING AND/OR SHAPING A FIBROUS BATT

Othmar Schildknecht, and Eduardo Cassoli, both of Sao Jose dos Campos, Brazil, assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Feb. 11, 1981, Ser. No. 233,421

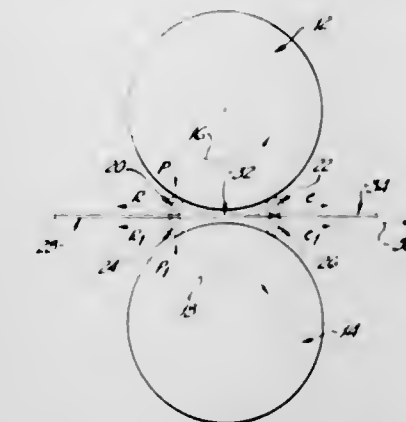
Int. Cl.<sup>3</sup> B26F 3/02

U.S. Cl. 225-4

1 Claim

1. Method for partitioning a continuous batt of loosely compacted fibers into a plurality of individual panels, characterized by comprising: conveying the batt at a constant displacement speed in a certain direction; gripping the batt with two pairs of opposing resilient means arranged transversely relative to the direction of motion of the batt, and at a predetermined distance one pair from the other, said pairs of opposing resilient means

consisting of a pair of trailing resilient means and a pair of leading resilient means; momentarily delaying the movement of the batt by an elastic reaction from the pair of trailing resilient means; momentarily advancing the batt, simultaneously to



the momentary delay, by an elastic reaction of the pair of leading resilient means so as to stress the fibrous batt and sever it without the formation of compaction lines on the edges thus formed and without leaving the general plane of travel.

4,417,677

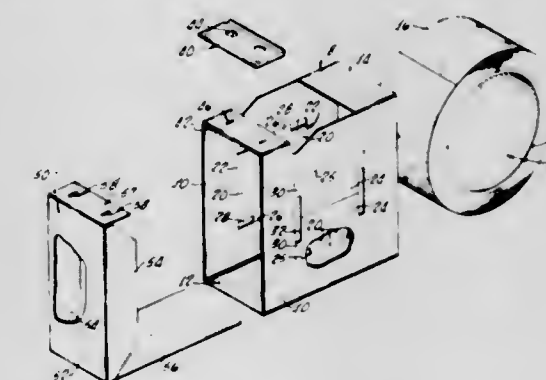
#### TAPE DISPENSER

Gary G. Mead, 12791 Barrett La., Santa Ana, Calif. 92705  
Filed Oct. 5, 1981, Ser. No. 308,921

Int. Cl.<sup>3</sup> B26D 1/02; B65D 85/672

U.S. Cl. 225-26

21 Claims



1. A dispenser for storing a roll of pressure-sensitive adhesive tape, dispensing a segment of tape from said roll, and severing said segment therefrom comprising:  
a receptacle sized compatibly to contain the roll of tape, said receptacle having an opening for withdrawing tape there-through from said roll,  
cutting means for severing a segment of the withdrawn tape, said cutting means comprising a planar member attached to the receptacle and oriented with respect to said opening so that when the cutting means is used for severing said segment the withdrawn tape is positioned with its adhesive side facing said planar member at an acute angle therewith,  
said planar member lying in a plane outside the periphery of the roll of tape and having a first edge adjacent said opening and a cutting edge for severing said tape remote from said opening, and  
said cutting means further comprising a positioning member adjacent said first edge, said positioning member having a substantially linear upper edge running substantially parallel to said cutting edge and being at least about two tape thicknesses above said planar member.



4,417,678

**CARTON OPENING DEVICE**

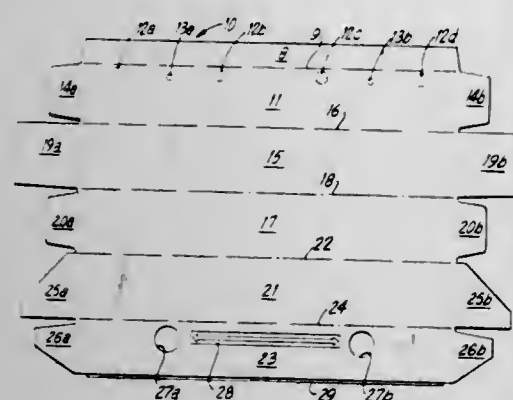
Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 8, 1981, Ser. No. 299,958

Int. Cl.<sup>3</sup> B65D 85/671

U.S. Cl. 225—43

10 Claims



1. A paperboard carton adapted to enclose material rolled upon a spool within the carton, said carton comprising:
  - a series of panels formed from a one-piece carton blank and connected along articulated lines, said panels forming front and opposite back panels, two opposed end panels, a bottom panel and a top panel hinged to the back panel;
  - a hood panel connected to said top panel and lying flat against said front panel when the carton is closed;
  - a cutting edge strip attached to a free edge of said hood panel and projecting beyond said free edge so that the material may be torn against the cutting edge strip after the carton is opened; and
  - a plurality of adhesive areas joining the hood panel and the front panel and at least one orifice in said hood panel of sufficient size to permit finger entry and located adjacent said adhesive areas so that finger pressure through said orifice against said front panel will break the jointure of said adhesive areas and separate the hood panel from the front panel.

4,417,679

**AMPULE OPENER**

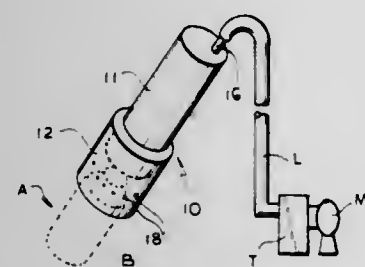
Walter Shields, 181-41 Henley Rd., Jamaica, N.Y. 11432

Filed Oct. 30, 1981, Ser. No. 316,470

Int. Cl.<sup>3</sup> B26F 3/00; C03B 33/06

U.S. Cl. 225—93

16 Claims



1. An ampule opener for an ampule having a head and a body, the ampule opener being adapted to prevent contamination of material in the ampule by particles formed in snap-opening the ampule, comprising
  - a holder for the ampule head having a cylindrical opening at one end, a hole extending inwardly from the cylindrical opening for receiving therein at least a part of the head of the ampule, and an outlet communicating with the hole, said outlet being adapted to be connected to a vacuum source to inspire air through said opening, and
  - an annular flexible jacket situated around the end of the head holder to extend outwardly therefrom, said flexible jacket having an inner diameter almost the same as the outer

diameter of the body of the ampule to be opened, so that when the ampule is positioned so that the head and the body are respectively located in the hole and the flexible jacket and then the body of the ampule is bent together with the flexible jacket to snap the head from the ampule, the particles formed by the snapping off of the ampule will be inspired into the vacuum source, thereby not contaminating the material in the ampule.

4,417,680

**LUMBER FEEDER**

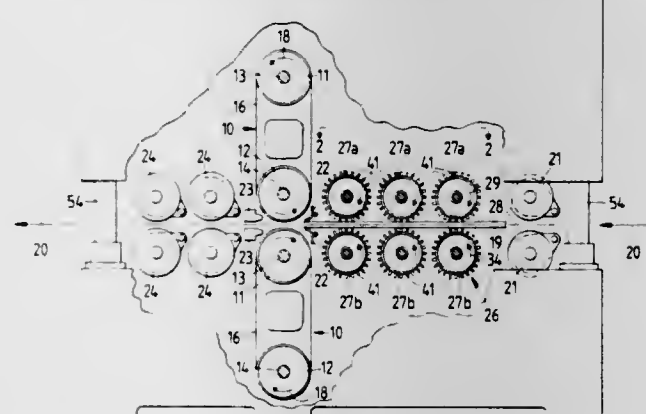
Donnell H. Culley, Jr., P.O. Box 118, Whitesburg, Tenn. 37891

Filed Dec. 17, 1981, Ser. No. 331,539

Int. Cl.<sup>3</sup> B65H 17/22; G03B 1/24

U.S. Cl. 226—181

7 Claims



1. In apparatus for feeding pieces of lumber of various thicknesses arranged in side-by-side relationship to each other along a path with the center lines of said pieces extending substantially on a preselected datum plane in the direction of said path, the improvement comprising,
  - (a) a plurality of spaced apart, upper transverse members mounted for rotation about horizontal axes above said datum plane with the lower sides of said upper transverse members traveling in the direction of said path,
  - (b) a plurality of spaced apart, lower transverse members mounted for rotation about horizontal axes below said datum plane with the upper sides of said lower transverse members traveling in the direction of said path,
  - (c) drive means operatively connected to said upper and lower transverse members for imparting rotation thereto at substantially the same speed,
  - (d) each of said transverse members comprising a plurality of rollers mounted non-rotatably on a horizontal shaft and in axial alignment with each other with each roller having a hub mounted on said horizontal shaft,
  - (e) a radially extending, annular member carried by said hub,
  - (f) a first pair of oppositely disposed, annular flanges projecting laterally and outwardly from said annular member adjacent the outer circumference thereof with there being radially extending openings in said first pair of annular flanges,
  - (g) a second pair of oppositely disposed annular flanges projecting laterally and outwardly from said annular member adjacent the inner circumference thereof with there being radially extending openings in said second pair of annular flanges and in radial alignment with said radially extending openings in said first pair of annular flanges,
  - (h) outwardly projecting lumber engaging pins mounted for radial movement within said radially extending openings in said first and second pair of annular flanges in position to engage opposite sides of a piece of lumber therebetween and move said piece of lumber in the direction of said path, and
  - (i) spring means urging said lumber engaging pins into engagement with said opposite sides of said piece of lumber therebetween with substantially equal force and providing

substantially equal spacing of said lumber engaging members from said datum plane.

4,417,681

**ELECTRONIC TACKER**

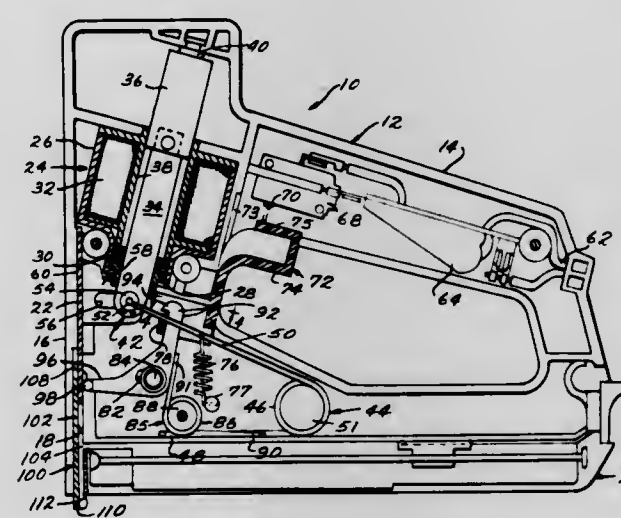
Harry F. Bernecki, Rolling Meadows; Voytech T. Skuza, Park Ridge; Kerry Dulin, Highland Park; Sri P. Sridharan, Hickory Hills; Glenn Zabec, Franklin Park, all of Ill., and James E. Edgell, Salem, Va., assignors to Textron Inc., Providence, R.I.

Filed Aug. 19, 1981, Ser. No. 294,422

Int. Cl.<sup>3</sup> B25C 5/15

U.S. Cl. 227—8

17 Claims



1. An electrically operated fastener driving device comprising
  - a housing structure including means defining a manually engageable handle for enabling a user to portably operate such a device, front wall means disposed in vertically extending relation forwardly and below said handle and means defining a straight vertically extending fastener drive track disposed closely adjacent said front wall means,
  - fastener magazine means disposed below said handle for feeding successive leading fasteners of a package of fasteners forwardly into said drive track,
  - a rigid fastener driving element slidably mounted in said drive track for movement through successive rectilinear reciprocating cycles of operation including a downward drive stroke during which a leading fastener fed within the drive track is engaged and moved outwardly of said drive track and an upward return stroke,
  - solenoid means carried by said housing structure forwardly of said handle and rearwardly and above said drive track, said solenoid means including elongated plunger means having a longitudinal axis inclined with respect to the vertical mounted for movement through successive reciprocating cycles of operation including a downward stroke along its axis and an upward return stroke,
  - cam means between an upper end portion of said fastener driving element and a lower end portion of said plunger means for causing a downward stroke of said plunger means in response to the energization of said solenoid means to effect a drive stroke of said fastener driving element, and
  - return spring means for effecting a return stroke of said fastener driving element and said plunger means in response to the deenergization of said solenoid means,
  - said return spring means including a central coil section disposed within said housing structure between said handle and said fastener magazine means, an operative end section extending from one end of said central coil section and connected for movement with said plunger means and a fixed end section extending from the opposite end of said

central coil section and connected in operatively fixed relation with respect to said housing structure.

4,417,682

**TAG ATTACHING MACHINE**

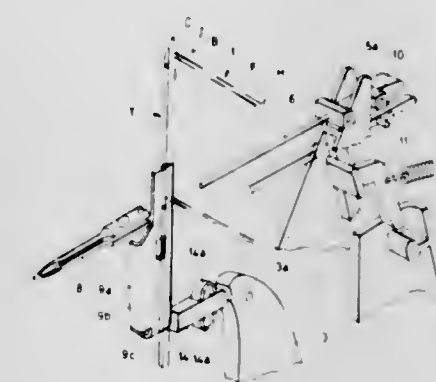
Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Oct. 21, 1981, Ser. No. 313,713

Claims priority, application Japan, Oct. 24, 1980, 55-148172 Int. Cl.<sup>3</sup> B65C 5/06, 7/00

U.S. Cl. 227—67

2 Claims



1. In a tag attaching device for receiving an assembly of tag pins removably coupled to a connecting bar and for removing said tag pins from said connecting bar for attachment to an object, the improvement comprising a guide groove formed in said tag attaching device for guiding said assembly of tag pins through said tag attaching device and cutting means disposed proximate said guide groove for selectively cutting off portions of said connecting bar as said tag pin assembly is guided through said tag attaching device, said cutting means including a cutting edge disposed adjacent said guide groove and pressing means including a pressing member for selectively pressing said connecting bar against said cutting edge to cut off portions of said connecting bar, lever means for selectively moving said pressing member to press said connecting bar against said cutting edge, said lever means including a cam portion proximate said pressing member, and a connecting member disposed between said pressing member and said cam portion for selectively intercepting and transmitting the pressing force exerted by said cam portion to said pressing member.

4,417,683

**CENTERING DEVICE FOR ELECTRICAL COMPONENTS**

Alan C. Lewis; Phillip A. Ragard, both of Binghamton, and Robert C. Shiptenko, Johnson City, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,405

Int. Cl.<sup>3</sup> B23P 19/04; H01R 43/04

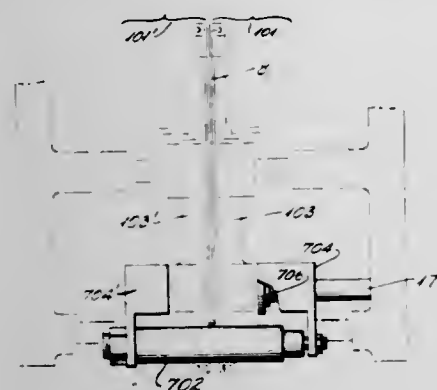
U.S. Cl. 227—109

6 Claims

1. An apparatus for centering the uncentered bodies of electrical components each body having leads extending from opposite ends thereof, said apparatus comprising:
  - first and second sections movable toward and away from each other for reception of said body therebetween;
  - first and second means for varying the spacing between said sections, said first spacing varying means capable of providing a first spacing variation larger than a second spacing variation provided by said second spacing varying means;
  - said first spacing varying means comprising a shaft having oppositely threaded equally spaced screw portions and threaded means in each of said sections for receiving one of said screw portions in a threaded relation having slack, and means for selectively rotating said shaft in opposite



directions to open and close said spacing to a predetermined spacing of said sections; and  
said second spacing varying means comprising means for removing said slack in said threaded relation such that said spacing is widened relative to said predetermined spacing



4,417,684

## PARTITION DEVICE

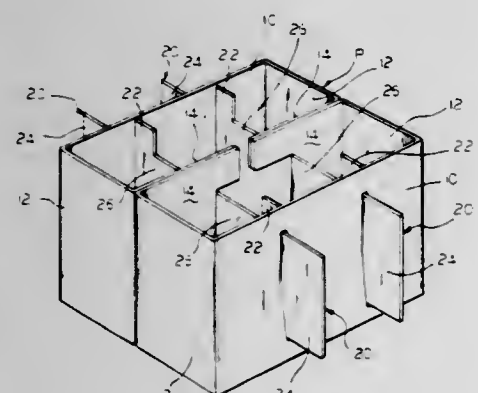
Boyd T. Skaggs, Louisville, Ky., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 16, 1983, Ser. No. 466,871

Int. Cl.<sup>3</sup> B65D 5/48

U.S. Cl. 229—15

3 Claims



1. An inner packing device for use within an outer container or wrapper to form therewith twelve cells, said structure being formed from a unitary blank of foldable sheet material, such as paperboard, to provide:

- a pair of opposed side panels disposed parallel to, but spaced from, each other and each presenting a pair of vertical slots extending therethrough;
- opposed pairs of end panels foldably joined at outer edges to end edges of respective side panels and extending inwardly therefrom and generally normal thereto;
- opposed pairs of center panel sections foldably joined at end edges to inner edges of respective end panels;
- each pair of said center panel sections being disposed in face-to-face relation, having corresponding edges foldably joined to each other, and being positioned in end-to-end, co-planar relation with respective center panel sections of the other of said pairs to form a center panel structure disposed between and parallel to, but spaced from, said side panels;
- opposed pairs of generally cruciformly-shaped transverse panels extending parallel to said end wall panels, but spaced therefrom and from each other;
- each of said transverse panels including a center portion

with a pair of integral inboard and outboard side portions extending therefrom;

- said inboard side portion being formed from material cut from and being foldably joined to a related center panel section adjacent a free end thereof on a vertical fold line;
- said outboard side portion being disposed to extend through a slot in a related side panel and outboardly therebeyond.

4,417,685

## ERECTABLE CARTON WITH ADHESIVE RELEASE

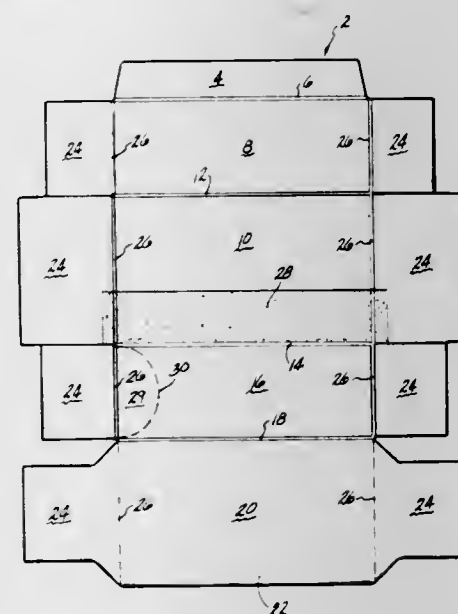
Ralph J. Korte, Darien, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 26, 1981, Ser. No. 314,951

Int. Cl.<sup>3</sup> B65D 5/36, 5/42

U.S. Cl. 229—41 B

8 Claims



1. A paperboard carton which is expandable to an operable form from a flattened bulk shipping form said carton comprising:

- a plurality of side panels connected to each other along parallel bending score lines and a pair of end closure flaps foldably connected to each side panel, said panels being disposed in face-to-face juxtaposition when said carton is in said flattened form;
- a glue seam formed on said carton by overlapping glue flaps disposed on opposite ends of a blank from which said carton is formed, an innermost one of said glue flaps lying in face-to-face contact with a portion of the inside surface of one of said side panels when said carton is in said flattened form; and
- a coating of glue release material completely coating said portions of said inside surface of said one of said side panels on said carton in an area lying adjacent to said glue seam when said carton is in said flattened form, said glue release material extending outwardly of each end of said one of said panels and onto respective end closure flaps to prevent oozing glue from adhering said glue seam to said inside surface of said one of said side wall panels on said carton whereby said carton may be readily expanded from said flattened form.

4,417,686

## OCTAGON TRAY WITH REINFORCED HANDHOLE

Roger M. Wozniacki, Charlotte, N.C., assignor to International Paper Company, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,688

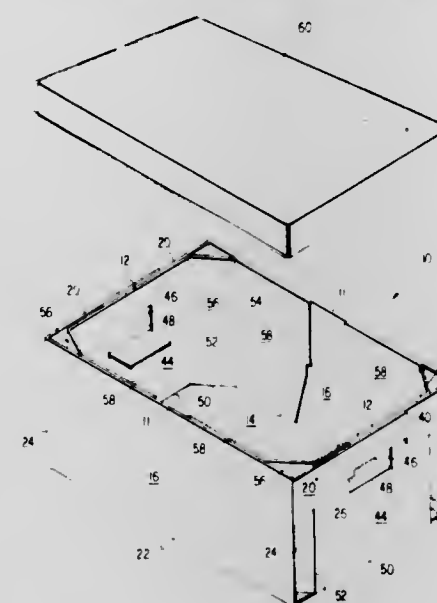
Int. Cl.<sup>3</sup> B65D 5/46, 5/26

U.S. Cl. 229—52 B

7 Claims

1. A one-piece blank of stiff, resilient and foldable material such as corrugated paperboard, the blank being adapted to be folded into a tray, the blank being of generally rectangular

form, the blank having a plurality of score lines and cut lines, the blank having a central bottom forming panel (14) defined by and bound on its upper and lower edges by score lines (22) and on its left and right edges by both cut and score lines (24, 50), the upper and lower edges (22) of said central panel (14) each carrying a generally T-shaped panel (16, 20, 20') whose base (22) is positioned at a respective edge of the central panel and whose bare ends extend toward the right and the left edges (12', 12) of the one piece blank, each T-shaped panel being defined by cuts (24, 26, 28, 30, 32) extending along the sides of



the base (16) of each T-shaped panel and running laterally away from it, the top (11) of each T-shaped panel extending along and being coincident with a respective end forming panel (44), the latter defined by said cuts (24, 26, 28, 30, 32), each end forming panel joined to a respective right or left edge of said central panel at the said central panel score lines, one edge of each of said end forming panels being coincident with a respective right or left edge portion (12', 12) of the one piece blank, the sides (24) of the base of each T-shaped panel (16) being non-collinear with the score lines (50) at the left and right edges of the central, bottom forming panel (14).

4,417,687

## MULTI-BLADE AUTOMATIC AIR REGISTER DAMPER

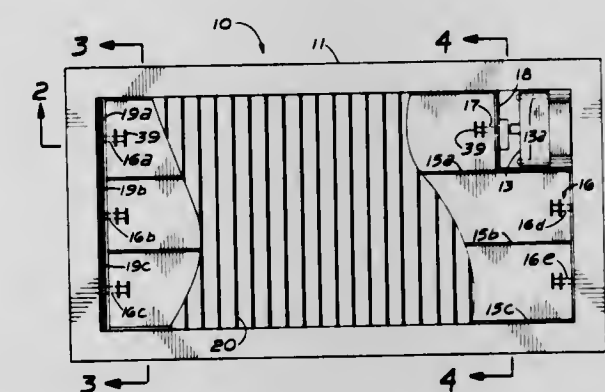
Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

Filed Jun. 7, 1982, Ser. No. 385,765

Int. Cl.<sup>3</sup> F24F 13/10

U.S. Cl. 236—9 A

9 Claims



1. Damper means automatically controlling the flow of a heating/cooling medium through ducts of a heating/cooling device, said ducts terminating in room floor, wall, or ceiling registers, said damper means comprising combinationally:

- housing means having end panels and side panels forming an enclosure with angular support means, said end panels receiving bearing pins supporting gear means of transmission means and damper blades of flow control means; said

panels receiving grille bars spanning the top of said enclosure;

- said flow control means being comprised of air sealing means and multiple damper blades rotatably supported in said enclosure by said bearing pins and a motor shaft, said bearing pins having attachment combinationally to said gear means and said damper blades;
- said transmission means comprising motor means and said gear means, said motor means having an integral shaft, with attaching cam, connecting to a driver blade of said damper blades, transmitting motor rotation from said motor means to other said damper blades, all said blades being interconnected by said gear means;
- electrical control means energizing and controlling said motor means of said transmission means and a fuel control device of said heating/cooling device, said electrical control means being comprised of thermostatic means electrically connecting relay means and said motor means to said fuel control device through switch means and light means; said relay means comprising first contacts operable by means of a coil, and second contacts operable by a time delay device.

4,417,688

## TEMPERATURE CONTROL SYSTEM FOR VEHICLE PASSENGER COMPARTMENT

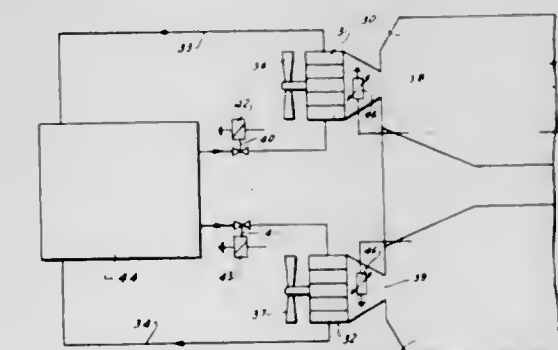
Eberhard Schnabel, Hemmingen, and Erich Junginger, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 78,594, Sep. 24, 1979, abandoned. This application Feb. 1, 1982, Ser. No. 344,772 Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849275

Int. Cl.<sup>3</sup> G05D 23/00

U.S. Cl. 236—91 F

11 Claims



1. A negative-feedback temperature control system for conditioning the temperature of air in the passenger compartment of a vehicle, comprising, in combination, heat exchanger means located to exchange heat with air entering the passenger compartment; adjusting means for adjusting the flow of heat-exchange fluid flowing through the heat exchanger means; passenger-compartment temperature sensing means for sensing the temperature inside the passenger compartment, heat-exchanger temperature sensing means for sensing the temperature at or near the surface of the heat exchanger means; adjustable command transducer means operable for selecting a passenger-compartment temperature; servo comparator means operative for receiving feedback and command signals and producing an error signal; actuating means connected to the adjusting means for actuating the latter and connected to the servo comparator means for receipt of a signal dependent upon the error signal; means connected to the command transducer means and to the servo comparator means for applying to the latter a command signal derived from the command transducer means; and



means applying to the servo comparator means a feedback signal derived from the passenger-compartment temperature sensing means and the heat-exchanger temperature sensing means, including means applying to the servo comparator means a signal whose value depends upon the rate of change with respect to time of the temperature sensed by the heat-exchanger temperature sensing means.

4,417,689

# **PRESSURE REGULATOR WITH TEMPERATURE COMPENSATION DEVICE**

Akira Sasaki, 358, Ohganedaira 5-chome, Matsudo-shi, Chiba-ken, Japan

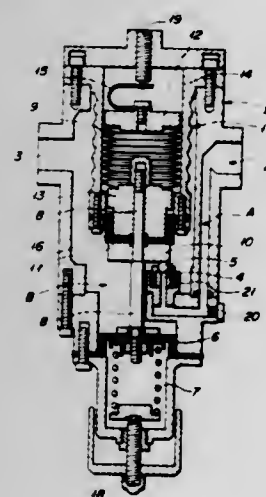
Filed May 25, 1982, Ser. No. 381,783

Claims priority, application Japan, Aug. 31, 1981, 56-136741

Int. Cl.<sup>3</sup> G05D 27/00

U.S. Cl. 236—92 R

10 Claims



7. In a pressure regulator with a temperature compensation device, comprising a main body having primary and secondary side fluid passages, a valve stem coupled to operate a valve, said valve stem extending upwardly from the center of a main diaphragm operated by the opposing forces of a pressure on said secondary side fluid pressure passage within said main body of said regulator and a pressure exerted by a pressure regulating spring, wherein the fluid pressure on the secondary side of said main diaphragm is maintained substantially constant by controlling the opening of said valve through the operation of said valve stem,

the improvement comprising:

a cylindrical inner casing formed of a material having good thermal conductivity and provided toward the upper end of said valve stem in a state sealed off from the passages in said main body, said cylindrical casing having a bottom which comprises an auxiliary diaphragm;

an assembly of bimetal plates in stacked arrangement, opposite sides of said plates having different coefficients of thermal expansion, the sides of adjacent plates having like coefficients of thermal expansion facing each other, said bimetal plates being arcuately bendable responsive to a temperature rise thereof;

a pair of washers for retaining said assembly within said inner casing between said pair of washers;

means for mechanically coupling said valve stem to said assembly of bimetal plates such that said valve stem is pushed downwardly by the expansive stroke of said bimetal plates when said bimetal plates bend arcuately with rising temperature; and

means for mechanically coupling said valve stem to said pressure regulating spring to compress said pressure regulating spring when said valve stem is pushed downwardly by said assembly of bimetal plates;

at least one of said main diaphragm and auxiliary diaphragm being formed of a resilient synthetic resin material and having sides formed as bellows.

4,417,690

# **STEEL RAILROAD SLEEPER**

William F. Langman, Lonsdale, Australia, assignor to Omark Industries, Inc., Portland, Oreg.

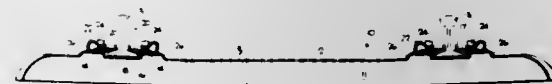
Filed Nov. 7, 1980, Ser. No. 205,014

Claims priority, application Australia, Nov. 27, 1979, PE1496

Int. Cl.<sup>3</sup> E01B 3/16

U.S. Cl. 238—59

8 Claims



8. A sleeper pressed from rolled steel stock of initially uniform cross-section and having side walls and an upper wall and two pairs of raised platforms each formed by upward deformation of a portion of the upper wall,

each platform having a flat portion adapted for receipt of a rail securing means and a first end wall which is approximately vertical, two side walls and a second end wall for each platform, the vertical first end walls of each pair of platforms defining the side edges of a respective rail retaining recess and all walls of each platform increasing the section modulus of the rail sleeper in the cross-section of the platform.

4,417,691

# **TURBINE DRIVE WATER SPRINKLER**

George H. Lockwood, Wilton Manors, Fla., assignor to Anthony Manufacturing Corp., Azusa, Calif.

Continuation-in-part of Ser. No. 914,507, Jun. 12, 1978,

abandoned, which is a continuation-in-part of Ser. No. 740,061, Nov. 8, 1976, abandoned. This application Dec. 1, 1980, Ser. No. 211,586

Int. Cl.<sup>3</sup> B05B 3/04

U.S. Cl. 239—206

41 Claims

1. A water sprinkler, comprising:

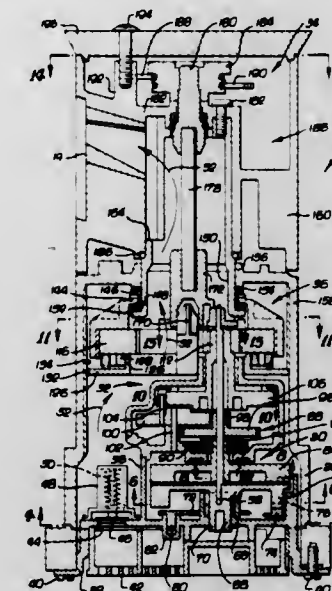
a sprinkler housing for connection to a supply of water under pressure;

a spray head carried by said housing and including a spray nozzle mounted for rotation with respect to said housing, said spray nozzle being oriented for direction of a stream of water radially outwardly from said spray head;

a drive assembly rotationally driven by at least a portion of the water under pressure for providing a continuous rotational output; and

an incremental motion mechanism including means coupled between said drive assembly and said spray nozzle for incrementally rotating said spray nozzle through a plurality of angularly spaced stationary positions of controlled duration separated by relatively rapid rotational movements through predetermined angular increments be-

tween said stationary positions, said rotational movements being of an angular magnitude such that the angular loca-



tion of each stationary position is varied upon successive revolutions of said spray nozzle.

4,417,692

# **VAPOR-PHASE AXIAL DEPOSITION TORCH**

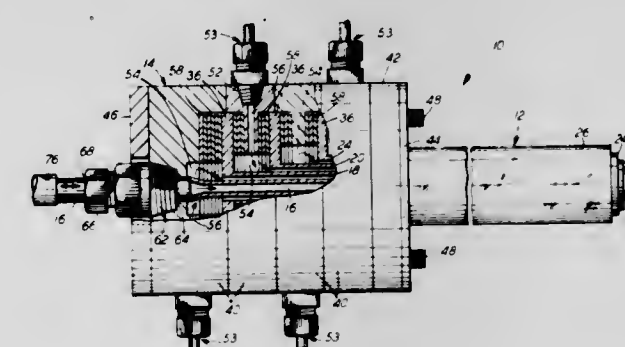
Matthew J. Andrejco, North Hanover Township, Burlington County, and Eugene Potkay, Hamilton Township, Mercer County, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,628

Int. Cl.<sup>3</sup> F23D 13/36

U.S. Cl. 239—424

4 Claims



1. A torch for fabricating lightguide preforms by the vapor-phase axial deposition process, comprising: a plurality of coaxially aligned elongated tubes with a coaxially aligned inner tube that is movable in an axial direction relative to the other tubes during the deposition process; each of the inner and intermediate tubes have a plurality of accurately machined splines on the outer surface thereof to maintain a predetermined distance between said tubes; and each of the plurality of outer tubes has a radially disposed flange on a first end thereof which is separated by and captured between a plurality of annular spacer members.

4,417,693

# **FUEL INJECTION VALVE FOR AN INTERNAL COMBUSTION ENGINE**

Paul Füssner, Sindelfingen; Karl Hofmann, Remseck; Iwan Komaroff, Regensburg; Kurt Seifert, Esslingen-Zollberg; Dietrich Trachte, Kornwestheim; Wilhelm Vogel, Stuttgart, and Hans-Jörg Vogtmann, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

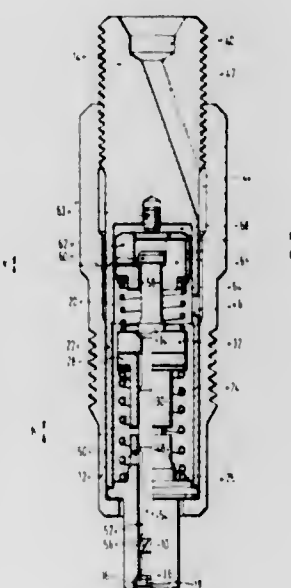
Filed Apr. 29, 1982, Ser. No. 373,000

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120060

Int. Cl.<sup>3</sup> B05B 1/00, 1/32

U.S. Cl. 239—453

13 Claims



1. Fuel injection valve-nozzle combination for an internal combustion engine having a valve body (10, 12, 14) formed with an internal space defining a first chamber portion (20) and a second chamber portion (68); a needle valve element (18) slidable in the first chamber portion; means (40, 42, 44) to conduct fuel to the first chamber portion (20) in the valve body; a closing spring (24) bearing against the valve element and the valve body, respectively, and urging the valve element into valve closing position, said valve element being movable to open position upon application of an opening force thereto counter the spring; and an inertia body (62), and coupling means (60) coupling the inertia body to the needle valve element upon opening movement only of the needle valve element,

wherein

the inertia body (62) is movably retained in the second chamber portion in the body, a throttle connection duct is provided connecting said first and second chamber portions; the outlet (46) from the fuel conduction means into the first chamber (20) is located in said first chamber portion and downstream of the inertia mass (62); wherein the second chamber portion forms a fluid storage chamber and movement of the inertia mass causes throttled displacement of fluid between said chamber portions through said throttle connection duct.







4,417,700

**APPARATUS FOR WINDING A PLURALITY OF YARNS AND A METHOD FOR CHANGING BOBBINS IN THE APPARATUS**

Hiroshi Ueda; Katsumi Hasegawa, and Masazumi Imae, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

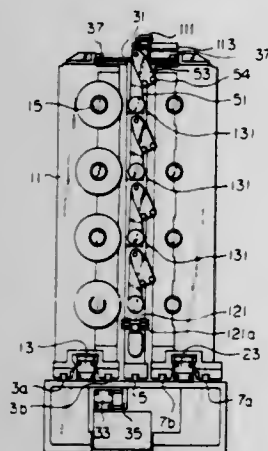
Filed Nov. 5, 1981, Ser. No. 318,574

Claims priority, application Japan, Nov. 7, 1980, 55-155844

Int. Cl.<sup>3</sup> B65H 54/02, 67/04

U.S. Cl. 242-18 A

19 Claims



1. An apparatus for winding a plurality of yarns comprising: a pair of spindle frames independently and horizontally movable along parallel passages; each of said spindle frames having a plurality of rotatable spindles horizontally projecting therefrom, which are vertically superposed and which are axially displaced by a predetermined length from the top spindle to the bottom spindle; a threading arm frame disposed between said spindle frames and having threading arms pivotally mounted thereon, the number of said threading arms being the same as that said spindles mounted on each spindle frame, and the threading arms are axially displaced by said predetermined length from the top arm to the bottom arm; and electric motors connected to said rotatable spindles, respectively.

4,417,701

**METHOD AND MEANS FOR CONTROLLING THE MANUFACTURE OF WINDINGS FOR INDUCTIVE APPARATUS**

Bertil Moritz, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

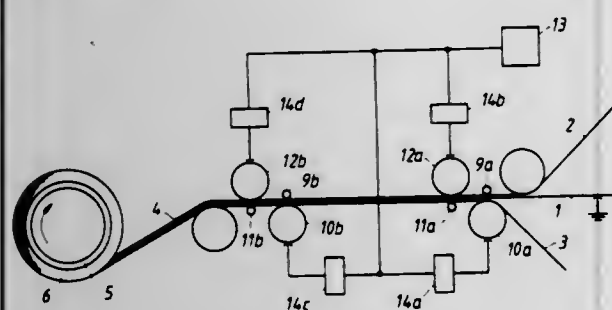
Filed Feb. 17, 1982, Ser. No. 349,655

Claims priority, application Sweden, Feb. 19, 1981, 8101112

Int. Cl.<sup>3</sup> B65H 39/16; H01G 7/00

U.S. Cl. 242-55

10 Claims



5. Means for controlling the manufacture of a winding for an inductive apparatus, which winding is of the kind comprising a plurality of turns of a sheet composed of an electrically conductive metallic foil and an electrically insulating film on each side of said metallic foil, said means comprising

at least one electrode device having at least two rolls arranged one on each side of said sheet, means pressing at least one of said rolls against said sheet with a certain pressure across the entire width of said sheet.

a voltage source for establishing a voltage difference between said rolls and said conductive metallic foil, members for sensing a leakage current, if any, which via each of said rolls passes through the respective insulating film, and

members for temporarily interrupting the winding process to enable strengthening of the insulation if the leakage current exceeds a predetermined value.

4,417,702

**AUTOMATIC ROLL-UP DEVICE FOR A SAFETY BELT** Arthur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

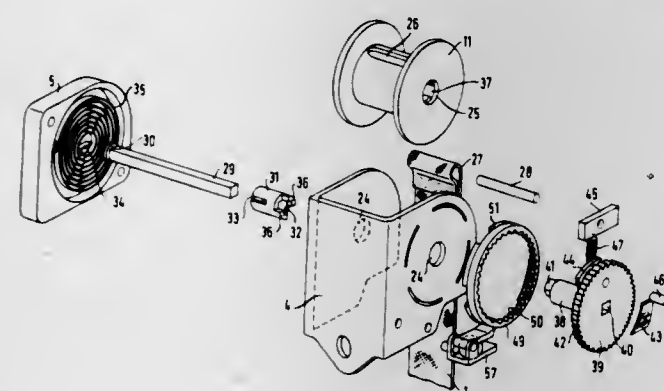
Filed Mar. 3, 1981, Ser. No. 240,153

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008299

Int. Cl.<sup>3</sup> A62B 35/02; B65H 75/48

U.S. Cl. 242-107.2

13 Claims



1. Automatic roll-up device for a safety belt in a vehicle with a braking or clamping device comprising, a control disc of lightweight construction in fixed, rigid connection with a belt roller rotatably mounted in a housing, a vehicle sensitive activating sensor and a belt sensitive activating sensor to activate the control disc when a predetermined acceleration or deceleration of the vehicle is exceeded, and locking means connected to the control disc to effect blocking of the belt roller, and said braking- or clamping device arranged after the belt roller and through which the belt from the belt roller passes in the direction the belt is pulled out, said braking- or clamping device activated solely by tension on the belt resulting from the blocking of the belt roller, wherein the control disc has small outer teeth, and wherein the vehicle-sensitive activating sensor has a locking lever, wherein the outer teeth can be engaged by the locking lever of the vehicle-sensitive activating sensor, wherein the control disc carries a hinged, belt-sensitive inertial mass, wherein a spring urges the mass to an inactive position, and wherein a set of small inner teeth are fixed at the housing surrounding the control disc and spaced therefrom and said mass when activated engages the set of inner teeth.

4,417,703

**QUICK RETRIEVE CORD REEL**

Dennis G. Weinhold, P.O. Box 462, Chapman, Ariz. 67431

Filed Nov. 19, 1981, Ser. No. 322,923

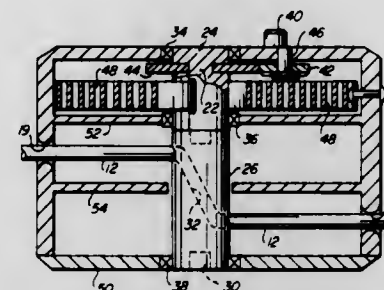
Int. Cl.<sup>3</sup> B65H 75/48

U.S. Cl. 242-107.12

6 Claims

1. A floating cord reel for storing cord, comprising: a sectioned axle having a spindle section and a bobbin section and defining an aperture lying generally in a diametrical plane of said bobbin section of said axle, said bobbin section removably engaging said spindle section to facilitate threading said cord through said aperture;

housing means having said axle rotatably mounted therein for maintaining said cord in general perpendicularity with respect to said axle as said cord approaches said bobbin section of said axle, said housing means including a removable end plate to allow said bobbin section to be disengaged from said spindle section; and



rotating means engaging said spindle section of said axle for selectively rotating said axle to spool said cord about said bobbin section of said axle and further for permitting said cord to be selectively unspooled from said bobbin section of said axle.

4,417,704

**MAGNETIC RECORDING TAPE CASSETTE**

Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Odawara, Japan

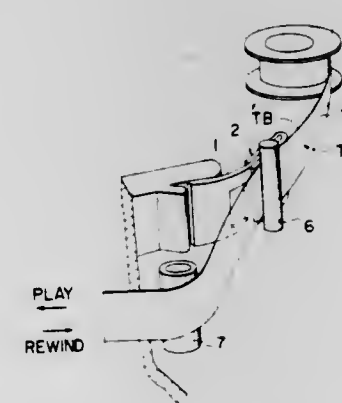
Filed Nov. 25, 1981, Ser. No. 324,835

Claims priority, application Japan, Dec. 18, 1980, 55-182183[U]

Int. Cl.<sup>3</sup> G03B 1/04; G11B 15/32

U.S. Cl. 242-197

1 Claim



1. A magnetic recording tape cassette having at least a hub for winding therearound a magnetic recording tape, a guide member disposed on the recording side of the magnetic recording tape and a tape pad member which is pressed against the base side of the magnetic recording tape when the magnetic recording tape runs in contact with the guide member, characterized in that at least the part of the tape pad which is brought in direct contact with the magnetic recording tape when the tape pad is pressed thereagainst is made of self-lubricating and hardwearing plastic resin wherein said plastic resin is ultra-high-molecular-weight-high-density polyethylene containing at least one additive such as carbon or graphite with an average molecular weight of 2,000,000 to 4,000,000 and a specific gravity of 0.90 to 0.98.

4,417,705

**TAPE CASSETTE**

Toshikazu Kato, Hino, and Sinichi Saitou, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 26, 1981, Ser. No. 266,936

Claims priority, application Japan, May 30, 1980, 55-73821

Int. Cl.<sup>3</sup> G11B 15/32

U.S. Cl. 242-199

7 Claims

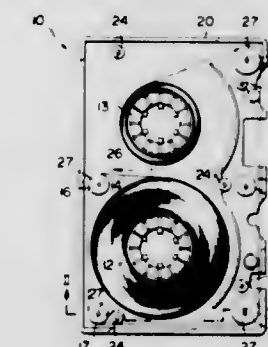
1. In a tape cassette having a front side adapted to confront

a tape head of a tape recorder and a rear side remote from said tape head, comprising:

a pair of cassette halves defining a tape receiving chamber therebetween;

a pair of reel hubs mounted between said cassette halves; a magnetic tape wound on said reel hubs and adapted to be fed from one of said reel hubs to the other; and

guide roller means mounted between said cassette halves for guiding the travel of said magnetic tape between said reel hubs, said guide roller means including a pair of front guide rollers arranged on the front side of said tape cassette, said front guide rollers each having a rotation axis substantially perpendicular to said cassette halves and having flanges thereon for engaging the tape to limit the position of the tape travel in the vertical direction of the cassette;



the improvement comprising:

a pair of position determining holes formed in at least one of said cassette halves to determine the position of said tape cassette relative to a chassis of a tape recorder, said pair of position determining holes each having a right circular cylindrical inner peripheral guiding surface portion and each of said position determining holes being formed under a respective associated front guide roller such that an extension of the rotation axis of said front guide rollers passes through its respective determining hole which is located therebeneath;

said right circular cylindrical inner peripheral guiding surface portion being adapted to engage in surface-to-surface contact with a right circular cylindrical outer surface portion of a guide pin of the tape recorder.

4,417,706

**FLYING WING DRIVEN BY AN EARTHBOUND MACHINE**

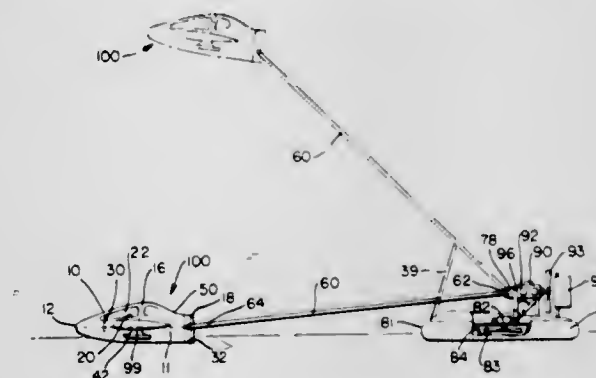
Donald L. Miller, 307 Steuben St., Horseheads, N.Y. 14845

Filed Dec. 12, 1980, Ser. No. 215,909

Int. Cl.<sup>3</sup> B64C 39/00; B63H 7/02

U.S. Cl. 244-2

10 Claims



1. A piloted flying craft which is connected to a surface vehicle, said piloted craft comprising:

a winged body having a front end, an opposite end, a pilot compartment adjacent to said front end, a vertically dis-



placeable connection means attached to said opposite end, and a longitudinal axis extending from said front end to said opposite end;

push tube means, mounted between the surface vehicle and said winged body, said push tube means being connected to said connection means for propelling said winged body in the air vertically relative to the ground surface, said push tube means further defining a line of thrust applied to said winged body due to the motion of the surface vehicle; and

means for controlling the line of thrust defined by said push tube by vertically adjusting the position of the connection means relative to said longitudinal axis of said winged body.

4,417,707

**HUMAN POWERED HANG GLIDER**

Ken Leong, 201 Oakland Ave., #4, Oakland, Calif. 94611

Filed Jan. 26, 1982, Ser. No. 342,833

Int. Cl.<sup>3</sup> B64C 33/00, 31/02

U.S. Cl. 244-11

6 Claims



1. A hang glider, comprising a fixed wing portion having two laterally disposed sides, a pair of movable wing portions, each respectively pivotally attached to the sides of said fixed wing portion, each of said movable wing portions comprising an air foil having a trailing edge, a pair of flexible sheet members each respectively attached to the trailing edges of said movable wing portions, a support structure, through which air may freely pass, for the flexible sheet members, means connected to said movable wing portions to pivot said wing portions in a downward direction, biasing means connected to said movable wing portions to pivot said wing portions in an upward direction opposed to the downward direction when force from said manual force applying means is released, said flexible sheet members being movable away from said support structure when said movable wing portions are moved in the upward direction and movable into engagement with said support structure when said movable wing portions are moved in the downward direction, said support structure comprising a plurality of frame members extending rearwardly away from the trailing edge of each of said movable wing portions and an edge member extending between each of the frame members, each of said support structures so formed being substantially co-extensive with one of said flexible sheet members when one of said flexible sheet members is in engagement with said support structure.

4,417,708

**INTERCHANGEABLE WING AIRCRAFT**

Rosario O. Negri, Great Neck, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 12, 1982, Ser. No. 377,352

Int. Cl.<sup>3</sup> B64C 3/38

U.S. Cl. 244-45 R

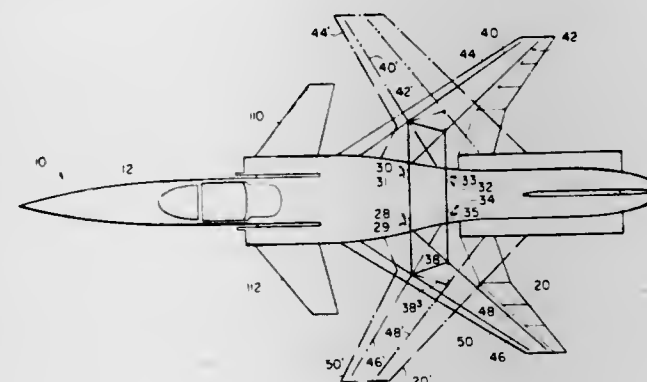
7 Claims

1. An interchangeable wing aircraft comprising: a common fuselage having a cut-out for the reception of a wing, said cut-out having associated therewith wing mounting means including hard points fixed in a standard pattern on fuselage

structure in close proximity to the center of gravity of said aircraft;

wings of different planforms to be used interchangeably with said fuselage, said wings having a center section which fits into said wing cut-out;

each of said wings having semi-spans joined at the roots thereof by a torque box center section which spans said fuselage transversely, each semi-span of each of said wings having at least a front main spar and a rear main spar; said torque box having a standard pattern of hard points mating with said standard pattern of fuselage hard points for mounting said wing, each of said torque boxes having at least a front and a rear center section spar joined at their outer ends by ribs to form a quadrilateral load-carrying structure;



said outer ends of said front center section spar of said torque box being connected to said front main spars of said semi-spans and said outer ends of said rear center section spars of said torque boxes being connected to said rear main spars of said semi-spans of each of said wings for transmitting wing loads into said fuselage structure; wherein the lengths of said front and rear center section spars of said torque boxes in each of the different planform interchangeable wings are selected to intersect for connection to said front and rear main spars of the semi-spans of said wings such that the quarter chord of each of said different wings is positioned at about the vertical plane of the center of gravity of said aircraft when said wings are mounted on said common fuselage.

4,417,709

**SPREADING DEVICE**

Björn O. Fehrm, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

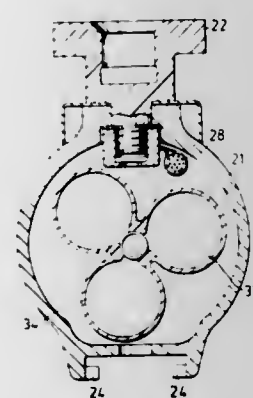
Filed Mar. 17, 1981, Ser. No. 244,542

Claims priority, application Sweden, Mar. 17, 1980, 8002058; Sep. 26, 1980, 8006725

Int. Cl.<sup>3</sup> B64D 1/16

U.S. Cl. 244-136

7 Claims



1. A chaff spreading device for attachment to equipment supporting means on an aircraft comprising:

- (a) an aerodynamically shaped cover having an ejection opening;
- (b) a magazine disposed within the cover for containing bundles of the chaff;
- (c) displacement means for moving bundles of the chaff toward the ejection opening;
- (d) a driving device for moving the displacement means;
- (e) first attachment means provided on a first side of the cover for attaching the chaff spreading device to the equipment supporting means on the airplane;
- (f) second attachment means provided on a second side of the cover for cooperating with suspension means of equipment to be suspended from the airplane, thereby supporting the equipment;
- (g) a coupling member provided on the first side of the cover for coupling with a corresponding member on the aircraft to receive power and control signals from the aircraft;
- (h) a contact member provided on the second side of the cover for coupling with a corresponding member on the equipment to be suspended, effecting transmission to the equipment of signals received from the aircraft; and
- (i) transfer means connecting the coupling member to the driving device and the contact member for providing received power and control signals to the driving device and the contact member.

4,417,710

**COMBINED SURGICAL INSTRUMENT AND TUBE HOLDER DEVICE**

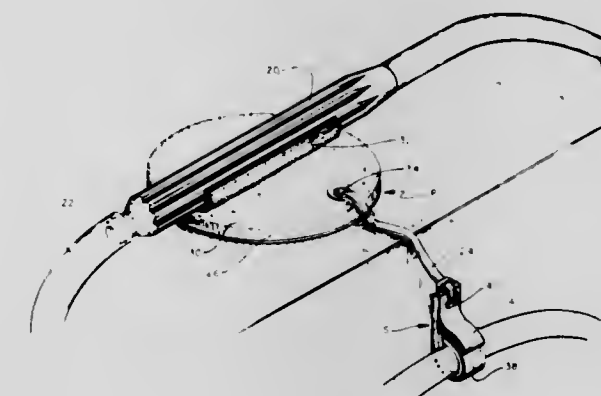
Edwin L. Adair, Denver, Colo., assignor to The Urology Group, P.C., Littleton, Colo.

Filed Jan. 25, 1982, Ser. No. 342,209

Int. Cl.<sup>3</sup> F16L 3/00

U.S. Cl. 248-51

10 Claims



- 1. A device for releasably supporting a surgical instrument and a tube or wire connected thereto, said device comprising: an attachment pad having an adhesive coating on a first side thereof for securing said pad to a permanent fixture;
- a tube holding strip having a resilient foam layer on one side and a fabric layer of intertwining material on the opposite side;
- a tab attached to said strip adjacent one end thereof and extending coextensively with at least a portion of said foam layer side, said tab having interlacing means on the side thereof facing said foam layer so that when said foam layer is looped around a tube or wire said tab overlaps the fabric side of said strip whereupon said interlacing means is engagable with said intertwining material to releasably hold the tube or wire; and
- a resilient connecting strap having one end connected to said attachment pad and the other end connected to said tube holding strip so that the tube or wire is held in a predetermined place but is yieldably movable in response to manipulation of the surgical instrument so as not to restrain movement of the instrument.

4,417,711

**PIPE HANGER**

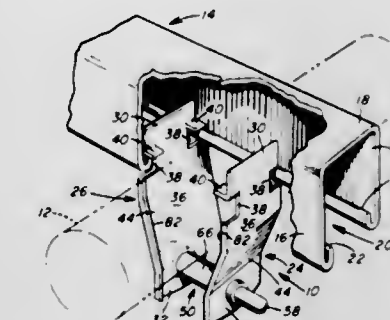
Edward A. Madej, Verona, Pa., assignor to Robroy Industries, Verona, Pa.

Filed May 17, 1982, Ser. No. 378,754

Int. Cl.<sup>3</sup> F16L 3/08

U.S. Cl. 248-74 R

12 Claims



- 1. A conduit hanger comprising, a first clamp member and a second clamp member positioned in opposed spaced relation, each of said clamp members having a body portion including an engaging end portion for positioning on a structural support, a connecting end portion, and an intermediate portion, said intermediate portion having an arcuate configuration extending between the engaging end portion and the connecting end portion and adapted to receive and support a conduit, a moisture resistant, polymeric coating encapsulating said clamp member body portion, a bore extending through said connecting end portion of each of said clamp members, said coating forming a seal structure extending outwardly on opposed sides of each clamp member in surrounding relation with said bore, said seal structure being telescopically movable to form an extensible sealed passageway between said first and second clamp members, a fastening element connecting said first and second clamp members to move said connecting end portions toward one another to securely hold a conduit between said intermediate portions, and said fastening element extending through said bores and positioned within said sealed passageway to provide a moisture resistant seal around said fastening element.

4,417,712

**WALL BRACKET CONSTRUCTION**

Damon H. DeHart, 31 Avon St., Wakefield, Mass. 01880

Filed Nov. 5, 1980, Ser. No. 204,306

Int. Cl.<sup>3</sup> F16B 5/06

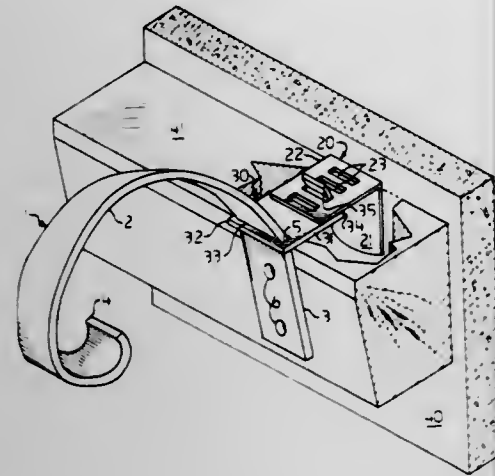
U.S. Cl. 248-225.2

11 Claims

- 1. A wall bracket construction comprising: an elongate bracket element having upper and lower end portions, said upper end portion being outwardly displaced from said lower end portion and having a hook for suspending an article therefrom;
- a tang element comprising a vertical, downwardly oriented, tag member adapted to be inserted into the interface between a wall and wall molding affixed to said wall and a first transverse member extending outwardly and substantially horizontally from the upper end of said tang member;
- a link element comprising a second transverse member, the outboard end of said second transverse member comprising slot means to receive the lower end portion of said bracket element;
- one of said first or second transverse members comprising a plurality of spaced apart apertures therethrough along at least a portion of the length thereof and the other of said first



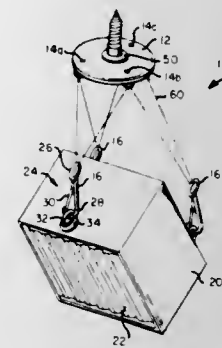
or second transverse members having at least one upturned projection adapted to engage any of said apertures of said one transverse member in interlocking relationship there-



**4,417,714**  
**HANGING DEVICE MOUNTING SYSTEM FOR DEVICES SUCH AS SPEAKER ENCLOSURES**  
Orrin Charm, 725 Lorraine Blvd., Los Angeles, Calif. 90005  
Filed Jun. 29, 1981, Ser. No. 278,597  
Int. Cl.<sup>3</sup> B61L 11/02

U.S. Cl. 248—323

5 Claims



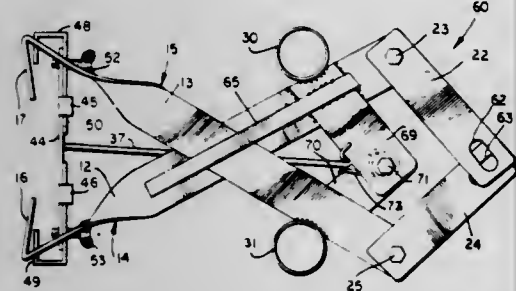
with, said bracket element further comprising stop means to prevent entry of said upper end portion thereof in said slot means of said link element.

**4,417,713**  
**SAFETY BELT CLAMP APPARATUS**  
Dennie C. Snowden, Dixon Mobile Home Pk., Lot #14, Leesburg, Ga. 31763, and Elwood D. Moree, Rte. 1, Vienna, Ga. 31092

Filed Oct. 28, 1980, Ser. No. 201,461  
Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—228

5 Claims



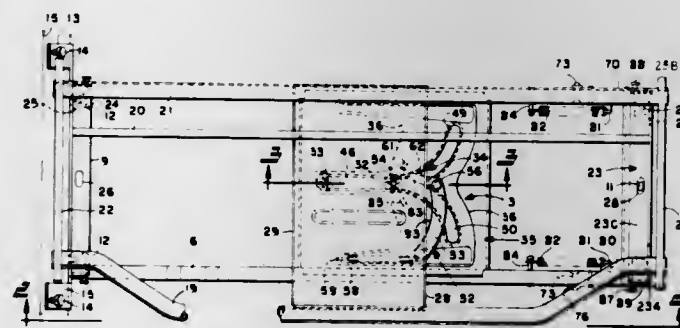
1. A clamp apparatus for releasably connecting a safety belt or harness to a beam, comprising:
  - a pair of arms pivotally connected intermediate the ends thereof and each defining at a first end thereof an inwardly turning hook member;
  - a pair of connecting members, one pivotally connected to a second end of each of said arms at one end of each of said connecting members, and defining therein adjacent to the other end of each of said connecting members a clip receiving opening;
  - a brace extending diagonally from the connection of said arms away from the plane of said arms in the direction of said hook members, said brace being connected to said arms for pivotal movement both about the axis of said pivotal connection between said arms and toward or away from said arms;
  - jaw means on said brace spaced apart from said arms for engaging said beam at a location spaced apart from the point at which said hook members engage said beam;
  - a pair of clip receiving rings, one attached to each of said arms between the second ends of said arms and the pivotal connection of said arms; and
  - a spring urging said hook members toward one another, whereby a plurality of safety belt clips can be engaged with said clip openings and said rings, the force exerted on said belts causing said hook members to be urged against a beam therebetween.

**4,417,715**  
**REVERSIBLE TRANSPORTATION SEAT**  
Robert L. Edwards, Mansfield, Ohio, assignor to National Seating Co., Mansfield, Ohio

Filed Mar. 5, 1981, Ser. No. 240,771  
Int. Cl.<sup>3</sup> F16M 13/00; A47C 3/18

U.S. Cl. 248—425

13 Claims



1. A reversible seat comprising a fixed lower frame; a guide plate carried by the lower frame having a Y shape slot therein, said Y shape slot including a stem section communicating with two divergent arcuate branch sections to form a Y configuration; a rotatable upper frame carrying a seat and having two spaced roller means fixedly mounted thereon, said roller means being received in the Y shape slot for selective movement therealong to connect the fixed frame to the rotatable frame for selective reversal of the seat; a pivotal switch lever positively to control the sequence of roller movement along the Y shape slot selectively to permit 180° rotation of the upper frame relative to the lower frame to reverse the seat orientation, the pivotal switch lever being generally L shape in configuration to define two arms respectively selectively associated with the

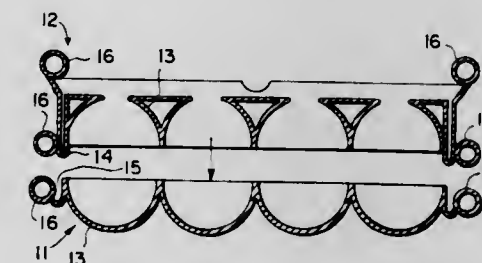
two branch sections of the Y shape slot; and locking means positively to secure the upper frame to the lower frame for seat use.

**4,417,716**  
**NOVELTY ICE TRAY**  
Americo Penna, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, c/o Americo Penna, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 27, 1982, Ser. No. 343,098  
Int. Cl.<sup>3</sup> B29C 1/02

U.S. Cl. 249—121

2 Claims



1. A novelty ice tray, comprising in combination, an upper and lower section, a plurality of hollow forms in each said section, lock means to secure said sections water tight together, and said forms of said sections aligning with each other, said forms being of various shape so that water frozen therein becomes a shaped ice cube, and means for a plurality of said ice cubes being frozen together, wherein said lock means comprises a U-shaped lock pin inserted tubes formed on said sections wherein an overflow pan is formed upon a top of said upper section.

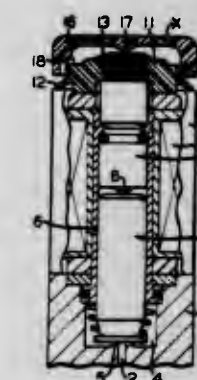
**4,417,717**  
**PRESSURE RELEASE FOR A VALVE**  
Rudolf Möller, Gehrden, Fed. Rep. of Germany, assignor to WABCO Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Dec. 19, 1980, Ser. No. 218,399  
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001538

U.S. Cl. 251—139

Int. Cl.<sup>3</sup> F16K 31/02

12 Claims



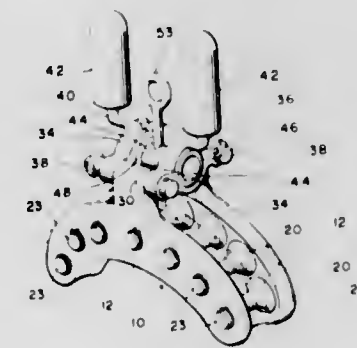
1. An electro-magnetic valve device comprising:
  - (a) a housing;
  - (b) an electro-magnetic coil in said housing;
  - (c) an air vent pipe secured to said housing at one end and projecting from said housing at the other end, said other end being threaded; and
  - (d) a nut threadedly connected to said other end of said air vent pipe and engageable with said coil to axially secure said coil in said housing, comprising:
    - (i) first annular seal means integral with said nut and projecting from the outer periphery thereof for engage-

ment with said housing when said nut is threaded onto said air vent pipe; and  
(ii) second annular seal means integral with said nut and projecting radially inwardly from the threads of said nut for engagement with said air vent pipe.

**4,417,718**  
**COUNTER BALANCED SHEAVE ASSEMBLY WITH MULTIPLE PULLEYS**  
Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140  
Continuation-in-part of Ser. No. 222,970, Jan. 7, 1981, Pat. No. 4,301,995. This application Oct. 22, 1981, Ser. No. 313,758  
Int. Cl.<sup>3</sup> B66D 1/36

U.S. Cl. 254—394

8 Claims



1. A counter-balanced sheave assembly for supporting a downward extending cable having a tension applied thereto, comprising:
  - a support frame;
  - a plurality of sheaves rotatably mounted to said support frame along a downwardly facing, arcuate path with their axis of rotation being substantially perpendicular to a plane containing said arcuate path;
  - counter-balancing means positioned above said support frame;
  - connecting means disposed between said counter-balancing means and said support frame for rigidly interconnecting the same;
  - suspension means pivotally connected to said connecting means with its pivotal axis being substantially parallel to said plane containing said arcuate path;
  - said suspension means including a first rotatable member, having said pivot axis, rotatably mounted at its ends to said connecting means, and a second rotatable member pivotally secured to said first rotatable member with its rotation axis being substantially perpendicular to said pivot axis of said first rotatable member, said second rotatable member being operable for supporting said counter-balanced sheave assembly;
  - whereby said plane containing said arcuate path at all times approximately passes through and lies parallel with the cable positioned over said sheaves.

**4,417,719**  
**TOP-AND-BOTTOM BLOWN CONVERTER**  
Kyoji Nakanishi, Tsutomu Nozaki, and Toshihiko Eml, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Aug. 10, 1982, Ser. No. 406,960  
Int. Cl.<sup>3</sup> C21D 11/00

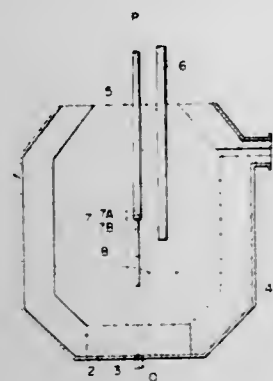
U.S. Cl. 266—78

8 Claims

1. A top-and-bottom blown converter comprising:
  - a converter housing having a vertical axis and a horizontal trunnion axis about which the housing is rotatable and provided with an opening at the top, said converter housing receiving molten metal therein;
  - a plurality of tuyeres arranged at the bottom of said converter housing and aligned in a line extending parallel to said trunnion axis for blowing a gas into said molten metal;



- a lance mounted for vertical motion into said converter housing through said opening for blowing an oxidizing gas into said molten metal; and
- a monitoring sub-lance mounted for vertical movement into said converter housing through said opening such that a



lower tip of said sub-lance may be immersed in said molten metal for measurement, said sub-lance being mounted for said vertical movement within a region defined between two vertical planes passing through two parallel lines each horizontally spaced by a distance of 300 mm from said tuyere aligning line.

#### 4,417,720 CONTINUOUS HEAT TREATMENT PLANT FOR STEEL SHEET

Philippe Paulus, Liege, Belgium, assignor to Centre de Recherches Metallurgiques, Brussels, Belgium

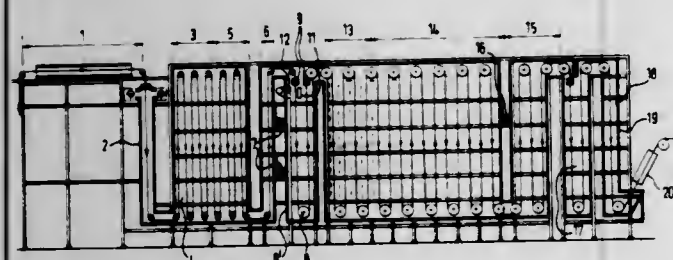
Filed Dec. 4, 1980, Ser. No. 213,196

Claims priority, application Belgium, Dec. 12, 1979, 880587; Luxembourg, Jul. 1, 1980, 82575

Int. Cl.<sup>3</sup> C21D 9/56

U.S. Cl. 266—112

15 Claims



1. A continuous heat treatment plant for steel sheet, comprising in sequence:

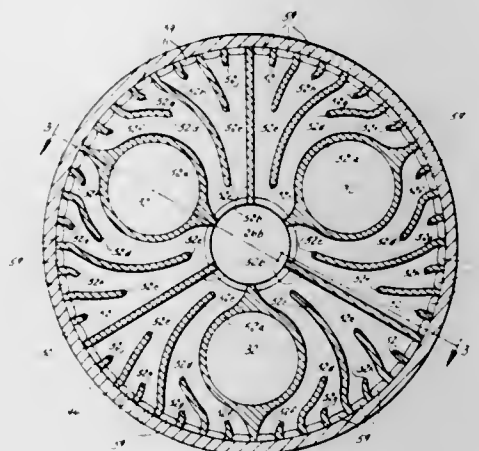
- (a) means for heating the steel sheet to a temperature higher than the recrystallization temperature of the steel;
- (b) means for holding the steel sheet at this temperature for more than 30 seconds; and
- (c) a rapid cooling zone comprising
  - (i) means for spraying a cooling fluid onto the steel sheet, and
  - (ii) a tank for containing an aqueous bath, means for maintaining the aqueous bath at a temperature greater than 75° C., (1) means for varying the level of the aqueous bath in the tank, and (2) a roller contained within the tank around which the steel sheet passes and means for displacing said roller—so that the length of the path of the sheet through the aqueous bath can be modified by employing either or both of (1) and (2).

4,417,721  
LANCET TIP FOR OXYGEN STEELMAKING  
Robert D. Pehlke, 9 Regent Dr., Ann Arbor, Mich. 48104; D. Roger Glass, 1575 Earhart Rd., Ann Arbor, Mich. 48105; Lyle J. Johnson, deceased, late of Grosse Ile, Mich., and by Evelyn Johnson, administratrix, East River Rd., Grosse Ile, Mich. 48138

Filed Jun. 4, 1982, Ser. No. 384,843  
Int. Cl.<sup>3</sup> C21C 5/32

U.S. Cl. 266—225

15 Claims



1. In an oxygen lance tip for steelmaking having an oxygen passage terminating in one or more oxygen outlets at the distal end face of the tip, and a coolant passage via which coolant is circulated through the tip, the improvement in said coolant passage for cooling the distal end face of the tip which comprises: means defining a plurality of coolant channels just interior of the distal end face, said channels being constructed and arranged to radiate from a central region of the tip toward the outer perimeter of the tip so that coolant flow across said distal end face radiates from said central region, said channels being axially bounded by said distal end face and by a wall surface spaced axially inwardly of said distal end face, and said channels being defined by a plurality of axial ridges extending between said wall surface and said distal end face and arranged and constructed to run generally radially and successively circumferentially subdivide the radiating coolant flow at least once after it has been axially confined by said wall surface and said distal end face as it radiates in the direction from the central region of the tip toward the outer perimeter of the tip.

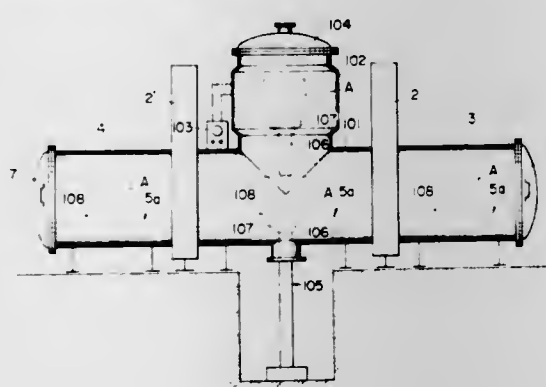
4,417,722  
VACUUM FURNACE FOR HEAT TREATMENT  
Hiroshi Ishii, Tokyo; Hiroshi Morii, and Saburo Ishijima, both of Yokohama, all of Japan, assignors to Japan Oxygen Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,797

Claims priority, application Japan, Dec. 23, 1980, 55/182679  
Int. Cl.<sup>3</sup> C21D 1/74; F27B 9/14

U.S. Cl. 266—250

6 Claims



1. A vacuum furnace for heat treatment comprising a heat-

ing furnace proper, pre-exhaust chambers, one adapted to feed a workpiece into the furnace proper therefrom and the other adapted to discharge the workpiece out of the furnace proper thereto, vacuum valves for partitioning between the furnace proper and the respective pre-exhaust chambers, and a line assembly for delivery of the workpiece from the feed chamber into the discharge chamber through the furnace proper, wherein a heating chamber forming part of said furnace proper is raised above said delivery line assembly, and an externally operable elevating means is disposed in said furnace proper, said workpiece being carried by said delivery line assembly, and being lifted to said heating chamber where it is heated.

#### 4,417,723 TUYERE FOR BLOWING GASES INTO MOLTEN METAL BATH CONTAINER

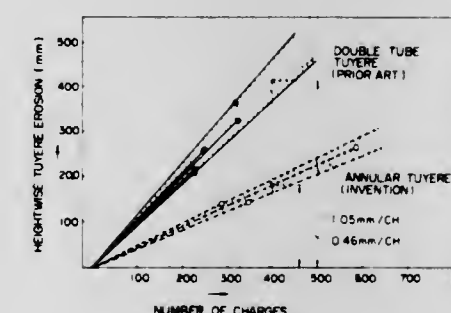
Minoru Kitamura, Nishinomiya; Shinji Koyama; Shuzo Ito, both of Kobe; Masahiko Ohgami, Kakogawa; Hideo Matsui, Hyogo; Isamu Hirose, Kakogawa; Hideaki Fujimoto, Akashi, and Tsuyoshi Yasui, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 4, 1982, Ser. No. 336,685

Claims priority, application Japan, Oct. 22, 1981, 56-169465  
Int. Cl.<sup>3</sup> C21B 7/16

U.S. Cl. 266—265

8 Claims



1. A tuyere having a longitudinal axis, said tuyere for blowing a gas therethrough to be embedded in a bottom or side wall of a molten metal bath container, said tuyere comprising:

- a cylindrical core body which further comprises a solid refractory material having a first outer diameter and located at the center of said tuyere coaxially with respect to said longitudinal axis;
- a first tube having a second outer diameter and fixed coaxially around and immediately adjacent said core body and forming a first continuous annular gap having a first width forming a first annular blowing passage;
- means for reducing erosion of said wall of said molten metal bath container adjacent said tuyere; and
- means for stabilizing a flow rate of said gas through said tuyere over a wide range of said flow rate.

#### 4,417,724 BRAKE ASSEMBLIES PRIMARILY FOR EXERCISING APPARATUS

Anthony Bikker, West Midlands, England, assignor to Welltron Limited, West Midlands, England

Filed Sep. 22, 1980, Ser. No. 189,233

Claims priority, application United Kingdom, Sep. 22, 1979, 7932949

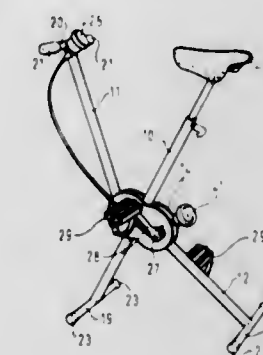
Int. Cl.<sup>3</sup> A63B 21/22

U.S. Cl. 272—73

4 Claims

1. An exercising apparatus comprising a frame, rotary means

turnable by a person's legs or arms to rotate a spindle, bearing means for supporting the spindle for rotation on the frame and braking means operable to apply resistance to turning of the spindle, wherein the bearing means comprise two components which have concave part-cylindrical bearing faces engaging a cylindrical portion of the spindle at diametrically opposed locations and are relatively movable towards and away from one another along a line passing through said locations and the axis of the spindle, the spindle being supported solely by the two components, wherein the two components are mounted in a housing which is fixed to the frame and carries the braking means, one component is acted upon by the braking means at



a location lying on said line to apply a force to said one component relative to the housing towards the other component to urge the bearing faces of the two components into engagement with the spindle, the bearing faces of the components being formed to provide resistance to turning of the spindle when urged into engagement with said portion thereof whilst at the same time providing a bearing for the spindle and said other component having projections received in holes in the housing to locate the component with respect to the housing.

#### 4,417,725 METHOD FOR TRANSFERRING ENERGY BETWEEN SUSPENDED OBJECTS

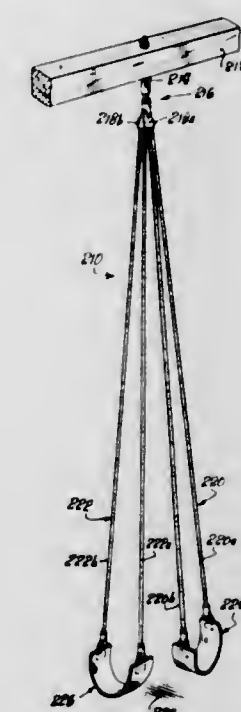
John W. Van Horn, 2953 Waterfield Dr., Sparks, Nev. 89431

Filed Oct. 19, 1981, Ser. No. 312,242

Int. Cl.<sup>3</sup> A63G 9/00

U.S. Cl. 272—85

2 Claims



1. The method of transferring energy and motion between two suspended objects which comprises: Suspending a first object at a predetermined distance above a base level from a single point; suspending a second object at a predetermined distance above a base level from said single point and at the same level as said first object; providing a swiveled connection



at the common junction of said first and said second objects; imparting a circular motion to the first of said suspended objects above the said second suspended object; causing said first suspended object to increase its speed and orbit about the second suspended object for a period of time; causing the second suspended object to obtain motion from the first suspended object to lose momentum and motion by transferring from its suspension means its kinetic energy to the second object; causing the second object to increase its momentum and transfer of kinetic energy from the first until the first comes to rest with the second still in motion.

2. The method as set forth in claim 1 wherein said first and second suspended objects are swings for supporting persons.

4,417,726

### FOOT HOLDDOWN DEVICE FOR PERFORMING SITUPS

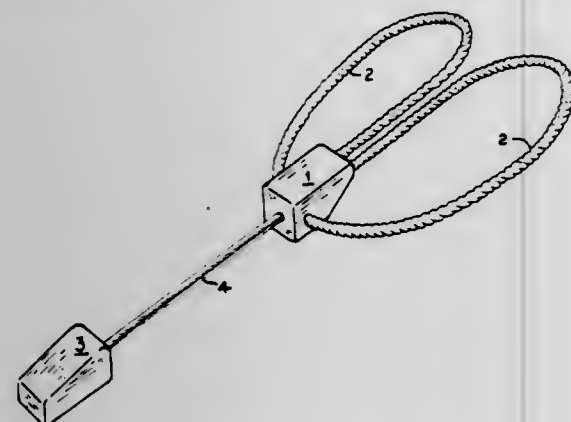
William J. Schleis, 2420 Ascension Dr., San Ramon, Calif. 94583

Filed Apr. 22, 1982, Ser. No. 352,137

Int. Cl.<sup>3</sup> A63B 23/00

U.S. Cl. 272—93

3 Claims



1. A physical fitness exercising device specifically designed to support a users feet while engaged in performing exercises performed from a position flat on the back to a sitting position said device comprising;

a pair of side-by-side loops of flexible rope secured within a central connector block, each loop forming a stirrup which is adapted to receive the foot of a user, a flexible connecting means secured at one end to said connector block and at its opposite end to an anchor block, said anchor block and connecting means being adapted to be secured under a door or clamped under on article of furniture while the user performs sit-up type exercises with a foot in each stirrup.

4,417,727

### ISOMETRIC EXERCISER

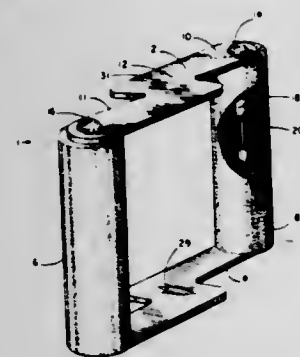
Charles J. Ottenheimer, 205 Lewers St., Suite 808, Honolulu, Hi. 96815

Filed Feb. 11, 1982, Ser. No. 348,030

Int. Cl.<sup>3</sup> A63B 21/00

U.S. Cl. 272—125

5 Claims



1. Isometric exercise apparatus comprising a pair of hand

grips, a pair of parallel Z-shaped rigid spacing bars having end portions thereof attached to each hand grip, and orientation means on at least one of said spacing bars for assisting the user in orienting the apparatus in various positions with respect to the user's body when performing various isometric exercises.

4,417,728

### TRAINING APPARATUS FOR RACKET SPORTS

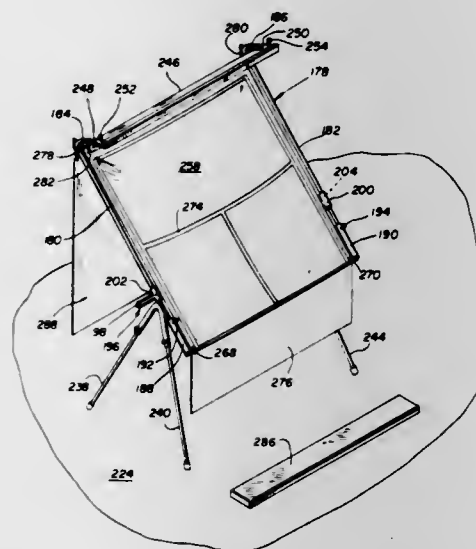
Eric Hay, Johanneshov, and Anders Nordstrom, Kungsangen, both of Sweden, assignors to Esselte Studium AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 252,979, filed as PCT SE80/00045, Feb. 13, 1980 published as WO80/01650, Aug. 21, 1980, §102(e) date Apr. 29, 1980. This application May 6, 1980, Ser. No. 147,233

Int. Cl.<sup>3</sup> A63B 69/38

U.S. Cl. 273—29 A

11 Claims



1. A training apparatus for racket sports such as tennis, squash, or the like comprising:

(a) elongated frame means having two mutually parallel frame members each having upper, upper distal and lower ends, and a principal segment between said upper and lower ends, said members being curved at their upper ends;

(b) a rigid rebound surface disposed across the width of said frame means at the upper distal ends of said frame members, said rebound surface being spaced vertically apart from and substantially parallel to a plane joining said principle segments;

(c) a flexible material, having upper and lower edges and longitudinal edges perpendicular thereto, attached to said rigid rebound surface, extending loosely across the width of said frame, said flexible material being relatively taut along the length of said frame and attached to the lower ends of said frame members, said upper edge being disposed rearwardly of said lower edge;

(d) horizontal support means connected to said frame means;

(e) means disposing said frame means and thus the said flexible material at different angles to said horizontal support means;

whereby the kinetic energy of a ball struck against the flexible material will be partially absorbed, the ball caused to run upwardly and rearwardly and hit the rigid rebound surface and be deflected downwardly back by said rebound surface towards the player.

4,417,729

### RACKET STRINGING APPARATUS

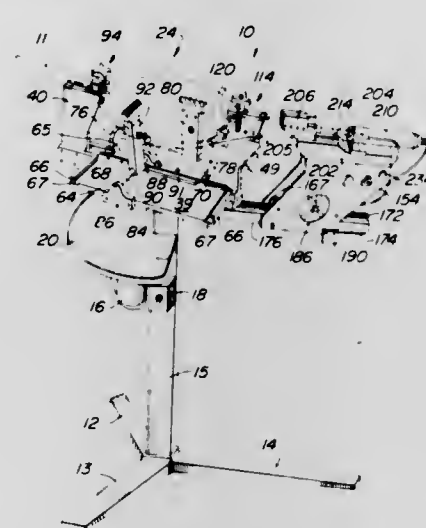
Ross F. Morrone, Jamesburg, N.J., assignor to Prince Manufacturing, Inc., Princeton, N.J.

Filed Feb. 26, 1982, Ser. No. 352,820

Int. Cl.<sup>3</sup> A63B 51/14

U.S. Cl. 273—73 A

22 Claims



1. A racket stringing apparatus comprising:

(a) a base,  
(b) a racket frame clamp assembly pivotally mounted on the base and adapted to clamp a racket to be strung,  
(c) a tension head support beam having a first end and a second end, the first end of the beam being mounted on the base,  
(d) a tension head assembly mounted for reciprocating movement along the beam and for limited pivotable movement about an axis transverse to the beam and transverse to the plane of the tension head assembly and adjacent a lower portion of the tension head assembly closest to the first end of the beam,

(e) driving means for continuously maintaining a predetermined final tension on a string with which the racket is to be strung, the driving means being activated by an actuator means which is activated upon sensing a predetermined initial string tension,

(f) means for regulating the tension on a string, and

(g) means for indicating the tension on the string,

the tension head assembly including a body, means for reciprocating the tension head assembly along the beam, locking means for locking the tension head assembly against movement along the beam, string gripping means mounted for reciprocating movement along a top portion of the body, the string gripping means being connected to the driving means, whereby when a sufficient initial tension is placed on the string held in the string gripping means as the body is moved in a direction toward the second end of the beam by the means for reciprocating the tension head assembly, the tension head assembly pivots about the transverse axis in a direction toward the first end of the beam, the pivoting simultaneously causing the locking means to interact with the beam to prevent reciprocating movement of the tension head assembly along the beam and the pivoting further simultaneously causing the actuator means to activate the driving means to apply and maintain the predetermined final tension on the string until the driving means is deactivated.

4,417,730

### TENNIS PRACTICE APPARATUS

Todd D. Weiner, 628 Binsted Rd., Glen Burnie, Md. 21061

Filed May 3, 1982, Ser. No. 374,296

Int. Cl.<sup>3</sup> A63B 61/00

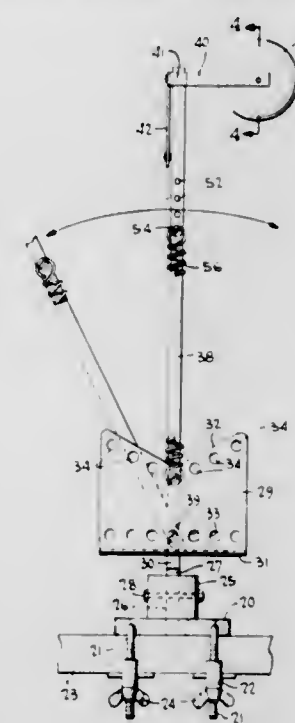
U.S. Cl. 273—29 A

10 Claims

1. Apparatus for moving a ball to be struck by a racket for practice comprising

elongate arm means having a mounting end and a target end carrying a ball to be struck by a racket;

support means pivotally mounting said arm means at said mounting end to permit said target end to move through a stationary position in opposite directions and limiting pivotal movement of said arm means to less than 360°; and spring means connected at a first end with said arm means and at a second end with said support means at a position spaced from said mounting end of said arm means, said



spring means being aligned along said arm means to bias said arm means toward said stationary position such that pivotal movement of said arm means in a first direction from said stationary position tensions said spring means to bias said arm means to move in a second direction opposite to said first direction whereby striking of said ball carried on said target end of said arm means with a racket causes said ball to oscillate about said stationary position for striking again with the racket while said ball is moving.

4,417,731

### HOLLOW METAL GOLF CLUB HEAD AND CLUB INCORPORATING IT

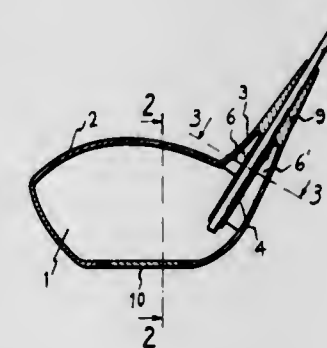
Kunio Yamada, 5-14, 4 chome, Hibarigaokakita, Houya-shi, Tokyo-to, Japan

Filed Jun. 16, 1982, Ser. No. 389,081

Int. Cl.<sup>3</sup> A63B 53/04, 53.08, 53.02

U.S. Cl. 273—167 H

12 Claims



1. A golf club head comprising: a hollow metal body portion having an external shape substantially similar to a conventional "wood", said head further including a hollow neck portion extending from said body portion, cylindrical socket means extending from said body portion, cylindrical socket means extending into said portions, a plurality of web means attached to and interconnecting said socket means and said neck portion



to support said socket means, with a spacing extending substantially around said socket means, said socket means having an aperture aligned with said neck portion to receive a shaft.

#### 4,417,732 ELECTRICAL CONSTRUCTION GAME

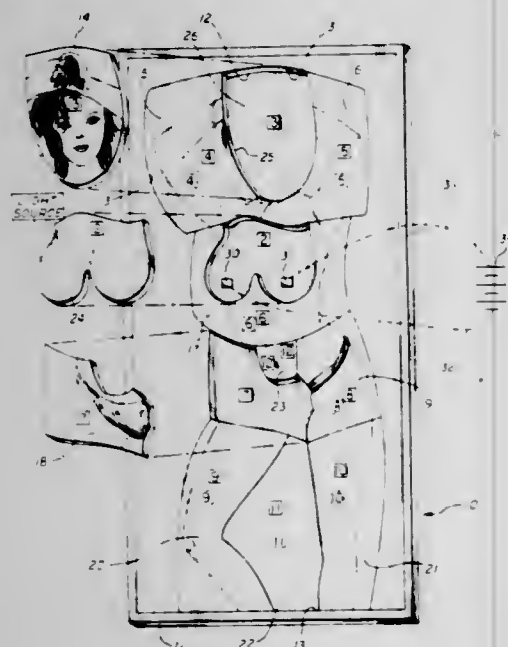
Andrew J. Guill, Rte. 3, Box 746, Houston, Tex. 77045

Filed May 8, 1981, Ser. No. 261,898

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273—238

6 Claims



1. A competitive puzzle-game for play by a plurality of players comprising at least one game board of substantial thickness and having a recessed area comprising a flat portion surrounded by a peripheral edge defining the outline of the outer periphery of said puzzle and inner markings in said flat recessed portion outlining the location of eleven separate playing pieces, each marked area for play of a jig saw puzzle piece bearing a selected number, eleven playing pieces for said board, each of said pieces having a shape fitting a selected marked area on said board and bearing a number corresponding to the number on such area, a pair of dice for use by each player for generating random numbers from two to twelve, and said pieces are played competitively by a player on said board according to numbers generated by said dice in the order of numbers from three to twelve and finally piece number two, each player being allowed a selected number of throws of said dice to produce the number of the piece to be played, after which he loses his turn, playing piece numbered two, the last piece to be played includes at least one signal light, and said board includes electric circuit means in said recessed area marked area number two cooperable with said puzzle piece number two to energize said light, whereby the rolling of the number two, having the lowest probability, results in completion of the board and illuminates the light.

#### 4,417,733 METHOD OF PRODUCING HIGH TEMPERATURE COMPOSITE SEAL

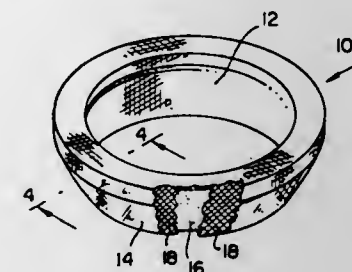
Peter P. Usher, Union, N.J., assignor to Metex Corporation, Edison, N.J.

Continuation of Ser. No. 949,580, Oct. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 856,174, Nov. 30, 1977. This application Nov. 5, 1980, Ser. No. 203,557

Int. Cl.<sup>3</sup> F16J 15/12; B32B 31/06

U.S. Cl. 277—1

3 Claims



1. A method of producing a substantially coherent high temperature composite seal comprising the steps of positioning a sheet of flexible refractory sheet material between two layers of knitted wire mesh, said wire mesh being formed of wire and having voids of given size between said wires, constructing a generally cylindrical preform of said flexible refractory sheet material and flexible knitted wire mesh, disposing said preform in a compression die, said die having a cavity size and shape which is substantially the same as the desired composite seal, and applying an axial load to said preform, said load being of sufficient force to collapse said preform to substantially the size and shape of said composite seal and to cause said refractory material to substantially fill the openings in said wire mesh and to become firmly interlocked with said wire mesh.

#### 4,417,734 SHAFT SEAL ASSEMBLY HAVING UNIVERSAL WASHER WITH BORES FOR SPRINGS

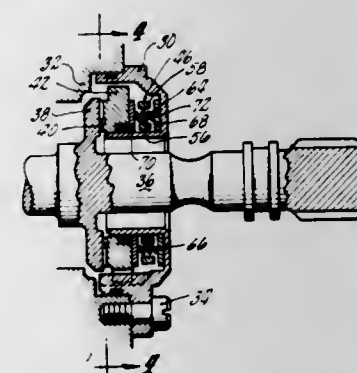
Jack G. Sundberg, Meriden, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 27, 1983, Ser. No. 489,019

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277—93 SD

4 Claims



1. In an improved shaft seal assembly for a pump having a pump housing and a drive shaft with a seal face extending therein of the type comprising: a seal housing mounted upon the front of the pump housing in surrounding relationship to the drive shaft, a carbon face seal, having its rear face in wiping engagement with the seal face, mounted in the seal housing for axial movement therein; a universal washer having two protuberances on each side thereof in diametrically opposed relationship mounted in the seal housing between the rear face of the carbon face seal and the front inner wall of the seal housing; and wherein the improvement comprises: first and second bores extending respectively through the protuberances on one side of the universal washer;

first and second compression springs respectively mounted in the first and second bores; and means for engaging the extremities of the first and second springs for transmitting the urging thereof to the carbon face seal.

#### 4,417,735 SEAL RING WITH TRAPEZOIDAL CONTOUR AND SPREADING ELEMENT

Kurt Heisler, Tetnang, Fed. Rep. of Germany, assignor to MTU Motoren-Und-Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

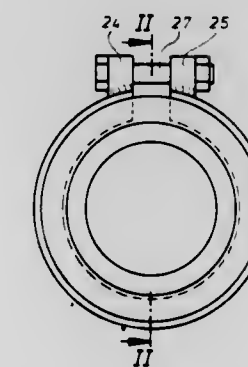
Filed Dec. 18, 1980, Ser. No. 217,833

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950837

Int. Cl.<sup>3</sup> F16J 15/06; F16L 25/00

U.S. Cl. 277—101

40 Claims



1. A sealing element adapted to be located between two adjacent components which are rigid with respect to one another, each of the components including an opening terminating in a sealing surface, the sealing surfaces being disposed in opposition to and spaced from one another, characterized in that a sealing ring is disposed between the two sealing surfaces, the ring includes a trapezoidal inner contour which opens toward an outside, and in that means are interposed between inner surfaces of the sealing ring for spreading outside surfaces of the sealing ring against the respective sealing surfaces.

#### 4,417,736 HIGH VOLTAGE RACK AND PANEL CONNECTOR

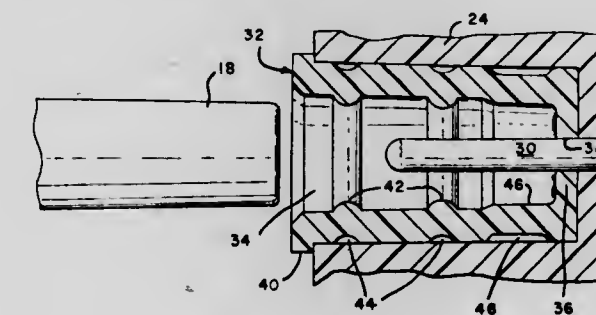
Henry O. Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 869,974, Jan. 16, 1978, abandoned. This application Oct. 26, 1978, Ser. No. 954,954

Int. Cl.<sup>3</sup> H01R 13/52

U.S. Cl. 277—212 R

8 Claims



1. An improved sealing means for high voltage electrical connectors to provide sealing interfaces between a tubular portion of one rigid mating connector member received in a corresponding cylindrical recess of a mating rigid connector member, said sealing means comprising: a unitary member of resilient material having a substantially cylindrical configuration and adapted to be received within said recess of said mating connector member and accept said tubular portion therein,

at least one inwardly directed annular recess formed on the exterior of the sealing means, an inwardly directed annular portion at one end of said member defining an aperture of lesser diameter than the remainder of the cylindrical configuration, said annular portion having substantially the same width as said annular recess, whereby said at least one annular recess allows for deformation and expansion of said member and said reduced diameter portion without lessening the sealing effect achieved by said sealing means.

#### 4,417,737 SELF-PROPELLED ROLLER SKATE

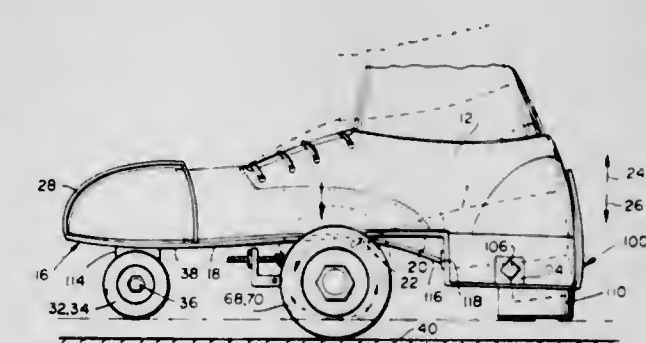
Hyman Suroff, 6813 21st Ave., Brooklyn, N.Y. 11204

Filed Sep. 13, 1982, Ser. No. 416,925

Int. Cl.<sup>3</sup> A63C 17/12

U.S. Cl. 280—11.115

11 Claims



1. A self-propelled roller skate for affixment to an individual's shoe comprising, in combination: A. an articulated frame having a front portion and a rear portion, said front and rear portions being coupled by a hinge means for providing movement in a vertical plane therebetween, said front portion including: (i) a forward toe portion adapted to receive and cooperate with the toe of a shoe removably retaining said shoe toe therein, (a) wheel means rotatably affixed to the underside of said forward toe portion; (ii) a central, generally horizontal section of said toe portion having means thereon for providing affixment to the sole of said shoe, said central section including: (a) a pair of downwardly extending arms provided with apertures at the distal ends thereof, (b) spring retaining means disposed on the underside of said central section, (c) a rearwardly extending section having said hinge means at one distal end thereof, said rearwardly extending section being provided with pivot means on the underside thereof disposed between the distal ends of said rearwardly extending section, (d) a ratchet rack pivotable in said pivot means and extending downwardly, with the teeth of said rack disposed rearwardly, (e) a first spring means having one end affixed to said underside of said central section with the other end thereof positioned to urge said ratchet rack rearwardly, (f) a generally U-shaped bracket means having a vertically extending base portion and horizontally disposed arm portions, said arm portions being disposed rearwardly and being provided with apertures adapted to cooperate with said apertures provided on said pair of said downwardly extending arms to form a pivot point, said U-shaped bracket base portion being provided with spring retaining means; and B. a rear portion having means to cooperate with the rearwardly extending section of said forward toe portion to form said hinge means; said rear portion further including:



- (i) a heel section adapted to receive the heel of an individual's shoe;
- (ii) retaining means disposed in said heel section for removably clamping the heel of said shoe and retaining it therein; and
- (iii) braking material disposed on the underside of said heel section for coming into contact with a surface upon which said skate is used, to provide braking; and
- C. a pair of wheels disposed on the distal ends of an axle, said axle having a centrally disposed ratchet gear thereon, said axle and wheels being rotatably mounted proximate the distal ends of said horizontally disposed arm portion of said U-shaped bracket means with said ratchet gear being in intimate contact with said ratchet rack for cooperation therebetween; and
- D. a second spring means connected between said U-shaped bracket base portion spring retaining means and said spring retaining means provided on the underside of said central frame section, said second spring means urging said U-shaped bracket base means towards said central frame section, said rack causing said gear and said pair of wheels to rotate in a forward direction on said surface when the weight of said individual is placed on said central frame section.

4,417,738

# RETRACTABLE CASTER ASSEMBLY HAVING A LEVER IN ROLLING ENGAGEMENT WITH A PRESSURE PLATE

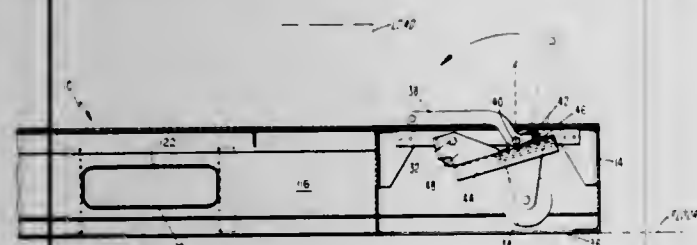
Ray Kendall, Fort Worth, Tex., assignor to Dynalectron Corporation, McLean, Va.

Filed Dec. 22, 1980, Ser. No. 218,826

Int. Cl.<sup>3</sup> B60B 33/06

U.S. Cl. 280—43.17

8 Claims



1. A retractable caster assembly for permanent attachment to a framework for allowing said framework to rest on a floor surface in a first stable position of the assembly, and for lowering the assembly and thereby raising at least one end of the framework above said floor surface in a second stable position of the assembly, the assembly comprising:

- (a) a hinge plate pivotally mounted at one end to said framework;
- (b) a pressure plate affixed to said hinge plate at the opposite end of said hinge plate from said pivotal mounting;
- (c) a caster rotatably mounted on the lower surface of said pressure plate and said hinge plate positioned so that on lowering said assembly said caster extends below the lower surface of said framework and, on raising said assembly, the lower periphery of said caster is not lower than the lower surface of said framework and is out of contact with said floor surface;
- (d) a lever having a fulcrum point pivotally mounted on said framework, said lever having a handle portion above said fulcrum point and an engagement point below said fulcrum point, said engagement point including a roller rolling along and against the upper surface of said pressure plate to lower said caster upon raising said handle portion of said lever, said engagement point of said lever acting directly on said pressure plate through said roller;

and

- (e) means mounted on the upper surface of said pressure plate for restricting the travel of said roller between a point where said caster is in a fully lowered stable position

supporting at least a portion of said pallet wherein said fulcrum point, said roller and the center of said caster are in substantially vertical alignment, and a point where said caster is in a fully raised position.

4,417,739

# AUXILIARY WHEEL SUPPORT FOR LOAD CARRYING VEHICLES

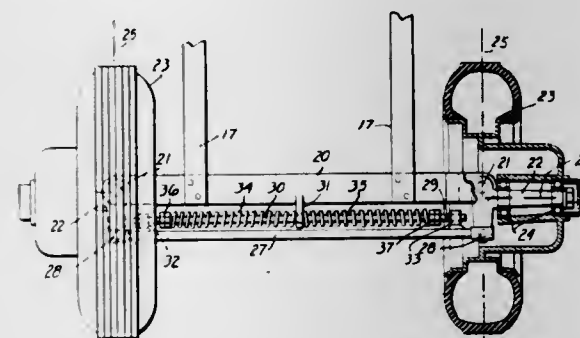
Robert F. Whitaker, 1304 N. Council Ave., Ontario, Calif. 91764

Filed Dec. 9, 1981, Ser. No. 280,070

Int. Cl.<sup>3</sup> B62D 61/12

U.S. Cl. 280—81 A

2 Claims



1. An auxiliary support for a vehicle having a frame structure for supporting a load, said frame structure including an axle extending transversely of said vehicle, rear support wheels, auxiliary wheels located rearwardly of said rear wheels, spindles supporting said auxiliary wheels for rotation about wheel axes, pivot means on said structure supporting said spindles for pivotal movement about vertical axes located forwardly of said wheel axes whereby to enable said wheels to caster about said vertical axes, means on said axle supporting said pivot means, and a tie rod connected between said spindles, comprising:

stressed spring means extending between said tie rod and said frame structure for yieldably maintaining said wheels in tracking relation with said vehicle and for yieldably resisting said pivotal movement of said auxiliary wheels about said vertical axes;

a projection on said axle intermediate the ends thereof, said projection having a hole therein;

a guide rod movable endwise in said hole; and

means attaching said guide rod to said tie rod;

said spring means comprising a pair of compression springs slidable on said guide rod, adjacent ends of said spring means engaging said projection; and

said guide rod having means thereon engaging the opposite ends of said springs whereby to maintain said springs in compression.

4,417,740

# VEHICLE FOR COASTING DOWN IN A CHANNEL-SHAPED ROLLER SLIDE

Hans G. Wechsler, Schwaz, Austria, assignor to Horst Schwamm, Sistrans and Friedbert Pessei, Grinzens, both of, Austria

Filed Apr. 28, 1981, Ser. No. 258,275

Claims priority, application Austria, May 5, 1980, 2371/80

Int. Cl.<sup>3</sup> A63G 21/02

U.S. Cl. 280—87.01

8 Claims

1. A vehicle for use in coasting down a non-rail roller slide of the type having a channel-shaped curved transverse cross-sectional configuration and having straight and curved length sections, with such curved length sections having banked outer sides, said vehicle comprising:

a vehicle chassis including at least one longitudinal member having rigidly fixed to front and rear ends thereof respective front and rear transverse cross members, each said cross member having a transverse configuration curved to

conform generally to the transverse configuration of the slide on which said vehicle is to be used;

rear wheels mounted for rotation by respective rear axles mounted in fixed alignment with respect to said rear cross member;

a pair of supporting members, each said supporting member having a rearwardly extending generally fork-shaped portion supporting an axle of a respective front wheel and a forwardly extending mounting portion pivotally mounted to a respective opposite end of said front cross member for rotation about a respective pin extending generally orthogonal to said axle of said respective front wheel, such that said front wheels are mounted with

wheels; said fabric element having a series of relatively narrow pockets extending along the width dimension of the element to fit onto the support arm sections of the brackets.

4,417,742

# MANUPEDAL BICYCLE

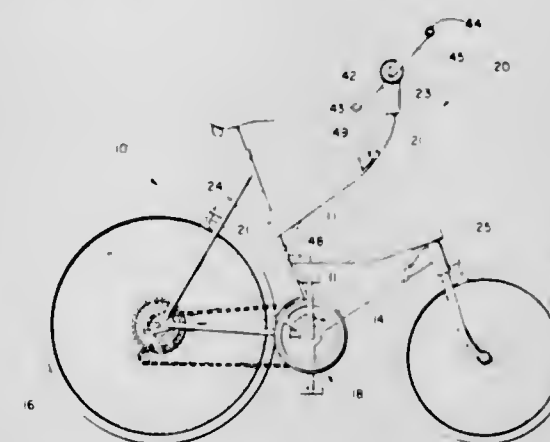
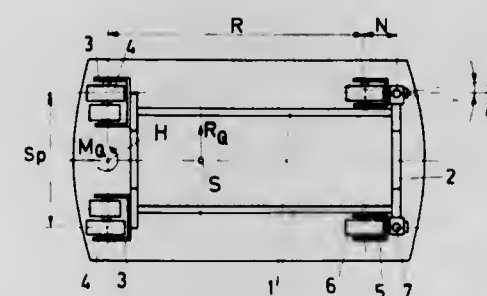
Franklin S. Intengan, P.O. Box 4058, Hialeah, Fla. 33014

Filed Jun. 10, 1981, Ser. No. 272,361

Int. Cl.<sup>3</sup> B62M 1/00

U.S. Cl. 280—234

6 Claims



caster with respect to said front cross member, and such that said front wheels and respective said supporting members are pivotable about said respective pins with respect to said front cross member;

stop means on said chassis and on each of said supporting members for limiting the extent of pivotal movement of each of said front wheels with respect to said front cross member; and

said rear wheels and said front wheels being mounted with reverse camber, the camber angle of each said wheel being equal to the angle between the horizontal and a tangent to the point of contact of said wheel to the slide on which said vehicle is to be used.

4,417,741

# PORTABLE DEFLECTOR SHIELDS

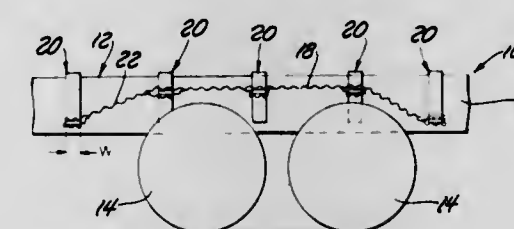
Benjamin Ciocan, 29154 Campbell Dr., Warren, Mich. 48093

Filed Jan. 18, 1982, Ser. No. 339,919

Int. Cl.<sup>3</sup> B62D 25/16; A47B 96/00

U.S. Cl. 280—154.5 R

9 Claims



1. In a vehicle that includes a frame and ground wheels located outboard from the frame so that the space directly above and behind a given wheel is free to receive mud or debris discharged by the wheel: the improvement comprising a portable add-on fender adapted to occupy the aforementioned space for intercepting and deflecting the mud and/or debris; said fender comprising a number of separately-formed brackets adapted to occupy different stations along the frame; each bracket comprising a hook section adapted to hook over the frame to preclude removal of the bracket in a first direction, a clamping section adapted to engage the frame to preclude removal of the bracket in a second direction, and a support arm section directed horizontally outwardly from the hook section and normal to the longitudinal axis of the vehicle frame when the bracket is in its installed position; said fender further comprising a fabric element having a longitudinal dimension corresponding to the spacing of the brackets along the vehicle frame and a width dimension corresponding to the transverse distance between the frame and the outboard edges of the ground

1. A bicycle comprising a main frame, a rear wheel assembly rotatably mounted on said main frame in supporting relation thereto, a foot operated crank assembly drivingly interconnected to said rear wheel assembly; said main frame including a front fork member pivotally mounted thereto and a front wheel assembly rotatably attached to said front fork in supporting relation to said main frame, said main frame further including a steering arm assembly movably mounted on said frame and including a pivot axis coincident to the central axis of a seat post of said main frame; means interconnecting said steering arm assembly and said front fork member, a manual crank assembly secured to said steering arm assembly so as to move therewith and rotatable about a central crank axis thereof, said crank assembly spaced outwardly from said pivot axis, said manual crank assembly structured and disposed for driving rotational operation by the hands of an occupant and further being drivingly interconnected to at least one of said front wheel and rear wheel assemblies, said manual crank assembly structured and disposed to maintain a substantially parallel relation between said crank axis and an imaginary line connecting the occupant's shoulders during operative rotation of said manual crank assembly, whereby propulsion of said bicycle may be accomplished by hand operation of said manual crank assembly by occupant.

4,417,743

# SELF ORIENTABLE VEHICLE PROPELLED BY A SYSTEM OF PEDALS ACTUATING A CHAIN

Yves Garel, Champ-la-Lioure, 07210 Chomeric, France

Filed Jun. 18, 1981, Ser. No. 275,120

Claims priority, application France, Jun. 25, 1980, 80 14581;

Aug. 8, 1980, 80 18078

Int. Cl.<sup>3</sup> B62K 5/04

U.S. Cl. 280—266

8 Claims

1. A velocipede comprising a frame, a seat mounted on said frame, a pedal bracket secured to said frame and rotatably mounting pedals about a pedal axis, chain and sprocket transmission means drivingly connecting said pedals to a single driving wheel, said single driving wheel being rotatable about a wheel axis disposed at the rear of said frame, a roller assembly mounted on said frame comprising relatively small diameter roller means rotatable about a roller axis, said roller axis being disposed lower than said pedal axis and said wheel axis, said pedal axis being disposed longitudinally between said roller axis and said wheel axis and adjacent said roller axis,



means for articulating said roller assembly forwardly of said roller axis about an inclined articulation axis for enabling the



4,417,744

**BICYCLE SEATPOST ASSEMBLY**

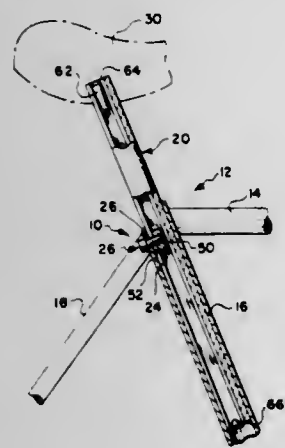
Kenneth J. Spear, St. Marys, Ohio, assignor to Huff Corporation, Miamisburg, Ohio

Filed Apr. 2, 1982, Ser. No. 364,718

Int. Cl.<sup>3</sup> B62K 19/36

U.S. Cl. 280—281 R

4 Claims



1. In combination with a tubular seat mast of a bicycle defining a radial hole through an upper rearward wall, a bicycle seatpost assembly comprising:

- a cylindrical seatpost sized to telescope within said bicycle seat mast, said seatpost defining a longitudinal slot having side walls forming opposing channels;
- means positioned within said slot and slidably engaging said opposing channels for threadingly receiving a bolt; and
- a threaded bolt extending through said radial hole in said rearward seat mast wall and into said slot to threadingly engage said bolt receiving means, said bolt having a head whereby said bolt may be threaded into said bolt receiving means to clamp a portion of said seatpost and a portion of said seat mast between said sliding means and said bolt head.

4,417,745

**FOLDING BICYCLE**

Robert D. Shomo, 22303 Fairfax, Taylor, Mich. 48180

Filed Mar. 16, 1981, Ser. No. 243,896

Int. Cl.<sup>3</sup> B62K 15/00

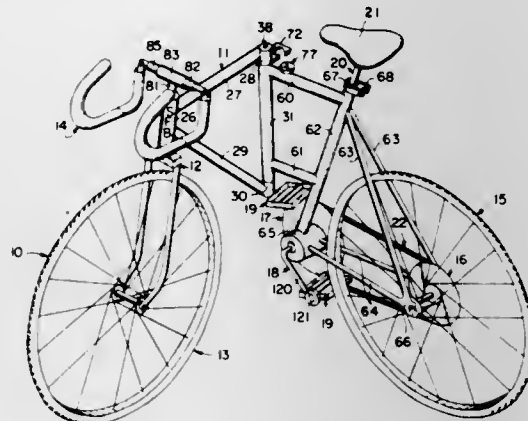
U.S. Cl. 280—287

27 Claims

3. A folding bicycle which includes a folding frame, front and rear wheels operatively mounted on the frame, a handlebar assembly, a seat mounted on the frame, a crankset with a pair of pedals and sprocket and a chain drive apparatus, characterized in that the folding frame includes:

- (a) a frame front portion;

- (b) a frame rear portion;
- (c) hinge means forming a part of the frame front portion;
- (d) means connecting said hinge means to said frame rear portion;
- (e) said frame front portion includes a plurality of interconnected tubes;
- (f) said hinge means includes a swingably mounted hinge tube as one of the frame front portion plurality of tubes;



- (g) said hinge means includes an upper bushing and a lower bushing carried in said hinge tube, and means inside of said hinge tube for interconnecting said bushings;
- (h) said means inside of said hinge tube for interconnecting said bushings includes means for exerting a tension on the bushings and a compression on said hinge tube; and,
- (i) said hinge means includes means for releasably attaching each of said upper and lower bushings to one of the other tubes on said frame front portion.

4,417,746

**KICKSTAND FOR A MOTORCYCLE**

Günter Baron, Neustadt, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

PCT No. PCT/EP81/00035, § 371 Date Jan. 4, 1982, § 102(e)

Date Jan. 4, 1982, PCT Pub. No. WO81/03155, PCT Pub.

Date Nov. 12, 1981

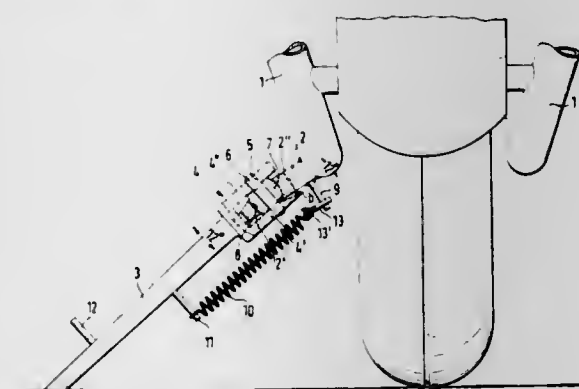
PCT Filed Apr. 30, 1981, Ser. No. 339,451

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016865

Int. Cl.<sup>3</sup> B62H 1/02

U.S. Cl. 280—301

5 Claims



1. A kickstand device for a motorcycle comprising a kickstand and means for articulating said kickstand to a frame of the motorcycle so that the kickstand is swivelable against the action of at least one spring from a swung-in travel position through a dead center point of the springs into a swung-out parking position with the free end of the kickstand, in the parking position, being displaceable upward relative to the motorcycle against the force of the springs over a limited angle range, characterized in that the kickstand is in contact with the ground in the lower extreme position of the angle range when the motorcycle is in a vertical position.

4,417,747

**AGRICULTURAL TRANSPORTER**

Gerald T. Johnson, Kulm, N. Dak. 58456

Continuation-in-part of Ser. No. 107,447, Dec. 26, 1979, Pat. No.

4,272,092. This application May 7, 1981, Ser. No. 261,505

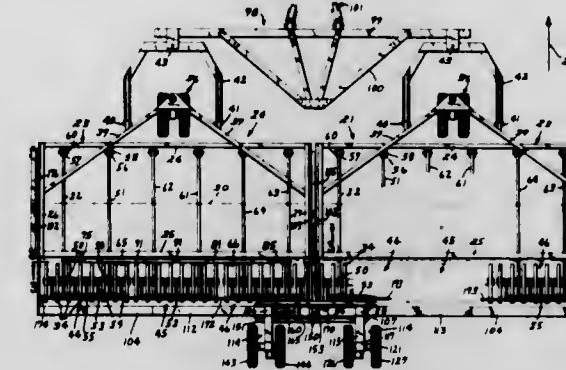
The portion of the term of this patent subsequent to Jun. 9, 1998,

has been disclaimed.

Int. Cl.<sup>3</sup> B60D 1/00

U.S. Cl. 280—405 B

5 Claims



1. A transporter apparatus for a plurality of transversely elongated agricultural drills with gangs of press wheels, said drills including generally side by side frame assemblies each having a front and a back, said transporter apparatus comprising:

- frame means;
- means for attaching said frame means to the back of at least one said drill frame assembly;
- wheel means for moveably supporting a portion of the back of said plurality of drills;
- means for mounting said wheel means to said frame means for linear, vertical movement relative thereto;
- means for releasably holding said frame assemblies of said plurality of drills at a constant vertical height relative to one another;
- means for yieldably securing said gangs of press wheels of said plurality of drills at an approximately constant vertical height with respect to each other and with respect to said frame assemblies; and
- means for powering said mounting means and said holding means in sequence between drill operative and transport positions.

4,417,748

**TRAILER SWIVEL HITCH GUIDE**

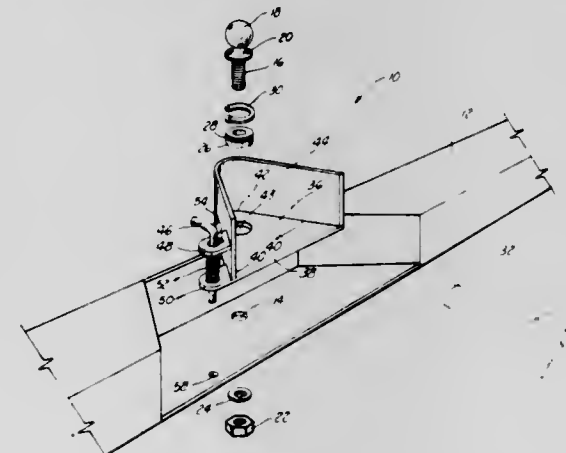
Laurence E. Dortch, 400 W. Central, Apt. 512, Wichita, Kans. 67203

Filed Feb. 4, 1982, Ser. No. 339,744

Int. Cl.<sup>3</sup> B60D 1/00

U.S. Cl. 280—477

6 Claims



1. A trailer swivel hitch guide adapted for attachment on the bumper of a vehicle and received around a trailer hitch ball secured to the bumper, the ball used for releasable attachment to a trailer or the like, the guide comprising:

a base plate having a front, rear and sides, the base plate having an aperture therethrough, the aperture having a circumference greater than the circumference of the ball and adapted for receipt around the ball, the plate resting on top of the bumper;

- an insert sleeve received between the base plate aperture and the ball, the ball secured to the sleeve;
- an upright sidewall attached to the sides of the base plate and angled inwardly toward the ball and around the rear of the plate, the sidewall having a height greater than the height of the hitch ball; and
- guide release means attached to the sidewall for securing the base plate to the bumper when the trailer is being attached to the ball, the guide release means releasing the base plate to swivel around the outer circumference of the sleeve when the vehicle is pulling the trailer.

4,417,749

**SKI BINDING WITH STEP-IN FRAME**

Hans Näpflin, Kastanienallee 5, CH 6375 Beckenried, Switzerland

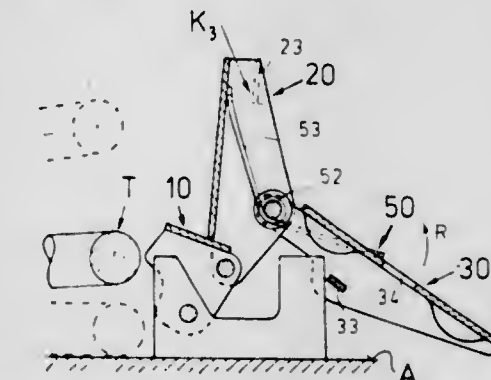
Filed Aug. 28, 1981, Ser. No. 297,107

Claims priority, application Austria, Sep. 3, 1980, 4435/80

Int. Cl.<sup>3</sup> A63C 9/085

U.S. Cl. 280—614

4 Claims



1. A ski binding comprising a step-in frame which is pivotally connected to the surface of the ski or to a sole plate at its forward end by means of pivotal connection, said step-in frame being adapted to be locked in position with respect to the top surface of the ski or the sole plate at its rearward end by means of a locking device, said locking device comprising a bearing block and a hold-down lever controlled by a locking lever, characterized in that said bearing block (40) has an open U-shaped cross section and profile forming a forward and rearward upstanding leg, said hold-down lever (10) is pivotally mounted in its lower portion about a first pivot axis (11) provided on said forward leg of said bearing block (40) adjacent said step-in frame portion of said binding, said locking lever (20) being pivotally attached at its forward end to said hold-down lever (10) by means of a second pivot axis (13), said locking lever (20) having pivotally attached to its middle section a third lever (30) by means of a third pivot axis (21) at the forward end of said third lever on which said third pivot axis is mounted a roller (22) and a spring clip (50), said spring clip urging said third lever (30) and said locking lever (20) radially apart about said third pivot axis towards a releasing position, and in a locking position, said roller (22) is pressed into engagement with the inner side of said rearward leg of said U-shaped bearing block.

4,417,750

**OCCUPANT RESTRAINT SYSTEM**

Donald L. Burry, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1981, Ser. No. 294,211

Int. Cl.<sup>3</sup> B60R 21/08

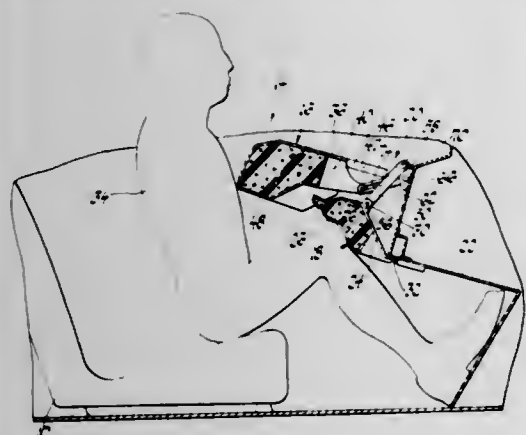
U.S. Cl. 280—753

2 Claims

1. An occupant restraint system adapted to be combined



with the instrument panel of an automotive vehicle and located in front of a seated passenger, said occupant restraint system comprising a torso-pad supported within a guide track formed in said instrument panel for movement between a first position wherein said torso-pad is in line with the upper portion of said instrument panel and a second position wherein said torso-pad is extended outwardly from said instrument panel towards said seated passenger and maintained in a fixed position for receiving the impact of the torso of said seated passenger; a knee-pad forming a lower portion of said instrument panel, hinge means supporting a lower portion of said knee-pad for pivotal movement in a direction away from said seated passenger so when the knees of said seated passenger impact against said knee-pad at a point higher than said hinge



means during sudden deceleration of said automotive vehicle said knee-pad moves towards said instrument panel; actuator means operatively interconnecting said torso-pad to said knee-pad whereby movement of said knee-pad in said direction away from said seated passenger causes said torso-pad to move from said first position to said second position; and cooperating locking means carried by said torso-pad and said track for maintaining said torso-pad in said second position when said torso of said seated passenger impacts against said torso-pad so as to prevent the impact of said torso against said torso-pad from acting through said actuator means to move said knee-pad.

4,417,751

## PASSIVE SAFETY BELT SYSTEM

Simon D. Packington, Bognor Regis, England, assignor to Britax (Wingard) Limited, Chichester, England

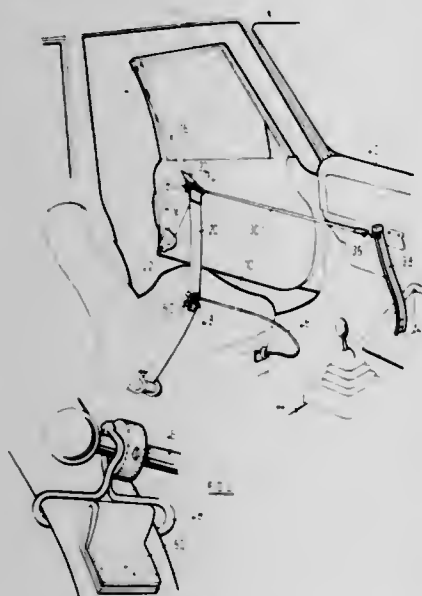
Filed Sep. 1, 1981, Ser. No. 298,357

Claims priority, application United Kingdom, Oct. 29, 1980, 8034787

Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280—802

3 Claims



1. A motor vehicle having a front-hinged door and an adjacent seat provided with a safety belt system comprising a

shoulder strap, a lap strap and a common strap interconnected to form a three-point safety belt, the free ends of the shoulder and lap straps being connected to the rear edge of said door in proximity to the top and bottom corners thereof and the free end of the common strap being guided, at a location inboard of and adjacent to the bottom of the back of the seat, on to an inertia reel, the system further comprising puller means interconnecting a point on the safety belt which is inboard of the seat when the door is closed and a point on the vehicle in front of and above the knees of an occupant of the seat when the door is open, an arm of which one end has an aperture through which the common strap runs and the other end is mounted for angular movement about a horizontal axis adjacent to the front inboard corner of the seat, the inboard end of said axis being in front of the outboard end thereof so that said aperture is movable between a first position adjacent to the location of which said common strap is guided on to the inertia reel and a second position above and outboard of said first position, and stop means on said common strap adapted to engage with said aperture to lift said arm from its first position to its second position when a pre-determined length of said common strap has been pulled off the inertia reel.

4,417,752

## PRESSURE-SENSITIVE COPYING MATERIAL

Marion Qualitz, Hoffeldstr. 70, D-4010 Hilden, and Viktor A. Krupp, Chopinstr. 12, D-4000 Düsseldorf, both of Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,746

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107707

Int. Cl.<sup>3</sup> B41M 5/22

U.S. Cl. 282—27.5

8 Claims

1. A pressure-sensitive copying material having improved shelf life and fastness to light and consisting of a support sheet or web coated with a dye precursor together with a binder therefor and of a support sheet or web containing a dye acceptor material which is capable of forming a dye by reaction with the dye precursor, characterised in that the support sheet or web containing the dye precursor is coated on one of its surfaces with an intimate mixture of from 7 to 35% by weight of hexacosanoic acid-1-triacontanol ester or hexacosanoic acid-1-hentriacontanol ester, from 0 to 18% by weight of a mixture of esters of higher aliphatic carboxylic acids and higher aliphatic alcohols, the mixture having a predominant content of nonacosanoic acid esters of aliphatic alcohols containing from 12 to 30 carbon atoms in the alcohol radical, from 0 to 30% by weight of a mixture of esters of one or more lower alkylene glycols containing from 2 to 4 carbon atoms and higher aliphatic, straight-chain or branched carboxylic acids, the mixture consisting predominantly of ethylene glycol and 1,4-butyleneglycol esters of straight-chain dotriacontanoic acid in addition to up to 10% by weight of corresponding esters of one or more straight-chain or branched-chain carboxylic acids containing a total of from 28 to 34 carbon atoms, from 0 to 25% by weight of a polyethylene wax having a dropping point of from 103° to 107° C. and a setting point of from 90° to 94° C., from 0 to 10% by weight of a low-pressure polyethylene having a dropping point of from 118° to 128° C. and a setting point of from 104° to 108° C., from 10 to 80% by weight of a plasticizer selected from the group consisting of phenol pentadecane sulfonate, cresol pentadecane sulfonate, and mixtures thereof, from 0 to 21% by weight of a plasticiser selected from the group consisting of phthalic acid polyesters of higher alkane diols, the plasticiser having a cold setting point of —35° C. or lower and a density d<sub>20/4</sub> of from 1.035 to 1.045 g/cc, from 0 to 8% by weight of a plasticiser selected from the group consisting of phthalic acid polyesters of higher alkane diols, the plasticiser having a cold setting point of —20° C. or lower and a density d<sub>20/4</sub> of from 1.090 to 1.100 g/cc, from 0 to 20% by weight of a finely particulate filler and from 3 to 15% by weight of one or more dye precursors.

4,417,753

## METHOD AND APPARATUS FOR JOINING MATERIALS

David Bacehowski, Wildwood; Paul Measells, Libertyville, and Kenneth Zablinski, McHenry, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 21, 1981, Ser. No. 265,933

Int. Cl.<sup>3</sup> F16L 13/02

U.S. Cl. 285—21

15 Claims



1. A method for joining materials comprising: fusing a first thermoplastic material to a first layer of a connector, said connector having telescopically related first and second layers, said layers being made of essentially different thermoplastic components, the primary component of said second layer being selected to melt or deform at a lower temperature than said first layer, and; fusing said connector to a second thermoplastic material, by heating said connector to a temperature sufficient to melt or deform said second layer without melting or deforming said first layer, whereby, said second layer bonds to said second thermoplastic material.

4,417,754

## PIPE JOINT FOR PREVENTING SEPARATION

Tadao Yamaji, Ashiya; Toshi Nakajima, Kobe, and Takeshi Kashi, Amagasaki, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

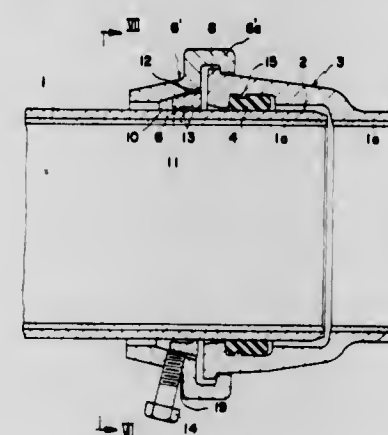
Filed Apr. 16, 1982, Ser. No. 369,115

Claims priority, application Japan, Sep. 30, 1981, 56-146274

Int. Cl.<sup>3</sup> F16L 21/02

U.S. Cl. 285—104

8 Claims



1. A pipe joint for preventing separation wherein an annular packing is provided between a packing seat formed on the inner periphery of a socket and the outer periphery of a spigot, the pipe joint comprising: a plurality of circular arc housings connected together in the form of an annular ring and surrounding the spigot outer periphery outside the socket, each housing comprising a first portion having a radially inwardly extending lip at

one axial end thereof and a radial web at the other axial end thereof remote from the socket end face, and a second portion extending axially from the inner end of said radial web away from the socket end face, said second portion being provided on its inner periphery with a tapered surface increasing in diameter toward the socket end; an annular outer flange formed on the end of the socket and engageable by said radially inwardly extending lips of the housing first portions; a stopper in the form of a ring divided at one location and interposed between the inner peripheral tapered surfaces of the housing second portions and the spigot outer periphery immediately inwardly of the radial webs of the housing first portions, said stopper being provided with engaging edge means in a plurality of circumferential rows on its inner periphery and with an outer peripheral tapered surface increasing in diameter toward the socket end and adapted to be in wedging engagement with the inner peripheral tapered surfaces of the housing second portions; and tap bolts extending through the housing second portions for pressing the stopper from outside against the spigot outer periphery, and radial recesses formed on the surfaces of said radial webs of the housing first portions, said radial recesses being opposed to said tap bolts.

4,417,755

## PIPE COUPLING

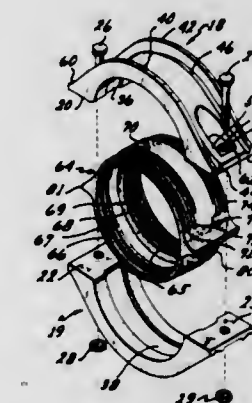
Morris Gittleman, Los Angeles, Calif., assignor to Familian Corp., Van Nuys, Calif.

Continuation of Ser. No. 512,958, Oct. 7, 1974. This application Oct. 5, 1981, Ser. No. 308,360

Int. Cl.<sup>3</sup> F16L 17/04

U.S. Cl. 285—373

11 Claims



1. In a pipe coupling for coupling the ends of pipes or conduits in fluid tight relationship adapted for pipes either with or without external annular end ribs comprising in combination, generally circular clamping means configured for clamping around the pipe ends, said clamping means embodying a pair of substantially semi-circular clamping members constructed to be clamped together and bolt means to draw the ends of the said clamping members towards each other, circular gasket means adapted to be interposed between the clamping means and the pipe ends being coupled and spanning the ends of the pipe, the said clamping members being constructed to clamp the gasket means against the pipe ends, the gasket means having diametrically opposed, outwardly-extending radial ears, the clamping members having end parts with the said ears clamped there between, the clamping members being held in spaced relationship by the ears, the improvement comprising said clamping means being constructed of plastic material, each of said clamping members having external annular radially extending side ribs and each having external annular grooves formed in it adjacent to and co-extensive with the annular ribs, the said annular ribs extending to the ends of the said end parts of each clamping member, additional external, radially extending ribs formed on each of said end parts on the



inside of the said grooves to provide the necessary strength to said clamping members while each clamping member having sufficient deformability to deform against the gasket when the a clamping members are clamped together, the said plastic material having sufficient deformability whereby in response to clamping force drawing said clamping members toward each other, the said clamping members deform in contour whereby to exert a substantially radially inward clamping force against the gasket through substantially 360° thereby having the capability of accommodating greater variations in dimensional tolerance of pipe diameters and of coupling rigid pipe ends with said bolt means torqued within the stress limitations of said material.

4,417,756

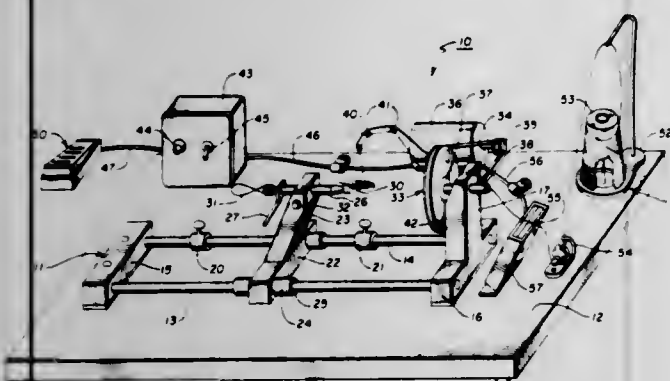
## THREAD LOOPING MACHINE

Donald P. Herke, 3474 N. Chatsworth, St. Paul, Minn. 55112  
Filed Jul. 28, 1981, Ser. No. 287,866

Int. Cl.<sup>3</sup> D03J 3/00

U.S. Cl. 289—2

11 Claims



1. A thread looping machine comprising:
  - (a) a frame mechanism having a longitudinal guideway;
  - (b) a carriage slidably secured to said longitudinal guideway having a dependent member spacedly disposed from one end of said longitudinal guideway;
  - (c) a vise secured to said dependent member near its end having a work gripping portion extending generally towards said one end of said longitudinal guideway;
  - (d) a circular bail mechanism including a tubular member extending through said circular bail mechanism substantially parallel to said longitudinal guideway and secured to said frame mechanism, said circular bail mechanism being rotatably disposed on said tubular member in spaced and confronting relationship to said vise;
  - (e) a thread station constructed and arranged outside said carriage to receive a spool of thread and including thread tension means applying tension to thread passing there-through;
  - (f) and a drive mechanism operably connected to said frame mechanism and to said circular bail mechanism to rotate the bail and any thread around any work in said work gripping portion of said vise.

4,417,757

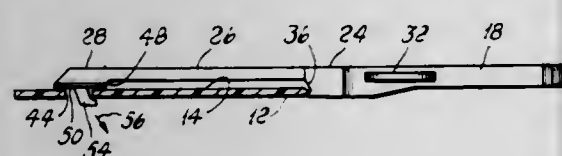
## RECORDING DISC HANDLING DEVICE

Thomas R. Morrison, 137 Overlook St., Mount Vernon, N.Y. 10552  
Filed Nov. 9, 1981, Ser. No. 319,475

Int. Cl.<sup>3</sup> B65G 7/12

U.S. Cl. 294—26

7 Claims



1. A recording disc handling device for handling a recording

disc having a circular edge and a spindle hole at a center thereof, comprising:

- first and second spaced-apart grooved members operative to engage said circular edge of said recording disc in grooves thereof at first and second spaced-apart locations;
- a support arm operatively connected to said first and second grooved members;
- said first and second grooved members being operative, when contacting said circular edge, to position said support arm adjacent said spindle hole;
- a retractable spindle in said support arm fully retractable in said support arm;
- means for extending said retractable spindle from said support arm into said spindle hole; and
- means for grippingly engaging said retractable spindle in said spindle hole whereby said recording disc is stably gripped at three points for handling thereof.

4,417,758

## REMOTELY RELEASABLE CHOKER

Dennis H. Vaders, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 3, 1981, Ser. No. 327,003

Int. Cl.<sup>3</sup> B66C 1/38

U.S. Cl. 294—78 R

7 Claims



1. A choker assembly, comprising:
  - a substantially closed body,
  - eye means on the body for allowing a cable to slide there-through,
  - a pivotally mounted latch arm on the outside of the body having an open position and a locked position where the locked position will capture and hold the end of a cable,
  - means on and extending within the body for locking the latch arm in its locked position, and
  - means within the body for releasing the locking means including a receiving means for receiving a remotely generated wave form release signal and actuating means for removing the locking means engaged with the latch arm in response to the release signal.

4,417,759

## GRAPPLE PIVOT JOINT WITH SWING DAMPENER

Victor C. Pierrot, III, and Gerald J. Ihm, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 8, 1981, Ser. No. 300,095

Int. Cl.<sup>3</sup> B66C 1/00; F16F 7/04

U.S. Cl. 294—86 R

5 Claims

1. In a pivot joint incorporating a friction brake having a first and second member respectively defining first and second axially aligned bores, a pivot pin non-rotatably received in said first bore and rotatably received in said second bore, means for maintaining said pivot pin, wherein the improvement comprises: a first and second partial rim generally axially extending

4,417,761

## SWIVEL BEARING PROTECTIVE HOUSING FOR AUTOMOTIVE SUN VISOR

Kurt Cziptschirsch, Wuppertal; Lothar Viertel, Saarlouis, and Peter Kaiser, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Gebr. Haplich GmbH, Fed. Rep. of Germany

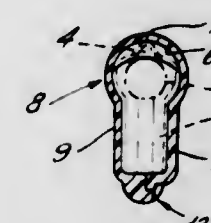
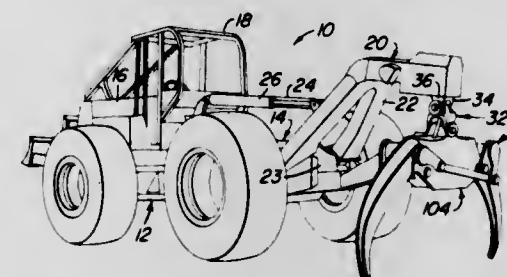
Filed Jan. 21, 1981, Ser. No. 226,684

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005824

Int. Cl.<sup>3</sup> B60J 3/02

U.S. Cl. 296—97 H

4 Claims



formed channel; said pivot pin having a portion extending through said first and second bores and between said rims; a friction brake located between said first and second partial rims and around said pivot pin including at least one brake disk having at least one tab extending radially therefrom and received in said channel of said first rim, at least one pressure plate having at least one tab extending radially therefrom and received in said channel of said second rim, compression means for compressing said brake disk against said pressure plate.

1. A sun visor for automotive vehicles, or the like, including a sun visor body, a mounting shaft for connecting the sun visor body to the body of a vehicle and a swivel bearing housing which is attached to the sun visor body and which is adapted to swivelably receive the mounting shaft, whereby the sun visor body may swivel around the mounting shaft at the swivel bearing housing;

a protective housing surrounding the swivel bearing housing for preventing access to the swivel bearing housing from the exterior of the protective housing; the protective housing having edges around the sides thereof, having corners joining the edges and having opposite sides at the opposite sides of the swivel bearing housing which sides are joined together at the edges; all of the edges, the corners between the edges and contoured areas on the exterior of the protective housing, being gradually curved to have an outer contour radius sufficiently large so as not to present any sharp edges; the swivel bearing housing has an exterior contour and the protective housing has an interior contour when it is surrounding the swivel bearing housing that is at least substantially the same as the outer contour of the swivel bearing housing.

4,417,760

## TAIL SPOILER FOR MOTOR VEHICLES, IN PARTICULAR FOR PASSENGER CARS WITH A TAIL TRUNK SPACE

Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Autohaus Lorinser GmbH & Co., Waiblingen, Fed. Rep. of Germany

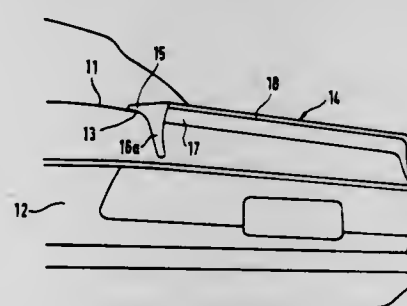
Filed Aug. 19, 1981, Ser. No. 294,170

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, MR848; May 21, 1981, 8115138

Int. Cl.<sup>3</sup> B62D 35/00

U.S. Cl. 296—1 S

7 Claims



1. A tail spoiler for motor vehicles, in particular for passenger cars including a tail trunk section provided with an upper outer face, a rear outer face downwardly extending therefrom, and a transition region connected to the upper outer face and to the rear outer face, the tail spoiler comprising a center portion arranged along the transition region and extending along the width of the tail trunk portion; an air deflection part connected to and extending rearwardly and upwardly from the center portion, so as to form an upper air guide face which is directed rearwardly and upwardly in longitudinal direction of the motor vehicle; and an angular mounting part connected to the center portion, the angular mounting part having at least two shank arms spaced from each other along the width of the motor vehicle and being located on the upper outer face in forward direction, and at least two further shank arms spaced from each other along the width of the motor vehicle and located on the rear outer face in a downward direction, at an angle less than 180° relative to said first mentioned shank arms.

4,417,762

## MOTOR VEHICLE ROOF

Eiji Imai; Yoshiharu Michiura, both of Yokohama, and Toshio Niihara, Ome, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

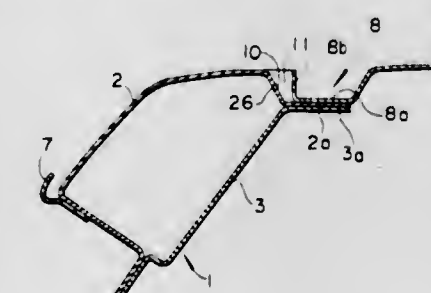
Filed Jun. 25, 1981, Ser. No. 277,334

Claims priority, application Japan, Jul. 4, 1980, 55-94477[U]

Int. Cl.<sup>3</sup> B62D 25/06

U.S. Cl. 296—210

10 Claims



1. A motor vehicle having a roof construction comprising: a main roof panel, each of the lateral sides of said main roof panel being so bent as to form a groove extending longitudinally of the vehicle and having a bottom; right and left secondary roof panels lying on each lateral side of said main roof panel, each of said secondary roof panels



having an inner portion which is welded to the underside of the bottom of said groove along a weld line extending longitudinally of the vehicle, a ramp portion extending outwardly and upwardly from said inner portion, and a roof portion extending outwardly from said ramp portion as far as an outermost edge of a contour of the roof surface so that the roof surface contour is constituted by said main roof panel and the roof portions of said right and left secondary roof panels, an interspace formed, on each side, between the outer side wall of said groove and said ramp portion of said secondary roof panel, said interspace being filled with a sealant; and

right and left inner panels each of which is welded to each respective secondary roof panel to form a hollow girder which extends longitudinally of the vehicle under the roof portion of said secondary roof panel.

4,417,763

**SLIDING-TILTING-ROOF FOR MOTOR VEHICLES**

Albert Schlapp, Dreieich, and Rudolf Roos, Maintal, both of Fed. Rep. of Germany, assignors to Rockwell International Corporation, Pittsburgh, Pa.

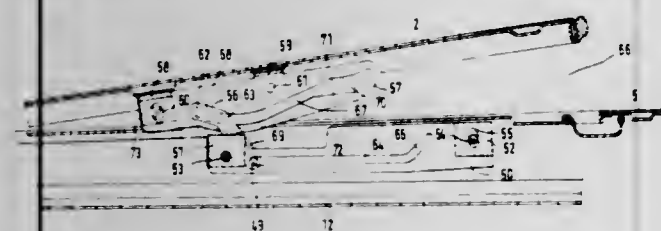
Filed May 28, 1981, Ser. No. 268,033

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020675

Int. Cl.<sup>3</sup> B60J 7/04

U.S. Cl. 296—216

19 Claims

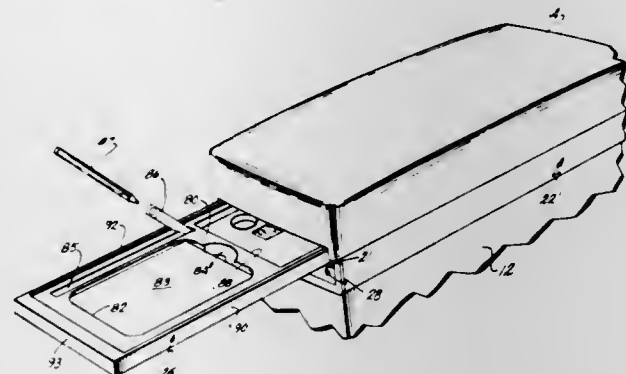


1. Sliding-rising roof for motor vehicles comprising: a rigid cover plate which in its closed position, closes a roof cut-out while forming an encircling marginal gap; said cover plate having front and rear slide blocks by which it is laterally guided on guide rails mounted in the roof cut-out; said front and rear slide blocks being driven by pressure-resistantly and displaceably guided cables which engage said rear slide blocks; said cover plate being capable of being either raised in the manner of front hinged ventilator flaps, by having its rear edge raised or, once its rear edge has been lowered, moved under the rear rigid roof cover; the front edge of said cover plate being pivotally mounted on an intermediate frame which is in turn pivotally mounted on the front slide blocks; the rear frame part of said intermediate frame engaging beneath a marginal gap with interposition of a first and second sealing element which when in the closed position said first sealing element bears on the underside of the cover plate and said second sealing element bears on the underside of the roof area; and in that the rear slide blocks are in driving connection with the intermediate frame and the cover plate, the intermediate frame is fixed in the closed position during pivoting movement of the cover plate and, starting from the closed position, is interlocked with the cover plate upon lowering of the rear edge of the cover plate and being displaceable together therewith; and a guide pin fixed on each of the two rear slide blocks directed substantially horizontally and transversely of the direction of cover plate displacement, the guide pin engaging a first guide link mounted laterally on the intermediate frame and having pivotally mounted on its free end a raising lever which has first and second spaced-apart slide pins mounted on it which engage into a second guide link mounted laterally on the cover plate.

4,417,764  
**AUTOMOTIVE ARMREST ASSEMBLY**  
Konrad H. Marcus, and Sheldon J. Watjer, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.  
Filed Nov. 9, 1981, Ser. No. 319,689  
Int. Cl.<sup>3</sup> A47C 7/62

U.S. Cl. 297—194

9 Claims



1. An armrest assembly comprising: compartment means adapted to be secured to a vehicle armrest base, and drawer means slidably mounted to said compartment means for movement between a stored position within said compartment means and an operative position extended from said compartment means; the improvement comprising: said drawer means having a generally horizontally extending floor with aperture means extending therethrough for admitting and holding a drink container; guide and support means extending from the front to the rear of said drawer means; and slide means slidably mounted on said guide and support means for providing sliding movement of said slide means to and from a position over said floor, whereby when said drawer is in an extended open position said slide means is slidable with respect to said floor and compartment between a stored position within said compartment means and an operative position over said floor extended from said compartment within said compartment said floor is capable of supporting a drink container within said aperture means, said drawer and slide means including means for holding a writing media in a position accessible for use when said slide means is in said operative position.

4,417,765

**DUMP CART**

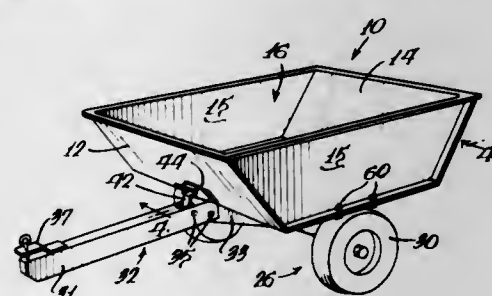
James L. Wirbinski, Marshfield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 24, 1981, Ser. No. 305,105

Int. Cl.<sup>3</sup> B60P 1/28

U.S. Cl. 298—5

5 Claims



1. A dump cart suitable for use with a garden or lawn tractor comprising:  
(a) a wheel assembly;  
(b) a body member having a front, back, and sides defining a cargo space;

(c) means for removably mounting the body member on the wheel assembly in one of two mounting positions approximately 180 degrees relative to each other;  
(d) a drawbar;  
(e) means for connecting the drawbar to the wheel assembly to permit pulling and pushing of the cart;  
(f) a first latching means mounted on the drawbar; and  
(g) two second latching means, each mounted on the front and back of the body member and adapted to coact with the first latch means to releasably maintain the body member in a fixed position with respect to the drawbar; whereby the body member may be mounted in either mounting position and one of the second latching means will coact with the first latching means to releasably maintain the body member in a first position with respect to the drawbar.

4,417,766

**WIRE SPOKE VEHICLE WHEEL AND METHOD OF MANUFACTURE**

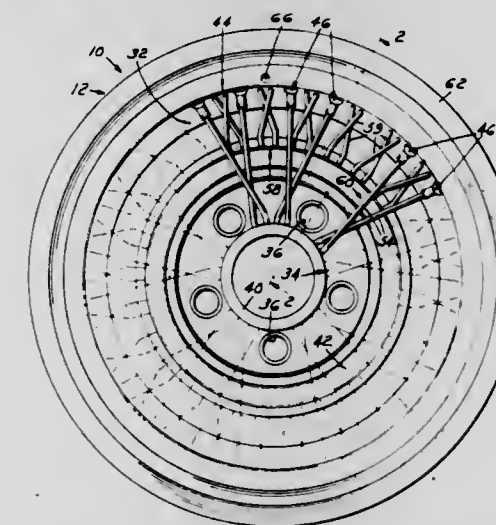
Richard W. Smith, Lansing, and William J. Waugaman, Grosse Pointe Farms, both of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed Sep. 10, 1981, Ser. No. 300,890

Int. Cl.<sup>3</sup> B60B 1/02

U.S. Cl. 301—55

12 Claims



1. A method of manufacturing a wire spoke wheel for pneumatic tubeless tires comprising the steps of:  
(a) forming a wheel rim segment comprising a rim base having an integral first bead retaining flange at one end and a circular base edge at the opposing end;  
(b) separately forming a circumferential band which includes an inner portion and a radially outer portion adapted to function as a bead retaining flange;  
(c) separately forming a center hub including openings for mounting the wheel to vehicle;  
(d) mounting said hub within band by assembling a plurality of wire spoke means between said radially inner portion of said band and said hub with said hub and band fixtured in coaxial relation, and then  
(e) permanently securing said rim segment to said band by welding said band to said circular edge entirely around said edge between said inner and outer portions of said band with said rim segment and the band/hub/spoke subassembly resulting from said step (d) fixtured in coaxial relation, such that said radially outer portion of said band is disposed to function as a second bead retaining flange on said rim segment, and said radially inner portion of said band with said wire spoke means assembled thereto is disposed radially inwardly of said rim segment.  
5. A wire spoke vehicle wheel comprising a rim including a first rim section having a bead seat, a first bead retaining flange integral with said bead seat and a rim base portion projecting from said bead seat and terminating in a circular edge, a second rim section welded to said first rim section entirely around said

edge with an outer portion of said second rim section projecting radially outwardly from said edge to form a second bead retaining flange on said rim and an inner portion of said second rim section projecting radially inwardly from said edge and being spaced radially inwardly of said first rim section; a hub structurally separate from said rim and including means for mounting the wheel to a vehicle; and a plurality of wire spoke elements adjustably secured at one end to said inner portion of said second rim section by a plurality of nipples and secured at an opposing end to said hub, with said hub being mounted by said wire spoke means and said nipples coaxially within said rim.

4,417,767

**EMPTY AND LOAD BRAKE SYSTEM WITH SEPARATE PROPORTIONAL VALVE AND LOAD SENSOR VALVE MEANS**

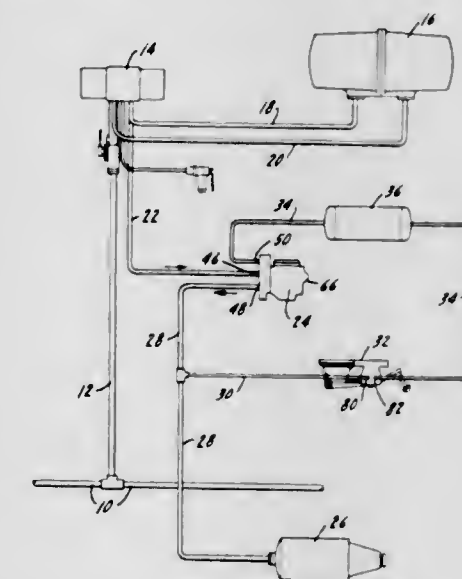
Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Jun. 24, 1982, Ser. No. 391,490

Int. Cl.<sup>3</sup> B60T 8/18, 8/20

U.S. Cl. 303—23 R

6 Claims



1. In an empty and load device of a railroad vehicle air brake system of the type having an air pressure source, a control valve connected to said source, a proportional valve connected to said control valve, a brake cylinder connected to said source through said control valve and proportional valve, and a load sensor valve connected to the line between the proportional valve and brake cylinder with a feedback line from the load sensor valve to the proportional valve for controlling the application of air through said proportional valve to said air cylinder, said load sensor valve having:  
a valve body having a chamber therein and an air inlet and an outlet;  
valve means for controlling air flow between the inlet and outlet;  
a piston movable within the valve chamber to control the position of the valve means;  
a load sensing arm pivotally attached to the valve body and connected to the piston; and  
a rock and roll spring disposed between the piston and the valve means for dampening movement of the piston relative to the valve means so as to prevent rough track conditions from simulating a loaded or unloaded vehicle.



4,417,768

**BRAKING OIL PRESSURE CONTROL DEVICE FOR AN ANTI-SKID BRAKE SYSTEM**

Makoto Satoh, Kamifukuoka; Yoshitaka Miyakawa, Kawagoe; Etsuo Fujii, Wako, and Shohei Matsuda, Ooi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

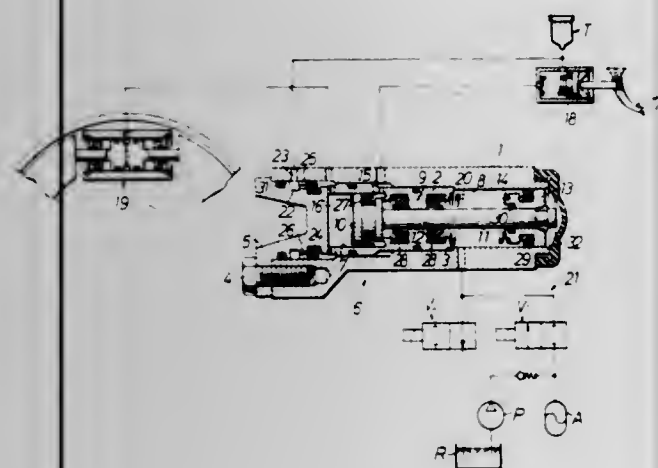
Filed Jul. 10, 1981, Ser. No. 282,000

Claims priority, application Japan, Jul. 25, 1980, 55-102123

Int. Cl.<sup>3</sup> B60T 8/00

U.S. Cl. 303—113

13 Claims



1. In an anti-skid brake system including: a cylinder body; first and second cylinder chambers serially disposed in said cylinder body on opposite sides of a partition wall; a brake piston slidable in said first cylinder chamber and defining on one side thereof a first braking oil pressure chamber communicating with a master cylinder to receive operating oil therefrom and on the other side a second braking oil pressure chamber containing operating oil and communicating with a wheel cylinder of a wheel brake; a reservoir for operating oil connected to said master cylinder; and a control piston slidable in said second cylinder chamber and cooperating with said partition wall to define therebetween a control oil pressure chamber which is in communication with a control oil pressure circuit, said control piston being connected to said brake piston such that when control oil is supplied from said control oil pressure circuit to said control oil pressure chamber, said control piston is moved together with said brake piston in a direction to reduce excessive brake pressure in said second braking oil pressure chamber;

a braking oil pressure control device for the anti-skid brake system comprising: a supplementary oil chamber in said cylinder body communicating with said second braking oil pressure chamber and said oil reservoir; a first seal cup interposed between said supplementary oil chamber and said second braking oil pressure chamber for preventing outflow of the operating oil from said second braking oil pressure chamber to said supplementary oil chamber but permitting inflow of operating oil from said supplementary oil chamber into said second braking oil pressure chamber; and a second seal cup interposed between said first braking oil pressure chamber and said second braking oil pressure chamber for preventing outflow of operating oil from said first braking oil pressure chamber to said second braking oil pressure chamber but permitting inflow of operating oil from said second braking oil pressure chamber to said first braking oil pressure chamber.

4,417,769

**SELF ADJUSTING BEARING ARRANGEMENT**

Charles R. Chelin, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US82/00380, § 371 Date Mar. 29, 1982; § 102(e)

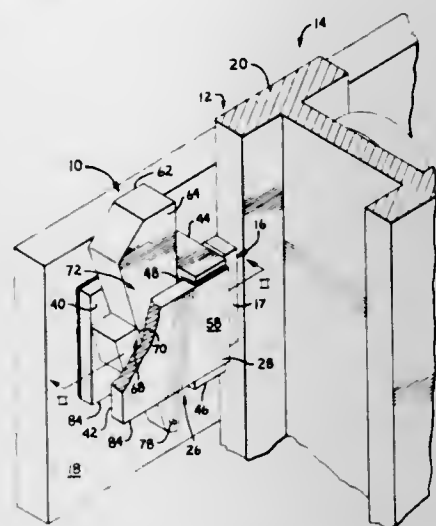
Date Mar. 29, 1982

PCT Filed Mar. 29, 1982, Ser. No. 375,115

Int. Cl.<sup>3</sup> F16C 29/04

U.S. Cl. 308—3 R

13 Claims



1. A self adjusting bearing arrangement (10) for a pair of relatively movable members (12) comprising:

bearing means (16) for guiding a first member (18) of said pair (12) for movement relative to a second member (20) of said pair (12), said second member (20) being an elongate upright having a longitudinal upright axis (25); carrier means (26) for connecting said bearing means (16) to the first member (18) of said pair (12) and guiding said bearing means (16) for movement between a first position at which said bearing means (16) is spaced from contact with the second member (20) and a second position at which said bearing means (16) is contactable with said second member (20);

said carrier means (26) includes a support assembly (28) having a bearing support passage (48) disposed therethrough and being connected to said first member (18), said passage (48) having a longitudinal passage axis (49) and being oriented substantially normal to the longitudinal upright axis (25);

said bearing means (16) includes a bearing (17) having a guide portion (34), a bearing portion (36) and a load surface portion (38), said guide portion (34) being slidably disposed in said passage (48) and movable relative to said passage (48) along said longitudinal passage axis (49) between said first position at which said bearing portion (36) is spaced from said second member (20) and said second position at which said bearing portion (36) is in contact with said second member (20); and

adjustment means (30) for automatically applying a predetermined force to said bearing means (16) for moving said bearing means (16) to said second position and preventing movement of said bearing means (16) from said second position toward said first position, said adjustment means (30) includes a thrust member (32) having a predetermined weight, said thrust member (32) being mounted on said carrier means (26) adjacent said bearing (17) and contactable with said load surface portion (38), said thrust member being movable in response to and under the influence of its own weight and relative to the support assembly (28) and the bearing (17), said predetermined force being a function of said weight, said thrust member (32) includes a triangular shaped wedge (54) having first, second and third sides (56,58,60), and first and second opposed surfaces (62,64), said first side (56) being contactable with said bearing (17) load surface portion (38).

4,417,770

**HIGH VACUUM COMPATIBLE AIR BEARING STAGE**

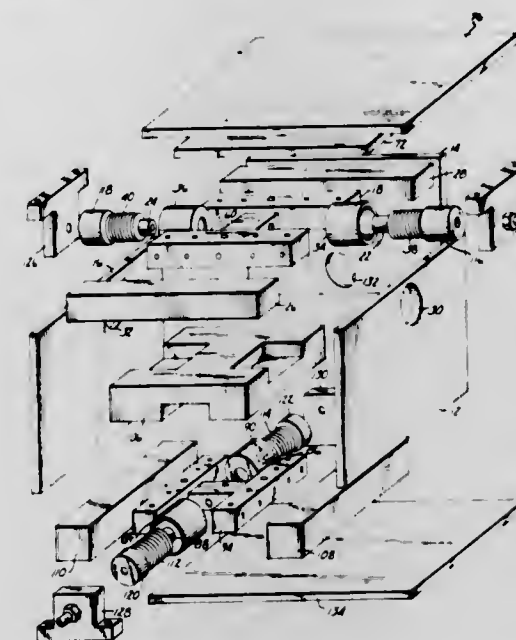
Theodore W. Tucker, Lincoln, Mass., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 21, 1981, Ser. No. 304,228

Int. Cl.<sup>3</sup> F16C 32/06, 29/02

U.S. Cl. 308—3.5

6 Claims



1. A high vacuum compatible air bearing comprising: an air-tight housing having four apertures; two moveable carriages mounted interior said housing, a first carriage having means for constraining its movement to a first direction, and the second carriage having means for constraining its movement to a second direction, the first direction being orthogonal to the second direction; a central plate mounted interior said housing intermediate said two carriages; two air inlet ports, one each mounted on a carriage and extending through one of said apertures; two air outlet ports, one each mounted on a carriage and extending through an aperture; a plurality of orifices mounted about the portion of the exterior of each carriage facing closely adjacent surfaces; two first communicating passageways, one each mounted interior to each carriage and extending between the air inlet port and each of said orifices; two second air communicating passageways, one each extending between the exterior of a carriage, through said carriage and to an outlet port; an airtight bellows, flexible in the direction of freedom of movement, mounted between each aperture and the port extending therethrough and forming an airtight seal therebetween; and a source of pressurized air communicated to said air inlet ports; the interfaces between the exterior of said carriages and closely adjacent surfaces forming a compensated air bearing therebetween.

4,417,771

**LINEAR BALL BEARING UNIT**

Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo, Japan 158

Filed Jun. 22, 1982, Ser. No. 390,915

Int. Cl.<sup>3</sup> F16C 29/06

U.S. Cl. 308—6 C

6 Claims

1. A linear ball bearing unit of the kind which includes a track shaft extending therethrough, essentially comprising: a bearing body including a cavity having a substantially rectangular cross-sectional configuration, said cavity being formed with a pair of oppositely located flanges at the lower part of the side walls and a pair of symmetrically located load carrying ball grooves having a radius of curvature substantially equal to one half of the diameter of

the rolling balls at the upper end of the side walls thereof, said bearing body further including two lines of non load carrying ball holes extending therethrough in parallel to one another, said non load carrying ball holes being located at a predetermined distance upward of said load carrying ball grooves in vertical alignment with the latter, retainer-cover assemblies fixedly secured to both the end faces of the bearing body, said retainer-cover assemblies comprising in integral combination a retainer and a cover and being formed with an U-shaped groove for reversing the direction of movement of the balls at the upper part of the inside wall of the cover respectively, the upper part of said U-shaped groove being in continuation with the non load carrying ball hole while the lower part of the same being in continuation with the load carrying ball groove, the retainer of said retainer-cover assemblies comprising a pair of symmetrically located horizontal members and a pair of symmetrically located holding members both of which are integrally secured to the cover so that a load carrying ball guide space is formed therebetween in such



a manner as to prevent the balls from falling down therefrom, said load carrying ball guide space having a radius of curvature substantially equal to the diameter of the balls,

both the horizontal members and the holding members of the retainer being provided with connecting means at the free end part thereof respectively at which they come in abutment against the oppositely located one,

a horizontal slide member fixedly secured to the top wall of the cavity, said horizontal slide member having a substantially trapezoidal cross-sectional configuration of which inclined end faces correspond to those of the horizontal members of the retainer, and

a pair of symmetrically located side slide members fixed to the side walls of the cavity, said side slide members having a substantially triangular cross-sectional configuration and being located between the holding member and the flange while the upper inclined end face of said side slide members corresponding to the lower inclined face of the holding member.

4,417,772

**METHOD AND APPARATUS FOR CONTROLLING THE ENERGIZATION OF THE ELECTRICAL COILS WHICH CONTROL A MAGNETIC BEARING**

Alan A. Robinson, Wassenaar, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Apr. 10, 1981, Ser. No. 252,849

Int. Cl.<sup>3</sup> F16C 39/06

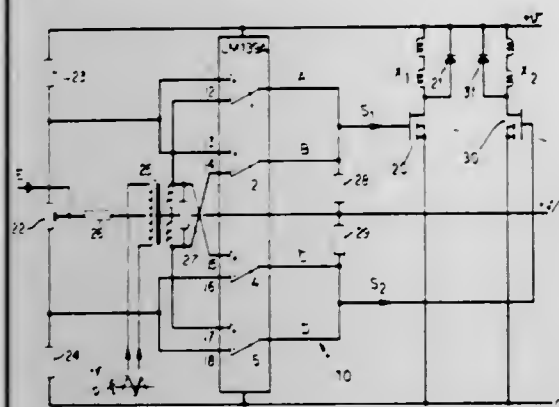
U.S. Cl. 308—10

5 Claims

1. A method of controlling the energization of electrical coils which control a magnetic bearing of the type having stator and rotor members disposed coaxially with each other in the same plane with an annular gap between them, said electrical coils being located in pairs on each axis in said plane, one coil in each pair being located on the magnetic bearing at one end of said axis and the other coil at the other end of said axis, and wherein the relative positions between the stator and rotor



members along the axis are detected and a position error signal representing the position deviation relative to a reference position is detected, the method comprising the improvement of generating a first control signal in response to the position error signal being positive and a second mutually exclusive control signal in response to the position error signal being negative; and applying said first control signal to a first elec-



tronic switching circuit coupled to the electrical coil located at one end of said axis and applying said second control signal to a second electronic switching circuit coupled to the electrical coil located at the other end of said axis, whereby only that coil is energized which is located near the point where the gap is smaller, thereby to reduce the magnetic flux there and restore the centered position.

4,417,773

# **BALL SWIVEL JOINT FOR AN EXCAVATOR OR THE LIKE**

Anton Becker, Neuss, Fed. Rep. of Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Fed. Rep. of Germany

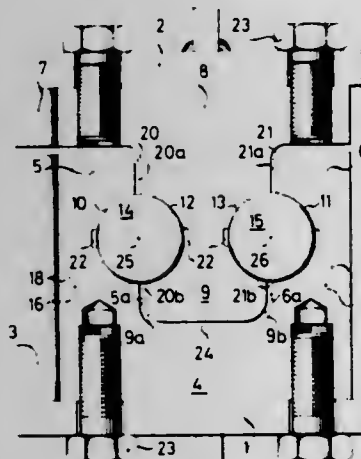
Filed Nov. 13, 1978, Ser. No. 959,878

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752487

Int. Cl.<sup>3</sup> F16C 19/18, 33/58

U.S. Cl. 308—178

1 Claim



1. A ball swivel joint for rotatably mounting a structure on a support of an excavator, rotatable crane or the like, comprising a first ring member having a U-shaped cross section and including two first annular leg portions which bound an annular recess therebetween, each of said first leg portions having a first semi-spherical groove which is open into said recess; a second ring member having a T-shaped cross section and including a second annular leg portion which is received in said recess bounded by said first leg portions, said second leg portion having two second semi-spherical grooves each of which is open toward a respective one of said first semi-spherical grooves and bounds with the same a spherical groove, said leg portions of said first ring member and said second ring member are so dimensioned that two gaps are formed between said first leg portions and said second leg portion, each of said

gaps being formed between said second leg portion and a respective one of said first leg portions and having an upper section located above said ball members and a lower section located below the same, said leg portions of said first ring member and said second ring member being so formed that the upper section of each of said gaps is offset relative to the lower section of the same gap; and two rows of ball members each received in a respective one of the thus-formed spherical grooves.

4,417,774

# **COLLAPSIBLE DISPLAY BOOTH**

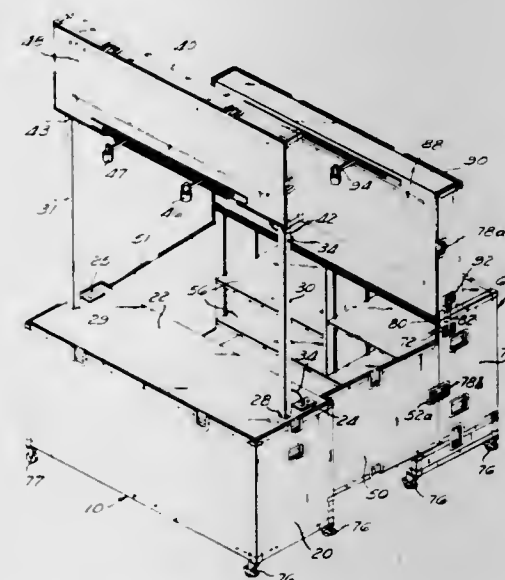
Mark H. Bevan, Manhattan Beach, and Garry C. Kief, Los Angeles, both of Calif., assignors to Hastings, Clayton, Tucker & Craig, Inc., Newport Beach, Calif.

Filed Jun. 25, 1981, Ser. No. 277,252

Int. Cl.<sup>3</sup> A47B 43/00, 53/00, 87/00

U.S. Cl. 312—108

8 Claims



6. A collapsible portable display booth for selling merchandise, comprising:  
a front portion, behind which is located a sales area from which merchandise is vended, said front portion being collapsible into a single unit so that it can be easily moved from location to location;  
a back portion, said back portion being sufficiently sturdy to prevent customers from approaching said sales area from said back portion, said back portion being collapsible into a single unit so that it can be easily moved from location to location;  
means for securing the area between said front portion and said back portion, said securing means being sufficiently sturdy to prevent customers from reaching said sales area behind said front portion, said securing means also preventing pilferage from said sales area, said securing means being collapsible into at least one of said front portion and said back portion for moving said booth from one location to another; and  
at least one elevated display, said elevated display located above said booth and displaying said merchandise offered for sale, said elevated display being collapsible into at least one of said front portion and said back portion for moving said booth from one location to another.

4,417,775

# **ELECTRICAL CONNECTOR DEVICE**

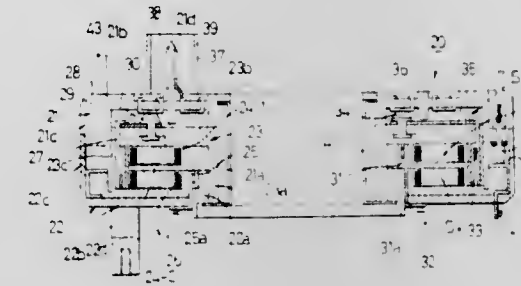
Yoshimi Sakurai, Tanashi; Yoshimi Furukawa, Tokyo; Masaaki Kanai, Tokyo, and Yasufumi Osada, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Furukawa Electric Co., Ltd., both of Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 323,716

Claims priority, application Japan, Nov. 26, 1980, 55-166350; Apr. 13, 1981, 56-55358

Int. Cl.<sup>3</sup> H01R 39/02

U.S. Cl. 339—5 M



1. An electrical connector device comprising a first insulator, at least one first conductor fixed to said first insulator, a second insulator angularly movable with respect to said first insulator, at least one second conductor fixed to said second insulator, a third conductor in the form of a flexible wire which is disposed between said first and second insulators and which is at least partially loose, first and second contact means electrically connecting either end of said third conductor with said first and second conductors, respectively, a third insulator angularly movable with respect to said first and second insulators, said second contact means being fixed to said third insulator, and a guide mechanism for rendering said second and third insulators to move angularly in the same direction.

4,417,776

# **CONNECTION TERMINAL DEVICE FOR ELECTRICAL IMPLEMENTS**

Kazuyasu Motoyama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

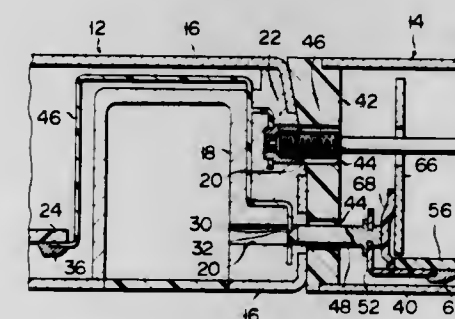
Filed Jul. 30, 1981, Ser. No. 288,494

Claims priority, application Japan, Aug. 12, 1980, 55-114157[U]; Aug. 12, 1980, 55-114158[U]

Int. Cl.<sup>3</sup> H01R 9/07

U.S. Cl. 339—17 F

18 Claims



1. In an electrical implement comprising a housing; a circuit substrate provided in said housing and having a plurality of terminals; and a connection terminal device, the improvement wherein said connection terminal device comprises:  
a flexible substrate mounted in said housing, said flexible substrate having two ends, one end thereof contacting said circuit substrate; and  
a plurality of printed conductive lines mounted on the surface of said flexible substrate, each of said printed conductive lines being provided with a first terminal exposed to the open air and a second terminal electrically connected to a terminal of said circuit substrate;  
a plug coupled to said first terminal of each of said printed

conductive lines, said plugs having inner ends and outer ends projecting into the open air and said plugs being axially movable through said housing; and  
urging means coupled to said plugs for urging said plugs in a direction in which said projecting outer end of the plug is moved away from the housing.

4,417,777

# **INTEGRATED CIRCUIT CARRIER ASSEMBLY**

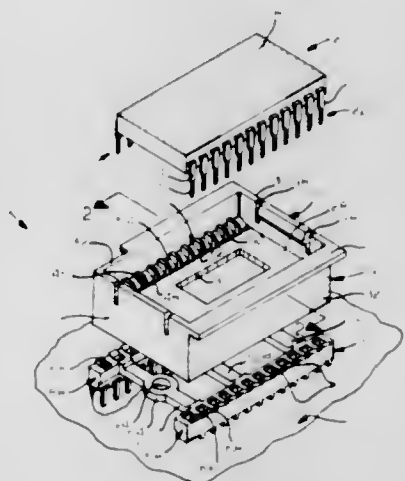
William C. Bamford, Hinsdale, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Oct. 13, 1981, Ser. No. 310,645

Int. Cl.<sup>3</sup> H01R 13/62

U.S. Cl. 339—17 CF

5 Claims



1. An integrated circuit carrier assembly for an integrated circuit device with a plurality of leads extending from opposite sides thereof including, in combination,  
a carrier for mounting said integrated circuit device, said carrier including a support surface upon which said integrated circuit device is supported,  
a socket for receiving the leads of said device, comprising a pair of parallel spaced apart housing portions and a plurality of terminals mounted in each of said housing portions, each terminal being adapted to electrically engage a lead when said device is received in said carrier, said housing portions being joined by at least two cross-members,  
a plurality of guide means included in said carrier, one for each of the leads of said integrated circuit device, for guiding said leads into said socket through said carrier, each of said guide means including a passage extending through said carrier, each of said guide means further including a funnelling means for directing said lead into said passage, and  
means for securing said device in said carrier upon insertion of said device into said carrier,  
the improvement comprising:  
tabs formed integrally with and extending from the support surface of said carrier defining channels for separately enclosing each of the housing portions of said socket when said carrier is in assembled relationship with said socket.

4,417,778

# **CIRCUIT INTERLOCK ARRANGEMENT**

Henry J. Halvorsen, Cranford; Albert V. Marchetto, Mountain-side, and Edwin P. Thomas, Brick, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1981, Ser. No. 314,244

Int. Cl.<sup>3</sup> H01R 23/70

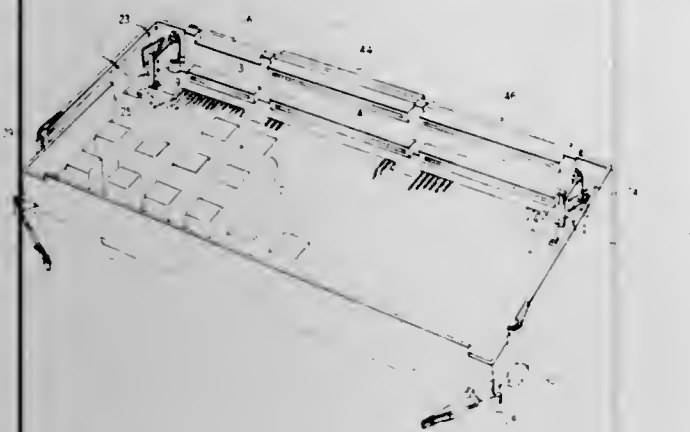
U.S. Cl. 339—17 M

6 Claims

1. An interlocking arrangement comprising:  
a first planar pluggable element and a first plug-in connector, the arrangement preventing removal of the first planar pluggable element from the first plug-in connector;

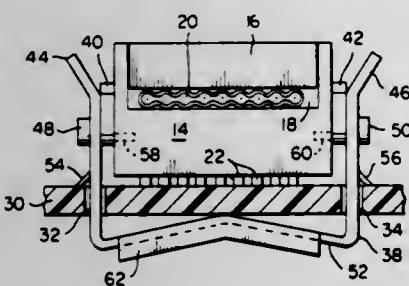


locking means for preventing the removal of the first planar pluggable element after insertion into the plug-in connector;  
 auxiliary connector means in circuit with the plug-in connector adapted to receive a planar pluggable element; and  
 unlocking means comprising a second planar pluggable



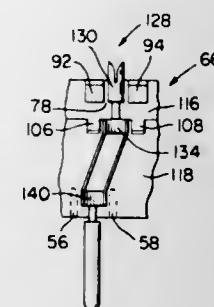
element adapted to mate with the auxiliary connector means and interacting with the locking means to free the first planar pluggable element to allow its removal from the first plug-in connector while maintaining a predetermined circuit status for the first plug-in connector irrespective of the removal of the first planar pluggable element.

**4,417,779**  
**PCB-MOUNTABLE CONNECTOR FOR TERMINATING FLAT CABLE**  
 Albert H. Wilson, Los Angeles, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.  
 Filed Mar. 26, 1981, Ser. No. 247,897  
 Int. Cl.<sup>3</sup> H01R 13/20  
 U.S. Cl. 339—75 MP 11 Claims



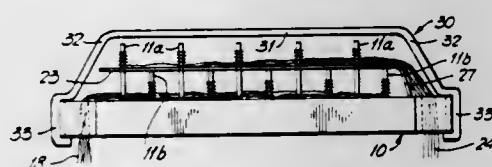
1. An electrical connection assembly comprising:  
 an upstanding housing;  
 a plurality of contact elements supported by said housing and defining connector input and output terminals;  
 a substrate having an upper surface supporting conductive members in facing relation to said connector output terminals and a lower surface, said substrate defining openings extending from said upper surface to said lower surface outwardly of said housing;  
 a clip member having arms extending through said substrate and a bowed expanse supported by said arms and engaging said substrate lower surface;  
 actuator means in engagement with said clip member and said housing and operable to apply a downward force by said housing upon said substrate upper surface and an upward force by said clip member upon said substrate lower surface; and  
 lever means for operating said actuator means.

**4,417,780**  
**PITCH TRANSITION CONNECTOR**  
 Robert E. Knapp, Covina, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.  
 Continuation of Ser. No. 145,363, Apr. 30, 1980, abandoned.  
 This application May 24, 1982, Ser. No. 381,130  
 Int. Cl.<sup>3</sup> H01R 13/38  
 U.S. Cl. 339—99 R 19 Claims



1. An electrical connector, comprising:  
 a housing defining first apertures mutually spaced in a first housing portion by one distance and opposed second apertures mutually spaced in a second housing portion by a second different distance, said first and second housing portions being separable, first and second sets of contact bending constraint posts being located respectively on said first and second housing portions adjacent said first and second apertures and extending therebeyond, said housing defining an open channel separating said first set of constraint posts and said second set of constraint posts; and  
 a plurality of contact elements, each having opposed end portions respectively disposed in ones of said first and second apertures and a bendable portion extending between said end portions, said first and second sets of constraint posts conforming the bend of said bendable portion to a preselected bend attitude.

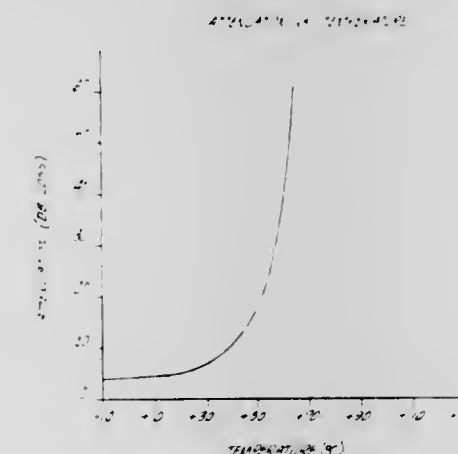
**4,417,781**  
**DIELECTRIC SEPARATION OF INCOMING AND OUTGOING TERMINATIONS IN A CABLE TERMINATION BLOCK**  
 Harold Johnston, Lachine; Zygmunt Lask, Montreal, and Frederick H. Gill, St. Bruno, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada  
 Filed Sep. 21, 1981, Ser. No. 303,830  
 Int. Cl.<sup>3</sup> H01R 9/03  
 U.S. Cl. 339—198 J 4 Claims



1. A cable terminating block comprising:  
 a rectangular block of dielectric material;  
 a plurality of rows of terminals extending along the block from one end to the other, and a plurality of terminals in each row, the rows spaced to define spaces for cable conductors;  
 each terminal including a terminal pin at one end extending from a top surface of said block and a terminal socket at the other end positioned within said block at a bottom surface thereof;  
 each row of terminals consisting of alternating long terminal pins and short terminal pins;  
 means at one end of said block for positioning conductors

from a first cable for passage along said spaces and connection to the outer ends of said long terminal pins;  
 means at the other end of said block for positioning conductors from a second cable for passage along said spaces and connection to said short terminal pins;  
 a flat sheet-like dielectric member extending over said block and having rows of holes therein, a hole for each long terminal pin, the holes spaced to fit over said long terminal pins, the dielectric member resting on the short terminal pins, the conductors of said second cable extending below said dielectric member when connected to said short terminal pins and the conductors of said first cable extending above said dielectric member when connected to said long terminal pins.

**4,417,782**  
**FIBER OPTIC TEMPERATURE SENSING**  
 Raymond Clarke, Sunnyvale, and Chester L. Sandberg, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.  
 Filed Mar. 31, 1980, Ser. No. 136,057  
 Int. Cl.<sup>3</sup> G02B 5/172  
 U.S. Cl. 350—96.29 120 Claims

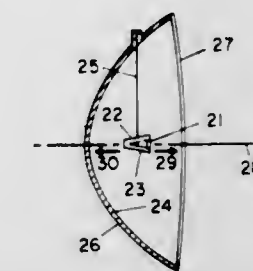


44. Apparatus for maintaining a material within a temperature range of from  $T_1$  to  $T_2$ ,  $T_1$  being less than  $T_2$ , and  $T_2$  being less than  $200^\circ\text{C}$ ., the apparatus comprising:  
 (a) a waveguide, at least part of the waveguide being in thermal communication with the material so that the temperature of said part of the waveguide is responsive to the temperature of the material, the waveguide comprising a core and cladding disposed on and around the exterior surface of the core, said part of the waveguide exhibiting blackout at a blackout temperature  $T_B$ ,  $T_B$  being about equal to  $T_2$ ;  
 (b) means for directing light at an end of the waveguide;  
 (c) means for monitoring the intensity of light transmitted by said part of the waveguide; and  
 (d) means for cooling the material when the means for monitoring detects a substantial change in the intensity of the light transmitted by said part of the waveguide.

**4,417,783**  
**PULSATING, OSCILLATING BICYCLE REFLECTOR**  
 Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356  
 Filed Mar. 16, 1981, Ser. No. 244,263  
 Int. Cl.<sup>3</sup> G02B 5/12 10 Claims

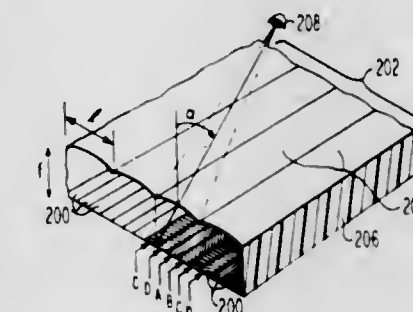
1. A reflecting device mounted on a bicycle that redirects light from a source back toward that source in the form of a pulsating or oscillating signal, comprising:  
 an optical means, for collecting light from a remote source and focusing it to a focal region, and for projecting light reflected from that focal region back toward the remote source,

a retro-reflector means, for receiving light and returning that light in the same direction from which it was received,  
 a support and oscillation means, for the retro-reflector means, that causes the retro-reflector means to move in a prescribed path, through the focal region of the optical means, with a regular periodic motion,



a case means, for enclosing and supporting said components means,  
 an attachment means, for affixing the case means to the bicycle.

**4,417,784**  
**MULTIPLE IMAGE ENCODING USING SURFACE RELIEF STRUCTURES AS AUTHENTICATING DEVICE FOR SHEET-MATERIAL AUTHENTICATED ITEM**  
 Karl H. Knop, Zurich, and Michael T. Gale, Wettswil, both of Switzerland, assignors to RCA Corporation, New York, N.Y.  
 Filed Feb. 19, 1981, Ser. No. 236,111  
 Int. Cl.<sup>3</sup> G02B 5/18; G09F 3/03  
 U.S. Cl. 350—162.19 14 Claims



1. In an article comprised of an authenticated item of sheet material which is subject to counterfeiting and an authenticating device bonded to said item, wherein said device includes a transparent material bonded to said sheet material, said material having a reflective periodic structure formed as a relief pattern on a viewable surface of said material which is proximate to said sheet material, said transparent material exhibiting a given index-of-refraction and being attached to said sheet material in a manner sufficiently secure to prevent said transparent material from being removed from said sheet material without effectively destroying said structure; the improvement in said device:

wherein the period of said periodic structure is smaller in size than 100 micrometers and each period is comprised of substantially the same given set of a plural number of juxtaposed elements, respective elements of said given set having significantly different reflective characteristics from one another, and

wherein said transparent material has a given thickness no greater than 100 micrometers and has a periodic lenticular array embossed on a surface thereof which is distal to and is oriented substantially parallel to said periodic structure, each period of said array being comprised of a lens having an aperture width that at least approximates that of a period of said structure and having a focal length substantially equal to said given thickness.



4,417,785

**LIQUID CRYSTAL DISPLAY WITH NEGATIVE TIMING SIGNAL AND DIELECTRIC INVERSION**

Haruo Nakamura, Suwa, Japan, assignor to Kabushiki Kaisha Sawa Seikosha, Tokyo, Japan

Continuation of Ser. No. 973,761, Dec. 27, 1978, abandoned.

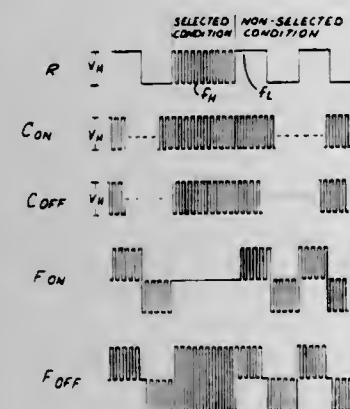
This application Jul. 20, 1981, Ser. No. 284,753

Claims priority, application Japan, Dec. 27, 1977, 52-160844; Dec. 29, 1977, 52-159310

Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350—346

4 Claims



1. A liquid crystal display device for operation in the twisted nematic mode, comprising liquid crystal display means including a matrix of display elements and two-frequency matrix-addressing means for supplying a two-frequency output including a high frequency signal  $f_H$  and a low frequency signal  $f_L$  for the multiplexed driving of said display elements in said display means, said liquid crystal display means containing a liquid crystal display cell including a nematic liquid crystal material having a critical frequency,  $f_c$ , intermediate the lower and higher frequency components in said output, the dielectric anisotropy of said liquid crystal material being positive at said lower frequency,  $f_L$ , and negative at said higher frequency,  $f_H$ , said matrix-addressing means connected to said display cell and being arranged and constructed for applying thereto said higher frequency component  $f_H$  as a timing signal for placing the element in a selected condition and as a data signal for turning said element ON and OFF, said higher frequency data signal being in phase with said high frequency timing signal for placing selected display elements in an ON condition and said high frequency data signal being 180° out-of-phase with said high frequency timing signal for placing the display elements in a selected condition into an OFF condition and applying said lower frequency signal  $f_L$  as a timing signal to the non-selected display elements.

4,417,786

**DEVICES BASED ON SURFACE TENSION CHANGES**

Gerardo Beni, Old Bridge, and Susan Hackwood, Freehold, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 236,113, Feb. 19, 1981, abandoned. This application Jun. 11, 1981, Ser. No. 272,490

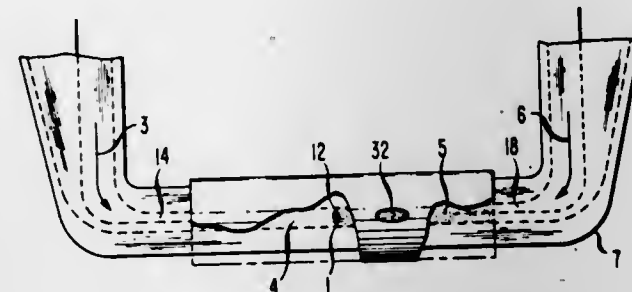
Int. Cl.<sup>3</sup> G02F 1/29

U.S. Cl. 350—359

12 Claims

1. A device comprising a vessel, a fluid medium, means for applying an electrical potential and a means for observing an optical change induced by a change in said potential characterized in that said device includes an interface capable of storing charge and formed between said fluid medium and a second element which is in intimate contact with said medium, said second element comprises a material which allows said interface to be polarizable wherein said fluid medium is capable of movement, whereby upon a suitable change of said electrical

potential applied to said interface through said means for applying an electrical potential, said movement of said fluid is



induced by an induced change in surface tension and said optical change results.

4,417,787

**FIVE-COMPONENT MICROSCOPE OBJECTIVE**

Lambert J. Danner, Vienna, Austria, assignor to C. Reichert Optische Werke AG, Vienna, Austria

Filed Nov. 16, 1981, Ser. No. 322,057

Int. Cl.<sup>3</sup> G02B 9/60, 21/02

U.S. Cl. 350—414

1 Claim



1. A sem-apochromatic microscope objective having an N.A. of substantially 0.85 which comprises a concavo-convex singlet I, a bi-convex singlet II, a plano convex doublet III, a bi-convex doublet IV, and a convex-concavo doublet V aligned sequentially on an optical axis and having the following parameters:

Lens No.	Radius (R)	Thickness (T)	Spacing (S)	Index of Refraction (ND)	Abbe No. (v)
S <sub>0</sub> = 0.794					
I	R <sub>1</sub> = -2.0075	T <sub>1</sub> = 3.15	S <sub>1</sub> = 0.30	ND <sub>1</sub> = 1.78161	v <sub>1</sub> = 37.08
	R <sub>2</sub> = -2.8929				
II	R <sub>3</sub> = 25.935	T <sub>2</sub> = 3.20	S <sub>2</sub> = 0.30	ND <sub>2</sub> = 1.564	v <sub>2</sub> = 60.80
	R <sub>4</sub> = -10.411				
III	R <sub>5</sub> = ∞	T <sub>3</sub> = 1.80	S <sub>3</sub> = 0.50	ND <sub>3</sub> = 1.673	v <sub>3</sub> = 32.20
	R <sub>6</sub> = 8.498				
IV	R <sub>7</sub> = -8.184	T <sub>4</sub> = 5.00	S <sub>4</sub> = 12.70	ND <sub>4</sub> = 1.434	v <sub>4</sub> = 95.58
	R <sub>8</sub> = 109.720				
V	R <sub>9</sub> = 8.498	T <sub>5</sub> = 2.80		ND <sub>5</sub> = 1.717	v <sub>5</sub> = 29.50
	R <sub>10</sub> = -15.435				
	R <sub>11</sub> = 15.435	T <sub>6</sub> = 5.00		ND <sub>6</sub> = 1.434	v <sub>6</sub> = 95.58
	R <sub>12</sub> = -15.435				
	R <sub>13</sub> = 7.735	T <sub>7</sub> = 5.10		ND <sub>7</sub> = 1.762	v <sub>7</sub> = 26.94
		T <sub>8</sub> = 6.50		ND <sub>8</sub> = 1.673	v <sub>8</sub> = 32.20

4,417,788

**STABILIZED ZOOM BINOCULAR**

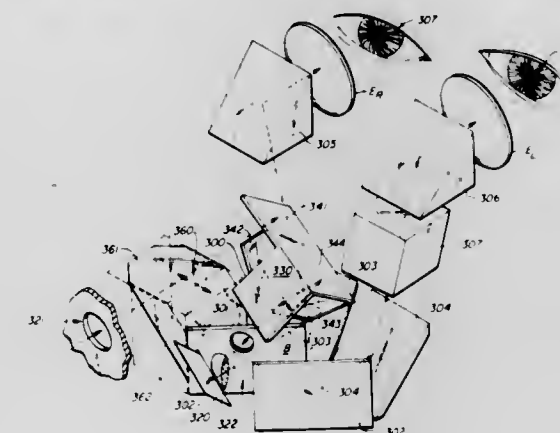
Luis W. Alvarez, Berkeley, and Arnold J. Schwemin, Walnut Creek, both of Calif., assignors to Schwem Instruments, Pleasant Hill, Calif.

Continuation-in-part of Ser. No. 97,114, Nov. 26, 1979, Pat. No. 4,316,649. This application Sep. 18, 1980, Ser. No. 188,200

Int. Cl.<sup>3</sup> G02B 23/00

U.S. Cl. 350—500

5 Claims



4. In an optic instrument having two oculars, each addressed to each eye of a viewer, at least one stabilized magnified path and one unstabilized finder path, said paths having a common portion between said oculars and an object to be viewed, the improvement comprising: a beam splitter aligned for the task of receiving light from the finder path and the magnified path and positioned so as to direct rays of light from said beam splitter to each ocular respectively; and a shutter mechanism for alternately blocking either said finder path or said magnified path.

4,417,789

**OBSERVATION DEVICE**

Ichiro Kano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

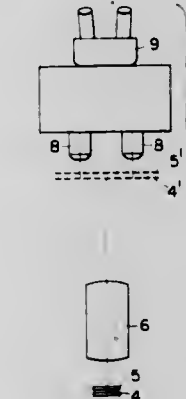
Filed Dec. 31, 1980, Ser. No. 221,634

Claims priority, application Japan, Jan. 17, 1980, 55-3923

Int. Cl.<sup>3</sup> G02B 22/18

U.S. Cl. 350—513

4 Claims



1. A device for simultaneously observing a plurality of sets of adjacent regions respectively on at least two objects which are superposed on each other with respect to the direction of the optical axis of said device, any one set of said adjacent regions respectively on said objects being spaced from other sets of said adjacent regions in a direction generally perpendicular to the optical axis of said device; said device comprising: (a) a single magnifying image projecting optical system for forming enlarged and projected images of said objects including said sets of said adjacent regions; and (b) a plurality of microscopes disposed with their optical axes spaced by a distance greater than the space between said any of said sets of said adjacent regions on said ob-

jects, each said microscope being positioned to observe the enlarged and projected images of one said set of said adjacent regions.

4,417,790

**FINISHED OPHTHALMIC LENS COMPRISING AN OPTICAL SMOOTH COATING OVER A ROUGH-SURFACED BASE**

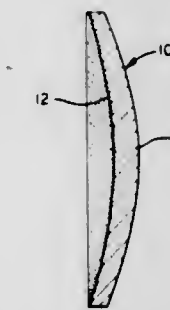
W. Clifford Dawson, East Woodstock; George D. Bard, Brooklyn, both of Conn.; Luther W. Smith, Brimfield, and Bernard L. Laurin, Ludlow, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 10, 1979, Ser. No. 37,786

Int. Cl.<sup>3</sup> G02B 1/10; G02C 7/02

U.S. Cl. 351—166

13 Claims



1. An ophthalmic lens including substrate having a machined and unpolished rough surface and a finish thereover of optical smoothness, clarity and high scratch resistance comprising a coating selected from the group consisting of:

- a pigment-free aqueous coating composition comprising a dispersion of colloidal silica in lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula  $RSi(OH)_3$  in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidioxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being  $CH_3Si(OH)_3$ , said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate;
- a hydrolysis product of about 35 to 70 weight percent tetraethyl orthosilicate and 55 to 20 weight percent of a silane selected from the group consisting of methyltrimethoxysilane, methyltriethoxysilane, ethyltrimethoxysilane, ethyltriethoxysilane, dimethyldimethoxysilane, dimethyldiethoxysilane and mixtures thereof and up to 20 weight percent of a siloxane having a reactive polar site; and
- a mixture of one or more compounds selected from a group of compounds including one or both of epoxy group, and silanol and/or siloxane group (provided, in any case so selected that epoxy group, and silanol and/or siloxane group are included in the same molecule or different molecule); silica particles having a size of 1 to 100 microns; and an aluminum chelate compound of a general formula:



wherein X is OL (L: lower alkyl), Y is at least a ligand derived from compounds of general formula  $M^1COCH_2COM^2$  ( $M^1$ ,  $M^2$  both lower alkyl) and a ligand derived from compounds of general formula  $M^3COCH_2COOM^4$  ( $M^3$ ,  $M^4$  both lower alkyl) and n is 0, 1 or 2.

8. The method of finishing an ophthalmic lens having a machined and unpolished rough surface comprising the steps of:

coating said rough surface with a liquid pigment-free aque-



ous composition which is curable to external optical smoothness, clarity and high scratch resistance; and curing said coating.

4,417,791

**PROCESS FOR COMPOSITE PHOTOGRAPHY**

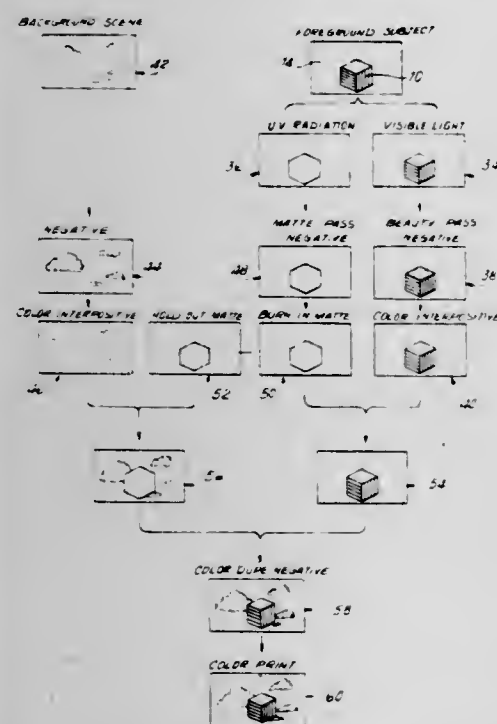
Jonathan Erland, 6026 Hayes Ave., Los Angeles, Calif. 90042, and Roger Dorney, 7057 Sunny Slope, Van Nuys, Calif. 91405

Filed Aug. 19, 1982, Ser. No. 409,749

Int. Cl.<sup>3</sup> G03B 19/18

U.S. Cl. 352-45

9 Claims



1. In a travelling matte process for composite photography, which comprises exposing a photosensitive medium to a foreground subject in front of a contrasting backing, printing high contrast black-and-white mattes therefrom, and printing images of the foreground subject in registration with said mattes and with a predetermined background scene to produce composite photographic images; the improvement comprising luminescing at least portions of the foreground subject during the exposure step at wavelengths actinic to said medium to form an image of solely said portions of the foreground subject in said medium, and printing said mattes from said image.

4,417,792

**DEVICE FOR MOUNTING DIAPOSITIVES IN A STRIP AND AN APPARATUS FOR PROJECTING THE STRIP-MOUNTED DIAPOSITIVES**

Liesel Martin, geb. Böser, Markschiedsweg 27, 6336 Solms/OT Oberbiel, Fed. Rep. of Germany

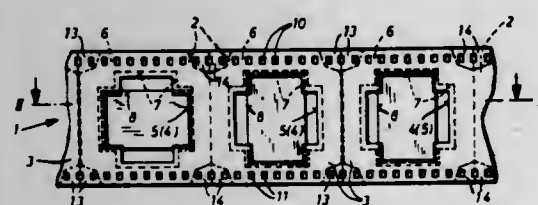
Filed Jun. 4, 1981, Ser. No. 270,333

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021138

Int. Cl.<sup>3</sup> G03B 23/08

U.S. Cl. 353-120

17 Claims



1. A film strip device for mounting a plurality of slide film sections in side-by-side relationship in a row to introduce successively the diapositives for projection in a slide projector and the like, comprising at least one first flexible sheet member having at least two picture openings therein in side-by-side relationship in a row, at least one second flexible sheet member

similarly having at least two picture openings therein in side-by-side relationship in a row, said first and second sheet members being fastened to each other in face-to-face relationship with their respective picture openings being aligned and one of said sheet members overlapping the other sheet member by one picture opening such that a portion of one of said sheet members corresponding in length to one picture opening is not covered whereby a plurality of said first and second sheet members can be fastened to each other in alternating overlapping relationship to form a film strip of such a length to accommodate a predetermined number of slide film sections, a frame having a second picture opening therein interposed between said sheet members and having its second picture opening corresponding with aligned picture openings in said two sheet members, said frame picture opening being slightly larger than a diapositive to be positioned therein and larger than the sheet member picture openings, said frame having a thickness greater than that of the diapositive such that a diapositive is freely moveable within a said frame and has play between said sheet members, said sheet member picture openings being smaller in size than the individual slide film sections mounted in the film strip.

4,417,793

**CAMERA CAPABLE OF FUNCTIONING IN ACCORDANCE WITH INFORMATIONS RECEIVED FROM A ROLL OF FILM**

Shigeru Oyokota; Nobuyuki Taniguchi; Takeo Hoda; Junichi Tanii; Kiyoshi Seigenji, all of Sakai, and Toshiaki Matsumoto, Izumisano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

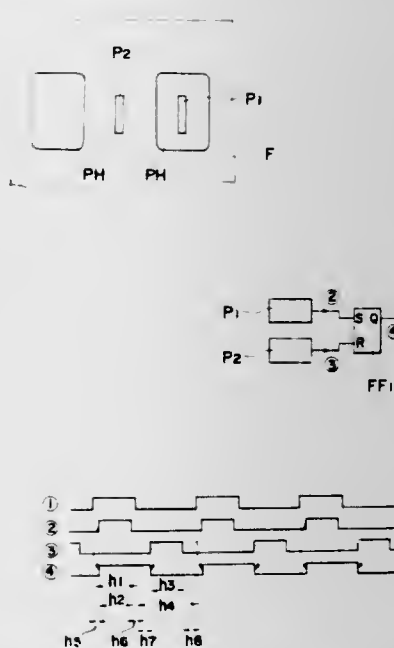
Filed Jan. 25, 1982, Ser. No. 342,594

Claims priority, application Japan, Jan. 28, 1981, 56-11301

Int. Cl.<sup>3</sup> G03B 1/66, 17/36; G01N 21/86; B65H 25/00

U.S. Cl. 354-21

16 Claims



1. In a camera capable of functioning in accordance with information received from a roll of film to be loaded in the camera, a sprocket hole detecting device comprising:

first and second detector means for generating a respective first electric signal and a second electric signal each changing between a first state and a second state in response to respective passages of the sprocket holes of the film during the winding-up motion thereof, a time lag being provided between the change in the first electric signal and the change in the second electric signal, said first and second detectors operating such that the second signal changes from said first to second state and changes from said second state back to said first state within the period defined between the change in said first signal from said first to second state and the change from said second state back to said first state; and

means for forming a sprocket hole signal indicative of the passage of sprocket holes in response to said first and second electric signals.

4,417,794

**AUTOMATIC DIAPHRAGM CONTROL CAMERA**

Masaaki Nakai, Nara, and Masayoshi Sahara, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

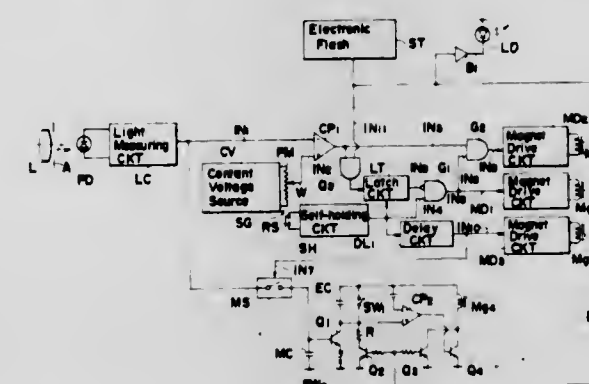
Filed Jul. 7, 1982, Ser. No. 395,992

Claims priority, application Japan, Jul. 16, 1981, 56-110071

Int. Cl.<sup>3</sup> G03B 7/09, 7/16

U.S. Cl. 354-38

7 Claims



1. A camera for use with a flash device capable of generating a flash readiness signal, comprising:  
an objective;  
a diaphragm normally retained in a fully opened aperture position;  
discrimination means including means for measuring light through said objective and diaphragm aperture and determining whether said diaphragm is to be set to the fully opened aperture position, based on the light measured through said objective and said diaphragm, a set film sensitivity and a set shutter speed, and generating a diaphragm stopping-down prevention signal when it is determined that said diaphragm is to be set to the fully opened aperture position;  
diaphragm stopping-down release means for allowing stopping-down of said diaphragm in response to a camera release operation;  
first diaphragm release control means for deactivating said diaphragm stopping-down release means in response to said diaphragm stopping-down prevention signal from said discrimination means; and  
second diaphragm release control means for overriding said first diaphragm release control means in response to said flash readiness signal from said flash device.

4,417,795

**AUTOMATIC FOCUS DETECTION DEVICE**

Shuichi Tamura, Yokohama; Toyotosi Suzuki; Hideo Tamamura, both of Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 191,429, Sep. 29, 1980, abandoned. This application Apr. 2, 1982, Ser. No. 364,882

Claims priority, application Japan, Oct. 8, 1979, 54-129645

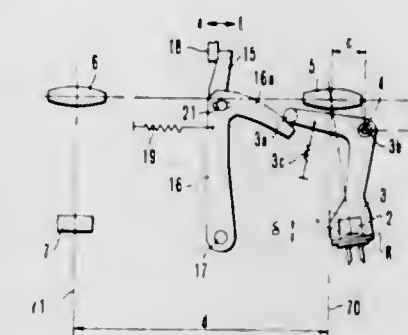
Int. Cl.<sup>3</sup> G03B 3/10

U.S. Cl. 354-25

16 Claims

1. An automatic focus detecting device comprising:  
two image forming lenses having optical axes fixedly spaced a predetermined distance and forming respective focal points;  
distance measuring elements, each arranged in the neighborhood of the focal point behind each image forming lens;  
a holding member for holding one of the distance measuring elements;  
a shaft outside of the space between the optical axes of the

two lenses, said holding member being rotatable around the shaft so as to alter the distance between the distance



measuring element and the image forming lens, said distance measuring element held by said holding member being spaced radially from said shaft.

4,417,796

**SINGLE LENS REFLEX CAMERA BODY**

Yoji Sugiura, Yokohama; Toshio Hagiwara, Kawasaki; Toru Okumura, Yokohama, and Syunichi Nakahara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

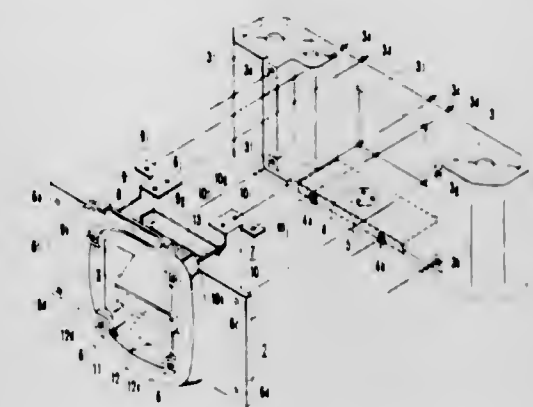
Filed Nov. 4, 1981, Ser. No. 318,159

Claims priority, application Japan, Nov. 6, 1980, 55-156316; Nov. 6, 1980, 55-156317; Nov. 6, 1980, 55-156318

Int. Cl.<sup>3</sup> G03B 17/02, 19/12

U.S. Cl. 354-152

10 Claims



1. A single lens reflex camera assembly comprising:  
a camera main body formed of plastic material structured to define  
a film cartridge chamber,  
a film take-up chamber,  
a side wall portion having an aperture therethrough, and an attachment portion;  
a mirror box made of metal having  
a mount attachment portion and  
a complementary attachment portion formed in correspondence with said attachment portion of said camera main body;  
a front panel of plastic material formed with a lens mount attachment base for attachment of a photo-taking lens and wings, said front panel being integrally formed with said mirror box with a portion of said mirror box adjacent said mount attachment portion thereof being inserted into said lens mount attachment base of said front panel in a manner such that mount attachment portion is exposed; and  
assembly means joining together said complementary attachment portion of said mirror box and said attachment portion of said camera main body, said assembly means coupling said front panel with said camera main body.



4,417,797

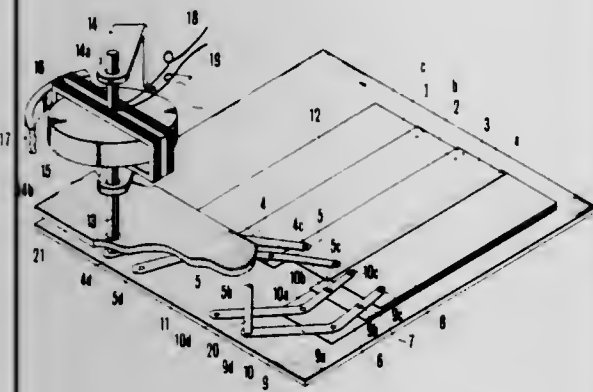
**VARIABLE FORCE ELECTROMAGNETIC SHUTTER**  
Michio Senuma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,563

Claims priority, application Japan, Dec. 27, 1980, 55-186509  
Int. Cl.<sup>3</sup> G03B 9/08

U.S. Cl. 354—234

6 Claims



1. A focal plane shutter comprising leading and trailing groups of shutter blades, an electromagnetic drive source to drive said shutter blades from a travel start position to a travel end position to effect an exposure, the electromagnetic drive source including a coil and a permanent magnet for producing a magnetic flux as well as a drive shaft connected to transmit rotation of one of the coil and magnet to the shutter blades; said permanent magnet being arranged relative to the coil so that the magnetic flux density distribution of the magnet produces a maximum magnetic flux density in the vicinity of the travel start position of the coil.

said electromagnetic drive source further including a yoke forming a gap with the magnet; and the magnetic flux density distribution of the magnet is adjusted by varying the gap formed between the permanent magnet and said yoke.

4,417,798

**DATA TRANSMITTING ELECTRICAL CONTACT MEANS SWITCHING DEVICE IN CAMERA**

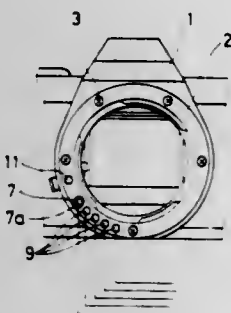
Zenichi Ohkura, Ichikawa, and Yasuyuki Haneishi, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,098

Claims priority, application Japan, Jun. 6, 1980, 55-79057[U]  
Int. Cl.<sup>3</sup> G03B 9/02, 17/00

U.S. Cl. 354—271

4 Claims



1. A data transmitting electrical contact switching device for a camera comprising: first and second switching electrical contacts provided on a lens mount and a body mount, respectively, at positions such that said first and second switching electrical contacts are adjacent one another when said lens mount is operatively coupled to said body mount; means for urging said first switching electrical contact on said lens mount side elastically to protrude from a surface of said lens mount, said second switching electrical contact on said body mount side being recessed from a surface of said body mount opposite

said first switching electrical contact; a switching plate supporting said first switching electrical contact; an aperture preset ring having an elongated groove formed therein and a notch extending from said elongated groove; a pin provided at an end portion of said switching plate, said pin abutting against a side wall of said elongated groove to prevent protrusion of said first switching electrical contact on said lens mount side for a manual aperture control mode position of said aperture preset ring and said pin being fitted into said notch in an automatic aperture control mode position of said aperture preset ring so that said first switching electrical contact on said lens mount side protrudes from said lens mount surface so as to be in contact with said second switching electrical contact on said body mount side.

4,417,799

**DISPOSABLE MANUALLY OPERABLE FILM PROCESSOR**

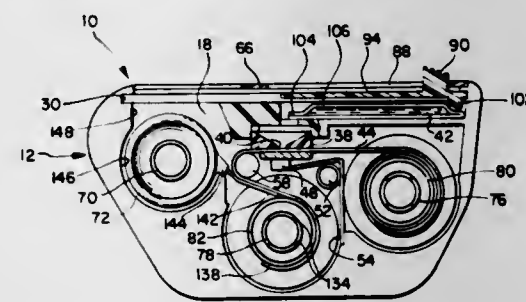
Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 3, 1982, Ser. No. 414,794

Int. Cl.<sup>3</sup> G03D 5/06

U.S. Cl. 354—304

19 Claims



1. A disposable, manually operable, film processor of the type specifically constructed to be disposed of after its processing materials have been depleted, the processor being adapted for use in the processing of a length of photographically exposed, self-developing type film, said film processor comprising:

a housing defining a lighttight chamber, said housing including means defining a loading door which is movable from a closed position to an open position for providing access to said chamber, said housing including a pair of spaced side walls;

a first roller rotatably supported within said chamber by said side walls for rotation in first and second directions, said first roller including drivable means accessible exteriorly of said processor and adapted to be engaged by a manually operable member for rotating said first roller in said first direction;

a length of sheet material having first and second opposite ends, said length of sheet material being wound upon said first roller with said first end secured to said first roller and said second end being attached to a second roller;

a second roller rotatably supported within said chamber for rotation about its axis, said second roller including drivable means accessible exteriorly of said processor and adapted to be engaged by a manually operable member for rotating said second roller;

means for supporting a film assemblage of the 35 mm type containing a cassette having therein a roll of exposed self-developing type film including a leader which is adapted to extend to the exterior of the cassette via a slot therein for attachment to said second roller;

a supply of processing composition;

an applicator mounted in said chamber in communication with said supply of processing composition for applying a coating to one side of said sheet material; and

a manually operable member engageable with said drivable means of said second roller for rotating it in a direction,

after said loading door has been moved to said closed position, so as to unwind said sheet material from said first roller and move it past said applicator where a coating of said processing composition is applied to one side of said sheet material, said rotation of said second roller also being effective to withdraw the exposed film from its cassette and wind it upon said second roller in engagement with the coated surface of said sheet material so as to form a laminate which is to remain wound upon said second roller for a period of time sufficient for visible images to be formed in the film.

4,417,800

**IMAGE TRANSFER MATERIAL SEPARATION APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE**

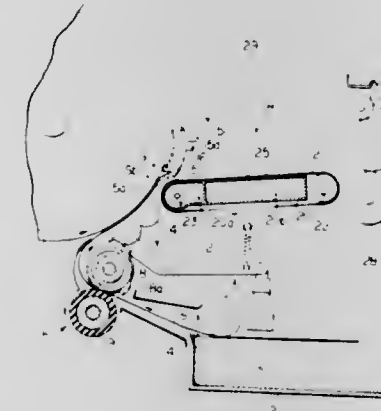
Akira Hirose, Tokyo, and Kenzo Ariyama, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 31, 1981, Ser. No. 288,784

Claims priority, application Japan, Aug. 1, 1980, 55-105972  
Int. Cl.<sup>3</sup> G03G 15/14, 15/22

U.S. Cl. 355—3 TR

28 Claims



1. An apparatus for separating image transfer material brought into close contact with a photoconductor having an image formed thereon, comprising:

a leading-edge-portion-lifting-and-deforming means for deforming a leading edge portion of said image transfer material as it is being directed to said photoconductor to lift the same from said photoconductor;

means including an image transfer material separation member having a base portion thereof swingably supported and the free end portion thereof disposed in close proximity to the surface of said photoconductor, said member including a catching portion for catching the deformed portion of the image transfer material so that after the deformed leading edge portion of said image transfer material comes into contact with said catching portion, the free end portion of said image transfer material separation member is caused to rotate in such a direction as to move away from the surface of said photoconductor by the advancing force of said image transfer material to gradually separate said image transfer material from the surface of said photoconductor and guide the leading edge of said image transfer material in such a direction so as to be separated from the surface of said photoconductor;

said image transfer material separation member having a gap formation means for continually maintaining a gap between the free end of said image transfer material separation member and the surface of said photoconductor, said gap formation means including an auxiliary sheet separation device having a base portion swingably supported independently of said image transfer material separation member and a free end portion having a pawl means for catching a leading edge of any image transfer material not caught by said image transfer material separation member, said pawl means adapted to ride in contact along a rim portion of said photoconductor, and a portion of said

4,417,801

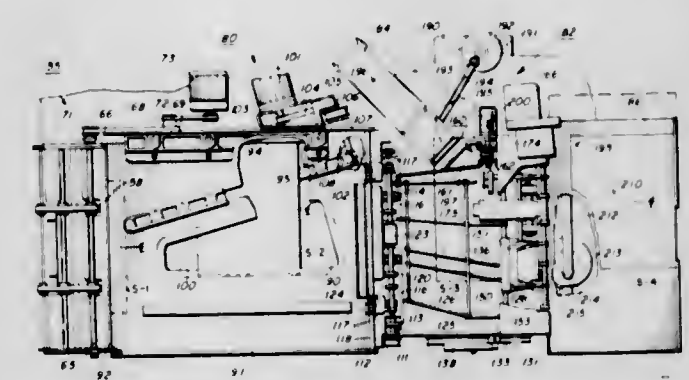
**SHEET REGISTRATION IN A FINISHING STATION**  
Richard E. Elsemann, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 89,334, Oct. 30, 1979, abandoned. This application Nov. 19, 1981, Ser. No. 322,828

Int. Cl.<sup>3</sup> G03G 15/00, 21/00

U.S. Cl. 355—3 SH

2 Claims



1. In an electrostatographic reproduction system having a document handling apparatus for advancing individual document sheets from a stack to an exposure station and return to the stack in repeated cycles, an electrostatographic processor for processing copy sheets, and an arrangement for registering each copy sheet as the same is moved in a path of movement to a sheet attaching station, the improvement comprising:

a transport assembly adapted to convey each sheet and to register the same in coarse registration along a side edge thereof during movement of the sheets therethrough, collecting means in said path of movement arranged to receive the copy sheets from said transport assembly and adapted to register each sheet along said side edge and the leading edge thereof and to provide final conditioning of a collected set of copy sheets prior to attaching the sheets of the set, said collecting means adapted to arrest movement of each sheet in preparation of a stapling action.

4,417,802

**PARTICLE DISPENSER**

Richard L. Forbes II, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1981, Ser. No. 322,999

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 DD

8 Claims

1. An apparatus for dispensing particles including:

a substantially rigid container;

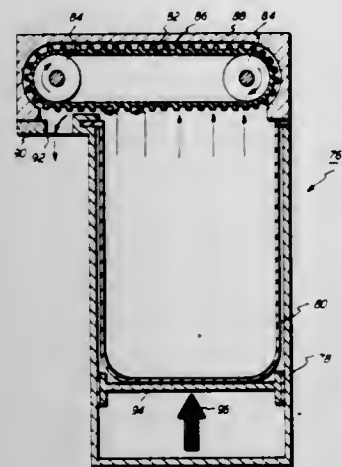
a flexible container disposed interiorly of said rigid container housing the supply of particles therein;

means for discharging particles received from said rigid container in a substantially downwardly direction;

means for transporting a portion of the particles from the uppermost portion of said rigid container to said discharging means; and



means for moving said flexible container relative to said rigid container in an upwardly direction to maintain a



continuous supply of particles in communication with said discharging means.

4,417,803

## PRESSURE FIXING DEVICE

Masato Kobayashi; Yasushi Hoshino; Kazuyoshi Tateishi, all of Yokosuka; Minoru Isobe, Tokyo; Hiroshi Konishi, Tokyo; Yoshitomo Koga, Tokyo, and Shigemi Hagiwara, Tokyo, all of Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

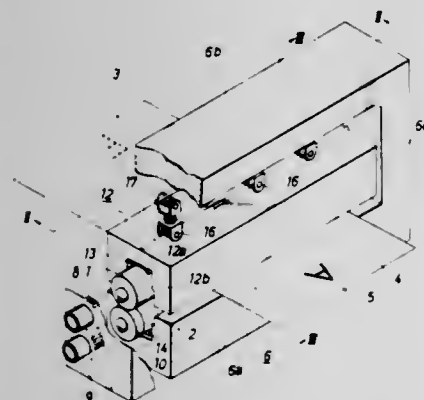
Filed May 26, 1982, Ser. No. 382,152

Claims priority, application Japan, Jun. 3, 1981, 56-084500

Int. Cl.<sup>3</sup> G03G 15/20

U.S. Cl. 355—3 FU

5 Claims



1. A device for the pressure fixing of a toner comprising a pair of fixing rolls arranged axially in parallel to each other, said rolls fixing a toner image on an image record carrier by applying pressing forces to said record carrier between said rolls, a frame supporting individually and rotatably the axles of said rolls and forming a housing, a pressure bar giving a distributed load to said fixing rolls, and a plurality of pressure generators disposed within a space formed by said frame and said pressure bar, said pressure generators giving pressing forces to said pressure bar and being arranged displaceably in the axial direction of said rolls depending upon the width of said image record carrier.

4,417,804

## HIGH VOLTAGE COMPARATOR FOR PHOTORECEPTOR VOLTAGE CONTROL

Alan J. Werner, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1981, Ser. No. 275,174

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 CH

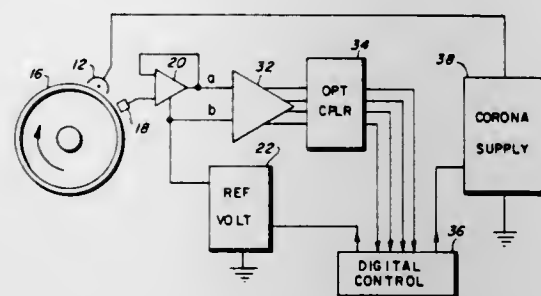
12 Claims

1. An automatic electrostatic voltage control system for use with the electrophotography apparatus for directly comparing a reference supply with the voltage on a photoreceptor sur-

face, the control having a high voltage supply to maintain the surface at a preset fixed potential comprising:

a detector electrostatically coupled to the surface to produce a control signal indicative of the polarity of the voltage difference of the surface relative to the present fixed potential,

a comparator, a preamplifier interconnecting the detector and the comparator, and



a digital control connected to the output of the comparator and to the high voltage supply, the digital control responding to the output of the comparator to supply a corresponding voltage to the high voltage supply to cause the supply to maintain the surface at the preset fixed potential.

4,417,805

## IMAGE SYNTHESIZING DEVICE

Hirotohi Kishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

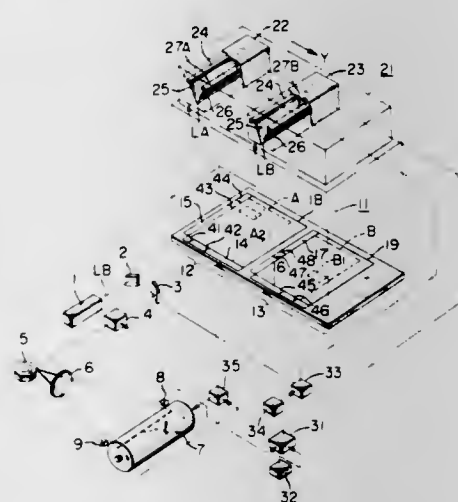
Filed Sep. 1, 1981, Ser. No. 298,459

Claims priority, application Japan, Sep. 8, 1980, 55-125112

Int. Cl.<sup>3</sup> G03G 15/04; H04N 1/30

U.S. Cl. 355—14 R

14 Claims



1. An image synthesizing device comprising an original table, means for reading an original on said original table, means for selecting an unnecessary area of the original, means for selecting a necessary area of an original to be synthesized in said unnecessary area, means for comparing the sizes of said selected unnecessary area and said necessary area, and means for controlling magnification of readout signals of said necessary area if the sizes of said unnecessary area and said necessary area do not match.

4,417,806

## METHOD FOR EFFECTING REGISTRATION FOR A COPYING APPARATUS

Tatsuo Tani, Tokyo, and Masao Kono, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Continuation of Ser. No. 55,154, Jul. 6, 1979, abandoned. This application Nov. 6, 1981, Ser. No. 319,108

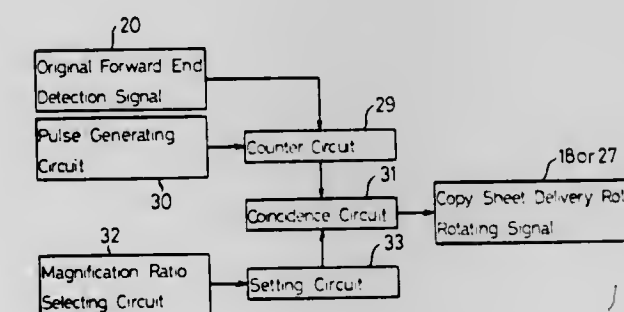
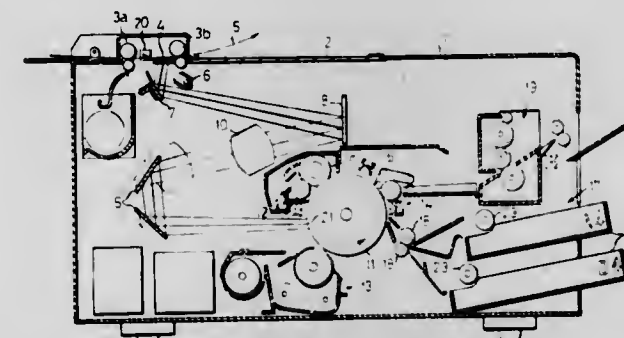
Claims priority, application Japan, Mar. 18, 1977, 52-29337; Mar. 22, 1977, 52-30483; Apr. 20, 1977, 52-44539; Apr. 22, 1977, 52-45871

The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> G03G 15/22

U.S. Cl. 355—14 SH

2 Claims



1. In an electrophotographic copying apparatus having a magnification ratio varying device, and in which a seamless photosensitive drum member (11) in motion and at any rotational position is exposed to an optical image of an original, by slit exposing, to form an electrostatic latent image thereon, with the scanning velocity of the original being adjustable in accordance with the selected magnification ratio, an improvement for effecting registration, consisting essentially of: first detection means having only a single stationary detector (20), for detecting the leading end of the original in one of a path of travel of the original and a path of travel of a movable optical system, to produce one detection signal; means (18) responsive only to said one detection signal connected to said first detection means to deliver a copy sheet to the photosensitive member (11) only after the lapse of a predetermined period of time following the production of said one detection signal, which predetermined period of time is varied in conformity with the selected magnification ratio; time period varying means (32,39) connected to said responsive means for varying the predetermined period of time; and other means responsive to a second signal (52) to perform other operations necessary for effecting electrophotographic copying other than said copy sheet delivering operation.

4,417,807

## CLEANING APPARATUS FOR RECORDING APPARATUS

Yoshio Yamazaki; Ken Nakamura, and Shigeru Inowa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

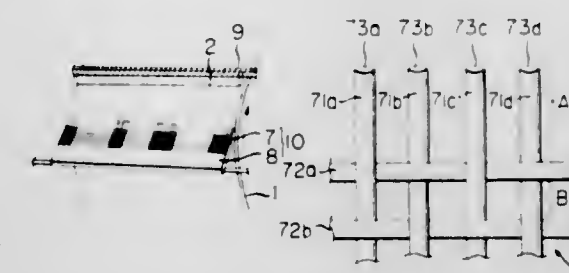
Filed Aug. 19, 1981, Ser. No. 294,393

Claims priority, application Japan, Sep. 10, 1980, 55-126412

Int. Cl.<sup>3</sup> G03G 21/00

U.S. Cl. 355—15

14 Claims



1. A cleaning apparatus for a recording apparatus which includes a photosensitive toner retaining member and a toner collection means, the cleaning apparatus comprising: means for cleaning toner remaining on the photosensitive toner retaining member; and a toner guide member having a plurality of spaced apart flexible front contact end portions in contact with said photosensitive toner retaining member for guiding said toner which is cleaned from said photosensitive toner retaining member to said toner collection means, at least the flexible front contact end portions of said toner guide member which are in contact with said photosensitive toner retaining member being in a comb-teeth shape.

4,417,808

## PHOTOGRAPHIC PAPER CUTTER

Mikio Kogane, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

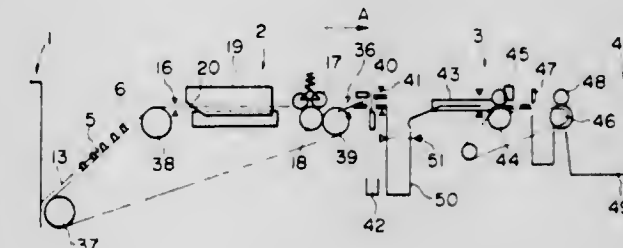
Filed Mar. 30, 1982, Ser. No. 363,734

Claims priority, application Japan, Apr. 1, 1981, 56-49196

Int. Cl.<sup>3</sup> G03B 29/00

U.S. Cl. 355—29

10 Claims



1. A photographic paper cutter, comprising: a cutting station, a photographic paper guide clip for transporting a strip of photographic paper, guide means for feeding to said cutting station said photographic paper guide clip while engaging a leading edge of said strip of photographic paper, a photographic paper guide clip cutter for separating said photographic paper guide clip by cutting said strip of photographic paper engaged by said photographic paper guide clip fed by said guide means, separating and guiding means for causing said separated photographic paper guide clip to drop from a travel path of said paper, and for guiding the leading edge of said cut strip of photographic paper, and an image frame cutter for cutting said strip of photographic paper guided by said separating and guiding means into individual image frames.



4,417,809

**PATTERN SCANNING DEVICE FOR COPYING MACHINES**

Joachim Nötzel; Anton Schätz, both of Munich; Harthmuth Buczek, Altenerding, and Günther Kirchhof, Taufkirchen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

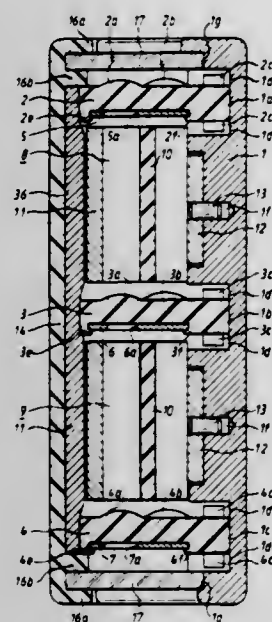
Continuation of Ser. No. 116,872, Jan. 30, 1980, abandoned. This application Feb. 12, 1982, Ser. No. 348,453

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905740

Int. Cl.<sup>3</sup> G03B 27/44

U.S. Cl. 355—46

15 Claims



1. A pattern scanning device for copying machines of the type in which a pattern is projected in a striplike manner by a plurality of elongated pattern scanning lens plates on an image recording support whereby the scanning lens diaphragms, the copying machine being provided with adjustable supports, the scanning device comprising an objective housing including two parts assembled into a unit detachable from the copying machine, said housing parts being spaced from one another so as to form longitudinal mounting grooves to receive the lens plates and the diaphragms therebetween, one of said housing parts engaging respective longitudinal edges of said lens plates and being formed with transversal guiding grooves provided in parallel planes for all said lens plates and operative for guiding respective lens plates when the latter are inserted into said housing; said lens plates being each formed with centering means projecting into the respective guiding groove and adapted for permitting limited displacement of the respective lens plate in its longitudinal direction within the respective longitudinal mounting groove, the centering means of all lens plates arresting all of said lens plates at single points lying in said parallel planes extending perpendicularly to the elongation of said lens plates; and securing means for securing said lens plates and said diaphragms in a fixed position, the other housing part sealingly closing said one housing part.

4,417,810

**METHOD FOR OBTAINING A COMPOSITE COLOR PICTURE AND A CAMERA EMPLOYING THE SAME**  
Yoshihiro Ueda, Shiga; Yoshikazu Kimura, Kusatsu; Hiroyuki Yonehara, and Kenjiro Tanabe, both of Hikone, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed May 7, 1980, Ser. No. 147,596

Claims priority, application Japan, May 7, 1979, 54-55424

Int. Cl.<sup>3</sup> G03B 27/58, 27/52, 27/32

U.S. Cl. 355—74

14 Claims

1. A duplicating camera for producing a color composite

picture out of a plurality of original color pictures with a desired layout arrangement, comprising,

an original picture frame holding a plurality of original color pictures side by side on a single plane,

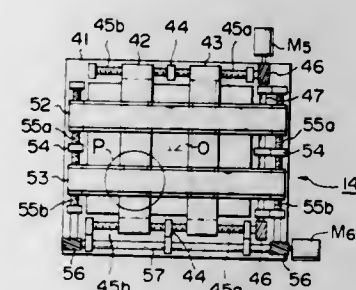
an original picture carriage supporting the original picture frame in a direction perpendicular to the plane on which the original pictures are mounted,

rotation means for rotatably supporting said frame at corners thereof to permit rotation of said pictures about an axis normal to said plane,

a means for successively moving the original picture frame across the optical center line of the duplicating camera, said rotation means supporting said moving means and being configured for clearance of said moving means to permit independent operation of said rotation means and said moving means while said original picture is oriented normally to said axis,

a light source for illuminating the color original picture which is placed on the optical center line,

a lens carriage comprising an optical system for producing the image of the original picture which is placed on the optical center line of the camera on its focal plane,



an exposure control device,

a cabinet which supports photosensitive material on the focal plane of the duplicating camera in such a manner that a desired point on the photosensitive material may be aligned on the optical center line of the duplicating camera for each of the original pictures,

a masking device having a variable light transmitting area over the photosensitive material surface having the lens carriage,

the masking device being provided with a light shielding screen which may be extended to or retracted from the central portion of the masking device on each side of the frame of the masking device,

the forward end of the light shielding screen being provided with a flat bar having knife edges, each pair of the neighboring flat bars with knife edges being slideably engaged one over another with their broader surfaces contacting back to back, and

a color compensating means adapted to be selectively actuated for each of the original pictures.

4,417,811

**METHOD AND DEVICE FOR MAKING PHOTOGRAPHIC COPIES**

Rudolf Hamer, Heintzmannstr. 166, 463 Bochum, BRD, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,826

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949290

Int. Cl.<sup>3</sup> G03B 27/32

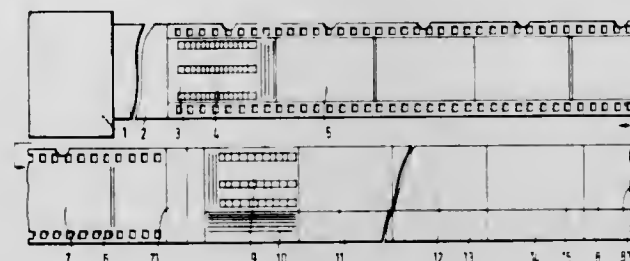
U.S. Cl. 355—77

2 Claims

1. A method for making positive photographic copies from uncut negative film strips which at the first order are stored in a camera cartridge in the undeveloped condition and are delivered with an order pocket which carries the general order data, comprising the steps of developing the negative film strips; making during the first order processing a positive strip copy, without making enlarged prints, including pictures of

data fields arranged in conjunction with the individual positive pictures of the negative film strip for receiving relevant film processing data readable by a data processing machine; connecting the positive strip copy with one end of the developed negative film strip; and upon completion of the first order, connecting the other end of the developed negative strip with

control unit (11) having separate outputs connected to said display (13) and to said manipulating unit (14) and to said optical system (1) and to said inverter (12) and to said sampler (15) and to each of said converters (8, 9), said inverter (12) also having separate outputs one connected to each of said converters (8, 9), said automatic sampler (15) having an output connected to said cuvette.



an auxiliary strip in the file cartridge to form a permanent file unit so that when it is necessary to make a reorder, it suffices to withdraw from the file cartridge only the positive strip copy with the individual positive pictures and the data fields to be read by a machine, while the negative film strip is withdrawn from the file cartridge only for making positive copies according to the reorder.

4,417,812

**CIRCUIT ARRANGEMENT FOR DETERMINING THE CHARACTERISTICS OF LIQUIDS AND/OR GASES, IN PARTICULAR THE HEMOGLOBIN CONTENT OF THE BLOOD**

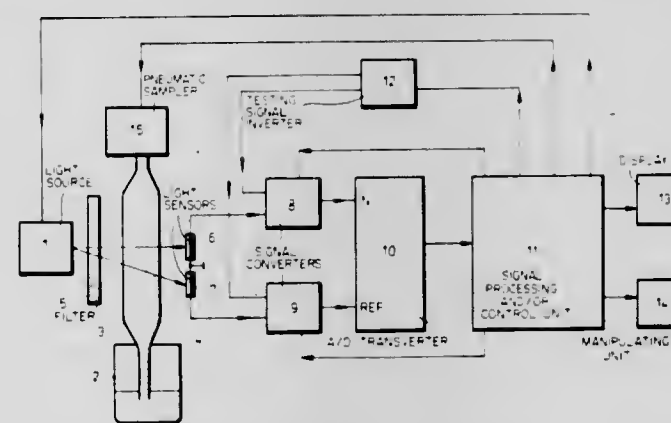
Laszlo Cserey; Gabor Horvath; Tamas Szabados; Sandor Simonkay; Janos Szitapanovits; Pal Vimlati; Zoltan Istvan, and Pal Villich, all of Budapest, Hungary, assignors to Medicor Muvek, Budapest, Hungary

Filed Mar. 3, 1981, Ser. No. 240,177

Int. Cl.<sup>3</sup> G01N 33/28, 21/27

U.S. Cl. 356—40

3 Claims



1. A circuit arrangement for determining the characteristics of fluids, comprising a double-light optical system (1), a measuring cuvette (3), an interference filter (5) disposed between the optical system and the cuvette and through which both lights from the optical system pass, two light sensing elements (6 and 7), two current-to-voltage converters (8 and 9), an A/D signal transverter (10), a signal processing and/or control unit (11), a testing D/A inverter (12), a display (13), a manipulating unit (14), and an automatic sampler (15), the cuvette dipping into a receptacle (2) for a fluid (4) to be tested, one of said lights passing through said cuvette (3) and striking one (6) of said light sensing elements, the other of said lights bypassing said cuvette (3) and striking the other (7) of said light sensing elements, said one (6) light sensing element being connected to an input of one (8) of said converters, said other (7) of said light sensing elements being connected to an input of the other (9) of said converters, an output of each of said converters (8, 9) being connected to a respective input of said signal transverter (10) which is in turn connected to an input of said signal processing and/or control unit (11), said signal processing or

4,417,813

**NON-SCANNED HETERODYNE IMAGING SENSOR**

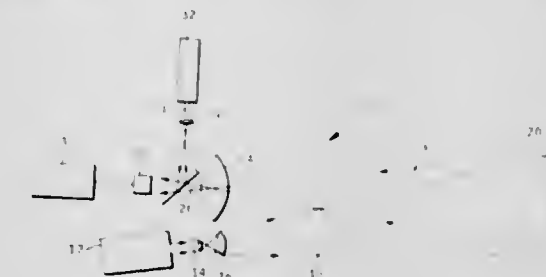
Bruce J. Bartholomew, Poway, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Sep. 11, 1981, Ser. No. 301,265

Int. Cl.<sup>3</sup> G02B 9/02

U.S. Cl. 356—349

4 Claims



1. A non-scanning heterodyne imaging sensor comprising a first source of coherent light, means directing a beam from said first source of coherent light for illuminating an object, a photodetector, means directing a beam of the reflection of said object onto said photodetector, a second multi-frequency coherent light source, means directing light from said multi-frequency light source onto said photodetector concurrently with the reflected beam of said object for providing a plurality of points on said photodetector each with a different frequency, means for sensing each of said points on said photodetector to provide an image of said object.

4,417,814

**NIGHT SIGHT WITH ILLUMINATED AIMING POINT**

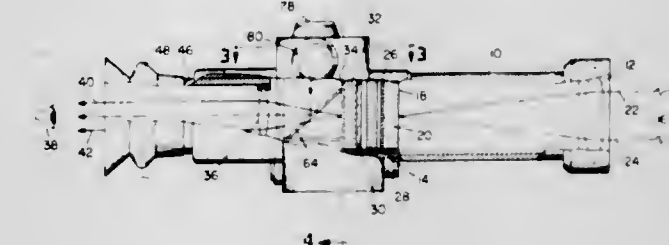
Darrel Doliber, Tempe, Ariz., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sep. 23, 1980, Ser. No. 190,007

Int. Cl.<sup>3</sup> G02B 23/10, 27/34

U.S. Cl. 356—252

13 Claims



1. A night sight comprising:  
(a) an image intensifier tube having an image input surface and image output surface;  
(b) first lens means for imaging a viewed scene onto said input surface;  
(c) second lens means for projecting to a viewer an output image of said scene formed at said output surface;  
(d) means, including a light source, for providing an illuminated aiming mark;  
(e) beam combiner means for directing light from said aiming mark along an optical axis through said second lens



means to said viewer so as to superimpose an image of said aiming mark onto said output image projected to said viewer;

(f) a housing for mounting and protecting the other components of said nightsight; and

(g) means for translating said image of said aiming mark in elevation and windage including

(1) a light source support block for holding said aiming mark;

(2) guide surfaces integral with said housing upon which said support block slides in one or the other of two mutually orthogonal directions;

(3) means, including an elevation adjustment knob, for controllably moving said support block in one of said directions so that said image of said aiming mark seen by said viewer moves in a vertical direction; and

(4) means, including a windage adjustment knob for controllably moving said support block in the other direction, so that said image of said aiming mark seen by said viewer moves in a horizontal direction.

4,417,815

## MEASURING APPARATUS

Robert T. Murray, Helsby, England, and Daniel J. Bradley, Dublin, Ireland, assignors to Imperial Chemical Industries PLC, London, England

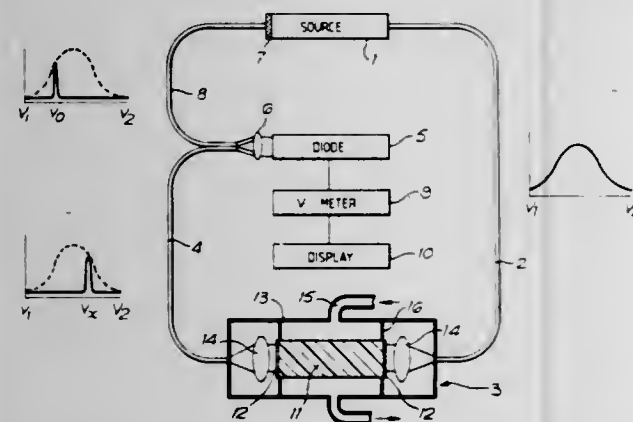
Filed Dec. 8, 1981, Ser. No. 328,710

Claims priority, application United Kingdom, Dec. 17, 1980, 8040393

Int. Cl.<sup>3</sup> G01B 9/02

U.S. Cl. 356—349

10 Claims



1. Apparatus for measuring or detecting changes in a physical or chemical parameter comprises:

a light source;

an interferometer having variable interference means positioned to receive light from the source and to transmit a portion of that light at a discrete frequency which is variable over a range of frequencies within the source bandwidth;

means for applying the parameter to the interference means thereby to vary the transmission frequency as a function of changes in the parameter;

means for beating the transmitted frequency with a reference frequency taken coherently from the same light source, and

detection means for measuring or detecting changes in the beat frequency thereby produced.

4,417,816

## LASER MEASURING SYSTEM AND METHOD FOR TURNING MACHINE

George F. Kindl, Newington; Olean E. Michaud, Bristol, and Joseph E. Brien, East Hartford, all of Conn., assignors to Colt Industries Operating Corp., West Hartford, Conn.

PCT No. PCT/01043, § 371 Date Aug. 11, 1980, § 102(e) Date Aug. 11, 1980, PCT Pub. No. WO82/00514, PCT Pub. Date Feb. 18, 1982. This application filed Aug. 11, 1980, Ser. No. 277,651

Int. Cl.<sup>3</sup> G01B 11/10

U.S. Cl. 356—357

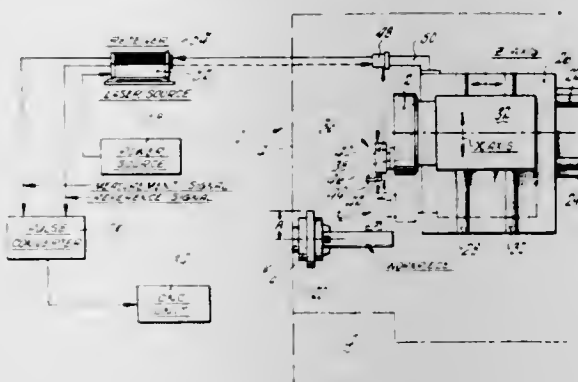
10 Claims

1. In an optical workpiece measuring system for a turning

machine having: a frame; a spindle mounted for rotation upon the frame and having a chuck secured thereto for rotation therewith; a Z-axis slide mounted upon the frame for movement along an axis parallel to the spindle axis; an X-axis slide carried by the Z-axis slide for movement along an axis transverse to the spindle axis; and a turret mounted upon the X-axis slide for rotation to a plurality of discrete index stations; the improvement comprising:

a gage head having a movable probe adapted to engage a surface of the workpiece and a reflector movable with the probe for receiving and reflecting a laser measurement beam;

a bracket connected to the gage head, and an index position on the turret for securing the gage head to the turret such



that when the turret is in a measuring index station the probe is adapted to be aligned with a diameter of the workpiece;

an interferometer for splitting a laser beam into a reference beam and the measurement beam and for reuniting the reference beam and the measurement beam to form a return beam, the interferometer being mounted upon the Z-axis slide such that it is in optical alignment with the reflector when the turret is in the measuring index station;

a laser transducer adapted to generate the laser beam positioned in optical alignment with the interferometer; and

a receiver for receiving the return beam and generating a measurement signal positioned in optical alignment with the interferometer.

4,417,817

## VOLUMETRIC MEASUREMENT OF PARTICLES

Rolf C. Böhme, Kyalami; Ian D. van Zyl, Bandburg, and Max M. Lazerson, Northcliff, all of South Africa, assignors to General Mining Union Corporation, Limited, South Africa

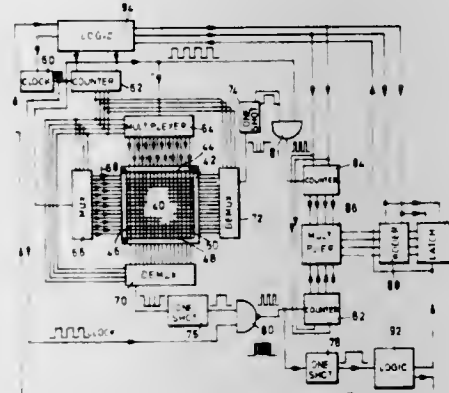
Filed Jan. 26, 1981, Ser. No. 229,053

Claims priority, application South Africa, Jun. 19, 1980, 80/3656; Jul. 15, 1980, 80/4250

Int. Cl.<sup>3</sup> G01B 11/28, 11/00

U.S. Cl. 356—380

9 Claims



1. Apparatus for obtaining a volumetric measurement of an article comprising a radiation imaging structure having a first

plurality of collimated radiation sources arranged to irradiate in a first direction a portion of the article within a zone, a first plurality of radiation detectors each of which is responsive to the radiation from a respective one of the first plurality of sources.

first counting means for determining the number of said first plurality of sources whose radiation impinges on the article thereby to derive a first measurement of a projection of a first dimension of the article in said first direction,

a second plurality of radiation sources arranged to irradiate the portion of the article within said zone in a second direction, a second plurality of radiation detectors each of which is responsive to the radiation from a respective one of the second plurality of sources,

second counting means for determining the number of said plurality of sources whose radiation impinges on the article thereby to derive a second measurement of a projection of a second dimension of the article in said second direction,

first and second multiplexing means for sequentially driving said first and second pluralities of radiation sources, respectively, to generate sequential radiation beams,

first and second demultiplexing means synchronized with said first and second multiplexing means, respectively, for sequentially sampling said first and second pluralities of radiation detectors to provide respective signals to said first and second counting means representing the number of sources of said first and second pluralities of sources whose radiation impinges on the portion of the article,

multiplying means for obtaining the product of the numbers in said first and second counting means thereby to derive a measurement of the volume of the portion of the article within the zone,

accumulating means for accumulating measurements of the volume portions of the article thereby to derive a volumetric measurement of the article, and

further comprising clock means generating a repetitive signal and a third counter means driven thereby for providing output signals controlling operation of said first and second multiplexing means and said first and second demultiplexing means.

4,417,818

## INTEGRATING DENSITOMETER

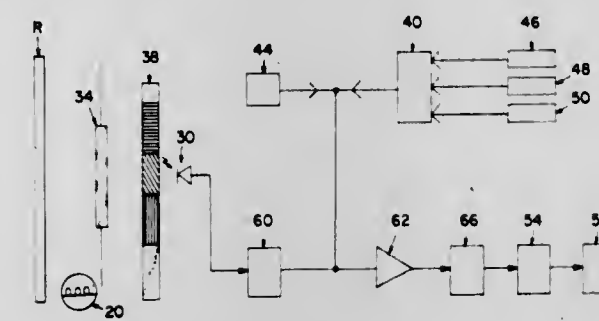
Ralph M. Weisner, 6447 Farralene Ave., Canoga Park, Calif. 91303

Filed Feb. 12, 1981, Ser. No. 233,785

Int. Cl.<sup>3</sup> G01J 3/40, 3/48; G03B 27/72

U.S. Cl. 356—404

8 Claims



1. An integrating densitometer for evaluating a reference and a photographically processed test print made by a photographing printing system, prior to making another print comprising: a light source; light sensor means; a stage for supporting an image of a reference or the test print as illuminated by said light source wherein said sensor means responds to light rays along a light path as influenced by the image at said stage; a plurality of color filter means movable selectively into the light path between said light sensor means, and said stage for ascertaining at least trichromatic quantity and quality values of the image at said stage; circuitry including means for establishing electrical reference values for the quantity and quality of light impinging on the reference image at said stage for evalua-

tion of said light sensor means, the electrical reference values representing the density and/or trichromatic quantity and quality of the light from the reference image at said stage; and density control means for biasing simultaneously said electrical reference establishing means to shift said trichromatic values proportionately as required to obtain equalization of the density value upon comparison of the reference and test print images wherein the differences in the density and/or the trichromatic values of the reference and the test print are introduced into the photographic printing system to generate another print.

4,417,819

## WATCHBAND LIGHT ATTACHMENT FOR A WRISTWATCH

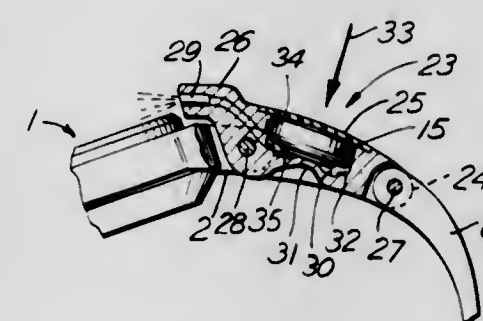
Jean P. Migeon, Recologne, France, assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 30, 1982, Ser. No. 394,032

Int. Cl.<sup>3</sup> G04B 19/30

U.S. Cl. 368—67

7 Claims



1. In a wristwatch having a case with connection means for attachment of a watchband and containing a timepiece face portion to be illuminated, and a watchband having first and second attachment ends, at least said first end being attached to said connection means, the improvement comprising a self-contained illumination device removably held by said second attachment end of the watchband and having an overhanging portion extending beyond said connection means and carrying a lamp arranged to illuminate said face portion, said illumination device defining a cavity, a battery disposed in said cavity having a pair of battery terminals, a pair of lamp terminals disposed in said cavity connected to said lamp a portion of the wall of said cavity being flexible and adapted to permit contact between at least one of said battery terminals and at least one of said lamp terminals when the illumination device is manually actuated.

4,417,820

## TIME-KEEPING DEVICE, ESPECIALLY A QUARTZ-CONTROLLED CLOCK

Peter Busch, Fenin, Switzerland, and Horst Schaefer, Friedrichsdorf, Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Continuation of Ser. No. 202,385 filed as PCT DE79/00137, Nov. 15, 1979, published as WO80/01113, May 29, 1980, § 102(e) date Jun. 19, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 358,934

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1978, 2850295; Nov. 20, 1978, 2850325; Nov. 20, 1978, 2850357

Int. Cl.<sup>3</sup> G04B 17/00, 17/12; G04F 5/00

U.S. Cl. 368—200

5 Claims

1. A quartz controlled timing device including a display system comprising:

an oscillator;

first and second electronic frequency divider stages, coupled to said oscillator for delivering a first pulse train having a first frequency;

an electronically controlled motor, with a set rotational speed, having an operating winding which drives the display system and a pick-up winding detecting the rota-

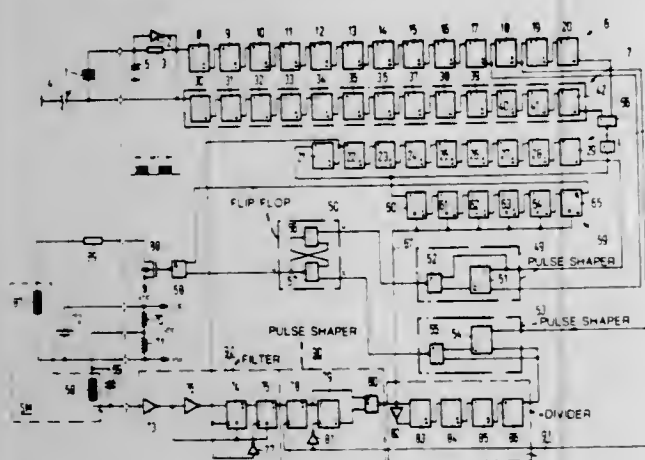


tions of the motor and delivering a second pulse train having a second frequency;

means for converting said second pulse train into a third pulse train having approximately the same frequency as said first pulse train;

a flip-flop means having a first and second input and an output, said first input receiving said first pulse train from said electronic frequency divider stages, said second input receiving said second pulse train, said output providing a high level signal after a set pulse of the first pulse train has arrived from said frequency divider stages and a low level signal after a pulse of the third pulse train has arrived from said converting means;

a multi-stage frequency divider having two inputs and an output, said first input being connected with the output of the first electronic frequency divider stage for providing a third frequency, said second input receiving the second pulse train;



a gate means for providing a fourth pulse train having a fourth frequency and having a first and second input and an output, said output of said multi-stage frequency divider being connected to said first input of said gate means, said second input of which being connected to said output of said flip-flop means; and

an amplifier means responsive to the output pulses of said gate means for applying said fourth pulses from the output of said multi-stage frequency divider to the operating winding of said electronically controlled motor when the output of said flip-flop means is generating a high level output signal, thus accelerating said motor to a maximum of set rotational speed and for dropping a flow of current to said motor when the output of said flip-flop means is generating a low level output signal thus being only one rotational speed above the set rotational speed controllably adjustable.

4,417,821

## WRIST WATCH

Wolfgang Herchenbach, Pforzheim, Fed. Rep. of Germany, assignor to Rodi & Wienenberger AG, Pforzheim, Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,928

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043263; Apr. 24, 1981, 3116306

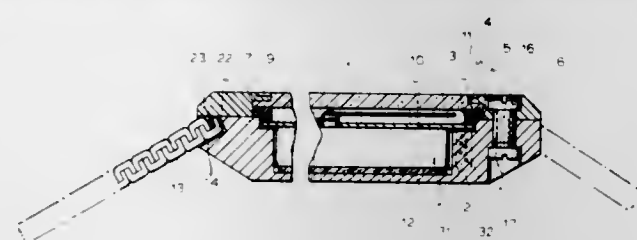
Int. Cl.<sup>3</sup> G04C 23/02; G04B 37/08

U.S. Cl. 368—291

30 Claims

1. A wrist watch, particularly a water-tight wrist watch, comprising a housing having a substantially cup-shaped lower housing part and a substantially frameshaped upper housing part connected with one another, said upper housing part having a collar-like portion; a watch mechanism received in said lower housing part; a watch glass having a step portion; a dial member; a spacer member having a wall; and an elastic element arranged in said lower housing part, said upper housing part pressing said watch mechanism via said watch glass,

said spacer member and said dial member against said elastic member, and said collar-like portion of said upper housing part



extending over said wall of said spacer member and lying on said step portion of said watch glass.

4,417,822

## LASER RADIOMETER

Alexander Stein, Secaucus, N.J.; Paul Rabinowitz, Old Bethpage, N.Y., and Andrew Kaldor, Watchung, N.J., assignors to Exxon Research and Engineering Company, Florham, N.J.

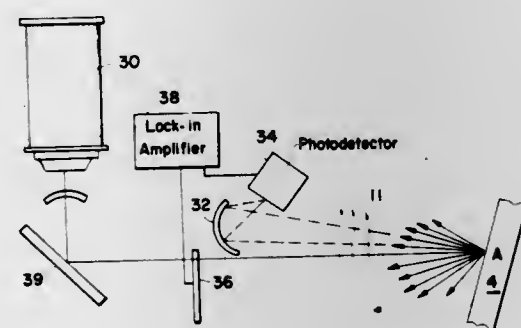
Continuation-in-part of Ser. No. 229,172, Jan. 28, 1981,

abandoned. This application Nov. 9, 1981, Ser. No. 319,244

Int. Cl.<sup>3</sup> G01J 5/52, 5/62

U.S. Cl. 374—129

16 Claims



1. A laser heterodyne temperature measuring device for temperature measurement of a remote radiant source, said device comprises:

a laser having a principal output at wavelength  $\lambda$ ;

means for intercepting an amount of thermal radiation emitted from said radiant source;

means for superimposing said intercepted radiation with said laser signal;

a photodetector positioned to receive said superimposed radiation and laser output, said photodetector responding thereto to provide a subject electrical beat signal, a value of power for said signal being a known function of thermal radiance of remote source;

discriminator means being operative to distinguish a subject signal for unwanted noise signals;

means for illuminating at least a portion of said radiant source with said laser signal, whereupon an amount of said illuminating laser signal is diffusely reflected from a surface region of said radiant source;

means for detecting at least a portion of said diffusely reflected laser signal over a predetermined solid angle, said detecting means being responsive to provide a photoelectric signal which is a known function of emissivity for a surface region of said radiant source, said signal corresponding to a value of emissivity whereupon compensating said value of power for thermal radiance for said value of emissivity an accurate measurement of the temperature of the remote radiant source is provided, said detecting means collecting a plurality of speckle lobes of varying brightness of said reflected laser signal of sufficient number so as to obtain a spatial average over the intensity of said reflected laser signal.

4,417,823

## HYDROSTATIC GUIDE BEARING OF A SEAT

Michel Drevet, Lyons, France, and Jean Trouillet, Fontaine-Valmont, Belgium, assignors to Jeumont Schneider Corporation, Puteaux, France

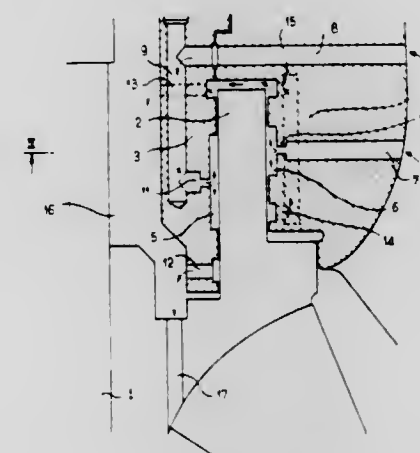
PCT No. PCT/FR80/00163, § 371 Date Jul. 6, 1981, § 102(e) Date Jul. 6, 1981, PCT Pub. No. WO81/01449, PCT Pub. Date May 28, 1981

PCT Filed Nov. 17, 1980, Ser. No. 281,190

Claims priority, application France, Nov. 20, 1979, 79 28524 Int. Cl.<sup>3</sup> F16C 32/06

U.S. Cl. 384—115

13 Claims



1. Hydrostatic guide bearing for a shaft having a journal in the form of a sleeve, characterized in that the bearing comprises a first and a second set of chambers disposed in concentric races respectively opposite the internal wall and the external wall of the said journal, and that the chambers of the said first set are angularly displaced with respect to the chambers of the said second set.

4,417,824

## OPTICAL KEYBOARD WITH COMMON LIGHT TRANSMISSION MEMBERS

Robert L. Paterson, Nicholasville, and Jerry M. Sublette, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

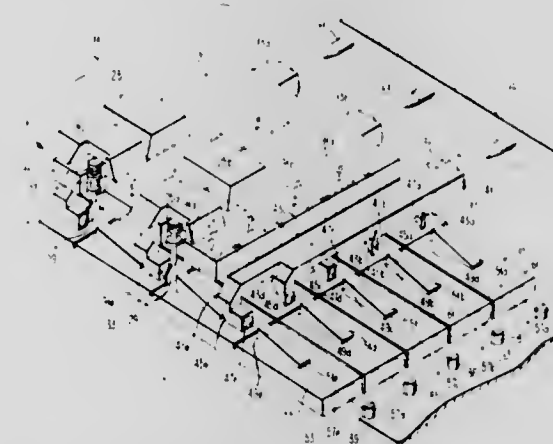
PCT No. PCT/US82/00379, § 371 Date Mar. 29, 1982, § 102(e) Date Mar. 29, 1982

PCT Filed Mar. 29, 1982, Ser. No. 375,799

Int. Cl.<sup>3</sup> B41J 5/00

U.S. Cl. 400—477

5 Claims



1. A keyboard comprising:

a plurality of keys arranged in an M row by N column matrix format;

a plurality of at least N light sources for generating N light beams, there being at least one light source for each column;

a first light transmission member having at least N common light transmission paths each for transmitting at least one

of said light beams from one of said N light sources to M terminal points, there being a terminal point for each row; a second light transmission member having at least M common light transmission paths, one for each row, each path having N light receptors, each N light receptor of a M light transmission path being aligned with a terminal point of a different light transmission path of said first light transmission member to form a light path therebetween; a plurality of interrupters each responsive to the depression of different key and each uniquely located between a terminal point and corresponding light receptor for interrupting the light path therebetween upon key depression; a plurality of M light sensors each aligned with a different one of said M light transmission paths for sensing the presence or absence of light transmitted along its associated second light transmission path; logic means for timewise sequencing said light sources and for gating the output signals of said sensors to provide a logic indication indicating the depressed key; wherein the improvement comprises:

said first light transmission member having a plurality of M reflecting surfaces along the transmission path of each of said N light beams, each reflecting surface deflecting a portion of its associated light beam vertically from its first plane of travel within said first transmission member to a second plane of travel within said first transmission member;

said first light transmission member having a second plurality of M reflecting surfaces for deflecting said portions of said light beams along a third plane of travel within said first transmission member vertically displaced from said first plane of travel and in a direction approximately orthogonal to the direction of travel of said light beam in said first plane of travel;

said second light transmission member having a plurality of at least N reflecting surfaces for each of said M light transmission paths for directing light from said light receptors to said light sensors along each M common light transmission path.

4,417,825

## PRINT DRIVE MEDIUM FOR LINE/SERIES PRINTERS

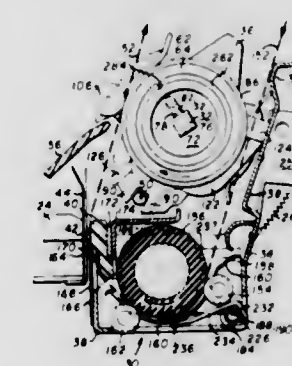
James E. Cushman, San Jose; Mario G. Plaza, and Helmut K. Waibel, both of Fremont, all of Calif., assignors to Durango Systems, Inc., San Jose, Calif.

Continuation of Ser. No. 239,983, Mar. 3, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 482,815

Int. Cl.<sup>3</sup> B41J 15/00

U.S. Cl. 400—605

19 Claims



1. An improved print medium driving mechanism adapted to advance individual cut sheets of print medium and a continuous web of print medium, said continuous web print medium having preformed lateral perforations uniformly spaced along its outer edges, the print medium driving mechanism including at least one rotatably driven spur drive member having a spur wheel with a plurality of spurs positioned equally about and projecting radially from its outer peripheral rim, said spur drive member being adapted for engaging continuous web



print medium about its lateral perforations and advancing said print medium uniformly along the path from its entry into the drive mechanism, through a printing station where it may be printed upon and thence of its departure from the drive mechanism wherein the improvement comprises:

a rotatably driven friction feed roller disposed upstream from the printing station and adapted to advance individual cut sheets of print medium into said printing station;

a plurality of pressure rollers individually shorter than and aligned coaxially with the friction feed roller, said pressure rollers being adapted to urge cut sheets of print medium into frictional engagement with said friction feed roller;

pressure means coupled to the pressure rollers and having a first position for maintaining the pressure rollers in a location immediately adjacent to and urged toward the friction feed roller whereby the pressure rollers may clamp cut sheets of print medium into frictional engagement with the feed roller, the pressure means having a second position for maintaining the pressure rollers in a location away from the friction feed roller whereby print medium is freed from frictional engagement with the feed roller;

at least one friction feed assembly including a driven friction feed wheel and a feed wheel pressure roller, the assembly further including force means having a first position for maintaining said feed wheel pressure roller in a location immediately adjacent to and urged towards said friction feed wheel whereby said feed wheel pressure roller may clamp cut sheets of print medium into frictional engagement with said friction feed wheel, said force means having a second position for maintaining said feed wheel pressure roller in a location out of said path along which a continuous web of print medium may be advanced by the spur drive member;

drive means for synchronously rotating the spur drive member, the friction feed roller and said friction feed wheel of the friction feed assembly; and

guide means for directing a continuous web or cut sheets of print medium along a path first directed toward the friction feed roller, thence passing between the friction feed roller and the pressure roller, thence passing through said printing station and last directed toward said friction feed wheel of the friction feed assembly.

4,417,826

# LIQUID DRIVEN ROTARY BRUSH WITH LIQUID SOAP FEEDER

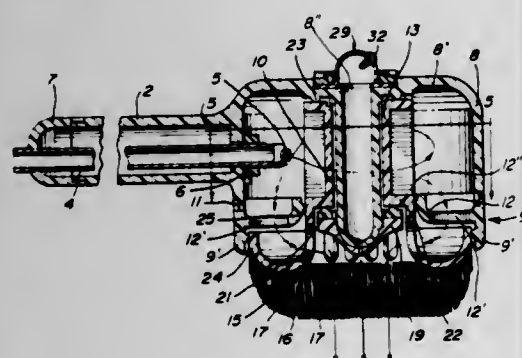
Constantinos Floros, 7475 Madrid St., Brossard, Canada J4Y 1G1

Filed Dec. 24, 1981, Ser. No. 334,306

Int. Cl.<sup>3</sup> A46B 11/02, 13/06

U.S. Cl. 401—41

3 Claims



1. A rotary brush comprising a casing having a cylindrical wall and first and second end walls, each having a central aperture, said casing formed of two sections, each including an end wall and a portion of said cylindrical wall, means to interconnect said cylindrical wall portions in end-to-end relation, the section including the second end wall having a skirt projecting beyond said second end wall, a hollow handle secured to and laterally extending from said cylindrical wall, a water

feed pipe extending within said handle, having an outer end formed with means for connection to a water supply under pressure and an inner end defining a nozzle directed within said Commissioner of Patents and Trademarks February 3, 1983 casing, a hollow shaft extending within and coaxial with said casing, said shaft having a first end fixed to said first end wall and surrounding the central aperture of the latter, and a free end portion extending through the central aperture of said second end wall and beyond the latter, said free end portion being closed, except for a small discharge opening, a paddle wheel including a hub and radial paddles, the hub mounted on said shaft with the paddles extending in said casing to be impinged upon and rotated by a water jet issuing from said nozzle, said hub having an extension protruding through said central aperture of said second end wall and defining a radially-outwardly extending annular shape brush bristle-carrying portion axially spaced from and overlying said second end wall and having a free circular edge portion in sliding and rotational engagement with said skirt, brush bristles carried by said bristle-carrying portion and extending therefrom in a direction away from said end wall, axially of said shaft, to form an annular brush with a central open space, said second end wall and said brush-carrying portion having a plurality of holes allowing water within said casing to flow into said central space, said small discharge opening exposed within said central space, a flexible cap closing the central aperture of said first end wall and the first end of said hollow shaft, and means to fill said hollow shaft with a liquid detergent, pressure exerted on said flexible cap causing detergent to flow into said central space through said small discharge opening.

4,417,827

# STICK-TYPE COSMETIC APPLICATOR

Yutaka Kasai, Yokohama, and Satoru Naramoto, Kashiwa, both of Japan, assignors to Shiseido Company, Ltd., Japan

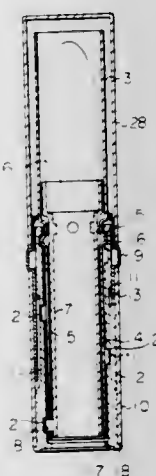
Filed May 11, 1981, Ser. No. 262,610

Claims priority, application Japan, May 20, 1980, 55-69061[U]

Int. Cl.<sup>3</sup> A45D 40/06

U.S. Cl. 401—68

2 Claims



1. A stick-type cosmetic applicator comprising:

a sliding sleeve having a solid cosmetic receiving portion for receiving a stick-type cosmetic extending from a first end thereof and having at least one radially extending projection on the outer surface near the second end thereof;

a guide sleeve surrounding said sliding sleeve from said second end to a point intermediate said first and second ends, having at least one longitudinal slot extending from an end of said guide sleeve proximate to said second end of said sliding sleeve, in which said radially extending projection of said sliding sleeve travels, said slot guiding said sliding sleeve and preventing rotation of said sliding sleeve with regard to said guide sleeve, and having an annular projection on the outer surface thereof;

a housing sleeve integrally formed with said guide sleeve,

surrounding said solid cosmetic receiving portion of said sliding sleeve and extending therefrom to house said stick-type cosmetic;

a driving sleeve surrounding said guide sleeve having at least one spiral groove for engagement with said radially extending projection of said sliding sleeve, said driving sleeve being rotatable about said guide sleeve and said sliding sleeve, and having an annular recess on the inner surface for engagement with said annular projection on said guide sleeve, an annular recess on the outer surface, a longitudinal projection on the outer surface and flanges on the inner and outer surfaces at the end distant from the cosmetic receiving portion of said sliding sleeve; said inner flange engaging said guide sleeve;

an intermediate sleeve fixedly installed on the outer surface of said driving sleeve and extending onto said housing sleeve having a longitudinal slot for engagement with said longitudinal projection of said driving sleeve and an annular projection;

an outer sleeve fixedly installed on said intermediate sleeve, secured between said annular projection of said intermediate sleeve and said flange on the outer surface of said driving sleeve, rotation of which is transmitted to said driving sleeve through said intermediate sleeve causing said radially extending projection to travel in said spiral groove, said sliding sleeve thereby travelling within said guide sleeve and said housing sleeve; and

a cap demountably installed on said intermediate sleeve surrounding said housing sleeve.

4,417,828

# EROSION PROTECTION MAT

Jan G. de Winter, Enschede, Netherlands, assignor to Nicolon B.V., Enschede, Netherlands

Filed Sep. 9, 1981, Ser. No. 300,673

Claims priority, application Netherlands, Sep. 15, 1980, 8005159

Int. Cl.<sup>3</sup> E02B 3/12

U.S. Cl. 405—17

7 Claims



1. An erosion-protecting mat comprising a water-pervious tissue layer having anchoring loops projecting outwardly from at least one surface of the tissue, the anchoring loops being integral portions of a yarn woven across the tissue and periodically protruding from said surface of the tissue.

4,417,829

# SAFETY DEVICE FOR UNDERGROUND STORAGE OF LIQUEFIED GAS

Georges Berezoutzky, Cesson, France, assignor to Societe Francaise de Stockage Geologique "Goestock", Paris, France

Continuation of Ser. No. 106,030, Dec. 21, 1979, abandoned.

This application Feb. 17, 1982, Ser. No. 349,668

Claims priority, application France, Dec. 28, 1978, 78 36633

Int. Cl.<sup>3</sup> B65G 5/00

U.S. Cl. 405—54

14 Claims

1. An apparatus for underground storage of liquefied gas in a storage chamber comprising:

water disposed within predetermined levels at a bottom portion of said storage apparatus;

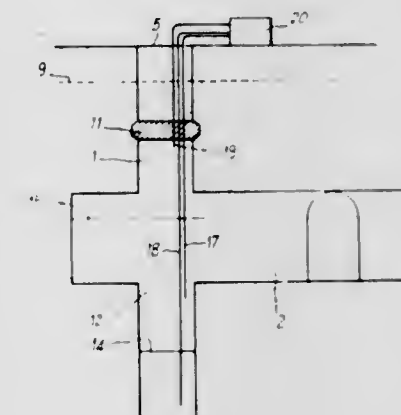
liquefied gas disposed above said water level to a predetermined liquid level;

gas in a gaseous phase disposed above said liquid level of said liquefied gas;

at least one tube extending from ground level into said storage for controlling and working said storage from above; said at least one tube comprising at least one extraction tube for extracting said liquefied gas from said storage;

means for generating an alarm signal in response to a change in said predetermined water levels;

means for filling said at least one extraction tube up to a hydrostatic balance level within said at least one extraction tube;



a trap for draining said water from said storage comprising a sunk draining trap in the form of a well disposed in a lower portion of said storage; and

said at least one extraction tube having a suction opening formed therein and extending down into said trap along a distance such that the volume of said trap above said suction opening is sufficient for filling said at least one extraction tube up to said hydrostatic balance level.

4,417,830

# CONNECTOR ASSEMBLY

Keith Shotbolt, London, England, assignor to Constructors John Brown Limited, Paddington, England

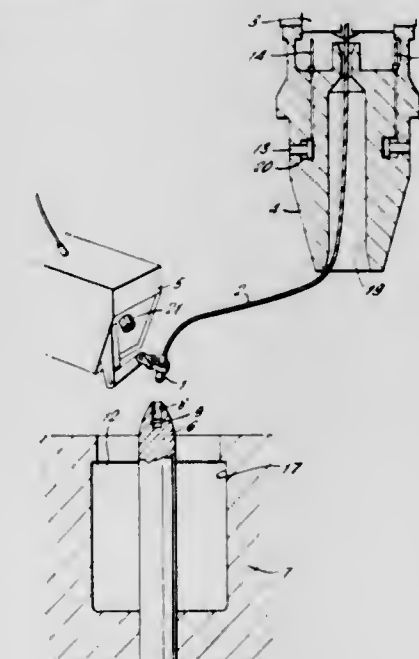
Filed Feb. 9, 1981, Ser. No. 232,547

Claims priority, application United Kingdom, Feb. 11, 1980, 8004493

Int. Cl.<sup>3</sup> E02B 3/16; E16L 35/00

U.S. Cl. 405—169

13 Claims



1. A connector assembly comprising first and second connecting parts together with means for laterally aligning the connecting parts for connection together, the first connecting part having a guide post and the second connecting part having means for receiving the guide post such that when the



guide post is received the first and second connecting part are laterally and angularly oriented for connection, wherein the first and second connecting parts are adapted to lock together and wherein the lateral alignment means comprises a line provided with a remotely releasable latching means by which the line is releasably attached to the guide post so that the line extends therefrom and may be passed through the receiving means of the second connecting part and the second connecting part may then be slid down the line so that the guide post is thereby brought into the receiving means and the two parts thereby laterally and angularly oriented for connection and after connection the latching means may be released and the line withdrawn through the second connecting part.

4,417,831

# MOORING AND SUPPORTING APPARATUS AND METHODS FOR A GUYED MARINE STRUCTURE

Philip A. Abbott, James E. Dailey, Demir I. Karsan, and Andrea Mangiavacchi, all of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

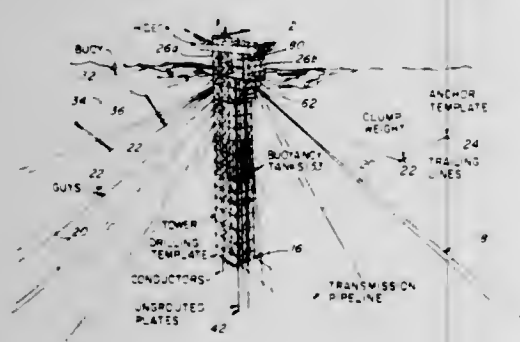
Filed Apr. 24, 1981, Ser. No. 257,391

Claims priority, application United Kingdom, Apr. 30, 1980, 8014261

Int. Cl.<sup>3</sup> E02B 17/00

U.S. Cl. 405—227

18 Claims



1. In a gyped marine structure having a substantially upright structural member, said member extending from the bottom of a body of water to a position above the surface of said body of water, a lateral support means connected to said member near said water surface for providing lateral support for said member against forces tending to move the member in a lateral direction, and a load supporting foundation connected to support at least a portion of the weight of said member, the improvement wherein said lateral support means comprises a first plurality of transversely spaced guy line pairs, each pair of lines being connected at a first end to an upper portion of said structural member and at a second end to a respective clump weight resting, under normal sea conditions, on said water bottom, and a second plurality of transversely spaced guy line pairs, each pair of lines being connected at a first end to a respective clump weight and at a second end to a respective anchor means radially spaced further from said member than said associated clump weight, whereby under severe sea conditions wherein at least a said clump weight is raised off said sea bottom said weight is raised without tipping over and each line of a said pair of guy lines remains transversely spaced from one another.

4,417,832

# SILO FOR BULK MATERIAL

Werner Krauss, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

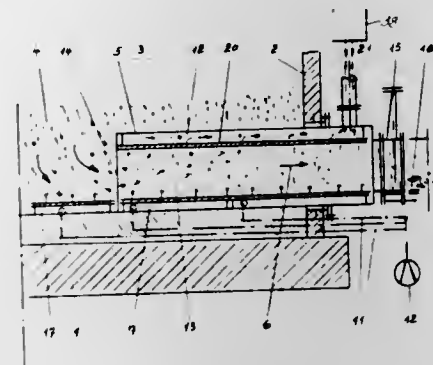
Filed Apr. 14, 1981, Ser. No. 254,209

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014206

Int. Cl.<sup>3</sup> B65G 53/22

U.S. Cl. 406—90

3 Claims



1. A silo capable of containing particulate material and having unloading means comprising a channel positioned in said silo at a relatively slight downwardly outwardly disposed incline terminating externally of said silo, said channel having an imperforate bottom, first sidewalls, and an imperforate top wall, a pneumatic conveyor chute disposed internally along the bottom of said channel, said pneumatic conveyor chute having a bottom, sidewalls and perforated top, air pressure means adapted and constructed to supply pressurized air to said pneumatic conveyor chute whereby said air is distributed into said channel through said perforated top, a air draining chamber disposed internally along the top of said channel and vertically displaced from said pneumatic conveyor chute, said air draining chamber having a top, sidewalls and a perforated bottom whereby air in said channel is removed, exhaust means adapted and constructed to drain air from said air draining chamber, said channel having at least one particulate receiving entrance located internally of said silo, said pneumatic conveyor chute extending internally within said silo beyond said channel at said entrance or entrances whereby particulate material is introduced into said entrance, said channel extending externally of said silo and having an opening for removal of particulate material.

4,417,833

# ROTARY SLOT CUTTING TOOLS

Seev Wertheimer, Nahariya, Israel, assignor to Iscar Ltd., Nahariya, Israel

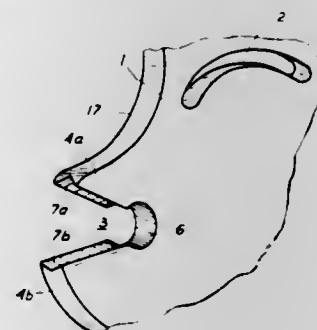
Filed Nov. 7, 1980, Ser. No. 205,047

Claims priority, application Israel, Oct. 21, 1980, 61323; Dec. 4, 1979, 58862

Int. Cl.<sup>3</sup> B26D 1/12

U.S. Cl. 407—61

13 Claims



1. A rotary slot cutting tool arrangement, comprising: a disc shaped tool,

cutting elements around the periphery of said tool, chip forming means on said cutting elements for forming the chips after the chips are generated during the cutting of slots on a workpiece, wherein said cutting elements have top cutting surfaces including said chip forming means, clearance sides extending from said top cutting surfaces, straight line cutting edges formed at the junctures of said top cutting surfaces and said clearance sides, land surfaces between said cutting edges and said chip forming means, and said chip forming means comprising rib means on said top cutting surfaces extending from said land surfaces longitudinally away from said cutting edges.

4,417,834

# MACHINE FOR DRILLING A DOUBLE T PROFILE

Leopold Jägers, Rudolf-Diesel-Strasse 1, D-5350 Euskirchen, Fed. Rep. of Germany, assignor to Leopold Jägers, Euskirchen, Fed. Rep. of Germany

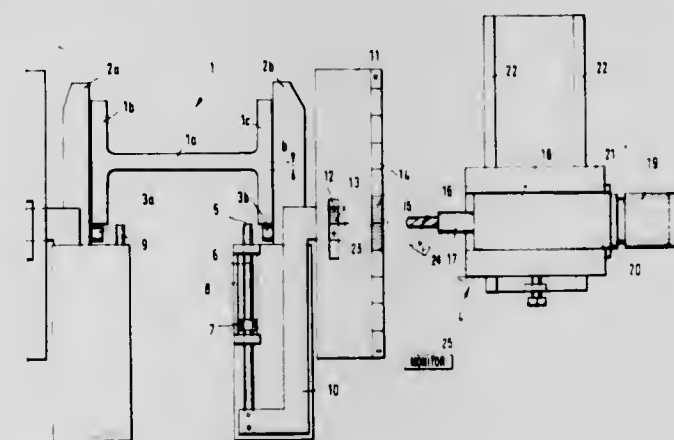
Filed Jan. 7, 1980, Ser. No. 109,974

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900469

Int. Cl.<sup>3</sup> B23B 41/00

U.S. Cl. 408—16

3 Claims



3. A drilling machine comprising means for mounting a profile having a stem along a longitudinal axis; a tracer mounted for movement perpendicularly of the profile stem for abutting the stem; a scale connected to said tracer for movement therewith and having a center line parallel with a center line of the profile stem to establish the position of said stem axis; a drill unit movably transversely of said longitudinal axis and including a drill for drilling a bore in the profile and an indicator positioned on said drill unit to indicate a drilling axis of said drill, said indicator being disposed in register with said center line of said scale to establish the position of said drill relative to said stem axis; an arm connected to said tracer for moving therewith; and a scale holder adjustably carried on said arm and having said scale attached thereto.

4,417,835

# APPARATUS FOR FORMING SHAPED EDGES

Wesley C. Lund, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 15, 1980, Ser. No. 216,534

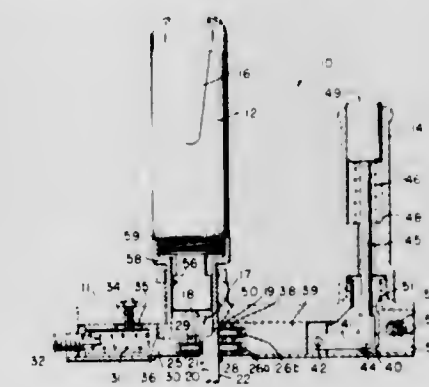
Int. Cl.<sup>3</sup> B23C 1/20

U.S. Cl. 409—180

5 Claims

1. A portable router comprising, in combination, a base member defining a horizontally oriented guide surface, a power driven routing tool fixedly mounted on said base member, said routing tool having a material removing blade extending below the plane of said guide surface, first back-up pressure roll means mounted on said base member with freedom for reciprocating sliding motion beneath said guide surface and

said material removing blade, a fixed stop mounted on said base member and positioned to be engageable with said back-up pressure roll means, first biasing means for normally biasing said back-up pressure roll means into engagement with said fixed stop, second pressure roll means mounted on said base member with freedom for reciprocating sliding motion beneath said base member, second biasing means for normally biasing said second pressure roll means in a direction away from said first back-up roll means so as to form a sheet workpiece receiving notch in said router beneath said guide surface, and operator controlled actuating means for overcoming said second biasing means for shifting said second pressure roll means towards said first back-up pressure roll means to clamp a sheet-like workpiece between said first and second pressure roll



means with an edge of the sheet-like workpiece engaged with said guide surface, and for thereafter relatively shifting said first and second pressure roll means and the sheet-like workpiece clamped therebetween laterally through a fixed predetermined distance so as to relatively move the face of the workpiece engaged with said first back-up pressure roll means and the sheet edge engaged with said guide surface into material removing engagement with said material removing blade whereby relative movement of said router along and with respect to the edge of the workpiece engaged with said guide surface serves to remove material from the face and edge of the workpiece in material removing engagement with said blade while maintaining a constant root face thickness at the thus formed shaped edge of the workpiece irrespective of variations in thickness of the workpiece.

4,417,836

# DEVICE FOR SEPARATING A STACK BY LAYERS, PARTICULARLY A STACK OF LONG TIMBERS OR LUMBER

Heinz Schlepe, Berlin, Fed. Rep. of Germany, assignor to Heinz Schlepe Grosshandel und Generalvertretung für Holzbearbeitungsmaschinen, Fed. Rep. of Germany

Filed Apr. 21, 1981, Ser. No. 256,010

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015648

Int. Cl.<sup>3</sup> B65G 59/02, 60/00

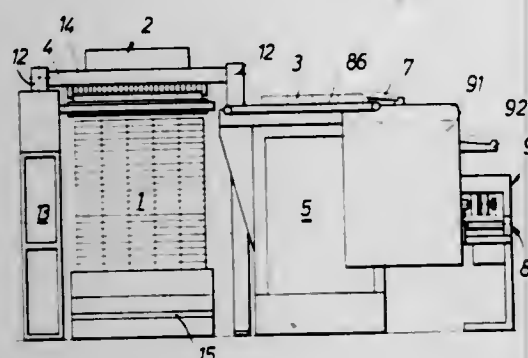
U.S. Cl. 414—32

26 Claims

1. A device for separating at least one elongated member at a time from a stack of such members comprising: shifting means positionable at one end of the stack for shifting at least one member of the stack so as to move a part of the member out over an opposite end of the stack; a propping element initially positionable at the opposite end of the stack, movable up under the part of the member over the opposite end of the stack to lift the at least one member, and across a top of the remainder of the stack to separate the shifted member from the remainder of the stack; drive means connected to said propping element for moving the propping element up under the member and across the top of the stack; and a plurality of transfer arms sequentially movable into a space between the lifted and separated at least one member and the



remainder of the stack, as the propping element moves across the top of the remainder of the stack, for receiving the at least one member and moving it away from the remainder



of the stack, and means connected to said transfer arms, positionable at a side of the stack for sequentially moving the transfer arms.

4,417,837

## APPARATUS FOR GROUPING ARTICLES

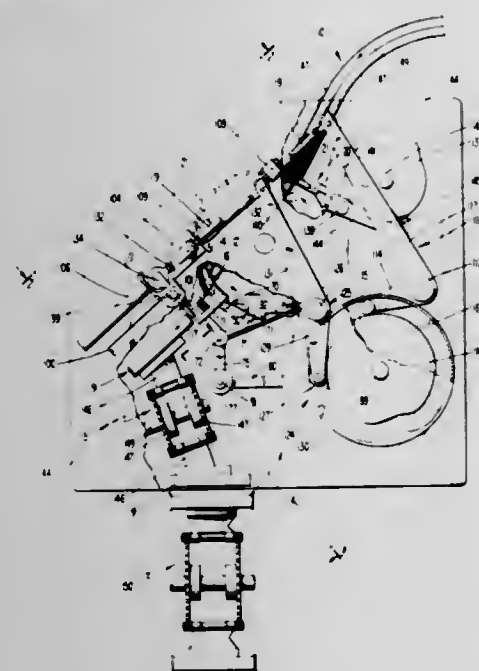
Albert A. Pinto, White Plains, N.Y., and George Ryder, West Orange, N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Filed Jun. 29, 1981, Ser. No. 278,874

Int. Cl.<sup>3</sup> B65G 57/00

U.S. Cl. 414—104

8 Claims



1. Article stacking apparatus comprising an infeed chute, a pair of inclined rails, a wheel for removing flat articles from the infeed chute and placing them on edge on said rails, said wheel being mounted about a generally horizontal axis and being formed with a plurality of serrated teeth on the outer edge thereof, each tooth having a generally radially oriented article engaging surface, and a generally tangentially oriented article receiving surface, said infeed chute extending downwardly to said wheel for delivering a column of flat articles into the path of said teeth, means for rotating said wheel so that each article engaging tooth surface in turn engages and removes the bottom article in the chute, vacuum means for holding the articles on the article receiving tooth surfaces as they are carried from said chute to said rails, wedge means mounted adjacent said rails for moving the articles away from the teeth, and a gate lever at the bottom end of said infeed chute, said lever being forked at one end thereof to provide two prongs separated by a slot, said prongs extending on each side of said teeth beneath the column of articles in said infeed chute, said teeth being received by said slot in said forked end of said lever, and cam means for operating said lever to lift said

prongs engaging the bottom article in said infeed chute and lifting the infeed column out of the path of said teeth.

6. Article stacking apparatus comprising an infeed chute, a pair of inclined rails, a wheel for removing flat articles from the infeed chute and placing them on edge on said rails, said wheel being mounted about a generally horizontal axis and being formed with a plurality of serrated teeth on the outer edge thereof, each tooth having a generally radially oriented article engaging surface and a generally tangentially oriented article receiving surface, said infeed chute extending downwardly to said wheel for delivering a column of flat articles into the path of said teeth, means for rotating said wheel so that each article engaging tooth surface in turn engages and removes the bottom article in the chute, vacuum means for holding the articles on the article receiving tooth surfaces as they are carried from said chute to said rails, wedge means mounted adjacent said rails for moving the articles away from the teeth, a conveyor having buckets movable into alignment with said rails for receiving and carrying away the stacks of articles deposited on the rails, first finger means extending upwardly between said rails for maintaining the articles deposited on said rails in an upright position, means for moving said first finger means first along said rails away from said wheel and then downwardly out of engagement with said articles, second finger means positioned above the conveyor bucket aligned with the rails and extending downwardly to maintain the articles upright after said first finger is moved out of engagement therewith, means for imparting a reciprocating motion to said second finger means along the length of the conveyor bucket, and means for rotating said second finger means into and out of an article engaging position so that the articles are guided into the conveyor bucket and the second finger means passes over the articles during its return to the starting position adjacent the rails.

4,417,838

## APPARATUS FOR LOADING ARTICLES INTO LANES ON HORIZONTAL SHELVES

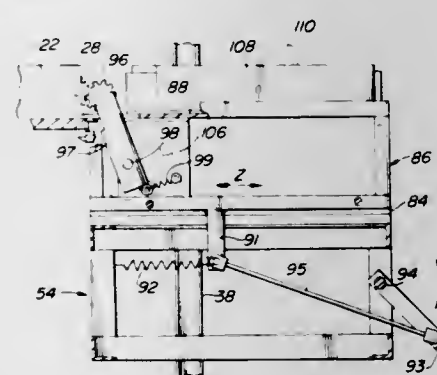
Charles W. Schultz, Easton, Pa., and James L. Thatcher, Alpha, N.J., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 23, 1980, Ser. No. 219,542

Int. Cl.<sup>3</sup> B65G 1/04

U.S. Cl. 414—277

10 Claims



1. Apparatus for loading articles into lanes on horizontal shelves comprising a loading frame mounted on wheels to permit the frame to move horizontally in a first direction, a main carriage supported by said frame for vertical movement, an auxiliary carriage supported by said main carriage for horizontal movement relative thereto in a second direction between operative and inoperative positions, said second direction being perpendicular to said first direction, a horizontal plate member supported by said auxiliary carriage and adapted to bridge a gap between said auxiliary carriage and a shelf in the operative position of the auxiliary carriage, a lane actuator supported by said auxiliary carriage and being adapted to drive an endless member connected to a pusher in a shelf lane to a reloading position, motor means on said auxiliary carriage for driving said lane actuator, whereby articles may be reloaded

onto a shelf lane from said plate member when said auxiliary carriage is in its operative position.

4,417,839

## AUTOMATIC HATCHERY TRAY DUMPER

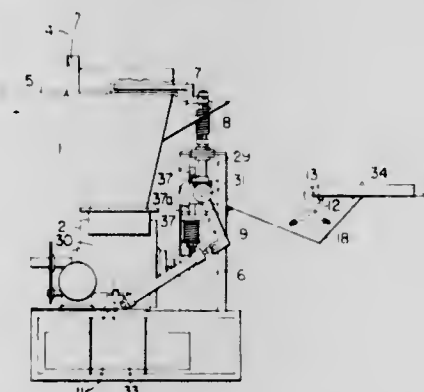
William F. Whitehead, Jr., Farmington; James A. Dickens, Watkinsville, and Benjamin C. Haynes, Jr., Athens, all of Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 85,440, Oct. 16, 1979, abandoned. This application Mar. 27, 1981, Ser. No. 248,371

Int. Cl.<sup>3</sup> B65G 65/23

U.S. Cl. 414—303

10 Claims



1. A hatchery tray dumper comprising:

- (a) a hopper having an open top;
- (b) a tray dumping means adjacent said hopper, said dumping means including: a tray support means to receive a tray in a horizontal, upright position, means for lifting said tray up and through an arc, tilting said tray past vertical, and inverting said tray onto the open top of the hopper, thereby dumping the contents of the tray into the hopper, said lifting means further including a means of initially assisting said lifting means and said support means further including means for holding said tray support means in a vertical position for a delayed time interval as well as tapered uprights affixed thereto to act as guides for the tray so that the tray will be centered over the hopper when dumped, and a means to retract the support means after the horizontal tray is dumped;
- (c) speed control means connected to the dumping means to slow down the speed of the support means near the end of its lift cycle so as to prevent trays from hitting the hopper with excessive force;
- (d) a tray pushing means connected to said hopper and said dumping means to push the trays off the hopper in response to retraction movement of the support means;
- (e) a striker plate affixed to the top of the hopper to control the travel of said tray when the tray is inverted onto the top of the hopper; and,
- (f) a spring assembly rigidly mounted to the pushing means, said spring assembly comprising a torsion spring inserted over the shaft of the pushing means, and a lugged collar communicating with a notched collar to retain the torsion spring on the pushing means.

4,417,840

## PARTICULATE MATERIAL TRANSFER SYSTEM

Weldon K. Johnson, Boise, Id., assignor to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Division of Ser. No. 81,888, Oct. 4, 1979, Pat. No. 4,290,725.

This application Apr. 2, 1981, Ser. No. 250,509

The portion of the term of this patent subsequent to Sep. 22, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B65G 67/06, 67/20, 67/22

U.S. Cl. 414—329

7 Claims

1. An improved overhead storage apparatus for protecting particulate material from the surrounding outside environment during the transfer of the material from the overhead storage

assembly adapted for use with a vehicle having a storage bin formed therein, at least one hatch door with each hatch door being connected to the vehicle and positioned so that the hatch doors cover the storage bin formed in the vehicle in a closed first position of the hatch doors, the hatch doors each being movable from the storage bin in the vehicle to an opened second position, the overhead storage assembly comprising:

- a loading chute having a lower end and a channel extending therethrough, the channel being in communication with the storage assembly for transferring the particulate material from the storage assembly through the channel in the loading chute;
- a temporary cover having an upper surface, a lower surface, a first end, an opposed second end, a first side and an opposed second side, the temporary cover being connected to the lower end of the loading chute with the channel of the loading chute extending through the temporary cover, at least a portion of the temporary cover



being positionable between the storage bin of the vehicle and the hatch door prior to the hatch door being moved from the closed first position to the opened second position, the temporary cover being positioned over and covering a portion of the storage bin of the vehicle covered by the hatch door in the closed first position of the hatch door thereby covering the storage bin of the vehicle prior to the hatch door being moved to the opened second position, the particulate material being transferrable from the overhead storage bin to the storage bin of the vehicle via the channel in the chute while the temporary cover covers the storage bin of the vehicle; and means operatively associated with the temporary cover for moving the hatch door from the closed first position to the opened second position after the temporary cover has been positioned over and covering a portion of the storage bin of the vehicle covered by the hatch door in the closed first position of the hatch door.

4,417,841

## LOADER AND TRANSPORTER

James B. Chadwick, Geebung, Australia, assignor to Hydraulics & Fabrications Pty. Ltd., Queensland, Australia

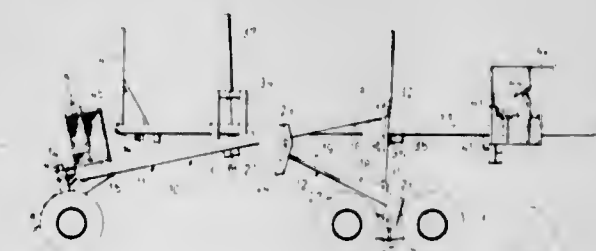
Filed Jul. 14, 1981, Ser. No. 283,339

Claims priority, application Australia, Jul. 30, 1980, PE4769

Int. Cl.<sup>3</sup> B60P 1/18, 1/30, 1/36

U.S. Cl. 414—346

11 Claims



1. A loader and transporter comprising a wheel mounted main frame, a deck, a reversible longitudinal conveyor on the deck, a pivotal connection transversely of and connecting the deck and main frame, lifting means for raising and lowering the



pivotal connection and deck relative to the main frame, tilting means for tilting the deck on the axis of the pivotal connection relative to the main frame when the deck is either lowered to bring it from a substantially horizontal low traveling position to a tilted loading position, or raised to bring it from a substantially horizontal high traveling position to a tilted unloading position, and the wheel mounted main frame including a rear chassis portion supported at its rear end on steerable wheels, and a pair of forward suspension arms pivoted at their rear ends about a transverse axis to said rear chassis portion and pivoted about transverse axes at their forward ends to a pair of laterally spaced drive wheel assemblies, said pivotal connection of the deck to the wheel mounted main frame being disposed substantially at the front of the rear chassis portion.

4,417,842

# SOIL EROSION PREVENTION BLOCK INSERT AND APPARATUS FOR POSITIONING

Kossuth J. Landry, Jr., P.O. Box 599, Channelview, Tex. 77530  
Filed Nov. 4, 1980, Ser. No. 204,055

Int. Cl.<sup>3</sup> E02B 3/12

U.S. Cl. 414—572

5 Claims



1. An apparatus for aligning and loading inserts for soil erosion prevention blocks, comprising:  
a rollably movable main frame;  
an insert holder frame movably coupled to said main frame, said insert holder frame adapted for movement between a first position, wherein said inserts are supported by said frame, and a second position, wherein said inserts are positioned for casting into soil erosion prevention blocks;  
at least one aligning frame formed within said insert holder frame for receiving at least one of said inserts;  
at least one hook movably coupled with said insert holder frame for engaging and retaining said at least one insert in said aligning frame; and  
means for moving said hook from a first engaged position wherein said hook engages said insert for movement with said insert holder frame to a second released position wherein said hook disengages said insert and said insert holder frame is movable independently of said insert.

4,417,843

# WAYSLESS MACHINE TOOL TABLE

Benno I. Bonga, Crans, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland  
Filed Jan. 9, 1981, Ser. No. 223,812

Claims priority, application Switzerland, Jan. 25, 1980, 596/80

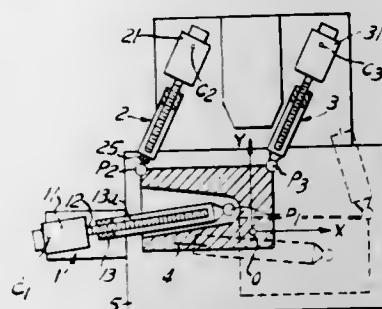
Int. Cl.<sup>3</sup> B23Q 7/00

U.S. Cl. 414—676

9 Claims

1. A machine tool comprising a stationary table, a movable table supported by and displaceable relative to said stationary table, a workpiece mounted on said movable table, bearing means between said tables permitting displacement of said

movable table relative to said stationary table in perpendicular directions within a single plane substantially parallel to said stationary table, at least three variable length linear actuators for displacing said movable table in said plane, said linear actuators having their axes in a single plane substantially paral-



lel to said stationary table, pivot means connecting an end of each of said linear actuators to said stationary table and an other end to said movable table, and means for controlling the length of each of said linear actuators for causing said movable table to occupy a predetermined position relative to said stationary table.

4,417,844

# AUTOMATIC TOOL MOUNTING FOR EXCAVATORS, LOADERS, GRADERS AND THE LIKE

Pierre J. de Pingon, 7 avenue du Parmelan, 74000 Annecy, France

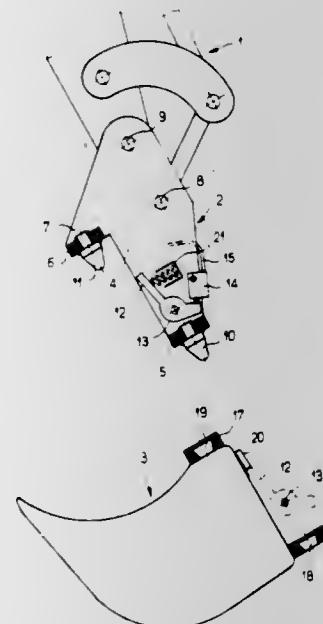
Filed Jan. 30, 1981, Ser. No. 229,927

Claims priority, application France, Jan. 31, 1980, 80 02095

Int. Cl.<sup>3</sup> E02F 3/81

U.S. Cl. 414—723

1 Claim



1. For use with an excavator, charger, grader or the like, the combination of a tool holder and a tool, at least two sets of at least two lugs each, fixedly secured on one of the tool holder and tool, means providing matching recesses for the lugs on the other of the tool holder and tool, a locking member on one of the tool holder and tool, an abutment on the other of the tool holder and tool behind which the locking member locks when the lugs are fully seated in the recesses thereby to maintain the lugs fully seated in the recesses, and means for selectively disengaging the locking member from behind the abutment, all the lugs and the axes of all the recesses being parallel to each other so that all the lugs are simultaneously engageable in the recesses by relative movement of the tool holder and tool in a single direction, the tool holder comprising two spaced parallel plates interconnected by spaced transverse members, said lugs or recesses being disposed in spaced relationship along said transverse members between the planes of said plates, said transverse members being flat bars that are spaced apart in a

direction perpendicular to the bars and are also laterally offset in a direction parallel to the plane of the bars but perpendicular to the length of the bars.

4,417,845

# PROGRAMMABLE POSITIONING AND OPERATING MECHANISM FOR INDUSTRIAL OPERATING HEAD

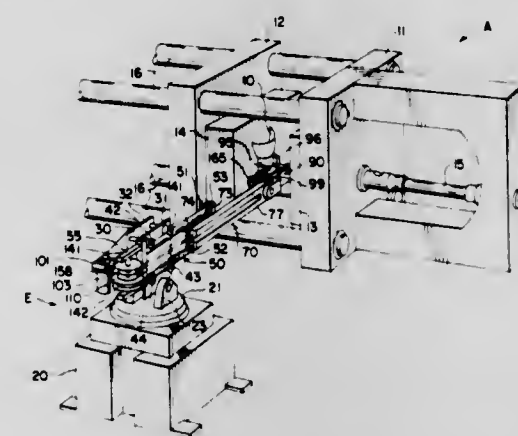
Charles A. Burton, Columbus, Ohio, assignor to Rimrock Corporation, Columbus, Ohio

Filed May 29, 1981, Ser. No. 268,393

Int. Cl.<sup>3</sup> B25J 5/00

U.S. Cl. 414—733

18 Claims



1. In apparatus for moving through coordinated functions, an operating head mounted on and extendable linearly relative to a base, the improvement comprising:  
a main carriage mounted on said base for pivotal movement about a tilt axis,  
an intermediate carriage mounted on said main carriage for travel relative thereto between an extended position and a retracted position,  
a head carriage mounted on said intermediate carriage for travel relative thereto between an extended position and a retracted position in telescoping fashion relative to said main carriage, said operating head being connected to said head carriage for pivotal movement about a wrist tip axis parallel to said tilt axis,  
drive means operatively connected between said main carriage and said intermediate carriage for moving said intermediate carriage between said extended and retracted positions,  
first control wheel means mounted for rotation at the forward end of said intermediate carriage,  
second control wheel means mounted for rotation at the rearward end of said intermediate carriage,  
a first length of flexible connecting means connected at one end to said main carriage and extending forwardly to and in operative engagement with said first control wheel means, and thence rearwardly to a connection to said head carriage,  
a second length of flexible connecting means connected at one end to said main carriage and extending rearwardly to and in operative engagement with said second control wheel means and thence forwardly to a connection to said head carriage whereby when said drive means extends and retracts said intermediate carriage relative to said main carriage, said lengths cause simultaneous extension and retraction respectively of said head carriage relative to said intermediate carriage,  
a pivotal tip control means operatively connected to said operating head and mounted on said head carriage for pivotal movement about said wrist tip axis,  
a pivotal wrist tip drive means mounted on said main carriage and having an axis parallel to said wrist tip axis,  
idler wheel means mounted at the rearward end of said intermediate carriage for free rotation about an axis angularly disposed relative to said wrist tip axis in a plane parallel to said wrist tip axis, and  
an endless, flexible, inextensible connecting means opera-

tively connecting said tip control means, said idler wheel means and said tip drive means whereby said wrist tip drive means remains operatively connected to said tip control means during telescoping extension and retraction movement of said head carriage and intermediate carriage relative to said main carriage.

4,417,846

# TRAVELING BLOCK ELEVATOR LATCH ASSEMBLY

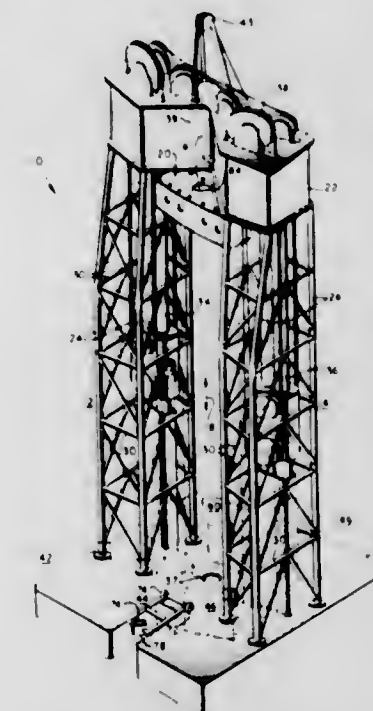
Thomas L. Elliston, Fort Worth, Tex., assignor to Hydra-Rig, Inc., Ft. Worth, Tex.

Filed Dec. 9, 1977, Ser. No. 858,948

Int. Cl.<sup>3</sup> E21B 19/00

U.S. Cl. 414—745

19 Claims



1. Apparatus for supporting a length of pipe to accommodate pipe stabbing and removal operations during launching or recovery of a length of pipe through an opening in a support platform, the length of pipe being of the type characterized by a tubular body portion terminated by an internally threaded upset connecting box having a shoulder which projects radially with respect to the tubular body portion comprising, in combination:

an elevator block having an axial bore for receiving the tubular body portion and having first and second seating surfaces for engaging the shoulder of the upset connecting box and the surface of the support platform which surrounds the opening, respectively, the first and second seating surfaces being simultaneously engageable by the shoulder of the upset connecting box and support platform, respectively, to permit the length of pipe to be supported in a vertical position with respect to the platform, the elevator block further including a radially projecting latching hub intermediate said first and second seating surfaces for engaging latching means;  
a traveling block having a first bore for receiving the elevator block and a second bore of larger diameter concentric with the first bore and having a side wall defining a latching chamber; and  
latching means carried by the traveling block including a plurality of lifting dogs disposed in the latching chamber, each lifting dog being moveable between first and second extreme positions, the lifting dogs engaging the side wall of the second bore and projecting radially into the first bore of the traveling block in response to movement of the lifting dogs to the first extreme position to permit latching engagement with the latching hub as the traveling block is lifted, and the lifting dogs being retractable within the latching chamber in response to movement of the lifting



dogs to the second extreme position to permit the traveling block and latching means to be displaced axially with respect to the length of pipe without engaging the latching hub.

4,417,847

# SEPARATE QUENCH AND EVAPORATIVE COOLING OF COMPRESSOR DISCHARGE STREAM

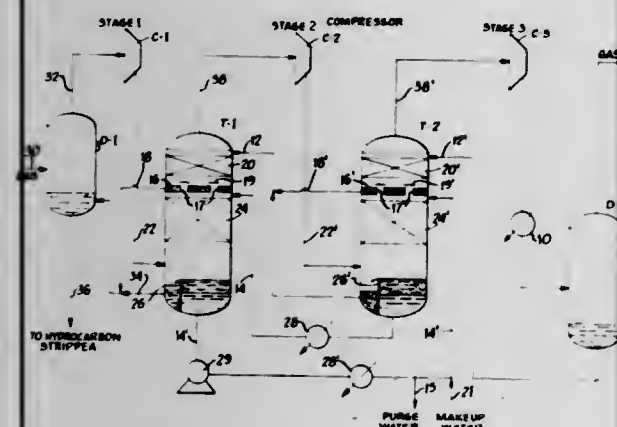
Gelhard K. Kube, Roesrath, Fed. Rep. of Germany, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 14, 1981, Ser. No. 292,892

Int. Cl.<sup>3</sup> F04D 29/58

U.S. Cl. 415—1

7 Claims



1. A process for multistage compression with interstage cooling of a mixture of gases having different boiling points which comprises, in each interstage cooling step, cooling the compressed gas by direct contact in sequence with a non-evaporative cooling liquid and then with a separate evaporative cooling liquid.

4,417,848

# CONTAINMENT SHELL FOR A FAN SECTION OF A GAS TURBINE ENGINE

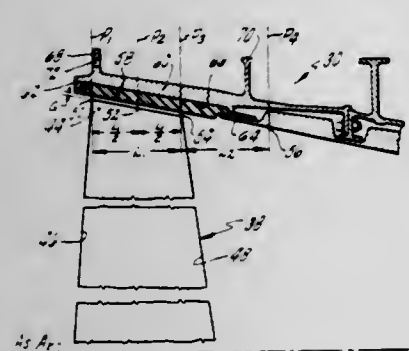
Kurt M. Dembeck, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1982, Ser. No. 344,901

Int. Cl.<sup>3</sup> F01D 25/24, 5/20

U.S. Cl. 415—121 G

8 Claims



1. In an axial flow gas turbine engine of the type having a fan case which includes a shell extending circumferentially about an array of fan rotor blades, and having an axis of symmetry as the improvement which comprises:

a shell having a thickness of material in the radial direction which increases in the axially rearward direction and which has a maximum thickness rearward of a plane P<sub>2</sub> perpendicular to the axis of symmetry A<sub>s</sub> and passing through the mid-chord point of one of the rotor blades wherein the increasing thickness of the shell selectively increases the cross-sectional area of the case to reinforce the case against the impact of blade fragments.

4,417,849

# VARIABLE GEOMETRY CENTRIFUGAL PUMP

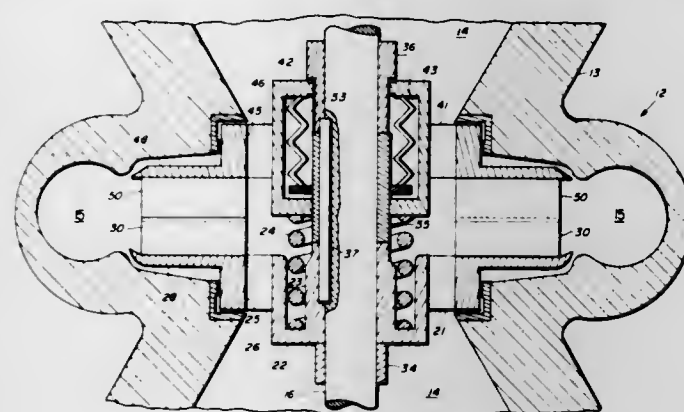
Joseph H. Morris, Queenstown, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1981, Ser. No. 302,343

Int. Cl.<sup>3</sup> F01D 7/00

U.S. Cl. 415—131

8 Claims



1. A variable geometry centrifugal pump comprising: a housing having an inlet, an outlet, and a pump chamber formed therebetween;

a rotational shaft positioned within the pump chamber of the housing;

first and second spaced impellers having intermeshing vane portions disposed within the pump chamber and positioned around the shaft for rotational movements therewith, the first impeller is rotationally keyed to the shaft at a fixed axial position, and one of the impellers has central deflector ports for conveying fluid from the housing inlet to the region defined between the impellers; and

flexible torque transmitting means interconnecting the first and second impellers for producing rotation of the second impeller in response to rotation of the first impeller and the shaft, and the torque transmitting means being capable of axial contraction and elongation in response to differential fluid pressure occurring on opposite surfaces of the impellers;

said flexible torque transmitting means comprising radially spaced concentric metal bellows elements having a plurality of pleated convolutions, said bellows elements are arranged so that the convolutions of each bellows are axially in phase, and a layer of elastomeric material disposed between the spaced bellows elements for reducing torsionally induced stresses within the bellows.

4,417,850

# VERTICAL COLUMN PUMP

Richard K. Hacker, West Allis, and James F. Tesch, New Berlin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 20, 1982, Ser. No. 451,555

Int. Cl.<sup>3</sup> F04D 13/00

U.S. Cl. 415—142

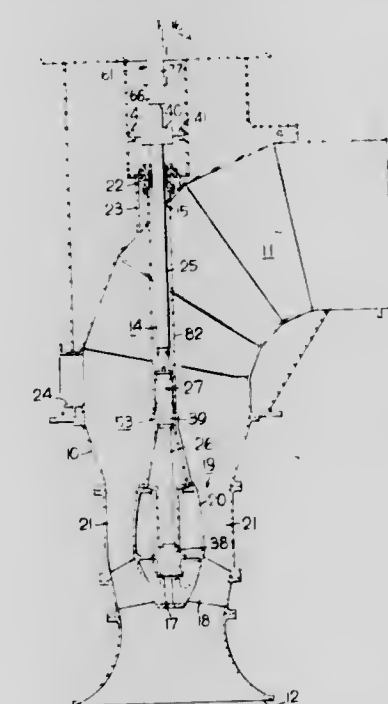
6 Claims

1. A hydraulic pump installation having a water passageway defined by a pump casing; an impeller within said water passageway; a rotary shaft including separable first and second shaft portions carrying said impeller and operably connecting said impeller to a pump motor with at least a portion of said shaft being disposed within said passageway; a first cylindrical bearing surrounding said shaft adjacent said impeller;

a diffuser surrounding said shaft adjacent said impeller and spaced from said shaft; said diffuser having a plurality of diffuser vanes extending therefrom and secured to said casing; a first bearing cartridge comprising a plurality of separable members adapted to be joined with opposing surfaces of said members defining a shaft receiving orifice extending through said first cartridge; said first cartridge

sized to be received within said diffuser with said shaft extending through said orifice; means for removably securing said cartridge to said diffuser on a side of said diffuser remote from said impeller with said cartridge extending toward said impeller and terminating at a free end; means for removably securing said first bearing to said free end;

coupling means for accommodating separation of said first and second shaft portions with said first portion extending from said motor and said second portion extending from said impeller; means for moving said first portion away



from said second portion an amount sufficient to provide a gap between said first and second portions with said gap between said portions being of a distance greater than an axial dimension of said first bearing whereby first bearing may be removed from said support and moved along said second portion to said gap and removed through said gap whereby said cartridge may be removed from said diffuser and moved along said shaft and away from said impeller with said cartridge carrying said first bearing and said plurality of members may be separated exposing said first bearing accommodating removal of said first bearing.

4,417,851

# MODULATED DIFFUSER PUMP

John E. Cygnor; Terry L. Whitesel, both of Rockford, and Duane C. Mosure, Poplar Grove, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 17, 1980, Ser. No. 207,302

Int. Cl.<sup>3</sup> F04D 29/46

U.S. Cl. 415—150

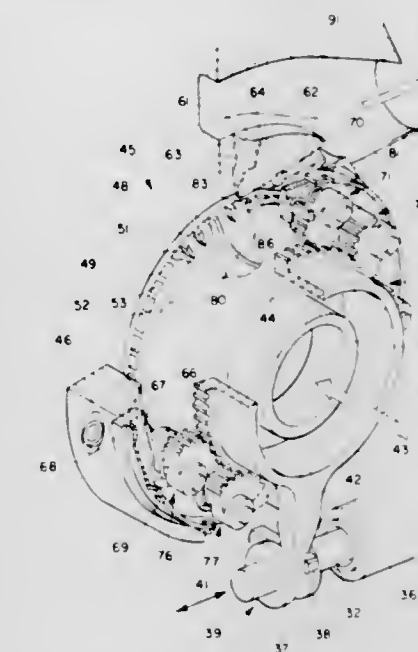
11 Claims

1. A centrifugal pump capable of handling a fluid containing solid contaminant particles, said pump of the type including an impeller to propel said fluid through a radial outlet to a diffuser which includes a plurality of diffuser passages, the improvement comprising:

rotatably mounted valve elements passing in part through said diffuser and across said diffuser passages, each valve element having a port therethrough to variably selectively allow fluid passage therethrough upon rotation of said valve element;

means drivingly coupled to each of said valve elements to thereby affect a yieldable rotation of said valve elements in one direction to progressively reduce the opening of said valve element port to said diffuser passage, said means drivingly coupled to said valve elements providing a direct mechanical coupling to said valve element to thereby affect a nonyieldable rotation of said valve element in an opposite direction to increase said opening of said valve element port to said diffuser passage to thereby ensure that contaminant particles

that lodge between a portion of said valve element port and said diffuser passage and interrupt movement of one or more valve element port closings do not prevent the remaining valve port elements from closing, while during the opposite



rotation of said valve elements there is a direct mechanical drive that ensures said opening of said valve port to thereby release said contaminant particle and allow passage of said particle from said valve port element and said diffuser.

4,417,852

# MARINE PROPELLER WITH REPLACEABLE BLADE SECTIONS

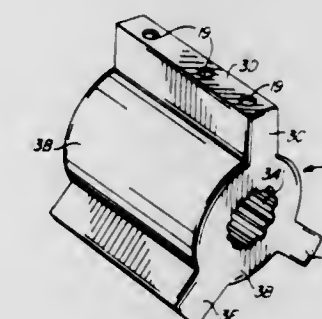
John J. Costabile, 7037 E. Moreland, Scottsdale, Ariz. 85257; Arvid B. Costabile, 2716 E. Forrest Cir., Tempe, Ariz. 85281, and Ernest Costabile, 2107 E. Carson Dr., Tempe, Ariz. 85282

Filed Aug. 28, 1981, Ser. No. 297,343

Int. Cl.<sup>3</sup> F03B 3/12

U.S. Cl. 416—2

4 Claims



1. A marine propeller comprising in combination: a hub comprising a cylindrical central portion having a hole therein for receiving a motor-driven shaft and a plurality of uniformly spaced spoke members integral with and extending substantially radially outwardly from said central portion, each of said spoke members having an outer surface and a plurality of spaced threaded holes therein; a plurality of substantially identical single blade units each including a blade support base and a propeller blade attached to that blade support base, each of said blade support bases including a substantially semi-cylindrical member having an inner lip located along one edge thereof with an inner surface abutting a respective one of said outer surfaces of one of said spoke members, said semi-cylindrical member also having an outer lip located along an opposite edge of that semi-cylindrical member for overlapping and abutting an outer surface of the inner lip of an adjacent one of said semi-cylindrical members, each



of said inner lips and the outer lip overlapping that inner lip having therethrough a plurality of clearance holes aligned with the respective ones of said threaded holes in the outer surface of the spoke member abutting the inner surface of that inner lip; and

a plurality of screws extending through respective ones of said aligned clearance holes and engaging the threads of corresponding ones of said threaded holes to tightly attach said edges of each of said blade support bases to said outer surfaces of two adjacent ones of said spoke members, respectively, said spoke members being sufficiently thick and rigid to allow said screws and said threads of said threaded holes to be large enough and strong enough to avoid being damaged when any of said propeller blades strikes a large, hard obstacle at such high speeds that that propeller blade is at least partially sheared off,

whereby individual ones of said single blade units that are severely damaged as a result of encountering large, hard objects at high speeds can be repeatedly replaced because no resulting damage to said hub occurs.

4,417,853

# WIND TURBINE SOFT AIRFOIL CONTROL SYSTEM AND METHOD

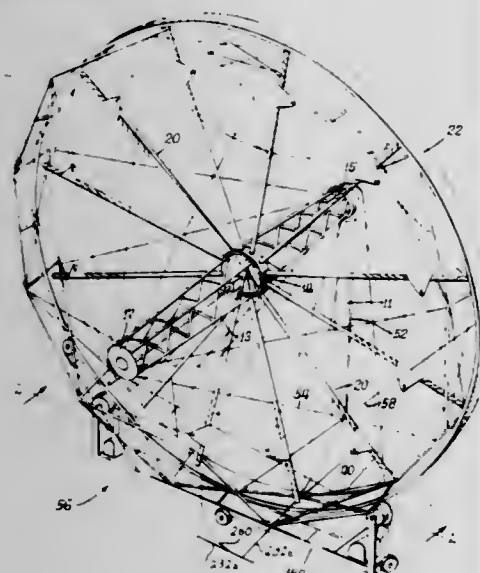
Gregory E. Cook, Warrenville, Ill., assignor to Windpowered Machines Ltd., Livingston, Mont.

Filed Feb. 17, 1981, Ser. No. 234,963

Int. Cl.<sup>3</sup> F03D 11/04

U.S. Cl. 416—132 B

28 Claims



1. Soft airfoil support and control assembly for a wind turbine having a wheel with an axle suspended from a rim, said axle having a hub assembly in the plane of said wheel, comprising:

- (a) an elongate support member mounted in tension extending between said hub and rim;
- (b) an elongate spindle mounted radially between said hub and rim in a manner minimizing longitudinal force loading thereof;
- (c) said spindle carrying a soft airfoil furled thereabout;
- (d) means for mounting said spindle for rotation about its elongate axis to permit furling and unfurling of said soft airfoil therefrom;
- (e) means for supporting a portion of said airfoil spaced from said spindle, said support means including at least one elongate boom member disposed intermediate said rim and said hub;
- (f) means for selectively changing the angular position of the boom member with respect to the plane of the wheel to control the angle of attack of said unfurled airfoil relative to wind conditions;
- (g) means for mounting said boom member and said spindle to pivot in unison about a common center line spaced from the rotational axis of said spindle;
- (h) said assembly cooperating to provide selective position-

ing of a selected amount of unfurled soft airfoil before the wind to effect rotation of said wind turbine wheel for power take-off from the rim thereof.

4,417,854

# COMPLIANT INTERFACE FOR CERAMIC TURBINE BLADES

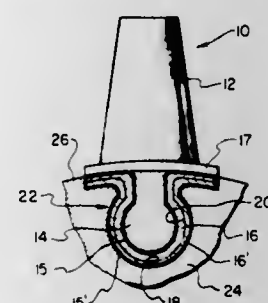
Edwin F. C. Cain, Canoga Park, and William T. McFarlen, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 132,575, Mar. 21, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,723

Int. Cl.<sup>3</sup> F01D 5/28

U.S. Cl. 416—241 B

16 Claims



1. A ceramic turbine blade suitable for attachment to a turbine disk having a peripheral surface and a series of footings in said peripheral surface, each of said footings having interior surfaces for receiving a turbine blade, said ceramic blade comprising:

- a ceramic body comprising a blade body and a root flange, a first layer of conductive metal deposited onto said root flange by chemical deposition,
- at least one layer of compliant metal electroformed onto said first layer, said compliant layer having an exterior surface engageably conforming to said interior surfaces of one of said footings.

4,417,855

# MOUNTING ASSEMBLY FOR HIGH SPEED TURBO DISCS

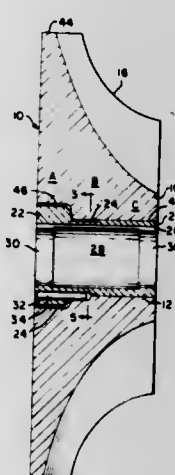
Robert E. Jepsen, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 8, 1981, Ser. No. 271,156

Int. Cl.<sup>3</sup> F01D 5/06

U.S. Cl. 416—244 A

7 Claims



1. A high speed turbo disc mounting assembly comprising:
  - (a) a shaft for transmitting rotational force to and from said disc assembly;
  - (b) a bushing mounted on said shaft by an interference fit between at least a portion of the bore surface of said bushing and the circumferential surface of said shaft, said bushing including a relatively large diameter annular

flange projecting radially outward at one end of said bushing through which a plurality of axially aligned torque pin apertures are formed within said flange but which form only partial cylindrical channels in the surface of the bushing adjacent said flange;

(c) a turbo disc mounted on said bushing consisting of a relatively large diameter portion and a relatively small diameter portion and having a stepped axial bore, which consists of a large diameter bore adjacent the disc's large diameter portion and a small diameter bore adjacent the disc's small diameter portion, said disc having a plurality of partial cylindrical torque pin channels in the portion of said small diameter bore immediately adjacent said large diameter bore such that said channels correspond to the channels in said bushing, and form an extension of said torque pin apertures, said disc having an interference fit with said bushing only in the area of said small diameter bore of said disc not juxtaposed to said channels;

(d) a plurality of torque pins located axially in the apertures and corresponding channels of said bushing and engaging the channels in the bore of said turbo disc for the transmission of torque between said bushing and said turbo disc without restraint of the outward migration of said disc during high speed operation, wherein said pins are fully encased in the flange of said bushing adjacent a high dynamic stress area of said turbo disc and are only partially engaged circumferentially in said turbo disc bore at its area of lower dynamic stress such that radially outward migration of the disc is not prevented by the torque pins.

4,417,856

# PERISTALTIC PUMP

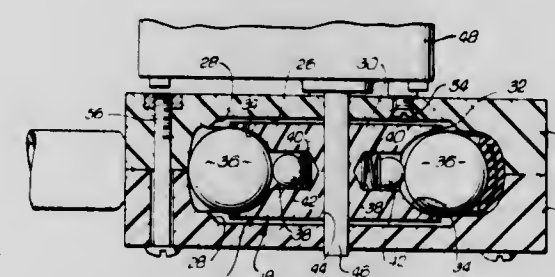
Kevin G. Minissian, P.O. Box 85C, Pasadena, Calif. 91104

Filed Aug. 25, 1981, Ser. No. 296,014

Int. Cl.<sup>3</sup> F04B 43/08

U.S. Cl. 417—477

5 Claims



1. A peristaltic pump comprising:
  - a housing having a substantially semi-annular seat for supporting a flexible tubing;
  - a flexible deformable resilient tubing disposed within the annular seat and defining a curvilinear tubing axis, the tubing having an outer surface and defining an outer radius, the seat having a radius of curvature slightly larger than the outer radius of the tubing to substantially engage the outer surface of the tubing when deformed;
  - a rotor having opposing ends, the rotor disposed and rotatable within the housing, a semispherical concave surface at either end of the rotor, and a roller ball disposed within each concave surface, the roller ball having a convex surface about a curvilinear axis parallel to the curvilinear axis of the tubing to cause significant central tubing deformation while limiting the deformation forces exerted at the tube edges, the rotor rotatable within the housing to cause the roller ball when the rotor is rotated to impinge normal to the tubing axis to deform the central region of the tubing, moving fluid through the tubing with the movement of the rotor and creating a vacuum rearward;
  - means for biasing the roller ball against the tubing to compensate for small variations in tubing outer diameter; and
  - ball bearing means for reducing rotational friction of the roller ball, the ball bearing means disposed intermediate the biasing means and the roller ball and bearing on the

roller ball, the ball bearing means having a smaller diameter than the roller ball.

4,417,857  
PISTON PUMP

Rainer Süßbeck, Duisburg, Fed. Rep. of Germany, assignor to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

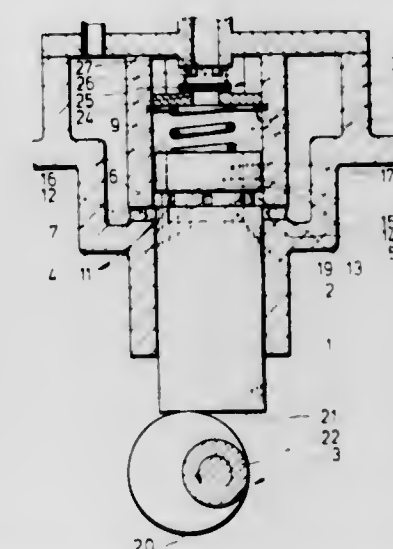
Filed Jan. 12, 1982, Ser. No. 338,892

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102506

Int. Cl.<sup>3</sup> F04B 7/04

U.S. Cl. 417—490

7 Claims



1. In a piston pump having a controlled delivery rate, said pump comprising a pump cylinder including a side wall, means defining at least one fluid inlet opening in said side wall, means defining an inlet chamber communicating with said at least one inlet opening upstream thereof, a piston in said cylinder, said piston including a side face, a driving mechanism operative to reciprocate said piston in said cylinder, said cylinder and said piston defining a working chamber between said piston and one end of said cylinder, a fluid outlet valve and means defining a pressure space on the outlet side of said valve, the improvement comprising means defining at least one piston opening in said side face of said piston and means defining at least one passage communicating said at least one piston opening with said working chamber, said at least one piston opening being so located that said at least one piston opening is moved into communication with said at least one inlet opening at two separate times during each cycle of reciprocating movement of said piston in said cylinder to allow fluid being pumped to be sucked from said at least one inlet opening into said working chamber only during said two separate times.

4,417,858

# PLUNGER LIFT CONTROL

Gregg W. Stout, Montgomery, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 29, 1981, Ser. No. 278,705

Int. Cl.<sup>3</sup> F04B 47/12

U.S. Cl. 417—58

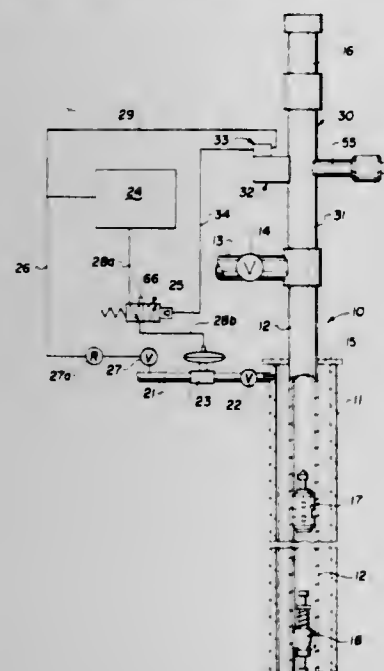
5 Claims

1. Control apparatus for use in a gas lift system for a producing well wherein liquid is lifted in the production tubing by a pneumatically driven magnetic plunger, said apparatus comprising

- a pneumatically operated motor valve in a flow line connected with said producing well;
- a timing mechanism including a flow control valve connected between a supply line and a signal line connected to said motor valve for pressurizing and venting said motor valve for closing and opening said motor valve;
- auxiliary control means for said motor valve including a magnetic actuator and associated pilot valve, said mag-



netic actuator comprising a segment of the production tubing fabricated from a non-magnetic material, a magnet supported on said tubing segment for movement between alternative first and second positions, a closure member for said pilot valve movable between alternate positions, and means for coupling said closure member and said magnet, said magnet being moved in response to detection of said pneumatically driven plunger to effect closing of said motor valve by operation of said pilot valve; and an auxiliary control valve in said signal line between said timing mechanism and said motor valve and connected with said pilot valve for pressurizing said motor valve to



open said motor valve and for venting said motor valve to close said motor valve, said auxiliary control valve being biased toward a first operating position opening said signal line to open said motor valve, and said auxiliary control valve being moved to a second position by a pressure signal from said pilot valve upon detection of said plunger by said magnet closing said signal line to said motor valve and venting said motor valve to close said motor valve, and said auxiliary control valve being held at said second position by pressure in said signal line from said flow control valve in said timing mechanism for maintaining said motor valve closed until termination of said pressure signal from said flow control valve.

4,417,859

# ROTARY DISPLACEMENT TURBINE ENGINE WITH VACUUM RELIEF VALVE MEANS

Frank C. Pruner, Rte. 2, Box 527, Fairhope, Ala. 36532  
Filed Oct. 4, 1979, Ser. No. 81,820

Int. Cl.<sup>3</sup> F04B 49/02; F01C 1/12, 19/00, 21/00

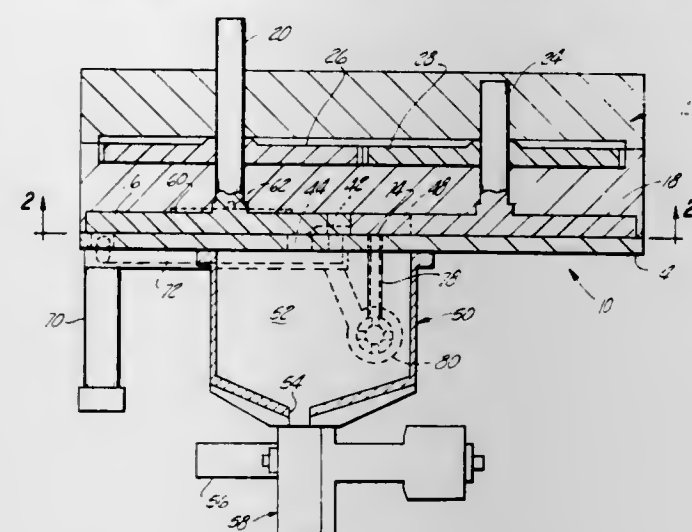
U.S. Cl. 417-310

13 Claims

1. A displacement turbine engine of the type including a rotatably supported power rotor of generally circular shape and having at least one peripheral piston formed thereon, and a sealing rotor of generally circular shape and means mounting said power and sealing rotors with a point of tangential contact with each other; said sealing rotor being formed with a piston recess receiving said piston as said power rotor rotates; and further including an engine block having a cylindrical recess receiving said power rotor for rotation therein with said piston adjacent the periphery thereof to form an expansion chamber space intermediate said piston and said point of tangential contact; intake valve means for admitting a working fluid under pressure into said expansion chamber space immediately after said piston is rotated out of said recess; and exhaust valve means exhausting said admitted fluid pressure prior to said piston again reentering said recess, the improvement comprising:

primary vacuum relief valve means responsive to develop-

ment of a subexhaust pressure in said exhaust chamber space to place said expansion chamber space in communication with exhaust pressure while said expansion chamber space is expanding as said piston recess receives said piston, said primary vacuum relief valve means continuing communication with said expansion chamber space while



said piston travels in said recess, said primary vacuum relief valve means further terminating communication with said expansion chamber space after said piston is rotated out of said recess and prior to admitting said working fluid into said expansion chamber space, whereby drag produced by development of said subexhaust pressure is avoided.

4,417,860

# SUBMERSIBLE WELL PUMP

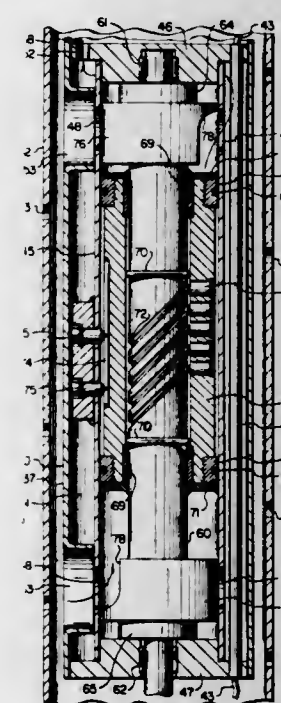
Orien N. Justice, Dallas, Tex., assignor to CamAct Pump Corp., Dallas, Tex.

Division of Ser. No. 5,845, Jan. 23, 1979, Pat. No. 4,291,588, which is a division of Ser. No. 747,884, Dec. 6, 1976, Pat. No. 4,145,166. This application Sep. 21, 1981, Ser. No. 304,111

Int. Cl.<sup>3</sup> F04B 35/04

U.S. Cl. 417-415

3 Claims



1. A submersible well pump adapted for use in a well of small bore comprising:

a generally cylindrical electrical motor having an axially aligned drive shaft;

a speed reducing transmission mounted on the top end of said motor, said transmission having an input shaft aligned

with and connected to the drive shaft of said motor and having an output shaft aligned with said input shaft, said transmission further comprising:

a housing;

input and output shafts mounted for rotation in said housing axially thereof, said shafts being axially aligned with each other and rotatively interconnected at their abutting ends, said shaft being mutually supportive against displacement of both relative axial position and shaft alignment to thereby reduce stress and vibration;

said input and output shafts each having a pinion mounted thereon for rotation therewith;

a pair of idler shafts mounted for rotation in said housing on opposite sides of said input and output shafts;

each of said idler shafts carrying a pair of gears being meshed with a pinion;

and an electrical conduit protective tube running lengthwise through said housing, for protecting an electrical conduit delivering power from a source located away from one end of said transmission to said electric motor connected to the other end of said transmission, said tubing being angularly offset from said idler shafts;

a pump mounted on the top end of said transmission, said pump having a shaft aligned with and connected to the output shaft of said transmission;

and an electrical power supply cable connected to said motor at the top end thereof and passing upwardly through the electrical conduit protective tube of said transmission and past said pump.

4,417,861

# CELL CULTURE PUMPING SYSTEM

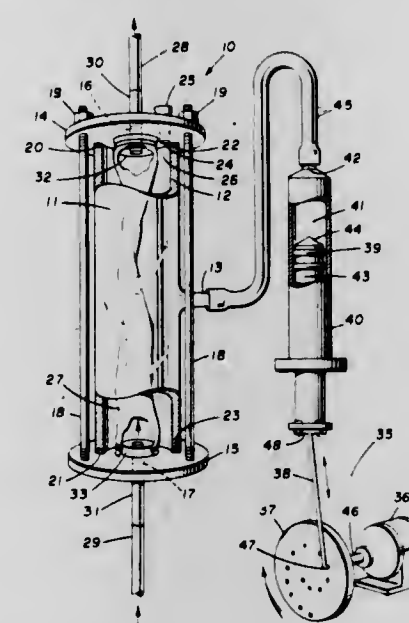
William R. Tolbert, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 291,216, Aug. 10, 1981. This application Dec. 24, 1981, Ser. No. 334,341

Int. Cl.<sup>3</sup> F04B 21/02

U.S. Cl. 417-315

5 Claims



1. A low trauma, reversible flow pumping system for transfer of biological fluids containing fragile components which comprises a length of collapsible and flexible tubing having inlet and outlet means at opposite ends, each said end being in fluid communication with a two-way, gravity actuated check valve means having disposed therein a self-centering, vertically slidable weight member with a center of gravity below its sealing position and adapted to permit fluid to be pumped through said tubing in either direction, said tubing being sealingly enclosed within a hydraulic fluid containing chamber and said chamber being in fluid communication with oscillatory pressure providing means to provide alternate expansion and collapsing of said tubing.

4,417,862

# ROTARY MOTOR WITH MULTILOBED ROTOR AND ORBITING COUPLING MEANS

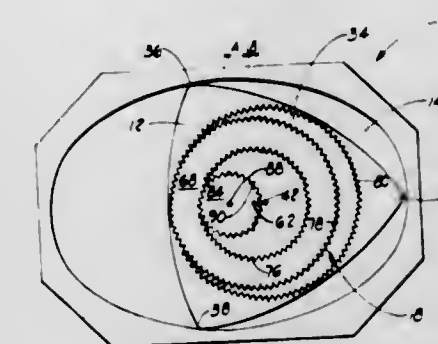
John W. Fenton, 1258 Aialapa, Kailua, HI. 96734

Filed Sep. 3, 1981, Ser. No. 298,925

Int. Cl.<sup>3</sup> F01C 1/22, 17/02

U.S. Cl. 418-54

13 Claims



1. A rotary motor comprising:

a housing having an internal chamber, the chamber surface being defined cross-sectionally by the equations

$$x = (A + B) \cos \alpha + R \cos (\alpha / M)$$

$$y = (A - B) \sin \alpha + KR \sin (\alpha / M)$$

where  $\alpha$  is an angle ranging between 0 and  $2\pi M$  radians where A, B and R are arbitrary constants, where M is an integer greater than or equal to 2, and where K is a number selected from the set consisting of +1 and -1;

a rotor disposed within the internal chamber of the housing, the rotor having M lobes, each lobe contacting the chamber surface, with the lobe extremities defining vertices of an equilateral polygon when M is greater than 2, and extremities of a straight line when M equals 2, the polygon and straight line having a circumscribed circle of radius R, having a centroid defining a first rotational axis extending through the rotor and parallel to the z-axis and having a converter engagement surface coaxial with the first rotational axis;

an output shaft fixedly supported by the housing and having a second rotational axis coextensive with the z-axis;

energy input means for powering movement of the rotor around the internal chamber surface in a selected orbital direction and parallel to the xy plane and for powering simultaneous rotational movement of the rotor about its first rotational axis; and

orbital coupling means operatively engaged with the rotor, for driving rotational movement of the output shaft in response to orbital movement of the rotor and rotational movement of the rotor about the first rotational axis, the orbital coupling means comprising:

a circular converter member, slidably engaged with the converter engagement surface of the rotor and having a third rotational axis offset from the first rotational axis by the distance B, the circular converter member movable in a combination of circular orbital movement and rotary movement about the third rotational axis in response to movement of the rotor; and

a rotary converter member, engaged with the circular converter member for driving rotation of the output shaft about the second rotational axis in response to movement of the circular converter member.



4,417,863

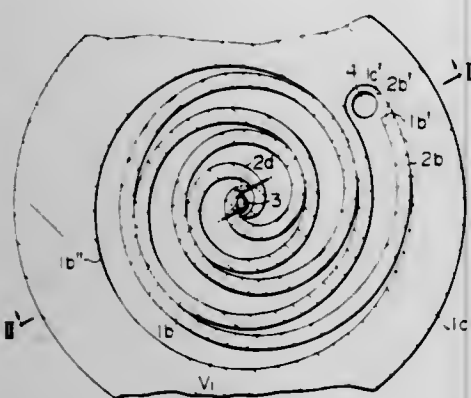
**SCROLL MEMBER ASSEMBLY OF SCROLL-TYPE FLUID MACHINE**

Masato Ikegawa, Kenji Tojo, and Masao Shiibayashi, all of Shimoinayoshi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1981, Ser. No. 225,741  
Int. Cl.<sup>3</sup> F01C 1/02

U.S. Cl. 418—55

14 Claims



1. A scroll-type fluid machine comprising an inlet port means, a pair of scroll members, each of said scroll members including an end plate and a wrap protruding upright from said end plate, said scroll members being assembled together with said wraps fitting each other so as to define at least a pair of closed spaces therebetween, means for mounting one of said scroll members so as to enable an orbiting motion relative to the other scroll member, the wrap of one of the scroll members has a scrolling angle which is greater than the scrolling angle of the wrap of the other of the scroll members, and wherein a starting end portion of at least one of the wraps is cut away from the theoretical starting point of said one wrap, which theoretical starting point would sealingly engage the other wrap at some time during the orbiting motion so as to enable one of said closed spaces to communicate with a discharge port of the fluid machine at an earlier point in time than the other of said closed spaces thereby substantially equalizing discharge pressures of both of said closed spaces.

4,417,864

**VACUUM TYPE BRICK FORMING MACHINE**

Iwasaki Shigeo, and Haguchi Hiroshi, both of Okayama, Japan, assignors to Mitsubishi Fukai Tekkosho, Ltd., Bizen, Japan  
PCT No. PCT/JP81/00111, § 371 Date Dec. 16, 1981, § 102(e)  
Date Dec. 16, 1981, PCT Pub. No. WO81/03304, PCT Pub. Date Nov. 26, 1981

PCT Filed May 15, 1981, Ser. No. 333,821  
Int. Cl.<sup>3</sup> B30B 11/02; B28B 3/02

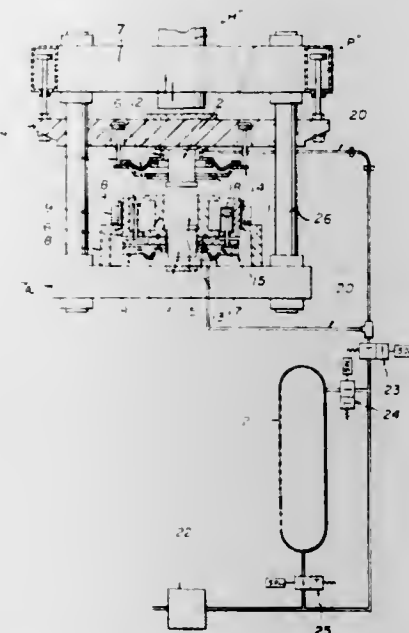
U.S. Cl. 425—73

10 Claims

1. A vacuum type brick forming machine comprising a mold in which brick raw material is filled, upper and lower pistons which have a center line and which press and form under vacuum said raw material into bricks as said mold and raw material are placed in the center line of said pistons, and a mechanism which transfers said mold containing said formed bricks to a position off said center line and there withdraws formed bricks and fills raw material into said mold again, characterized by:

a main body having a lower half and supporting a frame which can be lifted up and down having said upper piston mounted thereon in an upper vacuum room enclosing said upper piston fastened at its lower side, upper air cylinders installed inside said frame connected to an upper sealing ring which is adapted for contacting an upper face of said mold, a truck adapted to move back and forth on rails laid on said lower half of said main body a lower vacuum room depending from said truck encircling said lower piston, the upper face of said lower vacuum room having airtight contact with the underside of the mold by force of springs, lower air cylinders which are installed inside said truck

for lifting up and down a lower sealing ring located below said vacuum room for making and breaking contact with the upper face of the lower half of the main body, and upper and lower skirts which are made of soft material



and can be stretched and contracted freely connecting the upper vacuum room with the upper sealing ring and the lower vacuum room with the lower sealing ring respectively.

4,417,865

**CONTINUOUSLY OPERATING PRESS**

Heinrich Pfeiffer, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH Co., Eppingen, Fed. Rep. of Germany

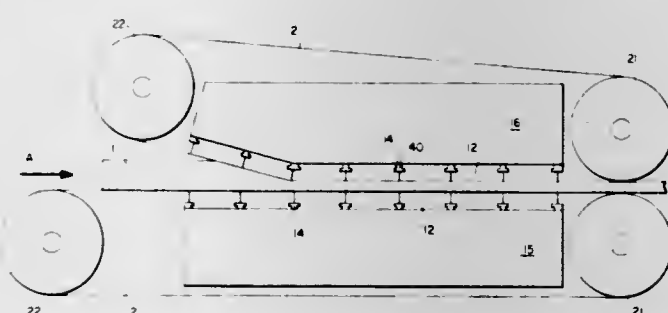
Continuation-in-part of Ser. No. 286,315, Jul. 24, 1981. This application Nov. 6, 1981, Ser. No. 318,933

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042972

Int. Cl.<sup>3</sup> B29J 5/04

U.S. Cl. 425—371

8 Claims



1. An apparatus for continuously receiving and pressing material for producing particleboard and fiberboard, comprising:

- (a) pressing means comprising a movable upper platen and a fixed lower platen;
- (b) a ram mounted to said upper platen to move said upper platen to define a press gap between said upper platen and said lower platen for receiving material to be pressed;
- (c) a first endless conveyor band disposed around said lower platen;
- (d) a second endless conveyor band disposed around said upper platen;
- (e) a plurality of rolls for supporting and guiding said first and second bands, respectively; and
- (f) support means for said rolls, comprising: a plurality of change plates, each of said change plates being removably mounted to said lower platen or said upper platen and including: a first rod mounted in a first level and con-

nected in supporting relation with one of said rolls, a plurality of T-shaped web plates connected to said first rod in said first level and to a pressure plate in a second level, whereby material moved between said upper platen and said lower platen is subjected to pressure to form a compressed product and counter pressure from said material being pressed is transferred to said pressure plate.

4,417,866

**PRESS FOR THE CONTINUOUS PRODUCTION OF PRESSEDBOARD**

Hans-Dietrich Sitzler, Nettetal-Hinsbeck, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

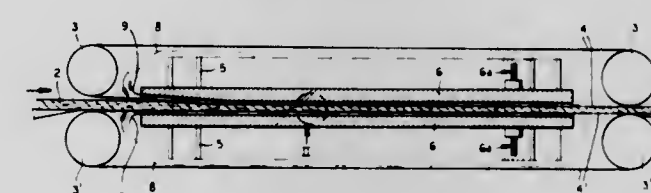
Filed Apr. 29, 1982, Ser. No. 373,225

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117778

Int. Cl.<sup>3</sup> B29J 5/08

U.S. Cl. 425—364 R

6 Claims



1. A press for the continuous production of pressedboard from a layer of comminuted material, said press comprising: a pair of spaced-apart press platens; respective steel pressing belts displaceable along said platens and juxtaposed with one another to define a space traversed by said layer and within which said layer is pressed, each of said belts being spaced from the respective platen to form a gap therewith; a multiplicity of spaced-apart rod-shaped cageless rollers in each of said gaps; and means for feeding said rollers to said gaps with a spacing substantially equal to the thickness  $d$  of said belts, said rollers having diameters  $D$  less than 20 mm and approximately equal to 10  $d$ .

4,417,867

**DOUGH FORMING MOLD ASSEMBLY**

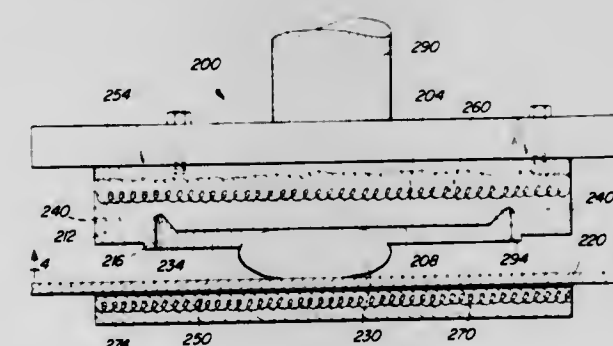
Marshall Bauer, Chicago, Ill., assignor to Nation Enterprises, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 270,510, Jun. 4, 1981. This application Jun. 1, 1982, Ser. No. 384,044

Int. Cl.<sup>3</sup> B29C 1/00; A21C 11/00

U.S. Cl. 425—394

1 Claim



1. A dough-molding apparatus for dough-shaping, functional, positive compressive coaction in cooperation with planar platen for transforming a deformable mass of dough into a generally dish-like sheet defining a substantially flat base integrally formed with an upstanding circumambient bead-like rim, said dough-molding apparatus comprising a dough-confining ring, a generally planar pressure plate spanning inter-

iorly of and bounded and integral with said ring, said ring including a wall portion projecting normally of a dough-presented, dough-engaging face of said plate extending beyond said face and abuttingly engaging a flat dough-mass-supporting substrate.

said dough-molding apparatus being formed at a juncture of an inside surface of said ring and said plate with an endless perimetric moat-like groove invading said plate and circumscribing a flat central zone thereof.

air passage means formed in said ring and communicating between said moat-like groove and ambient atmosphere for facilitating escape of air trapped within walls defining a dough-molding cavity delineated by said dough-molding apparatus and said floor-like dough-mass-supporting substrate therebeneath.

4,417,868

**COMPACT PLENUM FOR PULSE COMBUSTORS**

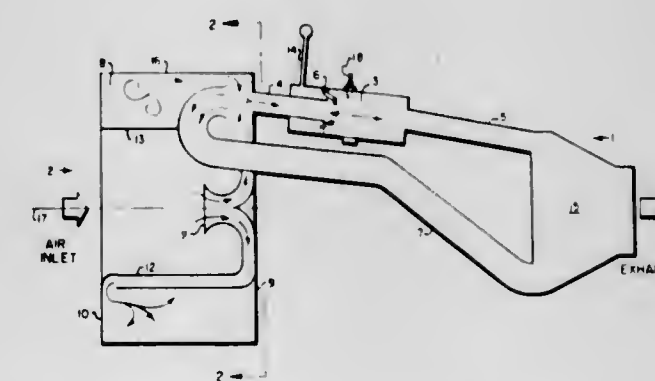
Abbott A. Putnam, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Sep. 4, 1981, Ser. No. 299,567

Int. Cl.<sup>3</sup> F23C 11/04

U.S. Cl. 431—1

6 Claims



1. A combustion system comprising a plurality of pulse combustors having air inlets, fuel inlets, combustion chambers and exhaust outlets and having substantially equal natural acoustic frequencies,  $f$ , said air inlets being commonly joined to an inlet plenum wherein said inlet plenum comprises

- (A) housing means forming an annular chamber, the outer perimeter of which is substantially less than  $\frac{1}{2} \lambda$ , where  $\lambda$  equals the speed of sound
- (B) means connecting the annular chamber with the air inlets of the pulse combustors,
- (C) means for admitting a source of oxygen to the annular chamber, and
- (D) baffling means in the annular chamber creating a circuitous acoustic path therearound of length substantially equal to  $\frac{1}{2} \lambda$ .

4,417,869

**FLAME ROLLOUT CONDITION SAFETY DEVICE FOR A COMBUSTION SYSTEM**

Lloyd F. Copenhaver, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,561

Int. Cl.<sup>3</sup> G08B 17/12; F23N 5/24

U.S. Cl. 431—21

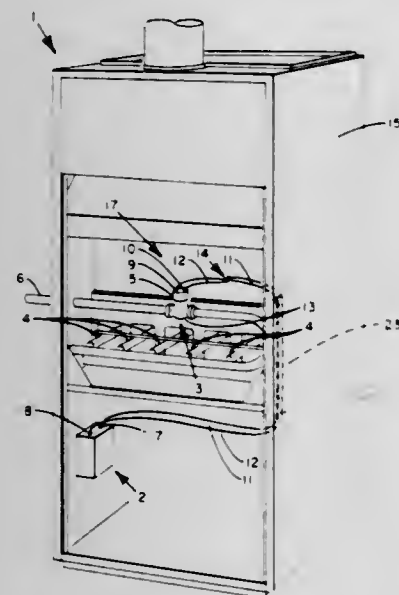
2 Claims

1. A safety device for discontinuing the flow of fuel to the burners of a combustion system when a flame rollout condition occurs at the burners, said device comprising:

- a fuel supply means for supplying fuel to the burners of the combustion system;
- an electrically actuated valve means for controlling the flow of fuel from the fuel supply means to the burners, said valve means allowing fuel flow to the burners only when electrical power is supplied to the valve means;
- a power supply means for providing electrical power for the electrically actuated valve means;



an electrical power supply lead having a conductor, with a covering of electrical insulation which is capable of being melted or burned away by heat, for supplying electrical power from the power supply means to the electrically actuated valve means, said lead having at least one section located at a position where flame rollout can occur; and a grounding medium in contact with each section of the power supply lead which is located at a position where



flame rollout can occur, said grounding medium providing a low resistance path for shunting the electrical power from the power supply means to ground only when the conductor of the power supply lead contacts the grounding medium whereby electrical power from the power supply means does not reach the electrically actuated valve means and fuel flow to the burners of the combustion system is discontinued if a flame rollout condition occurs.

4,417,870

## LIQUID FUEL COMBUSTION APPARATUS

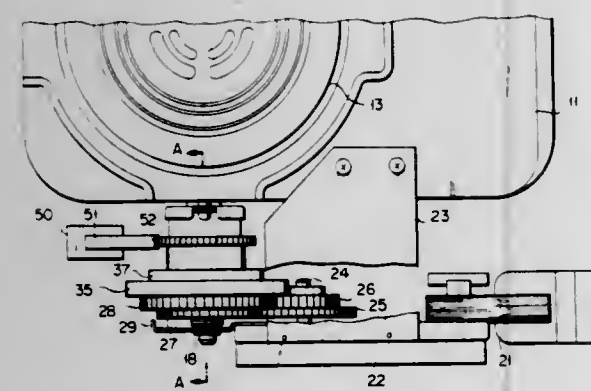
Shigeru Nakamura, Kamo; Yoshihiko Ueki, Niigata, and Hiroshi Takachi, Muramatsu, all of Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kamo, Japan

Filed Sep. 2, 1981, Ser. No. 298,895

Claims priority, application Japan, Sep. 10, 1980, 55-125451  
Int. Cl.<sup>3</sup> F23Q 25/00

U.S. Cl. 431-33

10 Claims



1. A liquid fuel combustion apparatus comprising:
  - (a) a wick holder;
  - (b) first means for vertically moving said wick holder between a raised combustion position and a lowered extinguished position, said means including a rotatable shaft;
  - (c) a driving motor;
  - (d) rotational force transmitting means operatively connecting said driving motor to said rotatable shaft for transmitting the rotational force of said driving motor to said rotatable shaft so as to rotate said rotatable shaft in a first

direction, thereby moving said wick holder vertically from its lowered extinguished position to its raised combustion position, said rotational force transmitting means comprising:

- (i) a clutch cam fixed on said rotatable shaft;
- (ii) a clutch supporting disc operatively connected to said driving motor such that rotation of said driving motor causes rotation of said clutch supporting disc; and
- (iii) a clutch carried by said clutch supporting disc in position:

(A) to engage said clutch cam during rotation of said clutch supporting disc, thereby transmitting the rotational force of said driving motor to said rotatable shaft and causing said rotatable shaft to rotate in said first direction, and

(B) to disengage from said clutch cam when said wick holder has reached its raised combustion position;

(e) second means for automatically disengaging said driving motor when said wick holder has reached its raised combustion position;

(f) a spring which is operatively connected to said rotatable shaft so as to be charged by the rotation of said rotatable shaft in said first direction and so as to rotate said rotatable shaft in the opposite direction upon discharge;

(g) holding means operatively connected to said rotational force transmitting means for preventing the rotation of said rotatable shaft in said opposite direction under the urging of said spring; and

(h) releasing means for releasing said holding means, thereby permitting said wick holder to return to its lowered extinguished position under the urging of said spring.

4,417,871

## METHOD AND APPARATUS FOR COOLING SKID PIPES IN CONTINUOUS SLAB REHEATING FURNACE

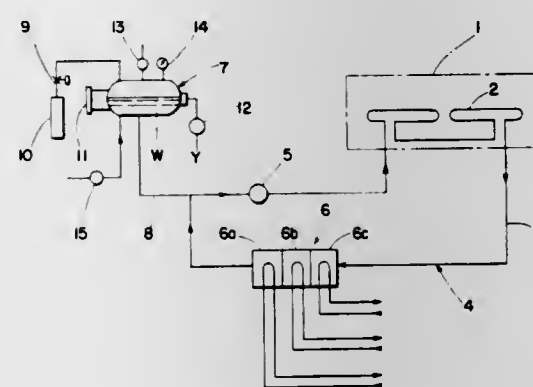
Mitio Tarumi, Hirakata; Tetsuya Tokitsu, Takarazuka, and Yoshio Matsumoto, Takatsuki, all of Japan, assignors to Chugai Ro Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 19, 1982, Ser. No. 359,991

Int. Cl.<sup>3</sup> F27D 3/02; F25B 29/00; F28D 13/00

U.S. Cl. 432-1

2 Claims



2. A method for cooling skid pipes of a continuous slab reheating furnace, the method comprising:
  - supplying clarified water at generally 190° C. to the skid pipes;
  - passing the water through the skid pipes at a rate and pressure which causes the water to be heated to generally 200° C.;
  - cooling the 200° C. water to generally 190° C. and recirculating the 190° C. water back to the skid pipes;
  - maintaining a hot water-nitrogen interface in fluid communication with the recirculating hot water to prevent dissolution of oxygen into the hot water; and
  - adjusting nitrogen pressure at the hot water-nitrogen interface to adjust the hot water pressure in the skid pipes such that the temperature of the recirculating hot water is also adjusted.

4,417,872

## HEAT TREATING

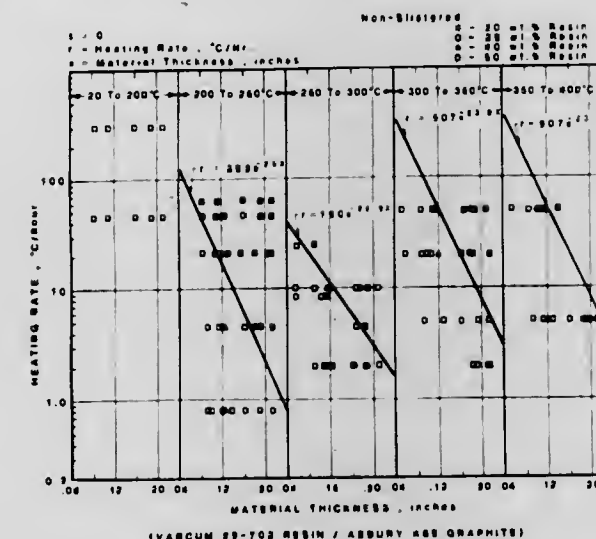
Larry G. Christner, Sandy Hook, and Dana A. Kelley, New Milford, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Feb. 1, 1982, Ser. No. 344,489

Int. Cl.<sup>3</sup> F26B 9/12; C10B 51/00

U.S. Cl. 432-18

15 Claims



1. A method of heat treating a material having carbon degradable content in order to convert said carbon degradable content to carbon comprising the steps of:
  - defining a temperature range;
  - segmenting the temperature range into at least two intervals including establishing at least a first interval capable of supporting a first maximum heating rate for said material without blistering and a second interval capable of supporting a second maximum heating rate for said material without blistering, said first maximum heating rate being different from said second maximum heating rate;
  - heating said material over an interval corresponding to said first interval at a first rate equal to or below said first maximum rate;
  - and heating said material over a further interval corresponding to said second interval at a second rate different from said first rate and equal to or below said second maximum rate.

4,417,874

## SUCTION DEVICE SUCH AS A DENTAL ASPIRATOR OR SUCKER

Bror A. E. Anderson, Österängsvägen 24, S-18246 Enebyberg, Sweden, and Arne B. Mo, Gästrikegatan 15, S-11334 Stockholm, Sweden

PCT No. PCT/SE81/00248, § 371 Date May 4, 1982, § 102(e) Date May 4, 1982, PCT Pub. No. W082/00764, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 3, 1981, Ser. No. 380,867

Claims priority, application Sweden, Sep. 4, 1980, 8006160; Jun. 5, 1981, 8103566

Int. Cl.<sup>3</sup> A61C 17/04

U.S. Cl. 433-96

2 Claims

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4,417,873

## DENTAL ARTICULATOR

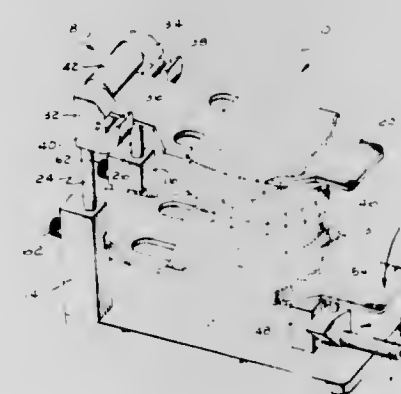
Walenty Kulas, 35 Amherst Ave., Feeding Hills, Mass. 01030

Filed Jul. 21, 1981, Ser. No. 285,597

Int. Cl.<sup>3</sup> A61C 11/00

U.S. Cl. 433-57

4 Claims



1. A dental articulator comprising:
  - (a) a longitudinally-extending base;
  - (b) a pair of spaced columns rising perpendicularly from the base;
  - (c) means for supporting a first denture horizontally above the base, said means comprising an upper longitudinally-extending carrier that is pivotally attached to said columns

1. In a suction tube intended as saliva sucker or surgical sucker comprising a cylindrical plastic tube (10) at least one portion of whose length is provided with a corrugation in the form of bellows folds having ridges and intermediate grooves, the bellows folds having sides (16, 17) of different widths which are so shaped and disposed that upon axial compression of the respective folded portion of the tube, the narrower sides (16) will snap over a center position to a position under the adjacent wider sides (17), whereafter any bending of the compressed portion for shaping the tube will result in the bend portion substantially remaining in its bent position; the improvement in which the bottoms of the grooves (20) have a plurality of suction openings (21) which are substantially evenly distributed along the circumference of the respective groove, one end of the tube being adapted to be connected to a suction source whereas the other end (11, 14) of the tube is closed, the suction openings being open (20a) not only when



the bellows folds are in the extended position, but also when the bellows folds are in their compressed position.

4,417,875

**FOOT CONTROLLER FOR DENTAL INSTRUMENT**  
Takahiro Matsui, Uji, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

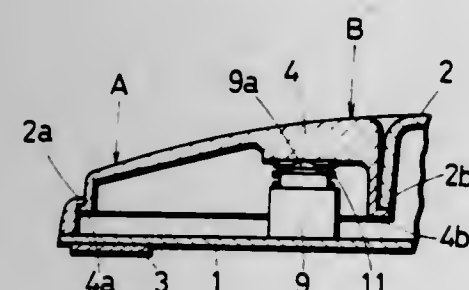
Filed Mar. 31, 1981, Ser. No. 249,386

Claims priority, application Japan, Dec. 2, 1980, 55-179377[U]

Int. Cl.<sup>3</sup> A61C 1/02

U.S. Cl. 433—101

1 Claim



1. A foot controller for a dental instrument comprising:
  - a base;
  - a foot controller cover provided on said base;
  - a pair of pedal fitting openings provided in said foot controller cover adjacent each other;
  - a flanged rear edge provided in each pedal fitting opening;
  - a front pensile edge provided in each pedal fitting opening;
  - a pedal provided in each of said pedal fitting openings;
  - a bent rear edge provided on each pedal for engagement with said flanged rear edges;
  - a bent front edge provided on each pedal for engagement with said front pensile edges;
  - a pair of air valves provided on said base, each of said air valves being provided subjacent one of said pedals, said air valves further being provided closer said front pensile edge than said flanged rear edge;
  - a valve rod extending from each of said air valves and engaging an undersurface of one of said pedals; and
  - a spring surrounding each of said valve rods and engaging said undersurface of each of said pedals for upwardly biasing each of said pedals.

4,417,876

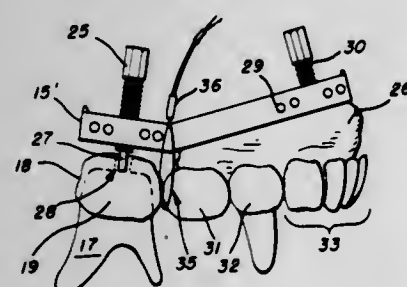
#### NONDESTRUCTIVE DENTAL CAP REMOVAL METHODS

Joseph A. Lynch, 51 E. 1st Ave., Hialeah, Fla. 33010  
Filed Dec. 11, 1981, Ser. No. 329,735

Int. Cl.<sup>3</sup> A61C 3/00

U.S. Cl. 433—161

10 Claims



1. The improved non-destructive method of removing dental crown and bridge caps anchored on a least one shaped tooth stub, comprising the steps of,
  - disposing a metal stabilizing member with a bolt threaded therethrough with the bolt extending through the hole in contact with the tooth stub in a substantially stabilized position for raising the cap without shear forces from the

tooth stub by means of pressure on the stub when the bolt is pressed against the stub,  
securing flexible filamentary means about the cap and stabilizing member with the stabilizing member in said stabilized position to grasp the cap and form with the stabilizing member a composite unit that may be moved to dislodge the cap from the tooth stub, and  
producing a dislodging pressure for non-destructive unseating of the cap from the stub by rotation of the threaded bolt against the tooth stub to thereby move said composite unit away from said stub.

4,417,877

#### WATER-JET DRIVE MECHANISM FOR DRIVING AND CONTROLLING OF PARTICULARLY SHALLOW-DRAUGHT WATERCRAFTS

Franz Krautkremer; Achim Kessler, both of Spay, and Gerd Krautkraemer, Boppard-Buchensau, all of Fed. Rep. of Germany, assignors to Schottel-Werft Josef Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany

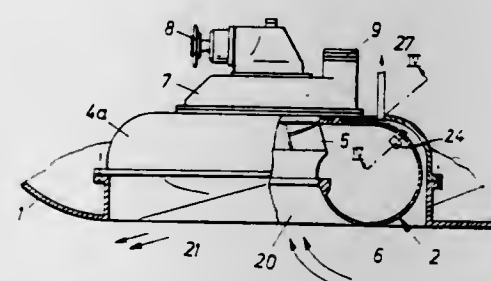
Filed Jun. 9, 1981, Ser. No. 271,897

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022909

Int. Cl.<sup>3</sup> B63H 11/00

U.S. Cl. 440—38

6 Claims



1. A water-jet drive mechanism adapted to propel a watercraft, comprising a centrifugal pump having a spiral housing and an impeller which is rotatably supported in said spiral housing for effecting a fluid flow through said spiral housing, means defining a ventilating opening through a wall of said spiral housing for facilitating the flow of gases from the inside of said spiral housing to the region outside said spiral housing, and means defining a ventilating valve in said ventilating opening responsive to said fluid flow through said spiral housing effected by said impeller for controlling the flow of gases through said ventilating opening.

4,417,878

#### PROPULSION MACHINERY FOR LNG SHIPS

Stein Koren, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Moss, Norway

Filed Mar. 25, 1981, Ser. No. 247,275

Claims priority, application Norway, Mar. 31, 1980, 800935

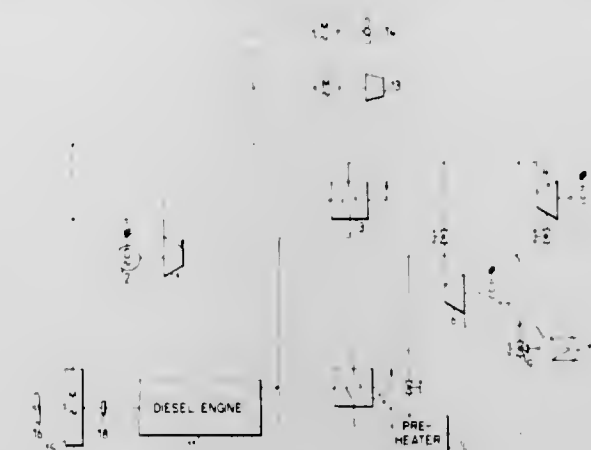
Int. Cl.<sup>3</sup> B63H 21/20

U.S. Cl. 440—3

5 Claims

1. A ship propulsion system for LNG tank ships using combustible bunker oil and boiled off cargo gas, said system including a propeller, an electromotor operatively engaged with said propeller for driving the propeller, at least one diesel engine operatively engaged with said propeller for selectively driving the propeller with said electromotor or independently thereof, and combined gas turbine-steam turbine electrical plant means operatively connected to said electromotor for driving said

propeller; said combined gas turbine-steam turbine-electrical plant fueled by boiled off gas, includes exhaust boiler means for



receiving and utilizing exhaust gas from the diesel engine for the production of steam used in the turbine.

4,417,879

#### FLEXIBLE SHAFT STICK CONTROL MECHANISM FOR STEERING MARINE VESSELS

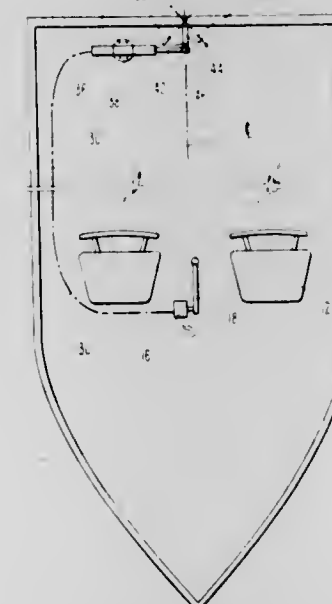
Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 268,539, May 29, 1981. This application Jul. 27, 1981, Ser. No. 286,814

Int. Cl.<sup>3</sup> B63H 21/26

U.S. Cl. 440—62

1 Claim



1. In a marine vessel steering system wherein gearless steering control means effects rotation of rotatable flexible shaft means for controlling movement of a steering member through screw means which converts rotary motion from said rotatable flexible shaft means to linear motion, said linear motion effecting movement of said steering member which controls direction of travel of said marine vessel, the combination therewith of the improvement comprising

a driver pulley rotating in response to movement of said steering control means,  
at least one pulley driven in response to rotation of said driver pulley,  
belt means operably interconnecting said driver pulley and said driven pulley whereby said driven pulley rotates a greater number of revolutions than said driver pulley,  
said steering control means including a steering stick mounted to an input shaft of said driver pulley, said stick unattached to any member at least at one end and adaptably mounted forwardly at an interior side portion of said vessel to permit movement of said stick only forwardly

and rearwardly when said stick is mounted for forward and rearward movement and only transversely from left to right or right to left when said stick is mounted for transverse movement whereby movement of said stick forwardly and rearwardly rotates said driver pulley a total of not more than 180°, and movement of said stick transversely said vessel from left to right or right to left rotates said driver pulley a total of not more than 180°.

said at least one driven pulley comprising two driven pulleys successively driven in response to rotation of said driver pulley, each of said driver and driven pulleys having a sprocket-spindle, a first belt means operably interconnecting said driver pulley and sprocket-spindle of first of said two driven pulleys, a second belt means operably interconnecting said first driven pulley and sprocket-spindle of second of said two driven pulleys, and a third belt means interconnecting said second driven pulley with an output shaft, said output shaft having a smaller diameter than diameter of said second driven pulley for rotating a greater number of revolutions than said second driven pulley, said rotatable flexible shaft means having one end connected to an end of said rotating output shaft and other end of said flexible shaft connected to said screw means.

4,417,880

#### JOINT ASSEMBLY

Tadanobu Kumagai, Toyota, and Yoshinobu Iwase, Toyokawa, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of Japan

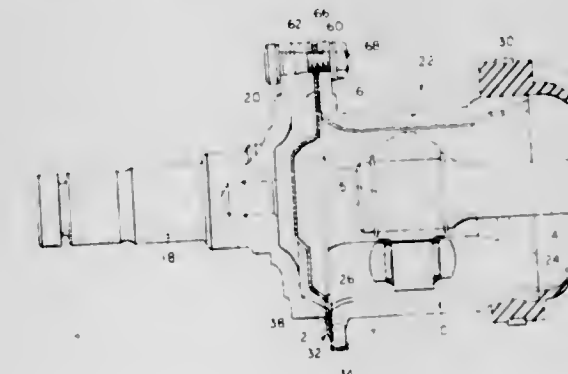
Filed Jun. 28, 1982, Ser. No. 392,616

Claims priority, application Japan, Oct. 6, 1981, 56/147729[U]

Int. Cl.<sup>3</sup> F16D 3/30, 3/20

U.S. Cl. 464—111

5 Claims



1. A joint assembly comprising a first shaft; a casing having two openings at its axial ends; receiving an end portion of the first shaft through the opening at one end and provided with a flange on the periphery of the other end; a second shaft provided at its one end with a flange to be joined to the flange of the casing, and a sealing means disposed between said flanges, said sealing means including a sealing member having an endless shape, and an end cover with its periphery held between said flanges and adapted to hold the sealing member in association with the flange of the casing, said end cover having first support portions spaced in equal interval from one another along said periphery, second support portions located between the adjacent first support portions, formed by folding back parts of the end cover and provided with bolt holes, a setting portion for said sealing member located inside of the first and second support portions, and a concave portion located inside of said setting portion, wherein the face of said setting portion on which said sealing member sits is recessed for a depth corresponding to the thickness of the end cover, from the faces of said first and second support portions which are in contact with the flange of said casing, and the faces of said second support portions which are in contact with the flange of said



second shaft are in the same plane as the face of said setting portion on the side opposite to the face on which said sealing member sits.

4,417,881

## DRIVE SHAFT SEAL

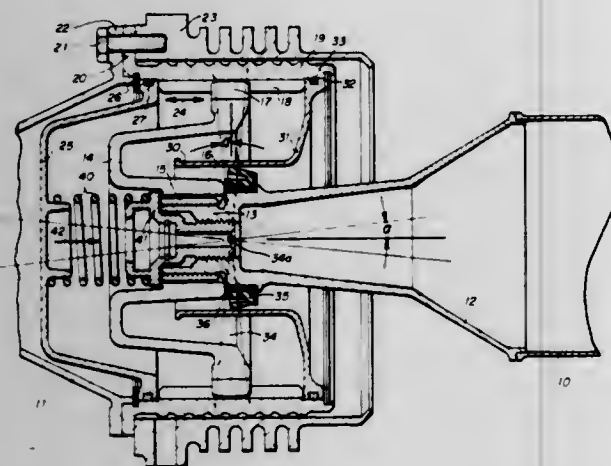
Lewis L. Dyson, Bedford, Tex., assignor to Textron Inc., Providence, R.I.

Continuation of Ser. No. 46,032, Jun. 6, 1979, abandoned. This application Dec. 11, 1981, Ser. No. 329,750

Int. Cl.<sup>3</sup> F16D 3/18

U.S. Cl. 464—150

4 Claims



1. In a coupling for one end of a floating drive shaft where lubricant is to be maintained in a zone of contact between a crown gear and an elongated interior spline, the combination which comprises:

- a cylinder interiorly supporting said spline substantially coaxial of said one end of said shaft and closed by a pan structure having a lip which engages the end of said cylinder adjacent to said one end of said shaft;
- support structure nested in said cylinder supporting said crown gear from said one end of said shaft;
- a cylindrical wear sleeve encompassing the end of said shaft and having a flange closure engaging and partially closing the end opposite said closed end of said cylinder to enclose said spline and having an open end portion spanning the pivotal plane of said crown gear radially inward of the zone of contact between the crown gear and interior spline; and
- a resilient seal ring substantially at said pivotal plane carried by said drive shaft to establish a lubricant seal between said shaft and the interior surface of said end portion to complete closure of said cylinder while accommodating misalignment between the axes of said shaft and of said cylinder and axial translation of said shaft relative to said cylinder.

4,417,882

## METHOD AND APPARATUS FOR ERECTING A CARTON TRAY

Kay Wallin, Halmstad, Sweden, assignor to Sprinter System AB, Sweden

Filed Oct. 21, 1980, Ser. No. 199,674

Claims priority, application Sweden, Oct. 30, 1979, 7908988

Int. Cl.<sup>3</sup> B31B 1/46

U.S. Cl. 493—174

10 Claims

1. A method of erecting a carton tray, the side and end walls of which are provided with outwardly turned edge flaps, at least on three sides and preferably on all four sides, for receiving a lid intended for attaching by means of a binding agent on the rim formed by the edge flaps, the end portions of the edge flaps being extended with end flaps situated one on top of the other and fastened by a binding agent for connecting the edge flaps to each other the erection being performed in two separate phases in two separate tools, the erection in the first tool being performed by means of a plunger which presses the

carton blank down into a forming chamber to form a partially ready-shaped tray with the side walls and end walls thereof erected in their final position, characterized in that joining of the two end flaps in the respective corner of the tray is performed by only one pair of opposing edge flaps being folded down by the plunger together with their associated end flaps to a position substantially in a plane parallel to the bottom of the tray, whereafter these end flaps are folded up in a subsequent operation and are attached to the outside of the end flaps of the



second pair of edge flaps, which together with their end flaps remain substantially in the same plane as the associated side wall of the tray, and that the partially erected tray is subsequently ejected out from the underside of the forming chamber, whereupon this partially erected tray is transferred to the second tool where all edge flaps are folded down to their first position over the edge of folding bars or the like to an oblique downward direction position, whereafter the tray is ejected from the forming chamber of the second tool as the edge flaps resiliently return to a position for receiving the lid.

4,417,883

## APPARATUS FOR CREASING PAPER USED IN THE PRODUCTION OF GYPSUM WALLBOARD

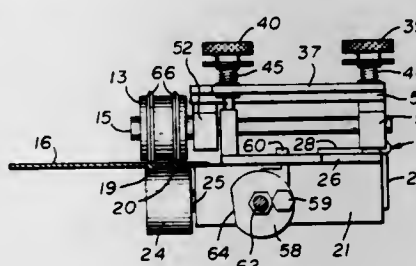
Robert L. Granger, and Alva P. Alexander, Jr., both of Houston, Tex., assignors to United States Gypsum Company, Chicago, Ill.

Filed Nov. 5, 1981, Ser. No. 318,521

Int. Cl.<sup>3</sup> B26D 3/08

U.S. Cl. 493—403

5 Claims



1. An apparatus for applying parallel spaced-apart creases to paper adapted for use as cover sheets in the manufacture of gypsum wallboard, which comprises:

- (1) a mounting plate,
- (2) a base plate,
- (3) hinge means having one portion connected to an edge of said base plate and the other portion connected to said mounting plate, thereby hingedly mounting said base plate on said mounting plate, wherein said hinge means comprises a pair of hinge members hingedly connected to each other by a hinge pin, one of said hinge members being

- affixed to said base plate and the other of said hinge members being affixed to said mounting plate,
- (4) supporting posts affixed to said base plate,
- (5) a floating plate adjustably supported by said supporting posts, wherein the means for adjustably supporting said floating plate comprise screws threadedly engaging threaded openings in said supporting posts, means affixed to said screws for engaging and supporting the lower surface of said floating plate, and means on the ends of said screws for manual engaging and adjusting,
- (6) adjustable means spring-loading said floating plate toward said base plate, comprising helical springs mounted over said screws,
- (7) a creasing wheel rotatably mounted on said floating plate having a pair of annular spaced-apart creasing ribs provided on the surface thereof, and bearings mounted on said floating plate having a shaft journaled therein, with said creasing wheel mounted on one end of said shaft,
- (8) a backing roller rotatably mounted on said mounting plate,
- (9) means for raising and lowering said base plate from operative to inoperative positions, comprising cam means rotatably mounted on said mounting plate and having a cam surface engaging the surface of said base plate, and hand operating means for revolving said cam means, wherein a portion of said cam surface is flat for engaging and maintaining said mounting plate in inoperative position, and
- (10) means for locking said base plate in operative position, wherein said cam means is provided with an integral hook, wherein said base plate is provided with a slot, and wherein said hook is adapted to extend through said slot and to engage the upper surface of said base plate in locked position when said apparatus is in operative position.

4,417,884

## CENTRIFUGE TIMER CLAMP

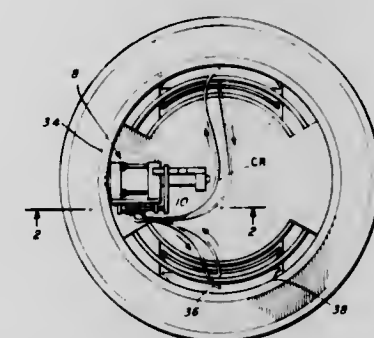
Donald W. Schoendorfer, Brookline, and Allen Latham, Jr., Jamaica Plain, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Jul. 9, 1981, Ser. No. 281,650

Int. Cl.<sup>3</sup> B04B 11/00

U.S. Cl. 494—4

16 Claims



1. Centrifuge apparatus comprising:
  - a first means for containing first and second volumes of fluid;
  - a fluid path intermediate said first and second volumes for providing fluid communications therebetween;
  - a piston disposed within said first means and capable of bidirectional movement therein;
  - valve means for controlling the velocity of the fluid flow between said first and second volumes; and
  - cam means coupled to said piston having at least one actuating surface which moves in proportion to the movement of said piston in response to centrifugal force.

4,417,885

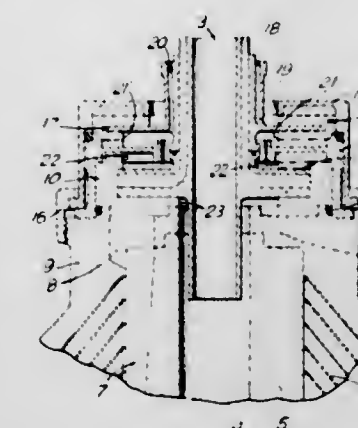
CENTRIFUGE WITH VERTICAL AXIS OF ROTATION  
Werner Kohlsette, and Willi Niernerg, both of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,220

Int. Cl.<sup>3</sup> B04B 15/00

U.S. Cl. 494—23

2 Claims



1. In a centrifuge with a vertical axis of rotation, having at least one skimmer in a skimming compartment in a centrifuge drum for continuously diverting a liquid phase being clarified or separated in the drum, a sealing disk rigidly connected to the skimmer above the skimming compartment and that extends into a blocking compartment rotating along with the drum and which is fillable with a blocking fluid, wherein the skimmer is stationary and the skimmer and the sealing disk are positioned at a distance from the rotating components of the drum, the improvement comprising: means providing fluid communication between the portions of the skimming and blocking compartments that are positioned below the sealing disk and above the skimmer; and means forming a channel connected to said portions of the skimming and blocking compartments and receptive of a gas at a higher than atmospheric pressure for shifting the fluid level in said portions radially outwardly from the vertical axis of rotation to prevent blocking fluid from entering the skimming compartment.

4,417,886

## CATHETER INTRODUCTION SET

Paul L. Frankhouser, Reading, Pa., and Ketan Shevde, Great Neck, N.Y., assignors to Arrow International, Inc., Reading, Pa.

Filed Nov. 5, 1981, Ser. No. 318,469

Claims priority, application Fed. Rep. of Germany.

Oct. 22, 1981, 3141888

Int. Cl.<sup>3</sup> A61M 5/00, 25/00

U.S. Cl. 604—53

7 Claims

7. A method of introduction of a catheter into a blood vessel of a patient comprising the steps of using a hollow introducer needle having a catheter telescopically fitted over the needle shank, the needle having a beveled tip which projects beyond the end of the catheter when the catheter is on the needle, wherein said needle has a tubular member extending rearwardly from the distal end thereof, an elongated flexible wire guide within the tubular member and means for advancing the wire guide through the hollow needle and outwardly through the needle tip, the method comprising: puncturing a selected blood vessel with the needle, thereafter while the needle tip is within the blood vessel, advancing the wire guide through the needle until a predetermined length is positioned within the blood vessel, thereafter advancing the catheter off the needle and over the wire guide until the catheter is placed within the



vessel and then separating and withdrawing the needle, the tubular member and the wire guide from the positioned catheter.

4,417,887

## CONNECTOR FOR CATHETER

Ihei Koshi, Fujinomiya, Japan, assignor to Fuji Terumo Co., Ltd., Fujinomiya, Japan

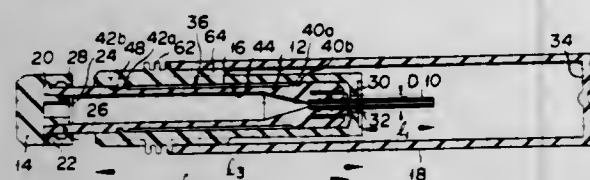
Filed Sep. 28, 1982, Ser. No. 426,246

Claims priority, application Japan, Oct. 30, 1981, 56-172929

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604-162

10 Claims



1. A connector for a catheter, which comprises: a hub provided at the leading end thereof with a hollow needle tube; a cap capable of detachably attaching itself to the rear end of the hub and watertightly sealing the interior of the hub; a sheath in the shape of a blind cylinder for admitting therein the hub from the needle tube side while allowing itself to be slidably fitted around the outer side of the hub, the blind cylinder being provided in the closed end thereof with an orifice for permitting the needle tube to be thrust out therethrough; and a case of the shape of a blind cylinder for admitting therein the sheath from the closed end side thereof while allowing itself to be detachably fitted round one end part of the sheath; the hub and the sheath having relative lengths such that the hub is free to move inside the sheath from a position at which the needle tube is fully thrust out through the orifice to a position at which it is wholly embraced within the sheath; the hub and the sheath being provided on the outer and inner surfaces thereof respectively with stop means for stopping the hub and the sheath relative to each other at the position at which the needle tube is fully thrust out through the orifice to the position at which it is wholly embraced within the sheath; the orifice having a diameter such that when the needle tube thrust out through the orifice is retracted to be embraced again within the sheath, the indwelling catheter meanwhile fitted fast around the outer side of the needle tube is allowed to pass through the orifice into the sheath; and the case having a length such that the hub and the cap may be completely incased therein, with the needle tube incased within the sheath, the hub stopped fast to the sheath by the stop means, and the case extended from the cap side of the hub and fitted at one end thereof around the sheath.

4,417,888

## PERCUTANEOUS IMPLANT

Louis C. Cosentino, Wayzata, and Felix J. Martinez, Plymouth, both of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Mar. 15, 1982, Ser. No. 358,229

Int. Cl.<sup>3</sup> A61M 5/00; A61F 1/00

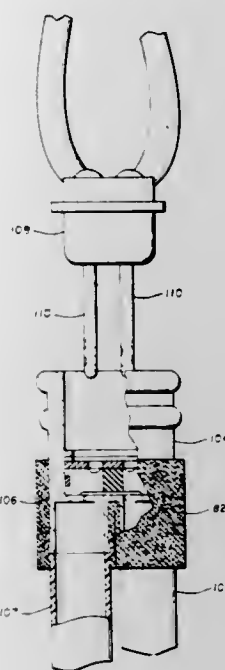
U.S. Cl. 604-175

7 Claims

1. A percutaneous device for providing communication between the body exterior and the body interior, the device comprising:

a rigid tubular body of biologically compatible material, said body including a transcutaneous stem portion defining a stem cavity therein and a plurality of subcutaneous arm portions joined to and in fluid communication with said

stem cavity, said stem having a substantially constant outer diameter along its subcutaneous portion and to at least the excutaneous portion of the stem, an elastomeric septum within said stem cavity, and means within said stem cavity for holding said septum member in a fixed



relationship to said arms so as to provide a separate interruptable seal between each of said arms and said stem cavity, and said device including a porous tissue ingrowth media on at least a part of the exterior subcutaneous surfaces of the device and wherein said ingrowth media is limited to said subcutaneous surfaces.

4,417,889

## DEVICE FOR A PORTABLE AUTOMATIC SYRINGE

Soo-Bong Choi, 47-3, 4-Ka, Namdaemoon-Ro, Joong-Ku, Seoul, Rep. of Korea

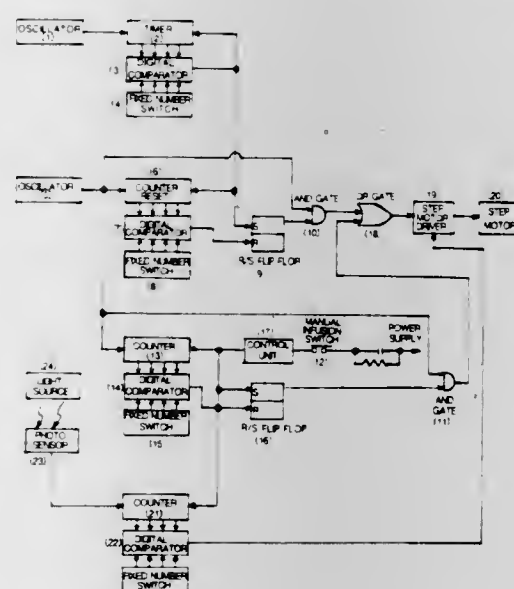
Filed Sep. 8, 1981, Ser. No. 299,951

Claims priority, application Rep. of Korea, Dec. 31, 1980, 80-5060; Dec. 31, 1980, 80-8520[U]; Dec. 31, 1980, 80-8521[U]

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604-246

4 Claims



1. In a portable automatic insulin injection syringe pump device including a step motor and a motor driving circuit, the improvement comprising:

(a) means for setting an injection time period comprising a first oscillator for producing pulses, a timer connected to said oscillator to count said pulses, a first fixed number switch for presetting a desired injection time, and a first

digital comparator for comparing the output of said timer with said first switch;

- (b) means for injecting a prescribed insulin dosage comprising a second oscillator for producing pulses slower than said first oscillator, a counter for counting said pulses, a second fixed number switch for presetting the prescribed amount of injections, and a second digital comparator for comparing the output of said counter and said second switch;
- (c) means for injecting an increased insulin dosage comprising a third oscillator for producing pulses, a counter for counting said pulses, a third fixed number switch for presetting the prescribed amount of injections, and a third digital comparator for comparing the output of said counter and said third switch, wherein said third fixed number switch is preset to permit delivery of an increased amount of insulin;
- (d) a control unit for preventing repetitive injection of increased amounts of insulin; and
- (e) means for preventing excess injection comprising a light source, a photosensor, counter for counting the number of light pulses, a fourth fixed number switch, and a fourth digital comparator.

4,417,890

## ANTIBACTERIAL CLOSURE

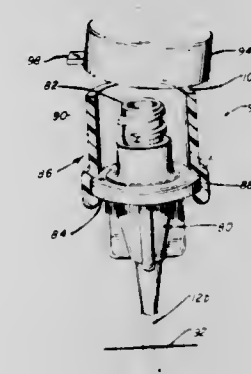
T. Michael Dennehey, Arlington Heights, Ill., and Charles K. Peterson, Fontana, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 17, 1981, Ser. No. 293,807

Int. Cl.<sup>3</sup> A61M 3/00

U.S. Cl. 604-256

17 Claims



1. A closure system for a conduit carrying a connector at its end said connector defining a forward end segment which closure system comprises a flexible, tubular closure member positioned about said connector in sealing relation thereto, said closure member being proportioned to telescope over said connector and defining a groove adapted for snap-fit relation with a projecting flange on said connector and defining annular sealing means for providing a seal between the flexible closure member and connector, said closure member being spaced from said forward end segment, said closure member carrying a removable cap for access to the system and adapted for enclosing antiseptic which is in contact with both the interior and exterior of said connector and wherein said closure member and removable cap are in a one-piece, molded elastomeric structure, means for limiting the forward penetration of said connector into said closure member, the inner diameter of the flexible structure telescoped around the connector being proportioned to define a space to permit the penetration of antiseptic about a portion of the exterior forward portion of said connector for improved antibacterial effect on the connector.

4,417,891

## COLLECTION DEVICE WITH ANTISEPTIC LIQUID FOR BODY FLUIDS

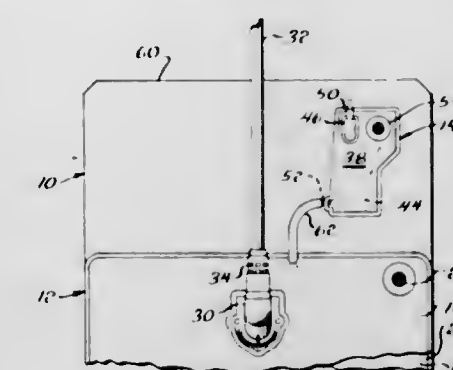
James P. Cianci, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 8, 1981, Ser. No. 309,625

Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604-317

8 Claims



1. A device for collecting urine from a patient comprising: a container having flexible walls with inner and outer surfaces, a drainage catheter, a discharge tube and a chamber to receive urine; a receptacle permanently secured to an outer surface of a wall of the container and having a cavity, a vent means through an upper portion of said cavity open to ambient atmosphere, the vent means including a bacteria filter, the receptacle cavity communicating with the container chamber directly through an opening means of approximately 0.030 inches in diameter, through a lower portion of said cavity, the internal diameter of the opening means and the surface tension of liquid contained within the cavity being so interrelated as to insure impeded passage of liquid from the cavity, through the opening means, to the container; and an antiseptic agent means in liquid form in said cavity, the passage of said agent through said opening means from the cavity to the chamber being facilitated by said vent means open to the ambient atmosphere, the antiseptic agent means in the container chamber minimizing the possibility of contamination to the patient's bladder caused by retrograde bacteria movement from the device to the patient through the drainage tube.

4,417,892

## URINE DRAINAGE BAG OUTLET TUBE AND METHOD FOR ELIMINATING OR REDUCING MIGRATION OF BACTERIA

Charles E. Meisch, Hasbrouck Heights, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Dec. 31, 1981, Ser. No. 336,289

Int. Cl.<sup>3</sup> A61M 1/00

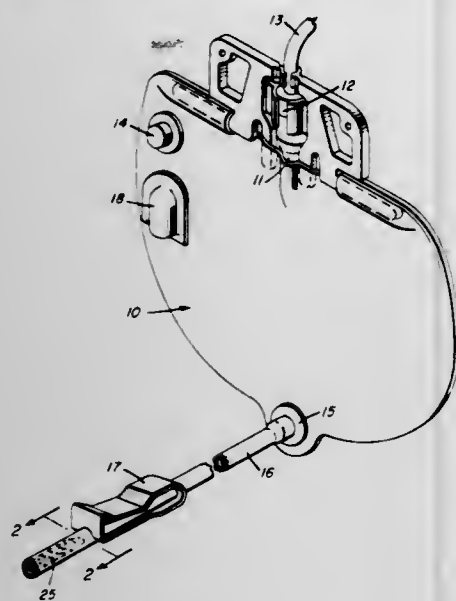
U.S. Cl. 604-323

10 Claims

1. An outlet for a urine drainage bag, comprising an elongated outlet tube secured to the bottom portion of the drainage bag, at least a portion of the interior of said tube having a hydrophilic coating means thereon, a normally totally sealed



frangible ampule containing an antimicrobial substance received in said outlet tube, the antimicrobial substance being



absorbed by said coating means on the tube interior when the frangible ampule seal is broken.

#### 4,417,893 SANITARY NAPKIN

Hiroshi Mizutani, and Yoshimi Tsuchiya, both of Yachiyo, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Filed Jun. 8, 1978, Ser. No. 913,880

Claims priority, application Japan, Jun. 17, 1977, 52-79368

Int. Cl.<sup>3</sup> A61F 13/16

U.S. Cl. 604—366

7 Claims



1. In a sanitary napkin for menstrual discharges, comprising an absorbent core, a liquid-impermeable layer covering the bottom, sides and the edge portion of the top surface of the absorbent core and a non-woven fabric covering the remainder

of the top surface of the absorbent core, the improvement which comprises:

said non-woven fabric consists essentially of a unitary laminate of an inner layer disposed adjacent to said absorbent core and an outer layer disposed on the opposite side of said inner layer from said absorbent core, each of said inner and outer layers consisting essentially of a blend of hydrophilic fibers and heat-fusible hydrophobic fibers with said inner layer containing a higher proportion of hydrophilic fibers than said outer layer, one of said inner and outer layers consisting essentially of randomly oriented fibers in a fluffy bulky state, the other of said inner and outer layers consisting essentially of substantially uniformly oriented fibers and having a high longitudinal tensile strength, the hydrophobic fibers of said first and second layers being heat-fused to each other at the locations where they are in contact with each other to unite said first and second layers to each other and to maintain the structural integrity of said first and second layers.

#### 4,417,894 TOWELSHEET DISPOSABLE-DIAPER

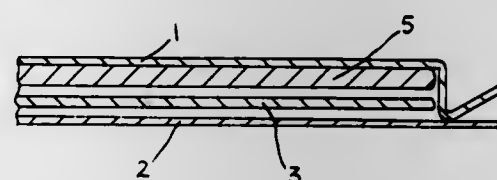
Kenneth E. Norris, 61352 Tombstone Dr., Montrose, Colo. 81401

Filed Mar. 11, 1982, Ser. No. 357,303

Int. Cl.<sup>3</sup> A61F 13/16

U.S. Cl. 604—385

4 Claims



1. In an integral disposable diaper having a backsheet and an absorbent body superposed on and associated with the backsheet, an improvement, comprising:

a towel-sheet, which is fastened to the diaper at the top area of the diaper, and which is removably fastened at the bottom area of the diaper such that when unfastened forms a towel, integral with the diaper, for cleaning a messy child, in which the towel-sheet is of moisture absorbent material and is sandwiched between the backsheet and the absorbent body, with a substantial portion of the towel-sheet extending over the backsheet.

## CHEMICAL

#### 4,417,895 TREATMENT OF TEXTILES WITH ANTIMICROBIAL AGENTS

Manfred Hennemann, Hilden; Hans Andree, Leichlingen; Rudolf Lehmann, Neuss; Harald Schneggelberger, Leichlingen, and Horst Bellinger, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,841

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1981, 3100470

Int. Cl.<sup>3</sup> D06L 1/12; C11D 3/48

U.S. Cl. 8—137

14 Claims

1. A process for the antimicrobial treatment of textiles during washing and softening cycles using liquid textile washing agents based upon nonionic tensides and containing fabric-softening quaternary nitrogen compounds, wherein one or more antimicrobially active azole compounds are added to the textile washing agent or to the bath.

#### 4,417,896 HAIR DYE COMPOSITIONS AND NEW COMPOUNDS USEFUL THEREIN

Andree Bugaut, Boulogne-sur-Seine, and Patrick Andrillon, Aulnay-sous-Bois, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 682,798, May 3, 1976, Pat. No.

4,337,061, which is a continuation-in-part of Ser. No. 628,999, Nov. 5, 1975, abandoned. This application Apr. 6, 1982, Ser. No. 365,993

Claims priority, application France, Nov. 5, 1974, 74 36651; Apr. 3, 1976, 76 18985

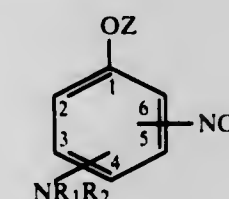
The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 7/13; C07C 93/14, 79/46, 103/29

U.S. Cl. 8—414

15 Claims

1. A process for dyeing human hair comprising applying to washed and rinsed hair an effective amount of a hair dyeing composition comprising a water-alcohol solution, having a pH between 3 and 11.5, of 0.001 to 5% by weight of at least one compound of the formula



wherein

Z is lower alkyl having 1-6 carbon atoms and substituted by —OH, and

each of R<sub>1</sub> and R<sub>2</sub> is hydrogen or alkyl having 1 to 6 carbon atoms,

the —NO<sub>2</sub> substituent is in the 2, 3, 4, 5 or 6 position on the ring and the —NR<sub>1</sub>R<sub>2</sub> substituent occupies any remaining position on the ring,

said alcohol being present in an amount from 20 to 75% by weight of the composition and being a lower alcohol having from 1 to 4 carbon atoms; said water-alcohol solution containing 1 to 3% by weight of a cosmetic resin selected from polyvinylpyrrolidone, a copolymer of crotonic acid and vinyl acetate, a copolymer of vinylpyrrolidone and vinyl acetate, a copolymer of methyl vinyl ether and maleic anhydride, a copolymer of the ethyl, isopropyl or butyl ester of maleic anhydride with methyl vinyl ether or a copolymer of maleic anhydride and butyl vinyl ether; setting the hair; and drying said hair.

4. A compound selected from the group consisting of (4-nitro-2-β-hydroxyethylamino)phenoxyethanol, (3-nitro-6-β-hydroxyethylamino)phenoxyethanol,

(3-nitro-6-carbamylmethylamino)phenoxyethanol, (3-nitro-6-carboxymethylamino)phenoxyethanol, (3-nitro-6-β-diethylaminoethylamino)phenoxyethanol, (5-nitro-2-carbamylethylamino)phenoxyethanol, (5-nitro-2-carboxyethylamino)phenoxyethanol and (2-nitro-4-N,N-di-β-hydroxyethylamino)phenoxyethanol.

#### 4,417,897 PROCESS FOR PREPARING BURN-OUT EFFECTS ON TEXTILE MATERIALS

Theo Stahl, Frankfurt am Main, and Ulrich Bühler, Schöneck, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Mar. 10, 1983, Ser. No. 473,784

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 3209329

Int. Cl.<sup>3</sup> D06P 5/15; D06C 23/02

U.S. Cl. 8—464

12 Claims

1. In the process for preparing white or colored burn-out effects on textile materials containing hydrophobic fibers and cellulose fibers which comprises applying to the material a dyeing liquor or printing paste containing at least one disperse dyestuff for dyeing the hydrophobic fibers alone or mixed with dyestuff for dyeing the cellulose fibers, applying a burn-out agent which is a strong acid or an agent which splits off strong acid to the textile material in the form of a pattern, and then heat-treating the textile material at about 100° to 240° C. whereby the dyestuff is fixed and the burn-out effect is produced.

the improvement comprises said dyeing liquor or print paste contains at least one disperse dyestuff which is discharged by the burn-out agent.

#### 4,417,898 CONTINUOUS DYEING PROCESS WHICH PROVIDES IMPROVED WETFASTNESS:

ALKANDLAMINE-CONTAINING DYE LIQUOR AND AFTER-TREATMENT WITH FIXING AGENT

Rolf Hasler, Bienenweg 7, 4104 Oberwil, Switzerland, and Francis Palacin, 32 rue des Jonquilles, Riedisheim, France

Filed Sep. 8, 1982, Ser. No. 415,852

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136032

Int. Cl.<sup>3</sup> D06P 3/62

U.S. Cl. 8—543

19 Claims

1. A process for continuous dyeing a cellulosic fibrous substrate with a direct or reactive dye comprising the steps of

(a) applying to the substrate an aqueous dyeing liquor containing a direct or reactive dye and an alkanolamine, followed by

(b) fixing the dyeings, and finally

(c) after-treating the dyed substrate with a fixing agent comprising a precondensate or mixture of

either (A) the product of reacting a mono- or polyfunctional primary or secondary amine with cyanamide, dicyandiamide, guanidine or bisguanidine; or ammonia with cyanamide or dicyandiamide, said product (A) containing reactive hydrogen atoms bound to nitrogen, or (B) a quaternary polyalkylene polyamine containing reactive hydroxy or amino groups

with (C) an N-methylol derivative of a urea, melamine, guanamine, triazinone, urone, carbamate or acid amide, optionally together

with (D) a catalyst for the crosslinking of N-methylol compounds of the type (C) above.







least two taps in open communication with said first conduit; wherein said at least two taps are in open communication with said first conduit at locations lower than said liquid level; wherein at least a portion of each of said at least two taps is higher than said liquid level; allowing gaseous bubbles escaping from said first conduit through said at least two taps to enter a second conduit in open communication with said gas space in said disengaging zone; wherein said taps are sufficiently disposed from a horizontal orientation to allow gaseous bubbles to escape from said first conduit to said second conduit; passing gaseous bubbles from said second conduit into said gas space in said disengaging zone; and removing gas from said disengaging zone.

4,417,908

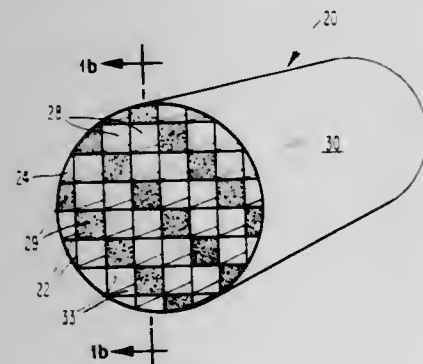
**HONEYCOMB FILTER AND METHOD OF MAKING IT**  
Wayne H. Pitcher, Jr., Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,995

Int. Cl.<sup>3</sup> B01D 39/20

U.S. Cl. 55—523

19 Claims



1. A filter for removing all or substantially all of the solid particulates in fluids passed through the filter comprising: a multiplicity of interconnected thin porous walls defining inlet end faces and outlet end faces of the filter and a multiplicity of cells, each cell extending through the filter from at least one of the inlet and outlet end faces and having a surface area defined by surfaces of the thin walls exposed within the cell,

the thin walls containing interconnected open porosity of a volume and size sufficient to enable the fluid to flow across the narrow dimension of the thin walls between adjoining cells and through the longer dimensions of the thin walls between adjoining or neighboring cells and to restrain at least a significant portion of the solid particulates from passing either across or through any of the thin walls,

an outlet group of cells, each cell of the outlet group being open at a said outlet face and closed where adjoining any said inlet end face,

an inlet group of cells, each cell of the inlet group being open at a said inlet end face and closed where adjoining any said outlet end face, and

the collective thin wall surface area of the inlet group of cells being significantly greater than the collective thin wall surface area of the outlet group of cells.

16. In the method of fabricating a filter for removing solid particulates from fluid streams comprising the steps of providing a honeycomb structure formed from a matrix of thin, intersecting porous walls which define a pair of open end faces and a multiplicity of hollow cells extending in a substantially mutually parallel fashion, closing a first group of cells near their end portions at one end face and the remaining cells near their end portion at the remaining end face, the interconnected open porosity of the thin walls being of volume and size sufficient to enable fluid flowing into the first group of cells to flow completely across the narrow dimensions of the thin walls into adjoining cells of the second group and through the thin walls in their longer dimension to adjoining or neighboring cells of the second group and preventing at least a significant portion

of the solid particulates from passing completely across or through the walls in any of their dimensions, the improvement comprising the step of:

further closing said cells to provide substantially greater collective thin wall surface area to the inlet group of cells than the collective thin wall surface area provided by the outlet group of cells.

4,417,909

**GAS SEPARATION PROCESS**

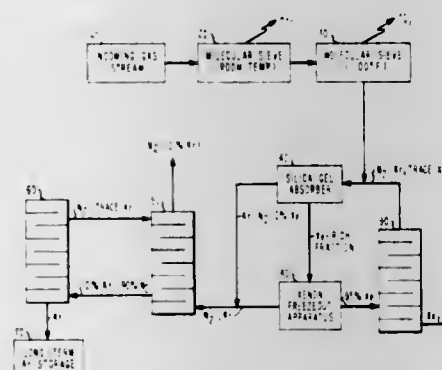
William R. Weltmer, Jr., Murray Hill, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Dec. 4, 1978, Ser. No. 966,446

Int. Cl.<sup>3</sup> F25J 3/06

U.S. Cl. 62—12

2 Claims



1. A method for separating xenon from a mixture consisting essentially of xenon, argon, nitrogen and krypton, comprising the steps of: (a) admitting a fixed quantity of said mixture into a chamber; (b) at least partially cooling the walls of said chamber by heat exchange with liquid nitrogen; (b) allowing sufficient time for essentially equilibrium conditions to be reached, at which the argon and nitrogen components of said mixture are liquefied and the xenon and krypton components are solidified; (c) removing the nitrogen and argon without removal of krypton and xenon; (d) thereafter warming the chamber to a degree such that the krypton and xenon are reliquefied; and (e) removing the reliquefied krypton and xenon from said chamber.

4,417,910

**PROCESS FOR MANUFACTURING A GLASS TUBE COMPRISING AT LEAST ONE DOPED SILICA LAYER**  
Michel Passaret, 20, rue Pierre Le Goffic, 22700 Perros Guirec, France

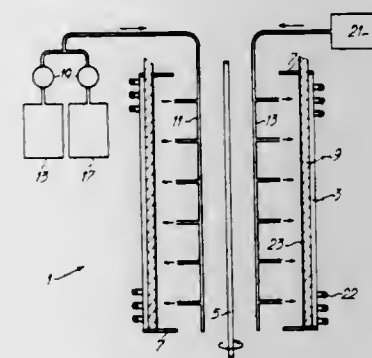
Filed Sep. 14, 1981, Ser. No. 302,145

Claims priority, application France, Sep. 17, 1980, 80 19986

Int. Cl.<sup>3</sup> C03B 37/01, 19/06

U.S. Cl. 65—3.12

17 Claims



1. A process for manufacturing a glass tube comprising at least one doped layer which process comprises the following steps:

atomizing onto the inside surface of a cylindrical mandrel rotated in a centrifuge, a gelable liquid containing an

alkoxysilane so as to form on the mandrel, a layer of said gelable liquid; simultaneously atomizing on said layer a hydrolyzing agent to convert the layer of gelable liquid to a layer of gel; with the hydrolyzing agent and/or the gelable liquid containing a doping element; withdrawing the mandrel from the centrifuge, with the layer of gel remaining in the centrifuge; and submitting the layer of gel thus obtained to at least one thermal treatment, to dry and thermally consolidate the layer into a tube of doped vitreous silica.

4,417,911

**MANUFACTURE OF OPTICAL FIBRE PREFORMS**

Steven L. Cundy, Stanmore; Ronald A. Evans, London; Oliver S. Johnson, Northfleet; John S. McCormack, Wembley, and Bruce A. Nichols, London, all of England, assignors to Associated Electrical Industries Limited, London, England

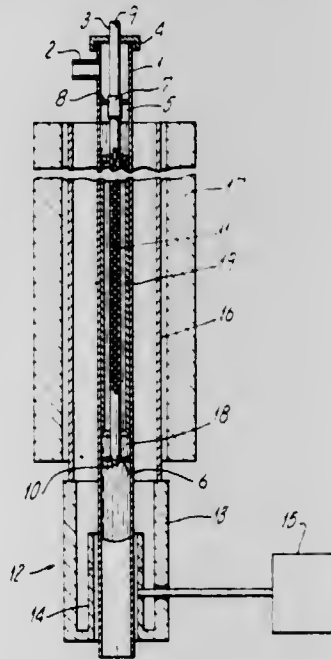
Filed Feb. 23, 1982, Ser. No. 351,483

Claims priority, application United Kingdom, Feb. 27, 1981, 8106311

Int. Cl.<sup>3</sup> C03B 19/00, 37/025

U.S. Cl. 65—3.12

6 Claims



1. A method of manufacturing a glass optical fibre preform in which a coating composed essentially of oxide material is formed on the interior surface of a glass substrate tube by causing a chemical reaction to take place between oxygen and the vapour of at least one compound capable of reacting with oxygen to produce the desired coating material, wherein an inner tube which has a multiplicity of perforations through its wall is supported coaxially within the substrate tube, an annular space being provided between the perforated tube and the substrate tube, and a gaseous mixture consisting of oxygen and each said vapour, and optionally an additional carrier gas, is caused to flow into the said annular space, at least each said vapour being introduced into the annular space by being passed into the inner tube so as to emerge through the perforations into said space, the gas pressure in the inner tube being maintained higher than that in the said annular space so as to cause gas to flow through the perforations into said annular space, while at least a major part of the length of the substrate tube is maintained at an elevated temperature, and a chemical reaction is caused to take place throughout the said annular space by generating energy in said space, whereby a coating of solid material resulting from the said reaction is formed simultaneously on the whole of the interior surface of the heated length of the substrate tube, while residual gases and gaseous reaction products are withdrawn from said annular space, the perforations in the said perforated inner tube being varied in respect of at least one of the features consisting of diameter, number and distribution along the length of the tube as re-

quired to control the rates of gas flow through the perforations and deposition of the coating so that the coating formed on the interior surface of the substrate tube is of uniform thickness both radially and longitudinally.

4,417,912

**METHOD OF PRODUCING CRYSTALLIZED GLASS FROM PHOSPHATE GLASS**

Yoshihiro Abe, 2-4-43, Taihoh, Atsuta-ku, Nagoya-shi, Aichi-ken, Japan, assignor to Ashai Glass Company Ltd., Tokyo and Yoshihiro Abe, Nagoya, both of Japan

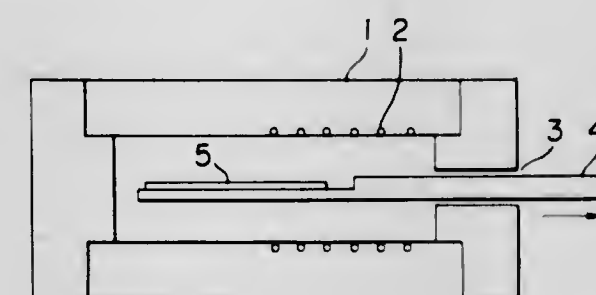
Filed Oct. 28, 1981, Ser. No. 315,864

Claims priority, application Japan, Oct. 28, 1980, 55/150114

Int. Cl.<sup>3</sup> C03B 32/00

U.S. Cl. 65—33

3 Claims



1. A method of producing crystallized glass from meta phosphate glass which comprises fabricating metaphosphate glass in an elongate shape and transferring the glass to a furnace having inside a temperature gradient ranging from the softening point to the glass transformation point of the glass and positioning the glass so that the longitudinal direction of the glass is parallel to the direction of the temperature gradient, and moving the glass so-positioned in the furnace, relative to the furnace, in the direction of the increase of temperature gradient so that a crystallized metaphosphate glass with its crystals oriented in its longitudinal direction is obtained.

4,417,913

**LOWER TEMPERATURE GLASS AND HERMETIC SEAL MEANS AND METHOD**

Earl K. Davis, Tempe; Rafael Landron, Phoenix, and Scot W. Taylor, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

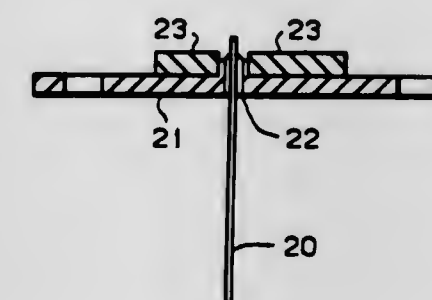
Division of Ser. No. 315,102, Oct. 26, 1981, Pat. No. 4,349,635.

This application May 26, 1982, Ser. No. 382,057

Int. Cl.<sup>3</sup> C03C 29/00, 7/02

U.S. Cl. 65—59.1

10 Claims



1. In a method for making an electrical device having at least one electrically conductive member hermetically sealed to another member by a sealing material, the improvement comprising:

utilizing a lead-free glass plus alumina ceramic sealing material consisting essentially of the following ingredients by weight percent in the range of:



4,417,915

## GLASSWARE FORMING APPARATUS

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

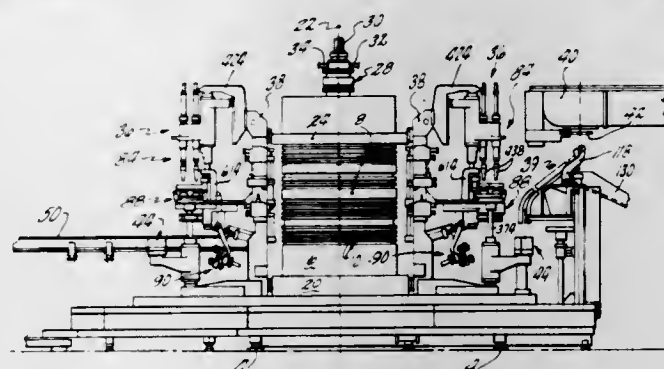
Division of Ser. No. 179,381, Aug. 18, 1980, Pat. No. 4,339,264.

This application May 7, 1982, Ser. No. 375,834

Int. Cl.<sup>3</sup> C03B 7/16

U.S. Cl. 65—159

5 Claims



1. A delivery system for delivering gobs of glass from a plurality of feeder orifices to a plurality of sets of a plurality of blank molds, said sets being rotated about a central axis with each said blank mold of each set being positioned a different radial distance from said central axis, said delivery system including a plurality of individual gob guiding units, each one feeding a gob from one orifice to one of the blank molds in a set of blank molds, and means mounting said gob guiding units so that the upper ends thereof are substantially under the orifice and the other ends are positioned over the blank molds as each set of blank molds are rotated underneath and the other end of each unit is moved at a different relative tangential velocity to match the different relative tangential velocity of its associated blank mold.

4,417,916

## ENCAPSULATION BY INTERFACIAL POLYCONDENSATION

George B. Beestman, Creve Coeur, and John M. Deming, Hazelwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 23,566, Mar. 26, 1979, Pat. No. 4,280,833. This application Jul. 22, 1981, Ser. No. 286,092

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A01N 43/48, 43/64, 37/18; B01J 13/02

U.S. Cl. 71—93

40 Claims

21. A composition consisting essentially of a mixture of water and microcapsules containing a water-immiscible material, said mixture being produced by a process which comprises the steps of:

- providing an aqueous phase containing an emulsifier selected from the group consisting of sodium, potassium, magnesium, calcium or ammonium salts of lignin sulfonate;
- dispersing in said aqueous phase, a water-immiscible phase consisting essentially of polymethylene polyphenylisocyanate dissolved in said water-immiscible material, to form a dispersion of water-immiscible phase droplets throughout the aqueous phase;
- adding, with agitation, to said dispersion a polyfunctional amine, whereby said amine reacts with polymethylene polyphenylisocyanate to form a polyurea shell wall about said water-immiscible material;

wherein the concentration of said water-immiscible material is from about 480 grams to about 600 grams per liter of said composition, wherein the concentration of polymethylene polyphenylisocyanate is from about 3.5% to about 15.0% by weight of said water-immiscible material, wherein the concentration of said polyfunctional amine is from about 1.5% to about 9.0% by weight of said water-immiscible material, and

## Ingredients Composition Range

SiO <sub>2</sub>	34-50
Al <sub>2</sub> O <sub>3</sub>	2-25
K <sub>2</sub> O	2-6
Na <sub>2</sub> O	4-9
Li <sub>2</sub> O	2-6
CaO	0-4
ZnO	4-12
BaO	1-5
TiO <sub>2</sub>	2-6
B <sub>2</sub> O <sub>3</sub>	11-21

6. An enclosure for an electrical device comprising: a portion of said enclosure containing at least one aperture; at least one electrically conductive lead positioned within said aperture; and means within said aperture and surrounding said at least one lead for sealing said aperture, said means comprising a lead-free glass plus alumina ceramic sealing material consisting essentially of the following ingredients by weight percent in the range:

## Ingredients Composition Range

SiO <sub>2</sub>	34-50
Al <sub>2</sub> O <sub>3</sub>	2-25
K <sub>2</sub> O	2-6
Na <sub>2</sub> O	4-9
Li <sub>2</sub> O	2-6
CaO	0-4
ZnO	4-12
BaO	1-5
TiO <sub>2</sub>	2-6
B <sub>2</sub> O <sub>3</sub>	11-21

4,417,914

## METHOD FOR FORMING A LOW TEMPERATURE BINARY GLASS

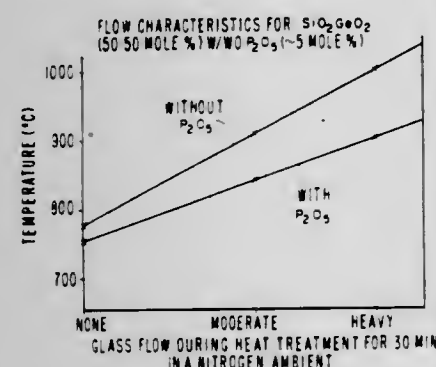
William I. Lehrer, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 243,989, Mar. 16, 1981, abandoned. This application Mar. 26, 1982, Ser. No. 362,333

Int. Cl.<sup>3</sup> C03B 29/00, 32/00

U.S. Cl. 65—60,53

8 Claims



1. The method of forming and smoothing a thin glass film, comprising:

- reacting a gaseous mixture of germane and silane with oxygen at a reaction temperature of from 350°-500° C. to form a mixed germanium oxide/silicon oxide glass vapor;
- depositing said glass mixture vapor on a semiconductor substrate as a film of less than about 5 microns in thickness, said germanium oxide being about 50 mole percent of the germanium oxide/silicon oxide glass mixture; and
- reflowing the resulting glass film at a temperature range of approximately 700° C. to 900° C. to smooth the surface topography of the film.

wherein the concentration of said emulsifier is from about 1/4% to about 15% by weight of said water-immiscible material; and wherein said water-immiscible material is selected from the group consisting of 2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide, N-(butoxymethyl)-2-chloro-2',6'-diethylacetanilide, 2-chloro-N-isopropyl acetanilide, α-chloro-2'-ethyl-6'-methyl-N-(1-methyl-2-methoxyethyl)acetanilide, α-chloro-N-(2-methoxy-6-methylphenyl)-N-(1-methylethoxymethyl)acetamide, α-chloro-N-methyl-N-[2-methyl-6-(3-methylbutoxy)phenyl]acetamide, α-chloro-N-[2-methyl-6-(2-methylpropoxy)phenyl]-N-(propoxymethyl)acetamide, N-{(acetylamino)methyl}-α-chloro-N-(2,6-diethylphenyl) acetamide, α-chloro-N-methyl-N-(2-methyl-6-propoxyphenyl)acetamide, N-(2-butoxy-6-methylphenyl)-α-chloro-N-methylacetamide, isobutyl ester of (2,4-dichlorophenoxy)acetic acid, 2-chloro-N-(ethoxymethyl)-6'-ethyl-o-acetoluidide, 1-(1-cyclohexen-1-yl)-3-(2-fluorophenyl)-1-methyl urea, S-2,3,3-trichloroallyl-diisopropylthiocarbamate, S-2,3-dichloroallyl-diisopropylthiocarbamate, α,α,α-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine, 2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine, 2-chloro-4,6-bis(ethylamino)-1,3,5-triazine, 2-chloro-4,6-bis(isopropylamino)-1,3,5-triazine, 4-amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one, N'-(3,4-dichlorophenyl)-N-methoxy-N-methylurea, 2-chloro-N-(ethoxymethyl)-N-[2-methyl-6-(trifluoromethyl)phenyl]acetamide, α-chloro-N-(ethoxymethyl)-N-[2-ethyl-6-(trifluoromethyl)phenyl]acetamide, methyl and ethyl parathion, ethyl 2-chloro-4-(trifluoromethyl)-5-thiazolecarboxylate, benzyl, 2-chloro-4-(trifluoromethyl)-5-thiazolecarboxylate and mixtures thereof.

4,417,917

## HERBICIDAL SULFONAMIDES

George Levitt, Wilmington, and Richard F. Sauers, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

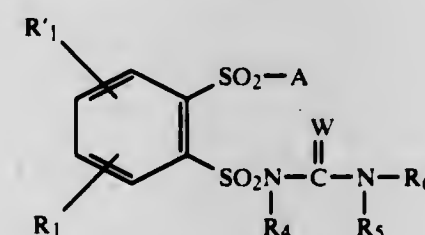
Division of Ser. No. 152,022, May 30, 1980, Pat. No. 4,310,346, which is a continuation-in-part of Ser. No. 130,342, Mar. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,153, Jul. 20, 1979, abandoned. This application Oct. 20, 1981, Ser. No. 313,348

Int. Cl.<sup>3</sup> C07D 251/46; A01N 43/66

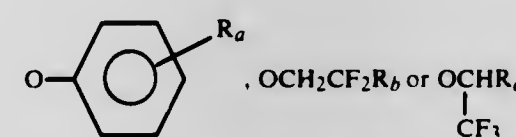
U.S. Cl. 71—93

30 Claims

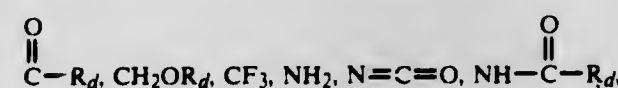
1. A compound of the formula



wherein

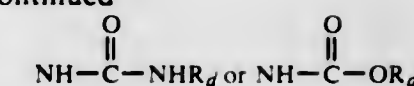
A is NR<sub>2</sub>R<sub>3</sub>, OCH<sub>2</sub>CCl<sub>3</sub>, OCH<sub>2</sub>CB<sub>3</sub> or

where R<sub>6</sub> is H, Cl, CH<sub>3</sub>, OCH<sub>3</sub> or NO<sub>2</sub> and R<sub>7</sub> is H, F or C<sub>1</sub>-C<sub>2</sub> alkyl with 0-5F and R<sub>8</sub> is CH<sub>3</sub> or CF<sub>3</sub>; R<sub>1</sub> is H, Cl, Br, F, C<sub>1</sub>-C<sub>3</sub> alkyl, NO<sub>2</sub>, OCH<sub>3</sub>,

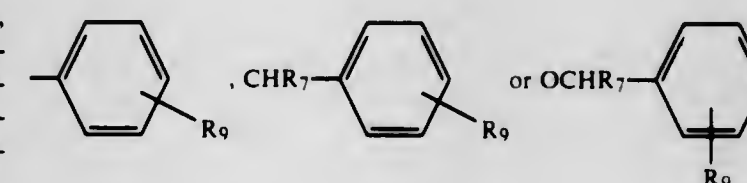


1036 O.G.—72

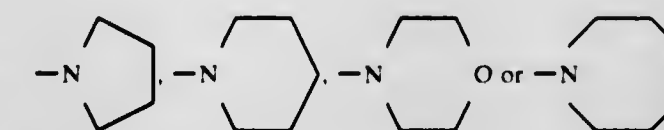
-continued



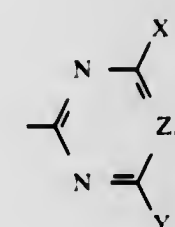
where R<sub>d</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, or R<sub>1</sub> is N(CH<sub>3</sub>)<sub>2</sub>, CN, CH<sub>2</sub>S(O)<sub>n</sub>CH<sub>3</sub> or S(O)<sub>n</sub>CH<sub>3</sub>, where n is 0, 1 or 2; R<sub>1</sub>' is H, Cl, F, Br, CH<sub>3</sub> or OCH<sub>3</sub>; R<sub>2</sub> is H, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>6</sub> cycloalkyl, C<sub>4</sub>-C<sub>7</sub> cycloalkylalkyl, C<sub>5</sub>-C<sub>6</sub> cycloalkenyl, C<sub>3</sub>-C<sub>5</sub> alkenyl, C<sub>3</sub>-C<sub>6</sub> cycloalkyl substituted with 1-2 CH<sub>3</sub> groups, CF<sub>2</sub>CF<sub>2</sub>H, CF<sub>2</sub>CHFCl, CF<sub>2</sub>CHFBr, CF<sub>2</sub>CHFCH<sub>3</sub>, C(CH<sub>3</sub>)<sub>2</sub>CN, (CH<sub>2</sub>)<sub>m</sub>CN, where m is 1 or 2, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH(CH<sub>3</sub>)OCH<sub>3</sub>, (CH<sub>2</sub>)<sub>3</sub>OCH<sub>3</sub>, CHR<sub>7</sub>CO<sub>2</sub>R<sub>8</sub> or CHR<sub>7</sub>CON(R<sub>8</sub>)<sub>2</sub>, where R<sub>7</sub> is H or CH<sub>3</sub> and R<sub>8</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, OCH<sub>3</sub>,



where R<sub>9</sub> is H, CH<sub>3</sub>, Cl, Br or F; R<sub>3</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH(CH<sub>3</sub>)OCH<sub>3</sub>, CH<sub>2</sub>CF<sub>3</sub>, or (CH<sub>2</sub>)<sub>m</sub>CN, where m is 1 or 2, or CHR<sub>7</sub>CO<sub>2</sub>R<sub>8</sub>, N<sub>2</sub>R<sub>3</sub> taken together are



R<sub>4</sub> and R<sub>5</sub> are independently H or CH<sub>3</sub>, but R<sub>4</sub> and R<sub>5</sub> cannot both be CH<sub>3</sub>;

R<sub>6</sub> is

wherein

X is H, CH<sub>3</sub>, CH<sub>3</sub>O or CH<sub>3</sub>CH<sub>2</sub>O; Y is Cl, Br, H, C<sub>1</sub>-C<sub>3</sub> alkyl, CF<sub>3</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, OCH<sub>2</sub>CF<sub>3</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, SCH<sub>3</sub>, O(CH<sub>2</sub>)<sub>p</sub>OR<sub>10</sub>, where p is 2 or 3 and R<sub>10</sub> is CH<sub>3</sub> or C<sub>2</sub>H<sub>5</sub>, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>OCH<sub>2</sub>CH<sub>3</sub>, OCHR<sub>7</sub>CO<sub>2</sub>R<sub>11</sub>, OCCHR<sub>7</sub>CON(R<sub>8</sub>)<sub>2</sub>, CO<sub>2</sub>R<sub>11</sub> and CH<sub>2</sub>CO<sub>2</sub>R<sub>11</sub>, where R<sub>11</sub> is H or C<sub>1</sub>-C<sub>3</sub> alkyl, CH<sub>2</sub>CN, NCH<sub>3</sub>(CH<sub>2</sub>CN), CH<sub>2</sub>CH<sub>2</sub>CN, CH<sub>2</sub>Cl, N<sub>3</sub>, OCH<sub>2</sub>CH=CH<sub>2</sub> or OCH<sub>2</sub>C≡CH;

Z is N; and

W is O or S;

provided that:

- when R<sub>2</sub> is OCH<sub>3</sub>, R<sub>3</sub> is CH<sub>3</sub>;
- when R<sub>2</sub> is CF<sub>2</sub>CHFCl, CF<sub>2</sub>CHFBr, CF<sub>2</sub>CF<sub>2</sub>H or CF<sub>2</sub>CHFCH<sub>3</sub>, then R<sub>3</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

and their agriculturally suitable salts.

27. A method for the control of undesirable vegetation comprising applying to the locus of such undesirable vegetation a herbicidally effective amount of a compound of claim 1.



4,417,918  
HERBICIDAL

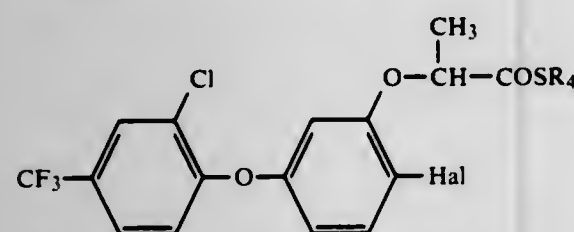
$\alpha$ -[3-(2-HALO-4-TRIFLUOROMETHYLPHENOXY)-6-HALOPHENOXY]PROPIONIC ACID THIO ESTERS AND ACIDS

Otto Rohr, Therwil, Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Beat Böhner, Binningen, and Kurt Burdessa, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 83,905, Oct. 11, 1979, Pat. No. 4,304,926, which is a continuation-in-part of Ser. No. 883,021, Mar. 3, 1978, abandoned. This application Aug. 28, 1981, Ser. No. 297,299, Claims priority, application Switzerland, Mar. 8, 1977, 2867/77; Jul. 4, 1977, 8182/77

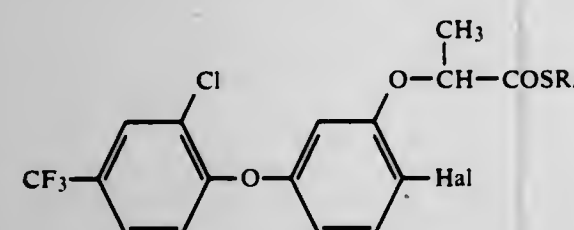
Int. Cl.<sup>3</sup> A01N 37/10; C07C 153/023, 149/40, 149/43  
U.S. Cl. 71-100 8 Claims

1. A compound of the formula



in which Hal is chlorine or bromine and R<sub>4</sub> is hydrogen, phenyl or benzyl.

4. A method of selectively controlling weeds in crops of cultivated plants which comprises applying areas where said crops are grown or to be grown, a herbicidally effective amount of a compound of the formula



in which Hal is chlorine or bromine and R<sub>4</sub> is hydrogen or benzyl.

## 4,417,919

3-HALOALKOXY-4-NITRO-2'-CHLORO-4'-TRI-FLUOROMETHYLDIPHENYL ETHERS AND HERBICIDAL USE THEREOF

Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1982, Ser. No. 347,400

Claims priority, application Switzerland, Feb. 19, 1981, 1106/81

Int. Cl.<sup>3</sup> A01N 31/00; C07C 43/263

U.S. Cl. 71-124 6 Claims

1. 3-Difluoromethoxy-4-nitro-2'-chloro-4'-trifluoromethyl-diphenyl ether.

2. A herbicidal composition which contains, as active ingredient, the compound according to claim 1, together with an agriculturally suitable carrier therefor.

## 4,417,920

PROCESS FOR ELIMINATING METALLIC IMPURITIES FROM MAGNESIUM BY INJECTING A HALOGENATED DERIVATIVE OR BORON

Andre Mena, St. Jean-de-Maurienne; Jean-Michel Charriere, Creil, and Jean Desbrest, Barbazan, all of France, assignors to Societe Francaise d'Electrometallurgie Sofrem, Paris, France  
Filed Nov. 2, 1982, Ser. No. 438,651

Claims priority, application France, Nov. 25, 1981, 81 22451  
Int. Cl.<sup>3</sup> C22B 26/22

U.S. Cl. 75-63

6 Claims

1. A process for the purification of a magnesium melt having iron, silicon and/or manganese impurities therein, comprising: injecting a halogenated boron derivative selected from the group consisting of BCl<sub>3</sub>, BF<sub>3</sub>, and their combination into or near the bottom of said melt, and recovering magnesium from the melt purified thereby.

## 4,417,921

WELDED FERRITIC STAINLESS STEEL ARTICLE  
Jack R. Maurer, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Nov. 17, 1981, Ser. No. 322,126

Int. Cl.<sup>3</sup> C22C 38/20

U.S. Cl. 75-125

12 Claims

1. A ferritic stainless steel consisting essentially of, in weight percent, up to 0.03% carbon, up to 0.03% nitrogen, and a total amount of carbon and nitrogen content of no more than 0.04%, from 11.50 to 13.50% chromium, up to 1.0% manganese, up to 1.0% silicon, up to 0.5% nickel, up to 0.15% copper, and a total amount of nickel and three times the copper of no more than 0.80%, at least one element from the group consisting of titanium and columbium in an amount from 0.1 and four times the total carbon and nitrogen up to 0.75%, and the balance essentially iron with usual steelmaking residuals, said steel characterized by low amounts of carbon, nitrogen, and copper for providing good fabricability suitable for integrally-finned tubing.

## 4,417,922

SINTERED HARD METALS

Fred W. Hall, Metallurg Group Industrial Development Office, 64 Fargate, Sheffield, South Yorkshire, S1 2HE, England, and Hans-Joachim Retelsdorf, Gesellschaft für Elektrometallurgie m.b.H., Zentrale Forschung, Postfach 2844, 8500 Nürnberg 1, Fed. Rep. of Germany

PCT No. PCT/GB80/00195, § 371 Date Jul. 20, 1981, § 102(e) Date Jul. 20, 1981, PCT Pub. No. WO81/01422, PCT Pub. Date May 28, 1981

PCT Filed Nov. 10, 1980, Ser. No. 285,189

Claims priority, application United Kingdom, Nov. 20, 1979, 7940140

Int. Cl.<sup>3</sup> C22C 29/00, 1/10

U.S. Cl. 75-236

17 Claims

1. A sintered hard metal which comprises at least one carbide of a metal selected from the groups IV to VI of the Periodic Table of the Elements, a binder comprising one or more metals or alloys of the iron group and a mixed crystal material prepared by subjecting a mixture comprising titanium, zirconium and hafnium carbides to heating at a temperature and for a time sufficient for the mixed crystal product to undergo spinodal decomposition upon cooling, the amount of mixed crystal material present in the hard metal being in the range from 1% to 30% by weight of the hard metal.

13. A process of manufacture of a sintered hard metal, in which a first mixture comprising titanium zirconium and hafnium carbides is heated under such conditions that the resultant first product contains titanium zirconium and hafnium carbides in mixed crystal form, a second mixture is formed from the first product in comminuted form and from at least one metal or alloy of the iron group, heating the second mixture under such conditions that the resultant second product

## 4,417,926

METHOD FOR CLEANING AND DISINFECTING USED PLASTIC PETRI DISHES

Lars B. Edebo, Linköping; Harald G. Swede, Malmö, and Nils-Erik Tornqvist, Sigtuna, all of Sweden, assignors to Assab Medicin AB, Sundbyberg, Sweden

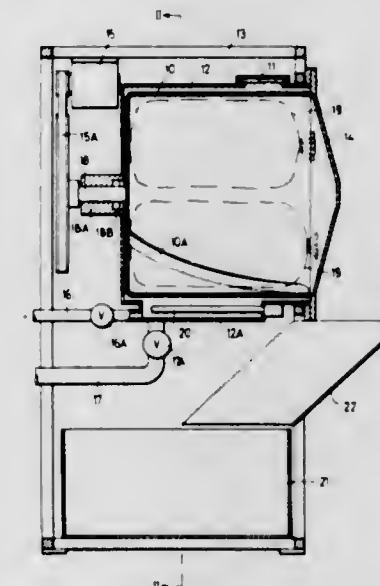
Filed Oct. 20, 1981, Ser. No. 313,349

Claims priority, application Sweden, Oct. 20, 1980, 8007348

Int. Cl.<sup>3</sup> B08B 3/06; A61L 2/00

U.S. Cl. 134-17

6 Claims



1. A method for rendering harmless and cleaning of agar plates, the plates comprising a plastic Petri dish containing an agar-based culture substrate, said method comprising the steps of:

- (a) loading batches of agar plates respectively into bag-like containers at least partly comprising a sheet material which is solid and substantially insoluble in water at room temperature but soluble in water at a predetermined temperature;
- (b) placing the loaded bag-like containers containing the batches of agar plates in a heating chamber;
- (c) closing the heating chamber in a bacterium tight manner;
- (d) feeding water into the heating chamber, the water having said predetermined temperature of at least about 80° C. but not more than 98° C. in the heating chamber, to dissolve said containers and for contacting the agar plates;
- (e) continuing said contacting for a predetermined period of time sufficient for disinfection of the agar plates while maintaining the heating chamber substantially at atmospheric pressure;
- (f) rinsing the agar plates with water; and
- (g) draining off the rinsing water through the bottom of the heating chamber, together with material washed out of the agar plates.

## 4,417,927

STEEL NITRIDING METHOD AND APPARATUS  
Robert L. Fullman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,330

Int. Cl.<sup>3</sup> C21D 1/48

U.S. Cl. 148-16.6

11 Claims

1. In the process of nitriding, wherein influent gas flow containing ammonia continuously enters a nitriding chamber to flowingly contact at least one steel body at elevated temperature therein whereby ammonia is caused to dissociate and effluent gas continuously exits said chamber; the method for controlling the nitriding process in said chamber comprising the steps of:

- (1) measuring the influent gas flow rate,
- (2) measuring the effluent gas flow rate,
- (3) measuring the current rate of dissociation of ammonia in

## 4,417,923

SOLID REFINING AGENTS FOR THE REFINING OF ALUMINUM AND ALLOYS THEREOF AND METHOD OF PREPARING SAID AGENTS

Ivan Beranek; Josef Kyrál; Miroslav Uhlir, and Ivan Zlesak, all of Usti nad Labem, Czechoslovakia, assignors to Spolek pro chemickou a hutní výrobu, národní podnik, Usti nad Labem, Czechoslovakia

Filed Sep. 13, 1982, Ser. No. 417,212

Claims priority, application Czechoslovakia, Sep. 14, 1981, 6752-81

Int. Cl.<sup>3</sup> C22B 21/06

U.S. Cl. 75-257

4 Claims

1. A method of preparing solid refining agents in the form of discrete bodies for the refinement of aluminum and alloys thereof by adding such bodies to a melt of such metals, said method comprising mixing of completely chlorinated hydrocarbon and at least one alkali metal chloride selected from the group consisting of sodium chloride and potassium chloride and exposing this mixture to pressure, said chlorinated hydrocarbon in the mixture with an alkaline chloride being hexachlorobenzene and the pressing being performed by exerting a pressure from 20 to 110 MPa to an amount of 0.05 to 10 kg of the mixture.

## 4,417,924

STEELMAKING ADDITIVE COMPOSITION

John W. Schwer, 1349 Azalea Dr., Munster, Ind. 46321

Filed Sep. 30, 1982, Ser. No. 431,540

Int. Cl.<sup>3</sup> C22B 9/10

U.S. Cl. 75-257

18 Claims

1. A steelmaking additive composition consisting essentially of from about 25 to 50 wt% lime and about 75 to 50 wt% calcium aluminate.

## 4,417,925

CERAMIC FIBER REFRACTORY MIXTURE

Carl J. Cherry, King of Prussia, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 16, 1982, Ser. No. 368,798

Int. Cl.<sup>3</sup> C04B 9/04

U.S. Cl. 106-85

12 Claims

1. A dry, lightweight refractory mixture, which becomes plasticized upon the addition of water to yield a moldable, air-setting, insulating refractory composition, comprising:

- a. from about 35 to about 70% by weight ceramic fiber;
- b. from about 10.5 to about 40% by weight setting agent for providing an air-setting mechanism whereby the refractory composition will harden at ambient temperature upon the addition of water;
- c. from about 5 to about 20% by weight of dry, watersoluble, powdered resin binder from the group consisting of solid resin binders prepared from urea formaldehyde, melamine formaldehyde, and mixtures thereof;
- d. from about 0.3 to about 2% by weight of dry, watersoluble, nonionic, powdered organic polymer plasticizing agent for gelling and imparting cohesiveness to the plasticized composition.



said chamber based upon the difference between said flow rates and

- (4) changing (x) the rate of influent gas flow, (y) the concentration of ammonia in the influent gas flow or (z) both (x) and (y) as required to adjust the mole fraction of ammonia to the value to be maintained in said chamber.

4,417,928

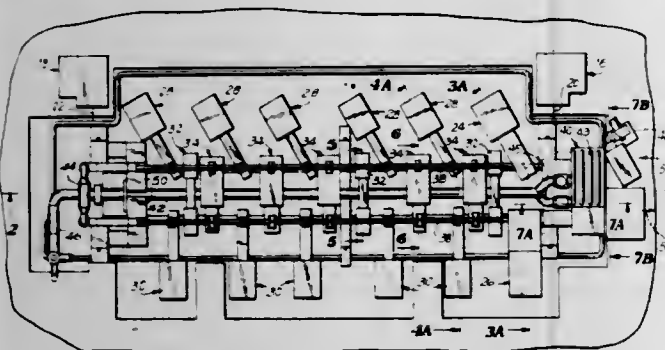
## INSIDE-OUTSIDE TUBE QUENCHING METHOD

Christian H. Heine, Jr., Longview; Robert W. McGaw, Irving; W. Edwin Wetzel, Jr., Daingerfield, all of Tex., and Joseph Ziegler, Apollo, Pa., assignors to Lone Star Steel Company, Dallas, Tex.

Filed Feb. 26, 1982, Ser. No. 352,945

Int. Cl.<sup>3</sup> C21D 9/08

U.S. Cl. 148—144



1. A method for quenching steel tubulars during horizontal axial movement of the tubular comprising heating the tubular in a furnace to a temperature suitable for quenching, conveying the tubular from the furnace in an axial direction through an outside quench head and over an inside quench head mounted on a mandrel longer than the tubular and containing a supply of quenching water; supporting the mandrel at discrete points along its length eccentrically in an oscillable frame, conveying the tubular over the mandrel and simultaneously quenching the tubular by directing quenching water from the outside quench head against the outer surface of the tubular and from the inside quench head against the inner surface of the tubular, sequentially removing the mandrel supports as the tubular moves along the mandrel, sensing the position of the tubular when the trailing end of the tubular passes the outside and inside quenching heads; discontinuing the flow of quenching water from the inside and outside quenching heads; clamping the quenched tubular eccentrically in the oscillable frame, disengaging the tubular conveying means, oscillating the frame with the clamped quenched tubular about its axis through an angle of 180°, engaging the tubular conveying means with the tubular, unclamping the quenched tubular from the oscillable frame, and conveying the quenched tubular back over the mandrel and the inside quenching head.

4,417,929

## SPECIAL BRASS WITH DEZINCIFICATION CORROSION RESISTANCE

Hisao Tomaru, Yamanashi, Japan, assignor to Kitz Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,287

Claims priority, application Japan, Sep. 11, 1980, 55-125342

Int. Cl.<sup>3</sup> C22C 9/04; C22F 1/08

U.S. Cl. 148—433

4 Claims

1. Brass having dezincification corrosion resistance, obtained by a process which comprises: providing a mixture which consists of 58.0% to 62.0% by weight of copper, 0.02% to 0.5% by weight of antimony, 0.5% to 3.0% by weight of lead, 0.2% to 1.0% by weight of tin, 0.1% to 0.5% by weight of iron, and, optionally, at least one member selected from the group consisting of 0.03% to 0.2% by weight of aluminium and 0.03% to

0.2% by weight of silicon, the rest being zinc and unavoidable impurities,

extruding said mixture at a temperature of about 700° C., cold drawing the extruded product, and subjecting the cold drawn product to a stress-relieving treatment to obtain a brass having a fractionated crystal structure and a tensile strength of at least 41.8 kg/mm<sup>2</sup>.

4,417,930

## ELECTROPHILIC SOLID PROPELLANT GAS GENERATOR

Joseph E. Flanagan, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 16, 1977, Ser. No. 779,882

Int. Cl.<sup>3</sup> C06B 45/10

8 Claims

U.S. Cl. 149—19.9

2 Claims

1. A solid propellant iodine atom gas generator system comprising:

iodine pentoxide as an iodine-containing primary oxidizer, ammonium perchlorate as a secondary oxidizer, hydroxy-terminated polybutadiene as the binder and fuel.

4,417,931

## WET COMPACTION OF LOW DENSITY AIR LAID WEBS AFTER BINDER APPLICATION

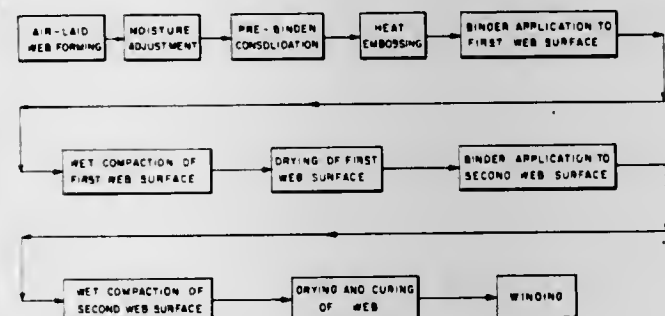
Shiu Kang L. Li, Toronto, Canada, assignor to CIP, Inc.

Filed Jul. 15, 1981, Ser. No. 283,426

Int. Cl.<sup>3</sup> B29J 5/00; B32B 17/00

U.S. Cl. 156—62.2

11 Claims



1. The method of manufacturing a low density web of predominantly ligno-cellulosic material comprising the steps of: a. air laying ligno-cellulosic fibers on a fabric to form a web; b. applying a liquid binder to the web; c. compacting the binder-laden web with a wet surface; and d. drying and curing the wet-compacted web.

4,417,932

## PROCESS FOR THE CONTINUOUS PRODUCTION OF A LENGTH OF STRATIFIED MATERIAL FROM FOAM PARTICLES

Hans-Ulrich Breitscheidel, Siegburg; Paul Spielau, Troisdorf-Eschmar, and Franz-Werner Alfter, Siegburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 25, 1981, Ser. No. 305,726

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037011

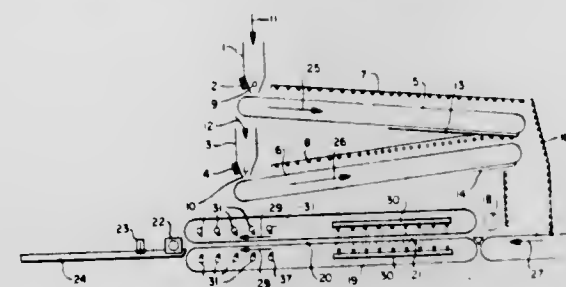
Int. Cl.<sup>3</sup> B29J 5/00; B32B 17/00, 5/18; B29D 27/00

U.S. Cl. 156—62.2

15 Claims

1. A process for the continuous production of a sheeting of stratified material from synthetic resin foam particles which are capable, upon the application of heat, of being bonded together with the use of pressure which comprises scattering foam particles onto a conveying means, preheating the foam particles during conveyance, superficially to a temperature in the range between 100° and 160° C.; thereafter feeding the thus-preheated foam particles to means defining a free falling zone, causing the preheated particle to freefall within said

zone, further heating the particles during falling, to a temperature of at least 200° C., and, at the end of the free fall, piling up



the particles on a support surface, compacting the piled-up particles into a sheetlike layer and then sizing the preliminarily compacted sheet with simultaneous cooling.

4,417,933

## VALVE

Georg Bernat, Menden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

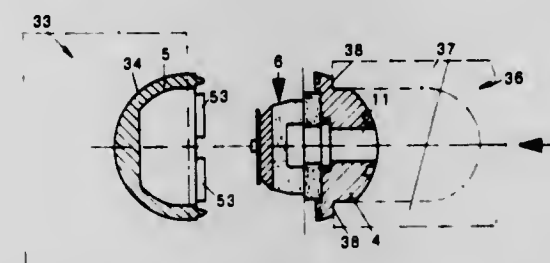
Division of Ser. No. 47,713, filed as PCT DE78/00014, Jul. 26, 1978, published as WO 79/00114, Mar. 8, 1979, § 102(e) date Apr. 30, 1979, Pat. No. 4,292,997. This application Jun. 8, 1981, Ser. No. 271,928

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739154

Int. Cl.<sup>3</sup> B29C 27/08

U.S. Cl. 156—64

6 Claims



1. A method of manufacturing a valve cartridge comprising the steps: assembling a valve assembly comprising first and second valve plates and sealing elements; placing said valve assembly between two semimonocoque cartridge body members, said body members each having corresponding mating surfaces; applying joining pressure to said two body members: applying ultrasonic vibration to said body members in the area of said mating surfaces concurrent with said application of joining pressure whereby a welding of said corresponding mating surfaces occurs; maintaining said pressure and said ultrasonic vibration to produce material deformation of said corresponding mating surfaces; discontinuing said ultrasonic vibration when said body members exert a predetermined force on said valve assembly; and removing said joining pressure.

4,417,934

## MONITORING A DEPOSIT ON A TRAVELLING WEB

Roger Vaughan, Pill, England, assignor to Imperial Group plc, Bedminster, England

Filed Oct. 16, 1981, Ser. No. 312,120

Claims priority, application United Kingdom, Nov. 5, 1980, 8035614

Int. Cl.<sup>3</sup> B32B 31/24

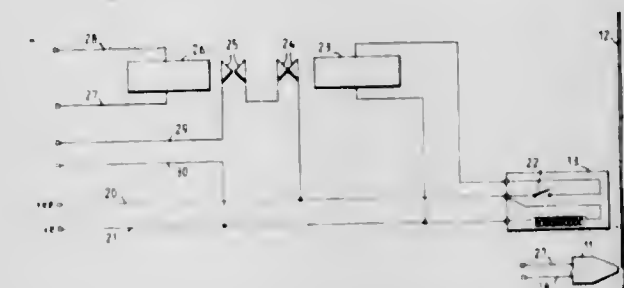
U.S. Cl. 156—64

7 Claims

1. In an adhesive application machine a method of monitoring a liquid adhesive applied to a travelling web of material prior to application of the web to an article in the machine, to

check for absence of the adhesive from the web, which method comprises,

- applying to a travelling web of material by means of an applicator valve a liquid adhesive which has a relative permittivity sufficiently high to distinguish it from the web material,
- sensing whether the applicator valve is open and generating a first electrical signal in response to the applicator valve being open,
- passing the web carrying the adhesive through the field of a capacitive proximity sensor,



- determining by means of the proximity sensor the presence or absence of the adhesive on the web and generating a second electrical signal if the adhesive is absent from the web,
- applying the web to the article, and,
- generating a third electrical signal consequent on the simultaneous presence of the first and second signals and (g) actuating by the third signal a means to eject the article and web from the machine at a point distinct from its point of normal exit.

4,417,935

## METHOD OF DIAPER MANUFACTURE

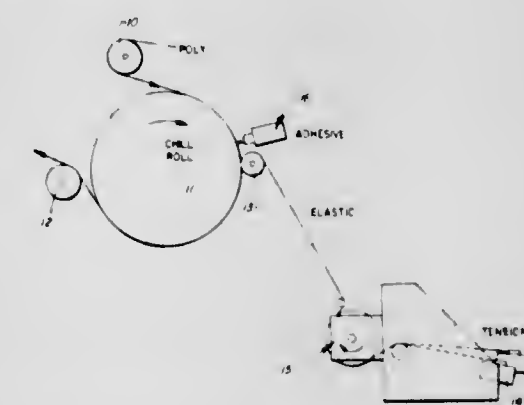
Harvey J. Spencer, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Oct. 13, 1981, Ser. No. 310,881

Int. Cl.<sup>3</sup> B32B 31/08, 31/10

U.S. Cl. 156—80

2 Claims



1. A method of attaching an elastic ribbon to a moisture impervious web comprising feeding an elastic ribbon to an assembly station in a uniformly stretched condition, feeding a moisture impervious web to substantially inelastic material to said assembly station, intermittently applying a foamed adhesive to said moisture impervious web just prior to said assembly station while said moisture impervious web is in contact with a cooling roll, adhering the stretched elastic ribbon to said moisture impervious web in the area occupied by said adhesive and immediately thereafter nipping said moisture impervious web and stretched elastic ribbon to puncture the air bubbles of the foam, integrating a second web and an absorbent pad means to said moisture impervious web, transversely severing the integrated webs and pad means, folding and packaging the diapers resulting therefrom.

2. A method of attaching an elastic ribbon to a moisture



impervious web comprising feeding a solid elastic ribbon to an assembly station in a uniformly stretched condition, feeding a moisture impervious web of substantially inelastic material to said assembly station, intermittently applying a pair of longitudinally extending beads of adhesive having quick setting, low heat properties to said moisture impervious web just prior to said assembly station under conditions promotive of maintaining said moisture impervious web below puckering temperature while maintaining said adhesive with sufficient bonding strength to adhere said ribbon securely to said moisture impervious web when said ribbon and moisture impervious web are nipped together, adhering the stretched elastic ribbon to said moisture impervious web in the area occupied by said adhesive, integrating a second web and an absorbent pad means to said moisture impervious web, transversely severing the integrated webs and pad means, folding and packaging the diapers resulting therefrom.

4,417,936

# PLASTIC WEB WITH MULTIPLICITY OF GAS FILLED BUBBLES, CONTAINING PRINTING THEREON AND METHOD OF MAKING SAME

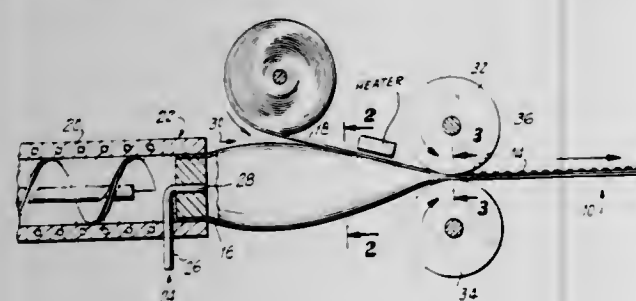
William Gaffney, Bronx, N.Y., assignor to Gafcel Industries, Inc., Bronx, N.Y.

Filed Oct. 19, 1981, Ser. No. 312,532

Int. Cl.<sup>3</sup> B29C 17/00; B32B 31/02

U.S. Cl. 156—145

1 Claim



1. A method of making a thermoplastic web composed of plural thermoplastic laminae mutually defining a multiplicity of gas-filled bubbles, and means providing printing on the exterior surface of the web such that it is an integral part of the web, said web constituting a collapsed blown extruded tube, there being a lamina of thermoplastic material compatible with that of the tube and having printing thereon, said lamina being fused to the external surface of one of the laminae defining the gas-filled bubbles, said method comprising the steps of:

- (A) extruding the blown tube within a certain temperature range;
- (B) printing on and heating the thermoplastic lamina;
- (C) simultaneously passing the extruded tube and the printed lamina between two juxtaposed parallel adjacent cylindrical rollers;
- (D) rotating said rollers in opposite directions to draw said extruded tube and said printed heated lamina into a nip between the rollers, at least one of said rollers having a plurality of recesses on its outer surface;
- (E) maintaining a subatmospheric pressure in the recesses at the nip whereby said extruded tube is squeezed into a collapsed extruded tube forming a continuous bilaminar web with raised closed gas-filled pockets; and
- (F) said certain temperature range being such that the printed heated lamina will autogenously fuse to the collapsed extruded tube as they jointly pass through the nip,
- (G) whereby, the printed lamina forms an upper layer of the web.

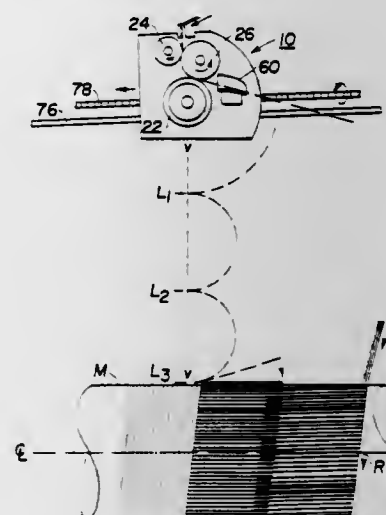
## 4,417,937 FIBRE REINFORCED PLASTIC STRUCTURES AND METHOD AND APPARATUS FOR PRODUCING SAME

Giorgio A. Escher, Mahone Bay, and Raymond C. Dahn, Lunenburg, both of Canada, assignors to Atlantic Bridge Company Limited, Nova Scotia, Canada

Continuation-in-part of Ser. No. 183,067, Sep. 2, 1980, abandoned, which is a continuation of Ser. No. 9,804, Feb. 6, 1979, abandoned. This application Jul. 9, 1982, Ser. No. 396,591  
Claims priority, application Canada, Feb. 23, 1978, 297587  
Int. Cl.<sup>3</sup> B65H 81/00

U.S. Cl. 156—169

21 Claims



1. A method of applying fibre reinforcing material to a mould surface, said method comprising: passing a strand of continuous length fibre through a cutting device to cut the strand into generally uniform length cut fibres; directing cut fibres endwise away from the cutting device along an initial path of travel; applying a force at a predetermined location along the length of the individual cut fibres to cause the individual cut fibres to deviate from the initial path of travel and to assume a selected motion pattern, and positioning a mould surface so as to intercept the moving cut fibres at a selected phase of the motion pattern to achieve a predetermined orientation of the cut fibres on the mould surface.

## 4,417,938 PRODUCING AN ELASTICIZED GARMENT UTILIZING AN ARTICULATED CONVEYOR

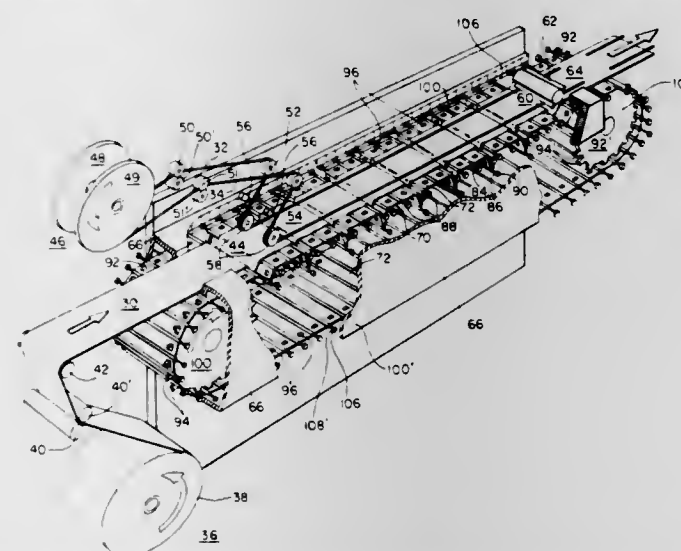
Wayne C. Sigl, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 30, 1981, Ser. No. 325,784

Int. Cl.<sup>3</sup> B32B 31/08

U.S. Cl. 156—270

14 Claims



1. In an apparatus for manufacturing elastic leg disposable diapers including means for continuously moving a web of

material in the direction of its length into engagement with a folding means and means for continuously moving elastic ribbon into engagement with the web, the combination wherein:

- the folding means comprises moving articulated means with which the web is brought into engagement, the moving articulated means engaging and holding the web immobile relative to the articulated means along the entire length of the web engaging the articulated means for forming fold pockets in the web;
- guide means for causing said articulated means to move from a relatively aligned condition to a folded condition in which the articulated means has fold spaces whereby the fold pockets are formed in the web;
- means for moving the elastic ribbon to a position in engagement with the web and spanning said fold pockets; and
- means for adhering the elastic ribbon to the web at positions other than along the fold pockets of the web.

4,417,939

## SYSTEM FOR PRODUCING A BITUMEN LAMINATE

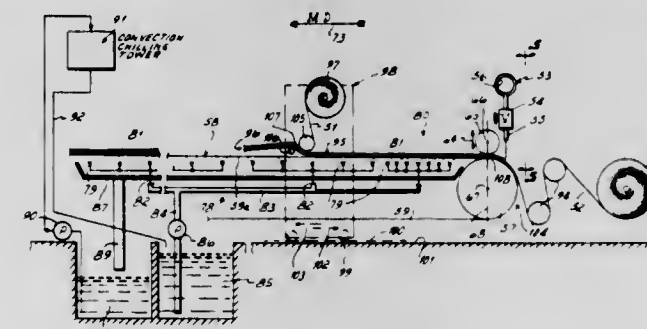
Ronald R. McAdams, North Bend, Ohio, assignor to McAdams Manufacturing Co., Inc., Cincinnati, Ohio

Filed Mar. 2, 1982, Ser. No. 353,950

Int. Cl.<sup>3</sup> B32B 31/06, 31/12

U.S. Cl. 156—282

15 Claims



1. A method for producing a laminate with a bitumen mastic core, said method comprising the steps of: conveying in a machine direction a preliminary laminate comprised of a lower fabric web with a hot bitumen mastic core deposited thereon, adhering an upper fabric web to said preliminary laminate on the exposed face of said hot bitumen mastic core at a lamination point, adjusting said lamination point upstream or downstream relative to said machine direction as desired in order to adhere said upper fabric web to said core face without substantial deterioration of said upper fabric web as might otherwise be caused by the temperature of said hot bitumen mastic core at said lamination point, and holding said lamination point in a fixed location relative to said machine direction of said preliminary laminate during the production of said laminate, said holding step being performed after said adjusting step has adjusted said lamination point to its desired position.
8. Apparatus for producing a laminate with a bitumen mastic core, said apparatus comprising: a conveyor for conveying, in a machine direction, a preliminary laminate comprised of a lower fabric web with a hot bitumen mastic core deposited thereon, means for adhering an upper fabric web to said preliminary laminate on the exposed face of said bitumen mastic core at a lamination point, means for adjusting said lamination point upstream or downstream relative to said machine direction as desired in order to adhere said upper fabric web to said core face without substantial deterioration of said upper fabric web as might otherwise be caused by the temperature of said hot bitumen mastic core at said lamination point, and means for holding said lamination point in a fixed position relative to said machine direction of said preliminary

laminate during the production of said laminate, said holding means being operational after said adjusting means has adjusted said lamination point to its desired position.

4,417,940

## SPLICER FOR LABEL FEEDER

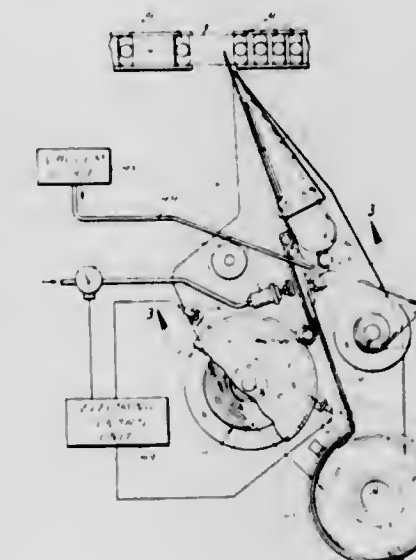
Harry D. Koster, Breckenridge Hills, Mo., assignor to Chemical Dynamics, Inc., St. Louis, Mo.

Filed Jan. 29, 1981, Ser. No. 229,509

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—351

4 Claims



1. In a label-feeder and splicing machine for use with strips of labels adhered to one side of a backing strip: a supply roll for such labels, a base, a supply roll mounting to hold the supply roll on the base, means to conduct a main label strip from the supply roll along a predetermined path to adjacent a point at a line of products to be labelled; a peeling edge at such point, a tension arm swivelled to the base to engage the tape between the supply roll and the peeling edge, a feed roll adjacent the path back of the peeling edge and adjacent to the other side of the backing strip but spaced therefrom so as not to interfere with travel of the strip, the feed roll being adapted to pull the backing strip around the peeling edge and enable the labels to move to the line of products; a rewind roll to receive the backing strip; the rewind roll being adjacent the other two rolls on the opposite side of the strip to the supply roll, means conducting the backing strip away from the feed roll to the rewind roll at a point spaced from the main label strip so as to provide a space between the main label strip path and the backing strip and rewind roll; a single motor having means to drive the feed roll, the rewind roll and the supply roll intermittently at a constant predetermined linear rate; means to support a supplemental label strip roll adjacent the main roll, means to direct the supplemental strip from the supplemental roll along a path between the supply roll and the rewind roll to adjacent the space between the path of the main label strip and the backing strip, releasable means in the said space to hold the end of the supplemental strip at a point in said space adjacent the main strip but out of contact therewith, the releasable means being downstream from the tension arm; means including a movable pressure-applying device on the other side of the main strip opposite the releasable means, operable to press the strips together for purposes of splicing the end of the supplemental strip and the tail end of the main strip together; sensing means responsive to the absence of the main strip at its tail end to energize the pressure-applying device to cause splicing to occur, including means to quickly cause withdrawal of the pressure-applying device to enable the spliced strip to be fed rapidly, the sensing means being located a distance from the



pressure-applying device such that the slicing occurs approximately at the end of the supply strip tail.

4,417,941

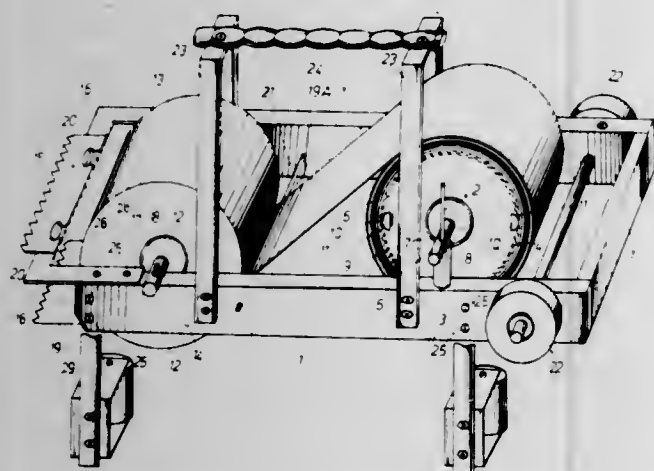
# PORTABLE CARTON BOX SEALER WITHOUT TOUCHING THE TAPE BY HAND

Yng-Lang Lin, No. 234, Hwai-Teh St., Pan-Chiao, Taiwan  
Filed Jun. 4, 1981, Ser. No. 270,390

Int. Cl.<sup>3</sup> B32B 35/00

U.S. Cl. 156—475

8 Claims



1. A hand-held carton sealer enabling automatic sealing of carton surfaces, comprising:

a planar frame having a roll of tape associated therewith; means for rotatably supporting said roll of tape at a forward portion of said frame so that tape may be freely pulled therefrom;

means for applying said tape to the surface to be sealed, said applying means being located rearwardly of said tape roll, and said tape being applied to said surface at a location beneath said frame; and

blade means disposed at a rearward portion of said frame for cutting the tape when sealing of said surface has been completed;

said frame further including means for locating a portion of the width of the tape over a carton edge, said locating means being carried below and within said frame.

4,417,942

# TAPE SPLICING BLOCKS

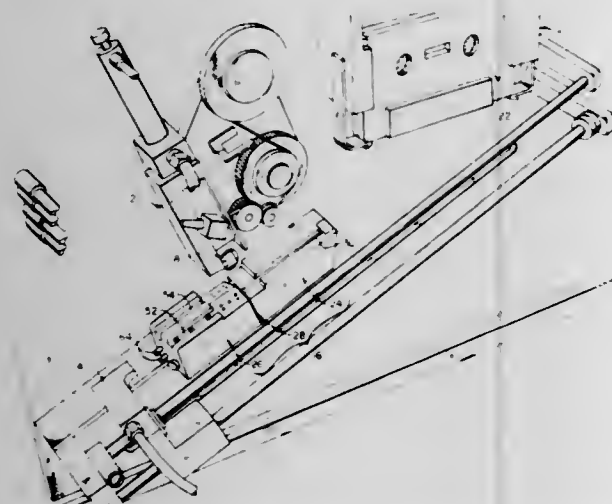
David Kincheloe, Upton, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Sep. 25, 1981, Ser. No. 305,700

Int. Cl.<sup>3</sup> B31F 5/06; B65H 21/00

U.S. Cl. 156—502

6 Claims



1. A splicing block assembly for supporting ends of a plural-

ity of tape-like items to be spliced, said assembly comprising, in combination:

a stationary block having a first guideway for receiving one of said tape-like items;

a rotationally movable block adjacent said stationary block, said movable block having a second guideway and a third guideway for receiving a pair of said tape-like items, said movable block being rotatably supported so as to be capable of rotation on an axis parallel to and substantially equidistant from said first, second, and third guideways, said movable block having first and second prismatic faces substantially parallel to said axis;

means for rotating said movable block on said axis selectively in a first direction and a second direction; and alignment means limiting rotational motion of said movable block between a first position wherein said first and second guideways are colinear and a second position wherein said first and third guideways are colinear, said first and second positions being determined by the alternate contact of said first and second prismatic faces on said stationary block with a stationary member secured to said stationary block.

4,417,943

# METHOD FOR CONTROLLING THE OXYGEN LEVEL OF SILICON RODS PULLED ACCORDING TO THE CZOCHRALSKI TECHNIQUE

Combronde Jacques, Saint Fargeau-Ponthierry, and Jean-Claude Felix, Le Chatelet en Brie, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed May 22, 1981, Ser. No. 266,227

Claims priority, application European Pat. Off., Jun. 26, 1980, 80430013.5

Int. Cl.<sup>3</sup> C30B 15/22

U.S. Cl. 156—601

4 Claims

1. An improved method for the production of a silicon monocrystalline rod grown according to the Czochralski method, in which the oxygen content ( $O_2$ ) is relatively high and maintained substantially constant throughout the length, L, of the rod at a desired value, the improvement comprising: determining the average oxygen content profile ( $O_2$ ) of the rod specific to the pulling equipment used when grown with a constant crucible rotation speed ( $V_{RC}$ )  $O_2 = R_{O_2}$ , and controlling the crucible rotation speed  $V_{RC}$  during the pulling so that its slope is opposite to the slope of the previously measured average oxygen concentration profile.

4,417,944

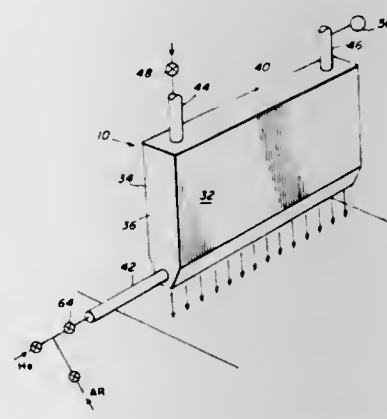
# CONTROLLED HEAT SINK FOR CRYSTAL RIBBON GROWTH

David N. Jewett, Under Pin Hill Rd., Harvard, Mass. 01451  
Continuation of Ser. No. 166,026, Jul. 7, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 301,639

Int. Cl.<sup>3</sup> C30B 15/06

U.S. Cl. 156—608

7 Claims



1. The method of forming a crystalline ribbon from a melt of

crystal forming material of silicon composition, comprising the steps of

(a) heating a melt of said material in a crucible having a shallow portion forming a shallow pool of said melt,

(b) placing on the surface of said melt in said shallow pool a crystalline seed of said material,

(c) controlling the temperature of said melt in said shallow pool to allow solidification of said melt at a free edge of said seed to form a ribbon while withdrawing said seed from said melt at a positive acute angle with respect to the melt surface at a speed commensurate with the longitudinal growth of said ribbon,

(d) providing a site of attachment inwardly from the edges of said crucible for a meniscus formed by the melt from the lower face of said ribbon as it leaves the surface to said melt to reduce spillage and freezing thereof and controlling the temperature of said melt selectively within the melt below both side edges of said ribbon to control the width of said ribbon,

(e) locating a heat sink above the surface of said melt and providing a thermally conductive gaseous medium between the melt surface proximate the growing end of said ribbon and said heat sink to control the growth of said ribbon,

(f) separately and actively cooling said heat sink at a rate corresponding to the rate of heat transfer from said melt through said gaseous medium to said heat sink, and

(g) replenishing the supply of melt in said shallow portion to maintain a substantially constant level therein.

4,417,945

# APPARATUS FOR CHEMICAL ETCHING OF A WAFER MATERIAL

Yasuo Komatsuzaki, Annaka, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

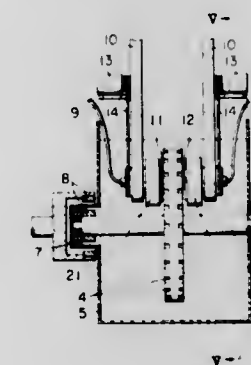
Filed Jan. 24, 1983, Ser. No. 460,355

Claims priority, application Japan, Mar. 29, 1982, 57-50483

Int. Cl.<sup>3</sup> H01L 21/306

U.S. Cl. 156—639

8 Claims



7. A method for chemically etching the surface of a wafer material in an etching solution contained in an etching vat which comprises the steps of

(a) holding the wafer material with a holding means in the etching solution in such a manner that one of the surfaces of the wafer material is exposed free to the etching solution and the wafer material is held closely side-by-side to face a disk rotatable in the etching solution around an axis to make a narrow gap space between the free surface of the wafer material and the disk, said disk being provided on the surface facing the wafer material with at least one liquid flow channel,

(b) rotating the disk around the axis thereof,

(c) rotating the wafer material around the axis thereof, and (d) moving the wafer material reciprocative-ly in parallel with the rotating disk along a radial direction thereof.

4,417,946

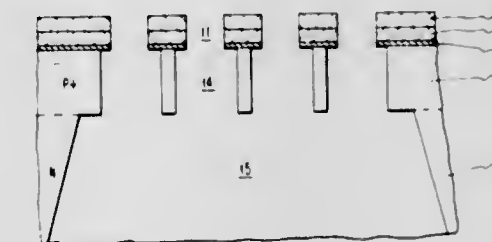
# METHOD OF MAKING MASK FOR STRUCTURING SURFACE AREAS

Harald Bohlen, Boeblingen; Helmut Engelke, Altdorf; Johann Greschner, Pliezhausen, and Peter Nehmiz, Stuttgart-Rohr, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 126,602, Mar. 3, 1980, Pat. No. 4,342,817. This application May 10, 1982, Ser. No. 376,320

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922416

Int. Cl.<sup>3</sup> H01L 21/306; B44C 1/22; C03C 15/00; C23F 1/02  
U.S. Cl. 156—643 12 Claims



1. A method of making a mask comprising applying at least one metallic layer on the front of a semiconductor substrate, etching a mask in said metallic layer, etching the semiconductor surface exposed in the etched metallic layer to a predetermined depth, and etching tub-shaped recesses from the back of said semiconductor substrate to such a depth that the holes etched into the semiconductor front also open toward the wafer back, prior to the application of said metal layer said semiconductor substrate is doped from the wafer front down to a predetermined depth to produce a surface layer, said doping differing from the remaining substrate, applying an oxide layer onto the top of said metal layer, etching apertures with vertical walls in the shape of said mask pattern in said oxide layer to expose said metal layer, etching through the metal layer and then into the semiconductor substrate deeper than the thickness of the doped surface layer and undercutting the metal layer.

4,417,947

# EDGE PROFILE CONTROL DURING PATTERNING OF SILICON BY DRY ETCHING WITH $CCL_4$ - $O_2$ MIXTURES

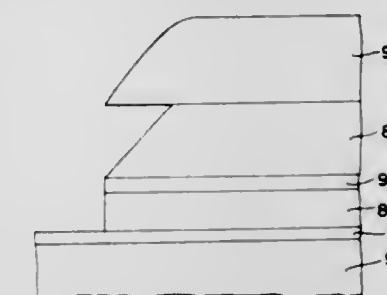
Alfred I. Pan, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jul. 16, 1982, Ser. No. 398,742

Int. Cl.<sup>3</sup> H01L 21/308

U.S. Cl. 156—643

12 Claims



1. A method for selectively etching a silicon region of an integrated circuit component, the method comprising the steps of:

forming a mask along a surface of the region such that the mask has at least one edge along which silicon of the region is exposed; and subjecting the component to a plasma comprising ions of carbon tetrachloride and oxygen to etch away silicon exposed through the mask while varying the proportion of oxygen in



the plasma so as to control the etching between isotropic and anisotropic modes.

**4,417,948**  
**SELF DEVELOPING, PHOTOETCHING OF**  
**POLYESTERS BY FAR UV RADIATION**

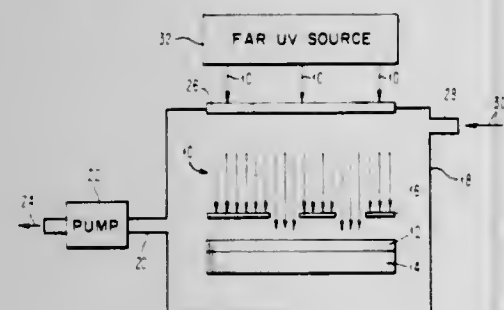
Veronica I. Mayne-Banton, and Rangaswamy Srinivasan, both of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,985

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

23 Claims



1. A method for etching polyethylene terephthalate (PET) comprising photoetching said PET to a depth of at least 1,000 Å without degradation of the bulk of the PET by irradiating said PET with uv radiation having wavelengths less than 220 nm.

**4,417,949**  
**ENHANCED ALUMINUM ETCHANT**

Walter E. Lindner, and Elias Malakelis, both of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sep. 7, 1982, Ser. No. 415,146

Int. Cl.<sup>3</sup> C23F 1/00, 1/02

U.S. Cl. 156—665

3 Claims

1. A process of chem-milling aluminum and aluminum alloys comprising the steps of adding in increments up to 70 g/l of sodium nitrate to a chem-milling composition which contains sodium hydroxide and continuing the chem-milling until the concentration of dissolved aluminum in the solution is about 20 g/l.

**4,417,950**  
**PAPERMAKING MACHINE CONTAINING TWO**  
**MOVABLE WATER PERVIOUS DEWATERING BANDS**

Alfred Bubik, Ravensburg, and Kurt Hack, Vorberg, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

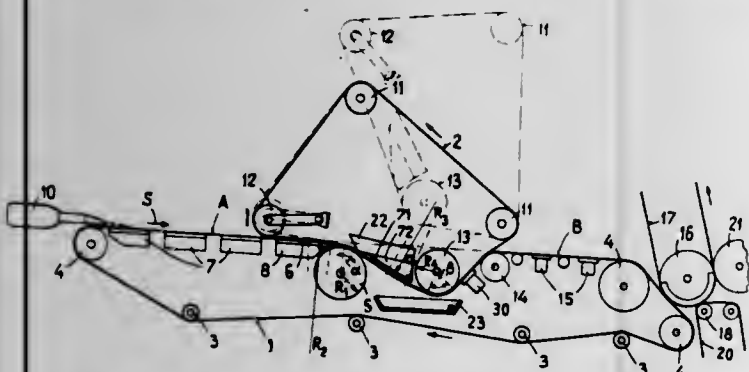
Filed Nov. 16, 1981, Ser. No. 321,677

Claims priority, application Switzerland, Nov. 26, 1980, 8746/80

Int. Cl.<sup>3</sup> D21F 1/40

U.S. Cl. 162—300

14 Claims



1. A papermaking machine comprising:

two movable water pervious dewatering bands defining a lower band and an upper band;  
said lower band possessing an essentially horizontally extending and essentially planar band portion;  
a headbox cooperating with said substantially planar band portion for the infeed of a fiber stock suspension for deposition onto the lower band;  
a dewatering shoe having a domed surface over which there can be guided at least one of said bands;  
a dewatering cylinder arranged after the dewatering shoe with respect to the direction of travel of both of said bands and over which both of said bands are conjointly guided over a portion of the circumference of said dewatering cylinder;  
the domed surface of said dewatering shoe possessing a larger radius of curvature than the radius of curvature of said dewatering cylinder;  
a deflection roll arranged following the dewatering cylinder with respect to the direction of movement of said bands; said deflection roll being located at the side of both bands which faces away from said dewatering cylinder;  
both of said bands being conjointly guided over said deflection roll throughout a portion of the circumference of said deflection roll at a contact surface thereof in a manner such that due to the action of said deflection roll there can be altered the direction of the bands in a sense opposite to the deflection of the bands which is accomplished by the dewatering cylinder;  
said contact surface of said deflection roll for both of said bands being located, during operation of the papermaking machine, totally within a projection of the height of the dewatering cylinder; and  
means for deflecting the lower band at a location following said deflection roll so as to cause said lower band following said deflection roll to travel essentially horizontally towards an outfeed end of the papermaking machine and in a direction corresponding essentially to the direction of said horizontally extending and essentially planar band portion of the lower band cooperating with said headbox, so that the lower band essentially maintains a horizontal direction of extent throughout the papermaking machine in order to have said lower band essentially maintain a configuration comparable to a lengthwise extending band of a longitudinal papermaking machine.

**4,417,951**  
**DISTILLER AND EVAPORATOR FOR SEA WATER**

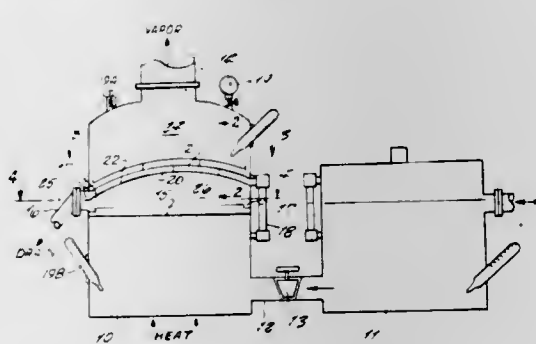
Jovo Stanisic, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Nov. 3, 1980, Ser. No. 203,063

Int. Cl.<sup>3</sup> C02F 1/04

U.S. Cl. 202—197

2 Claims



1. A Sea water distiller comprising a sea water supply tank connected by a conduit to the bottom of an evaporator with heating means, including a ring plate mounted around the inside periphery of said evaporator at a predetermined level, said ring plate including a peripheral drainage canal in combination with a plurality of spaced vertically curvate baffles above said plate, the lowermost of said baffles having a periph-

eral edge positioned above and laterally adjacent said canal whereby moisture is directed and drained from said baffle to said canal, in further combination with a drainage pipe having an inlet in communication with said canal for drainage purposes, said baffles having upward oriented diffusers and an upper solid baffle superimposed over said baffles with the diffusers, said upper baffle having an outer edge spaced from evaporator inner surface whereby deflected steam vapor is directed peripherally to the said edge and to a steam space above said upper baffle, including a steam outlet above said steam space wherein said diffusers including means for variably restricting water drops from passing therethrough comprising a Venturi section in said diffusers with electrical means in the Venturi section for vaporizing water drops upon contact of said electrical means with water drops.

**4,417,952**  
**APPARATUS FOR CLEANING COKE OVEN DOORS**

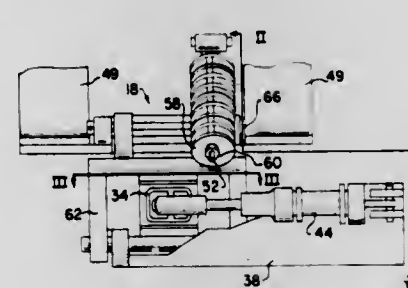
Rodney C. Irwin, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1981, Ser. No. 334,967

Int. Cl.<sup>3</sup> C10B 25/06, 43/04

U.S. Cl. 202—241

7 Claims



1. A device for cleaning a horizontal section of a coke oven door seal ring, said horizontal section having a vertical planar surface and a knife edge surface, comprising:  
(a) a lower base structure having a central upwardly projecting pin;  
(b) an arm member pivotally fixed on said upwardly projecting pin so as to oscillate thereon through a horizontal arc;  
(c) a cleaning head member engageable with said seal ring and pivotally connected to the terminal end of said arm member so as to be pivotable thereon in a second horizontal arc and said cleaning head member having an elongated body portion that holds a plurality of longitudinally angled chisel-like blades for contacting the seal ring vertical planar surface, said blades forming an acute angle in scraping relationship with said vertical planar surface;  
(d) means for pivoting the arm member on said upwardly projecting pin;  
(e) a supporting frame structure suspended over the arm member and having a compressible means for resisting and exerting force along its longitudinal axis attached thereto at a point above said arm member;  
(f) a vertical idler link pivotally connected at its upper end to said supporting frame structure and at its lower end to said base structure; and  
(g) a second vertical link connected at its upper end to said compressible means for resisting and exerting force along its longitudinal axis and at its lower end to said base structure and medially and pivotally connected to said frame structure, such that as the cleaning head is moved from a central position on the horizontal section of the seal ring by oscillation of the arm member on the upwardly projecting pin of said lower base structure, the second vertical link will be pivoted to move the lower base structure toward said horizontal section, and as the cleaning head member is returned to said central position by oscillation of the arm member the second vertical link will be pivoted to move the lower base structure away from said horizontal section so that the cleaning head member will bear against the vertical planar surface of the horizontal section

of the seal ring with approximately constant pressure as it is displaced from side to side thereon.

**4,417,953**  
**PROCESS AND APPARATUS FOR SEPARATING AN**  
**ELECTROLYTIC DEPOSIT FROM BOTH SIDES OF A**  
**CATHODE**

Jean F. Viellefont, Herenthout, and Henri M. F. J. Forton, Neerpelt, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

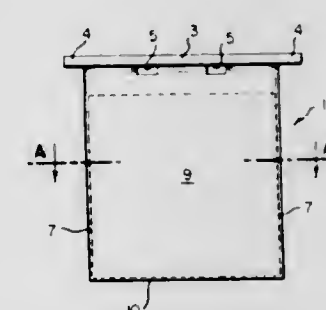
Filed Jul. 27, 1981, Ser. No. 287,069

Claims priority, application Luxembourg, Aug. 6, 1980, 82691

Int. Cl.<sup>3</sup> C25D 1/04, 17/00

U.S. Cl. 204—12

19 Claims



1. A process for separating electrolytic deposits from both sides of a generally vertically suspended cathode, comprising detaching at least a portion of the upper edge of each deposit from its respective side of the cathode, attaching a set of suction cups to each deposit, moving said sets of suction cups in a first step to an intermediate position, in which the deposits attached to the sets of suction-cups are in a form of a substantially V-shaped-configuration so that deposits are separated off the cathode downwardly, and bringing in a second step the sets of suction-cups from said intermediate position to a rest position in which the sets of suction-cups are oriented so that the deposits attached thereto are positioned beneath them.

**4,417,954**  
**ELECTROLYTE FOR THE ELECTRODEPOSITION OF**  
**ALUMINUM**

Siegfried Birkle, Höchststadt, and Klaus Stöger, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 25, 1983, Ser. No. 460,817

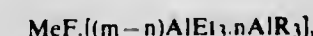
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202265

Int. Cl.<sup>3</sup> C25D 3/44

U.S. Cl. 204—14 N

6 Claims

1. An organometallic electrolyte for the electrodeposition of aluminum, comprising: a metal fluoride composition of the formula



wherein,

Me is potassium rubidium or cesium;

R is H or  $\text{C}_x\text{H}_{2x+1}$ , x being an integer selected from 1 and 3 to 8,

m is a number from 1.3 to 2.4 and n is a number from 0.1 to 1.1, m being larger than 2n; and

at least two R groups are alkyls selected from said formula  $\text{C}_x\text{H}_{2x+1}$ .



4,417,955

**METHOD OF AND SOLUTION FOR ELECTROPLATING CHROMIUM AND CHROMIUM ALLOYS AND METHOD OF MAKING THE SOLUTION**

Donald J. Barclay, Olivers Battery, and William M. Morgan, Chandlers Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 913,639, Jun. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 833,634, Sep. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 637,483, Dec. 3, 1975, Pat. No. 4,062,737. This application Sep. 22, 1982, Ser. No. 421,635

Claims priority, application United Kingdom, Jan. 26, 1977, 3179/77

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> C25D 3/06, 3/56

U.S. Cl. 204—43 R

18 Claims

1. An electroplating solution consisting essentially of an aqueous, time and temperature equilibrated solution of buffered chromium(III) thiocyanate complexes having at least one ligand other than thiocyanate or water selected from the group  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{PO}_4^{3-}$ , and  $\text{NO}_3^-$  in the chromium(III) inner coordination sphere, said equilibration being equivalent to that which is achieved by heating the solution for about one hour at 80° C., and the solution concentration of chromium-to-thiocyanate being in the molar ratio of from 1-to-2 to 1-to-6.

11. A solution as claimed in claim 1 further characterized by a source of nickel comprising nickel sulphate ( $\text{NiSO}_4 \cdot 6\text{H}_2\text{O}$ ) whereby to plate chromium nickel alloy.

4,417,956

**ALKALINE PLATING BATHS AND ELECTROPLATING PROCESS**

Ewald H. McCoy, Brookfield, Wis., assignor to Electrochemical Products, Inc., New Berlin, Wis.  
Division of Ser. No. 169,752, Jul. 17, 1980, Pat. No. 4,356,067, which is a continuation-in-part of Ser. No. 48,265, Jun. 13, 1979, abandoned. This application Sep. 28, 1982, Ser. No. 426,005

Int. Cl.<sup>3</sup> C25D 3/58

U.S. Cl. 204—44

6 Claims

1. A brightener for a cyanide-free electroplating bath for brass, said brightener being selected from metal ions consisting of antimony ions, cadmium ions, lead ions, selenium ions, tellurium ions, cobalt ions, nickel ions and molybdenum ions, and organic substances selected from aldehydes, compounds having carbonyl groups, compounds having C—SH groups, compounds having C=S groups, thiobenzanilide, 5-sulfosalicylic acid and sulfamide.

4,417,957

**AQUEOUS ACID PLATING BATH AND BRIGHTENER MIXTURE FOR PRODUCING SEMIBRIGHT TO BRIGHT ELECTRODEPOSITS OF TIN**

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Macedonia, Ohio

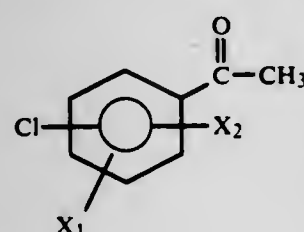
Filed Sep. 3, 1982, Ser. No. 414,582

Int. Cl.<sup>3</sup> C25D 3/32

U.S. Cl. 204—54 R

19 Claims

1. A primary tin plating brightening mixture, comprising: from about 1 to about 25 percent by weight of a chlorinated acetophenone having the formula:

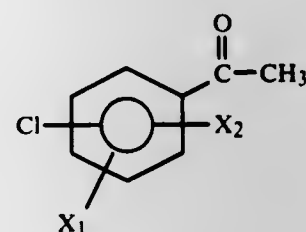


where  $\text{X}_1$  and  $\text{X}_2$  are ring substituted chlorine atoms or hydrogen atoms, and

from about 1 to about 97 percent by weight of a compound selected from the group consisting of acrylic acid, methacrylic acid, and combinations thereof.

10. An aqueous acid electroplating bath containing stannous ions and sulfuric acid for producing electrodeposits of tin, comprising:

from about 0.005 to about 0.2 grams per liter of bath solution of a chlorinated acetophenone having the formula:



wherein  $\text{X}_1$  and  $\text{X}_2$  are ring substituted chlorine atoms or hydrogen atoms.

4,417,958

**PROCESS FOR EXTINGUISHING THE ANODE EFFECT IN THE ALUMINUM ELECTROLYSIS PROCESS**

Tomas Arnason, Essen, Fed. Rep. of Germany; Alwis Franke, Gardabae, Iceland, and Theodor Tschopp, St. Louis, Mo., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

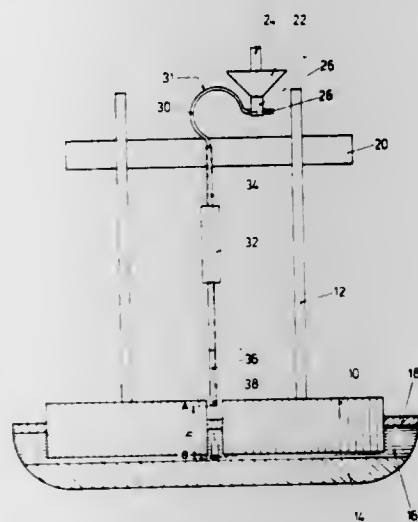
Filed Aug. 21, 1981, Ser. No. 294,912

Claims priority, application Switzerland, Sep. 9, 1980, 6745/80

Int. Cl.<sup>3</sup> C25C 3/06, 3/14, 3/20

U.S. Cl. 204—67

13 Claims



1. Process for extinguishing the anode effect which occurs during the production of aluminum by fused salt electrolysis, which comprises introducing into the molten electrolyte and under the anodes immediately after the anode effect appears, fine grained salts which are not harmful to the electrolytic process and which decompose to cause a vigorous production of gas at the operating temperature, wherein said salts are introduced into the molten electrolyte via an injection or carrier medium under pressure, thereby extinguishing the anode effect in a short period of time.

4,417,959

**ELECTROLYTIC CELL HAVING A COMPOSITE ELECTRODE-MEMBRANE STRUCTURE**

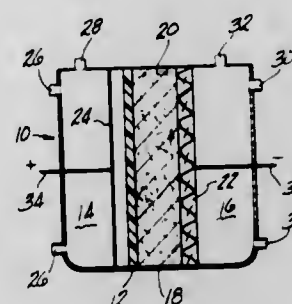
Igor V. Kadija; Kenneth E. Woodard, Jr., and David D. Justice, all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 29, 1980, Ser. No. 201,892

Int. Cl.<sup>3</sup> C25B 1/34, 11/03

U.S. Cl. 204—98

14 Claims



1. An electrolytic cell for the electrolysis of aqueous solutions of alkali metal chlorides which comprises a pair of reticulate electrodes of opposite polarity separated by a hydraulically impermeable ion exchange membrane, each of said reticulate electrodes being a three dimensional structure and comprised of a plurality of electroconductive filaments randomly distributed while having a plurality of contact points with adjacent filaments, said reticulate electrodes, having a porosity of from about 80 to about 98 percent, being in contact with said membrane, and means for applying an electric potential to said reticulate electrodes, said means comprised of electrically conductive fabrics having hooks or barbs as attachment means to said reticulate electrode.

4,417,960

**NOVEL ELECTROLYZER AND PROCESS**

Alberto Pellegrini, Luino, Italy, assignor to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 128,972, Mar. 10, 1980, Pat. No. 4,279,731.

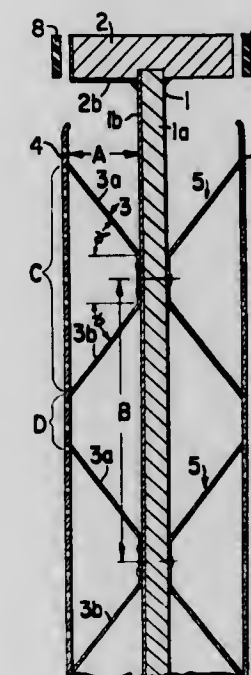
This application Jan. 6, 1981, Ser. No. 222,958

Claims priority, application Italy, Nov. 29, 1979, 27690 A/79

Int. Cl.<sup>3</sup> C25B 1/34

U.S. Cl. 204—98

10 Claims



1. A process for the electrolysis of an aqueous solution of an alkali metal halide in a bipolar, diaphragm type electrolyzer equipped with vertical foraminous electrodes comprising carrying out the electrolysis process with electrode compartments substantially filled with electrolyte, dividing said electrode compartments into a series of vertical flow channels extending for a substantial portion of the height of the compartments

with a series of baffles of a width substantially corresponding to the depth of the compartment and alternately inclined one way and the opposite with respect to the vertical plane normal to the plane of the separating wall and spaced apart one another, the ratio between the electrode surface intercepted by the edges of two baffles laterally defining a vertical flow channel and the flow section thereof being substantially different from the ratio between the electrode area intercepted by the edge of one of said baffles and of the one adjacent thereto in the series and the flow section of the channel adjacent to said channel, feeding concentrated brine to the anode compartments and water to the cathode compartments, generating multiple recirculation motions of the electrolyte contained in said compartments, said recirculation motions being distributed along the entire width of the compartments as the result of different densities of gas bubbles in adjacent channels and discharging the gas and the electrolyte effluent therefrom through outlets at the top of each compartment.

4,417,961

**MEMBRANE CELL BRINE FEED**

Bobby R. Ezzell, Lake Jackson, and Harry S. Burney, Jr., Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 30, 1981, Ser. No. 248,670

Int. Cl.<sup>3</sup> C25B 1/34

U.S. Cl. 204—98

57 Claims

1. A process for producing chlorine and an alkali metal hydroxide solution in an electrolytic cell containing a permselective cation exchange membrane disposed between an anode and a cathode to form an anolyte compartment and a catholyte compartment, said process comprising:

electrolyzing an alkali metal chlorine solution in said electrolytic cell with said alkali metal solution containing carbonate anions and carbon dioxide in such low concentrations so that the sum of their concentrations is no greater than about 70 ppm (expressed as parts per million carbon dioxide) at the moment before said solution becomes a part of the anolyte in the anolyte compartment in order that said permselective membrane in said cell will maintain a longer usefulness in producing chlorine and alkali metal hydroxide at low electrical energy consumption per unit of product produced.

4,417,962

**ELECTROEROSIVE MACHINING METHOD AND APPARATUS WITH DISCRETE METALLIC ELECTRODE BODIES**

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

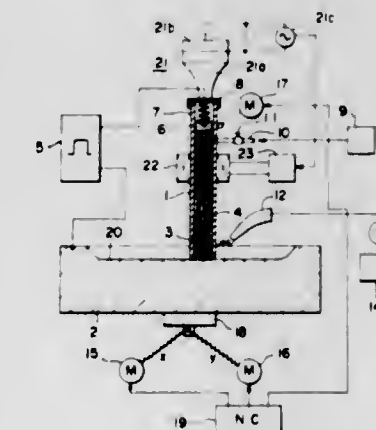
Filed May 12, 1981, Ser. No. 262,931

Claims priority, application Japan, May 15, 1980, 55-64468

Int. Cl.<sup>3</sup> B23P 1/04, 1/10, 1/12; B23K 9/16

U.S. Cl. 204—129.46

33 Claims



1. A method of electroerosively machining an electrically



conductive workpiece to form a cavity therein, comprising the steps of:

- axially juxtaposing an elongate, open-ended tubular casing of a heat-resistant material with said workpiece to define an electroerosion machining site in the region of said workpiece proximal to the open-ended portion of said casing, said casing having discrete metallic bodies packed therein in such a manner that they are arranged in a mutually contacting relationship at least in a longitudinal direction of said casing, each individually capable of constituting an electroerosion electrode;
- feeding a machining fluid into said machining site;
- feeding said discrete metallic bodies in said casing to discharge them successively into said machining region;
- passing an electroerosion machining current through said site between said workpiece and said discrete metallic bodies discharged into the machining site to electroerosively remove material from said region of the workpiece against said bodies functioning as counterelectrodes in said machining fluid; and
- relatively displacing said heat-resistant casing and said workpiece three-dimensionally while maintaining said open-ended portion in the proximity of said region of the workpiece so as to cause said open-ended portion to effectively sweep in a scanning manner over a predetermined zone of said workpiece to form said cavity therein.

4,417,963

# PROCESS FOR REMOVING CYANIDE IONS FROM SOLUTIONS

Jouko Janne, Köping, Sweden, assignor to Nils-Erik Södermark, Köping, Sweden

PCT No. PCT/SE81/00205, § 371 Date Mar. 1, 1982, § 102(e) Date Mar. 1, 1982, PCT Pub. No. WO82/00288, PCT Pub. Date Feb. 4, 1982

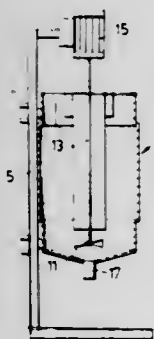
PCT Filed Jul. 7, 1981, Ser. No. 355,749

Claims priority, application Sweden, Jul. 11, 1980, 8005138

Int. Cl.<sup>3</sup> C25B 1/00

U.S. Cl. 204—130

13 Claims



1. A process for removing cyanide ions from a cyanide-containing solution by anodic oxidation, the solution being adjusted to a pH of at least about 11 and to a halide content at least equivalent to the cyanide concentration, characterized thereby that electrolysis is performed under intense agitation of the electrolyte to result in deposition of solid carbon on the anode.

4,417,964

# METHOD OF PREPARING OLEFINIC COMPOUNDS

Jürgen Wolfrum, Rosdorf; Michael Kneba, Göttingen, both of Fed. Rep. of Germany, and Peter N. Clough, Belfast, Ireland, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.v., Göttingen, Fed. Rep. of Germany

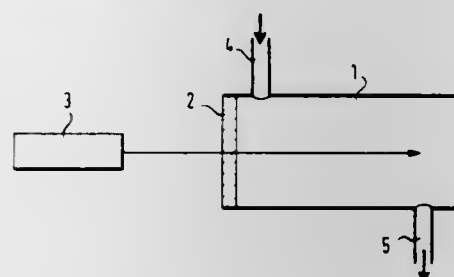
Continuation of Ser. No. 158,010, Jun. 9, 1980, abandoned. This application Nov. 2, 1982, Ser. No. 438,664

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938353; Mar. 7, 1980, 3008848

Int. Cl.<sup>3</sup> B01J 19/12

U.S. Cl. 204—158 R

20 Claims



1. Method of preparing a compound having at least one olefinic double bond, which method comprises initiating a chain reaction by irradiating the corresponding saturated halogenated compound in gaseous form, with pulsed coherent light or incoherent light, adjusting the wavelength of the irradiated light and the pressure and temperature conditions so that a capture cross-section of  $10^{-15}$  to  $10^{-25}$  cm<sup>2</sup> per molecule results, to split off hydrogen halide from said corresponding saturated compound yielding said olefinic compound.

4,417,965

# METHOD OF TREATING A RARE-EARTH MINERAL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

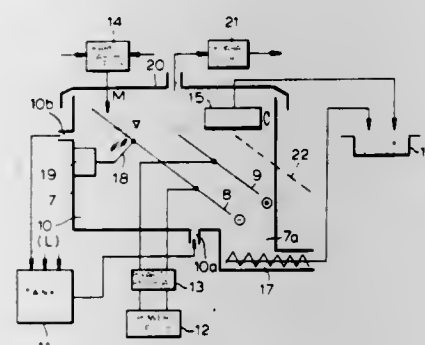
Filed Jun. 16, 1981, Ser. No. 274,258

Claims priority, application Japan, Jun. 20, 1980, 55-84362

Int. Cl.<sup>3</sup> C25B 1/00

U.S. Cl. 204—164

15 Claims



1. A method of dissociating a rare-earth mineral or concentrate in a pulverized form, comprising the steps of: positioning the pulverized rare-earth mineral or concentrate in mixture with an aqueous solution of an electrolyte at least in a region between a pair of electrodes, said electrolyte being at least one substance selected from the group which consists of potassium acetate, ammonium hydroxide, ammonium chloride, sodium chloride, sulfuric acid, sodium carbonate, sodium hydroxide and potassium hydroxide; and effecting electrical discharges between said electrodes at least through said region in the presence of said solution of the electrolyte whereby the individual particles of said rare-earth mineral or concentrate are subjected to said electrical discharges so as to form a rare-earth metal compound of the electrolyte.

4,417,966

# APPARATUS AND METHOD OF PRODUCING OZONE

Ralf Krauss, Palma de Mallorca, Spain, and Rainer Koehne, Essen, Fed. Rep. of Germany, assignors to Innovatron Krauss & Co., Switzerland

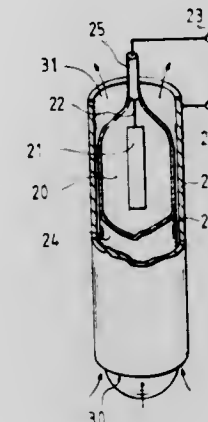
Filed Nov. 12, 1981, Ser. No. 320,497

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043176

Int. Cl.<sup>3</sup> C01B 13/10

U.S. Cl. 204—176

11 Claims



10. A method for producing ozone, comprising the steps of: surrounding a first electrode by a second annular electrode; disposing at least one tubular wall of electrically insulating material between the electrodes; sealing at least one of the electrodes in a glow discharge chamber, formed at least in part by the tubular wall; filling the glow discharge chamber with an ionizable gas, at low pressure; energizing the electrodes by applying an electrical potential therebetween in the form of voltage pulses at a frequency in the range of 10 to 60 KHz; and moving an oxygen charged medium between the electrodes, the ionized gas in the glow discharge chamber forming a plasma electrode.

4,417,967

# GROOVED GEL

Robert S. Ledley, Silver Spring, Md., assignor to Georgetown University, Washington, D.C.

Filed Nov. 24, 1981, Ser. No. 324,447

Int. Cl.<sup>3</sup> B01D 57/02; C25B 7/00; C25D 13/00

U.S. Cl. 204—180 G

20 Claims

1. A grooved gel arrangement suitable for two-dimensional gel electrophoresis comprising: a base portion having a latitudinal direction and a longitudinal direction, and including a grooved portion having grooves extending in said longitudinal direction for substantially the entire longitudinal width of said plate, said grooves being of such spacing that said grooves inhibit latitudinal spreading of protein which has been separated in said latitudinal direction when said protein travels in said longitudinal direction along said grooves; a gel disposed on said grooved portion and filling in said grooves thereof; and a top portion disposed on top of said base portion, with said gel sandwiched therebetween.

4,417,968

# MAGNETRON CATHODE SPUTTERING APPARATUS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Mar. 21, 1983, Ser. No. 477,069

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 R

15 Claims

1. A magnetron cathode sputtering apparatus, comprising an evacuable coating chamber, a central cylindrical cathode mounted in said chamber, a plurality of auxiliary cylindrical

cathodes also mounted in said chamber in surrounding relation to and parallel with said central cathode, means for rotating said central cathode and each of said auxiliary cathodes, a rotatable carrier for the articles to be coated positioned between said central cathode and said auxiliary cathodes, means for revolving said article carrier around said central cathode, and means for simultaneously rotating the articles carried by said carrier.

4,417,969

# SULFONIC ACID ELECTROLYTIC CELL MEMBRANES

Bobby R. Ezzell, Lake Jackson; William P. Carl, Angleton, and William A. Mod, Lake Jackson, all of Tex., assignors to The Dow Chemical Co., Midland, Mich.

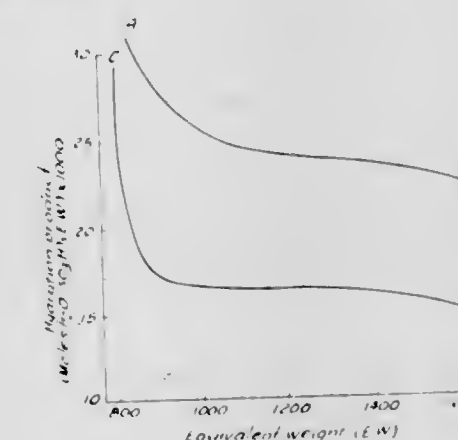
Division of Ser. No. 158,424, Jun. 11, 1980, Pat. No. 4,358,545.

This application Jan. 21, 1982, Ser. No. 341,431

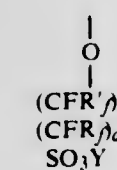
Int. Cl.<sup>3</sup> C25B 9/00, 1/14

U.S. Cl. 204—252

7 Claims



1. An electrolytic cell of the type having
  - (a) an anode in an anode chamber;
  - (b) a cathode in a cathode chamber;
  - (c) an ion exchange membrane separating the cathode chamber from the anode chamber;
 wherein the ion exchange membrane comprises a polymer having a substantially fluorinated backbone which has pendant groups attached directly to the backbone and represented by the formula



where

a=0-3

b=0-3

a+b=at least 1

R<sub>f</sub> and R<sub>g</sub> are independently selected from the group consisting of a halogen and a substantially fluorinated alkyl group having one or more carbon atoms

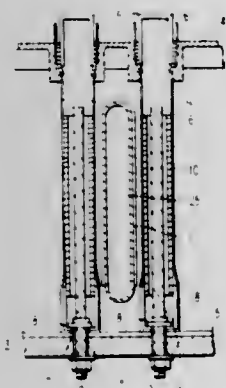
Y is hydrogen or alkali metal wherein the polymer has sulfonate ion exchange groups only, and has an equivalent weight of between about 800 and about 1500 and has a hydration product of less than 22,000.



4,417,970

**ELECTROLYTIC CELL FOR ION EXCHANGE MEMBRANE METHOD**

Menzo Yamaguchi, Tokyo; Teruo Ichisaka; Tadao Ikegami, both of Tamano, and Isao Kumagai, Tokyo, all of Japan, assignors to Chlorine Engineers Corp. Ltd., Tokyo, Japan  
 Filed Oct. 29, 1982, Ser. No. 437,598  
 Claims priority, application Japan, Nov. 24, 1981, 56-186928  
 Int. Cl.<sup>3</sup> C25B 9/00, 11/03, 13/02, 15/08  
 U.S. Cl. 204—257



1. An electrolytic cell for the ion exchange membrane method which comprises:

- (a) an electrolytic cell main body;
- (b) a plurality of porous and tubular cathodes disposed in the interior of the electrolytic cell main body;
- (c) an electrolytic cell bottom plate having therein a plurality of apertures;
- (d) a plurality of electrically conductive bars provided with a flange at a lower portion thereof, which are each inserted through the aperture of the electrolytic cell bottom plate into the interior of the electrolytic cell main body and secured to the electrolytic cell bottom plate by the flange;
- (e) a plurality of porous anodes which are each connected to the electrically conductive bar and placed vertically in a face-to-face relationship to the cathode, and which are disposed alone or in combination with each other between the cathodes;
- (f) a plurality of bag-shaped molds, at least the portions facing the anodes and the cathodes being formed by a cation exchange membrane, which are each provided at the bottom thereof with an aperture through which the electrically conductive bar can be passed, and are open at the top;
- (g) a partition plate which is provided on the top of the electrolytic cell main body, and which has a plurality of openings at the positions corresponding to the top openings of the bag-shaped molds; and
- (h) a plurality of lid members each of which covers an opening of the bag-shaped mold, wherein the bag-shaped mold accommodates one or more anodes; the bottom of the bag-shaped mold is secured to the electrolytic cell bottom plate together with the electrically conductive bar extending through the aperture of the bottom of the bag-shaped mold by the flange so that an anode compartment is defined inside the bag-shaped mold; and the top opening edge of the bag-shaped mold is secured at the opening of the partition plate by the lid member.

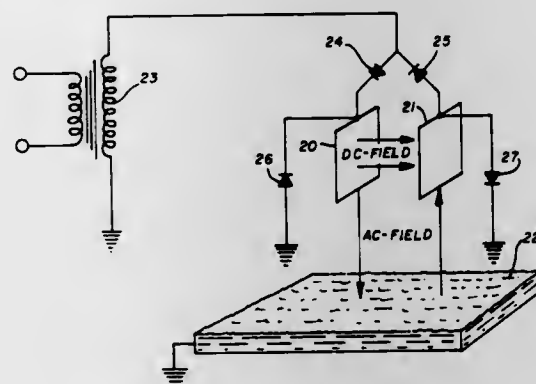
4,417,971

**CIRCUIT FOR MAINTAINING THE STRENGTH OF AN ELECTROSTATIC FIELD GENERATED IN A FLUID MIXTURE OF VARYING DIELECTRIC STRENGTH**

Charles R. Ferrin, Sand Springs, and Floyd L. Prestridge, Mounds, both of Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.  
 Filed Nov. 30, 1981, Ser. No. 325,799  
 Int. Cl.<sup>3</sup> B01D 17/06

5 Claims U.S. Cl. 204—305

4 Claims



1. A system for coalescing droplets of a relatively polar liquid which are finely dispersed within a body of an immiscible relatively non-polar liquid, including, at least two sources of DC voltage pulses, a pair of electrodes spaced within a mixture of polar and non-polar immiscible liquids, means for connecting the pair of electrodes and the DC voltage sources such that each of the electrodes has voltage pulses of one of the sources applied to it to generate an electrostatic field in which the polar liquid droplets will coalesce to a size which will cause their gravitation within the non-polar liquid, means for forming a body of the coalesced and gravitated polar liquid droplets below the pair of electrodes, and a rectifier connected between one of the electrodes and ground potential to maintain a differential of DC potential between the electrodes as the proportion of polar and non-polar immiscible liquids of the mixture changes to reduce the dielectric strength of their mixture.

4,417,972

**RECOVERY OF COAL LIQUEFACTION CATALYSTS**

James N. Francis, and Lavanga R Veluswamy, both of Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 4, 1981, Ser. No. 318,171  
 Int. Cl.<sup>3</sup> C10G 1/08, 37/14, 31/00; B01J 37/00  
 U.S. Cl. 208—10

20 Claims

1. A process for the liquefaction of coal which comprises:
  - (a) contacting said coal under liquefaction conditions in a liquefaction zone with a hydrogen-containing gas and/or an added hydrocarbon solvent in the presence of a catalyst containing a metal capable of forming an acidic oxide to produce a liquefaction effluent, wherein said metal salt is introduced into said liquefaction zone in the form of a water-soluble or oil-soluble compound or by impregnation onto said coal;
  - (b) treating said liquefaction effluent to recover hydrocarbon liquids thereby producing a heavy bottoms containing carbonaceous material comprised of high molecular weight hydrocarbon liquids boiling above about 1000° F. and unconverted carbonaceous solids, insoluble catalyst residues containing said metal, and ash;
  - (c) burning said heavy bottoms in a combustion zone at a temperature below the fusion temperature of said ash to convert the insoluble metal-containing catalyst residues into soluble metal-containing oxides;

- (d) withdrawing oxidized solids containing said soluble metal-containing oxides from said combustion zone;
- (e) contacting said oxidized solids with an aqueous solution of a basic alkali metal salt thereby extracting said soluble metal-containing oxides from said oxidized solids in the form of soluble alkali metal salts of said metal-containing oxides; and
- (f) recycling said soluble alkali metal salts of said metal-containing oxides to said liquefaction zone wherein said metal is reused as constituents of said catalyst.

4,417,973

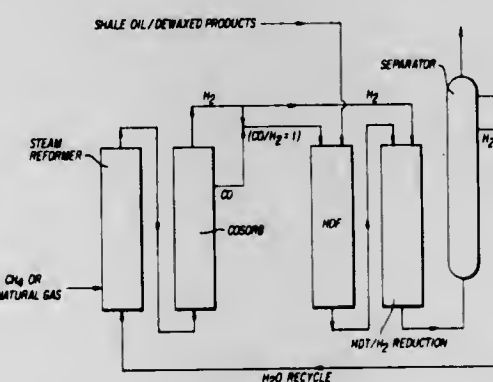
**UPGRADING OLEFINIC STOCKS VIA SEQUENTIAL HYDROFORMYLATION/HYDROGENATION**

Phillip J. Angevine, West Deptford, and Chiu T. Lam, Sewell, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,284  
 Int. Cl.<sup>3</sup> C10G 1/00

U.S. Cl. 208—46

11 Claims



1. A sequential process for upgrading hydrocarbon stocks selected from the group consisting of shale oil, catalytically dewaxed product, coker liquids, pyrolysis gasoline, FCC light cycle oil or other olefinic feedstock which comprises contacting said feedstock initially in a reaction zone in the presence of a hydroformylation catalyst under hydroformylation reaction conditions with synthesis gas having a ratio of carbon monoxide to hydrogen of about 1:1 for a time sufficient for the conversion of the olefinic compounds contained therein into branched alkanols, thereafter passing the effluent from said hydroformylation zone to a reaction zone containing a suitable hydrotreating/reduction catalyst under hydrotreating/reduction reaction conditions converting said effluent into saturates and recovering directly a branched hydrocarbon product having lower pour point, higher V.I. and improved thermal stability.

4,417,974

**RISER CRACKING OF CATALYST-DEACTIVATING FEEDS**

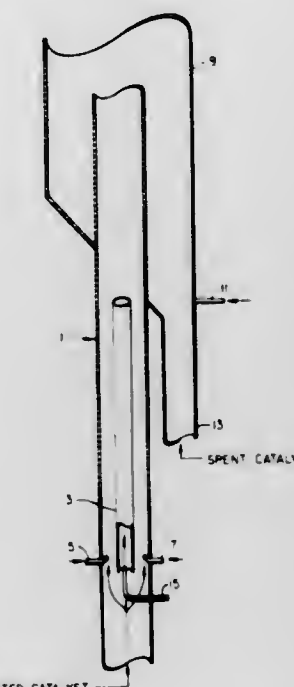
Willard M. Haunschild, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
 Filed Aug. 23, 1982, Ser. No. 410,206  
 Int. Cl.<sup>3</sup> C10G 11/18

U.S. Cl. 208—75

3 Claims

1. In a process for cracking a hydrocarbonaceous feedstock containing a catalyst-deactivating component in the absence of externally supplied hydrogen in contact with an entrained bed of particulate acidic cracking catalyst flowing through a riser-reactor zone, the method for increasing conversion of said feedstock which comprises:
  - (a) maintaining first and second unmixed portions of said catalyst in separated entrained flow through an upstream part of said riser-reactor zone, said first portion having sufficient heat energy to substantially vaporize said feedstock;
  - (b) vaporizing and partially cracking said feedstock in contact with said first portion of said catalyst and decreas-

ing the concentration of said catalyst-deactivating component in said vapor by depositing at least a portion of said catalyst-deactivating component on said first portion of said catalyst in said upstream part of said riser-reactor zone; and

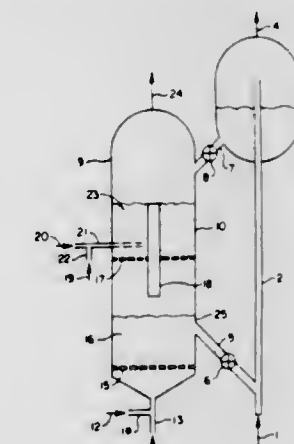


- (c) mixing said second portion of said catalyst with the resulting hydrocarbonaceous vapor and cracking said hydrocarbonaceous vapor in a downstream part of said riser-reactor zone with said second portion of said catalyst.

4,417,975

**ADDITION OF WATER TO REGENERATION AIR**  
 George D. Myers, deceased, late of Ashland, Ky. by Virginia K. Myers, administratrix, and Lloyd E. Busch, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.  
 Continuation-in-part of Ser. No. 99,050, Nov. 30, 1980, abandoned, which is a continuation of Ser. No. 969,601, Dec. 14, 1978, abandoned. This application Apr. 3, 1981, Ser. No. 251,032  
 Int. Cl.<sup>3</sup> C10G 11/05, 11/18; B01J 29/38, 21/20  
 U.S. Cl. 208—120

70 Claims



1. A process for economically converting carbo-metallic oils to lighter products, comprising:
  - I. providing a converter feed containing 650° F. ± material, said 650° F. ± material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 4 parts per million of Nickel Equivalents of heavy metal(s);
  - II bringing said converter feed together with particular cracking catalyst to form a stream comprising a suspen-



sion of said catalyst in said feed and causing the resultant stream to flow through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds at a temperature of about 900° to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

II. separating spent, coke-laden catalyst from the stream of hydrocarbons formed by vaporized feed and resultant cracking products;

V. maintaining a multistage regeneration zone comprising a sequence of separate dense fluidized beds, each of said beds containing catalyst undergoing regeneration with oxygen, said beds being positioned one above the other and arranged for downflow of catalyst from bed to bed through an internal transfer line counter-current to upwardly flowing regeneration gas to the lowermost bed of catalyst being regenerated, each of said beds being further characterized by a bed density in the range of about 25 to about 50 pounds per cubic foot and by being sustained by a fluidization gas, including a combustion supporting gas containing said oxygen, said fluidization gas having a linear velocity in the range of about 0.2 to about 4 feet per second;

V. charging said spent catalyst to said uppermost bed of catalyst for downflow through said sequence of catalyst beds; supplying liquid water directly in contact with said catalyst in one or more of said catalyst beds, the weight ratio of the total weight of said water charged to said catalyst beds relative to the total weight of said converter feed charged to said progressive flow conversion zone being in the range of about 0.01 to about 0.5;

VI. retaining said spent catalyst in said multistage regeneration zone in contact with a flow of said oxygen containing combustion supporting gas under conditions of temperature, pressure and catalyst particle residence time in said multistage regeneration zone in the range of from about 5 minutes to about 30 minutes for combustion of said coke on said spent catalyst, whereby said spent catalyst is regenerated to have a level of residual carbon on said regenerated catalyst particles of about 0.25 wt% or less, while forming combustion product flue gases comprising CO and/or CO<sub>2</sub>; and

VII. recycling the regenerated catalyst to the reactor for contact with fresh feed.

2. A process for economically converting carbo-metallic oils to lighter products, comprising:

I. providing a converter feed containing 650° F. + material, and 650° F. + material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 4 parts per million of Nickel Equivalents of heavy metal(s);

II. bringing said converter feed together with particulate cracking catalyst to form a stream comprising a suspension of said catalyst in said feed and causing the resultant stream to flow through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds at a temperature of about 900° to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

III. separating spent, coke-laden catalyst from the stream of

hydrocarbons formed by vaporized feed and resultant cracking products;

IV. maintaining a multistage regeneration zone comprising a sequence of separate dense fluidized beds, each of said beds containing catalyst undergoing regeneration with oxygen, said beds being positioned one above the other and arranged for downflow of catalyst from bed to bed through an internal transfer line counter-current to upwardly flowing regeneration gas charged to the lowermost bed of catalyst being regenerated, each of said beds being further characterized by a bed density in the range of about 25 to about 50 pounds per cubic foot and by being sustained by a fluidization gas, including a combustion supporting gas containing said oxygen, said fluidization gas having a linear velocity in the range of about 0.2 to about 4 feet per second;

V. charging said spent catalyst to said uppermost bed of catalyst for downflow through said sequence of catalyst beds; supplying liquid water directly in contact with said catalyst in one or more of said catalyst beds, the weight ratio of the total amount of said water introduced to each of said catalyst beds relative to the total weight of oxygen consumed by combustion of coke during regeneration being in the range of about 0.035 to about 1.8

VI. retaining said spent catalyst in said multistage regeneration zone in contact with a flow of said oxygen containing combustion supporting gas under conditions of temperature, pressure and catalyst particle residence time in said multistage regeneration zone in the range of from about 5 to about 30 minutes for combustion of said coke on said spent catalyst whereby said spent catalyst is regenerated to have a level of residual carbon on said regenerated catalyst particles of about 0.25 wt% or less, while forming combustion product flue gases comprising CO and/or CO<sub>2</sub>;

VII. recycling the regenerated catalyst to the reactor for contact with fresh feed.

40. A process according to claim 1 or claim 2 wherein liquid water is supplied to one or more of said fluidized beds by discharging said water directly to said bed or beds.

41. A process according to claim 1 or claim 2 wherein the liquid water is supplied to said fluidized regeneration bed or beds by first mixing the liquid water with said combustion supporting gas and then introducing the resultant mixture into said bed or beds.

4,417,976

#### DEWATERING OF PETROLEUM-CONTAINING SLUDGES WITH RECOVERY OF THE OIL COMPONENT

Bruno Sander, Ludwigshafen; Friedrich Hovemann, Hockenheim, and Kurt Scherling, Hemsbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,416

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100899

Int. Cl.<sup>3</sup> C10G 17/00, 17/09, 33/04

U.S. Cl. 208—188

4 Claims

1. A process for dewatering petroleum-containing sludges by a two-stage method using finely divided additives and organic flocculants which comprises:

(a) homogeneously dispersing in the petroleum-containing sludge finely divided additives selected from the group consisting of ash, coal, sand or mixtures of these, in a free-flowing form or as an aqueous suspension, in an amount such that the total solids content of the resulting mixtures is from 10 to 30% by weight,

(b) treating the sludge mixture with an aqueous solution of an organic flocculant,

(c) removing the greater part of the sludge water by gravity filtration,

- (d) treating the pre-dewatered sludge with an aqueous solution of aluminum salts or trivalent iron salts and  
(e) pressure filtering the resulting mixture from step (d) to separate the petroleum and water from the solids.

4,417,977

#### REMOVAL OF PCBs AND OTHER HALOGENATED ORGANIC COMPOUNDS FROM ORGANIC FLUIDS

Louis L. Pytlewski, Philadelphia, Pa.; Frank J. Iaconanni, Cherry Hill, N.J.; Kenneth Krevitz, Philadelphia, Pa., and Arthur B. Smith, Newark, Del., assignors to The Franklin Institute, Philadelphia, Pa.

Filed Sep. 30, 1982, Ser. No. 429,096

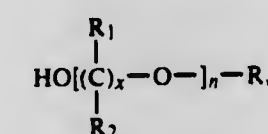
Int. Cl.<sup>3</sup> C07C 7/148, 39/12; C10G 19/073, 29/06

U.S. Cl. 208—262

11 Claims

1. A method for the removal of a halogenated organic compound from an organic fluid containing said compound, comprising the steps of:

- (a) providing a reagent comprising the product of the reaction of a first reactant selected from the group consisting of an alkali metal or an alkali metal hydroxide, a second reactant having the general formula



wherein R is hydrogen or lower alkyl, R<sub>1</sub> and R<sub>2</sub> are the same or different and are selected from the group consisting of hydrogen, unsubstituted or substituted lower alkyl, unsubstituted or substituted cycloalkyl having from 5 to 8 carbon atoms, and unsubstituted or substituted aryl, n has a value from about 2 to about 400 and x has a value of at least 2, and oxygen as a third reactant;

(b) mixing said reagent with said fluid containing said halogenated compound in an inert atmosphere under reactive conditions to form a derivative of said halogenated organic compound having a reduced halogen content and a reagent residue, the reagent residue being substantially immiscible with said fluid, and said derivative being more soluble in said reagent residue than in said fluid;

(c) allowing said mixture to separate into a two-phase system comprising a reagent residue phase containing said derivative and a fluid phase substantially free of said halogenated compound; and

(d) separating said reagent residue phase from said fluid phase.

4,417,978

#### CENTRIFUGAL SCREENING DEVICE

Karl V. L. Guth, Estrada Velha de Araucaria Km 1, Na Cidade de Curitiba, no Estado do Parana, Brazil

PCT No. PCT/BR79/00001, § 371 Date Sep. 24, 1979, § 102(e)

Date Sep. 24, 1979, PCT Pub. No. WO79/00547, PCT Pub.

Date Aug. 23, 1979

PCT Filed Jan. 24, 1979, Ser. No. 287,537

Int. Cl.<sup>3</sup> B07B 1/20

U.S. Cl. 209—306

14 Claims

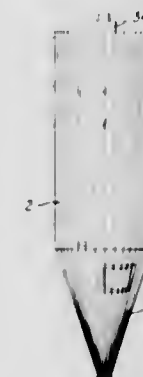
1. A centrifugal screening device for screening cereal produces comprising:

a cylindrical casing comprising upper and lower circular heads, a plurality of outer uprights extending between said heads and a plurality of arcuate casing sections fitting between said outer uprights and removably secured thereto by snap locks,

a cylindrical screen inside said cylindrical casing and spaced inwardly therefrom to provide a first annular zone therebetween, said cylindrical screen comprising a plurality of inner uprights extending between said heads and a plurality of arcuate screen sections fitting between said inner uprights and removably secured thereto by snap locks, each of said screen sections comprising an arcuate frame and

a parti-cylindrical sieve fitting in said frame and secured at its periphery to said frame by a flexible fabric strip absorbing vibration of said sieve, said fabric strip being protected from impact of the product by a metal strip secured on the internal face of said fabric strip in a manner to preserve flexibility of said fabric strip,

a central longitudinal shaft rotatably mounted axially of said cylindrical screen with a second annular zone between said shaft and said screen and with a product inlet at a lower end of said second annular zone and a product outlet at the upper end of said second annular zone, a



plurality of plates carried by and rotatable with said shaft, said plates being in said second annular zone and being inclined with respect to their plane of rotation so that the product being screened is thrown against said cylindrical screen by centrifugal force and is propelled longitudinally of said second annular zone from said inlet towards said outlet, finer particles of said product passing through said screen from said second annular zone to said first annular zone, and

funnel means at the bottom of said cylindrical casing for collecting and delivering product from said first annular zone.

4,417,979

#### PILE-UNLOADING DEVICE FOR PILED MOULDED ARTICLES

Bernardus T. Hof, Holten, Netherlands, assignor to Machinefabriek Joh' Abersson B.V., Olst, Netherlands

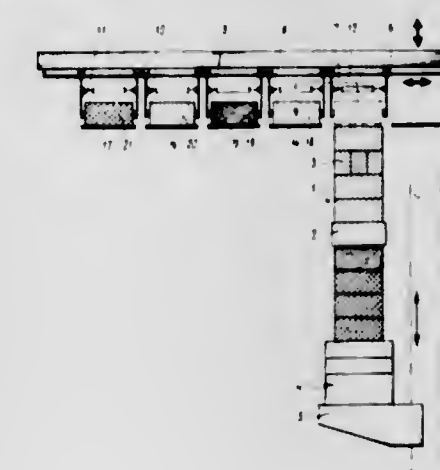
Filed Aug. 19, 1981, Ser. No. 294,413

Claims priority, application Netherlands, Aug. 20, 1980, 8004714

Int. Cl.<sup>3</sup> B65G 47/90

U.S. Cl. 209—617

7 Claims



1. A pile-unloading device for pileable moulded articles such as bricks, with grasping means to grasp moulded articles from the upper row of a pile and to displace them with respect thereto, characterized in that, above supporting means for the pile, there are sets of grasping means one to the side of the



other as seen in a plane substantially perpendicularly to the main vertical plane of the pile, said grasping means being connected to a common structure adapted to move said grasping means simultaneously in a substantially rectangular path in a vertical plane extending transversely to the main vertical plane of the pile, each set of grasping means comprising a multitude of grasping means one to the side of the other, as seen in a horizontal direction parallel to the pile, there being parts with take-up surfaces below said grasping means, movable substantially perpendicular to said vertical plane of movement of said grasping means, that the common structure to which the grasping means are connected is movable to move the grasping means in said vertical plane over a horizontal distance equal to the distance between the centres of two adjacent take-up surfaces and of two adjacent sets of grasping means and that at least those sets of grasping means, which do not take up a position right above the pile in part of their moving path, are operable separately in smaller numbers than the entire number in their set to take up moulded articles selectively from one take-up surface to put them onto an adjacent take-up surface.

4,417,980

## FILTRATION APPARATUS

Rolf Baur, Lautern, and Wolfgang Diemer, Waldstetten, both of Fed. Rep. of Germany, assignors to Schenk Filterbau GmbH, Waldstetten, Fed. Rep. of Germany

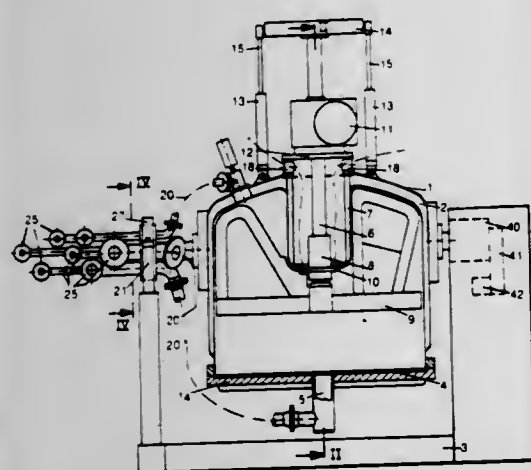
Filed Jun. 8, 1981, Ser. No. 271,716

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022644; Jun. 18, 1980, 3022658

Int. Cl.<sup>3</sup> B01D 29/02

U.S. Cl. 210—91

15 Claims

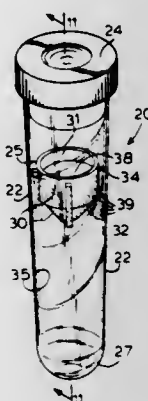


1. Filtration apparatus comprising in combination:
  - a container having inlet and outlet means, and a liquid permeable filter bottom situated between said inlet and outlet means;
  - mixing means including a power shaft extending into said container from a side opposite said bottom and carrying a mixing implement in the container, a drive for said power shaft and a lifting mechanism for axially displacing said power shaft;
  - a supporting frame;
  - means for tiltably mounting said container, including a support bearing at one side of said container and said frame, including several roller elements and an inner roller engaged by said roller elements, said inner roller having spaced-apart apertures; and
  - conduits leading through said spaced-apart apertures in said inner roller to and from said container for angular movement therewith.

4,417,981  
BLOOD PHASE SEPARATOR DEVICE  
Edward L. Nugent, North Caldwell, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.  
Filed May 4, 1981, Ser. No. 260,530  
Int. Cl.<sup>3</sup> B01D 21/26

U.S. Cl. 210—209

14 Claims



1. A blood collection device for receiving a sample of whole blood adapted to be centrifuged into a phase of lighter specific gravity and a phase of heavier specific gravity comprising:
  - a collection container having an open end and a closed end; a stopper in said open end sealing same closed end and being penetrable by a needle for delivering blood to said container;
  - a separator assembly positioned inside said container intermediate said open and closed ends adapted to move along a longitudinal axis therein and including a receptacle with a thixotropic barrier material in said receptacle, said receptacle having an aperture facing said closed end of the container, the size of said aperture and the viscosity of said thixotropic barrier material cooperating to prevent said barrier material from flowing out of said aperture under normal gravity conditions; said separator assembly having a specific gravity greater than the specific gravity of the heavier blood phase and adapted to move toward said closed end during centrifugation of said device, said barrier material having a specific gravity intermediate the specific gravities of the lighter and heavier phases of blood and adapted to flow under its own influence through said aperture during centrifugation of said device, travel to a position intermediate the lighter and heavier phases of blood separated during centrifugation and adhere to the inside wall of said container to form a barrier between said phases to maintain the separation therebetween; and
  - said receptacle having a smaller transverse dimension than the inside wall of said container to provide annular clearance therebetween for blood passage toward the closed end of said container during the blood collection procedure and for the passage of barrier material toward the interface of the phases separated during centrifugation.
5. The device of claim 1 wherein said assembly further includes a removable blood clotting activator at least on its surfaces bordering the annular clearance so that whole blood contacting said activator during passage through said clearance picks up said activator and rapid blood clotting is induced.

4,417,982  
DEVICE FOR THE DEWATERING OF NATURALLY MOIST LUMP PEAT

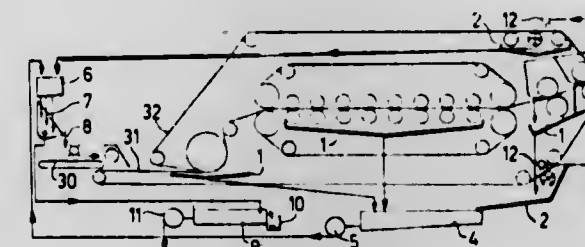
Hugo Britschgl, Stalden; Bruno Portmann, Emmenbrücke, and Louis Berchtold, Horw, all of Switzerland, assignors to Bell Maschinenfabrik Aktiengesellschaft, Kriens, Switzerland  
Filed Sep. 28, 1982, Ser. No. 425,580

Claims priority, application Switzerland, Nov. 13, 1981, 7301/81

Int. Cl.<sup>3</sup> B30B 9/24; B01D 33/14

U.S. Cl. 210—386

6 Claims



1. A wire press machine comprising elements designed, arranged and dimensioned for dewatering moist lump peat in the naturally obtained state and without flocculation agents including an inlet section for fresh moist peat which leads that material to moving press screens between which the peat is squeezed to yield a filtrate; washing means for applying water to the screens to repeatedly clean them; duct means to collect the filtrate from the press screens and the used wash water; static filter means connected to receive the liquid collected by the duct means and to separate it into a peat fines fraction and an essentially particle-free water fraction; means for guiding the peat fines fraction to the inlet section and mixing it with the incoming fresh moist peat; means for leading a portion of the water fraction to the washing means; and means for discharging the remaining, surplus portion of the water fraction.

4,417,983

## SCRAPER APPARATUS FOR SETTLING BASINS AND THE LIKE

Rudolf Smigerski, Aarbergen; Rosemarie Dörner, Heldenrod, and Peter Schmidt, Hohenstein-Holzhausen, all of Fed. Rep. of Germany, assignors to Passavant-Werke AG & Co. KG, Fed. Rep. of Germany

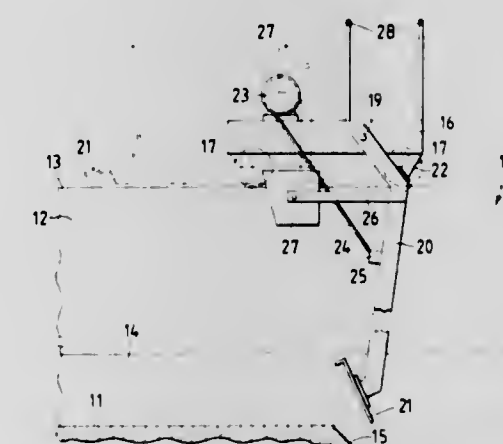
Filed Mar. 20, 1981, Ser. No. 245,731

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011752

Int. Cl.<sup>3</sup> B01D 21/04

U.S. Cl. 210—527

6 Claims



1. Scraper apparatus for settling basins and the like comprising a bridge transportable above the basin, a pivot arm pivotally connected adjacent one end to said bridge with a scraper blade mounted at the other end thereof for upward and rearward pivotal movement within said basin, and loading means

operatively connected to said pivot arm for generating a return force which increases during the initial upward and rearward pivoting of the scraper blade an angular distance of approximately 20° to 45° to load the scraper blade into the scraping position and then decreases.

4,417,984

## METHOD AND DEVICE FOR TREATING FLUIDS WITH MAGNETIC LINES OF FORCE

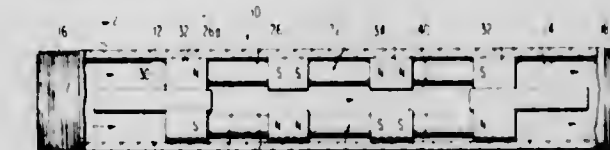
James R. O'Meara, Jr., P.O. Box 58170-MS-888, Houston, Tex. 77058

Continuation-in-part of Ser. No. 151,864, May 21, 1980, Pat. No. 4,289,621. This application Sep. 14, 1981, Ser. No. 301,696. The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C02B 1/48

U.S. Cl. 210—695

17 Claims



1. A device for the treatment of fluids with magnetic lines of force comprising:
  - an elongated hollow outer casing having a longitudinal axis and fluid inlet and outlet means at the longitudinal ends thereof;
  - at least two spaced-apart and longitudinally coextensive elongated magnet assemblies, each positioned within said outer casing and having a longitudinal axis substantially parallel with that of adjacent magnet assemblies and with the longitudinal axis of said outer casing to form at least one elongated laminar passageway for said fluid therebetween;
  - each of said magnet assemblies comprising at least one tier of at least two permanent magnets, each magnet being magnetized along its longitudinal axis and arranged in a coaxial line with the other magnet or magnets in the same tier with like polar ends of said magnets adjacent each other; each of said tiers having one end supported by an inlet end support member, the length of each tier of magnets being supported between its ends by means associated with said end support members;
  - said magnet assemblies being positioned so that the polarities of adjacent polar ends of magnets in one of said magnet assemblies are unlike the polarities of the oppositely disposed adjacent polar ends of magnets in a spaced-apart magnet assembly, thereby providing at least three concentrated flux lines of magnetic force and adjacent flux lines of reversed polarity in each said passageway; and
  - means for fixedly positioning said magnet assemblies within said outer casing.
17. A method for the treatment of a fluid with magnetic lines of force which comprises directing said fluid through at least one passageway defined by spaced-apart and longitudinally coextensive magnet assemblies each comprising at least one tier of at least two permanent magnets magnetized along the longitudinal axis thereof and arranged in coaxial line with like poles adjacent each other, said magnet assemblies being positioned so that the polarities of adjacent polar ends of magnets in one of said magnet assemblies are unlike the polarities of the oppositely disposed polar ends of magnets in a spaced-apart magnet assembly, thereby treating said fluid with at least three concentrated flux lines of force and adjacent flux lines of reverse polarity in each said passageway.

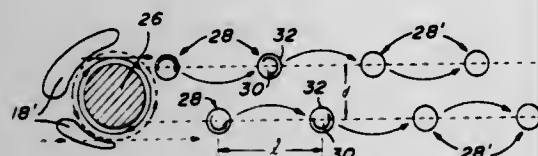


4,417,985

TREATMENT OF WATERS WITH BROAD SPECTRUM  
CONTAMINANTSJames Keane, 23, S. Harlan St., York, Pa. 17402  
Filed Nov. 6, 1981, Ser. No. 318,820  
Int. Cl.<sup>3</sup> C02F 1/54

U.S. Cl. 210—707

98 Claims



1. A composition for the direct nucleation of materials which are dissolved or suspended in a hydrogen-bonded liquid, which comprises a discontinuous phase of gas in the form of surfactant-stabilized spherical bubbles having a narrowly distributed size in the range of from about 12 to about 100 microns and a half-life of at least about 2 minutes, each said gas bubble being encapsulated in a double surfaced hydration layer containing said hydrogen-bonded liquid and a soluble surfactant having a HLB ratio greater than about 10, said encapsulated gas bubbles being dispersed in a continuous phase of said hydrogen-bonded liquid and each having an outer surface layer of collector ions movably held to said hydration layer of Coulomb forces and active to react with said materials, said surfactant being present in an amount up to about 3 times critical micelle concentration so as to stabilize said bubbles and impart to said hydration layer sufficient thickness and viscosity to retard migration of said collector ions through said hydration layer for a period of time sufficient to enable said collector ions to react with said materials and cause nucleation thereof directly at said surface layers of said bubbles, whereby when said composition is turbulently mixed with said hydrogen-bonded liquid containing said materials dissolved or suspended therein, the reaction between said collector ions and said materials causes said bubbles to rupture and to release their entrapped gas as naked gas bubbles and forms an insoluble reaction product, said ruptured bubbles exposing the surfactant contained in the respective hydration layer thereof for reaction with any unreacted collector ions to form a further insoluble reaction product, any unreacted bubbles also rupturing in time as a result of said collector ions having migrated through the respective hydration layer thereof and reacted with said surfactant to form said further insoluble reaction product, both said insoluble reaction product and said further insoluble reaction product forming a recoverable agglomerated material.

4,417,986

PROCESS FOR REDUCING THE CHEMICAL OXYGEN  
DEMAND OF SPENT ALKALINE REAGENTS

Ruth M. Connaught, Turnersville, N.J.; Vernon F. Coty, West Chester, Pa., and Michael Sedlak, West Deptford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 13, 1981, Ser. No. 243,310  
Int. Cl.<sup>3</sup> C10G 19/00, 19/08, 27/12

U.S. Cl. 210—759

11 Claims

1. A process for significantly reducing the chemical oxygen demand of an aqueous solution of spent alkaline reagent containing alkali metal mercaptide resulting from the treatment of mercaptan-containing hydrocarbon fluid with alkali metal hydroxide which consists essentially of contacting the spent alkaline reagent solution with hydrogen peroxide at ambient pressure and temperature to convert at least about 50 weight percent of the total spent alkaline reagent originally present to alkali metal sulfate and alkali metal carbonate.

4,417,987

## PROCESS FOR DETOXIFICATION

Anthony P. Harrison, Rochdale, England, assignor to Interco Chemicals Limited, London, England

Filed Dec. 7, 1981, Ser. No. 328,109

Claims priority, application United Kingdom, Dec. 12, 1980, 8039829

Int. Cl.<sup>3</sup> C02F 1/72

U.S. Cl. 210—759

17 Claims

1. In a process for the detoxification of an aqueous alkaline solution of a metal cyanide complex by introduction therein of hydrogen peroxide, the improvement wherein detoxification is effected in the presence of a complexing agent in a mole ratio to metal in the metal cyanide of from 0.5:1 to 3:1, said complexing agent being one which can form with nickel cyanide a mixed ligand complex having a stability constant  $\beta_{12}$  of not greater than 9.5, said stability constant  $\beta_{12}$  being expressed as a logarithm to the base 10 for the dissociation reaction



wherein L represents a molecule of the complexing agent and wherein

$$\beta_{12} = \frac{[\text{NiL}(\text{CN})_2^{n-}]}{[\text{NiL}^{2-n}][\text{CN}^-]^2}$$

4,417,988

METHOD FOR IMPROVING SOLIDS REMOVAL IN  
CLARIFIERS

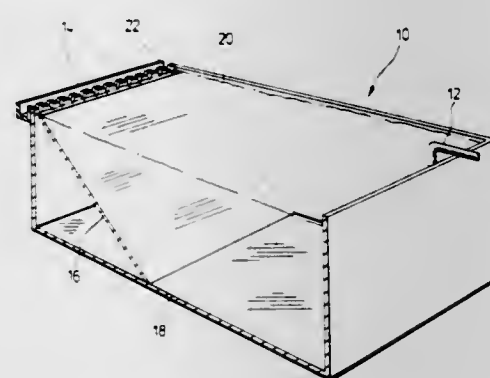
Jesus F. Cordoba-Molina, Div. de Fuentes de Energia, Inst. de Investigaciones Elec., Interior Internado Palmira, Apartado Postal 475, Cuernavaca, Morelos, Mexico; Robert R. Hudgins, 196 Bellehaven Ave., and Peter L. Silveston, 121 Allen St., both of Waterloo, Ontario, Canada

Filed May 26, 1981, Ser. No. 266,733

Int. Cl.<sup>3</sup> B01D 21/00

U.S. Cl. 210—801

7 Claims



1. A method of improving the settleability of a suspension of solid particles in water flowing through a settling zone from an inlet thereto to an outlet therefrom, which comprises: flowing a suspension of solid particles in water through said settling zone from said inlet thereto towards said outlet thereof at a flow rate which permits settling of said solid particles in said settling zone, and decreasing the effective depth of said settling zone towards said outlet to effect acceleration of the flow of said suspension towards said outlet to achieve a densimetric Froude number of the suspension of at least  $0.1/\pi$  at the point of maximum velocity of said suspension and minimum volume of said settling zone, said densimetric Froude number (F) being determined by the relationship:

$$F = \frac{V}{\sqrt{(g\Delta\rho/\rho)h}}$$

wherein V is the horizontal velocity of liquid at a point in the settling zone and h is the depth of liquid in the settling zone at the same point, g is the acceleration due to gravity,  $\Delta\rho$  is the density difference between that of the feed to and that of the overflow from the settling zone and  $\rho$  is the average density of said suspension in said settling zone.

4,417,989

## PROPPING AGENT FOR FRACTURING FLUIDS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 142,550, Apr. 21, 1980, Pat. No. 4,326,969, which is a continuation-in-part of Ser. No. 953,375, Oct. 23, 1978, abandoned. This application Aug. 3, 1981, Ser. No. 289,559

Int. Cl.<sup>3</sup> E21B 43/26, 43/267

U.S. Cl. 252—8.55 R

2 Claims

1. A composition for use in fracturing fluids comprising sand grains having a Tyler mesh size of about 8 to about 40 coated with a thin film of polyacrylamide or partially hydrolyzed polyacrylamide of number average molecular weight from about 500,000 to about 2,000,000 alkoxylated with about 20 to about 100 weight percent of a material selected from the group consisting of propylene oxide and a mixture of propylene oxide and ethylene oxide wherein the weight percent of propylene oxide in the said mixture is about 65 to 95, wherein in the partially hydrolyzed polyacrylamide from 12 to 67 mole percent of the original carboxamide groups are hydrolyzed, said alkoxylated polyacrylamide or partially hydrolyzed polyacrylamide being water insoluble.

4,417,990

MIXED METAL SALTS/SULFURIZED PHENATE  
COMPOSITIONS AND LUBRICANTS AND  
FUNCTIONAL FLUIDS CONTAINING THEM

Donald L. Clason, Mentor, and Calvin W. Schroeck, Eastlake, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

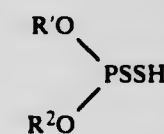
Continuation-in-part of Ser. No. 205,095, Nov. 7, 1980, Pat. No. 4,308,154, which is a continuation of Ser. No. 44,286, May 31, 1979, abandoned. This application Dec. 24, 1981, Ser. No. 334,251

Int. Cl.<sup>3</sup> C10M 1/48

U.S. Cl. 252—32.7 E

35 Claims

1. A composition comprising (A) a mixed metal salt of (A)(I) at least one acid of formula I



wherein R' and R<sup>2</sup> are the same or different and each of R' and R<sup>2</sup> is a hydrocarbon-based radical, and (A)(II) at least one aliphatic or alicyclic carboxylic acid containing from about 2 to about 40 carbon atoms; the ratio of equivalents of (A)(I) to (A)(II) being in the range of about 0.5:1 and about 400:1, and (B) at least one sulfurized Group II metal phenate; the weight ratio of (A) to (B) being in the range of about 40:1 to about 1:2.

4,417,991

## GRAPHITED GEAR OILS

Dominic A. Apikos, Crown Point, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Sep. 15, 1982, Ser. No. 418,135

Int. Cl.<sup>3</sup> C10M 1/10, 1/28

U.S. Cl. 252—29

4 Claims

1. An energy efficient lubricating composition suitable for lubricating gears comprising:  
(a) about 60% to about 85% by weight of a base oil;  
(b) about 0.5% to about 5.0% by weight of graphite particles wherein at least 90% by weight of said particles, based upon the total weight of said particles, is no greater than one micron in particle size;  
(c) an effective dispersant amount of an ethylene-propylene copolymer grafted with a nitrogen-containing vinyl functionality selected from the group consisting of an N-vinyl pyrrolidone and a C-vinyl pyridine.  
(d) about 4% to about 10% by weight of a sulfur- and phosphorus-containing EP additive; wherein the percent by weight of all components added together equals 100%.

4,417,992

## DUST CONTROL

Bhupati R. Bhattacharyya, Downers Grove, and William J. Roe, Aurora, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 288,665, Jul. 30, 1981. This application Dec. 13, 1982, Ser. No. 449,434

Int. Cl.<sup>3</sup> C09K 11/02

U.S. Cl. 252—88

14 Claims

1. A method of controlling dust on roads, in mines, on mineral and/or tailings piles or impoundments, controlling dust and wind erosion from surfaces of pulverized coal and mineral piles contained within open transit cars such as coal cars or trucks, and on other surfaces containing coal particles, rock dust, clay, soil particles and other finely divided particles subject to dusting, which comprises applying thereto a dust inhibiting amount of a liquid dispersion of watery consistency of a highly branched water swellable polymer of acrylamide or an acrylamide-acrylic acid copolymer, cross-linked with a multifunctional unsaturated monomer containing more than one ethylenically unsaturated group, said cross-linked polymer or copolymer having a three-dimensional structure and being in the form of microgelatinous particles, having an average particle size not exceeding approximately one micron in an oil continuous emulsion form, and having the property of allaying such dust.

4,417,993

## CLEANSING TABLETS FOR TOOTH PROSTHESES

Gerhard Gergely, Gartengasse 8, A-1053 Vienna, Austria

Filed Oct. 20, 1980, Ser. No. 198,413

Claims priority, application Austria, Oct. 30, 1979, 7005/79

Int. Cl.<sup>3</sup> C11D 7/08, 7/12, 7/18, 17/00

U.S. Cl. 252—90

5 Claims

1. An effervescent cleansing tablet for a dental prosthesis comprising a faster dissolving acidic component which is a mixture of sodium bicarbonate, potassium persulfate, sulfamic acid, and citric acid, and  
a slower-dissolving alkaline component which is a mixture of sodium carbonate and magnesium hydroxycarbonate, said alkaline component present in stoichiometric excess within the tablet, said tablet providing an initial acidic pH in solution while effervescing and gradually adjusting to an alkaline pH.  
4. A process for preparing an effervescent cleansing tablet for a dental prosthesis, comprising a distinct, faster-dissolving acidic layer and a distinct, slower-dissolving alkaline layer, which comprises the steps of  
(A) preparing a mixture of sulfamic acid, sodium bicarbonate, sodium carbonate, sodium persulfate, polyethylene



glycol and a surface active substance, forming the faster-dissolving acidic component,

- (B) pre-pressing this acidic component (A) in a table press,  
(C) preparing a mixture of sodium carbonate, sodium pyrophosphate, potassium persulfate, a surface active substance, and a partial glyceride of a straight-chain vegetable fatty acid of eight to twelve carbon atoms in length, forming the slower-dissolving alkaline component,  
(D) depositing said alkaline component (C) onto the pre-pressed acidic component (B), and  
(E) pressing said two components (D) in a tablet press.

4,417,994

# PARTICULATE DETERGENT ADDITIVE COMPOSITIONS

Barry Stoddart, Newcastle upon Tyne, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Jan. 20, 1982, Ser. No. 340,954

Claims priority, application United Kingdom, Jan. 24, 1981, 8102221

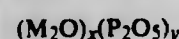
Int. Cl.<sup>3</sup> C11D 3/06, 7/56

U.S. Cl. 252—135

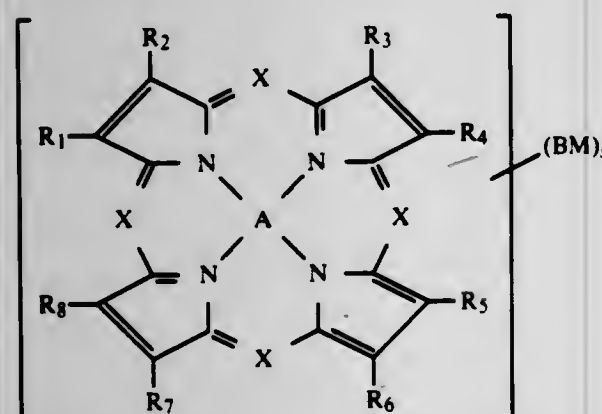
22 Claims

1. A detergent additive composition in particulate form comprising:

- (a) a storage-sensitive detergent additive material releasably enclosed within  
(b) a water-soluble glassy matrix of amorphous phosphate having the general formula I:



wherein M is selected from the group consisting of hydrogen, alkali metal, ammonium and substituted ammonium groups, y has a value in the range from 2 to 50, and the ratio x:y is from 0.7:1 to 1.7:1; wherein said storage sensitive detergent additive material is a multifunctional photoactivator/dye which is a porphine having the general formula II:



wherein each X is (=N—) or (=CY—), and the total number of (=N—) groups is 0, 1, 2, 3 or 4; wherein each Y, independently, is hydrogen or meso substituted alkyl, cycloalkyl, aralkyl, aryl, alkaryl or heteroaryl; wherein each R, independently, is hydrogen or pyrrole substituted alkyl, cycloalkyl, aralkyl, aryl, alkaryl or heteroaryl, or wherein adjacent pairs of R's are joined together with ortho-arylene groups to form pyrrole substituted alicyclic or heterocyclic rings; wherein A is 2(H) atoms bonded to diagonally opposite nitrogen atoms, or Zn(II), Cd(II), Mg(II), Ca(II), Al(III), Sc(III), or Sn(IV); wherein B is an anionic, nonionic or cationic solubilizing group substituted into Y or R; wherein M is a counterion to the solubilizing groups; and wherein s is the number of solubilizing groups; wherein, when B is cationic, M is an anion and s is from 1 to 8; when B is nonionic, B is polyethoxylate, M is zero, s is from 1 to 8, and the number of condensed ethylene oxide molecules per porphine molecule is from 8 to 50; when B is anionic and proximate, M is cationic and s is from 3 to 8; when B is anionic and remote, M is cationic and s is from 2 to 8; and when B is sulphonate the number of sulphonate groups is no greater than the number of aromatic and heterocyclic substituent groups.

onic and s is from 2 to 8; and when B is sulphonate the number of sulphonate groups is no greater than the number of aromatic and heterocyclic substituent groups.

4,417,995

# FABRIC CONDITIONING COMPOSITION

Alexander Lips, Pavenham; Martin A. Wells, Wirral, and Edwin Willis, Bromborough, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,879

Claims priority, application United Kingdom, Apr. 21, 1981, 8112392

Int. Cl.<sup>3</sup> D06M 15/08

U.S. Cl. 252—174.23

10 Claims

1. A fabric conditioning composition in liquid form comprising from about 0.5% to about 60% by weight of a fabric conditioning agent which includes at least one cationic fabric softening material, characterized in that the composition further comprises from about 0.1% to about 8% by weight of an inorganic polymeric material capable of precipitating a metal hydroxide or hydrated oxide at a pH of about 7.5 or less in water, the weight ratio of the fabric conditioning agent to the inorganic polymeric material being at least about 1.5:1.

4,417,996

# AQUEOUS BASIC POLYALUMINUM-IRON HALIDE SOLUTIONS

Vincent H. S. Kuo, Liverpool, and Christian A. Wamser, Camillus, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

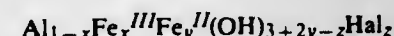
Division of Ser. No. 218,984, Dec. 22, 1980, Pat. No. 4,362,643, which is a continuation of Ser. No. 55,416, Jul. 6, 1979, abandoned. This application Sep. 16, 1982, Ser. No. 418,879

Int. Cl.<sup>3</sup> C01F 7/56; C01G 49/10; C02B 1/20

U.S. Cl. 252—175

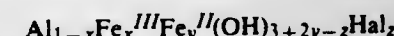
4 Claims

1. A method of preparing an aqueous basic polyaluminum-iron halide solution containing a concentration of metal ions ranging from about 1.35 to 4.5 mol/liter as a dissolved salt of the formula



wherein Hal is chlorine, bromine, iodine or mixtures thereof; (x+y)/(1-x) is 0.2 to 1.5 (3+2y-z)/(3+2y) is 0.24 to 0.67; z is less than 3+2y; and wherein x/y is about 0 to 1 by mixing a polyaluminum halide solution with one or more members of the group consisting of ferrous halide and ferric halide.

3. A method of preparing an aqueous basic polyaluminum-iron halide solution containing a concentration of metal ions ranging from about 1.35 to 4.5 mol/liter as a dissolved salt of the formula



wherein Hal is chlorine, bromine, iodine or mixtures thereof; (x+y)/(1-x) is 0.2 to 1.5; (3+2y-z)/(3+2y) is 0.24 to 0.67; z is less than 3+2y; and wherein x/y is about 0 to 1 which comprises reacting an aqueous aluminum halide solution or aqueous low basic polyaluminum halide solution with metallic iron.

4,417,997

# METHOD FOR RECOVERY OF METALS FROM SPENT IRON-CHROME SHIFT CATALYST AND METHOD OF FORMING NEW CATALYST

James R. Jennings, Yarm, England, and George N. Pessimis, Westchester, Ill., assignors to Katalco Corp., Oak Brook, Ill., and Imperial Chemical Industries Limited, London, England, a part interest

Filed May 24, 1982, Ser. No. 380,979

Int. Cl.<sup>3</sup> C09K 3/00

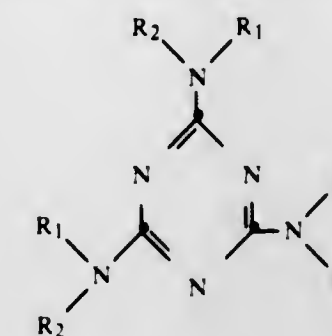
U.S. Cl. 252—182

7 Claims

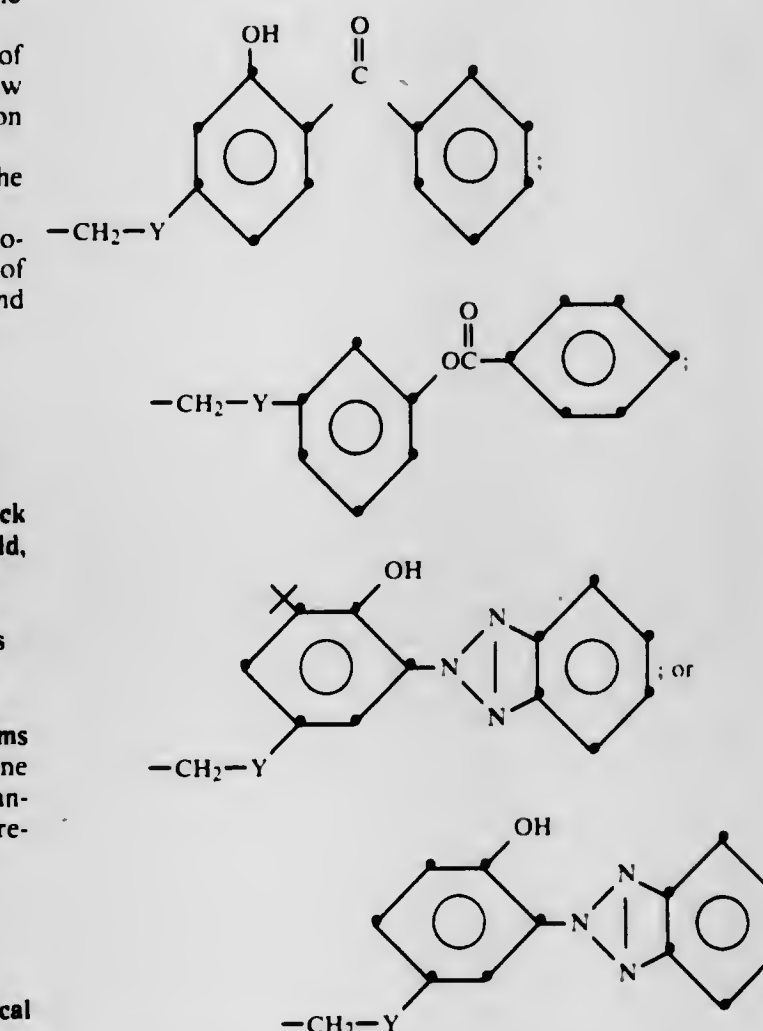
2. A method of making a solution of the nitrates of iron and chromium from a spent catalyst containing oxides of iron and chromium which method comprises:

- (a) dissolving the spent catalyst incompletely in nitric acid;  
(b) separating the resulting solution of the nitrates of iron and chromium from the nitric acid insoluble residue containing undissolved iron and chromium components;  
(c) dissolving the nitric acid insoluble residue in sulphuric acid to obtain a solution of metal sulphates;  
(d) reacting the metal sulphates solution with a source of nitrate ions and of cations of which the sulphate is of low solubility, so as to prepare a solution of the nitrates of iron and chromium and an insoluble sulphate precipitate;  
(e) separating the insoluble sulphate precipitate from the solution of the metal nitrates; and then,  
(f) combining the solution of the nitrates of iron and chromium of step b with the solution of the metal nitrate of step e to recover a solution of the nitrates of iron and chromium from said spent catalyst.

dation stabilized against such degradation with a stabilizing amount of a compound having the formula:



wherein R is a member selected from the group consisting of:



R<sub>1</sub> is a member selected from the group consisting of —CH<sub>2</sub>OH and —CH<sub>2</sub>OX where X is a branched or unbranched alkyl group containing 1 to 18 carbon atoms.

R<sub>2</sub> is the same as R<sub>1</sub>, and

Y is an oxy group, an oxy alkyl oxy group, or an oxy alkyl carbonyl group, wherein said alkyl member is a branched or unbranched alkyl group containing 1 to 10 carbon atoms.

4,417,999

# FREE FLOWING ANTISTATIC COMPOSITION

James P. Duffy, Memphis, Tenn., assignor to Witco Chemical Corporation, New York, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,444

Int. Cl.<sup>3</sup> C08L 3/36, 5/17

U.S. Cl. 252—383

16 Claims

1. A particulate free flowing antistatic composition for a polymer comprising an ethoxylated alkyl amine and silicon dioxide particulates.

11. A method of making a solid free flowing antistatic composition comprising spraying an ethoxylated amine to form a powder and mixing with silicon dioxide particulates so as to form a free flowing powder.

4,418,000

# MELAMINE GROUP CONTAINING ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Joseph S. Zannucci, and Wayne P. Pruett, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,901

Int. Cl.<sup>3</sup> C09K 15/20; C08K 5/16

U.S. Cl. 252—403

82 Claims

1. An organic composition susceptible to ultraviolet degradation

4,418,001

# MELAMINE GROUP CONTAINING ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS III

Joseph S. Zannucci, and Wayne P. Pruett, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,902

Int. Cl.<sup>3</sup> C09K 15/20; C08K 5/16

U.S. Cl. 252—403

30 Claims

1. An organic composition susceptible to ultraviolet degradation







A is at least one of the metals selected from nickel, cobalt, manganese and lead;  
 B is at least one of the metals selected from chromium and gallium;  
 a is the sum of the values indicating the amounts present of each of the metals A, and is a number ranging from greater than 0 to about 12;  
 c and d are numbers each equal to or greater than 0 and ranging to 12, with the sum c+d being about 12;  
 b<sub>1</sub> is the sum of the values indicating the amounts present of each of the metals B and can be zero or greater, b<sub>2</sub> and b<sub>3</sub> are greater than zero, and the sum of b<sub>1</sub>+b<sub>2</sub>+b<sub>3</sub> is a number ranging from greater than 0 to about 1.5 [(c+d)-a]; and

x is a number satisfying all unbalanced valences.  
 said process comprising, in a first stage, intimately admixing in aqueous phase the salts of all metals to comprise such active catalyst, with the salts of molybdenum and/or tungsten being ammonium salts and at least one salt of at least one of bismuth, iron and the metals A and B being a nitrate or a chloride, and further wherein in such first stage said intimate admixing comprises successively adding to a first aqueous solution comprising said ammonium salts of molybdenum and/or tungsten in amounts sufficient to satisfy the values c and d, an amount of ammonia sufficient to adjust the pH thereof to a value ranging from about 6 to 8, next adding to the solution which results a second aqueous solution comprising said bismuth salts, iron salts and A and B metal salts in amounts sufficient to satisfy the values a, b<sub>1</sub>, b<sub>2</sub> and b<sub>3</sub> and, simultaneously, also adding thereto an amount of ammonia sufficient to maintain the pH of the combined solution at a value ranging from about 6 to 8, and thence filtering the suspension which results to obtain a paste of the desired active catalyst; and, in a second stage, then drying said paste and, at least once, calcining same.

4,418,008

#### PROCESS FOR INCREASING THE ACTIVITY OF PEROVSKITE CATALYSTS AND HYDROCARBON TREATING PROCESSES USING THE ACTIVATED CATALYST

Robert C. Schucker, and Kenneth S. Wheelock, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham, Fla.

Filed Feb. 24, 1982, Ser. No. 351,969

Int. Cl.<sup>3</sup> B01J 21/04, 23/10

U.S. Cl. 502—340

8 Claims

1. A process for increasing the activity of a fresh catalyst comprising a perovskite having at least one alkaline earth metal constituent selected from the group consisting of barium, beryllium, magnesium, calcium, strontium and mixtures thereof, which comprises the step of contacting said catalyst with a reducing gas at reducing conditions for a time sufficient to increase the activity of said catalyst.

4,418,009

#### ELECTRICAL RESISTOR AND METHOD OF MAKING THE SAME

Curtis L. Holmes, Elkhart, Ind.; William M. Faber, Sr., Plano, Tex.; Gaylord L. Francis, Morristown, N.J., and Otis F. Boykin, Chicago, Ill., assignors to CTS Corporation, Elkhart, Ind.

Continuation of Ser. No. 169,355, Jan. 29, 1962, abandoned. This application Oct. 24, 1965, Ser. No. 506,449

Int. Cl.<sup>2</sup> H01B 1/02

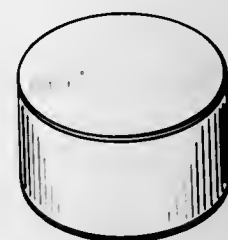
U.S. Cl. 252—514

3 Claims

1. The method of manufacturing an electrical resistor comprising:

a. admixing glass particles, finely divided refractory filler oxide, and a pyrolytically decomposable resinate compound containing one of the noble metals,

b. heating the mixture to decompose the metal containing compound,  
 c. forming the mixture into the desired shape, and



d. firing the mixture at a temperature sufficient to fuse the glass but below the temperature required to soften the refractory filler oxide.

4,418,010

#### SUBSTITUTED TRICYCLODECANE DERIVATIVES, PROCESSES FOR PRODUCING SAME AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation of Ser. No. 335,564, Dec. 29, 1981, Pat. No. 4,386,023, which is a continuation of Ser. No. 220,621, Dec. 29, 1980, abandoned, which is a division of Ser. No. 144,898, Apr. 29, 1980, Pat. No. 4,275,251. This application Jan. 10, 1983, Ser. No. 456,979

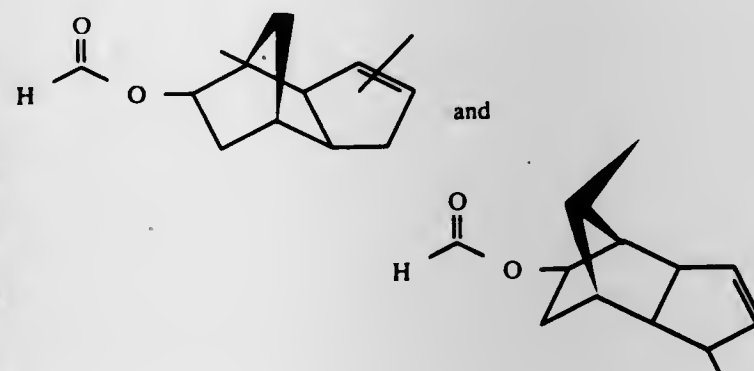
Int. Cl.<sup>3</sup> C11B 9/00

U.S. Cl. 252—522 R

1 Claim



1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to a perfume base or a cologne base, an aroma augmenting or enhancing quantity of a composition consisting essentially of a mixture of compounds defined by the structures:



produced by the process consisting essentially of the step of reacting in the presence of a protonic acid catalyst or a Lewis acid catalyst at least one methylcyclopentadiene isomer having a structure selected from the group consisting of

4,418,013

#### RAPESEED PROTEIN ISOLATE

Jacquelyn J. Cameron, Harwood, and Chester D. Myers, Ajax, both of Canada, assignors to General Foods, Inc., Don Mills, Canada

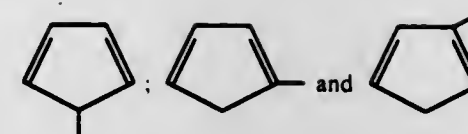
Continuation of Ser. No. 244,248, Mar. 16, 1981, Pat. No. 4,366,097. This application Jul. 29, 1982, Ser. No. 402,839. The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A23J 1/14

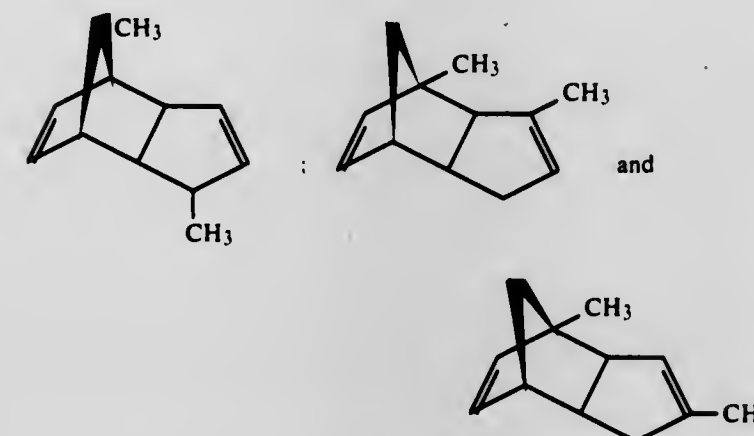
U.S. Cl. 260—123.5

1 Claim

1. A method of preparing a rapeseed protein isolate having a protein content of at least 90% by weight, as determined by Kjeldahl nitrogen  $\times 6.25$ , and which is substantially undenatured, as determined by gel filtration, which comprises: contacting a rapeseed source material solely with water to extract rapeseed protein therefrom and form a rapeseed protein solution, and diluting the protein solution with water to precipitate the rapeseed protein from said protein solution.



or at least one precursor thereof having a structure selected from the group consisting of:



with formic acid at a temperature in the range of from about 0° C. up to about 50° C. with a concentration of acid catalyst in the reaction mass varying from 0.01% up to 1 mole percent based on the weight of reaction mass.

4,418,011

#### DETERGENT COMPOSITION PROVIDING ANTISTATIC PROPERTIES

Robert A. Bauman, New Brunswick, and Robert C. Pierce, Plainsboro, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,795

Int. Cl.<sup>3</sup> C11D 1/52

U.S. Cl. 252—544

10 Claims

1. An antistatic composition for laundering fabrics comprising an antistatic amount of isostearic acid, a nonionic detergent and an acrylamide-based cationic polymer in an effective amount to overcome the inactivation of the antistatic properties by said detergent.

4,418,012

#### LEUCYLALANY-ARGININE DERIVATIVE

Setsuro Fujii, Toyonaka; Mamoru Sugimoto, Sakura, and Takashi Yaegashi, Funabashi, all of Japan, assignors to Torii & Co. Ltd., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,415

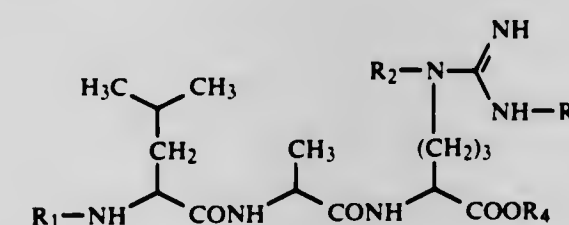
Claims priority, application Japan, Sep. 16, 1980, 55-128271

Int. Cl.<sup>3</sup> C07C 103/52

U.S. Cl. 260—112.5 R

6 Claims

1. A leucylalanylarginine derivative represented by the formula,



wherein R<sub>1</sub> represents hydrogen or an amino-protecting group; R<sub>2</sub> and R<sub>3</sub> represent hydrogen or guanidino-protecting groups; and R<sub>4</sub> represents naphthyl.

4,418,015

#### PHTHALOCYANINE REACTIVE DYESTUFFS

Kurt Schreiner, Hoenebach, and Horst Jäger, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 17, 1981, Ser. No. 322,354

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044798

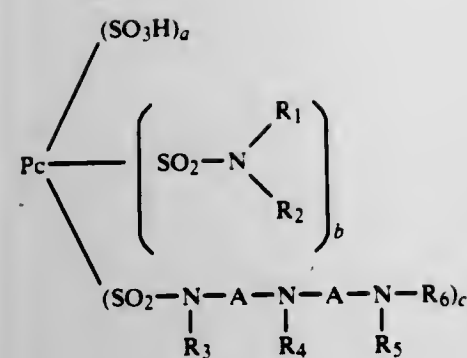
Int. Cl.<sup>3</sup> C09B 47/30, 47/04

U.S. Cl. 260—242.2

4 Claims

1. Reactive dyestuffs which, in the form of the free acids, correspond to the formula I

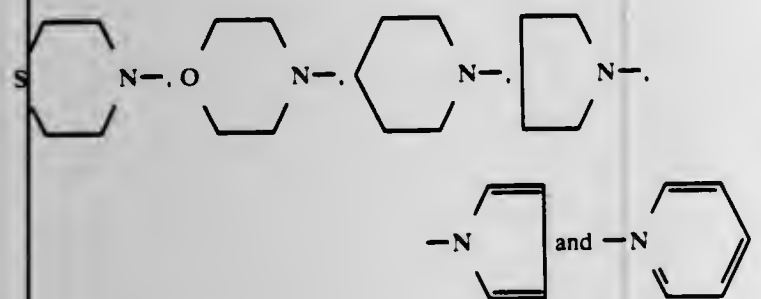




wherein

Pc is the radical of a phthalocyanine, R<sub>1</sub> and R<sub>2</sub> are identical or different and represent hydrogen, unsubstituted alkyl, alkyl substituted by OH, COOH or SO<sub>3</sub>H, unsubstituted cycloalkyl, cycloalkyl substituted by OH, COOH or SO<sub>3</sub>H, unsubstituted aralkyl, aralkyl substituted by OH, COOH or SO<sub>3</sub>H in the aryl part, unsubstituted aryl, aryl substituted by OH, COOH, SO<sub>3</sub>H or halogen, or wherein

R<sub>1</sub> and R<sub>2</sub>, together with the nitrogen atom between them form a heterocyclic radical selected from



and wherein

a is a number from 0 to 3,  
b is a number from 0 to 3 and  
c is a number from 1 to 4,  
wherein

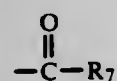
(a+b+c) ≤ 4,

and wherein

the radicals A are identical or different and represent unsubstituted straight-chain alkylene with at least 2 carbon atoms, straight-chain C<sub>2</sub>-C<sub>10</sub>-alkylene substituted by OH, SO<sub>3</sub>H or COOH; unsubstituted branched C<sub>3</sub>-C<sub>10</sub>-alkylene, branched C<sub>3</sub>-C<sub>10</sub>-alkylene substituted by OH, SO<sub>3</sub>H or COOH; unsubstituted C<sub>5</sub>-C<sub>7</sub>-cycloalkylene, C<sub>5</sub>-C<sub>7</sub>-cycloalkylene substituted by OH, SO<sub>3</sub>H or COOH

R<sub>3</sub> is hydrogen, unsubstituted C<sub>1</sub>-C<sub>8</sub>-alkyl, C<sub>1</sub>-C<sub>8</sub>-alkyl substituted by COOH, SO<sub>3</sub>H or OH; unsubstituted phenyl-C<sub>1</sub>-C<sub>4</sub> alkyl or naphthyl C<sub>1</sub>-C<sub>4</sub>-alkyl, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkyl or naphthyl-C<sub>1</sub>-C<sub>4</sub>-alkyl substituted by OH, SO<sub>3</sub>H or COOH

R<sub>4</sub> is a radical of the formula



wherein

R<sub>7</sub> is unsubstituted C<sub>1</sub>-C<sub>12</sub>-alkyl, C<sub>1</sub>-C<sub>12</sub>-alkyl substituted by OH, SO<sub>3</sub>H, COOH, halogen, C<sub>1</sub>-C<sub>4</sub>-alkoxy or phenoxy; unsubstituted C<sub>3</sub>-C<sub>7</sub>-cycloalkyl; C<sub>3</sub>-C<sub>7</sub>-cycloalkyl substituted by OH, COOH or SO<sub>3</sub>H; unsubstituted benzyl, naphthylmethyl or phenethyl; benzyl, naphthylmethyl or phenethyl substituted by OH, SO<sub>3</sub>H, COOH, halogen, NO<sub>2</sub>, C<sub>1</sub>-C<sub>4</sub>-alkyl or C<sub>1</sub>-C<sub>4</sub>-alkoxy; unsubstituted phenyl or naphthyl; phenyl or naphthyl substituted by OH, SO<sub>3</sub>H, COOH, C<sub>1</sub>-C<sub>4</sub>-alkoxy, halogen, NO<sub>2</sub>, C<sub>1</sub>-C<sub>4</sub>-acyl or C<sub>1</sub>-C<sub>4</sub>-alkyl; unsubstituted hetero-aryl, hetero-aryl

substituted by OH, SO<sub>3</sub>H, COOH, halogen or C<sub>1</sub>-C<sub>4</sub>-alkyl; and wherein

R<sub>5</sub> is Z  
wherein

Z is the radical of a halogenotriazine, a halogenopyrimidine, the radical of 2,3-dichloroquinoxaline-6-carboxylic acid chloride, 2,3-dichloroquinoxaline-6-sulphonic acid chloride, 2-chloroacetyl chloride or 2-chloroethanesulphonyl chloride,

and wherein

R<sub>6</sub> is hydrogen, unsubstituted C<sub>1</sub>-C<sub>8</sub>-alkyl, C<sub>1</sub>-C<sub>8</sub>-alkyl substituted by COOH, SO<sub>3</sub>H or OH; unsubstituted phenyl-C<sub>1</sub>-C<sub>4</sub>-alkyl, or naphthyl-C<sub>1</sub>-C<sub>4</sub>-alkyl, phenyl-C<sub>1</sub>-C<sub>4</sub>-alkyl or naphthyl-C<sub>1</sub>-C<sub>4</sub>-alkyl substituted by OH, SO<sub>3</sub>H or COOH.

4,418,016

#### METHOD FOR RECOVERING OMEGA-AMINO-DODECANOIC ACID FROM CRYSTALLIZATION MOTHER LIQUORS

Mario De Gaetano, Cesano Maderno, and Luigi Canavesi, Solbiate Olona, both of Italy, assignors to Snia Viscosa Società Nazionale Industria Applicazioni Viscosa SpA, Milan, Italy  
Continuation of Ser. No. 161,468, Jun. 20, 1980, abandoned.

This application Aug. 14, 1981, Ser. No. 292,423

Claims priority, application Italy, Jun. 29, 1979, 23990 A/79

Int. Cl.<sup>3</sup> C09F 5/00; C11C 3/00

U.S. Cl. 260—404

14 Claims

1. A method for recovering omega-amino-dodecanoic acid by separating the by-products from said crude acid, comprising the following steps in the sequence indicated herebelow:

- treating the crude omega-amino-dodecanoic acid with an acid (A) in such an amount as to obtain an acid (A)/amino acid molar ratio between 2:1 and 1:1, in the presence of water in an amount to dissolve at least a part of the salt formed from the acid (A) with the amino-acid while not dissolving most of the by-products which are present in the crude amino acid whereby two phases are obtained;
- separating the two phases into a first phase containing most of the salt of the amino-acid with the acid (A), and a second phase containing most of the by-products;
- decomposing the salt of the amino-acid, in the first phase, by treating with an organic or inorganic base (B), to obtain free amino acid; and isolating said free amino acid.

4,418,017

#### PREPARATION OF PHENYLACETONITRILES CARRYING BASIC SUBSTITUENTS

Werner Seitz, Plankstadt; Klaus Scheib, Schauernheim, and Alfred Michel, Enkenbach/Alsenborn, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,468

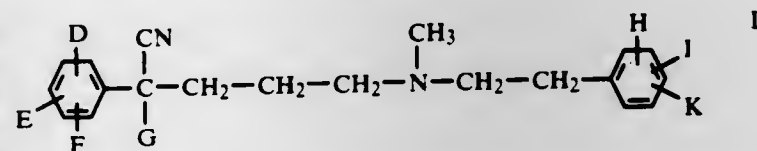
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121766

Int. Cl.<sup>3</sup> C07C 121/78

U.S. Cl. 260—465 E

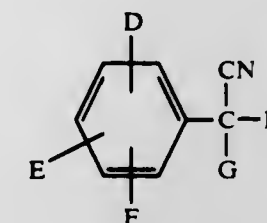
2 Claims

1. A process for the preparation of phenylacetone nitriles carrying basic substituents, for the formula I

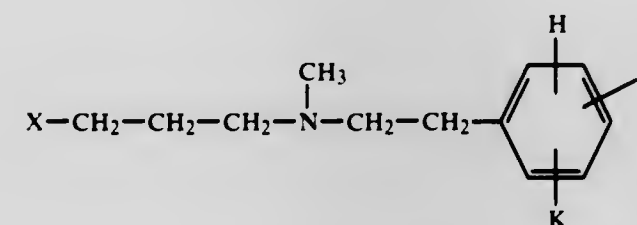


where D, E, F, H, I and K are hydrogen or halogen or alkoxy or alkyl of 1 to 4 carbon atoms and G is a straight-chain or branched aliphatic hydrocarbon radical of not more than 20 carbon atoms or a saturated or unsaturated cyclic or bicyclic

hydrocarbon radical of 3 to 20 carbon atoms, by reaction of an α-substituted phenylacetone nitrile of the formula II



where D, E, F and G have the above meanings, with a compound of the formula III



where H, I and K have the above meanings and X is chlorine, bromine or a leaving group, wherein the reaction is carried out in a solid liquid phase system in the presence of a phase transfer catalyst.

4,418,018

#### PROCESS FOR THE PRODUCTION OF 2,3-DICHLOROPROPIONITRILE

Kazuyuki Kuroda; Riyoiti Ikematsu, and Kazunari Nitta, all of Ohmura, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jan. 26, 1982, Ser. No. 342,804

Claims priority, application Japan, Feb. 5, 1981, 56-15024

Int. Cl.<sup>3</sup> C07C 120/00, 121/16

U.S. Cl. 260—465.7

6 Claims

1. In a process for the production of 2,3-dichloropropionitrile by the chlorination of acrylonitrile, the improvement which comprises chlorinating acrylonitrile at a temperature of 10° to 60° C. using a chlorine gas in the presence of 0.3 to 15% by weight, based on acrylonitrile, of pyridine or an alkylpyridine and at least 1.0% by weight, based on acrylonitrile, of an alkaline earth metal carbonate.

4,418,019

#### PROCESS FOR THE MANUFACTURE OF 1-AMINOALKANE-1,1-DIPHOSPHONIC ACIDS

Werner Klose, Erftstadt, and Theodor Auel, Edingen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 327,888

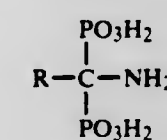
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047107

Int. Cl.<sup>3</sup> C07F 9/38

U.S. Cl. 260—502.5 C

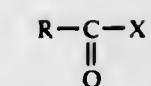
16 Claims

1. Process for making 1-aminoalkane-1,1-diphosphonic acids of the general formula (I)



in which R stands for a straight or branched aliphatic hydrocarbon radical having from 1 to 12 carbon atoms, which comprises:

- reacting tetraphosphorus hexoxide with at least one compound of the general formula (II)



(II)

in which R has the meaning given above and X stands for an —ONH<sub>4</sub> or NH<sub>2</sub>-radical, the reaction being effected in inert gas atmosphere at a temperature within the range 30° to 100° C., the molar ratio of tetraphosphorus hexoxide to the compound of general formula (II) being about 1 to 2-6; and

(b) crystallizing the 1-aminoalkane-1,1-diphosphonic acid formed and separating it from the reaction mixture.

4,418,020

#### 2,2-DICHLOROACETOACETYL CHLORIDE

Jean-Claude Periberger, Mies, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

Filed Nov. 13, 1981, Ser. No. 321,053

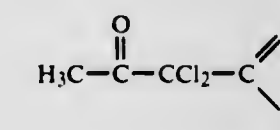
Claims priority, application Switzerland, Nov. 19, 1980, 8549/80

Int. Cl.<sup>3</sup> C07C 53/50

U.S. Cl. 260—544 Y

1 Claim

1. 2,2-Dichloroacetoacetyl chloride having the formula:



4,418,021

#### N-ISOPROPYLCARBANILYLMETHYL DITHIOPHOSPHATES

Natu R. Patel, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 145,943, May 2, 1980, abandoned, which is a division of Ser. No. 815,335, Jul. 13, 1977, abandoned.

This application Sep. 11, 1981, Ser. No. 301,886

Int. Cl.<sup>3</sup> C07F 9/165; A01N 57/14

U.S. Cl. 260—943

2 Claims

- O,O-Diethyl S-(N-isopropyl-3,4-dichlorophenylcarbamoylmethyl)dithiophosphate.
- O,O-Diethyl S-(N-isopropyl-4-nitrophenylcarbamoylmethyl)dithiophosphate.

4,418,022

#### PHOSPHORAMIDATES CONTAINING A P-PHENYLENEDIAMINE GROUP

Paul K. Battey, North Yorkshire, and Peter Hope, Littleborough, both of England, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jul. 19, 1982, Ser. No. 399,580

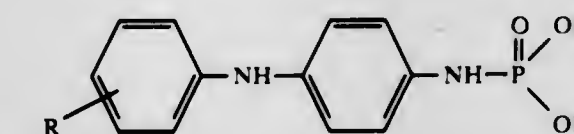
Claims priority, application Netherlands, Jul. 20, 1981, 8103418

Int. Cl.<sup>3</sup> C07F 9/24; B01J 1/18

U.S. Cl. 260—944

3 Claims

1. A phosphoramidate compound of the general formula:



wherein R is a hydrogen atom, a straight-chain or branched alkyl or alkoxy group containing not more than 10 carbon atoms, or cycloalkyl or cycloalkoxy group containing from 5 to 8 carbon atoms, and wherein R' and R'' may be the same or different and each represents a halogenated or unhalogenated straight-chain or branched-chain alkyl group having 1



to 22 carbon atoms, a halogenated or unhalogenated cycloalkyl group having 5 to 8 carbon atoms, an alkenyl group having 3 to 22 carbon atoms, a halogenated or unhalogenated phenyl group, an alkylphenyl group containing from 7 to 14 carbon atoms, or an aralkyl group containing from 7 to 15 carbon atoms, or alternatively wherein R' and R'' together are a 1,2- or 1,3-alkylene group containing from 2 to 8 carbon atoms or an *p*-arylene group containing from 6 to 10 carbon atoms.

4,418,023

## COOLING TOWER APPARATUS

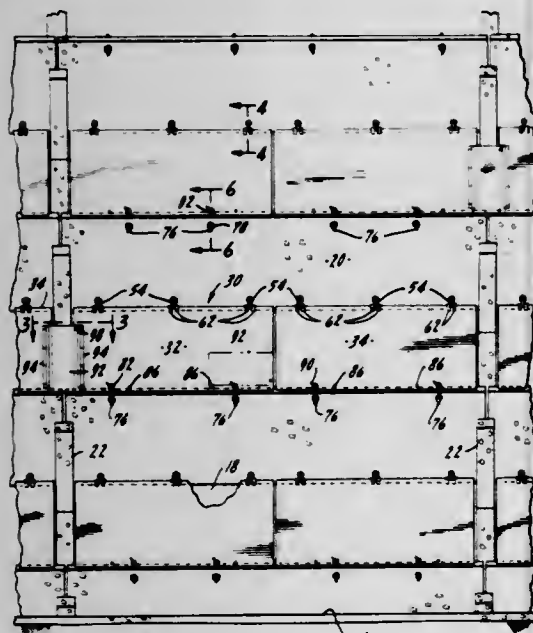
Norman E. Dolan, Santa Rosa, Calif., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Apr. 26, 1982, Ser. No. 371,587

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261—109

15 Claims



1. In a liquid cooling tower having means for delivering liquid and for causing such liquid to fall within said tower, an air inlet, an air outlet, means for causing air to flow from said inlet to said outlet so as to intersect the liquid falling within the tower, and an improved inlet air control assembly at said air inlet, comprising:

- (a) a plurality of horizontally spaced, generally inclined louver blade support arms;
- (b) a plurality of vertically spaced rows of louver blades secured to said louver blade support arms; and
- (c) air control panels secured to at least some of said louver blades, said air control panels comprising:
  - (i) a substantially rectangular panel member having a first generally horizontal edge portion pivotally secured to said louver blade, said panel member being pivotable between an up position and a down position;
  - (ii) said panel member cooperates with the louver blade immediately therebelow when in said down position so as to prevent the entry of air between such louver blades; and
  - (iii) said panel member permits the entry of air between said louver blade and the louver blade immediately therebelow when in said up position.

4,418,024

## PROCESS FOR PRODUCING OPTICALLY TRANSLUCENT CERAMIC

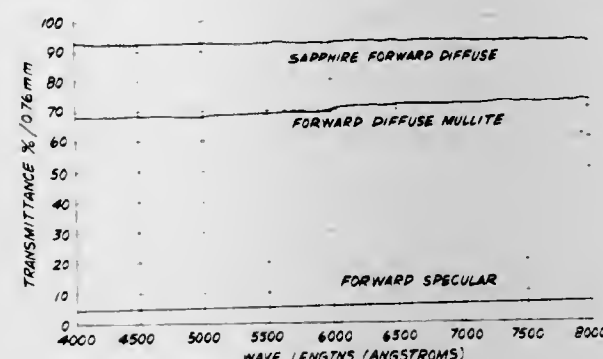
Svante Prochazka, Ballston Lake, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 25, 1982, Ser. No. 381,820

Int. Cl.<sup>3</sup> B29D 11/00; C04B 35/18

U.S. Cl. 264—1.2

4 Claims



1. A process for producing a polycrystalline mullite body optically translucent in the visible wave length which comprises providing an amorphous shapeless mixed oxide powder consisting essentially of from about 74 weight % to about 76.5 weight %  $\text{Al}_2\text{O}_3$  balance  $\text{SiO}_2$  with a surface area ranging from about 100 square meters per gram to about 400 square meters per gram and a bulk density ranging from about 0.2 g/cc to about 0.3 g/cc containing a significant amount of water, calcining said powder at a temperature ranging from about 490° C. to about 1100° C. to remove water and any organic material therefrom leaving no significant amount thereof producing an amorphous shapeless mixed oxide powder consisting essentially of from about 74 weight % to about 76.5 weight %  $\text{Al}_2\text{O}_3$  balance  $\text{SiO}_2$ , said calcining having no significant effect on the oxide composition or morphology of said powder, said calcined powder being pressable at about room temperature into a compact having a minimum density of 1.0 g/cc, pressing said calcined powder into a compact having a minimum density of 1.0 g/cc, firing the compact at a temperature which has no significant deleterious effect on it in oxygen or in a vacuum ranging from about 0.05 torr to about 1 torr producing a gas-impermeable compact, and sintering said gas-impermeable compact in an atmosphere selected from the group consisting of air, argon, helium, nitrogen and mixtures thereof, at a temperature ranging from about 1700° C. to about 1850° C. producing an optically translucent sintered body of theoretical density based on the density of 3.16 g/cc $\pm$ 0.01 or 3.17 g/cc $\pm$ 0.01 for said mullite body.

4,418,025

## PROCESS FOR PRODUCING OPTICALLY TRANSLUCENT MULLITE CERAMIC

Svante Prochazka, Ballston, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 25, 1982, Ser. No. 381,821

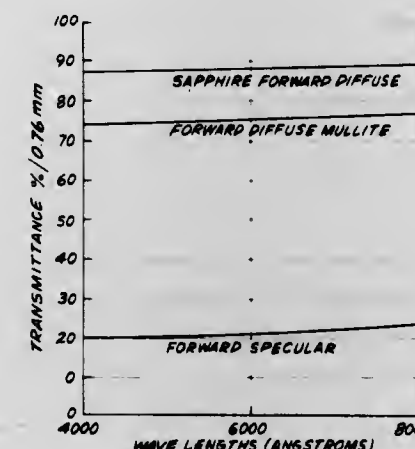
Int. Cl.<sup>3</sup> B29D 11/00; C04B 35/18

U.S. Cl. 264—1.2

5 Claims

1. A process for producing a polycrystalline mullite body optically translucent in the visible wave length which comprises providing an amorphous shapeless mixed oxide powder consisting essentially of from about 74 weight % to about 76.5 weight %  $\text{Al}_2\text{O}_3$  balance  $\text{SiO}_2$  with a surface area ranging from about 100 square meters per gram to about 400 square meters per gram and a bulk density ranging from about 0.2 g/cc to about 0.3 g/cc containing a significant amount of water, calcining said powder at a temperature ranging from about 490° C. to about 1100° C. to remove water and any organic material therefrom leaving no significant amount thereof producing an amorphous shapeless mixed oxide powder consisting essen-

tially of from about 74 weight % to about 76.5 weight %  $\text{Al}_2\text{O}_3$  balance  $\text{SiO}_2$ , said calcining having no significant effect on the oxide composition or morphology of said powder, said calcined powder being pressable at about room temperature into a compact having a minimum density of 1.0 g/cc, pressing



said calcined powder into a compact having a minimum density of 1.0 g/cc, and sintering said compact in an atmosphere of oxygen at a temperature ranging from about 1700° C. to about 1850° C. producing a sintered body of theoretical density based on the density of 3.16 g/cc $\pm$ 0.01 or 3.17 g/cc $\pm$ 0.01 for said mullite body.

4,418,026

## PROCESS FOR SPINNING CELLULOSE ESTER FIBRES

Merrick S. Blackie, West Haddon, and John R. Collins, Leamington Spa, both of England, assignors to Courtaulds Limited, London, England

Filed May 6, 1981, Ser. No. 260,914

Int. Cl.<sup>3</sup> B29C 6/00

U.S. Cl. 264—8

7 Claims

1. A process for spinning fibers of a cellulose ester which comprises using as the spinning dope the product liquor from the carboxylation reaction used to prepare the cellulose ester, adding to said dope not more than about 5 percent, by weight, of another fiber-forming polymer which is soluble or dispersible in said dope to improve the spinnability of said dope, and dry spinning said dope to form fibers.

4,418,027

## METHOD OF MOULDING A CERAMIC ARTICLE BY SLIP-CASTING

Ebrahim Massoud, Shelton, England, assignor to National Research Development Corporation, London, England

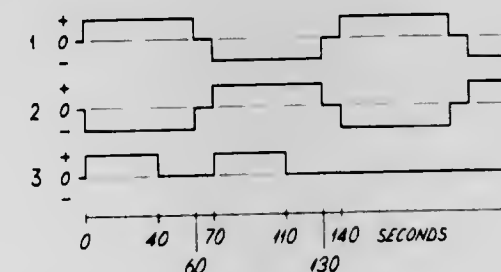
Continuation of Ser. No. 187,446, Sep. 15, 1980, abandoned. This application Apr. 16, 1982, Ser. No. 368,964

Claims priority, application United Kingdom, Sep. 13, 1979, 7931739; Jun. 18, 1980, 8019913

Int. Cl.<sup>3</sup> B06B 1/02

U.S. Cl. 264—24

10 Claims



1. A method of moulding a ceramic article by electrophoretically slip-casting, the article having an inner and an outer surface, the method comprising:

- (1) placing an aqueous suspension of a ceramic material in a

mould having at least three mould parts, each part of which has an electrically conductive porous carbonaceous operative surface constituting the sole electrodes for the electrophoretic slip-casting, the operative surfaces conforming to said outer surfaces of a respective part of the article, the inner surface being undefined by the mould, the carbonaceous component of the surface region being made of particles of from 70  $\mu\text{m}$  to 200  $\mu\text{m}$  maximum diameter, the parts of the mould being electrically insulated from one another, and

- (2) intermittently electrically charging the operative surfaces of the mould independently making each part anodic with respect to said aqueous suspension, a plurality of the parts taking turns at being cathodic with respect to the suspension, each part of said plurality being cathodic and anodic at least twice each, at least one part at any time being cathodic except for possible intervals when no part is anodic and continuing the electrical charging until the ceramic material has built up to the desired thickness.

4,418,028

## FILTRATION BLOCK FOR LIQUID METALS AND ALLOYS, WITH A MECHANICAL AND PHYSICAL-CHEMICAL EFFECT

Pierre du Manoir de Juaye, Vimlès Cognin; Pierre Guerit, Chambéry; Gilbert Pollet, LaRavoire, and Marc Vassiliadis, Saint Germain en Laye, all of France, assignors to Servimetal, Paris, France

Division of Ser. No. 111,905, Jan. 14, 1980, abandoned. This application Jul. 2, 1981, Ser. No. 279,804

Int. Cl.<sup>3</sup> B29H 7/20

U.S. Cl. 264—43

7 Claims

1. A process for producing a block for filtering select molten metals and alloys by mechanical and physical-chemical means, comprising:

- (a) placing within a mold a plurality of sinterable elements of active mineral compounds having a select shape and size, and comprising one mineral salt selected from the group consisting of  $\text{CaF}_2$ ,  $\text{MgF}_2$ ,  $\text{AlF}_3$ ,  $\text{LiF}$ ,  $\text{KF}$  and  $\text{BaF}_2$ , said mineral compounds having a melting point exceeding that of the molten metal or alloys to be filtered;
- (b) heating within said mold said elements of active mineral compounds within a dry atmosphere to sinter and consolidate said elements into a porous block; and
- (c) cooling said sintered block to form said filter having pores selectively dimensioned to mechanically remove impurities from said molten metal and alloy while said mineral compound provides a physical-chemical reaction with said molten metal and alloy for removal of additional impurities.

4,418,029

## STABILIZED POLYPHENYLENE SULFIDE FIBER

Jerry O. Reed, and Ronald D. Mathis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1982, Ser. No. 376,991

Int. Cl.<sup>3</sup> D01F 1/10

U.S. Cl. 264—211

6 Claims

1. In a process for melt extruding fiber grade poly(arylene sulfide) resin having a melt flow of about 50 to about 400 into a fiber, the improvement for reducing gel formation during melt extrusion of said resin into a fiber which comprises incorporating into said resin an effective heat and melt flow stabilizing amount of at least one Group IIA or Group IIB metal salt of a fatty acid which amount is sufficient to retard curing and cross-linking or substantial alteration of physical properties during heating of said resin during melt extrusion and thereby minimizing plugging of filters and spinnerets with gel.



4,418,030

# PROCESS FOR THE PRODUCTION OF GRANULATES OF ORGANIC SUBSTANCES PRESENT IN THE FORM OF A MELT

Ernst-Willi Müller, and Claus Rathjen, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

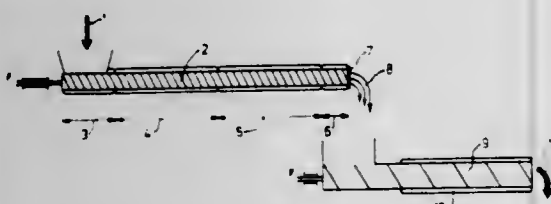
Filed Dec. 15, 1981, Ser. No. 330,880

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049196

Int. Cl.<sup>3</sup> B29B 1/02

U.S. Cl. 264-142

7 Claims



1. A process for the production of granulates of crystallizable organic substances from a melt comprising low-temperature crystallization of the melt in a twin-screw extruder, extrusion through a breaker plate at the end of the extruder and subsequent cooling of the extruded product, further comprising adjusting the temperature prevailing in the screw extruder, adjusting the twin screw rotational speed and adjusting the temperature of the breaker plate to produce crystallization of from 70% to 99.5% of the organic substances by the time it reaches the end of the twin screw, and crystallizing the remainder in a subsequent cooling operation.

4,418,031

# MOLDABLE FIBROUS MAT AND METHOD OF MAKING THE SAME

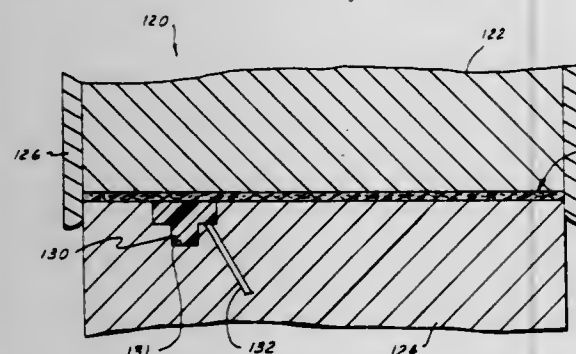
Richard P. Doerer, Grosse Pointe, Mich., and Joseph T. Karpik, Woodwood, Minn., assignors to Van Dresher Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 251,239, Apr. 6, 1981. This application Mar. 2, 1982, Ser. No. 352,501

Int. Cl.<sup>3</sup> B28B 9/00

U.S. Cl. 264-241

8 Claims



1. A two-stage method of manufacturing a permanently rigid shaped end product comprising:

- (1) in a first stage and by a dry process, making a soft, flexible, handleable fibrous mat by providing a mixture consisting essentially of cellulose base fibers, linking and activatable bonding means including carrier fibers, and a thermosetting ingredient, forming said mixture into a mat in which said fibers are interspersed, activating said bonding means to cause said carrier fibers to bond to said base fibers and to each other forming connections therebetween and holding said fibers together,

said thermosetting ingredient remaining in an uncured state during said activation of said bonding means and (2) thereafter making said end product in a second stage at any later time by subjecting said mat to sufficient heat and pressure in a compression molding operation to cause said thermosetting ingredient to cure and to compress the material to the desired thickness and density, and molding and bonding an attachment to said end product simultaneously with the making of said end product and in said compression molding operation, thereby completing the manufacture of said end product.

4,418,032

# PROCESS FOR DRAWING TOWS OF FILAMENTS IN WATER

Erich H. Keil, Untermeitingen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

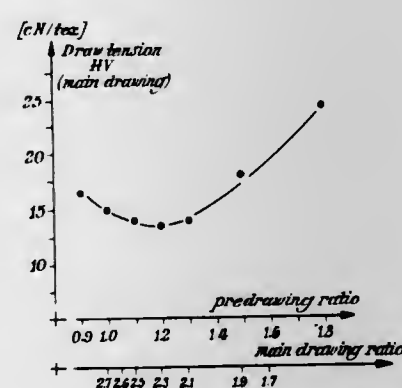
Filed Nov. 19, 1981, Ser. No. 322,730

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044073

Int. Cl.<sup>3</sup> B29C 17/02

U.S. Cl. 264-289.6

6 Claims



1. A process including a predrawing and a main drawing stage for drawing a fiber tow made from polyester fibers, said process comprising: predrawing the fiber tow in water having a temperature of from 71° to 90° C. at a predrawing ratio which (a) orients the fibers in the fiber tow without attaining the draw point and (b) substantially minimizes the draw tension needed for orientation and draw point attainment in a subsequent main drawing stage; cooling the fiber tow to a temperature below 40° C. after the predrawing and before the main drawing stage; subsequently drawing the fiber tow in a main drawing stage at a main drawing ratio corresponding to a drawing tension which is not more than about 10% greater than the minimum drawing tension for orienting the fibers in the fiber tow and providing draw point formation; whereas, for a given total draw ratio, the predrawing ratio is selected so as to permit the selection of a main drawing ratio corresponding to the said drawing tension, thereby not exceeding about 10% above the minimum drawing tension and nevertheless providing draw point formation.

4,418,033

# METHOD OF MANUFACTURING A DECORATED FORMING ARTICLE

Yoshiharu Hatakeyama, 5-29-10, Tachibana, Sumidaku, Tokyo, Japan

Filed Jan. 17, 1980, Ser. No. 112,726

Claims priority, application Japan, Jun. 20, 1979, 54-76885; Dec. 3, 1979, 54-166103[U]

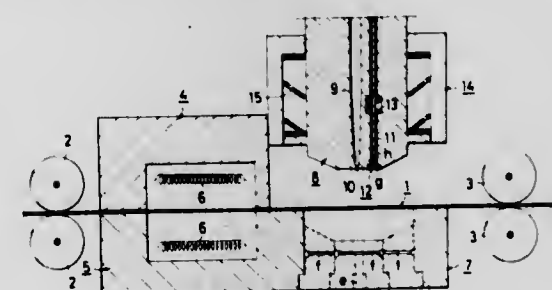
Int. Cl.<sup>3</sup> B29C 1/00

U.S. Cl. 264-509

2 Claims

1. A method of manufacturing a decorated article comprising heating a transfer foil in a preheating apparatus, said transfer foil having a base film, a mold lubricant layer overlying the

base film, a printing layer overlying the mold lubricant layer, and an adhesive layer overlying the printing layer, guiding said heated transfer foil into a metal mold, said metal mold including a pouring mold and an injection mold, causing said transfer foil to contact the inner circumference of a wall surface of the pouring mold by spraying hot air from the injection mold and by applying a vacuum from the pouring mold while guiding



the heated transfer foil into the metal mold with the printing layer of the transfer foil facing the injection mold, closing both the injection mold and the pouring mold completely, forming an article by injecting synthetic resin from the injection mold, peeling off the article from the base film and mold lubricant layer of the transfer foil while removing the article from the metal mold and only transferring the printing layer and adhesive layer of the transfer foil to the outer surface of the article.

4,418,034

# METHOD FOR PRODUCING A CONTAINER

Georg Nemeskeri, Chester, Canada, assignor to G.N. Plastics Company Limited, Nova Scotia, Canada

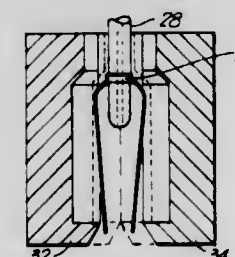
Filed Oct. 16, 1981, Ser. No. 312,071

Claims priority, application Canada, Oct. 24, 1980, 363175

Int. Cl.<sup>3</sup> B29C 17/04, 17/07

U.S. Cl. 264-522

1 Claim



1. The method of making a re-sealable container with a preformed neck from a flat piece of plastic sheet comprising the steps of:

- (a) providing an aperture in a flat sheet of plastic;
- (b) inserting a heated pin in said aperture to re-shape the sheet of plastic surrounding the aperture to form a neck opening and subsequently removing the heated pin;
- (c) inserting a non-conductive blow pin in said neck opening and evenly heating said plastic sheet;
- (d) raising said non-conductive blow pin to make said preformed neck and to allow the plastic sheet to fold, and inserting said plastic sheet between open mold halves;
- (e) closing said mold halves and applying blow pressure through said blow pin to blow up said plastic sheet within the confines of said mold;
- (f) applying a welding pulse to said mold halves to create a weld along the free edges of the plastic sheet material to form said container; and
- (g) opening said mold halves, removing said blow pin from the preformed neck, and removing the finished container.

# COOLANT CONDITION MONITOR FOR NUCLEAR POWER REACTOR

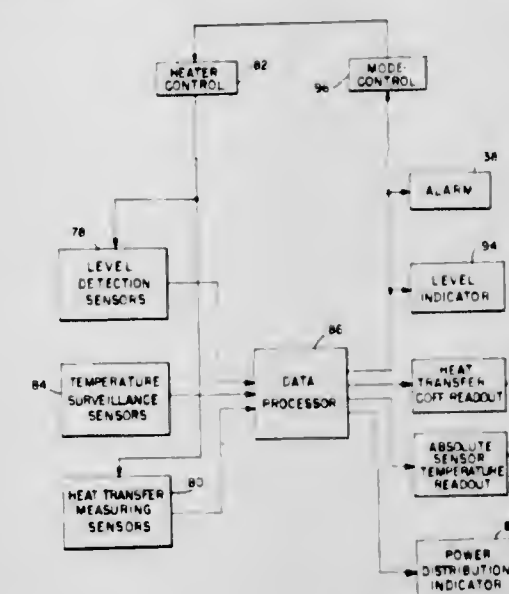
Robert D. Smith, Bethesda, Md., assignor to Scandpower, Inc., Bethesda, Md.

Filed May 27, 1981, Ser. No. 267,541

Int. Cl.<sup>3</sup> G21C 17/00

U.S. Cl. 376-247

19 Claims



19. In combination with a power distribution sensor for the fuel core of a nuclear power reactor having a body of coolant, the sensor including a gamma radiation heated body, in heat transfer relation to the coolant, within which a varying temperature distribution is established, thermocouple junctions mounted within the body at spaced locations, and monitoring means connected to said thermocouple junctions for measuring temperature differentials in the heated body reflecting localized power generation, the improvement comprising additional means connected to the thermocouple junctions for detecting changes in the temperature differentials caused by changes in relative coolant conditions at said spaced locations, and alarm means connected to the additional detecting means for indicating a drop in coolant level within the reactor.

4,418,036

# FUEL ASSEMBLY FOR A NUCLEAR REACTOR

Robert K. Gjertsen, Monroeville; Stephen N. Tower, Washington Twp., Westmoreland County, and Edgar A. Huckestein, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1980, Ser. No. 217,051

Int. Cl.<sup>3</sup> G21C 3/34

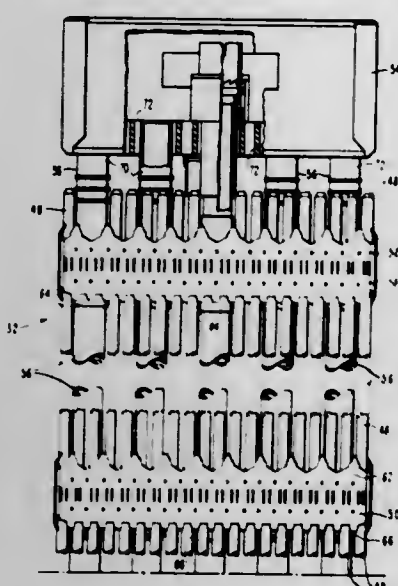
4 Claims

U.S. Cl. 376-438

1. A fuel assembly for a nuclear reactor comprising: a top nozzle; a bottom nozzle; a plurality of Zircaloy guide tubes extending from said top nozzle to said bottom nozzle and arranged in a regular array with a center guide tube arranged in substantially the center of said array; a plurality of fuel elements containing nuclear fuel and arranged between said top nozzle and said bottom nozzle; an Inconel top grid arranged near said top nozzle and having a plurality of stainless steel first sleeves brazed thereto with all but said center guide tube bulge attached to said first sleeves and with said center guide tube being slidably and rotatably disposed in said top grid; an Inconel bottom grid arranged near said bottom nozzle and having a plurality of stainless steel second sleeves brazed thereto with all but said center guide tube bulge attached to said second sleeves and with said center guide tube being slidably and rotatably disposed in said bottom grid; and



a plurality of Zircaloy intermediate grids arranged between said top grid and said bottom grid and having a plurality of Zircaloy sleeves welded to each of said intermediate



grids with all but said center guide tube bulge attached to said Zircaloy sleeves and with said center guide tube being slidably and rotatably disposed in said intermediate grids.

4,418,037

#### COLOR INDICATOR COMPOSITION AND FILM FOR DETECTING HYDROGEN PEROXIDE

Harumi Katsuyama, Asakashi, and Tadao Shishido, Minamiashiharashi, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

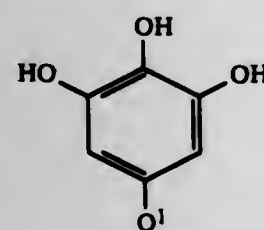
Filed Apr. 19, 1982, Ser. No. 369,718

Claims priority, application Japan, Apr. 17, 1981, 56-058068  
Int. Cl.<sup>3</sup> G01N 33/52, 33/66

U.S. Cl. 422—56

17 Claims

1. In a color indicator composition for detecting hydrogen peroxide comprising a substance having peroxidase activity and a substance capable of causing a detectable change in the presence of hydrogen peroxide and said substance having a peroxidase activity, the color indicator composition for detecting hydrogen peroxide comprising a pyrogallol derivative represented by formula (1):



(1)

wherein Q<sup>1</sup> represents a nitro group, a cyano group, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a carboxyl group or a —COOQ<sup>2</sup> group wherein Q<sup>2</sup> represents an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or an aralkyl group.

4,418,038

#### DISINFECTING WITH CHLORINE-CONTAINING BIOCIDES DISPENSED FROM SHAPED POLYMERIC BODY

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Nov. 2, 1981, Ser. No. 317,528

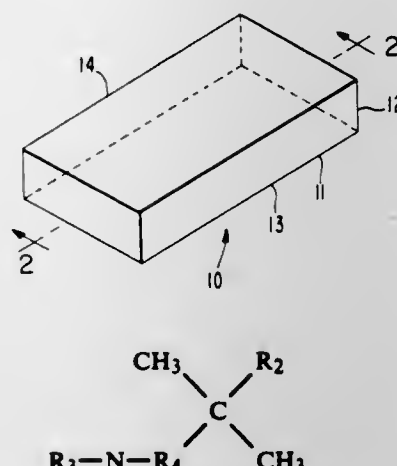
Int. Cl.<sup>3</sup> A01N 25/08, 29/00

U.S. Cl. 422—37

9 Claims

1. A process for disinfecting an article of manufacture, which process comprises placing the article in the presence of

a device, which device comprises a body of a polymer containing a biocide of the formula:



wherein R<sub>2</sub> is a member selected from the group consisting of CO<sub>2</sub>R<sub>5</sub> and CH<sub>2</sub>OCR<sub>5</sub>, wherein R<sub>5</sub> is a member selected from the group consisting of alkyl of 1 to 20 carbons, and an alkyleneedioxy of 1 to 7 carbons; R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of chlorine, hydrogen and alkyl with at least one of R<sub>3</sub> and R<sub>4</sub> chlorine; and the acid addition salts; which biocide on its release from the device and in the presence of moisture contacts the article for disinfecting same.

4,418,039

#### SOLUTE TRANSFER TECHNIQUE

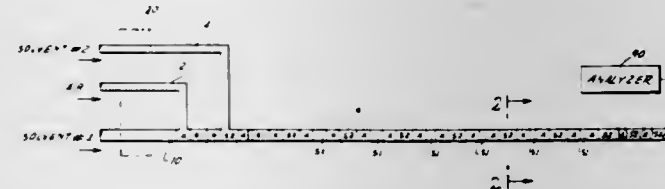
Harvey J. Adler, New City, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 754,773, Dec. 17, 1976, abandoned. This application May 19, 1978, Ser. No. 907,370

Int. Cl.<sup>3</sup> G01N 31/08

U.S. Cl. 422—82

7 Claims



1. Apparatus for transferring a solute from a first solvent to a second solvent, comprising: a selectively permeable tubular membrane, said membrane being impermeable to said solute and to said second solvent, first means flowing said first solvent along said membrane for evaporation to dryness of said first solvent across said membrane to leave a residue of all of said solute on an inner surface wall of said membrane, second means for flowing said second solvent along said tubular membrane to dissolve said residue, and analyzing means for analyzing said second solvent containing said solute containing said solute residue, said second means including means for segmenting said first solvent with segments of an immiscible gas, said membrane being impermeable to said immiscible gas, and means for introducing said second solvent as discrete segments intermediate successive segments of said first solvent and separated therefrom by immiscible gas segments.

4,418,040

#### LABORATORY STAND ASSEMBLY

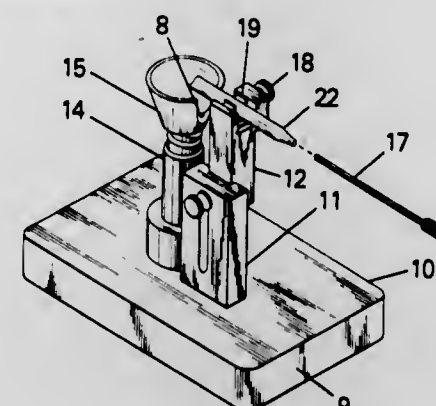
Narbik A. Karamian, 7609 Exeter Rd., Bethesda, Md. 20014

Filed Sep. 21, 1981, Ser. No. 304,308

Int. Cl.<sup>3</sup> B01L 9/00, 11/00

U.S. Cl. 422—101

4 Claims



1. A laboratory stand assembly comprising a base, a support extending vertically from said base, a sample holder adjustably positioned on said support for vertical movement, a clamp member attached to an upper end of said sample holder to horizontally secure an adsorption tube containing a sample thereto, an adsorption tube horizontally secured in said clamp member, a donut shaped member contacting said base and positioned adjacent to said vertically extending support for receiving a sample receiving vial therein, a funnel having a cut out portion on the side thereof for insertion of one end of said adsorption tube and a discharge end adapted to be received by a sample receiving vial, said funnel containing a screen positioned therein and probe means to discharge an adsorbent and glass wool plugs from said adsorption tube into said funnel.

4,418,041

#### HIGH-PRESSURE MIXING HEAD

Vincent L. Johnson, Seabrook, Tex., and Kurt Moser, Lindau, Fed. Rep. of Germany, assignors to Admiral Maschinenfabrik GmbH, Lindau, Fed. Rep. of Germany

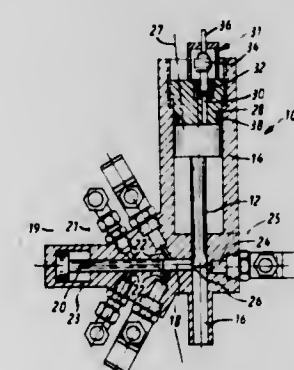
Filed Oct. 26, 1981, Ser. No. 315,071

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040922

Int. Cl.<sup>3</sup> B01F 5/04, 15/02; B01J 14/00

U.S. Cl. 422—133

6 Claims



1. A high-pressure mixing head for mixing and foaming at least two reactive plastics material components, comprising: a mixing chamber which has opening thereto nozzle orifices associated with said plastics material components and a blowing agent; a metering plunger reciprocable within said mixing chamber; a mixing chamber outlet; a discharge section in communication with said mixing chamber through an opening at said mixing chamber outlet and extending approximately normal to said mixing

chamber, said discharge section being of greater dimensions than said mixing chamber; a purging plunger reciprocable within said discharge section; variable damper means for varying the size of the opening at said mixing chamber outlet to said discharge section comprising a throttling plunger reciprocable along the longitudinal axis of said mixing chamber between a withdrawn position out of said discharge section and a damping position at which said throttling plunger extends into said discharge section and at least partially restricts the size of the opening of said mixing chamber outlet to said discharge section.

4,418,042

#### ION EXCHANGE PROCESS USING RESINS OF HIGH LOADING CAPACITY, HIGH CHLORIDE TOLERANCE AND RAPID ELUTION FOR URANIUM RECOVERY

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 69,688, Aug. 27, 1979, Pat. No. 4,312,838. This application Dec. 4, 1981, Ser. No. 327,395

Int. Cl.<sup>3</sup> C01G 56/00

U.S. Cl. 423—7

8 Claims

1. A method for the recovery of uranium from a carbonate lixiviant, comprising the steps of:  
a. passing said lixiviant over a type I or a type II anionic ion exchange resin to retain uranium predominantly in the form of a precipitate; and  
b. recovering said precipitated uranium from the resin by contacting the resin with an aqueous carbonate solution having a pH not lower than 8.

4,418,043

#### PROCESS FOR SEPARATING METALS FROM AQUEOUS SOLUTIONS

Klaus Lehr, Hürth-Knapsack, and Gero Heymer, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,667

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029897

Int. Cl.<sup>3</sup> C01G 7/00, 55/00, 13/00

U.S. Cl. 423—22

6 Claims

1. A process for separating seminoble metals and noble metals, respectively, from aqueous solutions having compounds of these metals dissolved therein, by reaction with yellow phosphorus, which comprises conveying the aqueous solutions through a first zone and a second zone, the two zones being arranged one above the other; said first zone having carrier material coated with yellow phosphorus placed therein, the coated carrier material containing carrier and yellow phosphorus in a ratio by weight within the range (1:0.001) to (1:x), x standing for the product of the volume of pores of the carrier in cc and the density of yellow phosphorus in grams per cc.; said second zone having uncoated carrier material placed therein; and the carrier material in said two zones being selected from the group consisting of active carbon, carbon black, hydrophobic silicic acid and hydrophobic zeolites.

4,418,044

#### NITRIC OXIDE AND SULFUR OXIDE ABSORPTION BY SCRUBBING WITH FE<sup>++</sup>/S<sub>2</sub>O<sub>3</sub><sup>2-</sup>

Metro D. Kulik, Pittsburgh, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Jan. 15, 1982, Ser. No. 339,279

Int. Cl.<sup>3</sup> C01B 21/00, 17/00

U.S. Cl. 423—235

12 Claims

1. A method of scrubbing a gaseous mixture comprising NO and SO<sub>2</sub> said method comprising providing a scrubbing solution, said scrubbing solution comprising ions of either an alkali metal or ammonium and



$\text{Fe}^{++}$  and  $\text{S}_2\text{O}_3^{--}$  in a  $\text{S}_2\text{O}_3^{--}/\text{Fe}^{++}$  mol ratio of about 5.0 at a  $\text{S}_2\text{O}_3^{--}$  ion concentration of at least 1.3 mols per liter of  $\text{S}_2\text{O}_3^{--}$  in a liquid mixture consisting essentially of alcohol and water scrubbing said gas comprising nitric oxide and  $\text{SO}_2$  with said scrubbing solution.

4,418,045

# METHOD FOR DISPOSAL OF WASTE GAS AND APPARATUS THEREFOR

Takahisa Sato; Keizo Maruyama, both of Himeji, and Kunio Sano, Aka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

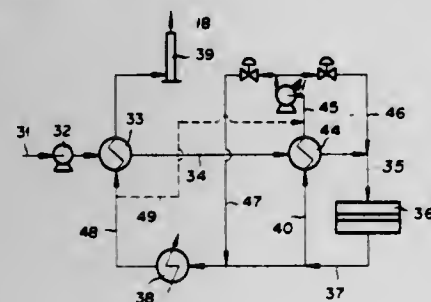
Filed Sep. 14, 1981, Ser. No. 302,219

Claims priority, application Japan, Sep. 19, 1980, 55-129218; Sep. 24, 1980, 55-131698

Int. Cl.<sup>3</sup> B01D 53/36

U.S. Cl. 423-245

8 Claims



1. A method for the disposal of waste gas containing hydrocarbons, carbon monoxide and other inflammable organic compounds, comprising the steps of:

- heating said waste gas by heat exchange with the outlet gas of a catalytic-oxidation reactor to provide hot waste gas;
- heating the said hot waste gas by heat exchange with a first portion of the outlet gas of said catalytic-oxidation reactor to yield heated waste gas;
- subjecting the said heated waste gas to complete oxidation in said catalytic-oxidation reactor thereby rendering the gas no longer noxious and providing a stream of hot outlet gas having a first and second portion
- utilizing the first portion of said outlet gas to heat said hot waste gas;
- mixing a first part of said first portion of said outlet gas after its utilization for heating said hot waste gas with the remaining second portion of said outlet gas
- mixing the remaining part of said first portion of said outlet gas after its utilization for heating said hot waste gas with said heated waste gas; and
- subjecting to heat recovery the combined mixture of the second portion of the said outlet gas with said first part of said first portion of the outlet gas after its utilization for heating said hot waste gas.

4,418,046

# CATALYTIC OXIDATION APPARATUS

Masanori Izumo, Neyagawa; Keiichi Kametani, Osaka; Sogehito Ota, Hirakata, and Kenji Mikami, Takatsuki, all of Japan, assignors to Dalkin Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 220,892, Dec. 29, 1980, abandoned, which is a continuation of Ser. No. 133,264, Mar. 24, 1980, abandoned. This application Ser. No. 304,944

Claims priority, application Japan, Apr. 4, 1979, 54-45297

Int. Cl.<sup>3</sup> B01D 53/36

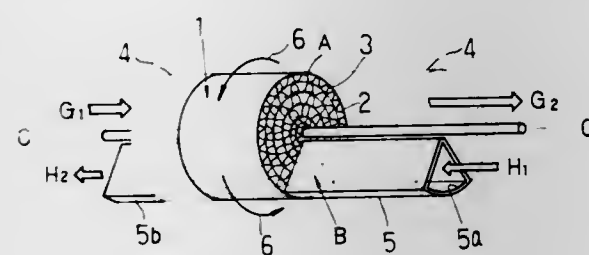
U.S. Cl. 423-245

3 Claims

1. A process for catalytically oxidizing a gas containing at least one member selected from a group consisting of carbon monoxide, formaldehyde and methyl alcohol comprising

- utilizing a catalytic oxidation apparatus comprising a cylindrical honeycomb structure including a multiplicity of small passageways extending therethrough in parallel

and having an oxidizing catalyst deposited thereon, means for separating a number of the passageways as a catalyst regenerating zone from the other passageways serving as an oxidizing zone, said oxidizing zone being held in communication with a passage for the gas and said catalyst regenerating zone being held in communication with a passage for hot air, means for providing continuously shifting of the passageways which constitute the regenerating zone, and hence those which constitute the oxidizing zone, throughout the entire honeycomb structure circumferentially thereof to continuously render sequential portions of the honeycomb structure serviceable, from por-



tion to portion, as the regenerating zone provided by said number of passageways, the area of the regenerating zone constituting 1/10 to 1/500 of the whole passageway area; and

- introducing said gas containing at least one member selected from the group consisting of carbon monoxide, formaldehyde and methyl alcohol into the catalytic oxidation apparatus at a room temperature; and simultaneously introducing a hot gas into the regenerating zone at a temperature of at least 80° C., while continuously shifting said regenerating zone circumferentially of said honeycomb structure.

4,418,047

# STABLE ISOCYANIC ACID COMPOSITIONS

Steven L. Trenbeath, Fairfield; Robert W. Novak, Stamford, and Allan M. Feldman, Norwalk, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 23, 1981, Ser. No. 304,728

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C01C 3/00, 3/14

U.S. Cl. 423-265

7 Claims

1. A stable isocyanic acid composition consisting essentially of isocyanic acid, a solubilizing amount of an organic solvent therefor, and a labile halide compound in an amount calculated as hydrogen halide of between 0.01 and 1 weight percent based on the isocyanic acid.

4,418,048

# ALUMINOPHOSPHORUS COMPOUNDS

Alan Dyer, Manchester, and Abraham Araya, London, both of England, assignors to Laporte Industries Limited, London, England

Filed Jun. 10, 1980, Ser. No. 158,294

Int. Cl.<sup>3</sup> C01B 25/36

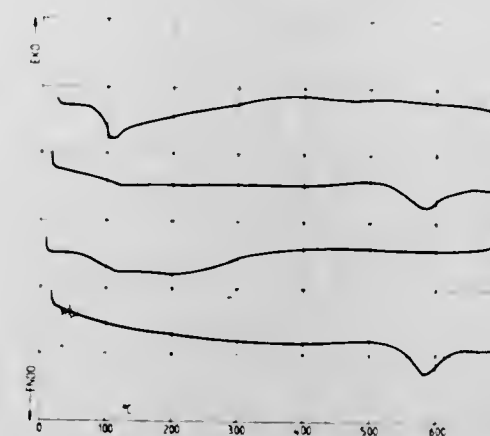
U.S. Cl. 423-305

16 Claims

1. A process for the preparation of an anion exchanger comprising an aluminophosphorus compound comprising contacting an aluminous compound with an excess, over that required to form the aluminophosphorus compound, of an ammonium phosphate melt, thereafter dissolving the excess of phosphate used to form the melt in water or an aqueous solution and recovering the remaining crystalline water insoluble aluminophosphorus compound.

11. A water insoluble crystalline anion exchanger comprising an aluminophosphorus compound consisting essentially of

a cationic framework of aluminum, oxygen and phosphorus atoms, the ratio of the number of atoms of phosphorus to the



number of atoms of aluminum being greater than 1:1, and, optionally, silicon atoms.

4,418,049

# CHANGING OIL TUBES IN A CARBON BLACK REACTOR

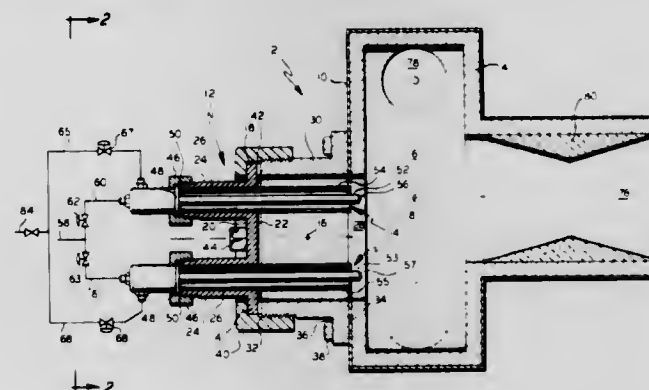
Willie Tillman, Vinton, La., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1982, Ser. No. 383,371

Int. Cl.<sup>3</sup> C01B 31/02; C09C 1/48

U.S. Cl. 423-450

5 Claims



1. A method for producing carbon black wherein the feedstock tubes are changed comprising

- introducing a carbonaceous feedstock into the reaction flow passage of a carbon black reactor through a first feedstock tube;
- positioning a second feedstock tube parallel to the first feedstock tube;
- shifting the second feedstock tube into the position which was occupied by the first feedstock tube;
- introducing the carbonaceous feedstock into the carbon black reactor through the second feedstock tube; and
- terminating the flow of carbonaceous feedstock through the first feedstock tube.

4,418,050

# CARBON BLACK PROCESS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1982, Ser. No. 411,230

Int. Cl.<sup>3</sup> C01B 31/02, 31/14; C09C 1/48

U.S. Cl. 423-450

4 Claims

1. A process for producing carbon black by pyrolysis of a feed hydrocarbon which comprises:

- subjecting the feed hydrocarbon to carbon black producing conditions in a carbon black reaction zone to form a gaseous effluent comprising carbon black smoke containing finely divided carbon black particles,

(b) quenching said effluent to substantially reduce the temperature thereof;

- passing said quenched smoke to a preagglomeration zone operated under conditions which form agglomerated carbon black particles of increased size in said smoke, and
- flowing the fluids from (c) containing agglomerated carbon black particles through tubular flow path of an indirect heat exchange zone to thereby minimize deposition of carbon black on the walls of said flow path, and increase the heat transfer coefficient of said indirect heat exchange zone.

4,418,051

# PROCESS FOR PREPARING THALLIUM (III)

Richard A. Brown, Trenton; Lance R. Byers, East Windsor, and Robert D. Norris, Cranbury, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

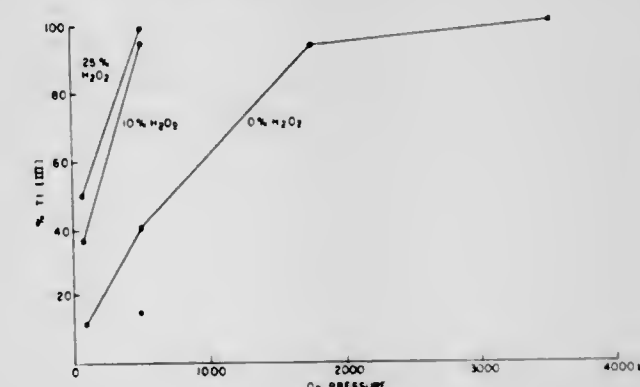
Filed Feb. 28, 1983, Ser. No. 470,344

Int. Cl.<sup>3</sup> C01G 15/00

U.S. Cl. 423-592

20 Claims

SYNERGISTIC EFFECT OF HYDROGEN PEROXIDE FOR OXIDATION OF THALLIUM (I) TO THALLIUM (III) WITH OXYGEN



1. A process for converting a thallium(I) compound to a thallium(III) compound comprising contacting an alkaline solution of the thallium(I) compound with gaseous oxygen in the presence of an effective amount of a peroxygen compound.

4,418,052

# NOVEL DIAGNOSTIC COMPOSITIONS AND METHOD FOR RADIOLOGIC IMAGING OF FIBRINOGEN DEPOSITION IN THE BODY

Dennis W. Wong, 2853 Sunnyglen Rd., Torrance, Calif. 90505

Filed Aug. 12, 1980, Ser. No. 177,503

Int. Cl.<sup>3</sup> A61K 43/00, 49/00

U.S. Cl. 424-1.1

15 Claims

1. A method of labeling human or animal fibrinolytic enzymes with the radionuclide Technetium-99m at physiological pH 6-8 condition comprising the sequential steps of:

- treating 2-3 ml (60-100 mCi) <sup>99m</sup>Tc-pertechnetate in normal saline with 0.5 ml of a solution of 0.1-5 mg stannous chloride, stannous tartrate or stannous fluoride in 0.05 N hydrochloric acid at room temperature for about 1-10 minutes;
- raising the pH of the acidic mixture of step (a) to 7.4 with a sufficient amount of pH 12.4 sodium citrate/NaOH solution;
- adding 5,000 to 10,000 units of the desired fibrinolytic enzyme to be labeled in 1-2 ml diluents to the admixture of step (b) and incubating at 37° C. or at room temperature for 10-30 minutes.



4,418,053

**DENTAL PROPHYLAXIS COMPOSITIONS AND THEIR USE**

Joseph C. Muhler, Howe, and Mark S. Putt, Fort Wayne, both of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 131,266, Mar. 17, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,780  
Int. Cl.<sup>3</sup> A61K 7/16, 7/18

U.S. Cl. 424—52

8 Claims

1. A dental prophylaxis preparation comprising, as its principle cleaning and polishing constituent, particles of a calcined mineral selected from the group consisting of smectite, sepiolite, and chlorite minerals, substantially none of the calcined particles being retained on an 80 mesh screen, essentially all of the calcined particles passing through a 100 mesh screen, with the median particle size lying in the range of about 10-40 microns, the calcined particles being predominantly of the magnesium metasilicate form and having a lamellar crystal structure comprising superimposed layers of two-dimensional silica tetrahedra and two-dimensional octahedra.

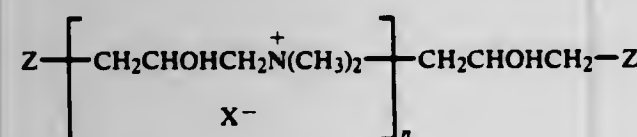
4,418,054

**POLYMERIC QUATERNARY AMMONIUM COMPOUNDS FOR SKIN CARE**Harold A. Green, Havertown, Pa.; John J. Merianos, Middletown, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Group, Inc., New York, N.Y.  
Continuation-in-part of Ser. No. 119,948, Feb. 2, 1980, Pat. No. 4,325,940, which is a continuation-in-part of Ser. No. 29,778, Feb. 13, 1979, Pat. No. 4,304,910, which is a continuation-in-part of Ser. No. 980, Jan. 4, 1979, Pat. No. 4,188,293, which is a continuation-in-part of Ser. No. 902,894, May 4, 1978, Pat. No. 4,190,644, which is a continuation-in-part of Ser. No. 744,617, Nov. 24, 1976, Pat. No. 4,089,977. This application Feb. 16, 1982, Ser. No. 348,827  
Int. Cl.<sup>3</sup> A61K 31/785, 7/48

U.S. Cl. 424—70

2 Claims

1. A method of skin care which comprises applying to the skin a softener composition containing, as an additive, from about 0.3 to about 1.0% by weight of an uncapped linear polyquaternary ammonium compound having the formula:



wherein Z is either X or N(CH<sub>3</sub>)<sub>2</sub>, X is a halogen of atomic weight above 30 and n is an integer of from 2 to about 30.

4,418,055

**STERILIZATION SYSTEM**

Harold W. Andersen; Shirley R. Andersen, both of Oyster Bay; Clifford Zaner, Holbrook, and Charles H. Harrison, Oyster Bay, all of N.Y., assignors to Anprosol Incorporated, Oyster Bay, N.Y.

Continuation of Ser. No. 119,614, Feb. 8, 1980, abandoned, which is a continuation of Ser. No. 924,018, Jul. 12, 1978, abandoned. This application Aug. 19, 1981, Ser. No. 294,113  
Int. Cl.<sup>3</sup> A01N 25/00, 59/00

U.S. Cl. 424—126

6 Claims

1. A chlorine-based sterilizing solution suitable for practical use for sterilizing medical articles including metal medical articles comprising:

- 0.02 to 1% of an alkali metal or alkaline earth metal hypochlorite;
- 0.1 to 0.5% dimethyl lauryl amine oxide (30% active); and
- 4 to 20% of di(alkali metal) phosphate titrated to a pH of 7.0 to 8.0 with mono(alkali metal) phosphate with the proviso that the lower limit of di(alkali metal) phosphate is 4.0% when the amount of said hypochlorite is from 0.5 to

1%, said percentages being based on weight (in grams) per 100 ml. of solution, said sterilizing solution being operable to effect sterilization within a sixty-minute contact time and having an effective life of at least twenty-four hours, said sterilizing solution being free of deleterious effects on said metal articles within said sixty-minute contact time and being substantially non-irritating to tissue.

4,418,056

**PROCESS FOR MAKING CUPRIC HYDROXIDE**Mario R. R. Gonzalez, Colonia Industrial Vallejo La Patera, Mexico, assignor to Cuproquim S.A., Mexico City, Mexico  
Filed Dec. 27, 1982, Ser. No. 453,212Int. Cl.<sup>3</sup> C01G 3/02; A01N 59/20; A61K 33/34

U.S. Cl. 424—142

4 Claims

2. A method for making a stable cupric hydroxide which comprises the steps of:

- preparing a suspension of insoluble copper oxychloride in an aqueous medium, the concentration of said copper oxychloride being 98 grams per liter;
- adding approximately 1.0% by weight sodium lignosulfonate to said copper oxychloride suspension for more uniformly dispersing said copper oxychloride in suspension, agitating the copper oxychloride suspension and added sodium lignosulfonate until a desired viscosity is reached, continuing agitation of the mixture of sodium lignosulfonate and copper oxychloride suspension while rapidly adding a 50.0% concentration of a sodium hydroxide solution that contains up to an 80% excess of sodium hydroxide by weight over the stoichiometrically equivalent quantity necessary to react with said copper oxychloride to form cupric hydroxide, said sodium lignosulfonate further acting as a stabilizer to prevent water loss from the cupric hydroxide, and
- recovering the cupric hydroxide.

4,418,057

**METHOD OF FORMING STABLE DENTAL GEL OF STANNOUS FLUORIDE**

Dennis E. Groat; Richard W. Sell, both of Dallas; Richard J. Kalish, Carrollton, and Horace E. Melton, Irving, all of Tex., assignors to Scherer Laboratories, Inc., Dallas, Tex.

Filed Feb. 9, 1983, Ser. No. 465,107

Int. Cl.<sup>3</sup> A61K 7/18, 33/16

U.S. Cl. 424—151

7 Claims

1. A method for producing a commercial-scale size batch of a stable gel consisting essentially of from about 96% to about 98% of anhydrous glycerin, from about 1.8% to about 2.2% of hydroxyethyl cellulose and from about 0.38% to about 0.43% of stannous fluoride wherein the concentration of stannous fluoride in said gel is stable during storage against deterioration to levels below that enabling the use of said gel as a topical treating agent for the prevention of dental caries,

the first stage of said method comprising the sequential steps:

- (a) dissolving 50% of the stannous fluoride present in said gel from about 15% to about 18% of the anhydrous glycerin present in said gel at a temperature in the range of from about 150° C. to about 180° C.;
- (b) adding a sufficient quantity of anhydrous glycerin to said mixture to reduce the temperature thereof of from about 130° C. to about 150° C.;
- (c) dissolving in said mixture 50% of the hydroxyethyl cellulose present in said gel; and
- (d) adding to said mixture sufficient anhydrous glycerin to bring the volume thereof up to about 50% of the volume of said gel; and

the second stage of said method comprising repeating the

said sequential steps of said first stage and combining the product of said second stage with the product of said first stage.

4,418,058

**PROTECTION OF LYOPHILIZED BETALACTAMS FROM COLOR FORMATION**

Eizo Hirai, Kawanishi, and Kazuhiro Shima, Yamatokoriyama, both of Japan, assignors to Shionogi &amp; Co., Ltd., Osaka, Japan

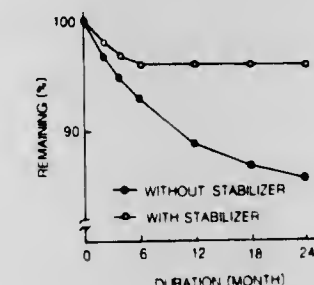
Filed Jun. 12, 1981, Ser. No. 272,895

Claims priority, application Japan, Jun. 23, 1980, 55-85789

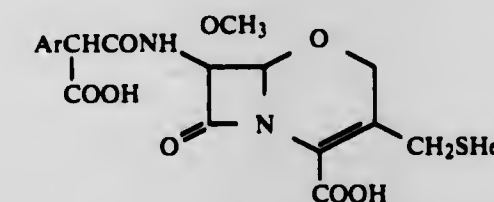
Int. Cl.<sup>3</sup> A61K 31/00, 47/00, 31/535

U.S. Cl. 424—176

27 Claims



1. A stable lyophilized antibacterial preparation containing an alkali metal salt of 7β-(α-carboxy-α-arylacetoamido)-7α-methoxy-3-heterocyclic thiomethyl-1-dethia-1-oxa-3-cephem-4-carboxylic acid of the formula



wherein Ar is a p-hydroxyphenyl group which is unsubstituted or substituted by halogen, hydroxy, 1 to 3 C alkoxy or 1 to 3 C alkyl, and

Het is a 5 to 6 membered monocyclic heterocyclic group having 3 or 4 heteroatoms selected from nitrogen, oxygen or sulfur which is unsubstituted or is substituted by 1 to 5 C alkyl as antibacterial component and 0.1 to 1.0 part per part by weight antibacterial component of a sugar or sugar alcohol compound selected from arabitol, dambonitol, dulcitol, inositol, mannitol, ononitol, pinitol, quercitol, sequoytol, sorbitol, viburnitol, xylitol, allose, altrose, arabinose, fructose, galactose, glucose, gulose, idose, lactose, lyxose, maltose, mannose, ribose, ribulose, sedoheptulose, sorbose, sucrose, tagatose, talose and xylose as stabilizing agent for the purpose of preventing blue color formation.

4,418,059

**NUCLEOSIDE ESTER COMPOSITIONS**Iraj Lalezari, Scarsdale, N.Y., assignor to Montefiore Medical Center and The Albert Einstein College of Medicine at Yeshiva University, both of New York, N.Y., a part interest  
Filed Jul. 20, 1981, Ser. No. 285,013Int. Cl.<sup>3</sup> A61K 31/70; C07H 17/00

U.S. Cl. 424—180

5 Claims

4. An ester of a nucleosidic anti-tumor agent and a carboxylic acid-containing bile acid, wherein the ester is of 5-fluoro-2-deoxyuridine and deoxycholic acid.

5. The ester of claim 4 wherein said ester is admixed with an inert carrier.

4,418,060

**THERAPEUTICALLY ACTIVE COMPLEXES OF TETRACYCLINES**Ilona Kahán née László, Budapest; Helga Hammer, and Ilona Béldi, both of Szeged, all of Hungary, assignors to Medimpex Gyógyszerkúkereskedelmi Vállalat, Budapest, Hungary  
Continuation of Ser. No. 862,343, Dec. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 784,840, Apr. 4, 1977, abandoned, which is a continuation of Ser. No. 302,667, Nov. 1, 1972, abandoned. This application Sep. 17, 1979, Ser. No. 76,337  
Claims priority, application United Kingdom, Sep. 6, 1971, 41533/71Int. Cl.<sup>3</sup> C07C 103/19

U.S. Cl. 424—227

9 Claims

1. A complex of a tetracycline and derivatives thereof and an amino compound containing per molecule at least a tris(hydroxyalkyl) group and at least a primary or secondary amino group, said tetracycline being selected from the group consisting of tetracycline, oxytetracycline, chlortetracycline, methacycline, doxycycline, minocycline, demethylchlortetracycline and chelocardin and acid addition salts thereof and said amino compound being selected from the group consisting of tris(hydroxymethyl)amino methane, 1,3-bis[tris(hydroxymethyl)methylamino]propane, N-tris(hydroxymethyl)methyl-3-amino-propane sulfonic acid, N-tris(hydroxymethyl)methyl-2-aminomethane sulfonic acid and N-tris(hydroxymethyl)methylglycine and salts thereof.

4,418,061

**SECALONIC ACID DERIVATIVES AND METHOD FOR PREPARING THEREOF**

Mitsuru Shibukawa, Yokohama; Chiee Shibuya, Fuji, and Kunihiko Ishii, Numazu, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Apr. 7, 1982, Ser. No. 366,333

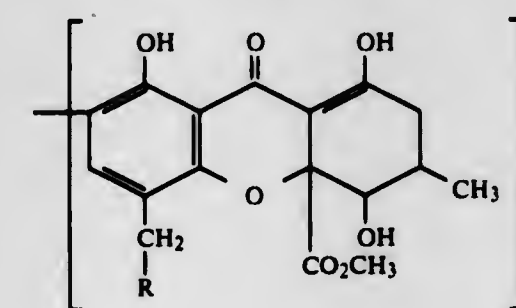
Claims priority, application Japan, Apr. 16, 1981, 56-56219; Apr. 25, 1981, 56-61916

Int. Cl.<sup>3</sup> C07D 405/14; A61K 31/40

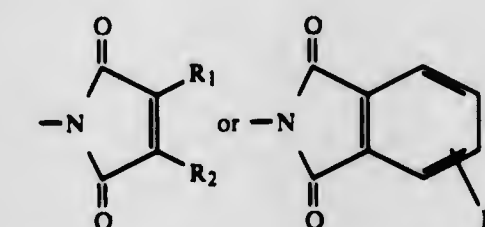
U.S. Cl. 424—245

7 Claims

1. A secalonic acid having the formula (I):



wherein R is



wherein R<sub>1</sub> and R<sub>2</sub> each independently is a hydrogen atom or a C<sub>1-4</sub> alkyl group; R<sub>3</sub> is a hydrogen atom, a C<sub>1-4</sub> alkyl group, a C<sub>1-5</sub> alkoxy group or a halogen atom; and the pharmaceutically acceptable salts thereof.

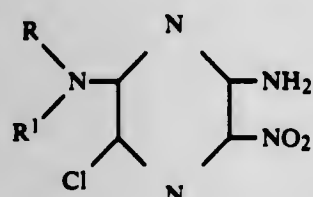


4,418,062

AMINO DERIVATIVES OF CHLORO NITRO AMINO  
PYRAZINES USEFUL AS ADJUNCTS TO RADIATION  
THERAPYGeorge D. Hartman, Lansdale, Pa., assignor to Merck & Co.,  
Inc., Rahway, N.J.Continuation-in-part of Ser. No. 295,446, Aug. 24, 1981,  
abandoned, which is a continuation-in-part of Ser. No. 194,100,  
Oct. 6, 1980, abandoned. This application Jul. 19, 1982, Ser. No.  
399,924Int. Cl.<sup>3</sup> A61K 31/495; C07D 241/16, 241/20

U.S. Cl. 424—248.4

10 Claims

1. A pharmaceutical composition useful in enhancing the  
therapeutic effect of radiation treatment comprising an effective  
amount of a radiation enhancing compound of the formula

wherein R and R<sup>1</sup> are each C<sub>1</sub>–C<sub>6</sub> loweralkyl and substituted  
lower alkyl having one or two amino C<sub>1</sub> lower alkylamino or  
dialkylamino, lower alkoxy, hydroxy or halo C<sub>1</sub>–C<sub>6</sub> loweralk-  
enyl, and substituted lower alkenyl having one or two amino,  
C<sub>1</sub>–C<sub>6</sub> alkylamino or dialkylamino, loweralkoxy, or hydroxy  
groups or when taken together and linked through an addi-  
tional nitrogen or oxygen constitutes a 5–7 member saturated  
heterocyclic ring comprising a morpholine, a piperazine or an  
N-substituted piperazine wherein the N-substituent is either  
hydrogen, C<sub>1</sub>–C<sub>6</sub> alkyl, C<sub>1</sub>–C<sub>6</sub> hydroxyalkyl, C<sub>1</sub>–C<sub>6</sub> alkoxyal-  
kyl and a pharmaceutical carrier.

4,418,063

GROWTH PROMOTING QUINOXALINE-DI-N-OXIDE  
CARBOXYAMIDESWolfgang Schmid, Therwil, Switzerland, assignor to Ciba-Geigy  
Corporation, Ardsley, N.Y.

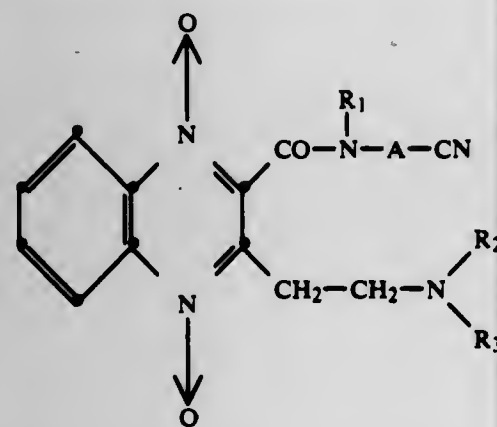
Division of Ser. No. 102,281, Dec. 10, 1979, Pat. No. 4,254,120.

This application Dec. 29, 1980, Ser. No. 220,224

The portion of the term of this patent subsequent to Mar. 3,  
1998, has been disclaimed.Int. Cl.<sup>3</sup> A61K 27/00, 31/495

U.S. Cl. 424—248.54

6 Claims

1. A method for promoting the growth of animals and of  
productive livestock which comprises administering to said  
animals or said productive livestock a growth promoting  
amount of a compound of the formula

in which

R<sub>1</sub> is hydrogen or alkyl having 1 to 4 carbon atoms, each of  
R<sub>2</sub> and R<sub>3</sub> is alkyl having 1 to 4 carbon atoms or, together  
with the nitrogen atom to which they are attached, form  
a heterocyclic ring which is unsubstituted or substituted  
by alkyl having 1 to 4 carbon atoms and which has 4 or 5

ring carbon atoms and optionally an oxygen atom as a  
further hetero atom and,  
A is alkylene having 1 to 4 carbon atoms  
or an acid addition salt thereof.

4,418,064

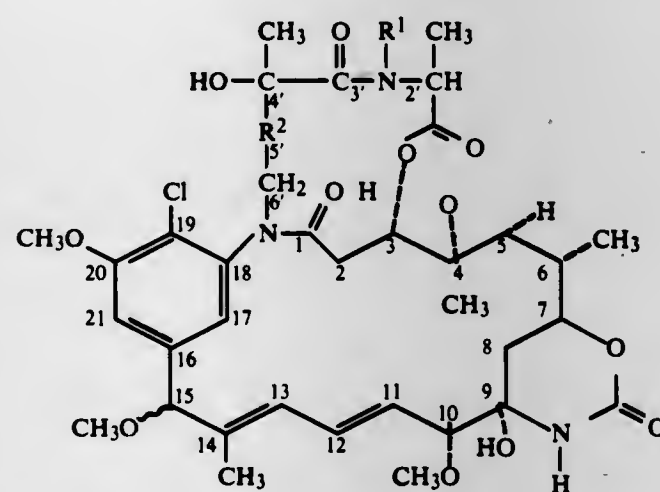
CHEMOTHERAPEUTICALLY ACTIVE  
MAYTANSINOIDS: TREFLORINE, TRENUDINE, AND  
N-METHYLTRENUDINERichard G. Powell, Peoria, and Cecil R. Smith, Jr., Dunlap, both  
of Ill., assignors to The United States of America as repre-  
sented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,439

Int. Cl.<sup>3</sup> A61K 31/535; C07D 498/18

U.S. Cl. 424—248.54

8 Claims

1. A substantially pure compound selected from the group  
consisting of treflorine, trenudine, and N-methyltrenudone  
characterized by the formula

wherein for treflorine: R<sup>1</sup> = —H and R<sup>2</sup> = —CH<sub>2</sub>—;  
wherein for trenudine: R<sup>1</sup> = —H and R<sup>2</sup> = —CHOH—; and  
wherein for N-methyltrenudone: R<sup>1</sup> = —CH<sub>3</sub> and R<sup>2</sup> =



5. A chemotherapeutic composition suitable for the remis-  
sion of leukemia comprising a pharmaceutically acceptable  
vehicle and an amount effective to promote said remission of a  
substantially pure compound selected from the group consist-  
ing of treflorine, trenudine, and N-methyltrenudone.

4,418,065

HALOPHENYL-PYRIDYL-ALLYLAMINE  
DERIVATIVES AND USEThomas Högberg, Järna; Tomas de Paula, Södertälje; Svante B.  
Ross, Södertälje, and Carl B. J. Ulf, Södertälje, all of Swe-  
den, assignors to Astra Lakemedel Aktiebolag, Södertälje,  
SwedenPCT No. PCT/SE80/00286, § 371 Date Jul. 16, 1981, § 102(e)  
Date Jan. 13, 1981, PCT Pub. No. WO81/01407, PCT Pub.  
Date May 28, 1981

PCT Filed Nov. 14, 1980, Ser. No. 232,043

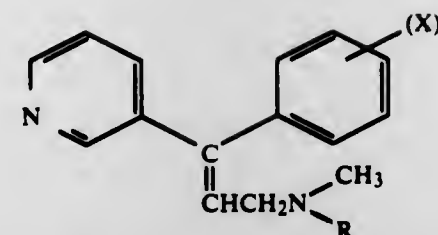
Claims priority, application Sweden, Nov. 16, 1979, 7909514

Int. Cl.<sup>3</sup> A61K 31/44; C07D 213/38

U.S. Cl. 424—263

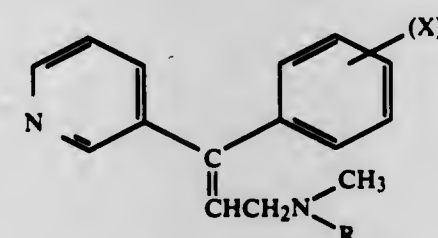
24 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, in which R is H  
or CH<sub>3</sub>, n is 1 or 2 and X is F bound in any position to the  
phenyl group.

2. A compound of the formula



or a pharmaceutically acceptable salt thereof, in which R is H  
or CH<sub>3</sub>, n is 1 or 2 and X is I bound in any position to the  
phenyl group.

4,418,066

## PHENYLBENZOYLUREAS

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and  
Josef Ehrenfreund, Allschwil, Switzerland, assignors to Ciba-  
Geigy Corporation, Ardsley, N.Y.

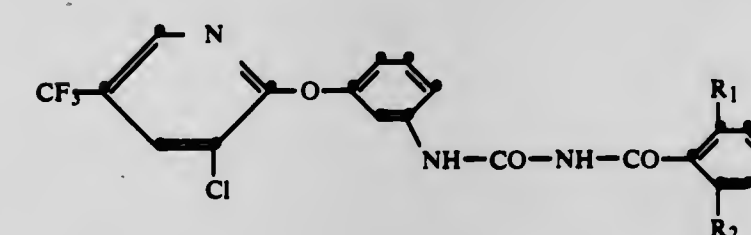
Filed May 13, 1981, Ser. No. 263,320

Claims priority, application Switzerland, May 14, 1980,  
3777/80Int. Cl.<sup>3</sup> A01N 43/40; C07D 213/64

U.S. Cl. 424—263

10 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is fluorine or chlorine andR<sub>2</sub> is hydrogen, fluorine or chlorine.

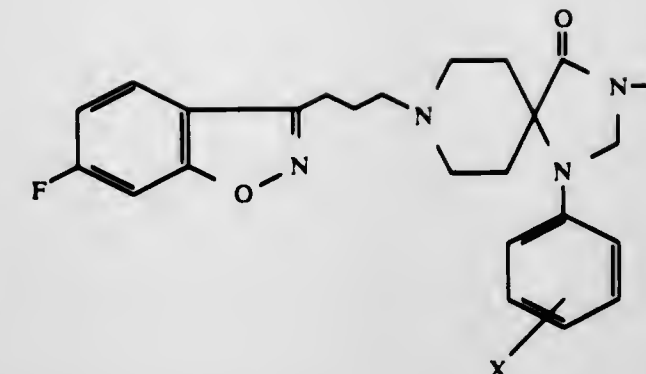
9. A method of combatting pests which comprises applying  
a pesticidally effective amount of a compound according to  
claim 1 to said pests or to a locus desired to be protected from  
said pests.

4,418,067

8-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-1-  
PHENYL-1,3,8-TRIAZASPIRO[4.5]DECAN-4-ONE  
TO TREAT PAINLarry Davis, Sergeantsville, and Joseph T. Klein, Somerville,  
both of N.J., assignors to Hoechst-Roussel Pharmaceuticals  
Inc., Somerville, N.J.Division of Ser. No. 366,246, Apr. 9, 1982, Pat. No. 4,574,245.  
This application Nov. 17, 1982, Ser. No. 442,390Int. Cl.<sup>3</sup> A61K 31/445

U.S. Cl. 424—267

2 Claims

1. A method of alleviating pain comprising administering to  
a mammal in need of pain alleviation a pain alleviating effective  
amount of a compound of the formula

wherein R is hydrogen or loweralkyl; X is hydrogen, loweral-  
kyl, loweralkoxy, halogen or trifluoromethyl; the optical anti-  
podes thereof, or pharmaceutically acceptable acid addition  
salts thereof.

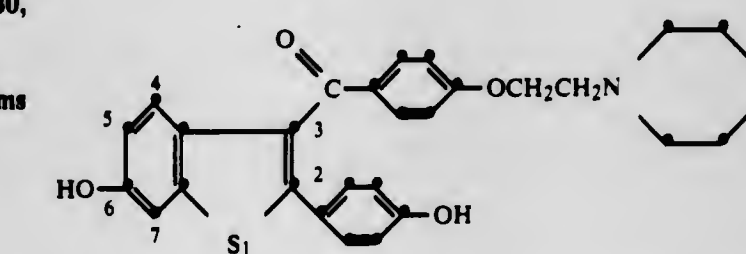
4,418,068

ANTIESTROGENIC AND ANTIANDROGENIC  
BENZOTHIOPHENESCharles D. Jones, Indianapolis, Ind., assignor to Eli Lilly and  
Company, Indianapolis, Ind.Continuation-in-part of Ser. No. 246,335, Apr. 3, 1981,  
abandoned. This application Dec. 16, 1981, Ser. No. 331,042Int. Cl.<sup>3</sup> A61K 31/445; C07D 409/12

U.S. Cl. 424—267

62 Claims

39. A method of alleviating a pathological condition of an  
endocrine target organ, which condition is dependent or par-  
tially dependent on an estrogen or on an androgen, which  
comprises administering to a subject suffering from such a  
condition an effective dose of a compound of the formula



a physiologically acceptable ester or ether thereof, or a physio-  
logically acceptable acid addition salt thereof.

4,418,069

BENZISOSELAZOLONES AND PROCESS FOR THE  
TREATMENT OF RHEUMATIC AND ARTHRITIC  
DISEASES USING THEMAndre Welter, Cologne, Fed. Rep. of Germany; Leon Christia-  
ens, Nandrin, Belgium, and Ferdinand Wirtz-Peltz, Cologne,  
Fed. Rep. of Germany, assignors to A. Nattermann & Cie  
GmbH, Cologne, Fed. Rep. of Germany

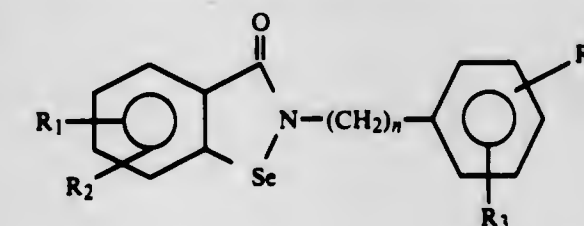
Filed Jul. 9, 1981, Ser. No. 281,719

Claims priority, application Fed. Rep. of Germany, Jul. 17,  
1980, 3027075Int. Cl.<sup>3</sup> A61K 31/41; C07D 293/10, 293/12

U.S. Cl. 424—269

4 Claims

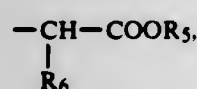
1. A benziselenazolone having the general formula I



wherein R<sub>1</sub> and R<sub>2</sub> which may be the same or different from



each other, represent hydrogen, fluorine, chlorine, bromine,  $C_{1-4}$ -alkyl,  $C_{1-4}$ -alkoxy, hydroxy, trifluoromethyl, nitro, or  $R_1$  and  $R_2$  together represent the methylenedioxy group  $-\text{O}-\text{CH}_2-\text{O}-$ ,  $R_3$  and  $R_4$  which may be the same or different from each other, represent hydrogen, fluorine, chlorine, bromine,  $C_{1-4}$ -alkyl,  $C_{1-4}$ -alkoxy, hydroxy, trifluoromethyl, nitro, di- $(C_{1-4}$ -alkyl)-amino or,  $R_3$  and  $R_4$  together, represent the methylenedioxy group  $-\text{O}-\text{CH}_2-\text{O}-$  or  $R_3$  represents hydrogen with  $R_4$  being  $-\text{CN}$ ,  $-\text{COOR}_5$  or



wherein  $R_5$  is hydrogen, an alkali metal ion or  $C_{1-4}$ -alkyl and  $R_6$  being hydrogen, methyl or ethyl, and  $n$  is 0 or an integer from 1 to 4, with the exclusion of the compounds of formula I, wherein  $n$  is 0,  $R_1$ ,  $R_2$  and  $R_3$  are hydrogen and  $R_4$  is hydrogen or  $n$ -methyl or  $n$  is 1 and  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  are hydrogen.

4. Process for the treatment of inflammation symptoms of rheumatic and arthritic diseases comprising administering to the being suffering from such disease a compound according to claim 1, 2 or 3 in an amount corresponding to 10 to 1000 mg. per day until the desired degree of alleviation of the symptoms of such disease is achieved.

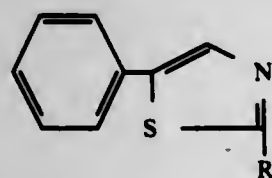
#### 4,418,070 CARDIOTONIC AGENTS

Tsuneo Okonogi, Yokohama; Shunzo Fukatsu; Mitsugu Hachisu, both of Tokyo; Hiroko Kawashima, Yokohama; Keiko Saitoh, Kawasaki, and Yasuharu Sekizawa, Tokyo, all of Japan, assignors to Meiji Seika Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,672  
Claims priority, application Japan, Feb. 14, 1981, 56-20490  
Int. Cl.<sup>3</sup> C07D 277/34

U.S. Cl. 424—270 11 Claims  
1. A method for treating cardiac failure conditions, comprising:

administering to a human or animal in need of such treatment a safe and effective amount of a 5-phenylthiazole derivative represented by the formula:



wherein  $R$  represents a hydrogen atom, a lower alkyl group, a hydroxyl group, an amino group, or a mercapto group, or a pharmaceutically acceptable salt thereof.

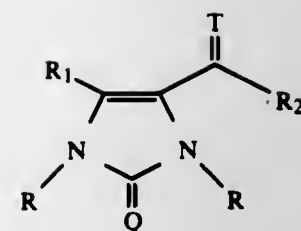
11. 2-Hydroxy-5-phenylthiazole.

#### 4,418,071 CARDIOTONIC IMIDAZOLECARBOXYLIC ACID DERIVATIVES

Richard A. Schnettler; Richard C. Dage, both of Cincinnati, Ohio, and J. Martin Grisar, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Nov. 4, 1981, Ser. No. 317,956  
Int. Cl.<sup>3</sup> A61K 31/415

U.S. Cl. 424—273 R 5 Claims  
1. A method for the treatment of a condition requiring the strengthening of heart action in a patient in need thereof which comprises administering to said patient a cardiotonically effective amount of a compound of the formula

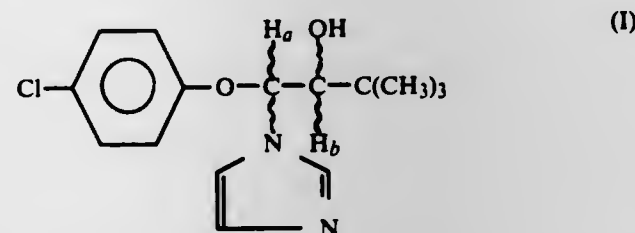


wherein  $Q$  and  $T$  are each independently an oxygen atom or a divalent sulfur atom;  $R$  is hydrogen, lower alkyl, lower alkyl-carbonyl or benzoyl;  $R_1$  is hydrogen, or  $-\text{CH}(\text{R}_3)\text{R}_4$ ;  $R_2$  is lower alkoxy, phenoxy or phenoxy substituted at the ortho, meta or para position with lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl, lower alkylthio, lower alkylsulfone or lower alkylsulfoxide;  $R_3$  is hydrogen or lower alkyl;  $R_4$  is hydrogen, hydroxy, lower alkoxy, lower alkylcarbonyloxy,  $-\text{ONO}_2$ , or halogen; or a pharmaceutically acceptable salt thereof.

#### 4,418,072 DIASTEREOMERIC 1-(4-CHLOROPHENOXY)-1-(1-IMIDAZOLYL)-3,3-DIMETHYL-2-BUTANOL COMPOUNDS AND THEIR ANTIMYCOTIC USE

Wolfgang Krämer; Karl H. Büchel; Ingo Haller, and Manfred Plempel, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 95,000, Nov. 16, 1979, abandoned. This application Mar. 25, 1981, Ser. No. 247,413  
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850057

Int. Cl.<sup>3</sup> A61K 31/415; C07D 233/60  
U.S. Cl. 424—273 R 9 Claims  
1. A compound which is the diastereomeric form A of 1-(4-chlorophenoxy)-1-(1-imidazolyl)-3,3-dimethyl-2-butanol of the formula



or its hydrochloride, said diastereomeric form A of 1-(4-chlorophenoxy)-1-(1-imidazolyl)-3,3-dimethyl-2-butanol having a melting point of  $158^\circ\text{--}159^\circ\text{C}$ . and its hydrochloride having a melting point of  $236^\circ\text{--}237^\circ\text{C}$ .

7. A method of combating mycoses in warm-blooded animals which comprises administering to an animal in need thereof, an antimycotically effective amount of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

#### 4,418,073 COMBATING PESTS WITH N-ACYLATED N-METHYL-CARBAMIC ACID O-PYRAZOL-4-YL ESTERS

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jun. 8, 1981, Ser. No. 271,080

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023675  
Int. Cl.<sup>3</sup> A01N 43/56; C07D 231/18

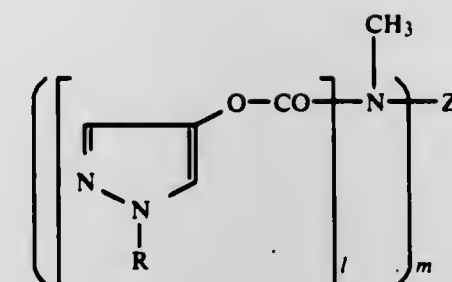
U.S. Cl. 424—273 P 11 Claims  
1. An N-acylated N-methyl-carbamic acid O-pyrazol-4-yl ester of the formula

#### 4,418,076 7-OXABICYCLOHEPTANE HYDRAZONE PROSTAGLANDIN ANALOGS USEFUL IN TREATING THROMBOLYTIC DISEASES

Masami Nakane, Plainsboro; Joyce Reid, Dayton, and Martin F. Haslanger, Lambertville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 3, 1982, Ser. No. 374,125  
Int. Cl.<sup>3</sup> A61K 31/34; C07D 307/00

U.S. Cl. 424—285 13 Claims  
1. A compound having the structural formula



in which

$R$  represents  $C_1\text{--}C_5$ -alkyl which is optionally substituted by halogen, cyano,  $C_1\text{--}C_4$ -alkoxy or  $C_1\text{--}C_4$ -alkylthio, or represents  $C_3\text{--}C_5$ -alkenyl,  $C_3\text{--}C_5$ -alkynyl or  $C_3\text{--}C_6$ -cycloalkyl, or represents an optionally halogen-substituted phenyl, benzyl or phenylethyl radical,

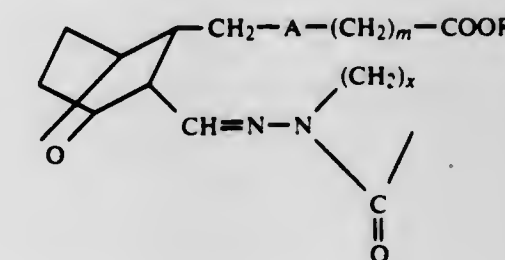
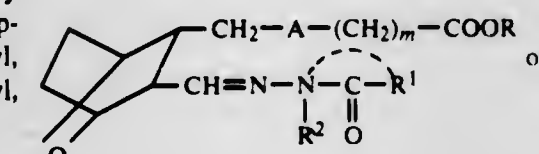
$Z$  represents the radical  $-\text{S}(\text{O})_2\text{R}^4$ ,

$r$  represents 1 or 2,

$s$  represents zero, 1 or 2, and

$R^4$  represents optionally halogen-substituted  $C_1\text{--}C_4$ -alkyl,  $C_3\text{--}C_5$ -alkenyl,  $C_3\text{--}C_5$ -alkynyl or  $C_3\text{--}C_6$ -cycloalkyl, or represents a phenyl, benzyl or phenylethyl radical which is optionally substituted by halogen, cyano, nitro, trifluoromethyl,  $C_1\text{--}C_4$ -alkyl or  $C_1\text{--}C_4$ -alkoxy, when each of  $l$ ,  $m$  and  $n$  represents 1; or  $Z$  represents sulfur when  $l$  is 1,  $m$  is 2 and  $n$  is 1; and when  $n$  represents zero,  $l$  is 2 and  $m$  is 1.

7. A method of combating pests comprising applying to the pests, or to a habitat thereof, a pesticidally effective amount of a compound according to claim 1.



and including all stereoisomers thereof wherein

$A$  is  $\text{CH}=\text{CH}$  or  $(\text{CH}_2)_2$ ;

$m$  is 1 to 8;

$R$  is H or lower alkyl;  $R^2$  is H or lower alkyl; and

$R^1$  is lower alkoxy and  $x$  is 3, 4 or 5.

#### 4,418,074 2,6-DI(T-BUTYL)-4-(2'-PYRROL)-PHENOL AND ANTI-INFLAMMATORY USE THEREOF

George G. I. Moore, Houlton, Wis., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 23, 1981, Ser. No. 324,061  
Int. Cl.<sup>3</sup> C07D 207/333; A61K 31/40

U.S. Cl. 424—274 4 Claims  
1. The compound 2,6-di(t-butyl)-4-(2'pyrrolyl)phenol.

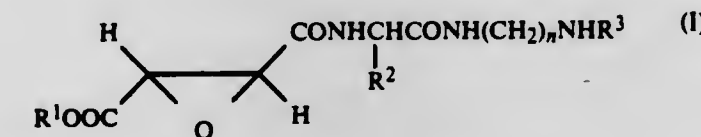
3. A method for combatting inflammatory reactions in a mammal which comprises administering to said mammal an effective dose, less than a toxic amount, of a composition according to claim 2.

#### 4,418,075 EPOXYSUCCINYL AMINO ACID DERIVATIVES

Masaharu Tamai; Shigeo Morimoto; Takashi Adachi; Kiyoshi Oguma; Kazunori Hanada, and Sadafumi Omura, all of Saitama, Japan, assignors to Taiho Pharmaceutical Co., Ltd., Japan

Continuation-in-part of Ser. No. 149,312, May 13, 1980. This application Nov. 10, 1981, Ser. No. 320,113  
Claims priority, application Japan, May 17, 1979, 54-60858  
Int. Cl.<sup>3</sup> C07D 303/48; A61K 31/335

U.S. Cl. 424—278 5 Claims  
1. An epoxysuccinyl amino acid derivative of the formula



wherein  $R^1$  is hydrogen or alkali metal,  $R^2$  is isobutyl,  $R^3$  is hydrogen or benzyloxycarbonyl, and  $n$  is an integer of 5 to 7.

wherein:

$Y$  is hydrogen or fluorine;  
 $Z$  is  $-\text{CH}_2\text{NR}_1\text{R}_2$ , where  $R_1$  and  $R_2$  are as defined below, or  $-\text{COR}_3$  where  $R_3$  is as defined below;

$R_a$  is hydrogen or  $R_4$ , where  $R_4$  is as defined below;

$R_1$  is hydrogen,  $C_1\text{--}C_6$ -alkyl or phenyl- $(C_1\text{--}C_4$ -alkyl);

$R_2$  is hydrogen,  $C_1\text{--}C_6$ -alkyl, phenyl- $(C_1\text{--}C_4$ -alkyl), or, when

$R_a$  is hydrogen,  $R_4$ , where  $R_4$  is as defined below;

$R_3$  is hydroxy, or, when  $R_a$  is hydrogen,  $C_1\text{--}C_8$ -alkoxy,

$-\text{NR}_5\text{R}_6$ , where  $R_5$  and  $R_6$  are as defined below, or an

aminocarboxylic acid residue derived by removal of an

hydrogen atom from the amino moiety of glycine or an

L-aminocarboxylic acid of the formula

$\text{NH}_2\text{CH}(\text{R}_7)\text{CO}_2\text{H}$  wherein  $R_7$  is  $C_1\text{--}C_4$ -alkyl, aminopropyl, aminobutyl, benzyl, or p-hydroxybenzyl;

each  $R_4$ , independently, is  $C_2\text{--}C_5$ -alkylcarbonyl, phenylcar-



bonyl, phenyl-(C<sub>1</sub>-C<sub>4</sub>alkyl)carbonyl, or an aminocarboxylic acid residue derived by removal of an hydroxy group from the carboxy moiety of glycine or an L-aminocarboxylic acid of the formula HO-COCH(R<sub>7</sub>)NH<sub>2</sub> or HO-CO(CH<sub>2</sub>)<sub>n</sub>CH(NH<sub>2</sub>)CO<sub>2</sub>H wherein R<sub>7</sub> is C<sub>1</sub>-C<sub>4</sub>alkyl, aminopropyl, aminobutyl, benzyl, or p-hydroxybenzyl and n is 1 or 2;

R<sub>5</sub> and R<sub>6</sub>, independently, are hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl; and p is 1 or 2,

or a pharmaceutically acceptable salt thereof.

19. A pharmaceutical composition for inhibiting gamma-aminobutyric transaminase comprising an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier.

4,418,078

#### METHOD OF TREATING TUMORS IN WARM-BLOODED ANIMALS

Keith C. Murdock, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 965,114, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 873,041, Jan. 30, 1978. This application Aug. 27, 1979, Ser. No. 69,672

Int. Cl.<sup>3</sup> H61K 31/135

U.S. Cl. 424-330

1 Claim

1. A pharmaceutical composition in dosage unit form comprising from about 5 to about 200 milligrams of a compound selected from the group consisting of 1,4-bis(3-aminopropylamino)-5,8-dihydroxyanthraquinone, the leuco base or tautomer thereof, and the pharmacologically acceptable acid-addition salts thereof; in association with a pharmaceutical carrier.

4,418,079

#### CONJUGATED KETONE COMPOUNDS IN PREVENTING PLATELET THROMBOSIS

Akayuki Kojima; Tsunemasa Irie, both of Hyogo; Shuichi Harada, Osaka; Yoshito Kameno, Osaka; Junki Katsube, Osaka, and Hisao Yamamoto, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 217,043, Dec. 16, 1980, abandoned, which is a continuation of Ser. No. 973,639, Dec. 27, 1978, abandoned.

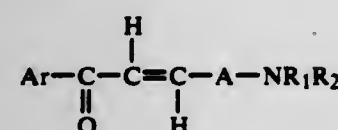
This application Dec. 29, 1981, Ser. No. 335,522  
Claims priority, application Japan, Jan. 13, 1978, 53-2938; Jan. 13, 1978, 53-2939

Int. Cl.<sup>3</sup> A61K 27/00, 31/34, 31/36, 31/38, 31/40, 31/44, 31/135, 31/445

U.S. Cl. 424-330

11 Claims

1. A method for the prevention of platelet thrombosis which comprises administering to warm-blooded animals an effective blood platelet anti-aggregative amount of at least one compound of the formula



wherein Ar is naphthyl, furyl, thienyl or phenyl optionally bearing one or more substituents selected from the group consisting of chlorine, bromine, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, trifluoromethyl and methylenedioxy, R<sub>1</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>5</sub> alkenyl, C<sub>3</sub>-C<sub>6</sub> cycloalkyl, C<sub>7</sub>-C<sub>8</sub> aralkyl or adamantyl, R<sub>2</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>5</sub> alkenyl or C<sub>3</sub>-C<sub>6</sub> cycloalkyl, or when R<sub>1</sub> and R<sub>2</sub> are taken together with the nitrogen atom to which they are attached, they form a heterocyclic amino group containing up to 8 carbon atoms, A is straight or branched C<sub>1</sub>-C<sub>3</sub> alkylene, N-[4-(p-chlorophenyl)-4-oxo-2-trans-butenyl]morpholine and N-[4-(p-methoxyphenyl)-4-oxo-2-trans-butenyl]piperidine being excluded or a non-toxic salt thereof and at least one pharmaceutically acceptable inert carrier or diluent.

4,418,080

#### NATURAL RED COLORING PREPARED FROM WHEAT AND BARLEY SUBSTRATES

Mao Yueh, Barrington, and Stephan A. Rashbaum, Evanston, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jul. 6, 1981, Ser. No. 280,618

Int. Cl.<sup>3</sup> A23L 1/27, 1/28; C12P 1/02; C12N 1/14

U.S. Cl. 426-18

5 Claims

1. A method for imparting a red, meaty color to a food product comprising culturing a mold of the genus *Monascus* on a grain substrate selected from the group of wheat and barley, to obtain red pigments thereon, wherein the step of culturing the *Monascus* mold comprises:

- preparing a nutrient solution by mixing water with a salt selected from the group consisting of MgSO<sub>4</sub>, KH<sub>2</sub>PO<sub>4</sub>, NaNO<sub>3</sub>;
- submerging a grain substrate selected from the group of barley and wheat grain flour or steel cut grain in the nutrient solution to form a grain and nutrient solution;
- inoculating said grain and nutrient solution with *Monascus purpureus* mold;
- agitating the mold-inoculated grain and nutrient solution to aerate;
- incubating the *Monascus purpureus* mold in the agitated grain and nutrient solution, yielding a red pigmented grain product; and
- adding the red pigmented grain product as an ingredient to a food product.

4,418,081

#### NATURAL RED COLORING PREPARED FROM AN OAT SUBSTRATE

Stephan A. Rashbaum, Evanston, and Mao Yueh, Barrington, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jul. 6, 1981, Ser. No. 280,617

Int. Cl.<sup>3</sup> A23L 1/27, 1/28; C12P 1/02; C12N 1/14

U.S. Cl. 426-18

4 Claims

1. A method for imparting a red, meaty color to a food product comprising culturing a mold of the genus *Monascus* which produces pigment of the Monascorubrin or Rubropunctatin type on an oat substrate to obtain red pigments thereon, drying and subdividing said oat substrate into a finely-divided form, and adding said finely divided substrate to said food product in an amount effective to impart a red color to said food product, wherein the step of culturing the *Monascus* mold comprises:

- cutting oat groats so that each oat groat is cut into at least three individual pieces;
- moistening said cut oat groats to about 30% moisture content and sterilizing said moistened groats;
- inoculating and culturing said sterilized moist, cut oat groats with a *Monascus* mold selected from the group of *Monascus* mold which produces pigments of the Monascorubrin or Rubropunctatin type;
- maintaining said moisture level at about 30% throughout said culturing step; and
- incubating said *Monascus* mold on said oat substrate.

4,418,082

#### IMPROVED FRUIT COMPOSITION HAVING A DEPRESSED FREEZING POINT

Marvin L. Kahn, Williamsville, and John S. O'Mahony, Amherst, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Division of Ser. No. 168,903, Jul. 14, 1980, Pat. No. 4,356,195.  
This application Dec. 9, 1981, Ser. No. 329,006

Int. Cl.<sup>3</sup> A23L 1/212; C12P 19/24

U.S. Cl. 426-51

11 Claims

1. A citrus fruit containing juice the freezing point of which has been depressed by the steps of adding to said citrus fruit

containing at least about 1% sucrose based on the weight of the fresh fruit, an enzyme capable of converting at least about 21% of the naturally present sucrose within said fruit into fructose.

4,418,083

#### PROCESS OF MAKING HOLLOW DRIED GRAPE

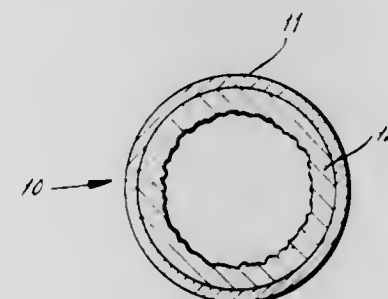
Howard F. McKinney; Frederick C. Wear, both of St. Louis County, and Harold L. Sandy, St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 167,688, Jul. 11, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,141

Int. Cl.<sup>3</sup> A23B 7/00; A23L 3/26

U.S. Cl. 426-242

4 Claims



1. A process for making dried grapes comprising the steps of:
  - (a) removing bloom from fresh grapes,
  - (b) drying the grapes from about 20% moisture to less than about 10% moisture in an environment containing less than about 2% oxygen and at a pressure of less than about 40 Torr,
  - (c) raising the temperature of the grapes to between about 170° F. to about 200° F. in said reduced pressure environment for a time sufficient to rigidify the sugar structure in the grapes,
  - (d) cooling the grapes to below about 100° F. while maintaining said reduced atmosphere, and
  - (e) recovering hollow substantially round intact grapes having substantially the same size and color as the fresh grapes.

4,418,084

#### NEUTRAL PROTEIN BEVERAGE

Edward D. Murray, Winnipeg; Brenda J. Woodman, Port Hope; Terrence J. Maurice, Colborne, and Robert R. Sirett, Cobourg, all of Canada, assignors to General Foods Inc., Don Mills, Canada

Filed Feb. 23, 1979, Ser. No. 14,657

Claims priority, application Canada, Mar. 21, 1978, 299433

Int. Cl.<sup>3</sup> A23J 1/12, 1/14

U.S. Cl. 426-250

7 Claims

1. A process for the production of a dry protein composition capable of rapid dispersion in water to provide a stable protein dispersion having a pH greater than about 6.2 and up to a pH of about 8.0, said process comprising:

- (a) extracting protein from a protein source material with an aqueous food grade salt solution at a temperature of about 15° to about 35° C, a salt concentration of about 0.2 to about 0.8 ionic strength and a pH of about 5.5 to about 6.5,
- (b) diluting the resulting protein solution to an ionic strength of less than about 0.1 to form an aqueous dispersion of protein micelles consisting of amphiphilic protein moieties,
- (c) settling the solid phase from said aqueous dispersion to form a protein micellar mass,
- (d) separating said settled protein micellar mass from the residual aqueous phase,
- (e) homogeneously mixing said separated protein micellar mass with sufficient at least one food grade buffering agent to provide on dispersion in water said stable protein dispersion having a pH of about 6.2 to about 8.0, and

(f) drying the resulting homogeneous mixture to a powder.

4,418,085

#### PROCESS FOR MANUFACTURING FROZEN FOOD PRODUCTS COMPOSED OF LAYERS OF PASTA AND SAUCE

Louis E. Becquelet, Alfortville, France, assignor to Nultoni Foods Corporation, South Hackensack, N.J.

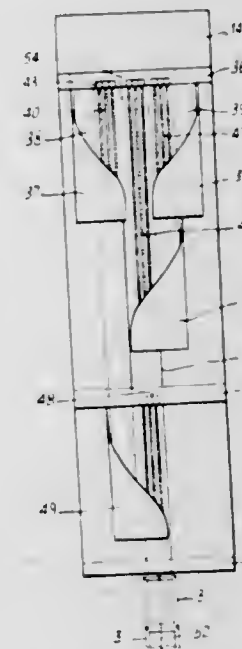
Filed Sep. 17, 1982, Ser. No. 419,279

Claims priority, application France, Sep. 17, 1981, 81 17546

Int. Cl.<sup>3</sup> A23L 1/16

U.S. Cl. 426-297

10 Claims



1. A process for automatically and continuously manufacturing food products, comprising the sequential steps of: mixing a plurality of ingredients into a mixer to form dough; extruding said dough from said mixer to form a continuous sheet of pasta having first (38), second (40), third (42), fourth (41), and fifth (39) adjacent longitudinal surface area rows; passing said continuous sheet of pasta under a first sauce dispenser; dispensing first sauces from said first sauce dispenser onto said second, third, and fourth adjacent surface area rows, said second, third and fourth adjacent surface area rows being between first and second outer end surface area rows which comprise said first and fifth surface area rows; first folding said respective first and fifth surface area rows by means of first and second guides (37) over said second and fourth surface area rows, respectively, said respective first and fifth surface area rows substantially covering said second and fourth surface area rows, said second and fourth area rows being spaced apart along a widthwise direction of said sheet of pasta and being on opposite sides of said third surface area row; second folding said fourth and fifth surface area rows over said third surface area row by means of a third guide (44); dispensing additional sauce over one of said first and fourth surface area rows by means of a second sauce dispenser (47); third folding said one of said first and fourth surface area rows which does not have said additional sauce dispensed thereon over said one of said first and fourth surface area rows which has said additional sauce dispensed thereon by means of a fourth guide (49), said continuous sheet of pasta continuously passing said first sauce dispenser, passed said first, second and third guides, passed said second sauce dispenser and passed said fourth guide.



4,418,086

**EXPANDED TEXTURED PROTEIN PRODUCT AND METHOD FOR MAKING SAME**

Richard P. Marino, Bedford Hills; Richard J. Rothamel, Ossining, both of N.Y., and William C. Rieken, Jackson, N.J., assignors to General Foods Corporation, White Plains, N.Y.  
Filed Jan. 28, 1982, Ser. No. 343,603

Int. Cl.<sup>3</sup> A23L 1/31; A23J 3/00

U.S. Cl. 426—302

2 Claims

1. A method for preparing an expanded, resilient protein product which has an open cellular, fibrous structure, a fat content of at least 5% up to about 35% dry weight basis, and a moisture content of from 15% to 30% by weight. The steps comprising:

- forming a mixture containing, on a weight basis, 10% to 40% fresh meat, 12% to 25% soy flour, 1% to 20% combined wheat and corn, 0.01% to 2.5% elemental sulfur or a sulfur compound, and from 1% to 10% of a polyhydric alcohol plasticizing agent, said mixture being free of any non-proteinaceous and non-farinaceous extrusion agent and said mixture containing sufficient water to produce the 15% to 30% moisture content in the expanded product;
- heating the mixture of step (a) to a temperature of above 280° F. while mechanically working the heated mixture at a pressure above 100 psig in a twin screw extruder;
- extruding the mixture from the twin screw extruder such that the mix expands from about 1.75 to 2.25 times in size as compared to the orifice size;
- cutting the extruded material into chunks; and
- coating the chunks with a layer of a palatability improving material.

4,418,087

**MIXTURE OF****4,4A,5,6-TETRAHYDRO-7-METHYL-2-(3H)-NAPHTHALENONE AND BENZODIOXANONES AND USE THEREOF IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS**

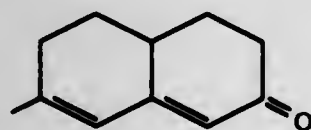
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Myrna L. Hagedorn, Edison, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.  
Division of Ser. No. 368,640, Apr. 15, 1982, which is a continuation-in-part of Ser. No. 354,111, Mar. 2, 1982, abandoned. This application Apr. 7, 1983, Ser. No. 482,762

Int. Cl.<sup>3</sup> A23L 1/226; A61K 7/46

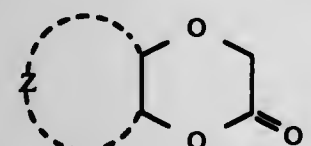
U.S. Cl. 426—536

2 Claims

1. A composition of matter comprising 4,4A,5,6-tetrahydro-7-methyl-2-(3H)-naphthalenone having the structure:



and intimately admixed therewith at least one bicyclic compound defined according to the generic structure:



wherein Z is benzo or cyclohexano, the proportion of said naphthalenone in said mixture being from 0.1% up to 99.9% by weight of said mixture.

4,418,088

**PROCESS FOR PREPARING A FOOD PRODUCT**

Francois Cantenot, St. Usage, France, assignor to M.B.E. Misonnerie Biscotterie d'Echenon, Saint Jean de Losne, France  
Filed Nov. 4, 1981, Ser. No. 318,154

Claims priority, application France, Nov. 10, 1980, 80 23975  
Int. Cl.<sup>3</sup> A21D 13/04

U.S. Cl. 426—549

12 Claims

1. Process for manufacturing a food product, comprising the steps of intimately mixing the following substances in units by weight:

- 100 units of flour at a rate of 10 to 60 units of roast corn flour and the complement composed of wheat flour;
- from 1 to 5 units of sugar;
- from 0 to 3.5 units of milk;
- from 0 to 3.5 units of fat;
- about 1 unit of salt,

shaping the mixture and baking it simultaneously and continuously by extrusion-baking at a temperature higher than 100° C. to provoke a vaporization of water, and cooling the extruded-baked mixture immediately after extrusion to condense the water vaporized during baking and provoke the formation of cells.

4,418,089

**METHOD AND APPARATUS FOR PRODUCING A CELLULAR FOOD PRODUCT**

David W. Bouette, Macclesfield, England, assignor to Simon-Vicars Limited, Merseyside, England

Filed Feb. 9, 1982, Ser. No. 347,347

Int. Cl.<sup>3</sup> A23G 1/10, 3/00

U.S. Cl. 426—572

14 Claims

1. A method of making a cellular chocolate product, comprising the steps of heating a supply of chocolate to bring it to a molten state, introducing into the molten chocolate under pressure a gas which is largely soluble in the chocolate, feeding the molten chocolate under pressure into a mixing device having closely adjacent relatively movable mixing parts, operating the mixing device to disperse the gas uniformly, so that it is dissolved throughout the molten chocolate, passing the molten chocolate through a restricted orifice to release the pressure suddenly to atmosphere, so that the dissolved gas forms gaseous bubbles within the chocolate, and solidifying the molten chocolate into a finally resulting cellular chocolate product by cooling, the clearance between the closely adjacent relatively movable mixing parts of the mixing device being less than half the minimum transverse dimension of the orifice.

4,418,090

**STARCH CONTAINING FOOD PRODUCTS AND PROCESS FOR PREPARING SAME**

Hans Bohrmann, Talheim; Thomas Campbell, Fein; Werner Grigoteit, Unterheimbriet, and Günter Müller, Fein, all of Fed. Rep. of Germany, assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 237,304, Feb. 23, 1981, which is a continuation of Ser. No. 59,415, Jul. 20, 1978, abandoned. This application May 19, 1982, Ser. No. 379,676

Claims priority, application United Kingdom, Jul. 31, 1978, 31695/78

Int. Cl.<sup>3</sup> A23L 1/195, 1/40

U.S. Cl. 426—578

9 Claims

1. A prepared, dry food product having a thickening component, said food product being intended for reconstitution by direct addition to boiling aqueous liquid and which in part comprises

- a thickening component comprising a modified root starch or tuber starch having retarded thickening properties

wherein said modified starch is prepared by

- heating native starch having a moisture content from about 16% to 35% by weight, in a closed system at a temperature from 55° C. to about 135° C. for a sufficient

time period to impart to the starch the characteristic of retarded thickening,  
(b) cooling and drying the starch prepared in step (a).

4,418,091

**PROCESS FOR PREPARING A DRY, POWDERY MILK PRODUCT**

Cor Glas, Tietjerk, Netherlands, assignor to Centrale Veevoederfabriek "Sloten", Leeuwarden, Netherlands  
Continuation of Ser. No. 196,429, Oct. 14, 1980, abandoned.

This application Aug. 16, 1982, Ser. No. 408,570

Claims priority, application Netherlands, Oct. 17, 1979, 7907654

Int. Cl.<sup>3</sup> A23C 9/16, 21/06

U.S. Cl. 426—580

6 Claims

1. In a process for preparing a dry, powdery milk product comprising at least one whey product, homogenized fat, from 0.1 to 10% by weight of at least one saturated or unsaturated mono-, di-, or tri-carboxylic acid and/or hydroxycarboxylic acid having up to 6 carbon atoms, salts thereof or mixtures thereof by homogenizing one or a number of fats in a milk liquid, drying the resultant liquid mixture and mixing the resultant dried mixture with the acids and/or salts to form an end product, the improvement wherein:

- said whey product is selected from the group consisting of whey, delactosed whey, whey permeate, delactosed whey permeate and whey protein obtained after ultrafiltration;
  - said milk liquid contains all or a portion of said whey product or a mixture thereof with low fat milk or products derived from said two starting materials;
  - said resultant liquid mixture with said fat homogenized therein is dried to provide an intermediate dry product (fatty core) containing up to 40% by weight of fat; and
  - said intermediate dry product is mixed with said acid, salt or mixture thereof, with any remainder of said whey product or mixture thereof with low fat milk or products derived from said two starting materials in dry powdery form and with at least 0.05% by weight of lecithin in the form of a dry, concentrated powdery composition to obtain said dry powdery milk product,
- at least 25% and up to 100% of the protein in said dry powdery milk product being derived from said whey product, the fat content being derived from said intermediate dry product and ranging up to 17.5% by weight of said dry powdery milk product, and said dry powdery milk product, when dissolved into cold water or a cold aqueous product, having a pH in the range of 4.0 to 6.0 and being useful for feeding calves, lambs and goats.

4,418,092

**PRESERVATION OF HOPS**

Churchill G. Blackwell, 1008 S. Cherry, Unit B-101, Denver, Colo. 80222

Filed Feb. 4, 1982, Ser. No. 345,775

Int. Cl.<sup>3</sup> C12C 3/04, 9/02

U.S. Cl. 426—600

10 Claims

1. A brewing composition adapted for use in brewing beer or ale, comprising:  
a fermentable hydroscopic powdered sugar, and granulated hops having a particle size less than or equal to one millimeter in diameter and having a moisture content of 0.2% to 16% by weight, said hops being intimately mixed with an equal or greater amount by weight of said hydroscopic powdered sugar.

4,418,093

**METHOD FOR DISTRIBUTING MATERIAL INSIDE A TIRE CASING**

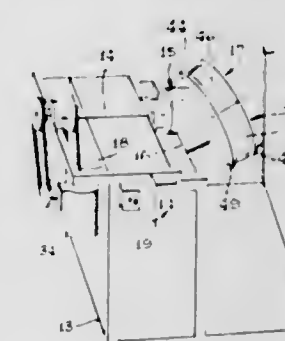
Edward N. Gomberg, Hixon, and James O. B. Wright, Chattanooga, both of Tenn., assignors to Synair Corporation, Chattanooga, Tenn.

Filed Mar. 26, 1982, Ser. No. 362,342

Int. Cl.<sup>3</sup> B05D 7/22, 7/02

U.S. Cl. 427—8

5 Claims



1. A method of producing an elastomeric liner insitu within a pneumatic tire casing comprising the steps of:

- mounting a tire casing for rotation about a spin axis;
- introducing a liquid mixture of material adapted to cure to an elastomer into the interior of said tire casing;
- rotating said tire casing about spin axis at a first speed to distribute said material about the interior periphery of said tire casing;
- rotating said tire casing about a second axis before said material has polymerized, said second axis being at an angle to and intersecting said spin axis at a fixed point whereby said tire casing oscillates and causes said unpolymerized material to spread across the bottom and contiguous portions of the sidewalls of the inner periphery of the tire casing; and
- continuing said oscillating movement of said tire casing until said material is polymerized to the point of non-flow-ability.

4,418,094

**VERTICAL-ETCH DIRECT MOAT ISOLATION PROCESS**

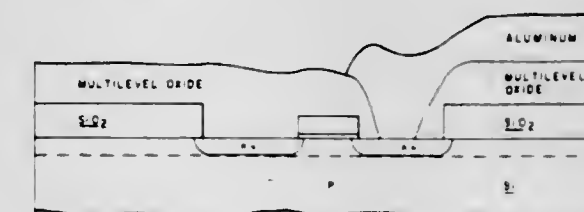
Yee-Chung See, Plano; Roderick D. Davies, Richardson, and Dennis C. Hartman, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 2, 1982, Ser. No. 353,994

Int. Cl.<sup>3</sup> H01L 27/00

U.S. Cl. 427—38

9 Claims



1. A process for forming integrated circuit device structures, comprising the steps of:

- providing a silicon substrate;
- forming a uniform oxide layer on said substrate;
- etching windows in said oxide to expose selected moat regions of said substrate;
- forming a thin gate oxide layer within said respective moat regions;
- depositing polysilicon on exposed surfaces;
- patterning said polysilicon to define selected gate regions within said moat regions;
- etching said polysilicon where exposed by said gate patterning step;



forming a plurality of respective sources and drains within respective ones of said moats; and forming a plurality of respective contacts to respective ones of said sources, drains, and gates, wherein said oxide etch is anisotropic and selective over silicon, and does not deposit substantial quantities of polymers in said moat regions; and wherein said polysilicon etch is anisotropic and has a selectivity over oxide which is greater than 15; whereby an MOS integrated circuit structure is formed.

4,418,095

# METHOD OF MAKING PLANARIZED JOSEPHSON JUNCTION DEVICES

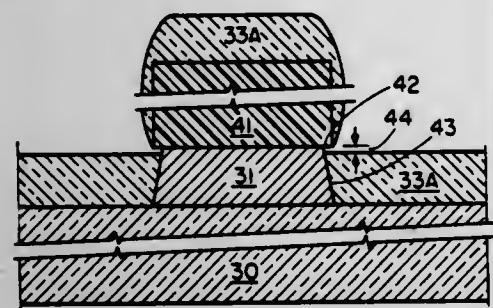
Peter L. Young, North Wales; Barry F. Stein, Dresher, and John E. Sheppard, Cornwells Heights, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,578

Int. Cl.<sup>3</sup> H01L 39/24

U.S. Cl. 427—63

11 Claims



1. A method of making planarized Josephson junction devices having raised base electrodes, comprising the steps of: providing a substantially non-porous dielectric substrate, evaporating and depositing a uniform layer of base electrode material on said substrate in a vacuum chamber, applying a photoresist pattern on said base electrode layer which defines a base electrode area, etching away portions of said base electrode material leaving a discrete tapered raised base electrode having a ledge undercut below the photoresist pattern area, placing said substrate in a vacuum chamber disposed at a predetermined offset angle from a source of planarizing insulation material, rotating said offset substrate, evaporating and depositing a planarizing insulation layer to form a uniform layer on said substrate which connects to the sides of said tapered raised base electrode under said ledge of said photoresist pattern leaving a horizontal gap between the top of said planarizing insulation layer on said substrate and the bottom of said photoresist pattern, dissolving said planarizing insulation layer coated photoresist pattern by introducing liquid solvent through said gap under said ledge of said photoresist pattern, removing the remaining photoresist pattern and said planarizing insulation layer thereon leaving the top of said tapered raised base electrode exposed and planarized within said uniform planarizing insulation layer having undulations of approximately 400 angstroms or less, applying a second photoresist pattern to provide a mushroom shaped isolated photoresist area on a portion of said base electrode where a tunnel barrier junction will be formed, evaporating and depositing a via insulation layer over the planarized layers, part of said base electrode, and said second photoresist pattern, dissolving said mushroom shaped photoresist pattern, removing the remaining photoresist pattern and the via insulation layer coated thereon leaving a via aperture at said tunnel barrier junction area in said via insulation layer,

applying a third photoresist pattern over said via insulation layer defining an open counter electrode area, oxidizing the exposed base electrode material in the bottom of said via aperture to form a tunnel barrier junction, evaporating and depositing counter electrode material in said open counter electrode area of said third photoresist pattern, and removing said third photoresist pattern leaving a planarized Josephson junction device comprising two electrodes and a tunnel barrier junction therebetween.

4,418,096

# PROCESS FOR PREPARING LAYERS OF $Hg_{1-x}Cd_xTe$

André Gauthier, Paris, and Jean C. F. Morand, Ozoir-la-Ferrière, both of France, assignors to Societe Anonyme de Telecommunications, France

Continuation of Ser. No. 161,916, Jun. 23, 1980, abandoned.

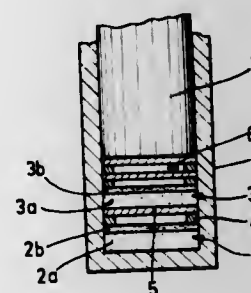
This application Nov. 19, 1981, Ser. No. 322,932

Claims priority, application France, Jun. 29, 1979, 79 17014

Int. Cl.<sup>3</sup> B05D 3/04

U.S. Cl. 427—76

6 Claims



1. A process for preparing layers of an alloy  $Hg_{1-x}Cd_xTe$  useful in the manufacture of infrared detectors, comprising the steps of introducing into a tube a wafer having a substrate of Cd Te and a superficial layer of  $Hg_{1-y}Cd_yTe$ , the value of y being less than the desired value of x, applying a mask above the wafer adding a quantity of mercury above the mask, introducing a piston into the tube for holding the whole in position, creating a vacuum inside the tube, sealing the tube, placing the tube in a furnace whose temperature is between 350° C. and 750° C. to subject the wafer to a thermal interdiffusion treatment without decomposing the layer of  $Hg_{1-y}Cd_yTe$ .

4,418,097

# COATING FOR GRAPHITE ELECTRODES

Mohan S. Misra, Lakewood, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Dec. 11, 1981, Ser. No. 329,896

Int. Cl.<sup>3</sup> B05D 5/12

U.S. Cl. 427—113

3 Claims

1. A process for reducing high temperature oxidation of a graphite electrode by forming on said electrode an outer coating of  $SiO_2$  powder and a subsurface coating of SiC bonded to the electrode surface, said process consisting of the steps of: (a) suspending SiC particles in a dimethylpolysiloxane fluid; (b) coating said electrode with the SiC-dimethylpolysiloxane fluid; and (c) heating said electrode to thereby facilitate the formation of said outer coating of  $SiO_2$  powder and said subsurface coating of SiC.

4,418,098

# IMAGING MEDIA CAPABLE OF DISPLAYING SHARP INDICIA

Anthony R. Maistrovich, Lake Elmo, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 182,974, Sep. 2, 1980,

abandoned. This application Feb. 12, 1982, Ser. No. 348,653

Int. Cl.<sup>3</sup> B05D 5/00; B32B 3/26; B41M 5/00

U.S. Cl. 427—161

12 Claims

1. In sheet material of the type wherein a base sheet is coated on at least one face with a layer comprising a first organic polymer containing interconnected microvoids, said layer being locally transparentizable to display contrasting indicia when there is applied to its exposed surface a transparent, colorless liquid which has a refractive index similar to that of the solid constituents of the layer but which is a non-solvent for said first polymer,

the improvement comprising, incorporated in said layer, a second organic polymer which has a solubility parameter differing from that of the liquid by about 2 hildebrands and which jellifies the liquid,

whereby the indicia maintain substantially the same dimensions throughout the time that the layer is locally transparentized.

11. The sheet material of claim 1 provided with contrasting indicia that maintain substantially the same dimensions during their period of visibility, said indicia being formed by localized transparentization of the microvoid-containing layer resulting from the presence of a transparent, colorless liquid that is a non-solvent for the solid constituents of the microvoid-containing layer and has a solubility parameter differing from that of the second organic polymer by about 2 hildebrands.

4,418,099

# NON-BURNISHED PRECIOUS METAL COMPOSITION

Danilo L. Cuevas, Kearney; Frank R. Russo, North Brunswick, and Francis E. Schindler, East Brunswick, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Feb. 5, 1982, Ser. No. 346,346

Int. Cl.<sup>3</sup> B06D 3/02

U.S. Cl. 427—229

26 Claims

1. A coating composition for glass or ceramic which, when fired, produces a lustrous satin burnished appearance without burnishing which comprises in combination:

- (a) a vehicle or solvent;
- (b) at least one precious metal metallo-organic component;
- (c) at least one base metal metallo-organic component; and
- (d) at least one non-metallic luster pigment.

4,418,100

# APPARATUS AND METHOD FOR REDUCING SPANGLE IN GALVANIZED PRODUCTS

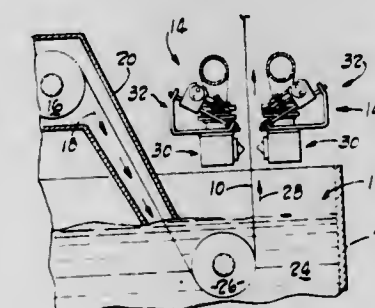
Junion L. Bedwell, and Harold C. Overton, both of Gadsden, Ala., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Feb. 2, 1982, Ser. No. 344,998

Int. Cl.<sup>3</sup> B05D 3/04, 3/12, 1/18

U.S. Cl. 427—348

18 Claims



14. A method of coating and cooling a substrate in a manner to reduce spangle, the method comprising steps of:

coating a substrate with a molten coating material, screening the coating material on the substrate by impinging air from an air knife thereagainst, and directing a gas and liquid spray directly toward the coated substrate at a location sufficiently close to where air from said air knife has impinged the coated substrate to have the air from the air knife materially affect the spray flow.

4,418,101

# METHOD OF MAKING THERMOPLASTIC HARDBOARD FROM ACETYLATED MAT

Cynthia B. House, Arlington Heights, Ill., and Robert J. Leichtli, Auburn, Ala., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 213,263, Dec. 5, 1980, Pat. No. 4,388,378.

This application Dec. 27, 1982, Ser. No. 453,859

Int. Cl.<sup>3</sup> B32B 23/04; D21F 11/00

U.S. Cl. 427—393

9 Claims

1. A method for acetylating wood fiber comprising the steps of forming said wood fiber into a substantially dry mat, coating the mat with from about 5% to about 70% by volume of acetic anhydride, enclosing the mat in a sealed space, heating the enclosed mat at a temperature of from about 150° F. to about 300° F. for a period of from about 20 minutes to about 120 minutes, and removing by-product acetic acid and residual anhydride.

4,418,102

# LIQUID CRYSTAL DISPLAYS HAVING IMPROVED HERMETIC SEAL

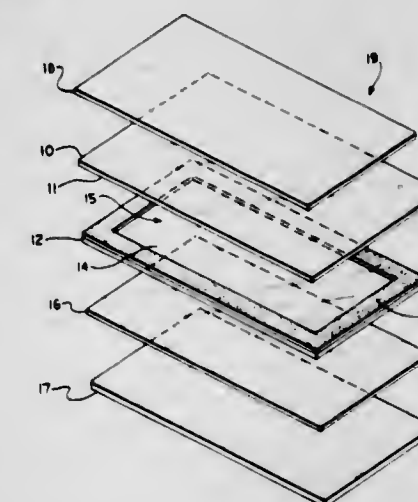
Joseph P. Ferrato, Stow, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 14, 1981, Ser. No. 263,791

Int. Cl.<sup>3</sup> G02F 1/13

U.S. Cl. 428—1

13 Claims



1. A hermetically sealed liquid crystal display comprising a liquid crystal layer enclosed between a pair of parallel plates of which at least one plate is transparent, said plates chemically bonded together by means of an electrically insulative sealant material disposed between the plates and surrounding the liquid crystal layer, said display having improved resistance to vapor penetration provided by said sealant material being a crosslinked thermoset product of an initially uncrosslinked composition comprising a mixture of at least one phenoxy resin and at least one epoxy resin in conjunction with a crosslinking agent, said composition adapted to be sufficiently flowable before crosslinking to enable the composition to be disposed as said sealant material between said plates, and said composition containing an amount of said crosslinking agent sufficient to insure that said composition is sufficiently crosslinked to provide said sealant material with improved resistance to vapor penetration after said composition has been disposed as said sealant material between the plates.



4,418,103

FILLING MATERIAL AND PROCESS FOR  
MANUFACTURING SAMEMasami Tani, Kurashiki; Tamemaru Esaki, Takatsuki, and  
Yoshikata Ohno, Asaguchi, all of Japan, assignors to Kuraray  
Co., Ltd., Kurashiki, Japan

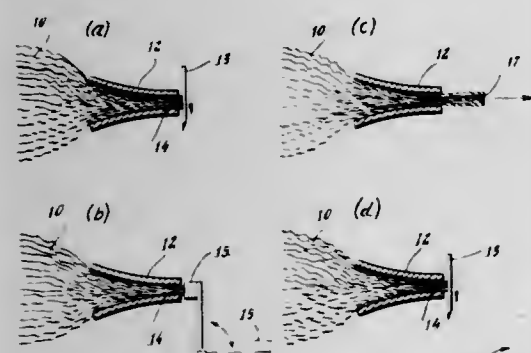
Filed Mar. 8, 1982, Ser. No. 355,859

Claims priority, application Japan, Jun. 8, 1981, 56-88559

Int. Cl.<sup>3</sup> D02G 1/00; D04D 7/06

U.S. Cl. 428—4

11 Claims



1. Filling material comprising a multiplicity of crimped fibers joined together at one end which spread spherically or radially about said one end, said fibers having a fineness of 0.05 to 30 denier, a crimping rate of at least 5%, and a maximum length of 50 mm, said fibers having 3 to 25 crimps per inch, said crimps being located in mutually deviating phases, and said fibers having a density of 30,000 to 1,500,000 denier/cm<sup>2</sup> at said end thereof.

5. A continuous process for manufacturing filling material, said process comprising the steps of:  
opening a tow of crimped fibers at a rate of at least 30%, said fibers having a fineness of 0.05 to 30 denier, a crimping rate of at least 5%, and from 3 to 25 crimps per inch;  
compressing at least one end of said opened tow until said tow has a fiber density of 30,000 to 1,500,000 denier/cm<sup>2</sup> at said end thereof;  
cutting said tow at said end thereof to expose a tow end surface;  
joining said fibers together at said tow end surface while said tow is maintained in its compressed position;  
cutting away a tow length of no more than about 50 mm from said end surface while said tow is maintained in its compressed position, whereupon said tow length is released from compression, and spreads spherically or radially about said end surface to form a spherically or radially spread fiber product; and  
repeating the foregoing sequence of steps to form a multiplicity of spherically or radially spread fiber products.

4,418,104

FUR-LIKE NAPPED FABRIC AND PROCESS FOR  
MANUFACTURING SAMEYoshiteru Kiyomura, Shiga; Yutaka Masuda, Otsu, and Tatsuji  
Kojima, Uji, all of Japan, assignors to Toray Industries, Inc.,  
Tokyo, Japan

Continuation of Ser. No. 199,545, Oct. 22, 1980, abandoned.

This application May 27, 1982, Ser. No. 382,569

Claims priority, application Japan, Oct. 25, 1979, 54-138146

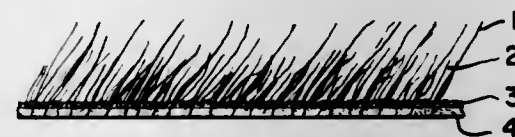
Int. Cl.<sup>3</sup> B32B 5/06; 7/08; D04H 11/00

U.S. Cl. 428—15

9 Claims

1. In a fur-like fabric of the type having a base cloth and a multiplicity of napped fibers extending from said base cloth the improvement wherein:

- (a) said napped fibers comprise sharpened tip portions disposed at at least one endwise fiber portion thereof;  
(b) said napped fibers being implanted in said base fabric by needle punching and raised from said points of implantation;  
(c) said points of implantation are not interconnected by said napped fibers;



- (d) said napped fibers are non-uniform in length;  
(e) said napped fibers are substantially uncrimped;  
(f) said napped fibers are parallel with substantially no intertwining therebetween; and  
(g) said napped fibers have a static frictional coefficient of less than 0.35.

4,418,105

DOUBLE-COATED TAPE CONSTRUCTION HAVING AN  
IDENTIFIABLE EXTENDED LINERJames A. Stratton, Mahtomedi, Minn., assignor to Minnesota  
Mining and Manufacturing Company, St. Paul, Minn.

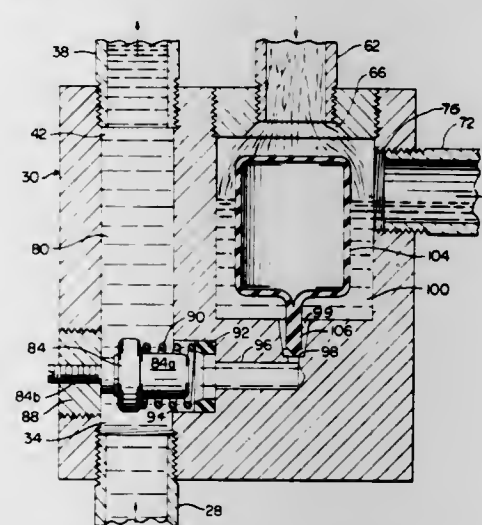
Continuation of Ser. No. 124,212, Feb. 25, 1980, abandoned.

This application Sep. 21, 1981, Ser. No. 303,952

Int. Cl.<sup>3</sup> B32B 3/02

U.S. Cl. 428—40

3 Claims



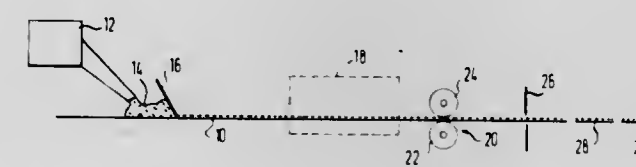
1. An adhesive tape assembly including a backing having a pressure sensitive adhesive coating covering its top and its bottom surfaces and a release liner covering one of said adhesive coatings, wherein one edge of said release liner is co-linear with said backing along one edge of said backing, and the opposing edge of said release liner extends laterally beyond the other edge of said backing so as to afford a tab portion for removing said release liner from said backing, and wherein said extended edge of said release liner has a different outer profile than said co-linear edge, with said outer profile of said extended edge being wave-shaped so as to afford its easy identification and location.

4,418,106

METHOD OF PRODUCING A FLOCKED COMPOSITE  
BODYJosef Landler, Wolfratshausen, and Max Mayr, Hart, both of  
Fed. Rep. of Germany, assignors to Alkor GmbH Kunststoffver-  
kauf, Munich, Fed. Rep. of GermanyContinuation of Ser. No. 127,856, Mar. 6, 1980, abandoned. This  
application Apr. 12, 1983, Ser. No. 483,418Claims priority, application Fed. Rep. of Germany, Mar. 15,  
1979, 2910234; Jul. 24, 1979, 2930007Int. Cl.<sup>3</sup> B32B 3/26

U.S. Cl. 428—89

32 Claims



1. A method for producing a flocked web comprising:  
(a) applying a layer of a spreadable thermosetting plastic material in the form of a foam onto a porous sheet carrier, the viscosity of said spreadable material and the porosity of the sheet carrier being such that the spreadable material penetrates only into the upper portion of the porous sheet carrier and does not penetrate completely through the carrier;  
(b) applying flocked fibers onto the thermosetting plastic material layer;  
(c) partially crosslinking the thermosetting plastic layer to fix the flocked fibers in the thermosetting plastic material layer;  
(d) pressing the composite composed of the carrier sheet, partially crosslinked plastic material layer and flock between embossing tools, particularly embossing rollers, said embossing tools being heated so as to continue the crosslinking of the plastic material layer, wherein at least one of the embossing tools adjacent the flocked layer has an embossing design therein so as to provide a corresponding embossed pattern on the flocked layer;  
(e) connecting the side of the porous sheet carrier to a backing which increases the stiffness of the carrier, said backing being a polyolefin/wood-dust panel, said connecting being effected in a press having opposite pressing tools, said back panel being introduced in the hot state together with the sheet carrier carrying said flocked layer of plastic material foam between said pressing tools such as to effect connection of said porous sheet carrier and said panel under pressure exerted by said pressing tools through the thermoplastified polyolefin of the back panel.

- generally rigid direction running in the short direction of said rectangular cover;  
(b) a flexible layer of ceramic fiber insulation adjacent one surface of said expanded metal backing;  
(c) first attaching means attaching said layer of ceramic fiber insulation to said expanded metal backing, said first attaching means adapted to permit said expanded metal backing and said attached layer of ceramic fiber insulation to flex in the said flexible direction;  
(d) a generally rigid elongated handle means extending in the direction of the long dimension of said rectangular cover and substantially the length thereof; and  
(e) second attaching means attaching said handle means to the other surface of said expanded metal backing, said second attaching means adapted to permit flexing of said expanded metal backing and said ceramic fiber insulation in said flexible long dimension independent of said generally rigid elongated handle means.

4,418,108

## COMPOSITE ROOFING PANEL

David C. K. Lin, Newark, Ohio, assignor to Owens-Corning  
Fiberglass Corporation, Toledo, Ohio

Filed Feb. 8, 1982, Ser. No. 346,696

Int. Cl.<sup>3</sup> B32B 3/10; 5/20

U.S. Cl. 428—139

6 Claims



1. A composite panel for roof insulation, said panel comprising a fibrous glass board susceptible to penetration of foamable liquid thereto when foamable liquid is placed on an upper surface thereof, a generally uniformly perforated sheet on the upper surface of the board for limiting penetration of foamable liquid thereto during manufacture of the panel while allowing bonding of foam thereto at the perforations, and a layer of plastic foam foamed and cured in place from foamable liquid placed on top of the perforated sheet, the perforated sheet having at least two generally circular holes per square inch, the diameter of the holes of the perforated sheet being 0.46 of an inch or less, and the amount of open area represented by the holes being less than 1.5 percent of the total area of the sheet.

4,418,109

## DURABLE, LOW-MAINTENANCE FLOORING TILE

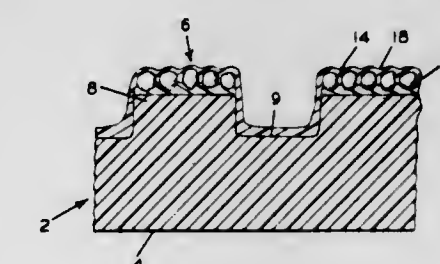
Jesse D. Miller, Jr., Lancaster; James A. Tshudy, Ephrata, and  
Ralph E. Unruh, Denver, all of Pa., assignors to Armstrong  
World Industries, Inc., Lancaster, Pa.

Filed Mar. 29, 1982, Ser. No. 362,645

Int. Cl.<sup>3</sup> B32B 3/00; 5/16

U.S. Cl. 428—142

3 Claims



4,418,107

## COVER FOR CARBON BAKE PIT

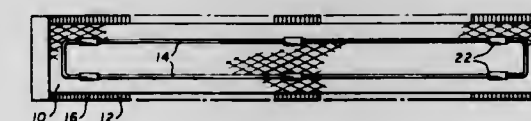
Richard J. Yost, Medford Lakes, N.J., assignor to Combustion  
Engineering, Inc., Windsor, Conn.

Filed May 20, 1982, Ser. No. 380,199

Int. Cl.<sup>3</sup> F27D 1/18; B32B 3/24

U.S. Cl. 428—138

3 Claims



1. A flexible insulated rectangular cover comprising:  
(a) an expanded metal backing having the generally flexible direction of said expanded metal running in the direction of the long dimension of said rectangular cover and the

1. A decorative plastic floor covering in tile form compris-



ing a decorative plastic base having raised and depressed areas, and a plurality of elements positioned on the raised areas only, a cured clear or translucent wear layer overlying both the elements and the plastic base, said elements comprising particles embedded in a cured plastic matrix positioned only on the surface of the raised areas of the base, said particles being distributed on the plastic matrix in a substantially abutting relationship with a single layer structure of particles, those particles protruding above the matrix, but being below the uppermost level of the wear layer, the particles are rounded inorganic particles and have a Moh hardness greater than 4, and a particle size distribution such that none of the particles are greater than about 595 microns, and about 55% of the particles are between about 149 and 296 microns.

4,418,110

**VAPOR-PERMEABLE RETROREFLECTIVE SHEETING**  
David C. May, Stillwater, and Terry R. Bailey, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Jun. 21, 1982, Ser. No. 390,636  
Int. Cl.<sup>3</sup> G09F 13/16, 13/06

U.S. Cl. 428—143

17 Claims



1. Retroreflective sheeting comprising a monolayer of transparent microspheres, a metallic specularly reflective layer underlying and in optical connection with the microspheres, and a transparent polymeric layer in which the microspheres are supported; the specularly reflective layer having an extensive array of minute discontinuities sufficient for the sheeting to transmit water vapor through the sheeting at a rate of at least 15 grams/square meter/24 hours.

4,418,111

**NON-SKID SURFACE COMPOSITIONS FOR PAPER PRODUCTS**

Donald Carstens, Anacortes, Wash., assignor to Key Tech Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 252,035, Apr. 8, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,340  
Int. Cl.<sup>3</sup> B32B 5/16, 29/04

U.S. Cl. 428—145

23 Claims

1. An article comprising a paper substrate formed at least in part from recycled fiber having adhered to at least one surface thereof an anti-skid effective amount of a composition resulting from an aqueous solution comprising colloidal silica having a pH greater than 7 to approximately 11 and a mean particle size in the range of 10 to 150 millimicrons, and a clathrating agent selected from the group consisting of urea and thiourea.

4,418,112

**COMPOSITE FILM AND UTILIZATION THEREOF**

Takashi Toyoda, Yozo Ohba, and Masaaki Yamanaka, all of Hasaki, Japan, assignors to Oji Yuka Goseishi Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,976

Claims priority, application Japan, Sep. 16, 1980, 55-128350  
Int. Cl.<sup>3</sup> B32B 7/02, 5/16

U.S. Cl. 428—212

3 Claims

1. A composite film for a diazo copying paper comprising a biaxially oriented backing layer comprising a polyolefin resin containing finely divided calcium carbonate dispersed therein in a quantity of from 0 to 45 parts by weight per 100 parts by weight of the resin, an interlayer comprising a polyolefin resin

containing finely divided calcium carbonate dispersed therein in a quantity of from 10 to 200 parts by weight of the resin, which interlayer is bonded to at least one surface of the backing layer, and a uniaxially oriented surface layer comprising a polyolefin resin containing a finely divided acidic filler dispersed therein in a quantity of from 20 to 300 parts by weight per 100 parts by weight of the resin, which surface layer is bonded to the surface of the interlayer and has a thickness of from 3 to 15 microns and has fine surface cracks and which surface layer is to receive thereon a photosensitive diazo layer.

4,418,113

**REINFORCING MAT FOR FIBER REINFORCED PLASTIC MATERIAL**

Sadao Kawashima, and Chiharu Ito, both of Sohwa, Japan, assignors to Asahi Fiber Glass Company Limited, Tokyo, Japan

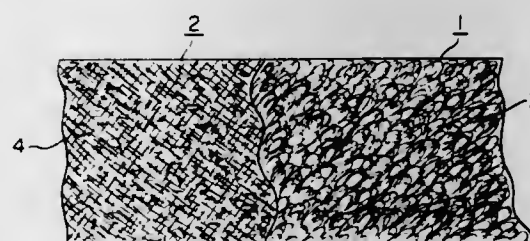
Continuation of Ser. No. 239,648, Mar. 2, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,419

Claims priority, application Japan, Mar. 21, 1980, 55-35804[U]

Int. Cl.<sup>3</sup> B32B 17/02, 17/04, 17/12

U.S. Cl. 428—213

18 Claims



1. A reinforcing mat for fiber reinforced plastic material to be manufactured by the hand-layup process, which consists essentially of:

- a first layer of curled glass fiber strands arranged in a non-directional manner in the layer, each strand being formed of a collection of at least 300 glass filaments and each having a length of more than 60 cm and the density of said first layer being in a range of from 400 g/m<sup>2</sup> to 1500 g/m<sup>2</sup>;
- a second layer, thinner than said first layer, of glass fiber strands arranged in a non-directional manner on said first layer, the length of the strands being in a range of from 2 cm to 15 cm and the density of said second layer being in a range of from 50 g/m<sup>2</sup> to 500 g/m<sup>2</sup>; and
- a polyester binder for bonding said first and said second layers.

4,418,114

**COEXTRUDED THERMOPLASTIC STRETCH-WRAP**

William F. Briggs, Chelmsford, Mass., and Edward M. Bullard, Rochester, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 373,079, Apr. 29, 1982, which is a continuation of Ser. No. 187,678, Sep. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 942,715, Sep. 15, 1978, abandoned. This application Aug. 11, 1982, Ser. No. 407,205

Int. Cl.<sup>3</sup> B32B 7/02, 27/08, 27/32; B65B 53/00

U.S. Cl. 428—218

5 Claims

- 1. A unitized plurality of goods comprising: a plurality of goods having a polyethylene stretch wrap film layed on about the girth of said goods in stretched condition, the end region of said film being attached to a previous layer of said film; said polyethylene stretch wrap film comprising a coextruded three-layer thermoplastic film having a core layer comprising a linear low-density polyethylene, said linear low-

density polyethylene consisting essentially of ethylene copolymerized with a minor amount of at least one alpha-olefin having 4 to 10 carbon atoms and exterior skin layers comprising highly branched low density polyethylene.

4,418,115

**FRICTION LINING**

Michel Le Lannou, Erment, France, assignor to Valeo S.A., Paris, France

Filed Aug. 25, 1981, Ser. No. 296,231

Claims priority, application France, Sep. 4, 1980, 80 19087

Int. Cl.<sup>3</sup> F16D 69/02

U.S. Cl. 428—283

5 Claims

1. A friction lining containing mineral fibers, organic fibers, fillers and a binder, wherein said organic fibers are all of the initially fusible type but cross-linkable to form a protective crust under the heating conditions of service.

4,418,116

**COPOLYESTER BINDER FILAMENTS AND FIBERS**

Paul T. Scott, Kinston, N.C., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 3, 1981, Ser. No. 317,874

Int. Cl.<sup>3</sup> D02G 3/04, 3/34; D04H 1/04, 3/14

U.S. Cl. 428—288

8 Claims

1. A copolyester binder filament wherein the copolyester consists essentially of a terephthalate of ethylene and diethylene glycols and the mol percent of diethylene glycol based on the mols of terephthalate is within the range of 25 to 35%, with the binder filaments having a crystallinity based on fiber density of less than 25%, and the copolyester having a crystalline half-time at 150° C. of greater than 2 minutes.

6. A blend of filaments suitable for making a heat-bonded filament structure consisting essentially of filaments of poly-(ethylene terephthalate) and from 5 to 35% by weight of binder filaments of a copolyester which consists essentially of a terephthalate of ethylene and diethylene glycols in which copolyester the mol percent of diethylene glycol based on mols of terephthalate is within the range of 25 to 35%, with the binder filaments having a crystallinity based on fiber density of less than 25%, and the copolyester having a crystalline half-time at 150° C. of greater than two minutes.

4,418,117

**CONDUCTIVE BARRIER COAT FOR ELECTROSTATIC MASTERS**

Michael J. Shaw, Paw Paw, Mich., assignor to Allied Paper Incorporated, Kalamazoo, Mich.

Division of Ser. No. 235,602, Feb. 18, 1981, Pat. No. 4,379,822.

This application Dec. 21, 1982, Ser. No. 451,784

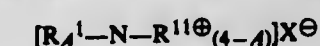
Int. Cl.<sup>3</sup> B32B 5/16; G03G 5/14

U.S. Cl. 428—327

3 Claims

1. In a substrate suitable for the preparation of printing masters comprising a base and a water resistant barrier coat applied to said base, the masters having a photoconductive layer comprising a photoconductive material and a binder applied to said barrier coat; the improvement wherein said barrier coat comprises, on a dry weight basis;

- (a) a film-forming amount of about 50-95% of an ethylene acrylic acid copolymer;
- (b) a conductive amount of about 5-15%, sufficient to obtain a resistivity less than about 10<sup>11</sup> ohms per square, of a quaternary ammonium salt having the formula;



wherein R<sup>1</sup> is a radical selected from the group consisting of



R<sup>11</sup> is lower alkyl having from one to three carbon atoms; A is 1, 2, or 3; and

X is an anion selected from the group consisting of chloride, fluoride, bromide, sulfate, phosphate or acetate; and (c) filler, a proportion of which is plastic particles, present in the amount of about 0-100% based on the dry weight of copolymer, said barrier coat being substantially free of materials which affect water resistance.

4,418,118

**ELECTROLUMINESCENCE STRUCTURE**

Sven G. Lindors, Espoo, Finland, assignor to Oy Lohja Ab, Virkkala, Finland

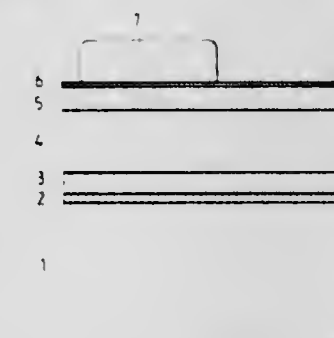
Filed Apr. 8, 1982, Ser. No. 366,573

Claims priority, application Finland, Apr. 22, 1981, 811244

Int. Cl.<sup>3</sup> H05B 33/14; B32B 17/06

U.S. Cl. 428—336

8 Claims



1. An electroluminescence structure including a substrate member, acid structure further comprising: a first electrode layer disposed on the substrate; a second electrode layer forming a thick film comprising a binder and conductive particles; and a luminescence layer and at least first and second additional layers disposed between the first and the second electrode layers; wherein said first additional layer is disposed between a said electrode layer and the luminescence layer and has at least one of the functions of current limitation and chemical protection; and wherein said second additional layer is formed of resistive material having a thickness of the order of about 10-100 nm, is disposed between the second electrode layer and the luminescence layer, and is bounded by the second electrode layer so as to form a spreading resistance for the point contacts formed by the conductive particles in the second electrode layer for homogenizing inhomogeneous current densities before the currents reach the luminescence layer.

4,418,119

**OVENABLE BOARD**

George W. Morrow, and Phillip R. Lambert, Cullman, both of Ala., assignors to Daubert Industries, Inc., Oak Brook, Ill.

Filed Nov. 18, 1981, Ser. No. 322,437

Int. Cl.<sup>3</sup> B32B 9/04; B05D 3/02

U.S. Cl. 428—342

2 Claims

1. An ovenable board for packaging of pizza comprising a paperboard substrate material having two discrete coatings palced thereon, the first coating comprising at least one addition to the surface of said substrate of a coating of polyvinyl alcohol, said polyvinyl alcohol being present on the paper substrate material in an amount in the range of from about 3 to about 12 pounds per ream of said paperboard substrate and a second coating comprising a layer of a silicone release coating being placed on the exposed surface of said first coating of polyvinyl alcohol, said second coating being present on the surface of said first coating comprising polyvinyl alcohol in an



amount in the range of from about 0.7 to about 0.9 pounds per ream of said paperboard substrate and being inert to and not absorbed by the components of said pizza which are in contact with said second coating, that their integrity is unaffected at temperatures ranging from about 0° F. to about 350° F.

4,418,120

## TACKIFIED CROSSLINKED ACRYLIC ADHESIVES

Joanne P. Kealy, Maplewood, Minn., and Robert E. Zenk, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Jul. 19, 1982, Ser. No. 399,350

Int. Cl.<sup>3</sup> C09J 7/02; B05D 1/36

U.S. Cl. 428—343

7 Claims

1. Normally tacky and pressure-sensitive adhesive tape comprising a sheet material having, on at least one surface, a thin layer of normally tacky and pressure-sensitive adhesive containing trace amounts of solvent and consisting essentially of an at least substantially surfactant-free blend of (a) a crosslinked pressure-sensitive copolymer of 100 parts by weight of monomers consisting essentially of iso-octyl acrylate and 3-7 parts by weight of acrylic acid, said copolymer, prior to crosslinking being soft, tacky, and having an inherent viscosity on the order of 0.75-1.5 dl/g, (b) a small amount of an antioxidant that is based on either a hindered phenol or a sulfur-containing organo-metal salt, and (c) a tackifying rosin ester, said adhesive having the properties of (1) a rolling ball tack value of less than 6 cm, (2) an ability to bond firmly to stainless steel, ABS terpolymer, low density polyethylene, and isotactic polypropylene, and (3) a shear value of at least 5,000 minutes at 70° C.

4,418,121

## TILE FOR CONSTRUCTION REPRESENTING ANTIQUE PATTERN

Kaneaki Moriyama, 24-2 Mukocho 1-chome, Amagasaki-shi, Hyogo, 661, Japan

PCT No. PCT/JP79/00163, § 371 Date Feb. 23, 1981, § 102(e) Date Jul. 10, 1980, PCT Pub. No. WO81/00015, PCT Pub. Date Jan. 8, 1981

PCT Filed Jun. 23, 1979, Ser. No. 227,096

Int. Cl.<sup>3</sup> C04B 41/02; E04F 13/14

U.S. Cl. 428—409

4 Claims

1. A method of producing construction tiles having an antique color appearance comprising the steps of:  
(1) removing refractory bricks used to line a high temperature furnace fueled by oil or coke and exposed to the highest temperature in said furnace, the removed refractory bricks having an antique color appearance on the exposed surfaces thereof and ordinarily discarded as waste; and  
(2) cutting the removed refractory bricks to produce tiles having antique colored surfaces.

4,418,122

## ELECTRICAL CONDUCTOR WITH POLYESTER INSULATING LAYER AND METHOD THEREFOR

Werner Rieder, Vienna, and Martin Fehrle, Bietigheim-Bissingen, both of Austria, assignors to Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Division of Ser. No. 375,205, May 5, 1982, Pat. No. 4,388,454. This application Mar. 2, 1983, Ser. No. 471,266

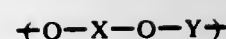
Claims priority, application European Pat. Off., May 7, 1981, 81-890076.3; Austria, Dec. 9, 1981, 5278/81

Int. Cl.<sup>3</sup> B32B 15/08; C08G 63/16; B05D 5/12

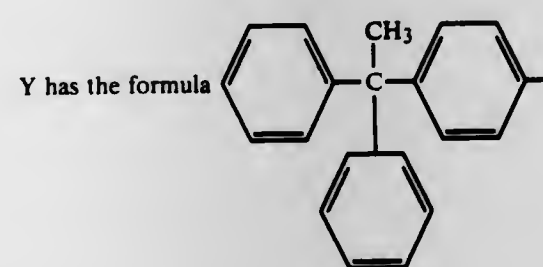
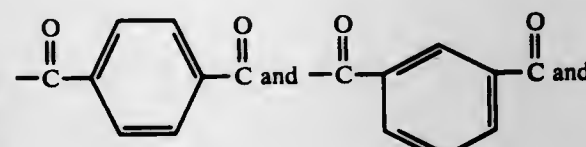
U.S. Cl. 428—480

14 Claims

1. An electrical conductor provided with an electrically insulating layer of an organic, high-molecular weight polyester containing substantially chain members of the formula

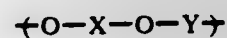


wherein X is at least one member selected from the group consisting of

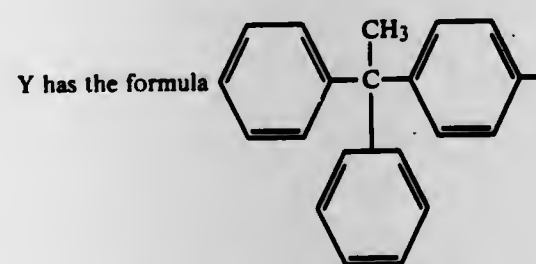
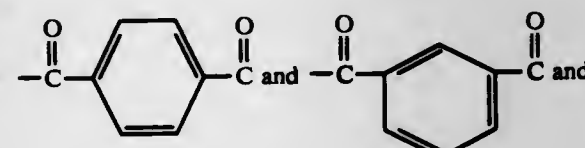


having an inherent viscosity of at least 1.0 dl/g measured at 30° C. in a solution of 0.5 g of the polyester in 100 ml of a mixture of 60% by weight of phenol and 40% by weight of 1,1,2,2-tetrachloroethane and whose films cast from a chlorinated organic solution have an elongation at break of more than about 20%.

8. A method of insulating an electrical conductor comprising providing the exterior surface of the electrical conductor with an electrically insulating layer of an organic, high-molecular weight polyester containing substantially chain members of the formula



wherein X is at least one member selected from the group consisting of



having an inherent viscosity of at least 1.0 dl/g measured at 30° C. in a solution of 0.5 g of the polyester in 100 ml of a mixture of 60% by weight of phenol and 40% by weight of 1,1,2,2-tetrachloroethane and whose films cast from a chlorinated organic solution have an elongation at break of more than about 20%.

4,418,123

## EXTRUDABLE SELF-ADHERING ELASTIC AND METHOD OF EMPLOYING SAME

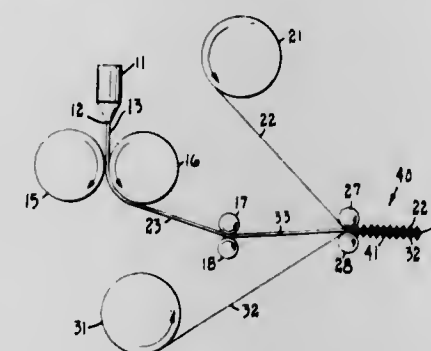
William L. Bunnelle, Stillwater, and Richard C. Lindmark, Coon Rapids, both of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 141,959, Apr. 21, 1980, abandoned, which is a division of Ser. No. 36,858, May 7, 1979, Pat. No. 4,259,220, which is a continuation-in-part of Ser. No. 944,845, Sep. 22, 1978, abandoned, and a continuation-in-part of Ser. No. 966,794, Dec. 6, 1978, abandoned. This application Dec. 3, 1981, Ser. No. 326,949

Int. Cl.<sup>3</sup> B32B 27/08, 31/08

U.S. Cl. 428—517

21 Claims



1. A method for imparting elastic properties to a flexible substrate, which comprises contacting a surface of the flexible substrate with a band of a self-adhering elastic composition which consists essentially of:

- (a) a block copolymer comprising at least one substantially amorphous, rubbery polymeric midblock and at least one glassy poly(vinylarene) end blocks;
- (b) about 20 to 150 parts by weight of a midblock associating resin; and
- (c) about 10 to 50 parts by weight of an endblock associating resin having a glass transition temperature and a softening point above about 115° C. each per 100 parts of the block copolymer;

wherein the proportions of components (a), (b), and (c) are selected to provide the following properties:

- (i) a tensile strength at 500% elongation, determined at 20°-25° C., of at least 50 pounds per square inch;
- (ii) a 180° peel resistance, according to PSTC-1, determined at 20°-25° C. 24 hours after formation of the pressure-sensitive adhesive bond, of at least about 450 grams per 25.4 mm-width;
- (iii) a dead load deformation, tested at 37.8° C. and 1500 g/cm<sup>2</sup>, less than 50%; and
- (iv) a loss modulus of 5×10<sup>4</sup> to 100×10<sup>4</sup> dynes/cm<sup>2</sup>, a storage modulus of 65×10<sup>4</sup> to 225×10<sup>4</sup> dynes/cm<sup>2</sup>, and a loss tangent of 0.03 to 1.0, at 0.01-0.25 Hz at 25°-50° C.

13. The method for imparting a self-adhering elastic to a flexible substrate comprising the steps of:

- (a) unreeling a band of self-adhering elastic composition from a roll, said roll being maintained at a temperature below the softening point of said self-adhering elastic and said band of self-adhering elastic being an extrudate at least 50 microns in thickness which consists essentially of a block copolymer comprising at least one substantially amorphous, rubbery polymeric midblock and at least two glassy poly(vinylarene) end blocks; (ii) 20-150 parts per hundred of a midblock associating resin; and (iii) 10-150 parts per hundred of an aromatic, essentially hydrocarbon endblock associating resin having a T<sub>g</sub> and a softening point above 115° C. each per one hundred parts of the block copolymer; wherein the proportions (i), (ii), and (iii) are selected to provide the following properties:
- (i) a tensile strength at 500% elongation, determined at 20°-25° C., of at least 50 pounds per square inch;
- (ii) at 180° peel resistance, according to PSTC-1, determined at 20°-25° C. 24 hours after formation of the

pressure-sensitive adhesive bond, of at least about 450 grams per 25.4 mm-width;  
(iii) a dead load deformation, tested at 37.8° C. and 1500 g/cm<sup>2</sup>, less than 50%; and  
(iv) a loss modulus of 5×10<sup>4</sup> to 100×10<sup>4</sup> dynes/cm<sup>2</sup>, a storage modulus of 65×10<sup>4</sup> to 225×10<sup>4</sup> dynes/cm<sup>2</sup>, and a loss tangent of 0.03 to 1.0, at 0.01-0.25 Hz at 25°-50° C.

(b) contacting the band of self-adhering elastic with a surface of a flexible substrate forming a bond between the substrate and elastic.

4,418,124

## PLASMA SPRAY-CAST COMPONENTS

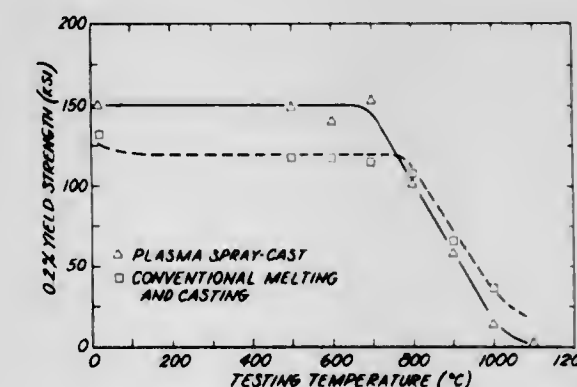
Melvin R. Jackson, and John R. Rairden, III, both of Schenectady, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 194,084, Oct. 6, 1980. This application Aug. 14, 1981, Ser. No. 292,857

Int. Cl.<sup>3</sup> B05D 1/10

U.S. Cl. 428—548

22 Claims



1. An article of manufacture formed by the low pressure/high velocity plasma spray-casting of a superalloy selected from the group consisting of nickel-base superalloy, cobalt-base superalloy and iron-base superalloy, said article in the as-plasma-spray-cast condition having a density greater than about 97% of theoretical, the superalloy of said article having in the as-plasma-spray-cast condition a grain size in the range of from about 0.2 micron to about 0.5 micron, less than about 1,000 parts per million oxygen and a chemically homogeneous microstructure substantially free from microsegregation.

4,418,125

## MULTI-LAYER MULTI-METAL ELECTROPLATED PROTECTIVE COATING

John A. Henricks, 742 N. Oak Park Ave., Oak Park, Ill. 60302

Filed Dec. 6, 1982, Ser. No. 432,562

Int. Cl.<sup>3</sup> C25D 5/14; B32B 15/01, 15/18

U.S. Cl. 428—639

2 Claims

1. A method of electroplating a composite protective coating for steel which comprises electroplating on said steel an initial layer of about 0.00015" of sulfur free nickel, followed by about 0.00015" of sulfur containing bright nickel and followed in succession by about 0.0002" of cadmium and by about 0.0002" of copper which is then coated with a second layer of about 0.00015" of sulfur free nickel and a second layer of about 0.00015" of sulfur containing bright nickel, after which the bright nickel is electroplated with about 0.00001" of microporous chromium.

2. A steel article coated with the composite multi-layer multi-metal coating of claim 1.



4,418,126

**MAGNETIC RECORDING MEDIUM**

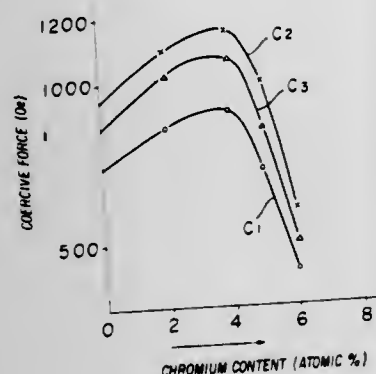
Toshiaki Izumi, Yasuta Taketomi, and Takayoshi Kobuke, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,548

Claims priority, application Japan, Jul. 28, 1980, 55-103405  
Int. Cl.<sup>3</sup> G11B 5/70

U.S. Cl. 428—694

2 Claims



1. A magnetic recording medium which comprises a thin metallic magnetic layer on a non-magnetic substrate wherein said thin metallic magnetic layer is made of cobalt, nickel and chromium having a ratio of cobalt to nickel in a range of 9:1 to 7:3 and chromium content of up to 5 atomic percent based on the total of cobalt and nickel.

4,418,127

**BATTERY CELL MODULE**

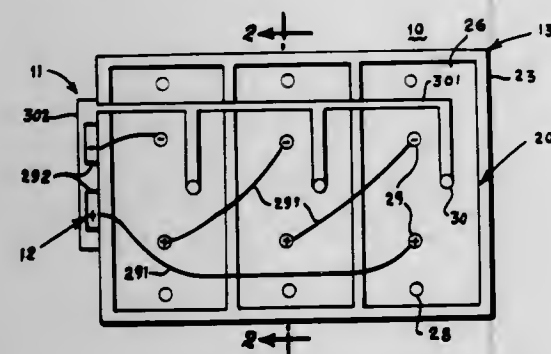
John S. Shambaugh, Holliston; Robert G. Yetman, Carlisle, and Hyman Zeltzer, Needham, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1981, Ser. No. 324,348

Int. Cl.<sup>3</sup> H01M 14/00

U.S. Cl. 429—8

5 Claims



1. A battery cell module for use with high energy lithium sources comprising:

a plurality of battery cells, each of said battery cells having a cell casing made of metal and shaped as a rectangular compartment, a vent valve fitting attached to the top of said cell casing, a pair of cell electrical terminals attached to the top of said cell casing, and fill ports in the top of said cell casing;

means for containing said plurality of battery cells, said containing means including a metal modular casing shaped as a rectangular compartment having an open top, a plastic top cover for fixedly mounting in said open top of said modular casing, spacers for aligning and electrically insulating said battery cells mounted in said containing means, and foam for potting said plurality of battery cells in said modular casing, said foam filling voids between said modular casing and said cell casing and being bonded to said modular casing, said top cover, and each of said cell casing to form a composite wall being a unitized

structure capable of withstanding high internal pressure from within said battery cells;

means for electrically connecting said plurality of battery cells, said electrically connecting means connected to said cell electrical terminals, said cell electrical terminals extending through said top cover of said modular casing whereon said electrically connecting means makes contact; and

chemical scrubbing means attached to the external surface of said modular casing, said scrubbing means operably connected to said vent valve fitting of each of said battery cells extending through said top cover.

4,418,128

**METAL-BROMINE SECONDARY BATTERY**

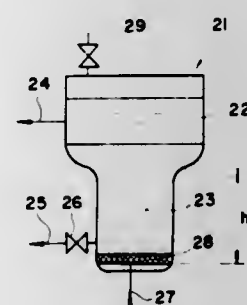
Toshinobu Fujii, Hino, Japan, assignor to Meldensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,817

Int. Cl.<sup>3</sup> H01M 2/40

U.S. Cl. 429—70

3 Claims



1. In an electrolyte circulation type secondary battery in which the positively active material is bromine and the negatively active material is a metal selected from the group consisting of cadmium, zinc and lead, wherein the improvement in the metal-bromine secondary battery comprises an anode electrolyte storage tank having a complexing agent storage tank having a smaller cross-sectional area contained in the lower portion therein, wherein recycled electrolyte is introduced in the anode electrolyte storage tank by first passing the electrolyte through a complexing agent stored in the lower portion therein.

4,418,129

**ELECTROCHEMICAL CELL**

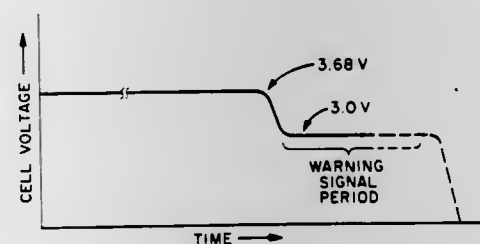
Franz Goebel, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 3, 1982, Ser. No. 354,275

Int. Cl.<sup>3</sup> H01M 6/14

U.S. Cl. 429—91

8 Claims



1. A button-type electrochemical cell comprising: a generally-flat housing enclosing a volume; an electrochemical system within the housing and including an electrolytic solution and a generally-flat battery stack exposed to said electrolytic solution, said battery stack comprising: a pair of spaced-apart carbon cathode elements each in the form of a flat disc; and

a generally-flat anode structure between the pair of carbon cathode elements and comprising:

a first, flat, active element of a first material having a first oxidation potential within the cell, said first active element being consumed by electrochemical action within the cell during discharge of the cell and establishing a first value of operating voltage for the cell during discharge of the cell and the consumption of the first active element; and

a second, flat, active element of a second material having a second oxidation potential within the cell, said second active element being consumed by electrochemical action within the cell during discharge of the cell and establishing a second, different value of operating potential for the cell during discharge of the cell and consumption of the second active element;

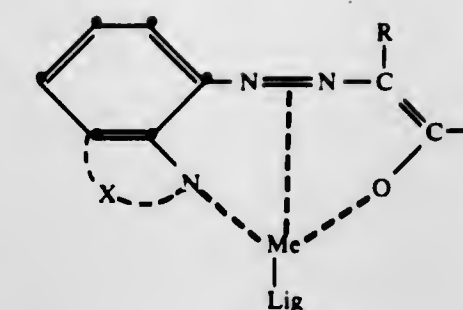
said first and second active elements being arranged with respect to each other so that one of the active elements is consumed before the other whereby the value of operating voltage of the cell changes from one of its two values to the other of its two values;

wherein:

the electrolytic solution includes a catalytically-reducible soluble cathode;

the carbon cathode elements are porous carbon structures operative during discharge of the cell to catalytically reduce the soluble cathode of the electrolytic solution; and

the first active element is of a material having a greater oxidation potential within the cell than that of the second active element and covers the second active element.



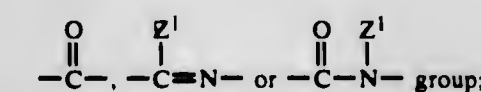
wherein:

(a) X represents the atoms necessary to complete a 5- or 6-membered aromatic heterocyclic fused ring;

(b) Z represents alkyl, substituted alkyl, aryl or substituted aryl;

(c) R represents CN or J-L;

(d) J represents a bivalent



(e) L represents alkyl, substituted alkyl, aryl, substituted aryl, or can be taken together with Z to complete a carbonyl-containing 5- or 6-membered heterocyclic or carbocyclic ring;

(f) Z<sup>1</sup> represents the same groups as Z;

(g) Lig is a monoanionic tridentate ligand; and

(h) Me is a polyvalent, hexacoordinate metal ion.

4,418,132

**MEMBER FOR ELECTROSTATIC PHOTOCOPYING WITH Si<sub>3</sub>N<sub>4-x</sub> (0 < x < 4)**

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

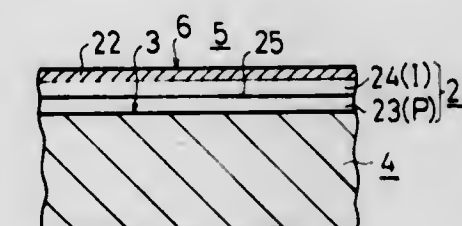
Filed Jun. 23, 1981, Ser. No. 276,503

Claims priority, application Japan, Jun. 25, 1980, 55-86801

Int. Cl.<sup>3</sup> G03G 5/082, 5/14

U.S. Cl. 430—57

5 Claims



1. A printing member for electrostatic photocopying comprising:

a substrate having a conductive surface; and a photoelectrically-sensitive, electrically chargeable layer on the conductive surface of the substrate;

wherein the photoelectrically-sensitive, electrically chargeable layer has a non-single-crystalline semiconductor layer on the conductive surface of the substrate and an insulating or semi-insulating layer formed on the non-single-crystalline semiconductor layer;

wherein the non-single-crystalline semiconductor layer is formed principally of Si<sub>3</sub>N<sub>4-x</sub> (0 < x < 4) and has a first layer on the side of the substrate and a second layer on the first layer to create a transition region;

wherein the first layer is P or N type, the second layer is I type, and the transition region is PI or NI type depending on whether the first layer is P or N type;

wherein the energy band gap of the first layer is equal to or less than the energy band gap of the second layer which in

4,418,131

**PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE YELLOW DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF**

Steven Evans, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 392,509, Jun. 28, 1982. This application Apr. 14, 1983, Ser. No. 484,801

Int. Cl.<sup>3</sup> G03C 1/40, 1/10, 1/84; C09B 45/00

U.S. Cl. 430—17

7 Claims

1. A photographic element comprising a support having thereon a layer comprising a photographic mordant having bound thereto a coordination complex having the formula:



turn is much less than the energy band gap of the insulating or semi-insulating layer.

4,418,133

# DISAZO PHOTOCONDUCTIVE MATERIAL AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING DISAZO PIGMENT LAYER

Kazuharu Katagiri, Mitaka; Shoji Umehara, Fuchu; Katsunori Watanabe, Yamato, and Shozo Ishikawa, Sayama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Mar. 4, 1982, Ser. No. 354,899

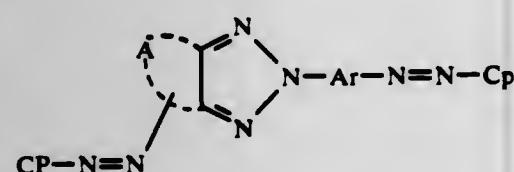
Claims priority, application Japan, Mar. 27, 1981, 56-44066; Jul. 17, 1981, 56-112658; Jul. 17, 1981, 56-112659

Int. Cl.<sup>3</sup> G03G 5/06

U.S. Cl. 430—58

26 Claims

1. An organic photoconductive material represented by the formula



wherein A is an atomic group necessary for completing a substituted or unsubstituted aromatic hydrocarbon ring, Ar is a substituted or unsubstituted arylene group, and Cp is a coupler residue.

4,418,134

# AQUEOUS COMPOSITION-SENSITIVE PHOTOCONDUCTIVE COMPOSITION

Jayanti Patel, Fairlawn, N.J., and Ken-ichi Shimazu, Briarcliff Manor, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation of Ser. No. 289,027, Aug. 3, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,612

Int. Cl.<sup>3</sup> G03G 5/087, 5/06, 5/09

U.S. Cl. 430—88

11 Claims

1. A photoconductive composition, which is dispersible in aqueous compositions, consisting essentially of an admixture of  
I. at least one inorganic photoconductor selected from the group consisting of ZnO and TiO<sub>2</sub>,  
II. at least one photoconductive anthraquinone pigment, and  
III. at least one insulating resin soluble or dispersible in an aqueous composition.

4,418,135

# THERMALLY-STABLE, INFRARED-SENSITIVE ZINC OXIDE ELECTROPHOTOGRAPHIC COMPOSITIONS ELEMENT AND PROCESS

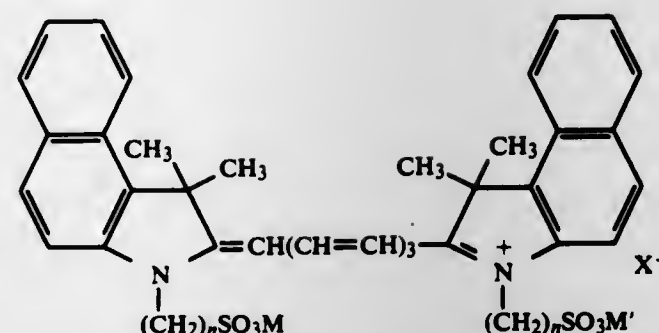
Karl W. Beeson, Princeton; Himangshu R. Bhattacharjee, and Frederick R. Hopf, both of Parsippany, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.  
Filed Sep. 22, 1982, Ser. No. 421,703

Int. Cl.<sup>3</sup> G03G 5/05

U.S. Cl. 430—93

18 Claims

1. A photoconducting composition for use in electrophotography comprising:  
(a) photoconducting zinc oxide,  
(b) a binder for the zinc oxide comprising a mixture of a styrene acrylate resin and a vinyl alkanolate resin, and  
(c) a sensitizing dye selected from those having the general formula



wherein n is an integer in the range between 1 and 7, M and M' are independently selected from the group consisting of hydrogen and the alkali metals, and X is an acid anion.

10. A photosensitive sheet comprising a substrate having a surface that is coated with the composition of claim 1.

15. A process for preparing an electrophotographic image on a photosensitive sheet comprising the sequential steps of:

- (a) electrically charging the coated surface of the photosensitive sheet of claim 10,
- (b) imagewise exposing the photosensitive sheet to a beam of electromagnetic radiation whose wavelength is in the range between about 780 and about 840 nm, and
- (c) toning the sheet with an electrostatic toner to produce a toned image.

4,418,136

# ELECTROPHOTOGRAPHIC ELEMENT COMPRISES ARSENIC SELENIDE DOPED WITH BI

Masahiro Kameda, Ibaragi, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 17, 1982, Ser. No. 379,223

Claims priority, application Japan, May 21, 1981, 56-76874

Int. Cl.<sup>3</sup> G03G 5/09

U.S. Cl. 430—95

12 Claims

1. An electrophotographic element comprising an electrically conductive substrate and a first photoconductive layer on said substrate, said first photoconductive layer consisting essentially of As<sub>2</sub>Se<sub>3</sub> containing an amount of Bi metal effective to extend the sensitivity of the As<sub>2</sub>Se<sub>3</sub> to include sensitivity to radiation having a wavelength longer than 80 nm, the amount of Bi metal also being effective to maintain the electric charge characteristics of said first photoconductive layer substantially equivalent to those of a layer consisting of As<sub>2</sub>Se<sub>3</sub>.

4,418,137

# ELECTROPHOTOGRAPHIC PROCESS

Yasuo Mitsuhashi, Yokohama, and Masashi Kiuchi, Toride, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 67,006, Aug. 16, 1979, abandoned, which is a division of Ser. No. 913,231, Jun. 6, 1978, Pat. No. 4,206,247. This application Feb. 27, 1981, Ser. No. 238,727

Claims priority, application Japan, Jun. 8, 1977, 52-67587; Jun. 8, 1977, 52-67589

Int. Cl.<sup>3</sup> G03G 9/14

U.S. Cl. 430—109

6 Claims

1. A process for preparing toner particles having hydrophobic fine particles of silica coated thereon which comprises heating a mixture of toner particles and hydrophobic silica fine particles while the mixture floats in a gas so that the hydrophobic silica fine particles are caused to adhere to the surface of the toner particles wherein said hydrophobic fine silica particles have an average particle size of about 1-100 mu.

4,418,138

# PHOTOPOLYMERIZABLE MATERIALS FOR USE IN PRODUCING STENCILS FOR SCREEN PRINTING

John R. Curtis, Thanet, England, assignor to Sericol Group Limited, London, England

Filed Aug. 25, 1982, Ser. No. 411,565

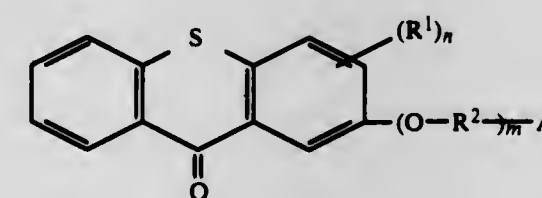
Claims priority, application United Kingdom, Nov. 3, 1981, 8133114

Int. Cl.<sup>3</sup> G03C 1/68, 5/00/00

U.S. Cl. 430—253

18 Claims

1. An aqueous photopolymerisable composition comprising (1) at least one terminally ethylenically unsaturated monomer, which is dispersible, miscible or soluble in water, (2) at least one tertiary nitrogen-containing compound as accelerator, (3) a water-soluble colloid, and (4) a water-soluble photoinitiator of the formula:



where R<sup>1</sup> is halogen, alkyl, alkoxy, alkylthio, nitro, amino, alkylamino, dialkylamino, hydroxyalkylamino, alkanoylamino, benzoylamino, N-alkanoyl-N-benzoylamino, sulphonamido or acetyl, R<sup>2</sup> is alkylene of 1 to 4 carbon atoms, n is 0, 1 or 2, m is 1 or 2, and A is —COOH, —SO<sub>3</sub>H, —OSO<sub>3</sub>H, or —OCO-X-COOH (where X is such that HOOC-X-COOH is a di- or tri-carboxylic acid of up to 8 carbon atoms), the aforesaid alkyl, alkoxy, and alkenyl residues containing up to 4 carbon atoms each, or a water-soluble salt thereof.

16. A transparent flexible support sheet coated with a composition according to claim 1 and dried.

17. A method of producing a stencil for screen printing which comprises irradiating a coated sheet as claimed in claim 16 with actinic light, developing the irradiated sheet and transferring the insolubilised image to a screen.

4,418,139

# FILM UNITS CONTAINING THERMALLY INDUCED WATER-RELEASING BENZOTRIAZOLE COMPLEX

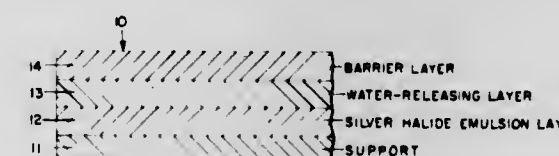
Howard G. Rogers, Weston; Robert D. Eckert; Ronald A. Sahatjian, both of Lexington, and Robert A. Sulesky, Georgetown, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 221,845, Dec. 31, 1980, Pat. No. 4,359,397. This application Sep. 30, 1982, Ser. No. 428,623

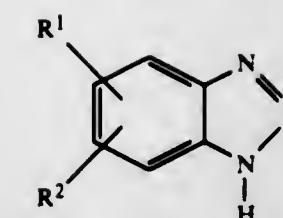
Int. Cl.<sup>3</sup> G03C 5/24

U.S. Cl. 430—354

17 Claims



13. A photographic process comprising the steps of: imagewise exposing a photographic film unit comprising a support carrying on one surface a photosensitive silver halide emulsion layer; a silver halide developing agent; a layer comprising a solid complex of water, a benzotriazole of the formula



wherein R<sup>1</sup> and R<sup>2</sup> are independently hydrogen, a monovalent organic radical, halogen, or nitro, and a water-soluble base having a basicity greater than that of said benzotriazole and capable of dissociating to provide an anion and a monovalent or divalent metal cation, said composition having a melting range above 35° C. and being capable of releasing a substantial portion of said water to the internal environment of said film unit when melted; and a substantially water-impermeable barrier layer positioned within said film unit so as to retain said substantial portion of said water sufficiently within said film unit as to permit thermal processing thereof;

heating said film unit to a temperature sufficient to melt said solid composition; and maintaining said film unit at a processing temperature for a period of time effective to provide a silver image to said film unit.

4,418,140

# PROCESS FOR THE DEVELOPMENT OF COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hiroaki Mitune; Shoji Ishiguro; Tadao Shishido, all of Minami-ashigara, and Tatsuo Nishimura, Ashiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Apr. 8, 1982, Ser. No. 366,515

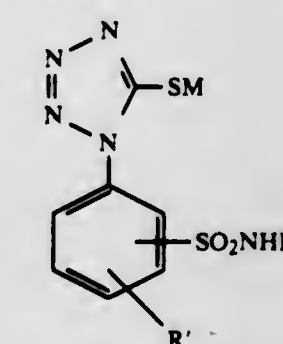
Claims priority, application Japan, Apr. 8, 1981, 56-52771

Int. Cl.<sup>3</sup> G03C 7/00

U.S. Cl. 430—351

11 Claims

1. A process for developing a color photographic light-sensitive material which comprises exposing a color photographic light-sensitive material and, thereafter, color developing the exposed light-sensitive material in the presence of a compound represented by the general formula (I):



wherein M is a hydrogen atom, an alkali metal atom, NH<sub>4</sub> or a protective group for the mercapto group which undergoes cleavage by the action of an alkali; R is a hydrogen atom or an alkyl group containing 1 to 3 carbon atoms; and R' is a hydrogen atom or an alkyl group containing 1 to 3 carbon atoms in an amount effective to prevent the formation of development fog while minimizing the inhibition of color development and reduction of sensitivity.

7. A process for developing a color photographic light-sensitive material as claimed in claim 1, wherein said process is carried out at a temperature of from 18° C. to 50° C.



4,418,141

## PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Hideo Kawaguchi, Minami-ashigara, and Takayuki Inayama, Fujinomiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1981, Ser. No. 333,347

Claims priority, application Japan, Dec. 23, 1980, 55-182613

Int. Cl.<sup>3</sup> G03C 1/78

U.S. Cl. 430—530

16 Claims

1. A photographic light-sensitive material comprising a plastic support, at least one photographic light-sensitive emulsion layer on one side of the support, and an antistatic layer on the other side of the support, wherein the antistatic layer comprises a binder having dispersed therein fine particles of at least one crystalline metal oxide selected from the group consisting of ZnO, TiO<sub>2</sub>, SnO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, In<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, MgO, BaO, and MoO<sub>3</sub>, or a composite oxide thereof, said crystalline metal oxide or composite thereof having a volume resistivity of 10<sup>7</sup> Ω·cm or less, a hydrophobic layer being provided on the antistatic layer, said antistatic layer being between said hydrophobic polymer layer and said support.

4,418,142

## LIGHT-SENSITIVE PHOTOGRAPHIC SILVER HALIDE RECORDING MATERIAL

Hans Langen, Bonn; Erich Wolff, Solingen, and Erwin Ranz, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 307,858

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037912

Int. Cl.<sup>3</sup> G03C 1/40, 1/06

U.S. Cl. 430—549

5 Claims

1. Light-sensitive color photographic silver halide recording material consisting of a layer support and applied to this layer at least one light-sensitive gelatine-containing layer containing color couplers for the formation of the image dyes in the three primary colors, a cross-linking agent which activates the carboxyl groups of the gelatine and a compound acting as aldehyde-scavenger, characterised in that the cross-linking agent which activates the carboxyl groups of gelatine is a gelatine hardener selected from carbamoylpyridinium salts, carbamoylpyridinium salts and carbamoyloxypyridinium salts, and the compound acting as aldehyde-scavenger corresponds to the following general formula:



wherein Z represents the atoms required for completing a 5- or 6-membered, substituted or unsubstituted carbocyclic ring or a substituted or unsubstituted heterocyclic ring which may contain oxygen, nitrogen or sulfur as heteroatom.

4,418,143

## COLOR PHOTOGRAPHIC RECORDING MATERIAL

Peter Berghaller; Günther Schenk, both of Cologne; Gerhard Wolfrum, Odenthal-Leverkusen; Hans-Volker Runzheimer, Odenthal-Gloebusch, and Holger Heidenreich, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1982, Ser. No. 351,103

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107540

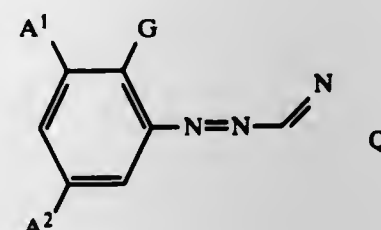
Int. Cl.<sup>3</sup> G03C 7/00, 1/40, 1/10

U.S. Cl. 430—562

5 Claims

1. The color photographic recording material for the production of color images by the dye diffusion transfer process, containing at least one light-sensitive silver halide emulsion layer and a non-diffusible color-providing compound associ-

ated with said light-sensitive layer from which color-providing compound a diffusible azo dye which is capable of forming a complex with metal ions is released under the conditions of alkaline development as a function of the development of the silver halide emulsion layer, wherein the improvement comprises the azo dye corresponds to the following general formula II:



wherein

A<sup>1</sup> and A<sup>2</sup> represent electronegative substituents whose metasigma values  $\sigma_m$ , which are defined as follows:  $\sigma_m = \log K_m - \log K^*$  where  $K_m$  is the ionization constant for a meta substituted benzoic acid in water at 25° C. and  $K^*$  is the ionization constant for the benzoic acid itself, conform to at least one of the following three relationships:

1.  $\sigma_m(A^1), \sigma_m(A^2) \geq +0.33$
2.  $\sigma_m(A^1) + \sigma_m(A^2) \geq +0.75$ ; and
3.  $\sigma_m(A^1) \geq +0.33$  and

A<sup>2</sup> represents —SO<sub>2</sub>X wherein

X represents H, —OH, —NH<sub>2</sub>, —NH—Y or a cyclic amino group and

Y represents alkyl, aryl, alkylsulfonyl, arylsulfonyl or acyl, Q represents a group for completing a 2-amino-3-hydroxypyridine ring, a 4,5-diphenylimidazole ring or a 4-hydroxyisoquinoline ring which is attached through the 1-position; and

G represents a group capable of chelate formation.

4,418,144

## PROCESS FOR PRODUCING GAMMA-CYCLODEXTRINS

Minoru Okada, Mishima; Masamitsu Matsuzawa, Fuji; Osamu Uezima, Mishima; Teruo Nakakuki, Ibaragi, and Koki Horikoshi, Tokyo, all of Japan, assignors to Nihon Shokuhin Kako Co., Ltd. and Rikagaku Kenkyusho, both of, Japan

Filed Jul. 27, 1981, Ser. No. 287,252

Claims priority, application Japan, Mar. 6, 1981, 56/31259

Int. Cl.<sup>3</sup> C12P 19/20, 19/18

U.S. Cl. 435—96

2 Claims

1. A process for the production of  $\gamma$ -cyclodextrin, which consists of:

preparing a sugar solution containing glucose and  $\alpha$ -,  $\beta$ - and  $\gamma$ -cyclodextrins as primary ingredients by reacting glucoamylase having substantially no  $\alpha$ -amylase activity with a starch hydrolyzate containing cyclodextrins produced by reacting gelatinized or liquified starch with cyclodextrin glycosyltransferase;

passing the sugar solution through a column packed with alkali or alkaline earth metal salts or a strongly acidic cation exchange resin to separate  $\alpha$ -,  $\beta$ - and  $\gamma$ -cyclodextrins fraction from glucose fraction; and

passing the  $\alpha$ -,  $\beta$ - and  $\gamma$ -cyclodextrins fraction through a column packed with gel resin particles to separate and collect  $\gamma$ -cyclodextrin.

4,418,145

## XANTHOMONAS CAMPESTRIS ATCC 31601 AND PROCESS FOR USE

William P. Weisrock, Tulsa, Okla., and Edward F. McCarthy, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 167,870

Int. Cl.<sup>3</sup> C12P 19/06; C12N 1/20; C12R 1/64

U.S. Cl. 435—104

14 Claims

1. A method for the production of a heteropolysaccharide which comprises continuously culturing a degenerative resistant strain of bacteria designated *Xanthomonas campestris* XCP-19, having the identifying characteristics of ATCC 31601, in an aqueous nutrient comprising essentially assimilable sources of carbon, nitrogen and inorganic substances wherein said medium is continuously fed to a fermentation zone to produce said polysaccharide, and withdrawing the resulting fermented medium from said zone.

4,418,147

## ENZYME IMMOBILIZATION IN A STARCH GEL

Johannes Muetgeert, Delft; Petrus H. L. Otto, De Lier, and Frans A. Filppo, Delft, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Continuation of Ser. No. 94,055, Nov. 14, 1979, abandoned. This application Jan. 5, 1982, Ser. No. 337,303

Claims priority, application Netherlands, Nov. 20, 1978, 78,11417

Int. Cl.<sup>3</sup> C12N 11/10, 11/00, 11/04

U.S. Cl. 435—178

17 Claims

1. An immobilized enzyme consisting of a starch gel, occluding one or more cell-free enzymes, wherein said starch gel is formed by mixing one or more cell-free enzymes with a starch sol or a partially gelled starch gel, said mixture having a starch content of 20-60% by weight, whereupon said mixture gels and the gelled mixture is extruded into strands and said strands are dried and broken into pieces to form shaped structures.

4,418,148

## MULTILAYER ENZYME ELECTRODE MEMBRANE

Bruce J. Oberhardt, Mishawaka, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 5, 1981, Ser. No. 318,627

Int. Cl.<sup>3</sup> C12N 11/12, 11/08, 11/04; C12M 1/40

U.S. Cl. 435—179

15 Claims

1. A method of making a contiguous multilayer membrane of about 40 to about 100 microns in overall thickness suitable for use with an electrochemical sensor in the measurement of an unknown which comprises:

providing as a first layer, a polymer dissolved in an inert organic solvent and casting said polymer in solution onto an inert support surface which is unreactive with said polymer and does not form a bond to said polymer; permitting said solution to form a film and thereby obtaining a first relatively nonporous dense polymer layer of about 2 to about 5 microns in thickness;

providing as a second layer, a composition comprising a polymer dissolved in an inert organic solvent, mixing said polymer dissolved in solvent with a nonsolvent for said polymer to obtain a dispersion and thereafter casting said dispersion onto said first layer and thereafter permitting said second layer to dry to form a porous polymer layer of about 2 to about 20 microns in thickness and less dense and more porous than the first layer;

providing a third layer comprising an enzyme solution or suspension and depositing said third layer onto the exposed surface of the second layer;

providing as a fourth layer, a composition comprising a polymer dissolved in an inert organic solvent, mixing said polymer dissolved in solvent with a nonsolvent for said polymer to obtain a dispersion and thereafter casting said dispersion onto the exposed surface of the third layer to provide a fourth porous polymer layer of about 2 to about 20 microns in thickness and less dense and more porous than the first layer; and

thereby forming said contiguous multilayer membrane.

4,418,149

## FUSED HYBRID GENE

Mark Ptashne; Gail D. Lauer; Thomas M. Roberts, all of Cambridge, Mass., and Keith C. Backman, San Francisco, Calif., assignors to President and Fellows of Harvard College, Cambridge, Mass.

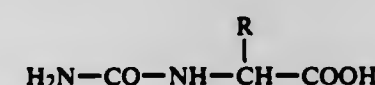
Division of Ser. No. 111,101, Jan. 10, 1980, Pat. No. 4,332,892, which is a continuation of Ser. No. 3,102, Jan. 15, 1979, abandoned. This application Feb. 5, 1982, Ser. No. 346,084

Int. Cl.<sup>3</sup> C12N 1/20, 15/00; C12P 21/00; C07H 21/04

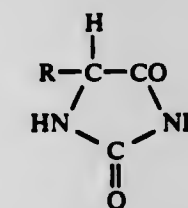
U.S. Cl. 435—253

8 Claims

1. A fused hybrid gene capable of expressing native unfused



where R is alkyl of 1 to 4 carbon atoms, of which one hydrogen can be replaced by NH<sub>2</sub>, OH, —SCH<sub>3</sub> or SH, or R is benzyl, of which one or two hydrogens can be replaced by OH, or R is phenyl, in which one or two hydrogens can be replaced by OH, acetoxy or C<sub>1-4</sub>-alkoxy, by enzymatic hydrolysis of a hydantoin of the formula II



where R has the above meanings, wherein the enzymatic conversion is effected with the aid of the thermophilic, non-sporulating, hydantoin-cleaving micro-organisms CBS 303.80 or CBS 363.50 or of extracts obtained therefrom.

2. A pure culture of the thermophilic, non-sporulating microorganism CBS 303.80.







4,418,159

**PROCESS FOR THE PRODUCTION OF POLYURETHANES AND A STORABLE INTERMEDIATE PRODUCT FOR CARRYING OUT THIS PROCESS**

Werner Raschofer; Richard Kopp, both of Cologne, and Reiner Paul, Muehlheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Oct. 7, 1982, Ser. No. 433,198

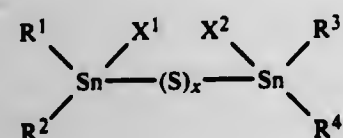
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141117

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—121

10 Claims

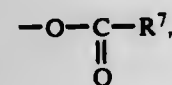
1. A process for the production of polyurethanes by reacting polyisocyanates with organic compounds containing at least two isocyanate-reactive hydrogen atoms and having molecular weights of from 400 to 10,000 in the presence of activators, characterized in that the activators used are compounds corresponding to the general formula:



wherein

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> may be the same or different and may represent C<sub>1</sub>-C<sub>20</sub>-alkyl, C<sub>3</sub>-C<sub>7</sub>-cycloalkyl, C<sub>6</sub>-C<sub>14</sub>-aryl or C<sub>7</sub>-C<sub>30</sub>-alkaryl;

X<sup>1</sup> and X<sup>2</sup> may be the same or different and represent a halogen radical or a radical of the formula —OR<sup>5</sup>, —SR<sup>6</sup> or



with the proviso that X<sup>1</sup> and X<sup>2</sup> cannot both represent a halogen atom;

R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> may be the same or different and represent C<sub>1</sub>-C<sub>20</sub>-alkyl, C<sub>3</sub>-C<sub>7</sub>-cycloalkyl, C<sub>6</sub>-C<sub>14</sub>-aryl or C<sub>7</sub>-C<sub>30</sub>-alkaryl; and 1 ≤ x ≤ 4.

4,418,160

**POLYAMINES AND PROCESSES FOR THE PRODUCTION OF SUCH POLYAMINES AND OF POLYURETHANE PLASTICS THEREFROM**

Werner Raschofer, Cologne; Dieter Dieterich, Leverkusen, and Holger Meyborg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 308,326, Oct. 5, 1981, Pat. No. 4,386,218.  
This application Aug. 30, 1982, Ser. No. 412,614

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039600

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—159

2 Claims

1. A process for the production of a polyurethane comprising:

- reacting a polyisocyanate with
- a polyamine and optionally
- other compounds having isocyanate-reactive groups, optionally

(d) in the presence of an auxiliary agent and/or additive in which the polyamine (b) is a polyamine having urethane and/or urea and/or biuret groups made by:

- mixing an isocyanate prepolymer having urethane and/or urea and/or biuret groups with an aqueous base solution at a temperature of/from 0° to 80° C. and in a quantity such that the equivalent ratio of hydroxyl to isocyanate groups is between from 0.3:1 to ≥ 1.01:1,
- treating the product of (a) with an acid ion exchanger to form an amine; and

- separating the product amine from any other materials present.

4,418,161

**RESIN COATED SAND AND METHOD FOR PRODUCING SAME**

Noriaki Matsushima; Yukio Saeki, and Yukio Tokunaga, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 410,117

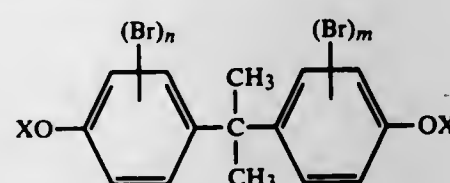
Claims priority, application Japan, Feb. 9, 1981, 56-136953

Int. Cl.<sup>3</sup> C08K 3/36

U.S. Cl. 523—145

17 Claims

1. A resin coated foundry sand with improved shake-out properties which comprises foundry sand coated with a lubricant-containing phenolic resin and one or more aromatic bromides of the following formula:



wherein:

- Br positions are ortho to XO—,  
m and n are integers selected from 0, 1 and 2, but not zero at the same time and,  
x is selected from —H, —CH<sub>2</sub>—CH<sub>2</sub>—OH, —CH<sub>2</sub>—CH=CH<sub>2</sub>, and —CH<sub>2</sub>CHBrCH<sub>2</sub>B.

4,418,162

**PROCESS FOR TREATING THE SURFACE OF POLYACETAL RESIN**

Takuzo Kasuga; Yukio Ikenaga, and Masami Yamawaki, all of Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan  
PCT No. PCT/JP81/00101, § 371 Date Dec. 28, 1981, § 102(e)  
Date Dec. 28, 1981, PCT Pub. No. WO81/03178, PCT Pub. Date Nov. 12, 1981

PCT Filed Apr. 30, 1981, Ser. No. 339,454

Claims priority, application Japan, Apr. 30, 1980, 55-57280

Int. Cl.<sup>3</sup> C08K 9/04

U.S. Cl. 523—205

8 Claims

1. A method for the surface treatment of polyacetal resin characterized in that the resin is treated with an acidic solution containing chloride ions and sulfuric acid ions, wherein the hydrogen ion content of the solution is about 0.6 to about 1.5 equivalents per 100 grams of the solution and wherein the weight ratio of hydrogen chloride to sulfuric acid is about 1:20 to 20:1.

4,418,163

**WATER ABSORBING COMPOSITE COMPRISING INORGANIC POWDER ENCAPSULATED WITH A CROSSLINKED CARBOXYL POLYMER**

Tetsuo Murakami; Hirotoshi Miyazaki, and Hiroshi Harima, all of Ibaraki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 13, 1982, Ser. No. 407,894

Claims priority, application Japan, Aug. 17, 1981, 56-129132

Int. Cl.<sup>3</sup> C08L 33/02; C08K 3/34, 3/00

U.S. Cl. 523—205

16 Claims

1. A water absorbing composite comprising:

- an inorganic powder; and  
a highly absorbent resin;  
wherein said highly absorbent resin covers totally the surfaces of the individual particles of said powder, and  
wherein said resin is obtained by reacting a basic substance with a polymer containing at least 40 mol % of repeating monomeric units of an α,β-unsaturated compound having

in its molecule one or two carbonyl groups, on one or two other groups convertible to a carboxyl group or groups, and then crosslinking the reaction product with a polyamine.

4,418,164

**ARAMID FIBER COATED WITH POLYFUNCTIONAL AZIRIDINE**

Francis M. Logullo, Sr., Hockessin, Del., and Yun-Tai Wu, Newtown Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

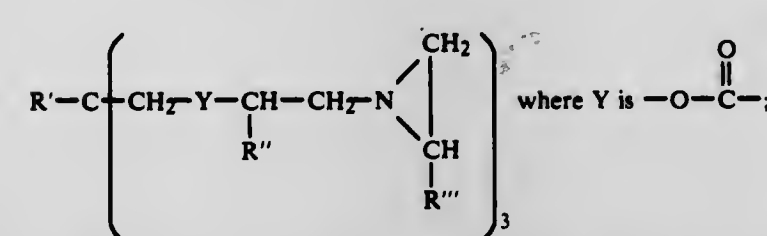
Filed Jul. 19, 1982, Ser. No. 399,689

Int. Cl.<sup>3</sup> C08L 67/06

U.S. Cl. 523—207

9 Claims

1. Aramid fiber coated with an aziridine of the formula



R' is alkyl or hydroxyalkyl of from 1 to 4 carbon atoms; R'' and R''' are independently selected from hydrogen and methyl.

4,418,165

**OPTICALLY CLEAR SILICONE COMPOSITIONS CURABLE TO ELASTOMERS**

Keith E. Polmanteer, and Harry L. Chapman, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 156,003, Jun. 3, 1980, abandoned. This application Oct. 7, 1981, Ser. No. 309,302

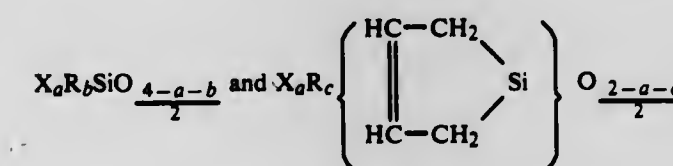
Int. Cl.<sup>3</sup> C08K 83/06

U.S. Cl. 523—210

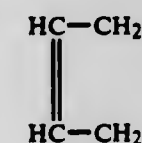
76 Claims

1. An optically clear composition curable to an elastomer which comprises:

- (A) 100 parts by weight of at least one polydiorganosiloxane consisting essentially of siloxane units selected from the group consisting of siloxane units of the unit formula

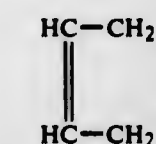


wherein each R radical is selected from the group consisting of alkyl radicals of from 1 to 6 inclusive carbon atoms, cyclohexyl radicals, phenyl radicals, halogenated alkyl radicals of from 1 to 10 inclusive carbon atoms and alkenyl radicals of from 2 to 6 inclusive carbon atoms, each X being selected from the group consisting of hydroxyl radicals, hydrogen radicals and alkoxy radicals of from 1 to 6 inclusive carbon atoms, at least 50 percent of the total amount of R radicals and



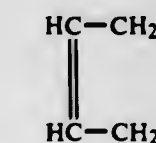
radicals present in said polydiorganosiloxane being methyl radicals, a having a value of from 0 to 1 inclusive, b having a value of from 1 to 3 inclusive and c having a value of from 0 to 1 inclusive, the sum of a+b having a value of from 1 to 3 inclusive, the sum of a+c having a value of

from 0 to 1 inclusive, the values of a, b and c being such that the ratio of total R radicals and



radicals to total silicon atoms present in said polydiorganosiloxane is in the range of from 1.98/1 to 2.02/1 inclusive, said polydiorganosiloxane having a viscosity of at least 0.1 pascal.seconds at 25° C., and

(B) 15 to 120 parts by weight of a hydrophobic reinforcing silica filler consisting essentially of surface-treated silica particles wherein said particles consist essentially of Si-O<sub>4/2</sub> units containing a sufficient amount of organosiloxy units chemically bonded to the surface of said particles to render the silica filler hydrophobic, said organosiloxy units being selected from the group consisting of R<sub>3</sub>Si-O<sub>1/2</sub> units, R<sub>2</sub>SiO units, O<sub>1/2</sub>R<sub>2</sub>SiO(R<sub>2</sub>SiO)<sub>d</sub>SiR<sub>2</sub>O<sub>1/2</sub> units, XR<sub>2</sub>SiO(R<sub>2</sub>SiO)<sub>d</sub>SiR<sub>2</sub>O<sub>1/2</sub> units and mixtures thereof where each R and each X are as above defined and d has an average value of from 1 to 12 inclusive, wherein substantially all of said particles have an aggregate particle size of no greater than 4,000 Angstroms in their largest dimension and are of an overall particle size distribution which is sufficiently small such that when 60 parts by weight of said filler is homogeneously mixed with 100 cubic centimeters at 23° ± 2° C. of a polydiorganosiloxane of the type described in (A) to form a test blend, wherein (1) the refractive index (at 25° C., sodium D line) of the polydiorganosiloxane chosen for use in said blend differs from the refractive index (at 25° C., sodium D line) of the filler by at least 0.025 units and (2) the organosiloxy units employed to render said filler hydrophobic are primarily the same as the R radicals and the



radicals present in the polydiorganosiloxane chosen for use in said blend, then the test blend possesses a haze value of less than 4% per 2.54 millimeter thickness of said blend at 23° ± 2° C. according to the procedure set out in ASTM D1003-61;

wherein the mixture of (A) and (B) is an optically clear composition possessing a luminous transmittance value of at least 85% and a haze value of no greater than 4% per 2.54 millimeter thickness of said composition at 23° ± 2° C. according to the procedure set out in ASTM D1003-61.

4,418,166

**HIGH TEMPERATURE RESISTANT ADHESIVE BONDING COMPOSITION OF EPOXY RESIN AND TWO-PART HARDENER**

Joseph J. Chesney, Jr., Plainsboro, and Robert E. Schaefer, Hillsdale, both of N.J., assignors to Tile Council of America, Inc., Princeton, N.J.

Filed Jul. 14, 1981, Ser. No. 283,133

Int. Cl.<sup>3</sup> C09J 3/14, 3/16

U.S. Cl. 523—400

12 Claims

1. A solventless, cross-linked adhesive bonding composition which cures and/or gels in the presence of water comprising a resin base portion and a filled hardener portion; said resin base portion comprising an epoxy resinous material containing terminal epoxy groups and being essentially free from units derived from vegetable oils and aliphatic ethers; said filler hardener portion comprising the combination of a modified polyamine and polyamido-amine, said modified polyamine is



comprised of the reaction product of an aliphatic polyamine and a compound selected from the group consisting of aliphatic and aromatic mono and di epoxides, mono and dihydric phenols, aldehydes, nitriles and mixtures of any of the foregoing.

4,418,167

# **THERMOPLASTIC ELASTOMER BLENDS WITH BITUMEN**

Georg G. A. Böhm; Lee E. Vescellus, and Gary R. Hamed, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 140,905, Apr. 16, 1980, which is a continuation-in-part of Ser. No. 1,623, Jan. 8, 1979, Pat. No. 4,250,273, which is a continuation-in-part of Ser. No. 879,308, Feb. 21, 1978, abandoned, which is a division of Ser. No. 806,306, Jun. 13, 1977, abandoned. This application Sep. 17, 1981, Ser. No. 303,242

Int. Cl.<sup>3</sup> C08L 95/00

U.S. Cl. 524—68

4 Claims

1. A process for making a thermoplastic elastomer blend composition, comprising the steps of providing a blend of a largely crystalline 1-olefin polymer, a random styrene-butadiene rubber and a bitumen, the amount of said 1-olefin polymer ranging from about 30 to about 45 parts by weight, the amount of said styrene-butadiene rubber ranging from about 65 to about 25 parts by weight, the amount of said bitumen ranging from about 10 to about 40 parts by weight, said 1-olefin polymer selected from the class consisting of a homopolymer and a copolymer made from 1-olefin monomers having from 2 to about 20 carbon atoms, said homopolymer or said copolymer having a melting point of at least 90° C., and mixing said blend at a temperature at or above the melting point of said 1-olefin polymer and forming a reprocessible thermoplastic elastomer blend.

4,418,168

# **PROCESS FOR IMPARTING STABILITY TO PARTICULATE VINYLIDENE CHLORIDE POLYMER RESINS**

Earl H. Johnson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1982, Ser. No. 359,347  
Int. Cl.<sup>3</sup> C08K 5/15, 5/36; C08L 27/08

U.S. Cl. 524—109

16 Claims

1. In a method for imparting stability against decomposition to a particulate copolymer resin, the copolymer having polymerized therein a major amount of vinylidene chloride and at least one monoethylenically unsaturated monomer copolymerizable therewith, stability being imparted by blending an effective amount of at least one oil insoluble particulate inorganic stabilizer with the resin, the improvement comprises forming a generally uniform dispersion of the stabilizer in a liquid plasticizer, the dispersion then being placed generally on and/or in the resin particles.

4,418,169

# **STABILIZED PVC RESINS**

Ambrose J. Gibbons, Jr., East Brunswick, and Robert C. Ringwood, Jr., Sewaren, both of N.J., assignors to M & T Chemicals Inc., Woodbridge, N.J.

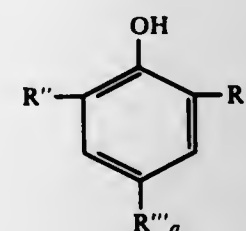
Filed Sep. 4, 1962, Ser. No. 221,366  
Int. Cl.<sup>3</sup> C08K 5/57

U.S. Cl. 524—178

18 Claims

1. A novel heat and light stable halogen-containing vinyl polymer composition comprising a halogen-containing vinyl polymer; a stabilizing amount of a synergistic stabilizer combination of a first stabilizer having the formula  $R_2Sn(OOCCH=CHCOOR)_2$  wherein R is an alkyl radical containing less than about 10 carbon atoms, and R' is selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, alke-

nyl, cycloalkyl, and cycloalkenyl radicals containing less than about 22 carbon atoms; and a second stabilizer having the formula



wherein R'' is a branched alkyl radical containing less than about 10 carbon atoms, R''' is an alkyl radical containing less than about 10 carbon atoms, and a is a number selected from the group consisting of 0 and 1.

4,418,170

# **METHOD FOR STABILIZING ORGANIC POLYMERS AGAINST OXIDATIVE DECOMPOSITION**

Wolfgang von Gentzkow, Kleinsendelbach, and Manfred Schmiedel, Nürnberg-Grossgründlach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,206

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131221

Int. Cl.<sup>3</sup> C08K 5/25

U.S. Cl. 524—193

7 Claims

1. A method for stabilizing organic polymers against copper-catalyzed oxidative decomposition, comprising forming a paste containing finely-crystalline N,N'-bis-salicyloyl hydrazine finely-distributed in a liquid to wax-like aliphatic hydrocarbon of low volatility, and admixing said paste with said organic polymers.

4,418,171

# **ANTI-TRACKING MATERIAL FOR HIGH VOLTAGE APPLICATIONS**

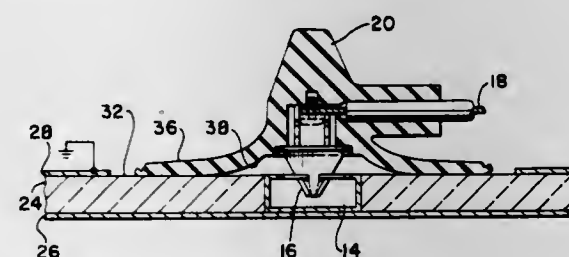
Harold E. Hall, Middlefield, Ohio, assignor to Blasius Industries, Inc., Bedford, Ohio

Division of Ser. No. 228,280, Jan. 26, 1981, abandoned. This application Feb. 16, 1982, Ser. No. 348,322

Int. Cl.<sup>3</sup> C08K 5/54

U.S. Cl. 524—268

17 Claims



1. In a high voltage insulated connector for a high voltage electrical connection to a device having an insulating surface surrounding said connection, said connector comprised of a metallic electrical clip, a cup formulated from an elastomeric insulating material surrounding said metallic clip and having a skirt with a surface adapted to be pressed against said insulating surface over a wide area, the improvement which comprises an insulating oil incompatible with said elastomeric insulating material dispersed throughout the material of said cup and exuding from said material to fill the interface between said skirt surface and said insulating surface.

4,418,172

# **POLYESTER COMPOSITION CONTAINING 2-METHYL-1,3-PROPYLENE GLYCOL DIBENZOATE**

Takuzo Kasuga, Fuji; Yuzo Toga, Himeji; Ichiro Okamoto, Himeji, and Katsuhiko Takahashi, Fuji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai and Polyplastics Co., Ltd., Osaka, both of Japan

Filed Dec. 13, 1982, Ser. No. 449,288

Claims priority, application Japan, Dec. 28, 1981, 56-214122

Int. Cl.<sup>3</sup> C08K 3/38, 5/12; C08L 67/02

U.S. Cl. 524—292

5 Claims

1. A polyester composition comprising polyethylene terephthalate or a polyester containing at least 80% of ethylene terephthalate recurring units which further contains 0.1 to 15 wt. % of 2-methyl-1,3-propylene glycol dibenzoate.

4,418,173

# **VULCANIZABLE RUBBER MIXTURE AND VULCANIZING PROCESS FOR SUCH A RUBBER MIXTURE**

Walter Brachmann, Nonnenhorn; Horst Kornau, and Klaus Thiel, both of Lindau, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 268,096

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020746

Int. Cl.<sup>3</sup> C08K 3/22; C08L 9/02, 9/06, 61/10

U.S. Cl. 524—425

5 Claims

1. Vulcanizable rubber mixture for producing an area of leather-hard rubber for a composite profile of leather-hard rubber/soft rubber, consisting essentially of  
(a) 100 parts by weight of a rubber selected from the group consisting of natural rubber, polyisoprene rubber, styrene butadiene rubber, polybutadiene rubber, and acrylonitrile butadiene rubber and mixtures thereof,  
(b) 12 to 40 parts by weight of sulfur,  
(c) 4 to 15 parts by weight reinforcement resin, selected from the group consisting of phenol-formaldehyde resin and styrene butadiene polymerizable resin  
(d) 3 to 4 parts by weight accelerator  
(e) 7 to 15 parts by weight zinc oxide, said composite profile in the vulcanization thereof heated by hot air to 180°-280° C. and rapidly cooling the vulcanized composite product to 10°-50° C. yields a shore D hardness for the leather-hard rubber.

4,418,174

# **PROCESS FOR THE PREPARATION OF POLYESTERS USING MANNITOL OR SORBITOL DERIVATIVES, MIXTURES OF POLYESTERS AND THESE MANNITOL OR SORBITOL DERIVATIVES AND THE USE THEREOF FOR THE PRODUCTION OF AQUEOUS STOVING LACQUERS**

Rolf Dhein, Krefeld; Lothar Bäcker, Dormagen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,464

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115071

Int. Cl.<sup>3</sup> C08L 51/00, 67/00

U.S. Cl. 524—539

2 Claims

1. Mixtures of:  
(A) from 10 to 90% by weight, of polyesters having an average molecular weight  $\bar{M}_n$  of from 1,000 to 10,000,  
(B) from 10 to 50% by weight of reactive diluent,  
(C) up to 50% by weight of water, and  
(D) from 0 to 50% by weight of aminoplast resin, the percentages being based on the total of the components A, B and D, characterised in that the reactive diluent B is dianhydromannitol, dianhydrosorbitol, dianhydromannitol semi-ester

and/or dianhydrosorbitol semi-ester or a salt of these compounds.

4,418,175

# **CATIONIC SIZING AGENTS FOR PAPER**

Joachim Probst, Cologne; Günter Kolb, Leverkusen; Friedhelm Müller, Odenthal, and Heinz Bäumgen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 226,866, Jan. 21, 1981, abandoned. This application Dec. 11, 1981, Ser. No. 329,721

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002687

Int. Cl.<sup>3</sup> C08F 220/46

U.S. Cl. 524—555

4 Claims

1. A method of sizing paper comprising treating the paper with an aqueous 10 to 30% by weight solution of a statistical terpolymer having an average molecular weight of from 10,000 to 70,000 containing quaternized amino groups and having a regular chemical structure of  
(a) from 8 to 20%, by weight of N,N-dimethylaminoethyl acrylate and/or N,N-dimethylaminoethyl methacrylate;  
(b) from 45 to 80% by weight, of styrene; and  
(c) from 8 to 35%, by weight, of acrylonitrile;  
the sum of (a) to (c) being 100%, by weight, and at least 10% of the dimethylamino groups of the terpolymer being quaternized and the remainder protonated.

4,418,176

# **SELF-CRIMPING ACRYLIC FIBER FROM A MELT OF TWO NON-COMPATIBLE POLYMERS**

William E. Streetman, Gulf Breeze, and Shashikumar H. Dattary, Pensacola, both of Fla., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 129,765, Mar. 12, 1980, Pat. No. 4,301,104. This application Jun. 2, 1981, Ser. No. 269,076

Int. Cl.<sup>3</sup> C08L 23/06, 23/12, 33/20

U.S. Cl. 525—57

4 Claims

1. A self-crimping, melt-spun acrylonitrile polymer fiber comprising as the continuous fiber matrix a first polymer comprising from about 80 to about 99 weight percent acrylonitrile and from about 1 to about 20 weight percent of one or more monomers copolymerizable with acrylonitrile and heterogeneously dispersed within said fiber matrix a second polymer selected from the group consisting of polyethylene and polypropylene incompatible with said first polymer and having thermal and/or hydrophilic properties which differ from those of said first polymer by an amount sufficient to provide self-crimping properties to said fiber, said first polymer constituting the major weight proportion of said fiber.

4,418,177

# **THERMOSETTING ADHESIVE COMPOSITIONS AND USE**

Fumihiko Doura, Sakai; Masamitsu Nakabayashi, Sennan, and Taiji Morimoto, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 22, 1982, Ser. No. 341,700

Claims priority, application Japan, Jan. 26, 1981, 56-10548

Int. Cl.<sup>3</sup> C08L 23/26

U.S. Cl. 525—57

11 Claims

1. A thermosetting adhesive composition which contains  
(a) a half-ester product of a saponified ethylene/vinyl ester copolymer with a dicarboxylic acid, the esterification degree being 10 to 90%,  
(b) a liquid epoxy resin having an epoxide equivalent of about 100 to 350, the component (b) being used in the amount of about 1/100 to 1.5 times by weight to the component (a), and  
(c) a polymer bearing two or more carboxyl groups selected from a polyester having an acid value of about 10 to 100 and a modified butadiene/acrylonitrile copolymer having



a molecular weight of ca. 1,000 to 10,000, the component (b) being in an amount of about 0.1 to 10 equivalent of the epoxide per one equivalent of the carboxyl groups of the components (a) and (c).

4,418,178

## IMPACT MODIFIED POLYCYCLOOLEFINS

Elmer J. DeWitt, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,368  
Int. Cl.<sup>3</sup> C08L 23/06, 23/12, 45/00, 9/00

U.S. Cl. 525—97

11 Claims

1. Process for preparing impact modified polycycloolefins comprising feeding a liquid mix into a mold maintained at an elevated temperature whereby ring opening polymerization in bulk of said liquid mix is thermally initiated, and extracting molded impact modified polycycloolefin from the mold; said liquid mix comprising an organoammonium catalyst selected from organoammonium molybdates and tungstates, an alkoxylaluminum halide cocatalyst or reactants needed to make said cocatalyst in situ, at least one monomer containing at least one norbornene group, a crystalline polyolefin selected from lower polyolefin powders or polyvinylidene fluoride powder and a rubbery polymeric material, the amount of said polyolefin or polyvinylidene fluoride and said rubbery material being sufficient to render said polycycloolefin ductile which occurs at a notched Izod of about 250 J/M and above.

4,418,179

## IMPACT MODIFIED POLYCYCLOOLEFINS

Elmer J. DeWitt, Cuyahoga Falls; Robert J. Minchak, Parma Heights; Bing-Lin Lee, Broadview Heights, and George M. Benedikt, Lakewood, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,369  
Int. Cl.<sup>3</sup> C08L 23/06, 23/12, 45/00

U.S. Cl. 525—249

10 Claims

1. Process for preparing impact modified polycycloolefins comprising feeding a liquid mix into a mold maintained at an elevated temperature whereby ring opening polymerization in bulk of said liquid mix is thermally initiated, and extracting molded impact modified polycycloolefin from the mold; said liquid mix comprising an organoammonium catalyst selected from organoammonium molybdates and tungstates, an alkoxylaluminum halide cocatalyst or reactants needed to make said cocatalyst in situ, at least one monomer containing at least one norbornene group, and a sufficient amount of an impact modifier consisting essentially of a material selected from crystalline lower polyolefin powders, polyvinylidene fluoride powder and mixtures thereof to impart at least a doubling of impact strength when compared to the impact strength of the neat polymer of said monomer(s), measured by the notched Izod test.

4,418,180

## PREPARATION OF BRANCHED BLOCK COPOLYMERS

Gerhard Heinz, Weisenheim; Burghard Schmitt, Worms; Ingo H. Dorn, Dannstadt-Schauernheim; Hermann Gausepohl, Mutterstadt; Karl Gerberding, Wachenheim; Rudolf H. Jung, Worms; Hans Mitnacht, Weinheim; Jürgen Pohrt, Mannheim, and Paul Witmer, Landau, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,849  
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032832

Int. Cl.<sup>3</sup> C08F 297/04

U.S. Cl. 525—314

1 Claim

1. A process for the preparation of branched block copolymers of from 60 to 95% by weight of a monovinyl-aromatic monomer and from 40 to 5% by weight of a conjugated diene of 4 to 8 carbon atoms by polymerizing the monomers in an inert solvent in the presence of a monolithium-hydrocarbon as the initiator, wherein, in a first process stage (a), from 50 to 80,

or where necessary at most 90, % by weight of the total amount of monovinyl-aromatic compound are polymerized to virtually complete conversion in the presence of a relatively small amount of the monolithium-hydrocarbon, and thereafter, in a second process stage (b), an additional amount of initiator, which may be equal to or greater than the originally employed amount of initiator, is added to the reaction solution, after which a further 1-30% by weight of the total amount of monovinyl-aromatic monomer can be added, the sum of the amounts of monovinyl-aromatic monomer added in the first and second process stages being at most 90% by weight of the total amount of monovinyl-aromatic monomer, and any such monovinyl-aromatic monomer added in the second process stage is polymerized to virtually complete conversion, after which, in a further process stage (c), the remainder of the monovinyl-aromatic monomer and all of the conjugated diene are added, at least predominantly in the form of a mixture, and are polymerized, and finally, after virtually complete conversion of the monomers, the mixture of the resulting linear block copolymers, having active terminal lithium-carbon bonds, is subjected to coupling by addition of a polyfunctional coupling agent, with stirring, to form branched block copolymers, in which process 30-70% by weight of the total amount of vinyl-aromatic monomer to be reacted in process stage (a) is initially taken and 70-30% by weight is added, in the feed, during the polymerization in such a way that the polymerization temperature, which at the start of the polymerization is from 30° to 40° C., is kept at from 45° to 70° C., with use of reflux cooling, during stage (a), after completion of the monomer feed the reaction temperature is lowered to 30°-40° C. by evaporative cooling before fresh initiator is added in order to carry out stage (b) or (c), if stage (b) is carried out, the same temperature profile as for stage (a) is employed, and furthermore the polymerization of the remaining vinyl-aromatic monomer and the conjugated diene in stage (c) is carried out in such a way that the reaction temperature does not rise above 90°-110° C., and finally, after completion of the polymerization, and preferably without prior cooling, a suitable liquid coupling agent is run undiluted into the reaction mixture.

4,418,181

## POLYIMIDES HAVING BIS-MALEIMIDE TERMINAL GROUPS

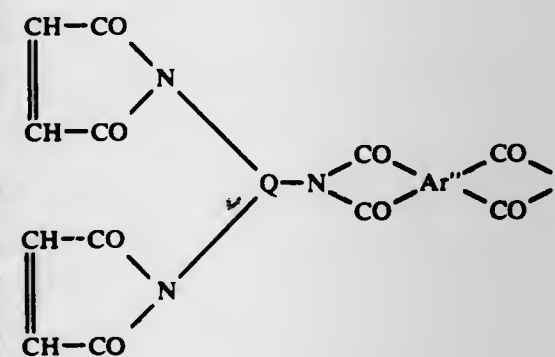
Walter J. Monacelli, St. Petersburg, Fla., assignor to Plastics Engineering Company, Sheboygan, Wis.

Filed May 26, 1981, Ser. No. 267,379  
Int. Cl.<sup>3</sup> C08G 73/10, 73/12

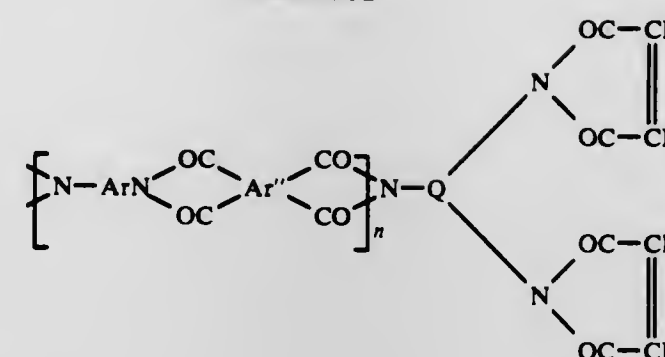
U.S. Cl. 525—426

27 Claims

1. A tetra-maleimide polyimide having the formula:



-continued



wherein

Q is a trivalent aromatic radical;

Ar' is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms of said aromatic radical and each pair of carbonyl groups being attached to adjacent carbon atoms or peri carbon atoms in Ar';

Ar is a divalent aromatic radical; and

n is zero or an integer having a value of 1-20.

4,418,182

## HIGH SOLIDS COATINGS FROM NEW TETRAHYDROXY OLIGOMERS

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,800  
Int. Cl.<sup>3</sup> C08L 67/02, 63/02

U.S. Cl. 525—438

26 Claims

1. A thermosetting coating composition adapted for low temperature bake applications comprising:

(A) a tetrahydroxy oligomer having a number average molecular weight of between about 600-2000 and being the reaction product of:

(i) an ester containing pendant hydroxyl and carboxyl functionality and being made by a reaction wherein the reactants consist essentially of:

(a) a C<sub>3</sub>-C<sub>10</sub> aliphatic branched diol and

(b) an alkyl hexahydrophthalic anhydride, wherein (a) and (b) are combined in the reaction mixture in an amount sufficient to allow reaction in about a 1:1 molar ratio; and

(ii) a diepoxide having a number average molecular weight between about 130-1500, wherein (i) and (ii) are combined in the reaction mixture in an amount sufficient to allow reaction in about a 2:1 molar ratio;

(B) an amine-aldehyde crosslinking agent;

(C) 0-50 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight ( $\bar{M}_n$ ) of between about 150-6000; and

(D) solvent,

said amine-aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.60 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxyl functionality included in said composition either on said tetrahydroxy oligomer or as a hydroxyl group of said hydroxy functional additive.

4,418,183

## METHOD FOR THE PRODUCTION OF HIGH CONCENTRATIONS OF EMULSION POLYMERS

Albert C. Chiang, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 12, 1981, Ser. No. 320,360  
Int. Cl.<sup>3</sup> C08F 2/24

U.S. Cl. 526—80

12 Claims

1. A process for the preparation of emulsion polymers having a solid content of about 65% to about 80% which com-

prises adding a monomeric mixture to a reaction system maintained at a temperature of from about 60° C. to about 90° C., said monomer addition not exceeding an hourly rate of about one-fourth of the total monomer to be added, said mixture comprising monomers having a particle size of from about 10-100 microns, said system having therein an emulsifier and initiator at the time of said monomeric addition.

4,418,184

## PROCESS FOR PREPARATION OF ETHYLENE POLYMER WAX

Takashi Ueda, Ohtake, and Norio Kashiwa, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 157,009, Jun. 6, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,440

Claims priority, application Japan, Jun. 11, 1979, 54-72221

Int. Cl.<sup>3</sup> C08F 2/40, 10/02

U.S. Cl. 526—125

14 Claims

1. In a process for preparing an ethylene polymer wax which comprises polymerizing ethylene or copolymerizing ethylene with up to 10 mole% of an alpha-olefin having 3 to 30 carbon atoms in an inert hydrocarbon solvent at a temperature of about 140° C. to about 300° C. and a pressure of about 5 to about 200 kg/cm<sup>2</sup>.G in the presence of hydrogen and a catalyst composed of (A) a highly active titanium catalyst component activated by a magnesium compound and obtained by copolymerizing an inorganic magnesium compound selected from the group consisting of magnesium chloride, magnesium bromide, magnesium iodide, magnesium fluoride, magnesium hydroxide, magnesium oxide and magnesium hydroxyhalides and a titanium compound, or by reacting said inorganic magnesium compound which has been treated with an electron donor with a titanium compound and (B) an organoaluminum catalyst component; the improvement wherein

(i) said organoaluminum catalyst component is composed of

(B-1) an organoaluminum compound free from halogen bonded directly to the aluminum atom selected from the group consisting of trialkyl aluminums having a C<sub>1</sub>-C<sub>15</sub> alkyl group and alkyl aluminum hydrides having C<sub>1</sub>-C<sub>15</sub> alkyl group and

(B-2) a halogen compound selected from the group consisting of aluminum trihalides, halogen compounds of aluminum having a C<sub>1</sub>-C<sub>15</sub> alkoxy group, halogen compounds of C<sub>1</sub>-C<sub>20</sub> aliphatic hydrocarbon, halogen compounds of a C<sub>6</sub>-C<sub>20</sub> aromatic hydrocarbon, tetrahalosilanes halogen compounds of silicon having a C<sub>1</sub>-C<sub>12</sub> alkyl group and halogen compounds of silicon having a C<sub>1</sub>-C<sub>12</sub> alkoxy group the atomic ratio of halogen to aluminum in the organoaluminum catalyst component (B) being from about 1:6 to about 9:10, provided that when said halogen compound is a halogen compound of carbon, this atomic ratio is from about 1:6 to about 10:1, and

(ii) said polymerization or copolymerization is carried out under such conditions that the concentration of ethylene polymer wax in the polymerization or copolymerization system is about 200 to about 600 g/liter of solvent, to form a wax having a viscosity average molecular weight of up to about 6000.







group; (b) reacting the intermediate (I) with a loweralkyl metal halide in the presence of N,N-dimethylformamide to produce N-protected-2-epi-fortimicin A; and (c) subjecting the N-protected-2-epi-fortimicin A to catalytic hydrogenolysis to obtain 2-epi-fortimicin A.

4,418,194

## DNA FRAGMENTS FOR FORMING PLASMIDS

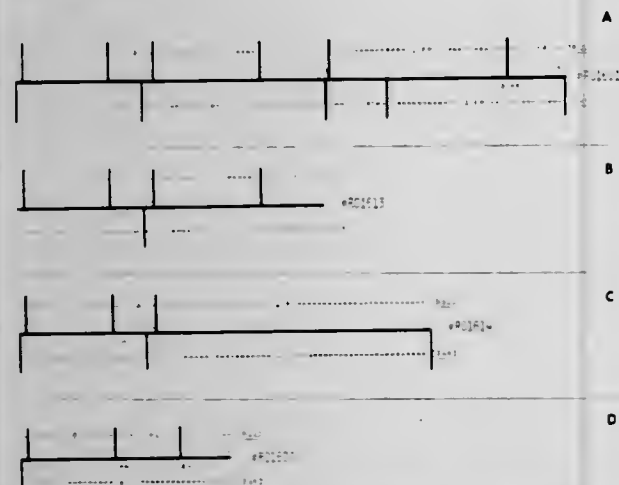
Ronald H. Olsen, Ann Arbor, Mich., assignor to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 147,563, May 8, 1980. This application Oct. 19, 1981, Ser. No. 312,515

Int. Cl.<sup>3</sup> C07N 15/12; C12P 21/00, 21/02, 19/34; C12N 15/00, 1/20, 1/00

U.S. Cl. 536—27

3 Claims



1. A deoxyribonucleic acid fragment for forming plasmids, the fragment being formed from a first plasmid originally derived from a plasmid aggregation with plasmid RPI, the fragment measuring about  $2 \times 10^6$  daltons or less in molecular size, wherein the fragment is from pRO1600 as carried on *Pseudomonas aeruginosa* NRRL-B-12124 and includes a critical restriction endonuclease BglI digestion fragment from pRO1600 which is indispensable for replication in a plasmid.

4,418,195

## SILICON-CONTAINING QUATERNARY AMMONIUM THIAZINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

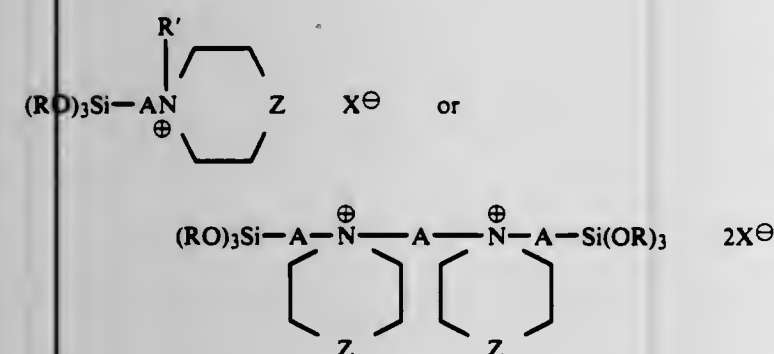
Filed Jul. 11, 1977, Ser. No. 814,513

Int. Cl.<sup>3</sup> C07F 7/18; A61K 31/695

U.S. Cl. 544—58.2

5 Claims

1. A compound of the formula



where  
R and R' are alkyl, aryl, aralkyl and cycloalkyl;  
Z is S, SO, SO<sub>2</sub>;  
A is alkylene; and  
X is an anion.

4,418,196

## PROCESS FOR PREPARING TRIACETONE AMINE

Yutaka Nakahara, Iwatsuki; Naohiro Kubota, Ageo; Bunji Hirai, Kuki, and Tohru Haruna, Okegawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Aug. 23, 1982, Ser. No. 410,239

Claims priority, application Japan, Sep. 16, 1981, 56-145771

Int. Cl.<sup>3</sup> C07D 211/74

U.S. Cl. 546—242

16 Claims

1. A process for the preparation of triacetone amine, which comprises reacting an acetone compound with ammonia at a temperature at which the reaction proceeds in the presence of a catalytically effective amount of a compound selected from the group consisting of organotin halides, 1,3,5,2,4,6-triazatriphosphorin hexahalides, and cyanuric halides until triacetone amine is formed, and then separating triacetone amine from the reaction mixture.

4,418,197

## 1,4-DIHYDROPYRIDINE DERIVATIVES

Masato Kamibayashi, Hasuda; Shinji Tsuchiya, Washimiya; Kozo Hiratsuka, Tsurugashima, and Susumu Tsuchiya, Tanashi, all of Japan, assignors to Tokyo Tanabe Company, Limited, Japan

Filed Jan. 13, 1983, Ser. No. 457,867

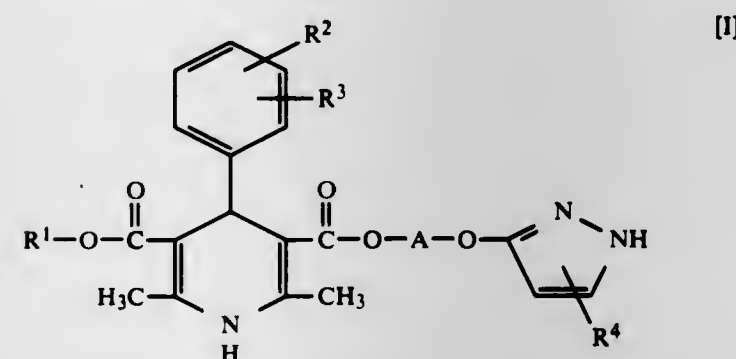
Claims priority, application Japan, Feb. 1, 1982, 57-13398

Int. Cl.<sup>3</sup> C07D 401/14, 401/12

U.S. Cl. 546—256

18 Claims

1. A 1,4-dihydropyridine derivative of the following general formula [I]:



wherein R<sup>1</sup> represents an alkyl group having from 1 to 4 carbon atoms or an alkoxyalkyl group having from 3 to 6 carbon atoms, R<sup>2</sup> represents a hydrogen atom or a halogen atom, R<sup>3</sup> represents either a nitro group when R<sup>2</sup> is a hydrogen atom or a halogen atom when R<sup>2</sup> is a halogen atom, R<sup>4</sup> represents a pyridyl group, a phenethyl group, a benzyl group which may optionally be substituted by at least one member selected from the group consisting of a lower alkyl group, a lower alkoxy group, a methylenedioxy group and a halogen atom or a phenyl group which may optionally be substituted by at least one member selected from the group consisting of a lower alkyl group, a lower alkoxy group, a trifluoromethyl group, a nitro group, a cyano group, an amino group, a mono-lower-alkylamino group, a di-loweralkylamino group, an acetylaminogroup, a benzoylamino group, a methylenedioxy group and a halogen atom, and A represents a hexamethylene group which may optionally be substituted by one or two alkyl groups having from 1 to 3 carbon atoms.

4,418,198

## SUBSTITUTED PYRIDINE CARBONYL AMINO ETHYL ESTERS OF 2-METHYL-2-PROPENOIC ACID

Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

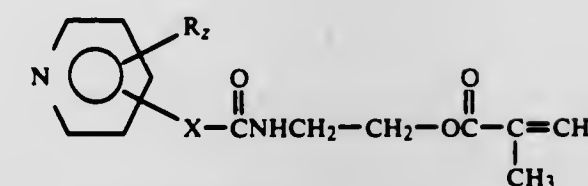
Filed Nov. 16, 1981, Ser. No. 321,356

Int. Cl.<sup>3</sup> C07D 213/64, 213/68

U.S. Cl. 546—292

17 Claims

1. A compound corresponding to the formula:



wherein X is oxygen, sulfur, imino (—NH—) or oxyalkyloxy of one to four carbon atoms both inclusive; each R independently represents halo, alkyl of one to four carbon atoms both inclusive, alkyloxy of one to four carbon atoms both inclusive, alkylthio of one to four carbon atoms both inclusive, nitro or cyano; and z is an integer of from zero to four, both inclusive, provided that when X is imino (—NH—) z is not zero and further provided that when X is imino and z is the integer one, R is a substituent other than alkyl of one to four carbon atoms.

4,418,199

## TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,120

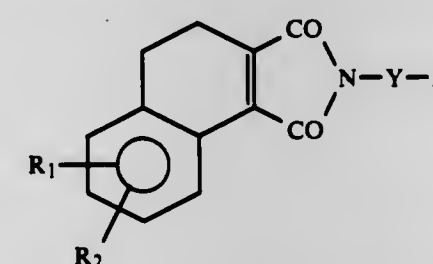
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.<sup>3</sup> C07D 209/66

U.S. Cl. 548—451

5 Claims

1. A compound of the formula



in which R and R<sub>1</sub> independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, Y is alkylene having 1 to 30 carbon atoms, cycloalkylene having 5 or 6 carbon atoms, methylenebis(cyclohexylene), arylene having 6 to 10 carbon atoms, aralkylene having 7 or 8 carbon atoms or alkylarylene having 7 or 8 carbon atoms; or said arylene substituted by one alkyl of 1 to 4 carbon atoms, by one alkoxy of 1 to 4 carbon atoms or by one nitro, and X is —COOH or —COCl.

4,418,200

## TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,418

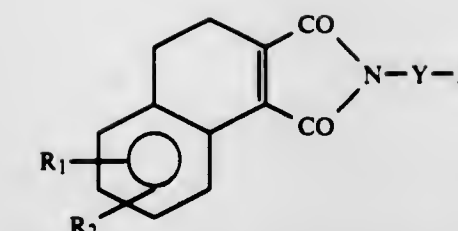
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.<sup>3</sup> C07D 209/66

U.S. Cl. 548—451

5 Claims

1. A compound of the formula



in which R and R<sub>1</sub> independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, Y is alkylene having 2 to 30 carbon atoms, cycloalkylene having 5 or 6 carbon atoms, methylenebis(cyclohexylene), arylene having 6 to 10 carbon atoms, aralkylene having 7 or 8 carbon atoms or alkylarylene having 7 or 8 carbon atoms; or said arylene substituted by one alkyl of 1 to 4 carbon atoms, by one alkoxy of 1 to 4 carbon atoms or by one nitro, and X is —OH.

4,418,201

## PROCESS FOR PREPARATION OF N-HETEROCYCLIC COMPOUNDS

Billy M. Williams, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

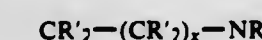
Filed May 16, 1980, Ser. No. 150,500

Int. Cl.<sup>3</sup> C07D 207/06

U.S. Cl. 548—579

10 Claims

1. A liquid phase process for forming saturated heterocyclic compounds of the formula



wherein R and R' independently in each occurrence are selected from the group consisting of hydrogen, phenyl and C<sub>1-20</sub> alkyl, alkoxy or polyalkoxy, and x is an integer from 1 to 4 comprising heating a diamino-substituted aliphatic compound of the formula



wherein R, R' and x are as above-defined and R'' is selected from the group consisting of hydrogen, phenyl and C<sub>1-20</sub> alkyl, alkoxy or polyalkoxy in the presence of a catalytically effective amount of a halide-containing Lewis acid at a temperature sufficient to cause formation of the saturated heterocyclic reaction product.

4,418,202

## 2-VINYL- AND 2-ETHYLCYCLOPROPANE MONOCARBOXYLATES

Richard G. Fayter, Jr., Fairfield, and Allen L. Hall, Amelia, both of Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

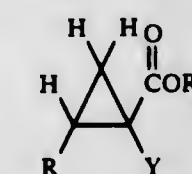
Filed Dec. 21, 1981, Ser. No. 333,213

Int. Cl.<sup>3</sup> C07D 307/16; C07C 69/74, 121/46, 121/75

U.S. Cl. 549—496

14 Claims

1. A compound of the formula



wherein R is an ethyl or vinyl group, Y is selected from the group consisting of nitrile or aryl, R<sub>1</sub> is hydrogen, a hydrocarbon radical having from 1 to 30 carbon atoms or an aliphatic, cycloaliphatic or aromatic group having from 1 to 30 carbon atoms and one or more oxygen, sulfur, nitrogen or halogen



atoms, with the proviso that when Y is nitrile R<sub>1</sub> cannot be hydrogen or an alkyl group having fewer than 5 carbon atoms.

4,418,203

**PROCESS FOR THE EPOXIDATION OF OLEFINS**  
Lee Kim, Alamo, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1981, Ser. No. 332,425  
Int. Cl.<sup>3</sup> C07D 301/12

U.S. Cl. 549—531

5 Claims

1. In the process for the production of epoxides by contacting a substituted or unsubstituted phenylallyl ether with hydrogen peroxide in an organic solvent in the presence of homogeneous transition metal catalyst selected from the group consisting of molybdenum, tungsten and rhenium and a homogeneous organo metallic co-catalyst selected from the group consisting of organo tin, organo arsenic, organo antimony and organo germanium, the improvement which comprises using as the organic solvent a fluorinated alcohol having the formula  $\text{CF}_n(\text{CF}_2)_m\text{CH}_2\text{OH}$  where n ranges from 0 to about 10.

4,418,204

**METHOD FOR MAKING ESTERS**

Peter J. Arndt, Seeheim-Jugenheim; Joachim Lowitz, Alsbach-Haehnlein; Manfred Müller, Rosdorf, and Fritz Schlosser, Darmstadt-Kranichstein, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,253  
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1981, 3140764

Int. Cl.<sup>3</sup> C07D 301/00

U.S. Cl. 549—539

5 Claims

1. A method for making an ester of a carboxylic acid with an alcohol containing an epoxy group by the transesterification of another ester of said carboxylic acid with said epoxy alcohol in the presence of 1,4-diazabicyclo(2,2,2)octane as a transesterification catalyst.

4,418,205

**16-AMINO-18,19,20-TRINOR-PROSTAGLANDIN DERIVATIVES, AND ACID ADDITION SALTS**

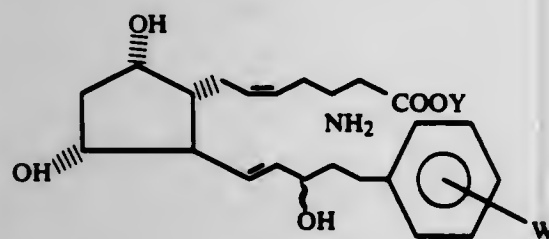
Eva Toth-Sarady; Gabor Ambrus; György Cseb; Janos Borveneg; Imre Moravcsik, and Gabriella Mezei, all of Budapest, Hungary, assignors to Patentbureau Danubia, Budapest, Hungary

Filed Dec. 9, 1981, Ser. No. 329,039  
Claims priority, application Hungary, Dec. 9, 1980, 2941/80  
Int. Cl.<sup>3</sup> C07C 177/00

U.S. Cl. 560—39

11 Claims

1. 16-Amino-18,19,20-trinor-prostaglandin derivatives of general formula I



having at C-17 a substituted or unsubstituted phenyl group, wherein C-15 and C-16 may have either S or R configuration, Y stands for a hydrogen atom or a lower alkyl group, W for a hydrogen atom, halogen atom, hydroxy group, lower alkyl or alkoxy group, and their acid addition salts.

4,418,206  
**9-DEOXY-9-METHYLENE DERIVATIVES OF (DL)-16-PHENOXY AND 16-PHENOXY SUBSTITUTED PROSTATRIENE COMPOUNDS**

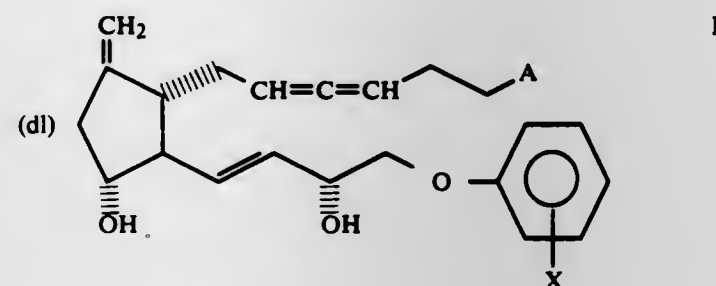
Douglas L. Wren, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 22, 1982, Ser. No. 360,286  
Int. Cl.<sup>3</sup> C07C 177/00

U.S. Cl. 560—55

19 Claims

1. A compound selected from the group of those represented by the following Formula:



wherein A is CHOH, CHO or COOR wherein R is hydrogen, a lower alkyl group of 1 to 4 carbon atoms or the pharmaceutically acceptable, non-toxic salts of compounds in which R is hydrogen; and X is hydrogen, o-, m- or p-halo (fluoro, chloro or bromo), o-, m- or p-methyl or o-, m- or p-methoxy.

4,418,207

**ACETYLACETOXYALKYL-ALLYL ETHERS**

Helmuth Braun, Krieffel; Helmut Rinno, Hofheim am Taunus, and Karl J. Rauterkus, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

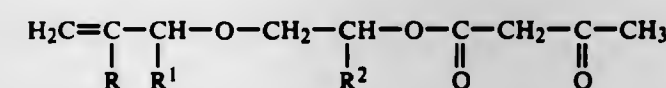
Filed Jul. 9, 1980, Ser. No. 167,004  
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927933

U.S. Cl. 560—178

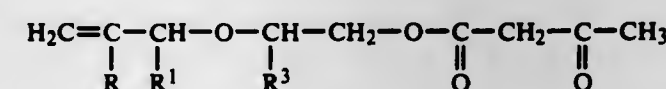
Int. Cl.<sup>3</sup> C07C 69/72

9 Claims

1. Acetylacetoxyalkyl-allyl ether of formula (I)



or of formula (II)



or mixtures thereof, in which R is a hydrogen atom or a methyl group, R<sup>1</sup> is a hydrogen atom or an alkyl group having 1, 2 or 3 carbon atoms, R<sup>2</sup> is a hydrogen atom, an aryl group having 6 to 8 carbon atoms, or an alkyl group having 1, 2 or 3 carbon atoms unsubstituted or substituted by a halogen atom, a hydroxyl group, or an acyloxy group having from 3 to 6 carbon atoms, and R<sup>3</sup> is an aryl group having 6 to 8 carbon atoms, or an alkyl group having 1, 2 or 3 carbon atoms unsubstituted or substituted by a halogen atom, a hydroxyl group or an acyloxy group having from 3 to 6 carbon atoms.

4,418,208

**N-SUBSTITUTED IMINODIACETIC ACIDS**

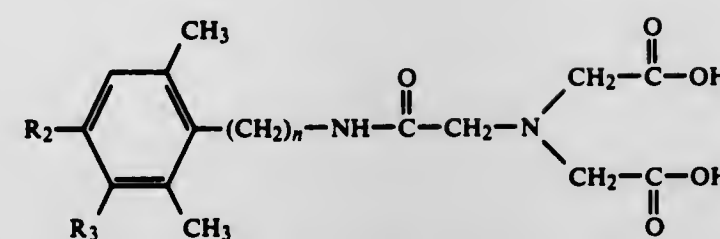
Adrian Nunn, Hopewell, and Michael Loberg, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 221,155, Dec. 29, 1980, abandoned.  
This application Jun. 16, 1982, Ser. No. 388,795

U.S. Cl. 562—449

9 Claims

1. A compound having the formula



or a pharmaceutically acceptable, water soluble salt thereof, wherein one of R<sub>2</sub> and R<sub>3</sub> is methyl and the other is bromine and n is 0, 1 or 2.

4,418,209

**AMIDINOTHIUREAS**

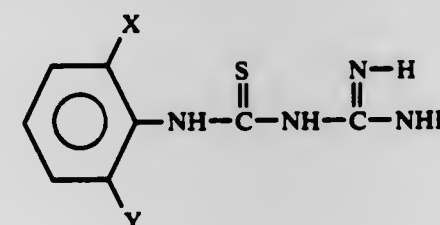
George H. Douglas, Malvern, Pa.; Julius Diamond, Morris Plains, N.J.; William L. Studd, Harleysville, and Stuart A. Dodson, Lansdale, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 140,135, Apr. 14, 1980, abandoned.  
This application Dec. 21, 1981, Ser. No. 333,169

U.S. Cl. 564—27

9 Claims

1. A compound of the formula



wherein

X and Y may be the same or different and are halo or lower alkyl;  
R is lower alkynyl;  
or a non-toxic salt thereof.

wherein

X and Y may be the same or different and are halo or lower alkyl;  
R is lower alkynyl;  
or a non-toxic salt thereof.

4,418,210

**PROCESS FOR PRODUCING ASYMMETRICAL THIOUREAS**

Jeffrey D. Robbins, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 28, 1981, Ser. No. 334,705  
Int. Cl.<sup>3</sup> C07C 157/05

U.S. Cl. 564—24

3 Claims

1. A process for preparing asymmetrical thioureas having the formula



wherein R and R<sub>1</sub> are independently selected from the group of alkyl containing from 1 to 20 carbon atoms and cycloalkyl

containing from 1 to 20 carbon atoms, and R<sub>2</sub> is selected from the group consisting of hydrogen, alkyl containing from 1 to 20 carbon atoms and cycloalkyl containing from 1 to 20 carbon atoms and provided that when R<sub>2</sub> is hydrogen, R<sub>1</sub> can not equal R; comprising

- (1) forming a reaction of water, an organic solvent, an amine having the formula RNH<sub>2</sub>, wherein R is as defined above, a molar excess of a base having the formula MOH wherein M<sup>+</sup> is a cation selected from the group of Na<sup>+</sup>, Li<sup>+</sup>, K<sup>+</sup>, Cs<sup>+</sup> and a quaternary ammonium ion having the formula (R<sub>3</sub>)<sub>4</sub>N<sup>+</sup> wherein R<sub>3</sub> is a lower alkyl containing from 1 to 4 carbon atoms and CS<sub>2</sub>;
- (2) reacting said reaction mixture under suitable temperature and pressure conditions to form RNHCS<sub>2</sub>M, wherein R is as defined above, and H<sub>2</sub>O;
- (3) forming a second reaction mixture comprising the mixture generated in step (2), an amine having the formula R<sub>1</sub>R<sub>2</sub>NH wherein R<sub>1</sub> and R<sub>2</sub> are as described above and catalytic amount of MOH, wherein M is as described above; and
- (4) reacting said second reaction mixture under suitable temperature and pressure conditions to form said



4,418,211

**PREPARATION OF**

**TRANS-CYCLOHEXANE-1,4-DISULPHONYL UREA**  
Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 49,112, Jun. 18, 1979, Pat. No. 4,275,223, which is a division of Ser. No. 883,949, Mar. 6, 1978, Pat. No. 4,203,416. This application Dec. 11, 1980, Ser. No. 215,415  
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710595

Int. Cl.<sup>3</sup> C07C 127/15

U.S. Cl. 564—40

1 Claim

1. A process for making trans-cyclohexane-1,4-disulphonyl urea preferentially to its cis-stereoisomer, which comprises
- (a) reacting mixed cis- and trans-cyclohexane-1,4-dicarboxylic acid or an ester thereof with ammonia in a liquid polyhydric alcohol solvent for the acid or ester at a temperature of from about 25° C. to about 200° C. and under an ammonia partial pressure of about 0.1 bar to 50 bars;
  - (b) separating the resulting solid dicarboxylic acid diamide from the liquid phase including any water soluble constituents therein;
  - (c) suspending the resulting solid diamide in an aqueous mineral acid or water;
  - (d) chlorinating the resulting suspended diamide to form cyclohexane-1,4-dicarboxylic acid-bis-N-chloramide, and
  - (e) reacting said chloramide with a primary sulphonamide in a reaction mixture containing water, dimethyl formamide and an alkali metal hydroxide or alkaline earth metal hydroxide to form substantially exclusively trans-cyclohexane-1,4-disulphonyl urea.



4,418,212  
SYNTHESIS OF DIMETHYLMETHYLENE  
DINITRAMINE

Marguerite S. Chang, Fort Washington, and Robert R. Orndoff, Waldorf, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1982, Ser. No. 394,218  
Int. Cl.<sup>3</sup> C07C 111/00

U.S. Cl. 564—109 17 Claims  
1. A process for preparing methylnitramine comprising the following steps in order:

- (1) adding N,N'-dimethylurea on an organic solvent to mixed acid which is maintained at a temperature which is above the freezing point of mixed acid up to 5° C. to produce N,N'-dimethyl-N,N'-dinitrourea and then drowning the mixed acid in ice water;
- (2) using an organic solvent to extract the N,N'-dimethyl-N,N'-dinitrourea from the mixed acid-water mixture;
- (3) hydrolyzing the N,N'-dimethyl-N,N'-dinitrourea to form methylnitramine by adding the N,N'-dimethyl-N,N'-dinitrourea—organic solvent solution to water which is at a temperature of from 37° C. to 100° C.; and
- (4) isolating the product methylnitramine by:
  - (a) evaporating the organic solvent to completion;
  - (b) reducing the volume of the water phase by removing water to a minimum until just before methylnitramine begins to decompose;
  - (c) extracting methylnitramine from the water phase with the organic solvent; and
  - (d) evaporating the organic solvent to obtain methylnitramine.

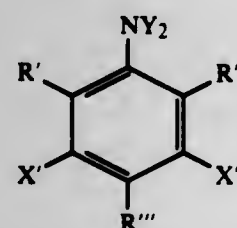
4,418,213  
PROCESS FOR THE SELECTIVE PREPARATION OF  
META-CHLOROANILINES

Georges Cordier, Francheville, and Pierre Fouilloux, Caluire, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jul. 14, 1981, Ser. No. 283,151  
Claims priority, application France, Aug. 1, 1980, 80 17324;  
Sep. 26, 1980, 80 20979

Int. Cl.<sup>3</sup> C07C 85/11, 85/24  
U.S. Cl. 564—412 20 Claims

1. A process for the preparation of anilines substituted in the meta-position by chlorine, by the catalytic hydrogenation, in the liquid phase, under the action of heat and under pressure, in the presence of noble metals from group VIII of the periodic classification, of nitrogen-containing and chlorine-containing benzene derivatives of the formula:



in which: Y represents the hydrogen atom or the oxygen atom, X' and X'', which are identical to or different from one another, each represent a chlorine atom, or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy radical, at least one of the symbols X' and X'' necessarily being a chlorine atom and it being furthermore possible for one of the symbols X' and X'' to be hydrogen, and R', and R'' and R''', which are identical to or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aralkyl, alkoxy or aralkoxy radical, at least one of these three symbols representing the chlorine atom and it being furthermore possible for at most two of the symbols R', R'' or R''' to be hydrogen, in which process the reaction is carried out in an essentially anhydrous medium at between 90° and 300° C., in the

presence of a catalytic amount of at least one Lewis acid as a catalyst, wherein the Lewis acid is a halide of an element selected from the group consisting of boron, aluminum, gallium, tin, phosphorus, arsenic, antimony, bismuth, titanium, zirconium, molybdenum, manganese, iron, cobalt, nickel, copper, zinc and cadmium, wherein the molar ratio of the Lewis acid to the starting nitrogen-containing and chlorine-containing benzene derivative is between 0.0001 and 1.

4,418,214  
HYDROGEN RECOVERY BY ALCOHOL SCRUBBING IN  
ALCOHOL AMINATION

Michael G. Turcotte, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 18, 1982, Ser. No. 434,768  
Int. Cl.<sup>3</sup> C07C 85/06

U.S. Cl. 564—479 6 Claims

1. In a process for the preparation of alkylamines which comprises contacting an alkanol feed having at least three carbon atoms with ammonia in the presence of a hydrogenation catalyst and hydrogen in a reaction zone to yield a product effluent stream, and separating the product effluent stream into an alkylamine stream for distillation and a vent stream comprising hydrogen and hydrocarbon by-products, the method comprising

- (a) contacting the hydrogen and hydrocarbon by-products vent stream with an alkanol which is the same as the alkanol feed to the reaction zone, to yield a hydrogen gas stream and an alkanol wash stream containing the hydrocarbons,
- (b) recycling the hydrogen gas stream to the reaction zone,
- (c) stripping the alkanol wash stream to provide a hydrocarbon waste stream and a regenerated alkanol stream, and
- (d) recycling the regenerated alkanol stream to the reaction zone.

4,418,215  
CATALYSTS

John W. Jenkins, Chalkhouse Green, Near Reading, England, assignor to Johnson, Matthey & Co., Limited, London, England

Division of Ser. No. 214,983, Dec. 10, 1980. This application Nov. 10, 1981, Ser. No. 320,065

Claims priority, application United Kingdom, Dec. 18, 1979, 7943484

Int. Cl.<sup>3</sup> C07C 47/052

U.S. Cl. 568—473 2 Claims

1. A process for the oxidative dehydrogenation of methanol to produce formaldehyde which comprises contacting a mixture of methanol and oxygen in which the ratio of methanol to oxygen is above the rich flammability limit with a catalyst or catalyst substrate comprising a metal body wherein said body comprises a silver alloy containing silver and from 0.1 to 7.5% by weight of copper and is made by a melt spin or melt extraction process, said body being in the form of an elongate element.

4,418,216  
BIS-TERT-BUTOXYPENTANALS AND  
BIS-TERT-BUTOXYPENTANOLS  
Walter Himmele, Walldorf, and Werner Hoffmann, Neuhausen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany  
Division of Ser. No. 167,790, Jul. 11, 1980. This application Feb. 24, 1982, Ser. No. 352,047

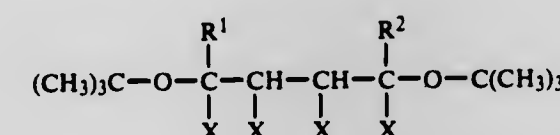
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932527

The portion of the term of this patent subsequent to Feb. 24, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C07C 47/198

U.S. Cl. 568—497

1. A compound having the formula



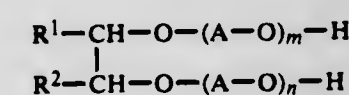
where R<sup>1</sup> and R<sup>2</sup> are hydrogen or C<sub>1</sub> to C<sub>4</sub>-alkyl, one of the radicals X is formyl or hydroxymethyl and the others are hydrogen.

4,418,217  
MIXED FORMALS OF POLYGLYCOL ETHERS  
Karl Schmid, Mettmann; Margarete Grünert, Kaarst; Jochen Heidrich, and Holger Tesmann, both of Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany  
Filed Apr. 27, 1981, Ser. No. 257,632  
Claims priority, application Fed. Rep. of Germany, May 12, 1980, 3018135

Int. Cl.<sup>3</sup> C07C 41/14, 43/11  
U.S. Cl. 568—593 7 Claims

1. The mixed formal of polyglycol ethers produced by the process consisting essentially of the steps of:

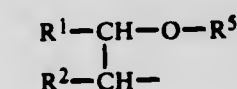
- (1) reacting a polyglycol ether having the formulae selected from the group consisting of



and



wherein R<sup>1</sup> is a straight or branched chain alkyl having from 1 to 18 carbon atoms, and R<sup>2</sup> is selected from the group consisting of hydrogen and straight or branched chain alkyl having from 1 to 17 carbon atoms, where the sum of the carbon atoms in R<sup>1</sup> plus R<sup>2</sup> is from 6 to 18, R<sup>3</sup> is a member selected from the group consisting of monoalkylphenyl having from 14 to 26 carbon atoms, dialkylphenyl having from 14 to 26 carbon atoms, trialkylphenyl having from 14 to 26 carbon atoms, a straight or branched chain alkyl having from 8 to 22 carbon atoms, a straight or branched chain alkenyl having from 8 to 22 carbon atoms, and a radical having the formula



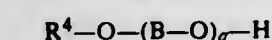
wherein R<sup>1</sup> and R<sup>2</sup> have the above assigned values, and R<sup>5</sup> is selected from the group consisting of a straight or branched chain alkyl having from 1 to 5 carbon atoms, phenyl and alkylphenyl having from 7 to 9 carbon atoms, A is selected from the group consisting of ethylene and isopropylene, m and n are integers from 0 to 50, and p is an

integer from 2 to 50, where the sum of m plus n, is from 2 to 50, with a diformal having the formula



wherein R<sup>4</sup> is a straight or branched chain alkyl having from 1 to 5 carbon atoms, B is selected from the group consisting of ethylene and propylene, and q is an integer from 0 to 3, at a temperature of from 60° to 150° C. in the presence of a strong acid, while employing from 2 to 10 mols of said diformal per mol of hydroxyl groups in said polyglycol ether,

- (2) distilling off the alcohol formed having the formula



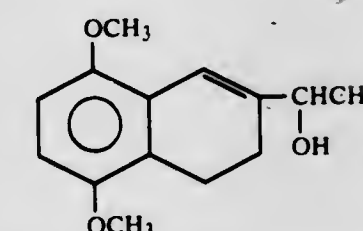
wherein R<sup>4</sup>, B and q have the above-assigned values,

- (3) neutralizing,
- (4) distilling of unreacted diformal, and
- (5) recovering said mixed formal of polyglycol ethers, having an OH-number of 6 or less and which is extremely stable in the presence of strong alkalis.

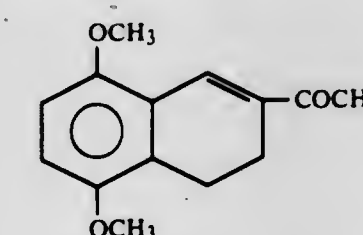
4,418,218  
PROCESS FOR PRODUCING  
DIHYDRONAPHTHALENE DERIVATIVES  
Shiro Terashima, Norihiko Tanno, and Kenji Koga, all of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan  
Division of Ser. No. 238,136, Feb. 25, 1981, abandoned. This application Mar. 29, 1982, Ser. No. 363,048  
Claims priority, application Japan, Mar. 4, 1980, 55-27673;  
Jul. 18, 1980, 55-98956

Int. Cl.<sup>3</sup> C07C 41/18 3 Claims

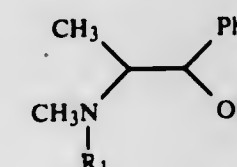
1. A process for producing 2-(1'-hydroxy)ethyl-5,8-dimethoxy-3,4-dihydronaphthalene of the formula,



which comprises reducing 2-acetyl-5,8-dimethoxy-3,4-dihydronaphthalene of the formula,

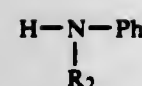


with the reducing agent obtained by reacting one equivalent of lithium aluminum hydride with one equivalent of an optically active N-substituted ephedrine of the formula



(wherein R<sub>1</sub> is a C<sub>1</sub>-C<sub>4</sub> alkyl or benzyl group and Ph is phenyl group) and two equivalents of an N-substituted aniline of the formula,





(wherein R<sub>2</sub> is a C<sub>1</sub>-C<sub>4</sub> straight-chain alkyl or phenyl group and Ph is phenyl group).

4,418,219

### PREPARATION OF METHYL TERTIARY-BUTYL ETHER

Ronnie M. Hanes, Milford, and Orville D. Prampton, Wyoming, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 239,249, Mar. 2, 1981, abandoned. This application Mar. 22, 1982, Ser. No. 360,531  
Int. Cl.<sup>3</sup> C07C 41/06

U.S. Cl. 568-697

12 Claims

1. A process for preparing methyl tertiary-butyl ether which comprises reacting isobutylene and methanol in the presence of a catalytically effective amount of at least one heterogeneous catalyst selected from the group consisting of boron phosphate and blue tungsten oxide at a temperature of from about 50° C. to about 400° C.

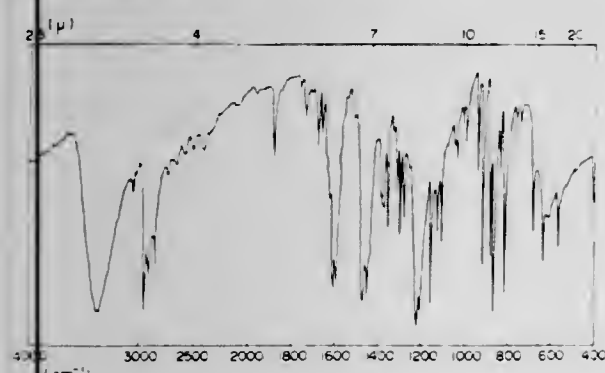
4,418,220

### NOVEL INDENE COMPOUND AND NOVEL PROCESS FOR PRODUCING INDENE COMPOUNDS

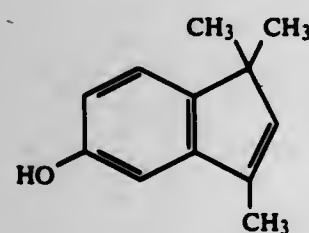
Satoshi Numata, Yokohama; Kiyoshi Nakatani, Tokyo; Noboro Yamazaki, and Tetsuo Yuasa, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan  
Division of Ser. No. 97,147, Nov. 26, 1979, Pat. No. 4,366,378. This application Mar. 24, 1982, Ser. No. 361,433  
Int. Cl.<sup>3</sup> C07C 39/14

U.S. Cl. 568-734

1 Claim



1. Novel compound, 5-hydroxy-1,1,3-trimethyl-2-indene, of the formula



### 4,418,221 PROCESS FOR TREATING AQUEOUS SOLUTIONS CONTAINING PHENOLS

Sinichi Yasuda, Otsu; Takayuki Kurohara, Hirakata, and Akira Taguro, Osaka, all of Japan, assignors to Koel Chemical Co., Ltd., Osaka, Japan

Filed Mar. 12, 1982, Ser. No. 357,466

Claims priority, application Japan, Mar. 19, 1981, 56-41124  
Int. Cl.<sup>3</sup> C07C 37/68, 37/84

U.S. Cl. 568-757

11 Claims

1. A process for treating an aqueous solution containing at least one phenol selected from the group consisting of phenol, cresols, xylenols, catechols, chlorophenols and nitrophenols, characterized by removing said phenol from said aqueous solution by extraction using an extracting solvent comprising a nitrogen-containing heterocyclic compound having a total carbon number of 9 or more, selected from the group consisting of a compound having the skeletal structure of pyridine, a compound having the skeletal structure of piperidine and a compound having the skeletal structure of triazine.

4,418,222

### CONTINUOUS PHENOL ALKYLATION PROCESS

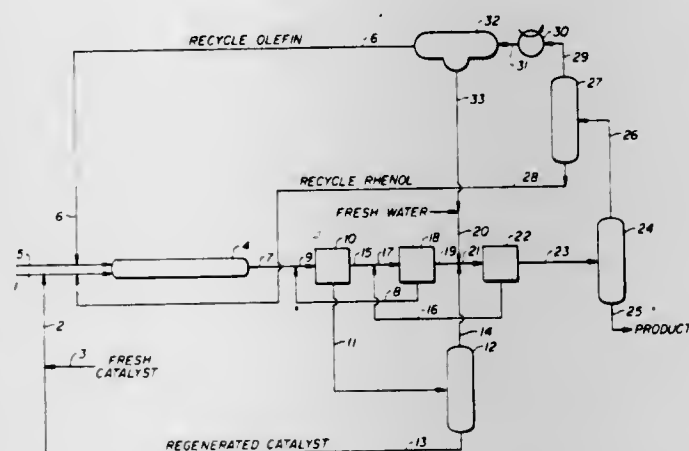
Lewis R. Honnen, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 26, 1981, Ser. No. 267,164

Int. Cl.<sup>3</sup> C07C 37/14, 39/06

U.S. Cl. 568-793

3 Claims



1. An improved process for the continuous production of para monoalkyl phenol comprising reacting phenol with polypropylene under liquid phase alkylation conditions by contacting the reactants in the presence of an effective amount of trifluoromethanesulfonic acid catalyst, said contacting being at a temperature in the range of from about 20° C. to 150° C. for a period of from 0.5 to 10 minutes which time is sufficient for substantial completion of said alkylation and insufficient for appreciable isomerization of said para alkyl phenol; quenching the resulting alkylation reaction mixture and producing an aqueous phase containing said catalyst and an organic phase containing said para alkyl phenol by introducing water into said mixture; and recovering said alkyl phenol from said organic phase.

4,418,223

### PREPARATION OF 2,4,6-TRIALKYLPHENOLS

Bruce E. Firth, Elk Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 29, 1982, Ser. No. 362,774

Int. Cl.<sup>3</sup> C07C 37/14, 39/06

U.S. Cl. 568-794

6 Claims

1. A method of preparing 2,4,6-tri-sec-alkylphenol comprising reacting phenol with a monosubstituted or alpha, beta-disubstituted olefin at a temperature from about 150° to about 300° C. in the presence of a catalyst which is a composite consisting essentially of silica and alumina containing from

about 40 to about 60% silica and from about 60 to about 40% alumina, and recovering the 2,4,6-tri-sec-alkylphenol.

4,418,224

### PREPARATION OF ORTHO-ALKYLATED PHENOLS USING MAGNESIUM COMPOUND CATALYSTS

James G. Bennett, Delmar, N.Y., and Freddie L. Tungate, Georgetown, Ind., assignors to General Electric Company, Pittsfield, Mass.

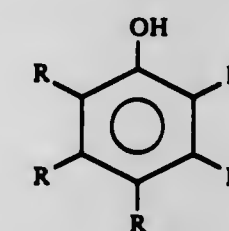
Filed Sep. 18, 1981, Ser. No. 303,567

Int. Cl.<sup>3</sup> C07C 37/16

U.S. Cl. 568-804

24 Claims

1. In a process for alkylating a phenolic compound in the ortho position which comprises the vapor phase reaction in the presence of an alkylation catalyst of an alkylation feed mixture comprising an alkyl alcohol having up to about 16 carbon atoms and a phenolic compound having at least one ortho hydrogen, the phenolic compound represented by the formula



wherein R is a monovalent substituent selected from the group consisting of hydrogen, alkyl, phenyl and alkyl substituted phenyl, the improvement comprising conducting the reaction in the presence of a catalyst consisting of a calcination residue derived from heating a magnesium-containing compound wherein said heating which provides a calcination residue takes place in the presence of said alkylation feed mixture in situ in a reactor.

4,418,225

### RESOLUTION OF D,1-MENTHOL

David W. House, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 8, 1982, Ser. No. 338,443

Int. Cl.<sup>3</sup> C07C 35/12

U.S. Cl. 568-829

14 Claims

1. A method of preparing optically active menthol comprising contacting a solution containing the diastereomeric esters from racemic menthol and an optically active amino acid selected from the group consisting of naturally occurring amino acids, phenylglycine, 4-hydroxyphenylglycine, meta-tyrosine, 3,4-dihydroxyalanine, and 3,5-diiodothyronine with a chromatographic support, eluting said support with a solvent under chromatographic conditions, collecting at least one effluent fraction containing a purified diastereomer, treating the purified diastereomer to liberate optically active menthol, and recovering said optically active menthol.

11. A method of obtaining a purified diastereomer from which l-menthol may be readily regenerated comprising contacting a solution containing the diastereomeric esters from racemic menthol and an optically active amino acid selected from the group consisting of naturally occurring amino acids, phenylglycine, 4-hydroxyphenylglycine, meta-tyrosine, 3,4-dihydroxyalanine, and 3,5-diiodothyronine, with a chromatographic support, eluting said support with a solvent under chromatographic conditions, and collecting at least one effluent fraction containing a purified diastereomer of l-menthol and said amino acid.

4,418,226

### PROCESS FOR REFINING WASTE LIQUOR

Martin J. Jacobs, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 4, 1982, Ser. No. 432,602

Int. Cl.<sup>3</sup> C07C 31/24, 29/86

U.S. Cl. 568-854

3 Claims

1. A process for the purification of pentaerythritol waste liquor resulting from the process of crystallizing pentaerythritol from the mother liquor containing it, the waste liquor comprising an aqueous solution of pentaerythritol, dipentaerythritol, sodium formate, cyclic pentaerythritol monoformal and bispentaerythritol monoformal comprising the steps of extracting the waste liquor with tetrahydrofuran in a ratio of about 1-4:1 thereby forming an extract containing most of the cyclic pentaerythritol monoformal and bispentaerythritol monoformal and a raffinate containing most of the pentaerythritol, dipentaerythritol and sodium formate and recycling the raffinate to the crystallization process.

4,418,227

### IMPROVED PROCESS FOR HYDROGENATING ALDEHYDES AND KETONES BY EMPLOYING ANIONIC GROUP VIII METAL HYDRIDE COMPOSITIONS AS HYDROGENATION CATALYSTS

Guido P. Pez, Boonton, and Roger A. Grey, Denville, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 70,583, Aug. 29, 1979, Pat. No. 4,268,454. This application Oct. 20, 1980, Ser. No. 200,165  
Int. Cl.<sup>3</sup> C07C 27/00, 29/00, 31/18

U.S. Cl. 568-861

2 Claims

1. An improved process for hydrogenating an aldehyde group in a chemical compound to a primary alcohol group including contacting a solution of hydrogenation catalyst and said aldehyde, neat or in an inert solvent therefore, with an atmosphere containing hydrogen gas; the improvement which comprises providing an anionic Group VIII metal hydride complex having 1 to 3 ligands per Group VIII metal atom as said catalyst, said ligands being selected from triphenyl phosphine, diphenyl phosphide and methyldiphenylphosphine; wherein the Group VIII metal is an element selected from the first and second transition series; and the charge of the complex anion is neutralized by cations selected from Group IA and Group IIA metals.

4,418,228

### PROCESS FOR RING BROMINATION OF NITROBENZENE

James J. Harrison, Glenshaw; John P. Pellegrini, Pittsburgh, and Charles M. Selwitz, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 22, 1982, Ser. No. 370,733

Int. Cl.<sup>3</sup> C07C 79/12

U.S. Cl. 568-937

6 Claims

1. A process for ring bromination of nitrobenzene which comprises contacting nitrobenzene with an alkali metal bromate and aqueous sulfuric acid, the reaction mixture being such that the amount of nitrobenzene therein will be in the range of about 0.25 to about 2.0 mols per liter of solution, the amount of alkali metal bromate being in the range of about 0.25 to about 2.5 mols per liter of solution and the concentration of the sulfuric acid in the reaction mixture being in the range of about 52 to about 75 weight percent.







## ELECTRICAL

4,418,238

### PHOTOELECTRIC SOLAR CELL ARRAY

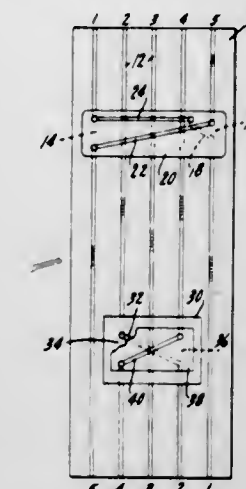
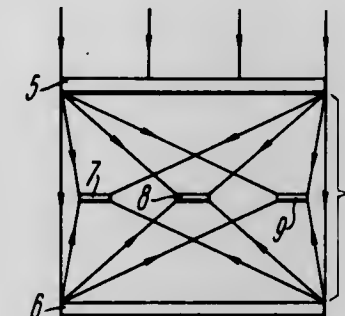
Nikolai S. Lidorenko, ulitsa Kibalehicha, 2, kv. 217, Moscow; Viktor V. Afian, ulitsa Sevaka, 2, kv. 13, Erevan; Albert V. Vartanian, Aigestan, 10 ulitsa, 2, kv. 57, Erevan; Ruben G. Martirosian, ulitsa Shinararneri, 27, kv. 32, Erevan; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64, and Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17, both of Moscow, all of U.S.S.R.

Filed Oct. 20, 1981, Ser. No. 313,339

Int. Cl.<sup>3</sup> H01L 31/04

U.S. Cl. 136—246

1 Claim



said insulating patch and extending therethrough into electrical contact with said certain conductive paths.

1. A photoelectric solar cell comprising:
    - a light dispersing element adapted to be exposed to the sun's radiation and implemented as a hologram, having first and second parts, representing light sources with different wavelengths;
    - a plurality of photocells, each having different spectral sensitivities and first and second working surfaces with different spectral sensitivities and arranged behind the dispersing element along the path of the sun's radiation, said working surfaces being exposed to the light beams with the wavelengths corresponding to the maximum spectral sensitivities of said photocells, said photocells each being positioned in the image planes of the light sources producing the light beams of the corresponding wavelengths;
- wherein said first part of said hologram faces first working surfaces of said photocells and is implemented as a transmission hologram representing light sources which have wavelengths corresponding to the maxima of the spectral sensitivities of said first working surfaces; and said second part of said hologram faces said second working surfaces of said photocells and is implemented as a reflection hologram representing light sources which have wave lengths corresponding to the maxima of the spectral sensitivities of said second working surfaces.

4,418,240

### ELECTRICAL STRESS CONTROL ELECTRODE IN COMBINATION WITH A JUNCTION END OF A SHIELDED INSULATED ELECTRICAL CONDUCTOR

Elie Chazelas, Montereau, France, assignor to Societe Industrielle de Liaisons Electriques Silec, Paris, France

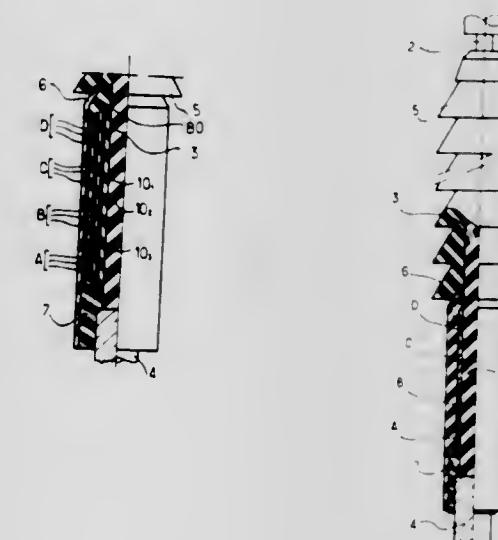
Filed Apr. 1, 1981, Ser. No. 249,864

Claims priority, application France, Apr. 2, 1980, 80 07487

Int. Cl.<sup>3</sup> H02G 15/064, 15/184

U.S. Cl. 174—73 R

1 Claim



4,418,239

### FLEXIBLE CONNECTOR WITH INTERCONNECTION BETWEEN CONDUCTIVE TRACES

Willis A. Larson, and Anthony J. Van Zeeland, both of Crystal Lake, Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Aug. 24, 1981, Ser. No. 295,528

Int. Cl.<sup>3</sup> H01B 7/08

U.S. Cl. 174—34

10 Claims

1. A flexible connector including a flat thin insulating base, a plurality of spaced conductive paths formed on one side thereof, and means for providing selective interconnection between certain conductive paths including a thin defined

1. An electrical stress control electrode in combination with a junction end of an elongated shielded and insulated electrical conductor, said electrical stress control electrode being arranged around the periphery of the conductor insulator at the level of the end of the shield of the conductor and comprising:



at least two sheathing members radially separated from each other and each including a plurality of successive adjacent zones in the axial direction;  
each zone comprising particles of at least an active material exhibiting variable non-linear electrical resistance properties dispersed in an insulating binder;  
said particles being so distributed and size-selected as to progressively increase the electrical resistance of said successive adjacent zones towards one end;  
an internal tubular layer of insulating material interposed between the radially innermost sheathing member and said conductor insulator, said layer having a relative permittivity greater than that of said conductor insulator; and  
an insulating medium so designed as to separate said sheathing members from each other in a direction perpendicular to said axial direction.

#### 4,418,241 INSULATED COIL

Kenzo Fujiwara, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,387

Claims priority, application Japan, Feb. 25, 1981, 56-27236

Int. Cl.<sup>3</sup> H01B 7/02; H01H 85/02; B32B 5/16, 7/00

U.S. Cl. 174—121 SR 9 Claims

1. An insulated coil formed by a method, comprising:
  - a) heat bonding an integrated mica sheet (1) to an aromatic polyamide fibril sheet (2), said integrated mica sheet obtained by forming a mixture of mica flakes and aromatic polyamide fibrils into a sheet and said aromatic polyamide fibril sheet obtained by impregnating an insulating cloth or glass fiber cloth with aromatic polyamide fibrils;
  - b) treating the integrated sheet material obtained with a thermosetting resin;
  - c) wrapping an electric conductor with the integrated sheet material;
  - d) impregnating the wrapped electric conductor with a thermosetting resin under the force of a vacuum or a vacuum-pressure treatment; and
  - e) molding the resin impregnated wrapped conductor while heating the same.

#### 4,418,242 COORDINATE READING APPARATUS

Takum Kouno, Machida, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

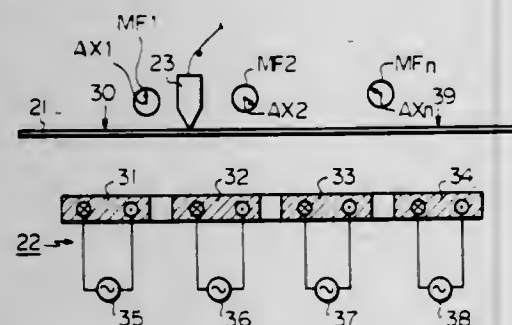
Filed Feb. 27, 1981, Ser. No. 238,961

Claims priority, application Japan, Mar. 4, 1980, 55/27095; Apr. 15, 1980, 55/49478; Apr. 15, 1980, 55/49479; Dec. 11, 1980, 55/173755

Int. Cl.<sup>3</sup> G08C 21/00

U.S. Cl. 178—19

15 Claims



1. A coordinate reading apparatus, comprising:
  - a) tablet including therein magnetic-field generating coils;
  - b) position detector, responsive to magnetic fields induced by said magnetic-field generating coils, for generating an analogue electric signal corresponding to a desired position to be read on said tablet; and
  - c) processing unit, operatively connected to said position detector and said tablet, for receiving said analogue elec-

tric signal from said position detector, for generating coordinate data corresponding to said desired position to be read on said tablet, and for supplying alternating signals to said magnetic-field generating coils, the phases of the respective alternating signals in each coil being shifted with respect to each other, each coil having a magnetic field component which when summed with the magnetic field component of an adjacent coil produces a rotating magnetic-field vector, and said position detector sensing the rotating magnetic-field vector which is comprised of the magnetic field components induced above said table, thereby the coordinate data to be read is generated by said processing unit by applying thereto the analogue electric signal representing said rotating magnetic-field vector comprising the magnetic-field components.

#### 4,418,243 ACOUSTIC PROJECTION STEREOPHONIC SYSTEM

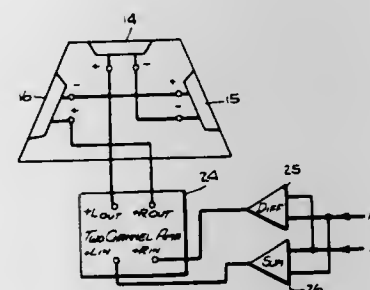
Jon S. Fixler, Andalusia, Pa., assignor to Robert Genin, Miami, Fla.

Filed Feb. 16, 1982, Ser. No. 349,380

Int. Cl.<sup>3</sup> H04R 5/02

U.S. Cl. 381—24

8 Claims



1. A system for acoustically projecting sounds into a listening chamber to substantially recreate the three-dimensional ambience of an original sound source composed of a central zone flanked by left and right zones, the sounds emanating from these zones being picked up by at least two microphones one adjacent the left zone and the other adjacent the right zone to produce signals which are conveyed by a stereophonic system in separate signal channels, said system comprising:
  - A. means coupled to said channels to extract therefrom a first power output derived from the sum of the channel signals; a second power output derived from the difference between the left and right signals, and a third power output derived from the difference between the right and left signals;
  - B. a reproducer array composed of a middle speaker flanked by left and right speakers;
  - C. means to apply said first power output to said middle speaker to energize same to project sounds from the front and rear thereof representing the sounds originating at all of said zones;
  - D. means to apply said second power output to said left speaker to energize same to project sounds from the front and rear thereof representing the difference between the sounds originating at the left and right zone;
  - E. means to apply said third power output to said right speaker to energize same to project sounds from the front and rear thereof representing the difference between the sounds originating at the right and left zones, and
  - F. a common cabinet including front, back and side walls and an open interior placeable within said listening chamber and having said array of speakers mounted therein in an arrangement in which said middle speaker is mounted on the back wall of the cabinet whereby the sound from the front of this speaker is projected toward the rear of the chamber, said left and right speakers being mounted on the corresponding side walls of the cabinet whereby the respective sounds from the fronts of these speakers are projected toward the corresponding side walls of the

chamber, the front wall of the cabinet being defined by a baffle having a central port therein whereby the sounds from the rear of the speakers in the array are intermixed in the interior of the cabinet, and the resultant sound projected through said port toward the front of the chamber represents sound mainly originating at the central zone of said original sound source.

#### 4,418,244 BISTABLE SWITCH REMOTELY OPERABLE OVER TELEPHONE LINE

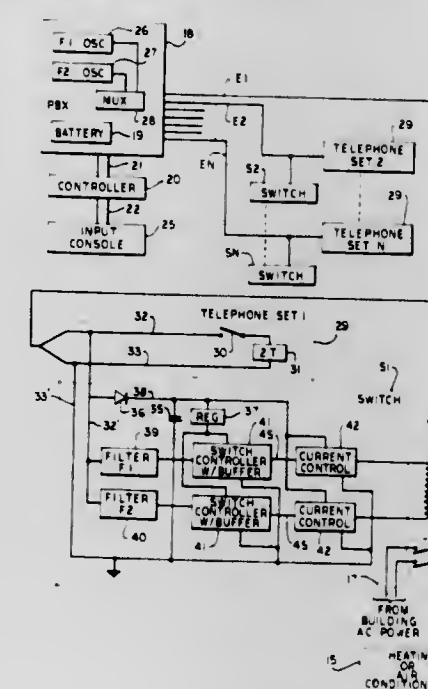
C. Mills Edgar, Marietta, Ga., assignor to Solid State Systems, Inc., Marietta, Ga.

Filed Jun. 21, 1982, Ser. No. 390,182

Int. Cl.<sup>3</sup> H04M 11/00

U.S. Cl. 179—2 A

6 Claims



1. A bistable switch for controlling an external load through a pair of telephone conductors comprising in combination:
  - a) an input pair of conductors for providing a connection to said pair of telephone conductors;
  - b) a passive energy storing means connected between said input pair for storing charge;
  - c) a bistable relay including a coil arrangement and a set of contacts characterized by said set of contacts assuming a first state in response to current flowing through said coil arrangement in a set direction and said contacts assuming a second state in response to current flowing said coil arrangement in a reset direction;
  - d) current control means including a pair of electronic switches connected to said coil arrangement and to said passive energy storage means, one of said pair being connected to conduct current in said set direction in response to receiving a firing signal, and the other of said pair being connected to said coil arrangement to conduct current in said reset direction, in response to receiving said firing signal;
  - e) a pair of switch controllers, each connected to a respective one of said electronic switches, and each comprising an input connected to said pair of telephone conductors, a filter connected to said input having a characteristic pass band distinct from the filter of the other of said pair of said switch controllers; and
  - f) buffering means connected to said filter for providing said firing signal to said respective one of said electronic switches in response to the presence of a signal on said pair of telephone conductors having a frequency within said characteristic pass band, for a predetermined period of time.

#### 4,418,245 INTERFERENCE LIMITING TWO-PORT NETWORK FOR 1+1 TYPE TRANSMISSION SYSTEMS

Yves-Marie Le Grand, Trappes, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

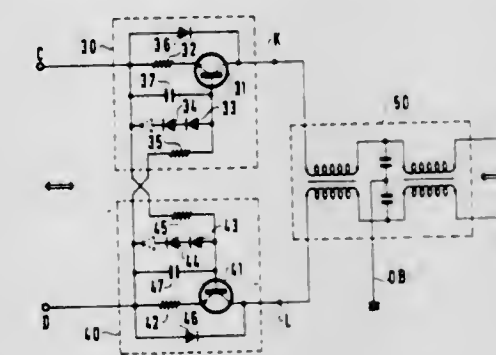
Filed Feb. 22, 1982, Ser. No. 351,079

Claims priority, application France, Nov. 13, 1981, 81 21314

Int. Cl.<sup>3</sup> H04J 1/00

U.S. Cl. 179—2.51

4 Claims



1. An interference-limiting two-port network for use in a 1+1 type transmission system connecting two subscriber terminals via a common two-wire link to a telephone exchange provided with an exchange battery, one of the subscriber terminals being connected via a channel referred to as an audio channel using base band transmission over the common two-wire link and being remotely powered by the exchange battery via said two-wire link, the other subscriber terminal being connected via a channel referred to as a super-audio channel using frequency transposed bands for transmission over the common two-wire link, the audio and super-audio channels being superimposed on the common two-wire link and being separated at the ends of said link by separation filters, each of which includes a low pass filter connecting the common two-wire link to a two-wire line on which the audio channel is isolated, wherein said interference-limiting two-port network is located at the exchange end of the system and comprises two current limiter circuits, each placed in series in a respective one of the two wires of the two-wire line of the audio channel in between the low pass filter of the exchange end separation filter and the rest of the exchange.

#### 4,418,246 CELL ASSEMBLY FOR ELECTRET TRANSDUCER

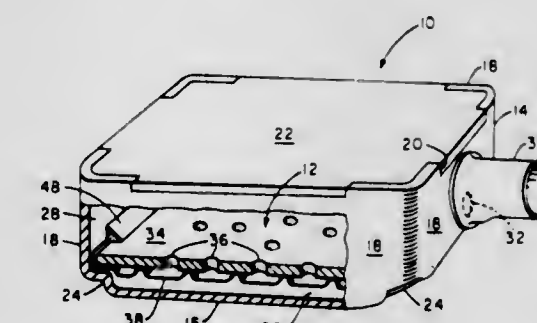
Joseph A. Sawyer, Camden, Me., assignor to Tibbetts Industries, Inc., Camden, Me.

Filed Oct. 29, 1980, Ser. No. 201,787

Int. Cl.<sup>3</sup> H04R 31/00

U.S. Cl. 179—111 E

10 Claims



1. A cell assembly for an electret transducer comprising, in combination,
  - a) a substantially flat backplate, and
  - b) a diaphragm formed of flexible sheet material and including a central plate portion and an edge portion around the periphery of the plate portion and attached to the back-



plate, the plate portion having at least one corrugation therein located inwardly of and spaced from the edge portion and being formed to protrude from the superficial plane of a principal surface of the plate portion, said at least one corrugation having a curved protruding surface thereof resting directly upon the backplate, defining at least one vibrationally active region of the plate portion and supporting said at least one active region against electrostatic collapse and with precise spacing from the backplate, said at least one corrugation having a principal dimension extending in a direction parallel to said superficial plane and being configured to relieve membrane stress in the plate portion directed transversely to said direction, said at least one corrugation having a total area of contact with the backplate that is small compared to the total area of said plate portion, one of said backplate and plate portion comprising an electret material.

4,418,247

## ELECTRODYNAMIC TRANSDUCER

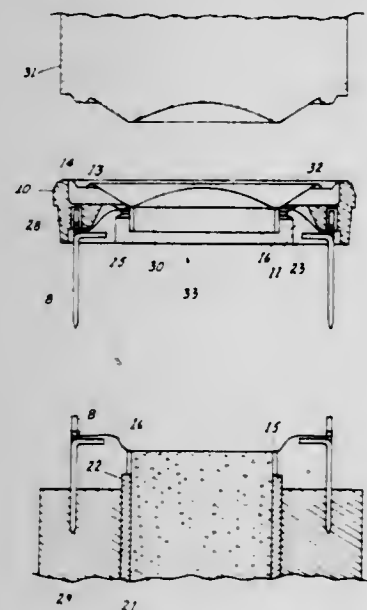
Kaj B. Hansen, Horsens, Denmark, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 20, 1981, Ser. No. 265,717

Claims priority, application Denmark, May 23, 1980, 2264/80  
Int. Cl.<sup>3</sup> H04R 1/02, 1/22, 9/04

U.S. Cl. 179—115.5 R

2 Claims



1. A method of making an electrodynamic transducer having a diaphragm connected to a coil which is axially movable in an annular slit between inner and outer pole shoes connected to respective poles of a magnet, and where the transducer is made from a magnet part and a separate coil/diaphragm part, the magnet part being made an integral part of a casing unit that includes a guide pin by attaching a pole shoe/magnet unit to the guide pin, comprising the steps of

fixing in a first station a heat deformable, planar diaphragm material to one side of a carrier ring which has an inwardly facing, cylindrical face having the same diameter as an outwardly facing, cylindrical face of the outer pole shoe such that one major surface of the diaphragm material faces the carrier rings,

applying in a second station a heat activatable glue capable of bonding the coil to the diaphragm material to one of said one major surface and said coil at a region which is coaxial with the carrier ring and has the same diameter at the annular slit between the pole shoes,

applying a third station a heat emitting diaphragm forming tool coaxially to a side of the diaphragm material facing away from the carrier ring, simultaneously pressing the diaphragm material into engagement with the forming tool by directing pressurized air against the opposite side of the diaphragm material to form the diaphragm therefrom, and pressing the coil against said region while said coil is supported on a guide templet which has an annular

engagement face of the same outer diameter as the outer pole shoe.

4,418,248

## DUAL ELEMENT HEADPHONE

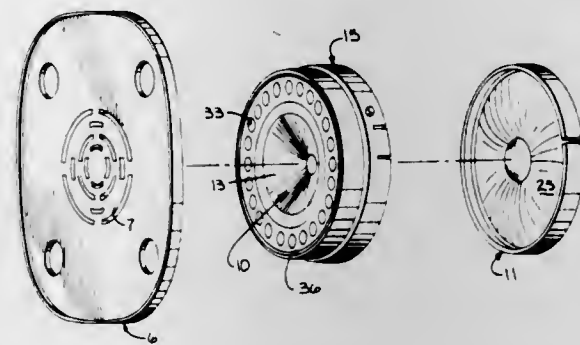
Terry D. Mathis, Thiensville, Wis., assignor to Koss Corporation, Milwaukee, Wis.

Filed Dec. 11, 1981, Ser. No. 329,763

Int. Cl.<sup>3</sup> H04R 1/28, 1/22

U.S. Cl. 179—156 R

3 Claims



1. In a headphone having a cup assembly with sound openings, the combination comprising:

a first acoustic transducer mounted within the cup assembly and positioned to direct sound through the sound openings, the first acoustic transducer having a cut-off frequency below which its acoustic output is substantially attenuated;

a housing which defines a cavity and a constricted passage which acoustically couples the cavity to the sound openings; and

a second transducer mounted to the housing and positioned to direct sound into the cavity, the second transducer having a resonant frequency below the cut-off frequency of the first acoustic transducer and being operable to provide substantial acoustic output below that cut-off frequency,

wherein the constricted passage is constructed to attenuate the acoustic output of the second acoustic transducer above a selected roll-off frequency, and in which the first acoustic transducer is fastened to a front wall on the housing and the housing is fastened to a face plate which contains the sound openings such that the acoustic output of the first acoustic transducer is directed through the sound openings, and in which ports are formed in the front wall of the housing around the periphery of the first acoustic transducer and the acoustic output of the second acoustic transducer is coupled to the sound openings through the ports.

4,418,249

## FOUR-WIRE TERMINATING CIRCUIT

Winfried Birth, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,210

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019835

Int. Cl.<sup>3</sup> H04B 1/58

U.S. Cl. 179—170 NC

12 Claims

1. A four-wire termination circuit for connecting a two-wire line having a given surge impedance to a transmitting arm and a receiving arm of a four-wire line while simultaneously decoupling the two arms of the four-wire line from one another, comprising:

a terminal impedance connected across the two-wire line which at least approximately simulates the surge impedance of the two-wire line;

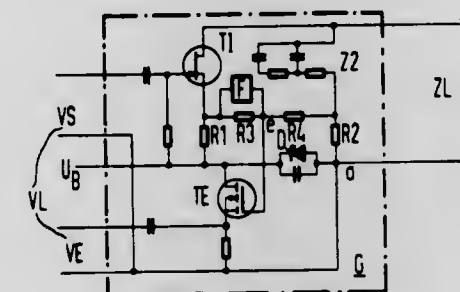
a series arrangement of a first resistor and a signal current

source which causes a transmitted signal current to flow when a signal is applied to a control input thereof by the transmitting arm connected for controlling the signal current source;

the terminal impedance being formed by a series arrangement of a second resistor and a further impedance, and being connected in parallel to the series arrangement of the signal current source and first resistor;

the first and second resistors each having one of their terminals coupled to one another and to a first of the two-wire line wires;

the other terminals of the first and second resistors being connected to one another via a series arrangement of third and fourth resistors;



the receiving arm of the four-wire line being connected between the connection of the first and second resistors and the connection of the third and fourth resistors; and values of said first, second, third and fourth resistors being chosen such that said receiving arm is supplied with a received signal which corresponds to an intermediate voltage substantially proportional to a received signal current from the two-wire line, said intermediate voltage lying between a first and second voltage, the first voltage occurring across the second resistor as a result of a portion of said transmitted signal current modulated in accordance with the transmitted signal in the transmitting arm and by the received signal current flowing therein supplied from the two-wire line, and said second voltage occurring across the first resistor as a result of said transmitted signal current flowing therein.

4,418,250

## TELEPHONE CABLE SPLICERS TEST SET AND METHOD OF TESTING

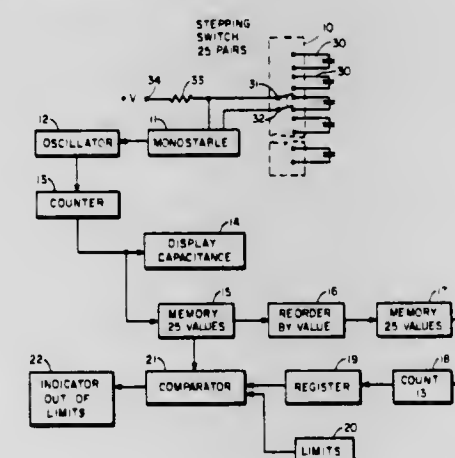
Lawrence O. Hilligoss, Seal Beach, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Dec. 14, 1981, Ser. No. 330,439

Int. Cl.<sup>3</sup> H04B 3/46; G01R 31/08

U.S. Cl. 179—175.3 R

16 Claims



1. In an apparatus for measuring the capacitance of a circuit component, the combination of:  
a monostable multivibrator having on and off outputs and

having a timing circuit for varying the duration of said on output;

means for connecting a circuit component, the capacitance of which is to be measured, in said timing circuit, with the duration of said on output varying as a function of the capacitance of the circuit component;

an oscillator providing output pulses at an output;

a counter having an input and an output; and

means for connecting said oscillator output to said counter input during said multivibrator on output for counting oscillator output pulses during said on output, with the counter output at the end of said on output varying as a function of the capacitance of the circuit component.

4,418,251

## MECHANISM FOR ASSURING REGISTRATION AND CONTACT BETWEEN MULTIPLE TRAVELING COLLECTORS AND PARALLEL CONDUCTORS

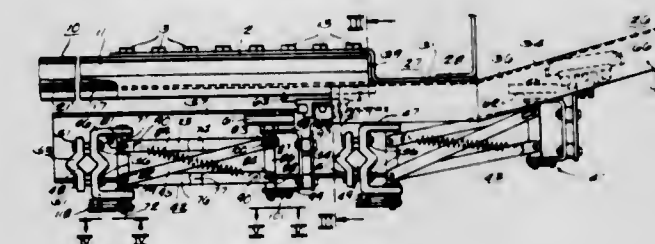
Peter W. Hartman, Pittsford; Keith E. Hanford, Macedon; Stephen L. Markle, Rochester, and Elmer C. Hartman, Fairport, all of N.Y., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 332,980

Int. Cl.<sup>3</sup> B60L 5/36, 5/08, 5/30

U.S. Cl. 191—35

8 Claims



1. In combination,  
a substantially horizontal, longitudinally extending trolley rail housing provided with at least first and second downwardly open slots extending longitudinally of the housing, an electrical conductor mounted in the upper part of each slot presenting a downwardly facing collector-receiving surface, and

an electrical pickup unit adapted to be carried by a vehicle traveling in a path directly below and generally parallel to said housing, said unit including

supporting means,

an arm pivotally mounted at one of its ends to said supporting means for limited pivotal movement about a vertical axis and about a horizontal transverse axis,

means biasing said arm to swing upwardly about said horizontal transverse axis,

means biasing said arm to a predetermined horizontally centered position,

first and second horizontally elongated collectors adapted to extend into said first and second slots, respectively,

for electrical contact with said conductors therein,

first and second support members pivotally mounting said collectors, respectively, for limited pivotal movement about horizontal transverse rocking axes,

a mounting structure pivotally connected to the other end of said arm for limited horizontal swinging movement about a generally vertical axis, and

equalizer means connecting said first and second support members to said mounting structure including a horizontally extending equalizer beam having opposite ends pivotally connected to said first and second support members, respectively, on generally longitudinal axes and having a central part pivotally connected to said mounting structure on a generally longitudinal axis.



4,418,252

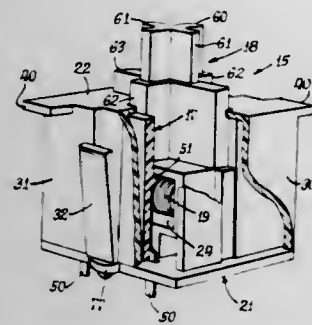
## KEY SWITCH ASSEMBLY

Phillip R. Daigle, 4298 Wilson Ave., Rolling Meadows, Ill. 60008

Filed Apr. 5, 1982, Ser. No. 365,565  
Int. Cl.<sup>3</sup> H01H 15/00

U.S. Cl. 200—16 A

6 Claims



1. A key switch assembly comprising: a housing having a hollow interior and a top wall with a central multi-sided opening therethrough; a key stem member mountable within said housing and having a lengthwise stem portion formed with a transverse cross section conforming to said multi-sided opening to provide non-rotational guided movement of said stem portion therethrough; additional linear guide means within said housing comprising interfitting means on said key stem member and interior walls of said housing for restricting movement of said key stem member to a rectilinear path; a pair of co-planar, laterally spaced contact means mounted within said housing in opposing adjacency to one lateral side of said key stem member; coil contact spring means carried within a socket recess formed inwardly of said one lateral side of said key stem member; said socket recess being formed with parallel end walls, substantially parallel elongated side walls, extending between said end walls, and a planar bottom wall extending between said end and side walls and having a central recessed area of substantially semi-cylindrical formation; said coil contact spring means abutting said end walls and having central coils thereof extending into and confined by said recessed area whereby to angularly cant coil portions thereof lying axially between said central coils and said end walls; the spacing between said side walls permitting said coil contact spring means to rotate or roll in said socket recess in response to movement thereof with said key stem member as the latter moves linearly past said contact means thereby to cause the canted coil portions thereof to engage said contact means and clean the same with a scrubbing action.

4,418,253

## TWO-SPEED TIMER

Akio Okada, Ida, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Mar. 12, 1981, Ser. No. 243,160

Claims priority, application Japan, Mar. 18, 1980, 55-36923[U]

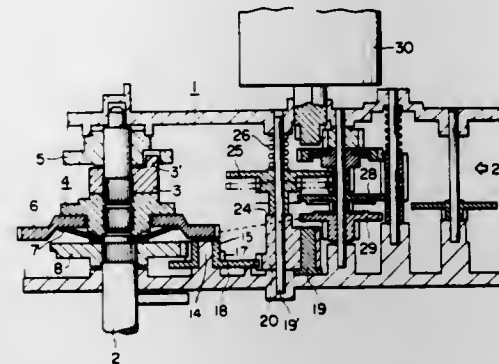
Int. Cl.<sup>3</sup> H01H 43/10

U.S. Cl. 200—35 R

9 Claims

1. A two-speed timer assembly comprising:  
a time set shaft;  
a reduction gear means;  
means for coupling said time set shaft to an output of said reduction gear means so that said reduction gear means drives said time set shaft;  
an electric motor;  
means for coupling said electric motor to said reduction gear means to rotate said reduction gear means;  
a disc having engagement means at a position on a circumferential portion thereof, said disc being mounted on said time set shaft;  
a driven gear cooperating with said engagement means and having a change-over surface  
a speed change gear positioned in contact with said change-over surface, and being slidable on said change-over sur-

face, means for biasing said speed change gear toward said change-over surface, said speed change gear being selec-



tively engaged with gears in said reduction gear means to vary a rotational speed of said output of said reduction gear means and said time set shaft.

4,418,254

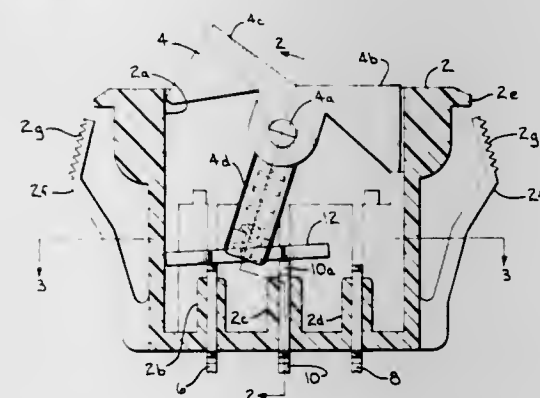
## ONE PIECE OPERATOR FOR ELECTRIC SWITCH HAVING PIVOTING AND SLIDING CONTACTOR

Robert A. Busby; Gursharan P. S. Nat, and John W. Stearley, all of Smithfield, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 16, 1982, Ser. No. 369,061  
Int. Cl.<sup>3</sup> H01H 21/42, 13/00

U.S. Cl. 200—68.3

5 Claims



1. An electric switch comprising in combination:

a housing;  
a pair of contact terminals spaced apart in said housing;  
a third terminal mounted between said contact terminals in said housing, said third terminal having a contact portion centrally located and substantially narrower in width than the remainder of that terminal and extending above said contact terminals;  
a movable contactor of a width greater than said contact portion of said third terminal cooperating with said terminals to complete electrical circuits between said contact terminals, said contactor having lateral projections intermediate its ends;  
an operator pivotally mounted in said housing and having a portion exteriorly of said housing which is engageable to effect pivoting thereof, said operator having a contactor actuating leg extending interiorly of said housing and having a slot in an end thereof defining spaced end portions, said actuator leg straddling said contactor with said spaced end portions extending along lateral edges of said contactor, recesses in each said spaced end portion engaging said lateral projections to provide a driving connection for sliding movement of said contactor while affording free pivoting of the latter therein, said actuating leg being pivotally movable by said operator to pivot said contactor on the contact portion of said third terminal and

to slide it thereon into engagement with either of said contact terminals; and  
spring means carried by said actuating leg for biasing said contactor into engagement with the contact portion of said third terminal.

4,418,255

## CONTACT ARRANGEMENT FOR AIR-BLAST SWITCHES WITH A TUBULAR ELEMENT OF FERROMAGNETIC MATERIAL

Ruediger Hess, and Heiner Marin, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany

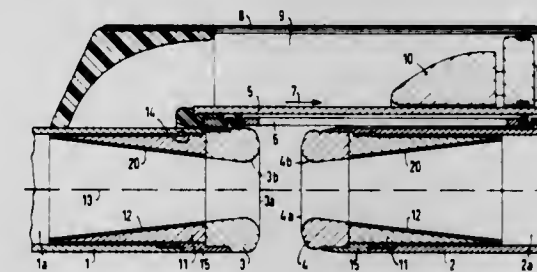
Filed Oct. 22, 1981, Ser. No. 314,009

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3041083

Int. Cl.<sup>3</sup> H01H 33/18

U.S. Cl. 200—147 A

5 Claims



1. A contact arrangement for an air-blast switch comprising:  
a tubular first contact piece;  
a second contact piece axially associated with the first contact piece and positioned so that upon cutoff under load an arc is drawn between the contact pieces and subjected to a blast of compressed gas;  
the first contact piece including at its end face a nozzle body having a conical nozzle aperture contour that expands inwardly from the end face; at its interior a tubular element of ferromagnetic material having an inner wall surface; a layer of graphite disposed on said inner wall surface; and the tubular element being positioned adjacent the nozzle body so that the inner wall surface continues the contour of the nozzle of the aperture.

4,418,256

## ELECTRICALLY INSULATING PLASTIC ELEMENT FOR AN ELECTRICAL SWITCHING DEVICE, ESPECIALLY FOR USE AS THE BLAST NOZZLE OF A GAS-BLAST SWITCH

Rudolf Graf, Obermuhlen, Switzerland, assignor to Sprecher &amp; Schuh AG, Aarau, Switzerland

Filed Nov. 3, 1980, Ser. No. 202,944

Claims priority, application Switzerland, Jan. 11, 1980, 197/80

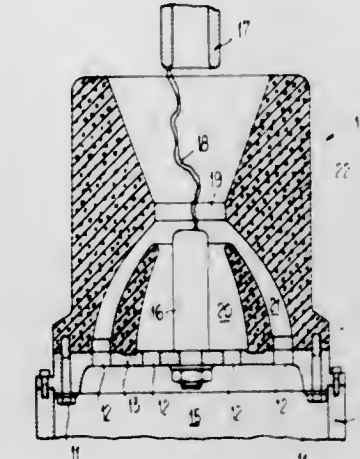
Int. Cl.<sup>3</sup> H01H 33/59

U.S. Cl. 200—148 R

10 Claims

1. An electrically insulating blast nozzle for a gas-blast switch, comprising:  
a plastic material forming said electrically insulating blast nozzle;  
said plastic material of the blast nozzle containing a filler which essentially prevents penetration of electromagnetic radiation into the interior of the plastic material of the blast nozzle;  
said filler consisting of a powder of at least one metal se-

lected from the group consisting essentially of tungsten, copper, aluminum and iron; and



4,418,257

## KEYBOARD SWITCH

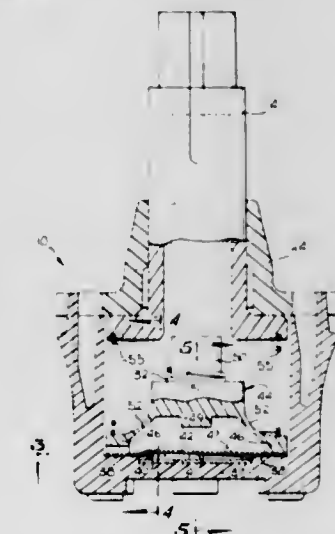
Michael Muller, Newport Beach, and Gary C. Butts, Huntington Beach, both of Calif., assignors to The Keyboard Company, Garden Grove, Calif.

Filed Nov. 23, 1981, Ser. No. 323,550

Int. Cl.<sup>3</sup> H01H 3/12, 13/52

U.S. Cl. 200—159 B

10 Claims



1. An improved key switch assembly, comprising:  
a housing including a base;  
first and second spaced apart electrical contacts disposed on said base, said first contact extending above said second contact;  
an electrically conductive resilient diaphragm disposed over said first and second contacts and in physical contact only with said first electrical contact;  
a resilient and deformable actuator member disposed generally over said diaphragm, said diaphragm being held relatively taut over said first and second contacts by said actuator member;  
actuator means for deforming said actuator member in response to the depression of said key by a user, the deformation of said actuator member forcing said diaphragm to contact said second electrical contact;  
whereby an electrical coupling between said first and second contacts occurs upon the actuation of said key switch by a user.



4,418,258

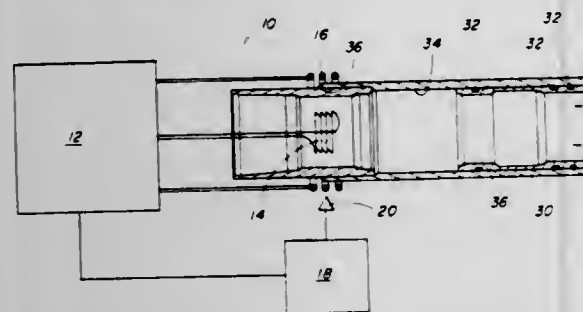
**METHOD FOR HEAT TREATING METAL**

Richard C. McNealy, and Charles F. Cravens, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.  
Division of Ser. No. 166,739, Jul. 7, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 348,119

Int. Cl.<sup>3</sup> H05B 6/38, 6/44

U.S. Cl. 219—10.41

3 Claims



1. The method of induction heating a tubular workpiece to effect a heat treatment of an annular portion thereof, comprising:

- positioning said tubular workpiece with said annular portion substantially coaxially disposed between inner and outer induction coils;
- rotating said tubular workpiece about its longitudinal axis while said coils are energized to heat said annular portion;
- sensing the temperature in said annular portion with an infrared sensor associated with a radiation pyrometer during said rotation of said workpiece; and
- controlling the output of said coils in response to the output of said radiation pyrometer, whereby said annular portion is heated to and maintained at a selected temperature level in a substantially uniform manner.

4,418,259

**METHOD AND APPARATUS OF UNIFORM INDUCTION HEATING OF AN ELONGATED WORKPIECE**

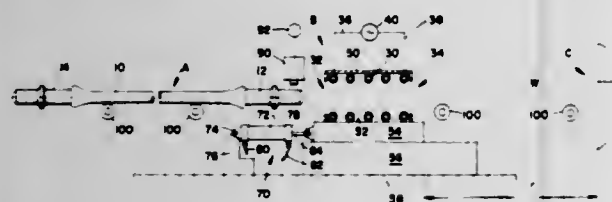
John C. Lewis, Dundas, Canada, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Aug. 21, 1981, Ser. No. 294,932

Int. Cl.<sup>3</sup> H05B 6/40

U.S. Cl. 219—10.43

16 Claims



1. A method for effecting uniform induction heating of an elongated workpiece which includes a first portion having a substantially uniform cross-section over a major portion of the workpiece length and a second portion having a larger cross-section than said first portion, said method comprising the steps of:

- (a) providing a multi-turn inductor generally coaxially disposed about and movable along an elongated workpath and adapted to be energized to a predetermined level;
- (b) continuously feeding said workpiece at a predetermined constant rate of travel longitudinally along said workpath in a feed direction toward and through said inductor, while the inductor is continuously energized to said predetermined level, for continuously inductively heating the advancing workpiece along the length thereof and sequentially heating the entirety of said workpiece first portion generally to a predetermined desired temperature; and
- (c) moving said inductor in said feed direction along with said workpiece from a first position along said workpath, while the said workpiece second portion is inductively

coupled with said energized inductor, to reduce the rate of relative movement between said workpiece and inductor to a preselected level for increasing the effective heating time for said workpiece second portion, whereby said workpiece second portion is also heated to generally said predetermined temperature.

4,418,260

**WOOD TREATING METHOD AND APPARATUS FOR FACILITATING REMOVAL OF FERROUS MATERIALS THEREFROM**

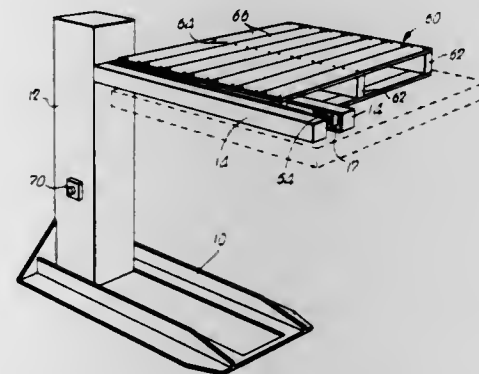
Jeffrey C. Detrick, 7108 W. 67th St., Overland Park, Kans. 66204

Filed Oct. 19, 1981, Ser. No. 312,246

Int. Cl.<sup>3</sup> H05B 6/40; B23P 19/06

U.S. Cl. 219—10.43

16 Claims



1. Apparatus for facilitating removal of a plurality of metallic nails from a pallet having a number of spaced, elongated, wood frame pieces each provided with a pair of opposed, longitudinally-extending sides and a pair of longitudinally-extending edges, together with a series of wood members each having an inner and an outer surface, said inner surfaces being held in engagement with a corresponding one of said edges by said fasteners extending through the members and into the frame pieces, said apparatus including:

induction coil means having a pair of elongated loops, said loops being spaced apart for reception of one of said frame pieces therebetween with one loop extending along one of said sides thereof and the other loop extending along the other of said sides thereof adjacent a portion of the fasteners extending beyond the proximal members into the one frame piece,

whereby, upon generation of sufficient heat by said coil means, the temperature of the fasteners is raised to such extent as to cause the wood surrounding such fasteners to become charred, rendering the fasteners easily removed from said proximal members and said one frame piece.

4,418,261

**MICROWAVE OVEN AND VENTILATOR SYSTEM**

John J. Jailor, Marengo, and Ronald A. Thalacker, Amana, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 15, 1982, Ser. No. 339,787

Int. Cl.<sup>3</sup> H05B 6/64; F24C 15/30

U.S. Cl. 219—10.55 R

4 Claims

1. In a combined microwave and ventilator system for installation above a range top or the like, a ventilator assembly including an oven receiving and supporting compartment, a first air path through said ventilator, said first air path including air intake means underlying said oven compartment, vertically extending air passage means positioned laterally of and out of communication with said oven compartment, said air passage means being in air receiving communication with said air intake means, air discharge means remote from said air intake means and said oven compartment, said air passage means communicating with said air discharge means, a power driven exhaust blower assembly adjacent said air discharge means for effecting a flow of air along said first air path with

4,418,262

**PROGRAMMABLE MICROWAVE OVEN WITH PROGRAM DISPLAY**

Tomitsugu Noda, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

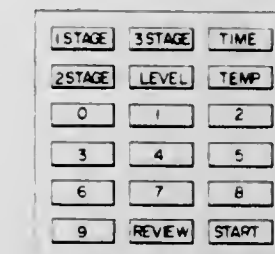
Continuation of Ser. No. 186,622, Sep. 12, 1980, abandoned. This application May 12, 1982, Ser. No. 377,478

Claims priority, application Japan, Sep. 14, 1979, 54-118061; Sep. 14, 1979, 54-118073

Int. Cl.<sup>3</sup> H05B 6/68

U.S. Cl. 219—10.55 B

3 Claims



1. A programmable microwave oven including means for reviewing previously programmed cooking instructions, comprising:

a keyboard data input means having function keys for inputting data representing cooking instructions defining a sequence of heating power levels and a cooking time or a cooking temperature associated with each such power level;

a means for exciting a heating element at selectable power levels;

a display means for displaying data previously inputted via said keyboard data input means; and

a control means, including a microprocessor, coupled to said keyboard data input means, exciting means, and display means, including read only memory (ROM) means for storing a fixed program, a random access memory (RAM) means for memorizing data inputted via said keyboard data input means, and a central logic unit for (a) carrying out the fixed program of said ROM means in accordance with the data inputted via said keyboard data input means and (b) generating signals for controlling said exciting means in accordance therewith so as to obtain a combination of power levels and times or temperatures associated therewith according to the cooking instructions previously inputted via said keyboard data input means,

said keyboard data input means, said RAM means and said display means being controlled according to said fixed program of said ROM such that in response to a single actuation of said reviewing means after data has been entered via said keyboard data input means and stored in said RAM means, the so stored data in said RAM means are successively read out and displayed before the cooking is carried out in accordance with data indicative of the cooking instructions, the display changing automatically at predetermined intervals of time between successive displays to display successive data,

the control means inhibiting the execution of the cooking instruction unless they have been reviewed by operation of the reviewing means.

4,418,263

**ELECTROEROSIVE WIRE-CUTTING METHOD AND APPARATUS WITH A SHAPED WIRE ELECTRODE**

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 3, 1981, Ser. No. 240,246

Claims priority, application Japan, Mar. 7, 1980, 55-28979

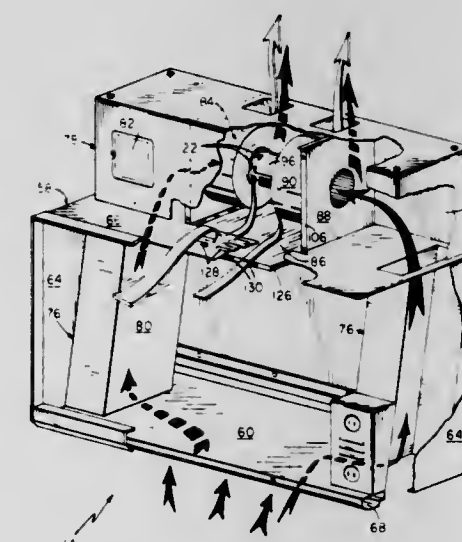
Int. Cl.<sup>3</sup> B23P 1/08

U.S. Cl. 219—69 W

15 Claims

1. A method of electroerosively wire-cutting a conductive

said flow moving into said air intake means, along said air passage means and out said discharge means, a second air path extending through said oven receiving compartment and including an air intake above and remote from said air intake means of the first air path, a third air path for supplying cooling air to said blower assembly, said third air path comprising an air intake above and remote from said air intake of said second air path and said air intake means of said first air path, said third air path communicating with said air discharge means of said first air path whereby both said first air path and said third air path exhaust through a common air discharge means, said ventilator assembly including a main housing having a bottom panel, opposed side panels, and a top panel, a downwardly directed cavity defined immediately beneath and substantially coextensive with said bottom panel, said cavity comprising said air intake means of said first air path, said air passage means of said first air path comprising a pair of vertically elongated closed channels, one extending along each of said side panels, each of said channels having a lower end in direct communication with the cavity underlying said panel, said oven receiving compartment being defined between said channels, means for associating filters with said cavity defining said air intake means, a secondary housing of lesser depth than said

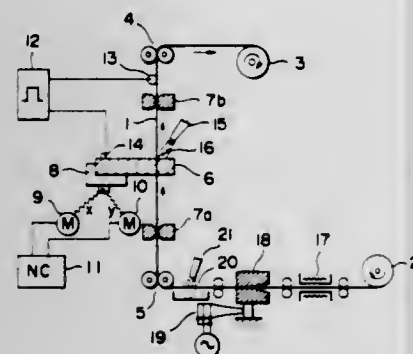


main housing, said secondary housing overlying said main housing, said top panel of said main housing constituting the bottom of said secondary housing, said air passage means-defining channels having upper ends opening into said secondary housing, said secondary housing including a chamber receiving said blower assembly, said air discharge means of said first path exiting outward from said secondary housing, said chamber receiving said blower assembly being generally aligned over said oven compartment, said secondary housing including side chambers to each side of said blower assembly chamber and in air flow passing communication therewith, one of said air passage means channels communicating with each side chamber, said third air path comprising an opening defined through said top panel between said blower assembly chamber and said underlying oven compartment, a shallow tray underlying said top panel within said oven compartment, said tray underlying said opening and extending beyond said secondary housing, said air intake of said third air path comprising at least one intake opening into that portion of the tray beyond the secondary housing, said tray having peripheral edge portions sealed to the overlying top panel to preclude communication between said oven compartment and the interior of the tray.



workpiece with a continuous wire electrode supported to extend and axially transported continuously to move between a supply site and a collection site through a cutting zone, said method comprising the steps of:

- feeding the wire electrode having a given cross-sectional contour from said supply site;
- downstream of the supply site and upstream of the cutting zone, shaping said wire electrode and forming it with a cross-sectional contour varied in shape from said given cross-sectional contour and preselected in conjunction with a localized pattern of cut to be progressively machined in said workpiece;



- feeding said wire electrode shaped with said preselected cross-sectional contour into said cutting zone to permit said shaped wire electrode to continuously move therethrough in an electroerosive wire-cutting relationship with said workpiece and to be fed continuously toward the collection site; and
- effecting relative displacement between said moving wire electrode and said workpiece along a predetermined path to form the desired wire-cut pattern in said workpiece.

4,418,264

# DEVICE AND METHOD FOR REPAIRING CONDUCTOR PATH BREAKS BY WELDING

Rüdiger Thorwarth, Glonn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

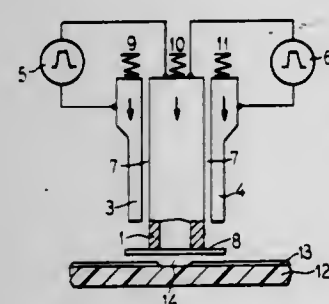
Filed Jul. 8, 1981, Ser. No. 281,328

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025875

Int. Cl.<sup>3</sup> B23K 11/32

U.S. Cl. 219—78.01

5 Claims



1. A device for repairing conductor path interruptions on printed circuit boards by means of micro-resistance welding a specific shaped part from a foil strip at both sides of the conductor path interruption, comprising: a three-part electrode system formed of a central inside electrode equipped with a vacuum connection means for sucking-on the shaped part, and around which two semicircular-shaped outside electrodes sit concentrically, the three electrodes in each case being separated from one another electrically by means of an air gap, and the three electrodes being spring-suspended mechanically, independently of one another.

5. A method for repairing conductor path interruptions on printed circuit boards by means of micro-resistance welding a

specific shaped part at both sides of the conductor path interruption, comprising the steps of: providing a three-part electrode system formed of a central inside electrode with a vacuum connection and two outer electrodes on each side of the central electrode; sucking-on the shaped part at the end of the central electrode; moving the central electrode to place the shaped part at the interruption; moving the two outer electrodes down into contact with ends of the shaped part where a micro-resistance weld is desired; applying a first micro-resistance welding pulse between one of the outer electrodes and the central electrode; and providing another micro-resistance welding pulse after the first welding pulse to the other outside electrode and central electrode.

4,418,265

# DEVICE WITH HIGH FREQUENCY CONTACTLESS TYPE ARC GENERATING MECHANISM

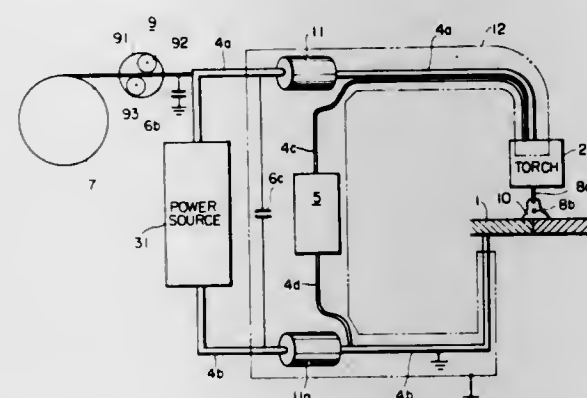
Yoichiro Tabata; Shigeo Ueguri; Hirotugu Komura, all of Amagasaki, and Toshio Ito, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 239,926

Int. Cl.<sup>3</sup> B23K 9/06

U.S. Cl. 219—130.4

8 Claims



1. A welding device with a high frequency, contactless type arc generating mechanism which comprises: a single electrode disposed confronting an electrically conductive material to be processed therewith through an electric discharge gap; a main power source for supplying an arc discharge current between said electrode and said material; an electrical conductor for coupling said main power source to said electrode; a high frequency electric source for applying a high frequency high voltage between said electrode and said material to generate a high frequency discharge for arc ignition in said electric discharge gap; a high frequency magnetic choke element surrounding a predetermined part of said electrical conductor between said main power source and said electrode, said high frequency magnetic choke element comprising a plurality of stacked ferrite discs in the form of a cylinder, each of said ferrite discs having a central hole, said electrical conductor passing through said hole; and a high-frequency bypass capacitor connected in parallel with said main power source and having one terminal connected to said electrical conductor between said magnetic choke element and said main power source.

4,418,266

# WELDING SYSTEM FOR CONTOUR JOINTS

William H. Rosenbeck, Torrington; Frederick Eckart, Southington, and Francis C. Gerath, Collinsville, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 21, 1981, Ser. No. 313,412

Int. Cl.<sup>3</sup> B23K 9/12

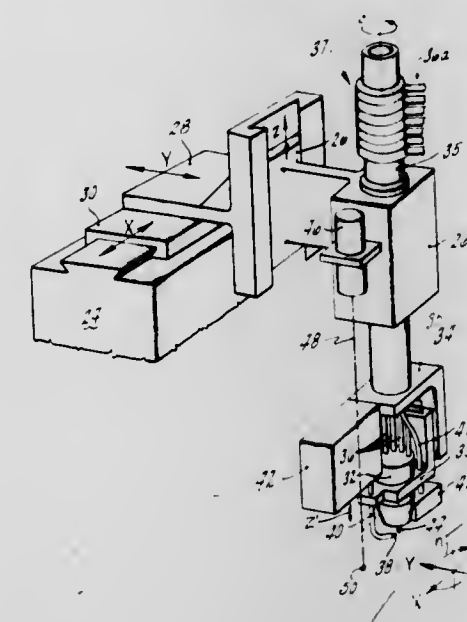
U.S. Cl. 219—137 R

10 Claims

7. The method of arc welding a joint on the surface of a

workpiece having a complex three dimensional x, y, and z axis surface contour, using an arc welding head movably mounted on a movable carriage, characterized by:

- moving the carriage along a predetermined x, y, and z axis path, generally following the path of the weld joint;



moving the head with z' motion along the z axis relative to the carriage to control the arc length; and rotating the welding head with c motion about a z' axis, to orient a wire feed unit attached thereto for proper wire feed into the welding arc zone between the head and the workpiece.

4,418,267

# PROTECTION APPARATUS

Josef Pfanzelt, Forstenrieder Allee 17, 8000 München 71, Fed. Rep. of Germany

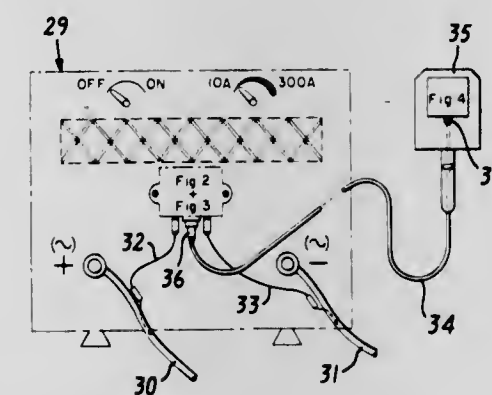
Filed May 5, 1981, Ser. No. 260,771

Claims priority, application Fed. Rep. of Germany, May 6, 1980, 3017215; May 6, 1980, 3017241

Int. Cl.<sup>3</sup> B23K 9/32

U.S. Cl. 219—147

15 Claims



1. The combination with electric welding apparatus comprising welding electrodes and a welding electrode circuit, an automatic electrically operated protective system for protecting a welder from harmful light rays and sputtering emanating from the welding zone, said system comprising an electrically controlled light shield means changeable from an open condition in which it permits a free view of the weld area and a closed condition in which it blocks harmful light rays and particles projected from the weld area, and

an electric circuit controlling said light shield means, said electric circuit means comprising threshold value switching means having an output coupled with said light shield means and an input coupled with said welding electrode

circuit, said threshold value switching means being responsive to switching values analogous to the absolute values of the electrode circuit voltage, to produce at its output a light shield opening signal when the absolute value of the voltage in the welding electrode circuit is smaller than the electrode open circuit voltage but greater than the maximum electrode welding voltage upon ignition of the welding arc, and to produce a light shield closing signal, prior to the ignition of an arc, when the absolute value of the electrode circuit voltage is greater than the electrode short circuit voltage and only slightly smaller than the electrode open circuit voltage.

4,418,268

# SOLDERING IRON HOLDER WITH READY INDICATOR AND SAFETY SHUTOFF

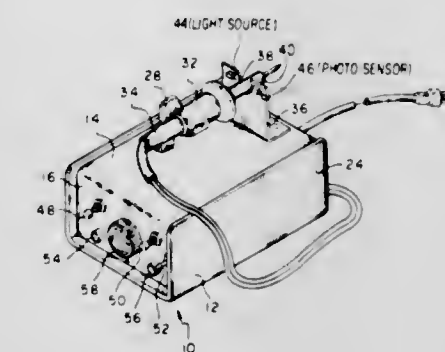
Harold A. Munshaw, 2624 Starr Rd., Pennsauken, N.J. 08109

Filed Jan. 22, 1981, Ser. No. 227,439

Int. Cl.<sup>3</sup> H05B 1/02; B32K 3/02

U.S. Cl. 219—242

4 Claims



1. A soldering iron holder including: a substantially rectangular box-shaped housing; support means mounted on said housing for supporting an electric soldering iron thereon; switch means carried by said housing for applying electrical power to a soldering iron so supported to thereby heat the same; indicator means carried by said housing; a first timing circuit, said first timing circuit being activated upon initiation of said switch means and being connected to said indicator means such that said indicator means is activated after a predetermined and preset time duration as measured by said first timing circuit to indicate readiness of the iron for use; means for deactivating said switch means including means for sensing the removal of the iron from said support means and a resettable second timing circuit which deactivates said switch means after a predetermined time period greater than said time duration has been measured, said sensing means resetting said second timing circuit each time the iron is removed from said support means whereby the iron is turned off whenever it has not been in use and remains on said support means for said predetermined time period.

4,418,269

# MULTI-ELECTRODE BOILER

Raymond H. Eaton-Williams, "Heathers" Farnaby Dr. Sevenoaks, Kent, England TN13 2LQ

Filed Mar. 17, 1981, Ser. No. 244,621

Claims priority, application United Kingdom, Mar. 24, 1980, 8009842

Int. Cl.<sup>3</sup> H05B 1/02, 3/60

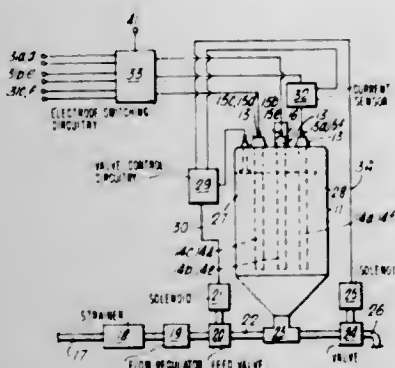
U.S. Cl. 219—295

10 Claims

1. A multi-electrode boiler, especially for use as a humidifier, comprising water-changing means arranged to allow at least some of the water in the boiler to be changed, monitoring means arranged to monitor the electrical-current which flows



through at least one of the electrodes of the boiler, control means responsive to the monitoring means to control the change of at least some of the water in the boiler to maintain the electrical-current in said at least one monitored electrode within a predetermined range of values, in which switching circuitry is provided to switch in and out electrodes of the boiler to vary the boiling rate, wherein the monitoring means



are arranged to monitor the electrical current which flows through at least one but less than all of the electrodes in the boiler, and wherein the switching circuitry ensures that the electrodes of the boiler which are not monitored are switched in successively in such an order, for successively increasing boiling rate, that the value of the electrical-current passing through said at least one monitored electrode remains within a predetermined range of values.

4,418,270

**ELECTRIC LIQUID HEATING APPLIANCE**

Michael Inskip, Stoke-on-Trent, and Alan Warren, Western Downs, both of England, assignors to TI Russell Hobbs Limited, England

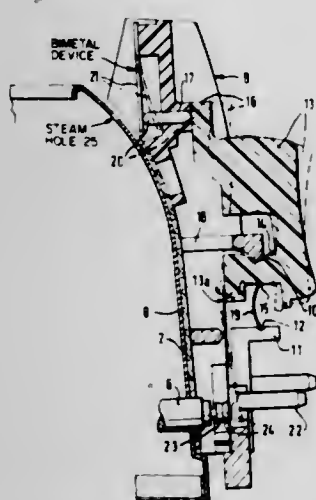
Filed Jun. 16, 1981, Ser. No. 274,266

Claims priority, application United Kingdom, Jun. 18, 1980, 8019847

Int. Cl.<sup>3</sup> H05B 3/80; A47J 31/56, 27/21

U.S. Cl. 219—328

4 Claims



1. An electric liquid heating appliance comprising a body shell, a heating element within the body shell and having two ends which project through the body shell, a switch housing mounted on the outside of the body shell, a switch operating member supported relative to the switch housing and operable to open and close a pair of switching contacts for interrupting and making respectively an electrically conductive path, which includes the heating element, between a pair of terminal pins, a pivot about which the switch operating member can rock between first and second positions and against which the switch operating member is urged by a spring means acting between the switch operating member and a support, and means on said switch housing providing said pivot and said support, said switch housing being formed as an integral plas-

tics moulding to fix the relative locations of said pivot and said support.

4,418,271

**CONTROL SYSTEM INCLUDING A TIMING MECHANISM FOR A DRYING APPARATUS**

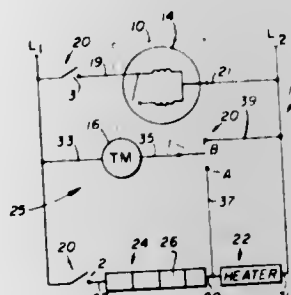
Steven W. Smock, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 192,948, Oct. 2, 1980, abandoned. This application May 3, 1982, Ser. No. 374,185

Int. Cl.<sup>3</sup> H05B 1/02

U.S. Cl. 219—493

5 Claims



1. In a dryer including a dryer motor wherein material is dried through heat, a control system regulating the amount of time and heat applied thereto, comprising:

- (a) a timing mechanism including a timer motor, cam means coupled to said timer motor, and cam switch means responsive to said cam means to open and close electrical circuits including a first cam switch connected to said dryer motor, a second cam switch connected to a temperature regulating means, and a two position cam switch;
- (b) temperature regulating means electrically connected in series with a heating means; and
- (c) electrical circuit means including said two position switch means wherein when said two position switch means is in a first position said timer motor is in parallel with said second cam switch, said temperature regulating means and said heating means, and when in a second position said timer motor is in parallel with said temperature regulating means and said second cam switch means and in series with said heating means.

4,418,272

**ELECTRIC HEATER**

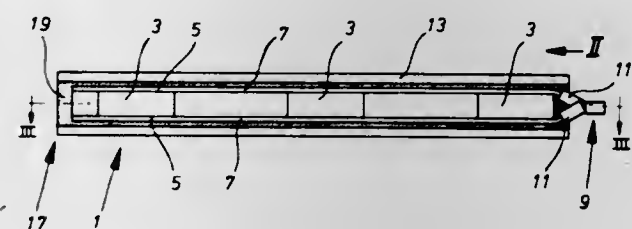
Hanno Roller, Kandel, and Karl-Heinz Nauwerth, Erlenbach, both of Fed. Rep. of Germany, assignors to Fritz Eichenauer GmbH & Co. KG, Kandel, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,598

Int. Cl.<sup>3</sup> H05B 3/02

U.S. Cl. 219—541

13 Claims



1. Electric heater, especially for small electric appliances, such as hair roller heaters, egg boilers, or the like, comprising: at least one flat, heating element having contact-making zones on opposite planar parallel surfaces thereof; electrical connection elements in the form of essentially planar contact plates, a contact plate being placed on each of said opposite surfaces; and a holding member formed of a flat sheet of material which has been bent into a U-shape having legs which are

mutually spaced in a manner so as to hold the contact plates clamped fast to said at least one heating element between the legs of said U-shape of the holding member by the direct action of a clamping pressure exerted thereby, said holding member extending over the entire width of the at least one heating element and the contact plates having a heat conducting electrical insulating layer upon an inner surface of said U-shape between said plates and holding member.

4,418,274

**SLIDE RULE - CALENDAR**

Guido Masillo, Via Lanzalone, 26, 84100 Salerno, Italy

Filed Mar. 20, 1981, Ser. No. 245,783

Claims priority, application Italy, Mar. 24, 1980, 35659/80[U]

Int. Cl.<sup>3</sup> G06C 3/00; G09D 3/10

U.S. Cl. 235—85 R

1 Claim



4,418,273

**MECHANICAL FUEL PUMP COMPUTER CONVERSION MECHANISM**

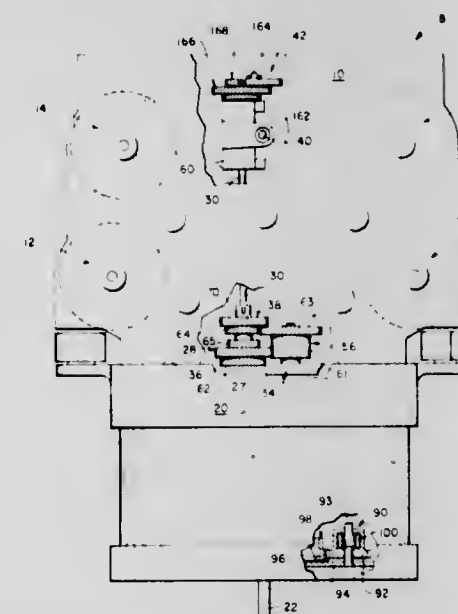
Raymond H. Devanney, Winsted, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,394

Int. Cl.<sup>3</sup> B67D 5/72; F16H 3/22; G06C 15/04

U.S. Cl. 235—61 L

21 Claims



1. In a mechanical computer for a fuel dispenser operable for setting the unit volume price and registering the volume and cost amounts of fuel dispensed and having a volume counter drive train, at least one rotary volume counter, with a plurality of coaxial number wheels of increasing order of significance, rotated by the volume counter drive train for registering the volume amount of fuel dispensed, a cost counter drive train with a first rotary cost shaft rotated in accordance with the volume amount of fuel dispensed and the set unit volume price and a second rotary cost shaft transverse to and rotated by said first rotary cost shaft, and at least one rotary cost counter, with a plurality of coaxial number wheels of increasing order of significance, rotated by said second rotary cost shaft for registering the cost amount of fuel dispensed, the improvement wherein the mechanical computer comprises a cost drive ratio selector mechanism for selectively providing a plurality of different cost counter drive ratios between said first and second rotary cost shafts, the cost drive ratio selector mechanism comprising an intermediate rotary shaft generally parallel to one of said first and second rotary shafts, first and second intermeshing gear means adapted to be selectively mounted on said one and said intermediate rotary shafts to selectively intermesh to selectively provide a plurality of different drive ratios therebetween, and third and fourth intermeshing gear means mounted on the said intermediate rotary shaft and the other of said first and second rotary shafts to provide a rotatable drive therebetween.

1. An infinite calendar comprising a flat sheath member defining an enclosed space having closed front and rear surfaces, closed top and bottom surfaces, a closed first end, and an open second end; first and second slide members slidably received within the enclosed space and slideable out said open second end and with respect to each other, said first and second slide members being of a length to abut against said closed first end when fully withdrawn within said enclosed space; said first slide member having thereon two rows of indicia correlated respectively to the first two months of the year, said second slide member having thereon rows of indicia correlated respectively to the remaining months of the year, each row of indicia including indicia indicative of the days of the week for a plurality of weeks at least equal to the number of weeks in the correlative month; each of said slide members additionally having an indicator indicium thereon; said sheath member front surface having thereon two sets of seven correlating indicia, one set of correlating indicia adjacent each of said indicator indicia when said slide members are positioned in said enclosed space; said sheath member further having along one edge thereof numerical indicia corresponding to the days of the month and having a transparent window overlying said slide members rows of indicia when said slide members are in said enclosed space to make said rows of indicia visible through said transparent window; a cursor member slidably positioned on said sheath member and having a transparent window overlying said front surface transparent window to make said rows of indicia visible therethrough and a marker adjacent said sheath member one edge; one of said members having thereon a table correlating the years of the Gregorian calendar with a pair of said correlating indicia, one of said pair of said correlating indicia being from the set adjacent the indicator indicium of said first slide member and the other of said pair of said correlating indicia being from the set adjacent the indicator indicium of said second slide member, the pair of correlating indicia correlated with a selected year of the Gregorian calendar being the correlating indicia to be positioned adjacent said indicator indicia to position said first and second slide members such that said rows of indicia align with said numerical indicia to provide a calendar for the selected year with said cursor member slidable to a selected one of said numerical indicia to show through said transparent windows the day of the week for the day of the month corresponding with the selected numerical indicium for each month of the selected year.



4,418,275

## DATA HASHING METHOD AND APPARATUS

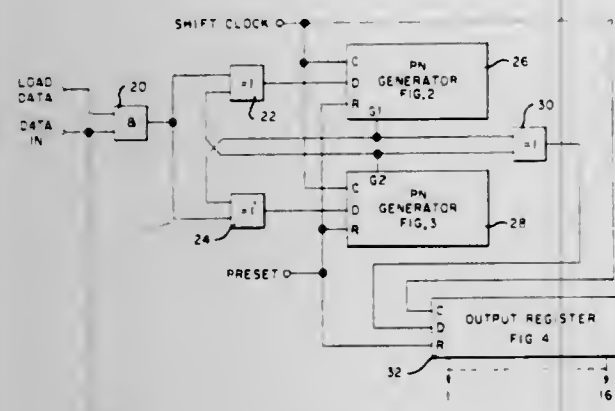
DeWayne D. Oosterbaan, Escondido, and Gerard J. Williams, Valley Center, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 7, 1979, Ser. No. 101,319

Int. Cl.<sup>3</sup> H03K 21/30

U.S. Cl. 377—33

2 Claims



1. A randomizing apparatus characterized by: data signal input means; first and second pseudo-random generators (26 and 28) each having an input and an output operatively connected in a cross-coupled configuration (22 and 24) for generating a pseudo-random signal in response to data signals; logic means (20) for coupling the data signal input means to the input of said first and said second pseudo-random generators (26 and 28); output register means (32) adapted to serially receive said generated pseudo-random signal for providing a segment of said serially received signal in parallel at its outputs; and programmable counting means (36-56) for counting count pulses, said counting means having an input terminal operatively connected to said data signal input means and being adapted to receive a predetermined number, said predetermined number having a value equal to the number of bits that are to be used to form the segment in said output register means, said counting means further providing an output valid signal when said counted counting pulses corresponds to said predetermined number, thereby indicating the availability of the segment of said generated pseudo-random signal at the outputs of said output register means.

4,418,276

## OPTICAL BAR CODE READER

Kenro Yatsunami, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

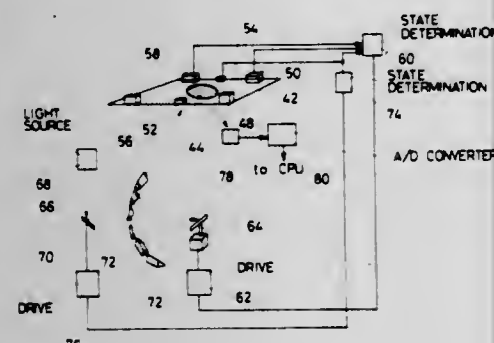
Filed Jan. 25, 1982, Ser. No. 342,406

Claims priority, application Japan, Jan. 30, 1981, 56-13228

Int. Cl.<sup>3</sup> G06K 7/14

U.S. Cl. 235—462

4 Claims



1. An optical bar code reader which selectively operates in

a coarse scanning mode and a fine scanning mode for reading a bar code label, said optical bar code reader comprising: detection means for detecting the kind of said bar code label; determination means for selectively developing a first control signal and a second control signal in response to an output signal of said detection means; and control means for selectively placing the optical bar code reader in said coarse scanning mode in response to said first control signal, and in said fine scanning mode in response to said second control signal.

4,418,277

## APPARATUS FOR COLLECTING, TRANSMITTING AND PROCESSING DATA STORED IN CODE, PREFERABLY IN BAR CODE

Hartmut Tremmel, In der Kappisau 4, 6921 Sinsheim, Staatsange, and Hartmut Bernot, Schmeilweg 3, 6900 Heidelberg, Staatsange, both of Fed. Rep. of Germany

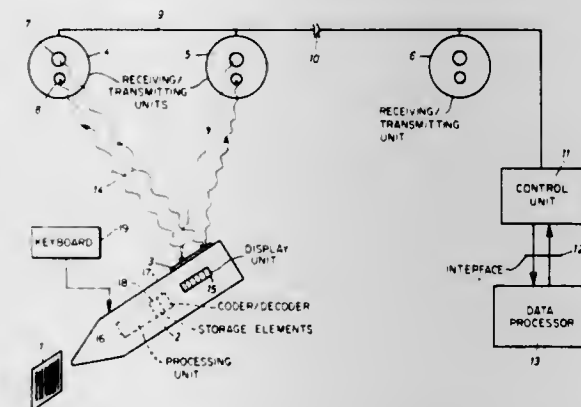
Filed Nov. 18, 1981, Ser. No. 322,716

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043557

Int. Cl.<sup>3</sup> G06K 7/10

U.S. Cl. 235—472

6 Claims



1. An improved apparatus for collecting, transmitting, and processing data stored in a code such as a bar code, said apparatus including a portable wand reader with processing and transmitting units for radiating information in the form of electromagnetic waves, a stationary receiver physically separated from the wand reader, and a data processor coupled to the stationary receiver, wherein the improvement comprises: the wand reader also has a receiving unit, the stationary receiver is part of a stationary receiving/transmitting unit which includes a transmitter for the receiver of the wand reader, and a plurality of physically separated stationary receiving/transmitting units connected in parallel to one another are associated with the wand reader, the receiving/transmitting units being coupled to the data processor for the processing and storing of the data and the data transfer occurring both ways from the wand reader to the data processor and vice versa.

4,418,278

## EMBEDDED OPTIC FIBER PAGE

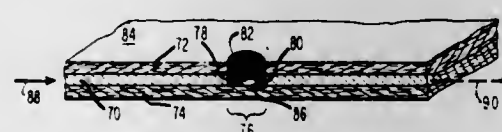
Lee F. Mondschein, 31 Green Park, Newton, Mass. 02158

Filed May 20, 1981, Ser. No. 265,533

Int. Cl.<sup>3</sup> G06K 19/00

U.S. Cl. 235—487

4 Claims



1. An input/output device in the form of a page having one or more optical fibers therein, said device being selectively codeable by an individual using the device, the one or more

optical fibers being capable of being switched, after manufacture, by said individual from one informational state to another, each of said fibers having a normal light-transmissive state and a non-light-transmissive state in which the selection of the informational state of an optical fiber is selectively codeable in real time from a position readily accessible by the individual at a designated location on a surface of the page, the device comprising:

a thin, planar sheet having opposed surfaces, a plurality of edges, and one or more designations on one of said surfaces at one or more predetermined locations;

at least one optical fiber embedded in said thin sheet, said fiber being divided into two sections to provide two ends embedded in the sheet, said embedded ends having faces orthogonal to the longitudinal axis of said fiber, the embedded ends being spaced apart by an amount which permits light transmission therebetween such that light in one section of the fiber is transmitted to the other section of the fiber across an interface established by said embedded ends for establishing the normal light-transmissive state of said fiber;

the designation-containing surface of said sheet having at least one aperture therethrough associated with a respective designation, said aperture extending through said designation-containing surface to the space defined by the corresponding spaced-apart ends, said embedded ends being disposed within said aperture;

each section of said fiber extending within the plane of said thin sheet to an edge thereof; and

means insertable from said apertured surface through said aperture into the space defined by the spaced-apart embedded ends for selectively changing the normal light-transmissive state of said fiber to the non-light-transmissive state by occluding the space between said embedded ends, such that the state of said optical fiber embedded in said thin planar sheet is readily changeable from one state to the other from the designation-containing surface of said device after the manufacture thereof, thereby to permit real-time coding of said device by the individual using said device.

4,418,279

## AUTOMATIC CRT EXPOSURE REGULATION

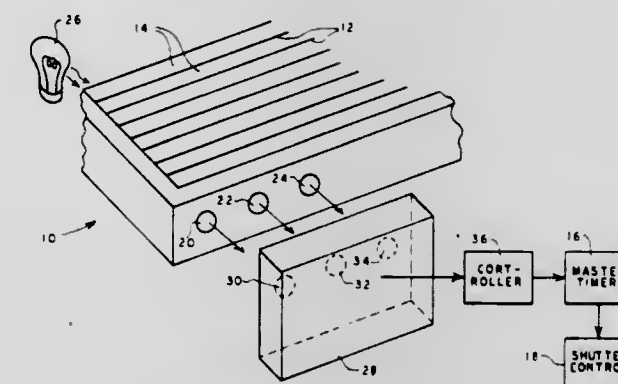
Robert E. Hager, Schaumburg, and Laurence H. Moss, Hoffman Estates, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 28, 1981, Ser. No. 306,448

Int. Cl.<sup>3</sup> H01J 40/14

U.S. Cl. 250—201

12 Claims



8. In a CRT manufacturing operation which includes a light house for exposing a coated CRT screen and a mated mask to a source of illumination, and which includes a master timer for limiting exposure to a preset time, an exposure regulator for automatically changing exposure time to accommodate masks having different aperture sizes, comprising:

means for selecting and storing a plurality of exposure time modifiers, one for each expected mask aperture size;

means for sensing the aperture size of the mask to be exposed;

decoding means responsive to a sensed mask aperture size for selecting one of said modifiers; and

means coupled to the master timer and responsive to the selected modifier for altering the preset exposure time of the master timer in accordance with the selected modifier so as to set exposure time to correspond with the sensed aperture size.

4,418,280

## DOUBLE FOCUSING MASS SPECTROMETER

Hisashi Matsuda, Takarazukashi, Japan, assignor to Jeol Ltd., Tokyo, Japan

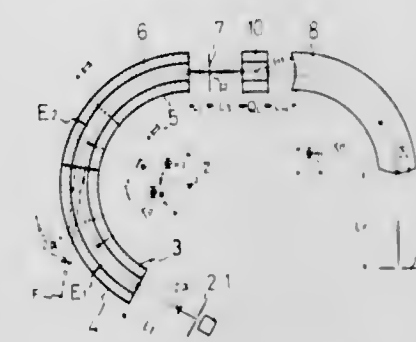
Filed Jun. 5, 1981, Ser. No. 270,845

Claims priority, application Japan, Jun. 13, 1980, 55-79699

Int. Cl.<sup>3</sup> D01D 59/44

U.S. Cl. 250—296

7 Claims



1. A double focusing mass spectrometer comprising: an ion source for producing an ion beam; first inner and outer electrodes for producing a diverging electrostatic field so as to diverge the ions emitted from said source; second inner and outer electrodes for producing a converging electrostatic field so as to converge the ions delivered from said diverging electrostatic field at an intermediate focus point; means for producing a converging magnetic field so as to re-converge the ions once converged at said intermediate focus point by said converging electrostatic field; and means for detecting the ions converged by the magnetic field; such that said two electrostatic fields are connected with each other without substantial free space therebetween, and that said intermediate focus point of the ion beam is formed at a position adjacent to the ion exit boundary of said converging electrostatic field.

4,418,281

## QUENCH CORRECTION IN LIQUID SCINTILLATION COUNTING

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 29, 1981, Ser. No. 278,769

Int. Cl.<sup>3</sup> G01T 1/00, 1/20

U.S. Cl. 250—328

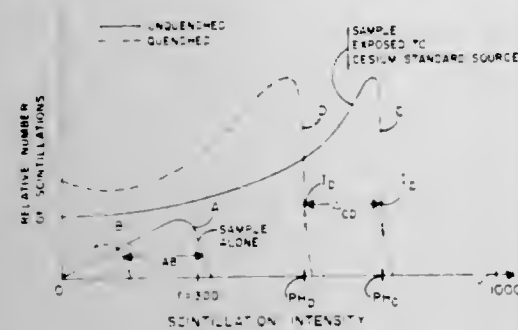
8 Claims

1. A method of quench correction in the measurement of a liquid scintillation sample comprising the steps of:

- (1) establishing from a measure of sample quench a quench corrected pulse height window for measuring scintillations of the sample;
- (2) establishing a threshold pulse height which distinguishes a first region for which said measure of sample quench is generally proportional to the effect of quench on the sample pulse height spectrum and a second region for which said measure is generally nonproportional;
- (3) comparing the quench corrected pulse height window to the threshold pulse height; and



- (4) adjusting the relative position of the corrected pulse height window if the step of comparing indicates that the



quench corrected pulse height window lies in the region of nonproportionality.

4,418,282

# METHOD AND APPARATUS FOR DETERMINING RANDOM COINCIDENCE COUNT RATE IN A SCINTILLATION COUNTER UTILIZING THE COINCIDENCE TECHNIQUE

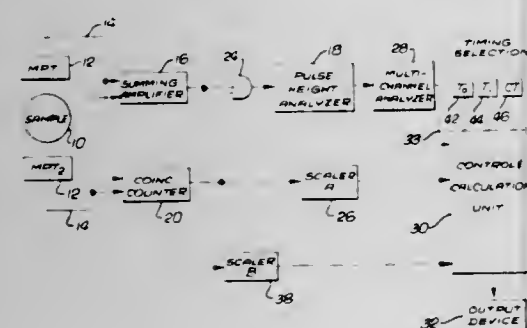
Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 29, 1981, Ser. No. 278,770

Int. Cl. G01T 1/20

U.S. Cl. 250-366

9 Claims



- For use with a scintillation counter utilizing at least two detectors in a coincidence counting technique, a method for determining a random coincidence count due to events resulting in single-quantum emissions which may chance to occur in such a manner that pairs of essentially coincident single-quantum events are detected one on each detector and are erroneously counted as radioactive disintegrations occurring in a sample, said method comprising the steps of:

- counting the number of essentially coincident events detected in both detectors of the counter during a sample count time to measure the radioactivity of the sample;
- counting the number of essentially coincident events detected in both detectors of the counter during a random coincidence monitoring time occurring during part of the sample count time;
- counting the total number of events detected in both detectors, regardless of coincidence in time, during the random coincidence monitoring time; and
- determining from the results of said counting steps during the random coincidence monitoring time, a random coincidence count rate attributable to chance coincidences of single-quantum events in accordance with the equation

$$S_c = (t_R/2) (TCN - TC)^2$$

where:

$S_c$  = random coincidence count rate,

$t_R$  = coincidence resolving time, which is the longest time

by which events can be separated and still considered coincident.

TC = counts per minute recorded in said second counting step, and

TCN = counts per minute recorded in said third counting step.

4,418,283

# MICROLITHOGRAPHIC SYSTEM USING A CHARGED PARTICLE BEAM

Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

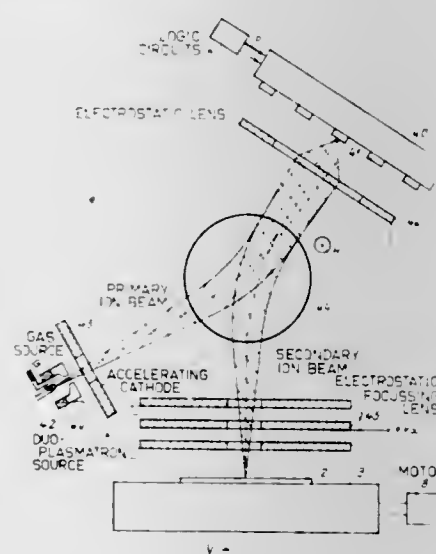
Continuation of Ser. No. 59,200, Jul. 20, 1979. This application Nov. 17, 1980, Ser. No. 207,707

Claims priority, application France, Jul. 24, 1978, 78 21826

Int. Cl. H01J 37/147

U.S. Cl. 250-492.2

15 Claims



- A microlithography device for drawing a predetermined pattern on a sample comprising:

a movable object holder for carrying said sample;

means for moving said object holder;

a data source containing readable data specifying said pattern;

and

means for providing charged particles including an array of elements arranged in a first plane, the elements positioned so as to correspond to a matrix, each element emitting a beam of charged particles when modulated to a first "on" state and not emitting a beam of charged particles when modulated to a second "off" state;

position sensor means for sensing the displacement of said object holder and hence the displacement of said sample carried on said object holder;

an imaging system for focusing the charged particle beams from said array of source elements into the plane of said sample; and

means, coupled to said data source and to said position sensor means, for sequentially applying signals to said array of elements so as to modulate them in accordance with said pattern and in synchronism with the displacement of said object holder

said means for providing charged particles comprising a single source of charged particles, focusing means for producing a focused beam of said particles and a magnetic prism for deflecting said focused beam toward said array of elements through an electrostatic lens, each element being operable in an active state in which charged particles issuing from said single source are reflected toward said sample through a further passage through said lens and prism, and operable in a passive state in which no such reflection occurs.

4,418,284

# SOLID-STATE COLOR-IMAGE SENSOR AND PROCESS FOR FABRICATING THE SAME

Kazufumi Ogawa; Shigeru Kondo, both of Hirakata; Yoshiko Yasuda, Sakai; Taketoshi Yonezawa, Ibaraki, and Isamu Kitahiro, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

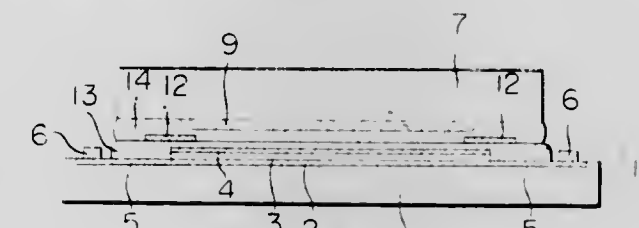
Filed Mar. 11, 1981, Ser. No. 242,577

Claims priority, application Japan, Mar. 17, 1980, 55-33805; Mar. 19, 1980, 55-35291

Int. Cl. B29C 27/10; B32B 31/20; H01L 31/18

U.S. Cl. 250-578

6 Claims



- A solid-state color-image sensor characterized by the provision of

(a) a first resin layer which is formed over a picture-element grid on a solid-state color-image sensor chip and which is transparent at least to the visible light range,

(b) a light-shielding layer which is formed over said first resin layer so as to optically shield a predetermined portion of said picture-element grid, and

(c) a color filter chip comprising a glass substrate and a filter pattern formed thereon, and

(d) a second resin layer with which said color filter is bonded to said light-shielding layer and which is transparent at least to the visible light range.

- A process for fabricating solid-state color-image sensors characterized by the steps of

(a) forming a first resin layer over a picture-element grid on a solid-state color-image sensor chip, said first resin layer being transparent at least to the visible light range,

(b) forming a light-shielding layer over the first resin layer so as to optically shield an area of said picture-element grid, and

(c) bonding a color filter formed on a glass substrate to said light-shielding layer with a second resin which is transparent at least to the visible light range.

4,418,285

# SYSTEM AND METHOD FOR CONTROLLING A TURBINE POWER PLANT IN THE SINGLE AND SEQUENTIAL VALVE MODES WITH VALVE DYNAMIC FUNCTION GENERATION

Leaman B. Podolsky, Wilmington, Del.; Uri G. Ronnen, Monroeville, and Francesco Lardi, O'Hara Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 306,942, Nov. 15, 1972, abandoned.

This application Dec. 30, 1977, Ser. No. 866,150

Int. Cl. F01B 25/00

U.S. Cl. 290-40 R

25 Claims

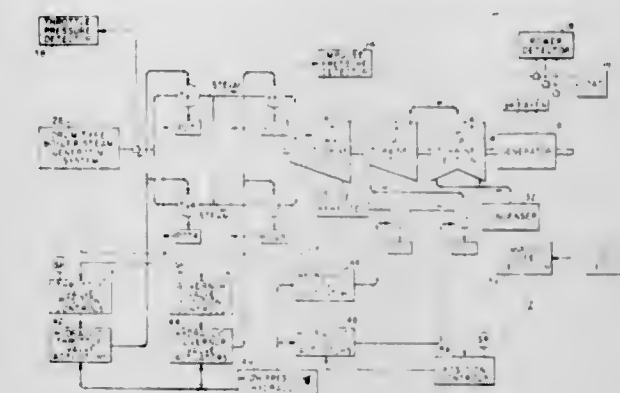
- A control system for a turbine power plant wherein the valve lift position of each of a plurality of steam inlet valve means, each including at least one valve, is controlled to admit a selected portion of the total turbine steam flow through associated nozzle groups in accordance with a selected single or sequential mode of valve operation and the flow of steam through each of the valve means varies for a given valve lift position in accordance with the total flow of steam to the turbine, said system comprising:

means to generate an electrical representation in accordance with the total steam flow demand for the turbine;

means governed by a selected mode of operation and the total steam flow demand representation to generate an

electrical representation of desired flow for each of the valve means;

calculating means including (a) means governed by the total flow demand representation to generate an electrical representation of steam flow versus valve lift position based upon the effect of pressure drop across the nozzles, (b) means governed by the electrical representation of



desired flow and the generated electrical representation of steam flow versus valve lift to generate for each respective valve means an electrical representation of valve position; and

means governed by the electrical representation of valve lift position to operate each of the valve means to a position representation corresponding to such valve lift position.

4,418,286

# WAVE AND TIDAL ENERGY DRIVEN ELECTRIC GENERATOR

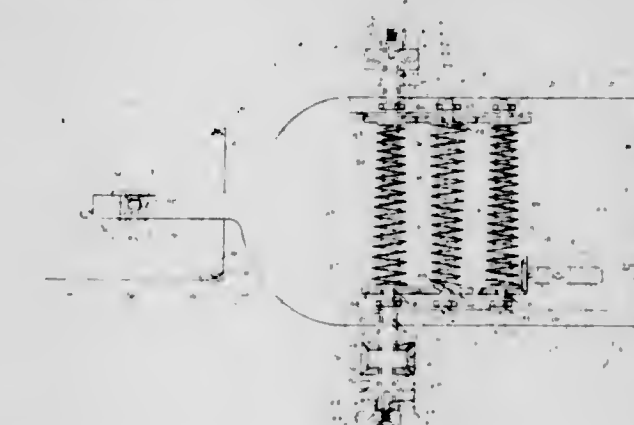
Lisbon Scott, 7920 Bi-County Rd., Apt. 10, Norfolk, Va. 23518

Filed Dec. 7, 1981, Ser. No. 328,199

Int. Cl. F03B 13/12

U.S. Cl. 290-42

8 Claims



- An electricity generating system using either wave or a combination of wave and tidal movement as a prime source of driving energy comprising: a wave energy transducer means; means operatively connecting said transducer to a tapered, superimposed primary energy storage spring means; a tapered, superimposed secondary energy storage spring means operatively connected to said primary energy storage means; an energy regulating spring means operatively connected to said secondary energy storage means; speed control means operatively associated with said means connecting said secondary energy storage means and said energy regulating means whereby a relatively constant RPM can be achieved; and a combination torque converter and speed reducer means operatively connecting said energy regulating means to an electrically generating means whereby wave and/or combined wave and tidal energy can be transferred to an energy storage means and released therefrom at a constant rate to drive an electricity generating means.



# 4,418,287 WIND POWER GENERATOR AND CONTROL THEREFORE

Charles D. Syverson, North Mankato, Minn., assignor to Power Group International Corporation, Houston, Tex.  
Division of Ser. No. 950,009, Oct. 10, 1978. This application Nov. 20, 1981, Ser. No. 323,279  
The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> F03D 7/02

U.S. Cl. 290—44

3 Claims



1. An electric generator assembly adapted to be driven by the wind, including a support for retaining the generator assembly in a desired position, said generator assembly having an armature fixedly mounted on said support, a housing, bearing means to rotatably mount said housing directly on said support for rotation about a central axis, said housing having an outer mounting portion spaced radially outward from and overlapping at least a portion of said armature, permanent magnet means carried by said mounting portion of said housing for interacting with the armature to provide for generation of an electrical output from the armature upon rotation of the housing, means connected to said housing for rotation with said housing, and means for connecting a wind sensitive element thereto to provide wind powered rotation of said housing relative to the armature to produce an electrical output, and means connected to said armature for carrying electrical output from the armature.

# 4,418,288 ROTATION DETECTOR

Yutaka Imai, Jiro Nakano, and Motoharu Ezaki, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Company Limited, Kariya, both of, Japan

Filed Jan. 27, 1982, Ser. No. 343,364

Claims priority, application Japan, Jan. 29, 1981, 56-11808

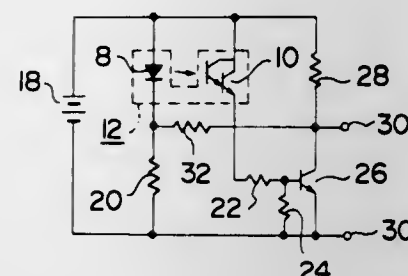
Int. Cl.<sup>3</sup> H01H 35/00

U.S. Cl. 307—117

11 Claims

1. A rotation detector, comprising:  
light emitting means adapted to be energized for emitting light;  
light receiving means for sensing the light emitted from said light emitting means and providing output signals;  
rotary means interposed between said light emitting means and said light receiving means, and adapted to be rotatably driven by a driving source, for causing the light emitted from said light emitting means to be sensed in intermittently interrupted states by the light receiving means; and means, including switching means turned ON or OFF in response to signals outputted from said light receiving

means, for increasing the luminous intensity of said light emitting means when said switching means is turned ON

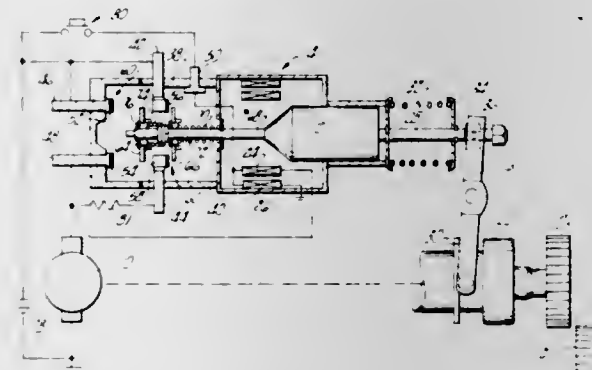


and for decreasing the luminous intensity of said light emitting means when said switching means is turned OFF.

4,418,289  
TWO STAGE STARTER DRIVE SYSTEM  
Harold R. Mortensen, Horseheads, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.  
Continuation of Ser. No. 962,353, Nov. 20, 1978, Pat. No. 4,305,002. This application Jan. 8, 1981, Ser. No. 223,539  
The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> F02N 11/00

U.S. Cl. 307—142

2 Claims



1. In combination with an electrically activated device of the type having an external source of electrical power; and a solenoid actuator of the type having a pull-in coil energized by said external source of electrical power; a hold-in coil energized by said external source of electrical power; a resiliently biased armature; a dual mode power switch; and means for moving said armature from a first position to a second position in response to said external source of electrical power energizing said pull-in and hold-in coils; the improvement comprising:

said dual mode power switch comprising two normally open electrical switches sequentially closed by said means for moving the armature of said solenoid actuator from said first position to said second position, the first of said two switches having an input terminal for receiving electrical power from the external electrical power source, and an output terminal, said first switch closing in response to said means for moving said armature so that the resiliently biased armature of the solenoid actuator is displaced to a predetermined intermediate position between said first and second position, said second of said two switches having an input terminal for receiving electrical power from the external source and an output terminal connected to the output of said pull-in coil and to the input terminal of said electrically activated device, said second switch closing in response to said armature having been moved to said second position by said moving means; and a resistance having a predetermined value connected between the output terminal of said first switch and the input terminal of said electrically activated device.

4,418,290  
VOLTAGE COMPARATOR  
Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

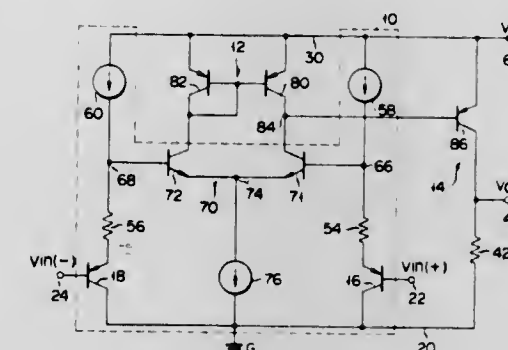
Filed May 19, 1981, Ser. No. 265,236

Claims priority, application Japan, May 26, 1980, 55-69939

Int. Cl.<sup>3</sup> H03K 5/24

U.S. Cl. 307—355

17 Claims



1. A voltage comparator comprising:
  - (a) input circuit means connected to a first potential line for receiving first and second electrical signals and providing an output current varying according to the voltage level difference between the first and second electrical signals, said input circuit means including:
    - (i) first and second transistors of one conductivity type each having an emitter, a base, and a collector electrode, the first and second electrical signals being respectively supplied to said base electrodes of said first and second transistors, and said collector electrodes being connected to said first potential line;
    - (ii) a differential pair formed by third and fourth transistors of the opposite conductivity type from that of said first and second transistors, said third and fourth transistors each having an emitter, a base, and a collector electrode, said emitter electrodes being connected to each other; and
    - (iii) first and second resistors connected respectively between said first transistor emitter electrode and said third transistor base electrode and between said second transistor emitter electrode and said fourth transistor base electrode; and
  - (b) a current-mirror circuit connected between a second potential line and said collector electrodes of said third and fourth transistors of said input circuit means; and
  - (c) output circuit means connected to said current-mirror circuit, for switching operation in response to the output current from said input circuit means to provide a third electrical signal corresponding to the voltage level difference between said first and second electrical signals, said output circuit means including a fifth transistor having an emitter, a base, and a collector electrode, said base electrode being connected directly to said collector electrode of either said third or said fourth transistor and the emitter-collector path of said fifth transistor being connected between said first and second potential lines.

4,418,291  
LOGIC GATE HAVING AN ISOLATION FET AND NOISE IMMUNITY CIRCUIT

Richard B. Watson, Jr., Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 28, 1980, Ser. No. 153,988

Int. Cl.<sup>3</sup> H03K 19/003, 19/017, 19/094, 19/20

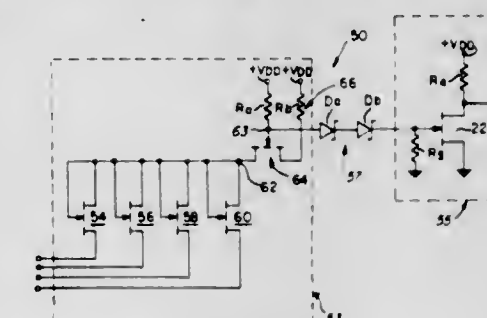
U.S. Cl. 307—443

10 Claims

1. A logic circuit comprising:
  - (a) input circuit means including: an input field effect transistor having an input terminal for coupling to a logic signal source and output terminal coupled to an intermediate terminal; and means for biasing such input transistor either to a relatively high conducting state or a relatively low

conducting state selectively in accordance with the state of the logic signal source coupled to such input transistor, such input circuit means producing a predetermined voltage drop between the input terminal of the transistor and the intermediate terminal when such input transistor is biased to the relatively high conducting state;

- (b) an output circuit means including: an output enhancement mode field effect transistor; and means for biasing such output transistor to the high conduction or low conduction state selectively in accordance with the level of a voltage fed to a gate electrode of such output transistor, such output transistor being biased to the low conducting state when such voltage level at the gate electrode is less than a threshold voltage of such output transistor;



- (c) noise immunity circuit means, coupled between the intermediate terminal and the gate electrode of the output transistor, for providing a voltage drop between the intermediate terminal and the gate electrode of the output transistor sufficiently greater than the predetermined voltage drop provided by the input circuit means between the input terminal of the input transistor and the intermediate terminal to ensure that the output transistor is biased to the low conducting state;
- (d) and wherein such input circuit means includes an additional field effect transistor having:
  - an input terminal connected to the output terminal of the input field effect transistor;
  - an output terminal coupled to a first current source;
  - a gate electrode connected to a second current source at the intermediate terminal.

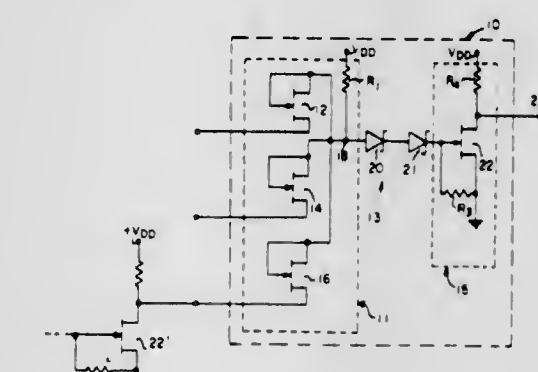
4,418,292  
LOGIC GATE HAVING A NOISE IMMUNITY CIRCUIT  
Nicholas B. Cserhalmi, Melrose, and Arthur M. Cappon, Newton Centre, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 28, 1980, Ser. No. 154,154

Int. Cl.<sup>3</sup> H03K 19/003, 19/017, 19/094, 19/20

U.S. Cl. 307—443

7 Claims



1. A logic circuit comprising:
  - (a) input circuit means including: an input field effect transistor having an input terminal for coupling to a logic signal source and output terminal connected to an intermediate terminal; and means for biasing such input transistor either to a relatively high conducting state or a relatively low conducting



state selectively in accordance with the state of the logic signal source coupled to such input transistor, such input circuit means producing a predetermined voltage drop between the input terminal of the transistor and the intermediate terminal when such input transistor is biased to the relatively high conducting state;

(b) an output circuit means including: an output field effect transistor; and means for biasing such output transistor to a high conduction or low conduction state selectively in accordance with the level of a voltage fed to a gate electrode of such output transistor, such output transistor being biased to the low conduction state when such voltage level at the gate electrode is less than a threshold voltage of such output transistor;

(c) noise immunity circuit means, coupled between the intermediate terminal and the gate electrode of the output transistor, for providing a voltage drop between the intermediate terminal and the gate electrode of the output transistor sufficiently greater than the predetermined voltage drop provided by the input circuit means between the input terminal of the input transistor and the intermediate terminal to ensure that the output transistor is biased to the low conducting state.

4,418,293

# HIGH PERFORMANCE DYNAMIC SENSE AMPLIFIER WITH MULTIPLE COLUMN OUTPUTS

Joseph C. McAlexander, III, Sugar Land; Lionel S. White, Jr., and G. R. Mohan Rao, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 944,822, Sep. 22, 1978, Pat. No. 4,239,993. This application Oct. 22, 1980, Ser. No. 199,397

Int. Cl.<sup>3</sup> H03K 5/24; G11C 7/06

U.S. Cl. 307—530

12 Claims



1. A semiconductor memory device of the type having an array of rows and columns of memory cells at a face of a semiconductor body with each column split into two column line halves and having sense amplifiers connected to pairs of sense nodes at ends of each pair of column line halves, the columns being arranged in M groups of N columns where M and N are integers and M is greater than N, comprising:

a pair of cross-coupled driver transistors in each sense amplifier, and at least one grounding transistor, each of the transistors having a current path and a control electrode, means connecting the current path of each one of the driver transistors separately between one of the sense nodes and a grounding node and connecting the current path of the grounding transistor between the grounding node and reference potential,

means for precharging the sense nodes to a voltage level prior to an active operating cycle,

means for addressing a selected row of the memory cells in the array at a given time in the beginning of said operating cycle,

means for applying a clock voltage to turn on said at least

one grounding transistor at a first time subsequent to the said given time in the beginning of an active operating cycle,

a plurality of N pairs of column output lines running parallel to said rows of cells, each pair including a data line and a data line, and selectively-activated coupling means connecting each of said column output lines separately to one of said column line halves in each group, and column addressing means connected to said coupling means to activate said coupling means in one group at a time after said given time in an active operating cycle.

4,418,294

# SUPERSONIC MHD GENERATOR SYSTEM

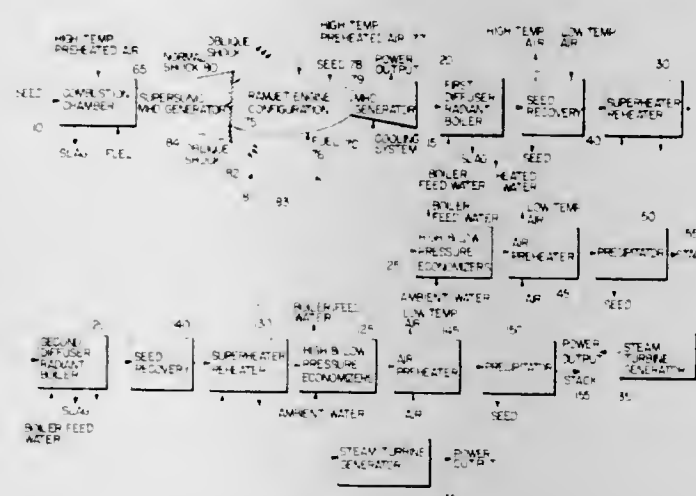
Muhammed A. Rahman, 1850 Columbia Pike, Apt. #129, Arlington, Va. 22204

Filed Jul. 2, 1982, Ser. No. 394,806

Int. Cl.<sup>3</sup> H02K 44/00

U.S. Cl. 310—11

4 Claims



1. An improved MHD power generating system of the type having a MHD topping cycle and a steam generating bottoming cycle and including a combustion system, at least one conventional MHD generator and a first radiant boiler in fluid communication with the secondary MHD generator, wherein the improvement comprises a first supersonic MHD generator and a ramjet engine operatively connected in series with said first supersonic MHD generator, said ramjet engine fluidly coupling said supersonic MHD generator with said conventional MHD generator for increasing the power output and improving the operating efficiency of the electric power generating system.

4,418,295

# MULTI-PATH COOLING IN AC GENERATOR FOR VEHICLE

Tsutomu Shiga, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 194,603, Oct. 6, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 358,901

Claims priority, application Japan, Oct. 9, 1979, 54-129429; Oct. 12, 1979, 54-131565

Int. Cl.<sup>3</sup> H02K 9/06

U.S. Cl. 310—59

2 Claims

1. An AC generator for vehicles comprising:

a housing including a generally cylindrical peripheral wall portion extending between end wall portions, each of said end wall portions having formed therein openings for air passage;

a stator assembly disposed within said housing and fixed to said cylindrical wall portion at a location between first and second spaced air outlet openings in the cylindrical wall portion, said stator assembly including a stator coil which at least partially overlaps said air outlet openings;

a rotor assembly disposed radially inwardly of said stator

assembly in spaced relationship therewith, the rotor assembly including a rotor shaft, a rotor coil, and a rotor core carrying said rotor coil, said rotor core being fixed to the rotor shaft for rotation therewith and comprising interleaved pole members which define a plurality of angularly separated fingers having therebetween axially extending spaces;

bearings for journaling said rotor shaft within the housing;

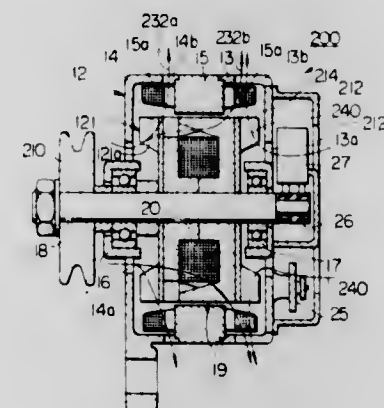
a first cooling fan secured to one end of said rotor core for rotation therewith, said fan including a substantially flat section disposed around said rotor shaft in contacting face-to-face relationship with said one end of the core and a plurality of vanes integral with the flat section, said vanes obliquely extending from the surface of said flat section at an angle in the range of 100 degrees to 150 degrees with respect to the flat section and being equal in number to the number of fingers of the rotor core, the vanes being disposed in substantially axial alignment with the spaces between said fingers and being arranged in overlapping relationship with one side portion of said stator coil, whereby during rotation of the rotor core, the

disposed around the inner rim of said pole-wheel in alternating sequence of polarity;

a stationary armature having an iron core (17) provided with substantially straight radial pole legs (18) extending in star configuration having their respective outer ends constituted as pole faces facing said magnet poles of said pole-wheel;

electric generator windings around said pole legs (18) for providing electrical energy for engine ignition and for other electric power consuming devices;

an inductive pulse generator affixed to said armature for generating ignition timing control pulses and constituted by an elongated core piece (25,27) extending from said



fan draws air through the openings in one of said end wall portions and directs the air (1) radially of the housing past said stator assembly and through the first air outlet opening in the cylindrical wall portion and (2) axially of the housing through the spaces between the rotor core fingers, and between the rotor and stator assemblies; and

a second cooling fan secured to the other end of said rotor core for rotation therewith, a substantially flat section of said second fan being disposed around said rotor shaft in contacting face-to-face relationship with said other end of the core, and a plurality of vanes integral with the flat section and arranged in overlapping relationship with the other side portion of said stator coil, whereby during rotation of the rotor core, the second fan draws air through the openings in the other of said end wall portions and directs this air, as well as that air axially directed by the first cooling fan through the spaces between the rotor core fingers and between the rotor and stator assemblies, radially of the housing past said stator assembly and through the second air outlet opening in the cylindrical wall portion.

4,418,296

# MAGNETO-GENERATOR FOR ENGINE IGNITION SYSTEMS

Hans Ebentheuer, Nuremberg, and Adam Hirt, Ammerndorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,685

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043267

Int. Cl.<sup>3</sup> H02K 11/00; F02P 1/00

U.S. Cl. 310—70 R

6 Claims

1. A magneto-generator for engine ignition systems comprising:

a cup-shaped revolving pole-wheel of magnetically soft material disposed for being driven by an engine;

a multiplicity of permanently magnetized magnet poles

1. In combination:

first and second signal responsive switches connected in series and provided with an output at the junction thereof;

a resonant load circuit including at least crystal transducer means connected to said output and driven by said first and second signal responsive switches, said crystal transducer means exhibiting changes in reactance as a function





of temperature, age and load and said resonant load circuit manifesting resonant characteristics including a changing resonant frequency over a sufficiently wide frequency range to accommodate said changes in reactance of said crystal transducer means; and

means for feeding back a signal associated with said resonant load circuit to alternately switch said first and second signal responsive switches, said means for feeding back maintaining a constant phase relationship between current and voltage over said range of frequencies and alternately switching said first and second signal responsive switches at substantially zero-crossover locations for reflected load current and current through said first and second signal responsive switches throughout said range of frequencies and substantially at any resonant frequency assumed within said range to achieve minimum power dissipation in said first and second signal responsive switches.

4,418,298

## MOTOR SPEED CONTROL CIRCUIT

Hitoshi Suzuki, and Fusao Makino, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

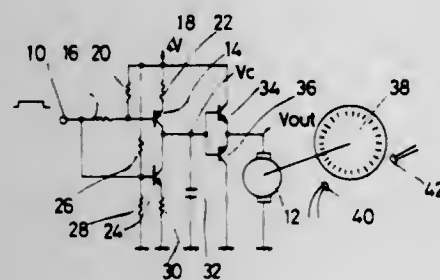
Filed Mar. 13, 1981, Ser. No. 243,598

Claims priority, application Japan, Mar. 22, 1980, 55-37698

Int. Cl.<sup>3</sup> H02P 5/16

U.S. Cl. 318—341

5 Claims



1. A motor speed control comprising:

a motor;

means for sensing the rotational speed of said motor;

means responsive to said sensing means for developing a motor speed pulse signal including a series of pulses having a pulse width which varies in response to the sensed rotational speed of said motor;

converting means responsive to said pulse signal produced by said developing means for developing a voltage signal having a voltage level corresponding to the pulse width of said series of pulses;

drive means responsive to said voltage signal produced by said converting means for amplifying said voltage signal and driving said motor, said drive means including, first and second transistors having controlled terminals commonly connected together and to a first terminal of said motor, the bases of said transistors being commonly connected to said converting means to receive said voltage signal,

said first transistor applying a drive voltage to said first terminal to drive said motor,

said second transistor conducting to brake said motor by absorption of counter electromotive force when said voltage signal is at a level lower than the level indicative of the desired motor speed.

#### 4,418,299 FACE-SHEAR MODE QUARTZ CRYSTAL VIBRATORS AND METHOD OF MANUFACTURE

Eishi Momosaki, Owa Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

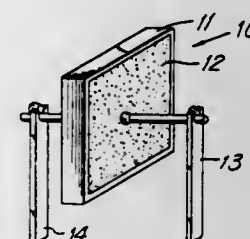
Continuation-in-part of Ser. No. 167,296, Jul. 10, 1980, abandoned, which is a continuation of Ser. No. 868,762, Jan. 12, 1978, abandoned. This application Sep. 29, 1982, Ser. No. 427,047

Claims priority, application Japan, Jan. 12, 1977, 52-2026; Jan. 19, 1977, 52-4729; Jan. 27, 1977, 52-8038; Oct. 26, 1977, 52-128409

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—361

10 Claims



1. A miniaturized quartz crystal vibrator comprising a rectangular face-shear mode quartz crystal plate having a long-side and a short-side dimension, said plate cut from a single quartz crystal less than 500  $\mu\text{m}$  thick having two opposed principal substantially planar surfaces and four edge surfaces and metallic film electrodes disposed on at least a portion of said opposed planar surfaces, said quartz crystal plate being a Y-cut rotated about the X-axis from 45° to 55° and further rotated an angle of 45° from the X-axis, said quartz crystal plate being formed with a pair of holding portions integrally extending from the two opposed short-side edge surface with said holding portion extending along the long-side of said vibrator for supporting said quartz crystal vibrator and metallic film electrodes disposed on said holding portions.

4,418,300

#### METAL VAPOR DISCHARGE LAMP WITH HEAT INSULATOR AND STARTING AID

Katsuya Otani; Ryo Suzuki; Keiji Watanabe, and Michihiro Tsuchihashi, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

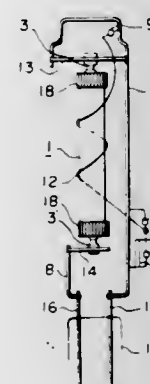
Filed Oct. 2, 1980, Ser. No. 193,018

Claims priority, application Japan, Jan. 17, 1980, 55-3914; Jan. 17, 1980, 55-3915

Int. Cl.<sup>3</sup> H01J 61/30, 61/20, 61/54

U.S. Cl. 313—573

7 Claims



6. A metal vapor discharge lamp which comprises: an arc tube having opposed ends and made of at least an oxide crystal; a starting aid equipped on the outer circumference of said arc tube;

one end of said arc tube having a heat insulator to keep said one end warm, wherein the opposed end of the arc tube represents the coolest side thereof; and a rare gas enclosed at 100 Torr or above together with at least sodium and mercury in said arc tube, wherein said starting aid and an electrode at the coolest side of the arc tube are so arranged to have the same potential.

of the frequencies of the digital input signals supplied by the respective speed sensing means, and (ii) second means responsive to said output pulses and to the number of said speed sensing means for producing a digital speed feedback signal having a frequency proportional to the frequency of said output pulses divided by the number of speed sensing means, whereby the frequency of said speed feedback signal is representative of the average angular velocity of the respective rotors of said motors.

4,418,301

#### CIRCUIT FOR AVERAGING A PLURALITY OF SEPARATE MOTOR SPEED SIGNALS

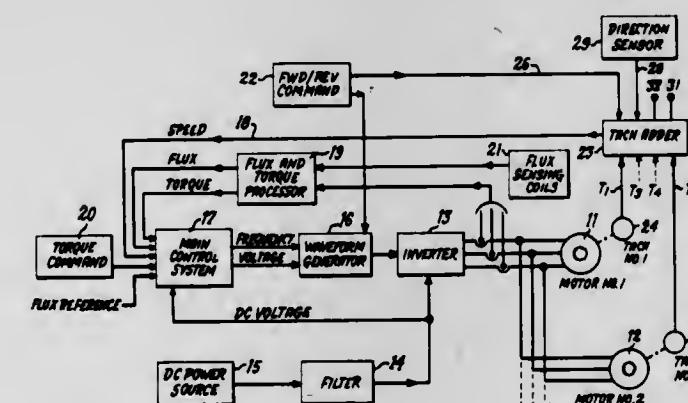
Robert J. Griffith, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed May 12, 1982, Ser. No. 377,282

Int. Cl.<sup>3</sup> H02P 5/00

U.S. Cl. 318—59

14 Claims



4,418,302

#### DC MOTOR CONTROL CIRCUIT

Fumiyoshi Abe, Zama, and Takayuki Okafuji, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

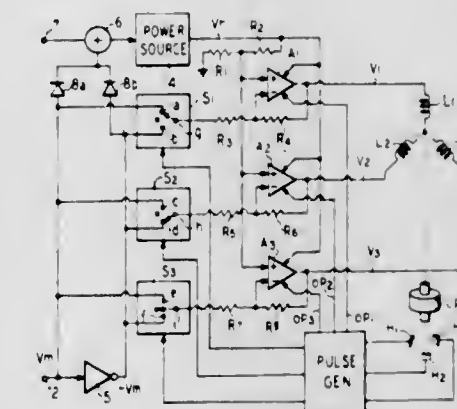
Filed Mar. 22, 1982, Ser. No. 360,435

Claims priority, application Japan, Mar. 30, 1981, 56-46745

Int. Cl.<sup>3</sup> H02K 29/02

U.S. Cl. 318—254

9 Claims



1. An electric propulsion system for a traction vehicle having a plurality of axle-wheels sets, comprising:

a. a plurality of adjustable speed, 3-phase a-c motors, each of said motors having stator windings and a rotor, with the rotors of the respective motors being mechanically coupled to separate axle-wheel sets of the vehicle;

b. a corresponding plurality of speed sensing means coupled to the rotors of the respective motors, each of said speed sensing means being arranged to supply a separate digital input signal having a frequency that varies with the angular velocity of the associated rotor;

c. means including a controllable electric power inverter for supplying 3-phase a-c power to the stator windings of all of said motors;

d. means for varying the fundamental amplitude of the a-c power supplied to said motors;

e. means responsive to an excitation frequency control signal for controlling the operation of said inverter so as to vary the fundamental frequency of said a-c power as desired;

f. means for developing said excitation frequency control signal and for varying the same as a function of the frequency of a digital speed feedback signal; and

g. said speed feedback signal being provided by a circuit including (i) first means connected to all of said speed sensing means for developing a single train of discrete output pulses having a frequency proportional to the sum

1. A DC motor control circuit for controlling the rotation of a DC motor comprising, a plurality of linear amplifiers, respectively connected to each stator windings of the DC motor, a pulse generator for generating rotational pulse trains which represent rotational phases of the rotor of said DC motor, an output impedance control pulse generator for generating in response to said rotational pulse train, control pulses for selectively controlling said plurality of linear amplifiers so they have almost infinite output impedances, a motor control voltage, a signal inverter for inverting said motor control voltage, a plurality of switching circuits respectively connected to the input circuits of said plurality of linear amplifiers for supplying said motor control voltage and said phase inverted motor control voltage selectively to each of said linear amplifiers, and a switching circuit control pulse generator, for generating, based on said rotational pulse train, switching pulses which are supplied to each of said switching circuits.



4,418,304

**CIRCUIT FOR CONTROLLING ROTATION OF MOTOR**  
Hiroshi Iwai, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

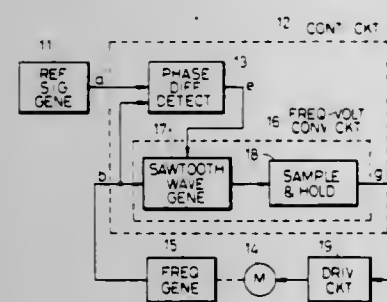
Filed Apr. 7, 1981, Ser. No. 251,778

Claims priority, application Japan, Apr. 7, 1980, 55-45463

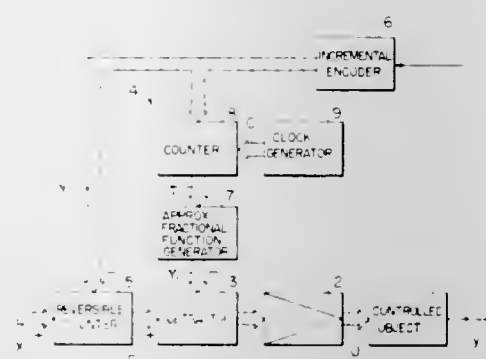
Int. Cl.<sup>3</sup> H02P 5/16

U.S. Cl. 318—311

5 Claims



lating means comprising first means for measuring the time required for said controlled object to make a predetermined change, second means for dividing the predetermined change



of said controlled object by the time measured by said first means, thereby calculating the velocity, and third means for subtracting the velocity calculated by said second means from the position signal applied from said position servomechanism.

1. A circuit for controlling rotation of motor comprising: rotational velocity signal generating means for generating a rotational velocity signal responsive to the rotational velocity of a motor whose rotation is to be controlled; reference signal generating means for generating a reference signal; phase comparing means for comparing the phases of said rotational velocity signal and said reference signal; multiplexing means for multiplexing said rotational velocity signal and the output signal of said phase comparing means; sample-and-hold means for sampling and holding the output multiplexed signal of said multiplexing means by said rotational velocity signal; and controlling means for controlling the rotation of said motor by the output signal of said sample-and-hold means.

4,418,305

**VELOCITY FEEDBACK CIRCUIT**

Haruki Otsuki, Shimoinayoshi, and Hiromu Hirai, Yatabemachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 14, 1981, Ser. No. 292,802

Claims priority, application Japan, Aug. 27, 1980, 55-117109

Int. Cl.<sup>3</sup> G05B 5/01

U.S. Cl. 318—616

5 Claims

1. A velocity feedback circuit for a position servomechanism operative to control the position of a controlled object, said velocity feedback circuit comprising velocity calculating means responsive to a position signal applied from said position servomechanism for calculating the velocity to be fed back to the input of said position servomechanism, said velocity calcu-

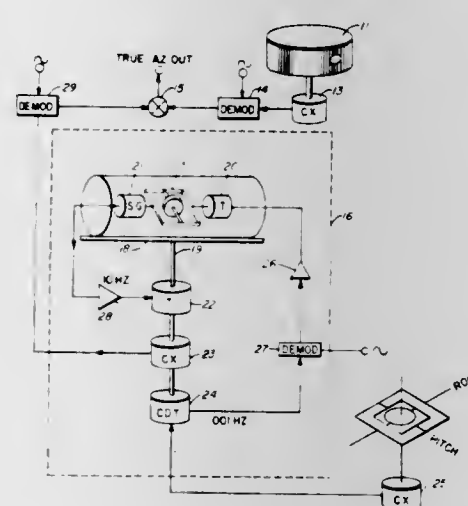
**4,418,306**  
**DIRECTIONAL DATA STABILIZATION SYSTEM**  
Richard W. Samsel, Pittsfield, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1981, Ser. No. 319,153

Int. Cl.<sup>3</sup> B64C 17/02

U.S. Cl. 318—648

24 Claims



1. A directional data stabilization system comprising: a gimbal mounted instrumentality, an inertial device aligned with an axis of said gimbal, means to maintain the inertial orientation of said device, means to provide an error signal proportional to the deviation of said device from inertial orientation, a directional reference, means to align said device with said directional reference, and means to provide a signal proportional to the angle of said instrumentality from said device when said device is aligned with said reference.

4,418,307

**METHOD AND APPARATUS FOR CONTROLLING THE ROTATIONAL SPEED AND PHASE OF SYNCHRONOUS MOTORS**

Harald Hoffmann, Kiel, and Dan-Corneluz Raducanu, Eberbach, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

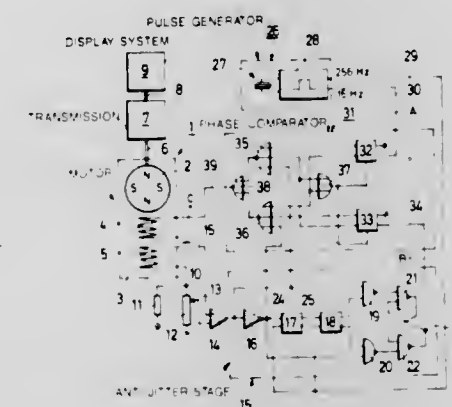
Filed Sep. 16, 1980, Ser. No. 187,855

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937838

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—721

4 Claims



1. Apparatus for controlling the rotational speed and phase of a synchronous motor having a rotor with at least one pair of poles and a stator with at least one field coil, to which acceleration driving or braking driving pulses are applied, comprising: a sensor coil, having an output, coupled with the stator capable of being influenced by the rotor and for providing sensor signals of a frequency proportional to the rpm of the rotor; comparator means, having an output, connected to said output of said sensor coil for converting said sensor signals into rectangular sensor pulses; a pulse generator, having an output, for generating control pulses of constant frequency and width; and a phase comparator means, having an output, and including means for generating driving pulses at said output, connected to the field coil, said driving pulses being synchronized with said sensor pulses, said phase comparator means being connected to said output of said comparator means and said output of said pulse generator, for comparing said sensor pulses with said control pulses as to phase and pulse width, wherein if a positive phase shift (poles lagging) results, accelerating driving pulses are generated of a time duration in proportion to that phase shift, if a negative phase shift (poles leading) results, braking driving pulses are generated of a time duration in proportion to that phase shift.

4,418,308

**SCALAR DECOUPLED CONTROL FOR AN INDUCTION MACHINE**

Bimal K. Bose, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,589

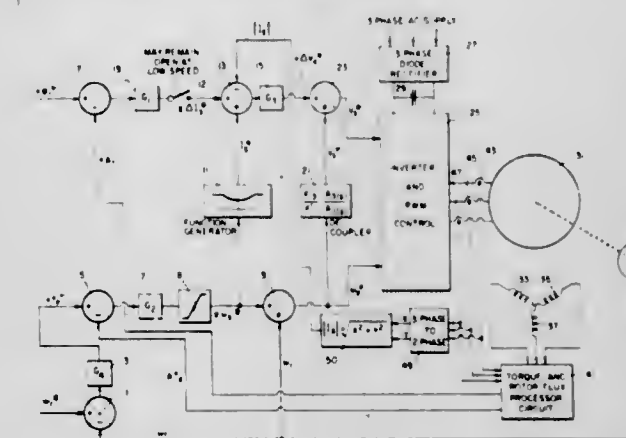
Int. Cl.<sup>3</sup> H02P 5/34

U.S. Cl. 318—803

7 Claims

1. An induction machine drive for achieving fast transient response, comprising: a voltage fed inverter providing variable frequency a.c. power to the induction machine; torque sensing means coupled to said machine for generating a signal indicative of actual machine torque; first comparison means coupled to said torque sensing means for comparing a commanded torque signal to said signal indicative of actual machine torque to generate a commanded torque error;

slip command generating means for generating a slip command from the commanded torque error; a first function generator coupled to said slip generating means and being responsive to commanded slip for providing a stator current magnitude command to maintain rotor flux constant during steady state condition at a predetermined value dependent on a predetermined relationship between slip and stator current, said stator current magnitude command providing a torque producing component; stator current measuring means coupled to said induction machine for generating a signal indicative of actual stator current; second comparison means coupled to said stator current measuring means and to said first function generator for comparing commanded stator current with actual stator current to generate a stator current error signal; stator voltage command signal generating means responsive to said stator current error signal for generating a first stator voltage command signal;



signal generating means responsive to rotor speed of said machine for generating a signal indicative of actual rotor speed; first summation means coupling said slip command generating means and signal generating means to said inverter, said first summation means adding said slip command to said actual rotor speed to generate a stator frequency command for said inverter; a second function generator coupled to said summation means and being responsive to changes in commanded stator frequency for generating a decoupling signal to compensate said first stator voltage command to maintain rotor flux constant at said predetermined value during transient conditions due to changes in the commanded machine stator frequency; and second summation means coupling said second function generator and said stator voltage command signal generating means to said inverter, said second summation means adding the decoupling signal from said second function generator to said first stator voltage command signal for supplying a compensated stator voltage command signal to said inverter.

4,418,309

**TWO PHASE INDUCTION MOTOR CIRCUIT WITH SERIES CONNECTED CENTER-TAPPED STATOR WINDINGS**

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems, Inc., Eldridge, Iowa

Filed Jul. 13, 1982, Ser. No. 397,929

The portion of the term of this patent subsequent to Jan. 14, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> H02P 5/28

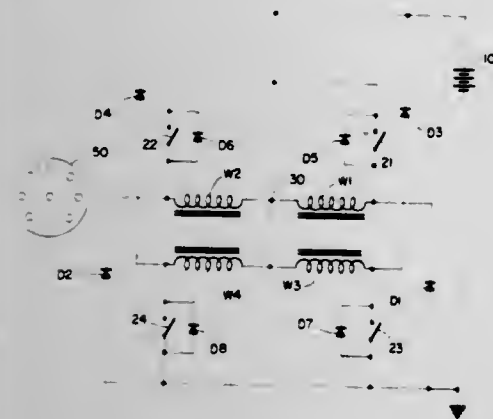
U.S. Cl. 318—818

5 Claims

1. An induction motor circuit comprising: (a) a power source, having a first voltage terminal and a second, more positive, voltage terminal; (b) first, second, third, and fourth switch means;



c) first, second, third, and fourth induction motor stator windings, each of said windings having one end connecting to the other said windings; the other ends of said first and second windings being switchably connected to said second voltage terminal through said first and second switch means respectively; the other ends of said third and fourth windings being switchably connected to said first voltage terminal through said third and fourth switch means;



d) a first diode and a second diode, said diodes connecting the other ends of said first and said second windings with said first voltage terminal respectively; the anodes of said diodes being connected to said first voltage terminal;  
e) a third diode and a fourth diode, said diodes connecting the other ends of said third winding and said fourth winding with said second voltage terminal respectively; the cathodes of said diodes being connected to said second voltage terminal.

4,418,310

## BATTERY CHARGER CONTROL CIRCUIT

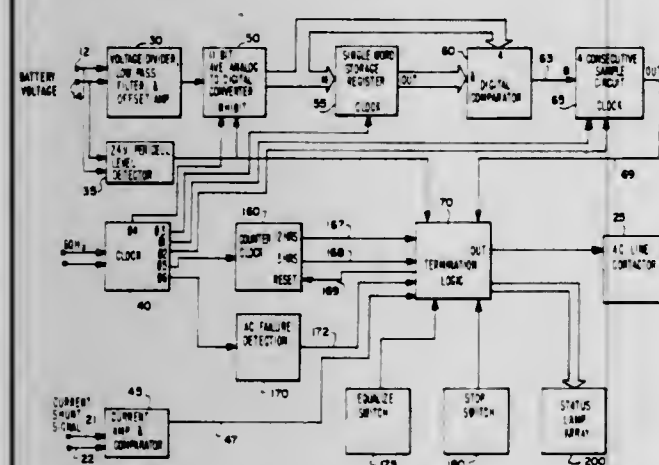
David D. Bollinger, Troy, Ohio, assignor to Hobart Brothers Company, Troy, Ohio

Filed Nov. 18, 1981, Ser. No. 322,333

Int. Cl.<sup>3</sup> H02J 7/04

U.S. Cl. 320-39

4 Claims



1. An automatic battery charging apparatus including, means for providing a source of regulated electrical current for charging a battery, means for sensing the battery voltage at regular intervals, said means including an analog to digital converter providing a digital output representative of average battery voltage taken over a predetermined period of time, means for comparing successive average battery voltage readings, means responsive to a predetermined number of consecutive comparisons where the present battery average differs from the previous average battery voltage by less than a predetermined amount for generating a control signal, and

means responsive to said control signal for disconnecting said source of charging current from said battery.

4,418,311

## BATTERY CHARGE INDICATING SYSTEM

Koshi Torii, Iwakura, Toshinori Maruyama, Kariya, Yoshio Akita, Chiryu, and Takanori Teshima, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

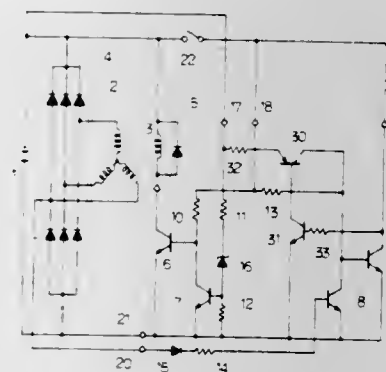
Filed Jan. 8, 1982, Ser. No. 338,056

Claims priority, application Japan, Feb. 18, 1981, 56-21421

Int. Cl.<sup>3</sup> H02J 7/24

U.S. Cl. 320-48

13 Claims



1. A battery charge indicating system comprising: an alternating current generator including output windings, a field winding and a full-wave rectifier connected to said output windings for rectifying the output therefrom; a battery connected to said generator and charged thereby; a voltage regulator unit connected to said generator and said battery for controlling the output of said generator in response to the battery voltage; indicating means connected to said battery through an ignition key switch; wherein said voltage regulator unit includes: power switching means connected to said battery through said field winding; voltage sensing means connected to said battery through a first terminal of said voltage regulator unit; a current supplying line, connected to said battery through a second terminal of said voltage regulator unit and said ignition key switch, for supplying a current to said power switching means when said voltage sensing means senses that the voltage of said battery is lower than a preset value; driving means, connected to said battery through said indicating means and said ignition key switch and through a third terminal of said voltage regulator unit, for driving said indicating means; detecting means connected to said battery through said third terminal for detecting a closed condition of said ignition key switch; and switching means connected to said battery through said first terminal and to said detecting means for supplying a signal to said driving means in response to an output of said detecting means indicative of the closed condition of said ignition key switch; said driving means being also connected to said generator and driving said indicating means when said generator is not generating its output and said driving means is supplied with said signal from said switching means.

4,418,312

## APPARATUS FOR TESTING MULTI-CONDUCTOR CABLES

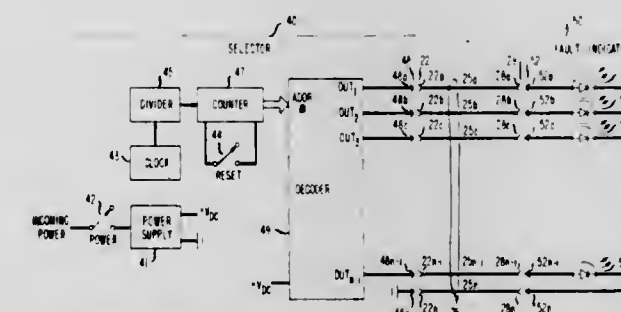
Bernard A. Figler, Aberdeen Township, Monmouth County, and Charles M. Fingerman, Manchester Township, Ocean County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1981, Ser. No. 314,245

Int. Cl.<sup>3</sup> G01R 31/08

U.S. Cl. 324-52

4 Claims



1. Apparatus for testing a cable, having two ends and  $n$  separate conductors, for conduction faults associated with each of said conductors comprising means at one end for establishing a conduction path between all of  $n-1$  conductors of said  $n$  conductors and a remaining one of said  $n$  conductors, means at the other end for sequentially establishing a conduction path between each of said  $n-1$  conductors and the remaining conductor whereby loops comprised of each of said  $n-1$  conductors and said remaining conductor are sequentially produced, means for causing test current to flow around each of said loops, and means connected to each of said  $n-1$  conductors at said one end of said cable and responsive to the test current flowing through each said loop for indicating any conduction faults associated with any of the  $n$  conductors.

4,418,313

## PROCESS AND CIRCUIT ARRANGEMENT FOR THE DETERMINATION IN A DILUTED BLOOD SAMPLE OF THE NUMBER OF RED BLOOD CORPUSCLES, THE MEAN CELL VOLUME, THE VALUE OF HAEMATOCRIT AND OTHER BLOOD PARAMETERS

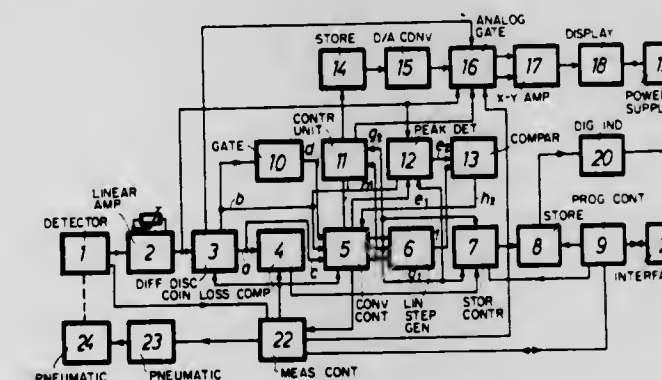
Laszlo Cserey, Pal Vilmati, and Pal Zillich, all of Budapest, Hungary, assignors to Medcor Művek, Budapest, Hungary, Continuation of Ser. No. 58,132, Jul. 17, 1979, abandoned, which is a continuation of Ser. No. 770,824, Feb. 22, 1977, abandoned. This application Sep. 8, 1981, Ser. No. 300,383

Claims priority, application Hungary, Feb. 24, 1976, ME 1955

Int. Cl.<sup>3</sup> G01N 27/00

U.S. Cl. 324-71.1

4 Claims



1. In a device for examining the size of particles suspended in a liquid, having a measurement aperture traversed by the suspension and two electrodes arranged in the region of the mea-

surement aperture and connected to evaluation circuitry, each of which electrodes produces one pulse per particle passing therethrough, the amplitude of which pulse is a measure of the volume of the particle, the improvement comprising a differential discriminator for the pulse amplitudes to determine the maximum amplitude of a pulse coming from a single particle and discriminating means connected in front of the evaluation circuitry, the discriminating means permitting the passage of only pulses whose duration is less than the duration of a pulse coming from a single particle which has a maximum amplitude determined by the differential discriminator.

4,418,314

## HIGH IMPEDANCE FAST VOLTAGE PROBE

Alfonso Nieto, Jr., Yorba Linda, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 20, 1980, Ser. No. 198,557

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324-72.5

3 Claims



1. A probe comprising a cylindrical outer conductor, a circuit board being of a material having a low relative dielectric constant which is metal clad etched to provide pads for mounting components and making connections, several chip resistors in series mounted longitudinally along the center of said circuit board, several chip capacitors also mounted longitudinally along the center of said circuit board with each said chip capacitor connected in parallel with one of said chip resistors, an input probe conductor connected to one end of said circuit board, an input resistor mounted on the circuit board in series between the input probe conductor and said chip resistors and chip capacitors, ferrite bead means connected in series with the chip resistors and chip capacitors along the center of the circuit board to a junction, output means having a center conductor and a ground conductor, an output resistor connected between said junction and the center conductor of the output means, a variable capacitor in series with a resistor connected between said junction and the ground conductor, and a shunt resistor connected between said junction and the ground conductor.

4,418,315

## METHOD FOR EFFECTING A SURFACE EXAMINATION OF COATED COMPONENTS

Lawrence J. Edwards, Suffield, and John P. Lareau, Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 22, 1981, Ser. No. 266,397

Int. Cl.<sup>3</sup> G01R 35/00

U.S. Cl. 324-202

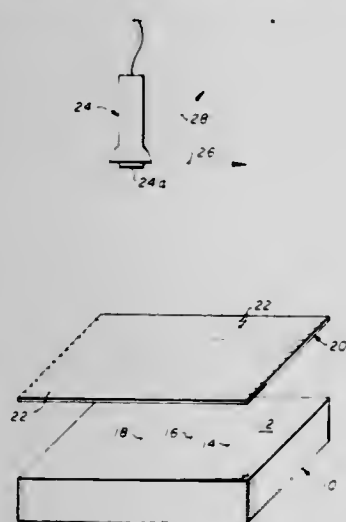
6 Claims

1. A method for effecting a surface examination of a coated metal component to detect defects in the surface thereof without requiring that the coating be removed from the component



for purposes of conducting the surface examination comprising the steps of:

- providing a calibration block embodying characteristics similar to the component that is to undergo the surface examination and having a plurality of crack-like notches formed in a surface thereof, one of the plurality of crack-like notches embodying the same dimension as the minimal dimensioned crack desired to be detected in the component that is to undergo the surface examination;
- providing a layer-like film of nonmetallic material embodying characteristics similar to the coating borne by the component that is to undergo the surface examination, the layer-like film of nonmetallic material comprises a plastic sheet-like member having a plurality of parallelly extending scribe lines provided thereon, the spacing between the adjoining ones of the multiplicity of scribe lines being such as to cause a reading to be provided of fifty percent of the value of the reading obtained from the minimal dimensioned crack-like notch when the eddy current means is moved along each of an adjoining pair of scribe lines;



- positioning the plastic sheet-like member in superimposed relation on the calibration block so as to cover the plurality of crack-like notches formed in the calibration block;
- establishing with eddy current means calibration readings from the calibration block having the plastic sheet-like member positioned in superimposed relation thereto;
- performing a surface examination of the coated metal component with the eddy current means by moving the eddy current means over the surface of the coated metal component in a traversing pattern corresponding to the pattern defined by the plurality of scribe lines provided on the sheet-like member; and
- comparing the readings obtained from the surface examination of the coated metal component with the calibration readings obtained from the calibration block to establish the presence of any cracks of at least a minimal dimension in the surface of the coated metal component.

4,418,316

## NUCLEAR MAGNETIC RESONANCE APPARATUS

Ian R. Young, Sunbury-on-Thames; Godfrey N. Hounsfield, Newark, and Michael Burl, Iver, all of England, assignors to Picker International Limited, Wembley, England

Filed May 19, 1981, Ser. No. 265,152

Claims priority, application United Kingdom, May 21, 1980, 8016807

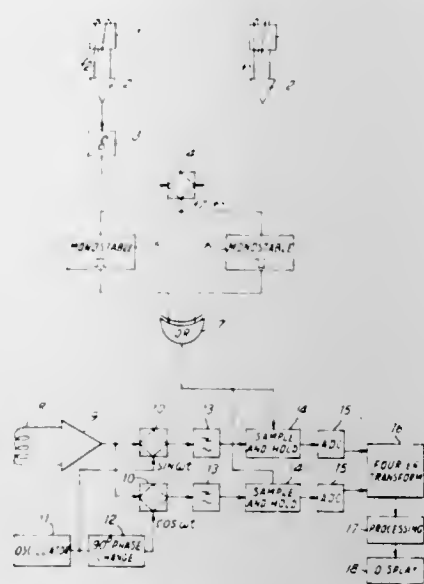
Int. Cl.<sup>3</sup> G01R 33/08

U.S. Cl. 324—309

9 Claims

1. A nuclear magnetic resonance apparatus using a field gradient to produce phase dispersion of resonating nuclei in a selected region of a body and including, a sampling arrangement for determining times of sampling signals produced by said nuclei, which times are spaced such that the gradient field integral in each interval between sampling times is substantially equal, said arrangement including two NMR probes

displaced in the direction of said gradient to produce NMR signals at frequencies representing the fields at their respective positions, means for determining the phase difference between



4,418,317

## LOGARITHMIC AMPLIFIER UTILIZING POSITIVE FEEDBACK

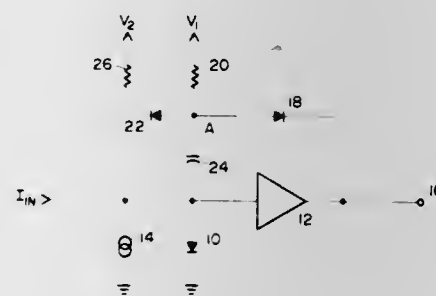
Glenn Bateman, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 18, 1981, Ser. No. 264,521

Int. Cl.<sup>3</sup> G06G 7/24

U.S. Cl. 328—145

6 Claims



1. A non-linear amplifier, comprising: an amplifier stage having an input and an output; a non-linear element coupled between said input and a reference potential level; a constant current source coupled to said input; and a feedback network coupled from said output to said input for providing positive feedback from said output to said input when the input signal is less than a predetermined value.

4,418,318

## DIGITAL PHASE-LOCKED LOOP CIRCUIT

Arnold Swagerty, Vienna, Va., and William A. Mitchell, Fairplay, Md., assignors to Frederick Electronics Corporation, Frederick, Md.

Filed Mar. 10, 1981, Ser. No. 242,245

Int. Cl.<sup>3</sup> H03L 7/08

U.S. Cl. 328—155

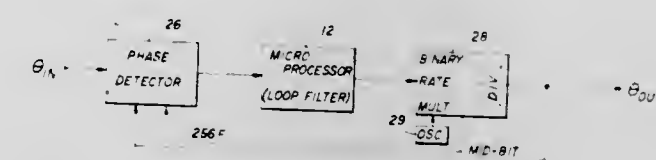
4 Claims

1. A digital phase-locked loop for controlling a digital output signal having time periods to track both as to its frequency and its phase a digital input signal having successive time intervals which defines a transmission frequency for said input signal, said input signal being in one of two possible logic states in each time interval, comprising:

- (a) a phase detector responsive to said input and output

signals, for detecting in the time intervals the phase difference therebetween;

- (b) a microprocessor responsive to the detected phase differences for generating for each interval a frequency select code to control the frequency of said output signal, the frequency select code for each interval including a phase shift correction component generated only from the measured phase difference for that interval if a phase difference measurement is obtained and a frequency correction component generated from all the measured phase differences; and



- (c) a binary rate multiplier responsive to the frequencies select code, for generating said output signal, the frequency select codes generated by said microprocessor controlling the frequency of said output signal on an interval-by-interval basis to cause the phase difference detected in successive intervals by said phase detector to approximate zero thereby locking the phase and frequency of said output signal to the phase and transmission frequency of said input signal.

4,418,319

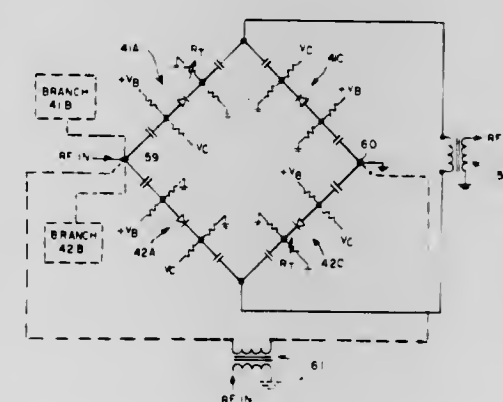
## SIGNAL PROCESSING PRODUCT CIRCUITRY

Paul F. Mahoney, Brighton, and Jerrold L. Bonn, Waltham, both of Mass., assignors to Signatron, Inc., Lexington, Mass. Continuation-in-part of Ser. No. 103,347, Dec. 13, 1979, Pat. No. 4,352,029. This application Jul. 7, 1982, Ser. No. 396,047

Int. Cl.<sup>3</sup> H03K 3/26; G06G 7/16

U.S. Cl. 328—160

18 Claims



1. A bridge circuit having four branches, first and second input terminals and first and second output terminals, said circuit for processing a first signal and a second signal, each branch of said bridge circuit including a current controllable resistance means having a first and second terminal; and capacitance means for providing d-c isolation thereof; first input circuit means for applying said first signal as an input signal to at least one of said first and second input terminals of said bridge circuit; bias circuit means for applying the same bias voltage to the first terminal of the current controllable resistance means of each of said branches; second input circuit means for applying said second signal to the first terminal of the current controllable resistance means of a first pair of opposite branches of said bridge circuit and to the second terminal of the current controllable resistance means of the other pair of opposite branches of said bridge circuit; output circuit means responsive to the signals at the first and second output terminals of said bridge circuit for combin-

ing said signals to produce an output signal which is the product of said first signal and said second signal.

4,418,320

## HIGH FREQUENCY DISCRIMINATOR WITH A CRYSTAL PHASE SHIFT NETWORK

James H. Guyton, 217-A Bobolink Way, Naples, Fla. 33942

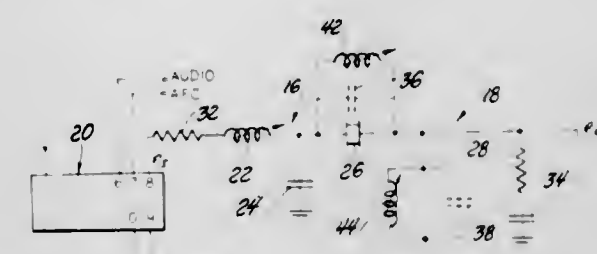
Continuation of Ser. No. 141,730, Apr. 18, 1980, abandoned.

This application Sep. 17, 1982, Ser. No. 419,264

Int. Cl.<sup>3</sup> H03D 3/16

U.S. Cl. 329—118

6 Claims



1. For use in developing an audio voltage in a receiver for angle modulated waves, said receiver including signal developing means for developing a signal voltage in the frequency range of at least several Mhz which is deviated about a center frequency by a deviation of several Khz in accordance with the modulation of the modulated wave; a discriminator circuit of the type adapted to combine the signal voltage and a quadrature voltage and having an input adapted to be coupled with said signal developing means, a crystal phase shift network in the discriminator circuit including a piezoelectric crystal and additional reactance means including distributed capacitance, said crystal with the additional reactance means having a reactance which is linearly proportional to signal deviation from center frequency, said phase shift network also including, in series with said crystal, a series impedance comprising reactance which includes distributed capacitance, the series impedance being resistance, said crystal being resonant at a frequency within a few Khz of said center frequency, whereby a modified signal voltage is produced across said series impedance, said modified signal voltage having a phase shift relative to said signal voltage which is linearly proportional to the deviation of said signal voltage frequency from said center frequency and means coupled with the crystal phase shift network for shifting the phase of the modified signal voltage by an additional 90° to produce said quadrature voltage, whereby said quadrature voltage is in quadrature phase relation with said signal voltage when the signal voltage is at said center frequency.

4,418,321

## FEEDBACK AMPLIFIER OR THRESHOLD VALUE SWITCH FOR A CURRENT FEED DIFFERENTIAL STAGE

Rolf Böhme, Bad Friedrichshall, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,484

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032703

Int. Cl.<sup>3</sup> H03F 3/45

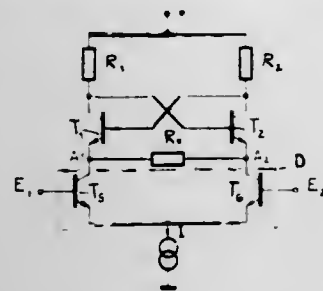
U.S. Cl. 330—252

6 Claims

1. A feedback amplifier including a current-fed differential stage having first and second outputs, said feedback amplifier additionally comprising a first transistor having an emitter connected to the first output of the differential stage; a second transistor having an emitter connected to the second output of the differential stage; a first resistor connected between both the outputs of the differential stage; a source of supply voltage; and second and third resistors comprising operating resistors



connected between said supply voltage source and said two transistors, wherein said second resistor is connected to the



collector of said first transistor and the base of said second transistor, and said third resistor is connected to the collector of said second transistor and the base of said first transistor.

4,418,322

### AUTOMATIC DIGITAL CIRCUIT FOR SYNCHRONIZING WITH A VARIABLE BAUD RATE GENERATOR

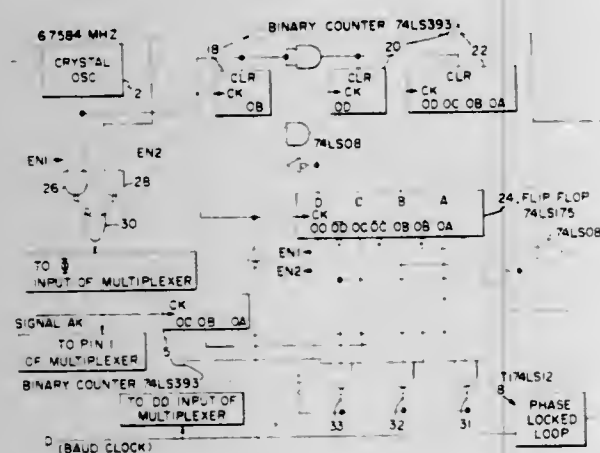
Paul S. Chang, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 137,038, Apr. 3, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 345,964

Int. Cl.<sup>3</sup> H03L 7/18

U.S. Cl. 331-1 A

4 Claims



1. A digital feedback circuit for synchronizing an oscillator output frequency with a signal input from a variable Baud Rate Clock in order to maintain a fixed input to output frequency ratio, comprising:

first binary means connected to a voltage controlled oscillator having an output frequency for counting down at a rate determined by said voltage controlled oscillator output frequency, and having sequentially activated divider outputs for binary division of said output frequency;

a system clock generating a system clock signal at a preset bit frequency;

second binary means counting down said system clock signal for a period determined by said Baud Rate Clock period; means for registering the count of said second binary counting means

logic means responsive to said registering means for selecting an output from said first binary counting means; means for connecting the output of said voltage controlled oscillator to an output terminal; and

means for comparing phase differential between said selected output of said first binary counting means and said signal input from said variable Baud Rate Clock and generating a voltage level based upon any phase differential therebetween for adjusting said voltage controlled oscillator output frequency.

### 4,418,323 OSCILLATOR HAVING CAPACITOR CHARGED AND DISCHARGED BY CURRENT MIRROR CIRCUITS

Akio Tokumo, and Yoshiro Kunugi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

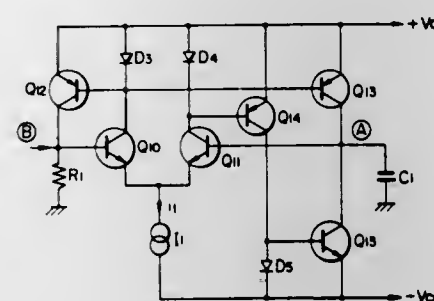
Filed Mar. 5, 1981, Ser. No. 240,686

Claims priority, application Japan, Mar. 7, 1980, 55/28838; Mar. 7, 1980, 55/28839; Mar. 10, 1980, 55/29216

Int. Cl.<sup>3</sup> H03K 3/282

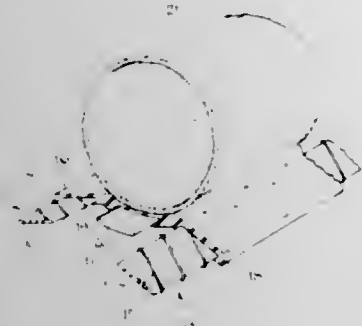
U.S. Cl. 331-111

10 Claims





reinforcing strands embedded between substantially flat strips of insulative thermoplastic material which are extruded and



thereafter compressed together sufficiently to form a bond therebetween.

4,418,329

**FAST-RESPONSE TEMPERATURE SENSOR**

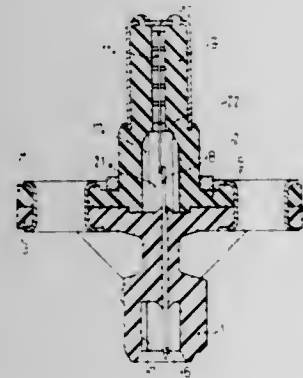
Heiko Gruner, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Mar. 17, 1982, Ser. No. 359,122

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111948

Int. Cl.<sup>3</sup> H01C 7/02

U.S. Cl. 338—28

2 Claims



1. Fast-response temperature sensor, particularly for use with an internal combustion engine, having  
a housing (1, 2, 9, 10) defining an air duct and a cavity (17) therein, joined to the air duct;  
apertures (11) formed in the housing and extending there-through and communicating with the air duct;  
connecting terminals (6, 8) secured in the housing;  
a thermal-electrical elongated sensing element positioned in the cavity and secured in the housing, comprising  
an insulating carrier (12) extending into the air duct and into the cavity;

a temperature-sensitive resistance track (13) deposited on the carrier and having connection means (14) for connection of the resistance track to the terminal (6, 8), said temperature-sensitive resistance track being located adjacent an end portion of the insulating carrier and arranged in meander shape; wherein

the resistance track comprises a thin-film track arrangement having a predetermined longitudinal extent (19);  
connection tracks (15, 16) are provided, having a length (24) at least as long as said predetermined longitudinal extent (19) extending from one end portion of said meander-shaped track arrangement to the connection means (14);  
and two protective coatings (20, 21) are provided, applied, respectively, in longitudinally staggered, and mutually overlapping position on the insulating carrier and over said track arrangement and the connection means;  
a first one of said coverings (20) covering said meander-shaped track arrangement and a major portion of the

connection means (15, 16) and consisting of an epoxy resin of about 5  $\mu$ m thickness;  
and the second (21) of said coverings comprising an epoxy resin casting compound compatible with the first covering (20) and filling said cavity (17), said second covering extending over the connection means and the adjacent portions of the terminals secured thereto and forming a holding and attachment body to secure the insulating carrier in the housing;  
and wherein the longitudinal extent is at least twice the distance (23) between the boundary line (22) of overlap of the second covering (21) over the first covering (20).

4,418,330

**ELECTRONIC SEQUENTIAL COMBINATION LOCKING DEVICE**

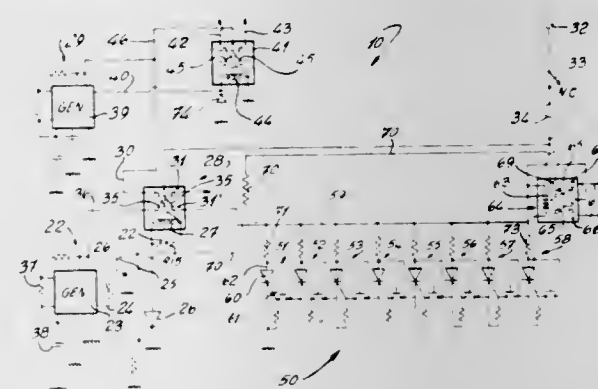
Stephen Kamichik, 1460 Montcalm St., Chomedey, Quebec, Canada

Filed Sep. 4, 1981, Ser. No. 299,328

Int. Cl.<sup>3</sup> B60R 25/04

U.S. Cl. 340—64

11 Claims



1. An electronic sequential combination locking device comprising a main switch, a timer circuit connected to said main switch through a first relay device, said timer circuit being activated by said main switch to provide a timer output signal after a predetermined time lapse, an electronic switching element connected to receive said timer output signal, alarm means connected to said electronic switching element and operable by said timer output signal, a combination lock circuit having a plurality of manually actionable switch circuits operable in a predetermined sequence to activate a second relay device and disable said electronic switching element through a feedback connection between said first and second relay devices, said electronic switching element when activated by said timer output signal after said time lapse applying power to said first relay device which activates said alarm means and disables said combination lock circuit, said second relay device providing a supply to an ignition circuit of an automobile, said second relay device having two sets of contacts through which power is supplied to said ignition circuit when said second relay device is activated and said alarm means is simultaneously disabled.

4,418,331

**MANUALLY OPERATED DEACCELERATION WARNING SYSTEM WITH VACUUM CONTROLLED OVERRIDE**

Gustave J. Chicoine, 1052 Cumberland Pl., San Jose, Calif. 95125

Continuation-in-part of Ser. No. 131,158, Mar. 17, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,751

Int. Cl.<sup>3</sup> B60Q 5/00; G08B 21/00

U.S. Cl. 340—72

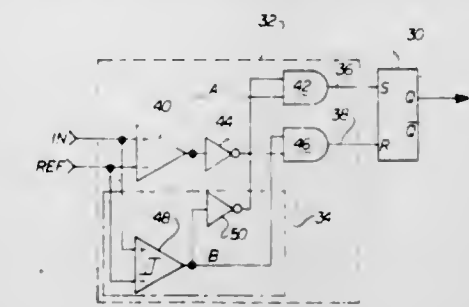
10 Claims

1. A warning system for downshifting deacceleration of vehicles having an internal combustion type engine with an intake manifold vacuum responsive to acceleration and deacceleration, the warning system having a hand operated control loop which is automatically enabled and disabled in response

to the manifold vacuum force, and a lamp operating loop which is separated from the control loop by an isolation relay therebetween, comprising:

a control loop;  
a control power source means for providing control current to the control loop;  
vacuum operated mode controller means connected in the control loop and automatically responsive to variations in the manifold vacuum force for enabling the warning system by permitting control current to flow in the control loop, and for disabling the warning system to override the hand operation by preventing control current to flow in the control loop;  
a normally open, push-to-close, hand operated switching means mounted on the downshift control lever and connected in the control loop for initiating the flow of control current through the control loop during downshift deacceleration warning when the warning system is enabled by the mode controller and the hand operated switching means is closed by the operator, and for terminating the flow of control current through the control

when the values of said first and second signals cross over, but only if said first and second signal values have deviated



from one another by more than a selected amount since said output means was last triggered.

4,418,333

**APPLIANCE CONTROL SYSTEM**

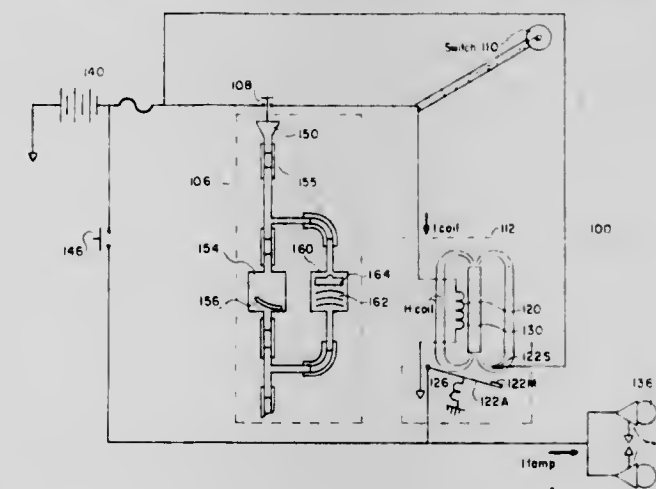
Richard J. Schwarzbach; Manley S. Keeler, both of Naperville; Randy J. Cavaiani, Hanover Park, and Michael K. Chapman, Sycamore, all of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Jun. 8, 1981, Ser. No. 271,244

Int. Cl.<sup>3</sup> H04Q 9/00; G06F 15/20; H04B 3/54

U.S. Cl. 340—310 A

33 Claims



loop when the hand operated switching means is released to open by the operator;

an isolation relay coil connected in the control loop, and responsive to control current flowing through the control loop during downshift deacceleration warning for generating a magnetic field;

an operating loop;

an operating power source means for providing operating current to the operating loop;

deacceleration warning lamp means connected in the operating loop for incandescing in response to operating current from the operating power source means when operating current flows through the operating loop;

isolation relay contacts at least one of which is movable from an open position distant from the isolation relay coil to a closed position proximate to the isolation relay coil in response to the magnetic field for moving the movable contact into electrical engagement with the other contact to complete the operating loop permitting operating current to flow through the warning lamps, the movable contact returning to the open distant position in response to the termination of the magnetic field.

4,418,332

**NOISE INSENSITIVE COMPARATOR**

Joseph P. Mefford, Glen Cove, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 24, 1981, Ser. No. 276,967

Int. Cl.<sup>3</sup> H03K 5/153, 5/24

U.S. Cl. 340—146.2

25 Claims

1. Apparatus for comparing the values of first and second signals comprising:  
output means triggerable to provide an indication; and  
output control means responsive to said first and second signals for triggering said output means to provide said indication

1. In a system including a central unit for controlling a remote lamp, a slave unit coupled to the remote lamp, and means providing communication between the central unit and the slave unit, the slave unit including light intensity control means variable among a plurality of intensity levels corresponding respectively to an OFF condition and a maximum intensity condition and a plurality of intermediate intensity conditions of the associated lamp, the central unit including means for transmitting to the slave unit a control signal for operating the light intensity control means, the improvement comprising: means in the central unit for transmitting to the slave unit a preset intensity signal; and processor means in the slave unit operating under stored program control; said processor means including means for sensing the intensity level of the light intensity control means; said processor means including means responsive to said preset intensity signal when said light intensity control means is in either the OFF level or the maximum intensity level for setting said light intensity control means to a predetermined intermediate intensity level.

4,418,334

**SIGNAL DISPLAY SYSTEM AND LUMINAIRE APPARATUS FOR OPERATING SAME**

Dorothy K. Burnett, 87 Pine St., Belmont, Mass. 02178

Filed Jan. 26, 1981, Ser. No. 228,270

Int. Cl.<sup>3</sup> G08B 7/06

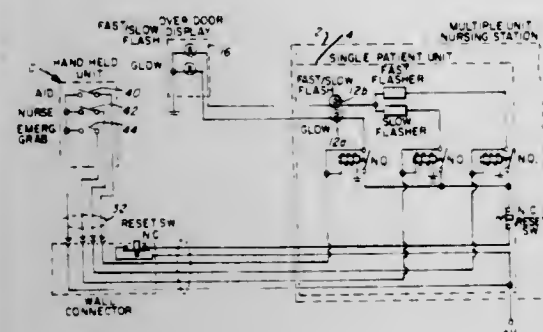
U.S. Cl. 340—332

7 Claims

1. A call system for use in hospitals, nursing homes and the like, wherein services provided may be classified in three groups in terms of importance in responding to the patient's needs including services lowest in importance by a nurse's aide, services of greater importance rendered by a nurse or a



doctor and services of greatest importance rendered by an emergency unit or team, said call system comprising a luminaire apparatus including a call lamp to be located at a nurse's call station, electrical circuitry for connecting the call lamp with a patient's room at a distance from the call station and a



portable call box located in the patient's room at a patient's bedside, said call box having constructed therein a plurality of switches for selectively energizing the call lamp and producing light signals or differing light characteristics which are arranged or coded in ascending order of importance and which are correlated with the said three classified groups of services.

4,418,335

**INFRARED INTRUSION DETECTOR WITH PYROELECTRIC SENSOR AND CHARGE AMPLIFIER**  
Rudolf Genähr, Männedorf, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

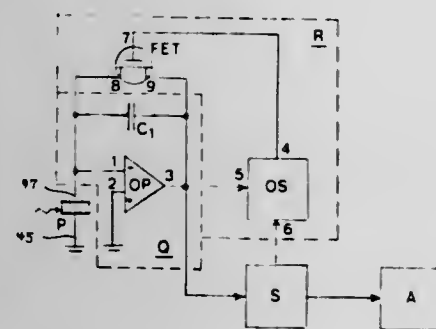
Filed Sep. 18, 1981, Ser. No. 303,630

Claims priority, application Switzerland, Oct. 6, 1980, 744/80

Int. Cl.<sup>3</sup> G08B 13/18

U.S. Cl. 340—565

12 Claims



1. An infrared intrusion detector comprising:  
a pyroelectric detector element;  
an evaluation circuit serving for giving an alarm signal in the event of a change in radiation of the detector element caused by a moving object;  
said evaluation circuit being operatively connected with said pyroelectric detector element;  
said evaluation circuit containing a charge amplifier;  
said detector element having an output;  
said charge amplifier having an input; and the input of the charge amplifier being connected with the output of the detector element.

4,418,336

**ALARM INDICATING DISLOCATION OF FIRE EXTINGUISHER**

Joan D. Taylor, 3951 Lotus Dr., Waterford, Mich. 48095

Filed Jul. 17, 1981, Ser. No. 284,474

Int. Cl.<sup>3</sup> G08B 13/14

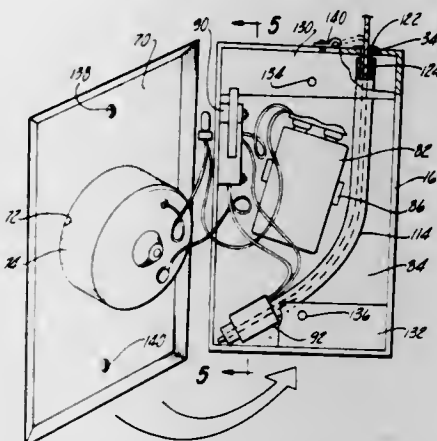
U.S. Cl. 340—571

10 Claims

1. An alarm for detection of dislocation of a portable fire extinguisher from a relatively stationary storage post comprising:

a substantially enclosed alarm housing having an audible

alarm and means for energizing said alarm enclosed therein, and said housing further including a tubular passageway open at one end to the exterior of the housing; switch means for activating said energizing means comprising an elongated, flexible member, a first free end of said elongated member being slidably receivable in said tubular passageway, and a means fixedly positioned with respect to said tubular passageway responsive to the position of said first end for activating and deactivating said energizing means so that with said flexible member in-



serted in said tubular passage to a position merely adjacent to, but not in electrical contact with said responsive means, said switch means deactivates said energizing means and so that with said flexible member spaced apart from said responsive means, said switch means activates said energizing means; and

said alarm housing being fixed relative to one of said fire extinguisher or said relatively stationary post, and a second end of said elongated member being fixed to a structural element displaceable with respect to said one of said fire extinguisher or said stationary post.

4,418,337

**ALARM DEVICE**

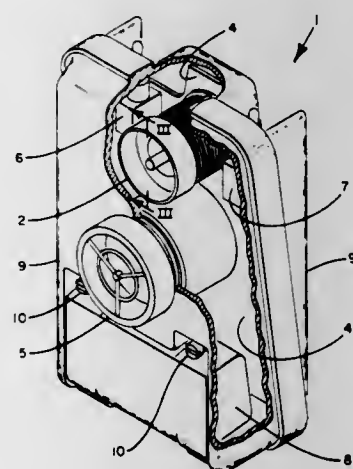
Ramzi N. Bader, West Covina, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.

Filed Aug. 3, 1981, Ser. No. 289,625

Int. Cl.<sup>3</sup> G08B 13/14

U.S. Cl. 340—571

10 Claims



1. A device for monitoring the movement of a person or article, comprising:

a first means for providing a magnetic field;

a second means for detecting changes in the magnetic field provided by the first means due to any changes in the position of the first means relative to the second means and for generating an electrical signal varying in magni-

tude in proportion of the amount of change in the magnetic field which is detected;  
a third means for moving the first means relative to the second means in response to movements of the person or article in any direction;  
an alarm means for producing an alarm signal when the alarm means is energized;  
a circuit means having an adjustable sensitivity, connected between the second means and the alarm means, for processing the electrical signal generated by the second means and for energizing the alarm means when the processed electrical signal meets predetermined conditions;  
a means for housing the first means, second means, third means, alarm means, and circuit means to form a self-contained unit; and  
a means for attaching the unit to the person or article.

4,418,338

**OPTICAL FIBRE U.V. AND/OR I.R. LINE FIRE DETECTOR**

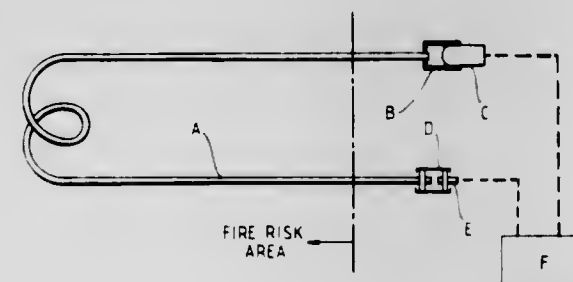
Dennis W. Burt, The Bungalow, Woodhouse La., Loosegate, Nr. Spalding, Lincolnshire, England

Filed Nov. 20, 1980, Ser. No. 208,558

Int. Cl.<sup>3</sup> G08B 17/12

U.S. Cl. 340—578

12 Claims



1. A fire detection system comprising an optical fibre having first and second ends and an exterior surface extending between the first and second ends and means connected to the optical fibre for detecting at least one of U.V. and I.R. radiation, said radiation being absorbed through any point of the entire exterior surface of the fibre.

4,418,339

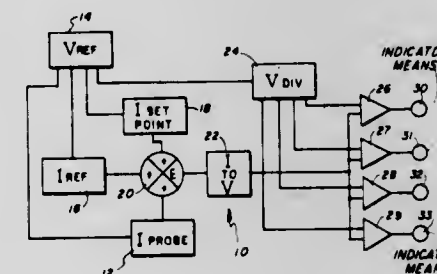
**TEMPERATURE SENSING CIRCUIT FOR SEMICONDUCTOR JUNCTION TEMPERATURE PROBE**  
Walter R. Spofford, Jr., Bedford, and Daniel I. Pomerantz, Lexington, both of Mass., assignors to Embart Industries, Inc., Indianapolis, Ind.

Filed Jun. 9, 1980, Ser. No. 157,477

Int. Cl.<sup>3</sup> G08B 17/06; G01K 7/02

U.S. Cl. 340—595

3 Claims



1. A temperature sensing circuit for a semiconductor junction temperature probe, comprising:  
means for biasing said probe for causing the current flowing

through said probe to be proportional to the temperature of said probe;

means for providing a selectively variable reference current representing a selectively variable set point temperature, said reference current being linearly variable with respect to selectable set point temperatures, said means for providing including a constant reference current source and a variable reference current source;

a current summation junction means for coupling said probe and said means for providing said reference current and for summing said reference current and the current flowing through said probe; and

means coupled to said junction means for producing an output signal in response to the summation of said reference current and the current flowing through said probe to indicate the relationship between said set point temperature and the temperature of said probe, said means for producing an output signal including a current to voltage converter having an input coupled to said current summation junction, said current to voltage converter including an operational amplifier having first and second inputs and an output, a feedback path for said operational amplifier, and means for providing a constant reference voltage to said amplifier first input, said amplifier second input being coupled to said current summation junction, said feedback path being coupled between said amplifier output and said amplifier second input.

4,418,340

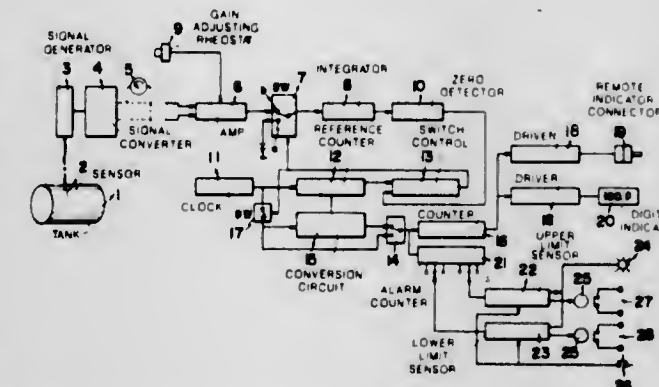
**LIQUID LEVEL INDICATOR IN A CYLINDRICAL GASOLINE TANK OF THE HORIZONTAL TYPE**  
Sozaburo Maehiba, 1-33 2 chome, Tanli, Chuo-ku, Fukuoka, Japan

Filed Apr. 10, 1981, Ser. No. 252,789

Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—618

3 Claims



1. An indicator for indicating the quantity of liquid in a tank comprising, a sensor for sensing the level of liquid in the tank and for generating an output signal indicative of the liquid level, a function generator connected to receive the output signal of the sensor and to supply a signal corresponding to a function comprising a straight line segment approximation of the relationship between the quantity of liquid and the liquid level in the tank, said function generator including an analog-to-digital converter which comprises an integrator, a two way switch for connecting the input of the integrator selectively to receive the signal from the sensor and a reference signal, a clock oscillator, a reference counter connected to the clock oscillator to control the switch to select the reference signal when a predetermined count is reached, and a zero detector connected to the output of the integrator to control the switch to select the sensor signal when the integrator output reaches zero, said function generator further comprising a nonlinear digital-to-digital conversion circuit connected to said clock for producing output pulses in response to clock pulses, corresponding to approximate polygonal lines of a curve of a segmental function corresponding to the relationship between the quantity of liquid and the liquid level in a cylindrical gasoline







within said housing to cause relative movement of said first and second materials, including translational movement, as a result of dielectrophoretic forces resulting from said electrical field;

said means for applying said non-uniform field including at least one electrode and means for selectively varying the charge on said at least one electrode for applying a non-uniform field to said first and second materials;

said first and second materials being electrically neutral both before and during the application of said non-uniform electrical field thereto;

whereby the relative positions of said first and second materials may be established by said electrical field to present visually identifiable information.

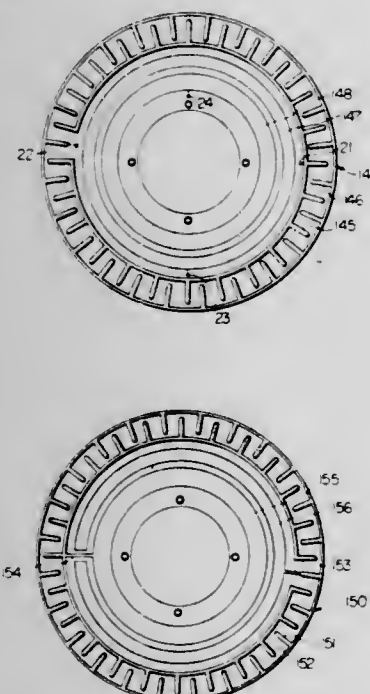
4,418,347

**ROTATIONAL POSITION DETECTING APPARATUS**  
Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan  
Continuation-in-part of Ser. No. 105,118, Dec. 19, 1979, abandoned. This application Nov. 6, 1981, Ser. No. 318,854  
Claims priority, application Japan, Dec. 27, 1978, 53-162707; Nov. 10, 1980, 55-157808

Int. Cl.<sup>3</sup> G08C 19/10

U.S. Cl. 340—870.37

7 Claims



1. A rotational position detecting apparatus comprising:

a first plate supported in a relation to a rotating member and provided with a first and a second toothed electrode electrically insulated from each other and a first and a second circular electrode electrically insulated from each other, said first and second toothed electrodes having a plurality of equispaced radial teeth respectively and alternately, and, said first toothed electrode and first circular electrode being electrically connected with each other and said second toothed electrode and second circular electrode being electrically connected with each other;

a second plate rotated by said rotating member and provided with a third and a fourth toothed electrode insulated electrically from each other and a third and a fourth circular electrode insulated electrically from each other, said third and fourth toothed electrodes having a plurality of equispaced radial teeth respectively and arranged alternately in a manner so that said first and second toothed electrodes and said first and second circular electrodes of said first plate can be opposite to said third and fourth toothed electrodes and said third and fourth circular electrodes of said second plate, correspondingly and respectively, said third toothed electrode and third circular electrode being electrically connected with each other,

and said fourth toothed electrode and fourth circular electrode being electrically connected with each other;

a rotation detecting circuit for detecting rotation of the second plate in accordance with a static capacitance change occurring between the electrodes of the first plate and second plate as one of the plates rotates by supplying said first and second toothed electrodes of said first plate with a first and a second periodic signal respectively which are opposite in phase and same in frequency with each other; and

a compensating capacitor for cancelling the distributed capacity existing between the electrodes of said first plate.

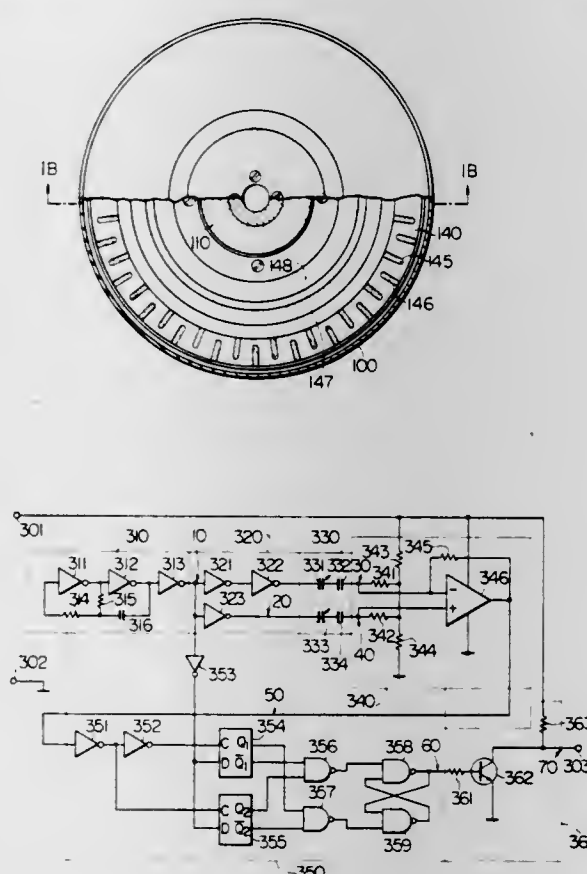
4,418,348

**ROTATION POSITION DETECTOR USING STATIONARY AND ROTATABLE DISK PLATES**  
Hiroaki Tanaka, and Sigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan  
Continuation of Ser. No. 105,118, Dec. 19, 1979, abandoned. This application Jan. 26, 1982, Ser. No. 343,015  
Claims priority, application Japan, Dec. 27, 1978, 53-162707

Int. Cl.<sup>3</sup> G08C 19/10

U.S. Cl. 340—870.37

2 Claims



1. An apparatus for detecting the rotation of a rotating member comprising:

a stationary disk plate supported in a stationary relation to said rotating member and provided with a first and second toothed electrodes electrically insulated from each other and a first and second circular electrodes electrically insulated from each other, said first and second toothed electrodes having a plurality of equispaced radial teeth respectively and arranged alternately and continuously, and said first and second circular electrodes being insulated electrically from said first and second toothed electrodes;

a rotatable disk plate rotated by said rotating member and provided with a third and fourth toothed electrodes insulated electrically from each other and a third and fourth circular electrodes insulated electrically from each other, said third and fourth toothed electrodes having a plurality of equispaced radial teeth respectively and arranged alternately, said third and fourth circular electrodes being

electrically connected to said third and fourth toothed electrodes respectively, and said third and fourth circular electrodes being arranged to face said first and second toothed electrodes and said first and second circular electrodes of said stationary disk plate with a spacing respectively;

input circuit means including an oscillator for supplying said first and second toothed electrodes of said stationary disk plate with a first and second periodic rectangular signals respectively which are opposite in phase and same in frequency with each other; and

output circuit means including a comparator for receiving output rectangular signals produced from said first and second circular electrodes of said stationary disk plate and a phase detector circuit responsive to the comparator output and the oscillator output to derive a rotation signal at every predetermined angular rotation of said rotating member.

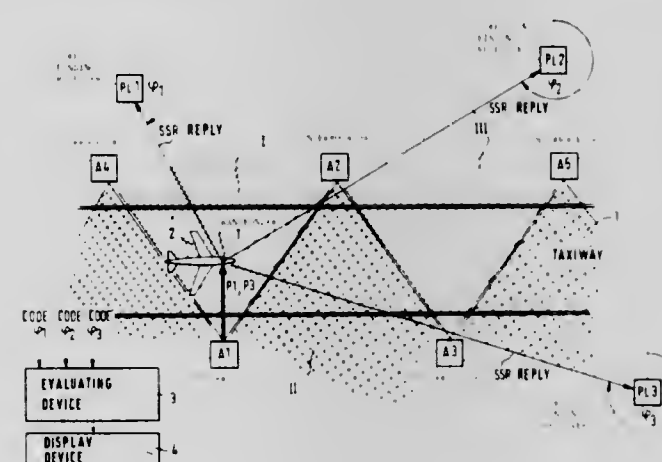
4,418,349

**AIRPORT SURVEILLANCE SYSTEM**  
Günter Höfgen, Kornwestheim, and Heinz L. Cohrs, Remseck, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.  
Filed Mar. 30, 1981, Ser. No. 248,877  
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012616

Int. Cl.<sup>3</sup> G01S 13/80, 13/91

U.S. Cl. 343—6.5 R

10 Claims



1. A radar system for airport surface surveillance for identifying the positions on said surface of vehicles including aircraft equipped with SSR transponders responsive to a predetermined P1 and P3 interrogation pulse format providing predetermined P1 to P2 time spacing, and to a P2 pulsed pattern comprising:

first means including a plurality of self-timed, mutually asynchronous pulsing interrogators providing generally lobe-shaped horizontal radiation patterns, said interrogators distributed along the sides of a pathway in a substantially symmetrical alternating pattern whereby each interrogator is located on a side of said pathway opposite that of the preceding and the next succeeding interrogator along the length of said pathway;

second means within each of said interrogators for radiating signals corresponding to said P1 and P3 pulses in a generally lobe-shaped pattern within a corresponding sector across said pathway, and signals corresponding to said P2 pulses in a pattern having lower amplitude within said sector than the amplitude of said lobe-shaped pattern but higher amplitude than said lobe-shaped pattern outside said sector;

third means comprising at least two auxiliary equipments spaced from said pathway for receiving the SSR transponder reply signals emitted by said SSR transponders, said auxiliary equipments each being adapted to determine at least one of the discrete parameters consisting of angle of

arrival of said SSR reply signals and time of arrival of said SSR reply signals; and

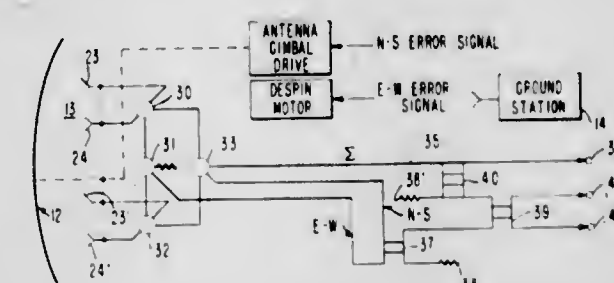
fourth means responsive to at least one of said discrete parameters determined by said third means for identifying the instantaneous position of said SSR transponder along said airport surface.

4,418,350

**TWO-AXIS ANTENNA DIRECTION CONTROL SYSTEM**  
Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.  
Filed Mar. 23, 1981, Ser. No. 246,793  
Int. Cl.<sup>3</sup> H04B 7/00

U.S. Cl. 343—359

6 Claims



1. In a communication system, an arrangement for producing an antenna pointing error signal, comprising:

a two-dimensional antenna assembly having feed horns and a reflector for receiving a radiated frequency modulated signal from a remote signal source;

means connected to said antenna feed horns for producing a sum signal and two orthogonally related difference signals;

means for combining said difference signals in phase quadrature relationship; and

circuit means including a directional filter having a flat amplitude response and linear phase shift over the frequency range of frequency modulation for combining said sum signal with said combined difference signals thereby to produce an antenna pointing error signal.

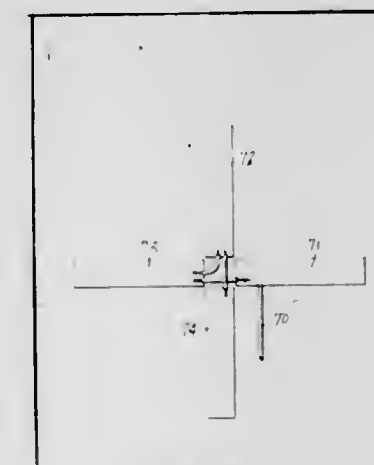
4,418,351

**ANTENNA SYSTEM WITH DIRECTIONAL SWITCHING MEANS**

John D. Fackler, 172 Center St., Southport, Conn. 06490  
Filed Apr. 13, 1981, Ser. No. 253,658  
Int. Cl.<sup>3</sup> H01Q 21/26

U.S. Cl. 343—797

26 Claims



1. An antenna system comprising a plurality of angular displaced antenna, each adapted to be coupled to a portable transmitter, said antenna system being in fixed relation to the transmitter, direction sensing means, means responsive to said direction sensing means for directionally orienting said antenna



system toward a predetermined location, antenna selection means, and means responsive to said direction sensing means and said means for orienting, for actuating said selection means to couple the antenna closest directionally oriented toward the predetermined location to the transmitter.

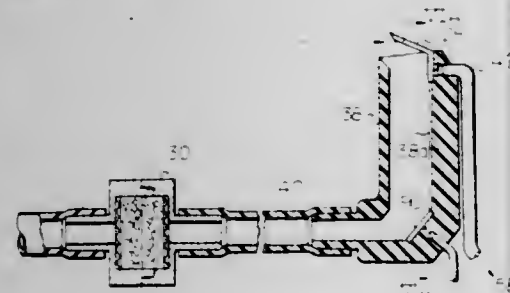
4,418,352

**INK JET PRINTING APPARATUS**

Masanori Horike, and Yutaka Ebi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
Filed May 10, 1982, Ser. No. 376,883  
Claims priority, application Japan, May 18, 1981, 56-74478; May 18, 1981, 56-74479; May 18, 1981, 56-74480  
Int. Cl.<sup>3</sup> G01D 18/00

U.S. Cl. 346—75

14 Claims



1. An ink jet printing apparatus comprising:  
an ink ejection head for ejecting a jet of ink;  
charging means for electrostatically and selectively charging ink droplets separated from the jet of ink;  
deflection means for electrostatically deflecting the charged ink droplets;  
charging pulse generator means for generating charging voltage pulses for a phase search and applying the voltage pulses to the charging means intermittently at a predetermined period;  
gutter means comprising an upper conductive member for catching the charged ink droplets for the phase search, a lower conductive member which is connected to ground and passageway means formed of an electrically insulative material operatively connected between the upper and lower conductive members, the passageway means in combination with ink flowing downwardly therethrough constituting resistance means through which the upper conductive member is grounded; and  
charge detection means for detecting a voltage appearing across the resistance means at said predetermined period when the charged ink droplets impinge on the conductive member of the gutter means to be discharged through the resistance means.

4,418,353

**INK CONTROL FOR INK JET PRINTER**

Jacob E. Thomas, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 7, 1982, Ser. No. 385,966

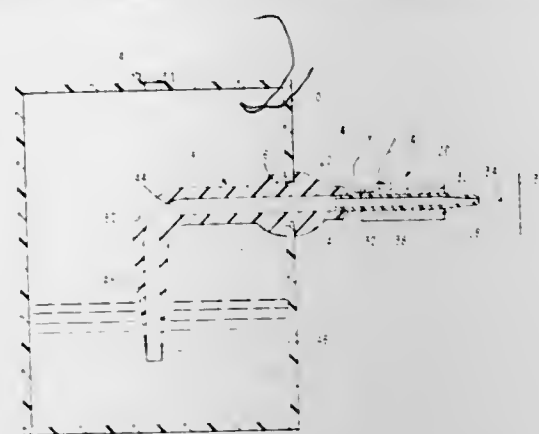
Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346—140 R

14 Claims

1. Means for absorbing pressure waves in an ink jet printing system comprising a reservoir containing a supply of ink therein, means operably associated with said supply of ink for ejecting ink in droplet form, and conduit means carrying ink from said supply thereof to said ink ejecting means, said conduit means formed to have a substantially constant inside diameter passageway therethrough and having a portion decreasing in outside diameter for a distance in a direction away from said ink ejecting

means and terminating in an ink inlet end immersed in said supply of ink whereby said decreased diameter portion is



responsive to absorb pressure waves by reason of the decreasing wall thickness of said portion.

4,418,354

**METHOD OF MANUFACTURING JET NOZZLE DUCTS, AND INK JET PRINTER COMPRISING A JET NOZZLE DUCT MANUFACTURED BY MEANS OF THE METHOD**

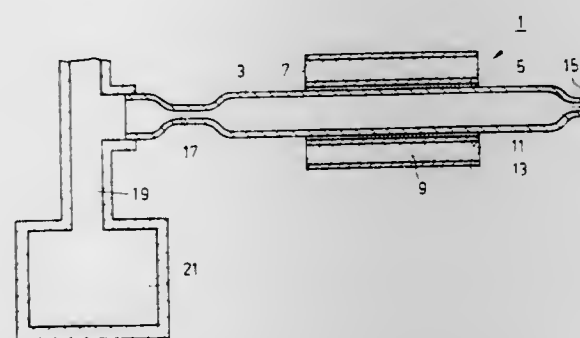
David J. Perduijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 375,149

Claims priority, application Netherlands, May 7, 1981, 8102227  
Int. Cl.<sup>3</sup> G01D 15/16; B05B 3/14

U.S. Cl. 346—140 R

5 Claims



1. A method of manufacturing jet nozzle ducts (1), notably for ink jet printers, in which an approximately radially polarized tubular piezo-electric pumping member (7) is arranged around a portion of each jet nozzle duct to be formed in order to obtain a pumping section, characterized in that for the formation of the pumping members (7) use is made of two plates (23, 25) of a piezo-electric material, in a first major surface (27) of at least the first plate (23) there being formed mutually parallel channels (35) which extend from one edge of the first principal surface to the opposite edge, on both major surfaces (27, 29) of the first plate and on both major surfaces (31, 33) of the second plate (25) there being provided metal layers, (37, 39, 41, 43), both plates being polarized by the application of an electric voltage between the metal layers, the first major surface of the first plate and the first major surface of the second plate being covered with a layer of adhesive (5), the second plate being arranged on the first plate so that the two major surfaces provided with adhesive face one another, the adhesive being subjected to a curing process.

4,418,355

**INK JET APPARATUS WITH PRELOADED DIAPHRAGM AND METHOD OF MAKING SAME**

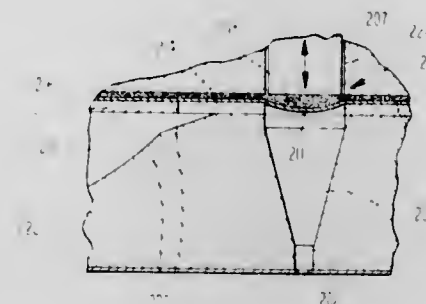
Thomas W. DeYoung, Stormville, and Hector Miranda, Yorktown Heights, both of N.Y., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 4, 1982, Ser. No. 336,601

Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346—140 R

22 Claims



1. An ink jet apparatus comprising:  
an ink jet chamber including an ink droplet ejection orifice;  
transducer means; and  
a deformable wall portion coupled to said transducer means and located between said transducer means and said chamber and forming a portion of said chamber, said wall portion mechanically preloaded to a deformed position extending into said chamber when said transducer means is in a de-energized state and returning to a position of lesser extension into the chamber when the transducer is in an energized state.

4,418,356

**INK JET PRINT HEAD**

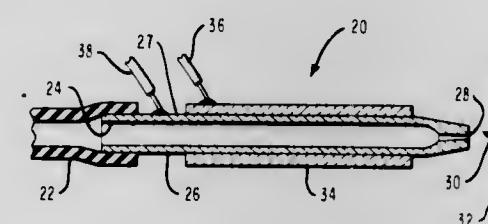
John W. Reece, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 23, 1981, Ser. No. 305,052

Int. Cl.<sup>3</sup> G01D 15/18

U.S. Cl. 346—140 R

7 Claims



1. An ink jet print head comprising a housing, means supplying ink into said housing, a chamber within the housing for receiving ink, and a plurality of electrically pulsed ink droplet drive elements positioned to receive ink from the chamber and disposed in substantially parallel manner and arranged in inclined rows within the housing, the drive elements having nozzles mutually parallel and operable to cause ink to be ejected in parallel manner from the housing in droplet form.

4,418,357

**TONER TRANSPORT SYSTEM FOR ELECTROGRAPHIC IMAGING**

Charles P. Huss, Oak Park Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 28, 1981, Ser. No. 267,790

Int. Cl.<sup>3</sup> G01D 15/06

U.S. Cl. 346—153.1

4 Claims

1. A toner powder transport system for providing controlled

movement of magnetically attractable toner powder over an imaging styli array including:

- a nonrotatable cylindrical member of nonmagnetic material having a protuberance at its surface;
- a rotatable magnetic means disposed for rotation about its axis in one direction within said nonrotatable cylindrical member, said rotatable magnetic means presenting alternate magnetic poles adjacent the inner surface of said nonrotatable cylindrical member;
- an imaging styli array positioned at the surface of said nonrotatable cylindrical member;
- a toner reservoir for holding a supply of magnetically attractable toner powder, said toner reservoir having an opening through which toner can be removed from said toner reservoir;
- a magnetic transport means disposed between said toner reservoir and said nonrotatable cylindrical member, said magnetic transport means having a first portion presented near said protuberance and a second portion presented near said nonrotatable cylindrical member, at an area removed from said protuberance, said magnetic transport means presenting a magnetic field at said protuberance



that is of a strength sufficient to move toner presented at said protuberance to said magnetic transport means, said rotatable magnetic means presenting a magnetic field at said second portion that is of a strength sufficient to move toner powder from said magnetic transport means to said nonrotatable cylindrical member, said magnetic transport means including a surface disposed for movement adjacent said opening in said toner reservoir whereby toner powder, when present in said toner reservoir, is magnetically transferred from said toner reservoir and carried to said second portion for magnetic transfer to said nonrotatable cylindrical member where rotation of said rotatable magnetic means causes said toner powder that is transferred to said nonrotatable cylindrical member to be magnetically transported over the surface of said nonrotatable cylindrical member to said imaging styli array and thence to said protuberance, where toner powder reaching said protuberance is magnetically transferred to said magnetic transport means from said nonrotatable cylindrical member at said first portion of said magnetic transfer means and returned by said magnetic transport means to said toner reservoir.

4,418,358

**METHOD AND SYSTEM TO CORRECT COLOR ERRORS IN COLOR TELEVISION SIGNALS GENERATED BY SCANNING A FILM**

Dieter Poetsch, Ober-Ramstadt, Fed. Rep. of Germany, and Armand Belmares-Sarabia, 4250 Veterans Hwy., Holbrook, N.Y. 11741, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany and Armand Belmares-Sarabia, Holbrook, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,883

Int. Cl.<sup>3</sup> H04N 9/535

U.S. Cl. 358—80

20 Claims

1. A Color Correction System for a television film scanner which includes an opto-electronic scanning device (1) provid-











positioning means for moving said transducer means radially with respect to said disc; and  
 a first means for detecting the radial location of said transducer means from said detected servo signals and for providing signals to said positioning means responsive to said 40 detected servo signals, said first means for detecting comprising:  
 means coupled to said transducer means for producing digitized clock pulses at times corresponding to the times of said detected servo signals detected by said transducer means;  
 a means for producing a fixed series of pulses from said detected synchronization signals, said fixed series of pulses containing a pulse corresponding to each adjacent data frame on a servo track, said pulse occurring at a time corresponding to either the first or second location for recorded servo signals within each data frame;  
 a shift register having its clock input coupled to said means for producing digitized clock pulses and its data input coupled to said means for producing a fixed series of pulses, whereby said shift register registers a binary number characteristic of the radial position of said transducer means relative to said servo and data tracks in a group; and  
 means for identifying the servo or data track with which said transducer means is radially aligned from said binary number characteristic of the radial position of said transducer means and for providing a signal to said positioning means in order to move said transducer means radially toward alignment with said selected data track.

4,418,369

# METHOD AND STRUCTURE FOR MAINTAINING A LOW CONTAMINATED ENCLOSURE

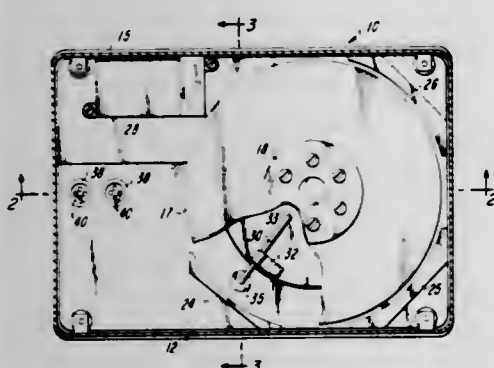
Ray A. Applequist, Windsor, Calif.; Richard M. Altobellis, Jamestown, and Robert F. Hoppe, Longmont, both of Colo., assignors to MiniScribe Corporation, Longmont, Colo.

Filed May 4, 1981, Ser. No. 260,494

Int. Cl.<sup>3</sup> G11B 23/02, 25/04

U.S. Cl. 360—98

11 Claims



1. In a memory storage device including a base and an enclosure substantially sealed to said base to define a volume, at least one disk mounted for rotation about a spindle passing through said base to the enclosed volume, and a spindle seal between said spindle and said base, the improvement comprising:  
 a ventilation opening defined from the enclosed volume through the enclosure to the surrounding ambient atmosphere with one end of the ventilation opening within the enclosed volume being position adjacent said spindle seal and the other end of the ventilation opening communicating with the surrounding ambient atmosphere to supply ambient pressure adjacent said spindle seal, resulting in substantially no pressure difference across said spindle seal;  
 whereby upon spinning the disk and spindle a relatively low pressure volume substantially equal to ambient pressure will be generated within the enclosure volume adjacent the spindle seal at the location of the opening of the ventilation opening thereby causing the remainder of the en-

closed volume to be maintained at a pressure above the surrounding ambient atmospheric pressure.

4,418,370

# BAND DRIVE ACTUATOR

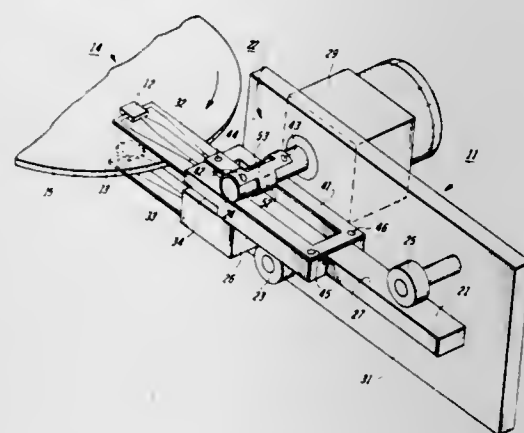
Joel N. Harrison, Campbell, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 100,580, Dec. 5, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 321,866

Int. Cl.<sup>3</sup> G11B 5/56

U.S. Cl. 360—106

7 Claims



1. An actuator for a disk drive having a rotating recording medium, said actuator comprising the combination of  
 a head/carryage assembly;  
 a rolling suspension means for supporting said head/carryage assembly and for guiding said head/carryage assembly for translational movement radially relative to said recording medium; said suspension means including a capstan, a fixed precision positioning bearing, and a spring biased preload bearing; said preload bearing being biased against a substantially flat surface on one side of said head/carryage assembly to load a parallel surface on the opposite said of said head/carryage assembly against said capstan and said positioning bearing, whereby said suspension means constrains said head/carryage assembly against movement toward and away from said recording medium;  
 a precision bearing motor coupled to said capstan;  
 a nonextensible, tensioned band wrapped around said capstan, said band being secured at an intermediate point along its length to said capstan and having a pair of ends extending substantially tangentially in opposite directions from said capstan, the ends of said band being secured to spaced apart points on said head/carryage assembly, whereby said head/carryage assembly moves radially of said recording medium under the control of said motor, and  
 wherein said preload bearing is disposed between said capstan and said positioning bearing lengthwise of said head/carryage assembly whereby the load forced applied to said capstan and said positioning bearing are substantially independent of the position of said head/carryage assembly radially relative to said recording medium.

4,418,371

# ROLLING BIAS SPRING

Thomas J. Menden, Kenosha, Wis., assignor to Teletype Corporation, Skokie, Ill.

Filed Nov. 20, 1981, Ser. No. 323,169

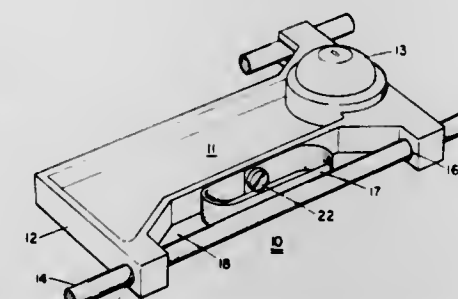
Int. Cl.<sup>3</sup> G11B 21/08, 5/56

U.S. Cl. 360—106

8 Claims

1. Linear positioning apparatus for a read/write head comprising:  
 a carriage having a frame for supporting the read/write head,  
 the carriage slidably mounted on one or more guide rods the

frame and said at least one guide rod forming a movable pocket therebetween,  
 a bias spring formed in a loop positioned in said pocket, and



means for affixing said spring to the frame whereby the spring rolls along the guide rod together with the movement of the carriage while exerting a separating force between the carriage and said guide rod.

4,418,372

# MAGNETIC ROTARY ENCODER

Hiroshi Hayashida, Mito; Tadashi Takahashi; Kunio Miyashita, both of Hitachi, and Kanji Kawakami, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

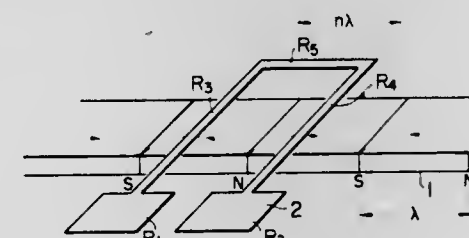
Filed Jul. 30, 1980, Ser. No. 173,842

Claims priority, application Japan, Aug. 2, 1979, 54-98070; Aug. 2, 1979, 54-98071; Sep. 5, 1979, 54-112959

Int. Cl.<sup>3</sup> G11B 5/12, 5/30

U.S. Cl. 360—113

21 Claims



1. A rotary magnetic encoder for use with a rotary body having plural pieces of magnetic information recorded on at least one circumferentially running track, said rotary magnetic encoder comprising at least one magnetoresistive element including at least two members extending substantially in the radial direction of said rotary body in a relation opposite to and overlying said magnetic information recorded on said track of said rotary body, two lead connection terminals formed at the outer ends of said radially extending members respectively, and a circumferentially extending member interconnecting said radially extending members at their ends, so as to form a signal path which passes both of said radially extending members and terminates in said two lead connection terminals, said lead connection terminals having at least portions thereof disposed outside of the outer peripheral edge of said rotary body, said rotary body being a magnetic recording medium and said pieces of magnetic information being arranged on said track with a predetermined pitch  $\lambda$ , said encoder further comprising a substrate having a surface disposed opposite to and at least partially overlying said rotary body, said magnetoresistive element being formed of a ferromagnetic material and provided on the surface of said substrate, said magnetoresistive element being formed on the surface of said substrate as an integral pattern, at least one of said radially extending members being a sensing member, and protective covering means provided on at least said radially extending members.

4,418,373

# TAPE CASSETTE

Tohru Fujimori, Tokyo, and Yoshino Kusui, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

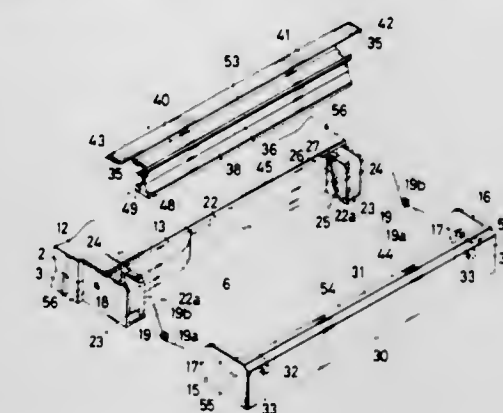
Filed Jan. 14, 1983, Ser. No. 457,903

Claims priority, application Japan, Jan. 25, 1982, 57-9659

Int. Cl.<sup>3</sup> G11B 23/02

U.S. Cl. 360—132

8 Claims



1. A tape cassette comprising:  
 a housing containing reels on which a supply of tape is wound and having first and second walls, an opening along one side of the housing and a cutout extending through said first and second walls and communicating with said opening along a portion of said opening, wherein said tape is guided between said reels in a path extending along said opening;  
 a front cover mounted on said housing and movable relative thereto between a closed position for covering said opening in front of said tape and an opened position for exposing said opening and the front of said tape, wherein an edge of said front cover, when said front cover is in said closed position, is disposed proximate to and spaced from an edge of said first wall of said housing at said cutout; and  
 an inner cover movable with said front cover wherein said inner cover is positioned behind said tape to enclose said tape between said inner cover and said front cover when said front cover is in said closed position and the back of said tape is exposed when said front cover is in said opened position so that said tape can be engaged through said cutout at said second wall for withdrawal of the tape through said opening, said inner cover having a lid portion rigidly secured thereto for spanning said edges of said front cover and said first wall of said housing to cover said cutout at said first wall when said front cover is in said closed position.

4,418,374

# LATCH RELAY DRIVE CIRCUIT

John E. Callan, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 29, 1982, Ser. No. 427,567

Int. Cl.<sup>3</sup> H01H 47/00

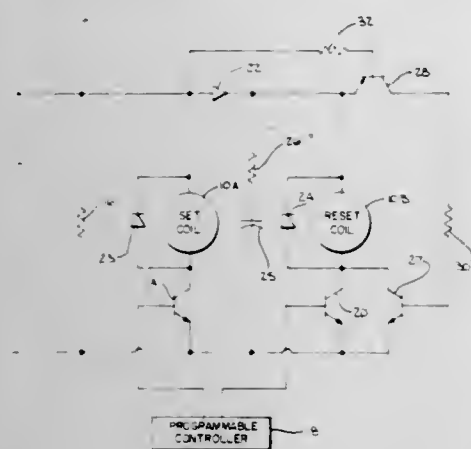
U.S. Cl. 361—167

7 Claims

1. A drive circuit for energizing the set and reset coils of a latch-relay comprising:  
 a source of potential;  
 a first electronic switch for coupling the set coil of the latch relay across said source of potential when said electronic switch is enabled so that the set coil is momentarily energized to set the latch-relay;  
 an energy storage device coupled across said source of potential for storing energy therein while the voltage magnitude of said source of potential is above a predetermined magnitude;  
 a second electronic switch for coupling the reset coil of the latch relay to said source of potential when said second electronic switch is rendered conductive to energize the reset coil to reset the latch relay; and



a switching circuit responsive to the voltage magnitude difference between said source of potential and the stored potential of said energy storage device for providing a completed circuit path between said energy storage device and the reset



coil of the latch relay when the voltage of said source of potential drops below the stored potential of said energy storage device so that the reset coil is energized from the energy stored in said energy storage device to reset the latch relay.

4,418,375

**SOLID STATE IGNITION SYSTEM**

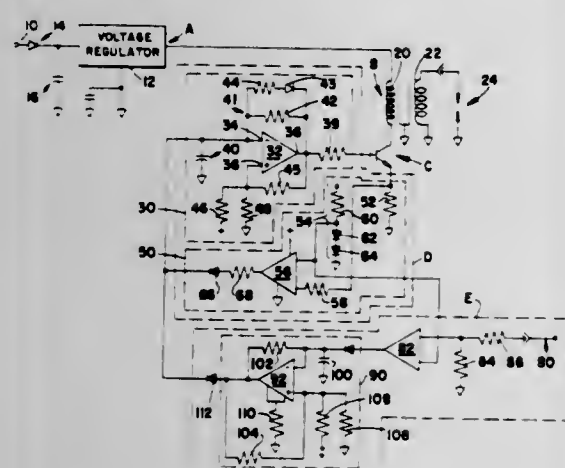
John W. Ober, Hiram, Ohio, assignor to Hunter Investment Company, Solon, Ohio

Filed Aug. 7, 1981, Ser. No. 291,069

Int. Cl.<sup>3</sup> F23Q 3/00

U.S. Cl. 361-253

17 Claims



1. A multi-voltage ignition system comprising:
  - a) an ignition transformer having a primary winding which is adapted to be connected with a power supply and a secondary winding which is adapted to be connected with an ignition device;
  - b) switching means having current blocking and permitting states for blocking and permitting a flow of electrical current through the primary winding, the switching means being operatively connected with the primary winding;
  - c) an oscillator operatively connected with the switching means for cyclically causing the switching means to assume its current flow permitting and blocking states with a first frequency and a first duty cycle, such that the first frequency determines the periodicity with which current is permitted to flow and the first duty cycle determines a proportion of each first frequency cycle that current is permitted to flow;
  - d) current sensing means for sensing the magnitude of the primary winding current, the current sensing means being operatively connected with the primary winding; and,
  - e) comparing means for comparing the sensed current magni-

tude with a preselected magnitude, said comparing means being operatively connected with said current sensing means and being operatively connected with the oscillator to shorten the first duty cycle such that the switching means blocks current flow when the sensed current magnitude meets or exceeds the preselected magnitude, whereby the primary winding current is held substantially below the preselected magnitude over a range of potentials supplied by the power supply.

4,418,376

**DISC TRIMMER**

Gerd Bertl, Röhrenbach, Fed. Rep. of Germany, assignor to Stettner & Co., Lauf, Fed. Rep. of Germany

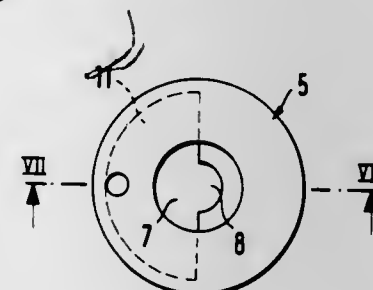
Filed Oct. 27, 1982, Ser. No. 437,041

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142671

Int. Cl.<sup>3</sup> H01G 5/06

U.S. Cl. 361-293

9 Claims



1. A disc trimmer comprising two segmented circular condenser plates, a dielectric member disposed between said two plates, and means for effecting relative rotations between said two plates, said dielectric member having a segmented circular configuration conforming to the segmented circular configuration of one of said plates with said one plate being formed as a covering on said dielectric member.

4,418,377

**APPARATUS TO PREVENT REFLECTION OF VEHICLE INSTRUMENT PANEL ILLUMINATION LIGHT**

Takeo Tamura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

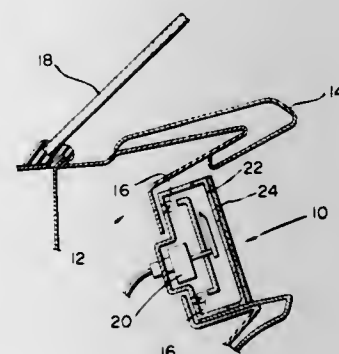
Filed Sep. 9, 1980, Ser. No. 185,645

Claims priority, application Japan, Sep. 20, 1979, 54-130989

Int. Cl.<sup>3</sup> F21V 9/14

U.S. Cl. 362-19

10 Claims



1. In a vehicle having a cabin, the combination of:
  - a) an instrument panel having a light emitting meter;
  - b) a windshield mounted forward of and adjacent said instrument panel;
  - c) a canopy mounted on said instrument panel which shades said meter and blocks the transmission of light from said meter to said windshield;
  - d) a side window oriented with respect to said meter so that light emitted from said meter impinges on said side window;

a polarizing filter adapted to polarize the light emitted from said meter to attenuate the reflection of the light impinging on said side window; and  
a non reflective surface disposed adjacent said side window for further attenuating the reflection of said light impinging on said side window.

4,418,378

**LIGHT BOX**

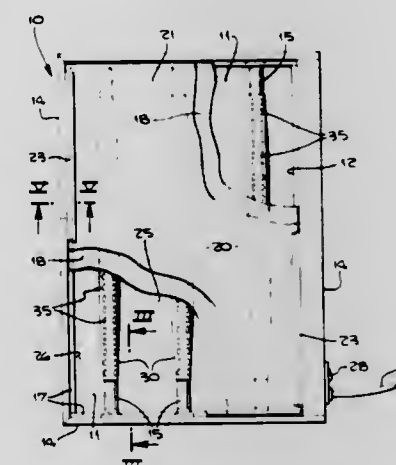
Sigurd A. Johnson, Glendora, Calif., assignor to Plan Hold Corporation, Irvine, Calif.

Filed Mar. 5, 1981, Ser. No. 240,851

Int. Cl.<sup>3</sup> G09F 13/04

U.S. Cl. 362-97

10 Claims



1. A light intensity modifying means for an elongated tubular light emitting source comprising:
  - a) a tubular cylindrical member of sheet material having means for transmitting selected amounts of light therethrough along its length, having a central portion of substantially cylindrical shape transmitting a selected amount of light and adapted to be sleeved over the central cylindrical portion of said tubular light source, said light transmitting means providing progressively increased amounts of light to the ends of the tubular member with respect to the amount of light transmitted at the central portion of said tubular member, and whereby the amount of light emitted by said source and transmitted by said tubular member is reduced at said central portion and the amount of light transmitted at said end portions is progressively increased with respect to the reduced amount of light at said central portion to provide substantially uniform illumination.

4,418,379

**HALIDE AND LIKE LIGHT REFLECTOR AND SOCKET ASSEMBLY FOR GREENHOUSE AND LIKE USE**

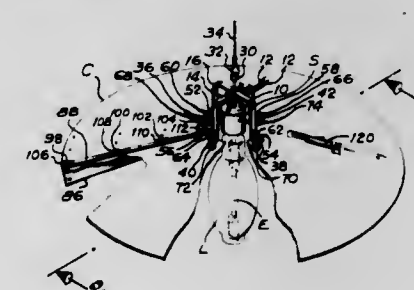
Melvin J. De Marsh, 4306 SW. Juneau St., #11, Seattle, Wash. 98136

Filed Sep. 8, 1981, Ser. No. 299,673

Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362-282

8 Claims



1. A reflector socket assembly for a high powered halide light or the like, especially adapted to enhance use thereof for

effectively illuminating and promoting the growth of plants in a greenhouse or the like, said assembly comprising:

- a) a frustoconically shaped reflector in the form of a simple cone, with the lower, concavical, reflecting surface thereof adjustable through a range of cone angles from about 76° to about 64° with respect to the center axis of the cone, said cone being of substantially unitary construction and fabricated from a centrally apertured disk, of nominally planar sheet stock, with a single small segment cut therefrom along cuts extending generally radially from the central aperture to the exterior edge of the disk, the radially extending edges thereof being joined to provide the conical condition of the reflector, and the adjustability of the reflector cone angle with respect to the cone axis being provided by varying the extent of overlap of the respective radial edges; and
- b) a lamp socket mounted coaxially of and slightly above and in spaced relationship with respect to the central aperture of the cone, with the light emitting element of a halide lamp or the like installed in the socket being substantially in the plane of the lower, outer edge of the reflector cone.

4,418,380

**METHOD AND APPARATUS FOR CONTROLLING THE CIRCULATING CURRENT OF A CYCLOCONVERTER**

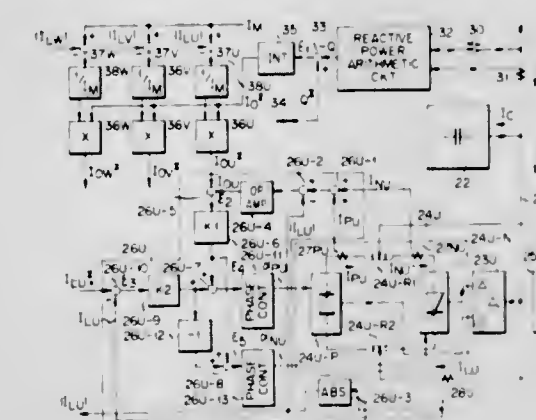
Shigeru Tanaka, Tama, and Susumu Tadakuma, Yamato, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1981, Ser. No. 305,226

Int. Cl.<sup>3</sup> H02P 13/30; H02M 5/27

U.S. Cl. 363-10

2 Claims



1. A control method for a reactive power compensating type cycloconverter wherein the lag reactive power of a connected AC power source system is controlled by controlling the circulating current of said cycloconverter which supplies a load current in each phase of a polyphase load and cancels the lead reactive power which is carried by a phase advancing capacitor connected to said AC power system, said reactive power compensating type cycloconverter controlling the reactive power of said AC power system, comprising the steps of:
  - deriving a circulating current command value in response to the reactive power of said AC power system;
  - compensating said circulating current command value in response to an absolute value of the load current of each phase;
  - deriving a circulating current reference value for each phase of said circulating current type cycloconverter; and
  - controlling the circulating current of said cycloconverter in response to said load current.



4,418,381

## SINGLE LOOP CONTROL SYSTEM

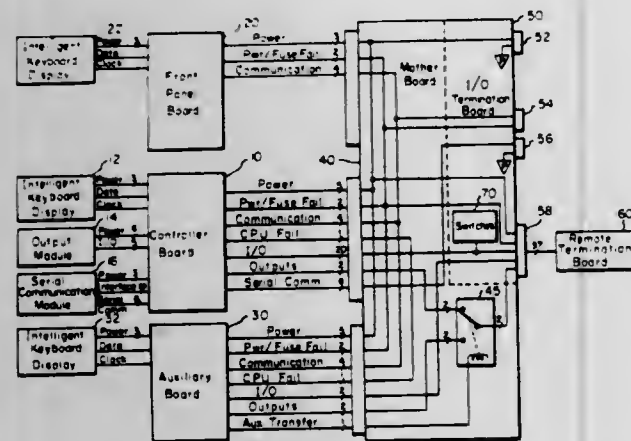
Anthony J. Molusis, Southington, and Thomas M. O'Loughlin, Milford, both of Conn., assignors to Bristol Babcock Inc., Waterbury, Conn.

Filed Jan. 23, 1981, Ser. No. 227,970

Int. Cl.<sup>3</sup> G06F 15/46, 15/16; G05B 11/42

U.S. Cl. 364—131

12 Claims



1. A microprocessor based single loop control instrument comprising:

- a first microprocessor,
- a read only memory in which is stored an operating program for said first microprocessor, said program containing machine instructions sufficient to perform a single loop control PID algorithm using the tuning parameters KP, KI and KD which produces an output signal in response to at least a process variable and a setpoint,
- a random access memory,
- means for entering into said random access memory at least two sets of said tuning parameters and at least one breakpoint, and
- means for selecting a tuning parameter from one set of tuning parameters or the other in accordance with whether a tuning variable is greater or lesser than said breakpoint.

4,418,382

## INFORMATION EXCHANGE PROCESSOR

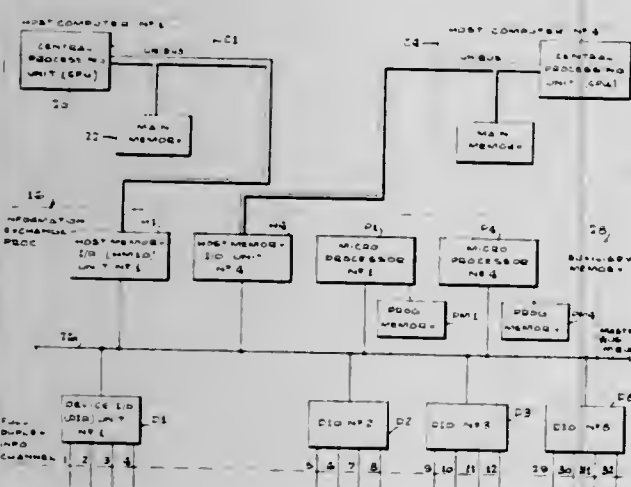
Kenneth N. Larson, Thousand Oaks; John S. Davis, Glendale, both of Calif., and Lewis M. Bostick, Honolulu, Hi., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 6, 1980, Ser. No. 147,252

Int. Cl.<sup>3</sup> G06F 1/00

U.S. Cl. 364—200

8 Claims



1. In a data processing system having one or more host computers, each host computer having a central processing unit and an associated main memory, and a plurality of peripheral devices, each of said peripheral devices intended to communicate with one or more of said host computers or with one or more other peripheral devices, the improvement comprising

an information exchange processor for responding to an input message from each host computer or each peripheral device via a shared or individual channel in accordance with a communication discipline defined for that channel, and for supplying a corresponding output message to one of said host computers or one of said peripheral devices on that or another channel in accordance with a communication discipline defined for that channel, said information exchange processor including:

- a bus;
- a host computer input/output channel;
- at least one host memory input/output unit coupled to said bus for receiving data from or transmitting data to a host computer via said host computer input/output channel;
- a plurality of device input/output channels;
- a plurality of device input/output units coupled to said bus, each for communicating data from or to said peripheral devices via at least one of said device input/output channels; and
- control means coupled to said bus and responsive to data supplied from said at least one host memory input/output unit or device input/output units for providing data to any one of said channels in accordance with a communication discipline defined for that channel and,
- said control means comprising at least one processor, connected to said bus, having means for identifying device input/output units indicated to said processor, said processor performing said providing operation and controlling data flow between said at least one host memory input/output unit and said one or more dedicated device input/output units, or between said one or more dedicated device input/output units.

4,418,383

## DATA FLOW COMPONENT FOR PROCESSOR AND MICROPROCESSOR SYSTEMS

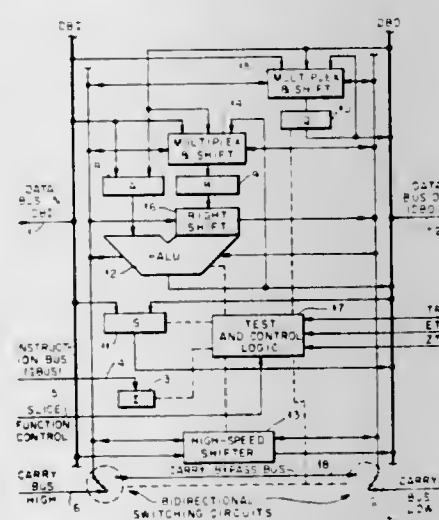
Donald E. Doyle, Delray Beach; George A. Hellwarth, Deerfield Beach, and Jack L. Quanstrom, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,738

Int. Cl.<sup>3</sup> G06F 1/00, 3/00

U.S. Cl. 364—200

2 Claims



1. A data processing system utilizing data flow components, such system having a processor control unit for processing microinstructions, and generating instruction signals, a control memory interconnected with said processor control unit to supply said microinstructions thereto, signal lines for interconnecting said data flow components to conduct signals for performing arithmetic and logical functions on data in said system, and interface means for interfacing the aforesaid elements to other elements in said system, said system comprising:

- a plurality of data flow components, each of said data flow

4,418,384

## COMMUNICATION SUBSYSTEM WITH AN AUTOMATIC ABORT TRANSMISSION UPON TRANSMIT UNDERRUN

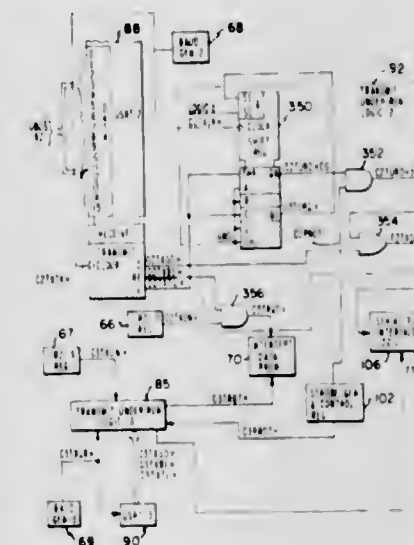
Thomas O. Holtey, Newton, Mass.; Richard P. Kelly, Nashua, N.H.; Steven S. Noyes, Boylston, and James C. Raymond, Framingham, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 6, 1980, Ser. No. 194,655

Int. Cl.<sup>3</sup> G06F 3/00, 11/06

U.S. Cl. 364—200

6 Claims



1. In combination with a data processing system comprising a system bus, at least one central processing unit (CPU), one main memory, one peripheral controller, each individually coupled to said system bus, a communications subsystem also coupled to said system bus, said communications subsystem including a communications controller coupled to said system bus and also including typical communication devices such as a modem, a dialing unit and a touch-tone receiver coupled to said communications controller, said communications controller controlling the receipt and transmission of messages by said data processing system, said communications controller comprising:

- (a) a microprocessor coupled to main memory for receiving a data byte of information from said main memory;
- (b) a universal synchronous receiver transmitter (USRT) coupled to said microprocessor for receiving the data byte of information from said microprocessor, said USRT further generating an underrun signal and a series of flag byte signals when said microprocessor fails to transmit a data byte to said USRT within a predetermined time interval; and
- (c) first means responsive to said underrun signal for generating a predetermined signal and superimposing the predetermined signal on one of the series of flag byte signals thereby generating an abort sequence of a predetermined number of binary ONE bits.

4,418,385

## METHOD AND DEVICE FOR ARBITRATION OF ACCESS CONFLICTS BETWEEN AN ASYNCHRONOUS TRAP AND A PROGRAM IN A CRITICAL SECTION

Jean-Marie Bourrez, Versailles, France, assignor to CII Honeywell Bull, Paris, France

Filed Jan. 22, 1981, Ser. No. 227,223

Claims priority, application France, Jan. 22, 1980, 80 01350

Int. Cl.<sup>3</sup> G06F 13/00

U.S. Cl. 364—200

6 Claims

1. A method of arbitrating attempts in a data processing system to requisition a process able to have operating phases in critical sections, the system including a program, a resource being defined as critical when it is the only resource of its type in the system, an operating phase being in a critical section

components including data registers and arithmetic and shift logic, each of said data flow components serving as a byte-wide slice and having a carry input circuit and a carry output circuit interconnected by way of a carry bypass bus, the carry input and carry output circuits in each data flow component comprising switching circuits controllable to route carry signals to and from their respective data flow component or to bypass carry signals around said respective data flow component, a test and control logic unit for providing test and control signals pertaining to said data flow components and responsive to instruction signals from said processor control unit to initiate and control said data flow component arithmetic and logic operations, said data flow components each being responsive to instruction signals from said processor control unit to perform one or more arithmetic and logic operations, such as add, subtract, divide, multiply, (including shift) data and status testing, and comparison testing, and each data flow component being operable in the following operating modes:

- LB—Lowest Active Byte wherein a data flow component operates as least significant slice,
- HB—Highest Active Byte wherein a data flow component operates as most significant slice,
- CB—Central Active Byte wherein a data flow component operates as an intermediate slice between LB and HB, any position,
- SAB—Standalone Byte wherein a data flow component operates as a single slice independently of all other slices,
- NAB—Non-Active Byte wherein a data flow component is not active but, by way of said carry bypass bus, serves as a transmission link between data flow components that are active slices,

a carry bus, said carry bus being connected to selected ones of said carry inputs and carry outputs of said data flow components to transfer shift and arithmetic carry information;

an instruction bus for supplying instruction signals from said processor control unit simultaneously to all of said data flow components for controlling their operation;

a plurality of data buses interconnected to convey full width data signals in said system among said processor control unit, said data flow components and other elements in said system, each of said data flow components serving a predetermined portion or "slice" of each data bus and the number of "slices" determining the total width of the data bus;

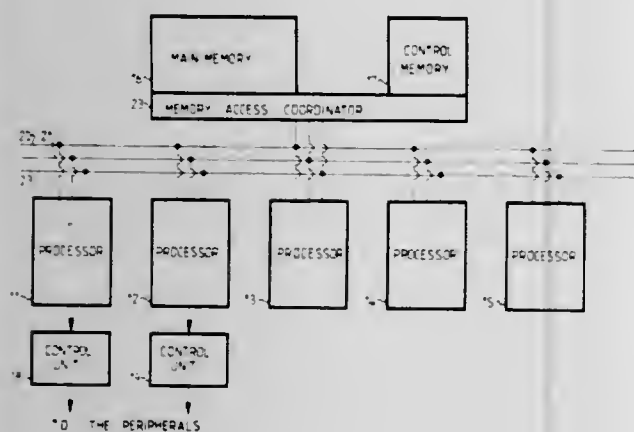
a control bus interconnected between said processor control unit and each of said data flow components to provide signals for communication between components and for control purposes, and also to convey signals representative of test result information from individual data flow components to said processor control unit, each line of said control bus being connected to said data flow components so that it can be activated by any component and so that its state can be sensed by any component or by the processor control unit whereby a small number of lines serves the control requirements of a large variety of commands or instructions;

a slice function control bus including a set of encoded control lines interconnected to each data flow component and providing slice status signals to each data flow component responsive to status signals from said processor control unit to establish the status of each data flow component in accordance with said operating modes whereby said system can utilize said slices in:

- (1) multiple-slice active combined operations of all slices,
- (2) active standalone operation of any selected slice,
- (3) multiple-slice operation of any active subset of less than the total number of available slices in any combination with selected ones of said slices being non-active and serving only as a transmission link between active slices.



when a portion of the program of the system being implemented mobilizes a critical resource, a process being defined as operating in a critical mode when the process is monopolizing a critical resource, the arbitrating method being performed in response to one or more asynchronous traps, wherein there are initially: predetermined hierarchical classifications of critical modes, each of said classifications of critical modes being defined as a function of at least one resource causing a process to operate in a critical mode; for each of the critical mode classifications, an indicator denoting occupation of the critical mode classification being allocated, the critical mode classification occupation indicators being set at zero before implementation of the method, each asynchronous trap being allocated a requisitioning capability defined by a utilization system as a function of a status of the asynchronous trap; an asynchronous trap presence indicator being allocated for each of said requisitioning capabilities; a hierarchical relationship being defined according to precedence among the critical mode classifications and the requisitioning capabilities of the asynchronous traps, the hierarchical relationship unequivocally determining in the presence of an asynchronous trap whether this asynchronous trap should either be complied with or stored, with a view to performance of this asynchronous trap upon disappearance of the critical mode classifications tending to prevent the performance of this asynchronous trap; the



method being at least partly performed with a system including an arbitration network comprising the steps of operating the system by: setting the indicator denoting occupation of the corresponding critical mode classification to a one state each time the process progresses so it enters into a critical operating phase, said critical mode classification occupation indicator then being defined as armed; resetting the critical classification occupation indicator to zero to indicate occupation of the corresponding critical mode classification, said critical mode classification occupation indicator then being defined as un-armed; in response to the presence of an asynchronous trap, setting the trap presence indicator corresponding to the capability of the asynchronous trap to a state of one, said asynchronous trap presence indicator then being defined as occupied; resetting to zero the asynchronous trap presence indicator corresponding to each executed asynchronous trap each time there is compliance with an asynchronous trap, said asynchronous trap presence indicator being defined as vacant when it is reset to zero; the arbitration network: comparing the levels of the critical mode classifications corresponding to the armed critical mode classification occupation indicators with levels for the capabilities of the asynchronous traps corresponding to the occupied asynchronous trap presence indicators; said arbitration network authorizing discharge of the asynchronous traps having an allocated capability level greater than the armed critical classifications.

#### 4,418,386 COMMUNICATION BUS FOR A MULTI-SOURCE/RECEIVER DATA PROCESSING SYSTEM

Hendrik Vrielink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

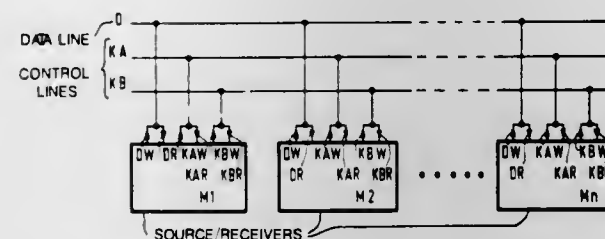
Filed Apr. 20, 1981, Ser. No. 255,916

Claims priority, application Netherlands, Apr. 23, 1980, 8002346

Int. Cl.<sup>3</sup> G06F 3/00

U.S. Cl. 364-200

18 Claims



1. A multi-source/receiver data processing system in which at least one data source and at least one data receiver are connected to a communication bus which consists of at least one transfer medium suitable for the transport of at least one logic level from a source to a receiver both being active participants, characterized in that:

the system includes a plurality of clock signal generators having different frequencies;

in a source and/or a receiver, determining means (HS) to effect a communication for determining between all sources and/or receivers (Mi) which actively participate in an action concerning a communication whether said bus (C) is ready for executing said action, said means (HS) comprising:

first and second detecting means whereby it can be determined that during a first and a second period of time, respectively, the communication bus is ready for said action, the first period of time being smaller than the second period of time, the first period of time being determined by a preparation time factor of a first active participant, the second period of time being the largest product (R·V) of the set of products (Ri·Vi) of all potential active participants, the product (Ri·Vi) being formed per active participant by a frequency tolerance factor (Ri) of the clock signal generator for the active participant and a response time factor (Vi) of this active participant; such that

when an active participant detects that the second period of time has expired, the bus is ready for executing an action and can thus be occupied by this action for this active participant and all further active participants which have also detected, at least during their relevant first period of time, that the bus is ready.

#### 4,418,387 METHOD OF RECONSTRUCTING A COMPUTED TOMOGRAPHIC IMAGE FROM A SINGLE X-RAY PROJECTION

Shoichiro Yamaguchi, and Fujio Kobayashi, both of Tokyo, Japan, assignors to The President of Tokyo Institute of Technology, Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,425

Claims priority, application Japan, Sep. 18, 1979, 54-119927; Nov. 20, 1979, 54-150218; Nov. 21, 1979, 54-151286; Nov. 21, 1979, 54-151287

Int. Cl.<sup>3</sup> G06F 15/42

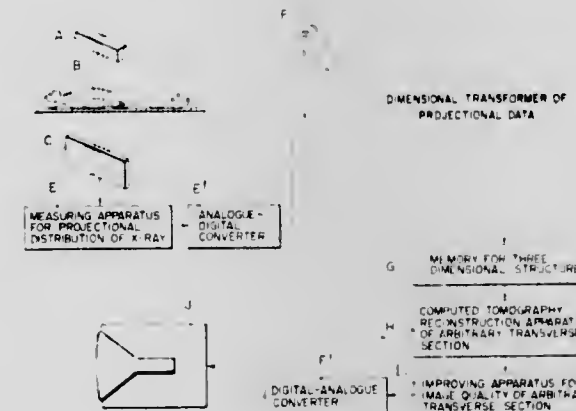
U.S. Cl. 364-414

8 Claims

1. A reconstruction method of a computed tomographic image from a single X-ray projection comprising:

(a) measuring each of the values  $d_k$  ( $k$  is a natural number) of

X-ray density on a single X-ray projectional distribution produced by projecting X-rays from a desired direction toward X-ray tested tissue of a body at a plurality of positions spaced apart from each other from one end of said projectional distribution toward the other end thereof, where said plurality of positions spaced apart from each other for measurement of the values  $d_k$  of X-ray density are selected according to the following two criteria (i) that the tomographic plane of the X-ray tested tissue of a body to be reconstructed is expressed by a pseudo-tomographic plane which is constituted collectively by  $m$  pieces of picture elements, with  $m$  pieces of picture elements in a row and  $n$  in a column (both  $m$  and  $n$  are natural numbers), which are formed by dividing said tomographic plane of the X-ray tested tissue of a body into small sections and each of which has a single piece of X-ray density information, and that said pseudo-tomographic plane is placed between an X-ray source and said single X-ray projectional distribution, (ii) that  $n$  rows, each of which is constituted by  $m$  pieces of picture elements are numbered in order 1, 2, ...,  $n$  from the left and that said  $m$  pieces of picture elements in each row are numbered respectively 1, 2, ...,  $m$ ;  $m+1, m+2, \dots, 2m; \dots; (n-1)m+1, (n-1)m+2, \dots, nm$  from the side of said X-ray source toward the side of said single X-ray projec-



tional distribution in order and that a plurality of X-ray beams passing through said pseudo-tomographic plane include X-ray beams numbering  $mn$ , each of which passes through a left lower corner of a corresponding picture element of said  $mn$  picture elements, said plurality of positions spaced apart from each other on the single X-ray projectional distribution for measurement of the values  $d_k$  of X-ray density correspond to the positions on said single X-ray projectional distribution which have X-ray density information to be obtained by said X-ray beams' passing through said pseudo-tomographic plane based on criteria (i) and (ii);

(b) calculating the X-ray absorption coefficient  $\mu_t$  ( $t=1, 2, 3, \dots, mn$ , and  $t$  is natural number) of each of the  $mn$  pieces of picture elements based on the values  $d_k$  of X-ray density measured in step (a) and the length of the X-ray beams passing through each picture element;

(c) reconstructing the computed tomographic image of said X-ray tested tissue of a body, where the picture elements having respectively X-ray absorption coefficients  $\mu_1, \mu_2, \dots, \mu_{mn}$  calculated in step (b) are positioned at the locations of said picture elements numbered 1, 2, ...,  $mn$  of the pseudo-tomographic plane and wherein the complete collection of picture elements located in the  $m \times n$  array constitute the reconstructed computed tomographic plane of the X-ray tested tissue of a body.

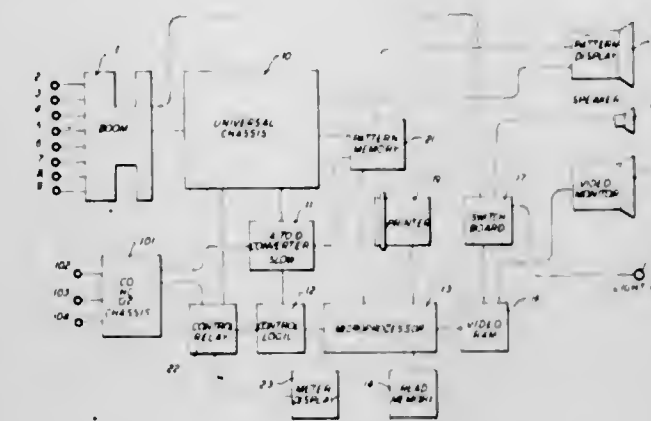
#### 4,418,388 ENGINE WAVEFORM PATTERN ANALYZER Clarence B. Allgor, Portage; Clair J. St. Clair, Otsego, and Richard A. Pearson, Kalamazoo, all of Mich., assignors to The Allen Group Inc., Melville, N.Y.

Filed Aug. 14, 1980, Ser. No. 178,187

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 364-431.01

42 Claims



1. Apparatus for electrically storing substantially a time-varying operating parameter of an internal combustion engine comprising:

electrical signal means adapted to be coupled to the engine for providing a time-varying electrical signal related to the time-varying operating parameter,

converting means coupled to the electrical signal means for converting the time-varying electrical signal to a series of digital signals representing discrete magnitudes of the time-varying electrical signal at temporally spaced intervals,

storing means coupled to the converting means for storing digital signals, and

control means coupled to the storing means for causing digital signals from the converting means representing discrete magnitudes of the time-varying electrical signal at temporally spaced intervals which are determined by the control means in accordance with an operating parameter of the internal combustion engine other than said time-varying operating parameter being electrically stored; to be stored in said storing means, and for causing reading of the stored digital signals out of the storing means.

#### 4,418,389 PRODUCT-TO-FREQUENCY CONVERTER Alain Finet, Newbury, and Louis R. Nerone, Cleveland, both of Ohio, assignors to Stock Equipment Company, Chagrin Falls, Ohio

Filed Dec. 12, 1980, Ser. No. 215,817

Int. Cl.<sup>3</sup> G06F 15/46

U.S. Cl. 364-478

20 Claims

1. A product-to-frequency converter comprising:

first signal-generating means providing a continuous DC signal with a varying amplitude constituting a multiplier value;

second signal-generating means providing a first periodic pulse signal whose frequency constitutes a multiplier value, the pulses constituting said first periodic pulse signal each being of predetermined duration;

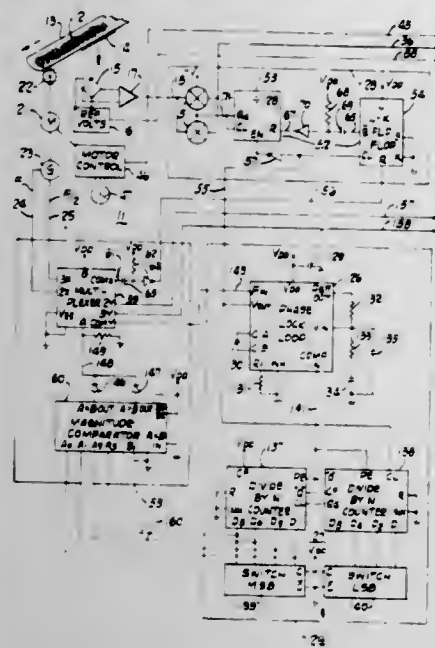
multiplying means providing, in response to said DC signal and said first periodic pulse signal, a product value constituted by a second periodic pulse signal having a frequency equivalent to said first periodic pulse signal, a peak amplitude equivalent to said DC signal, and a pulse duration equivalent to said predetermined duration;

a voltage-controlled oscillator means having an input, and an output; and

means responsive to said second periodic pulse signal for providing a signal to the input of said voltage-controlled oscillator means, said output providing a third periodic



pulse signal of a frequency proportional to said product value, said third periodic pulse signal remaining constant



4,418,390

# METHOD AND APPARATUS FOR MAKING A CODED CHART OF A COLOR SUBJECT

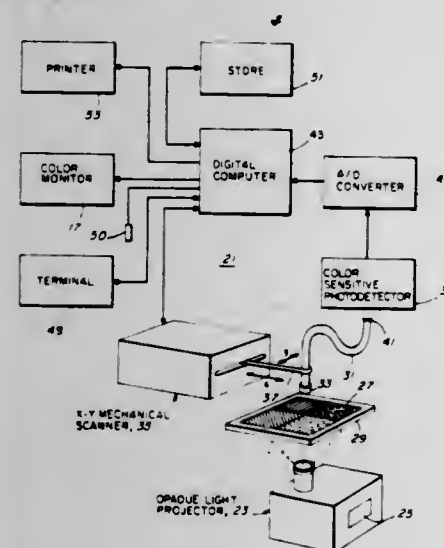
Rhoda J. Smith, 47 Basswood Ave., Sudbury, Mass. 01776, and Harold H. Smith, 6021 Commack Ct., Springfield, Va. 22152

Filed Nov. 24, 1980, Ser. No. 209,537

Int. Cl.<sup>3</sup> G06K 15/02; H04N 9/10, 7/18

U.S. Cl. 364—526

5 Claims



2. Apparatus for use in making a coded chart of a color subject for use in creating a likeness of said subject by need-  
leworking on a mesh canvas, said mesh canvas having a plural-  
ity of holes, said subject being characterized by an array of  
picture elements, said apparatus comprising:

- means for forming a color image of said color subject,
- photopickup means,
- means for causing said photopickup means to scan said color image,
- means for measuring the color content of the light received by the photopickup means as it scans said color image,
- means for converting the color content signals into digital signals,
- a computer for processing said digital signals to determine the proper color needlecraft material to use for each hole in said mesh canvas, and
- a printer for making a printout of the color information so obtained, said printout being in the form of an image of the

subject, with each picture element in the image corresponding to a single hole in said mesh canvas and appearing as a symbol corresponding to its particular color.

4,418,391

# METHOD OF INSPECTING OPERATION OF DRIVING SYSTEM INCLUDING A MAIN MACHINE AND A PLURALITY OF AUXILIARY MACHINES, AND DRIVING SYSTEM INCORPORATING INSPECTION APPARATUS FOR CARRYING OUT THE INSPECTION METHOD

Yoshikatsu Asada, and Shunji Mori, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

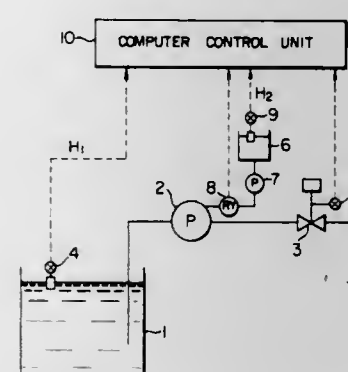
Filed Oct. 3, 1980, Ser. No. 193,444

Claims priority, application Japan, Oct. 5, 1979, 54-127955

Int. Cl.<sup>3</sup> G06F 11/30

U.S. Cl. 364—551

8 Claims



1. A method of inspecting at set time intervals a driving system having a main machine and a plurality of auxiliary machines, said main machine being so controlled as to be started only when the function of every auxiliary machine is satisfactory, said method including the steps of:

- sequentially checking the function of all of said auxiliary machines without interruption to detect a malfunction of any auxiliary machine, in response to which an indication of a malfunction of said auxiliary machine is produced and a main machine locking signal is produced;
- checking the function of said main machine if said main machine locking signal is not generated; and then
- correcting any malfunction in an auxiliary and the main machine.

4,418,392

# MEASURING DEVICE

Yoogo Hata, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 23, 1981, Ser. No. 276,527

Claims priority, application Japan, Jun. 26, 1980, 55-85909

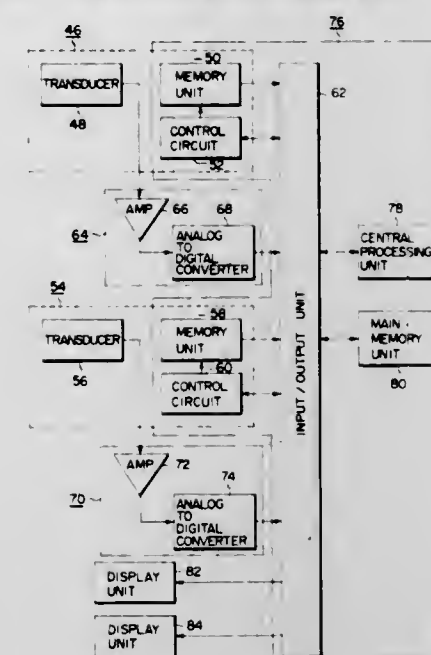
Int. Cl.<sup>3</sup> G06F 15/20

U.S. Cl. 364—571

2 Claims

- A measuring apparatus comprising:
  - measuring means including a plurality of transducers for measuring a plurality of different data and converting the measured data into analog electrical signals;
  - analog-digital converting means connected to the measuring means to convert analog electric signals from the measuring means into digital signals;
  - correction means connected to the analog-digital converting means for storing a plurality of different correction data for the plurality of measured data, for correcting each of the measured data using the corresponding correction data, and for further correcting a first of the corrected measured data using a second of the corrected measured data, said first corrected measured data being a function of at least two variable factors and said second corrected measured data being a function of at least one variable

factor and being one of said at least two variable factors of said first corrected measured data; and



d. display means connected to the correcting means for displaying corrected measured data.

4,418,393

# MATCHED FILTER SPREAD SPECTRUM CODE RECOVERY APPARATUS

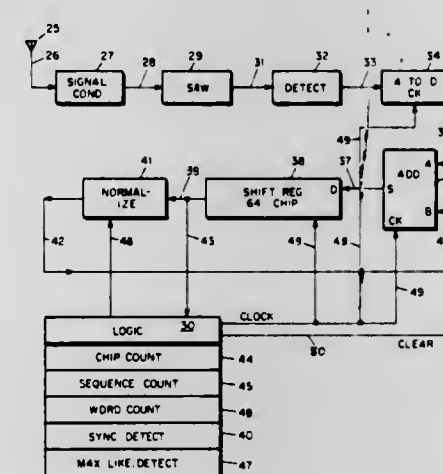
John W. Zachele, Jr., Murray, Utah, assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,827

Int. Cl.<sup>3</sup> G06F 15/31

U.S. Cl. 364—724

8 Claims



- Apparatus for receiving and decoding a transmitted coded message where the coded message is a modulated signal comprising a multibit data word converted into a spread spectrum code having a unique sequence of chips preceded by a sync signal and where the unique sequence of chips define a plurality of identical sequence groups each representative of said multibit data word, the combination comprising:
  - means for receiving said sync signal and said sequence groups of chips,
  - means for processing said sync signal and said groups of chips coupled to said receiving means to provide a time base signal and processed chips,
  - a tapped delay line device coupled to said sync signal and said processed chips, said tapped delay line device having a chip length sufficient to accommodate one sequence group,
  - means for detecting the output of said tapped delay line device at each chip time,

means for converting the detected output of said tapped delay line device to a digital value at each chip time, shift register means coupled to said converting means being adapted to store said digital values at each chip time in the order of detection, logic means comprising a plurality of counters and maximum value detector means, said logic means being coupled to the output of said shift register means for detecting said sync signal and starting said plurality of counters, one of said counters being adapted to keep a sequence group count and another of said counters being adapted to keep a chip position count as said digital values are shifted through said shift register means, adder means connected to said converting means and to said shift register means for summing the digital value of the output of said device at each chip time with the digital value stored in said shift register means representative of the same chip time of the previously detected sequence group, and said maximum value detector means in said logic means coupled to the output of said shift register means for detecting the chip position in said sequence group having the largest digital value stored in said shift register means, whereby the largest digital value chip position in said sequence group is indicative of a unique multibit data word.

4,418,394

# OPTICAL RESIDUE ARITHMETIC COMPUTER HAVING PROGRAMMABLE COMPUTATION MODULE

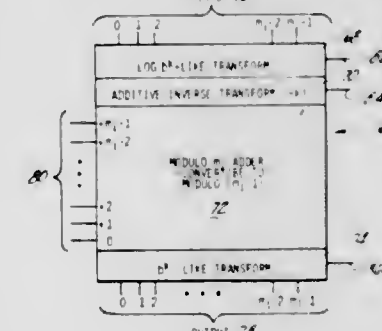
Anthony M. Tai, Plymouth, Mich., assignor to Environmental Research Institute of Michigan

Filed Aug. 13, 1980, Ser. No. 177,953

Int. Cl.<sup>3</sup> G06F 7/72

U.S. Cl. 364—746

23 Claims





said position corresponding to the function of said two residues.

4,418,395

# DIGITAL DATA PROCESSING SYSTEM WITH A VALUE SETTING UNIT FOR PROTECTING AND CONTROLLING AN ELECTRIC POWER SYSTEM

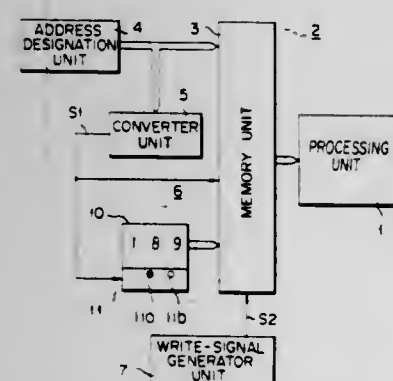
Junichi Inagaki, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 12, 1980, Ser. No. 129,647

Claims priority, application Japan, Mar. 28, 1979, 54-36738 Int. Cl.<sup>3</sup> G06F 15/56

U.S. Cl. 364-900

8 Claims



1. A digital data processing system for protecting and controlling an electric system, comprising:
  - a setting section for setting a plurality of data values, comprising,
  - an address designation unit for generating address signals corresponding to respective of the data values,
  - a converter unit connected to receive the address signals for generating predetermined decimal point signals in correspondence to respective of the address signals,
  - numerical data input means for generating numerical data signals representative of said data values and characterized by a predetermined number of digits, said data signals associated with respective of said address signals, each decimal point signal generated by said converter unit defining a predetermined position of a decimal point within said digits of a respective data signal,
  - decimal point display means connected to said converter unit and receiving therefrom said decimal point signals for displaying for each decimal point signal a position of a decimal point corresponding thereto, said decimal point display means being provided between said digits of said numerical data input means,
  - a write-signal generator unit for generating a write-signal, and
  - a memory unit connected to receive the address signals, decimal point signals, data signals and write-signal for storing each decimal point signal and each respective data signal at a respective address designated by the address signals, in response to the write-signal; and
  - a processing unit connected to said memory unit for reading said plurality of data signals and decimal point signals from the memory unit and processing the corresponding data values to protect and control the electric system based thereon.

4,418,396

# SIGNALLING SYSTEM

Goran A. H. Hemdal, Sint-Genesius Rode, and Jonny S. Jager, Brussels, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

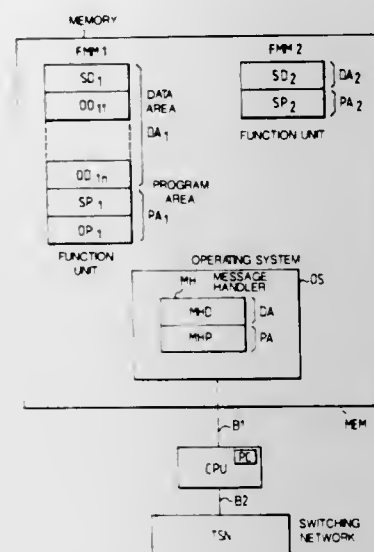
Filed May 1, 1980, Ser. No. 145,394

Claims priority, application Belgium, May 4, 1979, 57773

Int. Cl.<sup>3</sup> G06F 3/00

U.S. Cl. 364-900

5 Claims



1. In an electronic communication system for processing calls between terminals of the system in response to call processing signals from calling ones of said terminals, said system comprising a processor, a memory associated with said processor for storing messages for controlling the processing of said calls through the system, said memory comprised of a plurality of modular function units for furthering the processing of calls through the system, in which each of said function units comprises message data storage and program storage areas, each program storage area comprising receiving and transmitting procedure instructions for the message data storage area of the same function unit, and in which the processing of calls comprises the transmission of call control messages generated in one function unit between data storage areas of different function units in response to signals directed to said memory from system terminals, the improvement comprising a first and a second type of data messages stored in the message areas of the units, the data messages of the first type in which the message includes identification of a destination function unit for the message and data messages of the second type in which the destination function unit for the message is not specified in the message, and in which each unit includes a message handler for controlling the transmission of messages of the second type, each said message handler comprising a routing table containing destination unit identification to which reference is made to determine the destination unit for a message of the second type for transmission thereto of that message.

4,418,397

# ADDRESS DECODE SYSTEM

George L. Brantingham, Lubbock, Tex., and Warren S. Graber, St. Joseph, Mich., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1980, Ser. No. 154,339

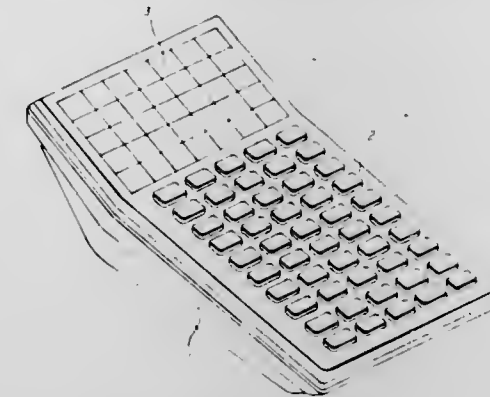
Int. Cl.<sup>3</sup> G06F 3/00; H03K 13/00

U.S. Cl. 364-900

5 Claims

1. A circuit having non-complementary address inputs comprising:
  - (i) first decode means for receiving address inputs for selectively providing an active first decode output in response to decoding a first logic level in a predefined combination from said received address inputs; and
  - (ii) second decode means coupled to said first decode means for receiving said address inputs for selectively providing an

active second decode output in response to decoding a second logic level in the predefined combination from said received address inputs and in response to receiving the active first decode output from said first decode means, whereby said active second decode output is indicative of



the address inputs corresponding to the predefined combination.

2. The circuit of claim 1 wherein the first and second decode means are programmable to allow selection of the desired predefined combination.

4,418,398

# MANUAL RESET CONTROL CIRCUIT FOR MICROPROCESSOR CONTROLLED WASHING APPLIANCE

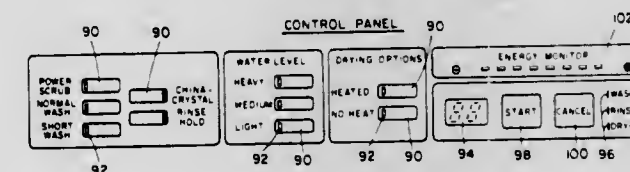
Richard E. Hornung, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 71,964, Sep. 4, 1979, abandoned. This application Jun. 10, 1982, Ser. No. 387,134

Int. Cl.<sup>3</sup> G06F 15/46

U.S. Cl. 364-900

9 Claims



1. In a washing appliance having means for performing a plurality of operating functions including a drain function, a control circuit adapted for energization from an external power supply, said control circuit comprising:
  - a microprocessor for controlling said plurality of function performing means to provide a plurality of operating modes including a drain mode in which the drain function is performed, and an idle mode in which no operating functions are performed, said microprocessor including a reset port and an input port, said microprocessor being constructed and arranged to assume a reset state thereby interrupting appliance operation, whenever a reset signal is present at its reset port at any time during appliance operation;
  - means for generating an internal reset signal of limited duration and applying said internal reset signal to said reset port in response to restoration of power from the external supply following an interruption thereof;
  - manually operable reset switch means having an actuated state and a deactuated state;
  - means for generating a manual reset signal responsive to said reset switch means and operative to apply said manual reset signal to said reset port when said reset switch means is in its actuated state and to remove said manual reset signal when said reset switch means resumes its deactuated state;
  - means for generating an initiating signal in response to said manual reset signal and operative to maintain said initiating signal at said input port for a predetermined period

following removal of said manual reset signal from said reset port;

said microprocessor being further constructed and arranged to scan said input port for the presence of an initiating signal following removal of a reset signal from its reset port and operative to initiate a first predetermined one of said operating modes if said initiating signal is detected and to initiate a second predetermined one of said operating modes otherwise;

whereby in response to a manual reset appliance operation is interrupted and a first predetermined one of the operating modes is initiated and in response to an internal reset, a second predetermined one of the operating modes is initiated.

4,418,399

# SEMICONDUCTOR MEMORY SYSTEM

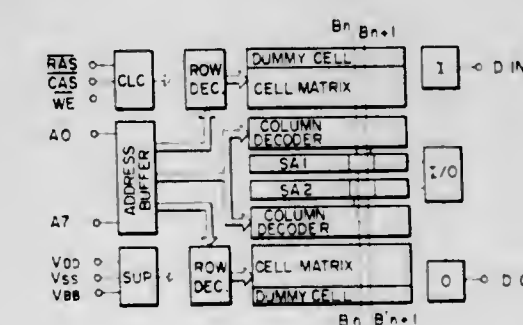
Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1980, Ser. No. 216,674

Claims priority, application Japan, Dec. 13, 1979, 54-162079 Int. Cl.<sup>3</sup> G11C 5/02, 7/00, 11/24

U.S. Cl. 365-51

18 Claims



1. A semiconductor memory system comprising:
  - a memory matrix area having a row direction and a column direction at an angle with said row direction, said matrix area comprising conductors, a first set of said conductors arranged in said row direction and a second set of said conductors arranged in said column direction, each conductor having a plurality of potentials, and said memory matrix area further comprising memory cells arranged at the intersections of said conductors,
  - peripheral circuits arranged adjacent to said memory matrix area, and being operatively connected to respective ones of said conductors, a predetermined number of said peripheral circuits being sequentially arranged along a first direction comprising one of the row direction and the column direction such that at least some of said predetermined number of peripheral circuits are substantially arranged in files extending in a direction perpendicular to said first direction.

4,418,400

# DATA TRACK FOR CROSS TIE WALL MEMORY SYSTEM

Gregory J. Cosimini, St. Paul; David S. Lo, Burnsville, and Maynard C. Paul, Bloomington, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,993

Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-87

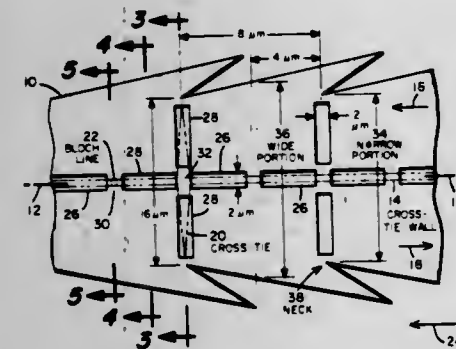
5 Claims

1. In a magnetic memory system in which binary data are stored as inverted Neel wall sections about the Bloch-lines of associated cross-tie, Bloch-line pairs, which cross-tie, Bloch-line pairs are generated in and are serially propagated downstream along a cross-tie wall in a magnetizable layer by appropriate drive fields, said magnetizable layer being configured into a data track forming strip whose two opposing edges are



formed into mirror-imaged, uniformly spaced, repetitive patterns of asymmetrically shaped edges which repetitive patterns are formed of successive narrow portions, forming wide portions therebetween, and which are formed about the geometric centerline of the data track for establishing said cross-tie wall along said geometric centerline and structuring each of said cross-ties along said cross-tie wall and at a narrow portion of said data track and the associated Bloch-line at the next adjacent downstream wide portion of said data track, the improvement comprising:

forming a plurality of energy wells along the geometric centerline of said data track but not in the areas of said



narrow portions and said wide portions where said cross-ties and said Bloch-lines, respectively, are stored; forming a plurality of energy wells transverse said geometric centerline in the areas of said narrow portions where said cross-ties are stored but not in the areas of said geometric centerline; forming a continuous cross-tie wall along said geometric centerline and within said plurality of energy wells that are formed along said geometric centerline; and, forming two large domains of opposite polarity on opposite sides of said continuous cross-tie wall, the polarities of which are parallel to said continuous cross-tie wall.

4,418,401

## LATENT IMAGE RAM CELL

Jai P. Bansal, Manassas, Va., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,314

Int. Cl.<sup>3</sup> G11C 17/00, 11/40

U.S. Cl. 365—95

2 Claims



1. A latent image storage cell, comprising:

an N channel depletion mode load FET device having its drain/source path connected between a pulsed drain voltage and a first node, having its gate connected to said first node;

a first N channel enhancement mode FET device having its drain/source path connected between said first node and ground potential, and its gate connected to a second node;

a P channel enhancement mode FET device having its

drain/source path connected between said pulsed drain voltage and said second node, and its gate connected to said first node;

a second N channel enhancement mode FET device having its source/drain path connected between said second node and said ground potential, and having its gate connected to said first node;

said first node charging up faster than said second node when said pulsed drain voltage turns on, providing a latent image operation for the circuit, the circuit operating as a RAM circuit by selectively applying positive or ground potential to said first or said second node to dynamically store a selected binary state in the circuit.

4,418,402

## RADIATION HARDENED ACCESSIBLE MEMORY

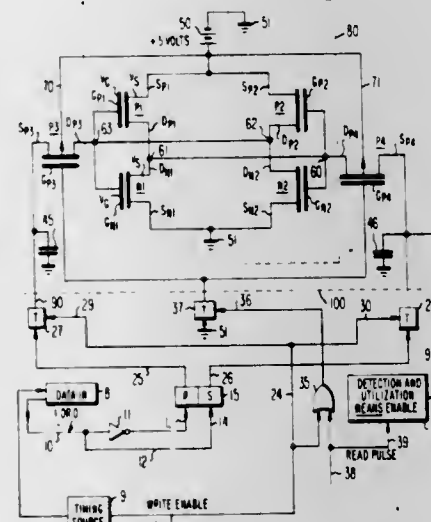
William F. Heagerty, Norristown, Pa.; Gerald T. Caracciolo, Trenton, and William F. Gehweiler, Moorestown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 13, 1981, Ser. No. 263,124

Int. Cl.<sup>3</sup> G11C 11/40

U.S. Cl. 365—156

4 Claims



1. In combination with a bistable device comprised of N and P-type devices, and having first and second input terminals, and responsive to high and low level signals or to low and high level signals supplied to said first and second input terminals, respectively, to assume its first or second state, respectively, accessing means for supplying high and low signal levels or low and high signal levels to said first and second input terminals, respectively, and comprising:

first and second P-type devices each having a drain electrode connected to one of said input terminals, a source electrode, and a gate electrode, and responsive to enabling and disabling voltages applied across said gate electrode and said source electrode to supply said high level signal or said low level signal, respectively, to said one of said input terminals;

means for generating a control signal having first and second levels;

logic means responsive to the first level of said control signal to generate and supply said enabling and disabling signals to said first and second P-type devices respectively, and responsive to said second level of said control signal to generate and supply said enabling and disabling signals to said second and first P-type devices, respectively;

means for supplying a reference potential to the gate electrodes of said first and second P-type devices when said enabling and disabling voltages are supplied to said first and second P-type devices; and

means for sensing the state of said bistable device comprising: capacitor means connected between said source electrodes of said first and second P-type devices and said reference potential; and

means for detecting the potential across said capacitor means during a time period between successive level changes of said control signal.

4,418,403

## SEMICONDUCTOR MEMORY CELL MARGIN TEST CIRCUIT

James E. O'Toole, and Robert J. Proebsting, both of Carrollton, Tex., assignors to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US81/00136, § 371 Date Feb. 2, 1981, § 102(e)

Date Feb. 2, 1981, PCT Pub. No. WO82/02792, PCT Pub.

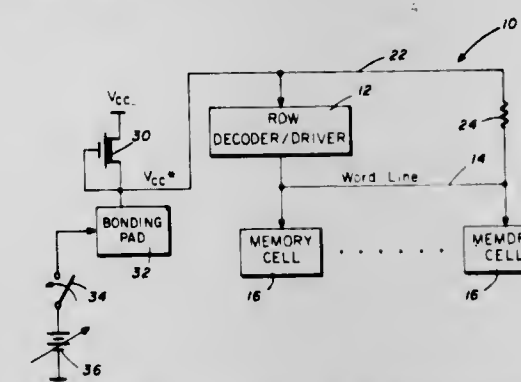
Date Aug. 19, 1982

PCT Filed Feb. 2, 1981, Ser. No. 275,057

Int. Cl.<sup>3</sup> G11C 11/40

U.S. Cl. 365—201

5 Claims



1. A margin testing circuit for a semiconductor memory circuit having a plurality of memory cells, the memory cells being arranged in rows and those memory cells along one row being connected to a word signal line and the semiconductor memory circuit operating at a supply voltage, comprising: means interconnected to a word signal line for varying the voltage applied to a word signal line without varying the supply voltage to test for proper functioning of the memory cells along a row of the semiconductor memory circuit while operating with reduced voltage on the selected word signal line.

4,418,404

## SINGLE-SIDE-BAND ACOUSTIC TELEMETRY

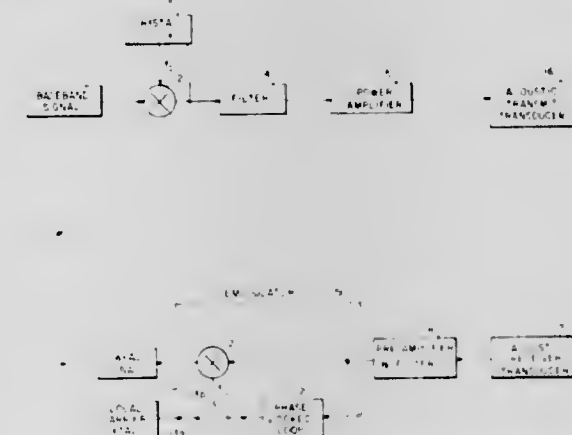
Alan Gordon; Stanley J. Watson; Steven J. Cowen; Gerald Mackelburg, all of San Diego, and Brett D. Castle, Del Mar, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1981, Ser. No. 307,403

Int. Cl.<sup>3</sup> H04B 1/74, 11/00

U.S. Cl. 367—132

5 Claims



1. An apparatus for undersea transmitting and receiving comprising:

a first crystal clock for generating a carrier signal between eight and forty KHz;

means for providing an acoustic baseband information signal;

means coupled to the generating means and the providing means for shifting the acoustic baseband information sig-

nal to a frequency determined by the carrier signal; means for passing signals made up of at least a single sideband of the acoustic baseband information modulation carrier signal; means for transmitting the passed signals through a water medium; means for receiving remotely originating signals in the water disposed near the transmitting means, the remotely originating signals being single sideband modulated signals and sideband signals along with a carrier signal; means coupled to the receiving means for synchronously and asynchronously demodulating the remotely originating signals into an information signal; a second crystal clock coupled to the demodulating means and generating substantially the same signal as the carrier signal for the first crystal clock to provide a demodulating signal when operating in the asynchronous mode; and a phase lock loop coupled to the demodulating means to provide a demodulating signal when operating in the synchronous mode.

4,418,405

## LENS POSITIONING CONTROLLER FOR OPTICAL PLAYBACK APPARATUS

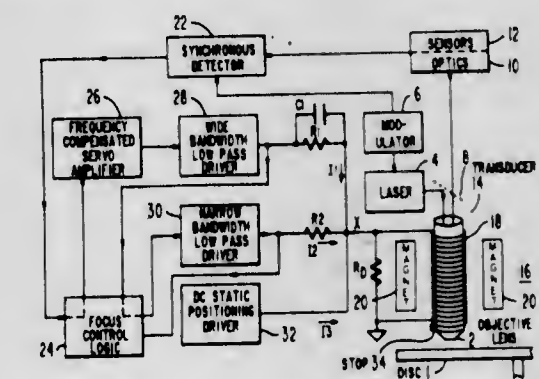
William E. Barnette, Levittown, Pa., and Robert W. Jebens, Skillman, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,452

Int. Cl.<sup>3</sup> G11B 7/12

U.S. Cl. 369—45

15 Claims



1. In a focus control system for maintaining the distance between a surface of a record medium and an objective lens substantially constant when relative motion is established between the surface and the objective lens, an apparatus comprising:

means for generating an error signal that varies in accordance with variations from a given value in the distance between said objective lens and said surface;

means for moving said objective lens along an axis of said objective lens which is normal to said surface of said record medium;

means for providing a DC control signal to said moving means, said DC control signal effecting a static positioning of said objective lens;

first means for providing a first dynamic control signal of a first bandwidth to said moving means, said first dynamic control signal effecting a displacement of said objective lens such that said given value in said distance between said objective lens and said surface is maintained substantially constant; and

second means for providing a second dynamic control signal of a second bandwidth to said moving means, said first bandwidth of said first dynamic control signal providing means being greater than said second bandwidth of said second dynamic control signal providing means, said second dynamic control signal effecting a displacement of said objective lens such that displacements of said objective lens which maintain said give value in said distance between said objective lens and said surface as effected by



said first dynamic control signal average to approximately zero.

4,418,406

## SIGNAL WAVE CONTROL CIRCUIT

Hiroshi Ogawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

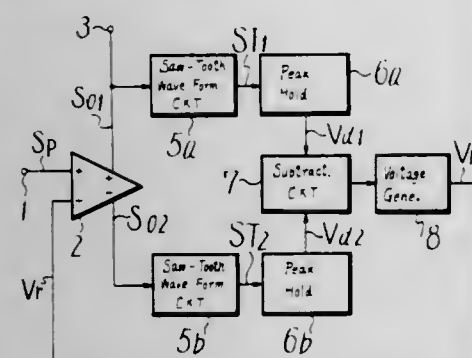
Filed Sep. 21, 1981, Ser. No. 304,167

Claims priority, application Japan, Sep. 24, 1980, 55-132522

Int. Cl.<sup>3</sup> G11B 5/09

U.S. Cl. 369—124

12 Claims



1. A control circuit for a signal wave having predetermined transition intervals, said circuit comprising:

comparator means having first and second input terminals receiving said signal wave and a reference signal, respectively, and generating a comparator output signal having positive and negative portions corresponding to said signal wave;

detector means for detecting one of said predetermined transition intervals included in said comparator output signal and generating a detected signal in response thereto;

holding means for storing said detected signal; and

control means for receiving said detected signal from said holding means and supplying said reference signal to said comparator means so that said positive portions of said comparator output signal are equal in length to said negative portions of said output signal.

4,418,407

## VIDEO DISC PICKUP STYLUS

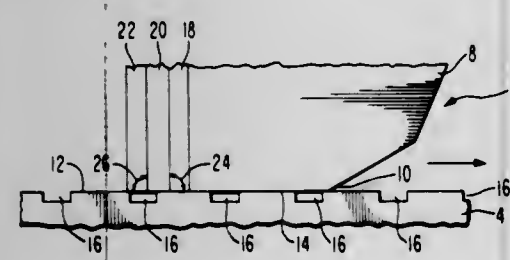
Jay J. Brandinger, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 3, 1981, Ser. No. 327,079

Int. Cl.<sup>3</sup> G11B 11/06, 3/44

U.S. Cl. 369—126

8 Claims



1. A playback stylus adapted for use in capacitively recovering information recorded as a series of geometric variations in the surface of an information disc record which acts as a first conductive plate of a capacitor wherein the stylus comprises:

a body comprising a first dielectric material having a first dielectric constant,

a first layer of a second dielectric material having a dielectric constant less than said first dielectric constant overlaying the body,

a second conductive layer overlaying the first layer which acts as a second conductive plate of a capacitor, and

a third layer of a dielectric material having a dielectric

constant which is less than said first dielectric constant overlaying the conductive layer.

4,418,408

## STYLUS ARM FOR VIDEO DISC PLAYER

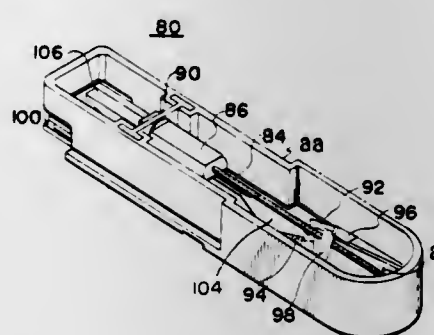
Byron K. Taylor, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,303

Int. Cl.<sup>3</sup> G11B 3/44

U.S. Cl. 369—170

2 Claims



1. A method of forming a stylus arm assembly comprising the steps of:

(A) heating a stylus;

(B) inserting said stylus into a section of heat shrinkable material at one end thereof to form said stylus arm assembly; and

(C) heat shrinking said material to fixedly secure said stylus to said section.

4,418,409

## BYTE DATA ACTIVITY COMPRESSION

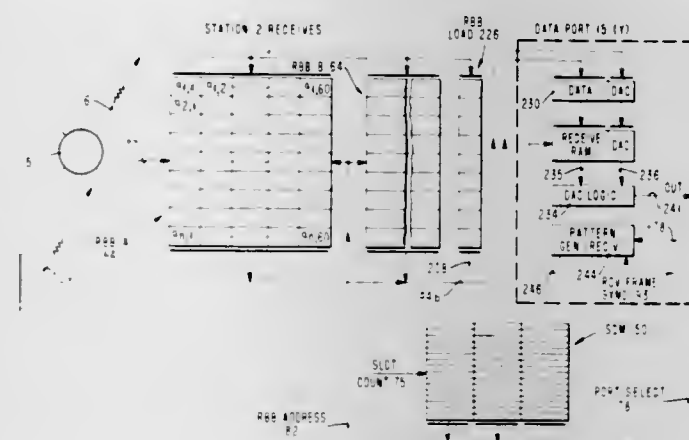
Larry C. Queen, Silverspring, Md., assignor to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 128,058, Mar. 7, 1980. This application Aug. 31, 1981, Ser. No. 297,595

Int. Cl.<sup>3</sup> H04B 1/66; H04J 3/18

U.S. Cl. 370—104

2 Claims



1. In a TDMA satellite communication system containing a transmitting data port at a first earth station and a receiving data port at a second earth station for transferring channels of digital information of N bytes in length during each time frame, wherein the improvement comprises:

a storage means in the transmitting data port for storing the last byte in the present time frame transmitted to the receiving data port;

a comparison means connected to said storage means in said transmitting data port and connected to the input data source to the transmitting data port, for comparing the last byte transmitted in the present frame to each byte of data in the channel to be transmitted in the next frame;

data transmission switching means connected to said input data source and said comparison means for transmitting

the channel of data in said next frame if said comparison means determines that said last byte in said storage means has not been replicated in every byte in said next channel and said switching means preventing the transmission of said next channel of data if said byte stored in said storage means is replicated by every byte of data in said next channel of said next frame;

a synchronization means connected to said transmitting data port and communicating with said receiving data port for synchronizing the operation of said transmitting port and said receiving data port;

a second storage means in said receiving data port for storing the last byte of data received from said transmitting data port in said present time frame;

replication means connected between said second storage means and the data destination connected to said receiving data port, and communicating with said synchronization means, for generating N replicated bytes and transmitting them to said destination when no data is received from said transmission port in said next frame.

4,418,410

## ERROR DETECTION AND CORRECTION APPARATUS FOR A LOGIC ARRAY

Volkmar Goetze, Grafenau, and Dieter Schuett, Munich, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

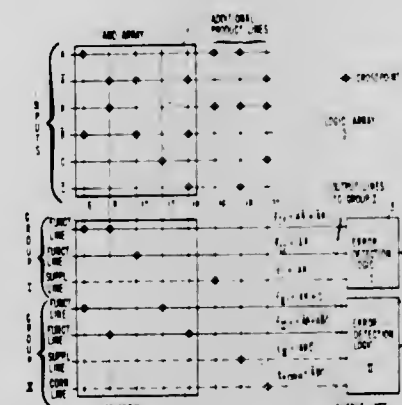
Filed Dec. 8, 1980, Ser. No. 214,313

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951946

Int. Cl.<sup>3</sup> G06F 11/00

U.S. Cl. 371—15

14 Claims



1. Error detection and correction apparatus for testing a binary logic array having at least one AND and one OR logic combination therein and a plurality of output lines, each of which output lines has an available function of said binary logic array present thereon, said apparatus including:

(a) first circuit means, coupled to said binary logic array, for grouping the output function lines thereof so that each of said groups formed thereby include all possible minterms of the binary variables of that group and that all of the groups jointly include the totality of available binary functions of said binary logic array;

(b) second circuit means, appropriately coupled to said first circuit means, for testing each of said groups of output function lines to determine whether one and only one function line in each of said groups has a binary value of one; and

(c) third circuit means, appropriately coupled to said second circuit means, for generating an error signal at its output in response to said test which is indicative of the results thereof.

4,418,411

## METHOD AND APPARATUS FOR GENERATING AN EQUIPMENT REPLY SIGNAL FOR THE AUTOMATIC IDENTIFICATION OF OBJECTS AND/OR LIVING BEINGS

Rainer Strietzel, Heidelberg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

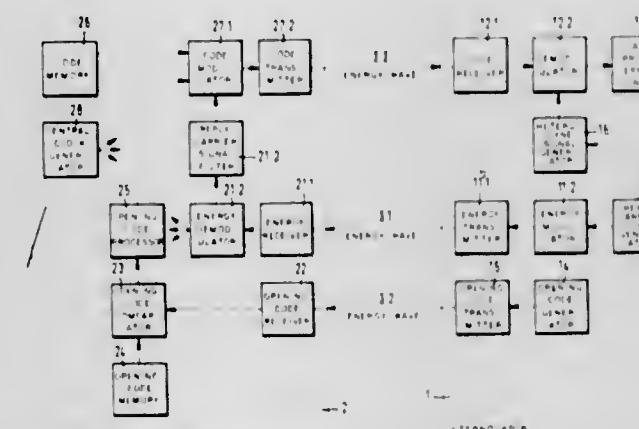
Filed Mar. 10, 1981, Ser. No. 242,177

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009179

Int. Cl.<sup>3</sup> G06F 11/00; G06K 7/01; H04Q 9/00

U.S. Cl. 371—67

16 Claims









4,418,418

## PARALLEL-SERIAL CONVERTER

Kazuhide Aoki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

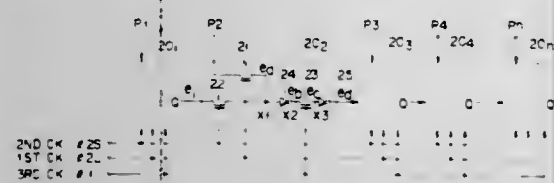
Filed Nov. 24, 1981, Ser. No. 324,557

Claims priority, application Japan, Jan. 13, 1981, 56-2747

Int. Cl.<sup>3</sup> G11C 19/28; H03K 23/22

U.S. Cl. 377-79

2 Claims



1. A parallel-serial converter which comprises a plurality of cascade connected selection-delay unit circuits, each of which delays a signal selected from a plurality of input signals, and which converts parallel input signals into serial signals, said selection-delay unit circuit comprising:

a first transfer gate which receives a parallel signal and whose control gate is supplied with a first clock signal;  
a second transfer gate which receives an output signal from the immediately preceding selection-delay unit circuit, and whose control gate is supplied with a second clock signal;

a first inverter which receives output signals from said first and second transfer gates;

a third transfer gate which receives an output signal from said first inverter and whose control gate is supplied with a third clock signal; and

a second inverter which receives an output signal from said third transfer gate and sends forth an output signal to the second transfer gate of the immediately succeeding selection-delay unit circuit;

said first clock signal having a phase opposite to that of said third clock signal, and being supplied to the control gate of said first transfer gate only during the load mode in which a parallel signal is supplied to the selection-delay unit circuit; and

said second clock signal having a phase opposite to that of said third clock signal, and being supplied to the control gate of said second transfer gate only during the shift mode in which the previously supplied parallel signal is shifted.

4,418,419

## DENTAL TOMOGRAPHY APPARATUS

Peter Schreiber, Rellingen; Eberhard Steinfadt, Stade, both of Fed. Rep. of Germany, and Gerard P. M. Bergman, DJ Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 238,350, Feb. 26, 1981, abandoned.

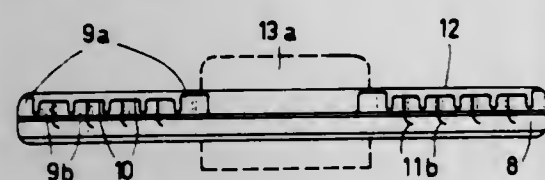
This application Sep. 10, 1982, Ser. No. 416,792

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007935

Int. Cl.<sup>3</sup> A61B 6/14

U.S. Cl. 378-040

10 Claims



1. Apparatus for dental tomography comprising:  
an array of electrical contacts which are activated by biting and are adapted for insertion into the mouth of a patient;  
an X-ray source;

a film holder; and  
means for moving the source and film holder around the head of the patient along a path which is determined by a pattern of activated contacts in the array.

4,418,420

## METHOD AND ARRANGEMENT FOR GRIPPING X-RAY FILM

Walter Bauer; Heinrich Färber, both of Munich, and Reimund Kluge, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

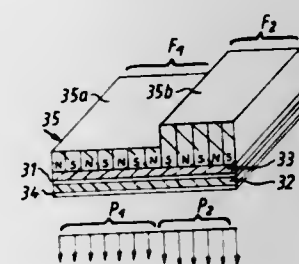
Filed Aug. 7, 1981, Ser. No. 290,930

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030201

Int. Cl.<sup>3</sup> G03B 41/16

U.S. Cl. 378-187

31 Claims



1. An arrangement for gripping photosensitive material, particularly X-ray film, comprising:

(a) an enclosure for accommodating the photosensitive material; and

(b) a pair of relatively movable units in said enclosure for engaging opposite sides of the photosensitive material, each of said units having a magnetic element for attracting the other unit, and said units including cooperating first portions arranged to engage the photosensitive material with a first magnetic force of first magnitude, said units further including cooperating second portions arranged to engage the photosensitive material with a second magnetic force of second magnitude larger than said first magnitude.

4,418,421

## X-RAY APPARATUS

Kenichiro Kitadate, Higashimurayama, and Yoshinori Tanimoto, Hachioji, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

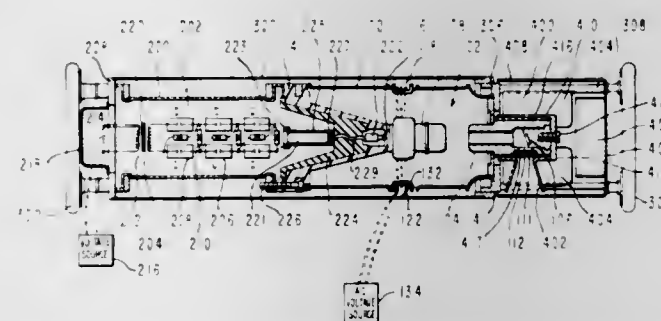
Filed Dec. 9, 1981, Ser. No. 329,057

Claims priority, application Japan, Jul. 20, 1981, 56-112109

Int. Cl.<sup>3</sup> H05G 1/06

U.S. Cl. 378-199

22 Claims



1. An X-ray apparatus arranged as a single portable unit, said apparatus comprising:

an X-ray generator section,  
a high voltage generator section,  
a cooled section including means for cooling,  
each of said sections being enclosed in an individual casing;

4,418,423

## DISPARITY DETECTION APPARATUS

Yoshitake Tsuji; Nobuhiko Mori, and Kazunari Egami, all of Tokyo, Japan, assignors to Nippon Electric Co. Ltd., Tokyo, Japan

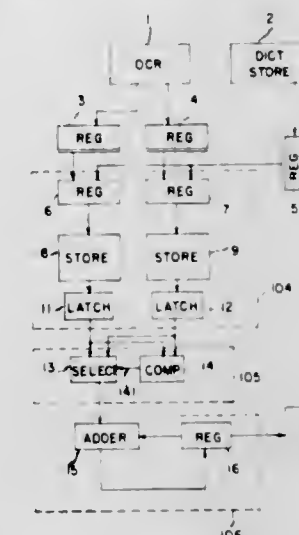
Filed Sep. 9, 1981, Ser. No. 300,569

Claims priority, application Japan, Sep. 11, 1980, 55-126244

Int. Cl.<sup>3</sup> G06K 9/00

U.S. Cl. 382-40

1 Claim



1. A word recognition apparatus comprising:

a character reader outputting a first train of characters  $\alpha_1, \alpha_2, \dots, \alpha_n$  regarded as characters of a first kind and a second train of characters  $\beta_1, \beta_2, \dots, \beta_n$  regarded as characters of second kind in response to one character field,

a first register for storing said first train of characters  $\alpha_1, \alpha_2, \dots, \alpha_n$  delivered thereto from said character reader in the order of delivery,

a second register for storing said second train of characters  $\beta_1, \beta_2, \dots, \beta_n$  delivered thereto from said character reader in the order of delivery,

a first storage device for storing a first kind intercharacter distance  $d(\alpha, U(i))$  between the  $i$ th character category  $U(i)$  of the first kind of characters and a character  $\alpha$  outputted from said character reader regarded as the first kind of character,

a second storage device for storing a second kind intercharacter distance  $d(\beta, L(i))$  between the  $i$ th character category  $L(i)$  of the second kind of characters and a character  $\beta$  outputted from said character reader regarded as the second kind of character,

a third storage device for storing a dictionary word to be compared with the output character train of said character reader,

intercharacter distance reading means for reading out of said first storage device as the first kind intercharacter distance the distance  $d(\alpha, a_j)$  which is determined by the  $j$ th character  $a_j$  of said dictionary word and the content  $\alpha_k$  of the  $k$ th elements (where  $J-s \leq k \leq J+s$  and  $s$  is preselected constant 0, 1, 2, ...) of said first register to be compared with the  $j$ th character  $a_j$  of said dictionary word and out of said second storage device as the second kind intercharacter distance the distance  $d(\beta, a_j)$  which is determined by said  $j$ th character  $a_j$  of said dictionary word and the content  $\beta_k$  of the  $k$ th element of said second register to be compared therewith,

intercharacter distance comparing means for comparing the read-out intercharacter distances  $d(\alpha, a_j)$  and  $d(\beta, a_j)$  to select a smaller one as a representative intercharacter distance between the character  $a_j$  of the dictionary word and the  $k$ th output characters  $\alpha_k$  and  $\beta_k$ , and  
means for calculating the disparity between the dictionary word and the character output trains by use of the representative character distances selected by said comparing means.

4,418,422

## AIMING DEVICE FOR SETTING NAILS IN BONES

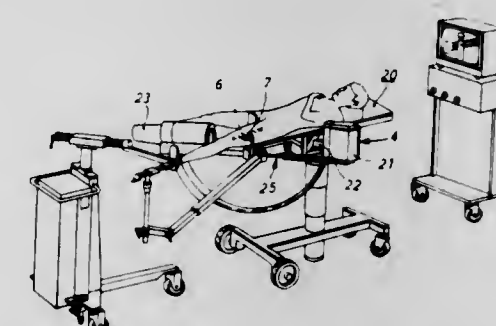
Karl M. Richter, Wentorf; Hans E. Harder, Probstelrerhagen, and Klaus Behrens, Rickling, all of Fed. Rep. of Germany, assignors to Howmedica International, Inc., Schonkirchen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 7,308, Jan. 29, 1979, abandoned. This application Mar. 11, 1981, Ser. No. 242,679  
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 7805301

Int. Cl.<sup>3</sup> G21K 5/08

U.S. Cl. 378-205

10 Claims



1. An aiming device for fasteners of an implanted bone nail, said device being suitable for use with a Roentgen ray source having an exit window emitting a radiation beam, said device comprising:

a reception socket (7) for receiving a fastener aiming sleeve (32);  
support means (25) for said reception socket; and  
mounting means (3, 12) for joining said support means with the housing (21) of the Roentgen ray source (4),  
said support means comprising means for positioning said reception socket spaced from the exit window (22) of the Roentgen ray source and approximately in the center of the radiation beam of the source.



4,418,424

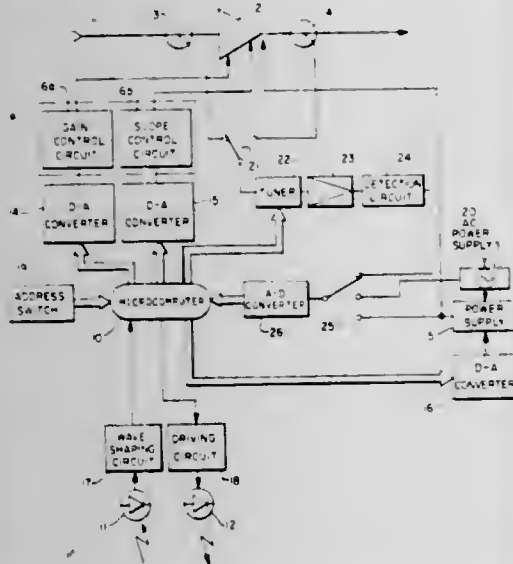
## CABLE TELEVISION TRANSMISSION CONTROL SYSTEM

Noriyuki Kawamoto, Shijonawate; Toru Higashi, Moriguchi, and Harumasa Kajita, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Mar. 16, 1981, Ser. No. 244,327

Claims priority, application Japan, Mar. 17, 1980, 55-34414  
Int. Cl.<sup>3</sup> H04B 17/00

U.S. Cl. 455—4

11 Claims



1. A cable transmission control system comprising:
  - a line amplifier installed between coaxial cables for amplifying signals transmitted through said coaxial cables;
  - remote control box which is wirelessly coupled to said line amplifier for receiving data with respect to the operating conditions of said line amplifier and for checking said line amplifier based on said operating conditions and for transmitting control instructions to adjust said line amplifier;
  - receiver for receiving said control instructions from said control box;
  - microcomputer which is connected to said receiver for deciphering said control instructions transmitted by said control box and received by said receiver, and for collecting data with respect to operating conditions from the input and output of said line amplifier, and for generating control data for controlling said line amplifier;
  - a control means which is connected to said line amplifier and said microcomputer for controlling said line amplifier according to said control data; and
  - a transmitter which is connected to said microcomputer for transmitting said collected data from said microcomputer to said remote control box by propagation through space.

4,418,425

## ENCRYPTION USING DESTINATION ADDRESSES IN A TDMA SATELLITE COMMUNICATIONS NETWORK

John W. Fennel, Jr., Olney, and Miles T. Heinz, Jr., Seabrook, both of Md., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,607

Int. Cl.<sup>3</sup> H04K 1/00; H04J 3/16

U.S. Cl. 455—27

6 Claims

1. In a TDMA satellite communications network having a master station and a plurality of subsidiary earth stations, each communicating through a satellite transponder in a plurality of TDMA frames grouped into superframes, each said station including a TDMA communications controller having a plurality of input/output ports for transferring channels of data from respective, local data users to a TDMA output to said satellite transponder and transferring said channels of data via a TDMA input from said satellite transponder to said respective local users on a time interleaved basis during periodic TDMA frames, an encryption/decryption system for said network, comprising:
  - a superframe initialization vector generator in said master

station, having an output connected to said TDMA output thereof, for transmitting a superframe synchronization vector once during each superframe;

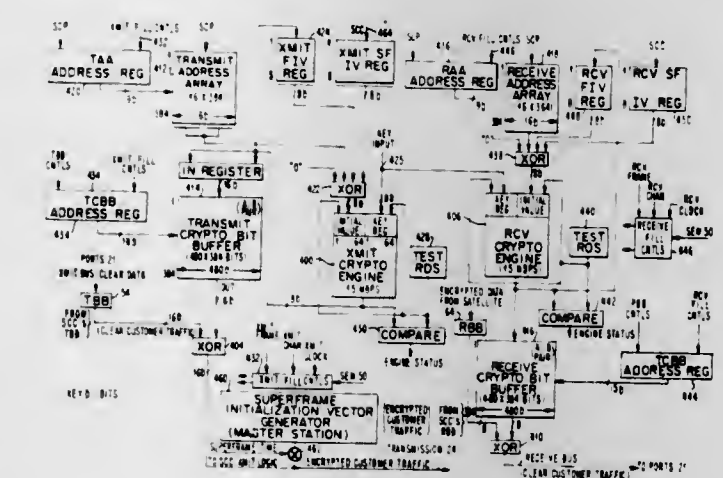
a first encryption engine in each of said stations, having an input connected to said TDMA input thereof, for receiving said superframe synchronization vector and encrypting it with a key, forming a first frame initialization vector prior to a first transmit frame of a transmit superframe, to be used for said first transmit frame;

a frame initialization vector buffer in each of said stations, having an input connected to said first encryption engine, for storing frame initialization vectors output therefrom;

a transmit address array buffer in each of said stations, for storing a plurality of destination addresses, each respectively corresponding to each of said plurality of channels of data to be transmitted;

a first exclusive-OR circuit in each of said stations, having a first input connected to said frame initialization vector buffer and a second input connected to said transmit address array buffer, and an output connected to said input of said first encryption engine, for generating a plurality of channel units of exclusive-OR bits from said first initialization vector and said plurality of destination addresses, each said channel unit corresponding to each of said channels of data to be transmitted;

said first encryption engine receiving each of said plurality of channel units of exclusive-OR bits and encrypting it with a key, forming a corresponding plurality of channel units of encryption bits;



a transmit crypto bit buffer in each of said stations, having an alternate A/B storage cycle, with an input connected to said output of said first encryption engine, and an output, for storing said plurality of channel units of encryption bits on a first side during the transmit frame immediately preceding said first transmit frame;

a second exclusive-OR circuit in each of said stations, having a first input connected to the output of said transmit crypto bit buffer and an output connected to said TDMA output;

a transmit burst buffer in each of said stations having an alternate A/B storage cycle, with a data input connected to a transmit bus common to the data outputs of all of said ports and an output connected to a second input of said second exclusive-OR circuit, for storing, in clear-text form, said plurality of channels of data on a first side during said transmit frame immediately preceding said first transmit frame;

said transmit burst buffer bursting said plurality of clear-text data channels from said first side thereof during said first transmit frame, to said second input of said second exclusive-OR circuit synchronously with said transmit crypto bit buffer bursting said plurality of channel units of encryption bits from said first side thereof to said first input of said second exclusive-OR circuit;

said second exclusive-OR circuit outputting to said TDMA output a resultant plurality of encrypted data channels,

each of which is transmitted to said satellite transponder with a corresponding destination address.

4,418,426

## EMERGENCY CITIZENS' BAND RADIO SYSTEM

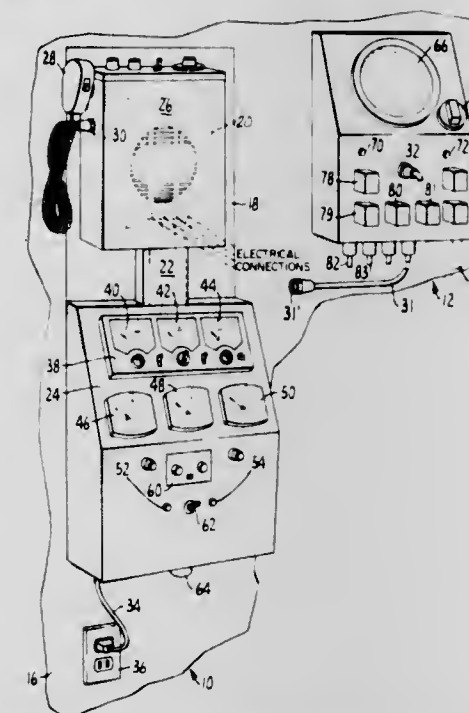
Alger E. Singletary, 1948 Esperanza Dr., Concord, Calif. 94520

Filed Dec. 11, 1980, Ser. No. 215,448

Int. Cl.<sup>3</sup> H04B 17/00, 1/38

U.S. Cl. 455—67

4 Claims



1. An emergency Citizens' Band radio system including a base station adapter, said base station adapter comprising:
  - an antenna electrical connection and a power supply electrical connection adapted to be respectively connected to an antenna lead connection and a power supply connection of a mobile Citizens' Band transceiver; rectifier means for rectifying line voltage and providing direct current power to said transceiver via said power supply electrical connection; battery means; battery charger means for charging said battery means; automatic switching means for connecting said battery means to said power supply electrical connection when said line voltage fails; system performance optimizing means connected to said antenna electrical connection for monitoring the operating condition of the transceiver; and at least one remote operating unit for remotely operating said transceiver, said remote operating unit comprising a pair of operating condition indicating lights, and means in said base station adapter for extinguishing said operating condition indicating lights when said line voltage fails.

4,418,427

## TUNING SYSTEM FOR A MULTI-BAND TELEVISION RECEIVER

Max W. Muterspaugh, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,567

Int. Cl.<sup>3</sup> H04B 1/16

U.S. Cl. 455—180

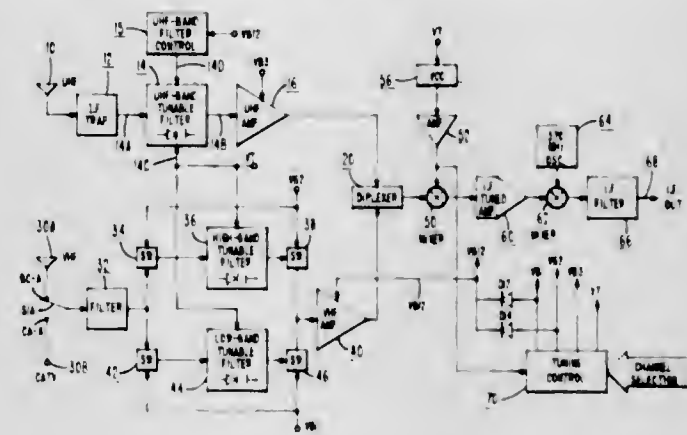
7 Claims

1. A tuning system for a television receiver comprising:
  - first and second signal paths for receiving radio frequency signals disposed in respective first and second frequency bands, each of said signal paths including filter means for providing frequency selective characteristics controllable in response to a tuning signal, said filter means of said first signal path including first and second resonant circuits responsive to said tuning signal;
  - tuning control means for developing said tuning signal to select one of said radio frequency signals within said first and second frequency bands and for developing a band

signal indicative of the one of said first and second frequency bands which includes said selected radio frequency signal;

combining means for combining signals from said first and second signal paths onto a common signal path;

means for applying said tuning signal to said filter means of said first and second signals paths; and



means coupled to said first signal path and responsive to said band signal for modifying said tuning signal applied to said first and second resonant circuits by different amounts when said selected radio frequency signal is included in said second frequency band.

4,418,428

## TUNING SYSTEM FOR A MULTI-BAND TELEVISION RECEIVER

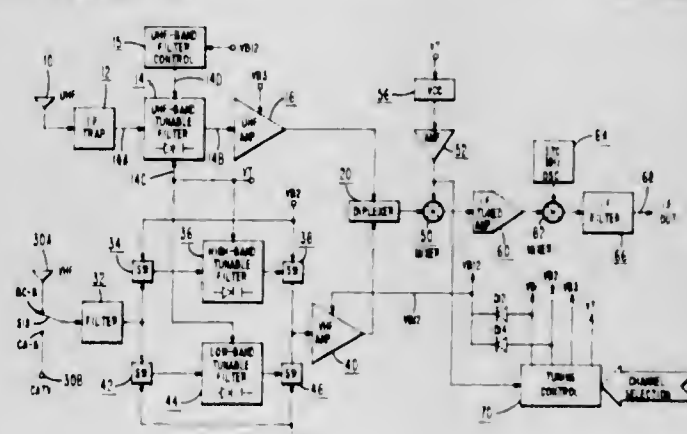
Robert M. Evans, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,570

Int. Cl.<sup>3</sup> H04B 1/26

U.S. Cl. 455—180

10 Claims



1. A tuning system for a television receiver comprising:
  - first and second signal paths for receiving radio frequency signals disposed in respective first and second frequency bands, each of said signal paths including filter means for providing frequency selective characteristics controllable in response to a tuning control signal;
  - tuning control means for developing said tuning control signal having a magnitude to select one of said radio frequency signals within said first and second frequency bands and for developing a band signal indicative of the one of said first and second frequency bands which includes said selected radio frequency signal;
  - combining means for combining signals from said first and second signal paths onto a common signal path;
  - means for applying said tuning control signal to said filter means of said first and second signal paths; and
  - means coupled to said first signal path and responsive to said band signal for modifying the magnitude of said tuning



control signal applied to said filter means of said first signal path relative to that applied to said filter means of said second signal path when said selected radio frequency signal is included in said second frequency band.

4,418,429

**MIXER FOR USE IN A MICROWAVE SYSTEM**

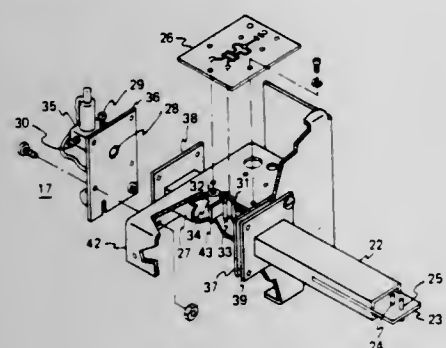
Clayton R. Roberts, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed May 7, 1982, Ser. No. 375,816

Int. Cl.<sup>3</sup> H04B 1/26

U.S. Cl. 455—327

15 Claims



1. A mixer comprising:

A. waveguide means for propagating waves in a TE 10 mode, comprising:

- (1) two electrically isolated waveguide sections, each having an electrically shorted transverse end wall;
- (2) a first mating end associated with the first waveguide section; and
- (3) a second mating end associated with the second waveguide section;

B. a local oscillator for coupling high frequency energy into said first waveguide section via said first mating end;

C. means for coupling a signal into said second waveguide section via said second mating end to be heterodyned with local oscillator energy;

D. a microstrip circuit comprising a ground plane, a dielectric layer, and surface conductors formed on said dielectric layer, said microstrip circuit further comprising:

- (1) a four-port hybrid coupler formed of surface conductors having two serial branches and two shunt branches,
- (2) a balanced detector comprising a pair of diodes, each having one electrode connected via a surface conductor to one hybrid coupler output port, the other diode electrodes being joined and connected to a surface conductor at which the detector output, containing heterodyned signals appear, and
- (3) a low pass filter formed of surface conductors, and connected to the detector output for selecting the desired low frequency heterodyne and rejecting undesired higher frequency heterodynes;

said microstrip circuit being disposed adjacent the wide face of said second waveguide section in proximity to the transverse end wall thereof;

E. a first resonant stub of approximately  $\frac{1}{4}$  electrical wavelength projecting through an aperture in the wide face of said first waveguide section into the interior thereof for coupling local oscillator energy from said first waveguide

section to one input port of said hybrid coupler, the stub forming an effective impedance transformer for matching the impedance of said first waveguide section to the impedance of said one hybrid coupler input port;

F. a second resonant stub of approximately  $\frac{1}{4}$  electrical wavelength projecting through an aperture in said wide face of said second waveguide section into the interior thereof for coupling signal energy from said second waveguide section to said other input port of said hybrid coupler, the stub forming an effective impedance transformer for matching the impedance of said second waveguide section to the impedance of the other said hybrid coupler input port.

4,418,430

**MILLIMETER-WAVELENGTH OVERMODE BALANCED MIXER**

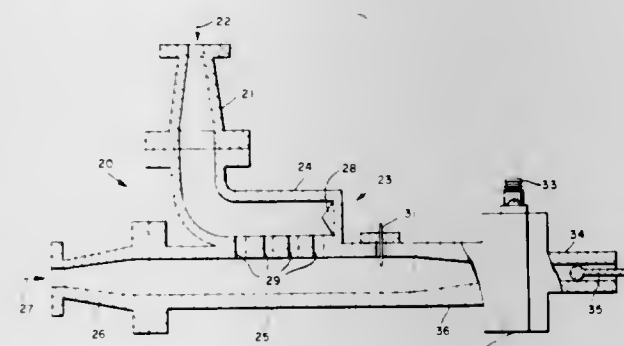
Garry N. Hulderman, Riverside, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Oct. 5, 1981, Ser. No. 308,325

Int. Cl.<sup>3</sup> H04B 1/26

U.S. Cl. 455—328

16 Claims



1. An overmode mixer comprising:

first waveguide means for converting a first applied signal at a first predetermined fundamental frequency having a first predetermined energy mode to a first output signal having a predetermined energy overmode;

second waveguide means for converting a second applied signal at a second predetermined fundamental frequency having a second predetermined energy mode to a second output signal having said predetermined energy overmode;

the first and second fundamental frequencies differing in nominal value by a selected intermediate frequency, the energy modes of the first and second applied signals being of like fundamental mode, the energy overmodes of the first and second output signals being of like overmode;

third means coupled to said first and second means for combining the energy of said first and second output signals at said predetermined energy overmode to produce intermediate frequency signals within said third means corresponding to said selected intermediate frequency; and

fourth means coupled to said third means for coupling said intermediate frequency signals out of said third means to provide an intermediate frequency output signal of said mixer.

## DESIGNS

NOVEMBER 29, 1983

271,534

**TWO COLOR CHEWING GUM**

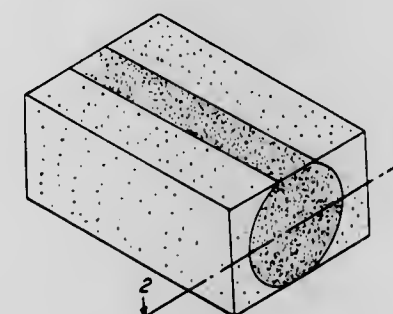
Robert J. Huzinec, Brooklyn, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 12, 1980, Ser. No. 215,962

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—12



271,537

**JEANS OR THE LIKE**

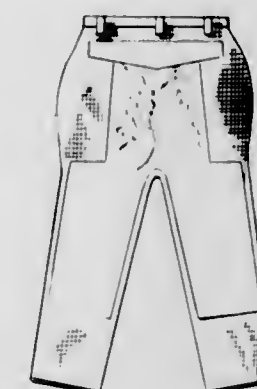
W. Homer Alsop, P.O. Box 6703, San Francisco, Calif. 94101

Filed Oct. 26, 1981, Ser. No. 315,188

Term of patent 14 years

Int. Cl. D2—02

U.S. Cl. D2—28



271,535

**TWO COLOR CHEWING GUM**

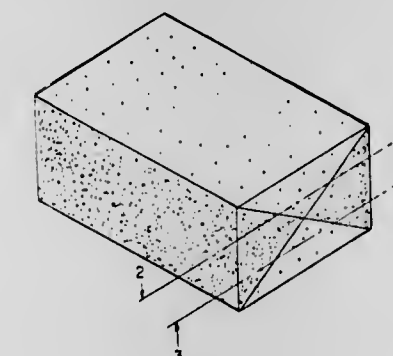
Robert J. Huzinec, Brooklyn, N.Y., assignor to Warner-Lambert Co., Morris Plains, N.J.

Filed Dec. 12, 1980, Ser. No. 215,963

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—12



271,538

**WESTERN HAT**

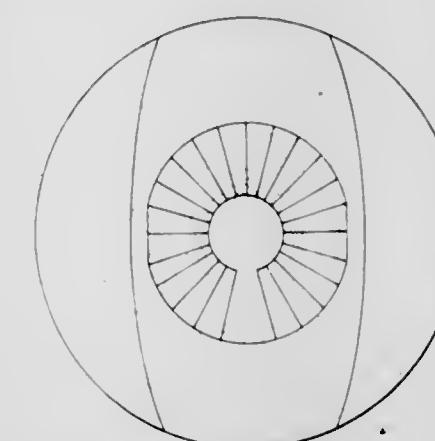
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94118

Filed Mar. 13, 1981, Ser. No. 243,300

Term of patent 14 years

Int. Cl. D02—03

U.S. Cl. D2—253



271,536

**TWO COLOR CHEWING GUM**

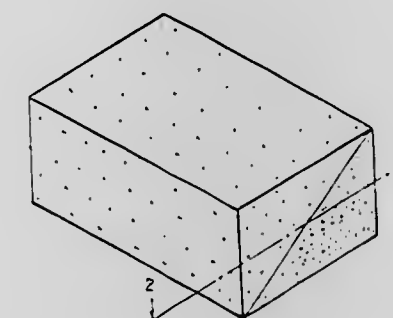
Albert E. Siecke, Westfield, N.J., assignor to Warner-Lambert Co., Morris Plains, N.J.

Filed Dec. 12, 1980, Ser. No. 215,984

Term of patent 14 years

Int. Cl. D01—01

U.S. Cl. D1—12

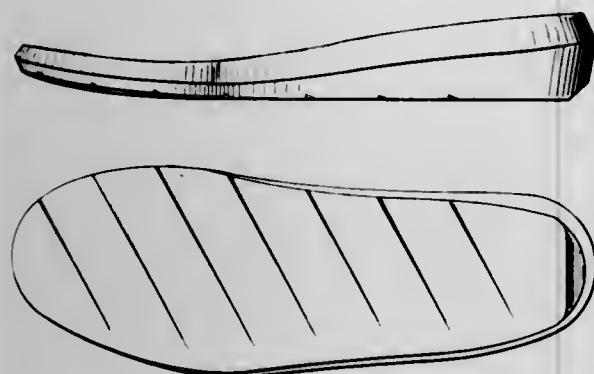




271,539  
SHOE SOLE

Charles Bergmans, Sprang Capelle, Netherlands, assignor to Clarks of England, Inc., Norwalk, Conn.  
Filed Aug. 23, 1982, Ser. No. 410,320  
Term of patent 14 years  
Int. Cl. D2-04

U.S. Cl. D2-320



271,540  
BINOCULAR CASE

Brandt G. Williams, 12090 Mound View Pl., Studio City, Calif. 91604

Filed Nov. 9, 1981, Ser. No. 319,226  
Term of patent 14 years  
Int. Cl. D3-02

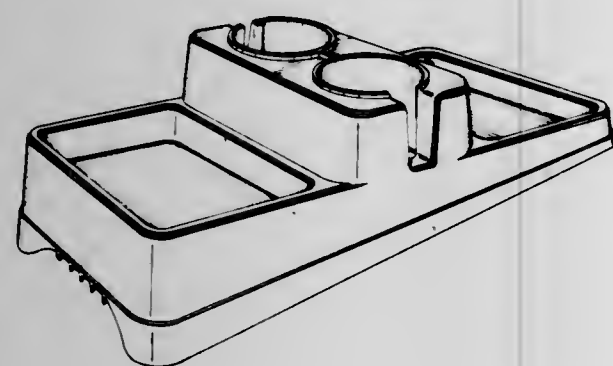
U.S. Cl. D3-33



271,541  
AUTOMOBILE SNACK TRAY

Gary L. Rockwell, 205 Willowcrest Way, LaGrange, Ga. 30240  
Filed Feb. 12, 1982, Ser. No. 348,262  
Term of patent 14 years  
Int. Cl. D12-16

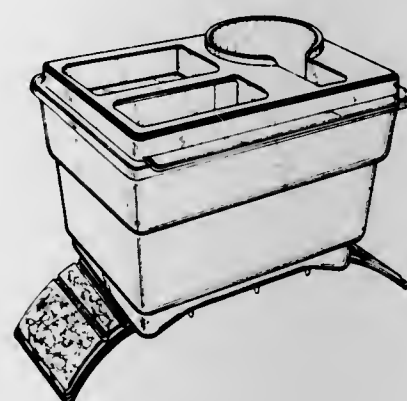
U.S. Cl. D3-40



271,542  
COMBINED SNACK TRAY AND LITTER BASKET FOR AN AUTOMOBILE

Gary L. Rockwell, 205 Willowcrest Way, LaGrange, Ga. 30240  
Filed Feb. 12, 1982, Ser. No. 348,263  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D3-40

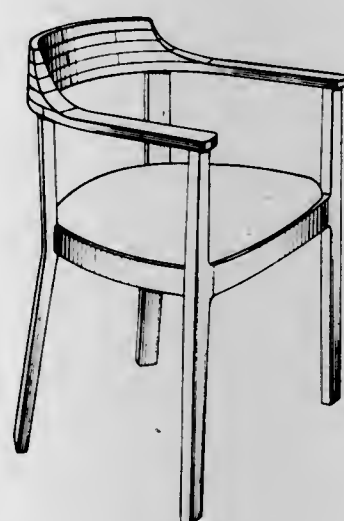


271,543  
CHAIR

Robert DeFuccio, Spinnerstown, Pa., assignor to Simmons Universal Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,734  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-73

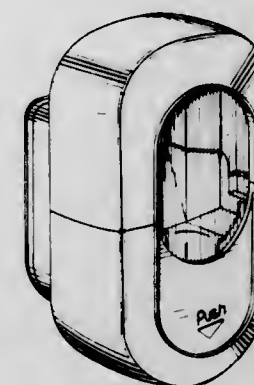


271,544  
DISPENSER FOR FLUID OR SEMI-FLUID MATERIALS

Gary B. Kleman, St. Louis, Mo., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 18, 1981, Ser. No. 274,955  
Term of patent 14 years  
Int. Cl. D23-02

U.S. Cl. D6-95

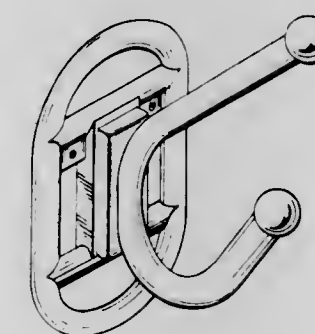


271,545  
HANGER RACK FOR GARMENTS OR THE LIKE

Vito Licari, and Yaffa Licari, both of 875 Ocean Ave., Elberon, N.J. 07740

Filed Apr. 22, 1981, Ser. No. 256,485  
Term of patent 14 years  
Int. Cl. D6-06; D8-08

U.S. Cl. D6-122

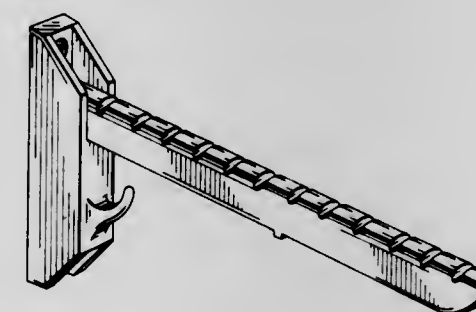


271,546  
COLLAPSIBLE RACK FOR CLOTHES HANGERS, BOLA TIES OR JEWELRY ITEMS

John N. Smith, Tempe, Ariz., assignor to Warren F. B. Lindsley, Phoenix, Ariz., a part interest

Filed Aug. 24, 1981, Ser. No. 295,868  
Term of patent 14 years  
Int. Cl. D6-04; D8-08

U.S. Cl. D6-124

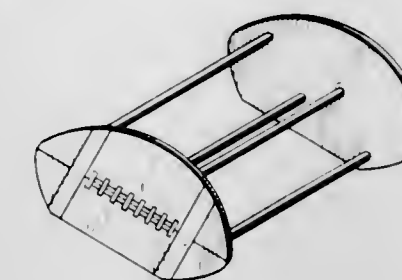


271,547  
SHOE RACK

Robert L. Bowsher, 212 - 19th Ave., Moline, Ill. 61265  
Filed Jul. 27, 1981, Ser. No. 289,831

Term of patent 14 years  
Int. Cl. D06-04

U.S. Cl. D6-153

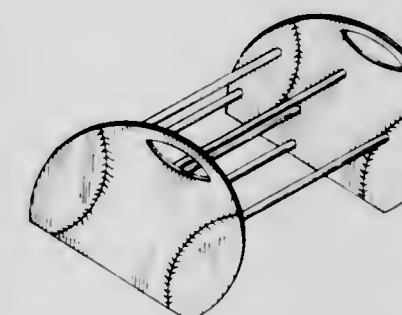


271,548  
SHOE RACK

Robert L. Bowsher, 212 - 19th Ave., Moline, Ill. 61265  
Filed Jul. 27, 1981, Ser. No. 289,832

Term of patent 14 years  
Int. Cl. D06-04

U.S. Cl. D6-153

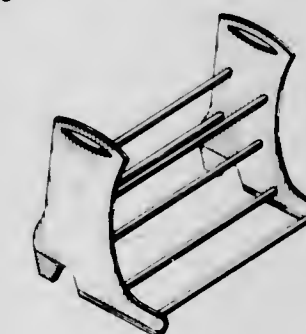


271,549  
SHOE RACK

Robert L. Bowsher, 212 - 19th Ave., Moline, Ill. 61265  
Filed Jul. 27, 1981, Ser. No. 289,833

Term of patent 14 years  
Int. Cl. D06-04

U.S. Cl. D6-153



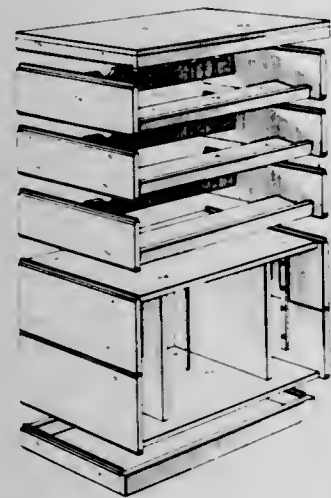


271,550

## MODULAR WINE RACK

Samuel McMillan, 2 Valley View Dr., Bloomfield, Conn. 06002  
 Filed Apr. 28, 1981, Ser. No. 258,430  
 Term of patent 14 years  
 Int. Cl. D06-04

U.S. Cl. D6-188

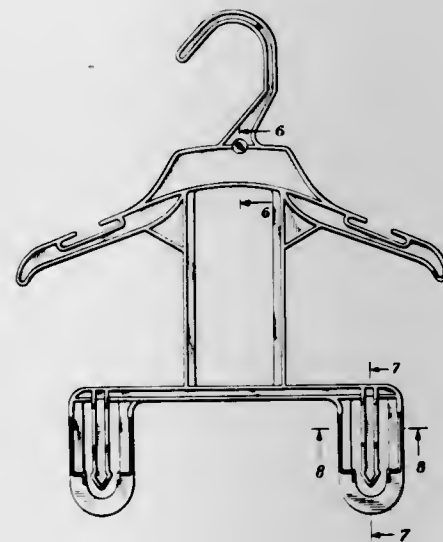


271,552

## GARMENT HANGER

Howard Samuels, Fort Lee, N.J., assignor to A&E Products Group, Inc., Keasbey, N.J.  
 Filed Oct. 30, 1981, Ser. No. 316,712  
 Term of patent 14 years  
 Int. Cl. D6-08

U.S. Cl. D6-252



271,551

## FRAME FOR A TABLE

Karl Rausch, Im Rosengartle 15, 7500 Karlsruhe-Durlach, Fed. Rep. of Germany  
 Filed Jul. 11, 1980, Ser. No. 167,530  
 Claims priority, application Fed. Rep. of Germany, Jan. 11, 1980, MR VIII/133

Term of patent 14 years  
 Int. Cl. D6-06

U.S. Cl. D6-191



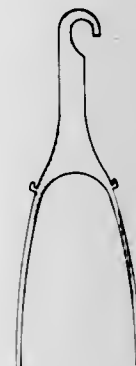
271,553

## SKIRT HANGER

Seroun Kesh, 3620 Orchard Lake Rd., West Bloomfield, Mich. 48033

Filed May 20, 1981, Ser. No. 265,528  
 Term of patent 14 years  
 Int. Cl. D6-08

U.S. Cl. D6-254



271,554

## CONTAINER CLOSURE OR THE LIKE

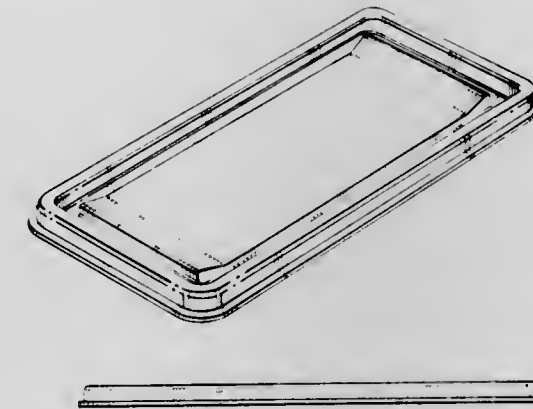
Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 20, 1981, Ser. No. 294,718

Term of patent 14 years

Int. Cl. D07-01

U.S. Cl. D7-40



271,556

## MICROWAVE COOKING UTENSIL

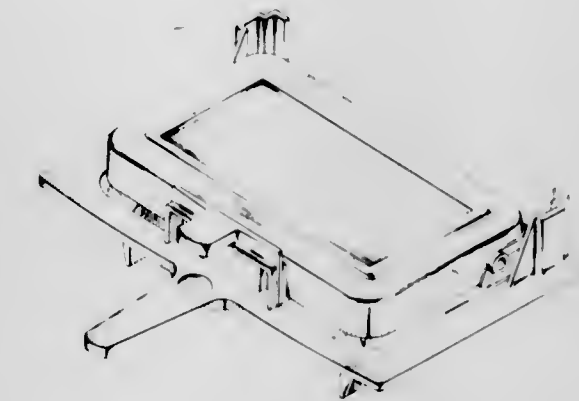
Robert F. Bowen, Burlington, Mass.; Walter B. Herbst, Evanston, Ill., and Thomas J. Martel, North Reading, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 3, 1981, Ser. No. 270,177

Term of patent 14 years

Int. Cl. D07-02

U.S. Cl. D7-352



271,555

## ICE CONTAINER

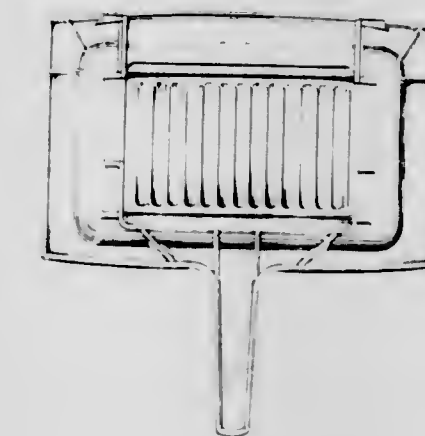
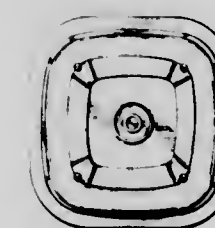
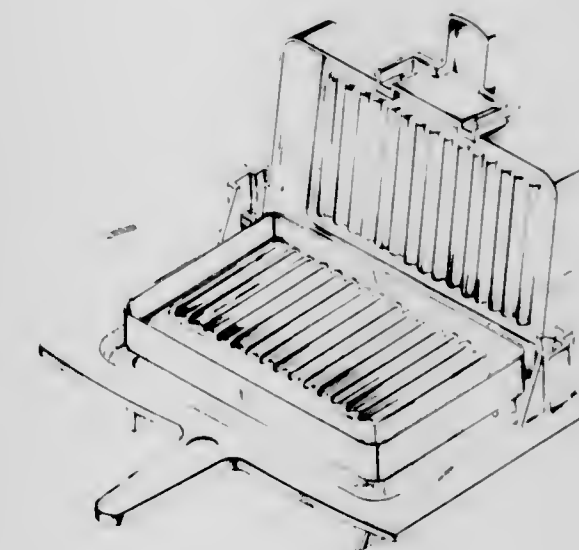
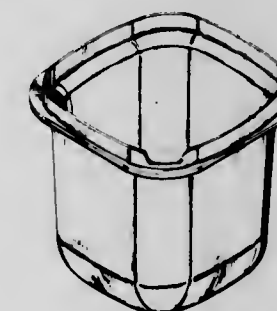
Daenen, Robert H. C. M., Hekelgem, Belgium, and Erik Herlow, Tikob, Denmark, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Sep. 17, 1981, Ser. No. 280,685

Term of patent 14 years

Int. Cl. D07-01

U.S. Cl. D7-78





271,557  
GRIDDLE

Joseph W. Schwarzli, 430 Comstock Rd., Scarborough, Ontario, Canada

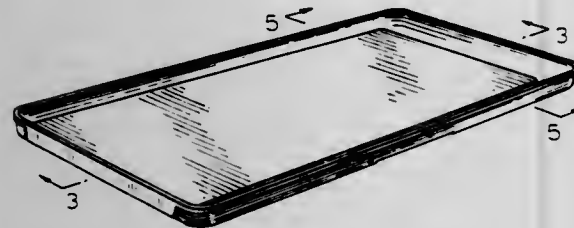
Filed Jan. 19, 1981, Ser. No. 226,053

Claims priority, application Canada, Nov. 12, 1980, 12-11-80-6

Term of patent 14 years

Int. Cl. D07-02

U.S. Cl. D7-363



271,559  
WEDGE

Richard D. Reimann, 18901 S. Lyons Rd., and Roger J. Usinger, 11331 S. Forest Ridge La., both of Oregon City, Oreg. 97045

Filed Apr. 10, 1981, Ser. No. 252,907

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-47



271,558

ACTUATOR HANDLE FOR A BEVERAGE DISPENSING VALVE

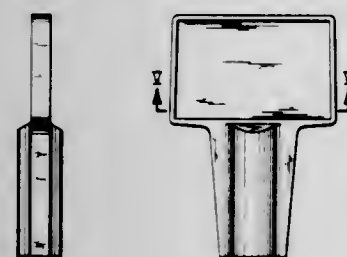
Terrance C. Belland, Maple Grove, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.

Filed Feb. 5, 1982, Ser. No. 345,979

Term of patent 14 years

Int. Cl. D15-08

U.S. Cl. D7-398



271,560

LEVER HANDLE FOR DOORS OR WINDOWS

Pasquale Valli, Renate, Italy, assignor to Valli & Colombo S.P.A., Italy

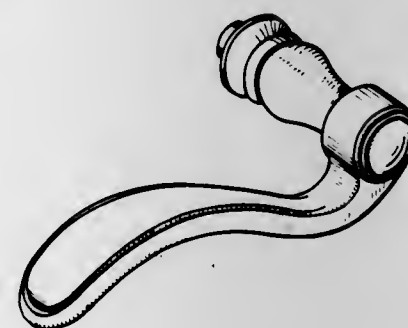
Filed Jun. 3, 1981, Ser. No. 269,949

Claims priority, application Italy, Dec. 23, 1980, 23752 B/80[U]

Term of patent 14 years

Int. Cl. D8-06

U.S. Cl. D8-308



271,561

LEVER HANDLE FOR DOORS OR WINDOWS

Pasquale Valli, Renate, Italy, assignor to Valli & Colombo S.P.A., Italy

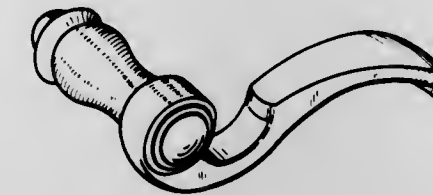
Filed Jun. 3, 1981, Ser. No. 269,950

Claims priority, application Italy, Dec. 23, 1980, 23750 B/80[U]

Term of patent 14 years

Int. Cl. D8-06

U.S. Cl. D8-308



271,564

BOTTLE

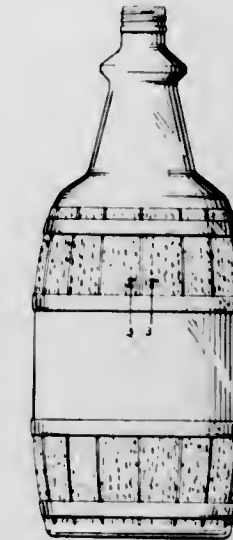
Howard Cooper, 67 W. Chestnut St., Chicago, Ill. 60610

Filed Oct. 15, 1981, Ser. No. 312,279

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-325



271,562

NESTABLE LATCH OPERATING HANDLE AND HOUSING UNIT

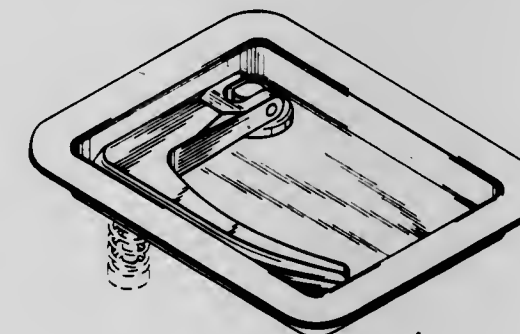
Lee S. Weirnerman, Medina, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Mar. 18, 1981, Ser. No. 245,152

Term of patent 14 years

Int. Cl. D8-07

U.S. Cl. D8-338



271,565  
BOTTLE

Glenn L. Slater, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 17, 1981, Ser. No. 284,043

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-370



271,563

ROTARY DIAL FOR COMBINATION LOCKS AND THE LIKE

Charles S. Gehrie, West Orange, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed May 19, 1981, Ser. No. 265,218

Term of patent 14 years

Int. Cl. D8-07

U.S. Cl. D8-343





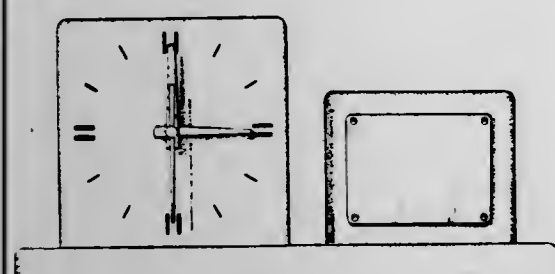
271,566

COMBINED CLOCK AND INSCRIPTION PLATE  
PEDESTAL

Clyde W. Powell, Roan Mountain, Tenn., assignor to Alpine Enterprises, Inc., Roan Mountain, Tenn.

Division of Ser. No. 26,219, Apr. 2, 1979, Pat. No. Des. 266,992.  
This application Sep. 14, 1981, Ser. No. 302,177Term of patent 14 years  
Int. Cl. D10-01

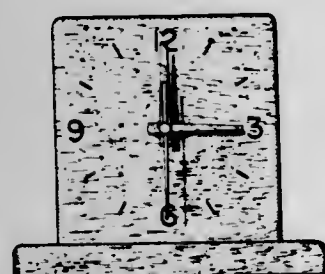
U.S. Cl. D10-2

271,567  
CLOCK

Clyde W. Powell, Roan Mountain, Tenn., assignor to Alpine Enterprises, Inc., Roan Mountain, Tenn.

Division of Ser. No. 26,219, Apr. 2, 1979, Pat. No. Des. 266,992.  
This application Sep. 14, 1981, Ser. No. 302,176Term of patent 14 years  
Int. Cl. D10-01

U.S. Cl. D10-26



271,568

## ULTRASONIC WAVE THICKNESS METER

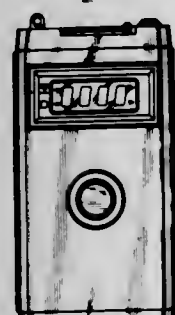
Toyohiko Kitada, Sagami, Japan; Minoru Tamura, Chigasaki, and Takanori Arioka, Tokyo, all of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,545

Claims priority, application Japan, Oct. 31, 1980, 55-45358  
Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-46



271,569

CONTROL UNIT HOUSING FOR A CONTROL PANEL  
MOUNTED CONTROL STATION

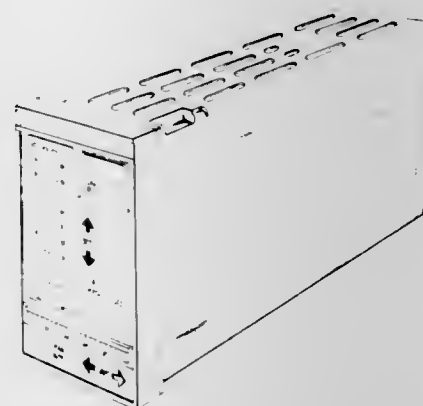
Peter K. Lui, Mentor; Thomas Scheib, Chesterland, and George S. Whaley, Eastlake, all of Ohio, assignors to The Babcock &amp; Wilcox Company, New Orleans, La.

Filed Apr. 21, 1981, Ser. No. 256,261

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-49



271,570

HIGH TEMPERATURE, HIGH PRESSURE FILTER  
PRESS FOR TESTING DRILLING FLUIDS OR SIMILAR  
APPARATUS

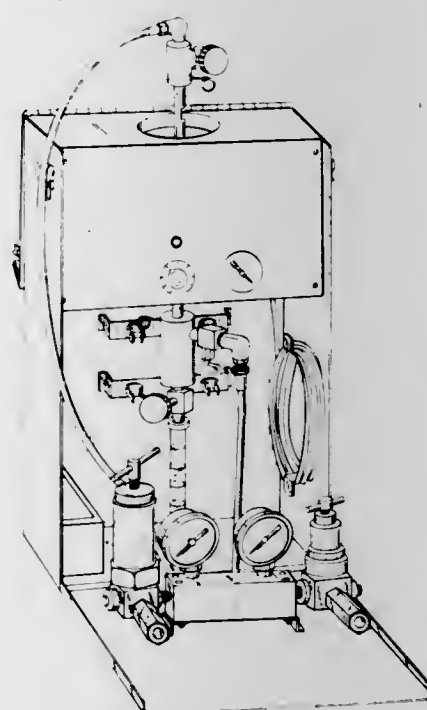
David E. Cain, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 6, 1981, Ser. No. 263,442

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-83



271,571

## CONTACT PRESSURE MEASURING A DEVICE

Bo G. Lonnstedt, Kvarnbergsvagen 23, S-141 45 Huddinge, Sweden

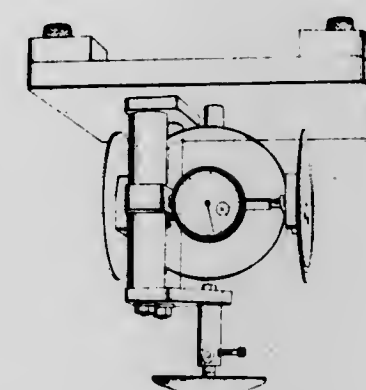
Filed Jun. 9, 1981, Ser. No. 271,958

Claims priority, application Sweden, Dec. 10, 1980, 80-2499

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-83



271,572

SIGNALLING DEVICE FOR DETECTING WAVES IN A  
BODY OF WATER

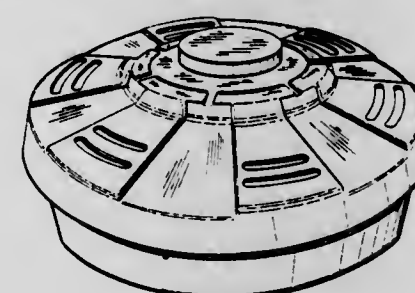
R. Douglas Creelman, Weston, Canada, assignor to Georgian Manufacturing Ltd., Don Mills, Canada

Filed May 26, 1981, Ser. No. 266,897

Term of patent 14 years

Int. Cl. D10-05

U.S. Cl. D10-106



271,573

## ULTRA SONIC ALARM DETECTOR

Seihei Wada, Yachiyo, and Kiyozumi Chino, Musahino, both of Japan, assignors to Uro Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,813

Term of patent 14 years

Int. Cl. D10-05

U.S. Cl. D10-106



271,574

## NECKLACE

Gianni Bulgari, 11 Via del Condotti, Rome, Italy 00187

Continuation-in-part of Ser. No. 345,112, Feb. 2, 1982. This application Sep. 20, 1982, Ser. No. 420,469

Claims priority, application Italy, Aug. 7, 1981, 35963 B/81[U]

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-13



271,575

## LINK

Clyde K. Nichols, LaMoutonniere Mourex, 01220 Divonne Les Bains, France

Filed Feb. 22, 1982, Ser. No. 350,647

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-93



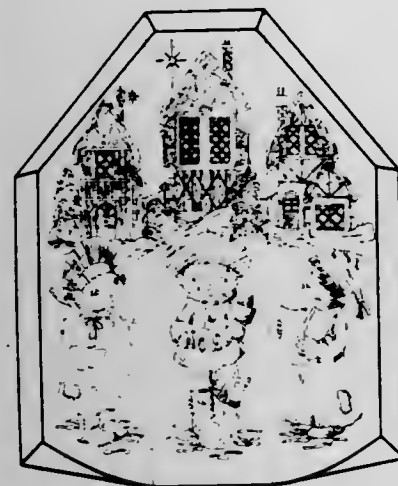


271,576

## ORNAMENT

George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002  
 Filed Nov. 24, 1981, Ser. No. 324,561  
 Term of patent 14 years  
 Int. Cl. D11-05

U.S. Cl. D11-128



271,577

## FIGURINE

Susan J. Culkin, 169 N. Kellogg, Apt. C, Santa Barbara, Calif.  
 93111

Filed May 14, 1981, Ser. No. 263,416  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-161



271,578

## FIGURINE

Susan J. Culkin, 169 N. Kellogg, Apt. C, Santa Barbara, Calif.  
 93111

Filed Sep. 4, 1981, Ser. No. 299,398  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-161



271,579

## DESIGN FOR A BOAT

Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.

Filed Jun. 5, 1981, Ser. No. 270,794  
 Term of patent 14 years  
 Int. Cl. D12-06

U.S. Cl. D12-300



271,580

## BOAT

Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.

Filed Jun. 5, 1981, Ser. No. 270,796  
 Term of patent 14 years  
 Int. Cl. D12-06

U.S. Cl. D12-300



271,581

## BOAT

Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.

Filed Jun. 10, 1981, Ser. No. 270,859  
 Term of patent 14 years  
 Int. Cl. D12-06

U.S. Cl. D12-300



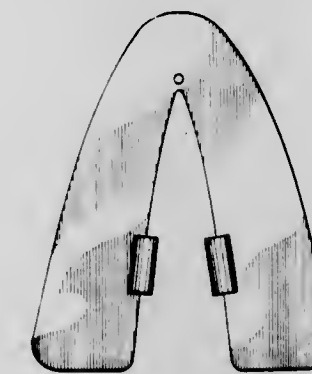
271,582

## CATAMARAN ANTI-PITCH HYDROFOIL

Lloyd C. Knowles, 43 Front St., Hopkinton, Mass. 01748

Filed Sep. 3, 1981, Ser. No. 298,944  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-317



271,583

## PROPELLER SHAFT LOCK HOUSING

Richard D. Badzinski, Oak Creek, and George G. Nigel, St. Francis, both of Wis., assignors to Shaft Lok, Inc., New Berlin, Wis.

Filed Sep. 4, 1981, Ser. No. 299,396  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-317



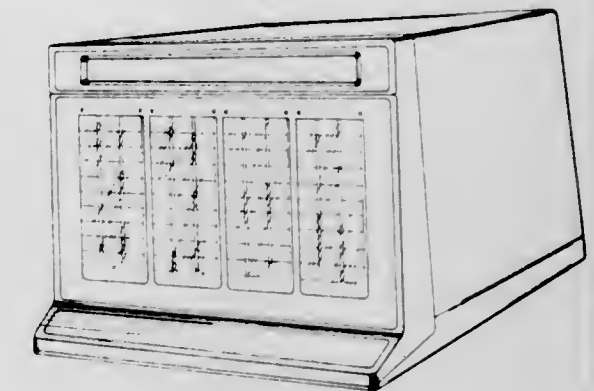
271,584

## CONTROL STATION

David M. Arrigoni, 19900 Old Santa Cruz Hwy., Los Gatos, Calif. 94030

Filed Feb. 12, 1981, Ser. No. 233,800  
 Term of patent 14 years  
 Int. Cl. D13-03; D14-02

U.S. Cl. D13-12



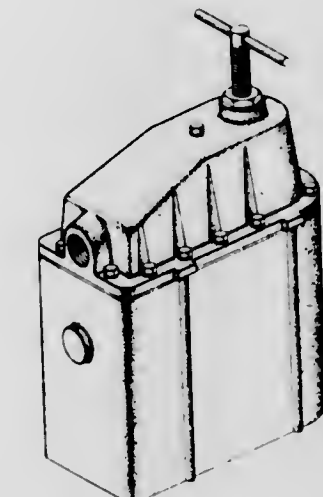
271,585

## AIR DOME FOR PUMPING AND DEWATERING SYSTEMS

Wendell L. Bradford, Corona, Calif., assignor to Stang Hydronics Inc., Orange, Calif.

Filed Jul. 20, 1981, Ser. No. 284,617  
 Term of patent 14 years  
 Int. Cl. D15-02

U.S. Cl. D15-7



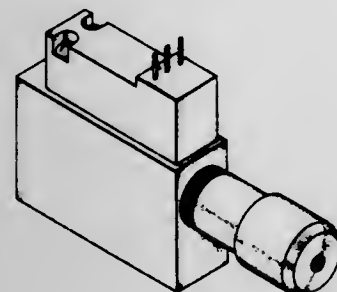


271,586

**COMBINED VACUUM PUMP AND CONTROL VALVE THEREFOR**

Yoji Ise, Tokyo, Japan, assignor to Myotoku Ltd., Japan  
 Filed Oct. 19, 1981, Ser. No. 312,551  
 Claims priority, application Japan, Apr. 30, 1981, 56-18295  
 Term of patent 14 years  
 Int. Cl. D15-02

U.S. Cl. D15-7

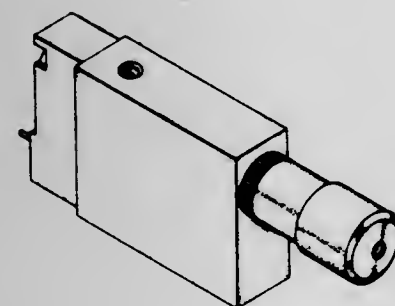


271,587

**COMBINED VACUUM PUMP AND CONTROL VALVE THEREFOR**

Yoji Ise, Tokyo, Japan, assignor to Myotoku Ltd., Japan  
 Filed Oct. 19, 1981, Ser. No. 312,568  
 Claims priority, application Japan, Apr. 30, 1981, 56-18296  
 Term of patent 14 years  
 Int. Cl. D15-02

U.S. Cl. D15-7

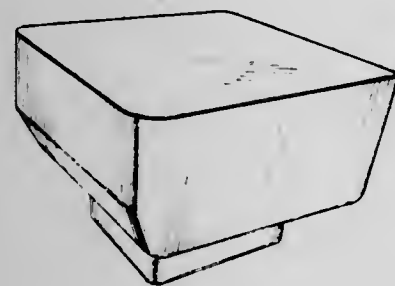


271,588

**METAL BAR**

Christian S. Bakken, Ski, and Jan B. Ronhaug, Porsgrunn, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway  
 Filed Apr. 28, 1981, Ser. No. 258,271  
 Term of patent 14 years  
 Int. Cl. D31-00

U.S. Cl. D15-144

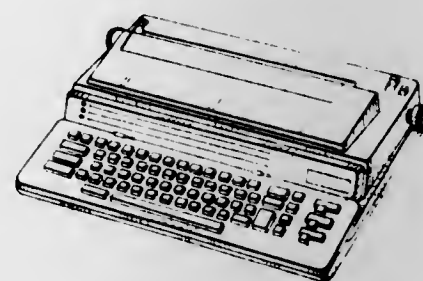


271,589

**TYPEWRITER**

Takashi Hirata, Yokohama; Junichi Motoyoshi, Funabashi; Yoshihiro Kobata, and Masahiro Rachi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Jun. 18, 1981, Ser. No. 275,401  
 Claims priority, application Japan, Dec. 22, 1980, 55-53820  
 Term of patent 14 years  
 Int. Cl. D18-01

U.S. Cl. D18-1

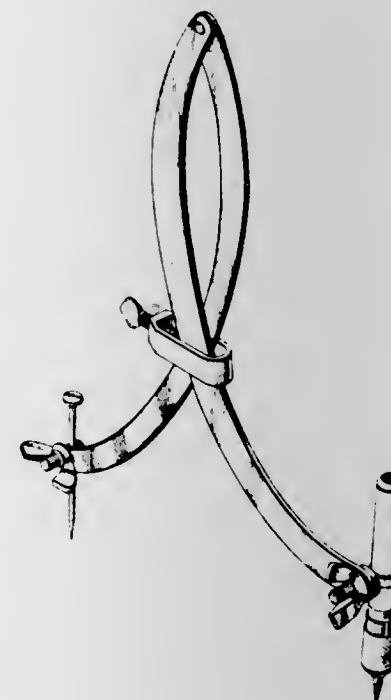


271,590

**COMPASS**

James E. Ashcroft, 1307 Westmoreland, Colorado Springs, Colo. 80907  
 Filed Apr. 16, 1981, Ser. No. 254,952  
 Term of patent 14 years  
 Int. Cl. D19-06

U.S. Cl. D19-38



271,591

**TOY TRACK WAY**

Ottilla Z. Taylor, San Carlos, and Janos J. Lazar, Redwood City, both of Calif., assignors to Injection Mold Partners, Ltd., San Rafael, Calif.  
 Filed Oct. 17, 1980, Ser. No. 182,414  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D21-59

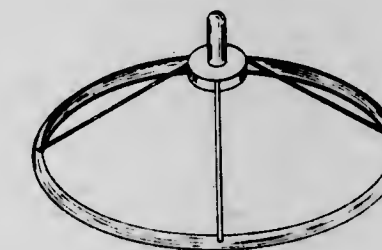


271,592

**TOY TRACKWAY**

Ottilla Z. Taylor, San Carlos, and Janos J. Lazar, Redwood City, both of Calif., assignors to Injection Mold Partners, Ltd., San Rafael, Calif.  
 Filed Oct. 17, 1980, Ser. No. 182,415  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D21-59



271,593

**SAND MOLD**

Lorraine D. Stone, and Susan C. Clark, both of Newport Beach, Calif., assignors to Sand Designs, Inc., Costa Mesa, Calif.  
 Filed Mar. 24, 1981, Ser. No. 246,997  
 Term of patent 14 years  
 Int. Cl. D21-03

U.S. Cl. D21-59

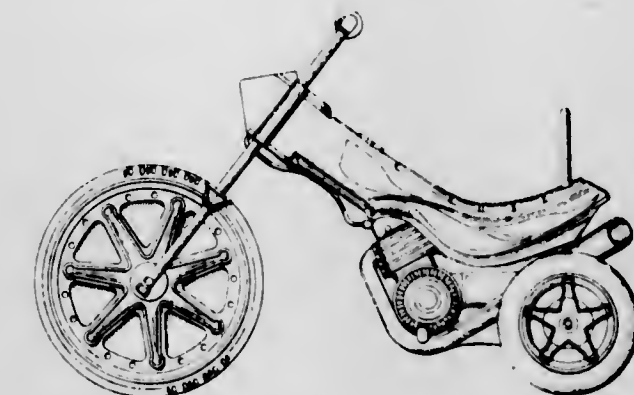


271,594

**TOY RIDING CYCLE FOR CHILDREN**

Frank Mercurio, Wallingford, and Richard H. Ratkewich, Prospect, both of Conn., assignors to Coleco Industries, Inc., Hartford, Conn.  
 Filed Jun. 8, 1981, Ser. No. 271,432  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D21-80

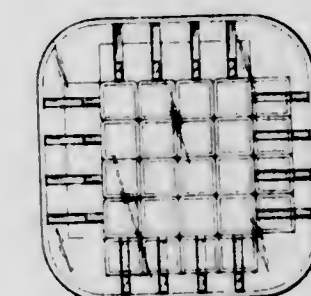
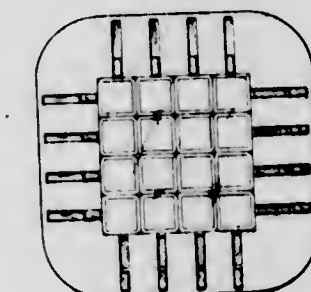


271,595

**PUZZLE TOY**

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Japan  
 Filed Nov. 23, 1981, Ser. No. 323,968  
 Claims priority, application Japan, Jun. 4, 1981, 56/24515  
 Term of patent 14 years  
 Int. Cl. D21-01

U.S. Cl. D21-104





271,596

**COMBINED TOY TYPEWRITER AND LOUDSPEAKER  
THEREFOR**Alan Collison, Rainworth, England, assignor to Dobson Park  
Industries, Limited, England

Filed May 21, 1981, Ser. No. 265,971

Claims priority, application United Kingdom, Dec. 8, 1980, U.S. Cl. D21-166  
80/997942Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D21-127

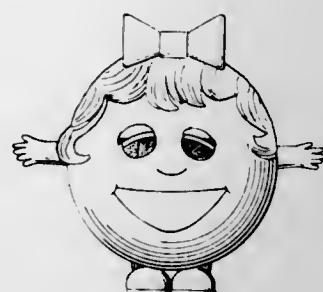
271,598  
DOLL

Charles H. Helein, 11752 Dry River Ct., Reston, Va.

Filed Jan. 27, 1982, Ser. No. 343,104

Term of patent 14 years

Int. Cl. D21-01



271,599

**CHILD'S DOLL**

Lorrie E. Foster, 25357 Via Oriol, Valencia, Calif. 91355

Filed Nov. 24, 1981, Ser. No. 324,592

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-171

271,600  
DOLL

Masahiko Yamada, 1-15-30, Tomiokita, Nara, Japan

Filed Sep. 28, 1981, Ser. No. 306,247

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-177

271,597  
DOLLElizabeth M. Beanland, 19919- 48th Ave., Langley, British  
Columbia, Canada

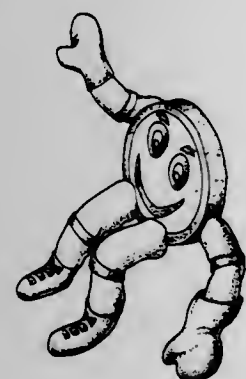
Filed Oct. 19, 1981, Ser. No. 312,422

Claims priority, application Canada, May 1, 1981, 01-05-81-4

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-166



271,601

**STUFFED FIGUREHEAD DOLL**

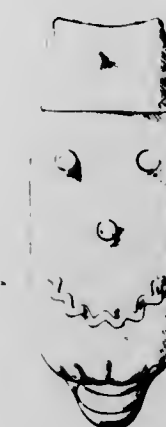
Lynda H. Newman, 666 W. 18th St., No. 3, Costa Mesa, Calif. 92627

Filed Oct. 19, 1981, Ser. No. 312,420

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-190



271,604

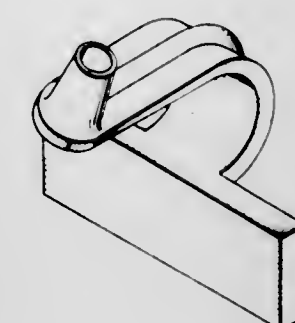
**GOLF PUTTER HEAD**Frank B. Stone, Rte. #3, Box 297, Woodruff, S.C. 29388, and  
Robert L. Hatcher, Sallsbury, N.C., assignors to Frank B.  
Stone, Woodruff, S.C.

Filed Jun. 11, 1981, Ser. No. 272,567

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-217



271,605

**CAP FOR SKATE WHEEL OR SIMILAR ARTICLE**Michael Esposito, and Dominic Esposito, both of 330 S. Regent  
St., Port Chester, N.Y. 10573

Filed Oct. 24, 1980, Ser. No. 200,374

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-226



271,602

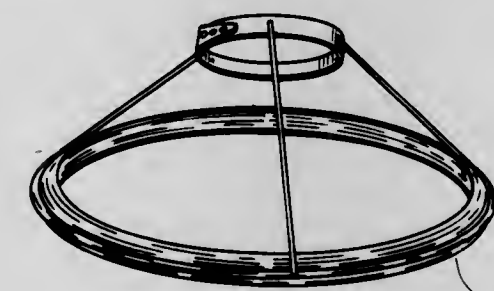
**HOOP EXERCISER**Ottilia Z. Taylor, San Carlos, and Janos J. Lazar, Redwood  
City, both of Calif., assignors to Injection Mold Partners,  
Ltd., San Rafael, Calif.

Filed Oct. 17, 1980, Ser. No. 182,416

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-191



271,603

**PHYSICAL EXERCISER**

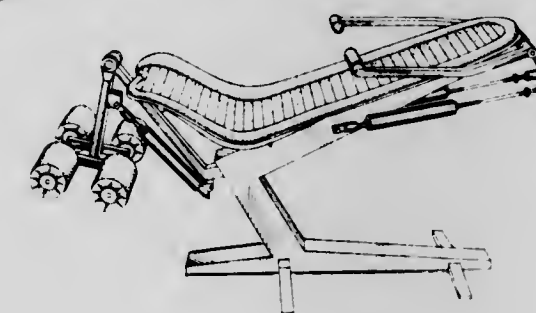
James H. Berner, 121 Merritt Way, Sacramento, Calif. 95825

Filed Nov. 27, 1981, Ser. No. 325,115

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-195



271,606

**MARINE RESCUE AND RECREATIONAL BOARD**Charles D. Corey, 5 Jones La., Huntington, N.Y. 11743, and  
Francesco A. Pia, 3 Boulder Brae La., Larchmont, N.Y. 10538Continuation-in-part of Ser. No. 82,278, Oct. 5, 1979,  
abandoned. This application Oct. 9, 1981, Ser. No. 309,996

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-228

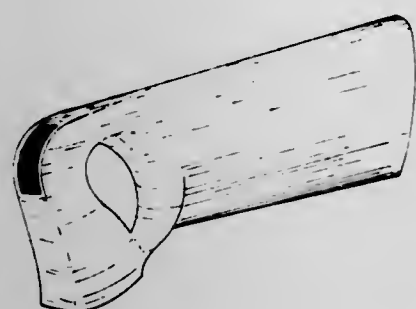




271,607  
GUN STOCK

Aspenwall, John E., 1327 Madrid Way, Sandy, Utah 84070  
Filed Aug. 17, 1981, Ser. No. 293,350  
Term of patent 14 years  
Int. Cl. D22-01

U.S. Cl. D22-6



271,608  
RIFLE SLING

Randall B. Finley, 362 S. 100 W., Orem, Utah 84057  
Filed Oct. 5, 1981, Ser. No. 308,257  
Term of patent 14 years  
Int. Cl. D22-01

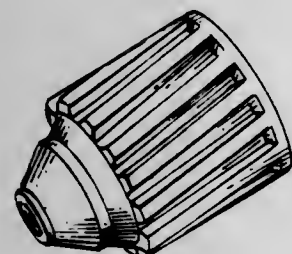
U.S. Cl. D22-7



271,609  
PROJECTILE FOR A SHOTGUN

Worthy H. Brown, R.D. #2, Box 268, Gillette Rd., Mexico, N.Y. 13114  
Filed Jul. 10, 1981, Ser. No. 282,156  
Term of patent 14 years  
Int. Cl. D22-03

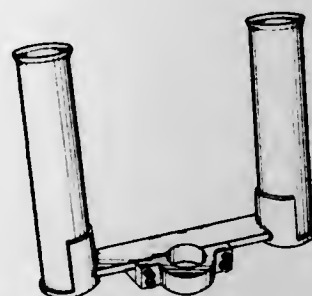
U.S. Cl. D22-10



271,610  
CLAMPABLE FISHING ROD HOLDER

Michael G. Lummis, Portage, Mich., assignor to Pacific-Atlantic Products, Ltd., Kalamazoo, Mich.  
Filed Dec. 28, 1981, Ser. No. 334,973  
Term of patent 14 years  
Int. Cl. D22-05

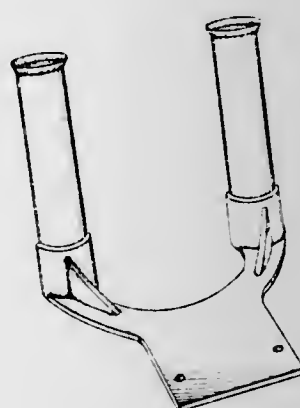
U.S. Cl. D22-13



271,611  
FISHING ROD HOLDER

Michael G. Lummis, Portage, Mich., assignor to Pacific-Atlantic Products, Ltd., Kalamazoo, Mich.  
Filed Dec. 28, 1981, Ser. No. 334,974  
Term of patent 14 years  
Int. Cl. D22-05

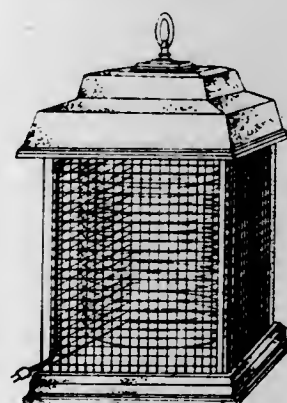
U.S. Cl. D22-13



271,612  
ELECTRIC INSECT KILLER

Harold N. Minick; Russell O. Blanchard, both of Marshall, Mich., and Donald L. Townsend, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.  
Filed Aug. 21, 1981, Ser. No. 295,245  
Term of patent 14 years  
Int. Cl. D22-06

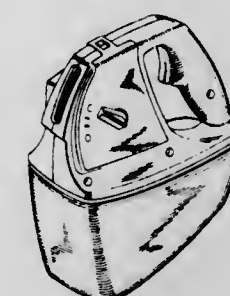
U.S. Cl. D22-19



271,613  
PAINT SPRAYER

Donald E. Watkins, Parma, Ohio, assignor to The Wooster Brush Company, Wooster, Ohio  
Filed Jan. 12, 1981, Ser. No. 224,611  
Term of patent 14 years  
Int. Cl. D23-01

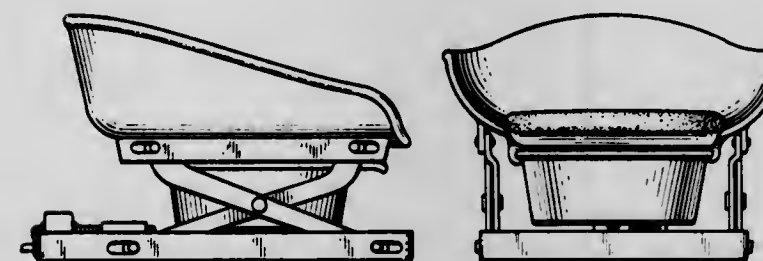
U.S. Cl. D23-18



271,614  
ADJUSTABLE COMMODE CHAIR

James W. Martin, Midlothian Country Club Grounds, Midlothian, Ill. 60445  
Filed May 26, 1981, Ser. No. 266,941  
Term of patent 14 years  
Int. Cl. D23-02

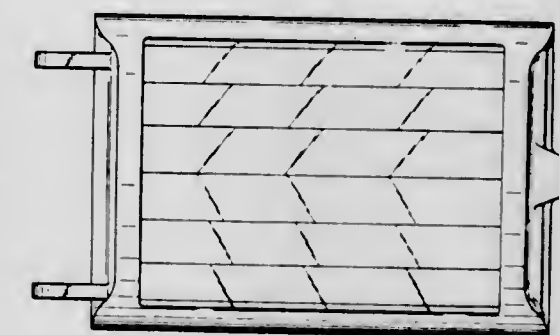
U.S. Cl. D23-48



271,616  
STOVE FRONT

William Albinson, and Fred Albinson, both of 4018 W. 21st Ave., Vancouver, B.C., Canada V6S 1H9  
Filed Nov. 3, 1981, Ser. No. 317,768  
Claims priority, application Canada, Oct. 5, 1981, 05-10-81-1  
Term of patent 14 years  
Int. Cl. D23-03

U.S. Cl. D23-128



271,617  
DENTAL ROOT-CANAL BROACH HANDLE

Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France  
Filed Mar. 27, 1981, Ser. No. 248,227  
Claims priority, application Hague, Oct. 30, 1980, N DM/000416; Nov. 20, 1980, N DM/000447  
Term of patent 14 years  
Int. Cl. D24-02

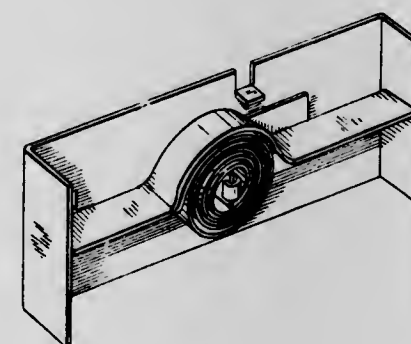
U.S. Cl. D24-10



271,615  
DAMPER UNIT

John Prikkel, III, Dayton; Dale R. Booher, and Jeffrey R. Killin, both of Fairborn, all of Ohio, assignors to Energy Vent, Inc., Dayton, Ohio  
Filed Apr. 6, 1981, Ser. No. 251,207  
Term of patent 14 years  
Int. Cl. D23-03

U.S. Cl. D23-127





271,618

**ADAPTOR FOR ENDOSCOPE**

Shinichi Nishigaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

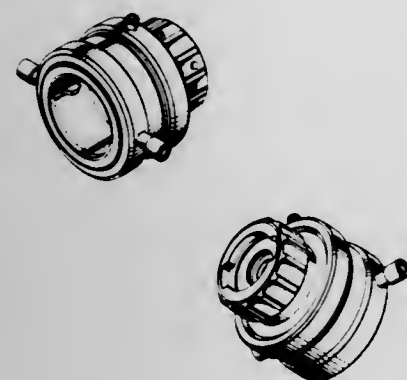
Filed Jun. 29, 1981, Ser. No. 278,670

Claims priority, application Japan, Mar. 13, 1981, 56-10637

Term of patent 14 years

Int. Cl. D24-02; D16-05

U.S. Cl. D24-18



271,619

**SPECIMEN CUP ASSEMBLY FOR A CLINICAL CHEMISTRY ANALYZER**

Raymond J. Herrmann, Westlake, Ohio, assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 30, 1982, Ser. No. 404,478

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-29



271,620

**BUILDING STRUCTURE**

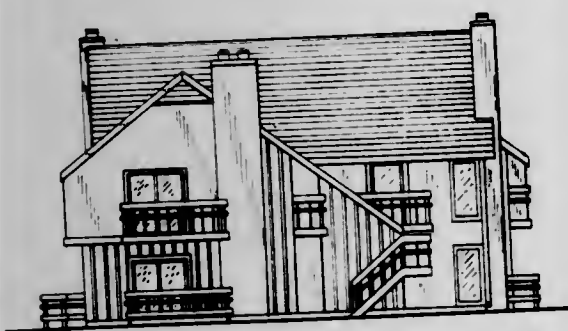
Jack P. DeBoer, Wichita, Kans., assignor to The Residence Inn Corp., Wichita, Kans.

Filed Nov. 27, 1981, Ser. No. 325,217

Term of patent 14 years

Int. Cl. D25-03

U.S. Cl. D25-17



271,621

**DUAL HEADLIGHT ASSEMBLY**

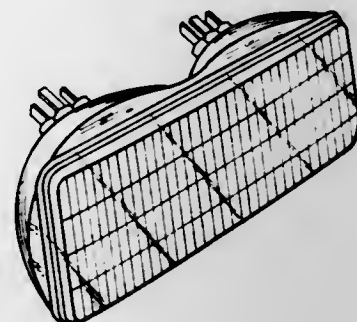
Gar M. Ziver, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,681

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D26-35



271,622

**POUCH FOR SMOKING MATERIALS**

Doris A. Holloway, Rte. 3, Box 315, Bowling Green, Ky. 42101

Filed Dec. 15, 1980, Ser. No. 216,390

Term of patent 14 years

Int. Cl. D27-06

U.S. Cl. D27-44



271,623

**ANIMAL CAPSULE**

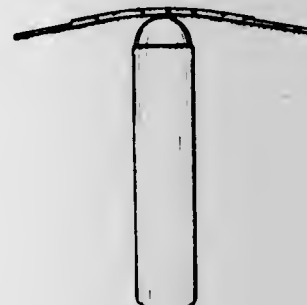
Barbara E. Simpson, Indianapolis, Ind., and Norman A. Gervais, Hardy, Va., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 27, 1981, Ser. No. 258,223

Term of patent 14 years

Int. Cl. D28-01

U.S. Cl. D28-2



271,624

**LOTION APPLICATOR**

Ralph E. Paulson, 14802 Grevillea Ave., Lawndale, Calif. 90260

Filed Apr. 30, 1981, Ser. No. 258,957

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-7



271,626

**WINDSHIELD CLEANER**

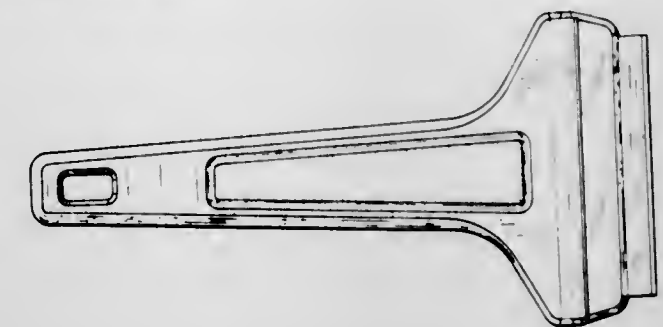
Harold F. Bauer, Newton, Kans., assignor to Conchemco, Incorporated, Overland Park, Kans.

Filed Oct. 16, 1981, Ser. No. 312,140

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D32-42



271,627

**WINDSHIELD CLEANER**

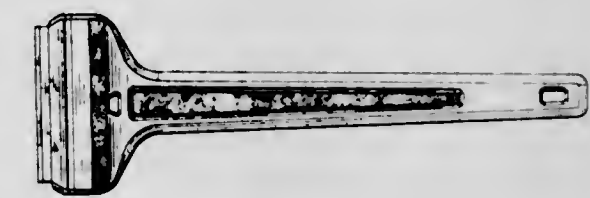
Harold F. Bauer, Newton, Kans., assignor to Conchemco, Incorporated, Overland Park, Kans.

Filed Nov. 16, 1981, Ser. No. 321,690

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D32-42



271,625

**RAZOR HANDLE**

Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.

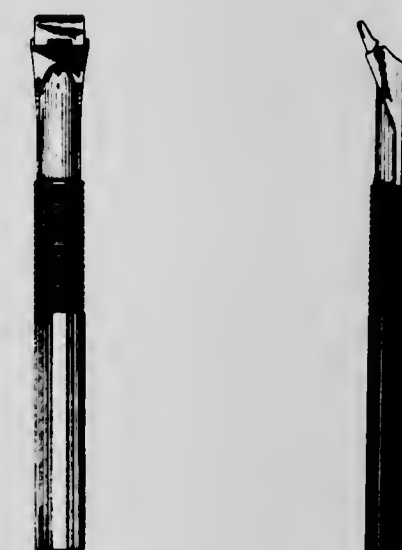
Continuation-in-part of Ser. No. 359,876, Mar. 19, 1982. This

application Sep. 28, 1982, Ser. No. 425,264

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-48



271,628

**WINDSHIELD CLEANER**

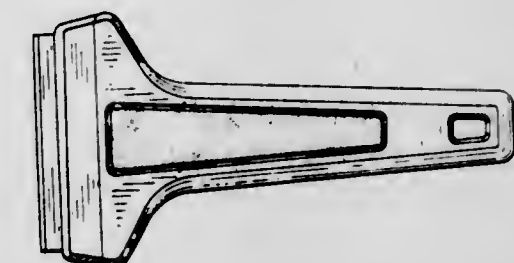
Harold F. Bauer, Newton, Kans., assignor to Conchemco, Incorporated, Overland Park, Kans.

Filed Oct. 26, 1981, Ser. No. 314,710

Term of patent 14 years

Int. Cl. D7-05

U.S. Cl. D32-49





## REEXAMINATIONS

NOVEMBER 29, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

### B1 4,010,756 (140th) HEART PACER LEAD WIRE WITH BREAK-AWAY NEEDLE

Jacques DuMont, Asnieres, and Jacques Romagne, Les Essarts le Roi, both of France, assignors to Ethicon, Inc., Somerville, N.J.

Reexamination Request No. 90/000,284, Nov. 8, 1982.  
Reexamination Certificate for Patent No. 4,010,756, issued Mar. 8, 1977, Ser. No. 657,897, Feb. 13, 1976.

Claims priority, application France, Feb. 14, 1975, 75 04710  
Int. Cl.<sup>3</sup> A61N 1/04

U.S. Cl. 128—786

AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:

Claims 1 and 10 are determined to be patentable as amended:

Claims 2-9, dependent on amended claims, are determined to be patentable.

New claims 11-14 are added and determined to be patentable.

1. In a surgical electrode comprising
  - a. an electrically conductive wire,
  - b. a metal needle having a pointed end and a blunt end, said needle being attached adjacent its blunt end to and in electrical contact with said wire and having a substantially straight shank portion adjacent the point of attachment to said wire, and
  - c. a non-conductive coating over the exterior surface of the wire electrically insulating said wire over a major portion of the length thereof,

the improvement comprising providing a weakened zone in the needle adjacent the straight shank portion of said needle, said electrically conductive wire terminating between said blunt end and said weakened zone whereby said needle may be readily broken at said weakened zone without said electrically conductive wire extending outwardly beyond said straight shank portion to thereby facilitate connection of said straight shank portion to an electrical device, including to a pacemaker or the like.

### B1 4,116,358 (141st) WEATHER AND VAPOR SEAL FOR STORAGE TANK

John S. Kinghorn; Robert B. Wagoner, both of Houston, and Alfred J. Turala, Seabrook, all of Tex., assignors to Graver Tank & Mfg. Co., Inc., Pasadena, Tex.

Reexamination Request No. 90/000,214, Jun. 7, 1982.  
Reexamination Certificate for Patent No. 4,116,358, issued Sep. 26, 1978, Ser. No. 797,465, May 16, 1977.

Int. Cl.<sup>3</sup> B65D 88/42, 88/46

U.S. Cl. 220—222

AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:

Claims 1-9 and 11-15 having been finally determined to be unpatentable, are cancelled.

Claim 10 is determined to be patentable as amended:

New claim 16 is added and determined to be patentable.

16. In a storage tank having a cylindrical wall and a floating roof spaced from the wall by a rim space having a dimension between the wall and the roof which varies about an average dimension, a combined weather and vapor seal for covering the rim space, comprising:

a flexible shield comprising a plurality of adjacent flexible shield sections disposed around the perimeter of the roof and substantially completely covering the rim space, each such shield section having a first end rigidly connected to an upper portion of the floating roof and a second end extending toward the wall of the storage tank; said shield being inclined upwardly from the horizontal toward the wall of the tank;

flexible means supported from said shield for engaging the inner surface of the wall, the combination of said shield and said flexible means disposed to extend from the upper portion of the roof to the wall at an acute angle A with respect to the horizontal, and each shield section having, when unflexed, a substantially linear dimension in the direction of its intended extension from the roof toward the wall which is greater than the average rim space dimension divided by the cosine of the angle A, such that, upon installation in the tank, each shield section flexes along its linear dimension to urge said flexible means against the tank wall;

said flexible means comprising a wiper blade having an upwardly facing top surface, a downwardly facing lower surface and a slot between the top and bottom surfaces of the wiper blade for receiving said shield sections;

vapor seal means associated with said shield sections for preventing the escape of vapors from within the tank and between the shield sections;

whereby the dimensioning of said shield ensures that said flexible means remains firmly pressed against the tank wall as the rim space varies so as to inhibit the release of vapors from the interior of the tank and to protect the interior of the tank from atmospheric contaminants, and said vapor seal means further inhibits the loss of vapors from the interior of the tank to the atmosphere; and

a plurality of resilient metal strips fastened to the underside of said shield sections and dimensioned to extend from the connection between a shield section and the roof to beyond and beneath the point where said shield section mates with said slot in said wiper blade, whereby after elevation of the roof to a point where said wiper blade extends above the wall of the tank, said resilient strips bear on the top of the tank wall when the roof descends so as to cover an interface between said shield and said wiper blade and prevent said interface from being held by the top of the tank wall.

B1 4,265,393 (142nd)

### BOX CONSTRUCTION

Edgar L. Orchard, St. Louis County, Mo., assignor to Orco Sales Co., Inc., St. Louis, Mo.

Reexamination Request No. 90/000,204, May 24, 1982.  
Reexamination Certificate for Patent No. 4,265,393, issued May 5, 1981, Ser. No. 83,237, Oct. 10, 1979.

Int. Cl.<sup>3</sup> B65D 5/10, 5/66, 45/00

U.S. Cl. 229—40

AS A RESULT OF REEXAMINATION, IT HAS BEEN  
DETERMINED THAT:



Claims 8 and 9, having been finally determined to be unpatentable, are cancelled.

Claims 1, 2, 4, 5, 7, and 10 are determined to be patentable as amended:

Claims 3 and 6, dependent on amended claims, are determined to be patentable.

New claims 11-14 are added and determined to be patentable.

1. A box construction having a bottom wall, parallel side walls, front and back walls, a top wall closure *having a front*

*free end, opposite side edge portions, and being* swingable about its rearward end upon said rear wall for movement between raised, box-open and lowered, box-closed condition, latch tabs extending downwardly from said top wall when in closed condition, keeper-forming means provided in said side walls for accepting said latch tabs when the box is in closed condition, and stop means projecting laterally *outwardly beyond the adjacent side walls of the container, the adjacent side edge portion of the top wall, and the adjacent latch tab when the box is in closed condition, in which latter condition said stop means are* [of said box] immediately rearwardly of said latch tabs [when the box is in closed condition] for detent relationship with the rearward edges of said latch tabs to inhibit accidental opening of said box.

## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Nattermann & Cie GmbH: See—  
Welter, Andre; Christiaens, Leon; and Wirtz-Peitz, Ferdinand, 4,418,069, Cl. 424-269.000.
- Abbott Laboratories: See—  
Genese, Joseph N.; and Muetterties, Andrew J., 4,417,577, Cl. 604-81.000.
- McAlpine, James B.; and Carney, Ronald E., 4,418,193, Cl. 536-16.100.
- Abbott, Philip A.; Dailey, James E.; Karsan, Demir I.; and Mangiavacchi, Andrea, to Brown & Root, Inc. Mooring and supporting apparatus and methods for a guyed marine structure, 4,417,831, Cl. 405-227.000.
- Abe, Fumiyoshi; and Okafuji, Takayuki, to Sony Corporation. DC Motor control circuit, 4,418,303, Cl. 318-254.000.
- Abe, Michio; and Maeda, Naoyuki, to Tokai TRW & Co., Ltd. Electrically driven oil pressured power steering apparatus, 4,417,640, Cl. 180-142.000.
- Abe, Yoshihiro, to Ashai Glass Company Ltd.; and Abe, Yoshihiro. Method of producing crystallized glass from phosphate glass, 4,417,912, Cl. 65-33.000.
- Abt, Anton; Dettelbach, Alfred; and Gresser, Gerhard, to Reich Spezialmaschinen GmbH. Melting and application device for melting adhesives, 4,417,675, Cl. 222-146.0HE.
- Adachi, Takashi: See—  
Tamai, Masaharu; Morimoto, Shigeo; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,418,075, Cl. 424-278.000.
- Adair, Edwin L., to Urology Group, P.C., The. Combined surgical instrument and tube holder device, 4,417,710, Cl. 248-51.000.
- Adeka Argus Chemical Co., Ltd.: See—  
Nakahara, Yutaka; Kubota, Naohiro; Hirai, Bunji; and Haruna, Tohru, 4,418,196, Cl. 546-242.000.
- Adeline, Joseph B. Means for mounting a crane on a load carrying platform, 4,417,665, Cl. 212-224.000.
- Adler, Harvey J., to Technicon Instruments Corporation. Solute transfer technique, 4,418,039, Cl. 422-82.000.
- Admiral Maschinenfabrik GmbH: See—  
Johnson, Vincent L.; and Moser, Kurt, 4,418,041, Cl. 422-133.000.
- Afian, Viktor V.: See—  
Lidorenko, Nikolai S.; Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,418,238, Cl. 136-246.000.
- Agence Spatiale Europeenne: See—  
Robinson, Alan A., 4,417,772, Cl. 308-10.000.
- Agency of Industrial Science & Technology: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175.000.
- AGFA-Gevaert Aktiengesellschaft: See—  
Bauer, Walter; Farber, Heinrich; and Kluge, Reimund, 4,418,420, Cl. 378-187.000.
- Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; Runzheimer, Hans-Volker; and Heidenreich, Holger, 4,418,143, Cl. 430-562.000.
- Langen, Hans; Wolff, Erich; and Ranz, Erwin, 4,418,142, Cl. 430-549.000.
- Notzel, Joachim; Schatz, Anton; Buczek, Harthmuth; and Kirchhof, Gunther, 4,417,809, Cl. 355-46.000.
- Aico Manufacturing Co. Limited: See—  
Zwezerynen, Johannes C. W., 4,417,653, Cl. 198-718.000.
- Ailor, James C.: See—  
Iyer, Sankar P.; Lewis, Roy D.; Klein, H. Joseph; Hord, William C.; and Ailor, James C., 4,417,617, Cl. 164-254.000.
- Air Preheater Company, Inc.: See—  
Stockman, Richard F., 4,417,615, Cl. 164-94.000.
- Air Products and Chemicals, Inc.: See—  
Hegarty, William P.; and Schmidt, William P., 4,417,449, Cl. 62-28.000.
- Jepsen, Robert E., 4,417,855, Cl. 416-244.00A.
- Turcotte, Michael G., 4,418,214, Cl. 564-479.000.
- Airco, Inc.: See—  
Weltmer, William R., Jr., 4,417,909, Cl. 62-12.000.
- Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Garment measuring device, 4,417,401, Cl. 33-175.000.
- Aisin Seiki Kabushiki Kaisha: See—  
Furuta, Youichi, 4,417,445, Cl. 60-554.000.
- Kumagai, Tadanobu; and Iwase, Yoshinobu, 4,417,880, Cl. 464-111.000.
- Akagi, Kazuo; Fukuda, Akihiro; and Saito, Tomio, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for polishing interior surfaces of pipes or the like, 4,417,421, Cl. 51-16.000.
- Akami, Hitoshi: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175.000.
- Akita, Shigeyuki: See—  
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,418,347, Cl. 340-870.370.
- Akita, Shigeyuki: See—  
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,418,348, Cl. 340-870.370.
- Akita, Yoshio: See—  
Torii, Koshi; Maruyama, Toshinori; Akita, Yoshio; and Teshima, Takanori, 4,418,311, Cl. 320-48.000.
- Aktiebolaget Bofors: See—  
Bakke, Jan; and Liaskar, Jermund, 4,418,230, Cl. 568-940.000.
- Akzona Incorporated: See—  
Battey, Paul K.; and Hope, Peter, 4,418,022, Cl. 260-944.000.
- Zengel, Hans; and Bergfeld, Manfred, 4,418,211, Cl. 564-40.000.
- Al-Jon, Inc.: See—  
Sharp, Allen B., 4,417,510, Cl. 100-98.00R.
- Albert Einstein College of Medicine at Yeshiva University, The: See—  
Lalezari, Iraj, 4,418,059, Cl. 424-180.000.
- Alexander, Alva P., Jr.: See—  
Granger, Robert L.; and Alexander, Alva P., Jr., 4,417,883, Cl. 493-403.000.
- Alfter, Franz-Werner: See—  
Breitscheidel, Hans-Ulrich; Spielau, Paul; and Alfter, Franz-Werner, 4,417,932, Cl. 156-62.200.
- Alkor GmbH Kunststoffverkauf: See—  
Landler, Josef; and Mayr, Max, 4,418,106, Cl. 428-89.000.
- Allegheny Ludlum Steel Corporation: See—  
Maurer, Jack R., 4,417,921, Cl. 75-125.000.
- Allen-Bradley Company: See—  
Callan, John E., 4,418,374, Cl. 361-167.000.
- Allen Group Inc., The: See—  
Allgor, Clarence B.; St. Clair, Clair J.; and Pearson, Richard A., 4,418,388, Cl. 364-431.010.
- Allgor, Clarence B.; St. Clair, Clair J.; and Pearson, Richard A., to Allen Group Inc., The. Engine waveform pattern analyzer, 4,418,388, Cl. 364-431.010.
- Allied Corporation: See—  
Beeson, Karl W.; Bhattacharjee, Himangshu R.; and Hopf, Frederick R., 4,418,135, Cl. 430-93.000.
- Kuo, Vincent H. S.; and Wamser, Christian A., 4,417,996, Cl. 252-175.000.
- Larson, Kenneth N.; Davis, John S.; and Bostick, Lewis M., 4,418,382, Cl. 364-200.000.
- Major, Jeffrey T., 4,417,388, Cl. 29-598.000.
- Pez, Guido P.; and Grey, Roger A., 4,418,227, Cl. 568-861.000.
- Allied Paper Incorporated: See—  
Shaw, Michael J., 4,418,117, Cl. 428-327.000.
- Allis-Chalmers Corporation: See—  
Hacker, Richard K.; and Tesch, James F., 4,417,850, Cl. 415-142.000.
- Hartman, Peter W.; Hanford, Keith E.; Markle, Stephen L.; and Hartman, Elmer C., 4,418,251, Cl. 191-35.000.
- Altobellis, Richard M.: See—  
Applequist, Roy A.; Altobellis, Richard M.; and Hoppe, Robert F., 4,418,369, Cl. 360-98.000.
- Alvarez, Luis W.; and Schwemin, Arnold J., to Schwem Instruments. Stabilized zoom binocular, 4,417,788, Cl. 350-500.000.
- Alza Corporation: See—  
Theeuwes, Felix, 4,418,038, Cl. 422-37.000.
- Amana Refrigeration, Inc.: See—  
Jailor, John J.; and Thalacker, Ronald A., 4,418,261, Cl. 219-10.55R.
- Ambrus, Gabor: See—  
Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, 4,418,205, Cl. 560-39.000.
- American Cyanamid Company: See—  
Murdock, Keith C., 4,418,078, Cl. 424-330.000.
- Streetman, William E.; and Daftary, Shashikumar H., 4,418,176, Cl. 525-57.000.
- Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., 4,418,047, Cl. 423-265.000.
- American Industrial Research: See—  
Harvey, Bruce F., 4,417,638, Cl. 180-125.000.
- American Optical Corporation: See—  
Dawson, W. Clifford; Bard, George D.; Smith, Luther W.; and Laurin, Bernard L., 4,417,790, Cl. 351-166.000.



Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., to Elfab Corporation. Method for manufacturing integrated circuit connections. 4,417,396, Cl. 29-884,000.

AMP Incorporated: See—

Brown, Christopher K.; Busler, Willard L.; and Wion, Donald A., 4,417,378, Cl. 29-33,000.

Chang, Paul S., 4,418,322, Cl. 331-1,00A.

Herrmann, Henry O., Jr., 4,417,736, Cl. 277-212,00R.

Andersen, Harold W.; Andersen, Shirley R.; Zane, Clifford; and Harrison, Charles H., to Anprosol Incorporated. Sterilization system. 4,418,055, Cl. 424-126,000.

Andersen, Shirley R.: See—

Andersen, Harold W.; Andersen, Shirley R.; Zane, Clifford; and Harrison, Charles H., 4,418,055, Cl. 424-126,000.

Anderson, Brenda L.; and Boyd, Ronald J., to General Electric Company. Braking arrangement for vehicles. 4,417,648, Cl. 188-119,000.

Anderson, Daniel B.: See—

Cysek, Gerry R.; and Anderson, Daniel B., 4,417,415, Cl. 47-1,400.

Anderson, David L.; and Joseph, A. David, to Sealed Power Corporation. Method of assembling pipe joint. 4,417,383, Cl. 29-511,000.

Anderson, Bror A. E.; and Mo, Arne B. Suction device such as a dental aspirator or sucker. 4,417,874, Cl. 433-96,000.

Ando, Takashi; and Oka, Naoki, to Idemitsu Kosan Co., Ltd. Mixed fuel of coal and oil. 4,417,901, Cl. 44-51,000.

Andree, Hans: See—

Hennemann, Manfred; Andree, Hans; Lehmann, Rudolf; Schnegleberger, Harald; and Bellinger, Horst, 4,417,895, Cl. 8-137,000.

Andrzejko, Matthew J.; and Potkay, Eugene, to Western Electric Co., Inc. Vapor-phase axial deposition torch. 4,417,692, Cl. 239-424,000.

Andrillon, Patrick: See—

Bugaut, Andree; and Andrillon, Patrick, 4,417,896, Cl. 8-414,000.

Angelini, Philip J.; and Lam, Chiu T., to Mobil Oil Corporation. Upgrading olefinic stocks via sequential hydroformylation/hydrogenation. 4,417,973, Cl. 208-46,000.

Anprosol Incorporated: See—

Andersen, Harold W.; Andersen, Shirley R.; Zane, Clifford; and Harrison, Charles H., 4,418,055, Cl. 424-126,000.

Anthony, Donald R., to Atlantic Richfield Company. Sand consolidation with organic silicate. 4,417,623, Cl. 166-294,000.

Anthony Manufacturing Corp.: See—

Lockwood, George H., 4,417,691, Cl. 239-206,000.

Aoki, Kazuhide, to Tokyo Shibaura Denki Kabushiki Kaisha. Parallel-series converter. 4,418,418, Cl. 377-79,000.

Apikis, Dominic A., to Atlantic Richfield Company. Graphited gear oils. 4,417,991, Cl. 252-29,000.

Applequist, Roy A.; Altobelli, Richard M.; and Hoppe, Robert F., to MinScribe Corporation. Method and structure for maintaining a low contaminated enclosure. 4,418,369, Cl. 360-98,000.

Araki, Mikio: See—

Tsukiji, Yoshihiro; Maeda, Haruo; and Araki, Mikio, 4,417,486, Cl. 74-813,00R.

Araya, Abraham: See—

Dyer, Alan; and Araya, Abraham, 4,418,048, Cl. 423-305,000.

Argy, Gilles, to Technigaz. Flexible heat-insulated pipe-line for in particular cryogenic fluids. 4,417,603, Cl. 138-149,000.

Ariyama, Kenzo: See—

Hirose, Akira; and Ariyama, Kenzo, 4,417,800, Cl. 355-3,0TR.

Armstrong World Industries, Inc.: See—

Miller, Jesse D., Jr.; Tshudy, James A.; and Unruh, Ralph E., 4,418,109, Cl. 428-142,000.

Arnason, Tomas; Franke, Alvis; and Tschopp, Theodor, to Swiss Aluminium Ltd. Process for extinguishing the anode effect in the aluminum electrolysis process. 4,417,958, Cl. 204-67,000.

Arndt, Peter J.; Lowitz, Joachim; Muller, Manfred; and Schlosser, Fritz, to Rohm GmbH. Method for making esters. 4,418,204, Cl. 549-539,000.

Arrow International, Inc.: See—

Frankhouser, Paul L.; and Shevde, Ketan, 4,417,886, Cl. 604-53,000.

Arturo, Salice S.p.A.: See—

Salice, Luciano, 4,417,366, Cl. 16-258,000.

Asada, Yoshikatsu; and Mori, Shunji, to Hitachi, Ltd. Method of inspecting operation of driving system including a main machine and a plurality of auxiliary machines, and driving system incorporating inspection apparatus for carrying out the inspection method. 4,418,391, Cl. 364-551,000.

Asahi Fiber Glass Company Limited: See—

Kawashima, Sadao; and Ito, Chiharu, 4,418,113, Cl. 428-213,000.

Asahi Glass Company Ltd.: See—

Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,418,186, Cl. 526-247,000.

Asahi Kasei Kogyo Kabushiki Kaisha: See—

Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, 4,418,061, Cl. 424-245,000.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—

Okura, Zenichi; and Haneishi, Yasuyuki, 4,417,798, Cl. 604-271,000.

Aschoff, Hans-Joachim; and Cholewa, Lothar, to Vorwerk & Co. Inteholding GmbH. Method of and a circuit for indicating the optimum adjustment of the working position of a brush roller in an electrically operated floor cleaning appliance. 4,418,342, Cl. 340-579,000.

ASEA Aktiebolag: See—

Moritz, Bertil, 4,417,701, Cl. 242-55,000.

Ashai Glass Company Ltd.: See—

Abe, Yoshihiro, 4,417,912, Cl. 65-33,000.

Asher, Mark S.: See—

Horn, Stuart B.; Wright, Richard A.; and Asher, Mark S., 4,417,448, Cl. 62-6,000.

Ashland Oil, Inc.: See—

Myers, George D., deceased; and Busch, Lloyd E., 4,417,975, Cl. 208-120,000.

Assab Medicin AB: See—

Edebo, Lars B.; Swede, Harald G.; and Tornqvist, Nils-Erik, 4,417,926, Cl. 134-17,000.

Associated Electrical Industries Limited: See—

Cundy, Steven L.; Evans, Ronald A.; Johnson, Oliver S.; McCormack, John S.; and Nichols, Bruce A., 4,417,911, Cl. 65-3,120.

Astra Lakemedel Aktiebolag: See—

Hogberg, Thomas; de Paulis, Tomas; Ross, Svante B.; and Ulf, Carl B. J., 4,418,065, Cl. 424-263,000.

Ateliers des Charmilles, S.A.: See—

Bonga, Benno I., 4,417,843, Cl. 414-676,000.

Atlantic Bridge Company Limited: See—

Escher, Giorgio A.; and Dahn, Raymond C., 4,417,937, Cl. 156-169,000.

Atlantic Richfield Company: See—

Anthony, Donald R., 4,417,623, Cl. 166-294,000.

Apikos, Dominic A., 4,417,991, Cl. 252-29,000.

Audi NSU Auto Union AG: See—

Rossie, Egbert; Hahn, Michael; and Schemperg, Lutz, 4,417,419, Cl. 49-348,000.

Auel, Theodor: See—

Klose, Werner; and Auel, Theodor, 4,418,019, Cl. 260-502,50C.

Autohaus Lorinser GmbH & Co.: See—

Koch, Adolf, 4,417,760, Cl. 296-1,00S.

Automation Systems, Inc.: See—

Bartlett, Peter G., 4,418,309, Cl. 318-818,000.

Aviation Electric Ltd.: See—

Hawes, David J., 4,417,440, Cl. 60-39,281.

B. F. Goodrich Company, The: See—

DeWitt, Elmer J., 4,418,178, Cl. 525-97,000.

DeWitt, Elmer J.; Minchak, Robert J.; Lee, Bing-Lin; and Benedikt, George M., 4,418,179, Cl. 525-249,000.

Babcock-BSH Aktiengesellschaft: See—

Eibich, Peter, 4,417,406, Cl. 34-155,000.

Bachowski, David; Measells, Paul; and Zabielski, Kenneth, to Baxter Travenol Laboratories, Inc. Method and apparatus for joining materials. 4,417,753, Cl. 285-21,000.

Backer, Lothar: See—

Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, 4,418,174, Cl. 524-539,000.

Backman, Keith C.: See—

Plashne, Mark; Lauer, Gail D.; Roberts, Thomas M.; and Backman, Keith C., 4,418,149, Cl. 435-253,000.

Bader, Ramzi N., to Spectrol Electronics Corporation. Alarm device. 4,418,337, Cl. 340-571,000.

Bagnall-Wild, Ralph H.; Smith, Gordon R.; Stewart, John H.; and Ritchie, David S., to Barr & Stroud Limited. Tracking link. 4,418,361, Cl. 358-125,000.

Bailey, Terry R.: See—

May, David C.; and Bailey, Terry R., 4,418,110, Cl. 428-143,000.

Bakke, Jan; and Liaskar, Jermund, to Aktiebolaget Bofors. Method for gaseous phase nitration of aromatics. 4,418,230, Cl. 568-940,000.

Baliozian, Mardick, to Tekno AG. Device for the calculation of the characteristics of rectilinear geometric shapes. 4,417,399, Cl. 33-448,000.

Bamford, William C., to Molex Incorporated. Integrated circuit carrier assembly. 4,417,777, Cl. 339-17,0CF.

Banko, Anton, to Surgical Design. Ultrasonic transducer with energy shielding. 4,417,578, Cl. 128-303,00R.

Banks, Reginald G. S.; and Williams, Alan, to British Gas Corporation. Gas making. 4,417,905, Cl. 48-214,00A.

Bansal, Jai P., to International Business Machines Corporation. Latent image ram cell. 4,418,401, Cl. 365-95,000.

Baran, Ostap E. Double-wall surgical cuff. 4,417,576, Cl. 128-207,150.

Barclay, Donald J.; and Morgan, William M., to International Business Machines Corporation. Method of and solution for electroplating chromium and chromium alloys and method of making the solution. 4,417,955, Cl. 204-43,00R.

Bard, George D.: See—

Dawson, W. Clifford; Bard, George D.; Smith, Luther W.; and Laurin, Bernard L., 4,417,790, Cl. 351-166,000.

Barnette, William E.; and Jebens, Robert W., to RCA Corporation. Lens positioning controller for optical playback apparatus. 4,418,405, Cl. 369-45,000.

Baron, Gunter, to Bayerische Motoren Werke AG. Kickstand for a motorcycle. 4,417,746, Cl. 280-301,000.

Barr & Stroud Limited: See—

Bagnall-Wild, Ralph H.; Smith, Gordon R.; Stewart, John H.; and Ritchie, David S., 4,418,361, Cl. 358-125,000.

Barthel, Horst K. F. High temperature solid fire starter. 4,417,900, Cl. 44-34,000.

Bartholomew, Bruce J., to General Dynamics Corporation/Convair Div. Non-scanned heterodyne imaging sensor. 4,417,813, Cl. 356-349,000.

Bartlett, Peter G., to Automation Systems, Inc. Two phase induction motor circuit with series connected center-tapped stator windings. 4,418,309, Cl. 318-818,000.

BASF Aktiengesellschaft: See—

Danz, Eckehard; and Krome, Gerd, 4,418,233, Cl. 570-239,000.

Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jürgen; and Witmer, Paul, 4,418,180, Cl. 525-314,000.

Himmele, Walter; and Hoffmann, Werner, 4,418,216, Cl. 568-497,000.

Lungershausen, Rolf; Martin, Christoph; Marcinowski, Stefan; Siegel, Harido; and Kuesters, Werner, 4,418,146, Cl. 435-106,000.

Muench, Volker; Naarmann, Herbert; and Penzien, Klaus, 4,418,187, Cl. 526-259,000.

Sander, Bruno; Hovemann, Friedrich; and Scherling, Kurt, 4,417,976, Cl. 208-188,000.

Seitz, Werner; Scheib, Klaus; and Michel, Alfred, 4,418,017, Cl. 260-465,00E.

Batchelder, J. Samuel. Method and apparatus for providing a dielectrophoretic display of visual information. 4,418,346, Cl. 340-787,000.

Bateman, Glenn, to Tektronix, Inc. Logarithmic amplifier utilizing positive feedback. 4,418,317, Cl. 328-145,000.

Battelle Development Corporation: See—

Cysek, Gerry R.; and Anderson, Daniel B., 4,417,415, Cl. 47-1,400.

Putnam, Abbott A., 4,417,868, Cl. 431-1,000.

Battelle Institut e.V.: See—

Lohberg, Peter, 4,417,632, Cl. 177-212,000.

Batley, Paul K.; and Hope, Peter, to Akzona Incorporated. Phosphoramidates containing a p-phenylenediamine group. 4,418,022, Cl. 260-944,000.

Bauer, Marshall, to Nation Enterprises, Inc. Dough forming mold assembly. 4,417,867, Cl. 425-394,000.

Bauer, Walter; Farber, Heinrich; and Kluge, Reimund, to AGFA-Gevaert Aktiengesellschaft. Method and arrangement for gripping X-ray film. 4,418,420, Cl. 378-187,000.

Baum, Heinz W.: See—

Cotter, Edmund; Whatley, Francis; and Baum, Heinz W., 4,417,647, Cl. 188-73,380.

Bauman, Robert A.; and Pierce, Robert C., to Colgate-Palmolive Company. Detergent composition providing antistatic properties. 4,418,011, Cl. 252-544,000.

Baumgen, Heinz: See—

Probst, Joachim; Kolb, Gunter; Muller, Friedhelm; and Baumgen, Heinz, 4,418,175, Cl. 524-555,000.

Baur, Rolf; and Diemer, Wolfgang, to Schenk Filterbau GmbH. Filtration apparatus. 4,417,980, Cl. 210-91,000.

Baxter Travenol Laboratories, Inc.: See—

Bachowski, David; Measells, Paul; and Zabielski, Kenneth, 4,417,753, Cl. 285-21,000.

Dennehey, T. Michael; and Peterson, Charles K., 4,417,890, Cl. 604-236,000.

Bayer Aktiengesellschaft: See—

Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, 4,418,174, Cl. 524-539,000.

Hennemann, Manfred; Andree, Hans; Lehmann, Rudolf; Schnegleberger, Harald; and Bellinger, Horst, 4,417,895, Cl. 8-137,000.

Kramer, Wolfgang; Buchel, Karl H.; Haller, Ingo; and Plempel, Manfred, 4,418,072, Cl. 424-273,00R.

Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,418,073, Cl. 424-273,00P.

Muller, Ernst-Willi; and Rathjen, Claus, 4,418,030, Cl. 264-142,000.

Probst, Joachim; Kolb, Gunter; Muller, Friedhelm; and Baumgen, Heinz, 4,418,175, Cl. 524-555,000.

Rasshofer, Werner; Kopp, Richard; and Paul, Reiner, 4,418,159, Cl. 521-121,000.

Rasshofer, Werner; Dieterich, Dieter; and Meyborg, Holger, 4,418,160, Cl. 521-159,000.

Schreiner, Kurt; and Jager, Horst, 4,418,015, Cl. 260-242,200.

Bayerische Motoren Werke AG: See—

Baron, Gunter, 4,417,746, Cl. 280-301,000.

Bear Medical Systems, Inc.: See—

De Vries, Douglas F., 4,417,573, Cl. 128-204,250.

Bechai, Nabil R.; and Cousin, Alan J. Apparatus and method of internal examination of gastro intestinal tract and adjacent organs. 4,417,583, Cl. 128-660,000.

Becker, Anton, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Ball swivel joint for an excavator or the like. 4,417,773, Cl. 308-178,000.

Becker, Charles A., to General Electric Company. Method of fabricating high density electronic circuits having very narrow conductors. 4,417,393, Cl. 29-846,000.

Beckman Instruments, Inc.: See—

Horrocks, Donald L., 4,418,281, Cl. 250-328,000.

Horrocks, Donald L., 4,418,282, Cl. 250-366,000.

Smith, Leland B.; and McIntyre, Robert A., 4,417,590, Cl. 128-731,000.

Becquelet, Louis E., to Nunitoni Foods Corporation. Process for manufacturing frozen food products composed of layers of pasta and sauce. 4,418,085, Cl. 426-297,000.

Becton, Dickinson and Company: See—

Nugent, Edward L., 4,417,981, Cl. 210-209,000.

Bedwell, Junion L.; and Overton, Harold C., to Republic Steel Corporation. Apparatus and method for reducing spangle in galvanized products. 4,418,100, Cl. 427-348,000.

Beeson, Karl W.; Bhattacharjee, Himangshu R.; and Hopf, Frederick R., to Allied Corporation. Thermally-stable, infrared-sensitive zinc oxide electrophotographic compositions element and process. 4,418,135, Cl. 430-93,000.

Beestman, George B.; and Deming, John M., to Monsanto Company. Encapsulation by interfacial polycondensation. 4,417,916, Cl. 71-93,000.

Behrens, Klaus: See—

Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,418,422, Cl. 378-205,000.

Behrenz, Wolfgang: See—

Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,418,073, Cl. 424-273,00P.

Beladi, Ilona: See—

Kahan nee Laszlo, Ilona; Hammer, Helga; and Beladi, Ilona, 4,418,060, Cl. 424-227,000.

Bell, Lydia A. Needlework frame for handwork. 4,417,409, Cl. 38-102,910.

Bell Maschinenfabrik Aktiengesellschaft: See—

Britschgi, Hugo; Portmann, Bruno; and Berchtold, Louis, 4,417,982, Cl. 210-386,000.

Bell Telephone Laboratories, Incorporated: See—

Beni, Gerardo; and Hackwood, Susan, 4,417,786, Cl. 350-359,000.

Figler, Bernard A.; and Fingerman, Charles M., 4,418,312, Cl. 324-52,000.

Halvorsen, Henry J.; Marchetto, Albert V.; and Thomas, Edwin P., 4,417,778, Cl. 339-17,000M.

Lese, Gregory; and Nash, Donald H., 4,418,416, Cl. 375-5,000.

Bellafore, Francis V., to Chicago Bridge & Iron Company. Apparatus for coating narrow vertical elongated spaces. 4,417,542, Cl. 118-306,000.

Bellinger, Horst: See—

Hennemann, Manfred; Andree, Hans; Lehmann, Rudolf; Schnegleberger, Harald; and Bellinger, Horst, 4,417,895, Cl. 8-137,000.

Bellus, Daniel: See—

Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,199, Cl. 548-451,000.

Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,200, Cl. 548-451,000.

Belmares-Sarabia, Armand: See—

Poetsch, Dieter; and Belmares-Sarabia, Armand, 4,418,358, Cl. 358-80,000.

Ben Clements & Sons, Inc.: See—

Furusu, Akira, 4,417,682, Cl. 227-67,000.

Bendix Corporation, The: See—

Claxton, William B.; and Cromas, Joseph C., 4,417,694, Cl. 239-533,120.

Hall, James R.; and Whallon, William P., Jr., 4,417,395, Cl. 29-882,000.

Walter, Richard P., 4,417,557, Cl. 123-467,000.

Benedikt, George M.: See—

DeWitt, Elmer J.; Minchak, Robert J.; Lee, Bing-Lin; and Benedikt, George M., 4,418,179, Cl. 525-249,000.

Beni, Gerardo; and Hackwood, Susan, to Bell Telephone Laboratories, Incorporated. Devices based on surface tension changes. 4,417,786, Cl. 350-359,000.

Bennett, James G.; and Tungate, Freddie L., to General Electric Company. Preparation of ortho-alkylated phenols using magnesium compound catalysts. 4,418,224, Cl. 568-804,000.

Bennett, Robert W., to National Foam Systems, Inc. Variable proportioning valve for balanced pressure proportioning systems, and system containing the valve. 4,417,601, Cl. 137-556,600.

Benson, Inc.: See—

Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., 4,417,391, Cl. 29-825,000.

Beranek, Ivan; Kyral, Josef; Uhler, Miroslav; and Zlesak, Ivan, to Spolek pro chemickou a hutni výrobu, narodni podnik. Solid refining agents for the refining of aluminum and alloys thereof and method of preparing said agents. 4,417,923, Cl. 75-257,000.

Berchtold, Louis: See—

Britschgi, Hugo; Portmann, Bruno; and Berchtold, Louis, 4,417,982, Cl. 210-386,000.

Berentzen, Harido, to Theodor Groz & Sohne; and Ernst Becker & Nadelfabrik Commandit-Gesellschaft. Needle for knitting machines and method for making same. 4,417,454, Cl. 66-123,000.

Berezoutsky, Georges, to Societe Francaise de Stockage Geologique "Goestock". Safety device for underground storage of liquefied gas. 4,417,829, Cl. 405-54,000.

Bergfeld, Manfred: See—

Zengel, Hans; and Bergfeld, Manfred, 4,418,211, Cl. 564-40,000.

Bergman, Gerard P. M.: See—

Schreiber, Peter; Steinfeldt, Eberhard; and Bergman, Gerard P. M., 4,418,419, Cl. 378-040,000.

Bergmann, Gerhard; and Henz, Erhard. Thread positioning apparatus for a warp knitting machine. 4,417,456, Cl. 66-214,000.

Berghaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; Runzheimer, Hans-Volker; and Heidenreich, Holger, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material. 4,418,143, Cl. 430-562,000.

Bernat, Georg, to Friedrich Grohe Armaturenfabrik GmbH & Co. Valve. 4,417,933, Cl. 156-64,000.

Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., to Textron Inc. Electronic tacker. 4,417,681, Cl. 227-8,000.

Bernhard Beumer Maschinenfabrik KG: See—

Lauhoff, Heinz; and Bokamp, Alfons, 4,417,654, Cl. 198-815,000.

Bernot, Hartmut: See—

Tremmel, Hartmut; and Bernot, Hartmut, 4,418,277, Cl. 235-472,000.

Bertl, Gerd, to Stettner & Co. Disc trimmer. 4,418,376, Cl. 361-293,000.



- Bertolacini, Ralph J.: See—  
Kim, Dae K.; and Bertolacini, Ralph J., 4,418,006, Cl. 502-73.000.
- Bessho, Yasuo: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175.000.
- Bevan, Mark H.; and Kief, Garry C., to Hastings, Clayton, Tucker & Craig, Inc. Collapsible display booth, 4,417,774, Cl. 312-108.000.
- Bey, Philippe; Gerhart, Fritz; Jung, Michel; and Schirlin, Daniel, to Merrell Toradex et Compagnie. Fluorinated amino-butyric acid and diaminebutane derivatives, 4,418,077, Cl. 424-309.000.
- Bhattacharjee, Himangshu R.: See—  
Beeson, Karl W.; Bhattacharjee, Himangshu R.; and Hopf, Frederick R., 4,418,135, Cl. 430-93.000.
- Bhattacharyya, Bhupati R.; and Roe, William J., to Nalco Chemical Company. Dust control, 4,417,992, Cl. 252-88.000.
- Bikler, Anthony, to Welltron Limited. Brake assemblies primarily for exercising apparatus, 4,417,724, Cl. 272-73.000.
- Billeter, Henry R., to Sloan Valve Company. Empty and load brake system with separate proportional valve and load sensor valve means, 4,417,767, Cl. 303-23.000.
- Bilchmeier, Alfons. Tissue perforator, 4,417,580, Cl. 128-315.000.
- Birkle, Siegfried; and Stoger, Klaus, to Siemens Aktiengesellschaft. Electrolyte for the electrodeposition of aluminum, 4,417,954, Cl. 204-14.000.
- Birch, Winfrid, to Siemens Aktiengesellschaft. Four-wire terminating circuit, 4,418,249, Cl. 179-170.000.
- Bishop, Robert M.; Payette, Lionel J.; and Pike, Roscoe A., to Essex Group, Inc. Dielectric films from water soluble polyimides, 4,418,190, Cl. 528-353.000.
- Blackie, Merrick S.; and Collins, John R., to Courtaulds Limited. Process for spinning cellulose ester fibres, 4,418,026, Cl. 264-8.000.
- Blackwell, Churchill G. Preservation of hops, 4,418,092, Cl. 426-600.000.
- Blasius Industries, Inc.: See—  
Hall, Harold E., 4,418,171, Cl. 524-268.000.
- Bliss, Arthur E.: See—  
Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., 4,417,391, Cl. 29-825.000.
- Bliss & Laughlin Industries Incorporated: See—  
Deibel, Christopher J.; and Massey, Edward W., 4,417,509, Cl. 99-467.000.
- Bock, Gernot: See—  
Theurer, Josef; and Bock, Gernot, 4,417,522, Cl. 104-7.00B.
- Boeing Aerospace Company: See—  
Wilkinson, Calvin L., 4,417,428, Cl. 52-172.000.
- Boeing Company, The: See—  
Lund, Wesley C., 4,417,835, Cl. 409-180.000.
- Boger, Manfred; and Ehrenfreund, Josef, to Ciba-Geigy Corporation. Phenylbenzoylureas, 4,418,066, Cl. 424-263.000.
- Bohlen, Harald; Engelke, Helmut; Grieschner, Johann; and Nehmiz, Peter, to International Business Machines Corporation. Method of making mask for structuring surface areas, 4,417,946, Cl. 156-643.000.
- Böhm, Georg G. A.; Veselius, Lee E.; and Hamed, Gary R., to Firestone Tire & Rubber Company. The. Thermoplastic elastomer blends with bitumen, 4,418,167, Cl. 524-68.000.
- Bohme, Rolf, to Telefunken Electronic GmbH. Feedback amplifier or threshold value switch for a current feed differential stage, 4,418,321, Cl. 330-252.000.
- Bohme, Rolf C.; van Zyl, Ian D.; and Lazerson, Max M., to General Mining Union Corporation, Limited. Volumetric measurement of particles, 4,417,817, Cl. 356-380.000.
- Bohner, Beat: See—  
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,417,918, Cl. 71-100.000.
- Bohrmann, Hans; Campbell, Thomas; Grigoteit, Werner; and Muller, Gunter, to CPC International Inc. Starch containing food products and process for preparing same, 4,418,090, Cl. 426-578.000.
- Bokamp, Alfons: See—  
Lauhoff, Heinz; and Bokamp, Alfons, 4,417,654, Cl. 198-815.000.
- Bollinger, David D., to Hobart Brothers Company. Battery charger control circuit, 4,418,310, Cl. 320-39.000.
- Bonga, Benno I., to Ateliers des Charmilles, S.A. Waysless machine tool table, 4,417,843, Cl. 414-676.000.
- Bonn, Jerrold L.: See—  
Mahoney, Paul F.; and Bonn, Jerrold L., 4,418,319, Cl. 328-160.000.
- Booher, Homer L. Device for dispensing tissue paper and sheet material, 4,417,670, Cl. 221-210.000.
- Boor, Frank H., to Fairfield Manufacturing Co., Inc. Coupled planetary gear speed reducer for use in industrial vehicles, 4,417,485, Cl. 74-785.000.
- Borvendeg, Janos: See—  
Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, 4,418,205, Cl. 560-39.000.
- Bose, Bimal K., to General Electric Company. Scalar decoupled control for an induction machine, 4,418,308, Cl. 318-803.000.
- Bostick, Lewis M.: See—  
Larson, Kenneth N.; Davis, John S.; and Bostick, Lewis M., 4,418,382, Cl. 364-200.000.
- Bostock, James H.: See—  
McCracken, Oliver W.; and Bostock, James H., 4,417,470, Cl. 73-154.000.
- Bouette, David W., to Simon-Vicars Limited. Method and apparatus for producing a cellular food product, 4,418,089, Cl. 426-572.000.
- Bourrez, Jean-Marie, to CII Honeywell Bull. Method and device for arbitration of access conflicts between an asynchronous trap and a program in a critical section, 4,418,385, Cl. 364-200.000.
- Boyd, Ronald J.: See—  
Anderson, Brenda L.; and Boyd, Ronald J., 4,417,648, Cl. 188-119.000.
- Boykin, Otis F.: See—  
Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., 4,418,009, Cl. 252-514.000.
- Brachmann, Walter; Kornau, Horst; and Thiel, Klaus, to Metzeler Kautschuk GmbH. Vulcanizable rubber mixture and vulcanizing process for such a rubber mixture, 4,418,173, Cl. 524-425.000.
- Bradley, Daniel J.: See—  
Murray, Robert T.; and Bradley, Daniel J., 4,417,815, Cl. 356-349.000.
- Braintech, Inc.: See—  
Culver, Norman D., 4,417,591, Cl. 128-731.000.
- Brandinger, Jay J., to RCA Corporation. Video disc pickup stylus, 4,418,407, Cl. 369-126.000.
- Brantingham, George L.; and Graber, Warren S., to Texas Instruments Incorporated. Address decode system, 4,418,397, Cl. 364-900.000.
- Braun Aktiengesellschaft: See—  
Busch, Peter; and Schaefer, Horst, 4,417,820, Cl. 368-200.000.
- Hoffmann, Harald; and Raducanu, Dan-Corneluz, 4,418,307, Cl. 318-721.000.
- Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., to Hoechst Aktiengesellschaft. Acetylacetoxyalkyl-allyl ethers, 4,418,207, Cl. 560-178.000.
- Brehon, Garth A. Hand portable grain threshing apparatus, 4,417,593, Cl. 130-27.00F.
- Breitscheidel, Hans-Ulrich; Spielau, Paul; and Alfter, Franz-Werner, to Dynamit Nobel Aktiengesellschaft. Process for the continuous production of a length of stratified material from foam particles, 4,417,932, Cl. 156-62.200.
- Brenner, Robert A., to Whirlpool Corporation. Agitator mounted dispenser and shower spray device for automatic washer, 4,417,457, Cl. 68-17.00A.
- Brezina, Josef, to SKODA. Tool providing for the automatic exchange of different working fixtures, 4,417,377, Cl. 29-26.00A.
- Brien, Joseph E.: See—  
Kindl, George F.; Michaud, Olean E.; and Brien, Joseph E., 4,417,816, Cl. 356-357.000.
- Briggs, William F.; and Bullard, Edward M., to Mobil Oil Corporation. Coextruded thermoplastic stretch-wrap, 4,418,114, Cl. 428-218.000.
- Bristol Babcock Inc.: See—  
Molusis, Anthony J.; and O'Loughlin, Thomas M., 4,418,381, Cl. 364-131.000.
- Britax (Wingard) Limited: See—  
Packington, Simon D., 4,417,751, Cl. 280-802.000.
- British Gas Corporation: See—  
Banks, Reginald G. S.; and Williams, Alan, 4,417,905, Cl. 48-214.00A.
- British Hovercraft Corporation Ltd.: See—  
Hardy, Derek J.; and Eldridge, Michael W., 4,417,637, Cl. 180-116.000.
- Britschgi, Hugo; Portmann, Bruno; and Berchtold, Louis, to Bell Maschinenfabrik Aktiengesellschaft. Device for the dewatering of naturally moist lump peat, 4,417,982, Cl. 210-386.000.
- Brodie, Durvis W. Ignition system for internal combustion engine, 4,417,563, Cl. 123-606.000.
- Brogard, Paul D. Anti-theft device and method for deterring theft of mobile equipment, 4,417,644, Cl. 180-287.000.
- Brooks, Joe: See—  
Henson, George S.; and Brooks, Joe, 4,417,625, Cl. 166-387.000.
- Brother Kogyo Kabushiki Kaisha: See—  
Oshima, Nobuyasu; and Tsumura, Tetsuya, 4,417,533, Cl. 112-235.000.
- Brown, Boveri & Cif AG: See—  
Strietzel, Rainer, 4,418,411, Cl. 371-67.000.
- Brown, Christopher K.; Busler, Willard L.; and Wion, Donald A., to AMP Incorporated. Apparatus for applying heat shrinkable tubing, 4,417,378, Cl. 29-33.00M.
- Brown, Richard A.; Byers, Lance R.; and Norris, Robert D., to FMC Corporation. Process for preparing thallium (III), 4,418,051, Cl. 423-592.000.
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Abbott, Philip A.; Dailey, James E.; Karsan, Demir I.; and Man-giavacchi, Andrea, 4,417,831, Cl. 405-227.000.
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- Bschorr, Oskar. Method and apparatus for damping vibrations in large structures, such as buildings, 4,417,427, Cl. 52-167.000.
- Bubik, Alfred; and Hack, Kurt, to Escher Wyss GmbH. Papermaking machine containing two movable water pervious dewatering bands, 4,417,950, Cl. 162-300.000.
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Kramer, Wolfgang; Buchel, Karl H.; Haller, Ingo; and Plempel, Manfred, 4,418,072, Cl. 424-273.00R.
- Buczek, Harthmuth: See—  
Notzel, Joachim; Schatz, Anton; Buczek, Harthmuth; and Kirchhof, Gunther, 4,417,809, Cl. 355-46.000.

- Buffalo Bullet Company: See—  
Dahlitz, Ronald R., 4,417,521, Cl. 102-511.000.
- Buffon, Jean; and Trombe, Edouard, to Societe Anonyme dite: Ulmic France. Device for manufacturing, by extrusion, a piece having a recessed portion in its peripheral surface, 4,417,461, Cl. 72-345.000.
- Bugaut, Andree; and Andrillon, Patrick, to Societe Anonyme dite: L'Oreal. Hair dye compositions and new compounds useful therein, 4,417,896, Cl. 8-414.000.
- Buhler, Ulrich: See—  
Stahl, Theo; and Buhler, Ulrich, 4,417,897, Cl. 8-464.000.
- Bulanda, John J.: See—  
Moody, Roy A.; Bulanda, John J.; Guzey, Cazimir M.; and Schoenfeld, David R., 4,417,394, Cl. 29-882.000.
- Bullard, Edward M.: See—  
Briggs, William F.; and Bullard, Edward M., 4,418,114, Cl. 428-218.000.
- Bunnelle, William L.; and Lindmark, Richard C., to H. B. Fuller Company. Extrudable self-adhering elastic and method of employing same, 4,418,123, Cl. 428-517.000.
- Burdeska, Kurt: See—  
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,417,918, Cl. 71-100.000.
- Burl, Michael: See—  
Young, Ian R.; Hounsfield, Godfrey N.; and Burl, Michael, 4,418,316, Cl. 324-309.000.
- Burnett, Dorothy K. Signal display system and luminaire apparatus for operating same, 4,418,334, Cl. 340-332.000.
- Burney, Harry S., Jr.: See—  
Ezzell, Bobby R.; and Burney, Harry S., Jr., 4,417,961, Cl. 204-98.000.
- Burns, Lyle D.; and Parlman, Robert M., to Phillips Petroleum Company. N,N'-Dialkyl-N,N'-diphenyl alkylene diamine derivatives as antiknock agents, 4,417,904, Cl. 44-72.000.
- Burry, Donald L., to General Motors Corporation. Occupant restraint system, 4,417,750, Cl. 280-753.000.
- Burt, Dennis W. Optical fibre U.V. and/or I.R. line fire detector, 4,418,338, Cl. 340-578.000.
- Burton, Charles A., to Rimrock Corporation. Programmable positioning and operating mechanism for industrial operating head, 4,417,845, Cl. 414-733.000.
- Busby, Robert A.; Nat, Gursharan P. S.; and Stearley, John W., to Eaton Corporation. One piece operator for electric switch having pivoting and sliding contactor, 4,418,254, Cl. 200-68.300.
- Busch, Lloyd E.: See—  
Myers, George D.; deceased; and Busch, Lloyd E., 4,417,975, Cl. 208-120.000.
- Busch, Peter; and Schaefer, Horst, to Braun Aktiengesellschaft. Time-keeping device, especially a quartz-controlled clock, 4,417,820, Cl. 368-200.000.
- Busler, Willard L.: See—  
Brown, Christopher K.; Busler, Willard L.; and Wion, Donald A., 4,417,378, Cl. 29-33.00M.
- Butts, Gary C.: See—  
Muller, Michael; and Butts, Gary C., 4,418,257, Cl. 200-159.00B.
- Byers, Lance R.: See—  
Brown, Richard A.; Byers, Lance R.; and Norris, Robert D., 4,418,051, Cl. 423-592.000.
- C. R. Bard, Inc.: See—  
Meisch, Charles E., 4,417,892, Cl. 604-323.000.
- C. Reichert Optische Werke AG: See—  
Danner, Lambert J., 4,417,787, Cl. 350-414.000.
- Cabot Corporation: See—  
Iyer, Sankar P.; Lewis, Roy D.; Klein, H. Joseph; Hord, William C.; and Ailor, James C., 4,417,617, Cl. 164-254.000.
- Cain, Edwin F. C.; and McFarlen, William T., to Rockwell International Corporation. Compliant interface for ceramic turbine blades, 4,417,854, Cl. 416-241.000.
- Callan, John E., to Allen-Bradley Company. Latch relay drive circuit, 4,418,374, Cl. 361-167.000.
- CamAct Pump Corp.: See—  
Justice, Orien N., 4,417,860, Cl. 417-415.000.
- Cameo Container Corporation: See—  
Mason, James J., 4,417,660, Cl. 206-500.000.
- Cameron, Jacquelyn J.; and Myers, Chester D., to General Foods, Inc. Rapeseed protein isolate, 4,418,013, Cl. 260-123.500.
- Campbell, Thomas: See—  
Bohrmann, Hans; Campbell, Thomas; Grigoteit, Werner; and Muller, Gunter, 4,418,090, Cl. 426-578.000.
- Campbell, Willis R., to Sperry Corporation. Method of adjusting apron tension in roll baling machines, 4,417,436, Cl. 56-341.000.
- Camras, Marvin, to IIT Research Institute. Video disc transducer system, 4,418,365, Cl. 358-342.000.
- Canavesi, Luigi: See—  
De Gaetano, Mario; and Canavesi, Luigi, 4,418,016, Cl. 260-404.000.
- Canon Kabushiki Kaisha: See—  
Kano, Ichiro, 4,417,789, Cl. 350-513.000.
- Katagiri, Kazuharu; Umehara, Shoji; Watanabe, Katsunori; and Ishikawa, Shozo, 4,418,133, Cl. 430-58.000.
- Kishi, Hirotooshi, 4,417,805, Cl. 355-14.00R.
- Mitsuhashi, Yasuo; and Kiuchi, Masashi, 4,418,137, Cl. 430-109.000.
- Senuma, Michio, 4,417,797, Cl. 354-234.000.
- Sugiura, Yoji; Hagiwara, Toshio; Okumura, Toru; and Nakahara, Syunichi, 4,417,796, Cl. 354-152.000.
- Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,417,795, Cl. 354-25.000.
- Canenten, Francois, to M.B.E. Minoterie Biscotterie d'Echenon. Process for preparing a food product, 4,418,088, Cl. 426-549.000.
- Cappon, Arthur M.: See—  
Cserhalmi, Nicholas B.; and Cappon, Arthur M., 4,418,292, Cl. 307-443.000.
- Caracciolo, Gerald T.: See—  
Heagerty, William F.; Caracciolo, Gerald T.; and Gehweiler, William F., 4,418,402, Cl. 365-156.000.
- Carl, William P.: See—  
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,417,969, Cl. 204-252.000.
- Carney, Ronald E.: See—  
McAlpine, James B.; and Carney, Ronald E., 4,418,193, Cl. 536-16.100.
- Carrier Corporation: See—  
Copenhaver, Lloyd F., 4,417,869, Cl. 431-21.000.
- Carstens, Ronald, to Key Tech Corporation. Non-skid surface compositions for paper products, 4,418,111, Cl. 428-145.000.
- Case, James E.; Ruppert, Richard L.; and Manning, Lindley, to Dayton Superior Corporation. Apparatus for erecting concrete wall panels, 4,417,425, Cl. 52-125.500.
- Casio Computer Co., Ltd.: See—  
Kariya, Yutaka, 4,418,412, Cl. 371-68.000.
- Cassella Aktiengesellschaft: See—  
Daniek, Georg, 4,418,014, Cl. 260-125.000.
- Stahl, Theo; and Buhler, Ulrich, 4,417,897, Cl. 8-464.000.
- Cassoli, Eduardo: See—  
Schludknecht, Othmar; and Cassoli, Eduardo, 4,417,676, Cl. 225-4.000.
- Castile, Brett D.: See—  
Gordon, Alan; Watson, Stanley J.; Cowen, Steven J.; Mackelburg, Gerald; and Castile, Brett D., 4,418,404, Cl. 367-132.000.
- Catapano, Michael C.: See—  
Noe, Renato R.; and Catapano, Michael C., 4,417,465, Cl. 73-49.500.
- Caterpillar Tractor Co.: See—  
Stevenson, Thomas T.; and Zenios, Marios C., 4,417,469, Cl. 73-119.00A.
- Cathignol, Dominique; and Chapelon, Jean-Yves, to Institut National de la Sante et de la Recherche Medicale. Real-time measuring method and apparatus displaying flow velocities in a segment of vessel, 4,417,584, Cl. 128-663.000.
- Cavaiani, Randy J.: See—  
Schwarzbach, Richard J.; Keeler, Manley S.; Cavaiani, Randy J.; and Chapman, Michael K., 4,418,333, Cl. 340-310.00A.
- Cave, Eric F.; and Cowden, James J., to RCA Corporation. Stylus manufacturing method, 4,417,423, Cl. 51-283.00R.
- Celotex Corporation, The: See—  
Frentzel, Richard L., 4,418,158, Cl. 521-115.000.
- Centrale Veevoederfabriek "Sloten": See—  
Glas, Cor, 4,418,091, Cl. 426-580.000.
- Centre de Recherches Metallurgiques: See—  
Paulus, Philippe, 4,417,720, Cl. 266-112.000.
- Cerberus AG: See—  
Genahr, Rudolf, 4,418,335, Cl. 340-565.000.
- Chadwick, James B., to Hydraulics & Fabrications Pty. Ltd. Loader and transporter, 4,417,841, Cl. 414-346.000.
- Champion International Corporation: See—  
Korte, Ralph J., 4,417,685, Cl. 229-41.00B.
- Roccaforte, Harry I., 4,417,661, Cl. 206-625.000.
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- Chandler Evans Inc.: See—  
Sundberg, Jack G., 4,417,734, Cl. 277-93.05D.
- Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Conversion of synthesis gas to hydrocarbons enriched in linear alpha-olefins, 4,418,155, Cl. 518-719.000.
- Chang, Marguerite S.; and Orndoff, Robert R., to United States of America, Navy. Synthesis of dimethylmethylenedinitramine, 4,418,212, Cl. 564-109.000.
- Chang, Paul S., to AMP Incorporated. Automatic digital circuit for synchronizing with a variable baud rate generator, 4,418,322, Cl. 331-1.00A.
- Chapelon, Jean-Yves: See—  
Cathignol, Dominique; and Chapelon, Jean-Yves, 4,417,584, Cl. 128-663.000.
- Chapman, Harry L.: See—  
Polmanter, Keith E.; and Chapman, Harry L., 4,418,165, Cl. 523-210.000.
- Chapman, Michael K.: See—  
Schwarzbach, Richard J.; Keeler, Manley S.; Cavaiani, Randy J.; and Chapman, Michael K., 4,418,333, Cl. 340-310.00A.
- Charm, Orrin. Hanging device mounting system for devices such as speaker enclosures, 4,417,714, Cl. 248-323.000.
- Charriere, Jean-Michel: See—  
Mena, Andre; Charriere, Jean-Michel; and Desbrest, Jean, 4,417,920, Cl. 75-63.000.
- Chattha, Mohinder S., to Ford Motor Company. High solids coatings from new tetrahydroxy oligomers, 4,418,182, Cl. 525-438.000.
- Chazelas, Elie, to Societe Industrielle de Liaisons Electriques Silec. Electrical stress control electrode in combination with a junction end of a shielded insulated electrical conductor, 4,418,240, Cl. 174-73.00R.
- Chelin, Charles R., to Towmotor Corporation. Self adjusting bearing arrangement, 4,417,769, Cl. 308-3.00R.



- Chemical Dynamics, Inc.: See—  
Koster, Harry D., 4,417,940, Cl. 156-351.000.
- Chemische Werke Huls AG: See—  
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,418,156, Cl. 521-56.000.
- Cheng, Dah Y., to International Power Technology, Inc. Control system for Cheng dual-fluid cycle engine system. 4,417,438, Cl. 60-39.050.
- Cheng, Paul J., to Phillips Petroleum Company. Carbon black process. 4,418,050, Cl. 423-450.000.
- Cherry, Carl J., to Combustion Engineering, Inc. Ceramic fiber refractory mixture. 4,417,925, Cl. 106-85.000.
- Chesney, Joseph J., Jr.; and Schaefer, Robert E., to Tile Council of America, Inc. High temperature resistant adhesive bonding composition of epoxy resin and two-part hardener. 4,418,166, Cl. 523-400.000.
- Chevron Research Company: See—  
Hunschild, Willard M., 4,417,974, Cl. 208-75.000.  
Honnen, Lewis R., 4,418,222, Cl. 568-793.000.
- Chiang, Albert C., to Pitney Bowes Inc. Method for the production of high concentrations of emulsion polymers. 4,418,183, Cl. 526-80.000.
- Chicago Bridge & Iron Company: See—  
Bellafiore, Francis V., 4,417,542, Cl. 118-306.000.
- Chicoine, Gustave J. Manually operated deceleration warning system with vacuum controlled override. 4,418,331, Cl. 340-72.000.
- Chlorine Engineers Corp. Ltd.: See—  
Yamaguchi, Kenzo; Ichisaka, Teruo; Ikegami, Tadao; and Kumagai, Isao, 4,417,970, Cl. 204-257.000.
- Choi, Soo-Bong. Device for a portable automatic syringe. 4,417,889, Cl. 604-246.000.
- Cholewa, Lothar: See—  
Aschoff, Hans-Joachim; and Cholewa, Lothar, 4,418,342, Cl. 340-679.000.
- Christ, Ferdinand: See—  
Weber, Otto; Ohnsmann, Klaus; and Christ, Ferdinand, 4,417,630, Cl. 177-1.000.
- Christians, Leon: See—  
Welter, Andre; Christians, Leon; and Wirtz-Peitz, Ferdinand, 4,418,069, Cl. 424-269.000.
- Christner, Larry G.; and Kelley, Dana A., to Energy Research Corporation. Heat treating. 4,417,872, Cl. 432-18.000.
- Chugai Ro Kogyo Co., Ltd.: See—  
Tarumi, Mitio; Tokitsu, Tetsuya; and Matsumoto, Yoshio, 4,417,871, Cl. 432-1.000.
- Ciacci, James P., to Kendall Company. The. Collection device with antiseptic liquid for body fluids. 4,417,891, Cl. 604-317.000.
- Ciba-Geigy Corporation: See—  
Boger, Manfred; and Ehrenfreund, Josef, 4,418,066, Cl. 424-263.000.  
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,417,918, Cl. 71-100.000.  
Rohr, Otto, 4,417,919, Cl. 71-124.000.  
Schmid, Wolfgang, 4,418,063, Cl. 424-248.540.  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,199, Cl. 548-451.000.  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,200, Cl. 548-451.000.
- Cl Honeywell Bull: See—  
Bourrez, Jean-Marie, 4,418,385, Cl. 364-200.000.
- Ciocan, Benjamin. Portable deflector shields. 4,417,741, Cl. 280-154.50R.
- CIP, Inc.: See—  
Li, Shiu Kang L., 4,417,931, Cl. 156-62.200.
- Clark Equipment Company: See—  
Frost, Charles W., 4,417,649, Cl. 192-3.00R.
- Clarke, Raymond; and Sandberg, Chester L., to Raychem Corporation. Fiber optic temperature sensing. 4,417,782, Cl. 350-96.290.
- Clason, Donald L.; and Schroeck, Calvin W., to Lubrizol Corporation. The. Mixed metal salts/sulfurized phenate compositions and lubricants and functional fluids containing them. 4,417,990, Cl. 252-32.70E.
- Claudius Peters AG: See—  
Krauss, Werner, 4,417,832, Cl. 406-90.000.
- Claxton, William B.; and Cromas, Joseph C., to Bendix Corporation. The. Injector valve with contoured valve seat and needle valve interface. 4,417,694, Cl. 239-533.120.
- Clough, Peter N.: See—  
Wolfrum, Jurgen; Kneba, Michael; and Clough, Peter N., 4,417,964, Cl. 204-158.00R.
- Coca-Cola Company, The: See—  
Morgan, Annis R., Jr.; and King, Eddie W., 4,417,450, Cl. 62-126.000.
- Cohrs, Heinz L.: See—  
Hofgen, Gunter; and Cohrs, Heinz L., 4,418,349, Cl. 343-6.50R.
- Colgate-Palmolive Company: See—  
Bauman, Robert A.; and Pierce, Robert C., 4,418,011, Cl. 252-544.000.
- Collins, John R.: See—  
Blackie, Merrick S.; and Collins, John R., 4,418,026, Cl. 264-8.000.
- Colt Industries Operating Corp.: See—  
Kindl, George F.; Michaud, Olean E.; and Brien, Joseph E., 4,417,816, Cl. 356-357.000.
- Columbia Chemical Corporation: See—  
Rosenberg, William E., 4,417,957, Cl. 204-54.00R.
- Combustion Engineering, Inc.: See—  
Cherry, Carl J., 4,417,925, Cl. 106-85.000.
- Edwards, Lawrence J.; and Lareau, John P., 4,418,315, Cl. 324-202.000.
- Ferrin, Charles R.; and Prestidge, Floyd L., 4,417,971, Cl. 204-305.000.
- Yost, Richard J., 4,418,107, Cl. 428-138.000.
- Commins, Alfred D.; and Kindelovich, Frederick T., to Zip-Rib, Inc. Clip for retaining sheet metal roofing or siding. 4,417,431, Cl. 52-715.000.
- Commissariat a L'Energie Atomique: See—  
Delapierre, Gilles, 4,418,326, Cl. 338-5.000.
- Commonwealth Industrial Gases Limited, The: See—  
Hancock, Warren J., 4,417,673, Cl. 222-153.000.
- Compagnie Industrielle des Telecommunications Cit-Alcatel: See—  
Le Grand, Yves-Marie, 4,418,245, Cl. 179-2.510.
- Connaught, Ruth M.; Coty, Vernon F.; and Sedlak, Michael, to Mobil Oil Corporation. Process for reducing the chemical oxygen demand of spent alkaline reagents. 4,417,986, Cl. 210-759.000.
- Conoco Inc.: See—  
Dodd, John R.; and Ralston, Daniel H., 4,418,005, Cl. 502-217.000.  
Gockel, Charles E., 4,417,624, Cl. 166-362.000.  
Kulik, Metro D., 4,418,044, Cl. 423-235.000.
- Constructors John Brown Limited: See—  
Shotbolt, Keith, 4,417,830, Cl. 405-169.000.
- Container Corporation of America: See—  
Skaggs, Boyd T., 4,417,684, Cl. 229-15.000.
- Continental Group, Inc., The: See—  
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,417,667, Cl. 220-67.000.
- Control Data Corporation: See—  
Tucker, Theodore W., 4,417,770, Cl. 308-3.500.
- Cook, Gregory E., to Windpowered Machines Ltd. Wind turbine soft airfoil control system and method. 4,417,853, Cl. 416-132.00B.
- Copenhaver, Lloyd F., to Carrier Corporation. Flame rollout condition safety device for a combustion system. 4,417,869, Cl. 431-21.000.
- Corain, Luciano, to Nuovo Pignone S.p.A. Weft propelling grippers for textile looms. 4,417,606, Cl. 139-448.000.
- Cordier, Georges; and Fouilloux, Pierre, to Rhone-Poulenc Agrochimie. Process for the selective preparation of meta-chloroanilines. 4,418,213, Cl. 564-412.000.
- Cordoba-Molina, Jesus F.; Hudgins, Robert R.; and Silveston, Peter L. Method for improving solids removal in clarifiers. 4,417,988, Cl. 210-801.000.
- Cornelius, Gerhard; Hilsbein, Wolfgang; Ried, Helmut; and Gessner, Adolf W., to Metallgesellschaft Aktiengesellschaft. Method of producing gasoline hydrocarbons from methanol. 4,418,236, Cl. 585-408.000.
- Corning Glass Works: See—  
Milliman, Bruce A.; and Rodgers, Harris G., Sr., 4,417,513, Cl. 101-41.000.  
Pitcher, Wayne H., Jr., 4,417,908, Cl. 55-523.000.
- Cosentino, Louis C.; and Martinez, Felix J., to Renal Systems, Inc. Percutaneous implant. 4,417,888, Cl. 604-175.000.
- Cosimini, Gregory J.; Lo, David S.; and Paul, Maynard C., to Sperry Corporation. Data track for cross tie wall memory system. 4,418,400, Cl. 365-87.000.
- Costabile, Arvid B.: See—  
Costabile, John J.; Costabile, Arvid B.; and Costabile, Ernest, 4,417,852, Cl. 416-2.000.
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Costabile, John J.; Costabile, Arvid B.; and Costabile, Ernest, 4,417,852, Cl. 416-2.000.
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- Coster Tecnologie Speciali S.p.A.: See—  
Giuffredi, Giancarlo, 4,417,674, Cl. 222-402.180.
- Cotter, Edmund; Whatley, Francis; and Baum, Heinz W., to Lucas Industries Limited. Disc brakes and friction pad assemblies therefor. 4,417,647, Cl. 188-73.380.
- Coty, Vernon F.: See—  
Connaught, Ruth M.; Coty, Vernon F.; and Sedlak, Michael, 4,417,986, Cl. 210-759.000.
- Courtaulds Limited: See—  
Blackie, Merrick S.; and Collins, John R., 4,418,026, Cl. 264-8.000.
- Cousin, Alan J.: See—  
Bechai, Nabil R.; and Cousin, Alan J., 4,417,583, Cl. 128-660.000.
- Couture, Michael V.; and Keklak, Ronald. Pocket key holder. 4,417,612, Cl. 150-40.000.
- Cowden, James J.: See—  
Cave, Eric F.; and Cowden, James J., 4,417,423, Cl. 51-283.00R.
- Cowen, Steven J.: See—  
Gordon, Alan; Watson, Stanley J.; Cowen, Steven J.; Mackelburg, Gerald; and Castile, Brett D., 4,418,404, Cl. 367-132.000.
- CPC International Inc.: See—  
Bohrmann, Hans; Campbell, Thomas; Grigoteit, Werner; and Muller, Gunter, 4,418,090, Cl. 426-578.000.
- Cravens, Charles F.: See—  
McNealy, Richard C.; and Cravens, Charles F., 4,418,258, Cl. 219-10.410.
- Crehan, Patrick James: See—  
Kennedy, Richard B., 4,417,998, Cl. 252-182.000.
- Crispin, Brunhart; Voss, Nobert; Pohl, Wulf-Dieter; and Thomaier, Dieter, to Messerschmitt-Bokow-Blohm Gesellschaft mit beschränkter Haftung. Ram jet engine. 4,417,441, Cl. 60-251.000.
- Critikon, Inc.: See—  
Houghton, Richard B.; and Lentz, David J., 4,417,588, Cl. 128-713.000.

- Cromas, Joseph C.: See—  
Claxton, William B.; and Cromas, Joseph C., 4,417,694, Cl. 239-533.120.
- Cseh, Gyorgy: See—  
Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, 4,418,205, Cl. 560-39.000.
- Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Sztipanovits, Janos; Vimlati, Pal; Istvan, Zoltan; and Zillich, Pal, to Medicor Muvek. Circuit arrangement for determining the characteristics of liquids and/or gases, in particular the hemoglobin content of the blood. 4,417,812, Cl. 356-40.000.
- Cserey, Laszlo; Vimlati, Pal; and Zillich, Pal, to Medicor Muvek. Process and circuit arrangement for the determination in a diluted blood sample of the number of red blood corpuscles, the mean cell volume, the value of haematocrit and other blood parameters. 4,418,313, Cl. 324-71.100.
- Cserhalmi, Nicholas B.; and Cappon, Arthur M., to Raytheon Company. Logic gate having a noise immunity circuit. 4,418,292, Cl. 307-443.000.
- CTEC Company: See—  
Quaack, Manfred W.; and Ross, Douglas, 4,417,634, Cl. 180-22.000.
- CTS Corporation: See—  
Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., 4,418,009, Cl. 252-514.000.  
Ibrahim, Shawkil S.; and Elsner, James E., 4,417,392, Cl. 29-840.000.
- Cuevas, Danilo L.; Russo, Frank R.; and Schindler, Francis E., to Engelhard Corporation. Non-burnished precious metal composition. 4,418,099, Cl. 427-229.000.
- Culley, Donnell H., Jr. Lumber feeder. 4,417,680, Cl. 226-181.000.
- Culver, Norman D., to Braintech, Inc. Apparatus and method for topographic display of multichannel EEG data. 4,417,591, Cl. 128-731.000.
- Cundy, Steven L.; Evans, Ronald A.; Johnson, Oliver S.; McCormack, John S.; and Nichols, Bruce A., to Associated Electrical Industries Limited. Manufacture of optical fibre preforms. 4,417,911, Cl. 65-3.120.
- Cunningham, Charles L.; and Gwaltney, Robert E., to Hennessy Industries, Inc. Abrasion eliminating tire changing tool. 4,417,614, Cl. 157-1.240.
- Cuproquim S.A.: See—  
Gonzalez, Mario R. R., 4,418,056, Cl. 424-142.000.
- Curtis, John R., to Sericol Group Limited. Photopolymerizable materials for use in producing stencils for screen printing. 4,418,138, Cl. 430-253.000.
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- Dahlitz, Ronald R., to Buffalo Bullet Company. Bullet for muzzle loading guns. 4,417,521, Cl. 102-511.000.
- Dahms, Francis A., to Emhart Industries, Inc. Glassware forming apparatus. 4,417,915, Cl. 65-159.000.
- Dahn, Raymond C.: See—  
Escher, Giorgio A.; and Dahn, Raymond C., 4,417,937, Cl. 156-169.000.
- Daicel Chemical Industries, Ltd.: See—  
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- Daigle, Phillip R. Key switch assembly. 4,418,252, Cl. 200-16.00A.
- Daikin Kogyo Kabushiki Kaisha: See—  
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- Dailey, James E.: See—  
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Gaus, Hermann; Zaiser, Wolfgang; Pickard, Jurgen; and Eltze, Georg, 4,417,484, Cl. 74-688.000.
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Ueda, Yoshihiro; Kimura, Yoshikazu; Yonehara, Hiroyuki; and Tanabe, Kenjiro, 4,417,810, Cl. 355-74.000.
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- Dalke, Arthur E. Carburetor mixture control apparatus. 4,417,562, Cl. 123-592.000.
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Walter, Horst; Ebbinghaus, Werner; and Danckert, Hermann, 4,417,552, Cl. 123-198.00E.
- Danick, Georg, to Cassella Aktiengesellschaft. Process for the manufacture of sulphur which can be recycled. 4,418,014, Cl. 260-125.000.
- Danner, Lambert J., to C. Reichert Optische Werke AG. Five-component microscope objective. 4,417,787, Cl. 350-414.000.
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Brown, Robert J., 4,418,344, Cl. 340-726.000.
- Daubert Industries, Inc.: See—  
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See, Yee-Chang; Davies, Roderick D.; and Hartman, Dennis C., 4,418,094, Cl. 427-38.000.
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- Davis, John S.: See—  
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- Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 8-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-1-phenyl-1,3,8-triazaspiro[4.5]dec-5-yl decan-4-one to treat pain. 4,418,067, Cl. 424-267.000.
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- Dawson, William W., to University of Florida, The. Corneal electrode for electroretinography. 4,417,581, Cl. 128-639.000.
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Case, James E.; Ruppert, Richard L.; and Manning, Lindley, 4,417,425, Cl. 52-125.500.
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Pierrot, Victor C., III; and Ihm, Gerald J., 4,417,759, Cl. 294-86.00R.
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- DeHart, Damon H. Wall bracket construction. 4,417,712, Cl. 248-225.200.
- Deibel, Christopher J.; and Massey, Edward W., to Bliss & Laughlin Industries Incorporated. Tierable and nestable receptacle. 4,417,509, Cl. 99-467.000.
- Delapierre, Gilles, to Commissariat a L'Energie Atomique. Measuring device using a strain gauge. 4,418,326, Cl. 338-5.000.
- De Marsh, Melvin J. Halide and like light reflector and socket assembly for greenhouse and like use. 4,418,379, Cl. 362-282.000.
- Dembeck, Kurt M., to United Technologies Corporation. Containment shell for a fan section of a gas turbine engine. 4,417,848, Cl. 415-121.00G.
- Deming, John M.: See—  
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- Demke, Kent R.; and Mumola, Joanne L., to International Business Machines Corporation. Displaying a full page representation. 4,418,345, Cl. 340-731.000.
- Dennehey, T. Michael; and Peterson, Charles K., to Baxter Travenol Laboratories, Inc. Antibacterial closure. 4,417,890, Cl. 604-256.000.
- de Paulis, Tomas: See—  
Hogberg, Thomas; de Paulis, Tomas; Ross, Svante B.; and Ulff, Carl B. J., 4,418,065, Cl. 424-263.000.
- de Pignon, Pierre J. Automatic tool mounting for excavators, loaders, graders and the like. 4,417,844, Cl. 414-723.000.
- DePirro, Mario. Pneumatic valve. 4,417,598, Cl. 137-2.000.
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- Desbrest, Jean: See—  
Mena, Andre; Charriere, Jean-Michel; and Desbrest, Jean, 4,417,920, Cl. 75-63.000.
- Detrick, Jeffrey C. Wood treating method and apparatus for facilitating removal of ferrous materials therefrom. 4,418,260, Cl. 219-10.430.
- Dettelbach, Alfred: See—  
Abt, Anton; Dettelbach, Alfred; and Gresser, Gerhard, 4,417,675, Cl. 222-146.00E.
- Deutschmann, Herbert; and Kamleitner, Ewald, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Fuel injection pump arrangement. 4,417,555, Cl. 123-372.000.
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- De Vries, Douglas F., to Bear Medical Systems, Inc. Patient adaptor for medical ventilator. 4,417,573, Cl. 128-204.250.
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- Diamond, Julius: See—  
Douglas, George H.; Diamond, Julius; Studt, William L.; and Dodson, Stuart A., 4,418,209, Cl. 564-27.000.
- Dickens, James A.: See—  
Whitehead, William F., Jr.; Dickens, James A.; and Haynes, Benjamin C., Jr., 4,417,839, Cl. 414-303.000.
- Diehl GmbH & Co.: See—  
Siebert, Rainer; Stutzle, Dietmar; and Weidner, Peter, 4,417,518, Cl. 102-212.000.
- Diemer, Wolfgang: See—  
Baur, Rolf; and Diemer, Wolfgang, 4,417,980, Cl. 210-91.000.
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Grosser, Heinrich; Dierkes, Hermann; Lutke, Hubertus; and Schreckenberg, Klaus, 4,417,499, Cl. 89-36.00K.
- Dieterich, Dieter: See—  
Rasshofer, Werner; Dieterich, Dieter; and Meyborg, Holger, 4,418,160, Cl. 521-159.000.
- Dinger, Hans, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Electronically controlled fuel injection timer. 4,417,554, Cl. 123-357.000.
- Dinius, Harold B.: See—  
Nicholson, David W.; Smith, Larry G.; Dinius, Harold B.; and Oberle, Ronald R., 4,417,662, Cl. 209-522.000.
- Disctron, Inc.: See—  
Nalley, Robert E.; and Shenfield, Leonard R., 4,418,368, Cl. 360-78.000.
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- Dodd, John R.; and Ralston, Daniel H., to Conoco Inc. Pressure activation of magnesium oxide catalysts. 4,418,005, Cl. 502-217.000.
- Dodson, John S.: See—  
Lawrence, John C.; Stewart, Andrew D. G.; and Dodson, John S., 4,417,564, Cl. 125-30.00R.
- Dodson, Stuart A.: See—  
Douglas, George H.; Diamond, Julius; Studt, William L.; and Dodson, Stuart A., 4,418,209, Cl. 564-27.000.
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- Dolan, Norman E., to Ecodyne Corporation. Cooling tower apparatus. 4,418,023, Cl. 261-109.000.
- Doliber, Darrel, to Litton Systems, Inc. Night sight with illuminated aiming point. 4,417,814, Cl. 356-252.000.
- Dorn, Ingo H.: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mitnacht, Hans; Pohrt, Jürgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Dorner, Rosemarie: See—  
Smigierski, Rudolf; Dorner, Rosemarie; and Schmidt, Peter, 4,417,983, Cl. 210-527.000.
- Dorney, Roger: See—  
Erland, Jonathan; and Dorney, Roger, 4,417,791, Cl. 352-45.000.
- Dortch, Laurence E. Trailer swivel hitch guide. 4,417,748, Cl. 280-477.000.
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Ezzell, Bobby R.; and Burney, Harry S., Jr., 4,417,961, Cl. 204-98.000.
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- Pawloski, Chester E., 4,418,198, Cl. 546-292.000.
- Williams, Billy M., 4,418,201, Cl. 548-579.000.
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Polmanter, Keith E.; and Chapman, Harry L., 4,418,165, Cl. 523-210.000.
- Doyama, Umeo, to Riccar Company, Ltd. Sewing machine with electronic controlled stitch pattern generator. 4,417,531, Cl. 112-158.00E.
- Doyle, Donald E.; Hellwarth, George A.; and Quanstrom, Jack L., to International Business Machines Corporation. Data flow component for processor and microprocessor systems. 4,418,383, Cl. 364-200.000.
- Dresser Industries, Inc.: See—  
Shore, Daniel B., 4,417,502, Cl. 91-447.000.
- Drevet, Michel; and Trouillet, Jean, to Jeumont Schneider Corporation. Hydrostatic guide bearing of a seat. 4,417,823, Cl. 384-115.000.
- Duffy, James P., to Witco Chemical Corporation. Free flowing antistatic composition. 4,417,999, Cl. 252-383.000.
- Dulin, Kerry: See—  
Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., 4,417,681, Cl. 227-8.000.
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- Dunn, Donnell L., to J. I. Case Company. Hydraulic system for preventing leak down of hydraulic implements. 4,417,633, Cl. 180-132.000.
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Levitt, George; and Sauers, Richard F., 4,417,917, Cl. 71-93.000.
- Logullo, Francis M., Sr.; and Wu, Yun-Tai, 4,418,164, Cl. 523-207.000.
- Maurin, Louis J., III, 4,418,232, Cl. 570-228.000.
- Scott, Paul T., 4,418,116, Cl. 428-288.000.
- Durango Systems, Inc.: See—  
Cushman, James E.; Plaza, Mario G.; and Waibel, Helmut K., 4,417,825, Cl. 400-605.000.
- Durkoppwerke GmbH: See—  
Hannemann, Franz, 4,417,535, Cl. 112-304.000.
- Durnev, Valery V., deceased: See—  
Soloviev, Sergei A.; Fedorov, Svyatoslav N.; Osetsky, Vitaly P.; and Durnev, Valery V., deceased, 4,417,579, Cl. 128-303.00R.
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Soloviev, Sergei A.; Fedorov, Svyatoslav N.; Osetsky, Vitaly P.; and Durnev, Valery V., deceased, 4,417,579, Cl. 128-303.00R.
- Durville, Gerard, to Textilma AG. Machine for the production of knitted goods and method of the machine. 4,417,455, Cl. 66-207.000.
- Dustbane Products Limited: See—  
Hammond, Dennis A., 4,417,364, Cl. 15-147.00R.
- Dyer, Alan; and Araya, Abraham, to Laporte Industries Limited. Aluminophosphorus compounds. 4,418,048, Cl. 423-305.000.
- Dynalectron Corporation: See—  
Kendall, Ray, 4,417,738, Cl. 280-43.170.
- Dynamit Nobel Aktiengesellschaft: See—  
Breitscheidel, Hans-Ulrich; Spielau, Paul; and Alfter, Franz-Werner, 4,417,932, Cl. 156-62.200.
- Dyson, Lewis L., to Textron Inc. Drive shaft seal. 4,417,881, Cl. 464-150.000.
- E. R. Squibb & Sons, Inc.: See—  
Nakane, Masami; Reid, Joyce; and Haslanger, Martin F., 4,418,076, Cl. 424-285.000.
- Nunn, Adrian; and Loberg, Michael, 4,418,208, Cl. 562-449.000.
- Eastman Kodak Company: See—  
Evans, Steven, 4,418,131, Cl. 430-17.000.
- Zannucci, Joseph S.; and Pruett, Wayne P., 4,418,000, Cl. 252-403.000.
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Busby, Robert A.; Nat, Gursharan P. S.; and Stearley, John W., 4,418,254, Cl. 200-68.300.
- Ferrato, Joseph P., 4,418,102, Cl. 428-1.000.
- Kenny, Andrew A., 4,417,599, Cl. 137-85.000.
- Mazur, Joseph S., 4,417,636, Cl. 180-68.00R.
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- Eaton-Williams, Raymond H. Multi-electrode boiler. 4,418,269, Cl. 219-295.000.
- Ebbinghaus, Werner: See—  
Walter, Horst; Ebbinghaus, Werner; and Danckert, Hermann, 4,417,552, Cl. 123-198.00E.
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- Ebi, Yutaka: See—  
Horike, Masanori; and Ebi, Yutaka, 4,418,352, Cl. 346-75.000.
- Eckart, Frederick: See—  
Rosenbeck, William H.; Eckart, Frederick; and Gerath, Francis C., 4,418,266, Cl. 219-137.00R.
- Eckert, Robert D.: See—  
Rogers, Howard G.; Eckert, Robert D.; Sahatjian, Ronald A.; and Sulesky, Robert A., 4,418,139, Cl. 430-354.000.
- Ecodyne Corporation: See—  
Dolan, Norman E., 4,418,023, Cl. 261-109.000.
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- Edgar, C. Mills, to Solid State Systems, Inc. Bistable switch remotely operable over telephone line. 4,418,244, Cl. 179-2.00A.
- Edgell, James E.: See—  
Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., 4,417,681, Cl. 227-8.000.
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- Edwards, Robert L., to National Seating Co. Reversible transportation seat. 4,417,715, Cl. 248-425.000.
- Egami, Kazunari: See—  
Tsuiji, Yoshitake; Mori, Nobuhiko; and Egami, Kazunari, 4,418,423, Cl. 382-40.000.

- Egami, Tsuneyuki: See—  
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,417,471, Cl. 73-204.000.
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Boger, Manfred; and Ehrenfreund, Josef, 4,418,066, Cl. 424-263.000.
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- Eisemann, Richard E., to Xerox Corporation. Sheet registration in a finishing station. 4,417,801, Cl. 355-3.05H.
- Elderton, Peter P., to ITT. Densitometer. 4,417,474, Cl. 73-438.000.
- Eldridge, Michael W.: See—  
Hardy, Derek J.; and Eldridge, Michael W., 4,417,637, Cl. 180-116.000.
- Electrochemical Products, Inc.: See—  
McCoy, Ewald H., 4,417,956, Cl. 204-44.000.
- Elfab Corporation: See—  
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,417,396, Cl. 29-884.000.
- Eli Lilly and Company: See—  
Jones, Charles D., 4,418,068, Cl. 424-267.000.
- Nicholson, David W.; Smith, Larry G.; Dinius, Harold B.; and Oberle, Ronald R., 4,417,662, Cl. 209-522.000.
- Elliston, Thomas L., to Hydra-Rig, Inc. Traveling block elevator latch assembly. 4,417,846, Cl. 414-745.000.
- El-Ramey, Thomas A. Marine anchor with release capability. 4,417,538, Cl. 114-298.000.
- Elsel, Werner, to Siemens Aktiengesellschaft. Support structure for transmitting large forces. 4,418,325, Cl. 335-216.000.
- Elser, Dieter, to Zahnradfabrik Friedrichshafen, AG. Steering booster system. 4,417,501, Cl. 91-375.00A.
- Elsner, James E.: See—  
Ibrahim, Shauki S.; and Elsner, James E., 4,417,392, Cl. 29-840.000.
- Eltze, Georg: See—  
Gaus, Hermann; Zaiser, Wolfgang; Pickard, Jürgen; and Eltze, Georg, 4,417,484, Cl. 74-688.000.
- Emery Industries, Inc.: See—  
Fayter, Richard G., Jr.; and Hall, Allen L., 4,418,202, Cl. 549-496.000.
- Emes, Harry R.: See—  
Lopacki, John B.; and Emes, Harry R., 4,417,389, Cl. 29-619.000.
- Emhart Industries, Inc.: See—  
Dahms, Francis A., 4,417,915, Cl. 65-159.000.
- Smock, Steven W., 4,418,271, Cl. 219-493.000.
- Spofford, Walter R., Jr.; and Pomerantz, Daniel I., 4,418,339, Cl. 340-595.000.
- Emi, Toshihiko: See—  
Nakanishi, Kyoji; Nozaki, Tsutomu; and Emi, Toshihiko, 4,417,719, Cl. 266-78.000.
- Energy Research Corporation: See—  
Christner, Larry G.; and Kelley, Dana A., 4,417,872, Cl. 432-18.000.
- Engelhard Corporation: See—  
Cuevas, Danilo L.; Russo, Frank R.; and Schindler, Francis E., 4,418,099, Cl. 427-229.000.
- Engelke, Helmut: See—  
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,417,946, Cl. 156-643.000.
- Engelke, Henry C. Can crusher. 4,417,512, Cl. 100-266.000.
- Engels, Walter; and Willbanks, Charles E., to Milliken Research Corporation. Water paste extrusion die. 4,417,695, Cl. 239-590.300.
- Environmental Research Institute of Michigan: See—  
Tai, Anthony M., 4,418,394, Cl. 364-746.000.
- Eppenhach, Lawrence C. Dispenser for flowable material. 4,417,672, Cl. 222-81.000.
- Erland, Jonathan; and Dorney, Roger. Process for composite photography. 4,417,791, Cl. 352-45.000.
- Ernst Becker & Nadelfabrik Commandit-Gesellschaft: See—  
Berentzen, Harro, 4,417,454, Cl. 66-123.000.
- Erwin Sick GmbH Optik-Elektronik: See—  
Krause, Gerhard, 4,417,481, Cl. 73-861.280.
- Eryman, William S.: See—  
Udovich, Carl A.; and Eryman, William S., 4,418,003, Cl. 502-209.000.
- Esaki, Tamamaru: See—  
Tani, Masami; Esaki, Tamamaru; and Ohno, Yoshikata, 4,418,103, Cl. 428-4.000.
- Escher, Giorgio A.; and Dahn, Raymond C., to Atlantic Bridge Company Limited. Fibre reinforced plastic structures and method and apparatus for producing same. 4,417,937, Cl. 156-169.000.
- Escher Wyss GmbH: See—  
Bubik, Alfred; and Hack, Kurt, 4,417,950, Cl. 162-300.000.
- Esselte Studium AB: See—  
Hay, Eric; and Nordstrom, Anders, 4,417,728, Cl. 273-29.00A.
- Esser, Fred; Klopper, Detlev; Lachner, Walter; and Kruger, Albrecht, to VEB Edelmetallwerk Freiberg. Metallurgical plasma melting furnace. 4,418,414, Cl. 373-24.000.
- Essex Group, Inc.: See—  
Bishop, Robert M.; Payette, Lionel J.; and Pike, Roscoe A., 4,418,190, Cl. 528-353.000.
- Ethyl Corporation: See—  
Hinkamp, James B., 4,417,903, Cl. 44-53.000.
- Evans, Evan J.: See—  
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,417,396, Cl. 29-884.000.
- Evans, Robert M., to RCA Corporation. Tuning system for a multi-band television receiver. 4,418,428, Cl. 455-180.000.
- Evans, Ronald A.: See—  
Cundy, Steven L.; Evans, Ronald A.; Johnson, Oliver S.; McCormack, John S.; and Nichols, Bruce A., 4,417,911, Cl. 65-3.120.
- Evans, Steven, to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible yellow dye-releasing compounds and precursors thereof. 4,418,131, Cl. 430-17.000.
- Everling, Bruce W.: See—  
Goodman, Toronto P.; and Everling, Bruce W., 4,417,547, Cl. 123-25.00J.
- Exner, Klaus D., to Siemens Aktiengesellschaft. Method for mounting a semiconductor device in a housing. 4,417,386, Cl. 29-590.000.
- Exxon Research and Engineering Co.: See—  
DeYoung, Thomas W.; and Miranda, Hector, 4,418,355, Cl. 346-140.00R.
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- McCandlish, Larry E.; and Kugler, Edwin L., 4,418,154, Cl. 518-714.000.
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- Stein, Alexander; Rabinowitz, Paul; and Kaldor, Andrew, 4,417,822, Cl. 374-129.000.
- Ezaki, Motoharu: See—  
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Ronci, Fernando M., 4,417,372, Cl. 24-163.00R.
- Faber, William M., Sr.: See—  
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- Facet Enterprises, Incorporated: See—  
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- Fairfield Manufacturing Co., Inc.: See—  
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- Falbo, Dario: See—  
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- Falk Corporation, The: See—  
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- Familian Corp.: See—  
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- Farber, Heinrich: See—  
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- Favaloro, William E. Respiration monitor for mammals. 4,417,589, Cl. 128-716.000.
- Fayter, Richard G., Jr.; and Hall, Allen L., to Emery Industries, Inc. 2-Vinyl- and 2-ethylcyclopropane monocarboxylates. 4,418,202, Cl. 549-496.000.
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- Fehrle, Martin: See—  
Rieder, Werner; and Fehrle, Martin, 4,418,122, Cl. 428-480.000.
- Fehrm, Björn O., to U.S. Phillips Corporation. Spreading device. 4,417,709, Cl. 244-136.000.
- Feldman, Allan M.: See—  
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- Finet, Alain; and Nerone, Louis R., to Stock Equipment Company. Product-to-frequency converter. 4,418,389, Cl. 364-478.000.
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Dall'Aglio, Carlo, 4,417,400, Cl. 33-172.00E.



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- Finneston, Alan. Lower arm brace. 4,417,570, Cl. 128-87.00R.
- Finstone Tire & Rubber Company, The: See—  
Bohm, Georg G. A.; Vescelius, Lee E.; and Hamed, Gary R., 4,418,167, Cl. 524-68.000.
- Firth, Bruce E., to UOP Inc. Preparation of 2,4,6-trialkylphenols. 4,418,223, Cl. 568-794.000.
- Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary printing machine system. 4,417,516, Cl. 101-181.000.
- Fischer & Porter Company: See—  
Schmooch, Roy F.; and Shauger, Herbert A., 4,417,479, Cl. 73-861.160.
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- Flanagan, Joseph E., to Rockwell International Corporation. Electro-philic solid propellant gas generator. 4,417,930, Cl. 149-19.900.
- Flippo, Frans A.: See—  
Muetgeert, Johannes; Otto, Petrus H. L.; and Flippo, Frans A., 4,418,147, Cl. 435-178.000.
- Floros, Constantinos. Liquid driven rotary brush with liquid soap feeder. 4,417,826, Cl. 401-41.000.
- FM Corporation: See—  
Brown, Richard A.; Byers, Lance R.; and Norris, Robert D., 4,418,051, Cl. 423-592.000.
- Fohl, Artur, to Repa Feinstanzwerk GmbH. Automatic roll-up device for a safety belt. 4,417,702, Cl. 242-107.200.
- Fontenot, Delouis J., to Phillips Petroleum Company. Degassing method and apparatus. 4,417,907, Cl. 55-38.000.
- Forand, Ronald R.; and Menz, Edward T., Jr., to Rohm and Haas Company. Assay process with non-boiling denaturation. 4,418,151, Cl. 436-505.000.
- Forbes, Hampton E., Jr., to Westvaco Corporation. Shipping and display carton. 4,417,655, Cl. 206-45.250.
- Forbes II, Richard L., to Xerox Corporation. Particle dispenser. 4,417,802, Cl. 355-3.0DD.
- Ford Motor Company: See—  
Chattah, Mohinder S., 4,418,182, Cl. 525-438.000.
- Forton, Henri M. F. J.: See—  
Viellefant, Jean F.; and Forton, Henri M. F. J., 4,417,953, Cl. 204-12.000.
- Fouilloux, Pierre: See—  
Cordier, Georges; and Fouilloux, Pierre, 4,418,213, Cl. 564-412.000.
- Foulletier, Louis, to PCUK Produits Chimiques Ugine Kuhlmann. Catalysts for gaseous phase fluorination of aliphatic chlorinated and chlorofluorinated derivatives. 4,418,004, Cl. 502-182.000.
- Francis, Gaylord L.: See—  
Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., 4,418,009, Cl. 252-514.000.
- Francis, James N.; and Veluswamy, Lavanga R., to Exxon Research and Engineering Co. Recovery of coal liquefaction catalysts. 4,417,972, Cl. 208-10.000.
- Frank, Eugene O. Intake air booster for an internal combustion engine. 4,417,560, Cl. 123-559.000.
- Frank, Ulrich A. Liquid monitor. 4,417,585, Cl. 128-668.000.
- Frank, Alwis: See—  
Arnason, Tomas; Franke, Alwis; and Tschopp, Theodor, 4,417,958, Cl. 204-67.000.
- Frankhouser, Paul L.; and Shevde, Ketan, to Arrow International, Inc. Catheter introduction set. 4,417,886, Cl. 604-53.000.
- Franklin Institute, The: See—  
Pylewski, Louis L.; Iaconianni, Frank J.; Krevitz, Kenneth; and Smith, Arthur B., 4,417,977, Cl. 208-262.000.
- Franz Plasser Bahnmaschinen Industrie-Gesellschaft m.b.H.: See—  
Theurer, Josef; and Bock, Gernot, 4,417,522, Cl. 104-7.00B.
- Frederick Electronics Corporation: See—  
Swagerty, Arnold; and Mitchell, William A., 4,418,318, Cl. 328-155.000.
- Freedom, John. Indicia means for keys. 4,417,410, Cl. 40-330.000.
- Frentzel, Richard L., to Celotex Corporation. The. Polyoxalkylene/unsaturated diester reaction product for cellular foam stabilization. 4,418,158, Cl. 521-115.000.
- Fricke, Richard J.: See—  
Kennedy, Richard B., 4,417,998, Cl. 252-182.000.
- Friedrich Grohe Armaturenfabrik GmbH & Co.: See—  
Bernat, Georg, 4,417,933, Cl. 156-64.000.
- Fritz Eichenauer GmbH & Co. KG: See—  
Roller, Hanno; and Nauerth, Karl-Heinz, 4,418,272, Cl. 219-541.000.
- Fritz Schafer Gesellschaft mit beschränkter Haftung: See—  
Schafer, Gerhard, 4,417,541, Cl. 118-326.000.
- Frost, Charles W., to Clark Equipment Company. Arrangement for the brake system of a hydrostatic loader including a valve port block. 4,417,649, Cl. 192-3.00R.
- Fuji Electric Co., Ltd.: See—  
Kawasaki, Kikuo; Yoshida, Kazuo; Nonoyama, Nobuo; Yamaguchi, Toshiyumi; Hasegawa, Toshio; and Okamura, Jitsuo, 4,417,671, Cl. 222-56.000.
- Fuji Jukogyo Kabushiki Kaisha: See—  
Kageyama, Hayashi, 4,417,641, Cl. 180-247.000.
- Fuji Photo Film Co., Ltd.: See—  
Katsuyama, Harumi; and Shishido, Tadao, 4,418,037, Cl. 422-56.000.
- Kawaguchi, Hideo; and Inayama, Takayuki, 4,418,141, Cl. 430-530.000.
- Kogane, Mikio, 4,417,808, Cl. 355-29.000.
- Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; and Nishimura, Tatsuo, 4,418,140, Cl. 430-351.000.
- Oishi, Kengo; and Suzuki, Osamu, 4,417,704, Cl. 242-197.000.
- Fuji Terumo Co., Ltd.: See—  
Koshi, Isei, 4,417,887, Cl. 604-162.000.
- Fujida, Mamoru: See—  
Osuga, Minoru; Oyama, Yoshishige; and Fujida, Mamoru, 4,417,558, Cl. 123-489.000.
- Fujii, Etsuo: See—  
Satoh, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, 4,417,768, Cl. 303-113.000.
- Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, to Torii & Co. Ltd. Leucylalanyl-arginine derivative. 4,418,012, Cl. 260-112.50R.
- Fujii, Toshinobu, to Meidensha Electric Mfg. Co., Ltd. Metal-bromine secondary battery. 4,418,128, Cl. 429-70.000.
- Fujimori, Tohru; and Kusui, Yoshino, to Sony Corporation. Tape cassette. 4,418,373, Cl. 360-132.000.
- Fujimoto, Hideaki: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
- Fujimoto, Tadao; Fujiuchi, Hiroyuki; Shimizu, Kenichi; and Ueda, Seiichi, to Kubota Ltd. Method for melting and treating waste. 4,417,529, Cl. 110-346.000.
- Fujitsu Limited: See—  
Kouno, Tsutomu, 4,418,242, Cl. 178-19.000.
- Sakurai, Junji, 4,418,399, Cl. 365-51.000.
- Fujiuchi, Hiroyuki: See—  
Fujimoto, Tadao; Fujiuchi, Hiroyuki; Shimizu, Kenichi; and Ueda, Seiichi, 4,417,529, Cl. 110-346.000.
- Fujiwara, Kenzo, to Mitsubishi Denki Kabushiki Kaisha. Insulated coil. 4,418,241, Cl. 174-121.05R.
- Fukatsu, Shunzo: See—  
Okonogi, Tsuneo; Fukatsu, Shunzo; Hachisu, Mitsugu; Kawashima, Hiroko; Shitoh, Keiko; and Sekizawa, Yasuharu, 4,418,070, Cl. 424-270.000.
- Fukuda, Akihiro: See—  
Akagi, Kazuo; Fukuda, Akihiro; and Saito, Tomio, 4,417,421, Cl. 51-16.000.
- Fukuoka Kagaku Kogyo: See—  
Fukuoka, Sadao, 4,417,407, Cl. 36-3.00B.
- Fukuoka, Sadao, to Fukuoka Kagaku Kogyo. Footwear. 4,417,407, Cl. 36-3.00B.
- Fuller, John F., Jr., to H. J. Heinz Company. Article of manufacture and process. 4,417,405, Cl. 34-39.000.
- Fullman, Robert L., to General Electric Company. Steel nitriding method and apparatus. 4,417,927, Cl. 148-16.600.
- Furukawa Electric Co., Ltd.: See—  
Sakurai, Yoshimi; Furukawa, Yoshimi; Kanai, Masaaki; and Osada, Yasufumi, 4,417,775, Cl. 339-5.00M.
- Furukawa, Yoshimi: See—  
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- Furuta, Youichi, to Aisin Seiki Kabushiki Kaisha. Brake master cylinder with attached brake booster. 4,417,445, Cl. 60-554.000.
- Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Tag attaching machine. 4,417,682, Cl. 227-67.000.
- Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jorg, to Robert Bosch GmbH. Fuel injection valve for an internal combustion engine. 4,417,693, Cl. 239-453.000.
- G.N. Plastics Company Limited: See—  
Nemeskeri, Georg, 4,418,034, Cl. 264-522.000.
- G. Siempelkamp GmbH & Co.: See—  
Sitzler, Hans-Dietrich, 4,417,866, Cl. 425-364.00R.
- Gafcel Industries, Inc.: See—  
Gaffney, William, 4,417,936, Cl. 156-145.000.
- Gaffney, William, to Gafcel Industries, Inc. Plastic web with multiplicity of gas filled bubbles, containing printing thereon and method of making same. 4,417,936, Cl. 156-145.000.
- Gale, Michael T.: See—  
Knop, Karl H.; and Gale, Michael T., 4,417,784, Cl. 350-162.190.
- GAO Gesellschaft für Automation und Organisation mbH: See—  
Hoppe, Joachim; and Haghir-Tehrani, Yahya, 4,417,413, Cl. 40-630.000.
- Gardner, Donald E.; and Smith, David T., to Surgicot, Inc. Self-sealing sterilization bag. 4,417,658, Cl. 206-438.000.
- Garel, Yves. Self orientable vehicle propelled by a system of pedals actuating a chain. 4,417,743, Cl. 280-266.000.
- Garrone, Franco, to Sasib S.p.A. Apparatus forming a continuous cut tobacco braid in a cigarette making machine. 4,417,594, Cl. 131-110.000.
- Gauch, Hermann; and von Hagen, Wolf R., to Union Special G.m.b.H. Lubricant sensing device for sewing machines. 4,417,534, Cl. 112-256.000.
- Gaus, Hermann; Zaiser, Wolfgang; Pickard, Jurgen; and Eltze, Georg, to Daimler-Benz Aktiengesellschaft. Planetary change-speed transmission for automotive vehicles. 4,417,484, Cl. 74-688.000.
- Gausepohl, Hermann: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jurgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.

- Gauthier, Andre; and Morand, Jean C. F., to Societe Anonyme de Telecommunications. Process for preparing layers of Hg<sub>1-x</sub>Cd<sub>x</sub>Te. 4,418,096, Cl. 427-76.000.
- Gebr. Happich GmbH: See—  
Cziptschirsch, Kurt; Viertel, Lothar; and Kaiser, Peter, 4,417,761, Cl. 296-97.00H.
- Gehweiler, William F.: See—  
Heagerty, William F.; Caracciolo, Gerald T.; and Gehweiler, William F., 4,418,402, Cl. 365-156.000.
- Geisthoff, Hubert, to Jean Walterscheid GmbH. Safety clutch. 4,417,650, Cl. 192-56.00R.
- Genahr, Rudolf, to Cerberus AG. Infrared intrusion detector with pyroelectric sensor and charge amplifier. 4,418,335, Cl. 340-565.000.
- General Dynamics Corporation/Convair Div.: See—  
Bartholomew, Bruce J., 4,417,813, Cl. 356-349.000.
- General Dynamics, Pomona Division: See—  
Dissmeyer, Dean E.; and Mohiman, David F., 4,417,498, Cl. 89-1.814.
- Hulderman, Garry N., 4,418,430, Cl. 455-328.000.
- Audal, Inge, 4,417,520, Cl. 102-489.000.
- General Electric Company: See—  
Anderson, Brenda L.; and Boyd, Ronald J., 4,417,648, Cl. 188-119.000.
- Becker, Charles A., 4,417,393, Cl. 29-846.000.
- Bennett, James G.; and Tungate, Freddie L., 4,418,224, Cl. 568-804.000.
- Bose, Bimal K., 4,418,308, Cl. 318-803.000.
- Fullman, Robert L., 4,417,927, Cl. 148-16.600.
- Griffith, Robert J., 4,418,301, Cl. 318-59.000.
- Hetzl, Frederick; and McCracken, William G., Jr., 4,418,328, Cl. 338-20.000.
- Hornung, Richard E., 4,418,398, Cl. 364-900.000.
- Jackson, Melvin R.; and Rairden, John R., III, 4,418,124, Cl. 428-548.000.
- Knowlton, William K., 4,417,476, Cl. 73-660.000.
- Levy, Samuel, 4,417,525, Cl. 105-166.000.
- Modic, Frank J., 4,418,157, Cl. 521-82.000.
- Ohno, John M., 4,417,906, Cl. 51-307.000.
- Prochazka, Svante; and Klug, Frederic J., 4,418,024, Cl. 264-1.200.
- Prochazka, Svante; and Klug, Frederic J., 4,418,025, Cl. 264-1.200.
- Roberts, Clayton R., 4,418,429, Cl. 455-327.000.
- Temple, Victor A. K., 4,417,385, Cl. 29-571.000.
- General Foods Corporation: See—  
Marino, Richard P.; Rothamel, Richard J.; and Rieken, William C., 4,418,086, Cl. 426-302.000.
- General Foods, Inc.: See—  
Cameron, Jacquelyn J.; and Myers, Chester D., 4,418,013, Cl. 260-123.500.
- Murray, Edward D.; Woodman, Brenda J.; Maurice, Terrence J.; and Sirett, Robert R., 4,418,084, Cl. 426-250.000.
- General Mining Union Corporation, Limited: See—  
Bohme, Rolf C.; van Zyl, Ian D.; and Lazerson, Max M., 4,417,817, Cl. 356-380.000.
- General Motors Corporation: See—  
Burry, Donald L., 4,417,750, Cl. 280-753.000.
- McCartney, Charles P., Jr.; and Wheadon, Ellis G., 4,417,608, Cl. 141-1.100.
- Genese, Joseph N.; and Muetterties, Andrew J., to Abbott Laboratories. Gravitational flow system for the sequential administration of medical liquids. 4,417,577, Cl. 604-81.000.
- Genin, Robert: See—  
Fixler, Jon S., 4,418,243, Cl. 381-24.000.
- Gentry, Samuel, to Green, Paul W.; and Green, Wayne R., part interest to each. Telescoping nut driver. 4,417,488, Cl. 81-185.000.
- Geo. A. Hormel & Company: See—  
Leining, Lyndon R., 4,417,367, Cl. 17-21.000.
- Georgetown University: See—  
Ledley, Robert S., 4,417,967, Cl. 204-180.00G.
- Gerath, Francis C.: See—  
Rosenbeck, William H.; Eckart, Frederick; and Gerath, Francis C., 4,418,266, Cl. 219-137.00R.
- Gerberding, Karl: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jurgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Gergely, Gerhard. Cleansing tablets for tooth prostheses. 4,417,993, Cl. 252-90.000.
- Gerhart, Fritz: See—  
Bey, Philippe; Gerhart, Fritz; Jung, Michel; and Schirliu, Daniel, 4,418,077, Cl. 424-309.000.
- Gessner, Adolf W.: See—  
Cornelius, Gerhard; Hildebein, Wolfgang; Ried, Helmut; and Gessner, Adolf W., 4,418,236, Cl. 585-408.000.
- Gessner, Richard W. Earth boring apparatus. 4,417,628, Cl. 173-29.000.
- Gibbons, Ambrose J., Jr.; and Ringwood, Robert C., Jr., to M & T Chemicals Inc. Stabilized pvc resins. 4,418,169, Cl. 524-178.000.
- Gill, Frederick H.: See—  
Johnston, Harold; Lask, Zygmunt; and Gill, Frederick H., 4,417,781, Cl. 339-198.00J.
- Gittleman, Morris, to Familian Corp. Pipe coupling. 4,417,755, Cl. 285-373.000.
- Giuffredi, Giancarlo, to Coster Tecnologie Speciali S.p.A. Valve for the admixture of fluids and delivery of the resulting mixture. 4,417,674, Cl. 222-402.180.
- Gjertsen, Robert K.; Tower, Stephen N.; and Huckestein, Edgar A., to Westinghouse Electric Corp. Fuel assembly for a nuclear reactor. 4,418,036, Cl. 376-438.000.
- Glaenzler Spicer: See—  
Guimbretiere, Pierre, 4,417,643, Cl. 180-254.000.
- Glas, Cor, to Centrale Veevoederfabriek "Sloten". Process for preparing a dry, powdery milk product. 4,418,091, Cl. 426-580.000.
- Glasgow, John A., to Marconi Company Limited, The. Image processing. 4,418,360, Cl. 358-108.000.
- Glass, D. Roger: See—  
Pehlke, Robert D.; Glass, D. Roger; Johnson, Lyle J., deceased; and Johnson, Evelyn, administratrix, 4,417,721, Cl. 266-225.000.
- Gockel, Charles E., to Conoco Inc. Method and apparatus for controlling the flow of fluids from an open well bore. 4,417,624, Cl. 166-362.000.
- Goebel, Franz, to GTE Products Corporation. Electrochemical cell. 4,418,129, Cl. 429-91.000.
- Goellner, Robert F., to Manufacturers Supplies Co. Pattern matrix for skiving shoe parts. 4,417,458, Cl. 69-13.000.
- Goetze, Volkmar; and Schuett, Dieter, to International Business Machines Corporation. Error detection and correction apparatus for a logic array. 4,418,410, Cl. 371-15.000.
- Gomberg, Edward N.; and Wright, James O. B., to Synair Corporation. Method for distributing material inside a tire casing. 4,418,093, Cl. 427-8.000.
- Gonzalez, Mario R. R., to Cuproquim S.A. Process for making cupric hydroxide. 4,418,056, Cl. 424-142.000.
- Goode, Keith F., to Ingersoll Milling Machine Company, The. Machine tool head having nutating spindle. 4,417,379, Cl. 29-35.500.
- Goodman System Company, Inc.: See—  
Goodman, Toronto P.; and Everling, Bruce W., 4,417,547, Cl. 123-25.00J.
- Goodman, Toronto P.; and Everling, Bruce W., to Goodman System Company, Inc. Engine speed and engine load responsive fluid injection system for an internal combustion engine. 4,417,547, Cl. 123-25.00J.
- Goodyear Tire & Rubber Company, The: See—  
Smith, Richard R.; and Kelley, Mellis M., 4,418,188, Cl. 528-274.000.
- Throckmorton, Morford C.; and Sandstrom, Paul H., 4,418,185, Cl. 526-201.000.
- Gordon, Alan; Watson, Stanley J.; Cowen, Steven J.; Mackelburg, Gerald; and Castile, Brett D., to United States of America, Navy. Single-sideband acoustic telemetry. 4,418,404, Cl. 367-132.000.
- Gordon, John C., to Nautilus Crane & Equipment Corporation. Method and apparatus for mounting lift crane on offshore structures. 4,417,664, Cl. 212-192.000.
- Gordon, Marc J.; and Ruff, Stanley, to RGG, Inc. Web dispenser. 4,417,495, Cl. 83-175.000.
- Graber, Warren S.: See—  
Brantingham, George L.; and Graber, Warren S., 4,418,397, Cl. 364-900.000.
- Graf, Rudolf, to Sprecher & Schuh AG. Electrically insulating plastic element for an electrical switching device, especially for use as the blast nozzle of a gas-blast switch. 4,418,256, Cl. 200-148.00R.
- Grandmenil, Gaston. Scraper arm. 4,417,652, Cl. 198-511.000.
- Granger, Robert L.; and Alexander, Alva P., Jr., to United States Gypsum Company. Apparatus for creasing paper used in the production of gypsum wallboard. 4,417,883, Cl. 493-403.000.
- Grant, Willie T. Multi-blade automatic air register damper. 4,417,687, Cl. 236-9.00A.
- Green, David L.: See—  
Green, Frank H., 4,417,572, Cl. 128-134.000.
- Green, Frank H., to Green, David L., a part interest. Restrained patient excessive movement indicating safety device. 4,417,572, Cl. 128-134.000.
- Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Group, Inc. Polymeric quaternary ammonium compounds for skin care. 4,418,054, Cl. 424-70.000.
- Green, Paul W.: See—  
Gentry, Samuel, 4,417,488, Cl. 81-185.000.
- Green, Wayne R.: See—  
Gentry, Samuel, 4,417,488, Cl. 81-185.000.
- Green, William P.: See—  
Hattan, Mark, 4,417,402, Cl. 33-199.00R.
- Greschner, Johann: See—  
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- Gresser, Gerhard: See—  
Abt, Anton; Dettelbach, Alfred; and Gresser, Gerhard, 4,417,675, Cl. 222-146.0HE.
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Pez, Guido P.; and Grey, Roger A., 4,418,227, Cl. 568-861.000.
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Negri, Rosario O., 4,417,708, Cl. 244-45.00R.
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Palilla, Frank C.; MacAllister, Burton W., Jr.; and McKenna, John F., 4,418,327, Cl. 338-309.000.
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Goebel, Franz, 4,418,129, Cl. 429-91.000.
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Smith, Alfred A., 4,417,361, Cl. 4-577.000.
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Patel, Natu R., 4,418,021, Cl. 260-943.000.
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Harrison, James J.; Pellegrini, John P.; and Selwitz, Charles M., 4,418,228, Cl. 568-937.000.
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Cunningham, Charles L.; and Gwaltney, Robert E., 4,417,614, Cl. 157-1.240.
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Bunnelle, William L.; and Lindmark, Richard C., 4,418,123, Cl. 428-517.000.
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Fuller, John F., Jr., 4,417,405, Cl. 34-39.000.
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Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,417,508, Cl. 99-355.000.
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Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,417,508, Cl. 99-355.000.
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Okonogi, Tsuneo; Fukatsu, Shunzo; Hachisu, Mitsugu; Kawashima, Hiroko; Shitoh, Keiko; and Sekizawa, Yasuharu, 4,418,070, Cl. 424-270.000.
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Bubik, Alfred; and Hack, Kurt, 4,417,950, Cl. 162-300.000.
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Beni, Gerardo; and Hackwood, Susan, 4,417,786, Cl. 350-359.000.
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Schoendorfer, Donald W.; and Latham, Allen, Jr., 4,417,884, Cl. 494-4.000.
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Hoppe, Joachim; and Haghir-Tehrani, Yahya, 4,417,413, Cl. 40-630.000.
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Kobayashi, Masato; Hoshino, Yasushi; Tateishi, Kazuyoshi; Isobe, Minoru; Konishi, Hiroshi; Koga, Yoshitomo; and Hagiwara, Shigemichi, 4,417,803, Cl. 355-3.0FU.
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Rossie, Egbert; Hahn, Michael; and Schemperg, Lutz, 4,417,419, Cl. 49-348.000.
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Yoshida, Hajime, 4,418,341, Cl. 340-635.000.
- Hall, Allen L.: See—  
Fayter, Richard G., Jr.; and Hall, Allen L., 4,418,202, Cl. 549-496.000.
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Sprecker, Mark A.; and Hall, John B., 4,418,010, Cl. 252-522.00R.
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Johnson, Clifton E., 4,417,416, Cl. 37-2.00R.
- Haller, Ingo: See—  
Kramer, Wolfgang; Buchel, Karl H.; Haller, Ingo; and Plempel, Manfred, 4,418,072, Cl. 424-273.00R.
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Hyde, Walter E., 4,417,622, Cl. 166-264.000.
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Bohm, Georg G. A.; Vescelius, Lee E.; and Hamed, Gary R., 4,418,167, Cl. 524-68.000.
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Maurer, Fritz; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,418,073, Cl. 424-273.00P.
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Kahan, nee Laszlo, Ilona; Hammer, Helga; and Beladi, Ilona, 4,418,060, Cl. 424-227.000.
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- Hanada, Kazunori: See—  
Tamai, Masaharu; Morimoto, Shigeo; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,418,075, Cl. 424-278.000.
- Hancock Cutting Machines Limited: See—  
Wilkinson, Thomas, 4,417,384, Cl. 29-526.00R.
- Hancock, Warren J., to Commonwealth Industrial Gases Limited. The Spray dispenser for a container of a fluid under pressure. 4,417,673, Cl. 222-153.000.
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Ohkura, Zenichi; and Haneishi, Yasuyuki, 4,417,798, Cl. 354-271.000.
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Hartman, Peter W.; Hanford, Keith E.; Markle, Stephen L.; and Hartman, Elmer C., 4,418,251, Cl. 191-35.000.
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Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kamen, Yoshito; Katsube, Junki; and Yamamoto, Hisao, 4,418,079, Cl. 424-330.000.
- Harder, Hans E.: See—  
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,418,422, Cl. 378-205.000.
- Hardy, Derek J.; and Eldridge, Michael W., to British Hovercraft Corporation Ltd. Air cushion vehicle. 4,417,637, Cl. 180-116.000.
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Murakami, Tetsuo; Miyazaki, Hiroto; and Harima, Hiroshi, 4,418,163, Cl. 523-205.000.
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Mefford, Joseph P., 4,418,332, Cl. 340-146.200.
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Andersen, Harold W.; Andersen, Shirley R.; Zener, Clifford; and Harrison, Charles H., 4,418,055, Cl. 424-126.000.
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Hartman, Peter W.; Hanford, Keith E.; Markle, Stephen L.; and Hartman, Elmer C., 4,418,251, Cl. 191-35.000.

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- Harvey, Bruce F., to American Industrial Research. Air inlet and air dispersion grommet and improved air pallet bearing same. 4,417,638, Cl. 180-125.000.
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Ueda, Hiroshi; Hasegawa, Katsumi; and Imae, Masazumi, 4,417,700, Cl. 242-18.00A.
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Kawasaki, Kikuo; Yoshida, Kazuo; Nonoyama, Nobuo; Yamaguchi, Toshibumi; Hasegawa, Toshio; and Okamura, Jitsuo, 4,417,671, Cl. 222-56.000.
- Haslanger, Martin F.: See—  
Nakane, Masami; Reid, Joyce; and Haslanger, Martin F., 4,418,076, Cl. 424-285.000.
- Hasler, Rolf; and Palacin, Francis. Continuous dyeing process which provides improved wetfastness: alkandamine-containing dye liquor and after-treatment with fixing agent. 4,417,898, Cl. 8-543.000.
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Bevan, Mark H.; and Kief, Gary C., 4,417,774, Cl. 312-108.000.
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Redeker, Werner; and Uhlig, Uwe, 4,417,422, Cl. 51-50.00R.
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Morris, John D.; and Hayatdavoudi, Asadollah, 4,417,899, Cl. 44-6.000.
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Kopecky, Ivyl D., 4,417,530, Cl. 111-73.000.
- Haynes, Benjamin C., Jr.: See—  
Whitehead, William F., Jr.; Dickens, James A.; and Haynes, Benjamin C., Jr., 4,417,839, Cl. 414-303.000.
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Nelson, Carl L.; Haynes, Darrel W.; and Weber, Michael J., 4,417,571, Cl. 128-92.00B.
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Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; Runzheimer, Hans-Volker; and Heidenreich, Holger, 4,418,143, Cl. 430-562.000.
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Schmid, Karl; Grunert, Margarete; Heidrich, Jochen; and Tesmann, Holger, 4,418,217, Cl. 568-593.000.
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Fennel, John W., Jr.; and Heinz, Miles T., Jr., 4,418,425, Cl. 455-27.000.
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Schiepe, Heinz, 4,417,836, Cl. 414-32.000.
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Doyle, Donald E.; Hellwarth, George A.; and Quanstrom, Jack L., 4,418,383, Cl. 364-200.000.
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Hennemann, Manfred; Andree, Hans; Lehmann, Rudolf; Schnegleberger, Harald; and Bellinger, Horst, 4,417,895, Cl. 8-137.000.
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- Hennessy Industries, Inc.: See—  
Cunningham, Charles L.; and Gwaltney, Robert E., 4,417,614, Cl. 157-1.240.
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Bergmann, Gerhard; and Henz, Erhard, 4,417,456, Cl. 66-214.000.
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Lehr, Klaus; and Heymer, Gero, 4,418,043, Cl. 423-22.000.
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Kawamoto, Noriyuki; Higashi, Toru; and Kajita, Harumasa, 4,418,424, Cl. 455-4.000.
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Spaschus, Hans O., 4,417,451, Cl. 62-129.000.
- Hillgoss, Lawrence O. Telephone cable splicers test set and method of testing. 4,418,250, Cl. 179-175.30R.
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Cornelius, Gerhard; Hilsebein, Wolfgang; Ried, Helmut; and Gessner, Adolf W., 4,418,236, Cl. 585-408.000.
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Nakahara, Yutaka; Kubota, Naohiro; Hirai, Bunji; and Haruna, Tohru, 4,418,196, Cl. 546-242.000.
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- Hirai, Hiromu: See—  
Otsuki, Haruaki; and Hirai, Hiromu, 4,418,305, Cl. 318-616.000.
- Hirano, Makoto: See—  
Ikenoya, Yasuo; Hirano, Makoto; Shimizu, Yoji; and Matsuura, Masaaki, 4,417,442, Cl. 60-293.000.
- Hiratsuka, Koza: See—  
Kamibayashi, Masato; Tsuchiya, Shinji; Hiratsuka, Koza; and Tsuchiya, Susumu, 4,418,197, Cl. 546-256.000.
- Hirose, Akira; and Ariyama, Kenzo, to Ricoh Company, Ltd. Image transfer material separation apparatus for electrophotographic copying machine. 4,417,800, Cl. 355-3.0TR.
- Hirose, Isamu: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
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Shigeo, Iwasaki; and Hiroshi, Haguchi, 4,417,864, Cl. 425-73.000.
- Hirt, Adam: See—  
Ebentheuer, Hans; and Hirt, Adam, 4,418,296, Cl. 310-70.00R.
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Asada, Yoshikatsu; and Mori, Shunji, 4,418,391, Cl. 364-551.000.
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- Hobart Brothers Company: See—  
Bollinger, David D., 4,418,310, Cl. 320-39.000.



- Hoda, Takeo: See—  
Oyokota, Shigeru; Taniguchi, Nobuyuki; Hoda, Takeo; Tani, Junichi; Seigenji, Kiyoshi; and Matsumoto, Toshiaki, 4,417,793, Cl. 354-21.000.
- Hoechst Aktiengesellschaft: See—  
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,418,207, Cl. 560-178.000.  
Keil, Erich H., 4,418,032, Cl. 264-289.600.  
Klose, Werner; and Auel, Theodor, 4,418,019, Cl. 260-502.50C.  
Lehr, Klaus; and Heymer, Gero, 4,418,043, Cl. 423-22.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—  
Davis, Larry; and Klein, Joseph T., 4,418,067, Cl. 424-267.000.
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- Hoffmann, Werner: See—  
Himmele, Walter; and Hoffmann, Werner, 4,418,216, Cl. 568-497.000.
- Hofgen, Gunter; and Cohrs, Heinz L., to International Standard Electric Corporation. Airport surveillance system, 4,418,349, Cl. 343-6.50R.
- Hofmann, Karl: See—  
Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jorg, 4,417,693, Cl. 239-453.000.
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- Homeyer, Bernhard: See—  
Maurer, Fritz; Hamann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,418,073, Cl. 424-273.00P.
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Ikenoya, Yasuo; Hirano, Makoto; Shimizu, Yoji; and Matsuura, Masaaki, 4,417,442, Cl. 60-293.000.  
Matsuda, Minoru; Kato, Kentaro; and Suzuki, Masatoshi, 4,417,559, Cl. 123-559.000.  
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Ruminsky, Robert T.; and Serber, Stephen L., 4,417,452, Cl. 62-155.000.
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- Hoover, Donald R. Control roll for staple fibers, 4,417,369, Cl. 19-258.000.
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Applequist, Roy A.; Altobellis, Richard M.; and Hoppe, Robert F., 4,418,369, Cl. 360-98.000.
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Iyer, Sankar P.; Lewis, Roy D.; Klein, H. Joseph; Hord, William C.; and Ailor, James C., 4,417,617, Cl. 164-254.000.
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- Horikoshi, Koki: See—  
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- Hornung, Richard E., to General Electric Company. Manual reset control circuit for microprocessor controlled washing appliance, 4,418,398, Cl. 364-900.000.
- Horrocks, Donald L., to Beckman Instruments, Inc. Quench correction in liquid scintillation counting, 4,418,281, Cl. 250-328.000.
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- Hoshino, Yasushi: See—  
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Young, Ian R.; Hounsfield, Godfrey N.; and Burl, Michael, 4,418,316, Cl. 324-309.000.
- House, Cynthia B.; and Leichti, Robert J., to United States Gypsum Company. Method of making thermoplastic hardboard from acetylated mat, 4,418,101, Cl. 427-393.000.
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- Housewares Research Associates: See—  
Herbst, Walter B.; and Wolens, John, 4,417,506, Cl. 99-348.000.
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Sander, Bruno; Hovemann, Friedrich; and Scherling, Kurt, 4,417,976, Cl. 208-188.000.
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- Howmedica International, Inc.: See—  
Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, 4,418,422, Cl. 378-205.000.
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Gjertsen, Robert K.; Tower, Stephen N.; and Huckestein, Edgar A., 4,418,036, Cl. 376-438.000.
- Hudgins, Robert R.: See—  
Cordoba-Molina, Jesus F.; Hudgins, Robert R.; and Silveston, Peter L., 4,417,988, Cl. 210-801.000.
- Huffy Corporation: See—  
Spear, Kenneth J., 4,417,744, Cl. 280-281.00R.
- Hughes Aircraft Company: See—  
Rosen, Harold A., 4,418,350, Cl. 343-359.000.
- Huiderman, Garry N., to General Dynamics, Pomona Division. Millimeter-wavelength overmode balanced mixer, 4,418,430, Cl. 455-328.000.
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Ober, John W., 4,418,375, Cl. 361-253.000.
- Hunter, Walter D., to Texaco Development Corp. Propping agent for fracturing fluids, 4,417,989, Cl. 252-8.55R.
- Hurco Mfg. Co., Inc.: See—  
Mochizuki, Minoru, 4,417,490, Cl. 82-2.00B.
- Huss, Charles P., to Minnesota Mining and Manufacturing Company. Toner transport system for electrographic imaging, 4,418,357, Cl. 346-153.100.
- Hyde, Walter E., to Halliburton Company. Well sampling method and apparatus, 4,417,622, Cl. 166-264.000.
- Hydra-Rig, Inc.: See—  
Elliston, Thomas L., 4,417,846, Cl. 414-745.000.
- Hydraulics & Fabrications Pty. Ltd.: See—  
Chadwick, James B., 4,417,841, Cl. 414-346.000.
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Pytlewski, Louis L.; Iaconianni, Frank J.; Krevitz, Kenneth; and Smith, Arthur B., 4,417,977, Cl. 208-262.000.
- Ibrahim, Shawk S.; and Elsner, James E., to CTS Corporation. Process of making multi-layer ceramic package, 4,417,392, Cl. 29-840.000.
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- Ichisaka, Teruo: See—  
Yamaguchi, Kenzo; Ichisaka, Teruo; Ikegami, Tadao; and Kumagai, Isao, 4,417,970, Cl. 204-257.000.
- Idemitsu Kosan Co., Ltd.: See—  
Ando, Takashi; and Oka, Naoki, 4,417,901, Cl. 44-51.000.
- Ihm, Gerald J.: See—  
Pierrot, Victor C., III; and Ihm, Gerald J., 4,417,759, Cl. 294-85.00R.
- IIT Research Institute: See—  
Camras, Marvin, 4,418,365, Cl. 358-342.000.
- Ikegami, Tadao: See—  
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- Ikegawa, Masato; Tojo, Kenji; and Shiibayashi, Masao, to Hitachi, Ltd. Scroll member assembly of scroll-type fluid machine, 4,417,863, Cl. 418-55.000.
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Kuroda, Kazuyuki; Ikematsu, Ryoiti; and Nitta, Kazunari, 4,418,018, Cl. 260-465.700.

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Kasuga, Takuzo; Ikenaga, Yukio; and Yamawaki, Masami, 4,418,162, Cl. 523-205.000.
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- Ikeoka, Naoki, to Kabushiki Kaisha Komatsu Seisakusho. Moving bolster arrangement, 4,417,511, Cl. 100-229.00R.
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Ueda, Hiroshi; Hasegawa, Katsumi; and Imae, Masazumi, 4,417,700, Cl. 242-18.00A.
- Imai, Eiichi; Michiura, Yoshiharu; and Niihara, Toshio, to Nissan Motor Co., Ltd. Motor vehicle roof, 4,417,762, Cl. 296-210.000.
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Okumura, Takeo; and Imai, Miho, 4,417,595, Cl. 132-85.000.
- Imai, Tamotsu, to UOP Inc. Dehydrogenation of dehydrogenatable hydrocarbons, 4,418,237, Cl. 585-443.000.
- Imai, Yutaka; Nakano, Jiro; and Ezaki, Motoharu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Company Limited. Rotation detector, 4,418,288, Cl. 307-117.000.
- Imperial Chemical Industries Limited: See—  
Jennings, James R.; and Pessimis, George N., 4,417,997, Cl. 252-182.000.
- Imperial Chemical Industries PLC: See—  
Murray, Robert T.; and Bradley, Daniel J., 4,417,815, Cl. 356-349.000.
- Imperial Group plc: See—  
Vaughan, Roger, 4,417,934, Cl. 156-64.000.
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- Inayama, Takayuki: See—  
Kawaguchi, Hideo; and Inayama, Takayuki, 4,418,141, Cl. 430-530.000.
- Indiana University Foundation: See—  
Muhler, Joseph C.; and Putt, Mark S., 4,418,053, Cl. 424-52.000.
- Ingersoll Milling Machine Company, The: See—  
Goode, Keith F., 4,417,379, Cl. 29-35.500.
- Innovatron Krauss & Co.: See—  
Krauss, Ralf; and Koehne, Rainer, 4,417,966, Cl. 204-176.000.
- Inoue-Japax Research Incorporated: See—  
Inoue, Kiyoshi, 4,417,962, Cl. 204-129.460.  
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Inoue, Kiyoshi, 4,418,263, Cl. 219-69.00W.
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Yamazaki, Yoshio; Nakamura, Ken; and Inowa, Shigeru, 4,417,807, Cl. 355-15.000.
- Inskip, Michael; and Warren, Alan, to TI Russell Hobbs, Limited. Electric liquid heating appliance, 4,418,270, Cl. 219-328.000.
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Cathignol, Dominique; and Chapelon, Jean-Yves, 4,417,584, Cl. 128-663.000.
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Hansen, Arne, 4,417,626, Cl. 169-37.000.
- International Business Machines Corporation: See—  
Bansal, Jai P., 4,418,401, Cl. 365-95.000.  
Barclay, Donald J.; and Morgan, William M., 4,417,955, Cl. 204-43.00R.
- Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,417,946, Cl. 156-643.000.
- Demke, Kent R.; and Mumola, Joanne L., 4,418,345, Cl. 340-731.000.
- Doyle, Donald E.; Hellwarth, George A.; and Quanstrom, Jack L., 4,418,383, Cl. 364-200.000.
- Fennel, John W., Jr.; and Heinz, Miles T., Jr., 4,418,425, Cl. 455-27.000.
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- Mayne-Banton, Veronica I.; and Srinivasan, Rangaswamy, 4,417,948, Cl. 156-643.000.
- Paterson, Robert L.; and Sublette, Jerry M., 4,417,824, Cl. 400-477.000.
- Queen, Larry C., 4,418,409, Cl. 370-104.000.
- International Flavors & Fragrances Inc.: See—  
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,418,087, Cl. 426-536.000.
- Sprecker, Mark A.; and Hall, John B., 4,418,010, Cl. 252-522.00R.
- International Minerals & Chemical Corp.: See—  
Jacobs, Martin J., 4,418,226, Cl. 568-854.000.
- International Paper Company: See—  
Wozniacki, Roger M., 4,417,686, Cl. 229-52.00B.
- International Paper Company: See—  
Mehra-Palta, Asha, 4,417,417, Cl. 47-58.000.
- International Power Technology, Inc.: See—  
Cheng, Dah Y., 4,417,438, Cl. 60-39.050.
- International Standard Electric Corporation: See—  
Hansen, Kaj B., 4,418,247, Cl. 179-115.50R.  
Hemdal, Goran A. H.; and Jager, Jonny S., 4,418,396, Cl. 364-900.000.
- Hofgen, Gunter; and Cohrs, Heinz L., 4,418,349, Cl. 343-6.50R.
- International Telephone and Telegraph Corporation: See—  
Stapleton, John J., 4,418,359, Cl. 358-65.000.
- Interox Chemicals Limited: See—  
Harrison, Anthony P., 4,417,987, Cl. 210-759.000.
- Irie, Tsunemasa: See—  
Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kamen, Yoshito; Katsube, Junki; and Yamamoto, Hisao, 4,418,079, Cl. 424-330.000.
- Irvin, Howard B., to Phillips Petroleum Company. Solvent purification, 4,418,191, Cl. 528-500.000.
- Irwin, Rodney C., to Koppers Company, Inc. Apparatus for cleaning coke oven doors, 4,417,952, Cl. 202-241.000.
- Iscar Ltd.: See—  
Wertheimer, Seev, 4,417,833, Cl. 407-61.000.
- Ishiguro, Shoji: See—  
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; and Nishimura, Tatsuo, 4,418,140, Cl. 430-351.000.
- Ishii, Hiroshi; Morii, Hiroshi; and Ishijima, Saburo, to Japan Oxygen Co., Ltd. Vacuum furnace for heat treatment, 4,417,722, Cl. 266-250.000.
- Ishii, Kunihiko: See—  
Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, 4,418,061, Cl. 424-245.000.
- Ishijima, Saburo: See—  
Ishii, Hiroshi; Morii, Hiroshi; and Ishijima, Saburo, 4,417,722, Cl. 266-250.000.
- Ishikawa, Shozo: See—  
Katagiri, Kazuharu; Umehara, Shoji; Watanabe, Katsunori; and Ishikawa, Shozo, 4,418,133, Cl. 430-58.000.
- Ishikura, Tomoyuki: See—  
Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,418,192, Cl. 536-6.400.
- Ishioka, Yozo: See—  
Saiki, Yukihiko; Kumazawa, Eitaro; and Ishioka, Yozo, 4,417,697, Cl. 241-65.000.
- Isobe, Minoru: See—  
Kobayashi, Masato; Hoshino, Yasushi; Tateishi, Kazuyoshi; Isobe, Minoru; Konishi, Hiroshi; Koga, Yoshitomo; and Hagiwara, Shigemi, 4,417,803, Cl. 355-3.0FU.
- Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: See—  
Rieder, Werner; and Fehrl, Martin, 4,418,122, Cl. 428-480.000.
- Istvan, Zoltan: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Sztipanovits, Janos; Vimlati, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40.000.
- Ito, Chiharu: See—  
Kawashima, Sadao; and Ito, Chiharu, 4,418,113, Cl. 428-213.000.
- Ito, Novuei: See—  
Kobayashi, Akihiro; Kida, Masashi; Ito, Novuei; and Kato, Yoji, 4,417,550, Cl. 123-145.00A.
- Ito, Shuzo: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
- Ito, Toshio: See—  
Tabata, Yoichiro; Ueguri, Shigeo; Komura, Hirotsugu; and Ito, Toshio, 4,418,265, Cl. 219-130.400.
- Itoh, Hiroshi: See—  
Ohkawa, Nobushisa; and Itoh, Hiroshi, 4,417,553, Cl. 123-339.000.
- ITT: See—  
Elderton, Peter P., 4,417,474, Cl. 73-438.000.
- Iwai, Hiroshi, to Victor Company of Japan, Ltd. Circuit for controlling rotation of motor, 4,418,304, Cl. 318-311.000.
- Iwase, Yoshinobu: See—  
Kumagai, Tadanobu; and Iwase, Yoshinobu, 4,417,880, Cl. 464-111.000.
- Iyer, Sankar P.; Lewis, Roy D.; Klein, H. Joseph; Hord, William C.; and Ailor, James C., to Cabot Corporation. Apparatus for vacuum casting of rods, 4,417,617, Cl. 164-254.000.
- Izumi, Shinichi, to Tokico Ltd. Cylinder device, 4,417,503, Cl. 92-240.000.
- Izumi, Toshiaki; Taketomi, Yasuta; and Kobuke, Takayoshi, to TDK Electronics Co., Ltd. Magnetic recording medium, 4,418,126, Cl. 428-694.000.
- Izumo, Masanori; Kametani, Keiichi; Ota, Sigehito; and Mikami, Kenji, to Daikin Kogyo Kabushiki Kaisha. Catalytic oxidation apparatus, 4,418,046, Cl. 423-245.000.
- J. I. Case Company: See—  
Dunn, Donnell L., 4,417,633, Cl. 180-132.000.  
Wirsbinski, James L., 4,417,765, Cl. 298-5.000.
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- Jacobson, Darwin J. Segmented extendible boom, 4,417,424, Cl. 52-108.000.
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- Jagenberg Werke AG: See—  
Wohlfel, Gerhard, 4,417,540, Cl. 118-63.000.
- Jager, Horst: See—  
Schreiner, Kurt; and Jager, Horst, 4,418,015, Cl. 260-242.200.
- Jager, Jonny S.: See—  
Hemdal, Goran A. H.; and Jager, Jonny S., 4,418,396, Cl. 364-900.000.
- Jagers, Leopold, to Jagers, Leopold. Machine for drilling a double T profile. 4,417,834, Cl. 408-16.000.
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- Janne, Jouko, to Sodermark, Nils-Erik. Process for removing cyanide ions from solutions. 4,417,963, Cl. 204-130.000.
- Janome Sewing Machine Industry Co., Ltd.: See—  
Yasukata, Eguchi, 4,417,532, Cl. 112-169.000.
- Japan Bano'k Co., Ltd.: See—  
Furutsu, Akira, 4,417,682, Cl. 227-67.000.
- Japan Oxygen Co., Ltd.: See—  
Ishii, Hiroshi; Mori, Hiroshi; and Ishijima, Saburo, 4,417,722, Cl. 266-250.000.
- Jean Walterscheid GmbH: See—  
Geisthoff, Hubert, 4,417,650, Cl. 192-56.00R.
- Jebens, Robert W.: See—  
Barnette, William E.; and Jebens, Robert W., 4,418,405, Cl. 369-45.000.
- Jenkins, John W., to Johnson, Matthey & Co., Limited. Catalysts. 4,418,215, Cl. 568-473.000.
- Jennings, James R.; and Pessimis, George N., to Katalco Corp.; and Imperial Chemical Industries Limited, a part interest. Method for recovery of metals from spent iron-chrome shift catalyst and method of forming new catalyst. 4,417,997, Cl. 252-182.000.
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Matsuda, Hisashi, 4,418,280, Cl. 250-296.000.
- Jepsen, Robert E., to Air Products and Chemicals, Inc. Mounting assembly for high speed turbo discs. 4,417,855, Cl. 416-244.00A.
- Jermont Schneider Corporation: See—  
Drevet, Michel; and Trouillet, Jean, 4,417,823, Cl. 384-115.000.
- Jewett, David N. Controlled heat sink for crystal ribbon growth. 4,417,944, Cl. 156-608.000.
- Jewett, Warren R., to Vit Vet Research Group, Inc. Blood pressure measuring device. 4,417,586, Cl. 128-680.000.
- John, E. Roy. Digital electroencephalographic instrument and method. 4,417,592, Cl. 128-731.000.
- Johnsen & Jorgensen (Plastics) Limited: See—  
Roberts, Derek C., 4,417,666, Cl. 215-256.000.
- Johnson, Clifton E., to Halla Nursery, Inc. Tree transplanting machine. 4,417,416, Cl. 37-2.00R.
- Johnson, Earl H., to Dow Chemical Company, The. Process for imparting stability to particulate vinylidene chloride polymer resins. 4,418,168, Cl. 524-109.000.
- Johnson, Evelyn, administratrix: See—  
Pehlke, Robert D.; Glass, D. Roger; Johnson, Lyle J., deceased; and Johnson, Evelyn, administratrix, 4,417,721, Cl. 266-225.000.
- Johnson, Gerald T. Agricultural transporter. 4,417,747, Cl. 280-405.00B.
- Johnson, James, to Sensor Developments, Inc. Zero tracking circuit for electronic weighing scale. 4,417,631, Cl. 177-210.0FP.
- Johnson, Johnnie L. Karate glove. 4,417,359, Cl. 2-161.00A.
- Johnson & Johnson Baby Products Company: See—  
Schildknecht, Othmar; and Cassoli, Eduardo, 4,417,676, Cl. 225-4.000.
- Johnson, Kent N.: See—  
Marulic, Walter J.; and Johnson, Kent N., 4,417,526, Cl. 105-406.00R.
- Johnson, Lyle J., deceased: See—  
Pehlke, Robert D.; Glass, D. Roger; Johnson, Lyle J., deceased; and Johnson, Evelyn, administratrix, 4,417,721, Cl. 266-225.000.
- Johnson, Matthey & Co., Limited: See—  
Jenkins, John W., 4,418,215, Cl. 568-473.000.
- Johnson, Oliver S.: See—  
Cundy, Steven L.; Evans, Ronald A.; Johnson, Oliver S.; McCormack, John S.; and Nichols, Bruce A., 4,417,911, Cl. 65-3.120.
- Johnson, Sigurd A., to Plan Hold Corporation. Light box. 4,418,378, Cl. 362-97.000.
- Johnson, Vincent L.; and Moser, Kurt, to Admiral Maschinenfabrik GmbH. High-pressure mixing head. 4,418,041, Cl. 422-133.000.
- Johnson, Weldon K., to Kerr-McGee Coal Corporation. Particulate material transfer system. 4,417,840, Cl. 414-329.000.
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- Jon, Min-Chung; Palazzo, Vito; and Sturm, George W., to Western Electric Co., Inc. Method for determining lead frame failure modes using acoustic emission and discriminant analysis techniques. 4,417,478, Cl. 73-801.000.
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- Joseph, A. David: See—  
Anderson, David L.; and Joseph, A. David, 4,417,383, Cl. 29-511.000.
- Jung, Michel: See—  
Bey, Philippe; Gerhart, Fritz; Jung, Michel; and Schirlin, Daniel, 4,418,077, Cl. 424-309.000.
- Jung, Rudolf H.: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jurgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Junginger, Erich: See—  
Schnaibel, Eberhard; and Junginger, Erich, 4,417,688, Cl. 236-91.00F.
- Junkins, Philip D.: See—  
Tward, Emanuel; and Junkins, Philip D., 4,417,473, Cl. 73-304.00C.
- Justice, David D.: See—  
Kadija, Igor V.; Woodard, Kenneth E., Jr.; and Justice, David D., 4,417,959, Cl. 204-98.000.
- Justice, Orien N., to CamAct Pump Corp. Submersible well pump. 4,417,860, Cl. 417-415.000.
- K-Line Industries, Inc.: See—  
Kammeraad, James A.; and Tiger, Ronald L., 4,417,376, Cl. 29-26.00A.
- Kabushiki Kaisha Alps Tool: See—  
Uehara, Sukehiro; and Saiki, Akio, 4,417,491, Cl. 82-2.700.
- Kabushiki Kaisha Daini Seikosha: See—  
Museum, Katsuo, 4,417,437, Cl. 59-20.000.
- Kabushiki Kaisha Kobe Seiko Sho: See—  
Akagi, Kazuo; Fukuda, Akihiro; and Saito, Tomio, 4,417,421, Cl. 51-16.000.
- Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
- Kabushiki Kaisha Komatsu Seisakusho: See—  
Ikeoka, Naoki, 4,417,511, Cl. 100-229.00R.
- Tsukiji, Yoshihiro; Maeda, Haruo; and Araki, Mikio, 4,417,486, Cl. 74-813.00R.
- Kabushiki Kaisha Miyano Tekkosho: See—  
Uehara, Sukehiro; and Saiki, Akio, 4,417,491, Cl. 82-2.700.
- Kabushiki Kaisha Morita Seisakusho: See—  
Matsui, Takahiro, 4,417,875, Cl. 433-101.000.
- Kabushiki Kaisha Sankyo Seiki Seisakusho: See—  
Okada, Akio, 4,418,253, Cl. 200-35.00R.
- Kabushiki Kaisha Suwa Seikosha: See—  
Momosaki, Eishi, 4,418,299, Cl. 310-361.000.
- Nakamura, Haruo, 4,417,785, Cl. 350-346.000.
- Kadija, Igor V.; Woodard, Kenneth E., Jr.; and Justice, David D., to Olin Corporation. Electrolytic cell having a composite electrode-membrane structure. 4,417,959, Cl. 204-98.000.
- Kageyama, Hayashi, to Fuji Jukogyo Kabushiki Kaisha. System for controlling two-wheel and four-wheel drives. 4,417,641, Cl. 180-247.000.
- Kahan nee Laszlo, Ilona; Hammer, Helga; and Beladi, Ilona, to Medimpex Gyogyszerkulerkeskedelmi Vallalat. Therapeutically active complexes of tetracyclines. 4,418,060, Cl. 424-227.000.
- Kahn, Marvin L.; and O'Mahony, John S., to Rich Products Corporation. Improved fruit composition having a depressed freezing point. 4,418,082, Cl. 426-51.000.
- Kaiser, Peter: See—  
Cziptschirsch, Kurt; Viertel, Lothar; and Kaiser, Peter, 4,417,761, Cl. 296-97.00H.
- Kajita, Harumasa: See—  
Kawamoto, Noriyuki; Higashi, Toru; and Kajita, Harumasa, 4,418,424, Cl. 455-4.000.
- Kako, Hiroyoshi; and Kobayashi, Nobuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Triboelectrification type electrostatic paint gun for paint in a powder form. 4,417,696, Cl. 239-690.000.
- Kaldor, Andrew: See—  
Stein, Alexander; Rabinowitz, Paul; and Kaldor, Andrew, 4,417,822, Cl. 374-129.000.
- Kalish, Richard J.: See—  
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,418,057, Cl. 424-151.000.
- Kameda, Masahiro, to Ricoh Co., Ltd. Electrophotographic element comprises arsenic selenide doped with Bi. 4,418,136, Cl. 430-95.000.
- Kameno, Yoshito: See—  
Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kameno, Yoshito; Katsube, Junki; and Yamamoto, Hisao, 4,418,079, Cl. 424-330.000.
- Kametani, Keiichi: See—  
Izumo, Masanori; Kametani, Keiichi; Ota, Sieghito; and Mikami, Kenji, 4,418,046, Cl. 423-245.000.
- Kami, Tomohiro: See—  
Ichinomiya, Tsutomu; Kusonoki, Toshio; and Kami, Tomohiro, 4,417,587, Cl. 128-682.000.
- Kamibayashi, Masato; Tsuchiya, Shinji; Hiratsuka, Kozo; and Tsuchiya, Susumu, to Tokyo Tanabe Company, Limited. 1,4-Dihydropyridine derivatives. 4,418,197, Cl. 546-256.000.
- Kamichik, Stephen. Electronic sequential combination locking device. 4,418,330, Cl. 340-64.000.
- Kamiya, Michihiko: See—  
Yoshimi, Akio; Kamiya, Michihiko; and Moriya, Mitsutoshi, 4,417,618, Cl. 165-12.000.
- Kamleitner, Ewald: See—  
Deutschmann, Herbert; and Kamleitner, Ewald, 4,417,555, Cl. 123-372.000.
- Kammeraad, James A.; and Tiger, Ronald L., to K-Line Industries, Inc. Adjustable cylinder head holder. 4,417,376, Cl. 29-26.00A.
- Kanai, Masaaki: See—  
Sakurai, Yoshimi; Furukawa, Yoshimi; Kanai, Masaaki; and Osada, Yasufumi, 4,417,775, Cl. 339-5.00M.

- Kano, Ichiro, to Canon Kabushiki Kaisha. Observation device. 4,417,789, Cl. 350-513.000.
- Kao Soap Co., Ltd.: See—  
Mizutani, Hiroshi; and Tsuchiya, Yoshimi, 4,417,893, Cl. 604-366.000.
- Okumura, Takeo; and Imai, Miho, 4,417,595, Cl. 132-85.000.
- Karamian, Narbik A. Laboratory stand assembly. 4,418,040, Cl. 422-101.000.
- Kariya, Yutaka, to Casio Computer Co., Ltd. Data registering system with keyed in and voiced data comparison. 4,418,412, Cl. 371-68.000.
- Karpik, Joseph T.: See—  
Doerer, Richard P.; and Karpik, Joseph T., 4,418,031, Cl. 264-241.000.
- Karpinia, Walter. Fast and easy charcoal starter. 4,417,565, Cl. 126-25.00B.
- Karsan, Demir I.: See—  
Abbott, Philip A.; Dailey, James E.; Karsan, Demir I.; and Mangiacavalli, Andrea, 4,417,831, Cl. 405-227.000.
- Kasai, Yutaka; and Naramoto, Satoru, to Shiseido Company, Ltd. Stick-type cosmetic applicator. 4,417,827, Cl. 401-68.000.
- Kashi, Takeshi: See—  
Yamaji, Tadao; Nakajima, Toshi; and Kashi, Takeshi, 4,417,754, Cl. 285-104.000.
- Kashiwa, Norio: See—  
Ueda, Takashi; and Kashiwa, Norio, 4,418,184, Cl. 526-125.000.
- Kasuga, Takuzo; Ikenaga, Yukio; and Yamawaki, Masami, to Polyplastics Co., Ltd. Process for treating the surface of polyacetal resin. 4,418,162, Cl. 523-205.000.
- Kasuga, Takuzo; Toga, Yuzo; Okamoto, Ichiro; and Takahashi, Katsuhiko, to Daicel Chemical Industries, Ltd.; and Polyplastics Co., Ltd. Polyester composition containing 2-methyl-1,3-propylene glycol dibenzoate. 4,418,172, Cl. 524-292.000.
- Katagiri, Kazuharu; Umehara, Shoji; Watanabe, Katsunori; and Ishikawa, Shozo, to Canon Kabushiki Kaisha. Disazo photoconductive material and electrophotographic photosensitive member having disazo pigment layer. 4,418,133, Cl. 430-58.000.
- Katalco Corp.: See—  
Jennings, James R.; and Pessimis, George N., 4,417,997, Cl. 252-182.000.
- Kato, Kentaro: See—  
Matsuda, Minoru; Kato, Kentaro; and Suzuki, Masatoshi, 4,417,559, Cl. 123-559.000.
- Kato, Masami, to Toska Co., Ltd. Cluster type tag pin assembly. 4,417,656, Cl. 206-346.000.
- Kato, Toshikazu; and Saitou, Sinichi, to Olympus Optical Co., Ltd. Tape cassette. 4,417,705, Cl. 242-199.000.
- Kato, Yoji: See—  
Kobayashi, Akihiro; Kida, Masashi; Ito, Novuei; and Kato, Yoji, 4,417,550, Cl. 123-145.00A.
- Katsube, Junki: See—  
Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kameno, Yoshito; Katsube, Junki; and Yamamoto, Hisao, 4,418,079, Cl. 424-330.000.
- Katsuyama, Harumi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Color indicator composition and film for detecting hydrogen peroxide. 4,418,037, Cl. 422-56.000.
- Kaufmann, Gerhard: See—  
Waldstrom, Ejvind; and Kaufmann, Gerhard, 4,417,610, Cl. 141-91.000.
- Kawabata, Yasuro: See—  
Hosaka, Shuntaro; Murao, Yasuo; and Kawabata, Yasuro, 4,418,152, Cl. 436-511.000.
- Kawaguchi, Hideo; and Inayama, Takayuki, to Fuji Photo Film Co., Ltd. Photographic light-sensitive materials. 4,418,141, Cl. 430-530.000.
- Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, to Nippon Soken, Inc. Gas flow measuring device. 4,417,471, Cl. 73-204.000.
- Kawakami, Kanji: See—  
Hayashida, Hiroshi; Takahashi, Tadashi; Miyashita, Kunio; and Kawakami, Kanji, 4,418,372, Cl. 360-113.000.
- Kawakami, Moriatsu: See—  
Uchida, Isamu; and Kawakami, Moriatsu, 4,418,417, Cl. 377-8.000.
- Kawamoto Industrial Co., Ltd.: See—  
Kuroda, Susumu; and Komori, Tadashi, 4,417,374, Cl. 28-181.000.
- Kawamoto, Noriyuki; Higashi, Toru; and Kajita, Harumasa, to Matsushita Electric Industrial Co., Ltd. Cable television transmission control system. 4,418,424, Cl. 455-4.000.
- Kawasaki, Kikuo; Yoshida, Kazuo; Nonoyama, Nobuo; Yamaguchi, Toshihumi; Hasegawa, Toshio; and Okamura, Jitsuo, to Fuji Electric Co., Ltd. Automatic vending machine with ice preparation. 4,417,671, Cl. 222-56.000.
- Kawasaki Steel Corporation: See—  
Nakanishi, Kyoji; Nozaki, Tsutomu; and Emi, Toshihiko, 4,417,719, Cl. 266-78.000.
- Kawashima, Hiroko: See—  
Okonogi, Tsuneo; Fukatsu, Shunzo; Hachisu, Mitsugu; Kawashima, Hiroko; Shitoh, Keiko; and Sekizawa, Yasuharu, 4,418,070, Cl. 424-270.000.
- Kawashima, Sadao; and Ito, Chiharu, to Asahi Fiber Glass Company Limited. Reinforcing mat for fiber reinforced plastic material. 4,418,113, Cl. 428-213.000.
- Kazenmaier, Ulrich; and Quast, Gunter, to M.A.N. Maschinenfabrik Augsburg-Nuremberg Aktiengesellschaft. Sealing arrangement for wet cylinder liners. 4,417,549, Cl. 123-41.840.
- Kealy, Joanne P.; and Zenk, Robert E., to Minnesota Mining and Manufacturing Co. Tackified crosslinked acrylic adhesives. 4,418,120, Cl. 428-343.000.
- Keane, James. Treatment of waters with broad spectrum contaminants. 4,417,985, Cl. 210-707.000.
- Keeler, Manley S.: See—  
Schwarzbach, Richard J.; Keeler, Manley S.; Cavaiani, Randy J.; and Chapman, Michael K., 4,418,333, Cl. 340-310.00A.
- Keglewitsch, Josef, to Marathon Electric Manufacturing Corporation. Channel clamp. 4,417,373, Cl. 24-458.000.
- Keil, Erich H., to Hoechst Aktiengesellschaft. Process for drawing tows of filaments in water. 4,418,032, Cl. 264-289.600.
- Keklak, Ronald: See—  
Couture, Michael V.; and Keklak, Ronald, 4,417,612, Cl. 150-40.000.
- Kelleher, Kevin C., to RCA Corporation. Video disc player with RFI reduction circuit including sync tip clamp. 4,418,363, Cl. 358-336.000.
- Kelley, Dana A.: See—  
Christner, Larry G.; and Kelley, Dana A., 4,417,872, Cl. 432-18.000.
- Kelley, Mellis M.: See—  
Smith, Richard R.; and Kelley, Mellis M., 4,418,188, Cl. 528-274.000.
- Kelly, Richard P.: See—  
Holtey, Thomas O.; Kelly, Richard P.; Noyes, Steven S.; and Raymond, James C., 4,418,384, Cl. 364-200.000.
- Kendall Company, The: See—  
Cianci, James P., 4,417,891, Cl. 604-317.000.
- Kendall, Ray, to Dynalene Corporation. Retractable caster assembly having a lever in rolling engagement with a pressure plate. 4,417,738, Cl. 280-43.170.
- Kennecott Corporation: See—  
Lopacki, John B.; and Emes, Harry R., 4,417,389, Cl. 29-619.000.
- Raymond, Yvan G., 4,418,415, Cl. 373-130.000.
- Kennedy, Richard B., to Crehan, Patrick James; and Fricke, Richard J. Polyurethane foams and processes for preparation. 4,417,998, Cl. 252-182.000.
- Kenny, Andrew A., to Eaton Corporation. Vacuum signal integrator. 4,417,599, Cl. 137-85.000.
- Kerr-McGee Coal Corporation: See—  
Johnson, Weldon K., 4,417,840, Cl. 414-329.000.
- Kessler, Achim: See—  
Krautkremer, Franz; Kessler, Achim; and Krautkraemer, Gerd, 4,417,877, Cl. 440-38.000.
- Key Tech Corporation: See—  
Carstens, Ronald, 4,418,111, Cl. 428-145.000.
- Keyboard Company, The: See—  
Muller, Michael; and Butts, Gary C., 4,418,257, Cl. 200-159.00B.
- Kida, Masashi: See—  
Kobayashi, Akihiro; Kida, Masashi; Ito, Novuei; and Kato, Yoji, 4,417,550, Cl. 123-145.00A.
- Kief, Garry C.: See—  
Bevan, Mark H.; and Kief, Garry C., 4,417,774, Cl. 312-108.000.
- Kim, Dae K.; and Bertolacini, Ralph J., to Standard Oil Company (Indiana). Hydrocarbon conversion catalyst system. 4,418,006, Cl. 502-73.000.
- Kim, Jung S. Screwdriver. 4,417,611, Cl. 145-61.0EA.
- Kim, Leo, to Shell Oil Company. Process for the epoxidation of olefins. 4,418,203, Cl. 549-531.000.
- Kimberly-Clark Corporation: See—  
Sigl, Wayne C., 4,417,938, Cl. 156-270.000.
- Kimura, Yoshikazu: See—  
Ueda, Yoshihiro; Kimura, Yoshikazu; Yonehara, Hiroyuki; and Tanabe, Kenjiro, 4,417,810, Cl. 355-74.000.
- Kincheloe, David, to King Instrument Corporation. Tape splicing blocks. 4,417,942, Cl. 156-502.000.
- Kindelovich, Frederick T.: See—  
Commins, Alfred D.; and Kindelovich, Frederick T., 4,417,431, Cl. 52-715.000.
- Kindl, George F.; Michaud, Olean E.; and Brien, Joseph E., to Colt Industries Operating Corp. Laser measuring system and method for turning machine. 4,417,816, Cl. 356-357.000.
- King, Eddie W.: See—  
Morgan, Annis R., Jr.; and King, Eddie W., 4,417,450, Cl. 62-126.000.
- King Instrument Corporation: See—  
Kincheloe, David, 4,417,942, Cl. 156-502.000.
- Kirchhof, Gunther: See—  
Notzel, Joachim; Schatz, Anton; Buczek, Harthmuth; and Kirchhof, Gunther, 4,417,809, Cl. 355-46.000.
- Kishi, Hirotoshi, to Canon Kabushiki Kaisha. Image synthesizing device. 4,417,805, Cl. 355-14.00R.
- Kitadate, Kenichiro; and Tanimoto, Yoshinori, to Tokyo Shibaura Denki Kabushiki Kaisha. X-ray apparatus. 4,418,421, Cl. 378-199.000.
- Kitahiro, Isamu: See—  
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,418,284, Cl. 250-578.000.
- Kitamura, Masami, to Matsushita Electric Works, Ltd. Electric shaver. 4,417,397, Cl. 30-34.200.
- Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Teyere for blowing gases into molten metal bath container. 4,417,723, Cl. 266-265.000.



- Kita Corporation: See—  
Tomaru, Hisao, 4,417,929, Cl. 148-433.000.
- Kiuchi, Masashi: See—  
Mitsuhashi, Yasuo; and Kiuchi, Masashi, 4,418,137, Cl. 430-109.000.
- Kiyomura, Yoshiteru; Masuda, Yutaka; and Kojima, Tatsuji, to Toray Industries, Inc. Fur-like napped fabric and process for manufacturing same, 4,418,104, Cl. 428-15.000.
- Klein, H. Joseph: See—  
Iyer, Sankar P.; Lewis, Roy D.; Klein, H. Joseph; Hord, William C.; and Ailor, James C., 4,417,617, Cl. 164-254.000.
- Klein, Joseph T.: See—  
Davis, Larry; and Klein, Joseph T., 4,418,067, Cl. 424-267.000.
- Kleiner, Walter, to Staebli Ltd. Method and dobby for synchronizing all heddle frames of a weaving machine, 4,417,604, Cl. 139-329.000.
- Klopper, Detlev: See—  
Esser, Fred; Kloppe, Detlev; Lachner, Walter; and Kruger, Albrecht, 4,418,414, Cl. 373-24.000.
- Klose, Werner; and Auel, Theodor, to Hoechst Aktiengesellschaft. Process for the manufacture of 1-aminoalkane-1,1-diphosphonic acids, 4,418,019, Cl. 260-502.50C.
- Klug, Frederic J.: See—  
Prochazka, Svante; and Klug, Frederic J., 4,418,024, Cl. 264-1.200.
- Klug, Reimund: See—  
Bauer, Walter; Farber, Heinrich; and Kluge, Reimund, 4,418,420, Cl. 378-187.000.
- Knaapp, Robert E., to Thomas & Betts Corporation. Pitch transition connector, 4,417,780, Cl. 339-99.00R.
- Kneba, Michael: See—  
Wolfrum, Jürgen; Kneba, Michael; and Clough, Peter N., 4,417,964, Cl. 204-158.00R.
- Knop, Karl H.; and Gale, Michael T., to RCA Corporation. Multiple image encoding using surface relief structures as authenticating device for sheet-material authenticated item, 4,417,784, Cl. 350-162.190.
- Knowles, Henry L.; and Winningham, James P. Multiple bag dispenser, 4,417,669, Cl. 221-26.000.
- Knowlton, William K., to General Electric Company. Charge converter for vibration monitoring instrumentation, 4,417,476, Cl. 73-660.000.
- Kobayashi, Akihiro; Kida, Masashi; Ito, Novuei; and Kato, Yoji, to Nippon Soken, Inc. Engine preheating apparatus, 4,417,550, Cl. 123-145.00A.
- Kobayashi, Fujio: See—  
Yamaguchi, Shoichiro; and Kobayashi, Fujio, 4,418,387, Cl. 364-414.000.
- Kobayashi, Masato; Hoshino, Yasushi; Tateishi, Kazuyoshi; Isobe, Minoru; Konishi, Hiroshi; Koga, Yoshitomo; and Hagiwara, Shigemi, to Oki Electric Industry Co., Ltd. Pressure fixing device, 4,417,803, Cl. 355-3.0FU.
- Kobayashi, Nobuo: See—  
Kako, Hiroyoshi; and Kobayashi, Nobuo, 4,417,696, Cl. 239-690.000.
- Kobs, Frederick E.: See—  
Ryan, Joseph L.; Safdie, Elias; Watkins, Richard R.; and Kobs, Frederick E., 4,418,343, Cl. 340-723.000.
- Kobuke, Takayoshi: See—  
Izumi, Toshiaki; Taketomi, Yasuta; and Kobuke, Takayoshi, 4,418,126, Cl. 428-694.000.
- Koch, Adolf, to Autohaus Lorinser GmbH & Co. Tail spoiler for motor vehicles, in particular for passenger cars with a tail trunk space, 4,417,760, Cl. 296-1.00S.
- Kodama, Shun-ichi: See—  
Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,418,186, Cl. 526-247.000.
- Koehne, Rainer: See—  
Krauss, Ralf; and Koehne, Rainer, 4,417,966, Cl. 204-176.000.
- Koei Chemical Co., Ltd.: See—  
Yasuda, Sinichi; Kurohara, Takayuki; and Taguro, Akira, 4,418,221, Cl. 568-757.000.
- Koga, Kenji: See—  
Terashima, Shiro; Tanno, Norihiko; and Koga, Kenji, 4,418,218, Cl. 568-633.000.
- Koga, Yoshitomo: See—  
Kobayashi, Masato; Hoshino, Yasushi; Tateishi, Kazuyoshi; Isobe, Minoru; Konishi, Hiroshi; Koga, Yoshitomo; and Hagiwara, Shigemi, 4,417,803, Cl. 355-3.0FU.
- Kogane, Mikio, to Fuji Photo Film Co., Ltd. Photographic paper cutter, 4,417,808, Cl. 355-29.000.
- Kohama, Tokio: See—  
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,417,471, Cl. 73-204.000.
- Kohlstette, Werner; and Niemerg, Willi, to Westfalia Separator AG. Centrifuge with vertical axis of rotation, 4,417,885, Cl. 494-23.000.
- Kohn, Gary A., to Otis Engineering Corporation. Safety valve, 4,417,600, Cl. 137-553.000.
- Kohsaka, Yoji: See—  
Ohuchi, Chiaki; Kohsaka, Yoji; and Suenaga, Hiroyoshi, 4,417,493, Cl. 83-15.000.
- Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kameno, Yoshito; Katsube, Junki; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Conjugated ketone compounds in preventing platelet thrombosis, 4,418,079, Cl. 424-330.000.
- Kojima, Gen: See—  
Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,418,186, Cl. 526-247.000.
- Kojima, Tatsuji: See—  
Kiyomura, Yoshiteru; Masuda, Yutaka; and Kojima, Tatsuji, 4,418,104, Cl. 428-15.000.
- Kolb, Gunter: See—  
Probst, Joachim; Kolb, Gunter; Müller, Friedhelm; and Baumgen, Heinz, 4,418,175, Cl. 524-555.000.
- Komaroff, Iwan: See—  
Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jörg, 4,417,693, Cl. 239-453.000.
- Komatsuzaki, Yasuo, to Shin-Etsu Handotai Co., Ltd. Apparatus for chemical etching of a wafer material, 4,417,945, Cl. 156-639.000.
- Kommanditbolaget United Stirling (Sweden) A.B. & Co.: See—  
Lorant, Stefan, 4,417,443, Cl. 60-525.000.
- Komori, Tadashi: See—  
Kuroda, Susumu; and Komori, Tadashi, 4,417,374, Cl. 28-181.000.
- Komura, Hirotosugu: See—  
Tabata, Yoichiro; Ueguri, Shigeo; Komura, Hirotosugu; and Ito, Toshio, 4,418,265, Cl. 219-130.400.
- Kondo, Shigeru: See—  
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Takatoshi; and Kitahiro, Isamu, 4,418,284, Cl. 250-578.000.
- Konishi, Hiroshi: See—  
Kobayashi, Masato; Hoshino, Yasushi; Tateishi, Kazuyoshi; Isobe, Minoru; Konishi, Hiroshi; Koga, Yoshitomo; and Hagiwara, Shigemi, 4,417,803, Cl. 355-3.0FU.
- Konishioku Photo Industry Co., Ltd.: See—  
Yamazaki, Yoshio; Nakamura, Ken; and Inowa, Shigeru, 4,417,807, Cl. 355-15.000.
- Kono, Masao: See—  
Tani, Tatsuo; and Kono, Masao, 4,417,806, Cl. 355-14.0SH.
- Kopecky, Ivyl D., to Haybuster Manufacturing, Inc. Planting apparatus, 4,417,530, Cl. 111-73.000.
- Kopp, Richard: See—  
Rasshofer, Werner; Kopp, Richard; and Paul, Reiner, 4,418,159, Cl. 521-121.000.
- Koppers Company, Inc.: See—  
Irwin, Rodney C., 4,417,952, Cl. 202-241.000.
- Koren, Stein, to Moss Rosenberg Verft A/S. Propulsion machinery for LNG ships, 4,417,878, Cl. 440-3.000.
- Kornau, Horst: See—  
Brachmann, Walter; Kornau, Horst; and Thiel, Klaus, 4,418,173, Cl. 524-425.000.
- Korte, Ralph J., to Champion International Corporation. Erectable carton with adhesive release, 4,417,685, Cl. 229-41.00B.
- Koshi, Isei, to Fuji Terumo Co., Ltd. Connector for catheter, 4,417,887, Cl. 604-162.000.
- Koss Corporation: See—  
Mathis, Terry D., 4,418,248, Cl. 179-156.00R.
- Koster, Harry D., to Chemical Dynamics, Inc. Splicer for label feeder, 4,417,940, Cl. 156-351.000.
- Kouno, Tsutomu, to Fujitsu Limited. Coordinate reading apparatus, 4,418,242, Cl. 178-19.000.
- Koyama, Shinji: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
- Kramer, Wolfgang; Buchel, Karl H.; Haller, Ingo; and Plempel, Manfred, to Bayer Aktiengesellschaft. Diastereomeric 1-(4-chlorophenoxy)-1-(1-imidazolyl)-3,3-dimethyl-2-butanol compounds and their antimycotic use, 4,418,072, Cl. 424-273.00R.
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- Krauss, Werner, to Claudius Peters AG. Silo for bulk material, 4,417,832, Cl. 406-90.000.
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- Krevitz, Kenneth: See—  
Pytlewski, Louis L.; Iaconianni, Frank J.; Krevitz, Kenneth; and Smith, Arthur B., 4,417,977, Cl. 208-262.000.
- Krome, Gerd: See—  
Danz, Eckehard; and Krome, Gerd, 4,418,233, Cl. 570-239.000.
- Kronenberg, Kurt. Closure for flexible containers, 4,417,371, Cl. 24-30.50R.
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Kronogard, Sven-Olof; Kronogard, Clas-Olof; and Kronogard, Hakan, 4,417,551, Cl. 123-198.00F.
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Esser, Fred; Kloppe, Detlev; Lachner, Walter; and Kruger, Albrecht, 4,418,414, Cl. 373-24.000.
- Krupp, Viktor A.: See—  
Qualitz, Marion; and Krupp, Viktor A., 4,417,752, Cl. 282-27.500.
- Kube, Gebhard K., to Exxon Research & Engineering Co. Separate quench and evaporative cooling of compressor discharge stream, 4,417,847, Cl. 415-1.000.
- Kubis, Charles S.: See—  
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,417,667, Cl. 220-67.000.
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Fujimoto, Tadao; Fujiuchi, Hiroyuki; Shimizu, Kenichi; and Ueda, Seiichi, 4,417,529, Cl. 110-346.000.
- Yamaji, Tadao; Nakajima, Toshi; and Kashi, Takeshi, 4,417,754, Cl. 285-104.000.
- Kubota, Naohiro: See—  
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- Kuesters, Werner: See—  
Lungershausen, Rolf; Martin, Christoph; Marciniowski, Stefan; Siegel, Harro; and Kuesters, Werner, 4,418,146, Cl. 435-106.000.
- Kugler, Edwin L.: See—  
McCandlish, Larry E.; and Kugler, Edwin L., 4,418,154, Cl. 518-714.000.
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- Kulischenko, Walter, to Pennwalt Corporation. Flexible shaft stick control mechanism for steering marine vessels, 4,417,879, Cl. 440-62.000.
- Kumagai, Isao: See—  
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Saki, Yukihiro; Kumazawa, Eitaro; and Ishioka, Yozo, 4,417,697, Cl. 241-65.000.
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Tokumo, Akio; and Kunugi, Yoshiro, 4,418,323, Cl. 331-111.000.
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- Kuraray Co., Ltd.: See—  
Murakami, Tetsuo; Miyazaki, Hirotoshi; and Harima, Hiroshi, 4,418,163, Cl. 523-205.000.
- Tani, Masami; Esaki, Tamemaru; and Ohno, Yoshikata, 4,418,103, Cl. 428-4.000.
- Kuroda, Kazuyuki; Ikematsu, Riyoiti; and Nitta, Kazunari, to Mitsui Toatsu Chemicals, Inc. Process for the production of 2,3-dichloropropionitrile, 4,418,018, Cl. 260-465.700.
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Yasuda, Sinichi; Kurohara, Takayuki; and Taguro, Akira, 4,418,221, Cl. 568-757.000.
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Fujimori, Tohru; and Kusui, Yoshino, 4,418,373, Cl. 360-132.000.
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Ichinomiya, Tsutomu; Kusunoki, Toshio; and Kami, Tomohiro, 4,417,587, Cl. 128-682.000.
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Beranek, Ivan; Kyral, Josef; Uhlir, Miroslav; and Zlesak, Ivan, 4,417,923, Cl. 75-257.000.
- L & R Manufacturing Company: See—  
Marshall, Patrick J., 4,418,297, Cl. 310-316.000.
- Lachner, Walter: See—  
Esser, Fred; Kloppe, Detlev; Lachner, Walter; and Kruger, Albrecht, 4,418,414, Cl. 373-24.000.
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Haag, Werner O.; and Lago, Rudolph M., 4,418,235, Cl. 585-407.000.
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- Lam, Chiu T.: See—  
Angevine, Philip J.; and Lam, Chiu T., 4,417,973, Cl. 208-46.000.
- Lambert, Phillip R.: See—  
Morrow, George W.; and Lambert, Phillip R., 4,418,119, Cl. 428-342.000.
- Landler, Josef; and Mayr, Max, to Alkor GmbH Kunststoffverkauf. Method of producing a flocked composite body, 4,418,106, Cl. 428-89.000.
- Landron, Rafael: See—  
Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., 4,417,913, Cl. 65-59.100.
- Landry, Kossuth J., Jr. Soil erosion prevention block insert and apparatus for positioning, 4,417,842, Cl. 414-572.000.
- Lang, William H.: See—  
Chang, Clarence D.; and Lang, William H., 4,418,155, Cl. 518-719.000.
- Langen, Hans; Wolff, Erich; and Ranz, Erwin, to Agfa Gevaert Aktien-gesellschaft. Light-sensitive photographic silver halide recording material, 4,418,142, Cl. 430-549.000.
- Langman, William F., to Omark Industries, Inc. Steel railroad sleeper, 4,417,690, Cl. 238-59.000.
- Laporte Industries Limited: See—  
Dyer, Alan; and Araya, Abraham, 4,418,048, Cl. 423-305.000.
- Lardi, Francesco: See—  
Podolsky, Leaman B.; Ronnen, Uri G.; and Lardi, Francesco, 4,418,285, Cl. 290-40.00R.
- Lareau, John P.: See—  
Edwards, Lawrence J.; and Lareau, John P., 4,418,315, Cl. 324-202.000.
- Larson, Kenneth N.; Davis, John S.; and Bostick, Lewis M., to Allied Corporation. Information exchange processor, 4,418,382, Cl. 364-200.000.
- Larson, Willis A.; and Van Zeeland, Anthony J., to Oak Industries Inc. Flexible connector with interconnection between conductive traces, 4,418,239, Cl. 174-34.000.
- Lask, Zygmunt: See—  
Johnston, Harold; Lask, Zygmunt; and Gill, Frederick H., 4,417,781, Cl. 339-198.00J.
- Latham, Allen, Jr.: See—  
Schoendorfer, Donald W.; and Latham, Allen, Jr., 4,417,884, Cl. 494-4.000.
- Latsch, Reinhard, to Robert Bosch GmbH. Method for closed-loop control of the instant of ignition, 4,417,556, Cl. 123-425.000.
- Lauer, Gail D.: See—  
Plashen, Mark; Lauer, Gail D.; Roberts, Thomas M.; and Backman, Keith C., 4,418,149, Cl. 435-253.000.
- Lauhoff, Heinz; and Bokamp, Alfons, to Bernhard Beumer Maschinen-fabrik KG. Tensioning device for a vertical conveyor, 4,417,654, Cl. 198-815.000.
- Laurel Bank Machine Co., Ltd.: See—  
Uchida, Isamu; and Kawakami, Moriatsu, 4,418,417, Cl. 377-8.000.
- Laurin, Bernard L.: See—  
Dawson, W. Clifford; Bard, George D.; Smith, Luther W.; and Laurin, Bernard L., 4,417,790, Cl. 351-166.000.
- Lawrence, John C.; Stewart, Andrew D. G.; and Dodson, John S. Centering and working gemstones, 4,417,564, Cl. 125-30.00R.
- Lazerson, Max M.: See—  
Bohme, Rolf C.; van Zyl, Ian D.; and Lazerson, Max M., 4,417,817, Cl. 356-380.000.
- Ledley, Robert S., to Georgetown University. Grooved gel, 4,417,967, Cl. 204-180.00G.
- Lee, Bing-Lin: See—  
DeWitt, Elmer J.; Minchak, Robert J.; Lee, Bing-Lin; and Benedikt, George M., 4,418,179, Cl. 525-249.000.
- Lee, Cleve L., to Nordson Corporation. Power post for film frame for skin packaging machine, 4,417,432, Cl. 53-77.000.
- Lee, Lawrence L., to Magnavox Government and Industrial Electronics Company. Apparatus for individually encapsulating magnetic particles, 4,417,543, Cl. 118-620.000.
- Lee, Roy, Jr. Method of supporting pipe during machining, 4,417,363, Cl. 10-107.0PH.
- Le Grand, Yves-Marie, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Interference limiting two-port network for 1+1 type transmission systems, 4,418,245, Cl. 179-2.510.
- Lehmann, Rudolf: See—  
Hennemann, Manfred; Andree, Hans; Lehmann, Rudolf; Schnegleberger, Harald; and Bellinger, Horst, 4,417,895, Cl. 8-137.000.
- Lehr, Klaus; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for separating metals from aqueous solutions, 4,418,043, Cl. 423-22.000.
- Lehrer, William I., to Fairchild Camera and Instrument Corporation. Method for forming a low temperature binary glass, 4,417,914, Cl. 65-60.530.
- Leicht, Robert J.: See—  
House, Cynthia B.; and Leicht, Robert J., 4,418,101, Cl. 427-393.000.
- Leining, Lyndon R., to Geo. A. Hormel & Company. Mid-section skinning apparatus, 4,417,367, Cl. 17-21.000.
- Leithauser, Horst: See—  
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,418,156, Cl. 521-56.000.
- Le Lannou, Michel, to Valeo S.A. Friction lining, 4,418,115, Cl. 428-283.000.
- Lentz, David J.: See—  
Houghton, Richard B.; and Lentz, David J., 4,417,588, Cl. 128-713.000.
- Leong, Ken. Human powered hang glider, 4,417,707, Cl. 244-11.000.
- Lese, Gregory; and Nash, Donald H., to Bell Telephone Laboratories, Incorporated. Frequency modulation transmitter for voice or data, 4,418,416, Cl. 375-5.000.
- Le Vantine, Allan D. Pulsating, oscillating bicycle reflector, 4,417,783, Cl. 350-99.000.
- Lever Brothers Company: See—  
Lips, Alexander; Wells, Martin A.; and Willis, Edwin, 4,417,995, Cl. 252-174.230.
- Levitt, George; and Sauer, Richard F., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides, 4,417,917, Cl. 71-93.000.
- Levy, Samuel, to General Electric Company. Fluid self-steering railway vehicle truck, 4,417,525, Cl. 105-166.000.
- Lewis, Alan C.; Ragard, Phillip A.; and Shiptenko, Robert C., to Universal Instruments Corporation. Centering device for electrical components, 4,417,683, Cl. 227-109.000.



- Lewis, John C., to Park-Ohio Industries, Inc. Method and apparatus of uniform induction heating of an elongated workpiece. 4,418,259, Cl. 219-0.430.
- Lewis, Roy D.: See—  
Iyer, Sankar P.; Lewis, Roy D.; Klein, H. Joseph; Hord, William C.; and Ailor, James C., 4,417,617, Cl. 164-254.000.
- Lewis, Shawn D. Pocket handkerchief clip. 4,417,370, Cl. 24-3.00L.
- Li, Shu Kang L., to CIP, Inc. Wet compaction of low density air laid web after binder application. 4,417,931, Cl. 156-62.200.
- Liaskar, Jermund: See—  
Bakke, Jan; and Liaskar, Jermund, 4,418,230, Cl. 568-940.000.
- Lidorenko, Nikolai S.; Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S. Photoelectric solar cell array. 4,418,238, Cl. 136-246.000.
- Lin, David C. K., to Owens-Corning Fiberglass Corporation. Composite roofing panel. 4,418,108, Cl. 428-139.000.
- Lin, Ying-Lang. Portable carton box sealer without touching the tape by hand. 4,417,941, Cl. 156-475.000.
- Lindberg, John E., to U.S.A. 161 Developments Ltd. Combustion control system and improved elements therefor. 4,417,548, Cl. 123-25.00E.
- Lindbergh, Charles. Counterweight system. 4,417,646, Cl. 187-94.000.
- Lindgren, Peter: See—  
Hood, Robert A.; and Lindgren, Peter, 4,417,414, Cl. 43-43.120.
- Lindmark, Richard C.: See—  
Bunnelle, William L.; and Lindmark, Richard C., 4,418,123, Cl. 428-517.000.
- Lindner, Walter E.; and Malakelis, Elias, to McDonnell Douglas Corporation. Enhanced aluminum etchant. 4,417,949, Cl. 156-665.000.
- Lindos, Sven G., to Oy Lohja Ab. Electroluminescence structure. 4,418,118, Cl. 428-336.000.
- Lips, Alexander; Wells, Martin A.; and Willis, Edwin, to Lever Brothers Company. Fabric conditioning composition. 4,417,995, Cl. 252-174.230.
- Litton Systems, Inc.: See—  
Dolber, Darrel, 4,417,814, Cl. 356-252.000.
- Liu, Chung-hong R. Method and apparatus for machining a workpiece by varying the tool geometry. 4,417,489, Cl. 82-1.00C.
- Lo, David S.: See—  
Casimiri, Gregory J.; Lo, David S.; and Paul, Maynard C., 4,418,400, Cl. 365-87.000.
- Loberg, Michael: See—  
Nunn, Adrian; and Loberg, Michael, 4,418,208, Cl. 562-449.000.
- Lockwood, George H., to Anthony Manufacturing Corp. Turbine drive water sprinkler. 4,417,691, Cl. 239-206.000.
- Logullo, Francis M., Sr.; and Wu, Yun-Tai, to Du Pont de Nemours, E. I., and Company. Aramid fiber coated with polyfunctional aziridine. 4,418,164, Cl. 523-207.000.
- Lohberg, Peter, to Battelle Institut e.V. Automatic weighing method and device. 4,417,632, Cl. 177-212.000.
- Loikitt, Frank F., to Standard Keil Hardware Manufacturing Co. Direct drive positive locking panel fastener. 4,417,430, Cl. 52-384.000.
- Lone Star Steel Company: See—  
Heine, Christian H., Jr.; McGaw, Robert W.; Wetzel, W. Edwin, Jr.; and Ziegler, Joseph, 4,417,928, Cl. 148-144.000.
- Lonzal Ltd.: See—  
Perlbarger, Jean-Claude, 4,418,020, Cl. 260-544.00Y.
- Lopacki, John B.; and Emes, Harry R., to Kennecott Corporation. Method of terminating carbon ceramic composition resistors for use in high peak power and peak voltage energy dissipation application. 4,417,389, Cl. 29-619.000.
- Loran, Stefan, to Kommanditbolaget United Stirling (Sweden) A.B. & Co. Multi-cylinder, double-acting hot gas engine. 4,417,443, Cl. 60-325.000.
- Lowitz, Joachim: See—  
Arndt, Peter J.; Lowitz, Joachim; Muller, Manfred; and Schlosser, Fritz, 4,418,204, Cl. 549-539.000.
- Lu, Phong, to Luk Lamellen und Kupplungsbau GmbH. Balanced friction clutch system and method of making same. 4,417,651, Cl. 192-89.00B.
- Lubritrol Corporation, The: See—  
Cason, Donald L.; and Schroeck, Calvin W., 4,417,990, Cl. 252-32.70E.
- Lucas Industries Limited: See—  
Cotter, Edmund; Whitley, Francis; and Baum, Heinz W., 4,417,647, Cl. 188-73.380.
- Luk Lamellen und Kupplungsbau GmbH: See—  
Lu, Phong, 4,417,651, Cl. 192-89.00B.
- Lund, Wesley C., to Boeing Company, The. Apparatus for forming shaped edges. 4,417,835, Cl. 409-180.000.
- Lundholm, Gunnar, to Mechanical Technology Incorporated. Stirling cycle engine. 4,417,444, Cl. 60-525.000.
- Lungershausen, Rolf; Martin, Christoph; Marcinowski, Stefan; Siegel, Harro; and Kuesters, Werner, to BASF Aktiengesellschaft. Preparation of D-N-carbamyl- $\alpha$ -amino acids and micro-organisms for carrying out this preparation. 4,418,146, Cl. 435-106.000.
- Lutka, Hubertus: See—  
Crosier, Heinrich; Dierkes, Hermann; Lutke, Hubertus; and Schreckenberg, Klaus, 4,417,499, Cl. 89-36.00K.
- Lutz, Harry O., to McDonnell Douglas Corporation. Explosive switch. 4,417,519, Cl. 102-263.000.
- Lynch, Joseph A. Nondestructive dental cap removal methods. 4,417,876, Cl. 433-161.000.
- M.A.N. Maschinenfabrik Augsburg-Nuremberg Aktiengesellschaft: See—  
Kazenmaier, Ulrich; and Quast, Gunter, 4,417,549, Cl. 123-41.840.
- M.A.N.-Roland Druckmaschinen Aktiengesellschaft: See—  
Fischer, Hermann, 4,417,516, Cl. 101-181.000.
- M.B.E. Minoterie Biscotterie d'Echenon: See—  
Cantenot, Francois, 4,418,088, Cl. 426-549.000.
- M & T Chemicals Inc.: See—  
Gibbons, Ambrose J., Jr.; and Ringwood, Robert C., Jr., 4,418,169, Cl. 524-178.000.
- Mac Engineering and Equipment Co., Inc.: See—  
Simonton, Robert D., 4,417,390, Cl. 29-730.000.
- MacAllister, Burton W., Jr.: See—  
Palilla, Frank C.; MacAllister, Burton W., Jr.; and McKenna, John F., 4,418,327, Cl. 338-309.000.
- Machanian, William V., to Wurlitzer Company, The. Velocity sensitive keyer control circuit for an electronic musical instrument. 4,417,496, Cl. 84-1.270.
- Machinefabrik Joh' Abersson B. V.: See—  
Hofs, Bernardus T., 4,417,979, Cl. 209-617.000.
- Mackelburg, Gerald: See—  
Gordon, Alan; Watson, Stanley J.; Cowen, Steven J.; Mackelburg, Gerald; and Castile, Brett D., 4,418,404, Cl. 367-132.000.
- Madej, Edward A., to Robroy Industries. Pipe hanger. 4,417,711, Cl. 248-74.00R.
- Maeda, Haruo: See—  
Tsukiji, Yoshihiro; Maeda, Haruo; and Araki, Mikio, 4,417,486, Cl. 74-813.00R.
- Maeda, Naoyuki: See—  
Abe, Michio; and Maeda, Naoyuki, 4,417,640, Cl. 180-142.000.
- Maeshiba, Sozaburo. Liquid level indicator in a cylindrical gasoline tank of the horizontal type. 4,418,340, Cl. 340-618.000.
- Magnavox Government and Industrial Electronics Company: See—  
Lee, Lawrence L., 4,417,543, Cl. 118-620.000.
- Mahoney, Paul F.; and Bonn, Jerrold L., to Signatron, Inc. Signal processing product circuitry. 4,418,319, Cl. 328-160.000.
- Maistrovich, Anthony R., to Minnesota Mining & Manufacturing Company. Imaging media capable of displaying sharp indicia. 4,418,098, Cl. 427-161.000.
- Major, Jeffrey T., to Allied Corporation. Method of making a multiple open turn lap wound dynamoelectric machine. 4,417,388, Cl. 29-598.000.
- Makino, Fusao: See—  
Suzuki, Hitoshi; and Makino, Fusao, 4,418,298, Cl. 318-341.000.
- Malakelis, Elias: See—  
Lindner, Walter E.; and Malakelis, Elias, 4,417,949, Cl. 156-665.000.
- Mallingckrodt, Inc.: See—  
White, Carl R., 4,418,229, Cl. 568-938.000.
- Mangiacavalli, Andrea: See—  
Abbott, Philip A.; Dailey, James E.; Karsan, Demir I.; and Mangiacavalli, Andrea, 4,417,831, Cl. 405-227.000.
- Manning, Lindley: See—  
Case, James E.; Ruppert, Richard L.; and Manning, Lindley, 4,417,425, Cl. 52-125.500.
- Mansfield Carbon Products Inc.: See—  
Vining, Paul H.; and Smith, Jimmy B., 4,417,528, Cl. 110-229.000.
- Manufacturers Supplies Co.: See—  
Goellner, Robert F., 4,417,458, Cl. 69-13.000.
- Mapco, Inc.: See—  
Zacharias, Ellis M., Jr., 4,417,480, Cl. 73-861.180.
- Marathon Electric Manufacturing Corporation: See—  
Keglewitsch, Josef, 4,417,373, Cl. 24-458.000.
- Marchetto, Albert V.: See—  
Halvorsen, Henry J.; Marchetto, Albert V.; and Thomas, Edwin P., 4,417,778, Cl. 339-17.00M.
- Marcinowski, Stefan: See—  
Lungershausen, Rolf; Martin, Christoph; Marcinowski, Stefan; Siegel, Harro; and Kuesters, Werner, 4,418,146, Cl. 435-106.000.
- Marconi Company Limited, The: See—  
Glasgow, John A., 4,418,360, Cl. 358-108.000.
- Marcus, Konrad H.; and Watjer, Sheldon J., to Prince Corporation. Automotive armrest assembly. 4,417,764, Cl. 297-194.000.
- Marin, Heiner: See—  
Hess, Ruediger; and Marin, Heiner, 4,418,255, Cl. 200-147.00A.
- Marino, Richard P.; Rothamel, Richard J.; and Rieken, William C., to General Foods Corporation. Expanded textured protein product and method for making same. 4,418,086, Cl. 426-302.000.
- Mariol, James F. Rideable motor-driven toy train. 4,417,523, Cl. 105-1.00T.
- Markle, Stephen L.: See—  
Hartman, Peter W.; Hanford, Keith E.; Markle, Stephen L.; and Hartman, Elmer C., 4,418,251, Cl. 191-35.000.
- Marsh Industries, Inc.: See—  
Marsh, Richard B., 4,417,420, Cl. 49-482.000.
- Marsh, Richard B., to Marsh Industries, Inc. Door seal. 4,417,420, Cl. 49-482.000.
- Marshall, Patrick J., to L & R Manufacturing Company. Oscillatory resonant transducer driver circuit. 4,418,297, Cl. 310-316.000.
- Martin, Christoph: See—  
Lungershausen, Rolf; Martin, Christoph; Marcinowski, Stefan; Siegel, Harro; and Kuesters, Werner, 4,418,146, Cl. 435-106.000.
- Martin, Liesel, geb. Boser. Device for mounting diapositives in a strip and an apparatus for projecting the strip-mounted diapositives. 4,417,792, Cl. 353-120.000.

- Martin Marietta Corporation: See—  
Misra, Mohan S., 4,418,097, Cl. 427-113.000.
- Martinez, Felix J.: See—  
Cosentino, Louis C.; and Martinez, Felix J., 4,417,888, Cl. 604-175.000.
- Martirosian, Ruben G.: See—  
Lidorenko, Nikolai S.; Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,418,238, Cl. 136-246.000.
- Marui Industry Co., Ltd.: See—  
Miyagishima, Naoki; and Nakagawa, Shigeru, 4,417,411, Cl. 40-443.000.
- Marulic, Walter J.; and Johnson, Kent N., to United-American Car Co. Gondola car construction. 4,417,526, Cl. 105-406.00R.
- Maruyama, Keizo: See—  
Sato, Takahisa; Maruyama, Keizo; and Sano, Kunio, 4,418,045, Cl. 423-245.000.
- Maruyama, Toshinori: See—  
Torii, Koshi; Maruyama, Toshinori; Akita, Yoshio; and Teshima, Takanori, 4,418,311, Cl. 320-48.000.
- Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: See—  
Becker, Anton, 4,417,773, Cl. 308-178.000.
- Maschinenfabrik J. Dieffenbacher GmbH Co.: See—  
Pfeiffer, Heinrich, 4,417,865, Cl. 425-371.000.
- Masillo, Guido. Slide rule - calendar. 4,418,274, Cl. 235-85.00R.
- Mason, James J., to Cameo Container Corporation. Carton for packaging lamp shades or the like. 4,417,660, Cl. 266-500.000.
- Masse, Lucien: See—  
Medlin, William L.; Masse, Lucien; and Zumwalt, Gary L., 4,417,621, Cl. 166-249.000.
- Massey, Edward W.: See—  
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- Masuda, Yutaka: See—  
Kiyomura, Yoshiteru; Masuda, Yutaka; and Kojima, Tatsuji, 4,418,104, Cl. 428-15.000.
- Mathis, Ronald D.: See—  
Reed, Jerry O.; and Mathis, Ronald D., 4,418,029, Cl. 264-211.000.
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Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,417,795, Cl. 354-25.000.
- Matsuda, Shohei: See—  
Satoh, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, 4,417,768, Cl. 303-113.000.
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- Matsui, Hideo: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
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Matsuda, Susumu; Matsukura, Nobuaki; Suzuki, Masataka; and Narushima, Tsugio, 4,417,517, Cl. 101-288.000.
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Oyokota, Shigeru; Taniguchi, Nobuyuki; Hoda, Takeo; Tanii, Junichi; Seigenji, Kiyoshi; and Matsumoto, Toshiaki, 4,417,793, Cl. 354-21.000.
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Tarumi, Mitio; Tokitsu, Tetsuya; and Matsumoto, Yoshio, 4,417,871, Cl. 432-1.000.
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Ichinomiya, Tsutomu; Kusunoki, Toshio; and Kami, Tomohiro, 4,417,587, Cl. 128-682.000.
- Kitamura, Masami, 4,417,397, Cl. 30-34.200.
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Ikenoya, Yasuo; Hirano, Makoto; Shimizu, Yoji; and Matsuura, Masaaki, 4,417,442, Cl. 60-293.000.
- Matsuzawa, Masamitsu: See—  
Okada, Minoru; Matsuzawa, Masamitsu; Uezima, Osamu; Nakakuki, Teruo; and Horikoshi, Koki, 4,418,144, Cl. 435-96.000.
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- Maurer, Jack R., to Allegheny Ludlum Steel Corporation. Welded ferritic stainless steel article. 4,417,921, Cl. 75-125.000.
- Maurice, Terrence J.: See—  
Murray, Edward D.; Woodman, Brenda J.; Maurice, Terrence J.; and Sirett, Robert R., 4,418,084, Cl. 426-250.000.
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- May, David C.; and Bailey, Terry R., to Minnesota Mining and Manufacturing. Vapor-permeable retroreflective sheeting. 4,418,110, Cl. 428-143.000.
- Mayne-Banton, Veronica I.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Self developing, photoetching of polyesters by far UV radiation. 4,417,948, Cl. 156-643.000.
- Mayr, Max: See—  
Landler, Josef; and Mayr, Max, 4,418,106, Cl. 428-89.000.
- Mazur, Joseph S., to Eaton Corporation. Cooling fan ducting. 4,417,636, Cl. 180-68.00R.
- McAdams Manufacturing Co., Inc.: See—  
McAdams, Ronald R., 4,417,939, Cl. 156-282.000.
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Weisrock, William P.; and McCarthy, Edward F., 4,418,145, Cl. 435-104.000.
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Cundy, Steven L.; Evans, Ronald A.; Johnson, Oliver S.; McCormack, John S.; and Nichols, Bruce A., 4,417,911, Cl. 65-3.120.
- McCoy, Ewald H., to Electrochemical Products, Inc. Alkaline plating baths and electroplating process. 4,417,956, Cl. 204-44.000.
- McCracken, Oliver W.; and Bostock, James H., to Otis Engineering Corporation. Electronic temperature sensor. 4,417,470, Cl. 73-154.000.
- McCracken, William G., Jr.: See—  
Hetzel, Frederick; and McCracken, William G., Jr., 4,418,328, Cl. 338-20.000.
- McDonnell Douglas Corporation: See—  
Lindner, Walter E.; and Malakelis, Elias, 4,417,949, Cl. 156-665.000.
- Lutz, Harry O., 4,417,519, Cl. 102-263.000.
- McKinney, Howard F.; Wear, Frederick C.; and Sandy, Harold L., 4,418,083, Cl. 426-242.000.
- McFarlen, William T.: See—  
Cain, Edwin F. C.; and McFarlen, William T., 4,417,854, Cl. 416-241.00B.
- McGaw, Robert W.: See—  
Heine, Christian H., Jr.; McGaw, Robert W.; Wetzel, W. Edwin, Jr.; and Ziegler, Joseph, 4,417,928, Cl. 148-144.000.
- McIntyre, Robert A.: See—  
Smith, Leland B.; and McIntyre, Robert A., 4,417,590, Cl. 128-731.000.
- McKelvey, Harold E., to Shatterproof Glass Corporation. Magnetron cathode sputtering apparatus. 4,417,968, Cl. 204-192.00R.
- McKenna, John F.: See—  
Palilla, Frank C.; MacAllister, Burton W., Jr.; and McKenna, John F., 4,418,327, Cl. 338-309.000.
- McKeon, Ronald J.: See—  
Yaghmaie, Farrokh; and McKeon, Ronald J., 4,417,902, Cl. 44-51.000.
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- McNealy, Richard C.; and Cravens, Charles F., to Halliburton Company. Method for heat treating metal. 4,418,258, Cl. 219-10.410.
- Mead, Gary G. Tape dispenser. 4,417,677, Cl. 225-26.000.
- Measells, Paul: See—  
Bacehowski, David; Measells, Paul; and Zabielski, Kenneth, 4,417,753, Cl. 285-21.000.
- Mechanical Technology Incorporated: See—  
Lundholm, Gunnar, 4,417,444, Cl. 60-525.000.
- Medical Engineering Corporation: See—  
Trick, Robert E., 4,417,567, Cl. 128-1.00R.
- Medicor Muvek: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Sztipanovits, Janos; Vilmati, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40.000.
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- Meimex Gyogyszerkereskedelmi Vallalat: See—  
Kahan nee Laszlo, Ilona; Hammer, Helga; and Beladi, Ilona, 4,418,060, Cl. 424-227.000.
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- Melnscha Electric Mfg. Co., Ltd.: See—  
Fuji, Toshinobu, 4,418,128, Cl. 429-70.000.
- Melji Seika Kabushiki Kaisha: See—  
Okonogi, Tsuneo; Fukatsu, Shunzo; Hachisu, Mitsugu; Kawashima, Hiroko; Shitoh, Keiko; and Sekizawa, Yasuharu, 4,418,070, Cl. 424-270.000.
- Melech, Charles E., to C. R. Bard, Inc. Urine drainage bag outlet tube and method for eliminating or reducing migration of bacteria. 4,417,892, Cl. 604-323.000.
- Mellon, Horace E.: See—  
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,418,057, Cl. 424-151.000.
- Memorial University of Newfoundland: See—  
Finney, Jean R., 4,417,545, Cl. 119-1.000.
- Mena, Andre; Charriere, Jean-Michel; and Desbrest, Jean, to Societe Francaise d'Electrometallurgie Sofrem. Process for eliminating metallic impurities from magnesium by injecting a halogenated derivative or boron. 4,417,920, Cl. 75-63.000.
- Mencher, Alexander: See—  
Brudny, Joseph, 4,417,569, Cl. 128-77.000.
- Menden, Thomas J., to Teletype Corporation. Rolling bias spring. 4,418,371, Cl. 360-106.000.
- Menz, Donald L., to Quakebrace, Inc. Support system. 4,417,426, Cl. 52-126.700.
- Menz, Edward T., Jr.: See—  
Forand, Ronald R.; and Menz, Edward T., Jr., 4,418,151, Cl. 436-505.000.
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Hartman, George D., 4,418,062, Cl. 424-248.400.
- Merianos, John J.: See—  
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,418,054, Cl. 424-70.000.
- Merrill Dow Pharmaceuticals Inc.: See—  
Schnettler, Richard A.; Dage, Richard C.; and Grisar, J. Martin, 4,418,071, Cl. 424-273.00R.
- Merrill Torade et Compagnie: See—  
Bey, Philippe; Gerhart, Fritz; Jung, Michel; and Schirlin, Daniel, 4,418,077, Cl. 424-309.000.
- Messerschmitt-Bokow-Blohm Gesellschaft mit beschränkter Haftung: See—  
Crispin, Brunhart; Voss, Nobert; Pohl, Wulf-Dieter; and Thomaier, Dieter, 4,417,441, Cl. 60-251.000.
- Metallgesellschaft Aktiengesellschaft: See—  
Cornelius, Gerhard; Hilsebein, Wolfgang; Ried, Helmut; and Gessner, Adolf W., 4,418,236, Cl. 585-408.000.
- Metallurgie Hoboken-Overpelt: See—  
Vieliefont, Jean F.; and Forton, Henri M. F. J., 4,417,953, Cl. 204-12.000.
- Metex Corporation: See—  
Usher, Peter P., 4,417,733, Cl. 277-1.000.
- Metro, Robert D. Adjustable mechanically cushioned heel for a shoe. 4,417,408, Cl. 36-36.00R.
- Metteler Kautschuk GmbH: See—  
Brachmann, Walter; Kornau, Horst; and Thiel, Klaus, 4,418,173, Cl. 524-425.000.
- Meyborg, Holger: See—  
Rasshofer, Werner; Dieterich, Dieter; and Meyborg, Holger, 4,418,160, Cl. 521-159.000.
- Mexy, Gabriella: See—  
Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, 4,418,205, Cl. 560-39.000.
- Michaud, Olean E.: See—  
Kindl, George F.; Michaud, Olean E.; and Brien, Joseph E., 4,417,816, Cl. 356-357.000.
- Michel, Alfred: See—  
Seitz, Werner; Scheib, Klaus; and Michel, Alfred, 4,418,017, Cl. 260-465.00E.
- Michiura, Yoshiharu: See—  
Imai, Eiji; Michiura, Yoshiharu; and Niihara, Toshio, 4,417,762, Cl. 296-210.000.
- Microfilm Technics, Inc.: See—  
Olsen, Ronald H., 4,418,194, Cl. 536-27.000.
- Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; and Nishimura, Tatsuo, to Fuji Photo Film Co., Ltd. Process for the development of color photographic light-sensitive material. 4,418,140, Cl. 410-351.000.
- Mignon, Jean P., to Timex Corporation. Watchband light attachment for a wristwatch. 4,417,819, Cl. 368-67.000.
- Mikami, Kenji: See—  
Izumo, Masanori; Kametani, Keichiro; Ota, Sigehito; and Mikami, Kenji, 4,418,046, Cl. 423-245.000.
- Mikaya, Toshio: See—  
Nozawa, Nobuyuki; and Mikaya, Toshio, 4,417,568, Cl. 128-33.000.
- Miles Laboratories, Inc.: See—  
Oberhardt, Bruce J., 4,418,148, Cl. 435-179.000.
- Miller, Donald L. Flying wing driven by an earthbound machine. 4,417,706, Cl. 244-2.000.
- Miller, Jesse D., Jr.; Tshudy, James A.; and Unruh, Ralph E., to Armstrong World Industries, Inc. Durable, low-maintenance flooring tile. 4,418,109, Cl. 428-142.000.
- Milliken Research Corporation: See—  
Engels, Walter; and Willbanks, Charles E., 4,417,695, Cl. 239-590.300.
- Millman, Bruce A.; and Rodgers, Harris G., Sr., to Corning Glass Works. Printing apparatus and method. 4,417,513, Cl. 101-41.000.
- Millmaster Onyx Group, Inc.: See—  
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,418,054, Cl. 424-70.000.
- Mills, Loring K., to Polaroid Corporation. Disposable manually operable film processor. 4,417,799, Cl. 354-304.000.
- Minami, Kunihiko, to Sasakura Engineering Co., Ltd. Air-cooled heat exchanger. 4,417,619, Cl. 165-113.000.
- Minardi, Paolo: See—  
Di Tella, Vincenzo; Falbo, Dario; Minardi, Paolo; and Tinebra, Roberto, 4,417,537, Cl. 114-230.000.
- Minchak, Robert J.: See—  
DeWitt, Elmer J.; Minchak, Robert J.; Lee, Bing-Lin; and Benedikt, George M., 4,418,179, Cl. 525-249.000.
- MiniScribe Corporation: See—  
Appelquist, Roy A.; Altobellis, Richard M.; and Hoppe, Robert F., 4,418,369, Cl. 360-98.000.
- Minissian, Kevin G. Peristaltic pump. 4,417,856, Cl. 417-477.000.
- Ministry of International Trade & Industry: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175.000.
- Minnesota Mining and Manufacturing: See—  
May, David C.; and Bailey, Terry R., 4,418,110, Cl. 428-143.000.
- Minnesota Mining and Manufacturing Company: See—  
Huss, Charles P., 4,418,357, Cl. 346-153.100.
- Kealy, Joanne P.; and Zenk, Robert E., 4,418,120, Cl. 428-343.000.
- Maistrovich, Anthony R., 4,418,098, Cl. 427-161.000.
- Stratton, James A., 4,418,105, Cl. 428-40.000.
- Minolta Camera Kabushiki Kaisha: See—  
Murasaki, Hiroshi, 4,417,365, Cl. 15-256.510.
- Nakai, Masaaki; and Sahara, Masayoshi, 4,417,794, Cl. 354-38.000.
- Oyokota, Shigeru; Taniguchi, Nobuyuki; Hoda, Takeo; Tanii, Junichi; Seigenji, Kiyoshi; and Matsumoto, Toshiaki, 4,417,793, Cl. 354-21.000.
- Miranda, Hector: See—  
DeYoung, Thomas W.; and Miranda, Hector, 4,418,355, Cl. 346-140.00R.
- Misra, Mohan S., to Martin Marietta Corporation. Coating for graphite electrodes. 4,418,097, Cl. 427-113.000.
- Mitchell, Robert M., to Thomas J. Lipton, Inc. Method of making infusion package. 4,417,433, Cl. 53-413.000.
- Mitchell, William A.: See—  
Swagerty, Arnold; and Mitchell, William A., 4,418,318, Cl. 328-155.000.
- Mitsubishi Chemical Industries Limited: See—  
Gunge, Norio, 4,418,150, Cl. 435-256.000.
- Mitsubishi Denki Kabushiki Kaisha: See—  
Fujiwara, Kenzo, 4,418,241, Cl. 174-121.0SR.
- Otani, Katsuya; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,418,300, Cl. 313-573.000.
- Sasaki, Yoshio, 4,417,453, Cl. 62-503.000.
- Tabata, Yoichiro; Ueguri, Shigeo; Komura, Hirotugu; and Ito, Toshio, 4,418,265, Cl. 219-130.400.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—  
Hoshino, Noriyuki, 4,417,514, Cl. 101-54.000.
- Mitsuhashi, Yasuo; and Kiuchi, Masashi, to Canon Kabushiki Kaisha. Electrophotographic process. 4,418,137, Cl. 430-109.000.
- Mitsui Petrochemical Industries, Ltd.: See—  
Ueda, Takashi; and Kashiwa, Norio, 4,418,184, Cl. 526-125.000.
- Mitsui Toatsu Chemicals, Inc.: See—  
Kuroda, Kazuyuki; Ikematsu, Riyotii; and Nitta, Kazunari, 4,418,018, Cl. 260-465.700.
- Numata, Satoshi; Nakatani, Kiyoshi; Yamazaki, Noboru; and Yuasa, Teruo, 4,418,220, Cl. 568-734.000.
- Mitsuishi Fukai Tekkoshu, Ltd.: See—  
Shigeo, Iwasaki; and Hiroshi, Haguchi, 4,417,864, Cl. 425-73.000.
- Mitsumoto Coffee Co., Ltd.: See—  
Yamamoto, Noboru, 4,417,504, Cl. 99-306.000.
- Mitsutoyo Kiko Co., Ltd.: See—  
Tosa, Akio, 4,417,464, Cl. 72-478.000.
- Mitter, Mathias. Lateral support for squeegee. 4,417,515, Cl. 101-120.000.
- Mittnacht, Hans: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jürgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Miyagishima, Naoki; and Nakagawa, Shigeru, to Marui Industry Co., Ltd. Information display device. 4,417,411, Cl. 40-443.000.
- Miyakawa, Yoshitaka: See—  
Satoh, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, 4,417,768, Cl. 303-113.000.
- Miyashita, Kunio: See—  
Hayashida, Hiroshi; Takahashi, Tadashi; Miyashita, Kunio; and Kawakami, Kanji, 4,418,372, Cl. 360-113.000.
- Miyashita, Shoji. Fabric weaving method. 4,417,605, Cl. 139-383.00R.

- Miyazaki, Hiroto: See—  
Murakami, Tetsuo; Miyazaki, Hiroto; and Harima, Hiroshi, 4,418,163, Cl. 523-205.000.
- Mizutani, Hiroshi; and Tsuchiya, Yoshimi, to Kao Soap Co., Ltd. Sanitary napkin. 4,417,893, Cl. 604-366.000.
- Mo, Arne B.: See—  
Andersson, Bror A. E.; and Mo, Arne B., 4,417,874, Cl. 433-96.000.
- Moasser, Manoutchehr. Nontraumatic prosthetic valve with magnetic closure. 4,417,360, Cl. 3-1.500.
- Mobell Blowout Services Limited: See—  
Henson, George S.; and Brooks, Joe, 4,417,625, Cl. 166-387.000.
- Mobil Oil Corporation: See—  
Angevine, Philip J.; and Lam, Chiu T., 4,417,973, Cl. 208-46.000.
- Briggs, William F.; and Bullard, Edward M., 4,418,114, Cl. 428-218.000.
- Chang, Clarence D.; and Lang, William H., 4,418,155, Cl. 518-719.000.
- Connaught, Ruth M.; Coty, Vernon F.; and Sedlak, Michael, 4,417,986, Cl. 210-759.000.
- Haag, Werner O.; and Lago, Rudolph M., 4,418,235, Cl. 585-407.000.
- Shafir, Eleonora G., 4,417,620, Cl. 166-245.000.
- Yan, Tsoung Y., 4,418,042, Cl. 423-7.000.
- Mochizuki, Minoru, to Hurco Mfg. Co., Inc. Lathe tool calibrator and method. 4,417,490, Cl. 82-2.00B.
- Mod, William A.: See—  
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,417,969, Cl. 204-252.000.
- Modic, Frank J., to General Electric Company. Low density silicone foam compositions and method for making. 4,418,157, Cl. 521-82.000.
- Moen, Alfred M., to Stanadyne, Inc. Zero internal pressure cartridge. 4,417,602, Cl. 137-625.170.
- Mohlman, David F.: See—  
Dismeyer, Dean E.; and Mohlman, David F., 4,417,498, Cl. 89-1.814.
- Molex Incorporated: See—  
Bamford, William C., 4,417,777, Cl. 339-17.0CF.
- Moller, Rudolf, to WABCO Steuerungstechnik GmbH & Co. Pressure release for a valve. 4,417,717, Cl. 251-139.000.
- Molusis, Anthony J.; and O'Loughlin, Thomas M., to Bristol Babcock Inc. Single loop control system. 4,418,381, Cl. 364-131.000.
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- Monacelli, Walter J., to Plastics Engineering Company. Polyimides having bis-maleimide terminal groups. 4,418,181, Cl. 525-426.000.
- Mondschein, Lee F. Embedded optic fiber page. 4,418,278, Cl. 235-487.000.
- Monsanto Company: See—  
Beestman, George B.; and Deming, John M., 4,417,916, Cl. 71-93.000.
- Tolbert, William R., 4,417,861, Cl. 417-315.000.
- Montefiore Medical Center: See—  
Lalezari, Iraj, 4,418,059, Cl. 424-180.000.
- Montgomery, Rodney L. Awning structure. 4,417,597, Cl. 135-102.000.
- Moody, Roy A.; Bulanda, John J.; Guzay, Cezimir M.; and Schoenfeld, David R., to Panduit Corp. Method and apparatus for positioning an expandable insulating sleeve on a connector. 4,417,394, Cl. 29-882.000.
- Moore, Edward A.: See—  
Williams, Waymon D.; and Moore, Edward A., 4,417,527, Cl. 109-2.000.
- Moore, George G. I., to Riker Laboratories, Inc. 2,6 Di(t-butyl)-4-(2-pyrryl)-phenol and anti-inflammatory use thereof. 4,418,074, Cl. 424-274.000.
- Morand, Jean C. F.: See—  
Gauthier, Andre; and Morand, Jean C. F., 4,418,096, Cl. 427-76.000.
- Moravcsik, Imre: See—  
Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, 4,418,205, Cl. 560-39.000.
- Moree, Elwood D.: See—  
Snowden, Dennis C.; and Moree, Elwood D., 4,417,713, Cl. 248-228.000.
- Morello, Edwin F., to Standard Oil Company (Indiana). Polyamides from itaconic acid and diamines. 4,418,189, Cl. 528-345.000.
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- Morgan, William M.: See—  
Barclay, Donald J.; and Morgan, William M., 4,417,955, Cl. 204-43.00R.
- Mori, Nobuhiko: See—  
Tsuiji, Yoshitake; Mori, Nobuhiko; and Egami, Kazunari, 4,418,423, Cl. 382-40.000.
- Mori, Shunji: See—  
Asada, Yoshikatsu; and Mori, Shunji, 4,418,391, Cl. 364-551.000.
- Moriconi, Dario J. Hypodermic syringe destruction device. 4,417,460, Cl. 72-325.000.
- Morii, Hiroshi: See—  
Ishii, Hiroshi; Morii, Hiroshi; and Ishijima, Saburo, 4,417,722, Cl. 266-250.000.
- Morimoto, Shigeo: See—  
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- Morimoto, Taiji: See—  
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- Moritz, Bertil, to ASEA Aktiebolag. Method and means for controlling the manufacture of windings for inductive apparatus. 4,417,701, Cl. 242-55.000.
- Moriya, Mitsutoshi: See—  
Yoshimi, Akio; Kamiya, Michihiko; and Moriya, Mitsutoshi, 4,417,618, Cl. 165-12.000.
- Moriya, Ryusuke, to Sony Corporation. Head control and signal selector for playback at high-speed of helical scan video tape. 4,418,366, Cl. 360-75.000.
- Moriyama, Kaneaki. Tile for construction representing antique pattern. 4,418,121, Cl. 428-409.000.
- Morris, John D.; and Hayatdavoudi, Asadollah, to University of Oklahoma. The Board of Regents of The. Self-bursting coal pellets and a method of making them. 4,417,899, Cl. 44-6.000.
- Morris, Joseph H., to United States of America. Navy. Variable geometry centrifugal pump. 4,417,849, Cl. 418-366.000.
- Morrison, Thomas R. Recording disc handling device. 4,417,757, Cl. 294-26.000.
- Morrone, Ross F., to Prince Manufacturing, Inc. Racket stringing apparatus. 4,417,729, Cl. 273-73.00A.
- Morrow, George W.; and Lambert, Phillip R., to Daubert Industries, Inc. Ovenable board. 4,418,119, Cl. 428-342.000.
- Mortensen, Harold R., to Facet Enterprises, Incorporated. Two stage starter drive system. 4,418,289, Cl. 307-142.000.
- Moser, Kurt: See—  
Johnson, Vincent L.; and Moser, Kurt, 4,418,041, Cl. 422-133.000.
- Moskovsky Nauchno-Issledovatel'skiy Institut Mikrokhirurgii Glaza: See—  
Soloviev, Sergei A.; Fedorov, Svyatoslav N.; Osetsky, Vitaly P.; and Durnev, Valery V., deceased, 4,417,579, Cl. 128-303.00R.
- Moss, Laurence H.: See—  
Hager, Robert E.; and Moss, Laurence H., 4,418,279, Cl. 250-201.000.
- Moss Rosenberg Verft A/S: See—  
Koren, Stein, 4,417,878, Cl. 440-3.000.
- Mostek Corporation: See—  
O'Toole, James E.; and Proebsting, Robert J., 4,418,403, Cl. 365-201.000.
- Mosure, Duane C.: See—  
Cygnor, John E.; Whitesel, Terry L.; and Mosure, Duane C., 4,417,851, Cl. 415-150.000.
- Motor Wheel Corporation: See—  
Smith, Richard W.; and Waugaman, William J., 4,417,766, Cl. 301-55.000.
- Motoren-und Turbinen-Union Friedrichshafen GmbH: See—  
Deutschmann, Herbert; and Kamleitner, Ewald, 4,417,555, Cl. 123-372.000.
- Dinger, Hans, 4,417,554, Cl. 123-357.000.
- Motorola, Inc.: See—  
Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., 4,417,913, Cl. 65-59.100.
- Higgins, Robert J., 4,418,324, Cl. 333-204.000.
- Motoyama, Kazuyasu, to Olympus Optical Co., Ltd. Connection terminal device for electrical implements. 4,417,776, Cl. 339-17.00F.
- MTU Motoren-Und-Turbinen-Union Friedrichshafen GmbH: See—  
Heisler, Kurt, 4,417,735, Cl. 277-101.000.
- Muench, Volker; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Preparation of electrically conductive polymers. 4,418,187, Cl. 526-259.000.
- Muetgeert, Johannes; Otto, Petrus H. L.; and Flippo, Frans A., to Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer. Enzyme immobilization in a starch gel. 4,418,147, Cl. 435-178.000.
- Muetterties, Andrew J.: See—  
Genese, Joseph N.; and Muetterties, Andrew J., 4,417,577, Cl. 604-81.000.
- Muhler, Joseph C.; and Putt, Mark S., to Indiana University Foundation. Dental prophylaxis compositions and their use. 4,418,053, Cl. 424-52.000.
- Muller, Ernst-Willi; and Rathjen, Claus, to Bayer Aktiengesellschaft. Process for the production of granulates of organic substances present in the form of a melt. 4,418,030, Cl. 264-142.000.
- Muller, Friedhelm: See—  
Probst, Joachim; Kolb, Gunter; Muller, Friedhelm; and Baumgen, Heinz, 4,418,175, Cl. 524-555.000.
- Muller, Gunter: See—  
Bohrmann, Hans; Campbell, Thomas; Grigoteit, Werner; and Muller, Gunter, 4,418,090, Cl. 426-578.000.
- Muller, Manfred: See—  
Arndt, Peter J.; Lowitz, Joachim; Muller, Manfred; and Schlosser, Fritz, 4,418,204, Cl. 549-539.000.
- Muller, Michael; and Butts, Gary C., to Keyboard Company, The. Keyboard switch. 4,418,257, Cl. 200-159.00B.
- Mumola, Joanne L.: See—  
Demke, Kent R.; and Mumola, Joanne L., 4,418,345, Cl. 340-731.000.
- Munshaw, Harold A. Soldering iron holder with ready indicator and safety shutoff. 4,418,268, Cl. 219-242.000.



- Murakami, Tetsuo; Miyazaki, Hiroto; and Harima, Hiroshi, to Kura-ray Co., Ltd. Water absorbing composite comprising inorganic powder encapsulated with a crosslinked carboxyl polymer. 4,418,163, Cl. 523-205,000.
- Muralidhara, Ranya: See—  
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,418,087, Cl. 426-536,000.
- Mura, Yasuo: See—  
Hosaka, Shuntaro; Mura, Yasuo; and Kawabata, Yasuo, 4,418,152, Cl. 436-511,000.
- Muraoka, Akihiko: See—  
Suzuki, Kunihiro; and Muraoka, Akihiko, 4,417,642, Cl. 180-249,000.
- Murakami, Hiroshi, to Minolta Camera Kabushiki Kaisha. Cleaning apparatus. 4,417,365, Cl. 15-256,510.
- Murdoch, Keith C., to American Cyanamid Company. Method of treating tumors in warm-blooded animals. 4,418,078, Cl. 424-330,000.
- Murray, Edward D.; Woodman, Brenda J.; Maurice, Terrence J.; and Siret, Robert R., to General Foods Inc. Neutral protein beverage. 4,418,084, Cl. 426-250,000.
- Murray, Robert T.; and Bradley, Daniel J., to Imperial Chemical Industries PLC. Measuring apparatus. 4,417,815, Cl. 356-349,000.
- Museli, Katsuo, to Kabushiki Kaisha Daini Seikoshu. Watchband formed of tubular metal rods and method of manufacturing same. 4,417,437, Cl. 59-20,000.
- Muterpaugh, Max W., to RCA Corporation. Tuning system for a multi-band television receiver. 4,418,427, Cl. 455-180,000.
- Myers, Chester D.: See—  
Cameron, Jacquelyn J.; and Myers, Chester D., 4,418,013, Cl. 260-123,500.
- Myers, George D., deceased (by Myers, Virginia K., administratrix); and Busch, Lloyd E., to Ashland Oil, Inc. Addition of water to regeneration air. 4,417,975, Cl. 208-120,000.
- Myers, Virginia K., administratrix: See—  
Myers, George D., deceased; and Busch, Lloyd E., 4,417,975, Cl. 208-120,000.
- Naarmann, Herbert: See—  
Muench, Volker; Naarmann, Herbert; and Penzien, Klaus, 4,418,187, Cl. 526-259,000.
- Nahiso, Inc.: See—  
Pinto, Albert A.; and Ryder, George, 4,417,837, Cl. 414-104,000.
- Nadler, Morton. Method and device for image analysis. 4,418,362, Cl. 358-293,000.
- Nagai, Kiichiro; and Okamoto, Takashi, to Pioneer Electronic Corporation. Magnetic tape setting device for use in magnetic tape recording and/or reproducing apparatus. 4,418,367, Cl. 360-75,000.
- Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage comparator. 4,418,290, Cl. 307-355,000.
- Nagle, William J.: See—  
Seltis, Daniel G.; Sheibley, Dean W.; and Nagle, William J., 4,418,130, Cl. 429-206,000.
- Nakabayashi, Masamitsu: See—  
Doura, Fumihiko; Nakabayashi, Masamitsu; and Morimoto, Taiji, 4,418,177, Cl. 525-57,000.
- Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performing apparatus of electronic musical instrument. 4,417,494, Cl. 84-1,030.
- Nakagawa, Shigeru: See—  
Miyagishima, Naoki; and Nakagawa, Shigeru, 4,417,411, Cl. 40-443,000.
- Nakahara, Syunichi: See—  
Sugiura, Yoji; Hagiwara, Toshio; Okumura, Toru; and Nakahara, Syunichi, 4,417,796, Cl. 354-152,000.
- Nakahara, Yutaka; Kubota, Naohiro; Hirai, Bunji; and Haruna, Tohru, to Adeka Argus Chemical Co., Ltd. Process for preparing triacetone amine. 4,418,196, Cl. 546-242,000.
- Nakai, Masaaki; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Automatic diaphragm control camera. 4,417,794, Cl. 354-38,000.
- Nakajima, Toshi: See—  
Yamaji, Tadao; Nakajima, Toshi; and Kashi, Takeshi, 4,417,754, Cl. 285-104,000.
- Nakakuki, Teruo: See—  
Okada, Minoru; Matsuzawa, Masamitsu; Uezima, Osamu; Nakakuki, Teruo; and Horikoshi, Koki, 4,418,144, Cl. 435-96,000.
- Nakamoto, Yasunobu; and Terayama, Toshiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Combination power plant. 4,417,446, Cl. 60-441,700.
- Nakamura, Haruo, to Kabushiki Kaisha Suwa Seikoshu. Liquid crystal display with negative timing signal and dielectric inversion. 4,417,785, Cl. 350-346,000.
- Nakamura, Kazumasa: See—  
Yasuda, Keiichi; Ori, Takaaki; and Nakamura, Kazumasa, 4,417,468, Cl. 73-118,000.
- Nakamura, Ken: See—  
Yamazaki, Yoshio; Nakamura, Ken; and Inowa, Shigeru, 4,417,807, Cl. 355-15,000.
- Nakamura, Shigeru; Ueki, Yoshihiko; and Takachi, Hiroshi, to Toshiba Heating Appliances Co., Ltd. Liquid fuel combustion apparatus. 4,417,870, Cl. 431-33,000.
- Nakane, Masami; Reid, Joyce; and Haslinger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane hydrazone prostaglandin analogs useful in treating thrombolytic diseases. 4,418,076, Cl. 424-285,000.
- Nakanishi, Kyoji; Nozaki, Tsutomu; and Emi, Toshihiko, to Kawasaki Steel Corporation. Top-and-bottom blown converter. 4,417,719, Cl. 266-78,000.
- Nakano, Jiro: See—  
Imai, Yutaka; Nakano, Jiro; and Ezaki, Motoharu, 4,418,288, Cl. 307-117,000.
- Nakatani, Kiyoshi: See—  
Numata, Satoshi; Nakatani, Kiyoshi; Yamazaki, Noboro; and Yuasa, Teruo, 4,418,220, Cl. 568-734,000.
- Nalco Chemical Company: See—  
Bhattacharyya, Bhupati R.; and Roe, William J., 4,417,992, Cl. 252-88,000.
- Nalley, Robert E.; and Shenfield, Leonard R., to Discron, Inc. Method and apparatus for positioning a transducer using embedded servo track encoding. 4,418,368, Cl. 360-78,000.
- Napflin, Hans. Ski binding with step-in frame. 4,417,749, Cl. 280-614,000.
- Naramoto, Satoru: See—  
Kasai, Yutaka; and Naramoto, Satoru, 4,417,827, Cl. 401-68,000.
- Narushima, Tsugio: See—  
Matsuda, Susumu; Matsukura, Nobuaki; Suzuki, Masataka; and Narushima, Tsugio, 4,417,517, Cl. 101-288,000.
- Nash, Donald H.: See—  
Lese, Gregory; and Nash, Donald H., 4,418,416, Cl. 375-5,000.
- Nat, Gursharan P. S.: See—  
Busby, Robert A.; Nat, Gursharan P. S.; and Stearley, John W., 4,418,254, Cl. 200-68,300.
- Nation Enterprises, Inc.: See—  
Bauer, Marshall, 4,417,867, Cl. 425-394,000.
- National Distillers and Chemical Corporation: See—  
Hanes, Ronnie M.; and Prampton, Orville D., 4,418,219, Cl. 568-697,000.
- Tomita, Nobuya, 4,417,459, Cl. 72-56,000.
- National Foam Systems, Inc.: See—  
Bennett, Robert W., 4,417,601, Cl. 137-556,600.
- National Research Development Corporation: See—  
Massoud, Ebrahim, 4,418,027, Cl. 264-24,000.
- National Seating Co.: See—  
Edwards, Robert L., 4,417,715, Cl. 248-425,000.
- Nauerth, Karl-Heinz: See—  
Roller, Hanno; and Nauerth, Karl-Heinz, 4,418,272, Cl. 219-541,000.
- Nautilus Crane & Equipment Corporation: See—  
Gordon, John C., 4,417,664, Cl. 212-192,000.
- NCR Corporation: See—  
Oosterbaan, DuWayne D.; and Williams, Gerard J., 4,418,275, Cl. 377-33,000.
- Reece, John W., 4,418,356, Cl. 346-140,000.
- Thomas, Jacob E., 4,418,353, Cl. 346-140,000.
- Negri, Rosario O., to Grumman Aerospace Corporation. Interchangeable wing aircraft. 4,417,708, Cl. 244-45,000.
- Nehmiz, Peter: See—  
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; and Nehmiz, Peter, 4,417,946, Cl. 156-643,000.
- Nelson, Carl L.; Haynes, Darrel W.; and Weber, Michael J. Prosthetic cement spacer and method for using same. 4,417,571, Cl. 128-92,000.
- Nelson, Paul E., to Boeing Company, The. Ram assembly for electro-magnetic riveter. 4,417,463, Cl. 72-430,000.
- Nemeskeri, Georg, to G.N. Plastics Company Limited. Method for producing a container. 4,418,034, Cl. 264-522,000.
- Nerone, Louis R.: See—  
Finet, Alain; and Nerone, Louis R., 4,418,389, Cl. 364-478,000.
- Nichols, Bruce A.: See—  
Cundy, Steven L.; Evans, Ronald A.; Johnson, Oliver S.; McCormack, John S.; and Nichols, Bruce A., 4,417,911, Cl. 65-3,120.
- Nicholson, David W.; Smith, Larry G.; Dinius, Harold B.; and Oberle, Ronald R., to Eli Lilly and Company. Vial inspection machine. 4,417,662, Cl. 209-522,000.
- Nicklaus, Helen C. Stringed musical instrument teaching device and process. 4,417,497, Cl. 84-485,000.
- Nicolon B.V.: See—  
de Winter, Jan G., 4,417,828, Cl. 405-17,000.
- Niemerg, Willi: See—  
Kohlstette, Werner; and Niemerg, Willi, 4,417,885, Cl. 494-23,000.
- Nieto, Alfonso, Jr., to United States of America, Army. High impedance fast voltage probe. 4,418,314, Cl. 324-72,500.
- Nihon Shokuhin Kako Co., Ltd.: See—  
Okada, Minoru; Matsuzawa, Masamitsu; Uezima, Osamu; Nakakuki, Teruo; and Horikoshi, Koki, 4,418,144, Cl. 435-96,000.
- Niihara, Toshio: See—  
Imai, Eiji; Michiura, Yoshiharu; and Niihara, Toshio, 4,417,762, Cl. 296-210,000.
- Nippon Electric Co. Ltd.: See—  
Tsuiji, Yoshitake; Mori, Nobuhiko; and Egami, Kazunari, 4,418,423, Cl. 382-40,000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,417,494, Cl. 84-1,030.
- Nippon Kokan Kabushiki Kaisha: See—  
Ohuchi, Chiaki; Kohsaka, Yoji; and Suenaga, Hiroyoshi, 4,417,493, Cl. 83-15,000.
- Nippon Shokubai Kagaku Kogyo Co., Ltd.: See—  
Sato, Takahisa; Maruyama, Keizo; and Sano, Kunio, 4,418,045, Cl. 423-245,000.

- Nippon Soken, Inc.: See—  
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,417,471, Cl. 73-204,000.
- Kobayashi, Akihiro; Kida, Masashi; Ito, Novuei; and Kato, Yoji, 4,417,550, Cl. 123-145,000.
- Tanaka, Hiroaki; and Akita, Shigeyuki, 4,418,347, Cl. 340-870,370.
- Tanaka, Hiroaki; and Akita, Shigeyuki, 4,418,348, Cl. 340-870,370.
- Nippondenso Company Limited: See—  
Imai, Yutaka; Nakano, Jiro; and Ezaki, Motoharu, 4,418,288, Cl. 307-117,000.
- Shiga, Tsutomu, 4,418,295, Cl. 310-59,000.
- Torii, Koshi; Maruyama, Toshinori; Akita, Yoshio; and Teshima, Takatori, 4,418,311, Cl. 320-48,000.
- Yasuda, Keiichi; Ori, Takaaki; and Nakamura, Kazumasa, 4,417,468, Cl. 73-118,000.
- Yoshimi, Akizo; Kamiya, Michihiko; and Moriya, Mitsutoshi, 4,417,618, Cl. 165-12,000.
- Nishikawa, Shigeru: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175,000.
- Nishimura, Fuminobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing device. 4,417,544, Cl. 118-688,000.
- Nishimura, Tatsuo: See—  
Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; and Nishimura, Tatsuo, 4,418,140, Cl. 430-351,000.
- Niskin, Shale J. Counter balanced sheave assembly with multiple pulleys. 4,417,718, Cl. 254-394,000.
- Nissan Motor Co., Ltd.: See—  
Imai, Eiji; Michiura, Yoshiharu; and Niihara, Toshio, 4,417,762, Cl. 296-210,000.
- Suzuki, Kunihiro; and Muraoka, Akihiko, 4,417,642, Cl. 180-249,000.
- Tamura, Takeo, 4,418,377, Cl. 362-19,000.
- Yasuhara, Seishi, 4,417,561, Cl. 123-575,000.
- Nitta, Kazunari: See—  
Kuroda, Kazuyuki; Ikematsu, Riyoiti; and Nitta, Kazunari, 4,418,018, Cl. 260-465,700.
- Nitto Kohki Co., Ltd.: See—  
Nozawa, Nobuyuki; and Mikiya, Toshio, 4,417,568, Cl. 128-33,000.
- Noda, Tomimitsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Programmable microwave oven with program display. 4,418,262, Cl. 219-10,558.
- Noe, Renato R.; and Catapano, Michael C. Portable test unit, for high pressure testing of tubes. 4,417,465, Cl. 73-49,500.
- Nonoyama, Nobuo: See—  
Kawasaki, Kikuo; Yoshida, Kazuo; Nonoyama, Nobuo; Yamaguchi, Toshibumi; Hasegawa, Toshio; and Okamura, Jitsuo, 4,417,671, Cl. 222-56,000.
- Nordson Corporation: See—  
Lee, Cleve L., 4,417,432, Cl. 53-77,000.
- Nordstrom, Anders: See—  
Hay, Eric; and Nordstrom, Anders, 4,417,728, Cl. 273-29,000.
- Norris, Kenneth E. Towelsheet disposable diaper. 4,417,894, Cl. 604-385,000.
- Norris, Robert D.: See—  
Brown, Richard A.; Byers, Lance R.; and Norris, Robert D., 4,418,051, Cl. 423-592,000.
- Northern Telecom Limited: See—  
Johnston, Harold; Lask, Zygmunt; and Gill, Frederick H., 4,417,781, Cl. 339-198,000.
- Notzel, Joachim; Schatz, Anton; Buczek, Harthmuth; and Kirchhof, Gunther, to Agfa-Gevaert Aktiengesellschaft. Pattern scanning device for copying machines. 4,417,809, Cl. 355-46,000.
- Novak, Robert W.: See—  
Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., 4,418,047, Cl. 423-265,000.
- Noyes, Steven S.: See—  
Holley, Thomas O.; Kelly, Richard P.; Noyes, Steven S.; and Raymond, James C., 4,418,384, Cl. 364-200,000.
- Nozaki, Tsutomu: See—  
Nakanishi, Kyoji; Nozaki, Tsutomu; and Emi, Toshihiko, 4,417,719, Cl. 266-78,000.
- Nozawa, Nobuyuki; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Air bubble generating apparatus for use in bathtub. 4,417,568, Cl. 128-33,000.
- Nugent, Edward L., to Becton, Dickinson and Company. Blood phase separator device. 4,417,981, Cl. 210-209,000.
- Nuitoni Foods Corporation: See—  
Beccuquet, Louis E., 4,418,085, Cl. 426-297,000.
- Numata, Satoshi; Nakatani, Kiyoshi; Yamazaki, Noboro; and Yuasa, Teruo, to Mitsui Toatsu Chemicals Inc. Novel indene compound and novel process for producing indene compounds. 4,418,220, Cl. 568-734,000.
- Nunn, Adrian; and Loberg, Michael, to E. R. Squibb & Sons, Inc. N-Substituted iminodiacetic acids. 4,418,208, Cl. 562-449,000.
- Nuovo Pignone S.p.A.: See—  
Corain, Luciano, 4,417,606, Cl. 139-448,000.
- O.G. Hoyer A/S: See—  
Waldstrom, Ejvind; and Kaufmann, Gerhard, 4,417,610, Cl. 141-91,000.
- Oak Industries Inc.: See—  
Larson, Willis A.; and Van Zeeland, Anthony J., 4,418,239, Cl. 174-34,000.
- Obayashi, Hideki: See—  
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,417,471, Cl. 73-204,000.
- Ober, John W., to Hunter Investment Company. Solid state ignition system. 4,418,375, Cl. 361-253,000.
- Oberhardt, Bruce J., to Miles Laboratories, Inc. Multilayer enzyme electrode membrane. 4,418,148, Cl. 435-179,000.
- Oberle, Ronald R.: See—  
Nicholson, David W.; Smith, Larry G.; Dinius, Harold B.; and Oberle, Ronald R., 4,417,662, Cl. 209-522,000.
- Ogasawara, Masafumi: See—  
Sano, Takao; Ogasawara, Masafumi; and Tsubakimori, Hiroshi, 4,417,375, Cl. 28-272,000.
- Ogawa, Hiroshi, to Sony Corporation. Signal wave control circuit. 4,418,406, Cl. 369-124,000.
- Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, to Matsushita Electric Industrial Co., Ltd. Solid-state color-image sensor and process for fabricating the same. 4,418,284, Cl. 250-578,000.
- Ogawa, Shigeo: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175,000.
- Oguma, Kiyoshi: See—  
Tamai, Masaharu; Morimoto, Shigeo; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,418,075, Cl. 424-278,000.
- Ohba, Yozo: See—  
Toyoda, Takashi; Ohba, Yozo; and Yamanaka, Masaaki, 4,418,112, Cl. 428-212,000.
- Ohgami, Masahiko: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265,000.
- Ohkawa, Nobushisa; and Itoh, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the idling speed of an engine wherein the amount of air provided to the engine is increased by a predetermined amount when the engine speed becomes equal to zero. 4,417,553, Cl. 123-339,000.
- Ohkura, Zenichi; and Haneishi, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Data transmitting electrical contact means switching device in camera. 4,417,798, Cl. 354-271,000.
- Ohno, John M., to General Electric Company. Process for production of silicon carbide composite. 4,417,906, Cl. 51-307,000.
- Ohno, Yoshikata: See—  
Tani, Masami; Esaki, Tamemaru; and Ohno, Yoshikata, 4,418,103, Cl. 428-4,000.
- Ohnsmann, Klaus: See—  
Weber, Otto; Ohnsmann, Klaus; and Christ, Ferdinand, 4,417,630, Cl. 177-1,000.
- Ohuchi, Chiaki; Kohsaka, Yoji; and Suenaga, Hiroyoshi, to Nippon Kokan Kabushiki Kaisha. Method for cutting off steel plate. 4,417,493, Cl. 83-15,000.
- Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic recording tape cassette. 4,417,704, Cl. 242-197,000.
- Oji Yuka Goseishi Kabushiki Kaisha: See—  
Toyoda, Takashi; Ohba, Yozo; and Yamanaka, Masaaki, 4,418,112, Cl. 428-212,000.
- Oka, Naoki: See—  
Ando, Takashi; and Oka, Naoki, 4,417,901, Cl. 44-51,000.
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Kadija, Igor V.; Woodard, Kenneth E., Jr.; and Justice, David D., 4,417,959, Cl. 204-98.000.
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Kahn, Marvin L.; and O'Mahony, John S., 4,418,082, Cl. 426-51.000.
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Yasuda, Keiichi; Ori, Takaaki; and Nakamura, Kazumasa, 4,417,468, Cl. 73-118.000.
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Chang, Marguerite S.; and Orndoff, Robert R., 4,418,212, Cl. 564-109.000.
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Pellegrini, Alberto, 4,417,960, Cl. 204-98.000.
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Sakurai, Yoshimi; Furukawa, Yoshimi; Kanai, Masaaki; and Osada, Yasufumi, 4,417,775, Cl. 339-5.00M.
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Soloviev, Sergei A.; Fedorov, Svyatoslav N.; Osetsky, Vitaly P.; and Durnev, Valery V., deceased, 4,417,579, Cl. 128-303.00R.
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Kohn, Gary A., 4,417,600, Cl. 137-553.000.
- McCracken, Oliver W.; and Bostock, James H., 4,417,470, Cl. 173-154.000.
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Muegeert, Johannes; Otto, Petrus H. L.; and Flippo, Frans A., 4,418,147, Cl. 435-178.000.
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Bedwell, Junior L.; and Overton, Harold C., 4,418,100, Cl. 427-348.000.
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Lin, David C. K., 4,418,108, Cl. 428-139.000.
- Oy Lohja Ab: See—  
Lindors, Sven G., 4,418,118, Cl. 428-336.000.
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Osuga, Minoru; Oyama, Yoshishige; and Fujida, Mamoru, 4,417,558, Cl. 123-489.000.
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Hasler, Rolf; and Palacin, Francis, 4,417,898, Cl. 8-543.000.
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Jon, Min-Chung; Palazzo, Vito; and Sturm, George W., 4,417,478, Cl. 73-801.000.
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Spencer, Harvey J., 4,417,935, Cl. 156-80.000.
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Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, 4,418,205, Cl. 560-39.000.
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Pernet, Didier; and Pater, Francois, 4,417,698, Cl. 242-7.030.
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Cosimini, Gregory J.; Lo, David S.; and Paul, Maynard C., 4,418,400, Cl. 365-87.000.
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Rasshofer, Werner; Kopp, Richard; and Paul, Reiner, 4,418,159, Cl. 521-121.000.
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- Payette, Lionel J.: See—  
Bishop, Robert M.; Payette, Lionel J.; and Pike, Roscoe A., 4,418,190, Cl. 528-353.000.
- PCUK Produits Chimiques Ugine Kuhlmann: See—  
Fouletier, Louis, 4,418,004, Cl. 502-182.000.
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Vining, Paul H.; and Smith, Jimmy B., 4,417,528, Cl. 110-229.000.
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Allgor, Clarence B.; St. Clair, Clair J.; and Pearson, Richard A., 4,418,388, Cl. 364-431.010.
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Harrison, James J.; Pellegrini, John P.; and Selwitz, Charles M., 4,418,228, Cl. 568-937.000.
- Penna, Americo; and Spector, George. Novelty ice tray. 4,417,716, Cl. 249-121.000.
- Pennwalt Corporation: See—  
Kulischenko, Walter, 4,417,879, Cl. 440-62.000.
- Penzien, Klaus: See—  
Muench, Volker; Naarmann, Herbert; and Penzien, Klaus, 4,418,187, Cl. 526-259.000.
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- Perlberger, Jean-Claude, to Lonza Ltd. 2,2-Dichloroacetoacetyl chloride. 4,418,020, Cl. 260-544.00Y.
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Quinn, David A.; and Peros, Miladen, 4,417,524, Cl. 105-101.000.
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Wechsler, Hans G., 4,417,740, Cl. 280-87.010.

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Jennings, James R.; and Pessimis, George N., 4,417,997, Cl. 252-182.000.
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Dennehey, T. Michael; and Peterson, Charles K., 4,417,890, Cl. 604-256.000.
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Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,418,054, Cl. 424-70.000.
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Quinlan, Patrick M., 4,418,195, Cl. 544-58.200.
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Burns, Lyle D.; and Parlman, Robert M., 4,417,904, Cl. 44-72.000.
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- Tillman, Willie, 4,418,049, Cl. 423-450.000.
- Phillips, Robert E.: See—  
Talonn, Daniel A.; Phillips, Robert E.; and Ranford, Alan B., 4,417,574, Cl. 128-205.120.
- Pickard, Jürgen: See—  
Gaus, Hermann; Zaiser, Wolfgang; Pickard, Jürgen; and Eltze, Georg, 4,417,484, Cl. 74-688.000.
- Picker International Limited: See—  
Young, Ian R.; Hounsfield, Godfrey N.; and Burl, Michael, 4,418,316, Cl. 324-309.000.
- Pierburg GmbH & Co. KG: See—  
Sudbeck, Rainer, 4,417,857, Cl. 417-490.000.
- Pierce, Robert C.: See—  
Bauman, Robert A.; and Pierce, Robert C., 4,418,011, Cl. 252-544.000.
- Piereder, Ludwig. Methods and apparatus for producing encased meat and meat for encasing. 4,417,434, Cl. 53-469.000.
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- Pietrobelli, Silvio. Pop corn preparing and dispensing machine. 4,417,505, Cl. 99-323.600.
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Bishop, Robert M.; Payette, Lionel J.; and Pike, Roscoe A., 4,418,190, Cl. 528-353.000.
- Pinto, Albert A.; and Ryder, George, to Nabisco, Inc. Apparatus for grouping articles. 4,417,837, Cl. 414-104.000.
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Nagai, Kiichirou; and Okamoto, Takashi, 4,418,367, Cl. 360-75.000.
- Tokumo, Akio; and Kunugi, Yoshiro, 4,418,323, Cl. 331-111.000.
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Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,417,918, Cl. 71-100.000.
- Pitcher, Wayne H., Jr., to Corning Glass Works. Honeycomb filter and method of making it. 4,417,908, Cl. 55-523.000.
- Pitney Bowes Inc.: See—  
Chiang, Albert C., 4,418,183, Cl. 526-80.000.
- Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., to International Flavors & Fragrances Inc. Mixture of 4,4A,5,6-tetrahydro-7-methyl-2-(3H)-naphthalenone and benzodioxanones and use thereof in augmenting or enhancing the aroma or taste of consumable materials. 4,418,087, Cl. 426-536.000.
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Schwarzbach, Richard J.; Keeler, Manley S.; Cavaiani, Randy J.; and Chapman, Michael K., 4,418,333, Cl. 340-310.00A.
- Plan Hold Corporation: See—  
Johnson, Sigurd A., 4,418,378, Cl. 362-97.000.
- Plastics Engineering Company: See—  
Monacelli, Walter J., 4,418,181, Cl. 525-426.000.
- Plaza, Mario G.: See—  
Cushman, James E.; Plaza, Mario G.; and Waibel, Helmut K., 4,417,825, Cl. 400-605.000.
- Plempel, Manfred: See—  
Kramer, Wolfgang; Buchel, Karl H.; Haller, Ingo; and Plempel, Manfred, 4,418,072, Cl. 424-273.00R.
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Crispin, Brunhart; Voss, Nobert; Pohl, Wulf-Dieter; and Thomaier, Dieter, 4,417,441, Cl. 60-251.000.
- Pohrt, Jürgen: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jürgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Polaroid Corporation: See—  
Mills, Loring K., 4,417,799, Cl. 354-304.000.
- Rogers, Howard G.; Eckert, Robert D.; Sahatjian, Ronald A.; and Sulesky, Robert A., 4,418,139, Cl. 430-354.000.
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du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, 4,418,028, Cl. 264-43.000.
- Polmanteer, Keith E.; and Chapman, Harry L., to Dow Corning Corporation. Optically clear silicone compositions curable to elastomers. 4,418,165, Cl. 523-210.000.
- Polychrome Corporation: See—  
Patel, Jayanti; and Shimazu, Ken-ichi, 4,418,134, Cl. 430-88.000.
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Kasuga, Takuzo; Ikenaga, Yukio; and Yamawaki, Masami, 4,418,162, Cl. 523-205.000.
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Spofford, Walter R., Jr.; and Pomerantz, Daniel I., 4,418,339, Cl. 340-595.000.
- Portmann, Bruno: See—  
Britschgi, Hugo; Portmann, Bruno; and Berchtold, Louis, 4,417,982, Cl. 210-386.000.
- Post Office, The: See—  
Heslop, Christopher J., 4,417,387, Cl. 29-591.000.
- Potkay, Eugene: See—  
Andrejco, Matthew J.; and Potkay, Eugene, 4,417,692, Cl. 239-424.000.
- Powell, Richard G.; and Smith, Cecil R., Jr., to United States of America. Agriculture. Chemotherapeutically active maytansinoids: treflorine, trenudine, and N-methyltrenudone. 4,418,064, Cl. 424-248.540.
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Syverson, Charles D., 4,418,287, Cl. 290-44.000.
- PPG Industries, Inc.: See—  
Pamer, Steven E., 4,418,231, Cl. 570-115.000.
- Prampton, Orville D.: See—  
Hanes, Ronnie M.; and Prampton, Orville D., 4,418,219, Cl. 568-697.000.
- Praner, Frank C. Rotary displacement turbine engine with vacuum relief valve means. 4,417,859, Cl. 417-310.000.
- President and Fellows of Harvard College: See—  
Plashne, Mark; Lauer, Gail D.; Roberts, Thomas M.; and Backman, Keith C., 4,418,149, Cl. 435-253.000.
- Prestridge, Floyd L.: See—  
Ferrin, Charles R.; and Prestridge, Floyd L., 4,417,971, Cl. 204-305.000.
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Marcus, Konrad H.; and Watjer, Sheldon J., 4,417,764, Cl. 297-194.000.
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Morrone, Ross F., 4,417,729, Cl. 273-73.00A.
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- Procter & Gamble Company, The: See—  
Stoddart, Barry, 4,417,994, Cl. 252-135.000.
- Proebsting, Robert J.: See—  
O'Tole, James E.; and Proebsting, Robert J., 4,418,403, Cl. 365-201.000.
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Zannucci, Joseph S.; and Pruett, Wayne P., 4,418,000, Cl. 252-403.000.
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- Putt, Mark S.: See—  
Muhler, Joseph C.; and Putt, Mark S., 4,418,053, Cl. 424-52.000.
- Pytlewski, Louis L.; Iaconianni, Frank J.; Krevitz, Kenneth; and Smith, Arthur B., to Franklin Institute. The Removal of PCBs and other halogenated organic compounds from organic fluids. 4,417,977, Cl. 208-262.000.
- Quaeck, Manfred W.; and Ross, Douglas, to CTEC Company. Elevating transporter with mechanical drive. 4,417,634, Cl. 180-22.000.
- Quakebrack, Inc.: See—  
Meng, Donald L., 4,417,426, Cl. 52-126.700.
- Quaker Oats Company, The: See—  
Rashbaum, Stephan A.; and Yueh, Mao, 4,418,081, Cl. 426-18.000.
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- Qualitz, Marion; and Krupp, Viktor A. Pressure-sensitive copying material. 4,417,752, Cl. 282-27.500.



- Quarstrom, Jack L.: See—  
Doyle, Donald E.; Hellwarth, George A.; and Quarstrom, Jack L., 4,418,383, Cl. 364-200.000.
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Kazenmaier, Ulrich; and Quast, Gunter, 4,417,549, Cl. 123-41.840.
- Queen, Larry C., to International Business Machines Corporation. Byte data activity compression, 4,418,409, Cl. 370-104.000.
- Quinlan, Patrick M., to Petrolite Corporation. Silicon-containing quaternary ammonium thiazines, 4,418,195, Cl. 544-58.200.
- Quinn, David A.; and Peros, Mladen, to Supreme Equipment & Systems Corp. Modular file or the like system, 4,417,524, Cl. 105-101.000.
- Rabinowitz, Paul: See—  
Stein, Alexander; Rabinowitz, Paul; and Kaldor, Andrew, 4,417,822, Cl. 374-129.000.
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Milton, Joseph R.; and Wood, John D., 4,417,575, Cl. 128-206.190.
- Raducanu, Dan-Corneluz: See—  
Woffmann, Harald; and Raducanu, Dan-Corneluz, 4,418,307, Cl. 318-721.000.
- Ragard, Phillip A.: See—  
Lewis, Alan C.; Ragard, Phillip A.; and Shiptenko, Robert C., 4,417,683, Cl. 227-109.000.
- Rahman, Muhammed A. Supersonic MHD generator system, 4,418,294, Cl. 310-11.000.
- Rairden, John R., III: See—  
Jackson, Melvin R.; and Rairden, John R., III, 4,418,124, Cl. 428-548.000.
- Ralston, Daniel H.: See—  
Dodd, John R.; and Ralston, Daniel H., 4,418,005, Cl. 502-217.000.
- Ranford, Alan B.: See—  
Talonn, Daniel A.; Phillips, Robert E.; and Ranford, Alan B., 4,417,574, Cl. 128-205.120.
- Ranz, Erwin: See—  
Langen, Hans; Wolff, Erich; and Ranz, Erwin, 4,418,142, Cl. 430-549.000.
- Rao, G. R. Mohan: See—  
McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,418,293, Cl. 307-530.000.
- Rashbaum, Stephan A.; and Yueh, Mao, to Quaker Oats Company. The Natural red coloring prepared from an oat substrate, 4,418,081, Cl. 424-18.000.
- Rashbaum, Stephan A.: See—  
Yueh, Mao; and Rashbaum, Stephan A., 4,418,080, Cl. 426-18.000.
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- Rasshofer, Werner; Dieterich, Dieter; and Meyborg, Holger, to Bayer Aktiengesellschaft. Polyamines and processes for the production of such polyamines and of polyurethane plastics therefrom, 4,418,160, Cl. 521-159.000.
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Muller, Ernst-Willi; and Rathjen, Claus, 4,418,030, Cl. 264-142.000.
- Rauterkus, Karl J.: See—  
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,418,207, Cl. 560-178.000.
- Raychem Corporation: See—  
Clarke, Raymond; and Sandberg, Chester L., 4,417,782, Cl. 350-96.290.
- Raymond, James C.: See—  
Moltey, Thomas O.; Kelly, Richard P.; Noyes, Steven S.; and Raymond, James C., 4,418,384, Cl. 364-200.000.
- Raymond, Yvan G., to Kennecott Corporation. Ceramic fiber insulated furnace with electrical hanger element of great mechanical integrity, 4,418,415, Cl. 373-130.000.
- Raytheon Company: See—  
Cserhalmi, Nicholas B.; and Cappon, Arthur M., 4,418,292, Cl. 307-443.000.
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Marnette, William E.; and Jebens, Robert W., 4,418,405, Cl. 369-45.000.
- Brandinger, Jay J., 4,418,407, Cl. 369-126.000.
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- Reed, John W., to NCR Corporation. Ink jet print head, 4,418,356, Cl. 345-140.00R.
- Reed, Jerry O.; and Mathis, Ronald D., to Phillips Petroleum Company. Stabilized polyphenylene sulfide fiber, 4,418,029, Cl. 264-211.000.
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Wallace, Duane W., 4,417,629, Cl. 175-365.000.
- Regie Nationale des Usines Renault: See—  
Thépault, Yves, 4,417,635, Cl. 180-68.00R.
- Reich Spezialmaschinen GmbH: See—  
Abt, Anton; Dettelbach, Alfred; and Gresser, Gerhard, 4,417,675, Cl. 222-146.00E.
- Reid, Joyce: See—  
Nakane, Masami; Reid, Joyce; and Haslanger, Martin F., 4,418,076, Cl. 424-285.000.
- Renal Systems, Inc.: See—  
Cosentino, Louis C.; and Martinez, Felix J., 4,417,888, Cl. 604-175.000.
- Repa Feinstanzwerk GmbH: See—  
Fohl, Artur, 4,417,702, Cl. 242-107.200.
- Republic Steel Corporation: See—  
Bedwell, Junior L.; and Overton, Harold C., 4,418,100, Cl. 427-348.000.
- Retelsdorf, Hans-Joachim: See—  
Hall, Fred W.; and Retelsdorf, Hans-Joachim, 4,417,922, Cl. 75-236.000.
- Rexnord Inc.: See—  
Rosan, Jose, Jr., 4,417,380, Cl. 29-148.40R.
- RGG, Inc.: See—  
Gordon, Marc J.; and Ruff, Stanley, 4,417,495, Cl. 83-175.000.
- Rhone-Poulenc Agrochimie: See—  
Cordier, Georges; and Fouilloux, Pierre, 4,418,213, Cl. 564-412.000.
- Rhone-Poulenc Industries: See—  
Derrien, Jean-Yves, 4,418,007, Cl. 502-312.000.
- Riccar Company, Ltd.: See—  
Doyama, Umoe, 4,417,531, Cl. 112-158.00E.
- Rich Products Corporation: See—  
Kahn, Marvin L.; and O'Mahony, John S., 4,418,082, Cl. 426-51.000.
- Richter, Karl M.; Harder, Hans E.; and Behrens, Klaus, to Howmedica International, Inc. Aiming device for setting nails in bones, 4,418,422, Cl. 378-205.000.
- Ricoh Company, Ltd.: See—  
Hirose, Akira; and Ariyama, Kenzo, 4,417,800, Cl. 355-3.0TR.
- Horike, Masanori; and Ebi, Yutaka, 4,418,352, Cl. 346-75.000.
- Kameda, Masahiro, 4,418,136, Cl. 430-95.000.
- Tani, Tatsuo; and Kono, Masao, 4,417,806, Cl. 355-14.0SH.
- Ried, Helmut: See—  
Cornelius, Gerhard; Hilsbein, Wolfgang; Ried, Helmut; and Gessner, Adolf W., 4,418,236, Cl. 585-408.000.
- Rieder, Werner; and Fehrl, Martin, to Isovolta Österreichische Isolierstoffwerke Aktiengesellschaft. Electrical conductor with polyester insulating layer and method therefor, 4,418,122, Cl. 428-480.000.
- Rieken, William C.: See—  
Marino, Richard P.; Rothamel, Richard J.; and Rieken, William C., 4,418,086, Cl. 426-302.000.
- Rigler, Josef K.; Wienhofer, Ekkehard; Leithausner, Horst; and Trukenbrod, Karl, to Chemische Werke Huls AG. Fire retardant fine particulate expandable styrene polymers, 4,418,156, Cl. 521-56.000.
- Rikagaku Kenkyusho: See—  
Okada, Minoru; Matsuzawa, Masamitsu; Uezima, Osamu; Nakakuki, Teruo; and Horikoshi, Koki, 4,418,144, Cl. 435-96.000.
- Riker Laboratories, Inc.: See—  
Moore, George G. I., 4,418,074, Cl. 424-274.000.
- Rimrock Corporation: See—  
Burton, Charles A., 4,417,845, Cl. 414-733.000.
- Ringwood, Robert C., Jr.: See—  
Gibbons, Ambrose J., Jr.; and Ringwood, Robert C., Jr., 4,418,169, Cl. 524-178.000.
- Rinno, Helmut: See—  
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,418,207, Cl. 560-178.000.
- Ritchie, David S.: See—  
Bagnall-Wild, Ralph H.; Smith, Gordon R.; Stewart, John H.; and Ritchie, David S., 4,418,361, Cl. 358-125.000.
- Robbins, Jeffrey D., to Stauffer Chemical Company. Process for producing asymmetrical thioureas, 4,418,210, Cl. 564-24.000.
- Robert Bosch GmbH: See—  
Ebentheuer, Hans; and Hirt, Adam, 4,418,296, Cl. 310-70.00R.
- Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jorg, 4,417,693, Cl. 239-453.000.
- Gruner, Heiko, 4,418,329, Cl. 338-28.000.
- Latsch, Reinhard, 4,417,556, Cl. 123-425.000.
- Poetsch, Dieter; and Belmares-Sarabia, Armand, 4,418,358, Cl. 358-80.000.
- Schnaibel, Eberhard; and Junginger, Erich, 4,417,688, Cl. 236-91.00F.
- Roberts, Clayton R., to General Electric Company. Mixer for use in a microwave system, 4,418,429, Cl. 455-327.000.
- Roberts, Derek C., to Johnsen & Jorgensen (Plastics) Limited. Container and closure having tamper-proof feature, 4,417,666, Cl. 215-256.000.
- Roberts, Thomas M.: See—  
Plashne, Mark; Lauer, Gail D.; Roberts, Thomas M.; and Backman, Keith C., 4,418,149, Cl. 435-253.000.
- Robinson, Alan A., to Agence Spatiale Europeenne. Method and apparatus for controlling the energization of the electrical coils which control a magnetic bearing, 4,417,772, Cl. 308-10.000.
- Robroy Industries: See—  
Madej, Edward A., 4,417,711, Cl. 248-74.00R.
- Roccaforte, Harry I., to Champion International Corporation. Reclosable carton and blank therefor, 4,417,661, Cl. 206-625.000.
- Roccaforte, Harry I., to Champion International Corporation. Carton opening device, 4,417,678, Cl. 225-43.000.

- Rockwell International Corporation: See—  
Cain, Edwin F. C.; and McFarlen, William T., 4,417,854, Cl. 416-241.00B.
- Flanagan, Joseph E., 4,417,930, Cl. 149-19.900.
- Hon, John F., 4,418,413, Cl. 372-89.000.
- Palovcik, John, 4,417,462, Cl. 72-367.000.
- Schlapp, Albert; and Roos, Rudolf, 4,417,763, Cl. 296-216.000.
- Rodgers, Harris G., Sr.: See—  
Milliman, Bruce A.; and Rodgers, Harris G., Sr., 4,417,513, Cl. 101-41.000.
- Rodi & Wienberger AG: See—  
Herchenbach, Wolfgang, 4,417,821, Cl. 368-291.000.
- Roe, William J.: See—  
Bhattacharyya, Bhupati R.; and Roe, William J., 4,417,992, Cl. 252-88.000.
- Rogers, Howard G.; Eckert, Robert D.; Sahatjian, Ronald A.; and Sulesky, Robert A., to Polaroid Corporation. Film units containing thermally induced water-releasing benzotriazole complex, 4,418,139, Cl. 430-354.000.
- Rohm GmbH: See—  
Arndt, Peter J.; Lowitz, Joachim; Muller, Manfred; and Schlosser, Fritz, 4,418,204, Cl. 549-539.000.
- Rohm and Haas Company: See—  
Forand, Ronald R.; and Menz, Edward T., Jr., 4,418,151, Cl. 436-505.000.
- Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, to Ciba-Geigy Corporation. Herbicidal  $\alpha$ -[3-(2-halo-4-trifluoromethylphenoxy)-6-halophenoxy]propionic acid thio esters and acids, 4,417,918, Cl. 71-100.000.
- Rohr, Otto, to Ciba-Geigy Corporation. 3-Haloalkoxy-4-nitro-2'-chloro-4'-trifluoromethylphenyl ethers and herbicidal use thereof, 4,417,919, Cl. 71-124.000.
- Roller, Hanno; and Nauerth, Karl-Heinz, to Fritz Eichenauer GmbH & Co. KG. Electric heater, 4,418,272, Cl. 219-541.000.
- Rolls-Royce Limited: See—  
Higginbotham, Gordon J. S., 4,417,381, Cl. 29-156.80H.
- Ronci, Fernando M., to F. Ronci Company, Inc. Adjustable buckle construction, 4,417,372, Cl. 24-163.00R.
- Ronnen, Uri G.: See—  
Podolsky, Leaman B.; Ronnen, Uri G.; and Lardi, Francesco, 4,418,285, Cl. 290-40.00R.
- Roos, Rudolf: See—  
Schlapp, Albert; and Roos, Rudolf, 4,417,763, Cl. 296-216.000.
- Rosan, Jose, Jr., to Rexnord Inc. Method of forming metal ring in a bearing, 4,417,380, Cl. 29-148.40R.
- Rosen, Harold A., to Hughes Aircraft Company. Two-axis antenna direction control system, 4,418,350, Cl. 343-359.000.
- Rosenbeck, William H.; Eckart, Frederick; and Gerath, Francis C., to United Technologies Corporation. Welding system for contour joints, 4,418,266, Cl. 219-137.00R.
- Rosenberg, William E., to Columbia Chemical Corporation. Aqueous acid plating bath and brightener mixture for producing semibright to bright electrodeposits of tin, 4,417,957, Cl. 204-54.00R.
- Ross, Douglas: See—  
Quack, Manfred W.; and Ross, Douglas, 4,417,634, Cl. 180-22.000.
- Ross, Svante B.: See—  
Hogberg, Thomas; de Paulis, Tomas; Ross, Svante B.; and Uiff, Carl B. J., 4,418,065, Cl. 424-263.000.
- Rossie, Egbert; Hahn, Michael; and Schemperg, Lutz, to Audi NSU Auto Union AG. Window assembly for automotive vehicles, 4,417,419, Cl. 49-348.000.
- Roth, Donald J.; Kubis, Charles S.; and Walter, John, to Continental Group, Inc., The. Lightweight container, 4,417,667, Cl. 220-67.000.
- Rothamel, Richard J.: See—  
Marino, Richard P.; Rothamel, Richard J.; and Rieken, William C., 4,418,086, Cl. 426-302.000.
- Ruff, Stanley: See—  
Gordon, Marc J.; and Ruff, Stanley, 4,417,495, Cl. 83-175.000.
- Ruminsky, Robert T.; and Serber, Stephen L., to Honeywell Inc. Heat pump system defrost control, 4,417,452, Cl. 62-155.000.
- Runzheimer, Hans-Volker: See—  
Bergthaller, Peter; Schenk, Gunther; Wolfum, Gerhard; Runzheimer, Hans-Volker; and Heidenreich, Holger, 4,418,143, Cl. 430-562.000.
- Ruppert, Richard L.: See—  
Case, James E.; Ruppert, Richard L.; and Manning, Lindley, 4,417,425, Cl. 52-125.500.
- Rush, David H.: See—  
Hahn, James H., 4,418,302, Cl. 318-138.000.
- Russo, Frank R.: See—  
Cuevas, Danilo L.; Russo, Frank R.; and Schindler, Francis E., 4,418,099, Cl. 427-229.000.
- Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., to Benson, Inc. Method for forming a staggered recording head, 4,417,391, Cl. 29-825.000.
- Ryabikov, Stanislav V.: See—  
Lidorenko, Nikolai S.; Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,418,238, Cl. 136-246.000.
- Ryan, Gregory F.: See—  
Ryan, Kathryn A.; and Ryan, Gregory F., 4,417,613, Cl. 150-52.00R.
- Ryan, Joseph L.; Safdie, Elias; Watkins, Richard R.; and Kobs, Frederick E., to Honeywell Information Systems Inc. CRT Refresh memory system, 4,418,343, Cl. 340-723.000.
- Ryan, Kathryn A.; and Ryan, Gregory F. Universal pacifier case, 4,417,613, Cl. 150-52.00R.
- Ryder, George: See—  
Pinto, Albert A.; and Ryder, George, 4,417,837, Cl. 414-104.000.
- Sacki, Yukio: See—  
Matsushima, Noriaki; Sacki, Yukio; and Tokunaga, Yukio, 4,418,161, Cl. 523-145.000.
- Saeman, Walter C., to Olin Corporation. Layered glass batch pellets and apparatus for their production, 4,418,153, Cl. 501-29.000.
- Safdie, Elias: See—  
Ryan, Joseph L.; Safdie, Elias; Watkins, Richard R.; and Kobs, Frederick E., 4,418,343, Cl. 340-723.000.
- Sahara, Masayoshi: See—  
Nakai, Masaaki; and Sahara, Masayoshi, 4,417,794, Cl. 354-38.000.
- Sahatjian, Ronald A.: See—  
Rogers, Howard G.; Eckert, Robert D.; Sahatjian, Ronald A.; and Sulesky, Robert A., 4,418,139, Cl. 430-354.000.
- Saiki, Akio: See—  
Uehara, Sukichiro; and Saiki, Akio, 4,417,491, Cl. 82-2.700.
- Saiki, Yukihiko; Kumazawa, Eitaro; and Ishioka, Yozo, to Snow Brand Milk Products Co., Ltd. Crushing/discharging device for materials being dried in a multistage type vacuum drying apparatus, 4,417,697, Cl. 241-65.000.
- St. Clair, Clair J.: See—  
Allgor, Clarence B.; St. Clair, Clair J.; and Pearson, Richard A., 4,418,388, Cl. 364-431.010.
- Saito, Tomio: See—  
Akagi, Kazuo; Fukuda, Akihiro; and Saito, Tomio, 4,417,421, Cl. 51-16.000.
- Saitou, Sinichi: See—  
Kato, Toshikazu; and Saitou, Sinichi, 4,417,705, Cl. 242-199.000.
- Sakurai, Junji, to Fujitsu Limited. Semiconductor memory system, 4,418,399, Cl. 365-51.000.
- Sakurai, Yoshimi; Furukawa, Yoshimi, Kanai, Masaaki; and Osada, Yasufumi, to Honda Giken Kogyo Kabushiki Kaisha; and Furukawa Electric Co., Ltd. Electrical connector device, 4,417,775, Cl. 339-5.00M.
- Salice, Luciano, to Arturo Salice S.p.A. Hinge bracket mounting plate assembly having a spring biased locking mechanism, 4,417,366, Cl. 16-258.000.
- Samsel, Richard W., to United States of America, Navy. Directional data stabilization system, 4,418,306, Cl. 318-648.000.
- Sandberg, Chester L.: See—  
Clarke, Raymond; and Sandberg, Chester L., 4,417,782, Cl. 350-96.290.
- Sander, Bruno; Hovemann, Friedrich; and Scherling, Kurt, to BASF Aktiengesellschaft. Dewatering of petroleum-containing sludges with recovery of the oil component, 4,417,976, Cl. 208-188.000.
- Sandstrom, Paul H.: See—  
Throckmorton, Morford C.; and Sandstrom, Paul H., 4,418,185, Cl. 526-201.000.
- Sandy, Harold L.: See—  
McKinney, Howard F.; Wear, Frederick C.; and Sandy, Harold L., 4,418,083, Cl. 426-242.000.
- Sano, Kunio: See—  
Sato, Takahisa; Maruyama, Keizo; and Sano, Kunio, 4,418,045, Cl. 423-245.000.
- Sano, Takao; Ogasawara, Masafumi; and Tsubakimori, Hiroshi, to Toray Industries, Inc. Apparatus for interlacing multifilament yarn by fluid, 4,417,375, Cl. 28-272.000.
- Sanraku-Ocean Co., Ltd.: See—  
Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,418,192, Cl. 536-6.400.
- Sansom, William L. Fiber optic display device, 4,417,412, Cl. 40-547.000.
- Sasaki, Akira. Pressure regulator with temperature compensation device, 4,417,689, Cl. 236-92.00R.
- Sasaki, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Liquid separator for use in a refrigerating air conditioning apparatus, 4,417,453, Cl. 62-503.000.
- Sasakura Engineering Co., Ltd.: See—  
Minami, Kunihiko, 4,417,619, Cl. 165-113.000.
- Sasib S.p.A.: See—  
Garrone, Franco, 4,417,594, Cl. 131-110.000.
- Sato, Takahisa; Maruyama, Keizo; and Sano, Kunio, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for disposal of waste gas and apparatus therefor, 4,418,045, Cl. 423-245.000.
- Satoh, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohai, to Honda Giken Kogyo Kabushiki Kaisha. Braking oil pressure control device for an anti-skid brake system, 4,417,768, Cl. 303-113.000.
- Sauers, Richard F.: See—  
Levitt, George; and Sauers, Richard F., 4,417,917, Cl. 71-93.000.
- Sawyer, Joseph A., to Tibbets Industries, Inc. Cell assembly for electret transducer, 4,418,246, Cl. 179-111.00E.
- Scandpower, Inc.: See—  
Smith, Robert D., 4,418,035, Cl. 376-247.000.
- Schaefer, Horst: See—  
Busch, Peter; and Schaefer, Horst, 4,417,820, Cl. 368-200.000.
- Schaefer, Robert E.: See—  
Chesney, Joseph J., Jr.; and Schaefer, Robert E., 4,418,166, Cl. 523-400.000.
- Schafer, Gerhard, to Fritz Schafer Gesellschaft mit beschränkter Haftung. Apparatus for spraying workpieces and intercepting overspray, 4,417,541, Cl. 118-326.000.



- Schatz, Anton: See—  
Notzel, Joachim; Schatz, Anton; Buczek, Harthmuth; and Kirchhof, Gunther, 4,417,809, Cl. 355-46.000.
- Scheib, Klaus: See—  
Seitz, Werner; Scheib, Klaus; and Michel, Alfred, 4,418,017, Cl. 260-465.00E.
- Schemperg, Lutz: See—  
Rossie, Egbert; Hahn, Michael; and Schemperg, Lutz, 4,417,419, Cl. 49-348.000.
- Schenk Filterbau GmbH: See—  
Baur, Rolf; and Diemer, Wolfgang, 4,417,980, Cl. 210-91.000.
- Schenk, Gunther: See—  
Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; Runzheimer, Hans-Volker; and Heidenreich, Holger, 4,418,143, Cl. 430-562.000.
- Scherer Laboratories, Inc.: See—  
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,418,057, Cl. 424-151.000.
- Scherling, Kurt: See—  
Sander, Bruno; Hovemann, Friedrich; and Scherling, Kurt, 4,417,976, Cl. 208-188.000.
- Schiepe, Heinz, to Heinz Schiepe Grosshandel und Generalvertretung für Holzbearbeitungsmaschinen. Device for separating a stack by layers, particularly a stack of long timbers or lumber, 4,417,836, Cl. 414-32.000.
- Schiff, Sidney; and Trepka, William J., to Phillips Petroleum Company. Viscosity index improver soluble in synthetic poly( $\alpha$ -olefin) lubricants, 4,418,234, Cl. 585-12.000.
- Schicknecht, Othmar; and Cassoli, Eduardo, to Johnson & Johnson Baby Products Company. Method and apparatus for partitioning and/or shaping a fibrous batt, 4,417,676, Cl. 225-4.000.
- Schiff, Lothar. Method of thermally insulating vessels, 4,417,382, Cl. 294-21.00R.
- Schilling, Walter: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,199, Cl. 548-451.000.
- Schilling, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,200, Cl. 548-451.000.
- Schindler, Francis E.: See—  
Cuevas, Danilo L.; Russo, Frank R.; and Schindler, Francis E., 4,418,099, Cl. 427-229.000.
- Schirlin, Daniel: See—  
Bey, Philippe; Gerhart, Fritz; Jung, Michel; and Schirlin, Daniel, 4,418,077, Cl. 424-309.000.
- Schlapp, Albert; and Roos, Rudolf, to Rockwell International Corporation. Sliding-tilting-roof for motor vehicles, 4,417,763, Cl. 216-216.000.
- Schleis, William J. Foot holddown device for performing situps, 4,417,726, Cl. 272-93.000.
- Schlosser, Fritz: See—  
Arndt, Peter J.; Lowitz, Joachim; Muller, Manfred; and Schlosser, Fritz, 4,418,204, Cl. 549-539.000.
- Schmid, Karl; Grunert, Margarete; Heidrich, Jochen; and Tesmann, Holger, to Henkel Kommanditgesellschaft auf Aktien. Mixed forms of polyglycol ethers, 4,418,217, Cl. 568-593.000.
- Schmid, Wolfgang, to Ciba-Geigy Corporation. Growth promoting quinoxaline-di-N-oxide carboxamides, 4,418,063, Cl. 424-248.540.
- Schmidt, Noel J.: See—  
Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., 4,417,391, Cl. 29-825.000.
- Schmidt, Peter: See—  
Smigorski, Rudolf; Dörner, Rosemarie; and Schmidt, Peter, 4,417,983, Cl. 210-527.000.
- Schmidt, William P.: See—  
Hegarty, William P.; and Schmidt, William P., 4,417,449, Cl. 62-28.000.
- Schmiedel, Manfred: See—  
von Gentzkow, Wolfgang; and Schmiedel, Manfred, 4,418,170, Cl. 524-193.000.
- Schmitt, Burghard: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jürgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Schmooch, Roy F.; and Shauger, Herbert A., to Fischer & Porter Company. Electromagnetic flowmeter system having a feedback loop, 4,417,479, Cl. 73-861.160.
- Schnabel, Eberhard; and Junginger, Erich, to Robert Bosch GmbH. Temperature control system for vehicle passenger compartment, 4,417,688, Cl. 236-91.00F.
- Schnegelberger, Harald: See—  
Hennemann, Manfred; Andree, Hans; Lehmann, Rudolf; Schnegelberger, Harald; and Bellinger, Horst, 4,417,895, Cl. 8-137.000.
- Schnettler, Richard A.; Dage, Richard C.; and Grisar, J. Martin, to Merrell Dow Pharmaceuticals Inc. Cardiotonic imidazolecarboxylic acid derivatives, 4,418,071, Cl. 424-273.00R.
- Schoendorfer, Donald W.; and Latham, Allen, Jr., to Haemonetics Corporation. Centrifuge timer clamp, 4,417,884, Cl. 494-4.000.
- Schoenfeld, David R.: See—  
Moody, Roy A.; Bulanda, John J.; Guzay, Cazimir M.; and Schoenfeld, David R., 4,417,394, Cl. 29-882.000.
- Schoeps, Jochen: See—  
Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, 4,418,174, Cl. 524-539.000.
- Scholle Corporation: See—  
Scholle, William R.; Scholle, William J.; and Gunning, Michael J., 4,417,607, Cl. 141-1.000.
- Scholle, William J.: See—  
Scholle, William R.; Scholle, William J.; and Gunning, Michael J., 4,417,607, Cl. 141-1.000.
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- Schottel-Werft Josef Becker GmbH & Co. KG: See—  
Krautkremer, Franz; Kessler, Achim; and Krautkremer, Gerd, 4,417,877, Cl. 440-38.000.
- Schreckenberg, Klaus: See—  
Grosser, Heinrich; Dierkes, Hermann; Lutke, Hubertus; and Schreckenberg, Klaus, 4,417,499, Cl. 89-36.00K.
- Schreiber, Peter; Steinfeldt, Eberhard; and Bergman, Gerard P. M., to U.S. Philips Corporation. Dental tomography apparatus, 4,418,419, Cl. 378-040.000.
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- Schroock, Calvin W.: See—  
Clason, Donald L.; and Schroock, Calvin W., 4,417,990, Cl. 252-32.70E.
- Schucker, Robert C.; and Wheelock, Kenneth S., to Exxon Research and Engineering Co. Process for increasing the activity of perovskite catalysts and hydrocarbon treating processes using the activated catalyst, 4,418,008, Cl. 502-340.000.
- Schuetz, Dieter: See—  
Goetze, Volkmar; and Schuetz, Dieter, 4,418,410, Cl. 371-15.000.
- Schultz, Charles W.; and Thatcher, James L., to SI Handling Systems, Inc. Apparatus for loading articles into lanes on horizontal shelves, 4,417,838, Cl. 414-277.000.
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Wechsler, Hans G., 4,417,740, Cl. 280-87.010.
- Schwarzbach, Richard J.; Keeler, Manley S.; Cavaiani, Randy J.; and Chapman, Michael K., to Pittway Corporation. Appliance control system, 4,418,333, Cl. 340-310.00A.
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Alvarez, Luis W.; and Schwemin, Arnold J., 4,417,788, Cl. 350-500.000.
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Alvarez, Luis W.; and Schwemin, Arnold J., 4,417,788, Cl. 350-500.000.
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- Scott, Paul T., to Du Pont de Nemours, E. I., and Company. Copolyester binder filaments and fibers, 4,418,116, Cl. 428-288.000.
- Sealed Power Corporation: See—  
Anderson, David L.; and Joseph, A. David, 4,417,383, Cl. 29-511.000.
- Sedlak, Michael: See—  
Connaught, Ruth M.; Coty, Vernon F.; and Sedlak, Michael, 4,417,986, Cl. 210-759.000.
- See, Yee-Chaung; Davies, Roderick D.; and Hartman, Dennis C., to Texas Instruments Incorporated. Vertical-etch direct moat isolation process, 4,418,094, Cl. 427-38.000.
- Seifert, Kurt: See—  
Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jörg, 4,417,693, Cl. 239-453.000.
- Seigenji, Kiyoshi: See—  
Oyokota, Shigeru; Taniguchi, Nobuyuki; Hoda, Takeo; Tani, Junichi; Seigenji, Kiyoshi; and Matsumoto, Toshiaki, 4,417,793, Cl. 354-21.000.
- Seitz, Horst. Horizontal pressure die-casting machine, 4,417,616, Cl. 164-113.000.
- Seitz, Werner; Scheib, Klaus; and Michel, Alfred, to BASF Aktiengesellschaft. Preparation of phenylacetone nitriles carrying basic substituents, 4,418,017, Cl. 260-465.00E.
- Sekizawa, Yasuharu: See—  
Okonogi, Tsuneo; Fukatsu, Shunzo; Hachisu, Mitsugu; Kawashima, Hiroko; Shitoh, Keiko; and Sekizawa, Yasuharu, 4,418,070, Cl. 424-270.000.
- Sell, Richard W.: See—  
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,418,057, Cl. 424-151.000.
- Selwitz, Charles M.: See—  
Harrison, James J.; Pellegrini, John P.; and Selwitz, Charles M., 4,418,228, Cl. 568-937.000.
- Sensor Developments, Inc.: See—  
Johnson, James, 4,417,631, Cl. 177-210.00F.
- Senuma, Michio, to Canon Kabushiki Kaisha. Variable force electromagnetic shutter, 4,417,797, Cl. 354-234.000.
- Sepulveda, Domingo; and Striebel, Edmund E., to United Technologies Corporation. Starting means for a gas turbine engine, 4,417,439, Cl. 60-39.141.
- Serber, Stephen L.: See—  
Ruminsky, Robert T.; and Serber, Stephen L., 4,417,452, Cl. 62-155.000.
- Sericol Group Limited: See—  
Curtis, John R., 4,418,138, Cl. 430-253.000.
- Servimetal: See—  
du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, 4,418,028, Cl. 264-43.000.
- Shafir, Eleonora G., to Mobil Oil Corporation. Method of recovering oil using steam, 4,417,620, Cl. 166-245.000.

- Shambaugh, John S.; Yetman, Robert G.; and Zeltzer, Hyman, to United States of America, Air Force. Battery cell module, 4,418,127, Cl. 429-8.000.
- Sharp, Allen B., to Al-Jon, Inc. Shear baler, 4,417,510, Cl. 100-98.00R.
- Sharp Kabushiki Kaisha: See—  
Suzuki, Hitoshi; and Makino, Fusao, 4,418,298, Cl. 318-341.000.
- Yatsunami, Kenrow, 4,418,276, Cl. 235-462.000.
- Shatterproof Glass Corporation: See—  
McKelvey, Harold E., 4,417,968, Cl. 204-192.00R.
- Shauger, Herbert A.: See—  
Schmooch, Roy F.; and Shauger, Herbert A., 4,417,479, Cl. 73-861.160.
- Shaw, Michael J., to Allied Paper Incorporated. Conductive barrier coat for electrostatic masters, 4,418,117, Cl. 428-327.000.
- Sheibley, Dean W.: See—  
Solits, Daniel G.; Sheibley, Dean W.; and Nagle, William J., 4,418,130, Cl. 429-206.000.
- Shell Oil Company: See—  
Kim, Leo, 4,418,203, Cl. 549-531.000.
- Shenfield, Leonard R.: See—  
Nalley, Robert E.; and Shenfield, Leonard R., 4,418,368, Cl. 360-78.000.
- Sheppard, John E.: See—  
Young, Peter L.; Stein, Barry F.; and Sheppard, John E., 4,418,095, Cl. 427-63.000.
- Sherwood Medical Company: See—  
Talonn, Daniel A.; Phillips, Robert E.; and Ranford, Alan B., 4,417,574, Cl. 128-205.120.
- Sherwood, Tom W. Combination coupon carrier and bag stiffener, 4,417,609, Cl. 141-98.000.
- Shevde, Ketan: See—  
Frankhouser, Paul L.; and Shevde, Ketan, 4,417,886, Cl. 604-53.000.
- Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Secalonic acid derivatives and method for preparing thereof, 4,418,061, Cl. 424-245.000.
- Shibuya, Atsuo: See—  
Aisaka, Noboru; Nishikawa, Shigeru; Shibuya, Atsuo; Bessho, Yasuo; Akami, Hitoshi; and Ogawa, Shigeo, 4,417,401, Cl. 33-175.000.
- Shibuya, Chisei: See—  
Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, 4,418,061, Cl. 424-245.000.
- Shields, Walter. Ampule opener, 4,417,679, Cl. 225-93.000.
- Shiga, Tsutomu, to Nippondenso Co., Ltd. Multi-path cooling in AC generator for vehicle, 4,418,295, Cl. 310-59.000.
- Shigeo, Iwasaki; and Hiroshi, Haguchi, to Mitsubishi Fukai Tekkoshu, Ltd. Vacuum type brick forming machine, 4,417,864, Cl. 425-73.000.
- Shibayashi, Masao: See—  
Ikegawa, Masato; Tojo, Kenji; and Shibayashi, Masao, 4,417,863, Cl. 418-55.000.
- Shima, Kazuhiro: See—  
Hirai, Eizo; and Shima, Kazuhiro, 4,418,058, Cl. 424-176.000.
- Shimauchi, Yasutaka: See—  
Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,418,192, Cl. 536-6.400.
- Shimazu, Ken-ichi: See—  
Patel, Jayanti; and Shimazu, Ken-ichi, 4,418,134, Cl. 430-88.000.
- Shimizu, Kenichi: See—  
Fujimoto, Tadao; Fujiuchi, Hiroyuki; Shimizu, Kenichi; and Ueda, Seiichi, 4,417,529, Cl. 110-346.000.
- Shimizu, Yoji: See—  
Ikenoya, Yasuo; Hirano, Makoto; Shimizu, Yoji; and Matsuura, Masaaki, 4,417,442, Cl. 60-293.000.
- Shin-Etsu Handotai Co., Ltd.: See—  
Komatsuzaki, Yasuo, 4,417,945, Cl. 156-639.000.
- Shiomi, Kengo, to Tokyo Juki Industrial Co., Ltd. Laterally pivotable upper feed dog, 4,417,536, Cl. 112-311.000.
- Shionogi & Co., Ltd.: See—  
Hirai, Eizo; and Shima, Kazuhiro, 4,418,058, Cl. 424-176.000.
- Shtopenko, Robert C.: See—  
Lewis, Alan C.; Ragard, Phillip A.; and Shtopenko, Robert C., 4,417,683, Cl. 227-109.000.
- Shiseido Company, Ltd.: See—  
Kasai, Yutaka; and Naramoto, Satoru, 4,417,827, Cl. 401-68.000.
- Shishido, Tadao: See—  
Katsuyama, Harumi; and Shishido, Tadao, 4,418,037, Cl. 422-56.000.
- Mifune, Hiroyuki; Ishiguro, Shoji; Shishido, Tadao; and Nishimura, Tatsuo, 4,418,140, Cl. 430-351.000.
- Shitoh, Keiko: See—  
Okonogi, Tsuneo; Fukatsu, Shunzo; Hachisu, Mitsugu; Kawashima, Hiroko; Shitoh, Keiko; and Sekizawa, Yasuharu, 4,418,070, Cl. 424-270.000.
- Shomo, Robert D. Folding bicycle, 4,417,745, Cl. 280-287.000.
- Shore, Daniel B., to Dresser Industries, Inc. Load supporting hydraulic circuit with emergency automatic load restraint, 4,417,502, Cl. 91-447.000.
- Shotbolt, Keith, to Constructors John Brown Limited. Connector assembly, 4,417,830, Cl. 405-169.000.
- Shotwell, Jesse A. Shrimp processing system, 4,417,507, Cl. 99-352.000.
- SI Handling Systems, Inc.: See—  
Schultz, Charles W.; and Thatcher, James L., 4,417,838, Cl. 414-277.000.
- Siebert, Rainer; Stutzle, Dietmar; and Weidner, Peter, to Diehl GmbH & Co. Detonating arrangement for missiles, 4,417,518, Cl. 102-212.000.
- Siegel, Harro: See—  
Lungershausen, Rolf; Martin, Christoph; Marciniowski, Stefan; Siegel, Harro; and Kuesters, Werner, 4,418,146, Cl. 435-106.000.
- Siemens Aktiengesellschaft: See—  
Birkle, Siegfried; and Stoger, Klaus, 4,417,954, Cl. 204-14.00N.
- Birth, Winfrid, 4,418,249, Cl. 179-170.00C.
- Eisel, Werner, 4,418,325, Cl. 335-216.000.
- Exner, Klaus D., 4,417,386, Cl. 29-590.000.
- Hess, Ruediger; and Marin, Heiner, 4,418,255, Cl. 200-147.00A.
- Thorwarth, Ruediger, 4,418,264, Cl. 219-78.010.
- von Gentzkow, Wolfgang; and Schmiedel, Manfred, 4,418,170, Cl. 524-193.000.
- Sigl, Wayne C., to Kimberly-Clark Corporation. Producing an elastified garment utilizing an articulated conveyor, 4,417,938, Cl. 156-270.000.
- Signatron, Inc.: See—  
Mahoney, Paul F.; and Bonn, Jerrold L., 4,418,319, Cl. 328-160.000.
- Signetics Corporation: See—  
Pan, Alfred I., 4,417,947, Cl. 156-643.000.
- Silveston, Peter L.: See—  
Cordoba-Molina, Jesus F.; Hudgins, Robert R.; and Silveston, Peter L., 4,417,988, Cl. 210-801.000.
- Simon-Vicars Limited: See—  
Bouette, David W., 4,418,089, Cl. 426-572.000.
- Simonkay, Sandor: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Szitapanovits, Janos; Vimali, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40.000.
- Simonton, Robert D., to Mac Engineering and Equipment Co., Inc. Battery plate wrapper machine, 4,417,390, Cl. 29-730.000.
- Singletary, Alger E. Emergency citizens' band radio system, 4,418,426, Cl. 455-67.000.
- Sirett, Robert R.: See—  
Murray, Edward D.; Woodman, Brenda J.; Maurice, Terrence J.; and Sirett, Robert R., 4,418,084, Cl. 426-250.000.
- Sitzler, Hans-Dietrich, to G. Siempelkamp GmbH & Co. Press for the continuous production of pressedboard, 4,417,866, Cl. 425-364.00R.
- Skaggs, Boyd T., to Container Corporation of America. Partition device, 4,417,684, Cl. 229-15.000.
- SKODA: See—  
Brezina, Josef, 4,417,377, Cl. 29-26.00A.
- Skrobisch, Alfred. Apparatus for winding a wire or thread on C-shaped cores, 4,417,699, Cl. 242-7.150.
- Skuza, Voytech T.: See—  
Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., 4,417,681, Cl. 227-8.000.
- Sloan Valve Company: See—  
Billeter, Henry R., 4,417,767, Cl. 303-23.00R.
- Smigorski, Rudolf; Dörner, Rosemarie; and Schmidt, Peter, to Passavant-Werke AG & Co. KG. Scraper apparatus for settling basins and the like, 4,417,983, Cl. 210-527.000.
- Smith, Alfred A., to Guardian Products Company, Inc. Grab bar, 4,417,361, Cl. 4-577.000.
- Smith, Arthur B.: See—  
Pytlewski, Louis L.; Iaconianni, Frank J.; Krevitz, Kenneth; and Smith, Arthur B., 4,417,977, Cl. 208-262.000.
- Smith, Cecil R., Jr.: See—  
Powell, Richard G.; and Smith, Cecil R., Jr., 4,418,064, Cl. 424-248.540.
- Smith, David T.: See—  
Gardner, Donald E.; and Smith, David T., 4,417,658, Cl. 206-438.000.
- Smith, Gordon R.: See—  
Bagnall-Wild, Ralph H.; Smith, Gordon R.; Stewart, John H.; and Ritchie, David S., 4,418,361, Cl. 358-125.000.
- Smith, Harold H.: See—  
Smith, Rhoda J.; and Smith, Harold H., 4,418,390, Cl. 364-526.000.
- Smith, Jimmy B.: See—  
Vining, Paul H.; and Smith, Jimmy B., 4,417,528, Cl. 110-229.000.
- Smith, Larry G.: See—  
Nicholson, David W.; Smith, Larry G.; Dinius, Harold B.; and Oberle, Ronald R., 4,417,662, Cl. 209-522.000.
- Smith, Leland B.; and McIntyre, Robert A., to Beckman Instruments, Inc. Electroencephalograph, 4,417,590, Cl. 128-731.000.
- Smith, Luther W.: See—  
Dawson, W. Clifford; Bard, George D.; Smith, Luther W.; and Laurin, Bernard L., 4,417,790, Cl. 351-166.000.
- Smith, Rhoda J.; and Smith, Harold H. Method and apparatus for making a coded chart of a color subject, 4,418,390, Cl. 364-526.000.
- Smith, Richard R.; and Kelley, Mellis M., to Goodyear Tire & Rubber Company. The Polyethylene isophthalate having reduced cyclic dimer content and process therefore, 4,418,188, Cl. 528-274.000.
- Smith, Richard W.; and Waughman, William J., to Motor Wheel Corporation. Wire spoke vehicle wheel and method of manufacture, 4,417,766, Cl. 301-55.000.
- Smith, Robert D., to Scandpower, Inc. Coolant condition monitor for nuclear power reactor, 4,418,035, Cl. 376-247.000.
- Smock, Steven W., to Emhart Industries, Inc. Control system including a timing mechanism for a drying apparatus, 4,418,271, Cl. 219-493.000.



- Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa SpA: See—  
De Gaetano, Mario; and Canavesi, Luigi, 4,418,016, Cl. 260-404,000.
- Snow Brand Milk Products Co., Ltd.: See—  
Saiki, Yukihiko; Kumazawa, Eitaro; and Ishioka, Yozo, 4,417,697, Cl. 241-65,000.
- Snowden, Dennis C.; and Moree, Elwood D. Safety belt clamp apparatus, 4,417,713, Cl. 248-228,000.
- Societe Anonyme de Telecommunications: See—  
Gauthier, Andre; and Morand, Jean C. F., 4,418,096, Cl. 427-76,000.
- Societe Anonyme dite: L'Oreal: See—  
Fugaut, Andre; and Andrillon, Patrick, 4,417,896, Cl. 8-414,000.
- Societe Anonyme dite: Ulmic France: See—  
Buffon, Jean; and Trome, Edouard, 4,417,461, Cl. 72-345,000.
- Societe Francaise de Stockage Geologique "Goestock": See—  
Berezoutsky, Georges, 4,417,829, Cl. 405-54,000.
- Societe Francaise d'Electrometallurgie Sofrem: See—  
Mena, Andre; Charriere, Jean-Michel; and Desbrest, Jean, 4,417,920, Cl. 75-63,000.
- Societe Industrielle de Liaisons Electriques Silec: See—  
Chazelas, Elie, 4,418,240, Cl. 174-73,00R.
- Sodemark, Nils-Erik: See—  
Janne, Jouko, 4,417,963, Cl. 204-130,000.
- Solid State Systems, Inc.: See—  
Edgar, C. Mills, 4,418,244, Cl. 179-2,00A.
- Soloviev, Sergei A.; Fedorov, Svyatoslav N.; Osetsky, Vitaly P.; and Darnev, Valery V., deceased (by Durneva, Tamara S., administrator), to Moskovsky Nauchno-Issledovatel'skiy Institut Mikrokhirurgii Glaza. Device for marking out the cornea in ophthalmosurgical operations, 4,417,579, Cl. 128-303,00R.
- Soluk, Daniel G.; Sheibley, Dean W.; and Nagle, William J., to United States of America, National Aeronautics and Space Administration. Additive for zinc electrodes, 4,418,130, Cl. 429-206,000.
- Sony Corporation: See—  
Abe, Fumiyoshi; and Okafuji, Takayuki, 4,418,303, Cl. 318-254,000.
- Fujimori, Tohru; and Kusui, Yoshino, 4,418,373, Cl. 360-132,000.
- Moriya, Ryusuke, 4,418,366, Cl. 360-75,000.
- Osawa, Hiroshi, 4,418,406, Cl. 369-124,000.
- Spaichus, Hans O., to Hilliard-Lyons Patent Management, Inc. Vapor compression refrigerant system monitor and gas removal apparatus, 4,417,451, Cl. 62-129,000.
- Spear, Kenneth J., to Huffy Corporation. Bicycle seatpost assembly, 4,417,744, Cl. 280-281,00R.
- Spector, George: See—  
Penna, Americo; and Spector, George, 4,417,716, Cl. 249-121,000.
- Stanisic, Jovo; and Spector, George, 4,417,951, Cl. 202-197,000.
- Spectrol Electronics Corporation: See—  
Bader, Ramzi N., 4,418,337, Cl. 340-571,000.
- Spencer, Harvey J., to Paper Converting Machine Company. Method of diaper manufacture, 4,417,935, Cl. 156-80,000.
- Speno International S.A.: See—  
Panetti, Romolo, 4,417,466, Cl. 73-105,000.
- Sperdy Corporation: See—  
Campbell, Willis R., 4,417,436, Cl. 56-341,000.
- Cosimini, Gregory J.; Lo, David S.; and Paul, Maynard C., 4,418,400, Cl. 365-87,000.
- Young, Peter L.; Stein, Barry F.; and Sheppard, John E., 4,418,095, Cl. 427-63,000.
- Zscheile, John W., Jr., 4,418,393, Cl. 364-724,000.
- Spieglau, Paul: See—  
Breitschdel, Hans-Ulrich; Spieglau, Paul; and Alfter, Franz-Werner, 4,417,932, Cl. 156-62,200.
- Spooford, Walter R., Jr.; and Pomerantz, Daniel I., to Emhart Industries, Inc. Temperature sensing circuit for semiconductor junction temperature probe, 4,418,339, Cl. 340-595,000.
- Spolek pro chemickou a hutni vyrobu, narodni podnik: See—  
Beranek, Ivan; Kyril, Josef; Uhlir, Miroslav; and Zlesak, Ivan, 4,417,923, Cl. 75-257,000.
- Sprecher & Schuh AG: See—  
Graf, Rudolf, 4,418,256, Cl. 200-148,00R.
- Sprecker, Mark A.; and Hall, John B., to International Flavors & Fragrances Inc. Substituted tricyclodecane derivatives, processes for producing same and organoleptic uses thereof, 4,418,010, Cl. 252-522,00R.
- Sprinter System AB: See—  
Wallin, Kay, 4,417,882, Cl. 493-174,000.
- Sridharan, Sri P.: See—  
Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., 4,417,681, Cl. 227-8,000.
- Srinivasan, Rangaswamy: See—  
Mayne-Banton, Veronica I.; and Srinivasan, Rangaswamy, 4,417,948, Cl. 156-643,000.
- Stadubli Ltd.: See—  
Kleiner, Walter, 4,417,604, Cl. 139-329,000.
- Stahl, Theo; and Buhler, Ulrich, to Cassella Aktiengesellschaft. Process for preparing burn-out effects on textile materials, 4,417,897, Cl. 8-464,000.
- Stanadyne, Inc.: See—  
Moyn, Alfred M., 4,417,602, Cl. 137-625,170.
- Standard Keil Hardware Manufacturing Co.: See—  
Loikitz, Frank F., 4,417,430, Cl. 52-584,000.
- Standard Oil Company: See—  
Weisrock, William P.; and McCarthy, Edward F., 4,418,145, Cl. 435-104,000.
- Standard Oil Company (Indiana): See—  
Kim, Dae K.; and Bertolacini, Ralph J., 4,418,006, Cl. 502-73,000.
- Morello, Edwin F., 4,418,189, Cl. 528-345,000.
- Udovich, Carl A.; and Eryman, William S., 4,418,003, Cl. 502-209,000.
- Stanisic, Jovo; and Spector, George. Distiller and evaporator for sea water, 4,417,951, Cl. 202-197,000.
- Stapleton, John J., to International Telephone and Telegraph Corporation. Omnispectravisation, 4,418,359, Cl. 358-65,000.
- Stauffer Chemical Company: See—  
Robbins, Jeffrey D., 4,418,210, Cl. 564-24,000.
- Stearley, John W.: See—  
Busby, Robert A.; Nat, Gursharan P. S.; and Stearley, John W., 4,418,254, Cl. 200-68,300.
- Steck Manufacturing Co., Inc.: See—  
Steck, Mark A., 4,417,398, Cl. 30-116,000.
- Steck, Mark A., to Steck Manufacturing Co., Inc. Tool for handling wire, 4,417,398, Cl. 30-116,000.
- Steenfadt, Eberhard: See—  
Schreiber, Peter; Steenfadt, Eberhard; and Bergman, Gerard P. M., 4,418,419, Cl. 378-040,000.
- Stein, Alexander; Rabinowitz, Paul; and Kaldor, Andrew, to Exxon Research and Engineering Company. Laser radiometer, 4,417,822, Cl. 374-129,000.
- Stein, Barry F.: See—  
Young, Peter L.; Stein, Barry F.; and Sheppard, John E., 4,418,095, Cl. 427-63,000.
- Steinberg, Hyman A. Solar oven access door, 4,417,566, Cl. 126-451,000.
- Stephens, Vernon E. Tool for cleaning or changing mig-contact-tips, 4,417,487, Cl. 81-53,200.
- Stettner & Co.: See—  
Bertl, Gerd, 4,418,376, Cl. 361-293,000.
- Stevenson, Thomas T.; and Zenios, Marios C., to Caterpillar Tractor Co. Speed and timing angle measurement, 4,417,469, Cl. 73-119,00A.
- Stewart, Andrew D. G.: See—  
Lawrence, John C.; Stewart, Andrew D. G.; and Dodson, John S., 4,417,564, Cl. 125-30,00R.
- Stewart, John H.: See—  
Bagnall-Wild, Ralph H.; Smith, Gordon R.; Stewart, John H.; and Ritchie, David S., 4,418,361, Cl. 358-125,000.
- Stock Equipment Company: See—  
Finet, Alain; and Nerone, Louis R., 4,418,389, Cl. 364-478,000.
- Stockman, Richard F., to Air Preheater Company, Inc. Cast iron recuperator, 4,417,615, Cl. 164-94,000.
- Stoddart, Barry, to Procter & Gamble Company. The Particulate detergent additive compositions, 4,417,994, Cl. 252-135,000.
- Stoger, Klaus: See—  
Birkle, Siegfried; and Stoger, Klaus, 4,417,954, Cl. 204-14,00N.
- Stolle, Ralph J., to Stolle Research and Development Corporation. Easy open can end with pull tab having retained tear strip with stress relief means, 4,417,668, Cl. 220-269,000.
- Stolle Research and Development Corporation: See—  
Stolle, Ralph J., 4,417,668, Cl. 220-269,000.
- Storni, Angelo: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,199, Cl. 548-451,000.
- Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,418,200, Cl. 548-451,000.
- Stout, Gregg W., to Otis Engineering Corporation. Plunger lift control, 4,417,858, Cl. 417-58,000.
- Strange, Ronald L. Bow sight, 4,417,403, Cl. 33-265,000.
- Stratton, James A., to Minnesota Mining and Manufacturing Company. Double-coated tape construction having an identifiable extended liner, 4,418,105, Cl. 428-40,000.
- Strebkov, Dmitry S.: See—  
Lidorenko, Nikolai S.; Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,418,238, Cl. 136-246,000.
- Streetman, William E.; and Daftary, Shashikumar H., to American Cyanamid Company. Self-crimping acrylic fiber from a melt of two non-compatible polymers, 4,418,176, Cl. 525-57,000.
- Striebel, Edmund E.: See—  
Sepulveda, Domingo; and Striebel, Edmund E., 4,417,439, Cl. 60-39,141.
- Strietzel, Rainer, to Brown, Boveri & Cie AG. Method and apparatus for generating an equipment reply signal for the automatic identification of objects and/or living beings, 4,418,411, Cl. 371-67,000.
- Studt, William L.: See—  
Douglas, George H.; Diamond, Julius; Studt, William L.; and Dodson, Stuart A., 4,418,209, Cl. 564-27,000.
- Sturm, George W.: See—  
Jon, Min-Chung; Palazzo, Vito; and Sturm, George W., 4,417,478, Cl. 73-801,000.
- Stussi, Hans. Freestanding stair assembly and riser therefor, 4,417,429, Cl. 52-182,000.
- Stutzle, Dietmar: See—  
Siebert, Rainer; Stutzle, Dietmar; and Weidner, Peter, 4,417,518, Cl. 102-212,000.
- Sublette, Jerry M.: See—  
Paterson, Robert L.; and Sublette, Jerry M., 4,417,824, Cl. 400-477,000.

- Sudbeck, Rainer, to Pierburg GmbH & Co. KG. Piston pump, 4,417,857, Cl. 417-490,000.
- Suenaga, Hiroyoshi: See—  
Ohuchi, Chiaki; Kohsaka, Yoji; and Suenaga, Hiroyoshi, 4,417,493, Cl. 83-15,000.
- Sugimoto, Mamoru: See—  
Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, 4,418,012, Cl. 260-112,50R.
- Sugiura, Yoji; Hagiwara, Toshio; Okumura, Toru; and Nakahara, Syunichi, to Canon Kabushiki Kaisha. Single lens reflex camera body, 4,417,796, Cl. 354-152,000.
- Sulesky, Robert A.: See—  
Rogers, Howard G.; Eckert, Robert D.; Sahatjian, Ronald A.; and Sulesky, Robert A., 4,418,139, Cl. 430-354,000.
- Sumitomo Chemical Company, Limited: See—  
Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kamenoi, Yoshito; Katsube, Junki; and Yamamoto, Hisao, 4,418,079, Cl. 424-330,000.
- Terashima, Shiro; Tanno, Norihiko; and Koga, Kenji, 4,418,218, Cl. 568-633,000.
- Sumitomo Durez Company, Ltd.: See—  
Matsushima, Noriaki; Saeki, Yukio; and Tokunaga, Yukio, 4,418,161, Cl. 523-145,000.
- Sundberg, Jack G., to Chandler Evans Inc. Shaft seal assembly having universal washer with bores for springs, 4,417,734, Cl. 277-93,00SD.
- Sundstrand Corporation: See—  
Cygnor, John E.; Whitesel, Terry L.; and Masure, Duane C., 4,417,851, Cl. 415-150,000.
- Supreme Equipment & Systems Corp.: See—  
Quinn, David A.; and Peros, Mladen, 4,417,524, Cl. 105-101,000.
- Surgical Design: See—  
Banko, Anton, 4,417,578, Cl. 128-303,00R.
- Surgitool, Inc.: See—  
Gardner, Donald E.; and Smith, David T., 4,417,658, Cl. 206-438,000.
- Suroff, Hyman. Self-propelled roller skate, 4,417,737, Cl. 280-11,115.
- Suzuki, Hitoshi; and Makino, Fusao, to Sharp Kabushiki Kaisha. Motor speed control circuit, 4,418,298, Cl. 318-341,000.
- Suzuki, Kiyonobu. Apparatus for determining the sex of a chick, 4,417,663, Cl. 209-587,000.
- Suzuki, Kunihiko; and Muraoka, Akihiko, to Nissan Motor Company, Limited. Four-wheel-drive system for automotive vehicle, 4,417,642, Cl. 180-249,000.
- Suzuki, Masataka: See—  
Matsuda, Susumu; Matsukura, Nobuaki; Suzuki, Masataka; and Narushima, Tsugio, 4,417,517, Cl. 101-288,000.
- Suzuki, Masatoshi: See—  
Matsuda, Minoru; Kato, Kentaro; and Suzuki, Masatoshi, 4,417,559, Cl. 123-559,000.
- Suzuki, Osamu: See—  
Oishi, Kengo; and Suzuki, Osamu, 4,417,704, Cl. 242-197,000.
- Suzuki, Ryo: See—  
Otani, Katsuya; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,418,300, Cl. 313-573,000.
- Suzuki, Toyotosi: See—  
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,417,795, Cl. 354-25,000.
- Swagerty, Arnold; and Mitchell, William A., to Frederick Electronics Corporation. Digital phase-locked loop circuit, 4,418,318, Cl. 328-155,000.
- Swede, Harald G.: See—  
Edebo, Lars B.; Swede, Harald G.; and Tornqvist, Nils-Erik, 4,417,926, Cl. 134-17,000.
- Swiss Aluminium Ltd.: See—  
Arnason, Tomas; Franke, Alwis; and Tschopp, Theodor, 4,417,958, Cl. 204-67,000.
- Synair Corporation: See—  
Gomberg, Edward N.; and Wright, James O. B., 4,418,093, Cl. 427-8,000.
- Syntax (U.S.A.) Inc.: See—  
Wren, Douglas L., 4,418,206, Cl. 560-55,000.
- Syversen, Charles D., to Power Group International Corporation. Wind power generator and control therefor, 4,418,287, Cl. 290-44,000.
- Szabados, Tamas: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Sztipanovits, Janos; Vimali, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40,000.
- Sztipanovits, Janos: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Sztipanovits, Janos; Vimali, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40,000.
- Tabata, Yoichiro; Ueguri, Shigeo; Komura, Hirotsugu; and Ito, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Device with high frequency contactless type arc generating mechanism, 4,418,265, Cl. 219-130,400.
- Tadakuma, Susumu: See—  
Tanaka, Shigeru; and Tadakuma, Susumu, 4,418,380, Cl. 363-10,000.
- Taguro, Akira: See—  
Yasuda, Sinichi; Kurohara, Takayuki; and Taguro, Akira, 4,418,221, Cl. 568-757,000.
- Tai, Anthony M., to Environmental Research Institute of Michigan. Optical residue arithmetic computer having programmable computation module, 4,418,394, Cl. 364-746,000.
- Taisho Pharmaceutical Co., Ltd.: See—  
Tamai, Masaharu; Morimoto, Shigeo; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, 4,418,075, Cl. 424-278,000.
- Takachi, Hiroshi: See—  
Nakamura, Shigeru; Ueki, Yoshihiko; and Takachi, Hiroshi, 4,417,870, Cl. 431-33,000.
- Takahashi, Katsuhiko: See—  
Kasuga, Takuro; Toga, Yuzo; Okamoto, Ichiro; and Takahashi, Katsuhiko, 4,418,172, Cl. 524-292,000.
- Takahashi, Tadashi: See—  
Hayashida, Hiroshi; Takahashi, Tadashi; Miyashita, Kunio; and Kawakami, Kanji, 4,418,372, Cl. 360-113,000.
- Takeda Chemical Industries, Ltd.: See—  
Doura, Fumihiko; Nakabayashi, Masamitsu; and Morimoto, Taiji, 4,418,177, Cl. 525-57,000.
- Taketomi, Yasuta: See—  
Izumi, Toshiaki; Taketomi, Yasuta; and Kobuke, Takayoshi, 4,418,126, Cl. 428-694,000.
- Takeuchi, Tomio: See—  
Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,418,192, Cl. 536-6,400.
- Talonn, Daniel A.; Phillips, Robert E.; and Ranford, Alan B., to Sherwood Medical Company. Liquid drain for patient breathing apparatus, 4,417,574, Cl. 128-205,120.
- Tamai, Masaharu; Morimoto, Shigeo; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; and Omura, Sadafumi, to Taisho Pharmaceutical Co., Ltd. Epoxysuccinyl amino acid derivatives, 4,418,075, Cl. 424-278,000.
- Tamamura, Hideo: See—  
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,417,795, Cl. 354-25,000.
- Tamura, Mutsuhide, to Canon Kabushiki Kaisha. Automatic focus detection device, 4,417,795, Cl. 354-25,000.
- Tamura, Takeo, to Nissan Motor Co., Ltd. Apparatus to prevent reflection of vehicle instrument panel illumination light, 4,418,377, Cl. 362-19,000.
- Tanabe, Kenjiro: See—  
Ueda, Yoshihiro; Kimura, Yoshikazu; Yonehara, Hiroyuki; and Tanabe, Kenjiro, 4,417,810, Cl. 355-74,000.
- Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Rotational position detecting apparatus, 4,418,347, Cl. 340-870,170.
- Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Rotation position detector using stationary and rotatable disk plates, 4,418,348, Cl. 340-870,370.
- Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, to Sanraku-Ocean Co., Ltd. Anthracyclinone trisaccharide compounds, 4,418,192, Cl. 536-6,400.
- Tanaka, Shigeru; and Tadakuma, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for controlling the circulating current of a cycloconverter, 4,418,380, Cl. 363-10,000.
- Tani, Masami; Esaki, Tamemaru; and Ohno, Yoshikata, to Kuraray Co., Ltd. Filling material and process for manufacturing same, 4,418,103, Cl. 428-4,000.
- Tani, Tatsuo, and Kono, Masao, to Ricoh Company, Ltd. Method for effecting registration for a copying apparatus, 4,417,806, Cl. 355-14,05H.
- Taniguchi, Nobuyuki: See—  
Oyokota, Shigeru; Taniguchi, Nobuyuki; Hoda, Takeo; Tani, Junichi; Seigenji, Kiyoshi; and Matsumoto, Toshiaki, 4,417,793, Cl. 354-21,000.
- Tani, Junichi: See—  
Oyokota, Shigeru; Taniguchi, Nobuyuki; Hoda, Takeo; Tani, Junichi; Seigenji, Kiyoshi; and Matsumoto, Toshiaki, 4,417,793, Cl. 354-21,000.
- Tanimoto, Yoshinori: See—  
Kitadate, Kenichiro; and Tanimoto, Yoshinori, 4,418,421, Cl. 378-199,000.
- Tanno, Norihiko: See—  
Terashima, Shiro; Tanno, Norihiko; and Koga, Kenji, 4,418,218, Cl. 568-633,000.
- Tarumi, Mitio; Tokitsu, Tetsuya; and Matsumoto, Yoshio, to Chugai Ro Kogyo Co., Ltd. Method and apparatus for cooling skid pipes in continuous slab reheating furnace, 4,417,871, Cl. 432-1,000.
- Tateishi, Kazuyoshi: See—  
Kobayashi, Masato; Hoshino, Yasushi; Tateishi, Kazuyoshi; Isobe, Minoru; Konishi, Hiroshi; Koga, Yoshitomo; and Hagiwara, Shigemi, 4,417,803, Cl. 355-3,0FU.
- Taylor, Byron K., to RCA Corporation. Stylus arm for video disc player, 4,418,408, Cl. 369-170,000.
- Taylor, John D. Alarm indicating dislocation of fire extinguisher, 4,418,336, Cl. 340-571,000.
- Taylor, Scot W.: See—  
Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., 4,417,913, Cl. 65-59,100.
- TDK Electronics Co., Ltd.: See—  
Izumi, Toshiaki; Taketomi, Yasuta; and Kobuke, Takayoshi, 4,418,126, Cl. 428-694,000.
- Technicare Corporation: See—  
Trimmer, William S. N.; and Vilkomerson, David H. R., 4,417,582, Cl. 128-660,000.
- Technicon Instruments Corporation: See—  
Adler, Harvey J., 4,418,039, Cl. 422-82,000.



- Technigaz, See—  
Argy, Gilles, 4,417,603., Cl. 138-149.000.
- Tecnomare S.p.A.: See—  
Di Tella, Vincenzo; Falbo, Dario; Minardi, Paolo; and Tinebra, Roberto, 4,417,537., Cl. 114-230.000.
- Teepak, Inc.: See—  
Washburn, Harry G., 4,417,368., Cl. 17-49.000.
- Tekno AG: See—  
Malozian, Mardick, 4,417,399., Cl. 33-448.000.
- Tektionix, Inc.: See—  
Bateman, Glenn, 4,418,317., Cl. 328-145.000.
- Telefunken Electronic GmbH: See—  
Hohme, Rolf, 4,418,321., Cl. 330-252.000.
- Teletype Corporation: See—  
Menden, Thomas J., 4,418,371., Cl. 360-106.000.
- Temple, Victor A. K., to General Electric Company. Processes for manufacturing insulated gate semiconductor devices with integral shorts, 4,417,385., Cl. 29-571.000.
- Teramachi, Hiroshi. Linear ball bearing unit, 4,417,771., Cl. 308-6.000.
- Terashima, Shiro; Tanno, Norihiko; and Koga, Kenji, to Sumitomo Chemical Company, Limited. Process for producing dihydronaphthalene derivatives, 4,418,218., Cl. 568-633.000.
- Terayama, Toshiro: See—  
Nakamoto, Yasunobu; and Terayama, Toshiro, 4,417,446., Cl. 60-641.700.
- Tesch, James F.: See—  
Macker, Richard K.; and Tesch, James F., 4,417,850., Cl. 415-142.000.
- Teshima, Takanori: See—  
Torii, Koshi; Maruyama, Toshinori; Akita, Yoshio; and Teshima, Takanori, 4,418,311., Cl. 320-48.000.
- Tesmann, Holger: See—  
Schmid, Karl; Grunert, Margarete; Heidrich, Jochen; and Tesmann, Holger, 4,418,217., Cl. 568-593.000.
- Texaco Development Corp.: See—  
Hunter, Walter D., 4,417,989., Cl. 252-8.55R.
- Texaco Inc.: See—  
Yaghmaie, Farokh; and McKeon, Ronald J., 4,417,902., Cl. 44-51.000.
- Texas Instruments Incorporated: See—  
Brantingham, George L.; and Graber, Warren S., 4,418,397., Cl. 364-900.000.
- McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,418,293., Cl. 307-530.000.
- See: Yee-Chaung; Davies, Roderick D.; and Hartman, Dennis C., 4,418,094., Cl. 427-38.000.
- Textilma AG: See—  
Durville, Gerard, 4,417,455., Cl. 66-207.000.
- Texton Inc.: See—  
Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., 4,417,681., Cl. 227-8.000.
- Dyson, Lewis L., 4,417,581., Cl. 464-150.000.
- Thalacker, Ronald A.: See—  
Jailor, John J.; and Thalacker, Ronald A., 4,418,261., Cl. 219-10.55R.
- Thatcher, James L.: See—  
Schultz, Charles W.; and Thatcher, James L., 4,417,838., Cl. 414-277.000.
- Theruwes, Felix, to Alza Corporation. Disinfecting with chlorine-containing biocide dispensed from shaped polymeric body, 4,418,038., Cl. 422-37.000.
- Theodor Groz & Sohne: See—  
Berentzen, Harro, 4,417,454., Cl. 66-123.000.
- Thepault, Yves, to Regie Nationale des Usines Renault. Rapid fixing device consisting of a spring unit, 4,417,635., Cl. 180-68.00R.
- Theurer, Josef; and Bock, Gernot, to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H. Mobil track correction machine, 4,417,522., Cl. 104-7.00B.
- Thibodeau, David T. Beverage can container, 4,417,657., Cl. 206-427.000.
- Thiel, Klaus: See—  
Brachmann, Walter; Kornau, Horst; and Thiel, Klaus, 4,418,173., Cl. 524-425.000.
- Thomaier, Dieter: See—  
Crispin, Brunhart; Voss, Nobert; Pohl, Wulf-Dieter; and Thomaier, Dieter, 4,417,441., Cl. 60-251.000.
- Thomas & Betts Corporation: See—  
Knapp, Robert E., 4,417,780., Cl. 339-99.00R.
- Wilson, Albert H., 4,417,779., Cl. 339-75.0MP.
- Thomas, Edwin P.: See—  
Halvorsen, Henry J.; Marchetto, Albert V.; and Thomas, Edwin P., 4,417,778., Cl. 339-17.00M.
- Thomas J. Lipton, Inc.: See—  
Mitchell, Robert M., 4,417,433., Cl. 53-413.000.
- Thomas, Jacob E., to NCR Corporation. Ink control for ink jet printer, 4,418,353., Cl. 346-140.00R.
- Thomas, Luther B. Combined internal combustion and steam engine, 4,417,447., Cl. 60-712.000.
- Thompson, David M. Universal chock, 4,417,539., Cl. 114-381.000.
- Thomson-CSF: See—  
Trotel, Jacques, 4,418,283., Cl. 250-492.200.
- Thorn, Ruediger, to Siemens Aktiengesellschaft. Device and method for repairing conductor path breaks by welding, 4,418,264., Cl. 219-78.010.
- Throckmorton, Morford C.; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company. The Process for nonaqueous dispersion polymerization of butadiene in the presence of high cis-1,4-polyisoprene as a polymeric dispersing agent, 4,418,185., Cl. 526-201.000.
- Thyssen Industrie Aktiengesellschaft: See—  
Grosser, Heinrich; Dierkes, Hermann; Lutke, Hubertus; and Schreckenberg, Klaus, 4,417,499., Cl. 89-36.00K.
- TI Russell Hobbs Limited: See—  
Inskip, Michael; and Warren, Alan, 4,418,270., Cl. 219-328.000.
- Tibbetts Industries, Inc.: See—  
Sawyer, Joseph A., 4,418,246., Cl. 179-111.00E.
- Tiger, Ronald L.: See—  
Kammeraad, James A.; and Tiger, Ronald L., 4,417,376., Cl. 29-26.00A.
- Tile Council of America, Inc.: See—  
Chesney, Joseph J., Jr.; and Schaefer, Robert E., 4,418,166., Cl. 523-400.000.
- Tillman, Willie, to Phillips Petroleum Company. Changing oil tubes in a carbon black reactor, 4,418,049., Cl. 423-450.000.
- Timex Corporation: See—  
Migeon, Jean P., 4,417,819., Cl. 368-67.000.
- Tinebra, Roberto: See—  
Di Tella, Vincenzo; Falbo, Dario; Minardi, Paolo; and Tinebra, Roberto, 4,417,537., Cl. 114-230.000.
- Toga, Yuzo: See—  
Kasuga, Takuzo; Toga, Yuzo; Okamoto, Ichiro; and Takahashi, Katsuhiko, 4,418,172., Cl. 524-292.000.
- Tojo, Kenji: See—  
Ikegawa, Masato; Tojo, Kenji; and Shiibayashi, Masao, 4,417,863., Cl. 418-55.000.
- Tokai TRW & Co., Ltd.: See—  
Abe, Michio; and Maeda, Naoyuki, 4,417,640., Cl. 180-142.000.
- Tokico Ltd.: See—  
Hayashida, Yoshihiro, 4,417,500., Cl. 91-369.00A.
- Izumi, Shinichi, 4,417,503., Cl. 92-240.000.
- Tokitsu, Tetsuya: See—  
Tarumi, Mitio; Tokitsu, Tetsuya; and Matsumoto, Yoshio, 4,417,871., Cl. 432-1.000.
- Tokumo, Akio; and Kunugi, Yoshiro, to Pioneer Electronic Corporation. Oscillator having capacitor charged and discharged by current mirror circuits, 4,418,323., Cl. 331-111.000.
- Tokunaga, Yukio: See—  
Matsushima, Noriaki; Saeki, Yukio; and Tokunaga, Yukio, 4,418,161., Cl. 523-145.000.
- Tokyo Electric Co., Ltd.: See—  
Matsuda, Susumu; Matsukura, Nobuaki; Suzuki, Masataka; and Narushima, Tsugio, 4,417,517., Cl. 101-288.000.
- Tokyo Institute of Technology, The President of: See—  
Yamaguchi, Shoichiro; and Kobayashi, Fujio, 4,418,387., Cl. 364-414.000.
- Tokyo Juki Industrial Co., Ltd.: See—  
Shiomi, Kengo, 4,417,536., Cl. 112-311.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—  
Aoki, Kazuhide, 4,418,418., Cl. 377-79.000.
- Hata, Yoogo, 4,418,392., Cl. 364-571.000.
- Inagaki, Junichi, 4,418,395., Cl. 364-900.000.
- Kitadate, Kenichiro; and Tanimoto, Yoshinori, 4,418,421., Cl. 378-199.000.
- Nagano, Katsumi, 4,418,290., Cl. 307-355.000.
- Nakamoto, Yasunobu; and Terayama, Toshiro, 4,417,446., Cl. 60-641.700.
- Nishimura, Fuminobu, 4,417,544., Cl. 118-688.000.
- Noda, Tomitsugu, 4,418,262., Cl. 219-10.55B.
- Okazaki, Takahisa, 4,417,475., Cl. 73-606.000.
- Tanaka, Shigeru; and Tadakuma, Susumu, 4,418,380., Cl. 363-10.000.
- Tokyo Tanabe Company, Limited: See—  
Kamibayashi, Masato; Tsuchiya, Shinji; Hiratsuka, Kozo; and Tsuchiya, Susumu, 4,418,197., Cl. 546-256.000.
- Tolbert, William R., to Monsanto Company. Cell culture pumping system, 4,417,861., Cl. 417-315.000.
- Tomaru, Hisao, to Kitz Corporation. Special brass with dezincification corrosion resistance, 4,417,929., Cl. 148-433.000.
- Tomita, Nobuya, to National Distillers and Chemical Corporation. Autofretage process, 4,417,459., Cl. 72-56.000.
- Toray Industries, Inc.: See—  
Hosaka, Shuntaro; Murao, Yasuo; and Kawabata, Yasuro, 4,418,152., Cl. 436-511.000.
- Kiyomura, Yoshiteru; Masuda, Yutaka; and Kojima, Tatsuji, 4,418,104., Cl. 428-15.000.
- Sano, Takao; Ogasawara, Masafumi; and Tsubakimori, Hiroshi, 4,417,375., Cl. 28-272.000.
- Ueda, Hiroshi; Hasegawa, Katsumi; and Imae, Masazumi, 4,417,700., Cl. 242-18.00A.
- Torii & Co. Ltd.: See—  
Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, 4,418,012., Cl. 260-112.50R.
- Torii, Koshi; Maruyama, Toshinori; Akita, Yoshio; and Teshima, Takanori, to Nippondenso Co., Ltd. Battery charge indicating system, 4,418,311., Cl. 320-48.000.
- Tornqvist, Nils-Erik: See—  
Edebo, Lars B.; Swede, Harald G.; and Tornqvist, Nils-Erik, 4,417,926., Cl. 134-17.000.
- Tosa, Akio, to Mitsutoyo Kiko Co., Ltd. Nib for forming tool for bolt heads or nuts, 4,417,464., Cl. 72-478.000.
- Toshiba Heating Appliances Co., Ltd.: See—  
Nakamura, Shigeru; Ueki, Yoshihiko; and Takachi, Hiroshi, 4,417,870., Cl. 431-33.000.

- Toska Co., Ltd.: See—  
Kato, Masami, 4,417,656., Cl. 206-346.000.
- Toth-Sarudy, Eva; Ambrus, Gabor; Cseh, Gyorgy; Borvendeg, Janos; Moravcsik, Imre; and Mezey, Gabriella, to Patentbureau Danubia. 16-Amino-18,19,20-trinor-prostaglandin derivatives, and acid addition salts, 4,418,205., Cl. 560-39.000.
- Tower, Stephen N.: See—  
Gjertsen, Robert K.; Tower, Stephen N.; and Huckestein, Edgar A., 4,418,036., Cl. 376-438.000.
- Towmotor Corporation: See—  
Chelin, Charles R., 4,417,769., Cl. 308-3.00R.
- Toyoda, Takashi; Ohba, Yozo; and Yamanaka, Masaaki, to Oji Yuka Goseishi Kabushiki Kaisha. Composite film and utilization thereof, 4,418,112., Cl. 428-212.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
Imai, Yutaka; Nakano, Jiro; and Ezaki, Motoharu, 4,418,288., Cl. 307-117.000.
- Kako, Hiroyoshi; and Kobayashi, Nobuo, 4,417,696., Cl. 239-690.000.
- Kumagai, Tadanobu; and Iwase, Yoshinobu, 4,417,880., Cl. 464-111.000.
- Ohkawa, Nobushisa; and Itoh, Hiroshi, 4,417,553., Cl. 123-339.000.
- Yasuda, Keiichi; Ori, Takaaki; and Nakamura, Kazumasa, 4,417,468., Cl. 73-118.000.
- Trachte, Dietrich: See—  
Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jorg, 4,417,693., Cl. 239-453.000.
- Tremmel, Hartmut; and Bernot, Hartmut. Apparatus for collecting, transmitting and processing data stored in code, preferably in bar code, 4,418,277., Cl. 235-472.000.
- Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., to American Cyanamid Company. Stable isocyanic acid compositions, 4,418,047., Cl. 423-265.000.
- Trepka, William J.: See—  
Schiff, Sidney; and Trepka, William J., 4,418,234., Cl. 585-12.000.
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- Trimmer, William S. N.; and Vilkomerson, David H. R., to Technicare Corporation. Resolution measuring device for acoustical imaging systems and method of use, 4,417,582., Cl. 128-660.000.
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Buffon, Jean; and Trome, Edouard, 4,417,461., Cl. 72-345.000.
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- Trouillet, Jean: See—  
Drevet, Michel; and Trouillet, Jean, 4,417,823., Cl. 384-115.000.
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Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,418,156., Cl. 521-56.000.
- Tschopp, Theodor: See—  
Aranson, Tomas; Franke, Alwis; and Tschopp, Theodor, 4,417,958., Cl. 204-67.000.
- Tshudy, James A.: See—  
Miller, Jesse D., Jr.; Tshudy, James A.; and Unruh, Ralph E., 4,418,109., Cl. 428-142.000.
- Tsubakimori, Hiroshi: See—  
Sano, Takao; Ogasawara, Masafumi; and Tsubakimori, Hiroshi, 4,417,375., Cl. 28-272.000.
- Tsuchihashi, Michihiro: See—  
Otani, Katsuya; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,418,300., Cl. 313-573.000.
- Tsuchiya, Shinji: See—  
Kamibayashi, Masato; Tsuchiya, Shinji; Hiratsuka, Kozo; and Tsuchiya, Susumu, 4,418,197., Cl. 546-256.000.
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Kamibayashi, Masato; Tsuchiya, Shinji; Hiratsuka, Kozo; and Tsuchiya, Susumu, 4,418,197., Cl. 546-256.000.
- Tsuchiya, Yoshimi: See—  
Mizutani, Hiroshi; and Tsuchiya, Yoshimi, 4,417,893., Cl. 604-366.000.
- Tsuji, Yoshitake; Mori, Nobuhiko; and Egami, Kazunari, to Nippon Electric Co. Ltd. Disparity detection apparatus, 4,418,423., Cl. 382-40.000.
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- Tsumura, Tetsuya: See—  
Oshima, Nobuyasu; and Tsumura, Tetsuya, 4,417,533., Cl. 112-235.000.
- Tsuwano, Haruo: See—  
Wakamatsu, Atsuyuki; and Tsuwan, Haruo, 4,417,435., Cl. 53-532.000.
- Tucker, Theodore W., to Control Data Corporation. High vacuum compatible air bearing stage, 4,417,770., Cl. 308-3.500.
- Tungate, Freddie L.: See—  
Bennett, James G.; and Tungate, Freddie L., 4,418,224., Cl. 568-804.000.
- Turcotte, Michael G., to Air Products and Chemicals, Inc. Hydrogen recovery by alcohol scrubbing in alcohol amination, 4,418,214., Cl. 564-479.000.
- Tward, Emanuel, to Tward 2001 Limited. Fluid level sensor, 4,417,472., Cl. 73-304.00C.
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Tward, Emanuel, 4,417,472., Cl. 73-304.00C.
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- U.S.A. 161 Developments Ltd.: See—  
Lindberg, John E., 4,417,548., Cl. 123-25.00E.
- Uchida, Isamu; and Kawakami, Moriatsu, to Laurel Bank Machine Co., Ltd. Reception control system for paper counting machine, 4,418,417., Cl. 377-8.000.
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- Ueda, Seichiro: See—  
Fujimoto, Tadao; Fujiuchi, Hiroyuki; Shimizu, Kenichi; and Ueda, Seichiro, 4,417,529., Cl. 110-346.000.
- Ueda, Takashi; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for preparation of ethylene polymer wax, 4,418,184., Cl. 526-125.000.
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- Ueguri, Shigeo: See—  
Tabata, Yoichiro; Ueguri, Shigeo; Komura, Hirotosugu, and Ito, Toshio, 4,418,265., Cl. 219-130.400.
- Uehara, Sukehiro; and Saiki, Akio, to Kabushiki Kaisha Miyano Tekko-sho; and Kabushiki Kaisha Alps Tool. Automatic bar material feeding apparatus, 4,417,491., Cl. 82-2.700.
- Ueki, Yoshihiko: See—  
Nakamura, Shigeru; Ueki, Yoshihiko; and Takachi, Hiroshi, 4,417,870., Cl. 431-33.000.
- Uezima, Osamu: See—  
Okada, Minoru; Matsuzawa, Masamitsu; Uezima, Osamu; Nakakuki, Teruo; and Horikoshi, Koki, 4,418,144., Cl. 435-96.000.
- Uhlig, Uwe: See—  
Redeker, Werner; and Uhlig, Uwe, 4,417,422., Cl. 51-50.00R.
- Uhlir, Miroslav: See—  
Beranek, Ivan; Kyril, Josef; Uhlir, Miroslav; and Zlesak, Ivan, 4,417,923., Cl. 75-257.000.
- Uiff, Carl B. J.: See—  
Hogberg, Thomas; de Paulis, Tomas; Ross, Svante B.; and Uiff, Carl B. J., 4,418,065., Cl. 424-263.000.
- Umehara, Shoji: See—  
Katagiri, Kazuharu; Umehara, Shoji; Watanabe, Katsunori; and Ishikawa, Shozo, 4,418,133., Cl. 430-58.000.
- Umehara, Hamao: See—  
Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umehara, Hamao, 4,418,192., Cl. 536-6.400.
- Union Special G.m.b.H.: See—  
Gauch, Hermann; and von Hagen, Wolf R., 4,417,534., Cl. 112-256.000.
- United-American Car Co.: See—  
Marulic, Walter J.; and Johnson, Kent N., 4,417,526., Cl. 105-406.00R.
- United States Gypsum Company: See—  
Granger, Robert L.; and Alexander, Alva P., Jr., 4,417,883., Cl. 493-403.000.
- House, Cynthia B.; and Leitch, Robert J., 4,418,101., Cl. 427-393.000.
- United States of America Agriculture: See—  
Powell, Richard G.; and Smith, Cecil R., Jr., 4,418,064., Cl. 424-248.540.
- Whitehead, William F., Jr.; Dickens, James A.; and Haynes, Benjamin C., Jr., 4,417,839., Cl. 414-303.000.
- Air Force: See—  
Shambaugh, John S.; Yetman, Robert G.; and Zeltzer, Hyman, 4,418,127., Cl. 429-8.000.
- Army: See—  
Horn, Stuart B.; Wright, Richard A.; and Asher, Mark S., 4,417,448., Cl. 62-6.000.
- Nieto, Alfonso, Jr., 4,418,314., Cl. 324-72.500.
- National Aeronautics and Space Administration: See—  
Soltis, Daniel G.; Sheibley, Dean W.; and Nagle, William J., 4,418,130., Cl. 429-206.000.
- Navy: See—  
Chang, Marguerite S.; and Orndoff, Robert R., 4,418,212., Cl. 564-109.000.
- Gordon, Alan; Watson, Stanley J.; Cowen, Steven J.; Mackelburg, Gerald; and Castile, Brett D., 4,418,404., Cl. 367-132.000.
- Morris, Joseph H., 4,417,849., Cl. 415-131.000.
- Samsel, Richard W., 4,418,306., Cl. 318-648.000.
- U.S. Philips Corporation: See—  
Fehrm, Bjorn O., 4,417,709., Cl. 244-136.000.
- Perduijn, David J., 4,418,354., Cl. 346-140.00R.
- Schreiber, Peter; Steenfad, Eberhard; and Bergman, Gerard P. M., 4,418,419., Cl. 378-040.000.
- Vrielink, Hendrik, 4,418,386., Cl. 364-200.000.
- United Technologies Corporation: See—  
Dembeck, Kurt M., 4,417,848., Cl. 415-121.00G.



- Higgs, Raymond J.; and Palmer, Leslie W., 4,417,467, Cl. 73-117.300.
- Rosenbeck, William H.; Eckart, Frederick; and Gerath, Francis C., 4,418,266, Cl. 219-137.00R.
- Sepulveda, Domingo; and Striebel, Edmund E., 4,417,439, Cl. 60-39.141.
- Universal Instruments Corporation: See—  
Lewis, Alan C.; Ragard, Phillip A.; and Shiptenko, Robert C., 4,417,683, Cl. 227-109.000.
- University of Florida, The: See—  
Dawson, William W., 4,417,581, Cl. 128-639.000.
- University of Oklahoma, The Board of Regents of The: See—  
Morris, John D.; and Hayatdavoudi, Asadollah, 4,417,899, Cl. 44-6.000.
- Unruh, Ralph E.: See—  
Miller, Jesse D., Jr.; Tshudy, James A.; and Unruh, Ralph E., 4,418,109, Cl. 428-142.000.
- Untz, Reese E. Porta climb climbing tree stand, 4,417,645, Cl. 182-135.000.
- UOP Inc.: See—  
Firth, Bruce E., 4,418,223, Cl. 568-794.000.  
House, David W., 4,418,225, Cl. 568-829.000.  
Imai, Tamotsu, 4,418,237, Cl. 585-443.000.
- Urology Group, P.C., The: See—  
Adair, Edwin L., 4,417,710, Cl. 248-51.000.
- Usher, Peter P., to Metex Corporation. Method of producing high temperature composite seal, 4,417,733, Cl. 277-1.000.
- Vaders, Dennis H., to Weyerhaeuser Company. Remotely releasable choker, 4,417,758, Cl. 294-78.00R.
- Valeo S.A.: See—  
Le Lannou, Michel, 4,418,115, Cl. 428-283.000.
- Van Dresser Corporation: See—  
Doerer, Richard P.; and Karpik, Joseph T., 4,418,031, Cl. 264-241.000.
- Van Horn, John W. Method for transferring energy between suspended objects, 4,417,725, Cl. 272-85.000.
- Van Zeeland, Anthony J.: See—  
Larson, Willis A.; and Van Zeeland, Anthony J., 4,418,239, Cl. 174-34.000.
- van Zyl, Ian D.: See—  
Bohme, Rolf C.; van Zyl, Ian D.; and Lazerson, Max M., 4,417,817, Cl. 356-380.000.
- Vartanian, Albert V.: See—  
Lidorenko, Nikolai S.; Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; and Strebkov, Dmitry S., 4,418,238, Cl. 136-246.000.
- Vassiliadis, Marc: See—  
du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, 4,418,028, Cl. 264-43.000.
- Vaughan, Roger, to Imperial Group plc. Monitoring a deposit on a travelling web, 4,417,934, Cl. 156-64.000.
- VEB Edelstahlwerk Freital im VEB Rohrkombinat: See—  
Esser, Fred; Klopfer, Detlev; Lachner, Walter; and Kruger, Albrecht, 4,418,414, Cl. 373-24.000.
- Veeder Industries Inc.: See—  
Devanney, Raymond H., 4,418,273, Cl. 235-61.00L.
- Veluswamy, Lavanga R.: See—  
Francis, James N.; and Veluswamy, Lavanga R., 4,417,972, Cl. 208-10.000.
- Vescelius, Lee E.: See—  
Bohm, Georg G. A.; Vescelius, Lee E.; and Hamed, Gary R., 4,418,167, Cl. 524-68.000.
- Victor Company of Japan, Ltd.: See—  
Iwai, Hiroshi, 4,418,304, Cl. 318-311.000.
- Videocolor S.A.: See—  
Permet, Didier; and Pater, Francois, 4,417,698, Cl. 242-7.030.
- Viellefant, Jean F.; and Forton, Henri M. F. J., to Metallurgie Hoboken-Overpelt. Process and apparatus for separating an electrolytic deposit from both sides of a cathode, 4,417,953, Cl. 204-12.000.
- Viertel, Lothar: See—  
Cziptschirsch, Kurt; Viertel, Lothar; and Kaiser, Peter, 4,417,761, Cl. 296-97.00H.
- Vilkomerson, David H. R.: See—  
Trimmer, William S. N.; and Vilkomerson, David H. R., 4,417,582, Cl. 128-660.000.
- Vimlati, Pal: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Sztipanovits, Janos; Vimlati, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40.000.  
Cserey, Laszlo; Vimlati, Pal; and Zillich, Pal, 4,418,313, Cl. 324-71.100.
- Vining, Paul H.; and Smith, Jimmy B., to Mansfield Carbon Products Inc.; and Peabody Development Company. Coal gasification process and apparatus, 4,417,528, Cl. 110-229.000.
- Vit Vet Research Group, Inc.: See—  
Jewett, Warren R., 4,417,586, Cl. 128-680.000.
- Vogel, Wilhelm: See—  
Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jorg, 4,417,693, Cl. 239-453.000.
- Vogtmann, Hans-Jorg: See—  
Fussner, Paul; Hofmann, Karl; Komaroff, Iwan; Seifert, Kurt; Trachte, Dietrich; Vogel, Wilhelm; and Vogtmann, Hans-Jorg, 4,417,693, Cl. 239-453.000.
- Volkswagenwerk A.G.: See—  
Walter, Horst; Ebbinghaus, Werner; and Danckert, Hermann, 4,417,552, Cl. 123-198.00E.
- von Gentzkow, Wolfgang; and Schmiedel, Manfred, to Siemens Aktiengesellschaft. Method for stabilizing organic polymers against oxidative decomposition, 4,418,170, Cl. 524-193.000.
- von Hagen, Wolf R.: See—  
Gauch, Hermann; and von Hagen, Wolf R., 4,417,534, Cl. 112-256.000.
- Vorwerk & Co Interholding GmbH: See—  
Aschoff, Hans-Joachim; and Cholewa, Lothar, 4,418,342, Cl. 340-679.000.
- Voss, Nobert: See—  
Crispin, Brunhart; Voss, Nobert; Pohl, Wulf-Dieter; and Thomaier, Dieter, 4,417,441, Cl. 60-251.000.
- Vrieling, Hendrik, to U.S. Philips Corporation. Communication bus for a multi-source/receiver data processing system, 4,418,386, Cl. 364-200.000.
- WABCO Steuerungstechnik GmbH & Co.: See—  
Moller, Rudolf, 4,417,717, Cl. 251-139.000.
- Wachi, Hiroshi: See—  
Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,418,186, Cl. 526-247.000.
- Waibel, Helmut K.: See—  
Cushman, James E.; Plaza, Mario G.; and Waibel, Helmut K., 4,417,825, Cl. 400-605.000.
- Wakamatsu, Atsuyuki; and Tsuwano, Haruo, to Daiwa Can Company. Apparatus for automatically packing end closures for cans in paper bags, 4,417,435, Cl. 53-532.000.
- Waldstrom, Ejvind; and Kaufmann, Gerhard, to O.G. Hoyer A/S. Dispenser systems, 4,417,610, Cl. 141-91.000.
- Walker, Frank S. Bathroom fixture, 4,417,362, Cl. 4-606.000.
- Wallace, Duane W., to Reed Rock Bit Company. Drill bit and method of manufacture, 4,417,629, Cl. 175-365.000.
- Wallin, Kay, to Sprinter System AB. Method and apparatus for erecting a carton tray, 4,417,882, Cl. 493-174.000.
- Walter, Horst; Ebbinghaus, Werner; and Danckert, Hermann, to Volkswagenwerk A.G. Sound-insulated internal-combustion engine, 4,417,552, Cl. 123-198.00E.
- Walter, John: See—  
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,417,667, Cl. 220-67.000.
- Walter, Richard P., to Bendix Corporation. The. Feed and drain line damping in a fuel delivery system, 4,417,557, Cl. 123-467.000.
- Wamser, Christian A.: See—  
Kuo, Vincent H. S.; and Wamser, Christian A., 4,417,996, Cl. 252-175.000.
- Warning, Norman E. Air powered door operator, 4,417,418, Cl. 49-199.000.
- Warren, Alan: See—  
Inskip, Michael; and Warren, Alan, 4,418,270, Cl. 219-328.000.
- Washburn, Harry G., to Teepak, Inc. Apparatus for and process of controlled sub-volume filling of casings, 4,417,368, Cl. 17-49.000.
- Watanabe, Katsunori: See—  
Katagiri, Kazuharu; Umehara, Shoji; Watanabe, Katsunori; and Ishikawa, Shozo, 4,418,133, Cl. 430-58.000.
- Watanabe, Keiji: See—  
Otani, Katsuya; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,418,300, Cl. 313-573.000.
- Watjer, Sheldon J.: See—  
Marcus, Konrad H.; and Watjer, Sheldon J., 4,417,764, Cl. 297-194.000.
- Watkins, Richard R.: See—  
Ryan, Joseph L.; Saffie, Elias; Watkins, Richard R.; and Kobs, Frederick E., 4,418,343, Cl. 340-723.000.
- Watson, Richard B., Jr., to Raytheon Company. Logic gate having an isolation FET and noise immunity circuit, 4,418,291, Cl. 307-443.000.
- Watson, Stanley J.: See—  
Gordon, Alan; Watson, Stanley J.; Cowen, Steven J.; Mackelburg, Gerald; and Castile, Brett D., 4,418,404, Cl. 367-132.000.
- Waugaman, William J.: See—  
Smith, Richard W.; and Waugaman, William J., 4,417,766, Cl. 301-55.000.
- Wear, Frederick C.: See—  
McKinney, Howard F.; Wear, Frederick C.; and Sandy, Harold L., 4,418,083, Cl. 426-242.000.
- Weaver, Harry R.: See—  
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,417,396, Cl. 29-884.000.
- Weber, Michael J.: See—  
Nelson, Carl L.; Haynes, Darrel W.; and Weber, Michael J., 4,417,571, Cl. 128-92.00B.
- Weber, Otto; Ohnsmann, Klaus; and Christ, Ferdinand. Method and apparatus for checking the weight of consignments assembled in containers, 4,417,630, Cl. 177-1.000.
- Wechsler, Hans G., to Schwamm, Horst; and Pessei, Friedbert. Vehicle for coasting down in a channel-shaped roller slide, 4,417,740, Cl. 280-87.010.
- Wegener, Jack. Dynamic gas pressured jacking structure with improved load stability and air pallet employing same, 4,417,639, Cl. 180-125.000.
- Weidner, Peter: See—  
Siebert, Rainer; Stutzle, Dietmar; and Weidner, Peter, 4,417,518, Cl. 102-212.000.
- Weiner, Todd D. Tennis practice apparatus, 4,417,730, Cl. 273-29.00A.

- Weinhold, Dennis G. Quick retrieve cord reel, 4,417,703, Cl. 242-107.120.
- Weisner, Ralph M. Integrating densitometer, 4,417,818, Cl. 356-404.000.
- Weisrock, William P.; and McCarthy, Edward F., to Standard Oil Company. *Xanthomonas campestris* ATCC 31601 and process for use, 4,418,145, Cl. 435-104.000.
- Wells, Martin A.: See—  
Lips, Alexander; Wells, Martin A.; and Willis, Edwin, 4,417,995, Cl. 252-174.230.
- Welltron Limited: See—  
Bikker, Anthony, 4,417,724, Cl. 272-73.000.
- Welter, Andre; Christiaens, Leon; and Wirtz-Peitz, Ferdinand, to A. Nattermann & Cie GmbH. Benziselenazolones and process for the treatment of rheumatic and arthritic diseases using them, 4,418,069, Cl. 424-269.000.
- Weltmer, William R., Jr., to Airco, Inc. Gas separation process, 4,417,909, Cl. 62-12.000.
- Werner, Alan J., Jr., to Xerox Corporation. High voltage comparator for photoreceptor voltage control, 4,417,804, Cl. 355-14.0CH.
- Wertheimer, Seev, to Iscar Ltd. Rotary slot cutting tools, 4,417,833, Cl. 407-61.000.
- Western Electric Co., Inc.: See—  
Andrejco, Matthew J.; and Potkay, Eugene, 4,417,692, Cl. 239-424.000.  
Jon, Min-Chung; Palazzo, Vito; and Sturm, George W., 4,417,478, Cl. 73-801.000.
- Westfalia Separator AG: See—  
Kohlstette, Werner; and Niernerg, Willi, 4,417,885, Cl. 494-23.000.
- Westinghouse Electric Corp.: See—  
Gjertsen, Robert K.; Tower, Stephen N.; and Huckestein, Edgar A., 4,418,036, Cl. 376-438.000.
- Podolsky, Leaman B.; Ronnen, Uri G.; and Lardi, Francesco, 4,418,285, Cl. 290-40.00R.
- Westvaco Corporation: See—  
Forbes, Hampton E., Jr., 4,417,655, Cl. 206-45.250.
- Wetzel, W. Edwin, Jr.: See—  
Heine, Christian H., Jr.; McGaw, Robert W.; Wetzel, W. Edwin, Jr.; and Ziegler, Joseph, 4,417,928, Cl. 148-144.000.
- Weyerhaeuser Company: See—  
Vaders, Dennis H., 4,417,758, Cl. 294-78.00R.
- Whallon, William P., Jr.: See—  
Hall, James R.; and Whallon, William P., Jr., 4,417,395, Cl. 29-882.000.
- Whately, Francis: See—  
Cotter, Edmund; Whately, Francis; and Baum, Heinz W., 4,417,647, Cl. 188-73.380.
- Wheadon, Ellis G.: See—  
McCartney, Charles P., Jr.; and Wheadon, Ellis G., 4,417,608, Cl. 141-1.100.
- Wheelock, Kenneth S.: See—  
Schucker, Robert C.; and Wheelock, Kenneth S., 4,418,008, Cl. 502-340.000.
- Whirlpool Corporation: See—  
Brenner, Robert A., 4,417,457, Cl. 68-17.00A.
- Whitaker, Robert F. Auxiliary wheel support for load carrying vehicles, 4,417,739, Cl. 280-81.00A.
- White, Carl R., to Mallinckrodt, Inc. Method for producing fluoronitrobenzene compounds, 4,418,229, Cl. 568-938.000.
- White, Lionel S., Jr.: See—  
McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,418,293, Cl. 307-530.000.
- Whitehead, William F., Jr.; Dickens, James A.; and Haynes, Benjamin C., Jr., to United States of America, Agriculture. Automatic hatchery tray dumper, 4,417,839, Cl. 414-303.000.
- Whitesel, Terry L.: See—  
Cygnor, John E.; Whitesel, Terry L.; and Mosure, Duane C., 4,417,851, Cl. 415-150.000.
- Wienhofer, Ekkehard: See—  
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,418,156, Cl. 521-56.000.
- Wilkinson, Calvin L., to Boeing Aerospace Company. Integral purged multi-layer insulation design, 4,417,428, Cl. 52-172.000.
- Wilkinson, Thomas, to Hancock Cutting Machines Limited. Members for supporting a movable load, 4,417,384, Cl. 29-526.00R.
- Willbanks, Charles E.: See—  
Engels, Walter; and Willbanks, Charles E., 4,417,695, Cl. 239-590.300.
- William H. Rorer, Inc.: See—  
Douglas, George H.; Diamond, Julius; Studt, William L.; and Dodson, Stuart A., 4,418,209, Cl. 564-27.000.
- Williams, Alan: See—  
Banks, Reginald G. S.; and Williams, Alan, 4,417,905, Cl. 48-214.00A.
- Williams, Billy M., to Dow Chemical Company, The. Process for preparation of N-heterocyclic compounds, 4,418,201, Cl. 548-579.000.
- Williams, Gerard J.: See—  
Oosterbaan, DuWayne D.; and Williams, Gerard J., 4,418,275, Cl. 377-33.000.
- Williams, Waymon D.; and Moore, Edward A. Automatic teller security apparatus, 4,417,527, Cl. 109-2.000.
- Willibald, Josef. Apparatus for breaking rock located in a field, 4,417,627, Cl. 172-45.000.
- Willis, Edwin: See—  
Lips, Alexander; Wells, Martin A.; and Willis, Edwin, 4,417,995, Cl. 252-174.230.
- Wilson, Albert H., to Thomas & Betts Corporation. PCB-Mountable connector for terminating flat cable, 4,417,779, Cl. 339-75.0MP.
- Windpowered Machines Ltd.: See—  
Cook, Gregory E., 4,417,853, Cl. 416-132.00B.
- Wine, Charles M., to RCA Corporation. Video player apparatus having caption generator, 4,418,364, Cl. 358-336.000.
- Winecoff, John E. Apparatus for cutting used tires, 4,417,492, Cl. 82-46.000.
- Winningham, James P.: See—  
Knowles, Henry L.; and Winningham, James P., 4,417,669, Cl. 221-26.000.
- Wion, Donald A.: See—  
Brown, Christopher K.; Busler, Willard L.; and Wion, Donald A., 4,417,378, Cl. 29-33.00M.
- Wirsbinski, James L., to J. I. Case Company. Dump cart, 4,417,765, Cl. 298-5.000.
- Wirtz-Peitz, Ferdinand: See—  
Welter, Andre; Christiaens, Leon; and Wirtz-Peitz, Ferdinand, 4,418,069, Cl. 424-269.000.
- Witco Chemical Corporation: See—  
Duffy, James P., 4,417,999, Cl. 252-383.000.
- Witmer, Paul: See—  
Heinz, Gerhard; Schmitt, Burghard; Dorn, Ingo H.; Gausepohl, Hermann; Gerberding, Karl; Jung, Rudolf H.; Mittnacht, Hans; Pohrt, Jürgen; and Witmer, Paul, 4,418,180, Cl. 525-314.000.
- Witt, Ronald A., to Falk Corporation. The. Diaphragm mounted gear drive detuner, 4,417,482, Cl. 74-409.000.
- Wohlfel, Gerhard, to Jagenberg Werke AG. Coating apparatus with air-nozzle arrangement, 4,417,540, Cl. 118-63.000.
- Wolens, John: See—  
Herbst, Walter B.; and Wolens, John, 4,417,506, Cl. 99-348.000.
- Wolff, Erich: See—  
Langen, Hans; Wolff, Erich; and Ranz, Erwin, 4,418,142, Cl. 430-549.000.
- Wolfrum, Gerhard: See—  
Berghaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; Runzheimer, Hans-Volker; and Heidenreich, Holger, 4,418,143, Cl. 430-562.000.
- Wolfrum, Jürgen; Kneba, Michael; and Clough, Peter N., to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V. Method of preparing olefinic compounds, 4,417,964, Cl. 204-158.00R.
- Wong, Dennis W. Diagnostic compositions and method for radiologic imaging of fibrinogen deposition in the body, 4,418,052, Cl. 424-1.100.
- Wood, John D.: See—  
Hilton, Joseph R.; and Wood, John D., 4,417,575, Cl. 128-206.190.
- Woodard, Kenneth E., Jr.: See—  
Kadja, Igor V.; Woodard, Kenneth E., Jr.; and Justice, David D., 4,417,959, Cl. 204-98.000.
- Woodman, Brenda J.: See—  
Murray, Edward D.; Woodman, Brenda J.; Maurice, Terrence J.; and Siretti, Robert R., 4,418,084, Cl. 426-250.000.
- Wozniacki, Roger M., to International Paper Company. Octagon tray with reinforced handhole, 4,417,686, Cl. 229-52.00B.
- Wren, Douglas L., to Syntex (U.S.A.) Inc. 9-Deoxy-9-methylene derivatives of (dl)-16-phenoxyl and 16-phenoxyl substituted prostatriene compounds, 4,418,206, Cl. 560-55.000.
- Wright, James O. B.: See—  
Gomberg, Edward N.; and Wright, James O. B., 4,418,093, Cl. 427-8.000.
- Wright, Richard A.: See—  
Horn, Stuart B.; Wright, Richard A.; and Asher, Mark S., 4,417,448, Cl. 62-6.000.
- Wu, Yun-Tai: See—  
Logullo, Francis M., Sr.; and Wu, Yun-Tai, 4,418,164, Cl. 523-207.000.
- Wurlitzer Company, The: See—  
Machanian, William V., 4,417,496, Cl. 84-1.270.
- Xerox Corporation: See—  
Eisemann, Richard E., 4,417,801, Cl. 355-3.0SH.  
Forbes II, Richard L., 4,417,802, Cl. 355-3.0DD.  
Harrison, Joel N., 4,418,370, Cl. 360-106.000.  
Werner, Alan J., Jr., 4,417,804, Cl. 355-14.0CH.
- Yaegashi, Takashi: See—  
Fuji, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, 4,418,012, Cl. 260-112.50R.
- Yaghmaie, Farrokh; and McKeon, Ronald J., to Texaco Inc. Process for making and composition of low viscosity coal-water slurries, 4,417,902, Cl. 44-51.000.
- Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, to Asahi Glass Company Ltd. Copolymer for fluorine-containing elastomer having excellent low temperature resistance and alcohol resistance, 4,418,186, Cl. 526-247.000.
- Yamada, Kunio. Hollow metal golf club head and club incorporating it, 4,417,731, Cl. 273-167.00H.
- Yamaguchi, Kenzo; Ichisaka, Teruo; Ikegami, Tadao; and Kumagai, Isao, to Chlorine Engineers Corp. Ltd. Electrolytic cell for ion exchange membrane method, 4,417,970, Cl. 204-257.000.
- Yamaguchi, Shoichiro; and Kobayashi, Fujio, to Tokyo Institute of Technology, The President of. Method of reconstructing a computed tomographic image from a single X-ray projection, 4,418,387, Cl. 364-414.000.



- Yamaguchi, Toshitomi: See—  
Kawasaki, Kikuo; Yoshida, Kazuo; Nonoyama, Nobuo; Yamaguchi, Toshitomi; Hasegawa, Toshio; and Okamura, Jitsuo, 4,417,671, Cl. 222-56.000.
- Yamaji, Tadao; Nakajima, Toshi; and Kashi, Takeshi, to Kubota, Ltd. Pipe joint for preventing separation. 4,417,754, Cl. 285-104.000.
- Yamamoto, Hisao: See—  
Kojima, Atsuyuki; Irie, Tsunemasa; Harada, Shuichi; Kamen, Yoshito; Katsube, Junki; and Yamamoto, Hisao, 4,418,079, Cl. 424-330.000.
- Yamamoto, Noboru, to Mitsumoto Coffee Co., Ltd. Regular coffee set. 4,417,504, Cl. 99-306.000.
- Yamanaka, Masaaki: See—  
Toyoda, Takashi; Ohba, Yozo; and Yamanaka, Masaaki, 4,418,112, Cl. 428-212.000.
- Yamawaki, Masami: See—  
Kasuga, Takuzo; Ikenaga, Yukio; and Yamawaki, Masami, 4,418,162, Cl. 523-205.000.
- Yamazaki, Noboro: See—  
Numata, Satoshi; Nakatani, Kiyoshi; Yamazaki, Noboro; and Yuasa, Teruo, 4,418,220, Cl. 568-734.000.
- Yamazaki, Shunpei. Member for electrostatic photocopying with  $Si_3N_4$  ( $0 < x < 4$ ). 4,418,132, Cl. 430-57.000.
- Yamazaki, Yoshio; Nakamura, Ken; and Inowa, Shigeru, to Konishiroku Photo Industry Co., Ltd. Cleaning apparatus for recording apparatus. 4,417,807, Cl. 355-15.000.
- Yan, Tsung Y., to Mobil Oil Corporation. Ion exchange process using resins of high loading capacity, high chloride tolerance and rapid elution for uranium recovery. 4,418,042, Cl. 423-7.000.
- Yasuda, Keiichi; Ori, Takaaki; and Nakamura, Kazumasa, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Switching device for detecting rotational positions of rotary shaft. 4,417,468, Cl. 73-118.000.
- Yasuda, Sinichi; Kurohara, Takayuki; and Taguro, Akira, to Koei Chemical Co., Ltd. Process for treating aqueous solutions containing phenols. 4,418,221, Cl. 568-757.000.
- Yasuda, Yoshiko: See—  
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,418,284, Cl. 250-578.000.
- Yasuhara, Seishi, to Nissan Motor Co., Ltd. Method and apparatus for automatically changing and disposing of used engine oil. 4,417,561, Cl. 123-575.000.
- Yasui, Tsuyoshi: See—  
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; Matsui, Hideo; Hirose, Isamu; Fujimoto, Hideaki; and Yasui, Tsuyoshi, 4,417,723, Cl. 266-265.000.
- Yasukata, Eguchi, to Janome Sawing Machine Industry Co., Ltd. Suture instrument for surgical operation. 4,417,532, Cl. 12-169.000.
- Yasunami, Kenrow, to Sharp Kabushiki Kaisha. Optical bar code reader. 4,418,276, Cl. 235-462.000.
- Yetman, Robert G.: See—  
Shambaugh, John S.; Yetman, Robert G.; and Zeltzer, Hyman, 4,418,127, Cl. 429-8.000.
- Yonehara, Hiroyuki: See—  
Ueda, Yoshihiro; Kimura, Yoshikazu; Yonehara, Hiroyuki; and Tanabe, Kenjiro, 4,417,810, Cl. 355-74.000.
- Yonezawa, Taketoshi: See—  
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,418,284, Cl. 250-578.000.
- Yoshida, Hajime, to Hajime Industries Ltd. Noise detection apparatus. 4,418,341, Cl. 340-635.000.
- Yoshida, Kazuo: See—  
Kawasaki, Kikuo; Yoshida, Kazuo; Nonoyama, Nobuo; Yamaguchi, Toshitomi; Hasegawa, Toshio; and Okamura, Jitsuo, 4,417,671, Cl. 222-56.000.
- Yoshida, Kiyoshi: See—  
Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,417,494, Cl. 84-1.030.
- Yoshimi, Akira; Kamiya, Michihiko; and Moriya, Mitsutoshi, to Nippondenso Co., Ltd. Air-conditioner control system for vehicles. 4,417,618, Cl. 165-12.000.
- Yoshioka, Takeo: See—  
Tanaka, Hiroshi; Yoshioka, Takeo; Shimauchi, Yasutaka; Oki, Toshikazu; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,418,192, Cl. 536-6.400.
- Yost, Richard J., to Combustion Engineering, Inc. Cover for carbon bake pit. 4,418,107, Cl. 428-138.000.
- Young, Ian R.; Hounsfield, Godfrey N.; and Burl, Michael, to Picker International Limited. Nuclear magnetic resonance apparatus. 4,418,316, Cl. 324-309.000.
- Young, Peter L.; Stein, Barry F.; and Sheppard, John E., to Sperry Corporation. Method of making planarized Josephson junction devices. 4,418,095, Cl. 427-63.000.
- Yuasa, Teruo: See—  
Numata, Satoshi; Nakatani, Kiyoshi; Yamazaki, Noboro; and Yuasa, Teruo, 4,418,220, Cl. 568-734.000.
- Yueh, Mao; and Rashbaum, Stephan A., to Quaker Oats Company, The. Natural red coloring prepared from wheat and barley substrates. 4,418,080, Cl. 426-18.000.
- Yueh, Mao: See—  
Rashbaum, Stephan A.; and Yueh, Mao, 4,418,081, Cl. 426-18.000.
- Zabec, Glenn: See—  
Bernecki, Harry F.; Skuza, Voytech T.; Dulin, Kerry; Sridharan, Sri P.; Zabec, Glenn; and Edgell, James E., 4,417,681, Cl. 227-8.000.
- Zabielski, Kenneth: See—  
Bacehowski, David; Measells, Paul; and Zabielski, Kenneth, 4,417,753, Cl. 285-21.000.
- Zacharias, Ellis M., Jr., to Mapco, Inc. Dampened ultrasonic transducer. 4,417,480, Cl. 73-861.180.
- Zahnradfabrik Friedrichshafen, AG: See—  
Eiser, Dieter, 4,417,501, Cl. 91-375.00A.
- Zaiser, Wolfgang: See—  
Gaus, Hermann; Zaiser, Wolfgang; Pickard, Jurgen; and Eltze, Georg, 4,417,484, Cl. 74-688.000.
- Zaner, Clifford: See—  
Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., 4,418,055, Cl. 424-126.000.
- Zannucci, Joseph S.; and Pruett, Wayne P., to Eastman Kodak Company. Melamine group containing ultraviolet stabilizers and their use in organic compositions. 4,418,000, Cl. 252-403.000.
- Zannucci, Joseph S.; and Pruett, Wayne P., to Eastman Kodak Company. Melamine group containing ultraviolet stabilizers and their use in organic compositions III. 4,418,001, Cl. 252-403.000.
- Zannucci, Joseph S.; and Pruett, Wayne P., to Eastman Kodak Company. Melamine group containing ultraviolet stabilizers and their use in organic compositions II. 4,418,002, Cl. 252-403.000.
- Zeltzer, Hyman: See—  
Shambaugh, John S.; Yetman, Robert G.; and Zeltzer, Hyman, 4,418,127, Cl. 429-8.000.
- Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Preparation of trans-cyclohexane-1,4-disulphonyl urea. 4,418,211, Cl. 564-40.000.
- Zenios, Marios C.: See—  
Stevenson, Thomas T.; and Zenios, Marios C., 4,417,469, Cl. 73-119.00A.
- Zenith Radio Corporation: See—  
Hager, Robert E.; and Moss, Laurence H., 4,418,279, Cl. 250-201.000.
- Zenk, Robert E.: See—  
Kealy, Joanne P.; and Zenk, Robert E., 4,418,120, Cl. 428-343.000.
- Ziegler, Joseph: See—  
Heine, Christian H., Jr.; McGaw, Robert W.; Wetzel, W. Edwin, Jr.; and Ziegler, Joseph, 4,417,928, Cl. 148-144.000.
- Zillich, Pal: See—  
Cserey, Laszlo; Horvath, Gabor; Szabados, Tamas; Simonkay, Sandor; Szitanovits, Janos; Vimlati, Pal; Istvan, Zoltan; and Zillich, Pal, 4,417,812, Cl. 356-40.000.
- Cserey, Laszlo; Vimlati, Pal; and Zillich, Pal, 4,418,313, Cl. 324-71.100.
- Zip-Rib, Inc.: See—  
Commins, Alfred D.; and Kindelvich, Frederick T., 4,417,431, Cl. 52-715.000.
- Zlesak, Ivan: See—  
Beranek, Ivan; Kyral, Josef; Uhlir, Miroslav; and Zlesak, Ivan, 4,417,923, Cl. 75-257.000.
- Zscheile, John W., Jr., to Sperry Corporation. Matched filter spread spectrum code recovery apparatus. 4,418,393, Cl. 364-724.000.
- Zumwalt, Gary L.: See—  
Medlin, William L.; Masse, Lucien; and Zumwalt, Gary L., 4,417,621, Cl. 166-249.000.
- Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,418,199, Cl. 548-451.000.
- Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,418,200, Cl. 548-451.000.
- Zwezerynen, Johannes C. W., to Aico Manufacturing Co. Limited. Conveyor. 4,417,653, Cl. 198-718.000.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 29TH DAY OF NOVEMBER, 1983

NOTE:—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Casco Products Division of Sun Chemical Corporation: See—  
Fenn, Lawrence E.; and Sperry, Charles R., Re. 31,452, Cl. 219-265.000.
- Fenn, Lawrence E.; and Sperry, Charles R., to Casco Products Division of Sun Chemical Corporation. Quick-acting electric cigar lighter. Re. 31,452, Cl. 219-265.000.
- JSJ Corporation: See—  
Osborn, Charles, Re. 31,451, Cl. 74-476.000.
- Micro Motion, Inc.: See—  
Smith, James E., Re. 31,450, Cl. 73-861.380.
- Osborn, Charles, to JSJ Corporation. Manual transmission shifter for operating a transmission with elongated actuators such as flexible cables. Re. 31,451, Cl. 74-476.000.
- Smith, James E., to Micro Motion, Inc. Method and structure for flow measurement. Re. 31,450, Cl. 73-861.380.
- Sperry, Charles R.: See—  
Fenn, Lawrence E.; and Sperry, Charles R., Re. 31,452, Cl. 219-265.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

## CERTIFICATES WERE ISSUED

- DuMont, Jacques; and Romagne, Jacques, to Ethicon, Inc. Heart pacer lead wire with break-away needle. B1 4,010,756, 11-29-83, Cl. 128-786.000.
- Ethicon, Inc.: See—  
DuMont, Jacques; and Romagne, Jacques, B1 4,010,756, Cl. 128-786.000.
- Graver Tank & Mfg. Co., Inc.: See—  
Kinghorn, John S.; Wagoner, Robert B.; and Turala, Alfred J., B1 4,116,358, Cl. 220-222.000.
- Kinghorn, John S.; Wagoner, Robert B.; and Turala, Alfred J., to Graver Tank & Mfg. Co., Inc. Weather and vapor seal for storage tank. B1 4,116,358, 11-29-83, Cl. 220-222.000.
- Orchard, Edgar L., to Orco Sales Co., Inc. Box construction. B1 4,265,393, 11-29-83, Cl. 229-40.000.
- Orco Sales Co., Inc.: See—  
Orchard, Edgar L., B1 4,265,393, Cl. 229-40.000.
- Romagne, Jacques: See—  
DuMont, Jacques; and Romagne, Jacques, B1 4,010,756, Cl. 128-786.000.
- Turala, Alfred J.: See—  
Kinghorn, John S.; Wagoner, Robert B.; and Turala, Alfred J., B1 4,116,358, Cl. 220-222.000.
- Wagoner, Robert B.: See—  
Kinghorn, John S.; Wagoner, Robert B.; and Turala, Alfred J., B1 4,116,358, Cl. 220-222.000.

# LIST OF DESIGN PATENTEES

- A&E Products Group, Inc.: See—  
Samuels, Howard, 271,552, Cl. D6-252.000.
- Albinson, Fred: See—  
Albinson, William; and Albinson, Fred, 271,616, Cl. D23-128.000.
- Albinson, William; and Albinson, Fred. Stove front. 271,616, 11-29-83, Cl. D23-128.000.
- Alpine Enterprises, Inc.: See—  
Powell, Clyde W., 271,566, Cl. D10-2.000.
- Powell, Clyde W., 271,567, Cl. D10-26.000.
- Alsop, W. Homer. Jeans or the like. 271,537, 11-29-83, Cl. D2-28.000.
- Arioka, Takanori: See—  
Kitada, Toyohiko; Tamura, Minoru; and Arioka, Takanori, 271,568, Cl. D10-46.000.
- Arrigoni, David M. Control station. 271,584, 11-29-83, Cl. D13-12.000.
- Ashcroft, James E. Compass. 271,590, 11-29-83, Cl. D19-38.000.
- Aspenwall, John E. Gun stock. 271,607, 11-29-83, Cl. D22-6.000.
- Babcock & Wilcox Company, The: See—  
Lui, Peter K.; Scheib, Thomas; and Whaley, George S., 271,569, Cl. D10-49.000.
- Badzinski, Richard D.; and Nigel, George G., to Shaft Lok, Inc. Propeller shaft lock housing. 271,583, 11-29-83, Cl. D12-317.000.
- Bakken, Christian S.; and Ronhaug, Jan B., to Norsk Hydro a.s. Metal bar. 271,588, 11-29-83, Cl. D15-144.000.
- Bauer, Harold F., to Conchemco, Incorporated. Windshield cleaner. 271,626, 11-29-83, Cl. D32-42.000.
- Bauer, Harold F., to Conchemco, Incorporated. Windshield cleaner. 271,627, 11-29-83, Cl. D32-42.000.
- Bauer, Harold F., to Conchemco, Incorporated. Windshield cleaner. 271,628, 11-29-83, Cl. D32-49.000.
- Baxter Travenol Laboratories, Inc.: See—  
Slater, Glenn L., 271,565, Cl. D9-370.000.
- Beanland, Elizabeth M. Doll. 271,597, 11-29-83, Cl. D21-166.000.
- Belland, Terrance C.; and Mackrell, William B., to Cornelius Company, The. Actuator handle for a beverage dispensing valve. 271,558, 11-29-83, Cl. D7-398.000.
- Bergmans, Charles, to Clarks of England, Inc. Shoe sole. 271,539, 11-29-83, Cl. D2-320.000.
- Berner, James H. Physical exerciser. 271,603, 11-29-83, Cl. D21-195.000.
- Blanchard, Russell O.: See—  
Minick, Harold N.; Blanchard, Russell O.; and Townsend, Donald L., 271,612, Cl. D22-19.000.
- Booher, Dale R.: See—  
Prikkel, John, III; Booher, Dale R.; and Killin, Jeffrey R., 271,615, Cl. D23-127.000.
- Bowen, Robert F.; Herbst, Walter B.; and Martel, Thomas J., to Raytheon Company. Microwave cooking utensil. 271,556, 11-29-83, Cl. D7-352.000.
- Bowsher, Robert L. Shoe rack. 271,547, 11-29-83, Cl. D6-153.000.
- Bowsher, Robert L. Shoe rack. 271,548, 11-29-83, Cl. D6-153.000.
- Bowsher, Robert L. Shoe rack. 271,549, 11-29-83, Cl. D6-153.000.
- Bradford, Wendell L., to Stang Hydraulics Inc. Air dome for pumping and dewatering systems. 271,585, 11-29-83, Cl. D15-7.000.
- Brown, Worthy H. Projectile for a shotgun. 271,609, 11-29-83, Cl. D22-10.000.
- Bulgari, Gianni. Necklace. 271,574, 11-29-83, Cl. D11-13.000.
- Cain, David E., to Halliburton Company. High temperature, high pressure filter press for testing drilling fluids or similar apparatus. 271,570, 11-29-83, Cl. D10-83.000.
- Calgon Corporation: See—  
Kleman, Gary B., 271,544, Cl. D6-95.000.
- Canon Kabushiki Kaisha: See—  
Hirata, Takashi; Motoyoshi, Junichi; Kobata, Yoshihiro; and Rachi, Masahiro, 271,589, Cl. D18-1.000.
- Chino, Kiyozumi: See—  
Wada, Seihei; and Chino, Kiyozumi, 271,573, Cl. D10-106.000.



- Clark, Susan C.: See—  
Stone, Lorraine D.; and Clark, Susan C., 271,593., Cl. D21-59.000.
- Clarks of England, Inc.: See—  
Bergmans, Charles, 271,539., Cl. D2-320.000.
- Coleco Industries, Inc.: See—  
Mercurio, Frank; and Ratkiewicz, Richard H., 271,594., Cl. D21-80.000.
- Collison, Alan, to Dobson Park Industries, Limited. Combined toy typewriter and loudspeaker therefor. 271,596., 11-29-83, Cl. D21-127.000.
- Conchemco, Incorporated: See—  
Bauer, Harold F., 271,626., Cl. D32-42.000.  
Bauer, Harold F., 271,627., Cl. D32-42.000.  
Bauer, Harold F., 271,628., Cl. D32-49.000.
- Cooper, Howard. Bottle. 271,564., 11-29-83, Cl. D9-325.000.
- Corey, Charles D.; and Pia, Francesco A. Marine rescue and recreational board. 271,606., 11-29-83, Cl. D21-228.000.
- Cornelius Company, The: See—  
Belland, Terrance C.; and Mackrell, William B., 271,558., Cl. D7-398.000.
- Corning Glass Works: See—  
Herrmann, Raymond J., 271,619., Cl. D24-29.000.  
Ziver, Garo M., 271,621., Cl. D26-35.000.
- Creelman, R. Douglas, to Georgian Manufacturing Ltd. Signalling device for detecting waves in a body of water. 271,572., 11-29-83, Cl. D10-106.000.
- Culkin, Susan J. Figurine. 271,577., 11-29-83, Cl. D11-161.000.
- Culkin, Susan J. Figurine. 271,578., 11-29-83, Cl. D11-161.000.
- Daenen, Robert H. C. M.; and Herlow, Erik, to Dart Industries Inc. Ice container. 271,555., 11-29-83, Cl. D7-78.000.
- Dart Industries Inc.: See—  
Daenen, Robert H. C. M.; and Herlow, Erik, 271,555., Cl. D7-78.000.
- Grusin, Gerald M., 271,554., Cl. D7-40.000.
- DeBoer, Jack P., to Residence Inn Corp. The. Building structure. 271,620., 11-29-83, Cl. D25-17.000.
- DeFuccio, Robert, to Simmons Universal Corporation. Chair. 271,543., 11-29-83, Cl. D6-73.000.
- De Lozada, Rudy. Western hat. 271,538., 11-29-83, Cl. D2-253.000.
- Dobson Park Industries, Limited: See—  
Collison, Alan, 271,596., Cl. D21-127.000.
- Eastern Company, The: See—  
Weinerman, Lee S., 271,562., Cl. D8-338.000.
- Eli Lilly and Company: See—  
Simpson, Barbara E.; and Gervais, Norman A., 271,623., Cl. D28-2.000.
- Emerson Electric Co.: See—  
Minick, Harold N.; Blanchard, Russell O.; and Townsend, Donald L., 271,612., Cl. D22-19.000.
- Energy Vent, Inc.: See—  
Prikkel, John, III; Booher, Dale R.; and Killin, Jeffrey R., 271,615., Cl. D23-127.000.
- Esposito, Dominic: See—  
Esposito, Michael; and Esposito, Dominic, 271,605., Cl. D21-226.000.
- Esposito, Michael; and Esposito, Dominic. Cap for skate wheel or similar article. 271,605., 11-29-83, Cl. D21-226.000.
- Finley, Randall B. Rifle sling. 271,608., 11-29-83, Cl. D22-7.000.
- Foster, Lorrie E. Child's doll. 271,599., 11-29-83, Cl. D21-171.000.
- Gehrie, Charles S., to Presto Lock, Inc. Rotary dial for combination locks and the like. 271,563., 11-29-83, Cl. D8-343.000.
- Georgian Manufacturing Ltd.: See—  
Creelman, R. Douglas, 271,572., Cl. D10-106.000.
- Gervais, Norman A.: See—  
Simpson, Barbara E.; and Gervais, Norman A., 271,623., Cl. D28-2.000.
- Gillette Company, The: See—  
Gray, Michael J., 271,625., Cl. D28-48.000.
- Gray, Michael J., to Gillette Company, The. Razor handle. 271,625., 11-29-83, Cl. D28-48.000.
- Grusin, Gerald M., to Dart Industries Inc. Container closure or the like. 271,554., 11-29-83, Cl. D7-40.000.
- Halliburton Company: See—  
Cain, David E., 271,570., Cl. D10-83.000.
- Hatcher, Robert L.: See—  
Stone, Frank B.; and Hatcher, Robert L., 271,604., Cl. D21-217.000.
- Helein, Charles H. Doll. 271,598., 11-29-83, Cl. D21-166.000.
- Herbst, Walter B.: See—  
Bowen, Robert F.; Herbst, Walter B.; and Martel, Thomas J., 271,556., Cl. D7-352.000.
- Herlow, Erik: See—  
Daenen, Robert H. C. M.; and Herlow, Erik, 271,555., Cl. D7-78.000.
- Herrmann, Raymond J., to Corning Glass Works. Specimen cup assembly for clinical chemistry analyzer. 271,619., 11-29-83, Cl. D24-29.000.
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- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,643., Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,644., Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,645., Cl. D12-300.000.
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- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,676., Cl. D12-300.000.
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- Norsk Hydro a.s.: See—  
Bakken, Christian S.; and Ronhaug, Jan B., 271,588., Cl. D15-144.000.
- Olympus Optical Co., Ltd.: See—  
Nishigaki, Shinichi, 271,618., Cl. D24-18.000.
- Pacific-Atlantic Products, Ltd.: See—  
Lummis, Michael G., 271,610., Cl. D22-13.000.  
Lummis, Michael G., 271,611., Cl. D22-13.000.
- Paulson, Ralph E. Lotion applicator. 271,624., 11-29-83, Cl. D28-7.000.
- Pia, Francesco A.: See—  
Cofey, Charles D.; and Pia, Francesco A., 271,606., Cl. D21-228.000.
- Poley, Kenneth P.: See—  
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,579., Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,580., Cl. D12-300.000.
- Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,581., Cl. D12-300.000.
- Powell, Clyde W., to Alpine Enterprises, Inc. Combined clock and inscription plate pedestal. 271,566., 11-29-83, Cl. D10-2.000.
- Powell, Clyde W., to Alpine Enterprises, Inc. Clock. 271,567., 11-29-83, Cl. D10-26.000.
- Presto Lock, Inc.: See—  
Gehrie, Charles S., 271,563., Cl. D8-343.000.
- Prikkel, John, III; Booher, Dale R.; and Killin, Jeffrey R., to Energy Vent, Inc. Damper unit. 271,615., 11-29-83, Cl. D23-127.000.
- Rachi, Masahiro: See—  
Hirata, Takashi; Motoyoshi, Junichi; Kobata, Yoshihiro; and Rachi, Masahiro, 271,589., Cl. D18-1.000.
- Ratkiewicz, Richard H.: See—  
Mercurio, Frank; and Ratkiewicz, Richard H., 271,594., Cl. D21-80.000.
- Rausch, Karl. Frame for a table. 271,551., 11-29-83, Cl. D6-191.000.
- Raytheon Company: See—  
Bowen, Robert F.; Herbst, Walter B.; and Martel, Thomas J., 271,556., Cl. D7-352.000.
- Reimann, Richard D.; and Usinger, Roger J. Wedge. 271,559., 11-29-83, Cl. D8-47.000.
- Residence Inn Corp., The: See—  
DeBoer, Jack P., 271,620., Cl. D25-17.000.
- Rockwell, Gary L. Automobile snack tray. 271,541., 11-29-83, Cl. D3-40.000.
- Rockwell, Gary L. Combined snack tray and litter basket for an automobile. 271,542., 11-29-83, Cl. D3-40.000.
- Ronhaug, Jan B.: See—  
Bakken, Christian S.; and Ronhaug, Jan B., 271,588., Cl. D15-144.000.
- Samuels, Howard, to A&E Products Group, Inc. Garment hanger. 271,552., 11-29-83, Cl. D6-252.000.
- Sand Designs, Inc.: See—  
Stone, Lorraine D.; and Clark, Susan C., 271,593., Cl. D21-59.000.
- Scheib, Thomas: See—  
Lui, Peter K.; Scheib, Thomas; and Whaley, George S., 271,569., Cl. D10-49.000.
- Schwarzli, Joseph W. Griddle. 271,557., 11-29-83, Cl. D7-363.000.
- Shaft Lok, Inc.: See—  
Badzinski, Richard D.; and Nigel, George G., 271,583., Cl. D12-317.000.
- Siecke, Albert E., to Warner-Lambert Co. Two color chewing gum. 271,536., 11-29-83, Cl. D1-12.000.
- Simmons Universal Corporation: See—  
DeFuccio, Robert, 271,543., Cl. D6-73.000.
- Simpson, Barbara E.; and Gervais, Norman A., to Eli Lilly and Company. Animal capsule. 271,623., 11-29-83, Cl. D28-2.000.
- Slater, Glenn L., to Baxter Travenol Laboratories, Inc. Bottle. 271,565., 11-29-83, Cl. D9-370.000.
- Smith, John N., to Lindsley, Warren F. B., a part interest. Collapsible rack for clothes hangers, bola ties or jewelry items. 271,546., 11-29-83, Cl. D6-124.000.
- Stang Hydraulics Inc.: See—  
Bradford, Wendell L., 271,585., Cl. D15-7.000.
- Stone, Frank B.; and Hatcher, Robert L., to Stone, Frank B. Golf putter head. 271,604., 11-29-83, Cl. D21-217.000.
- Stone, Lorraine D.; and Clark, Susan C., to Sand Designs, Inc. Sand mold. 271,593., 11-29-83, Cl. D21-59.000.
- Sun, George C. Ornament. 271,576., 11-29-83, Cl. D11-128.000.
- Tamura, Minoru: See—  
Kitada, Toyohiko; Tamura, Minoru; and Arioka, Takanori, 271,568., Cl. D10-46.000.
- Taylor, Ottillia Z.; and Lazar, Janos J., to Injection Mold Partners, Ltd. Toy track way. 271,591., 11-29-83, Cl. D21-59.000.
- Taylor, Ottillia Z.; and Lazar, Janos J., to Injection Mold Partners, Ltd. Toy trackway. 271,592., 11-29-83, Cl. D21-59.000.
- Taylor, Ottillia Z.; and Lazar, Janos J., to Injection Mold Partners, Ltd. Hoop exerciser. 271,602., 11-29-83, Cl. D21-191.000.
- Tokyo Keiki Company Limited: See—  
Kitada, Toyohiko; Tamura, Minoru; and Arioka, Takanori, 271,568., Cl. D10-46.000.
- Townsend, Donald L.: See—  
Minick, Harold N.; Blanchard, Russell O.; and Townsend, Donald L., 271,612., Cl. D22-19.000.
- Uro Denshi Kogyo Kabushiki Kaisha: See—  
Wada, Seihei; and Chino, Kiyozumi, 271,573., Cl. D10-106.000.
- Usinger, Roger J.: See—  
Reimann, Richard D.; and Usinger, Roger J., 271,559., Cl. D8-47.000.
- Valli & Colombo S.P.A.: See—  
Valli, Pasquale, 271,560., Cl. D8-308.000.  
Valli, Pasquale, 271,561., Cl. D8-308.000.
- Valli, Pasquale, to Valli & Colombo S.P.A. Lever handle for doors or windows. 271,560., 11-29-83, Cl. D8-308.000.
- Valli, Pasquale, to Valli & Colombo S.P.A. Lever handle for doors or windows. 271,561., 11-29-83, Cl. D8-308.000.
- Wada, Seihei; and Chino, Kiyozumi, to Uro Denshi Kogyo Kabushiki Kaisha. Ultra sonic alarm detector. 271,573., 11-29-83, Cl. D10-106.000.
- Warner-Lambert Company: See—  
Huzinec, Robert J., 271



# LIST OF PLANT PATENTEES

Ecke, Paul, Jr. Poinsettia plant named R-13. 5,150., 11-29-83, Cl. 86.000.  
 Kerrigan, Howard. Rhododendron plant 'Goldilocks'. 5,149., 11-29-83, Cl. 55.000.  
 Millane, Cornelius A. Red maple tree named Vase. 5,148., 11-29-83, Cl. 51.000.  
 Nor'East Miniature Roses, Inc.: See—  
 Saville, F. Harmon, 5,145., Cl. 7.000.  
 Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant. 5,145., 11-29-83, Cl. 7.000.  
 Skrhak, Sam S. Peach tree "Peppermint". 5,147., 11-29-83, Cl. 43.000.  
 Zaiger, Chris F. Almond tree (Garden Princess). 5,146., 11-29-83, Cl. 30.000.

PI 42

# CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 29, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	547	4,417,412	CLASS 69	266	4,417,512	204.25	4,417,573	665	4,417,949
161 A	4,417,359	630	4,417,413	13	4,417,458	205.12	4,417,574	CLASS 157	
CLASS 3		CLASS 43		CLASS 71		206.19	4,417,575	1.24	4,417,614
1.5	4,417,360	43.12	4,417,414	93	4,417,916	207.15	4,417,576	CLASS 162	
CLASS 4		CLASS 44		100	4,417,917	303 R	4,417,578	300	4,417,950
577	4,417,361	6	4,417,899	124	4,417,918	315	4,417,580	CLASS 164	
606	4,417,362	34	4,417,900	56	4,417,919	639	4,417,581	94	4,417,615
CLASS 8		51	4,417,901	CLASS 72		660	4,417,582	113	4,417,616
137	4,417,895	53	4,417,902	325	4,417,459	663	4,417,583	254	4,417,617
414	4,417,896	72	4,417,903	345	4,417,460	668	4,417,584	CLASS 165	
464	4,417,897	CLASS 47		367	4,417,461	680	4,417,585	12	4,417,618
543	4,417,898	1.4	4,417,415	430	4,417,462	682	4,417,586	113	4,417,619
CLASS 10		58	4,417,417	478	4,417,464	713	4,417,588	CLASS 166	
107 PH	4,417,363	CLASS 48		CLASS 73		716	4,417,589	245	4,417,620
CLASS 15		214 A	4,417,905	49.5	4,417,465	731	4,417,590	249	4,417,621
147 R	4,417,364	CLASS 49		105	4,417,466	786	4,417,591	264	4,417,622
256.51	4,417,365	199	4,417,418	117.3	4,417,467	CLASS 130	4,417,592	294	4,417,623
CLASS 16		348	4,417,419	118	4,417,468	27 HF	4,417,593	362	4,417,624
258	4,417,366	482	4,417,420	119 A	4,417,469	CLASS 131		387	4,417,625
CLASS 17		CLASS 51		154	4,417,470	110	4,417,594	CLASS 169	
21	4,417,367	16	4,417,421	204	4,417,471	CLASS 132		37	4,417,626
49	4,417,368	50 R	4,417,422	304 C	4,417,472	85	4,417,595	CLASS 172	
CLASS 19		283 R	4,417,423	438	4,417,473	CLASS 133		45	4,417,627
258	4,417,369	307	4,417,906	606	4,417,474	CLASS 134		CLASS 173	
CLASS 24		CLASS 52		660	4,417,476	17	4,417,926	29	4,417,628
3 L	4,417,370	108	4,417,424	766	4,417,477	152	4,417,596	CLASS 174	
30.5 R	4,417,371	125.5	4,417,425	801	4,417,478	CLASS 135		34	4,418,239
163 R	4,417,372	126.7	4,417,426	861.16	4,417,479	102	4,417,597	73 R	4,418,240
458	4,417,373	167	4,417,427	861.18	4,417,480	CLASS 136		121 SR	4,418,241
CLASS 28		172	4,417,428	861.28	4,417,481	246	4,418,238	CLASS 175	
181	4,417,374	182	4,417,429	861.38	Re.31,450	CLASS 137		365	4,417,629
272	4,417,375	584	4,417,430	409	4,417,482	2	4,417,598	CLASS 177	
CLASS 29		715	4,417,431	476	Re.31,451	85	4,417,599	1	4,417,630
26 A	4,417,376	CLASS 53		553	4,417,483	553	4,417,600	210 FP	4,417,631
33 M	4,417,377	77	4,417,432	688	4,417,484	556.6	4,417,601	212	4,417,632
35.5	4,417,378	413	4,417,433	785	4,417,485	625.17	4,417,602	CLASS 178	
148.4 R	4,417,380	469	4,417,434	813 R	4,417,486	CLASS 138		19	4,418,242
156.8 H	4,417,381	532	4,417,435	63	4,417,920	149	4,417,603	CLASS 179	
421 R	4,417,382	CLASS 55		125	4,417,921	CLASS 139		2 A	4,418,244
511	4,417,383	38	4,417,907	236	4,417,922	329	4,417,604	2.51	4,418,245
526 R	4,417,384	523	4,417,908	257	4,417,923	383 R	4,417,605	111 E	4,418,246
571	4,417,385	CLASS 56		4,417,924	CLASS 81	448	4,417,606	115.5 R	4,418,247
590	4,417,386	341	4,417,436	53.2	4,417,487	CLASS 141		156 R	4,418,248
591	4,417,387	CLASS 59		185	4,417,488	1	4,417,607	170 NC	4,418,249
598	4,417,388	20	4,417,437	CLASS 82		1.1	4,417,608	175.3 R	4,418,250
619	4,417,389	CLASS 60		1 C	4,417,489	91	4,417,610	CLASS 180	
730	4,417,390	39.05	4,417,438	2 B	4,417,490	98	4,417,609	22	4,417,634
825	4,417,391	39.141	4,417,439	2.7	4,417,491	CLASS 145		68 R	4,417,635
840	4,417,392	39.281	4,417,440	46	4,417,492	61 EA	4,417,611	116	4,417,636
846	4,417,393	251	4,417,441	CLASS 83		CLASS 148		125	4,417,637
882	4,417,394	293	4,417,442	15	4,417,493	16.6	4,417,927	132	4,417,638
884	4,417,396	525	4,417,443	175	4,417,495	144	4,417,928	142	4,417,639
CLASS 30		554	4,417,444	CLASS 84		433	4,417,929	147	4,417,640
34.2	4,417,397	641.7	4,417,446	1.03	4,417,494	CLASS 149		247	4,417,641
116	4,417,398	712	4,417,447	1.27	4,417,496	19.9	4,417,930	249	4,417,642
CLASS 33		CLASS 62		485 R	4,417,497	CLASS 150		254	4,417,643
172 E	4,417,400	6	4,417,448	CLASS 89		40	4,417,612	287	4,417,644
175	4,417,401	12	4,417,449	1.814	4,417,498	52 R	4,417,613	CLASS 182	
199 R	4,417,402	28	4,417,450	36 K	4,417,499	62.2	4,417,931	135	4,417,645
265	4,417,403	126	4,417,451	CLASS 91		64	4,417,932	94	4,417,646
277	4,417,404	129	4,417,452	369 A	4,417,500	CLASS 156		CLASS 187	
448	4,417,399	155	4,417,453	375 A	4,417,501	62.2	4,417,933	CLASS 188	
CLASS 34		503	4,417,453	447	4,417,502	80	4,417,934	73.38	4,417,647
39	4,417,405	CLASS 65		CLASS 92		145	4,417,935	119	4,417,648
155	4,417,406	3.12	4,417,910	240	4,417,503	169	4,417,937	35	4,418,251
CLASS 36		33	4,417,911	CLASS 99		270	4,417,938	CLASS 191	
3 B	4,417,407	59.1	4,417,912	306	4,417,504	282	4,417,939	CLASS 192	
36 R	4,417,408	60.53	4,417,913	323.6	4,417,505	25 B	4,417,565	3 R	4,417,649
CLASS 37		159	4,417,915	348	4,417,506	451	4,417,566	56 R	4,417,650
2 R	4,417,416	CLASS 66		352	4,417,507	CLASS 128		89 B	4,417,651
CLASS 38		123	4,417,454	355	4,417,508	1 R	4,417,567	CLASS 198	
102.91	4,417,409	207	4,417,455	467	4,417,509	33	4,417,568	511	4,417,652
CLASS 40		214	4,417,456	CLASS 100		77	4,417,569	718	4,417,653
330	4,417,410	CLASS 68		98 R	4,417,510	87 R	4,417,570	815	4,417,654
443	4,417,411	17 A	4,417,457	229 R	4,417,511	92 B	4,417,571		
						134	4,417,572		

PI 43



16 A	4,418,252	4	4,417,676	123.5	4,418,013	113	4,417,768	4,418,348	526	4,418,390
35 R	4,418,253	26	4,417,677	125	4,418,014	117	4,418,288	4,418,349	551	4,418,391
68.3	4,418,254	43	4,417,678	242.2	4,418,015	142	4,418,289	4,418,350	571	4,418,392
147 A	4,418,255	93	4,417,679	404	4,418,016	359	4,418,290	4,418,351	724	4,418,393
148 R	4,418,256	181	4,417,680	465 E	4,418,017	797	4,418,291	4,418,352	746	4,418,394
159 B	4,418,257	109	4,417,681	502.5 C	4,418,018	140 R	4,418,292	4,418,353	900	4,418,395
		67	4,417,682	544 Y	4,418,019		4,418,293	4,418,354		4,418,396
		109	4,417,683	943	4,418,020			4,418,355		4,418,397
		15	4,417,684	944	4,418,021			4,418,356		4,418,398
		40	4,417,685		4,418,022			4,418,357		
		52 B	4,417,686					4,418,358		
		61 L	4,418,273					4,418,359		
		85 R	4,418,274					4,418,360		
		462	4,418,276					4,418,361		
		472	4,418,277					4,418,362		
		487	4,418,278					4,418,363		
								4,418,364		
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								4,418,366		
								4,418,367		
								4,418,368		
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								4,418,538		
								4,418,539		
								4,418,540		
								4,418,541</		



# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama .....	1	Kentucky .....	21	Oregon .....	41
Alaska .....	2	Louisiana .....	22	Pennsylvania .....	42
American Samoa .....	3	Maine .....	23	Puerto Rico .....	43
Arizona .....	4	Maryland .....	24	Rhode Island .....	44
Arkansas .....	5	Massachusetts .....	25	South Carolina .....	45
California .....	6	Michigan .....	26	South Dakota .....	46
Canal Zone .....	7	Minnesota .....	27	Tennessee .....	47
Colorado .....	8	Mississippi .....	28	Texas .....	48
Connecticut .....	9	Missouri .....	29	Utah .....	49
Delaware .....	10	Montana .....	30	Vermont .....	50
District of Columbia .....	11	Nebraska .....	31	Virginia .....	51
Florida .....	12	Nevada .....	32	Virgin Islands .....	52
Georgia .....	13	New Hampshire .....	33	Washington .....	53
Guam .....	14	New Jersey .....	34	West Virginia .....	54
Hawaii .....	15	New Mexico .....	35	Wisconsin .....	55
Idaho .....	16	New York .....	36	Wyoming .....	56
Illinois .....	17	North Carolina .....	37	U.S. Air Force .....	57
Indiana .....	18	North Dakota .....	38	U.S. Army .....	58
Iowa .....	19	Ohio .....	39	U.S. Navy .....	59
Kansas .....	20	Oklahoma .....	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,417,859	02 : 4,418,315	10 : 4,417,915	18 : 4,417,599	26 : 4,418,363	34 : 4,418,306
2 : 4,418,100	04 : 4,418,381	12 : 4,417,998	20 : 4,417,660	28 : 4,418,407	36 : 4,418,319
3 : 4,418,119	06 : 4,417,565	14 : 4,418,266	22 : 4,417,661	30 : 4,418,408	38 : 4,418,327
4 : 4,417,672	08 : 4,417,586	16 : 4,418,351	24 : 4,417,678	32 : 4,418,427	40 : 4,418,334
5 : 4,417,563	10 : 4,417,913	18 : 4,417,638	26 : 4,417,681	34 : 4,418,339	42 : 4,418,384
6 : 4,417,669	12 : 4,417,959	20 : 4,417,655	28 : 4,417,685	36 : 4,418,384	44 : 4,418,390
7 : 4,417,814	14 : 4,417,380	22 : 4,417,917	30 : 4,417,753	38 : 4,418,261	46 : 4,418,390
8 : 4,417,852	16 : 4,417,438	24 : 4,418,164	32 : 4,417,777	40 : 4,418,309	48 : 4,417,376
9 : 4,418,343	18 : 4,417,472	26 : 4,418,232	34 : 4,417,851	42 : 4,417,703	50 : 4,417,376
10 : 4,417,571	20 : 4,417,488	28 : 4,418,285	36 : 4,417,853	44 : 4,417,748	52 : 4,417,383
11 : 4,417,361	22 : 4,417,512	30 : 4,417,414	38 : 4,417,867	46 : 4,418,021	54 : 4,417,420
12 : 4,417,402	24 : 4,417,521	32 : 4,417,460	40 : 4,417,890	48 : 4,418,260	56 : 4,417,457
13 : 4,417,426	26 : 4,417,548	34 : 4,417,485	42 : 4,417,891	50 : 4,417,403	58 : 4,417,557
14 : 4,417,431	28 : 4,417,573	36 : 4,417,519	44 : 4,417,992	52 : 4,417,684	60 : 4,417,636
15 : 4,417,473	30 : 4,417,607	38 : 4,417,538	46 : 4,418,003	54 : 4,417,824	62 : 4,417,657
16 : 4,417,474	32 : 4,417,611	40 : 4,417,566	48 : 4,418,006	56 : 4,417,975	64 : 4,417,694
17 : 4,417,477	34 : 4,417,648	42 : 4,417,570	50 : 4,418,064	58 : 4,418,398	66 : 4,417,721
18 : 4,417,487	36 : 4,417,677	44 : 4,417,581	52 : 4,418,080	60 : 4,417,370	68 : 4,417,741
19 : 4,417,498	38 : 4,417,726	46 : 4,417,646	54 : 4,418,081	62 : 4,417,447	70 : 4,417,745
20 : 4,417,520	40 : 4,417,739	48 : 4,417,670	56 : 4,418,101	64 : 4,417,589	72 : 4,417,750
21 : 4,417,588	42 : 4,417,774	50 : 4,417,691	58 : 4,418,125	66 : 4,417,664	74 : 4,417,764
22 : 4,417,707	44 : 4,417,779	52 : 4,417,718	60 : 4,418,189	68 : 4,418,008	76 : 4,417,766
23 : 4,417,714	46 : 4,417,782	54 : 4,417,742	62 : 4,418,193	70 : 4,418,049	78 : 4,417,903
24 : 4,417,755	48 : 4,417,783	56 : 4,417,767	64 : 4,418,223	72 : 4,418,246	80 : 4,417,906
25 : 4,417,780	50 : 4,417,788	58 : 4,417,876	66 : 4,418,225	74 : 4,417,360	82 : 4,417,968
26 : 4,417,813	52 : 4,417,791	60 : 4,418,158	68 : 4,418,237	76 : 4,417,663	84 : 4,418,031
27 : 4,417,825	54 : 4,417,818	62 : 4,418,176	70 : 4,418,239	78 : 4,417,730	86 : 4,418,117
28 : 4,417,930	56 : 4,417,854	64 : 4,418,181	72 : 4,418,252	80 : 4,417,849	88 : 4,418,165
29 : 4,417,947	58 : 4,417,856	66 : 4,418,302	74 : 4,418,279	82 : 4,417,967	90 : 4,418,168
30 : 4,417,974	60 : 4,417,914	68 : 4,418,320	76 : 4,418,333	84 : 4,418,035	92 : 4,418,182
31 : 4,418,038	62 : 4,418,023	70 : 4,418,324	78 : 4,418,365	86 : 4,418,040	94 : 4,418,194
32 : 4,418,052	64 : 4,418,222	72 : 4,418,383	80 : 4,417,392	88 : 4,418,212	96 : 4,418,198
33 : 4,418,203	66 : 4,418,250	74 : 4,417,450	82 : 4,417,408	90 : 4,418,409	98 : 4,418,201
34 : 4,418,206	68 : 4,418,257	76 : 4,417,451	84 : 4,417,423	92 : 4,418,425	100 : 4,418,336
35 : 4,418,210	70 : 4,418,281	78 : 4,417,526	86 : 4,417,489	94 : 4,417,362	102 : 4,418,388
36 : 4,418,331	72 : 4,418,282	80 : 4,417,713	88 : 4,417,490	96 : 4,417,391	104 : 4,418,394
37 : 4,418,350	74 : 4,418,314	82 : 4,417,839	90 : 4,417,543	98 : 4,417,495	106 : 4,417,367
38 : 4,418,368	76 : 4,418,337	84 : 4,418,244	92 : 4,417,572	100 : 4,417,612	108 : 4,417,416
39 : 4,418,382	78 : 4,418,346	86 : 4,417,862	94 : 4,417,608	102 : 4,417,712	110 : 4,417,418
40 : 4,418,404	80 : 4,418,369	88 : 4,417,560	96 : 4,417,617	104 : 4,417,770	112 : 4,417,452
41 : 4,418,413	82 : 4,418,370	90 : 4,417,633	98 : 4,417,633	106 : 4,417,873	114 : 4,417,756
42 : 4,418,426	84 : 4,418,378	92 : 4,417,644	100 : 4,417,662	108 : 4,417,884	116 : 4,417,888
43 : 4,418,430	86 : 4,418,394	94 : 4,417,379	102 : 4,417,869	110 : 4,417,942	118 : 4,418,098
44 : 4,417,687	88 : 4,417,590	96 : 4,417,394	104 : 4,417,924	112 : 4,417,944	120 : 4,418,105
45 : 4,418,092	90 : 4,417,710	98 : 4,417,410	106 : 4,417,991	114 : 4,418,114	122 : 4,418,110
46 : 4,418,097	92 : 4,417,894	100 : 4,417,469	108 : 4,418,009	116 : 4,418,127	124 : 4,418,120
47 : 4,417,433	94 : 4,417,439	102 : 4,417,483	110 : 4,418,053	118 : 4,418,129	126 : 4,418,123
48 : 4,417,667	96 : 4,417,467	104 : 4,417,496	112 : 4,418,068	120 : 4,418,139	128 : 4,418,287
49 : 4,417,848	98 : 4,417,506	106 : 4,417,502	114 : 4,418,148	122 : 4,418,149	130 : 4,418,357
50 : 4,418,047	100 : 4,417,790	108 : 4,417,542	116 : 4,418,190	124 : 4,418,151	132 : 4,418,400
51 : 4,418,183	102 : 4,417,816	110 : 4,417,577	118 : 4,418,226	126 : 4,418,278	134 : 4,417,916
52 : 4,418,273	104 : 4,417,872	112 : 4,417,598	120 : 4,418,271	128 : 4,418,291	136 : 4,417,458
				130 : 4,418,292	138 : 4,417,574

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 47

32 :	4,417,861 4,417,940 4,417,949 4,418,083 4,418,195 4,418,229 4,265,393 4,417,425 4,417,609 4,417,725 4,417,727 33 : 4,417,799 34 : 4,417,430 4,417,465 4,417,478 4,417,539 4,417,582 4,417,585 4,417,591 4,417,613 4,417,639 4,417,692 4,417,729 4,417,733 4,417,778 4,417,786 4,417,822 4,417,879 4,417,892 4,417,909 4,417,973 4,417,981 4,417,986 4,418,010 4,418,011 4,418,051 4,418,067 4,418,076 4,418,087 4,418,099 4,418,107 4,418,134 4,418,135 4,418,154 4,418,155 4,418,166 4,418,169 4,418,208	36 :	4,418,227 4,418,235 4,418,268 4,418,297 4,418,312 4,418,344 4,418,359 4,418,364 4,418,366 4,418,428 4,417,385 4,417,389 4,417,393 4,417,395 4,417,412 4,417,417 4,417,476 4,417,513 4,417,524 4,417,525 4,417,546 4,417,569 4,417,576 4,417,578 4,417,592 4,417,615 4,417,658 4,417,679 4,417,683 4,417,699 4,417,706 4,417,708 4,417,716 4,417,737 4,417,757 4,417,801 4,417,802 4,417,804 4,417,837 4,417,902 4,417,908 4,417,927 4,417,936 4,417,948 4,417,966 4,418,024 4,418,025 4,418,039	37 :	4,418,055 4,418,059 4,418,078 4,418,082 4,418,086 4,418,124 4,418,131 4,418,157 4,418,224 4,418,251 4,418,289 4,418,308 4,418,332 4,418,353 4,418,355 4,418,356 4,418,429 4,417,369 4,417,492 4,417,645 4,417,686 4,417,695 4,418,116 4,418,254 4,417,530 4,417,971 4,418,005 4,418,029 4,418,145 4,417,373 4,417,388 4,417,390 4,417,398 4,417,409 4,417,459 4,417,462 4,417,509 4,417,523 4,417,602 4,417,628 4,417,651 4,417,668 4,417,715 4,417,744 4,417,769 4,417,845 4,417,868 4,417,939 4,417,957	40 :	4,417,990 4,418,071 4,418,102 4,418,108 4,418,130 4,418,167 4,418,171 4,418,178 4,418,179 4,418,185 4,418,188 4,418,202 4,418,219 4,418,231 4,418,310 4,418,328 4,418,375 4,418,389 4,417,470 4,417,480 4,417,562 4,417,622 4,417,899 4,417,904 4,417,971 4,418,005 4,418,029 4,418,050 4,418,145 4,418,191 4,418,234 4,418,258 4,418,317 4,417,378 4,417,405 4,417,436 4,417,449 4,417,479 4,417,601 4,417,626 4,417,711 4,417,736 4,417,838 4,417,855 4,417,886 4,417,921 4,417,925	44 : 45 : 47 :	4,417,372 4,417,432 4,417,528 4,417,614 4,417,659 4,417,680 4,417,959 4,417,999 4,418,000 4,418,001 4,418,002 4,418,093 4,418,153 4,417,363 4,417,396 4,417,497 4,417,527 4,417,600 4,417,620 4,417,621 4,417,623 4,417,624 4,417,629 4,417,631 4,417,732 4,417,738 4,417,831 4,417,842 4,417,846	49 : 51 :	4,417,372 4,417,432 4,417,528 4,417,614 4,417,659 4,417,680 4,417,959 4,417,999 4,418,000 4,418,001 4,418,002 4,418,093 4,418,153 4,417,363 4,417,396 4,417,497 4,417,527 4,417,600 4,417,620 4,417,621 4,417,623 4,417,624 4,417,629 4,417,631 4,417,732 4,417,738 4,417,831 4,417,842 4,417,846	53 :	4,417,415 4,417,424 4,417,428 4,417,463 4,418,093 4,418,153 4,417,363 4,417,396 4,417,497 4,417,527 4,417,600 4,417,620 4,417,621 4,417,623 4,417,624 4,417,629 4,417,631 4,417,732 4,417,738 4,417,831 4,417,842 4,417,846	54 : 55 :	4,417,547 4,417,482 4,417,567 4,417,765 4,417,624 4,417,935 4,417,938 4,417,956 4,418,074 4,418,371 4,418,374	4,417,858 4,417,860 4,417,881 4,417,883 4,417,907 4,417,928 4,417,961 4,418,062 4,418,095 4,418,109 4,418,209 4,418,214 4,418,228 4,418,243 4,418,301 4,418,322 4,418,402 4,418,405 4,416,358 4,418,393 4,417,448 4,418,286 4,418,294 4,418,318 4,418,401 4,417,415 4,417,424 4,417,428 4,417,463 4,418,093 4,418,153 4,417,363 4,417,396 4,417,758 4,417,835 4,418,111 4,418,379 4,417,547 4,417,482 4,417,567 4,417,765 4,417,624 4,417,935 4,417,938 4,417,956 4,418,074 4,418,371 4,418,374
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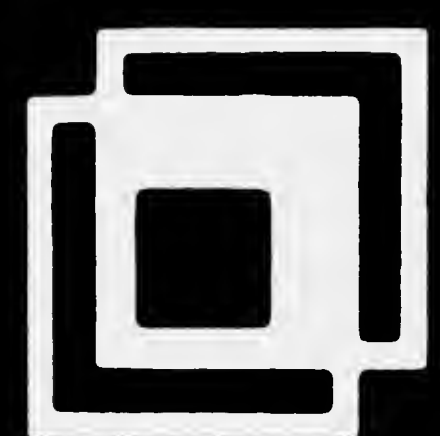
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